AGREEMENT BETWEEN COUNTY AND ENGINEER

THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES; CONSULTATION WITH AN ATTORNEY IS ENCOURAGED WITH RESPECT TO ITS COMPLETION OR MODIFICATION.

THIS AGREEMENT is made on the 6 day of February, 2024,

Between the **COUNTY:** BRAZOS COUNTY, TEXAS
c/o Brazos County Commissioners Court
Attention: County Judge
200 S. Texas Ave.
Suite 332
Bryan, Texas 77803

and the **ENGINEER:** QUIDDITY ENGINEERING LLC
Attention: Doug Bramwell, PE, RPLS
150 Venture Drive, Suite 100
College Station, Texas 77845

for the following **PROJECT:** Professional Engineering and Surveying Services for development of an alignment study, design schematic, environmental documents, and studies in support of the schematic work, public involvement, permit procurement, data collection and analysis, drainage, conceptual traffic control, traffic projections, traffic engineering and operations including capacity analysis, traffic simulations, safety analysis, and 3-D modeling, limited surveying and mapping, utility engineering investigation, and limited utility coordination for Inner Loop Phase 1 (New Location) from SH 6 North of Bryan to W.D. Fitch in Brazos County, Texas.

in an **AMOUNT** not to exceed: $ 11,201,952.00

The COUNTY and ENGINEER agree as set forth below.

ARTICLE I
ENGINEER'S RESPONSIBILITY

1.1 ENGINEER'S SERVICE

1.1.1 The ENGINEER'S services consist of those services performed by the ENGINEER, ENGINEER'S employees and the ENGINEER'S consultants as enumerated in Articles 2 and 3 of this Agreement.

1.1.2 The ENGINEER'S services shall be performed as expeditiously as is consistent with professional skill and care and the orderly progress of the Work. The ENGINEER shall submit for the COUNTY'S approval a schedule for the performance of the ENGINEER'S services which may be adjusted as the Project proceeds and shall include allowances for periods of time required for the COUNTY'S review and for approval of submissions by authorities having jurisdiction over the Project. Time limits established by this schedule approved by the COUNTY shall not, except for reasonable cause, be exceeded by the ENGINEER or the COUNTY.

ARTICLE II
SCOPE OF ENGINEER'S BASIC SERVICES

2.1 DEFINITION

2.1.1 The ENGINEER'S Basic Services consist of those described in attached Exhibit "A" and incorporated by reference hereto – SCOPE OF BASIC SERVICES TO BE PROVIDED BY QUIDDITY ENGINEERING LLC, TO BRAZOS COUNTY.

ARTICLE III
ADDITIONAL SERVICES

3.1 GENERAL

3.1.1 The services described in attached Exhibit "B" as Additional Services are not included in the Basic Services. It is expressly understood and agreed that ENGINEER shall not furnish any of the additional services without the prior written authorization of the COUNTY or the COUNTY'S designee. The COUNTY shall have no obligation to pay for such additional services, which have been performed without the prior written authorization of the COUNTY as herein above provided.

3.1.2 Services which could possibly be required, but at the time of this Agreement were yet to be determined and which are not included in the Basic Services or Additional Services as identified and described in EXHIBIT "A" and EXHIBIT "B," respectively, shall be considered Contingent Additional Services. A list of possible Contingent Additional Services that could be needed as the Project proceeds is included at the end of Exhibit "B."

It is expressly understood and agreed that the ENGINEER shall not furnish any of the Contingent Additional Services without the prior written authorization of the COUNTY or the COUNTY'S designee. The COUNTY shall have no obligation to pay for such Contingent Additional Services, which have been performed without the prior written authorization of the COUNTY as herein above provided.

ARTICLE IV
COUNTY'S RESPONSIBILITY

4.1 The COUNTY shall provide full information regarding requirements for the Project, including a program, which shall set forth the COUNTY's objective, schedules, constraints, and criteria.

4.2 The COUNTY shall establish and update an overall budget for the Project, including the Construction Cost, the COUNTY'S other costs and reasonable contingencies related to all of these costs.

4.3 The COUNTY shall designate a representative authorized to act on the COUNTY'S behalf with respect to the Project. The COUNTY, or such authorized representative, shall render decisions in a timely manner pertaining to documents submitted by the ENGINEER in order to avoid unreasonable delay in the orderly and sequential progress of the ENGINEER'S service.

4.4 The COUNTY shall give prompt written notice to the ENGINEER if the COUNTY becomes aware of any fault or defect in the Project or non-conformance with the contract documents. Any delay by the COUNTY in providing said notice shall not constitute a waiver, a bar or act to estop the COUNTY from exercising any of its rights under this contract.

4.5 Examine all studies, reports, sketches, drawings, specifications, proposals and other documents presented by the ENGINEER, obtain advice of an attorney, insurance counselor and other consultants as the COUNTY deems appropriate for such examination and render in writing decisions pertaining thereto within a reasonable time so as not to delay the services of the ENGINEER.

4.6 The proposed language of certificates or certifications requested of the ENGINEER or the ENGINEER'S consultants shall be submitted to the ENGINEER for review and approval at least 14 days prior to execution. The COUNTY shall not request certifications that would require knowledge or services beyond the scope of this Agreement.

4.7 The COUNTY shall also provide those specific items identified in the attached Exhibit A incorporated by reference hereto – ITEMS TO BE PROVIDED BY THE COUNTY TO THE ENGINEER.

ARTICLE V
CONSTRUCTION COST

5.1 DEFINITION

5.1.1 The Construction Cost shall be the total cost or estimated cost to the COUNTY of all elements of the Project designed or specified by the ENGINEER.

5.1.2 The Construction Cost shall include the cost at current market rates of labor and materials furnished by the COUNTY and equipment designed, specified, selected or specially provided by the ENGINEER, plus a reasonable allowance for the Contractor's overhead and profit. In addition, a reasonable allowance for contingencies shall be included for market conditions at the time of bidding and for changes in the work during construction.

5.1.3 Construction Cost does not include the compensation of the ENGINEER and the ENGINEER'S consultants, the costs of the land, right-of-way, financing or other costs which are the responsibility of the COUNTY.

5.2 RESPONSIBILITY FOR CONSTRUCTION COSTS

5.2.1 Evaluations of the COUNTY'S Project budget, preliminary estimates of Construction Cost and

detailed estimates of Construction Cost, if any, prepared by the ENGINEER, represent the ENGINEER'S best judgment as a design professional familiar with the construction industry. It is recognized, however, that neither the ENGINEER nor the COUNTY has control over the cost of labor, materials or equipment, over the Contractor's methods of determining bid prices, or over competitive bidding, market or negotiating conditions. Accordingly, the ENGINEER cannot and does not warrant or represent that bids or negotiated prices will not vary from the COUNTY'S Project budget or from any estimate of Construction Cost or evaluation prepared or agreed to by the ENGINEER.

ARTICLE VI
USE OF ENGINEER'S DRAWINGS, SPECIFICATIONS, AND OTHER DOCUMENTS

6.1 The COUNTY shall be the absolute and unqualified owner of all drawings, preliminary layouts, record drawings, sketches and other documents prepared pursuant to this Agreement by the ENGINEER with the same force and effect as if the COUNTY prepared same. Copies of complete or partially completed mylar reproducible, preliminary layouts, record drawings, sketches and other documents prepared pursuant to this Agreement shall be delivered to the COUNTY when and if this Agreement is terminated or upon completion of this Agreement, whichever occurs first. The ENGINEER may retain one set of reproducible copies of the documents and these copies shall be for the ENGINEER'S sole use in preparation of studies or reports for the COUNTY. The ENGINEER is expressly prohibited from selling, licensing, or otherwise marketing or donating these documents, or using the documents in preparation of other work for any other client, without the prior express written permission of the COUNTY.

6.2 All documents including reports, drawings and specifications prepared by the ENGINEER pursuant to this Agreement are instruments of service in respect of the Project. They are not intended or represented to be suitable for reuse by the COUNTY or others on extensions of the Project or on any other project. Any reuse without written verification or adaptation by the ENGINEER for the specific purposes intended will be at the COUNTY'S sole risk and without liability or legal exposure to the ENGINEER. Any such verification or adaptation will entitle the ENGINEER to further compensation at rates to be agreed upon by the COUNTY and the ENGINEER.

6.3 Submission or distribution of documents to meet official regulatory requirements or for similar purposes in connection with the Project is not to be construed as publication in derogation of the ENGINEER'S reserved rights.

ARTICLE VII
TERMINATION, SUSPENSION, OR ABANDONMENT

7.1 This Agreement may be terminated by either party upon not less than fourteen (14) days written notice should the other party fail to substantially perform in accordance with the terms of this Agreement through no fault of the party initiating the termination.

7.2 If the COUNTY suspends the Project for more than thirty (30) consecutive days, the ENGINEER shall be compensated for services performed prior to notice of such suspension.

7.3 This Agreement may be terminated by the COUNTY upon not less than fourteen (14) days written notice to the ENGINEER in the event that the Project is permanently abandoned. If the COUNTY abandons the Project for more than ninety (90) consecutive days, the ENGINEER may terminate this Agreement by

giving written notice.

7.4 If the COUNTY fails to give prompt written authorization to proceed with any phase of services after completion of the immediately preceding phase, the ENGINEER may, after giving seven (7) days written notice to the COUNTY, suspend services under this Agreement.

7.5 Failure of the COUNTY to make payments to the ENGINEER in accordance with this Agreement shall be considered substantial nonperformance and cause for termination.

7.6 If the COUNTY fails to make payment when due to the ENGINEER for services and expenses, the ENGINEER may, upon seven (7) days written notice to the COUNTY, suspend performance of services under this Agreement. Unless the ENGINEER receives payment in full within seven (7) days of the date of the notice, the suspension shall take effect without further notice. In the event of a suspension of services, the ENGINEER shall have no liability to the COUNTY for delay or damage caused by the COUNTY because of suspension of services.

7.7 In the event of termination that is not the fault of the ENGINEER, the ENGINEER shall be compensated for services performed prior to termination, together with Reimbursable Expenses, if any, then due.

ARTICLE VIII
MISCELLANEOUS PROVISIONS

8.1 Unless otherwise provided, this Agreement shall be governed by the law of the principal place of business of the COUNTY. Venue for any dispute or disagreement regarding the terms of this Agreement shall be in Brazos County, Texas.

8.2 Causes of action between the parties to this Agreement pertaining to acts or failures to act shall be deemed to have accrued and the applicable statutes of limitation shall commence to run not later than either the date of Substantial Completion, or the date of issuance of the final Certificate for Payment for acts or failures to act occurring after Substantial Completion.

8.3 The COUNTY and the ENGINEER, respectively, bind themselves, their partners, successors, assigns and legal representatives to the other party to this Agreement and to the partners, successors, assigns and legal representative of such other party with respect to all covenants of this Agreement. Neither the COUNTY nor the ENGINEER shall assign this Agreement without the express written consent of the other party.

8.4 This Agreement represents the entire integrated agreement between the COUNTY and the ENGINEER and supersedes all prior negotiations, representations or agreements, either written or oral. This Agreement may be amended only by written instrument signed by both the COUNTY and the ENGINEER.

8.5 Nothing contained in this Agreement shall create a contractual relationship with or a cause of action in favor of a third party against either the COUNTY or the ENGINEER.

8.6 Unless otherwise provided for in this Agreement, the ENGINEER and the ENGINEER'S consultants have no responsibility for the discovery, presence, handling, removal or disposal of, or exposure

of persons to, hazardous materials in any form at the Project site, including but not limited to asbestos, asbestos products, polychlorinated biphenyl (PCB) or other toxic substances.

8.7 The ENGINEER shall have the right to include representations of the design of the Project, including photographs, among the ENGINEER'S promotional professional materials. The ENGINEER'S materials shall not include the COUNTY'S confidential or proprietary information, if the COUNTY has previously advised the ENGINEER in writing of the specific information considered by the COUNTY to be confidential or proprietary.

8.8 COMPLIANCE AND STANDARDS. The ENGINEER agrees to perform the work hereunder in accordance with generally accepted standards applicable thereto, and shall use that degree of care and skill commensurate with the engineering profession to comply with all applicable state, federal and local laws, ordinances, rules and regulations relating to the work to be performed hereunder and the ENGINEER'S performance.

8.9 SURVEYING SERVICES: In accordance with the Professional Land Surveying Practices Act of 1989, the COUNTY is informed that any complaints about surveying services may be forwarded to the Texas Board of Professional Land Surveying, 7701 North Lamar, Suite 400, Austin, Texas 78752, (512) 452-9427.

8.10 INDEMNIFICATION: ENGINEER shall save and hold harmless the COUNTY from and against any and all claims and liability due to activities of the ENGINEER, its agents or employees, performed under this Agreement and which result from any negligent act, error, or omission of the ENGINEER, or of any person employed by the ENGINEER. The ENGINEER shall also save harmless the COUNTY from and against any and all expenses, including attorney's fees which might be incurred by the COUNTY in litigation, or otherwise, resisting said claims or liabilities which might be imposed on the COUNTY as the result of such activities by the ENGINEER, its agents or employees.

ARTICLE IX
PAYMENTS TO THE ENGINEER

9.1 PAYMENTS ON ACCOUNT OF BASIC SERVICES

9.1.1 Upon approval by the COUNTY, or the COUNTY'S designee, payment for Basic Services shall be made monthly and shall be in proportion to services performed that month within each phase of service.

9.2 PAYMENTS ON ACCOUNT OF ADDITIONAL SERVICES

9.2.1 Upon approval by the COUNTY or the COUNTY'S designee of the ENGINEER'S statement of services rendered or expenses incurred, payment on account of the ENGINEER'S Additional Services and for Reimbursable Expenses shall be made monthly.

9.3 PAYMENTS WITHHELD

9.3.1 No deductions shall be made from the ENGINEER'S compensation on account of penalty, liquidated damages or other sums withheld from payments to Contractors, or on account of the cost of changes in the work other than those for which the ENGINEER has been found to be liable.

9.4 ENGINEER'S ACCOUNTING RECORDS

9.4.1 Records of Reimbursable Expenses pertaining to Additional Services and services performed on an hourly basis shall be available to the COUNTY or the COUNTY'S authorized representative at mutually convenient times.

9.5 LIMIT OF APPROPRIATION

9.5.1 Prior to the execution of this Agreement, the ENGINEER has been advised by the COUNTY and the ENGINEER fully understand and agrees, such understanding and agreement being of the absolute essence to this Agreement, that the total maximum compensation that ENGINEER may become entitled to hereunder, and the total maximum sum that the COUNTY shall become liable to pay to the ENGINEER hereunder, shall not, under any conditions, circumstances or interpretations hereof, exceed the sum certified as available by the County Auditor in the Auditor's Certificate attached hereto.

ARTICLE X
BASIS OF COMPENSATION

The COUNTY shall compensate the ENGINEER from funds obtained through the Transportation Road Improvement Program Initiative or current revenue of Brazos County as follows:

10.1 BASIC COMPENSATION

10.1.1 For Basic Services, as described in Article 2, Basic Compensation shall be computed as follows:

In accordance with the attached Exhibit "C" incorporated by reference hereto, SCHEDULE OF FEES.

10.2 COMPENSATION FOR ADDITIONAL SERVICES

10.2.1 For Additional Services of the ENGINEER, as described in Article 3, compensation shall be computed as follows:

In accordance with the attached Exhibit "C" incorporated by reference hereto, SCHEDULE OF FEES.

10.3 COMPENSATION FOR CONTINGENT ADDITIONAL SERVICES

10.3.1 For Contingent Additional Services of the ENGINEER, as described in Article 3, compensation shall be computed as follows:

In accordance with the attached Exhibit "C" incorporated by reference hereto, SCHEDULE OF FEES.

10.3.2 Payments shall be made by the COUNTY in accordance with Texas Government Code Chapter 2251. The COUNTY shall pay the ENGINEER'S statement as approved by the COUNTY's designee within thirty (30) days after the COUNTY'S designee's approval of the same, provided that the approval or payment of any such statement shall not be considered to be evidence of performance by the ENGINEER to the point indicated by such statement or of receipt or acceptance by the COUNTY of the work covered

by such statement.

ARTICLE XI
OTHER CONDITIONS OR SERVICES

11.1 INSURANCE

11.1.1 The ENGINEER shall file with the COUNTY a Certificate of Professional Liability (Errors and Omissions) Insurance having minimum limits of One Million and No/100 Dollars ($1,000,000.00) for each occurrence and annual One Million and No/100 Dollars ($1,000,000.00) aggregate. Such Professional Liability (Errors and Omissions) Insurance shall have a deductible not in excess of Two Hundred Thousand and No/100 Dollars ($200,000.00) self-insured. Such Certificate shall bear the endorsement "Not to be canceled without thirty (30) days prior notice to BRAZOS COUNTY, TEXAS." The ENGINEER shall maintain the Professional Lability (Errors and Omissions) Insurance at all times this Agreement is in effect and for a period of five (5) years after completion of the Project. Failure to maintain the required insurance shall be deemed to be a material breach of this Agreement.

The ENGINEER shall also provide Worker's Compensation, automobile and comprehensive general liability policies. The ENGINEER shall deliver the insurance certificates to the COUNTY. The coverage provided herein shall contain an endorsement providing thirty (30) days notice to the COUNTY prior to any cancellation of coverage. Said coverage shall be written by an insurer acceptable to the COUNTY and shall be in a form acceptable to the COUNTY. If the ENGINEER has canceled or allowed to lapse any of these insurance policies then the COUNTY may pay for such insurance and may hold the amount of such payment out of the ENGINEER's fees or be otherwise reimbursed. Failure to maintain the required insurance shall be deemed to be a material breach of this Agreement.

11.2 PERIODS OF SERVICE

11.2.1 The ENGINEER shall begin work immediately upon receipt of the Notice-to-Proceed in writing by the COUNTY or the COUNTY's designee. The project will proceed according to the schedule shown in Exhibit "A." The schedule makes certain assumptions regarding review processes and other activities that are beyond the control of the ENGINEER.

11.2.2 Working days shall be defined as standard workdays between Monday and Friday, exclusive of national holidays.

11.2.3 This schedule assumes an orderly progression of the ENGINEER'S services. Delays beyond the control of the ENGINEER may be cause for extension of this period of service, in which case the ENGINEER shall submit in writing to the COUNTY its request for such extensions a minimum of thirty (30) calendar days prior to the end of the affected service period.

11.2.4 If the COUNTY has requested significant modifications or changes in the general scope, extent or character of the Project, the time or performance of the ENGINEER'S services shall be adjusted equitably.

11.3 PROJECT MANAGER COMMITMENT

11.3.1 The COUNTY expects the ENGINEER to commit its PROJECT MANAGER and TASK LEADERS, as proposed in the RFQ, for the duration of the contract. The COUNTY further expects the PROJECT MANAGER's commitment to the contract to include commitment as PROJECT MANAGER

for each work authorization without further delegation or substitution over the course of the contract. PROJECT MANAGER replacement on an active contract, while not strictly prohibited, will require the COUNTY's prior consent.

11.3.2 Requirement for Submittal of Request by Provider:
When requesting a replacement for a PROJECT MANAGER or TASK LEADER, the ENGINEER must submit a request to the COUNTY with the following information:

- Certification that replacement PROJECT MANAGER is employed by the ENGINEER, or certification that the replacement TASK LEADER is employed by the ENGINEER or one of the approved subconsultants.
- The name of proposed individual and the reason for the replacement.
- Resume of the proposed replacement including, the credentials and experience of the individual. Also include information about their licensures, TxDOT pre-certifications, or other certifications required in the contract.
- Resume of the person being replaced.

This Agreement entered into as of the day and year first written above.

The undersigned officers and/or agents of the parties hereto are the properly authorized officials and have the necessary authority to execute this Agreement on behalf of the parties hereto, and each party hereby certifies to the other that any necessary resolution extending said authority have been duly passed and are now in force and effect.

BRAZOS COUNTY, TEXAS

Duane Peters, County Judge

QUIDDITY ENGINEERING, LLC

by: Kevin Krahn, PE
Executive Vice President

Acting by and through the authority of
the Brazos County Commissioners Court

Attest:

County Clerk

Approved as to Form:

~~Assistant District Attorney~~ GENERAL Assistant COUNSEL

AUDITOR'S CERTIFICATE

I hereby certify that funds are available in the amount of $ 11,201,952.00 to accomplish and pay the obligation of Brazos County under this contract.

Brazos County Auditor

EXHIBIT A

SERVICES TO BE PROVIDED BY THE ENGINEER

INNER LOOP
SH 6 to W.D. FITCH
CSJ: TBD

The Engineer shall provide preliminary engineering services for development of an alignment study, design schematic, environmental documents, and studies in support of the schematic work, public involvement, permit procurement, data collection and analysis, drainage, conceptual traffic control, traffic projections, traffic engineering and operations including capacity analysis, traffic simulations, safety analysis, and 3-D modeling, limited surveying and mapping, utility engineering investigation, and limited utility coordination for Inner Loop Phase 1 (New Location) from SH 6 North of Bryan to W.D. Fitch in Brazos County, Texas.

GENERAL REQUIREMENTS

1.1. Coordination.

The Engineer shall coordinate issues and communications with State and/or County's internal resource areas through the County's Project Manager. The County will communicate the resolution of issues and provide the Engineer direction through the County's Project Manager.

The Engineer shall notify the County and coordinate with adjacent engineers on all controls at project interfaces. The Engineer shall document the coordination effort, and each engineer must provide written concurrence regarding the agreed project controls and interfaces. In the event the Engineer and the other adjacent engineers are unable to agree, the Engineer shall meet jointly with the County and each adjacent engineer to resolve disagreements. If the engineers are unable to resolve an issue with the County as mediator, the County may decide the issue and the decision will be final.

The Engineer shall prepare each exhibit necessary for approval by each railroad, utility, and other governmental or regulatory agency in compliance with the applicable format and guidelines required by each entity and as approved by the County. The Engineer shall notify the County in writing prior to beginning any work on any outside agency's exhibit.

1.2. Progress Reporting and Invoicing.

The Engineer shall invoice according to function code breakdowns shown in Exhibit A – Services to be Provided by Engineer, of the Contract for Engineering Services and Exhibit C – Fee Schedule, of each work authorization. The Engineer shall submit each invoice in a format acceptable to the County.

With each invoice, the Engineer shall include a completed projected vs. actual invoice form. The Engineer shall submit a monthly written progress report to the County's Project Manager regardless of whether the Engineer is invoicing for that month.

The Engineer shall complete the services according to the milestone work schedule established in the work authorization. The Engineer shall submit a monthly written progress report to the County indicating the actual work accomplished during the month, scheduled work to be accomplished for the month, the estimated work to be accomplished for the coming month, problems encountered and actions taken to remedy them, list of meetings attended, and overall status. The progress report must use a bar chart diagram to indicate the percentage complete of each task shown on the previous report and the percentage complete of each task. The Engineer is required to meet with the designated County project manager or environmental coordinator on a monthly basis for

progress tracking purposes unless prior written agreement is made with County not to hold a meeting in any given month. The Engineer shall submit minutes of the meeting summarizing the events of the meeting within seven calendar days after each meeting.

The Engineer shall prepare a project work schedule, using the latest version of Primavera software or another scheduling program approved by the County in writing. The schedules shall indicate tasks, subtasks, critical dates, milestones, deliverables, and review requirements in a format that depicts the interdependence of the various items. The work schedule must incorporate an allocation of time for stage reviews of the design schematic and the environmental documents by County personnel. The Engineer shall present the work schedule to the County for review and acceptance and provide assistance in interpreting the proposed work schedule. The Engineer shall provide advance written notice to the County if the Engineer is not able to meet the scheduled milestone review date.

Once the project has been completed and accepted by the County, the Engineer shall deliver all electronic files to the County within 30 calendar days of County's written request.

Final payment is contingent upon the County's receipt and confirmation by the County's Project Manager that the electronic files can be opened and are usable utilizing the current version of the software in use by the County, and all the review comments have been addressed.

The Engineer shall prepare a letter of transmittal to accompany each document submittal to the County. At a minimum, the letter of transmittal must include the TxDOT control-section-job (CSJ) number, the highway number, county, project limits, TxDOT contract number, and TxDOT work authorization number.

1.3. Traffic Control.

The Engineer shall provide all planning, labor, and equipment to develop and to execute each traffic control plan (TCP) needed by the Engineer to perform services under each work authorization. The Engineer shall comply with the requirements of the most recent edition of the *Texas Manual on Uniform Traffic Control Devices (TMUTCD)*. The Engineer shall submit a copy of each TCP to the County for approval prior commencing any work on any State and/or County roadway. The Engineer shall provide all signs, flags, and safety equipment needed to execute the approved TCP. The Engineer shall notify the State and/or County in writing 24 hours in advance of executing each TCP requiring a lane closure and shall not begin lane closure without having obtained State and/or County's written approval. The Engineer shall ensure that its field crew possess a copy of the approved TCP on the job site at all times. Upon request by the State and/or County, the field crew must make the TCP available to the State and/or County for inspection. The Engineer shall assign charges for any required traffic control to the applicable function code.

1.4. Right of Entry.

Prior to performing any work outside of the County's right of way, the Engineer shall request right of entry from public and private landowners to allow services (e.g. environmental services, surveying services, geotechnical services) to be performed and shall request concurrence from the County. The Engineer shall prepare right of entry permissions, which must be signed by the landowner. Letters or other materials seeking right of entry must contain explicit reference to the kinds of activities for which right of entry is requested and an indication of the impacts (if any) that will result from performance of these services. The Engineer shall not commit acts which will result in damages to private property and shall make every effort to comply with the wishes and address the concerns of private property owners.

1.5. Level of Effort.

For each work authorization, the Engineer shall base the level of effort at each phase on the prior work developed in earlier phases without unnecessary repetition or re-study. As directed by the County, the Engineer shall provide written justification regarding whether or not additional or

repeated level of effort of earlier completed work is warranted, or if additional detail will be better addressed at a later stage in the project development.

1.6. Quality Assurance (QA) and Quality Control (QC).

The Engineer shall provide peer review at all levels. For each deliverable, the Engineer shall retain evidence of their internal review and mark-up of that deliverable as preparation for submittal. A milestone submittal is not considered complete unless the required milestone documents and associated internal mark-ups are submitted. If requested by the County's Project Manager, the Engineer shall submit the Engineer's internal mark-up (e.g., red-lines, comments) developed as part of the Engineer's quality control step. When internal mark-ups are requested by the County in advance, the County may reject the actual deliverable if the Engineer fails to provide sufficient evidence of quality control. The Engineer shall clearly label each document submitted for quality assurance as an internal mark-up document.

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

1.7. Underground excavation

If necessary, the Engineer shall contact the Texas Excavation Safety System, Inc. (DIGTESS) or call telephone number 811 to have underground utilities marked prior to digging holes for right-of-way monuments, utility engineering investigation, geotechnical investigation, or other purposes. The Engineer shall separately contact utilities not a part of the DIGTESS organization. The Engineer shall maintain documentation of all notification calls. The Engineer shall comply with Texas's excavation laws.

1.8. Preventative Measures to Prevent the Spread of Oak Wilt Disease Contamination

The Engineer shall take the following preventive measures while cutting, pruning, or removing oak trees in counties which have confirmed cases of oak wilt disease or when directed by the County:

A. When possible, employ alternative methods instead of pruning or cutting oak trees.

B. When possible, perform necessary pruning and cutting of healthy trees during January or February when sap beetles are least active.

C. Treat wounds with pruning paint in oak wilt disease infected counties to discourage insects, especially during warm weather.

D. Sterilize all pruning tools between each use on each tree with either Lysol spray or a 70 percent rubbing alcohol solution.

E. Dispose of the tree cuttings by burning, burying, or another approved method.

1.9. Personal Protective Equipment (PPE).

A. The Engineer shall, and shall require its subcontractors to:

1. Provide personal protective equipment (PPE) to their personnel,
2. Provide business vehicles for their personnel, and
3. Require their personnel to use PPE and drive only business vehicles while performing work on or near roadways.

B. The PPE must meet all:

1. Current standards set by Occupation Safety and Health Administration (OSHA)

2. TxDOT requirements (e.g., safety glasses, Type 3 (TY 3) pants for night work).

C. Each business vehicle must be clearly marked with the Engineer's business name, or the name of the appropriate subcontractor, such that the name can be identified from a distance.

1.10. OMITTED.

1.11. Information Resources and Security Requirements.

A Contractor-Related Entity might create, access, transmit, store, or use Public TxDOT data in a Contractor-Related Entity Environment. Contractor shall ensure that Contractor-Related Entity Environments comply with the TxDOT Low Security Baseline.

TASK DESCRIPTIONS AND FUNCTION CODES

The Engineer shall categorize each task performed to correspond with the Function Codes (FC) and Task Descriptions.

FUNCTION CODE 102 (110) – FEASIBILITY STUDIES

ROUTE AND DESIGN STUDIES

The Engineer shall prepare an alignment and proposed roadway schematic layout that includes projected traffic volumes and existing and proposed typical sections. The Engineer shall furnish Microsoft Office and MicroStation and OpenRoads computer generated media containing the roadway schematic layout to the County. All supporting attachments and exhibits must accompany the schematic layout. All MicroStation and OpenRoads computer generated files containing the roadway design schematic must be fully compatible with the software used by the State without further modification or conversion.

The Engineer shall produce, obtain, review, and evaluate existing and twenty-year projected traffic data for use in the preparation of the schematic design layout. The data must be utilized in accordance with the requirements for schematic development and consistent with the policies of the State.

The Engineer shall prepare preliminary drawings to identify any potential impacts and constraints within the project corridor, including impacts to the nature, cultural, and human environment. The potential impacts and constraints identified must include all existing and proposed utilities (both public and private), structures, burial grounds, neighborhood communities, historical landmarks, and undeveloped areas. Any potential utility conflicts and structural impediments must be identified as such. The Engineer shall propose alternative alignments that avoid or minimize displacements and damages and prepare any additional attachments or exhibits required to illustrate a preferred alternative alignment. The Engineer shall assist the County with agency meetings during the development of the schematic design as requested by the County. If requested by the County, the Engineer shall prepare a Notice and Opportunity to Comment and assist the County with stakeholder meetings, public meetings, and a public hearing, if requested.

An itemization of the schematic design and engineering work activity to be performed under this contract is detailed below. The Engineer shall prepare all designs in accordance with the latest version of:

A. *Roadway Design Manual*, published by TxDOT

B. *TxDOT Project Development Process Manual*, published by TxDOT;

C. *Policy on Geometric Design of Highways and Streets*, published by the American Association of State Highway and Transportation Officials' (AASHTO);

D. *Standard Specifications for Construction of Highways, Streets, and Bridges*, published by TxDOT;

E. *Texas Manual on Uniform Traffic Control Devices (TMUTCD)*, published by TxDOT;

F. *Highway Capacity Manual (HCM)*, published by the Transportation Research Board (TRB);

G. *Highway Safety Manual (HSM)*, published by AASHTO;

H. *Hydraulic Design Manual*, published by TxDOT;

I. *Access Management Manual*, published by TxDOT; and

J. other State approved manuals and guides.

When design criteria are not identified in these manuals, the Engineer shall notify the County and request direction.

The design schematic horizontal layout must adhere to a design scale of 1 inch = 100 foot. The Engineer shall develop the schematic layout, exhibits, and attachments in English units. All Microsoft Office, MicroStation, Keyhole Markup Language (KML), Keyhole Markup Language Zipped (KMZ), and Bentley OpenRoads computer graphic files furnished to the County must be submitted on USB flash drive to the County in their native format, which must be fully compatible with the programs currently used by the State. Schematics must follow TxDOT and Federal Highway Administration (FHWA) standards. The schematic must follow TxDOT's computer-aided design and drafting (CADD) standards. The Engineer shall submit the schematic as an original document, accompanied with an original MicroStation formatted graphics file. Final copies of the schematic design must be signed and sealed by a professional engineer licensed in the state of Texas.

