

## **TASK ORDER NO. 2**

This Task Order is issued pursuant to that Professional Services Agreement (Agreement) between the City of KYLE, Texas (Owner) and BGE, Inc. (Professional) effective May 17, 2022, and constitutes authorization by Owner for Professional to proceed with the following described construction and engineering design services.

### **Construction and Engineering Design Services**

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#### **A. PROJECT DESCRIPTION**

The scope of the Agreement is to provide professional construction and engineering design services (Services) for the Owner based on the scope of services listed below in Item B. Professional services may include performing preliminary engineering and planning; generating plans, specifications and estimates; researching, analyzing, and providing technical recommendations; providing construction phase services; and providing general consulting services in the areas identified herein.

#### **B. SCOPE OF SERVICES AND DELIVERABLES**

Pursuant to the Agreement, this Task Order authorizes Professional to perform the Services shown in Attachment A.

#### **C. BASIS OF COMPENSATION**

The total compensation for the Services shall be based on the hourly rates as defined in Compensation Table provided on page 3 of this document, and on the corresponding rates and hours in the Fee Estimate attached as Attachment B. Attachment B shall use the template provided by the Owner. Owner will make payments to Professional for performing the Services described on a monthly billing basis in accordance with monthly statements submitted by the Professional and approved by Owner. Final payment shall be due upon completion of the Services described.

#### **D. TIME FOR COMPLETION**

Professional will work expeditiously to complete the Services described herein by June 2024.

BGE, Inc. shall begin work as soon as authorized in this Task Order No. 2.

**APPROVED:**

**CITY OF KYLE, TEXAS**

By \_\_\_\_\_

Title: City Manager

Attest \_\_\_\_\_

Date \_\_\_\_\_

**ACCEPTED:**

**BGE, INC.**

By Brian D Rice

Title Director

Attest Greg Galt

Date 3/1/23

## COMPENSATION

Compensation for the services provided pursuant to the Professional Services Agreement between the City of Kyle and BGE, Inc. executed the 17th day of May 2022 will be paid on a lump sum basis and calculated based on the amounts reflected below.

### BGE

<b>Professional Staff</b>	<b>Hourly Bill Rate</b>
Engineering Tech	\$138
Senior Engineering Tech	\$195
Graduate Engineer	\$140
Design Engineer	\$175
Environmental Specialist	\$125
Senior Environmental Specialist	\$240
QC Manager	\$285
Project Engineer	\$215
Senior Engineer	\$250
Project Manager	\$255
Senior Project Manager	\$275
Principal/Director	\$310

### BGE Survey

<b>Professional Staff</b>	<b>Hourly Bill Rate</b>
Senior Tech	\$135
RPLS	\$195
Crew Rate	\$175

### Corsair Consulting

<b>Professional Staff</b>	<b>Hourly Bill Rate</b>
Admin Clerical	\$58.99
Engineering Tech	\$64.24
Engineer in Training	\$99.63
Design Engineer	\$140.93
Project Engineer	\$121.26
Senior Engineer	\$186.81
Support Engineer	\$203.20

### CobbFendley

<b>Professional Staff</b>	<b>Hourly Bill Rate</b>
Senior Tech I	\$135
Project Engineer I	\$163
Senior Project Manager	\$238

**ATTACHMENT A**  
**TASK ORDER NO. 2 (SCHEMATIC PHASE)**

**SERVICES TO BE PROVIDED BY THE ENGINEER**

BGE, Inc. (Engineer) will provide staff to support the City of KYLE (Owner) with general construction and engineering support services. The Owner also includes the City's General Engineering Consultant (GEC), K Friese & Associates, Inc., which the Owner has secured to act on its behalf as an Owner's Representative. The Engineer is required to coordinate with the GEC for completion of this work. Specific tasks may include, but are not limited to, the following:

The work to be performed by the Engineer shall consist of providing preliminary engineering services for the development of a final design schematic of Bunton Creek Road from east of Lehman Drive (proposed roundabout designed by others) to Porter Cove. These services may include, but are not limited to, preparing a design schematic based on the preferred alternative from the Task Order No. 1 Preliminary Engineering Report, environmental documents/studies in support of the schematic work, public involvement support, permit procurement, data collection analysis, mitigation and remediation, monitoring, drainage, conceptual traffic control, traffic studies, 3-D modeling, surveying and mapping, environmental clearance, utility coordination, storm drain design, bridge design, and cross sections.

The Engineer shall complete the services to be provided by the Engineer according to the milestone work schedule established in the task order. The Engineer shall submit a written progress report to the Owner monthly indicating the actual work accomplished during the month, scheduled work to be accomplished for the month, and the estimated work to be accomplished for the coming month. The progress report will 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 Owner project manager and environmental coordinator bi-weekly for progress tracking purposes unless prior agreement is made with Owner not to hold a scheduled meeting. 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. The work schedule must incorporate an allocation of time for stage reviews of the design schematic, survey, ROW Mapping, and the environmental documents by Owner personnel. The Engineer shall present the work schedule to the Owner for review and acceptance and provide assistance in interpreting the proposed work schedule.

**GENERAL REQUIREMENTS**

**1.1. Design Criteria.**

Design Criteria. The Engineer shall prepare all work in accordance with the latest version of applicable Owner's procedures, specifications, manuals, guidelines, standard drawings, and standard specifications or previously approved special provisions and special specifications, which include:

- Kyle Connected 2040 Transportation Master Plan (2015)
- Kyle Transportation Master Plan Update (2021)
- The Vybe Kyle: Trail-Oriented Development (2021)

- Kyle Drainage Master Plan (2018)
- City of Kyle Roundabout Ordinance #1162 (2021)
- City of Kyle standard detail sheets and general construction notes
- Texas Department of Transportation (TxDOT) PS&E Preparation Manual
- TxDOT Roadway Design Manual
- TxDOT Hydraulic Design Manual
- Texas Manual on Uniform Traffic Control Devices (TMUTCD)
- Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (latest Edition)
- Other Owner approved manuals
- TxDOT ROW Acquisition Manual
- TxDOT Utilities Manual
- Texas Transportation Administrative Code – Utility Accommodation
- City of Austin Utility Criteria Manual
- City of Kyle utility standards
- Texas Commission on Environmental Quality (TCEQ)

When design criteria are not identified in Owner's manuals or TxDOT criteria, or if conflicting guidance is found, the Engineer shall notify the Owner and refer to City of Austin policies and the American Association of State Highway and Transportation Officials (AASHTO) A Policy on Geometric Design of Highways and Street (latest Edition).