110.1. Schematic Design Work Outline.

A. Develop Base Maps

The Engineer shall develop the base maps to be used for the analysis and proposed schematic layout from existing construction and right of way (ROW) plans as available. The Engineer shall re-establish the existing centerline horizontal alignments for all roadways, identify existing ROW and easements, property owners, and the approximate location of major utilities based on a utility engineering investigation in the preparation of base maps.

B. Planimetrics and Aerial Mapping

The Engineer shall obtain planimetrics, digital terrain modeling (DTM), and aerial photographs from the County, if available.

C. Analyze Existing Conditions

Using collected data and base maps, the Engineer shall develop an overall analysis of the existing conditions to develop the schematic design. The analysis must include the following:

1. Easement determination

   Approximately 182 acreage property Title Reports and 110 lot/block properties will be reviewed and entered into a GIS system. The GIS system will be developed and maintained for approximately 24 months during the schematic phase.

   Horizontal alignment

   Vertical alignment

2. Pavement cross slopes and pavement type
3. Soil exploration
4. Geotechnical testing
5. Highway-rail grade crossing studies, if applicable
6. Intersection design and analysis
7. Sight distance
8. Large guide signs and roadside signing

9. Level of service
10. Safety (i.e., crash data)
11. Locations of critical constraints
12. Drainage
13. Traffic control and construction phasing sequence

D. Schematic Alternatives

The Engineer shall identify and analyze schematic alternatives to minimize potential adverse operational impacts, crash impacts, ROW impacts, environmental impacts, major utility conflicts, structural impediments, or exceptions to the State and FHWA design criteria.

The Engineer will divide the corridor up into sections based on traffic projections, and study various alignment alternatives within each section. The alternatives will be reviewed and refined during team coordination, public involvement, and environmental evaluation to present two alternatives for consideration. Before moving onto the Deliverable Schematic, a Preferred Alternative must be selected and agreed upon by the State and/or the County.

E. Deliverable Schematic

The Engineer shall evaluate and document the following in the analysis to optimize the design:

1. Efficient use of the allocated ROW
2. Control of access (COA) and driveway locations
3. Roadway and intersection geometry
4. Cross sections
5. Bicycle and pedestrian design
6. Drainage and hydraulic design
7. Stopping sight distance
8. Level of service
9. Safety
10. Traffic and signal operations
11. Construction, ROW, easement, and utility costs
12. Construction sequencing
13. Traffic control during construction
14. Roadside safety appurtenances
15. Large guide signage
16. Environmental mitigation (e.g., noise walls, storm water best management practices (BMPs))
17. Bridge layouts and required vertical clearance, showing begin and end bridge stations and location of interior bents
18. Railroads (if applicable)
19. Interface with existing high occupancy vehicle (HOV) lane, managed lanes, and park-and-ride facilities
20. Accommodation of ultimate corridor configuration.

21. Accommodation of future cross street expansion as described in local thoroughfare plan (if applicable)
22. Avoidance of utility lines (if feasible)
23. Impact of construction delays from utility relocations

F. Project Management and Coordination

1. The Engineer shall direct and coordinate the various elements and activities associated with developing the design schematic.
2. The Engineer shall prepare the detailed graphic project work schedule indicating tasks, critical dates, milestones, deliverables, and State and/or County review requirements. The project work schedule must depict the order of the various tasks, milestones, and deliverables. The Engineer shall review the schedule monthly and provide updates regarding its progress on the schedule to the County.
3. The Engineer shall submit written monthly progress reports to the County.
4. The Engineer shall provide ongoing quality assurance and quality control to ensure completeness of product and compliance with the County procedures.
5. The Engineer shall conduct site visits in both the AM and PM peak hour and develop a technical report that includes photographs outlining the findings and observations.

G. Data Collection

The Engineer shall conduct field reconnaissance and collect data as necessary to complete the schematic design. Data must include the following information. Items 1 through 8 must be obtained from the County, if available. Items 9 through 13 must be obtained from other agencies as required.

1. Available corridor major investment studies
2. Design data from record drawings of existing and proposed facilities
3. Existing and future design year traffic data
4. Historical crash data
5. Roadway inventory information, including the number of lanes, speed limits, pavement widths and rating, bridge widths and ratings, and ROW widths
6. Aerial photos, planimetric mapping, and DTM
7. Environmental data
8. Previously prepared drainage studies
9. Adopted land use maps and plans (if available)
10. Federal Emergency Management Agency (FEMA) flood boundary maps and flood insurance studies and models
11. Public and private utility information
12. Plat research for adjacent properties (if available)
13. Local major thoroughfare plan

H. Roadway Design Criteria

The Engineer shall develop the roadway design criteria based on the TxDOT *Roadway Design Manual* and AASHTO *Policy on Geometric Design of Highways and Streets* guidelines. The design criteria must include the following roadway design elements: design speed, lane and shoulder widths, pavement structure and slopes, horizontal curvatures,

horizontal and vertical clearances, range of vertical profile grades, and side slopes. If there is a discrepancy between the two sources, the TxDOT *Roadway Design Manual* will govern unless otherwise directed by the County.

I. Preliminary Design Conference

The Engineer shall prepare and submit a preliminary Design Summary Report (DSR) to the County for review and approval and shall attend an initial kick-off meeting to establish and agree on fundamental aspects, basic features, concepts, and design criteria. This meeting will be coordinated with any adjacent roadway projects to ensure continuity with the design of the adjacent roadway projects.

110.2. Schematic Design – General Tasks.

A. ROW Property Base Map

The Engineer shall obtain information on existing ROW, easements, and property information from as-built plans, ROW maps, and tax records. The Engineer shall prepare a base map depicting the information.

B. Typical Sections

The Engineer shall develop both existing and proposed typical sections that depict the number and type of lanes, shoulders, median width, curb offsets, cross slope, border width, clear zone widths, and ROW limits.

C. Environmental Constraints

The Engineer shall evaluate and document impacts to environmentally sensitive sites (as identified by the Engineer and verified by the County) during the schematic design process. Environmentally sensitive sites include natural, cultural, and the human environment. Examples are historic and archeological resources, burial grounds, neighborhood communities and residential areas, farmland, floodplains, wetlands, endangered species, rare habitats, wildlife corridors, wildlife crossings, parks and nature preserves, geologic features, undeveloped areas, and significant trees.

D. Drainage

1. The Engineer shall use data from as-built plans and FEMA maps to locate drainage out falls and to determine existing storm sewer and culvert sizes, design flows, and water surface elevations for use in the design of roadway geometry.
2. The Engineer shall conduct a preliminary drainage study to determine and evaluate the adequacy of the ROW needed to accommodate the proposed roadway and drainage system. The drainage study must:
    a. identify the impacts to abutting properties and the 100-year floodplain due to proposed highway improvements
    b. identify the water surface elevations for the 2, 5, 10, 25, 50, and 100-year storm events
    c. identify and locate outfalls
    d. provide drainage outfall descriptions
    e. provide overall drainage area map, sub-drainage area map, and storm water detention facilities
    f. provide a drainage study report identifying the results of the study.
3. The drainage report, which must be signed and sealed by a professional engineer licensed in Texas, must include applicable hydrologic and hydraulic models (e.g., HEC-1

and HEC-2, HEC-RAS, HEC-HMS, XP-SWMM). The models must be approved by the local TxDOT district hydraulic engineer prior to generating any reports. If requested, the Engineer shall prepare a final drainage study in accordance with one or more of the following: TxDOT *Hydraulic Design Manual*, local TxDOT district criteria, and any other specific guidance provided by the State and/or County. If requested by the County, the Engineer shall evaluate the adequacy of the existing drainage structures; otherwise, the Engineer shall not evaluate the adequacy of the existing drainage structures.

The Engineer shall perform the following:

a. Hydrologic Analysis

(1) Drainage Area Maps

The Engineer shall delineate the drainage area boundaries for the drainage crossings within the project area using U.S. Geological Survey (USGS) or suitable topographic maps, available LiDAR elevation data, and other appropriate information. Drainage Area Map shall be included on the Preliminary Hydraulic Data Sheets for inclusion in Preliminary Drainage Study for the project.

(2) ii. Runoff Computations

The Engineer shall follow the methodology outlined in the State Hydraulic Design Manual. The Engineer shall also use a hydrologic check method (such as Regional Regression Equations) to compute peak runoff rates at the studied areas for larger drainage area crossings. The report must include the full range of frequencies (2, 5, 10, 25, and 100 AEP50%, 20% 10%, 4%, 2%, and 1% AEP).

The Engineer shall use information collected via field survey, field observations, review of as-built construction plans, and the effective FEMA Models (if available) to develop hydraulic modeling data for existing bridges and FEMA Zoned drainage structures if available. Software acceptable to the State such as HEC-RAS (1D/2D) and HY8 shall be utilized. Based on the results of the existing conditions hydraulic modeling and analysis, the Engineer shall propose and evaluate a design with the objective of reducing flooding potential, protecting structures from erosion and scour, and mitigating potential impacts on flood levels and flow rates. The hydraulic models for the FEMA Zone A/AE locations consist of:

i. Existing Model

ii. Updated Model, Zone AE only (if available)

iii. Corrected Existing Model, Zone AE only (if available)

iv. Proposed Model

v. Preliminary Hydraulic Data Sheets

(3) FEMA Zone Structures

The Engineer shall develop (11" x 17") Preliminary Hydraulic Data Sheets for each bridge or FEMA Zone A/AE drainage structure for inclusion in Preliminary Drainage Study for the project.

(4) Non-FEMA Zone Structures

The Engineer shall develop (11" x 17") Hydraulic Computation Sheets that summarize the input parameters and hydraulic results in table format for the comparison of the existing and proposed structures for the project.

Determine which cross-drainage structures are shown to be within areas classified as Waters of the United States, and account for ROW needs for storm drain outfalls.

This scope of work excludes scour analysis and FEMA letter of map change revisions.

E. ROW Requirements

The Engineer shall determine the ROW requirements based on the proposed alignment, typical sections, design cross sections, access control, terrain, construction requirements, drainage, clear zone, maintenance, intelligent transportation system (ITS), and environmental constraints and mitigation requirements.

F. Construction Sequence

The Engineer shall evaluate and document the requirements for construction staging and traffic control throughout the development of schematic design to ensure that the proposed design can be constructed. The Engineer shall provide construction phasing assumptions to the County for review.

G. Design Exceptions

The Engineer shall identify design exceptions and waivers. The Engineer shall determine the necessity for each design exception or waiver for approval. If the County agrees that design exception or waiver is necessary, the Engineer shall prepare the County's required design exception or design waiver documentation. The Engineer shall document the operational and safety analysis for comparison of the no-build, build with standard design, and build with proposed design alternatives. For interstate facilities, the safety analysis must include the following:

1. Expected change in crashes from existing conditions to standard design conditions
2. Expected change in crashes from existing conditions to the proposed design

H. Traffic Data and Projections

For the new highway alignment, the Engineer shall derive the project-level traffic data from TxDOT, Bryan/College Station MPO, and TTI Regional Travel Demand Models to develop the opening-year, design-year (opening year +20), and pavement design year (opening year + 30) travel forecasts, in accordance with the TxDOT Transportation Planning and Programming Division (TPP) Methodology and Procedures. The developed traffic projections must be utilized for design and environmental analysis. The Engineer shall develop traffic forecasts for the mainlanes, ramps, cross streets, interchanges, intersections, and frontage roads for no-build and build alternatives. These projections must include graphic representations of the anticipated daily movements along the corridor (suitable for inclusion in the design schematic and environmental document) and the traffic analysis for highway design table. The Engineer shall prepare a traffic projections methodology memo, based on the information provided in the traffic analysis package. The Engineer shall hold a methodology meeting in order to seek consensus among the different stakeholders (County, TxDOT, BCSMPO, TTI) and to go over critical input data and assumptions feeding the Travel Demand Models. The key performance metrics to evaluate and compare the effectiveness of build corridor scenario alternatives from the TDM output models will also be discussed and agreed upon at this point. The Engineer shall review the proposed methodology with the County and refine it based on these discussions. The Engineer shall submit the resulting corridor traffic volumes for the preferred build conditions to the County and/or TPP for review and approval. The Engineer shall revise the traffic volumes based on the County's and/or TPP's comments.

I. Financial Plan and Project Management Plan

The Engineer shall prepare a financial plan (FP) and project management plan (PMP), in accordance with the most recent FHWA Financial Plan Guidance, for submission by the State

and/or County to the FHWA Division Office for review and approval. The purpose of the FP is to document the project cost estimate and revenue structure and provide reasonable assurance that sufficient financial resources will be available to implement and complete the project as planned. The FP must cover topics such as the project cost estimate, revenue structure, funding resources, project implementation over time based on the available financial resources, and the cost and revenue assumptions used in development.

1. The initial FP shall consist of at least five main sections including:
    a. Cost estimate
    b. Implementation plan
    c. Financing and revenues
    d. Cash flow
    e. Risk identification and mitigation factors
2. The Engineer shall prepare for and attend a cost estimate review (CER) workshop with the State and/or County and the FHWA to develop and review information for inclusion in the FP such as cost estimation procedures and tools, identifying funding sources and revenues, and project implementation schedules. In preparation for the CER, the Engineer shall conduct a risk analysis assessment, provide cost spreadsheets and models for input into the FHWA's probability modeling software, review and provide comments on the CER summary report, and update cost information in the initial FP to reflect confidence limits established during the CER.
3. The Engineer shall provide annual updates (AUs) to the initial FP reflecting changes in project finances and funding resources. Each update must include revisions to the five main sections mentioned above as well as discussions of significant cost or revenue changes, comparisons to previous plan estimates, and explanations of mitigating actions taken to adjust for deviations.
4. The Engineer shall submit the PMP, FP, and FP AUs to the County for review and comment. For scoping purposes, it is assumed that the initial drafts of the FP and FP AUs will be reviewed concurrently by the District, the TxDOT Design Division, and TxDOT Finance Division. The Engineer shall address the County's comments and prepare a revised draft for review by the FHWA. The Engineer shall address FHWA comments and prepare the final FP (up to three revision cycles from the State and/or County and FHWA) for the State and/or County to submit to the FHWA for approval. To document each revision cycle, the Engineer shall develop a comment response forms that includes the comments, comment numbers, page and line numbers of draft where comments originated, page and line numbers where revisions can be located, and the responses.

J. Traffic and Operational Analysis

The Engineer shall derive and analyze traffic data (including percent trucks, design hourly volume, and directional distribution), obtain existing and projected roadway features (including ramp locations, weaving sections, number of lanes, offset to obstructions, lane widths, frontage road operations, and intersection operation and geometry), traffic flow patterns, and transit and traffic operations. The Engineer shall conduct capacity and Level of Service analyses corridor wide and make recommendations for improving traffic flow. The Engineer shall use the HCM to analyze and make appropriate recommendations. The analysis must be done for existing/base year, opening year, design year (opening+20 year), and interim year (if needed). Results of this analysis must be incorporated into the schematic design for the preferred build alternative. The Engineer shall develop and submit to TxDOT a traffic and operational analysis report summarizing all analysis performed. When microsimulation is

used, the Engineer shall develop and calibrate an existing condition traffic model. The calibration memo must be included in the traffic analysis report. The analysis must be performed using the latest versions of TxDOT-approved software (e.g., HCS, Synchro, VISSIM, CORSIM, SIDRA, AIMSUN) in accordance with the 2023 TxDOT's Traffic and Safety Analysis Procedures Manual.

K. Safety Analysis

The Engineer shall review and analyze historical crash data for latest 3 to 5 full calendar years (i.e., January 1 to December 31, inclusive) with respect to crash characteristics such as severity, crash types, frequency, rates, patterns, clusters, and their relationship to crash contributing factors. The purpose of the historical crash analyses is to determine safety performance of the existing conditions to understand any safety issues within the study area.

Predictive, or quantitative safety analysis, involves using HSM-based methods that use safety performance functions (SPFs) and crash modification factors (CMFs) to estimate anticipated change in crashes from existing condition to the proposed design. The predictive safety analysis must be done for no-build and build conditions for design year. The purpose of the predictive safety analysis is to compare the safety performance of the no-build and build alternatives to help determine the preferred alternative and to determine the countermeasures, if necessary, to improve safety. Predictive safety analysis must be performed using HSM based tools including Interactive Highway Safety Design Model (IHSDM), HSS, or other tools acceptable to the State and/or County. The Engineer shall develop and submit to the State and/or County a safety analysis as part of the Traffic and Operational Report summarizing all safety analysis performed corridor wide.

L. Bicycle and Pedestrian Accommodations

The Engineer shall comply with the *United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations.* The inclusion of bicycle and pedestrian facilities must be evaluated when the project is scoped. Public input when applicable, as well as local city and metropolitan planning organization for bicycle and pedestrian plans must be considered in this evaluation.

M. Omitted.

N. Omitted.

O. Project Implementation Plan

The Engineer shall develop an implementation plan for prioritizing improvements along the corridor and identify a sequence of improvements to manage future traffic operations and available funding. The implementation plan must consider traffic operation, the ultimate preferred alternative, and potential funding levels and sources to identify a timeline for short and mid-term improvements that accommodate corridor growth while minimizing future throwaway construction. The Engineer shall provide the recommendations for the implementation plan in a project implementation report deliverable and incorporate the recommendations into the engineering summary report.

110.3. Conceptual Design Schematics.

The Engineer shall develop conceptual design schematics in MicroStation format to evaluate various methods of handling traffic while providing access in key areas. The Engineer shall develop a single preferred design alternative that optimizes traffic flow and access. The conceptual schematics are to be plan view only. Profile work must be done only to the extent necessary to lay out the proper horizontal geometry.

The schematics must contain the following design elements:

A. Mainlane roadway alignment

B. Pavement edges, face of curbs, and shoulder lines of mainlanes, intersections, interchanges, and connecting highways or streets

C. Typical sections of existing and proposed roadways

D. Anticipated structure locations (including wildlife crossings and fencing structures)

E. Anticipated retaining wall and sound wall locations

F. Anticipated conveyance of major drainage elements

G. Preliminary ROW and easement requirements and control-of-access locations

H. Direction of traffic flow and the number of lanes on all roadways

I. Existing and projected traffic volumes

J. Existing utilities

K. Waters of the United States (WOTUS)

110.4. Geometric Design Schematics.

The Engineer shall develop geometric design schematics based on the conceptual schematics after the basic layout, lane arrangement, and anticipated ROW and easement impacts depicted on the conceptual schematics are approved. The Engineer shall use Bentley OpenRoads tools in performing this task. The geometric design schematics must include both a plan view and profile view.

A. The geometric schematic plan view must contain the following design elements:

1. Bentley OpenRoads calculated roadway alignments for mainlanes, general purpose lanes, ramps, direct connectors, bridges, HOV lanes, managed lanes, express lanes, collector distributor roads, frontage roads and cross streets at major intersections and grade separations
2. Horizontal curve data shown in tabular format
3. Pavement edges, curb lines, and sidewalks for all roadway improvements
4. Typical sections of existing and proposed roadways, rail locations, and superstructure depths.
5. Proposed bridge structures, including bridge deck, abutment, bent, and rail locations
6. Proposed retaining walls and sound walls
7. Proposed cross-drainage structures with outfall flow arrows and significant drainage features or waterways identified
8. Existing utilities and proposed utilities
9. Existing property lines and respective property ownership information
10. Existing ROW and easements
11. Proposed ROW and easements adequate for preparation of ROW maps
12. Waters of the US (WOTUS)
13. Control-of-access limits
14. Existing and projected traffic volumes
15. Location and text of the existing and proposed guide signs and the preliminary locations for changeable message signs

16. Lane lines, shoulder lines, and direction of traffic flow arrows indicating the number of lanes on all roadways

B. The geometric schematic profile view must contain the following design elements:

1. Calculated profile grade and vertical curve data including "K" values for all curves and sight distance values for crest vertical curves on the mainlanes
2. Existing ground line profiles along the mainlanes
3. Grade separations and overpasses including preliminary abutment and bent locations, girder type, and span lengths
4. Calculated vertical clearances at grade separations and overpasses
5. Anticipated cross-drainage structures with approximate inlet and outfall elevations
6. Proposed ditch grading (special grading), if it does not follow the typical section.
7. Approximate locations of existing and proposed major utility crossings
8. The calculated profile grade for frontage roads, connectors, ramps, and cross streets will be shown on separate Supplemental Profile rolls

110.5. Cross-Sections.

The Engineer shall use a Bentley 3D OpenRoads model to generate preliminary cross-sections at 100 feet intervals (unless otherwise directed by the County) and at culvert locations in conjunction with the geometric schematic. The Engineer shall determine earthwork volumes for use in the cost estimate. The Engineer shall prepare 11 inch x17 inch or roll plots of the cross-sections.

110.6. Retaining Walls.

The Engineer shall prepare preliminary retaining wall concepts to be shown on schematics, typical sections, and cross sections.

A. The Engineer shall determine if any additional walls are required and verify the need for and length of the retaining wall as shown on the ultimate schematic.

B. The Engineer shall compute and tabulate retaining wall quantities for preliminary design milestone plans submittal.

110.7. Renderings and/or Traffic Simulation.

The Engineer shall develop renderings, three-dimensional (3D) models, illustrations, and animations as a means of expression and understanding for what the owner of a project envisions and what the public perceives. In support of the public outreach effort, the County will choose reasonable build alternatives, which the Engineer shall carry forward into creating one rendering and/or one traffic animation for each of the various alternatives (up to three). The Engineer shall create a 3D model for the reasonable build alternatives from: horizontal and vertical alignments, existing and proposed DTMs, proposed typical sections, traffic counts, and ground photography. When requested by the County, the Engineer shall use aerial video footage captured by unmanned aircraft systems (UAS).

The use of UAS is regulated by the Federal Aviation Administration (FAA). The Remote Pilot in Command (RPIC) must possess a current FAA Remote Pilot Certificate (14 CFR Part 107) and be sufficiently trained, capable, and competent to operate the type of system in the environment in which it is to be operated. The RPIC must be responsible for the safe conduct of the UAS flight. Visual Observers as required must be familiar with UAS operations and in positive two-way communication with the RPIC. Additionally, operators must comply with the general safety protocols established in the TxDOT *Flight Operations Manual.*

The animations and renderings must give the public and stakeholders a clear awareness and appreciation for the reduction of traffic congestion and how traffic is to flow into and out of the project area.

110.8. Preliminary Construction Sequence.

The Engineer shall prepare preliminary construction sequence layouts in conjunction with the geometric design schematic depicting the phasing and traffic detours anticipated to safely convey traffic. The layouts must demonstrate that adequate horizontal and vertical alignments are maintained, sufficient lane widths and shoulder widths or barrier offsets are feasible, and construction zones are adequate for constructability of all proposed features. Proposed construction detours must ensure that adequate superelevation is provided. The layouts must indicate how existing pedestrian and bicycle facilities are accommodated for each phase.

110.9. Preliminary Cost Estimate.

The Engineer shall prepare a preliminary cost estimate for the project, including the costs of construction, required ROW and associated improvements, and eligible utility adjustments. Current State and/or County unit bid prices must be used in preparation of the estimate.

110.10. Engineering Summary Report.

The Engineer shall prepare an engineering summary report to summarize the design criteria, traffic analysis, preliminary cost estimate and basis of estimate, construction sequence description, and utility conflict issues.

110.11. Conduct/Support or Attendance at Value Engineering Study.

If requested by the County, the Engineer shall provide documents and drawings for the Value Engineering Study to an independent team. The independent team will review the documents, conduct the study, and present study findings to the County and Engineer at workshop meeting not to exceed three days.

110.12. Agency Coordination and Public Involvement.

A. The Engineer shall assist the County in conducting 150 meetings with property owners (100), stakeholders (25), and various agencies (25) to discuss and review the schematic design. The Engineer shall document and respond to issues related to the schematic design.

B. The Engineer shall prepare a Notice and Opportunity to Comment as needed and assist in conducting public meetings and public hearing during the project development process. The Engineer shall prepare schematic exhibits, constraints maps, and other necessary exhibits, and assist the County with all presentations.

C. The Engineer shall coordinate, schedule, reserve, and pay for all meeting locations and facilities.

D. For all public involvement activities, the Engineer shall prepare the adjacent property owner list; mail out and pay for notices; draft letters to public officials; prepare, publish and pay for notices to major and local newspaper; hire court reporter and law enforcement for public meetings and hearing; and provide audio and visual rental equipment and changeable message boards.

E. The Engineer shall attend pre-meetings in preparation for every meeting and hearing, as directed by the County.

F. The Engineer shall compile public comments received and responses to comments and prepare the required documentation for all public involvement activities. The Engineer shall comply with the environmental compliance toolkits related to public involvement.

110.13. Schematic Design Project Deliverables.

In conjunction with the performance of the services included under Function Code 110 of this attachment, the Engineer shall provide the following draft and final documents and associated electronic files as applicable

A. Draft and final copies of the engineering summary report

B. Draft and final copies of the traffic and operational analysis report and safety analysis report

C. Draft copies of the preliminary drainage study

D. Draft and final copies of the geometric schematic layouts on 11 inch x 17 inch cut sheets or rolls, as requested by the County

E. Draft and final copies of the conceptual design schematics roll plots

F. Draft and final copies of the geometric schematic layouts (1 inch = 100 feet)

G. Draft and final copies of the design schematic profiles rolls

H. Draft and final copies of the design schematic cross-sections on 11 inch x 17inch cut sheets or roll plot format, as requested by the County

I. Copy of the preliminary cross-sections in a roll plot format or 11 inch x17 inch format, as requested by the County

J. Electronic 3D model copy of the preliminary cross-sections created using OpenRoads tools

K. Six final copies of the preliminary drainage study

L. Electronic submittal of the hydrologic and hydraulic model digital files from the drainage study

M. Copies of the preliminary construction sequence layouts in a roll plot or 11 inch x 17 inch format, as requested by the County

N. Copies of the preliminary construction sequence typical sections in 11 inch x17 inch format

O. Electronic copy of the 3D rendering and/or traffic simulation for up to two reasonable build alternatives

P. Electronic files shall be furnished to the County on a USB flash drive

Q. Traffic data schematics

R. Traffic projections methodology memo and meeting

S. Average daily corridor traffic projections report

T. Risk management plan

U. Participation in CER

V. Draft project management plan

W. Draft financial plan

X. Final project management plan

Y. Final financial plan

Z. Line schematics with traffic data shown

AA. Documentation of public involvement activities

BB. Utility plan – electronic file in latest version of MicroStation fully compatible with OpenRoads civil design system

CC. Design exception and design waiver documents

DD. Hard copy of a draft hydraulic report for review and comment

EE. Culvert hydraulic data sheets and preliminary culvert layouts

FF. Drainage report – one hard copy of final drainage report, one electronic copy of the entire drainage report in PDF format, and computer files of hydrologic and hydraulic modeling with appropriate labeling of location, CSJ, and submittal date

GG. Retaining wall layouts

HH. Geotechnical report

II. Cost estimates for each milestone submittal

JJ. KMZ or KML file of conceptual design schematic created from applicable DGN files for reviewing in Google Earth

KK. Final schematic 3D model created using OpenRoads software

LL. Draft and final copies of traffic analysis report

FUNCTION CODE 120 (120) – SOCIAL/ECON/ENV STUDIES

SOCIAL, ECONOMIC, AND ENVIRONMENTAL STUDIES AND PUBLIC INVOLVEMENT

120.1. Environmental Documentation Standards.

Each environmental service provided by the Engineer must have a deliverable. Deliverables must summarize the methods used for the environmental services and the results achieved. The summary of results must be sufficiently detailed to provide satisfactory basis for thorough review by the State and/or County, and (where applicable) other agencies with regulatory oversight. All deliverables must meet regulatory requirements for legal sufficiency and adhere to the requirements for reports enumerated in the State's National Environmental Policy Act of 1969 (NEPA) Memorandum of Understanding (MOU).

A. Quality Assurance/Quality Control Review

For each deliverable, the Engineer shall perform quality assurance quality control (QA/QC) reviews of environmental documents and on all supporting environmental documentation to determine whether documents conform with:

1. Current Environmental Compliance Toolkit guidance, documentation requirements, and templates published by TxDOT's Environmental Affairs Division (ENV) and in effect as of the date of receipt of the documents or documentation to be reviewed;
2. Current state and federal laws, regulations, policies, guidance, agreements, and memoranda of understanding between the County and other state or federal agencies; and
3. Guidelines contained in Improving the *Quality of Environmental Documents, A Report of the Joint AASHTO/ACEC Committee in Cooperation with the Federal Highway Administration* (May 2006) for:
    a. Readability, and
    b. Use of evidence and data in documents to support conclusions.

Upon request by the County, the Engineer shall provide documentation that the QA/QC reviews were performed by qualified staff.

B. The Engineer shall maintain the project environmental record in TxDOT's Environmental Compliance Oversight System (ECOS), including project review, completing the work

development plan screens, uploading documents, and completing activities as assigned by the District.

C. Deliverables must contain all data acquired during the environmental service and be written to be understood by the public in accordance with the TxDOT's Environmental Toolkit guidance, documentation standards, and current guidelines, policies, and procedures.

D. Electronic versions of each deliverable must be written in software that is fully compatible with the software currently used by the State and/or County and provided in the native format of the document for future use by the County. The Engineer shall supplement all hard copy deliverables with electronic copies in searchable Adobe Acrobat (.pdf) format unless another format is specified. Each deliverable must be a single, searchable .pdf file that mirrors the layout and appearance of the physical deliverable. The Engineer shall deliver the electronic files in both the document's native format and the PDF format.

E. When the environmental service is to apply for a permit (e.g., United States Coast Guard (USCG) permit or USACE permit), the Engineer shall provide the permit and all supporting documentation to the County as the deliverable.

F. Submission of Deliverables

1. Deliverables shall consist of the preparation of an Environmental Assessment (EA). Technical reports and documentation must be prepared to support the applicable environmental classification (e.g. EA). Additionally, Classification Request Form shall be prepared to classify the project.

2. All deliverables must comply with all applicable state and federal environmental laws, regulations, procedures, and TxDOT's Environmental Compliance Toolkits, documentation requirements, and templates.

3. On the cover page of any environmental documentation, the Engineer shall insert the following language in a way that is conspicuous to the reader or include it in a CE project record:

"The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 9, 2019, and executed by FHWA and TxDOT."

G. The County will provide the State's and other agency comments on draft deliverables to the Engineer. The Engineer shall revise the deliverable:

1. To include any County commitments, findings, agreements, or determinations (e.g., wetlands, endangered species consultation, Section 106, or Section 4(f)), required for the transportation activity as specified by the State and/or County;

2. To incorporate the results of public involvement and agency coordination;

3. To reflect mitigation measures resulting from comments received or changes in the transportation activity; and

4. To include with the revised document a comment response form (matrix) in the format provided by the County.

H. The Engineer shall provide photographs and graphics that clearly depict details relevant to an evaluation of the project area..

120.2. Environmental Assessment (EA) Content and Format.

A. The Engineer shall provide an EA and ensure that:

1. The EA meets the requirements of 23 CFR §771.119 and TAC, Title 43, Part 1, Chapter 2 and the EA content is sufficiently detailed to meet regulatory requirements for legal

sufficiency and current (at the time of creation) TxDOT ENV guidance and Environmental Compliance Toolkits.

2. Exhibits to be included in reports or EAs must not exceed 11 inches x 17 inches and must be in color. Text pages must be 8.5 inches x 11 inches. Exhibits and text in reports or EAs must be reproducible via photocopying without loss of legibility. The EA documents must be reproduced on plain white paper unless otherwise approved in advance in writing by the County.1

3. The EA must use quality maps and exhibits and must incorporate by reference and summarized background data and technical analyses to support the concise discussions of the alternatives and their impacts.

B. Deliverables:

1. Draft EA

2. Revised Draft EA

3. Draft EA for Public Hearing

4. Final EA with FONSI

120.3. Omitted

120.4. Omitted

120.5. Environmental Technical Analyses and Documentation.

A. Definition of technical analyses and documentation for environmental services.

In general, technical analyses and documentation for environmental services might include a report, checklist, form, or analysis detailing resource-specific studies identified during the process of gathering data to make an environmental decision.

The County determines what technical reports and documentation are necessary for any given project. The Engineer shall prepare all technical reports and documentation for the County with sufficient detail and clarity to support environmental determinations. All technical reports must be compliant with TxDOT's Environmental Compliance Toolkits, documentation requirements, and templates. The environmental document must reference the technical reports.

Environmental technical reports and documentation must include appropriate NEPA or federal regulatory language in addition to the purpose and methodology used in delivering the service. Technical reports and forms must use templates and documentation standards as applicable and include sufficient information to determine the significance of impacts.

B. Minimum Deliverables:

1. Draft technical analyses and documentation

2. Final technical analyses documentation

3.

C. Technical analyses and documentation included as part of this work authorization level are as follows:

1. Section 4(f) Evaluations

   The Engineer shall provide Section 4(f) Evaluations. The Section 4(f) Evaluation must conform to the appropriate TxDOT Section 4(f) checklist for exceptions, de minimis, and programmatic evaluations. For individual Section 4(f) Evaluations, the format and outline must be approved by the State beforehand. All Section 4(f) Evaluations must meet the requirements set forth in TxDOT's Environmental Compliance Toolkits. The 4(f) Section of the environmental document states the reason a Section 4(f) evaluation is being completed. The 4(f) Section of the environmental document discusses the presence of all Section 4(f) properties located in the project area.

2. Section 6(f) Evaluation

   The Engineer shall determine if Land and Water Conservation Fund Act funds were used for the Section 4(f) property in accordance with the regulatory requirements and TPWD guidelines and document.

3. Environmental Public Involvement (23 CFR §771.111)

   The Engineer shall provide public involvement activities, which might include:

   a. Developing a plan for public involvement activities, public involvement plan. The plan must specify all activities to be performed and alternatives to be discussed during public involvement activities. The plan must also discuss outreach strategies for both the general public and targeted strategies for environmental justice and limited English proficiency populations

   b. Compiling, maintaining, and updating a mailing list of people, agencies, and organizations interested in the transportation activity. Responding to stakeholder questions and logging communications.

   c. Making all arrangements for up to two public meetings and up to one hearing, including the site of the meetings, mailing and distributing notices, preparation of exhibits, provision for taping or transcription of proceedings, security, and any other arrangements as directed by the County. The Engineer shall not hold public meetings or hearings in the absence of County personnel

   d. Submitting all meeting notices to the County for review no less than six weeks prior to publication

   e. Arranging a meeting with the County to review all exhibits and other materials to be used prior to public meetings or hearings

   f. Obtaining the County's approval for all legal notices, exhibits, and other materials

   g. Providing personnel to staff meetings and hearings; including, people to perform registration, make presentations, and answer questions. Staffing levels of personnel to be provided must be identified in the work authorization

   h. Developing and submitting to the County up to two meetings and one hearing documentation packet. Scope assumes up to 250 comments in each comment response matrix.

   i. Developing and sending acknowledgement or response letters to commenters at public meetings or hearings. The Engineer shall not distribute acknowledgement or response letters without prior approval by the County

j. Developing, publishing, and distributing a newsletter on the transportation activity, including compiling and maintaining a mailing list. The Engineer shall not distribute the newsletter without prior approval by the County

k. Submitting to the County a request for development and maintenance of a website to disseminate information on the transportation activity and to gather comments from the public.

l. Develop content for the County to post on their website with up to six updates.

4. Community Impacts Analysis

The Engineer shall provide community impact analyses. Community impacts includes environmental justice, limited English proficiency, and other issues as addressed in TxDOT environmental guidance. The Engineer shall perform community impact assessments including environmental justice analysis in accordance with Attachment A, Article 38, Sections J and K of the contract. Community impact analyses might include:

a. Community Impacts Assessment Technical Report Form;

b. Community Technical Report. The report must follow guidance provided in TxDOT's Community Impacts Assessment Toolkit. The assessment will include:

(1) Identification of environmental justice communities within the study area;

(2) A community profile;

(3) A displacement analysis;

(4) An access and travel pattern analysis;

(5) A community cohesion analysis;

(6) Determination if the project would have disproportionately high and adverse impacts on environmental justice communities. All impacts identified in the Community Impact Assessment and other relevant studies (i.e. noise analysis) must be considered to determine if the impacts disproportionately affect environmental justice communities;

(7) Identification of possible mitigation measures to avoid or minimize any adverse impacts to the environmental justice population within the project area;

(8) Summary of public involvement process including methods used to accommodate persons with limited English proficiency; and

(9) Identification of possible mitigation measures including those to avoid and minimize any adverse impacts to the environmental justice population within the project area.

5. Induced Growth Impact Analysis and Cumulative Impacts Analysis

The Engineer shall perform analysis to fulfill the requirements of NEPA and the most current version of the TxDOT *Guidance on Preparing Impact Analyses* and *Cumulative Impacts Analysis Guidelines* in TxDOT's Environmental Compliance Toolkits.

6. Air Quality Studies

The Engineer shall prepare all required technical reports and the air quality section of all environmental documents in accordance with the current version of the TxDOT *Environmental Handbook for Air Quality* and Air Quality Toolkit. The technical reports and documentation include:

a. Qualitative mobile source air toxics (MSAT) analysis,

b. Applicable disclosure statements in the environmental document as prescribed in the TxDOT *Guidance for Preparing Air Quality Statements*, and

c. Response to public comments received on air quality issues.

7. Noise Analysis Technical Reporting

The Engineer shall prepare all necessary noise analyses and technical reporting.

a. Noise Analysis Technical Reporting Requirements. At the work authorization level, the noise analysis technical reporting might include:

(1) Computer modeling of existing and predicted noise levels;

(2) Field measurements of existing noise levels and validation of existing model;

(3) Determining predicted noise impact contours for undeveloped property;

(4) Barrier analysis for impacted receivers.

b. Noise Analysis General Requirements.

(1) The Engineer shall use TxDOT's .DGN file coordinate system for all traffic noise modeling, so that all design files and traffic noise modeling software coordinate systems are the same.

(2) The Engineer shall provide TxDOT with all .DXF files used for the traffic noise model.

(3) The Engineer shall review all proposed noise barrier locations as part of the traffic noise modeling process.

8. The Engineer shall not begin identification of noise sensitive land uses unless TxDOT's Environmental Affairs Division's Historical Studies Branch (ENV-Historical Studies) has approved a Project Coordination Request (PCR).

9. Water Resources Analysis and Documentation

The Engineer shall provide environmental documentation, conduct field surveys, and provide analysis of water resources for compliance with state and federal regulations as described in the *Environmental Guide: Volume 2 Activity Instructions*, http://ftp.dot.state.tx.us/pub/txdot-info/env/toolkit/060-06-gui.pdf, and the associated forms, templates, and guidance found in the Water Resources section of the Natural Resources Toolkit, https://www.txdot.gov/inside-txdot/division/environmental/compliance-toolkits/natural-resources.html.

The Engineer shall provide the following water analysis:

a. Surface Water Analysis Form, including analysis of:

(1) Section 404 of the Clean Water Act

(2) Section 303(d) of the Clean Water Act

(3) General Bridge Act/Section 9 of the Rivers and Harbors Act

(4) Section 10 of the Rivers and Harbors Act

(5) Section 401 of the Clean Water Act

(6) Executive Order 11990, Protection of Wetlands

b. WOTUS Delineation report prepared in accordance with ENV's Documentation Standard for Waters of the U.S. Delineation Report using ENV's Template: Waters of the U.S. Delineation Report including all supporting forms and exhibits

c. Section 404/10 Impacts Table prepared in accordance with TxDOT ENV's Section *404/10 Impacts Table and Instructions – Preparing a Section 404/10 Impacts Table*

d. Section 404 Permitting Package, including:

(1) USACE PCN Permitting Application prepared in accordance with TxDOT ENV's *Documentation Standard for PCN*

(2) Conditional/Functional Assessment

(3) 401 Certification

e. For all WOTUS surveys, the Engineer shall:

(1) Provide the results of the land survey in electronic DGN file format to be incorporated into the schematic and plans. GIS and KMZ files of the land survey must also be provided.

(2) Determine the acres of permanent and temporary impacts and linear feet of impacts at each WOTUS and provide figures of the WOTUS and associated impacts overlaying the schematic and plan sheets.

10. Biological/Natural Resources Management Analysis and Documentation

The Engineer shall provide environmental documentation, conduct field surveys, and provide analysis of biological natural resources for compliance with state and federal regulations as described in the TxDOT *Environmental Guide: Volume 2 Activity Instructions*, http://ftp.dot.state.tx.us/pub/txdot-info/env/toolkit/060-06-gui.pdf, and the associated forms, templates, and guidance found in the Natural Resources Toolkit, https://www.txdot.gov/inside-txdot/division/environmental/compliance-toolkits/natural-resources.html. The Engineer shall provide the following biological/natural resource analysis:

a. Species Analysis Form, including:

(1) Species Analysis Spreadsheet, including a habitat analysis for the entire project area, and field surveys for protected species, or suitable habitat.

(2) Tier 1 Site Assessment, which can include early coordination or administrative coordination with TPWD.

(3) Bald and Golden Eagle Protection Act (BGEPA) analysis and coordination assistance.

b. Farmland Protection Policy Act (FPPA) analysis

11. Preparation of USFWS/National Marine Fisheries Service (NMFS) species consultation, including section 7 formal consultation for USFWS/NMFS

12. Initial Site Assessment (ISA) with Hazardous Materials Project Impact Evaluation Report

The Engineer shall provide an ISA with Hazardous Materials Project Impact Evaluation Report for the limits of the proposed project in accordance with Statement of Work for Hazardous Materials Processes related to NEPA in the TxDOT Hazardous Materials Management Toolkit (http://www.txdot.gov/inside-txdot/division/environmental/compliance-toolkits/haz-mat.html).

13. Archeological Documentation Services

The Engineer shall provide archeological studies and documentation. All archeological studies must be sufficient to satisfy the current TxDOT Archeological Sites and Cemeteries Toolkit. An archeological background study must be performed prior to field

work. If the Engineer was provided with a background study by the State, a new background study is not required.

The Engineer shall provide archeological resource identification, evaluation, and documentation services. In compliance with TxDOT's Environmental Compliance Toolkits, the Engineer shall provide the following archeological services/deliverables:

a. Archeological background study

b. Antiquities Permit Application

c. Archeological reconnaissance survey

d. Archeological intensive survey and reporting

An archeological survey (reconnaissance or intensive) must be sufficient to satisfy state and federal regulations. The applicable archeological survey must be determined at the work authorization level. The Engineer shall contact TxDOT's Environmental Affairs Division's Archeological Studies Branch (ENV-ARCH) for approval prior to starting field and survey work. ENV-ARCH will verify that approved methods and appropriately permitted and experienced staff will be used.

14. Historic Resource Identification, Evaluation, and Documentation Services

The Engineer shall provide historic resource identification, evaluation, and documentation services. In compliance with TxDOT's Environmental Compliance Toolkits, the Engineer shall provide the following historic resource services/deliverables:

a. Historic Resources PCR,

b. Historic Resources Research Design, and

c. Historic Resource Survey Report, including windshield, reconnaissance, or intensive level documentation.

All services, except the historic resource PCR, must have prior approval by TxDOT's Environmental Affairs Division's Historical Studies Branch (ENV-HIST) to be performed. The historic resource PCR must be accepted by ENV-HIST prior to survey field work.

15. Floodplain Impacts

The Engineer shall determine whether the transportation activity has the potential to affect floodplains. Studies for floodplain impacts must fulfill the requirements of Executive Order 11988 and 23 CFR 650, Subpart A. Documentation must:

a. Briefly describe the watershed characteristics of the study area in terms of land uses and changes in land use that may affect stream discharge.

b. Briefly describe the streams in the study area, including evidence of stream migration, down cutting, or aggradations.

c. Identify the presence and nature (e.g., zone A, zone AE, zone AE with floodway) of any FEMA mapped floodplains; including the panel number.

d. Indicate the existence of any significant development associated with the mapped area and identify the jurisdiction responsible for the floodplain.

e. Identify the locations where an alternative might encroach on the base (100-year) floodplain (encroachments), where an alternative might support incompatible floodplain development, and the potential impacts of encroachments and floodplain development. This identification must be included in the text and on a map.

f. Include a list of all jurisdictions having control over floodplains for each alternative.

g. Where an encroachment or support of incompatible floodplain development results in impacts, provide more detailed information on the location, impacts, and appropriate mitigation measures. In addition, if any alternative (1) results in a floodplain encroachment or supports incompatible floodplain development having significant impacts, or (2) requires a commitment to a particular structure size or type, the report must include an evaluation and discussion of practicable alternatives to the structure or to the significant encroachment. The report must include exhibits that display the alternatives, the base floodplains and, where applicable, the regulatory floodplains.

h. For each alternative encroaching on a designated or regulatory floodplain, provide a preliminary indication of whether the encroachment is consistent with or requires a revision to the regulatory floodplain. If the preferred alternative encroaches on a regulatory floodplain, the report must discuss the consistency of the action with the regulatory floodplain. In addition, the report must document coordination with FEMA and local or state agencies with jurisdiction indicating that a revision is acceptable or that a revision is not required.

i. If the preferred alternative includes a floodplain encroachment having significant impacts, the report must include a finding that it is the only practicable alternative as required by 23 CFR 650, Subpart A. The finding must refer to Executive Order 11988 and 23 CFR 650, Subpart A. In such cases the report must document compliance with the Executive Order 11988 requirements and must be supported by the following information:

(1) The reasons why the proposed action must be located in the floodplain;

(2) The alternatives considered and why they were not practicable; and

(3) A statement indicating whether the action conforms to applicable state or local floodplain protection standards

16. Stormwater Permits (Section 402 of the Clean Water Act)

The Engineer shall:

a. describe the need to use the TPDES General Permit, TX 150000. The text must describe how the project will comply with the terms of the TPDES, including the Stormwater Pollution Prevention Plan; and

b. describe the need for Municipal Separate Storm Sewer System (MS4) notification. List MS4 participating municipalities.

FUNCTION CODE 130 (130) – RIGHT-OF-WAY DATA

RIGHT-OF-WAY (ROW) DATA AND UTILITY ENGINEERING INVESTIGATION

For Function Codes 130 and 150, the term Surveyor means the firm (prime provider or subprovider) that is providing the surveying services shown in this scope.

The Engineer shall ensure that the following general standards for survey work are followed for Function Codes 130 and 150:

Unless otherwise indicated, any reference in this attachment to a manual, specification, policy, rule or regulation, or law means the version in effect at the time the work is performed. TxDOT manuals are available at: http://onlinemanuals.txdot.gov/manuals/.

All surveys must meet or exceed all applicable requirements and standards provided by: (1) Professional Land Surveying Practices Act, (2) General Rules of Procedures and Practices promulgated by the Texas Board of

Professional Engineers and Land Surveyors (TBPELS), and (3) *TxDOT Survey Manual.* The Surveyor shall perform all work in an organized and professional manner. All surveys are subject to the approval of the County.

The Surveyor shall use the TxDOT *ROW Preliminary Procedures for Authority to Proceed Manual* and *TxDOT Survey Manual* as the basis for the format and preparation of all right of way (ROW) documents produced, including ROW maps, written parcel descriptions, parcel plats, and other ROW work products, unless otherwise specified by the County.

Unless otherwise directed by the County, the Surveyor shall use (1) the North American Datum of 1983 (NAD83), Texas Coordinate System of 1983 (State Plane Coordinates) applicable to the zone or zones in which the work is performed, with values in U.S. survey feet, as the basis for all horizontal coordinates derived and (2) the datum adjustment currently in use by TxDOT.

Project or surface coordinates must be calculated by applying a combined adjustment factor (CAF) to State Plane Coordinate values. If provided by the County, the Surveyor shall use a project specific CAF.

Elevations must be based on the North American Vertical Datum 88 (NAVD88), unless otherwise specified by the County.

All work using the Global Positioning System (GPS), whether primary control surveys or other, must meet or exceed the requirements provided by the *TxDOT Survey Manual* 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 attachment or in a work authorization, the work must meet or exceed the order of accuracy specified in the publication listed in this paragraph.

All conventional horizontal and vertical control surveys must meet or exceed the order of accuracy specified in the *TxDOT Survey Manual* unless specified otherwise in the contract.

All boundary determination surveys, whether for ROW acquisition, ROW re-establishment, or other boundary needs, must meet or exceed the accuracy specified in the *TxDOT Survey Manual* unless specified otherwise in the contract.

The County may authorize the Surveyor to use an Unmanned Aircraft System (UAS) to perform services under this contract. The use of UAS is regulated by the Federal Aviation Administration (FAA). All UAS operators must comply with Federal Aviation Administration (FAA) regulations and the *TxDOT Unmanned Aircraft System (UAS) Flight Operations and User's Manual.*

The survey data must be fully compatible with the State's computer system and with programs in use by the State at the time of the submission, without further modification or conversion. The current programs used by TxDOT are: Microsoft Word, Bentley MicroStation, Bentley OpenRoads civil design system, Bentley GEOPAK Survey, Excel, and ESRI ArcGIS. Data collection programs must be compatible with the current import formats allowed by GEOPAK Survey and be attributed with current feature codes. These programs may be replaced at the discretion of the State.

Drawing sizes are defined, based on American National Standards Institute (ANSI) standard paper sizes, as follows: A-size means 8.5 inches by 11.0 inches, B-size means 11.0 inches by 17.0 inches, C-size means 17.0 inches by 22.0 inches, and D-size means 22 inches by 34.0 inches.

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. The County may also require the Surveyor to review the survey work performed by others. If, at any time, during the course of reviewing a submittal of any item it becomes apparent to the County that the submittal contains a substantial number of errors, omissions, and inconsistencies, the County may cease its review and return the submittal to the Surveyor immediately for appropriate corrective action. 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 construction specifications, design specifications, or as specified by the County:

130.1. Omitted

130.2. Omitted

A. GIS Submission Requirements and Standards

All ROW mapping project work authorizations are subject to the standards and required ArcGIS deliverables detailed in Chapter 4, Section 8 of the TxDOT *ROW Preliminary Procedures for the Authority to Proceed* Manual.

130.3. Omitted

130.4. Omitted

130.5. Utility Engineering Investigation.

Utility engineering investigation includes utility investigations subsurface and above ground prepared in accordance with ASCE/CI Standard 38-02

The Engineering Investigation for each Quality Level will be determined at each phase of the project as needed. [(http://www.fhwa.dot.gov/programadmin/asce.cfm)] and Utility Quality Levels.

A. Utility Quality Levels (QL)

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

1. Quality Level D - Quality level value assigned to a utility segment or utility feature after a review and compilation of data sources such as existing records, oral recollections, locations marked by DIGTESS, and data repositories.
2. Quality Level C - Quality level value assigned to a utility segment or utility feature after surveying aboveground (i.e., visible) utility features and using professional judgement to correlate the surveyed locations of these features with those from existing utility records.
3. Quality Level B - Designate: Quality level value assigned to a utility segment or subsurface utility feature whose existence and position is based upon appropriate surface geophysical methods combined with professional judgment and whose location is tied to the project survey datum. Horizontal accuracy of Designated Utilities is 18" (including survey tolerances) unless otherwise indicated for a specific segment of the deliverable. Quality Level B incorporates quality levels C and D information. A composite plot is created.
4. Quality Level A – Quality level value assigned to a portion (x, y, and z geometry) of a point of a subsurface utility feature that is directly exposed, measured, and whose location and dimensions are tied to the project survey datum. Other measurable, observable, and judged utility attributes are also recorded (per District Best Practices). The utility location must be tied to the project survey datum with an accuracy of 0.1 feet (30-mm) vertical and to 0.2 feet (60-mm) horizontal. As test holes may be requested up front or during the project, test holes done prior to completion of QL D, C, or B deliverables must be symbolized on the QL B deliverable with a call out indicating test holes number. This is in addition to and not in lieu of the test hole.

B. Utility Investigations Methodology

1. Utility Investigation Quality Level D For the Schematic / Environmental Phase, CivilCorp will provide only SUE Quality Level D within a single corridor that includes the following existing utilities: Bryan Texas Utilities (BTU), a municipally owned utility serving the citizens of Bryan/College Station and Brazos County with electricity, drinking water and wastewater services; communication companies including AT&T, Frontier, Next, Bright

Speed, Optimum and Earthlink; Water and Utility Districts providing drinking water and wastewater services. According to Texas Railroad Commission website, there are approx. 58 pipeline crossings including Atmos Gas, Atmos Pipeline, Energy Transfer, Wilson Creek Utility District, Enterprise Products, Magellan, Northfield Enterprises, Wildfire Energy Midstream, Entergy, and ExxonMobil Pipeline. Also, there are approx. 11 transmission power line crossings (138 KV and 69 KV). -

The Engineer shall:

a. Perform work site visitation / field reconnaissance

b. Develop work plans for County Approval.

c. Review and compile data sources.

d. Perform records research from all available resources. Sources include: Texas811, Railroad Commission of Texas (Texas RRC), verbal recollection, as-built information from plans, plats, permits and any other applicable information provided by the utility owners or other stakeholders.

e. Document utility owners and contact information.

f. Create a utility drawing of information gathered.

2. Designate (Quality Level B) (Within proposed 150'ft ROW only)

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. Designating (Quality Level B) services are inclusive of Quality Levels C and D.

The Engineer must:

a. As requested by the County, compile "as-built" information from plans, plats and other location data as provided by the utility owners.

b. Request Right of Entry in accordance to General Requirements Section 1.4 of this Attachment A.

c. Coordinate with Survey to tie utilities to project survey datum.

d. 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.

e. Designate, record, and mark the horizontal location of the existing utility facilities using non-destructive surface geophysical techniques.

f. Using both active and passive scans to attempt to locate any additional utilities, including unrecorded and abandoned storm and sanitary sewer facilities, at the direction of the state, may be investigated using additional methods such as rodding that would then classify them as Quality Level B. A non-water based pink paint or pink pin flags must be used on all surface markings of underground utilities.

g. Correlate utility owner records with designating data and resolve discrepancies using professional judgment. The Engineer must prepare and deliver to County a color-coded composite utility facility plan with utility owner names, quality levels, line sizes and subsurface utility locate (test hole) locations. The Engineer and County acknowledge that the line sizes of designated utility facilities detailed on the deliverable will be 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 "lines sizes are from best available

records". All above-ground utility feature locations must be included in the deliverable to the County. This information must be provided in the latest version of OpenRoads civil design system used by the State. The Engineer shall deliver the electronic file on USB flash drive, as requested by the State. A hard copy is required and must be signed, sealed, and dated by the registered engineer overseeing the utility engineering investigation. When requested by the County, the designated utility information must be over laid on the County's design plans.

h. Determine and inform the County of the approximate electronic utility depths at critical locations as determined by the County. The limits of this additional information should be determined prior to the commencement of work. 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 ROW and construction plans.

i. Provide a monthly summary, with weekly updates, of work completed and in process with adequate detail to verify compliance with agreed work schedule.

j. Close-out permits as required.

k. Clearly identify all utilities that were discovered from Quality Levels C and D investigation but cannot be depicted in Quality Level B standards. These utilities must have a unique line style and symbology in the designate (Quality Level B) deliverable.

l. Comply with all applicable TxDOT policy and procedural manuals.

3. Subsurface Utility Locate (Test Hole) Service (Quality Level A) (Estimated 10 test holes)

Locate is the process used 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 inclusive of Quality Levels B, C, and D.

The Engineer must:

a. 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. Request Right of Entry in accordance to General Requirement Section 1.4 of this Attachment A.

b. Coordinate with Survey to tie utilities to project survey datum. Prepare, review, and document test hole data sheets.

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

d. Place Texas 811 ticket 48 hours prior to excavation.

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

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

(1) Elevation of top of utility tied to the datum of the furnished plan.

(2) Minimum of two benchmarks utilized. Elevations must be within an accuracy of 15mm (.591 inches) of utilized benchmarks.

(3) Elevation of existing grade over utility at test hole location.

(4) Horizontal location referenced to project coordinate datum.

(5) Outside diameter of pipe or width of duct banks and configuration of non-encased multi-conduit systems.

(6) Utility facility materials.

(7) Utility facility condition.

(8) Pavement thickness and type.

(9) Coating/wrapping information and condition.

(10) Unusual circumstances or field conditions.

g. Excavate test holes in such a manner as to prevent any damage to wrappings, coatings, cathodic protection, and other protective coverings and features. Water excavation can only be utilized with written approval from the appropriate TxDOT district office.

h. Be responsible for any damage to the utility during the locating process. In the event of damage, the Engineer must stop work, notify the appropriate utility facility owner, the County, and appropriate regulatory agencies. The regulatory agencies include: 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 is liable for all costs involved in the repair or replacement of the utility facility.

i. Back fill all excavations with appropriate material, compact backfill by appropriate mechanical means, and restore pavement and surface material. The Engineer is responsible for the integrity of the backfill and surface restoration for a period of three years.

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

k. 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.

l.

130.6. Estimating Right of Way Costs.

The Right of Way Data task for estimating right of way costs will involve researching property information on up to two proposed routes for the project, providing estimates of the cost to acquire the right of way, offering suggested revisions to the route which could potentially save right of way costs and participate in regular project meetings.

More specifically, upon receipt of preliminary plans and a request to begin work, ORC will obtain the vesting deed and other information located in the County records for each property that appears to be directly affected by the project.

At the same time, ORC will work with an appraisal firm to prepare a market study for land values. This market study will provide information on current sales of properties which are similar to those properties possibly being affected by the project.

ORC will use this data from the market study to determine an estimate of the cost to acquire the property rights needed from each parcel. These values will be expressed in terms of the cost as of the date of the ORC deliverable. The information will be prepared via a desktop review and will not involve a visit to, nor an in-person review of, the project area. The ORC report will be provided in the form of an excel spreadsheet that will indicate each parcel being directly affected by the project and identified with the owner's name as determined by the current vesting deed and county records, along with county assessor parcel ID, and an estimate of the cost of the property rights to be acquired including possible damages to the remainder. Where

applicable, ORC will also estimate the amount of relocation benefits which may be claimed by each parcel. ORC will provide one update to each excel spreadsheet report, which incorporates agreed upon revisions. For each of the two routes, the report will be submitted within 90 days of ORC being provided with a set of preliminary plans and a request to begin work. The one updated report on each route will be submitted within 60 days of ORC being requested to begin work on the updated report.

It is assumed that there will be no more than 200 parcels to be researched.

ORC anticipates the need for a series of meetings to allow ORC to remain up to date on the project, to provide an explanation for information in the deliverables and to discuss possible revisions to the route or specific properties. ORC assumes there will be 20 virtual meetings, each about one hour in length, which will be attended by two ORC staff persons.

All information and requests will be provided to ORC to allow completion of this assignment by no later than December 31, 2024.

Deliverable

ORC will provide an excel spreadsheet that will indicate each parcel being directly affected by the project and identified with the owner's name as determined by the current vesting deed, along with county assessor parcel ID, and an estimate of the cost of the property rights to be acquired including possible damages to the remainder. Where applicable, ORC will also estimate the amount of relocation benefits which may be claimed by each parcel. ORC will provide two updates to each excel spreadsheet report which incorporates agreed upon revisions.

FUNCTION CODE 145 (145, 164) – MANAGING CONTRACTED/DONATED PE

CONTRACT MANAGEMENT AND ADMINISTRATION

145.1. Contract Management and Administration.

The Engineer shall:

A. Act as an agent for the County when specified in a work authorization.

B. Produce a complete and acceptable deliverable for each environmental service performed for environmental documentation.

C. Incorporate environmental data into identification of alternatives.

D. Notify the County of its schedule, in advance, for all field activities.

E. Notify the County as soon as practical, by phone and in writing, if performance of environmental services discloses the presence or likely presence of significant impacts (in accordance with 40 Code of Federal Regulations (CFR) 1500-1508). Inform the County of the basis for concluding there are significant impacts and the basis for concluding that the impacts might require mitigation.

F. Notify the County as soon as practical, by phone and in writing, if performance of environmental services results in identification of impacts or a level of controversy that might elevate the transportation activity's status from a categorical exclusion or environmental assessment. The County will reassess the appropriate level of documentation.

FUNCTION CODE 160 (150) – ROADWAY DESIGN

DESIGN SURVEYS AND CONSTRUCTION SURVEYS

150.1. Omitted

150.2. Omitted

150.3. Omitted

150.4. Omitted

150.5. Mapping (15.3).

Mapping includes the geospatial data collection and mapping by means of aerial photogrammetry, terrestrial (close range) photogrammetry, terrestrial LiDAR, mobile LiDAR, and other remote sensing technologies.

A. Purpose

The purpose of mapping is to provide map and related data to support transportation projects including project design and other uses.

B. Definitions

1. Aerial Photogrammetry (15.3.1) – Aerial Photogrammetry means the collection and processing of photography acquired from an airborne platform to develop DGN and DTM files.
2. Airborne LiDAR (15.3.4) – Airborne LiDAR means laser scanning equipment mounted on a helicopter or other airborne platform to collect data to process for DGN and DTM files.
3. Mobile LiDAR (15.3.4) – Mobile LiDAR means laser scanning equipment mounted on a moving vehicle operating on the earth's surface to collect data to process for DGN and DTM files.

150.6. Aerial Mapping Using a Metric Camera and Manned Aircraft.

Aerial mapping using a metric camera and manned aircraft includes the collection of digital aerial imagery using a calibrated large-format metric aerial camera, performing relative orientation of the imagery through the collection of tie and pass points between adjacent aerial photo frames, performing a least-squares bundled absolute orientation adjustment using ground control points supplemented with airborne GPS and inertial measurement unit (IMU) data, and deriving data from the processed imagery including compilation of planimetric and topographic maps, creation of point cloud digital elevation model (DEM) and digital terrain model (DTM) data, and production of orthophotography.

The Surveyor shall provide the services of a certified Photogrammetrist to perform or oversee the tasks under function code 150.6. The Surveyor remains ultimately responsible and shall ensure that the work is performed as required.

A. Purpose

The purpose of aerial mapping using a metric camera and manned aircraft is to provide map and related data to support transportation projects including project design and other uses.

B. Definitions

In 150.6, 150.7, and 150.8 the following definitions apply:

1. Photogrammetrist means an American Society for Photogrammetry and Remote Sensing (ASPRS) Certified Photogrammetrist with a current certification.

2. Mapping Scientist means an American Society of Photogrammetry and Remote Sensing (ASPRS) Certified Scientist-UAS with a current certification.
3. Metric Aerial Photograph means a vertical photograph taken from a manned aircraft using a large-format calibrated digital metric aerial mapping camera.
4. Large-format digital metric camera means a camera using charge-coupled device (CCD) or complementary metal oxide semiconductor (CMOS) technology to capture an image with a minimum final image size of 11500 by 7500 pixels.
5. Analytical triangulation means the process of developing absolute orientation parameters for individual photogrammetric stereo models through the use of image tie and pass points combined with ground control in a fully weighted least-squares bundle adjustment. Airborne GPS and IMU data may be used to reduce the number of ground control points.
6. Ground control means points established on the ground by the Surveyor and for which the Northing, Easting, and Elevation coordinates have been determined sufficient in number and geospatial distribution to allow analytical triangulation and mapping to meet the required project accuracy. Ground control can be targeted using paint or other marker material or can be non-targeted.
7. Airborne GPS/IMU – An airborne GPS receiver on-board the aircraft recording GPS and orientation data to be included in the analytical triangulation with the purpose of reducing the number of ground control points required for a metric aerial mapping task. IMU data to supplement the analytical triangulation is optional and its use is at the discretion of the Certified Photogrammetrist or Mapping Scientist.
8. KML means an uncompressed Google Keyhole Markup Language file, which is a two- or three- dimensional map showing a location on the earth.
9. KMZ means a compressed Google Keyhole Markup Language file, which is a two- or three- dimensional map showing a location on the earth.
10. DEM means digital elevation model, which is a three-dimensional DGN and/or point cloud in ASPRS LAS 1.2 file format containing all features located in the project area including features both on and above the ground surface.
11. DTM means digital terrain model, which is a three-dimensional DGN and/or point cloud in ASPRS LAS 1.2 format containing only features located on the ground surface.
12. Field Check means a ground survey validation of the deliverable map product with the purpose of ensuring that the required mapping accuracy has been met.
13. Flight Map means a map depicting the flight line and ground control layout over the project area.
14. Low Altitude Metric Aerial Photography means a metric aerial photography with a nominal ground pixel size of 5 cm or less.
15. DGN means a two or three-dimensional graphics file produced using Bentley MicroStation. The file may contain features and improvements plotted in a horizontal plane along the N and E axes which correspond to the Texas Coordinate System. The file may contain 2D or 3D elements representing topographic, existing, proposed, schematic, and general layout features.