The Engineer shall use applicable standards and guidance to tailor the Design Summary Report (DSR) template (provided by the City) to their project. The Engineer shall obtain approval from the City on all information contained in the DSR prior to schematic development.

The Engineer shall identify, prepare exhibits and complete all necessary forms for each Design Exception and Waiver required within project limits prior to the 50% project completion submittal. The Engineer shall submit each exception and waiver to the Owner for coordination and processing of approvals. If subsequent changes require additional exceptions, the Engineer shall notify the Owner in writing as soon as possible after identification of each condition that may warrant a design exception or waiver.

The Engineer shall prepare a design time schedule and an estimated construction contract time schedule, using the latest version of MS Project, Primavera, or any Owner approved programs. 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 Engineer shall provide assistance to Owner's personnel in interpreting the schedules. The Engineer shall schedule milestone submittals at 50%, 90% and final project completion phases unless directed by Owner otherwise. The Engineer shall advise the Owner in writing if the Engineer is not able to meet the scheduled milestone review date.

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

Milestone submittals shall include, but shall not be limited to, the following to be considered complete:

1. 50%

- Design Summary Report (DSR)
  - Draft Schematic of preferred alternative using border file provided by the Owner for the Kyle 2022 Road Bond Program
  - Cross Sections on 11X17 sheets
  - Draft Drainage Report
  - Draft Traffic Study (or Studies) including roundabout
  - Draft Traffic Control Layout
  - Draft Geotechnical Report
  - Draft Environmental Documents
  - Construction Cost Estimate
  - ROW Cost Estimate
  - Utility Conflict Matrix
  - Utility Relocation Cost Estimate including compensable and non-compensable subtotals
2. 90%
- All 50% items with review comments addressed
  - Comment resolution matrix
  - Draft ROW Acquisition Documents
  - Final versions of 50% items
3. Final
- All 90% items with review comments addressed
  - Comment resolution matrix
  - Final signed and sealed versions of 90% items

Submittals shall be provided electronically to the Owner using the Procore platform.

**1.2. Right-of-Entry.** The Engineer shall notify the Owner and secure permission to enter private property to perform any surveying, environmental, engineering, or geotechnical activities needed off Owner right-of-way. In pursuance of the Owner's policy with the general public, the Engineer shall not commit acts which would result in damages to private property, and the Engineer shall make every effort to comply with the wishes and address the concerns of affected private property owners. The Engineer shall contact each property owner prior to any entry onto the owner's property and shall request concurrence from the Owner prior to each entry.

**1.3. Progress Reporting and Invoicing.** The Engineer shall invoice according to Function Code breakdowns shown in Exhibit "A" of the Professional Services Agreement and Attachment "B" - Fee Schedule, of the Task Order. The Engineer shall submit each invoice in a format acceptable to the Owner.

The Engineer shall complete the services according to the milestone work schedule established in the task order. With each invoice the Engineer shall submit a monthly written progress report to the Owner's Project Manager regardless of whether the Engineer is invoicing for that month. Requirements for progress reports are included in Sections 145.2.b. and 145.2.c. of this scope of services.

The Engineer is required to meet with the designated Owner project manager or environmental

coordinator bi-weekly for progress tracking purposes unless prior written agreement is made with Owner not to hold a meeting in any given month. The Engineer shall submit minutes of the meeting summarizing the events of the meeting within five (5) business days after each meeting.

The Engineer shall prepare a project work schedule, using the latest version of Microsoft Project or Primavera software or another scheduling program approved by the Owner in writing. Requirements for schedules are included in Section 145.2.b. of this scope of services.

Condition precedents to final payment by the Owner are the Owner's receipt of all electronic files and confirmation by the Owner's Project Manager that (1) the electronic files can be opened and are usable by the Owner utilizing the Owner-owned version of the intended software, and (2) all of the Owner's review comments have been addressed.

The Engineer shall prepare a letter of transmittal to accompany each document submittal to the Owner. At a minimum, the letter of transmittal must include the project name, project limits, Owner's contract number, and Owner's task order number.

**1.4. 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 task order. The Engineer shall comply with the requirements of the most recent edition of the TMUTCD. The Engineer shall submit a copy of each TCP to the Owner for approval prior commencing any work on any Owner roadway. The Engineer shall provide all signs, flags, and safety equipment needed to execute the approved TCP. The Engineer shall notify the Owner in writing five (5) days (in advance of executing each TCP requiring a lane closure and shall have received written concurrence from the Owner prior to beginning the lane closure. The Engineer's field crew shall always possess a copy of the approved TCP on the job site and shall make the TCP available to the Owner for inspection upon request. The Engineer shall assign charges for any required traffic control to the applicable function code. The Owner requires Public Notice of lane and Road closure 7 days in advance of closure through use of message boards, thus notice to Owner would need to be about 10 days prior of closure.