C. Procedure for Aerial Mapping Using a Metric Camera and Manned Aircraft

1. Ground Control

The positioning and density of ground control is at the discretion of the Photogrammetrist. Ground control is required to be sufficient to meet the accuracy standard required for the final mapping products. Chapter 3 of the *TxDOT Survey Manual* provides guidance for

the location and density of the ground control. The Photogrammetrist must determine the approximate position for ground control points. The Surveyor shall locate and mark the ground control points in the field using surveying methods.

2. Metric Digital Aerial Photography

   The Photogrammetrist must acquire metric digital aerial photography using a large-format calibrated metric aerial mapping camera. Unless otherwise stated, the imagery will be low altitude with a maximum nominal ground sampling distance of 5.0 cm. The Photogrammetrist must ensure that all imagery acquisition requirements including all flight parameters are met such that the imagery is suitable for intended use.

3. Analytical Triangulation

   The Photogrammetrist must process the metric digital aerial photography, ground control, and airborne GPS/IMU data (if collected) to develop an absolute orientation of the imagery suitable for map compilation at the required accuracy.

4. Aerial Mapping

   The Photogrammetrist must prepare the following:

   a. A two-dimensional DGN file containing planimetric map features.

   b. A three-dimensional DGN file containing DTM features.

   c. Orthophotography

   The Photogrammetrist must provide orthorectified aerial imagery covering the project area.

D. Technical Requirements

1. Aerial mapping using a metric camera and manned aircraft must be performed under the direct supervision of an ASPRS Certified Photogrammetrist.

2. Unless otherwise stated, aerial mapping must meet or exceed the requirements for ASPRS Class 1 mapping at a 1 inch = 40 feet equivalent scale with a one-foot indicated contour interval.

E. Data Requirements

1. Planimetric DGN files must be fully compatible with the current Bentley MicroStation version graphics program used by TxDOT without further modification or conversion.

2. Electronically collected and processed field survey data files must be fully compatible with TxDOT's computer systems without further modification or conversion. All files must incorporate only those feature codes currently being used by the State.

3. DTM must be fully compatible with the current version of Bentley OpenRoads civil design system used by TxDOT without further modification or conversion. All DTM must be fully edited to provide a complete digital terrain model with all necessary break lines.

4. File features and level structure must be in accordance with the State's current photogrammetry mapping legend.

5. Minimum text size is 0.1 inches when plotted at a scale of 1 inch = 40 feet.

F. Deliverables for Aerial Mapping Using a Metric Camera and Manned Aircraft

The Photogrammetrist must submit the following:

1. Digital orthophotography delivered on USB flash-drive or hard-drive in Tagged Image File format (TIF) compatible with Bentley MicroStation software and including georeferenced world files.

2. A photo index map in DGN and KMZ format showing the location of each digital image frame. The index map must be overlaid on a base map to provide general location information.
3. An orthophoto index map in DGN, KMZ, and PDF format showing the location of each orthophoto panel. The PDF format index map must be overlaid on a base map to provide general locational information.
4. DGN files for the planimetric and DTM mapping.

150.7. Omitted

150.8. Omitted

150.9. Omitted

Placement and survey of horizontal and vertical control for aerial mapping establishes ground control for aerial mapping projects.

A. Purpose

The purpose of an aerial photography control survey is to provide ground control for aerial mapping projects.

B. Definitions

In 150.9, Aerial Photography Control Survey means reconnaissance, field work, analysis, computation, and documentation necessary to provide horizontal and vertical position of specific ground points. The ground control points are used in photogrammetric processing.

C. Procedure for Horizontal and Vertical Control for Aerial Mapping

The Surveyor shall:

1. Prepare and submit for approval an aerial ground control layout in DGN and KML format based on the target positions selected by the Certified Photogrammetrist. The layout must show the location of the proposed primary project control and aerial ground control points.
2. Establish and determine the horizontal and vertical coordinates of the primary project control points and aerial ground control points.
3. Place aerial ground control targets at the point location and maintain the targets until the aerial flight has been completed.

D. Technical Requirements

1. Aerial photography control surveys must be performed under the direct supervision of a RPLS currently registered with the TBPELS.
2. The horizontal and vertical coordinates of the aerial control points must be based on acceptable methods, conducted by the Surveyor, and must meet the standards of accuracy as set forth below:

   Survey Level 3 accuracy, as described in the *TxDOT Survey Manual*, latest edition, or the equivalent level of accuracy described in the *TSPS Manual of Practice for Land Surveying in the State of Texas*.

E. Data Requirement

The Surveyor shall perform post processing of field data, which will be reviewed by the State. Data processed by standard calculators, computers, and other business hardware and software normally maintained and used by the Surveyor will be considered acceptable.

F. Deliverables

The Surveyor shall submit the following:

1. A final aerial control point layout in DGN and KML format showing the location of the primary control and target points labeled with their respective alpha-numeric designation.
2. A plot and computer graphics of an B-size index map showing an overall view of the project and the relationship of primary monumentation and control used in the preparation of the project, signed and sealed by a RPLS, and as directed by the State.
3. A plot and computer graphics of a B-size horizontal and vertical control sheet showing the primary survey control monumentation used in the preparation of the project, signed and sealed by a RPLS, and as directed by the State.
4. An A-size data sheet for each aerial ground control point, which must include a location sketch, a physical description of the point, surface coordinates, elevation, and datums used.
5. A USB flash drive containing the graphics files and scanned images of the control data sheets.
6. A written statement describing the datum used along with copies of all relevant NGS and data sheets.
7. A written tabulation of all aerial control points with their respective alpha-numeric designations and horizontal and vertical coordinates.

150.10. Mapping Services to be Provided.

The Surveyor shall provide the following mapping services as requested by the State:

A. Aerial Photogrammetry

The Surveyor shall prepare planimetric design (DGN), digital terrain model (DTM), and triangulated irregular network (TIN) MicroStation graphics files and orthophotography files covering the specific work location, meeting standards and specifications as required.

B. Mobile and Aerial Lidar

The Surveyor shall prepare planimetric design (DGN), digital terrain model (DTM), and triangulated irregular network (TIN) MicroStation graphics files covering the specific work location, meeting standards and specifications as required.

C. Mapping Tasks to be Completed

The Surveyor shall perform the following tasks as requested for each mapping service.

1. Horizontal and Vertical Control for Aerial Mapping
   a. The Surveyor shall prepare and submit an aerial ground control layout showing the proposed aerial ground control points, for approval by the State.
   b. The Surveyor shall establish and determine the coordinates of the aerial ground control points.
   c. The Surveyor shall establish and determine the elevations of the aerial control points.
   d. The Surveyor shall place aerial ground control target material at the established points and maintain until the photographs from the flight are approved.
   e. The Surveyor shall prepare, to scale, a survey control index sheet for the aerial control points.

f. The Surveyor shall be prepared to locate additional points, as determined by the American Society for Photogrammetry and Remote Sensing (ASPRS) certified Photogrammetrist, if any panel points are not visible from the air.

2. Deliverables for Horizontal and Vertical Control for Aerial Mapping

The Surveyor shall provide the following deliverables:

a. A final aerial control point layout showing the location of the points and labeled with their respective alpha-numeric designations.

b. A plot and computer graphics of an B-size index map showing an overall view of the project and the relationship of primary monumentation and control used in the preparation of the project, signed and sealed by a RPLS, and as directed by the State.

c. An A-size data sheet for each aerial ground control point, which must include a location sketch, a physical description of the point, surface coordinates, the elevation, and datums used.

d. A USB flash drive containing the graphics files and scanned images of the control data sheets.

e. A written statement describing the datum used along with copies of all relevant NGS and data sheets.

f. A written tabulation of all aerial control points with their respective alpha-numeric designations, surface coordinates (for center panel points only), and elevations.

3. Prepare Planimetric and DTM Data

The Surveyor shall perform the following tasks for each requested mapping service:

a. The Surveyor shall provide low altitude aerial mapping to cover an area 1,200 feet wide centered on the roadway unless otherwise specified, with cross flights as directed by the State.

The Surveyor shall follow all standards and specifications in accordance with established guidelines and recommended or approved by the State.

b. The Surveyor shall prepare planimetric design (DGN), digital terrain model (DTM), and triangulated irregular network (TIN) Bentley MicroStation graphics files and orthophotography files covering the specific work location, meeting standards and specifications as required.

(1) The Surveyor shall collect supplemental planimetric and DTM survey data.

(2) The Surveyor shall update aerial 2D and 3D mapping with ground surveys.

(3) The Surveyor shall maintain the current DGN level structure and legend used by TxDOT.

(4) The Surveyor shall maintain the current DTM level structure and legend used by TxDOT.

(5) The Surveyor shall use file features and level structures in compliance with TxDOT's current photogrammetry mapping legend.

(6) The Surveyor shall locate, and field check random points.

c. The Surveyor shall conduct quality assurance and quality control (QA/QC) for each task performed and prepare a Surveyor's Report.

4. Deliverables for Planimetric and DTMs

The Surveyor shall provide the following:

a. Certification that the photographs or LiDAR imagery were taken on the date indicated, signed by the airplane pilot or aerial photographer.

b. The DGN, DTM, and TIN files on a medium and in a format acceptable to the State, delivered on USB flash-drive or hard-drive.

(1) Orthophotography (created using the DTM) delivered on USB flash drive, or hard-drive in tiff format (3 banded) with world files.

(2) TxDOT's photogrammetry mapping legend and supplements.

c. A tabulation showing the field-check points.

d. Quality Assurance and Quality Control (QA/QC) and Statement of Map Accuracy.

(1) Statement of map accuracy.

(2) A surveyor's report signed and sealed by an RPLS.

150.11. Horizontal And Vertical Control (15.3.5).

This includes the establishment of horizontal and vertical control for survey projects.

A. Overview of Horizontal and Vertical Control

A horizontal control survey is performed for the purpose of placing geographic coordinates of latitude and longitude on permanent monuments for referencing lower levels of surveys. A projection is used to place the coordinates on a plane of northing and easting values for simplified measurements. Scale and elevation factors are applied to make the distance measurements applicable to the exact location on the working surface and the type of projection chosen is an "equal angle" type.

A vertical control survey is performed for accurately determining the orthometric height (elevation) of permanent monuments to be used as bench marks for lower quality leveling. Spirit leveling is the usual method of carrying elevations across country from "sea level" tidal gauges. However, Global Positioning System (GPS) can be used indirectly but with less accuracy. Height measurements from the ellipsoid (as opposed to the "sea level" geoid) can be determined very accurately with GPS and only GPS. Trigonometric leveling, with a total station, is not acceptable for vertical control work.

B. Definitions

1. BM means bench mark, which is a relatively permanent object whose elevation above or below an adopted datum is known.

2. CORS means continuously operating reference station, which is a network of the highest quality horizontal stations, forming the National Spatial Reference System (NSRS).

3. Control Survey means a survey providing positions (horizontal or vertical) of points to which supplemental surveys are adjusted.

4. Datum means a mathematical model of the earth designed to fit part or all of the geoid.

5. Datum Point Rod or Deep Rod Monument means a monument driven to refusal by a power driver, used for major project control.

6. GPS means the Global Positioning System, which is based on a constellation of 24 satellites orbiting the earth at a very high altitude.

7. Horizontal Control Survey means placing geographic coordinates of latitude and longitude on permanent monuments.

8. Level 1 survey means RRP, CORS or major control densification.

9. Level 2 Survey means primary project control.
10. Level 3 Survey means secondary project control.
11. NGS means National Geodetic Survey
12. RRP means Regional Reference Point, which is a TxDOT Continuously Operating Reference Point.
13. Type II Monument means a disk driven onto a length of 5/8-inch rebar with the hole filled flush with concrete.
14. Vertical Control Surveys means a survey performed for accurately determining the orthometric height (elevation) of permanent monuments to be used as bench marks for lower quality leveling.

C. Procedure for Horizontal and Vertical Control

1. The Surveyor shall establish horizontal and vertical control points, including offsite points. The Surveyor shall prepare signed survey control data sheets, a survey control index sheet, and a composite layout of the horizontal and vertical controls, and as directed by the County.
2. The Surveyor shall update existing control information and prepare new survey control data sheets, as directed by the County, to be included in the construction plan set as described in Item 150.11, D.

D. Technical Requirements for Horizontal and Vertical Control

The Surveyor shall adhere to the following technical requirements.

1. Horizontal and vertical controls must be performed under the supervision of a RPLS currently registered with the TBPELS.
2. Horizontal ground control used for design surveys and construction surveys, furnished to the Surveyor by the County or based on acceptable methods conducted by the Surveyor, must meet the standards of accuracy required by the County.

   The Surveyor shall comply with the standards of accuracy for horizontal control traverses, as described in the *TxDOT Survey Manual* or the *TSPS Manual of Practice for Land Surveying in the State of Texas*, as may be applicable.
3. Vertical ground control used for design surveys and construction surveys, furnished to the Surveyor by the State or based on acceptable methods conducted by the Surveyor, must meet the standards of accuracy required by the State.

   The Surveyor shall comply with the standards of accuracy for vertical control traverses, as described in the *TxDOT Survey Manual* or the *TSPS Manual of Practice for Land Surveying in the State of Texas*, as may be applicable.
4. Monuments

   The Surveyor shall install survey monuments for a horizontal and vertical control survey that are reasonably permanent and substantial. The monuments shall be easily identified and afforded reasonable protection against damage and or destruction.

   a. Offsite primary control points whether set by GPS or conventional survey methods must be set in pairs approximately 2000 feet apart outside of the project on side roads. Offsite points must be constructed approximately every 2 miles and set approximately 6 inches below natural ground and must be inter-visible between each pair of points.

b. Secondary control points must be set approximately 6 inches below ground at a maximum distance of 1,500 feet apart.

5. Side shots or short traverse procedures for total stations used to determine horizontal and vertical locations must meet the following criteria:

   a. Short traverses and instrument setups for side shots must begin and end on horizontal and vertical ground control as described above.

   b. Standards, procedures, and equipment (e.g., GPS Equipment, LiDAR, Total Stations) used must be such that horizontal locations relative to the control can be reported within the specification to allow the engineer to accurately create the design to the following limits:

      (1) Bridges and other roadway structures: less than 0.02 feet.

      (2) Utilities and improvements: less than 0.2 feet.

      (3) Cross-sections and profiles: less than 0.2 feet.

      (4) Bore holes: less than 0.5 feet.

   c. Standards, procedures, and equipment (e.g., GPS Equipment, LiDAR, Total Stations) used must be such that vertical locations relative to the control may be reported to within 0.02 feet.

6. The Surveyor shall update existing control information and prepare new survey control data sheets, as directed by the County, to be included in the construction plan set as described below:

   a. The Surveyor shall prepare, sign, seal, and date a survey control index sheet and horizontal and vertical control sheets to be inserted into the plan set.

   b. The Surveyor shall prepare a survey control index sheet that provides an overview of the primary project control and must include:

      (1) An unscaled vicinity map showing the general location of the project in relation to nearby towns or other significant cultural features.

      (2) A scaled project map showing the extents of the project and the location of the primary control points. The map must show street networks, selected street names, control point identification, and significant culture features necessary to provide a general location of the primary control.

      (3) A table containing the primary control point values including the point number, northing, easting, elevation, stationing, and stationing offset values.

      (4) Map annotation including a graphic scale bar, north arrow, and standard TxDOT title block. The title block must contain a section for the district name, county, highway, and CSJ number. The title block must also contain a section for a Texas registered engineer to sign, seal, and date the sheet to include the following statement, "The survey control information has been accepted and incorporated into this PS&E".

      The Surveyor shall download the required format of the survey control index sheet from the TxDOT website.

      (5) In the title block under the heading "Notes", identification of the horizontal and vertical datum on which the primary control is based with the date of the current adjustment, the surface adjustment factor used, and unit of measure. The surveyor shall include a note stating that the coordinates are State Plane and a notation specifying either grid or surface adjusted coordinates.

E. Data Requirement

The Surveyor shall perform post processing of field data, which will be reviewed by the County. Data processed by standard calculators, computers, and other business hardware and software normally maintained and used by the Surveyor will be considered acceptable.

F. Tasks to be Completed

The Surveyor shall perform the following tasks:

1. The Surveyor shall establish horizontal and vertical control points, including offsite points. The Surveyor shall prepare signed survey control data sheets, a survey control index sheet, and a composite layout of the horizontal and vertical controls, and as directed by the County.
2. The Surveyor shall set primary offsite control points in pairs, approximately 2 miles apart outside of the project area.
3. The Surveyor shall set secondary control points approximately 6 inches below ground at a maximum distance of 1,500 feet apart.
4. The Surveyor shall establish horizontal and vertical control from the TxDOT Virtual Reference Station (VRS) Network, and as directed by the County.
5. The Surveyor shall tie and tabulate horizontal and vertical control to other control points and datums in the vicinity established by other sources such as the National Geodetic Survey (NGS), the Federal Emergency Management Agency (FEMA), TxDOT VRS Network, and as directed by the County.

G. Deliverables

The Surveyor shall provide the following:

1. A B-size plot and MicroStation graphics files of the index map showing an overall view of the project and the relationship of the primary monuments and control points established for the project, signed and sealed by a registered professional land surveyor (RPLS), and as directed by the County.
2. One A-size data sheet for each control point which shall include, but need not be limited to, a location sketch, a physical description of the point, surface coordinates, the elevation, and the datum used.
3. A USB flash-drive containing the graphics files and scanned images of the control data sheets.
4. A written statement describing the datum used, signed and sealed by a RPLS, along with copies of all relevant NGS and TxDOT data sheets.

FUNCTION CODE 160 (163) – ROADWAY DESIGN

MISCELLANEOUS ROADWAY

163.1. Utility Coordination.

A. Utility Base Map

The Engineer shall obtain information on existing utilities from utility owners and shall conduct investigations to identify and evaluate all known existing and proposed public and private utilities. The Engineer shall identify potential conflicts and attempt to minimize the potential adverse utility impacts in the preparation of the schematic design. The Engineer shall prepare a base map depicting the utility locations. The Engineer shall create and maintain a utility

conflict matrix along with a utility conflict exhibit through the duration of the contract identifying potential known conflicts. The format of the matrix and exhibit must be consistent with the latest version of the San Antonio District Utility Conflict Matrix and Utility Conflict Exhibit or other examples provided by the County.

B. Utility Coordination

The Engineer shall assist the County in conducting utility coordination meetings with utility companies, as required, to facilitate utility conflict identification and resolution.

1. The Engineer shall establish contact with all existing utilities within and adjacent to the project limits and set up utility coordination meetings to discuss concepts and options for design and construction. This process must also be extended to utilities that approach the County, regarding plans to install facilities within the project limits after the project has been initiated.
2. The Engineer shall establish and conduct workshop meetings, both individually with each utility and with all utilities that incorporate the County's project team to review and resolve conflicts.
3. The Engineer shall create agenda and exhibits for all coordination meetings as directed by the County.
4. The Engineer shall establish and promote the desired agenda and methodologies for utility construction within the project limits. This shall consist primarily of promoting the construction of utilities as a part of the highway contract.
5. The Engineer shall schedule and conduct a utility kick-off meeting to obtain more information on existing facilities within the project limits. Major utility facilities must be discussed and analyzed to avoid relocation, if possible.
6. The Engineer shall schedule and conduct milestone meetings (or as-needed meetings) with the County to coordinate the work effort and resolve problems. The Engineer shall prepare a written report of these meetings. The meetings must include review of the following:
    a. Existing facilities including major facilities to be avoided with the project, if possible
    b. Utility Conflict Matrix
    c. Utility Conflict Exhibit
    d. Long lead items that could potentially impact the schedule during PS&E

C. Deliverables

1. Utility Conflict Matrix along with Utility Conflict Exhibit. The Utility Conflict Exhibit must be on 11x17 sheets and include callouts to indicate the conflict ID#, utility owner, type of line (water, sewer, high pressure gas, etc.), material (if it is an AC pipe line), and size (if known).
2. Utility Contacts list in excel and pdf format
3. Utility Summary to indicate major utility facilities or time sensitive items pertaining to utilities that need to be addressed in PS&E.

163.2. Geotechnical Borings and Investigations

A. The Engineer shall determine the location of proposed soil borings for bridge design, embankment settlement analysis, retaining walls, slope stability pavement design in accordance with the latest edition of the TxDOT *Geotechnical Manual* and *Pavement Design Manual*, as applicable. The County will review and provide comments for a boring layout submitted by the Engineer showing the general location and depths of the proposed borings.

Once the Engineer receives the County's review comments, the Engineer shall perform soil borings (field work), soil testing, and prepare the boring logs in accordance with the latest edition of the TxDOT *Geotechnical Manual* and the local TxDOT district's procedures and design guidelines.

B. All geotechnical work must be performed in accordance with the latest version of the TxDOT *Geotechnical Manual*. All testing must be performed in accordance with TxDOT's Test Procedures, which are available at https://www.txdot.gov/business/resources/testing.html. American Society for Testing Materials (ASTM) test procedures may be used only in the absence of the TxDOT procedures. All soil classification must be done in accordance with the Unified Soil Classification System.

C. If applicable, the Engineer shall perform any retaining wall analyses including the settlement analysis. This analysis must include the computation of the factor of safety for bearing capacity, global stability, overturning, and sliding. In addition, the Engineer shall include allowable bearing pressure, passive earth pressure, friction factor, settlement analysis (consolidation report), and lateral earth pressure for the retaining walls.

D. If applicable, the Engineer shall perform soil borings, falling weight deflectometer testing (at intersections), dynamic cone penetrometer testing, pavement coring, piezometric readings, testing and analysis to include slope stability analysis, settlement analysis, and foundation design recommendations along proposed pavements, retaining walls, bridges, ponds, and embankments.

E. The Engineer shall provide a signed, sealed, and dated geotechnical report that contains soil boring locations, boring logs, laboratory test results, generalized subsurface conditions, ground water conditions, piezometer data, analyses and recommendations for settlement and slope stability of the earthen embankments, skin friction tables, and design capacity curves including skin friction and point bearing. The skin friction tables and design capacity curves must be present for piling and drilled shaft foundation, as applicable.

F. If applicable, the Engineer shall perform particle size analysis to include grain size distribution curves with D50 value for each cohesionless soil layer and a D50 grain size for a sample in the stream bed at the upstream face of the bridge in the upper 1-foot of the stream bed.

In addition, the Engineer shall provide a subsurface profile including the following information:

1. Determining Moisture Content in Soil Materials (Tex-103-E)
2. Particle Size Analysis (Tex-110-E) including:
    a. Median Grain Size (D50) and percent clay (percent passing No. 200 sieve)
    b. Soil type based on grain dimensions of cohesionless materials
3. Liquid Limit (Tex-104-E) as required for clayey soils
4. Plastic Limit (Tex-105-E) as required for clayey soils
5. Plasticity Index (Tex-106-E) as required for clayey soils
6. USCS Soil Classification (Tex-142-E) as required for clayey soils

In addition, the Engineer shall provide a subsurface profile including the following information

1. California Bearing Ratio (CBR) of Laboratory-Compacted Soils (ASTM D1883)
2. Unconfined Compressive Strength of Cohesive Soil (ASTM D2166)
3. Hydraulic Conductivity of Coarse-Grained Soils (ASTM D2434) for granular soils
4. One-Dimensional Consolidation Properties of Soils (ASTM D2435)
5. Direct Shear Test of Soils Under Consolidated Drained Conditions (ASTM D3080)

6. One-Dimensional Swell or Collapse of Soils (ASTM D4546, Method B)
7. Hydraulic Conductivity of Saturated Porous Materials (ASTM D5084) for clayey soils
8. Laboratory Compaction Characteristics and Moisture-Density Relationship of Subgrade, Embankment Soils, and Backfill Material (Tex-114-E, Parts I and/or II)
9. Triaxial Compression for Disturbed Soils and Base Materials (Tex-117-E)
10. Triaxial Compression Test for Undisturbed Soils (Tex-118-E)
11. Lime-pH Series of Treated Materials (Tex-121-E, Part III)
12. Potential Vertical Rise of Natural Subgrade Soils (Tex-124-E)
13. Consolidated Undrained Triaxial Compression Test for Undisturbed Soils (Tex-131-E)
14. Determining Sulfate Content in Soils (Tex-145-E)
15. Soil Organic Content Using UV-Vis Method (Tex-148-E)

G. The Engineer shall sign, seal, and date soil boring sheets to be used in the PS&E package. The preparation of soil boring sheets must be in accordance with a State's District standards.

H. Foundation Studies: The Engineer shall coordinate with the County to determine the location of soil borings to be drilled along the proposed pavements, retaining walls, bridges, bridges, embankments, and detention ponds. The soil borings must extend to a depth in accordance with the State's Geotechnical Manual. The Engineer shall provide a boring layout for the County's review and comment. Planned quantities of borings are as follows:

Proposed Structure	Approximate Location	Number of Borings	Proposed Depth (ft)
Bridge Class Culvert	2,000 ft east of SH 6	1	30
Bridge Class Culvert	1,000 ft east of Rabbit Lane	1	30
Bridge	Little Wickson Creek	2	90
Bridge	Little Wickson Creek	2	90
Bridge	US 190/SH 21	3	90
Bridge	Wickson Creek	2	90
Bridge	Wickson Creek	2	90
Bridge	Steep Hollow Branch	2	90
Bridge	Steep Hollow Road	2	80
Bridge Class Culvert	3,500 ft south of Steep Hollow Road	1	30
Bridge	Brushy Creek	2	90
Bridge	Brushy Creek	2	90
Bridge	Brushy Creek	2	90
Bridge	Near William D Fitch Parkway	2	90
Bridge	Carters Creek	2	90
Bridge	Carters Creek	2	90
Retaining Walls	US 190/SH 21 and Steep Hollow Road	6	35
Ponds	As Needed Along Alignment	10	30
Pavements	Along Entire Alignment (Approximate Spacing = 1,600 feet)	66	10
Existing Pavements	Intersections Along Alignment (14 total)	32	10
	Total	144	3,390

I. The Engineer shall incorporate soil boring data sheets prepared, signed, sealed, and dated by the geotechnical engineer overseeing the work. The soil boring sheets shall be in accordance

with the State's WINCORE software, which is available on the Texas Department of Transportation (TxDOT) website.

J. Pavement Design: The Engineer shall prepare permanent pavement designs for this project in accordance with the latest edition of TxDOT's Pavement Manual and the Bryan District's Pavement Design Standard Operating Procedure

The Engineer shall submit a signed and sealed pavement design report to the State. The pavement design report must be reviewed and approved by the State prior to its implementation. The pavement design report must document assumptions and design considerations. The pavement design report must include the following:

1. Cover sheet with highway designation, district, county, project control-section-job (CSJ) number, geographical limits, and signatures of persons involved in the preparation and approval
2. Existing and proposed typical sections
3. Soils map of the project area with a brief description of each type of soil located within the project area
4. Design input values and output
5. Conclusion consisting of recommended pavement design or designs based on the data, analyses, and procedures included in the report.
6. Pavement design details specified for each location that includes structural layer materials, general specifications, and layer thicknesses
7. Site conditions that might influence the design and performance of pavements
8. Relevant geotechnical data and drainage requirements including boring logs, laboratory soil test results, active or passive drainage system design, pavement coring and report log (up to 10-foot depth), and soil classifications with Atterberg limits
9. Results of the field explorations
10. Recommended pavement designs for new pavements
11. Design criteria used in determining pavement designs, including traffic loads, pavement material characterization, environmental conditions, and pavement design life
12. Design summary from the program used to design (e.g., FPS 21, DARWin, TxCRCP-ME, MODULUS 7.0)
13. Life-cycle cost analysis, as required by TxDOT's Pavement Manual, including the periods for resurfacing, reconstruction, and other rehabilitation measures and what these activities are likely to entail
14. Traffic control plans required for subsurface geotechnical and pavement investigations
15. Other considerations used in developing the pavement designs, including subgrade preparations and stabilization procedures. If applicable, the Engineer shall incorporate the pavement design developed by the State. If the pavement design is not available, the State may request the Engineer perform pavement design and submit to State for review and approval.

K. Deliverables

1. Preliminary Pavement Design Report
2. Geotechnical Report
3. DGN flies containing drilling log data from Geotechnical analysis

EXHIBIT B

ADDITIONAL SERVICES TO BE PROVIDED BY THE ENGINEER

INNER LOOP
SH 6 to W.D. FITCH
CSJ: TBD

The Engineer shall provide the necessary engineering and technical services for the preparation of plans, specifications, and estimates (PS&E) for the construction of the new location arterial Inner Loop East. The project will be prepared in conformance with state and federal requirements. The construction plan sets shall contain the drawings, details, and applicable standards required to describe the grading, paving, drainage, structures, signing, pavement marking, delineation, sequence of construction, and traffic control for this construction project. The project will also require a TxDOT approved pavement design, additional SUE investigations, and preparation of ROW maps and deed descriptions, in accordance with the TxDOT approved schematics and environmental documents described in Project 1.

Under subsequent work authorizations, the engineer may provide some or all the following:

- Right-of-Way Mapping and Acquisition, including, but not limited to, testimony at eminent domain proceedings,
- Conflict analysis for utility relocation plans and Utility Adjustment Coordination (UAC)
- Construction phase services, including, but not limited to, preparation of change orders, review of shop and fabrication drawings, schedule analysis and participation in project meetings, as requested by TxDOT.

The ENGINEER will be the single point of contact between the County and all contractors/subcontractors and will review all work performed, coordinate and conduct all meetings, and prepare and submit all project reports and documents.

Prime Provider: Quiddity Engineering LLC Project: Inner Loop County: Brazos		SUBTOTALS	Quiddity	AmaTerra	CivilCorp	CD&P	OR Colan	CP&Y (STV)	Terracon	Westwood
FC 102 (110)	Total Labor Cost (Lump Sum)	$ 6,110,231.50	$ 5,485,969.50					$ 64,162.38		$ 560,099.62
	Other Direct Expenses	$ 197,414.95	$ 179,979.70							$17,435.25
	Total Unit Cost	$ -								
FC 120 (120)	Total Labor Cost (Lump Sum)	$ 926,027.98	$ 128,573.84	$ 199,648.77		$ 298,824.38		$ 298,980.99		
	Other Direct Expenses	$ 88,932.00		$ 70,177.00		$ 18,755.00				
FC 130 (130)	Total Labor Cost (Lump Sum)	$ 758,739.41	$ 133,282.43		$ 585,629.98		$ 39,827.00			
	Other Direct Expenses	$ 33,964.00			$ 23,309.00		$ 10,655.00			
	Total Unit Cost	$ 134,105.00			$ 134,105.00					
FC 145 (164)	Total Labor Cost (Lump Sum)	$ 1,159,716.86	$ 815,434.12	$ 27,759.20	$ 80,460.40	$ 39,555.56	$ 23,952.00	$ 65,218.88	$ 38,258.82	$ 69,077.88
	Other Direct Expenses	$ 13,615.00						$ 13,615.00		
FC 160 (150)	Total Labor Cost (Lump Sum)	$ 120,061.73	$ 120,061.73							
	Other Direct Expenses	$ -	$ -							
	Total Unit Cost	$ 74,000.00	$ 74,000.00							
FC 160 (160)	Total Labor Cost (Lump Sum)	$ -								
	Other Direct Expenses	$ -								
FC 160 (161)	Total Labor Cost (Lump Sum)	$ -								
	Other Direct Expenses	$ -								
FC 160 (162)	Total Labor Cost (Lump Sum)	$ -								
	Other Direct Expenses	$ -								
FC 160 (163)	Total Labor Cost (Lump Sum)	$ 826,351.53	$ 107,117.48		$ 271,431.00				$ 447,803.05	
	Other Direct Expenses	$ 232,565.05							$ 232,565.05	
	Total Unit Cost	$ 526,227.00							$ 526,227.00	
FC 160 (165)	Total Labor Cost (Lump Sum)	$ -								
	Other Direct Expenses	$ -								
FC 160 (170)	Total Labor Cost (Lump Sum)	$ -								
	Other Direct Expense	$ -								
FC 300 (351)	Total Labor Cost	$ -								
	Other Direct Expense									
TOTAL LABOR COSTS (LUMP SUM)		$ 9,901,129.00	$ 6,790,439.09	$ 227,407.97	$ 937,521.38	$ 338,379.94	$ 63,779.00	$ 428,362.25	$ 486,061.87	$ 629,177.50
TOTAL OTHER DIRECT EXPENSES (LUMP SUM)		$ 566,491.00	$ 179,979.70	$ 70,177.00	$ 23,309.00	$ 18,755.00	$ 10,655.00	$ 13,615.00	$ 232,565.05	$ 17,435.25
TOTAL UNIT COST		$ 734,332.00	$ 74,000.00	$ -	$ 134,105.00	$ -	$ -	$ -	$526,227.00	$ -
Grand Totals		$ 11,201,952.00	$ 7,044,418.79	$ 297,584.97	$ 1,094,935.38	$ 357,134.94	$74,434.00	$441,977.25	$1,244,853.92	$646,612.75
Percentage			62.9%	2.7%	9.8%	3.2%	0.7%	3.9%	11.1%	5.8%

	$ 292.58	$ 244.64	$ 243.04	$ 244.64	$ 196.89	$ 187.07	$ 122.32	$ 119.37	$ 110.39	$ 104.42	$ 98.66	$ 308.57	$ 215.15	$ 122.32	$ 143.21	$ 226.74	$ 119.94	$ 110.39	$ 173.04	$ 131.27	$ 96.96		
TASK DESCRIPTION	PROJECT MANAGER	DEPUTY PROJECT MANAGER	QUALITY MANAGER	SENIOR ENGINEER	PROJECT ENGINEER	DESIGN ENGINEER	ENGINEER-IN-TRAINING	ENGINEERING TECHNICIAN	SENIOR CADD OPERATOR	CAD OPERATOR	ADMIN/ CLERICAL	TECHNICAL ADVISOR (STRUCTURAL)	10+ YEAR STRUCTURAL LEAD	STRUCTURAL ENGINEER	ENGINEERING TECHNICAL SENIOR	RPLS SENIOR	SENIOR SURVEY TECH	SENIOR CADD OPERATOR	GIS ANALYST SENIOR	GIS ANALYST	ADMIN/ CLERICAL	TOTAL	COMMENTS
FUNCTION CODE 102 (110) - FEASIBILITY STUDIES																							
ROUTE AND DESIGN STUDIES																							
110.1. Schematic Design Work Outline			18																			18	
A. Develop Base Maps	28	24			112		60		140													364	
B. Photogrammetric and Aerial Mapping	12	12			60		120		200													404	
C. Analyze Existing Conditions	48	72	16	136	296		240															808	185 acreage, 110 lot block parcels, platted and GIS Maintenance for 18 months
Tide Work Acreage Parcels (185 parcels)																63	1110					1203	
Tide Work Lot/Block Parcels (110 parcels)																55	660					715	
GIS Development Maintenance (18 months)																			374	198		576	
D. Schematic Alternatives	76	448	48		1248	960	1320		440													4572	
E. Deliverable Schematic																							
17. Bridge Layout												28	84	28								140	Assumed 14 bridges on two alignments
F. Project Management and Coordination	104	104	24	104	208	208	104		104													960	
G. Data Collection	24	48	12		80	80	80		48													356	
Right of Entry (185 tracts)																48	925		185	185		1341	
5. Existing Bridge Data												2	6	8								16	Assumed review of two bridges from TxDOT GIS database
H. Roadway Design Criteria	8	8	4		40																	60	
I. Preliminary Design Conference	16	16	4		16	16																68	
110.2. Schematic Design – General Tasks																							
A. ROW Property Base Map	4	16	4	2	16	40	80		80													242	
B. Typical Sections	4	16	4	16	40	20	60		80													240	
C. Environmental Constraints	2	12	4	2	16	16	32															84	
D. Drainage																							
County/TxDOT Coordination	24	60		60	16																	192	
Informal Coordination with local floodplain administrator (Brazos)	20	20		16	15	12	16															103	
Data Collection and Review of survey, As built, FIS reports, available models and CAD files	2	6		12	16	24	30															90	Review and obtain existing data including models and data prepared by local agencies, FEMA Map Change Information, and FEMA BLE models
Field Reconnaissance		8		32	40	40	40															160	Site assessments for up to 5 days to confirm existing conditions and drainage conditions
Locate Drainage Outfalls	2	8		24	36	45	60															175	Identify potential drainage outfalls for approximately 40 crossings for up to two alignments in order to minimize impacts and need for ROW
Overall Drainage Area Map (Major crossings)	2	8		20	45	60	75															208	Prepare watershed level drainage area maps for Wickson Creek and tributaries, Thompson's Creek and tributaries, Sleep Hollow Branch, Brushy Creek, and Carter's Creek Tributaries which is approximately 15 larger crossings.
Sub-Drainage Area Maps (Minor crossings and ditches)	2	10		40	60	120	160															392	Prepare hydrologic runoff calculations and drainage area delineations for up to 25 minor crossings and linear drainage systems for the 18 mile corridor map for interim and ultimate conditions for two phases.
Hydrologic Analysis (Bridges including FEMA crossings)	2	12		40	65	120	160															398	Prepare hydrologic analyses for approximately 15 major crossings using HEC-HMS for phase 1 and ultimate conditions with accuracy checks using Regressional Equations to confirm Synthetic Hydrographs.
Hydrologic Analysis (Bridge Class Culverts including FEMA crossings)	2	8		40	60	100	140															350	Prepare hydrologic analyses for up to approximately 15 major crossings using HEC-HMS for phase 1 and ultimate conditions with accuracy checks using Regressional Equations to confirm Synthetic Hydrographs.
Hydrologic Analysis (Culvert crossings)	2	8		40	75	100	140															383	Prepare hydrologic analyses for up to approximately 15 major crossings using HEC-HMS for phase 1 and ultimate conditions with accuracy checks using Regressional Equations to confirm Synthetic Hydrographs.
Hydrologic & Hydraulics Analyses along project (Exist, Interim and Final conditions)- 1D/2D	4	12		72	95	160	240															583	Review and updated available BLE hydraulic models with updated LIDAR / survey information. Prepared 2D sheetflow models along corridor near Brushy and Wickson Creeks to confirm 1D models and analyze impacts and help size pertinent ditch systems.
Exist Effective Hydraulics Analyses (HEC-RAS_FEMA crossings)	2	4		16	25	48	46															141	Update BLE models to create revised existing hydraulic models for all FEMA mapped structure crossings using HEC-RAS. There are 18 existing crossings on FEMA Zone A floodplains will be evaluated with updated cross sections and revised runoff information within the hydraulic models.
Exist Hydraulics Analysis (Bridges)	2	2		12	16	24	32															88	Update BLE models to create revised existing hydraulic models for all FEMA mapped structure crossings using HEC-RAS. The future bridge crossings on FEMA Zone A floodplains will be evaluated with updated cross sections and revised runoff information within the hydraulic models to create revised existing conditions
Exist Hydraulics Analysis (Bridge Class Culverts)	2	2		8	12	24	28															76	Update BLE models to create revised existing hydraulic models for all FEMA mapped structure crossings using HEC-RAS. The future bridge class culvert crossings on FEMA Zone A floodplains will be evaluated with updated cross sections and revised runoff information within the hydraulic models to create revised existing conditions
Exist Hydraulics Analysis (Culverts)	2	2		8	16	20	28															76	Update BLE models to create revised existing hydraulic models for all FEMA mapped structure crossings. The future culvert crossings on FEMA Zone A floodplains will be evaluated with updated cross sections and revised runoff information within the hydraulic models.
Prop. Hydraulics Analysis (Bridges including FEMA crossings-Using HEC-RAS)	2	6		48	65	96	140															354	Update existing conditions HEC-RAS models for bridges and bridge class culverts to be constructed within the phase 1 and ultimate ROW along the corridor. Approximately 15 bridges and or bridge class culverts will be analyzed to ensure no adverse impact for design storm and 100-year storm event.
Prop. Hydraulics Analysis (Bridge Class Culverts including FEMA crossings- Using HEC-RAS)	2	6		40	45	50	120															263	Update existing conditions HEC-RAS models for bridges and bridge class culverts to be constructed within the phase 1 and ultimate ROW along the corridor. Approximately 15 bridges and or bridge class culverts will be analyzed to ensure no adverse impact for design storm and 100-year storm event.
Prop. Hydraulics Analysis (Culvert crossings using HY-8)	2	4		30	45	60	85															228	Update existing conditions culvert models to be constructed within the phase 1 and ultimate ROW along the corridor. Approximately 25 non bridge class culverts will be analyzed to ensure no adverse impact for design storm and 100-year storm event using HY8.
Develop WSE Profiles	2	4		30	40	55	75															206	Existing and proposed water surface profiles will be developed for the major streams being analyzed with HEC-RAS. Approximately 15 miles of stream will be analyzed in detail with HEC-RAS to develop existing and proposed profiles.
Identify and mitigate impacts to adjacent properties	4	12		40	65	125	160															406	Approximately 40 crossings will be analyzed for pre and post project conditions for the proposed roadway improvements to ensure no adverse impact to adjacent properties. Efforts including looking at possible improvements within the proposed ROW to offset proposed bridge and culvert crossings including widened ditches and grading.
Evaluate floodplain cut and fill	2	6		40	60	100	120															323	Locations of FEMA effective floodplain areas will be evaluated to determine limits of revised existing floodplain to quantify loss of floodplain storage due to proposed project and locations of floodplain mitigation.
Identify ROW/Detention requirements	4	6		30	55	100	120															315	For storm crossings will include initial detention storage for mitigation of increased runoff, approximate sizing of up to 40 locations for detention including calculating pre and post runoff volumes and determining preliminary sizing of ponds for placement and ROW determination
Identify Preliminary Detention locations	2	4		30	40	80	100															256	Based on detention volume calculations, locations and sizes will be determined for the 40 crossings and storm drain outfalls based on pre and post runoff volumes and flow rates.
Review Proposed Structure Conflicts with Waters of the US (WOTUS)	2	2		12	20	30	50															116	Utilizing available wetlands information from Wetlands Mapper and Environmental subconsultants, proposed crossings will be reviewed against WOTUS to minimize impacts to these areas to plan for future permitting
Draft Preliminary Drainage Report	8	12		14	60	65	96															255	Preparation of draft drainage report including narrative, tables, exhibits, appendices, model, and output for local agency review and coordination.
CAD Exhibits, Tables and Appendices	2	4		16	60	60	80															222	Preparation of hydraulic data sheets for crossings and proposed detention ponds for use within preliminary drainage report and schematic document
Final Drainage Report	8	4	24	8	16	25	40															123	Final drainage report incorporated review comments from review agencies and internal design QC teams.
E. ROW Requirements	2	12	8		16	24	16															83	
F. Construction Sequence	24	24	4	24	60	24	120		80													372	
G. Design Exceptions		8	4	8	8																	28	
H. Traffic Data and Projections				40	60	120	180															380	
I. Financial Plan and Project Management Plan	24	160	24	140	100																	448	
J. Traffic and Operational Analysis				80	80	120	60															340	
K. Safety Analysis				60	76	120	96															352	
L. Bicycle and Pedestrian Accommodations			2	68			40															110	
Context Sensitive Solutions	16	40	12	72	120	120			120													500	
Stakeholder meetings	40	44		56	60																	220	
Workshop #1	16	16		16	40		40															128	
Workshop #2	16	16		16	40		40															128	
Workshop #3	16	16		16	40		40															128	
M. Interstate Access Justification																							
N. Toll Managed, Express, High Occupancy Vehicle, Managed Lanes, Other Special Use Lanes, and Transit Elements																							
O. Project Implementation Plan	12	80	4	80			40															196	
110.3. Conceptual Design Schematics	30	216	16	20	440	264	570		80													1616	
110.4. Geometric Design Schematics	30	206	16	16	400	264	570		60													1561	
A, 5. Proposed Bridge Structures												56	336	168	336							896	Quantities and estimates on two alignments, model setup on preferred alignment
110.5. Cross-Sections (100 Interval Electronic Delivery)	40	72	24	140	130	260	60		100													766	
110.6. Retaining Walls	8	38	8	16	104	40	40		220													474	
110.7. Renderings and Traffic Simulation				80	80	160	80															360	
110.8. Preliminary Construction Sequence	4	40	12	80	240	200	80		120													756	
110.9. Preliminary Cost Estimate	16	40	12		120	80	80		120													468	
110.10. Engineering Summary Report	20	52	12	16	140		80				40											400	
110.11. Construction or Maintenance at Value Engineering Study	24	24	24	24	24																	120	
110.12. Agency Coordination and Public Involvement	240	240			320																	800	
MAPO Exhibits	16	60		120	240		240	320														996	
110.13. Schematic Design Project Deliverables	24	48		80	80																	232	
110.14. Data Collection and Field Reconnaissance																							
110.15. Design Criteria																							
110.16. Preliminary Cost Estimates																							
110.17. Design Concept Conference																							
110.18. Geotechnical Borings and Investigations																							
HOURS SUB-TOTALS	1114	2586	342	2234	6404	4854	6411	320	1964		40	86	764	232	336	114	2695		563	383		31641	
CONTRACT RATE PER HOUR	$ 292.58	$ 244.64	$ 243.04	$ 244.64	$ 196.89	$ 187.07	$ 122.32	$ 119.37	$ 110.39	$ 104.42	$ 98.66	$ 308.57	$ 215.15	$ 122.32	$ 143.21	$ 226.74	$ 119.94	$ 110.39	$ 173.04	$ 131.27	$ 96.96		
TOTAL LABOR COSTS	$ 325,711.32	$ 627,746.24	$ 89,788.56	$ 546,533.36	$ 1,260,103.56	$ 811,810.31	$ 845,355.24	$ 36,278.82	$ 216,801.76	$ -	$ 3,878.49	$ 26,519.62	$ 85,630.92	$ 28,376.24	$ 48,112.16	$ 43,488.08	$ 321,815.56	$ -	$ 97,427.77	$ 50,277.20	$ -	$ 5,485,959.50	
% DISTRIBUTION OF STAFFING	3.52%	8.11%	1.08%	7.06%	20.24%	15.36%	21.84%	1.01%	6.21%		0.13%	0.27%	1.25%	0.73%	1.06%	0.61%	8.52%		1.78%	1.21%			
SUBTOTAL - FC 102 (110)																						$5,485,959.50	

TASK DESCRIPTION	PROJECT MANAGER	DEPUTY PROJECT MANAGER	QUALITY MANAGER	SENIOR ENGINEER	PROJECT ENGINEER	DESIGN ENGINEER	ENGINEER-IN-TRAINING	ENGINEERING TECHNICIAN	SENIOR CADD OPERATOR	CAD OPERATOR	ADMIN/ CLERICAL	TECHNICAL ADVISOR (STRUCTURAL)	10+ YEAR STRUCTURAL LEAD	STRUCTURAL ENGINEER	ENGINEERING TECHNICAL SENIOR	RPLS SENIOR	SENIOR SURVEY TECH	SENIOR CADD OPERATOR	GIS ANALYST SENIOR	GIS ANALYST	ADMIN/ CLERICAL	TOTAL	COMMENTS
FUNCTION CODE 130 (120) - SOCIAL, ECONOMIC STUDIES																							
SOCIAL, ECONOMIC, AND ENVIRONMENTAL STUDIES AND PUBLIC INVOLVEMENT																							
120.1. Environmental Documentation Standards	24	96																				120	
120.2. Environmental Assessment (EA) Content and Format	24	96																				120	
120.3. Environmental Impact Statement (EIS) Content and Format																							

120.4. Environmental Re-evaluation Form																						
120.5. Environmental Technical Analyses and Documentation	40	66	40																		176	
A. Definition of technical analyses and documentation for environmental services																						
B. Minimum Deliverables																						
C. The exact environmental technical analyses and documentation must be determined at the work authorization level, but can include:																						
1. Section 4(f) Evaluations	2	4																			6	
2. Section 6(f) Evaluation	2	4																			6	
3. Environmental Public Involvement (23 CFR §771.111)	2	4																			6	
4. Community Impacts Analysis	2	4																			6	
5. Induced Growth Impact Analysis and Cumulative Impacts Analysis	2	4																			6	
6. Air Quality Studies	2	4																			6	
7. Noise Analysis Technical Reporting	2	4																			6	
8. Water Resources Analysis and Documentation	2	4																			6	
9. Biological/Natural Resources Management Analysis and Documentation	2	4																			6	
10. Initial Site Assessment (ISA) with Hazardous Materials Project Impact Evaluation Report	2	4																			6	
11. Archeological Documentation Services	2	4																			6	
a. Prepare/submit archeological Background Study																						
b. Prepare/submit Antiquities Permit Application																						
c. Perform Archeological Intensive Survey, Reporting, and Curation																						
12. Historic Resource Identification, Evaluation, and Documentation Services	2	4																			6	
a. Prepare/submit historic resources project coordination request (PCR)																						
b. Perform historic resource research design																						
c. Prepare/submit historic resource survey report																						
13. Floodplain Impacts	2	4																			6	
14. Stormwater Permits (Section 402 of the Clean Water Act)	2	4																			6	
FC 120.5 Public Involvement																						
Database Development and Updates, Communications Log																						
Development of Project Materials																						
Stakeholder Communications																						
Property Owner Meetings and Documentation (up to 100)																						
Stakeholder and Agency Meetings and Coordination (up to 20)																						
Project Updates																						
FC 120.3 Public Meetings (2 Public Meetings and 1 Public Hearing)																						
Planning and Logistics																						
Meeting Notices and Promotion																						
Public Meeting Materials (PPT, Maps, Exhibits, Handouts)																						
Virtual Meeting Production Engagement Tool																						
Dry Run																						
Meeting Preparation and Facilitation (up to 5 staff)																						
Summary Report and Comment Responses (up to 200 comments each meeting)																						
HOURS SUBTOTALS	116	344	40																		500	
CONTRACT RATE PER HOUR	$ 292.38	$ 244.64	$ 242.54	$ 244.64	$ 169.99	$ 167.07	$ 122.02	$ 113.57	$ 110.59	$ 104.42	$ 95.79	$ 208.37	$ 215.16	$ 122.52	$ 141.21	$ 229.74	$ 110.24	$ 110.39	$ 179.04	$ 131.27	$ 84.98	
TOTAL LABOR COSTS	$ 33,916.08	$ 84,155.16	$ 10,501.60	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 128,573.84
% DISTRIBUTION OF STAFFING	23.20%	68.80%	8.00%																			
SUBTOTAL - FC 120 (120)																						$ 128,573.84

TASK DESCRIPTION	PROJECT MANAGER	DEPUTY PROJECT MANAGER	QUALITY MANAGER	SENIOR ENGINEER	PROJECT ENGINEER	DESIGN ENGINEER	ENGINEER-IN-TRAINING	ENGINEERING TECHNICIAN	SENIOR CADD OPERATOR	CAD OPERATOR	ADMIN/ CLERICAL	TECHNICAL ADVISOR (STRUCTURAL	10+ YEAR STRUCTURAL LEAD	STRUCTURAL ENGINEER	ENGINEERING TECHNICAL SENIOR	RPLS SENIOR	SENIOR SURVEY TECH	SENIOR CADD OPERATOR	GIS ANALYST SENIOR	GIS ANALYST	ADMIN/ CLERICAL	TOTAL	COMMENTS
FUNCTION CODE 130 (130) – RIGHT-OF-WAY DATA																							
RIGHT-OF-WAY (ROW) DATA AND UTILITY ENGINEERING INVESTIGATION																							
130.1. Right-Of-Way Surveys (15.1.1)	44	88	4		60				60													256	
130.2. Right-Of-Way Mapping – Traditional ROW Map																							
130.3. State Land Surveying (15.5.1)																							
130.4. ROW Hearing Services																							
130.5. Utility Engineering Investigation																							
A. Utility Quality Levels (QL)																							
1. Quality Level D																							
External Communication (Correspondence, phone conversation, etc.) for each of the following utility owners:																							
a. Bryan Texas Utilities (BTU)																							
b. AT&T																							
c. Frontier																							
d. Next																							
e. Optimum																							
f. Earthlink																							
g. Almos Pipeline																							
h. Energy Transfer																							
i. Wilson Creek Special Utility District																							
j. Enterprise Products																							
k. Magellan																							
l. Northfield Enterprises																							
m. Wildfire Energy Midstream																							
n. ExxonMobil Pipeline																							
o. Local entuers																							
2. Quality Level C – OMITTED																							
3. Quality Level B																							
External Communication (Correspondence, phone conversation, etc.) for each of the following utility owners:																							
a. Bryan Texas Utilities (BTU)																							
b. AT&T																							
c. Frontier																							
d. Next																							
e. Optimum																							
f. Earthlink																							
g. Almos Pipeline																							
h. Energy Transfer																							
i. Wilson Creek Special Utility District																							
j. Enterprise Products																							
k. Magellan																							
l. Northfield Enterprises																							
m. Wildfire Energy Midstream																							
n. ExxonMobil Pipeline																							
o. Local entuers																							
4. Quality Level A – 10 spots																							
B. Utility Investigations Methodology																							
1. Utility Investigation Quality Level D	22	44			60				60													186	
a. Walk-via visit / Field reconnaissance																							
b. Develop work plan for County Approval																							
c. Review and compile a list of data sources																							
i. Existing records																							
ii. Oral recollections																							
iii. Locations marked by DIGTESS																							
iv. Data repositories																							
d. Perform record research from all available resources																							
i. Texas811																							
ii. Railroad Commission of Texas (Texas RRC)																							
iii. Verbal recollection																							
iv. As-built information from plans																							
v. Plats																							
vi. Permits																							
e. Document utility owners and contact information																							
f. Create utility drawings of information gathered																							
2. Utility Investigation Quality Level C (Omitted)																							
3. Designate (Quality Level B)	22	44			60				60													186	
a. Compile "as-built" information from plans, plats, and other location data																							
b. Request Right of Entry in accordance to General Requirement Section 1.4 of this Attachement C																							
c. Coordinate with Survey to tie utilities to project survey datum																							
d. Coordinate with utility owners, when utility owner's policy is, to designate their own facilities at no cost for preliminary survey purposes;																							
e. Designate, record, and mark the horizontal location of existing utility facilities																							

f. Use active and passive scans to locate any additional utilities, including unrecorded and abandoned storm and sanitary sewer facilities.																						
g. Prepare and deliver a color-coded composite signed and sealed utility facility plan																						
h. Determine the approximate electronic utility depths at critical location.																						
i. Provide monthly summary and verify compliance with agreed work schedule																						
j. Closeout permits as required																						
k. Identify all utilities from QL D investigation that cannot be depicted by QL B																						
l. Comply with all applicable TxDOT policy and procedural manuals.																						
4. Subsurface Utility Locate (Test Hole) Service (Quality Level A) (Estimate 10 Test Holes)	20	4			4					10											38	
a. Review test hole location and advise County																						
i. Determine number of test holes																						
ii. Determine locations of test holes																						
iii. Request ROW of Entry																						
b. Coordinate with Survey																						
i. Tie utility location to project survey datum																						
ii. Prepare, review, and document test hole data sheets																						
c. Coordinate with utility owner inspectors																						
d. Plans Taken 811 ticket 48 hours prior to excavation																						
HOURS SUB-TOTALS	108	160	4		184					140											844	
CONTRACT RATE PER HOUR	$ 292.38	$ 244.64	$ 262.54	$ 244.64	$ 199.89	$ 187.07	$ 122.32	$ 113.37	$ 110.33	$ 104.42	$ 96.96	$ 308.37	$ 215.15	$ 122.32	$ 143.21	$ 328.74	$ 119.34	$ 110.39	$ 173.04	$ 131.27	$ 96.96	
TOTAL LABOR COSTS	$ 31,577.04	$ 44,035.20	$ 1,050.16	$ -	$ 36,780.05	$ -	$ -	$ -	$ -	$ 19,839.98	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 133,282.43
% DISTRIBUTION OF STAFFING	18.22%	27.83%	0.60%		27.83%					25.51%												
SUBTOTAL - FC 130 (130)																						$ 133,282.43

TASK DESCRIPTION	PROJECT MANAGER	DEPUTY PROJECT MANAGER	QUALITY MANAGER	SENIOR ENGINEER	PROJECT ENGINEER	DESIGN ENGINEER	ENGINEER-IN-TRAINING	ENGINEERING TECHNICIAN	SENIOR CADD OPERATOR	CAD OPERATOR	ADMIN/ CLERICAL	TECHNICAL ADVISOR (STRUCTURAL)	10+ YEAR STRUCTURAL LEAD	STRUCTURAL ENGINEER	ENGINEERING TECHNICAL SENIOR	RPLS SENIOR	SENIOR SURVEY TECH	SENIOR CADD OPERATOR	GIS ANALYST SENIOR	GIS ANALYST	ADMIN/ CLERICAL		COMMENTS
FUNCTION CODE 145 (145, 164) - MANAGING CONTRACTED/DONATED PE																							
CONTRACT MANAGEMENT AND ADMINISTRATION																							
145.1.Contract Management and Administration																							
A. Project Management	480	30	96									208									814		
1. AmeriServ	64																				64		
2. CDAP	72																				72		
3. CivilCorp	72																				72		
4. DPW	192																				192		
5. OR Colan	16																				16		
6. Terracon	48																				48		
7. Westwood																							
B. Project Administration	60	60									384										504		
C. Project Meetings	416	480	64	480																	1440		
HOURS SUB-TOTALS	1420	570	160	480							384	208									3223		
CONTRACT RATE PER HOUR	$ 292.38	$ 244.64	$ 262.54	$ 244.64	$ 199.89	$ 187.07	$ 122.32	$ 113.37	$ 110.33	$ 104.42	$ 96.96	$ 308.37	$ 215.15	$ 122.32	$ 143.21	$ 328.74	$ 119.34	$ 110.39	$ 173.04	$ 131.27	$ 96.96		
TOTAL LABOR COSTS	$ 415,179.60	$ 139,444.80	$ 42,006.40	$ 117,427.81	$ -	$ -	$ -	$ -	$ -	$ -	$ 37,233.53	$ 64,140.96	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 815,434.12	
% DISTRIBUTION OF STAFFING	44.07%	17.65%	4.97%	14.90%							11.92%	6.45%											
SUBTOTAL - FC 145 (145, 164)																						$ 815,434.12	

TASK DESCRIPTION	PROJECT MANAGER	DEPUTY PROJECT MANAGER	QUALITY MANAGER	SENIOR ENGINEER	PROJECT ENGINEER	DESIGN ENGINEER	ENGINEER-IN-TRAINING	ENGINEERING TECHNICIAN	SENIOR CADD OPERATOR	CAD OPERATOR	ADMIN/ CLERICAL	TECHNICAL ADVISOR (STRUCTURAL	10+ YEAR STRUCTURAL LEAD	STRUCTURAL ENGINEER	ENGINEERING TECHNICAL SENIOR	RPLS SENIOR	SENIOR SURVEY TECH	SENIOR CADD OPERATOR	GIS ANALYST SENIOR	GIS ANALYST	ADMIN/ CLERICAL	TOTAL	COMMENTS
FUNCTION CODE 160 (150) - DESIGN SURVEY AND CONSTRUCTION SURVEY																							
DESIGN SURVEY																							
150.1. Design And Construction Survey																							
150.2. Design Survey (15.2.1)																							
150.3. Construction Survey (15.2.2)																							
150.4. Deliverables for Design and Construction Surveys																							
150.5. Mapping (15.3)																							
150.6. Aerial Mapping Using a Metric Camera and Manned Aircraft																							
150.7. Aerial Mapping Using a Non-Metric Camera and Unmanned Aircraft System (UAS)																							
150.8. Field Check Survey for Aerial Mapping Using Manned Aircraft or UAS																							
150.9. Horizontal and Vertical Control for Aerial Mapping																30	140	70			5	245	
150.10. Mapping Services to be Provided																							
150.11. Horizontal And Vertical Control (15.3.5)																							
Primary Control																30	230	105			8	373	
Secondary Control																35	195	90			6	326	
HOURS SUB-TOTALS																95	565	265			19	944	
CONTRACT RATE PER HOUR	$ 292.38	$ 244.64	$ 262.54	$ 244.64	$ 199.89	$ 187.07	$ 122.32	$ 113.37	$ 110.33	$ 104.42	$ 96.96	$ 308.37	$ 215.15	$ 122.32	$ 143.21	$ 328.74	$ 119.34	$ 110.39	$ 173.04	$ 131.27	$ 96.96		
TOTAL LABOR COSTS	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 27,540.50	$ 67,426.11	$ 29,232.79	$ -	$ -	$ 1,842.28	$ 120,061.73	
% DISTRIBUTION OF STAFFING																10.96%	59.95%	28.07%			2.01%		
SUBTOTAL - FC 160 (150)																						$ 120,061.73	

TASK DESCRIPTION	PROJECT MANAGER	DEPUTY PROJECT MANAGER	QUALITY MANAGER	SENIOR ENGINEER	PROJECT ENGINEER	DESIGN ENGINEER	ENGINEER-IN-TRAINING	ENGINEERING TECHNICIAN	SENIOR CADD OPERATOR	CAD OPERATOR	ADMIN/ CLERICAL	TECHNICAL ADVISOR (STRUCTURAL	10+ YEAR STRUCTURAL LEAD	STRUCTURAL ENGINEER	ENGINEERING TECHNICAL SENIOR	RPLS SENIOR	SENIOR SURVEY TECH	SENIOR CADD OPERATOR	GIS ANALYST SENIOR	GIS ANALYST	ADMIN/ CLERICAL	TOTAL	COMMENTS
FUNCTION CODE 180 (163) - MISCELLANEOUS ROADWAY																							
MISCELLANEOUS ROADWAY																							
163.1. Utility Coordination	96	192				192															480		
A. Utility Base Map																							
1. Obtain information on existing utilities																							
2. Conduct investigations to identify all known utilities																							
3. Identify potential conflicts in accordance to SUE QL D and A only																							
4. Prepare base map depicting utility locations in accordance to SUE QL D & A only																							
5. Create and maintain a Utility Conflict Matrix (UCM) and utility conflict exhibit																							
B Utility Coordination (Schematic Phase)																							
1. Assist the County in conducting utility coordination meetings																							
a. Establish contact with all existing utilities within and adjacent to the project limits																							
b. Set up utility coordination meetings to discuss design and construction concepts																							
2. Establish and conduct workshop meetings with utility companies to review and resolve conflicts.																							
3. Create agenda and exhibits for all coordination meetings																							
4. Establish and promote the desired agenda and methodologies for utility construction																							
5. Schedule and conduct a utility kick-off meeting																							
6. Schedule and conduct milestone meetings with the County. Prepare reports for																							
a. Existing facilities including major facilities to be avoided																							
b. Utility Conflict Matrix																							
c. Utility Conflict Exhibit																							
d. Long lead items that could potentially impact schedule during PS&E																							
C. Deliverables																							
1. Obtain information on existing utilities																							
2. Conduct investigations to identify all known utilities																							
163.2.Utility Design																							
163.3. Retaining Walls and Miscellaneous Structures																							
163.4. Traffic Control Plan, Detours, and Sequence of Construction																							
163.5. Temporary Traffic Signals and Illumination																							
163.6. Illumination																							
163.7. Storm Water Pollution Prevention Plans (SWP3)																							
163.8. Compute and Tabulate Quantities																							
163.9. Special Utility Details (Water, Sanitary Sewer, etc.)																							
163.10. Miscellaneous Structural Details																							
163.12. Testimony for Right of Way Hearings																							