**1.5. State-Controlled Waters.** The placement of a new structure or modification of an existing structure(s) within State-Controlled waters will require confirmation that said structure(s) lie within the General Land Office (GLO) state owned land and whether the crossing is tidally influenced or not. Consequently, the Engineer shall request, as early in the design process as possible, that the State determine whether the proposed improvements are found within the tidal GLO, is a submerged GLO property or a non-tidal GLO property. The Owner may request assistance from the Engineer to prepare an exhibit demonstrating the location of the proposed improvements on the GLO State Owned Map for the project location.

**1.6. Coordination.** The Engineer shall coordinate issues and communications with Owner's internal departments through the Owner's Project Manager. The Owner will communicate the resolution of issues and provide the Engineer direction through the Owner's Project Manager.

Where applicable, the Engineer shall notify the Owner and coordinate with adjacent engineers and surveyors 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 Owner and each adjacent engineer to resolve disagreements. If the engineers are unable to resolve an issue with the Owner as mediator, the Owner 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 Owner. The Engineer shall notify the Owner in writing prior to beginning any work on any outside agency's exhibit.

**1.7. Level of Effort.** For each task order, 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 Owner, 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.

**1.8. Quality Assurance (QA) and Quality Control (QC).** The Engineer shall provide peer review at all levels. For each deliverable, the Engineer shall have some 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 red-line mark-ups are submitted. The Owner's Project Manager may require the Engineer to submit the Engineer's internal mark-up (red-lines) or comments developed as part the Engineer's quality control step. When internal mark-ups are requested by the Owner in advance, the Owner, at its sole discretion, may reject the actual deliverable should the Engineer fail to provide the 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 Owner. If, at any time, during the course of reviewing a survey submittal it becomes apparent to the Owner that the submittal contains errors, omissions, or inconsistencies, the Owner 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.

**1.11. Organization of Design Project Folder and Files (Electronic Project Files).** The Engineer shall organize the electronic project files in accordance with the Owner's File Management System (FMS) format. The Engineer shall maintain the project files in the Owner's file structure.

**1.12. Personal Protective Equipment (PPE).** 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. The PPE must meet all (1) current standards set by the Occupational Safety and Health Administration (OSHA) and (2) TxDOT requirements (e.g., safety glasses, Type 3 (TY 3) pants for night work). 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.

**1.13. Data Classification.** Unless otherwise clearly labeled or otherwise specifically excepted through a provision of this contract or its attachments, all data provided to or generated by the Engineer under this contract is considered public data for the purposes of applying the Owner's data security standards. The Engineer shall manage all data and work products according to the terms of the contract, including specifically Attachment I, Information Resources and Security Requirements.



## **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 collect, review, and evaluate data described below. The Engineer shall notify the Owner in writing whenever the Engineer finds disagreement with the information or documents provided.

The Engineer shall finalize an alignment and proposed roadway schematic layout that includes projected traffic volumes, when available, and existing and proposed typical sections. The Engineer shall furnish Microsoft Office and MicroStation, and OpenRoads Designer computer generated media containing the roadway schematic layout to the Owner. All supporting attachments and exhibits must accompany the schematic layout. All MicroStation, and OpenRoads Designer computer generated files containing the roadway design schematic must be fully compatible with the software used by the Owner without further modification or conversion. The Engineer shall be required to convert files to AutoCAD if requested by the Owner.

The Engineer shall produce, obtain, review, and evaluate available 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 Owner.

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 Owner with agency meetings during the development of the schematic design as requested by the Owner. .

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. Kyle Connected 2040 Transportation Master Plan (2015)
- B. Kyle Transportation Master Plan Update (2021)
- C. The Vybe Kyle: Trail-Oriented Development (2021)
- D. Kyle Drainage Master Plan (2018)
- E. City of Kyle Roundabout Ordinance #1162 (2021)
- F. City of Kyle standard detail sheets and general construction notes
- G. Texas Department of Transportation (TxDOT) PS&E Preparation Manual
- H. TxDOT Roadway Design Manual
- I. TxDOT Hydraulic Design Manual

- J. Texas Manual on Uniform Traffic Control Devices (TMUTCD)
- K. Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (latest Edition)
- L. Other Owner approved manuals and guides.

When design criteria are not identified in Owner manuals or TxDOT criteria, or when conflicts are found, the Engineer shall notify the Owner and refer to City of Austin policies and the American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Street, (latest Edition).

The design schematic horizontal layout must adhere to a design scale of 1 inch = 100 foot (or 1 inch = 200 foot, when directed by the Owner.) 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 Owner must be uploaded to the Owner's file management system in their native format, which must be fully compatible with the programs currently used by the Owner. 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 finalize the schematic for the preferred alternative from Task Order No. 1. 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 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 Owner, 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 schematic analysis must include the following:

2. ROW and easement determination
3. Horizontal alignment
4. Vertical alignment
5. Pavement cross slopes and pavement type
6. Soil exploration

7. Geotechnical testing
8. Highway-rail grade crossing studies, if applicable
9. Intersection design and analysis
10. Sight distance
11. Large guide signs and roadside signing
12. Level of service
13. Safety (i.e., crash data)
14. Locations of critical constraints
15. Drainage
16. Traffic control and construction phasing sequence

#### D. Schematic

The Engineer shall identify, analyze, and minimize potential adverse operational impacts, crash impacts, ROW impacts, environmental impacts, major utility conflicts, structural impediments, or exceptions to the Owner, State and FHWA design criteria. Schematics will be developed to the 50%, 90%, and 100% level of completion.

#### 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 operations
11. Construction, ROW, easement, and utility costs
12. Construction sequencing
13. Traffic control during construction
14. Roadside safety appurtenances
15. Environmental mitigation (e.g., noise walls, storm water best management practices (BMPs))
16. Roundabout Analysis
17. Accommodation of ultimate corridor configuration.
18. Accommodation of future cross street expansion as described in local thoroughfare plan (if applicable)
19. Avoidance of utility lines (if feasible)
20. 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 Owner 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 Owner.
3. The Engineer shall submit written monthly progress reports to the Owner.
4. The Engineer shall provide ongoing quality assurance and quality control to ensure completeness of product and compliance with the Owner 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 and Field Reconnaissance

The Engineer shall collect, review, and evaluate data described below. The Engineer shall notify the Owner in writing whenever the Engineer finds disagreement with the information or documents:

1. Data, if available, from the Owner, including “as-built plans”, existing schematics, right-of-way maps, Subsurface Utility Engineering (SUE) mapping, existing cross sections, existing planimetric mapping, environmental documents, existing channel and drainage easement data, existing traffic counts, accident data, Bridge Inspection records, identified endangered species, identified hazardous material sites, current unit bid price information, current special provisions, special specifications, and standard drawings.
2. Documents for existing and proposed development along proposed route from local municipalities and local ordinances related to project development.
3. Utility plans and documents from appropriate municipalities and agencies.
4. Flood plain information and studies from the Federal Emergency Management Agency (FEMA), the United States Army Corps of Engineers (USACE), local municipalities, and other governmental agencies.
5. Conduct field reconnaissance and collect data including a photographic record of notable existing features.

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 5 must be obtained from the Owner, if available. Items 6 through 13 must be obtained from other agencies as required.

1. Local major thoroughfare plan
2. Plat research for adjacent properties (if available)
3. Available corridor major investment studies
4. Design data from record drawings of existing and proposed facilities
5. Previously prepared drainage studies
6. Public and private utility information (It is necessary for the Engineer’s Surveyor to locate public and private utilities, even if the City has permits)
7. Existing and future design year traffic data

8. Historical crash data
9. Roadway inventory information, including the number of lanes, speed limits, pavement widths and rating, bridge widths and ratings, and ROW widths
10. Aerial photos, planimetric mapping, and DTM
11. Environmental data
12. Adopted land use maps and plans (if available)
13. Federal Emergency Management Agency (FEMA) flood boundary maps and flood insurance studies and models

#### H. Roadway Design Criteria

The Engineer shall develop the roadway design criteria based on the City of Kyle Transportation Master Plan Update (2021), 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 Roadway Design Manual will govern unless otherwise directed by the Owner.

The Engineer shall prepare and submit preliminary design criteria to the Owner 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 Owner) 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

The City of Kyle adopted the City of Austin DCM and ECM per the City of Kyle Code of Ordinances 41-134(a)(7). Distinctions from these codes are provided in the City of Kyle Drainage Design Criteria available on the City of Kyle website.

Engineer shall evaluate and refine design to make the proposed project compatible with anticipated drainage projects identified in the City of Kyle Drainage Master Plan.

Limits of drainage evaluation are from east of Lehman Drive (proposed roundabout designed by others) to Porter Cove. BGE's Preliminary Design Schematic proposed storm water outfalling into the tributary south of Lehman High School. This scope will not provide that evaluation and design, as Lehman Road design south of Bunton will be performed by others. As such, BGE will coordinate flows from Bunton Creek Road with the Lehman Road design team for them to include in their drainage design efforts.

The Engineer shall use data from as-built plans and FEMA maps to locate drainage outfalls and to determine existing storm sewer and culvert sizes, and design flows for use in the design of roadway geometry.

All hydrologic studies shall be based on Atlas 14 rainfall. City of Kyle Drainage Criteria Table 5 of Attachment 1– COK for Intensity Duration Frequency (IDF) curve coefficients shall be used to replace City of Austin DCM Table 2-2A (zone 1), IDF curve coefficients.

The Engineer shall conduct a preliminary drainage analysis to determine and evaluate the adequacy of the ROW needed to accommodate the proposed roadway and drainage system. The drainage analysis must (1) identify the impacts to abutting properties and the 100-year floodplain due to proposed highway improvements; (2) identify the water surface elevations for the 2, 10, 25, 50, and 100-year storm events; ; (3) identify, describe, and locate outfalls; (4) provide an overall drainage area map and sub-drainage area map, storm water detention facilities; and provide a drainage study report identifying the results of the study. The drainage analysis will be in accordance with one or more of the following: City of Kyle Drainage Criteria TxDOT Hydraulic Design Manual, local TxDOT district criteria, and any other specific guidance provided by the Owner.

The Drainage Report, which will be signed and sealed by a professional engineer licensed in Texas and will include applicable hydrologic and hydraulic models (e.g., HEC-HMS, Geopak Drainage, etc.). Within the Drainage Report, a hydrologic and hydraulic analysis, and models of the proposed storm sewer at the 50% design level will be provided. This includes the results of both localized and watershed "No Adverse Impact" (NAI) comparison analyses. It will also show existing data used to develop the parameters for the analysis such as field notes, photographs, and digital data. The Drainage Report will summarize the benefits and drawbacks of choosing each drainage alternative set forth in the preliminary engineering report through a prioritization scoring matrix and, with client feedback, will then recommend the preferred alternative. BGE will prioritize reducing flood risk and being able to incorporate the proposed design with future Bunton Creek Road improvements. An update to the Drainage Report will occur after each

milestone submittal after the 50% submittal. If requested by the Owner, the Engineer shall evaluate the adequacy of the existing drainage structures; otherwise, the Engineer shall not evaluate the adequacy of the existing drainage structures.

Water Quality: shall be provided in accordance with City of Kyle Code 41-134(a)(7). This water quality shall be designed in accordance with the latest version of the Texas Commission on Environmental Quality – Edwards Aquifer Technical Guidance Manual (TCEQ RG-348).