163.13. Estimate																							
163.14. Contract time determination																							
163.15. Specifications and General Notes																							
163.16. Constructability Review																							
163.17. Scheduling and Tracking																							
163.18. Deliverables																							
163.2. Geotechnical Borings and Investigations																							
Exploration Planning and Execution																							
Project Coordination, Planning, and Internal Progress Meetings																							
Review Existing Information																							
Preparing Boring Location and Field Investigation Safety Plans																							
Selection of Standard Traffic Control Plans for Borings																							
Coordination with Project Team and County for Approval of Boring Location Plans																							
Communication with Property Owners to Coordinate Site Visit and Exploration Schedules																							
Site Visits to Assess Access and Stake Boring Locations																							
Utility Clearance for Borings																							
Coordination with Coring, Drilling, Traffic Control, Survey, and Non-Destructive Testing Crews																							
Daily Travel, Borehole Logging, and Quality Assurance of Field Exploration																							
Site Safety Checkins During Field Work																							
Collection of Piezometric Readings (22 locations, monthly readings for 24 months)																							
Laboratory Testing and Data Reporting																							
Sample Inventory and Review for Laboratory Testing																							
Prepare and Coordinate Laboratory Testing Assignments																							
Review of Laboratory Test Results																							
Preparation of Soil Boring Logs (Wincore), Pavement Core Logs, and DCP Test Results																							
Preparation of Boring Location Maps																							
Preparation of Geotechnical Data Report																							
Geotechnical Engineering Analysis, Design, and Reporting																							
Review and Comment on Bridge and Retaining Wall Layouts																							
Develop Bridge Foundation Capacity Curves, LPILE Parameters, and Design Recommendations (27 borings)																							
Develop Bridge Foundation Construction Considerations																							
Develop Soil Parameters and Geomeric Models for Embankment and Retaining Wall Analyses																							
Perform Analysis for Embankment / Retaining Wall Settlement, Global, and External Stability (6 borings)																							
Develop Recommendations for Retaining Wall Reinforcement Lengths and Ground Improvement Requirements																							
Develop MSE DD Sheets																							
Develop Bridge Class Culvert Design Recommendations and Construction Considerations (3 borings)																							
Perform Analyses for Pond Slope Stability (10 locations)																							
Preparing Soil Boring Data Sheets																							
Preparation of Draft Geotechnical Engineering Report																							
Preparation of Final Geotechnical Engineering Report																							
Pavement Design and Reporting																							
Perform Visual Condition Assessment at Cross-Streets																							
Process and Review FWD and DCP data																							
Perform Potential Vertical Rise (PVR) Calculations and Develop PVR Mitigation Strategies																							
Review Monitoring Well Data and Identify Potential Groundwater Issues																							
Perform FPS 21 & TxCRCP-ME calculations for Asphalt & Concrete Pavements																							
Prepare Permanent Pavement Design Options																							
Prepare Temporary Pavement Design Options																							
Coordinate and Attend Pavement Design Conference with County/District																							
Perform Life Cycle Cost Analysis to Evaluate Flexible and Rigid Alternatives																							
Preparation of Draft Pavement Design Report																							
Preparation of Final Pavement Design Report																							
HOURS SUB-TOTALS	96	192				192																480	
CONTRACT RATE PER HOUR	$ 292.36	$ 244.64	$ 262.54	$ 244.64	$ 169.59	$ 167.07	$ 122.37	$ 113.37	$ 110.19	$ 154.42	$ 95.96	$ 308.37	$ 215.15	$ 122.32	$ 141.21	$ 224.74	$ 110.34	$ 140.39	$ 179.04	$ 131.27	$ 86.66		
TOTAL LABOR COSTS	$ 28,068.16	$ 46,970.88	$ -	$ -	$ -	$ 32,078.12	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 107,117.48
% DISTRIBUTION OF STAFFING	20.00%	40.00%				40.00%																	
SUBTOTAL - FC 180 (103)																							$ 107,117.48

LABOR SUBTOTAL SUMMARY																							
FUNCTION CODE 102 (110) – FEASIBILITY STUDIES	$ 325,711.33	$ 537,749.24	$ 89,768.50	$ 548,533.34	$ 1,280,105.50	$ 811,810.31	$ 845,365.24	$ 38,278.82	$ 216,801.78	$ -	$ 3,676.49	$ 26,519.82	$ 85,630.92	$ 28,378.24	$ 48,117.18	$ 43,968.04	$ 321,516.56	$ -	$ 97,421.77	$ 50,277.20	$ -	$ 5,485,969.50
FUNCTION CODE 120 (120) – SOCIAL/ECON/ENV STUDIES	$ 33,916.04	$ 84,156.16	$ 10,581.60	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 128,573.64
FUNCTION CODE 130 (130) – RIGHT-OF-WAY DATA	$ 31,577.04	$ 44,035.20	$ 1,050.16	$ -	$ 36,760.05	$ -	$ -	$ -	$ -	$ -	$ 19,839.98	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 133,262.43
FUNCTION CODE 145 (145, 164) – MANAGING CONTRACTED/DONATED PE	$ 415,179.60	$ 139,444.80	$ 42,008.40	$ 117,428.85	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 37,233.53	$ 64,140.96	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 815,434.12
FUNCTION CODE 150 (150) - DESIGN SURVEY AND CONSTRUCTION SURVEY	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 21,540.55	$ 67,426.11	$ 29,252.79	$ -	$ -	$ 1,842.28	$ 120,061.73
FUNCTION CODE 160 (160) - MISCELLANEOUS ROADWAY	$ 28,868.48	$ 48,970.88	$ -	$ -	$ -	$ 32,078.12	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 107,117.48
SUBTOTAL LABOR EXPENSES	$834,452.52	$942,353.28	$143,346.84	$665,962.17	$1,316,865.54	$843,888.43	$845,365.24	$ 38,278.82	$216,801.78	$19,839.98	$41,112.02	$ 90,660.76	$ 85,630.92	$ 28,378.24	$ 48,117.18	$65,529.83	$389,042.66	$29,252.79	$97,421.77	$50,277.20	$1,842.28	$6,790,439.09

FUNCTION CODE 102 (110) – FEASIBILITY STUDIES				
OTHER DIRECT EXPENSES	**UNIT**	**RATE**	**QUANTITY**	**TOTAL**
Title Report (lot/block)	EA	$300.000	110	$33,000.000
Title Report (acreage)	EA	$450.000	185	$83,250.000
Lodging/Hotel - Taxes and Fees	day/person	$45.00	80	$3,600.000
Lodging/Hotel (Taxes/fees not included)	day/person	$98.00	80	$7,840.000
Meals ($13 Breakfast, $15 Lunch, $26 Dinner, $5 Incidental)	day/person	$59.00	80	$4,720.000
Mileage	mile	$0.655	33740	$22,099.700
Tolls	day	$50.000	208	$10,400.000
Rental Car Fuel	gallon	$5.00	150	$750.000
Rental Car (Includes taxes and fees; Insurance costs will not be reimbursed)	day	$100.00	10	$1,000.000
Air Travel - In State - 2+ Wks Notice (Coach)	Rd Trip/person	$300.00	15	$4,500.000
Plots (Color on Bond)	per sq. ft.	$1.75	5040	$8,820.000
FUNCTION CODE 160 (150) - DESIGN SURVEY AND CONSTRUCTION SURVEY	**UNIT**	**RATE**	**QUANTITY**	**TOTAL**
Ground Target (includes paint, panel material, etc.)	each	$30.00	0	
Mobilization for Aerial Photography/LiDAR Fixed Wing Aircraft (Includes aircraft, pilot, camera/LiDAR operator, fuel, and transportation cost)	per project	$25,000.00	0	
Fixed Wing Airborne LiDAR - Project Flight Miles (On project flight miles)	per mile	$65.00	0	
Fixed Wing Airborne LiDAR - Transit Miles (including turn, maneuver miles and local airport to project)	per mile	$65.00	0	
Aerial Photography - Airborne GPS/IMU Data collection/Processing	per project	$2,500.00	0	
Aerial Photography - Project Flight Miles (On project flight miles)	per mile	$65.00	0	
Aerial Photography - Transit Miles (including turn, maneuver miles and local airport to project)	per mile	$65.00	0	
Mobilization for LiDAR Mobile Mapping System (travel to project)	per mile	$10.00	0	
				$179,979.70

FUNCTION CODE 160 (150) - DESIGN SURVEY AND CONSTRUCTION SURVEY				
UNIT COSTS	**UNIT**	**RATE**	**QUANTITY**	**TOTAL**
2-Man Crew				
Primary Control	HR	$200.000	145	$29,000.000
Secondary Control	HR	$200.000	125	$25,000.000
Aerial Control	HR	$200.000	100	$20,000.000
				$74,000.00

	$ 247.85	157.30	128.70	89.83	73.22	65.78	153.15	111.40	88.12	112.63	75.13	114.20	88.12	
TASK DESCRIPTION	SUPPORT MANAGER	QUALITY MANAGER	SENIOR PRINCIPAL INVESTIGATOR	ARCHEOLOGIST IV	ARCHEOLOGIST III	FIELD TECH (ARCHEOLOGIST)	SENIOR HISTORIAN	HISTORIAN IV	HISTORIAN III	SENIOR GIS ANALYST	GIS SPECIALIST	PROJECT CONTROL SPECIALIST	ADMIN/ CLERICAL	TOTAL	COMMENTS
FUNCTION CODE 120 (120) – SOCIAL/ECON/ENV STUDIES															
SOCIAL, ECONOMIC, AND ENVIRONMENTAL STUDIES AND PUBLIC INVOLVEMENT															
120.1. Environmental Documentation Standards															
120.2. Environmental Assessment (EA) Content and Format															
120.3. Environmental Impact Statement (EIS) Content and Format															
120.4. Environmental Re-evaluation Form															
120.5. Environmental Technical Analyses and Documentation															
A. Definition of technical analyses and documentation for environmental services															
B. Minimum Deliverables															
C. The exact environmental technical analyses and documentation must be determined at the work authorization level, but can include:															
1. Section 4(f) Evaluations															
2. Section 6(f) Evaluation															
3. Environmental Public Involvement (23 CFR §771.111)															
4. Community Impacts Analysis															
5. Induced Growth Impact Analysis and Cumulative Impacts Analysis															
6. Air Quality Studies															
7. Noise Analysis Technical Reporting															
8. Water Resources Analysis and Documentation															
9. Biological/Natural Resources Management Analysis and Documentation															
10. Initial Site Assessment (ISA) with Hazardous Materials Project Impact Evaluation Report															
11. Archeological Documentation Services															
a. Prepare/submit archeological Background Study	1	2	8	48	48					8	40	2	2	159	
b. Prepare/submit Antiquities Permit Application	1	2	8	16	8					4	8	2	2	51	
c. Perfom Archeological Intensive Survey, Reporting, and Curation	1	8	92	600	400	600				32	80	8	8	1829	
12. Historic Resource Identification, Evaluation, and Documentation Services															
a. Prepare/submit historic resources project coordination request (PCR)	1	2					2	16	8	1	4	2		36	
b. Perform historic resource research design	1	2					2	24	12	1	2	2		46	
c. Prepare/submit historic resource survey report	1	2					8	120	80	1	24	2	2	240	
13. Floodplain Impacts															
14. Stormwater Permits (Section 402 of the Clean Water Act)															
FC 120.5 Public Involvement															
Database Development and Updates, Communications Log															
Development of Project Materials															
Stakeholder Communications															
Property Owner Meetings and Documentation (up to 100)															
Stakeholder and Agency Meetings and Coordination (up to 20)															
Project Updates															
FC 120.5 Public Meetings (2 Public Meetings and 1 Public Hearing)															
Planning and Logistics															
Meeting Notices and Promotion															
Public Meeting Materials (PPT, Maps, Exhibits, Handouts)															
Virtual Meeting Production/Engagement Tool															
Dry Run															
Meeting Preparation and Facilitation (up to 5 staff)															
Summary Report and Comment Responses (up to 200 comments each meeting)															
HOURS SUB-TOTALS	6	18	108	664	456	600	12	160	100	47	158	18	14	2361	
CONTRACT RATE PER HOUR	$ 247.85	$ 157.30	$ 128.70	$ 89.83	$ 73.22	$ 65.78	$ 153.15	$ 111.40	$ 88.12	$ 112.63	$ 75.13	$ 114.20	$ 88.12		
TOTAL LABOR COSTS	$ 1,487.10	$ 2,831.40	$ 13,899.60	$ 59,647.12	$ 33,388.32	$ 39,468.00	$ 1,837.80	$ 17,824.00	$ 8,812.00	$ 5,293.61	$ 11,870.54	$ 2,055.60	$ 1,233.68	$ 199,648.77	
% DISTRIBUTION OF STAFFING	0.25%	0.76%	4.57%	28.12%	19.31%	25.41%	0.51%	6.78%	4.24%	1.99%	6.69%	0.76%	0.59%		
SUBTOTAL - FC 120 (120)														**$ 199,648.77**	

TASK DESCRIPTION	SUPPORT MANAGER	QUALITY MANAGER	SENIOR PRINCIPAL INVESTIGATOR	ARCHEOLOGIST IV	ARCHEOLOGIST III	FIELD TECH (ARCHEOLOGIST)	SENIOR HISTORIAN	HISTORIAN IV	HISTORIAN III	SENIOR GIS ANALYST	GIS SPECIALIST	PROJECT CONTROL SPECIALIST	ADMIN/ CLERICAL	TOTAL	COMMENTS
FUNCTION CODE 145 (145, 164) – MANAGING CONTRACTED/DONATED PE															
CONTRACT MANAGEMENT AND ADMINISTRATION															
145.1.Contract Management and Administration															
A. Project Management	40													40	
1. AmaTerra															

2. CD&P															
3. CivilCorp															
4. CP&Y															
5. OR Colan															
6. Terracon															
7. Westwood															
B. Project Administration	32													32	
C. Project Meetings	40													40	
HOURS SUB-TOTALS	112													112	
CONTRACT RATE PER HOUR	$ 247.65	$ 157.30	$ 128.70	$ 89.63	$ 73.22	$ 65.78	$ 153.15	$ 111.40	$ 88.12	$ 112.63	$ 75.13	$ 114.20	$ 88.12		
TOTAL LABOR COSTS	$ 27,759.20	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 27,759.20	
% DISTRIBUTION OF STAFFING	100.00%														
SUBTOTAL - FC 145 (145, 164)														**$ 27,759.20**	
LABOR SUBTOTAL SUMMARY															
FUNCTION CODE 120 (120) – SOCIAL/ECON/ENV STUDIES	$ 1,487.10	$ 2,831.40	$ 13,899.60	$ 59,647.12	$ 33,388.32	$ 39,468.00	$ 1,837.80	$ 17,824.00	$ 8,812.00	$ 5,293.61	$ 11,870.54	$ 2,055.60	$ 1,233.68	$ 199,648.77	
FUNCTION CODE 145 (145, 164) – MANAGING CONTRACTED/DONATED PE	$ 27,759.20	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 27,759.20	
SUBTOTAL LABOR EXPENSES	$29,246.30	$2,831.40	$ 13,899.60	$ 59,647.12	$ 33,388.32	$ 39,468.00	$ 1,837.80	$17,824.00	$ 8,812.00	$5,293.61	$ 11,870.54	$ 2,055.60	$ 1,233.68	**$227,407.97**	

MANAGING CONTRACTED/DONATED PE - FC 145 (164)					
OTHER DIRECT EXPENSES	**UNIT**	**FIXED COST**	**MAX COST**	**QUANTITY**	**TOTAL**
Mileage	mile	$0.655		3000	$1,965.00
Lodging/Hotel - Taxes and Fees	day/person		$45.00	160	$7,200.00
Lodging/Hotel (Taxes/fees not included)	day/person		$98.00	160	$15,680.00
Meals (Excluding alcohol & tips) (Overnight stay required)	day/person		$59.00	178	$10,502.00
Rental Car (Includes taxes and fees; Insurance costs will not be reimbursed)	day		$100.00	6	$600.00
Rental Car Fuel	gallon		$5.00	60	$300.00
Toll Charges	day		$50.00	10	$500.00
Photocopies B/W (8 1/2" X 11")	each	$0.15		200	$30.00
Photocopies Color (8 1/2" X 11")	each	$1.00		200	$200.00
Curator (Drawer & TX Archaeological Research Lab for artifacts & report)	each		$4,000.00	0.5	$2,000.00
TARL Curation Fee	site		$5,000.00	0.5	$2,500.00
Environmental Field Supplies (lathes, stakes, flagging, spray paint, etc.)	day		$35.00	40	$1,400.00
RTK Base Radio	hour	$30.00		80	$2,400.00
GPS Receiver Rate	hour	$30.00		80	$2,400.00
Backhoe Rental	day		$1,500.00	15	$22,500.00
					$70,177.00

	$ 248.10	$ 232.75	$ 187.33	$ 156.11	$ 174.00	$ 152.00	$ 120.00	$ 113.54	$ 121.34	$ 108.57	$ 126.31	$ 96.50		
TASK DESCRIPTION	**PROJECT MANAGER**	**SENIOR ENGINEER**	**PROJECT ENGINEER**	**DESIGN ENGINEER**	**UTILITY ENGINEER**	**SENIOR UTILITY COORDINATOR**	**UTILITY COORDINATOR**	**ENGINEER IN TRAINING**	**SENIOR ENGINEERING TECHNICIAN**	**ENGINEERING TECHNICIAN**	**SENIOR CADD OPERATOR**	**CADD OPERATOR**	**TOTAL**	**COMMENTS**
FUNCTION CODE 130 (130) – RIGHT-OF-WAY DATA														
RIGHT-OF-WAY (ROW) DATA AND UTILITY ENGINEERING INVESTIGATION														
130.1. Right-Of-Way Surveys (15.1.1)														
130.2. Right-Of-Way Mapping – Traditional ROW Map														
130.3. State Land Surveying (15.5.1)														
130.4. ROW Hearing Services														
130.5. Utility Engineering Investigation														
A. Utility Quality Levels (QL)														
1. Quality Level D														
External Communication (Correspondence, phone conversation, etc.) for each of the following utility owners:														
a. Bryan Texas Utilities (BTU)	1	1				8	16	8					34	
b. AT&T	1	1				8	16	8					34	
c. Frontier	1	1				8	16	8					34	
d. Next	1	1				8	16	8					34	
e. Optimum	1	1				8	16	8					34	
f. Earthlink	1	1				8	16	8					34	
g. Atmos Pipeline	1	1				8	16	8					34	
h. Energy Transfer	1	1				8	16	8					34	
i. Wilson Creek Special Utility District	1	1				8	16	8					34	
j. Enterprise Products	1	1				8	16	8					34	
k. Magellan	1	1				8	16	8					34	
l. Northfield Enterprises	1	1				8	16	8					34	
m. Wildfire Energy Midstream	1	1				8	16	8					34	
n. ExxonMobil Pipeline	1	1				8	16	8					34	
o. Entergy	1	1				8	16	8					34	
p. Local entities	4	2				8	16	8					38	
2. Quality Level C - OMITTED														
3. Quality Level B														
External Communication (Correspondence, phone conversation, etc.) for each of the following utility owners:														
a. Bryan Texas Utilities (BTU)	1	1				4	4						10	
b. AT&T	1	1				4	4						10	
c. Frontier	1	1				4	4						10	
d. Next	1	1				4	4						10	
e. Optimum	1	1				4	4						10	
f. Earthlink	1	1				4	4						10	
g. Atmos Pipeline	1	1				4	4						10	
h. Energy Transfer	1	1				4	4						10	
i. Wilson Creek Special Utility District	1	1				4	4						10	
j. Enterprise Products	1	1				4	4						10	
k. Magellan	1	1				4	4						10	
l. Northfield Enterprises	1	1				4	4						10	
m. Wildfire Energy Midstream	1	1				4	4						10	
n. ExxonMobil Pipeline	1	1				4	4						10	
o. Local entities	1	1				4	4						10	
4. Quality Level A - 10 spots	2	2			4	4	4						16	
B. Utility Investigations Methodology														
1. Utility Investigation Quality Level D														
a. Work site visit / Field reconnaissance	24	24			24	24	24						120	
b. Develop work plan for County Approval	4	8			8	16	24						60	
c. Review and compile a list of data sources	4	4				8	8						24	
i. Existing records			24		40			40	40				144	
ii. Oral recollections						12	12	24	24	24			96	
iii. Locations marked by DIGTESS			8					32	24	24			88	
iv. Data repositories					40	8	8	40	40	40			176	
d. Perform record research from all available resources	12	20			40			32	32				136	
i. Texas811							4	4	8	8			24	
ii. Railroad Commission of Texas (Texas RRC)								16	16	16			48	
iii. Verbal recollection			32					40	40	40			152	
iv. As-built information from plans	6	12	32	32	72			72	64	64			354	
v. Plats		6	24					64	32	40			166	
vi. Permits		12	24			16	16	40	24	24			156	
e. Document utility owners and contact information	4	6	8			16	40	40					114	
f. Create utility drawings of information gathered	6	20	40	48	56			136			152	320	778	
2. Utility Investigation Quality Level C (Omitted)														
3. Designate (Quality Level B)														
a. Compile "as-built" information from plans, plats, and other location data		2	4		8			8	8	8			38	

b. Request Right of Entry in accordance to General Requirement Section 1.4 of this Attachement C					16	16	32	32					96	
c. Coordinate with Survey to tie utilities to project survey datum								16	16	16			48	
d. Coordinate with utility owners, when utility owner's policy is, to designate their own facilities at no cost for preliminary survey purposes;	2	4				16	16						38	
e. Designate, record, and mark the horizontal location of existing utility facilities														
f. Use active and passive scans to locate any additional utilites, including unrecorded and abandoned storm and sanitary sewer facilities.														
g. Prepare and deliver a color-coded composite signed and sealed utility facility plan		2	4		16			32			64	128	246	
h. Determine the approximate electronic utility depths at critical location.														
i. Provide monthly summary and verify compliance with agreed work schedule	12	12											24	
j. Close-out permits as required	2	4	8			8	8						30	
k. Identify all utilities from QL D investigation that cannot be depicted by QL B		2	4		4			8	8	8			34	
l. Comply with all applicable TxDOT policy and procedural manuals.	4	4				8	8						24	
4. Subsurface Utility Locate (Test Hole) Service (Quality Level A) (Estimate 10 Test Holes)														
a. Review test hole location and advise County	4	4			8	8	8						32	
i. Determine number of test holes			8	8	16			16					48	
ii. Determine locations of test holes			8	16	16			16					56	
iii. Request Right of Entry					4	4	8	8					24	
b. Coordinate with Survey	2	4				16	16						38	
i. Tie utility location to project survey datum	2	2	4	4				8			8		28	
ii. Prepare, review, and document test hole data sheets	2	4	8		8			24	24	24			94	
c. Coordinate with utility owner inspectors						8	8						16	
d. Place Texas 811 ticket 48 hours prior to excavation							4	4	4	4			16	
HOURS SUB-TOTALS	126	190	240	108	380	376	564	880	404	340	224	448	4280	
CONTRACT RATE PER HOUR	$ 248.10	$ 232.75	$ 187.33	$ 156.11	$ 174.00	$ 152.00	$ 120.00	$ 113.54	$ 121.34	$ 108.57	$ 126.31	$ 96.50		
TOTAL LABOR COSTS	$ 31,260.60	$ 44,222.50	$ 44,959.20	$ 16,859.88	$ 66,120.00	$ 57,152.00	$ 67,680.00	$ 99,915.20	$ 49,021.36	$ 36,913.80	$ 28,293.44	$ 43,232.00	$ 585,629.98	
% DISTRIBUTION OF STAFFING	2.94%	4.44%	5.61%	2.52%	8.88%	8.79%	13.18%	20.56%	9.44%	7.94%	5.23%	10.47%		
SUBTOTAL - FC 130 (130)													**$585,629.98**	

TASK DESCRIPTION	PROJECT MANAGER	SENIOR ENGINEER	PROJECT ENGINEER	DESIGN ENGINEER	UTILITY ENGINEER	SENIOR UTILITY COORDINATOR	UTILITY COORDINATOR	ENGINEER IN TRAINING	SENIOR ENGINEERING TECHNICIAN	ENGINEERING TECHNICIAN	SENIOR CADD OPERATOR	CADD OPERATOR		COMMENTS
FUNCTION CODE 145 (145, 164) – MANAGING CONTRACTED/DONATED PE														
CONTRACT MANAGEMENT AND ADMINISTRATION														
145.1.Contract Management and Administration														
A. Project Management	72	48											120	
1. AmaTerra														
2. CD&P														
3. CivilCorp														
4. CP&Y														
5. OR Colan														
6. Terracon														
7. Westwood														
B. Project Administration	40	8										52	100	
C. Project Meetings	72	72											144	
HOURS SUB-TOTALS	184	128										52	364	
CONTRACT RATE PER HOUR	$ 248.10	$ 232.75	$ 187.33	$ 156.11	$ 174.00	$ 152.00	$ 120.00	$ 113.54	$ 121.34	$ 108.57	$ 126.31	$ 96.50		
TOTAL LABOR COSTS	$ 45,650.40	$ 29,792.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,018.00	$ 80,460.40	
% DISTRIBUTION OF STAFFING	50.55%	35.16%										14.29%		
SUBTOTAL - FC 145 (145, 164)													**$ 80,460.40**	

TASK DESCRIPTION	PROJECT MANAGER	SENIOR ENGINEER	PROJECT ENGINEER	DESIGN ENGINEER	UTILITY ENGINEER	SENIOR UTILITY COORDINATOR	UTILITY COORDINATOR	ENGINEER IN TRAINING	SENIOR ENGINEERING TECHNICIAN	ENGINEERING TECHNICIAN	SENIOR CADD OPERATOR	CADD OPERATOR	TOTAL	COMMENTS
FUNCTION CODE 160 (163) - MISCELLANEOUS ROADWAY														
MISCELLANEOUS ROADWAY														

163.1. Utility Coordination														
A. Utility Base Map														
1. Obtain information on existing utilities														
2. Conduct investigations to identify all known utilities	2					24	24	32	24	24			130	
3. Identify potential conflicts in accodance to SUE QL D and A only		4			24			32	48	48			156	
4. Prepare base map depicting utility locations in accordance to SUE QL D & A only		4	8	24	32			32					100	
5. Create and maintain a Utility Conflict Matrix (UCM) and utility conflict exhibit								16		24	32	72	144	
B Utility Coordination (Schematic Phase)		4	8		8	16	32	32	32	32	32	72	268	
1. Assist the County in conducting utility coordination meetings														
a. Establish contact with all existing utilities within and adjacent to the project limits	8	8				16	16						48	
b. Set up utility coordination meetings to discuss design and construction concepts	8	8			16	16	16						64	
2. Establish and conduct workshop meetings with utiltiy companies to review and resolve conflicts.	4	12				40	40	32					128	
3. Create agenda and exhibits for all coordination meetings	2	4	16					40			32	72	166	
4. Establish and promote the desired agenda and methodologies for utility construction	2	6			24	32	32						96	
5. Schedul and conduct a utility kick-off meeting	2	2				8	8						20	
6. Schedule and conduct milestone meetings with the County. Prepare reports for:	4	4				4	4						16	
a. Existing facilities including major facilities to be avoided			8		8	8		16					40	
b. Utility Conflict Matrix	2	6				16	32	48					104	
c. Utility Conflict Exhibit	2	4				16	16	48			48	80	214	
d. Long lead items that could potentially impact schedule during PS&E	2	4				4	4	8					22	
C. Deliverables														
1. Obtain information on existing utilities	2	6				40	40						88	
2. Conduct investigations to identify all known utilities					24			24	24	24			96	
163.2.Utility Design		8	24	24	24			60					140	
163.3. Retaining Walls and Miscellaneous Structures														
163.4. Traffic Control Plan, Detours, and Sequence of Construction														
163.5. Temporary Traffic Signals and Illumination														
163.6. Illumination														
163.7. Storm Water Pollution Prevention Plans (SWP3)														
163.8. Compute and Tabulate Quantities														
163.9. Special Utility Details (Water, Sanitary Sewer, etc.)														
163.10. Miscellaneous Structural Details														
163.12. Testimony for Right of Way Hearings														
163.13. Estimate														
163.14. Contract time determination														
163.15. Specifications and General Notes														
163.16. Constructability Review														
163.17. Scheduling and Tracking														
163.18. Deliverables														
163.2. Geotechnical Borings and Investigations														
Exploration Planning and Execution														
Project Coordination, Planning, and Internal Progress Meetings														
Review Existing Information														
Preparing Boring Location and Field Investigation Safety Plans														
Selection of Standard Traffic Control Plans for Borings														
Coordination with Project Team and County for Approval of Boring Location Plans														
Communication with Property Owners to Coordinate Site Visit and Exploration Schedules														
Site Visits to Assess Access and Stake Boring Locations														
Utility Clearance for Borings														
Coordination with Coring, Drilling, Traffic Control, Survey, and Non-Destructive Testing Crews														
Daily Travel, Borehole Logging, and Quality Assurance of Field Exploration														
Site Safety Check-Ins During Field Work														
Collection of Piezometric Readings (22 locations, monthly readings for 24 months)														
Laboratory Testing and Data Reporting														
Sample Inventory and Review for Laboratory Testing														
Prepare and Coordinate Laboratory Testing Assignments														
Review of Laboratory Test Results														
Preparation of Soil Boring Logs (Wincore), Pavement Core Logs, and DCP Test Results														
Preparation of Boring Location Maps														
Preparation of Geotechnical Data Report														

Geotechnical Engineering Analysis, Design, and Reporting														
Review and Comment on Bridge and Retaining Wall Layouts														
Develop Bridge Foundation Capacity Curves, LPILE Parameters, and Design Recommendations (27 borings)														
Develop Bridge Foundation Construction Considerations														
Develop Soil Parameters and Geometric Models for Embankment and Retaining Wall Analyses														
Perform Analysis for Embankment / Retaining Wall Settlement, Global, and External Stability (6 borings)														
Develop Recommendations for Retaining Wall Reinforcement Lengths and Ground Improvement Requirements														
Develop MSE DD Sheets														
Develop Bridge Class Culvert Design Recommendations and Construction Considerations (3 borings)														
Perform Analysis for Pond Slope Stability (10 locations)														
Preparing Soil Boring Data Sheets														
Preparation of Draft Geotechnical Engineering Report														
Preparation of Final Geotechnical Engineering Report														
Pavement Design and Reporting														
Perform Visual Condition Assessment at Cross-Streets														
Process and Review FWD and DCP data														
Perform Potential Vertical Rise (PVR) Calculations and Develop PVR Mitigation Strategies														
Review Monitoring Well Data and Identify Potential Groundwater Issues														
Perform FPS 21 & TxCRCP-ME calculations for Asphalt & Concrete Pavements														
Prepare Permanent Pavement Design Options														
Prepare Temporary Pavement Design Options														
Coordinate and Attend Pavement Design Conference with County/District														
Perform Life Cycle Cost Analysis to Evaluate Flexible and Rigid Alternatives														
Preparation of Draft Pavement Design Report														
Preparation of Final Pavement Design Report														
HOURS SUB-TOTALS	40	84	64	48	160	240	264	420	128	152	144	296	2040	
CONTRACT RATE PER HOUR	$ 248.10	$ 232.75	$ 187.33	$ 156.11	$ 174.00	$ 152.00	$ 120.00	$ 113.54	$ 121.34	$ 108.57	$ 126.31	$ 96.50		
TOTAL LABOR COSTS	$ 9,924.00	$ 19,551.00	$ 11,989.12	$ 7,493.28	$ 27,840.00	$ 36,480.00	$ 31,680.00	$ 47,686.80	$ 15,531.52	$ 16,502.64	$ 18,188.64	$ 28,564.00	$ 271,431.00	
% DISTRIBUTION OF STAFFING	1.96%	4.12%	3.14%	2.35%	7.84%	11.76%	12.94%	20.59%	6.27%	7.45%	7.06%	14.51%		
SUBTOTAL - FC 160 (163)													**$271,431.00**	