The Engineer shall design water quality Best Management Practices (BMP) in accordance with the latest editions of RG-348 – Complying with the Edwards Aquifer Rules Technical Guidance on Best Management Practices (July 2005); RG-348 Addendum Sheet (July 2012), or latest edition. As part of this work, the Engineer shall perform the following:

1. BMP analysis: The Engineer shall locate all BMPs previously permitted under the TCEQ Edwards Aquifer rules that might be impacted by the project. The Engineer shall determine the amount of total suspended solids (TSS) being treated under these permitted BMPs.
2. TSS load calculations: The Engineer shall develop TSS load calculations to determine the TSS amount required to be treated under the Edwards Aquifer rules. This calculation is based on the increase in the amount of impervious cover within the project area. The Engineer will determine 80% of the increase in TSS load resulting from the development on the project.
3. TSS removal determination: The Engineer shall utilize the TCEQ calculation spreadsheet to determine the total amount of TSS removal required for the project.
4. Design coordination and water quality report: After the 30% submittal, the Engineer shall meet with the Owner to discuss the TSS removal required for the project and delineate the design approach for the water quality BMPs. As geometry allows, the Engineer shall first maximize treatment via features in the roadway section (vegetative filter strips and grassy swales). For all other permanent BMP treatment options, the Engineer shall coordinate with the Owner for preferred treatment options and determine any necessary drainage easements required for the water quality BMP. The Engineer shall identify and document BMPs in the schematic water quality report. The Engineer shall submit a draft schematic water quality report with the 60% submittal, and a final schematic water quality report with the 100% submittal. The Engineer shall provide cost estimates for the BMPs and necessary drainage easements.

#### 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 Owner as requested and provide preliminary traffic control plan (TCP) layouts.

#### G. Design Exceptions

The Engineer will spend up to 40 hours identifying design exceptions and waivers. The Engineer shall determine the necessity for each design exception or waiver for approval. If the Owner agrees that design exception or waiver is necessary, the Engineer shall prepare the Owner'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.

#### H. Traffic Data and Projections

The Engineer shall obtain the base year traffic data from new counts and develop the opening-year, design-year (opening year +20), and pavement design year (opening year + 30) travel forecasts for the AM peak hour, PM peak hour, and 24-hour scenarios. The following traffic data locations shall be obtained on a Tuesday, Wednesday, or Thursday:

- 4-Hr Turning Movement Counts (7-9 AM and 4-6 PM)
  - Goforth Road at Bunton Creek Road
  - Lehman High School Driveway west of Lake Washington Drive
  - Lehman High School Driveway east of Lake Washington Drive
- 24-Hr Bidirectional Tube Count
  - Bunton Creek Road west of Brandi Circle
  - Bunton Lane east of Twin Estate Drive

The Owner shall provide information regarding proposed developments near the study area that have not yet been built. Traffic forecasts shall consider the traffic generated by these proposed developments.

The developed traffic projections must be utilized for design analysis. The Engineer shall develop traffic forecasts for the mainlanes and intersections listed in this section for no-build and build alternatives. Traffic projections for the AM peak hour, PM peak hour, and 24-hour shall be presented graphically.

#### I. Traffic and Operational Analysis

The Engineer shall develop and analyze traffic data (including percent trucks, peak hour factors, and traffic volumes), existing roadway features (number of lanes and intersection operation and geometry), traffic flow patterns, and traffic operations. The Engineer shall conduct the following operational and capacity analyses for the design year to make recommendations for improving traffic flow:

- Roadway Capacity Analysis
  - The Engineer shall conduct a roadway capacity analysis and make recommendations regarding the number of travel lanes within the project limits. The roadway capacity analysis will be performed based on the Highway Capacity Manual (HCM) methodology using Highway Capacity Software (HCS).



- Intersection Operational and Capacity Analysis
  - The Engineer shall analyze the operations and capacity of the following intersections using HCM methodology and Synchro 11 software:
    - Goforth Road at Bunton Creek Road
    - Lehman High School Driveway west of Lake Washington Drive
    - Lehman High School Driveway east of Lake Washington Drive

Roundabout analysis will be conducted using Sidra software for the Goforth Road at Bunton Creek Road intersection. Based on the operational and capacity analyses, recommendations will be made for improving traffic flow. Recommendations will consider intersection lane configuration (turn lanes), traffic control, and roundabouts. This analysis will include up to three (3) alternatives for each study intersection listed above.

The Engineer shall develop and submit to Owner a traffic and operational analysis report summarizing all analysis performed.

#### J. Safety Analysis

The Engineer shall review and analyze historical crash data for latest 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), Enhanced Interchange Safety Analysis Tools (ISATe), HSS, or other tools acceptable to the Owner. The Engineer shall develop and submit to the Owner a safety analysis report summarizing all analysis performed.

#### K. Bicycle and Pedestrian Accommodations

The Engineer shall comply with City of Kyle design criteria and planned improvements for bicycle and pedestrian accommodations, including the 2015 and 2021 Transportation Master Plans and The Vybe Kyle: Trail Oriented Development, and the United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations.

L. Relocate Overhead Utilities Underground

Schematic level design and cost estimates to relocate overhead utilities underground on Bunton Creek Road from Lehman Road to Porter Cove in Kyle, TX.

M. Roundabout Analysis

Analyze and further refine the proposed roundabout at Bunton Creek Rd and existing Goforth Rd intersection.

**110.4. Geometric Design Schematics**

The Engineer shall develop geometric design schematics based on the conceptual schematics developed in Task Order No. 1, 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 and cross streets at major intersections
2. Horizontal curve data shown in tabular format
3. Pavement edges, curb lines, sidewalks for all roadway improvements
4. Typical sections of existing and proposed roadways
5. Proposed retaining walls and sound walls
6. Proposed cross-drainage structures with outfall flow arrows and significant drainage features or waterways identified
7. Existing utilities and proposed utilities
8. Existing property lines and respective property ownership information
9. Existing ROW and easements
10. Proposed ROW and easements adequate for preparation of ROW maps
11. Waters of the US (WOTUS)
12. Control-of-access limits
13. Existing and projected traffic volumes
14. 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. Anticipated cross-drainage structures with approximate inlet and outfall elevations
4. Approximate locations of existing and proposed major utility crossings
5. The calculated profile grade for 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 50 feet intervals (unless otherwise directed by the Owner) 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 11inch x17inch sheets 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 Traffic Simulation**

N/A

### **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.

Traffic control shall be shown as a Conceptual Phase Layout in roll plot format including, plan view traffic control phasing, traffic control typical sections, and a conceptual, high-level, traffic control narrative.

### **110.12. Agency Coordination and Public Involvement**

- A. The Engineer shall assist the Owner in conducting meetings with property owners, stakeholders, and various agencies to discuss and review the schematic design. The Engineer shall document and respond to issues related to the schematic design. BGE will assist the owner in conducting and attending up to 8 meetings with property owners, stakeholders, and various agencies and attend up to 2 public outreach efforts. City will be responsible for sourcing locations for public outreach as well as advertising prior to any public outreach efforts.
- B. The Engineer shall prepare necessary exhibits and meeting materials to support stakeholder coordination and public outreach efforts. BGE will provide exhibits, meeting materials, and responses for up to 8 meetings with property owners, stakeholders, and various agencies and attend up to 2 public outreach efforts.

### **110.13. Schematic Design Project Deliverables**

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

- A. Draft and final copies of the traffic and operational analysis report
- B. 50%, 90%, and Final copies of the geometric schematic layouts on roll plots, or as requested by the Owner
- C. 50%, 90%, and Final copies of the geometric schematic layouts (1 inch = 100 feet)
- D. 50%, 90%, and Final copies of the design schematic profile rolls
- E. 50%, 90%, and Final copies of the design schematic cross-sections on 11-inch x 17-inch cut sheets, or as requested by the Owner
- F. Electronic 3D model copy of the preliminary cross-sections created using OpenRoads software
- G. Preliminary drainage study
- H. Electronic submittal of the hydrologic and hydraulic model digital files from the drainage study
- I. Copies of the preliminary construction sequence layouts in a roll plot format, or as requested by the Owner
- J. Copies of the preliminary construction sequence typical sections in roll plot format, or as requested by the Owner
- K. Electronic files shall be uploaded to the Owner's Procore file management system
- L. Traffic projections methodology memo
- M. Average daily corridor traffic projections report
- N. Line schematics with traffic data shown (shown on geometric schematic)
- O. Utility plan – electronic file in latest version of MicroStation fully compatible with OpenRoads civil design system
- P. Design exception and design waiver documents
- Q. Draft hydraulic report for review and comment
- R. Culvert hydraulic data sheets and preliminary culvert layouts
- S. Electronic copy of the entire drainage report in PDF format, and computer files of hydrologic and hydraulic modeling with appropriate labeling of location, and submittal date
- T. Geotechnical report
- U. Cost estimates for each milestone submittal
- V. KMZ or KML file of conceptual design schematic created from applicable DGN files for reviewing in Google Earth
- W. Final schematic 3D model created using OpenRoads software
- X. Draft and final copies of traffic analysis report

**110.14. Preliminary Cost Estimates.** The Engineer shall update preliminary cost estimates using the Average Low Bid Unit Price. The Engineer shall estimate the total project cost including preliminary engineering, final engineering, right-of-way (ROW) acquisition, environmental compliance and mitigation, construction, utility relocation, and construction engineering inspection (CEI).

**110.16. Geotechnical Borings and Investigations.**

N/A

## **FUNCTION CODE 120(120) – SOCIAL/ECON/ENVIRON STUDIES**

### **SOCIAL, ECONOMIC AND ENVIRONMENTAL STUDIES AND PUBLIC INVOLVEMENT**

#### **I. Environmental Permits, Issues and Commitments (EPIC)**

BGE will complete the EPIC sheet to include all environmental issues requiring monitoring commitments throughout the life of the project.

#### **II. Cultural Resources**

##### ***A. Research Design and Texas Antiquities Permit Application***

BGE will complete a background assessment to estimate the potential for cultural resources that may be impacted by the Project. In compliance with the National Historic Preservation Act and the ACT, BGE will use the assessment to a research design based on established THC/CTA field survey standards for the Project. BGE will include the research design in a TAP Application submitted to the THC. Coordination with the THC will be through the eTrac System.

##### ***B. Cultural Resources Investigation***

BGE will perform an intensive terrestrial archeological survey under a TAP issued by the THC and signed by a professional archeologist who meets Secretary of the Interior Qualifications for Archaeology. The investigation will be performed in compliance with the ACT and the guidelines set forth by the THC/CTA. The survey will be completed in accordance with the field survey standards and will include an estimated 20 shovel tests and, if required, backhoe trenching of up to 10 trenches.

##### ***C. Archeological Survey Report***

Based on the intensive archeological survey, BGE will prepare a survey report according to Secretary of the Interior Standards for Archeological Documentation, and the CTA's Guidelines for Cultural Resource Management for submittal to the THC for review and approval. Documents created during the investigation will be curated at a THC-approved facility, as required under a TAP.

##### ***Deliverables***

BGE will complete a Draft and Final Archeological Survey Report for submittal to the THC.

##### ***Assumptions***

This proposal is based upon the following assumptions:

- A. Field survey will be limited to areas of proposed new right-of-way (ROW), comprising no more than 2 kilometers (1.2 miles).
- B. Proposed new ROW will extend 30 meters (98.4 feet) or less from existing ROW.

- C. THC/CTA minimum survey standards of one shovel test for every 100 meters (328.1 feet) will be sufficient to investigate the Project and require 20 shovel tests or fewer total.
- D. If deep prospection is required, THC/CTA minimum requirements of one archaeological trench for every two shovel tests will be sufficient to investigate the entire Project and require 10 trenches or fewer total.
- E. No specialized geoarchaeological analyses would be required or requested.
- F. The entire proposed new ROW is accessible and landowner permission has been secured for field team entry;
- G. Excavation machinery (e.g., excavator, backhoe) will be able to access trench locations without construction matting, modifications to the project area, or special equipment.
- H. Archeological trenches will not be excavated more than 1.8 meters (6 feet) below ground surface.