LABOR SUBTOTAL SUMMARY														
FUNCTION CODE 130 (130) -- RIGHT-OF-WAY DATA	$ 31,260.60	$ 44,222.50	$ 44,959.20	$ 16,859.88	$ 66,120.00	$ 57,152.00	$ 67,680.00	$ 99,915.20	$ 49,021.36	$ 36,913.80	$ 28,293.44	$ 43,232.00	$ 585,629.98	
FUNCTION CODE 145 (145, 164) -- MANAGING CONTRACTED/DONATED PE	$ 45,650.40	$ 29,792.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,018.00	$ 80,460.40	
FUNCTION CODE 160 (163) - MISCELLANEOUS ROADWAY	$ 9,924.00	$ 19,551.00	$ 11,989.12	$ 7,493.28	$ 27,840.00	$ 36,480.00	$ 31,680.00	$ 47,686.80	$ 15,531.52	$ 16,502.64	$ 18,188.64	$ 28,564.00	$ 271,431.00	
SUBTOTAL LABOR EXPENSES	$86,835.00	$93,565.50	$56,948.32	$24,353.16	$ 93,960.00	$ 93,632.00	$ 99,360.00	$147,602.00	$ 64,552.88	$ 53,416.44	$ 46,482.08	$76,814.00	**$937,521.38**	

CIVILCORP UTILITY INVESTIGATION - FC 130				
OTHER DIRECT EXPENSES	**UNIT**	**RATE**	**QUANTITY**	**COSTS**
Mileage	Mile	$0.655	1200	$ 750.00
Lodging/Hotel - Taxes and Fees	Day/Person	$98.000	24	$ 2,400.00
Meals (Excluding alcohol & tips) (Overnight stay required)	Day/Person	$59.000	24	$ 1,344.00
Air Travel - In State - 2+ Wks Notice (Coach)	Rd Trip/Person	$530.000		$ -
Parking	Day	$30.000		$ 30.00
Rental Car (Includes taxes and fees; Insurance costs will not be reimbursed)	Day	$100.000		$ 100.00
Rental Car Fuel	Gallon	$5.000		$ 5.00
Traffic Control Services, Arrow Boards and Attenuator trucks - (Includes labor, equipment and fuel)	Day	$5,150.00	3	$15,450.00
Environmental Field Supplies	Day	$35.00		$ -
CD/DVD	Each	$2.00		$ -
Photocopies B/W (11" X 17")	Each	$0.25	2000	$ 500.00
Photocopies B/W (8 1/2" X 11")	Each	$0.15	2000	$ 300.00
Photocopies Color (11" X 17")	Each	$1.25	600	$ 750.00
Photocopies Color (8 1/2" X 11")	Each	$1.00	600	$ 600.00
Map Records	Each	$4.00		$ -
USB Stick	Each	$10.00		$ -
SUBTOTAL OTHER DIRECT EXPENSES				**$23,309.00**

CIVILCORP UTILITY INVESTIGATION - FC 130				
UNIT COSTS	**UNIT**	**RATE**	**QUANTITY**	**COSTS**
SUE (Quality Level B)				
Power Lines (Transmission) (OH)	LF	$1.95	12,800	$24,960.00
Power Lines (Distribution) (OH)	LF	$1.95	6,700	$13,065.00
Power Lines (Distribution) (UG)	LF	$1.95	2,000	$3,900.00
Power Lines (Stree Lights) (UG)	LF	$1.95	300	$585.00
Power Lines (Traffic Signals) (UG)	LF	$1.95	600	$1,170.00
Communication (OH)	LF	$1.95	6,200	$12,090.00
Communication (UG)	LF	$1.95	5,100	$9,945.00
Water	LF	$1.95	2,100	$4,095.00
Wastewater	LF	$1.95	2,100	$4,095.00
SUE (Quality Level A - Utility Locate, Test Holes)				
Level A: 0 to 5 ft.	Each	1,275	3	$3,825.00
Level A: < 5 to 8 ft.	Each	1,625	3	$4,875.00
Level A: < 8 to 13 ft.	Each	2,000	2	$4,000.00
Level A: < 13 to 20 ft.	Each	2,500	2	$5,000.00
SUE Mobilization / Demobilization	Mile	$ 6.00	2600	$15,600.00

Subsurface Utility Engineering (SUE) Field Services				
Two (2) Person Survey Crew	Hour	$185.00	90	$16,650.00
Two (2) Designating Person with equipment	Hour	$205.00	50	$10,250.00
SUBTOTAL UNIT COSTS FC 130				**$134,105.00**

	240.61	228.80	148.49	121.01	82.51		
TASK DESCRIPTION	**PRINCIPAL**	**PUBLIC ENGAGEMENT MANAGER**	**PUBLIC ENGAGEMENT SPECIALIST**	**PUBLIC ENGAGEMENT COORDINATOR**	**PUBLIC ENGAGEMENT ADMINISTRATOR**	**TOTAL**	**COMMENTS**
FUNCTION CODE 120 (120) – SOCIAL/ECON/ENV STUDIES							
SOCIAL, ECONOMIC, AND ENVIRONMENTAL STUDIES AND PUBLIC INVOLVEMENT							
120.1. Environmental Documentation Standards							
120.2. Environmental Assessment (EA) Content and Format							
120.3. Environmental Impact Statement (EIS) Content and Format							
120.4. Environmental Re-evaluation Form							
120.5. Environmental Technical Analyses and Documentation							
A. Definition of technical analyses and documentation for environmental services							
B. Minimum Deliverables							
C. The exact environmental technical analyses and documentation must be determined at the work authorization level, but can include:							
1. Section 4(f) Evaluations							
2. Section 6(f) Evaluation							
3. Environmental Public Involvement (23 CFR §771.111)							
4. Community Impacts Analysis							
5. Induced Growth Impact Analysis and Cumulative Impacts Analysis							
6. Air Quality Studies							
7. Noise Analysis Technical Reporting							
8. Water Resources Analysis and Documentation							
9. Biological/Natural Resources Management Analysis and Documentation							
10. Initial Site Assessment (ISA) with Hazardous Materials Project Impact Evaluation Report							
11. Archeological Documentation Services							
a. Prepare/submit archeological Background Study							
b. Prepare/submit Antiquities Permit Application							
c. Perfom Archeological Intensive Survey, Reporting, and Curation							
12. Historic Resource Identification, Evaluation, and Documentation Services							
a. Prepare/submit historic resources project coordination request (PCR)							
b. Perform historic resource research design							
c. Prepare/submit historic resource survey rerport							
13. Floodplain Impacts							
14. Stormwater Permits (Section 402 of the Clean Water Act)							
FC 120.5 Public Involvement							
Database Development and Updates, Communications Log		8		80	8	96	
Development of Project Materials		25	30			55	
Stakeholder Communications		48	48			96	
Property Owner Meetings and Documentation (up to 100)		175	175	150	30	530	
Stakeholder and Agency Meetings and Coordination (up to 20)		80	80			160	
Project Updates		35	35			70	
FC 120.5 Public Meetings (2 Public Meetings and 1 Public Hearing)							
Planning and Logistics		24	60	40	20	144	
Meeting Notices and Promotion	6	30	60	40	20	156	
Public Meeting Materials (PPT, Maps, Exhibits, Handouts)	6	30	60			96	
Virtual Meeting Production/Engagement Tool		25	28			53	
Dry Run		18	18	18		54	
Meeting Preparation and Facilitation (up to 5 staff)	6	18	48	48		120	

Summary Report and Comment Responses (up to 200 comments each meeting)		55	65	45	18	183	
HOURS SUB-TOTALS	18	571	707	421	96	1813	
CONTRACT RATE PER HOUR	$ 240.61	$ 228.80	$ 148.49	$ 121.01	$ 82.51		
TOTAL LABOR COSTS	$ 4,330.98	$ 130,644.80	$ 104,982.43	$ 50,945.21	$ 7,920.96	$ 298,824.38	
% DISTRIBUTION OF STAFFING	0.99%	31.49%	39.00%	23.22%	5.30%		
SUBTOTAL - FC 120 (120)						**$298,824.38**	

TASK DESCRIPTION	PRINCIPAL	PUBLIC ENGAGEMENT MANAGER	PUBLIC ENGAGEMENT SPECIALIST	PUBLIC ENGAGEMENT COORDINATOR	PUBLIC ENGAGEMENT ADMINISTRATOR		COMMENTS
FUNCTION CODE 145 (145, 164) – MANAGING CONTRACTED/DONATED PE							
CONTRACT MANAGEMENT AND ADMINISTRATION							
145.1.Contract Management and Administration							
A. Project Management	12	24	40			76	
1. AmaTerra							
2. CD&P							
3. CivilCorp							
4. CP&Y							
5. OR Colan							
6. Terracon							
7. Westwood							
B. Project Administration							
C. Project Meetings		48	96			144	
HOURS SUB-TOTALS	12	72	136			220	
CONTRACT RATE PER HOUR	$ 240.61	$ 228.80	$ 148.49	$ 121.01	$ 82.51		
TOTAL LABOR COSTS	$ 2,887.32	$ 16,473.60	$ 20,194.64	$ -	$ -	$ 39,555.56	
% DISTRIBUTION OF STAFFING	5.45%	32.73%	61.82%				
SUBTOTAL - FC 145 (145, 164)						**$ 39,555.56**	

LABOR SUBTOTAL SUMMARY						
FUNCTION CODE 120 (120) – SOCIAL/ECON/ENV STUDIES	$ 4,330.98	$ 130,644.80	$ 104,982.43	$ 50,945.21	$ 7,920.96	$ 298,824.38
FUNCTION CODE 145 (145, 164) – MANAGING CONTRACTED/DONATED PE	$ 2,887.32	$ 16,473.60	$ 20,194.64	$ -	$ -	$ 39,555.56
SUBTOTAL LABOR EXPENSES	$7,218.30	$147,118.40	$125,177.07	$ 50,945.21	$ 7,920.96	**$338,379.94**

MANAGING CONTRACTED/DONATED PE - FC 145 (164)				
OTHER DIRECT EXPENSES	**UNIT**	**RATE**	**QUANTITY**	**TOTAL**
Mileage	Mile	$0.655	2,000	$1,310.00
Corrugated Meeting Signs				
Foam Boards	Each	$75.00	45	$3,375.00
Postage	Each	$0.66	2,000	$1,320.00
Photocopies B/W (8.5x11)				
Photocopies B/W (11 X 17)				
Photocopies Color (8.5 X 11)	Each	$1.00	1,000	$1,000.00
Photocopies Color (11 X 17)	Each	$1.25	1,000	$1,250.00
Venue Rental (allowance for cleaning, deposits, etc.)	LS			$1,000.00
AV Equipment Rental Allowance	LS			$500.00
Court Reporter	LS			$500.00
Advertisements	LS			$5,000.00
Print/Mail Service	LS			$2,000.00
Virtual Engagement Platform	LS			$1,000.00
Video/Virtual Meeting Production/Editing				
Project Email Subscription	LS			$250.00
Project Hotline/Voicemail	LS			$250.00
Project Website (URL, Hosting, etc.)				
Direct Expenses Subtotal				$18,755.00

	$ 216.00	$ 156.00	$ 116.00	$ 105.00	$ 200.00		
TASK DESCRIPTION	**PROJECT MANAGER**	**DEPUTY PROJECT MANAGER**	**RIGHT OF WAY AGENT**	**GIS TECH**	**APPRAISER**	**TOTAL**	**COMMENTS**
FUNCTION CODE 130 (130) – RIGHT-OF-WAY DATA							
RIGHT-OF-WAY (ROW) DATA AND UTILITY ENGINEERING INVESTIGATION							
130.1. Right-Of-Way Surveys (15.1.1)							
130.2. Right-Of-Way Mapping – Traditional ROW Map	30	66	166	19	9	290	
d. Place Texas 811 ticket 48 hours prior to excavation							
HOURS SUB-TOTALS	30	66	166	19	9	290	
CONTRACT RATE PER HOUR	$ 216.00	$ 156.00	$ 116.00	$ 105.00	$ 200.00		
TOTAL LABOR COSTS	$ 6,480.00	$ 10,296.00	$ 19,256.00	$ 1,995.00	$ 1,800.00	$ 39,827.00	
% DISTRIBUTION OF STAFFING	10.34%	22.76%	57.24%	6.55%	3.10%		
SUBTOTAL - FC 130 (130)		$3.41	$8.59	$0.98	$0.47	**$39,827.00**	

TASK DESCRIPTION	PROJECT MANAGER	DEPUTY PROJECT MANAGER	RIGHT OF WAY AGENT	GIS TECH	APPRAISER	TOTAL	COMMENTS
FUNCTION CODE 145 (145, 164) – MANAGING CONTRACTED/DONATED PE							
CONTRACT MANAGEMENT AND ADMINISTRATION							
145.1.Contract Management and Administration							
A. Project Management							
1. AmaTerra							
2. CD&P							
3. CivilCorp							
4. CP&Y							
5. OR Colan	24	20				44	
6. Terracon							
7. Westwood							
B. Project Administration	8	36				44	
C. Project Meetings	24	20				44	
HOURS SUB-TOTALS	56	76				132	
CONTRACT RATE PER HOUR	$ 216.00	$ 156.00	$ 116.00	$ 105.00	$ 200.00		
TOTAL LABOR COSTS	$ 12,096.00	$ 11,856.00	$ -	$ -	$ -	$ 23,952.00	
% DISTRIBUTION OF STAFFING	42.42%	57.58%					
SUBTOTAL - FC 145 (145, 164)						**$23,952.00**	

LABOR SUBTOTAL SUMMARY						
FUNCTION CODE 130 (130) – RIGHT-OF-WAY DATA	$ 6,480.00	$ 10,296.00	$ 19,256.00	$ 1,995.00	$ 1,800.00	$ 39,827.00
FUNCTION CODE 145 (145, 164) – MANAGING CONTRACTED/DONATED PE	$ 12,096.00	$ 11,856.00	$ -	$ -	$ -	$ 23,952.00
SUBTOTAL LABOR EXPENSES	$18,576.00	$22,152.00	$19,256.00	$1,995.00	$1,800.00	**$63,779.00**

ROADWAY DESIGN - FC 160 (150) - DESIGN SURVEY				
OTHER DIRECT EXPENSES	**UNIT**	**RATE**	**QUANTITY**	**TOTAL**
Lodging/Hotel - Taxes and Fees	day/person			$0.00
Appraiser Market Study	day/person	$10,000.00	1	$10,000.00
Meals (Excluding alcohol & tips) (Overnight stay required)	day/person			$0.00
Mileage	mile	$0.655	1000	$655.00
SUBTOTAL OTHER DIRECT EXPENSES				**$10,655.00**

TASK DESCRIPTION	$ 243.97 QUALITY MANAGER	$ 265.32 SENIOR ENVIRONMENTAL PLANNER	$ 179.93 ENVIRONMENTAL PLANNER IV	$ 131.96 ENVIRONMENTAL PLANNER III	$ 106.31 ENVIRONMENTAL PLANNER I/II	$ 265.32 SENIOR BIOLOGIST	$ 179.93 BIOLOGIST IV	$ 131.96 BIOLOGIST III	$ 106.31 BIOLOGIST I/II	$ 152.48 SENIOR GIS OPERATOR	$ 121.98 GIS OPERATOR	$ 89.87 JUNIOR GIS OPERATOR	$ 94.54 ADMIN/ CLERICAL	TOTAL	COMMENTS
FUNCTION CODE 102 (110) -- FEASIBILITY STUDIES															
ROUTE AND DESIGN STUDIES															
110.1. Schematic Design Work Outline															
A. Develop Base Maps															
B. Planimetrics and Aerial Mapping															
C. Analyze Existing Condition:															185 acreage, 110 lot/block parcels, platted and GIS Maintenan
Title Work Acreage Parcels (185 parcels															
Title Work Lot/Block Parcels (110 parcels															
GIS Development/Maintenance (18 months															
D. Schematic Alternatives	2	16	8			8					24			58	
E. Deliverable Schematic															
17. Bridge Layou															Assumed 14 bridges on two alignments
F. Project Management and Coordinatio															
G. Data Collection															
Right of Entry (185 tracts)															
5. Existing Bridge Data															Assumed review of two bridges from TxDOT GIS databas
H. Roadway Design Criteria															
I. Preliminary Design Conferenc															
110.2. Schematic Design -- General Task															
A. ROW Property Base Map															
B. Typical Sections		4	16		24				24	6		40		114	
C. Environmental Constraints															
D. Drainage															
County/TxDOT Coordinatio															
Informal Coordination with local floodplain administrator (Brazo															
Data Collection and Review of survey, As builts, FIS reports, available models and CAD files															Review and obtain existing data including models and dat prepared by local agencies, FEMA Map Change Information, and FEMA BLE models
Field Reconnaisance															Site assessments for up to 5 days to confirm existing condition and drainage conditions
Locate Drainage Outfalls															Identify potential drainage outfalls for approximately 4 crossings for up to two alignments in order to minimize impacts and need for ROW
Overall Drainage Area Map (Major crossings)															Prepare watershed level drainage area maps for Wickson Creek and tributaries, Thompson's Creek and tributaries, Steep Hollow Branch, Brushy Creek, and Caster's Creek Tributaries which is approximately 15 larger crossings.
Sub-Drainage Area Maps (Minor crossings and ditches)															Prepare hydrologic runoff calculations and drainage are delineations for up to 25 minor crossings and linear drainage systems for the 18 mile corridor loop for interim and ultimate conditions for two phases.
Hydrologic Analysis (Bridges including FEMA crossings)															Prepare hydrologic analysis for approximately 15 majo crossings using HEC-HMS for phase 1 and ultimate conditions with accuracy checks using Regressional Equations to confirm Synthetic Hydrographs.
Hydrologic Analysis (Bridge Class Culverts including FEMA crossings)															Prepare hydrologic analysis for up to approximately 15 majo crossings using HEC-HMS for phase 1 and ultimate conditions with accuracy checks using Regressional Equations to confirm Synthetic Hydrographs.
Hydrologic Analysis (Culvert crossings)															Prepare hydrologic analysis for up to approximately 15 majo crossings using HEC-HMS for phase 1 and ultimate conditions with accuracy checks using Regressional Equations to confirm Synthetic Hydrographs.
Hydrologic & Hydraulics Analysis along project (Exist, Interim and Final conditions)- 1D/2D															Review and updated available BLE hydraulic models wit updated LiDAR / survey information. Prepared 2D sheetflow models along corridor near Brushy and Wickson Creeks to confirm 1D models and analyze impacts and help size parrallel ditch systems.
Exist Effective Hydraulics Analysis (HEC-RAS_FEMA crossings)															Update BLE models to create revised existing hydraulic model for all FEMA mapped structure crossings using HEC-RAS. There are 18 existing crossings on FEMA Zone A floodplains will be evaluated with updated cross sections and revised runo information within the hydraulic models.
Exist Hydraulics Analysis (Bridges)															Update BLE models to create revised existing hydraulic model for all FEMA mapped structure crossings using HEC-RAS. The future bridge crossings on FEMA Zone A floodplains will b evaluated with updated cross sections and revised runoff information within the hydraulic models to create revised existing conditions
Exist Hydraulics Analysis (Bridge Class Culverts)															Update BLE models to create revised existing hydraulic model for all FEMA mapped structure crossings using HEC-RAS. The future bridge class culvert crossings on FEMA Zone A floodplains will be evaluated with updated cross sections and revised runoff information within the hydraulic models to create revised existing conditions
Exist Hydraulics Analysis (Culverts)															Update BLE models to create revised existing hydraulic model for all FEMA mapped structure crossings. The future culvert crossings on FEMA Zone A floodplains will be evaluated with updated cross sections and revised runoff information within th hydraulic models.
Prop .Hydraulics Analysis (Bridges including FEMA crossings- Using HEC-RAS)															Update existing conditions HEC-RAS models for bridges and bridge class culverts to be constructed within the phase 1 and ultimate ROW along the corridor. Approximately 15 bridges and/or bridge class culverts will be analyzed to ensure no adverse impact for design storm and 100-year storm event.
Prop. Hydraulics Analysis (Bridge Class Culverts including FEMA crossings- Using HEC-RAS)															Update existing conditions HEC-RAS models for bridges and bridge class culverts to be constructed within the phase 1 and ultimate ROW along the corridor. Approximately 15 bridges and/or bridge class culverts will be analyzed to ensure no adverse impact for design storm and 100-year storm event.

Prop. Hydraulics Analysis (Culvert crossings using HY-8)														Update existing conditions culvert models to be constructe within the phase 1 and ultimate ROW along the corridor. Approximately 25 non bridge class culverts will be analyzed to ensure no adverse impact for design storm and 100-year storm event using HY8.
Develop WSE Profiles														Existing and proposed water surface profiles will be developed for the major streams being analyzed with HEC-RAS. Approximately 35 miles of stream will be analyzed in detail with HEC-RAS to develop existing and proposed profiles.
Identify and mitigate impacts to adjacent properties														Approximately 40 crossings will be analyzed for pre and pos project conditions for the proposed roadway improvements to ensure no adverse impact to adjacent properties. Efforts including looking at possible improvements within the propsoe ROW to offset proposed bridge and culvert crossings including widened ditches and grading.
Evaluate floodplain cut and fill														Locations of FEMA effective floodplain areas will be evaluated determine limits of revised existing floodplain to quantify loss o floodplain storage due to proposed project and locations of floodplain mitigation.
Identify ROW/Detention requirements														For storm crossings will include initial detention storage to mitigation of increased runoff, approximate sizing of up to 40 locations for detention including calculating pre and post runoff volumes and determining preliminary sizing of ponds for placement and ROW determination
Identify Preliminary Detention locations														Based on detention volume calculations, locations and sizes w be determined for the 40 crossings and storm drain outfalls based on pre and post runoff volumes and flow rates.
Review Proposed Structure Conflicts with Waters of the US (WOTUS)														Utilizing available wetlands information from Wetlands Mappe and Environmental subconsultants, proposed crossings will be reviewed against WOTUS to minimize impacts to these areas to plan for future permitting
Draft Preliminary Drainage Report														Preparation of draft drainage report including narrative, tables exhibits, appendices, model, and output for initial agency review and coordination.
CAD Exhibits, Tables and Appendices														Preparation of hydraulic data sheets for crossings and proposed detention ponds for use within preliminary drainage report and schematic document
Final Drainage Report														Final drainage report incorporated review comments fron review agencies and interal design QC teams.
E. ROW Requirements														
F. Construction Sequence														
G. Design Exceptions														
H. Traffic Data and Projections														
I. Financial Plan and Project Management Pla														
J. Traffic and Operational Analysis														
K. Safety Analysis														
L. Bicycle and Pedestrian Accommodation														
Context Sensitive Solution:														
Stakeholder meeting:														
Workshop #1														
Workshop #2														
Workshop #3														
~~M. Interstate Access Justificatior~~														
~~N. Toll Managed, Express, High Occupancy Vehicle, Managed Lane~~														
~~Other Special Use Lanes, and Transit Elements~~														
O. Project Implementation Plar														
110.3. Conceptual Design Schematic														
110.4. Geometric Design Schematic														
A. 5. Proposed Bridge Structures														Quantities and estimates on two alignments, model setup on pr
110.5. Cross-Sections (100' Interval, Electronic Delivery														
110.6. Retaining Walls														
110.7. Renderings and Traffic Simulatior														
110.8. Preliminary Construction Sequence														
110.9. Preliminary Cost Estimate														
110.10. Engineering Summary Repor		4	8										12	
110.11. Conduct/Support or Attendance at Value Engineering Stuc														
110.12. Agency Coordination and Public Involvemer	4	40	32	12	12	12	32	12	12		40		208	
MAPO Exhibits														
110.13. Schematic Design Project Deliverable														
~~110.14. Data Collection and Field Reconnaissanc~~														
~~110.15. Design Criteria~~														
~~110.16. Preliminary Cost Estimate~~														
~~110.17. Design Concept Conferenc~~														
~~110.18. Geotechnical Borings and Investigation~~														
HOURS SUB-TOTALS	6	64	64	12	36	20	32	12	36	6	64	40	392	
CONTRACT RATE PER HOUR	$ 243.97	$ 265.32	$ 179.93	$ 131.96	$ 106.31	$ 265.32	$ 179.93	$ 131.96	$ 106.31	$ 152.48	$ 121.99	$ 89.87	$ 84.54	
TOTAL LABOR COSTS	$ 1,463.82	$ 16,980.48	$ 11,515.52	$ 1,583.52	$ 3,827.16	$ 5,306.40	$ 5,757.76	$ 1,583.52	$ 3,827.16	$ 914.88	$ 7,807.36	$ 3,594.80	$ -	$ 64,162.38
% DISTRIBUTION OF STAFFING	1.53%	16.33%	16.33%	3.06%	9.18%	5.10%	8.16%	3.06%	9.18%	1.53%	16.33%	10.20%		
SUBTOTAL - FC 102 (110)														**$ 64,162.38**

TASK DESCRIPTION	QUALITY MANAGER	SENIOR ENVIRONMENTAL PLANNER	ENVIRONMENTAL PLANNER IV	ENVIRONMENTAL PLANNER III	ENVIRONMENTAL PLANNER I/II	SENIOR BIOLOGIST	BIOLOGIST IV	BIOLOGIST III	BIOLOGIST I/II	SENIOR GIS OPERATOR	GIS OPERATOR	JUNIOR GIS OPERATOR	ADMIN/ CLERICAL	TOTAL	COMMENTS
FUNCTION CODE 120 (120) – SOCIAL/ECON/ENV STUDIE:															
SOCIAL, ECONOMIC, AND ENVIRONMENTAL STUDIES AND PUBLI INVOLVEMENT															
120.1. Environmental Documentation Standard	4	20	12			8					8			52	
120.2. Environmental Assessment (EA) Content and Forma	8	48	64	24		16	16			8	32			216	
120.3. Environmental Impact Statement (EIS) Content and Forma															
120.4. Environmental Re-evaluation Forr															
120.5. Environmental Technical Analyses and Documentatic															
A. Definition of technical analyses and documentation fo environmental services															
B. Minimum Deliverable:															

C. The exact environmental technical analyses and documentation must be determined at the work authorization level, but can include:														
1. Section 4(f) Evaluations		20											20	
2. Section 6(f) Evaluation		20											20	
3. Environmental Public Involvement (23 CFR §771.111		72	40							4		32	148	
4. Community Impacts Analysis		4	8	32	64					2	16		126	
5. Induced Growth Impact Analysis and Cumulative Impacts Analysis		16	64	80	88		4	16	16	8	24	64	380	
6. Air Quality Studies		2	6	40								2	50	
7. Noise Analysis Technical Reporting		16		40							40	80	176	
8. Water Resources Analysis and Documentation	4	22				28	68	120	64	2	40		348	
9. Biological/Natural Resources Management Analysis and Documentation	2	12				12	65	50	64	2	32		239	
10. Initial Site Assessment (ISA) with Hazardous Materials Project Impact Evaluation Report		4	6	16	64					2		24	116	
11. Archeological Documentation Service		8											8	
a. Prepare/submit archeological Background Stud														
b. Prepare/submit Antiquities Permit Application														
c. Perform Archeological Intensive Survey, Reporting, and Curation														
12. Historic Resource Identification, Evaluation, and Documentation Services		8											8	
a. Prepare/submit historic resources project coordination request (PCR)														
b. Perform historic resource research design														
c. Prepare/submit historic resource survey report														
13. Floodplain Impacts								8				4	12	
14. Stormwater Permits (Section 402 of the Clean Water Act								8				2	10	
FC 120.5 Public Involvemen														
Database Development and Updates, Communications Log														
Development of Project Material														
Stakeholder Communications														
Property Owner Meetings and Documentation (up to 100														
Stakeholder and Agency Meetings and Coordination (up to 20)														
Project Updates														
FC 120.5 Public Meetings (2 Public Meetings and 1 Public Hearing)														
Planning and Logistics														
Meeting Notices and Promotion														
Public Meeting Materials (PPT, Maps, Exhibits, Handouts														
Virtual Meeting Production/Engagement Too														
Dry Run														
Meeting Preparation and Facilitation (up to 5 staff														
Summary Report and Comment Responses (up to 200 comments each meeting)														
HOURS SUB-TOTALS	16	272	200	232	216	64	153	202	144	28	192	208		1929
CONTRACT RATE PER HOUR	$ 243.97	$ 265.32	$ 179.93	$ 131.96	$ 106.31	$ 265.32	$ 179.93	$ 131.96	$ 106.31	$ 152.48	$ 121.99	$ 89.87	$ 94.54	
TOTAL LABOR COSTS	$ 4,391.46	$ 72,167.04	$ 35,986.00	$ 30,614.72	$ 22,962.96	$ 16,980.48	$ 27,529.29	$ 26,655.92	$ 15,308.64	$ 4,269.44	$ 23,422.08	$ 18,692.96	$ -	$ 298,980.99
% DISTRIBUTION OF STAFFING	0.93%	14.10%	10.37%	12.03%	11.20%	3.32%	7.93%	10.47%	7.47%	1.45%	9.95%	10.78%		
SUBTOTAL - FC 120 (120)														**$ 298,980.99**

TASK DESCRIPTION	QUALITY MANAGER	SENIOR ENVIRONMENTAL PLANNER	ENVIRONMENTAL PLANNER IV	ENVIRONMENTAL PLANNER III	ENVIRONMENTAL PLANNER I/II	SENIOR BIOLOGIST	BIOLOGIST IV	BIOLOGIST III	BIOLOGIST I/II	SENIOR GIS OPERATOR	GIS OPERATOR	JUNIOR GIS OPERATOR	ADMIN/ CLERICAL		COMMENTS
FUNCTION CODE 145 (145, 164) – MANAGING															
CONTRACTED/DONATED PE															
CONTRACT MANAGEMENT AND ADMINISTRATIO															
145.1.Contract Management and Administration															
A. Project Management	16	24												40	
1. AmaTerra															
2. CD&P															
3. CivilCorp															
4. CP&Y															
5. OR Colan															
6. Terracon															
7. Westwood															
B. Project Administration		36											144	180	
C. Project Meetings		80		80										160	
HOURS SUB-TOTALS	16	140		80									144	380	
CONTRACT RATE PER HOUR	$ 243.97	$ 265.32	$ 179.93	$ 131.96	$ 106.31	$ 265.32	$ 179.93	$ 131.96	$ 106.31	$ 152.48	$ 121.99	$ 89.87	$ 94.54		
TOTAL LABOR COSTS	$ 3,903.52	$ 37,144.80	$ -	$ 10,556.80	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 13,613.76	$ 65,218.88	
% DISTRIBUTION OF STAFFING	4.21%	36.84%		21.05%									37.89%		
SUBTOTAL - FC 145 (145, 164)														**$ 65,218.88**	

LABOR SUBTOTAL SUMMARY														
FUNCTION CODE 102 (110) – FEASIBILITY STUDIES	$ 1,463.82	$ 16,980.48	$ 11,515.52	$ 1,583.52	$ 3,827.16	$ 5,306.40	$ 5,757.76	$ 1,583.52	$ 3,827.16	$ 914.88	$ 7,807.36	$ 3,594.80	$ -	$ 64,162.38
FUNCTION CODE 120 (120) – SOCIAL/ECON/ENV STUDIES	$ 4,391.46	$ 72,167.04	$ 35,986.00	$ 30,614.72	$ 22,962.96	$ 16,980.48	$ 27,529.29	$ 26,655.92	$ 15,308.64	$ 4,269.44	$ 23,422.08	$ 18,692.96	$ -	$ 298,980.99
FUNCTION CODE 145 (145, 164) – MANAGING CONTRACTED/DONATED PE	$ 3,903.52	$ 37,144.80	$ -	$ 10,556.80	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 13,613.76	$ 65,218.88
SUBTOTAL LABOR EXPENSES	$ 9,758.80	$ 126,292.32	$ 47,501.52	$ 42,755.04	$ 26,790.12	$ 22,286.88	$ 33,287.05	$ 28,239.44	$ 19,135.80	$ 5,184.32	$ 31,229.44	$ 22,287.76	$ 13,613.76	**$428,362.25**