### ***Exclusions***

This proposal is limited in scope and the fee and reflects the following exclusions:

- 1. More than 2 kilometers (1.2 miles) requiring cultural resources survey.
- 2. Backhoe Trenching exceeding 10 locations.
- 3. Shovel Testing exceeding 20 locations.
- 4. Delineation and reporting of an archeological site or cultural resource.
- 5. Survey methodology changes caused by field conditions or requested by the THC or other review agencies beyond this scope of services.

### **120.1. Environmental Documentation Standards**

- A. 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 Owner and (where applicable) other agencies with regulatory oversight. 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 state and federal laws, regulations, policies, guidance, agreements, and memoranda of understanding between the Owner and applicable state or federal agencies; and

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

- B. Deliverables must contain all data acquired during the environmental service and be written to be understood by the public. Electronic versions of each deliverable must be written in software that is fully compatible with the software currently used by the Owner and provided in the native format of the document for future use by the Owner. 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 upload the electronic files to the Owner's Procore file management system in both the document's native format and the PDF format.
- C. When the environmental service is to apply for a permit (e.g., USCG permit or USACE permit), the Engineer shall submit all required documentation to the applicable regulatory agency and copy the Owner on all correspondence.
- D. Submission of Deliverables
- E. All deliverables must comply with all applicable state and federal environmental laws, regulations and procedures. The Engineer shall provide photographs and graphics that clearly depict details relevant to an evaluation of the project area. Comparable quality electronic photograph presentations must be at least 1200 x 1600-pixel resolution. The Owner can request images/graphics be provided in another format or quality.

#### **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.

- 1. The Owner may determine what technical reports and documentation are necessary for any given project. The Engineer shall prepare all technical reports and documentation for the Owner with sufficient detail and clarity to support environmental determinations. 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.

**120.8. Environmental Permits Issues and Commitments (EPIC) Sheets.** The Engineer shall complete the latest version of the EPIC sheets per information provided by the State. These sheets must be signed, sealed and dated by the Engineer as indicated in signature block.

## **FUNCTION CODE 130(130) – RIGHT-OF-WAY (ROW) DATA**

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) the TxDOT Survey Manual. The Surveyor shall perform all work in an organized and professional manner. All surveys are subject to the approval of the Owner.

The Surveyor shall use TxDOT's 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 Owner. Unless otherwise directed by the Owner, 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 Owner, 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 Owner.

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 task order. If the order of accuracy is not specified in this attachment or in a task order, 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 Owner 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 Owner's computer system and with programs in use by the Owner 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 Owner.

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 Owner.

The Surveyor shall perform quality control/quality assurance on all procedures, field surveys, right-of-way surveys, data, and products prior to delivery to the Owner. The Owner 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 Owner that the submittal contains a substantial number of errors, omissions, and inconsistencies, the Owner 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 and is not a reason for additional compensation.

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 Owner.

### **130.1. RIGHT-OF-WAY SURVEYS (15.1.1)**

The Engineer will pursue right of entries for up to 20 parcels to complete survey. This will be completed in 2 phases. Phase 1 will include BGE sending certified letters to property owners and placing letters on appropriate properties. Phase 2 will include BGE's subconsultant, Dianna Tinkler, pursuing right of entries for up to 12 of the unreached/unapproved parcels.

Titles will be run for up to 20 parcels to determine ownership, easements, and restrictions within the proposed ROW. These will not be certified / insured by a title company but will provide parcel encumbrances to use in preliminary design. Full titles will be developed in subsequent design phases.

Right-of-Way Surveys includes the performance of surveys to establish land boundaries, preparation of parcel descriptions and parcel plats, and the preparation of right-of-way (ROW) maps.

The Surveyor shall prepare:

- A. boundary surveys and create Property Descriptions (metes and bounds plus plats);
- B. traditional ROW map as requested by Owner

The standards and deliverables are detailed in Chapter 4, Section 8 of the TxDOT ROW Preliminary Procedures for the Authority to Proceed Manual.

## 130.2. RIGHT OF WAY MAPPING – TRADITIONAL ROW MAP

If requested in a task order, the Surveyor shall conduct traditional ROW mapping.

Traditional ROW mapping includes ground surveying and preparation of parcel maps, legal descriptions also known as metes and bounds descriptions, and ROW maps.

## 130.4. ROW Hearing Services

### A. ROW Hearing Services

The Engineer shall prepare color exhibits for eminent domain hearing cases (assume 8 exhibits). The exhibits must depict the subject property boundaries and the proposed ROW acquisition shown on an aerial map background. The exhibits must also show the pavement edges, drainage or other structures, and driveways.

The Engineer shall prepare for the eminent domain hearings by reviewing the approved design schematic and associated reports, cross-sections, ROW maps, and pertinent plan sheets provided by others, including those showing roadway, bridge, grading, drainage, signals, signs, intelligent transportation systems (ITS), illumination, traffic control plan and other elements or data.

The Engineer shall attend by teleconference pre-hearings (assume 8 meetings) for eminent domain proceedings. The Engineer shall also attend, in person, pre-hearings (assume 8 meetings) for eminent domain proceedings near the project location.

Deliverables include all services and documents stated in this section.

### B. Expert Witness Services

The Engineer shall prepare for and provide expert testimony in eminent domain trial cases (assume 8 trials) at the county courthouse near the project location. Preparation includes the developing color exhibits, reviewing material, and providing depositions.

Assume that depositions, on average, last no longer than four hours and that trial cases, on average, last no longer than two days.

Deliverables include all services and documents stated in this section.