MANAGING CONTRACTED/DONATED PE - FC 145 (164)				
OTHER DIRECT EXPENSES	**UNIT**	**RATE**	**QUANTITY**	**TOTAL**
Lodging/Hotel - Taxes and Fees	day/person	$45.00	20	$900.00
Lodging/Hotel (Taxes/fees not included)	day/person	$98.00	20	$1,960.00
Meals (Excluding alcohol & tips) (Overnight stay required)	day/person	$59.00	20	$1,180.00
Mileage	mile	$0.655	2500	$1,637.50
Rental Car Fuel	gallon	$5.00	100	$500.00
Rental Car (Includes taxes and fees; Insurance costs will not be reimbursed)	day	$100.00	5	$500.00
Air Travel - Out of State - 2+ Wks Notice (Coach)	Rd Trip/person	$1,000.00	1	$1,000.00
Oversize, special handling or extra baggage airline fees	each	$100.00	1	$100.00
Parking	day	$30.00	2	$60.00
Taxi/Cab fare (Includes Rideshare)	each/person	$40.00	2	$80.00
Toll Charges	day	$50.00	4	$200.00
Photocopies B/W (11" X 17")	each	$0.25	250	$62.50
Photocopies B/W (8 1/2" X 11")	each	$0.15	500	$75.00
Photocopies Color (11" X 17")	each	$1.25	500	$625.00
Photocopies Color (8 1/2" X 11")	each	$1.00	100	$100.00
Materials and Shipping	per package	$100.00	3	$300.00
Noise Meter Rental Unit - includes noise meter, camera, tripods, calibrator	per alternative	$300.00	2	$600.00
Aerial Photographs (1" = 500' scale)	each	$125.00	1	$125.00
Environmental Field Supplies (lathes, stakes, flagging, spray paint, etc.)	day	$35.00	4	$140.00
Hazardous Materials Database Report	per mile	$125.00	20	$2,500.00
Historical Aerial Images	unit	$250.00	1	$250.00
GPS Receiver Rate	hour	$30.00	24	$720.00
SUBTOTAL OTHER DIRECT EXPENSES				**$13,615.00**

	$ 242.49	$ 271.98	$ 235.94	$ 196.61	$ 169.75	$ 137.63	$ 124.52	$ 117.97	$ 109.78		
TASK DESCRIPTION	**SUPPORT MANAGER**	**QUALITY MANAGER**	**SENIOR ENGINEER**	**PROJECT ENGINEER**	**DESIGN ENGINEER**	**ENGINEER IN TRAINING**	**SENIOR ENGINEERING TECHNICIAN**	**SENIOR CAD OPERATOR**	**ADMIN/ CLERICAL**	**TOTAL**	**COMMENTS**
FUNCTION CODE 145 (145, 164) – MANAGING CONTRACTED/DONATED PE											
CONTRACT MANAGEMENT AND ADMINISTRATION											
145.1.Contract Management and Administration											
A. Project Management	24		12	15	9				36	96	
1. AmaTerra											
2. CD&P											
3. CivilCorp											
4. CP&Y											
5. OR Colan											
6. Terracon											
7. Westwood											
B. Project Administration	12			3	9				30	54	
C. Project Meetings	24		12	15	9					60	
HOURS SUB-TOTALS	60		24	33	27				66	210	
CONTRACT RATE PER HOUR	$ 242.49	$ 271.98	$ 235.94	$ 196.61	$ 159.75	$ 137.63	$ 124.52	$ 117.97	$ 109.78		
TOTAL LABOR COSTS	$ 14,549.40	$ -	$ 5,662.56	$ 6,488.13	$ 4,313.25	$ -	$ -	$ -	$ 7,245.48	$ 38,258.82	
% DISTRIBUTION OF STAFFING	28.57%		11.43%	15.71%	12.86%				31.43%		
SUBTOTAL - FC 145 (145, 164)										**$ 38,258.82**	

TASK DESCRIPTION	SUPPORT MANAGER	QUALITY MANAGER	SENIOR ENGINEER	PROJECT ENGINEER	DESIGN ENGINEER	ENGINEER IN TRAINING	SENIOR ENGINEERING TECHNICIAN	SENIOR CAD OPERATOR	ADMIN/ CLERICAL	TOTAL	COMMENTS
FUNCTION CODE 160 (163) - MISCELLANEOUS ROADWAY											
MISCELLANEOUS ROADWAY											
163.1. Utility Coordination											
A. Utility Base Map											
1. Obtain information on existing utilities											
2. Conduct investigations to identify all known utilities											
3. Identify potential conflicts in accodance to SUE QL D and A only											
4. Prepare base map depicting utility locations in accordance to SUE QL D & A only											
5. Create and maintain a Utility Conflict Matrix (UCM) and utility conflict exhibit											
B Utility Coordination (Schematic Phase)											
1. Assist the County in conducting utility coordination meetings											
a. Establish contact with all existing utilities within and adjacent to the project limits											
b. Set up utility coordination meetings to discuss design and construction concepts											
2. Establish and conduct workshop meetings with utiltiy companies to review and resolve conflicts.											
3. Create agenda and exhibits for all coordination meetings											
4. Establish and promote the desired agenda and methodologies for utility construction											
5. Schedul and conduct a utility kick-off meeting											
6. Schedule and conduct milestone meetings with the County. Prepare reports for:											
a. Existing facilities including major facilities to be avoidec											
b. Utility Conflict Matrix											
c. Utility Conflict Exhibit											
d. Long lead items that could potentially impact schedule during PS&E											
C. Deliverables											
1. Obtain information on existing utilities											
2. Conduct investigations to identify all known utilities											
163.2.Utility Design											
163.3. Retaining Walls and Miscellaneous Structures											
163.4. Traffic Control Plan, Detours, and Sequence of Construction											
163.5. Temporary Traffic Signals and Illumination											
163.6. Illumination											
163.7. Storm Water Pollution Prevention Plans (SWP3)											
163.8. Compute and Tabulate Quantities											

163.9. Special Utility Details (Water, Sanitary Sewer, etc.)											
163.10. Miscellaneous Structural Details											
163.12. Testimony for Right of Way Hearings											
163.13. Estimate											
163.14. Contract time determination											
163.15. Specifications and General Notes											
163.16. Constructability Review											
163.17. Scheduling and Tracking											
163.18. Deliverables											
163.2. Geotechnical Borings and Investigations											
Exploration Planning and Execution											
Project Coordination, Planning, and Internal Progress Meetings	18	9	6	12	24	6	24		12	111	
Review Existing Information	6		2	4	6					18	
Preparing Boring Location and Field Investigation Safety Plans	2	1	4	10	24	14	28			83	
Selection of Standard Traffic Control Plans for Borings	1		3	6	10		13			33	
Coordination with Project Team and County for Approval of Boring Location Plans	2		6	7	18		11			44	
Communication with Property Owners to Coordinate Site Visit and Exploration Schedules	4		2	15	30		40			91	
Site Visits to Assess Access and Stake Boring Locations	2		2	6	22		56			88	
Utility Clearance for Borings	2		4	8	22		28			64	
Coordination with Coring, Drilling, Traffic Control, Survey, and Non-Destructive Testing Crews	1		2	6	22		62			93	
Daily Travel, Borehole Logging, and Quality Assurance of Field Exploration	4	4	4	20	44	80	984			1140	
Site Safety Check-Ins During Field Work		4		2	8		10			24	
Collection of Piezometric Readings (22 locations, monthly readings for 24 months)				8	25		264			297	
Laboratory Testing and Data Reporting											
Sample Inventory and Review for Laboratory Testing	2		3	4	16	20	40			85	
Prepare and Coordinate Laboratory Testing Assignments	1		1	3	8	10				23	
Review of Laboratory Test Results	2	3	3	6	16					30	
Preparation of Soil Boring Logs (Wincore), Pavement Core Logs, and DCP Test Results		4	6	10	18	48				86	
Preparation of Boring Location Maps			1	1	3	6				11	
Preparation of Geotechnical Data Report	2	3	2	6	14	10			6	43	
Geotechnical Engineering Analysis, Design, and Reporting											
Review and Comment on Bridge and Retaining Wall Layouts	2		4	6	4					16	
Develop Bridge Foundation Capacity Curves, LPILE Parameters, and Design Recommendations (27 borings)	3		4	9	54					70	
Develop Bridge Foundation Construction Considerations	1		1	4	8					14	
Develop Soil Parameters and Geometric Models for Embankment and Retaining Wall Analyses	1		1	3	6					11	
Perform Analysis for Embankment / Retaining Wall Settlement, Global, and External Stability (6 borings)	2		3	6	20					31	
Develop Recommendations for Retaining Wall Reinforcement Lengths and Ground Improvement Requirements	1		2	3	10					16	
Develop MSE DD Sheets	1	1	1	1	1			4		9	
Develop Bridge Class Culvert Design Recommendations and Construction Considerations (3 borings)			1	2	8					11	
Perform Analysis for Pond Slope Stability (10 locations)	2		3	8	33					46	
Preparing Soil Boring Data Sheets	2	2	2	4	3			20	3	36	
Preparation of Draft Geotechnical Engineering Report	2	3	3	7	13				1	29	
Preparation of Final Geotechnical Engineering Report	1	1	2	3	4					11	
Pavement Design and Reporting											
Perform Visual Condition Assessment at Cross-Streets			12	12						24	
Process and Review FWD and DCP data		2	4	10	20					36	
Perform Potential Vertical Rise (PVR) Calculations and Develop PVR Mitigation Strategies		1	2	4	18					25	
Review Monitoring Well Data and Identify Potential Groundwater Issues		2	2	6	6					16	
Perform FPS 21 & TxCRCP-ME calculations for Asphalt & Concrete Pavements		1	3	4	36					44	
Prepare Permanent Pavement Design Options	1	1	2	6	12					22	
Prepare Temporary Pavement Design Options		1	1	2	6					10	
Coordinate and Attend Pavement Design Conference with County/District	2	4	4	6	10					26	
Perform Life Cycle Cost Analysis to Evaluate Flexible and Rigid Alternatives	1	2	6	10	24					43	
Preparation of Draft Pavement Design Report	2	2	8	16	56					84	
Preparation of Final Pavement Design Report											

HOURS SUB-TOTALS	73	51	122	266	682	194	1560	24	22	2994	
CONTRACT RATE PER HOUR	$ 242.49	$ 271.98	$ 235.94	$ 196.61	$ 159.75	$ 137.63	$ 124.52	$ 117.97	$ 109.78		
TOTAL LABOR COSTS	$ 17,701.77	$ 13,870.98	$ 28,784.68	$ 52,298.26	$ 108,949.50	$ 26,700.22	$ 194,251.20	$ 2,831.28	$ 2,415.16	$ 447,803.05	
% DISTRIBUTION OF STAFFING	2.44%	1.70%	4.07%	8.88%	22.78%	6.48%	52.10%	0.80%	0.73%		
SUBTOTAL - FC 160 (163)										**$447,803.05**	

LABOR SUBTOTAL SUMMARY											
FUNCTION CODE 145 (145, 164) -- MANAGING CONTRACTED/DONATED PE	$ 14,549.40	$ -	$ 5,662.56	$ 6,488.13	$ 4,313.25	$ -	$ -	$ -	$ 7,245.48	$ 38,258.82	
FUNCTION CODE 160 (163) - MISCELLANEOUS ROADWAY	$ 17,701.77	$ 13,870.98	$ 28,784.68	$ 52,298.26	$ 108,949.50	$ 26,700.22	$ 194,251.20	$ 2,831.28	$ 2,415.16	$ 447,803.05	
SUBTOTAL LABOR EXPENSES	$32,251.17	$13,870.98	$34,447.24	$58,786.39	$113,262.75	$26,700.22	$194,251.20	$ 2,831.28	$9,660.64	**$486,061.87**	

MISCELLANEOUS ROADWAY - FUNCTION CODE 160 (163)					TOTAL
OTHER DIRECT EXPENSES	**UNIT**	**RATE**	**QUANTITY**		**COST**
Lodging/Hotel - Taxes and Fees	day/person	$45.00	145		$6,525.00
Lodging/Hotel (Taxes/fees not included)	day/person	$98.00	145		$14,210.00
Meals (Excluding alcohol & tips) (Overnight stay required)	day/person	$59.00	145		$8,555.00
Mileage	mile	$0.655	2,710		$1,775.05
Mobilization and Demobilization of Non Destructive Deflection Testing (Trips within 100 miles from office to site)	each	$500.00			$0.00
Mobilization and Demobilization of Non Destructive Deflection Testing (Trips over 100 miles from office to site)	mile	$5.00	240		$1,200.00
Mobilization of ATV Buggy / Track Drilling Equipment less 100 mile	each	$1,800.00	13		$23,400.00
Mobilization of ATV Buggy / Track Drilling Equipment more than 100 mile	mile	$18.00			$0.00
ATV Surcharge (for rig installed on ATV)	LF	$5.00	3,150		$15,750.00
Stand By of Drilling Equipment	hour	$350.00	31		$10,850.00
Mobilization and Demobilization of Drilling Rig (Trips within 100 miles from office to site)	trip	$600.00	5		$3,000.00
Mobilization and Demobilization of Drilling Rig (Trips over 100 miles from office to site)	mile	$6.00			$0.00
Mobilization of coring equipment used to drill flexible and rigid pavement (2-man crew minimum, Labor paid separately)(less 100 miles)	trip	$600.00	12		$7,200.00
Mobilization of coring equipment used to drill flexible and rigid pavement (2-man crew minimum, Labor paid separately)(over 100 miles)	mile	$6.00			$0.00
Hydro-vacuum Excavation (equipment, materials, and labor)	hour	$450.00	8		$3,600.00
Portable Message Board	day	$500.00	24		$12,000.00
Flashing Arrow Board	day	$600.00			$0.00
Law Enforcement/Uniform Officer (including vehicle)	hour	$150.00	18		$2,700.00
Attenuator trucks - (Lane/Shoulder Closure) (Includes labor, equipment and fuel)	day	$1,600.00			$0.00
Attenuator trucks - (No Lane Closure) (Includes labor, equipment and fuel)	day	$1,000.00			$0.00
Traffic Control Services, Arrow Boards and Attenuator trucks - (Includes labor, equipment and fuel)	day	$5,150.00	12		$61,800.00
Bulldozer Rental	day	$3,000.00	20		$60,000.00
SUBTOTAL OTHER DIRECT EXPENSES					**$232,565.05**

MISCELLANEOUS ROADWAY - FUNCTION CODE 160 (163)				TEST	TOTAL
UNIT COSTS	**UNIT**	**RATE**	**QUANTITY**	**CODE**	**COST**
Borehole Grouting - Bentonite Chips	LF	$10.50	3,990		$41,895.00
Concrete/AC Patch	per patch	$70.00	45		$3,150.00
Core Drill Asphalt	each	$125.00	45		$5,625.00
Core Drill Concrete	each	$155.00			$0.00
Dynamic Cone Penetrometer in Shallow Pavement Applications	each	$120.00	58	ASTM D6951	$6,960.00
Non Destructive Deflection Testing - Falling Weight Deflection (FWD)	day	$3,500.00	5		$17,500.00
Piezometer Abandonment	each	$475.00	22		$10,450.00
Piezometer Finish: Flush Mount w/ 2' x 2' pad	each	$400.00	22		$8,800.00
Piezometer-2"	LF	$40.00	470		$18,800.00

Soil Boring/Rock Coring with TCP (< 60 ft.)	LF	$47.50	2,220	Tex-132-E	$105,450.00
Soil Boring/Rock Coring with TCP (> 60 ft.)	LF	$57.00	790	Tex-132-E	$45,030.00
Soil Boring/Rock Coring without TCP (< 60 ft.)	LF	$36.00	1,068		$38,448.00
Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils	each	$32.50	402	ASTM D1586	$13,065.00
California Bearing Ratio (CBR) of Laboratory-Compacted Soils (Single Sample without MD Curve)	test	$310.00	5	ASTM D1883	$1,550.00
Unconfined Compressive Strength (Soil)	each	$70.00	192	ASTM D2166	$13,440.00
Permeability of Granular Soils (Constant Head)	each	$400.00	5	ASTM D2434	$2,000.00
One-Dimensional Consolidation Properties of Soils Using Incremental Loading	each	$575.00	3	ASTM D2435	$1,725.00
Direct Shear Test of Soils Under Consolidated Drained Conditions	set of 3	$1,100.00	9	ASTM D3080	$9,900.00
Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter	each	$400.00	5	ASTM D5084	$2,000.00
Determining Moisture Content in Soil Materials	each	$18.00	595	Tex-103-E	$10,710.00
Determining Liquid Limits of Soils	each	$45.00	519	Tex-104-E	$23,355.00
Determining Plastic Soil Limits	each	$45.00	519	Tex-105-E	$23,355.00
Calculating the Plasticity Index of Soils	each	$45.00	519	Tex-106-E	$23,355.00
Particle Size Analysis of Soils	each	$110.00	35	Tex-110-E	$3,850.00
Determining the Amount of Material in Soils Finer than the 75 micrometer (No. 200) Sieve	each	$60.00	519	Tex-111-E	$31,140.00
Laboratory Compaction Characteristics and Moisture-Density Relationship of Subgrade, Embankment Soils, and Backfill Material	each	$275.00	5	Tex-114-E	$1,375.00
Triaxial Compression for Disturbed Soils and Base Materials	each	$1,950.00	4	Tex-117-E	$7,800.00
Triaxial Compression Test for Undisturbed Soils	each	$150.00	54	Tex-118-E	$8,100.00
Soil-Lime Testing - Part 3	each	$325.000	11	Tex-121-E	$3,575.00
Consolidated Undrained (CU) Triaxial Compression Test for Undisturbed Soils- Single Stage	set of 3	$1,980.00	2	Tex-131-E	$3,960.00
Determining Sulfate Content in Soils - Colorimetric Method	each	$132.00	132	Tex-145-E	$17,424.00
Soil Organic Content Using UV-Vis Method	each	$340.00	66	Tex-148-E	$22,440.00
SUBTOTAL UNIT COSTS					**$526,227.00**

	$ 305.00	$ 260.01	$ 243.76	$ 206.26	$ 134.38	$ 156.25	$ 143.75	$ 112.50	$ 103.13		
TASK DESCRIPTION	TECHNICAL ADVISOR (SENIOR)	SUPPORT MANAGER	SENIOR ENGINEER	PROJECT ENGINEER	ENGINEER-IN-TRAINING	ENGINEERING TECHNICIAN	SENIOR CADD OPERATOR	CAD OPERATOR	ADMIN/ CLERICAL	TOTAL	COMMENTS
FUNCTION CODE 102 (110) – FEASIBILITY STUDIES											
ROUTE AND DESIGN STUDIES											
110.1. Schematic Design Work Outline											
A. Develop Base Maps	4	8	12	24	40	60				148	
B. Planimetrics and Aerial Mapping											
C. Analyze Existing Condition:		8	12	24	40	40				124	185 acreage, 110 lot/block parcels, platted and GIS Maintenance for 18 month
Title Work Acreage Parcels (185 parcels)											
Title Work Lot/Block Parcels (110 parcels)											
GIS Development/Maintenance (18 months											
D. Schematic Alternatives	8	40	80	80	80	40				328	
E. Deliverable Schematic											
17. Bridge Layout	4	8	40		40	40				132	Assumed 14 bridges on two alignments
F. Project Management and Coordinatior	60	60	60	60	60					360	
G. Data Collection											
Right of Entry (185 tracts)											
5. Existing Bridge Data											Assumed review of two bridges from TxDOT GIS database
H. Roadway Design Criteria	8	8	8							24	
I. Preliminary Design Conference	8	12	12							32	
110.2. Schematic Design – General Tasks											
A. ROW Property Base Map	4	8	8	8		40				68	
B. Typical Sections	8	16	24	40		80				168	
C. Environmental Constraints	2	4		8		4				18	
D. Drainage											
County/TxDOT Coordination											
Informal Coordination with local floodplain administrator (Brazos											
Data Collection and Review of survey, As builts, FIS reports available models and CAD files											Review and obtain existing data including models and data prepared by local agencies, FEMA Map Change Information, and FEM BLE models
Field Reconnaisance											Site assessments for up to 5 days to confirm existing conditions and drainage conditon
Locate Drainage Outfalls											Identify potential drainage outfalls for approximately 40 crossings for up to two alignments in order to minimize impacts and need fo ROW
Overall Drainage Area Map (Major crossings)											Prepare watershed level drainage area maps for Wickson Creek and tributaries, Thompson's Creek and tributaries, Steep Hollow Branch, Brushy Creek, and Caster's Creek Tributaries which is approximately 15 larger crossings.
Sub-Drainage Area Maps (Minor crossings and ditches)											Prepare hydrologic runoff calculations and drainage area delineations for up to 25 minor crossings and linear drainage systems for th 18 mile corridor loop for interim and ultimate conditions for two phases.
Hydrologic Analysis (Bridges including FEMA crossings)											Prepare hydrologic analysis for approximately 15 major crossings using HEC-HMS for phase 1 and ultimate conditions with accurac checks using Regressional Equations to confirm Synthetic Hydrographs.
Hydrologic Analysis (Bridge Class Culverts including FEM/ crossings)											Prepare hydrologic analysis for up to approximately 15 major crossings using HEC-HMS for phase 1 and ultimate conditions wit accuracy checks using Regressional Equations to confirm Synthetic Hydrographs.
Hydrologic Analysis (Culvert crossings)											Prepare hydrologic analysis for up to approximately 15 major crossings using HEC-HMS for phase 1 and ultimate conditions wit accuracy checks using Regressional Equations to confirm Synthetic Hydrographs.
Hydrologic & Hydraulics Analysis along project (Exist, Interim and Final conditions)- 1D/2D											Review and updated available BLE hydraulic models with updated LiDAR / survey information. Prepared 2D sheetflow models along corridor near Brushy and Wickson Creeks to confirm 1D models and analyze impacts and help size parrallel ditch systems.
Exist Effective Hydraulics Analysis (HEC-RAS_FEMA crossings)											Update BLE models to create revised existing hydraulic models for all FEMA mapped structure crossings using HEC-RAS. There ar 18 existing crossings on FEMA Zone A floodplains will be evaluated with updated cross sections and revised runoff information within the hydraulic models.
Exist Hydraulics Analysis (Bridges)											Update BLE models to create revised existing hydraulic models for all FEMA mapped structure crossings using HEC-RAS. The futur bridge crossings on FEMA Zone A floodplains will be evaluated with updated cross sections and revised runoff information within the hydraulic models to create revised existing conditions
Exist Hydraulics Analysis (Bridge Class Culverts)											Update BLE models to create revised existing hydraulic models for all FEMA mapped structure crossings using HEC-RAS. The futur bridge class culvert crossings on FEMA Zone A floodplains will be evaluated with updated cross sections and revised runoff information within the hydraulic models to create revised existing conditions
Exist Hydraulics Analysis (Culverts)											Update BLE models to create revised existing hydraulic models for all FEMA mapped structure crossings. The future culver crossings on FEMA Zone A floodplains will be evaluated with updated cross sections and revised runoff information within the hydraulic models.
Prop .Hydraulics Analysis (Bridges including FEMA crossings-Using HEC-RAS)											Update existing conditions HEC-RAS models for bridges and bridge class culverts to be constructed within the phase 1 and ultimat ROW along the corridor. Approximately 15 bridges and/or bridge class culverts will be analyzed to ensure no adverse impact for design storm and 100-year storm event.
Prop. Hydraulics Analysis (Bridge Class Culverts including FEMA crossings- Using HEC-RAS)											Update existing conditions HEC-RAS models for bridges and bridge class culverts to be constructed within the phase 1 and ultimat ROW along the corridor. Approximately 15 bridges and/or bridge class culverts will be analyzed to ensure no adverse impact for design storm and 100-year storm event.
Prop. Hydraulics Analysis (Culvert crossings using HY-8)											Update existing conditions culvert models to be constructed within the phase 1 and ultimate ROW along the corridor. Approximately 25 non bridge class culverts will be analyzed to ensure no adverse impact for design storm and 100-year storm event using HY8.
Develop WSE Profiles											Existing and proposed water surface profiles will be developed for the major streams being analyzed with HEC-RAS. Approximatel 35 miles of stream will be analyzed in detail with HEC-RAS to develop existing and proposed profiles.
Identify and mitigate impacts to adjacent properties											Approximately 40 crossings will be analyzed for pre and post project conditions for the proposed roadway improvements to ensure n adverse impact to adjacent properties. Efforts including looking at possible improvements within the propsoed ROW to offset proposed bridge and culvert crossings including widenend ditches and grading.
Evaluate floodplain cut and fill											Locations of FEMA effective floodplain areas will be evaluated to determine limits of revised existing floodplain to quantify loss floodplain storage due to proposed project and locations of floodplain mitigation.
Identify ROW/Detention requirements											For storm crossings will include initial detention storage for mitigation of increased runoff, approximate sizing of up to 40 locations f detention including calculating pre and post runoff volumes and determining preliminary sizing of ponds for placement and ROW determination.
Identify Preliminary Detention locations											Based on detention volume calculations, locations and sizes will be determined for the 40 crossings and storm drain outfalls based o pre and post runoff volumes and flow rates.
Review Proposed Structure Conflicts with Waters of the US (WOTUS)											Utilizing available wetlands information from Wetlands Mapper and Environmental subconsultants, proposed crossings will b reviewed against WOTUS to minimize impacts to these areas to plan for future permitting
Draft Preliminary Drainage Report											Preparation of draft drainage report including narrative, tables, exhibits, appendices, model, and output for initial agency review ar coordination.
CAD Exhibits, Tables and Appendices											Preparation of hydraulic data sheets for crossings and proposed detention ponds for use within preliminary drainage report an schematic document
Final Drainage Report											Final drainage report incorporated review comments from review agencies and interal design QC teams
E. ROW Requirements	2	4	6		24					36	
F. Construction Sequence											
G. Design Exceptions											
H. Traffic Data and Projections											
I. Financial Plan and Project Management Plan											
J. Traffic and Operational Analysis											
K. Safety Analysis											
L. Bicycle and Pedestrian Accommodations		2		4	24					30	
Context Sensitive Solutions	8	24	24							56	
Stakeholder meetings	16	24								40	
Workshop #1	8	8	8							24	

Workshop #2	8	8	8							24	
Workshop #3	8	8	8							24	
~~M. Interstate Access Justification~~											
~~N. Toll Managed, Express, High Occupancy Vehicle, Managed Lanes~~											
~~Other Special Use Lanes, and Transit Elements~~											
O. Project Implementation Plan											
110.3. Conceptual Design Schematics	4	8	16	80	80	80				268	
110.4. Geometric Design Schematics	4	16	16	120	80	80				316	
A. 5. Proposed Bridge Structures											Quantities and estimates on two alignments, model setup on preferred alignmer
110.5. Cross-Sections (100' Interval, Electronic Delivery		8	8	30	60	20				126	
110.6. Retaining Walls	2	4	8	16	40	20				90	
110.7. Renderings and Traffic Simulation											
110.8. Preliminary Construction Sequence											
110.9. Preliminary Cost Estimate											
110.10. Engineering Summary Report	4	8	8	20						40	
110.11. Conduct/Support or Attendance at Value Engineering Stud	40	40	80	80						240	
110.12. Agency Coordination and Public Involvemer	24	24								48	
MAPO Exhibits											
110.13. Schematic Design Project Deliverables											
~~110.14. Data Collection and Field Reconnaissance~~											
~~110.15. Design Criteria~~											
~~110.16. Preliminary Cost Estimates~~											
~~110.17. Design Concept Conference~~											
~~110.18. Geotechnical Borings and Investigation~~											
HOURS SUB-TOTALS	254	358	446	614	588	504				2764	
CONTRACT RATE PER HOUR	$ 305.00	$ 250.01	$ 243.76	$ 206.26	$ 134.38	$ 156.25	$ 143.75	$ 112.50	$ 103.13		
TOTAL LABOR COSTS	$ 77,470.00	$ 89,503.58	$ 108,716.96	$ 126,643.64	$ 79,015.44	$ 78,750.00	$ -	$ -	$ -	$ 560,099.62	
% DISTRIBUTION OF STAFFING	9.19%	12.95%	16.14%	22.21%	21.27%	18.23%					
SUBTOTAL - FC 102 (110)										**$ 560,099.62**	

TASK DESCRIPTION	TECHNICAL ADVISOR (SENIOR)	SUPPORT MANAGER	SENIOR ENGINEER	PROJECT ENGINEER	ENGINEER-IN-.TRAINING	ENGINEERING TECHNICIAN	SENIOR CADD OPERATOR	CAD OPERATOR	ADMIN/ CLERICAL		COMMENTS
~~FUNCTION CODE 145 (145, 164) – MANAGING~~											
~~CONTRACTED/DONATED PE~~											
~~CONTRACT MANAGEMENT AND ADMINISTRATION~~											
145.1.Contract Management and Administration											
A. Project Management											
1. AmaTerra											
2. CD&P											
3. CivilCorp											
4. CP&Y											
5. OR Colan											
6. Terracon											
7. Westwood		60	16						40	116	
B. Project Administration		60	16						40	116	
C. Project Meetings		60	16						40	116	
HOURS SUB-TOTALS		180	48						120	348	
CONTRACT RATE PER HOUR	$ 305.00	$ 250.01	$ 243.76	$ 206.26	$ 134.38	$ 156.25	$ 143.75	$ 112.50	$ 103.13		
TOTAL LABOR COSTS	$ -	$ 45,001.80	$ 11,700.48	$ -	$ -	$ -	$ -	$ -	$ 12,375.60	$ 69,077.88	
% DISTRIBUTION OF STAFFING		51.72%	13.79%						34.48%		
SUBTOTAL - FC 145 (145, 164)										**$ 69,077.88**	

LABOR SUBTOTAL SUMMARY										
FUNCTION CODE 102 (110) – FEASIBILITY STUDIES	$ 77,470.00	$ 89,503.58	$ 108,716.96	$ 126,643.64	$ 79,015.44	$ 78,750.00	$ -	$ -	$ -	$ 560,099.62
FUNCTION CODE 145 (145, 164) – MANAGING CONTRACTED/DONATED PE	$ -	$ 45,001.80	$ 11,700.48	$ -	$ -	$ -	$ -	$ -	$ 12,375.60	$ 69,077.88
SUBTOTAL LABOR EXPENSES	$ 77,470.00	$134,505.38	$120,417.44	$ 126,643.64	$ 79,015.44	$ 78,750.00	$ -	$ -	$ 12,375.60	**$629,177.50**

FUNCTION CODE 102 (110) – FEASIBILITY STUDIES				TOTAL
OTHER DIRECT EXPENSES	UNIT	RATE	QUANTITY	COST
Lodging/Hotel - Taxes and Fees	day/person	$45.00	15	$675.00
Lodging/Hotel (Taxes/fees not included)	day/person	$98.00	15	$1,470.00
Meals ($13 Breakfast, $15 Lunch, $26 Dinner, $5 Incidental)	day/person	$59.00	40	$2,360.00
Mileage	mile	$0.655	5,550	$3,635.25
Tolls	day	$50.00	30	$1,500.00
Rental Car Fuel	gallon	$5.00	24	$120.00
Rental Car (Includes taxes and fees; Insurance costs will not be reimbursed)	day	$100.00	24	$2,400.00
Air Travel - In State - 2+ Wks Notice (Coach)	Rd Trip/person	$530.00	5	$2,650.00
Plots (Color on Bond)	per sq. ft.	$1.75	1,500	$2,625.00
SUBTOTAL OTHER DIRECT EXPENSES				$17,435.25

RFQ CIP 23-600-1 Bond Funded Engineering Design Services

Firm Name				
Max Points	**Evaluator #1**	Evaluator #2	Evaluator #3	Totals
	Project 1	Project 1	Project 1	Project 1
LJA				
BGE	80	75	93	248
Westwood	88	44	66	198
Binkley & Barfield				
Lamb-Star				
Freese & Nichols				
LAN				
Walker Partners				
LTRA				
Gessner				
Quiddity	96	100	84	280
R.G. Miller				
DEC				
Halff				

Committee Recommended Award: Quiddity

Approved by Commissioner's Court on this 6 day of FEBRUARY, 2023 by

_____ holding the position of COUNTY JUDGE