## 130.5. Utility Engineering Investigation

N/A

## 130.6. Utility Adjustment Coordination. (18.3.1)

The Engineer will continue to further determine existing utility locations, refine utility relocations and coordinate with existing utilities within the proposed ROW. This will include:

- Coordination with City of Kyle related to utilities through the corridor, including with the Utility Department (2 meetings)
- Prepare alternatives for relocation of GBRA / Kyle meter station/ meter station. Including: prepare up to 3 alternatives for relocation of GBRA / Kyle meter station/

meter station and develop concept level design of the preferred location of GBRA / Kyle take point/ meter station

- Coordination Meeting with GBRA (2 meetings)
- Coordination Meeting with County Line SUD (1 meeting)
- Refinement of Utility Layout and Utility Conflict Matrix
- Refinement and adjustment of the roadway alignment near the PEC substation may require further evaluation of the PEC and communications utilities' undergrounding alternatives and locations. This will include design efforts, communications with providers and development of revised cost estimates.

#### Relocate Overhead Utilities Underground

Engineer will further refine and adjust the schematic level design and cost estimates to relocate overhead utilities underground on Bunton Creek Road from Lehman Road to Porter Cove.

- Coordinate meeting with Pedernales Electric Cooperative (PEC) (up to 1), the Lower Colorado River Authority (up to 1), and telecommunication attachment companies (1 with each provider) to discuss cost estimates.
- Refine existing 3D schematic design (one alternative to the PER Draft Schematic) to remove overhead utilities to underground. The design will be completed in MicroStation and be combined with the overall roll plot.
- Prepare overhead to underground utility construction cost estimates based on the schematic design.
- Attend project team meetings (up to 6)

Exclusions for the relocation of overhead utilities underground include:

- Electric and Telecommunication wire design
- Permitting
- Reimbursement Percentage
- Easement Research
- Landowner Coordination

#### **130.7. Access Management.**

N/A

#### **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 Owner when specified in a task order.

- B. Notify the Owner of its schedule, in advance, for all field activities.
- C. Notify the Owner 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 Owner of the basis for concluding there are significant impacts and the basis for concluding that the impacts might require mitigation.
- D. Notify the Owner 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 Owner will reassess the appropriate level of documentation.

## **145.2. Project Management and Administration**

The Engineer, in association with the Owner's Project Manager shall be responsible for directing and coordinating all activities associated with the project to comply with Owner policies and procedures, and to deliver that work on time.

Project Management and Coordination. The Engineer shall coordinate all subconsultant activity to include quality of and consistency of plans and administration of the invoices and monthly progress reports. The Engineer shall coordinate with necessary local entities.

The Engineer shall:

- Prepare monthly written progress reports for each project.
  - Develop and maintain a detailed project schedule to track project conformance to Exhibit C, Work Schedule, for each task order. The schedule submittals shall be electronic format unless otherwise specified by the Owner.
  - Meet on a scheduled basis (assumed weekly) with the Owner to review project progress.
  - Prepare, distribute, and file both written and electronic correspondence.
  - Prepare and distribute meeting minutes.
  - Document phone calls and conference calls as required during the project to coordinate the work for various team members.
  - Provide QC/QA documentation for all submittals, including the subconsultants.
- a. **Perform Project Management tasks.** All firms participating in Kyle 2022 Road Bond Projects, either as a Prime Contractor or Subcontractor, must fully utilize Procore construction management software for full project implementation, as directed by the Owner. The Owner will provide Procore access to all firms. The Engineer shall:
- i. Meet on a scheduled basis with Owner to review Project progress. The Engineer will provide meeting summaries within five (5) working days of the meeting to all attendees.
  - ii. Conduct internal meetings with the consultant design team on a monthly basis or as needed for the duration of the Project.
  - iii. Provide Contract Administration
  - iv. Provide Project Management
  - v. Attend a kick-off meeting with the Owner.
  - vi. Attend and direct 50%, 90%, and 100% design review meetings.

- vii. Keep Project on track and on budget.
  - viii. Update Project design schedule on a monthly basis
  - ix. Prepare monthly invoice and monthly progress report including monthly updates to design schedule
- b. **Baseline Schedule.** Develop and submit for approval a Critical Path Method (CPM) baseline schedule within fourteen (14) calendar days of the Notice to Proceed. Schedule shall be in MS Project or Primavera P6. Modifications to the approved schedule will require approval by the Owner.
- i. Submit both pdf and native (.mpp or .xer) copies of the files.
  - ii. Include all planned work activities and sequences, major milestones, and show Contract completion
  - iii. Include activities that are the responsibility of the Owner, and estimate the duration for these activities. This time will not count against the Contract time, but is important to track as the critical path may run through them.
  - iv. Ensure that the activities are broken out to a level of detail that clearly explains the tasks associated with delivering the work product.
  - v. Provide activity durations in whole calendar days.
  - vi. Provide a legend for all abbreviations, run date, data date, project start date, and project completion date in the title block of each submittal.
  - vii. Begin the project schedule on the Notice to Proceed date.
  - viii. Show a predecessor and successor for each activity with the appropriate activity relationships.
  - ix. Ensure that all work sequences are logical and can be explained to the Owner if questions arise for clarification or understanding.
  - x. Do not use activities exceeding 28 calendar days, unless agreed upon with the Owner.
- c. **Progress Schedule**
- i. Project schedule updates shall be submitted as part of all invoice approval packages. Invoices submitted without schedule updates will be incomplete and will not be processed until schedule update is submitted.
  - ii. Submit both the pdf and electronic copy of the project schedule running through the end of each month, due no later than tenth (10<sup>th</sup>) calendar day of the following month, as it will become a record of the progress achieved on the project.
  - iii. Once established, the original duration and actual dates of all activities must remain unchanged.
  - iv. Revisions to the schedule may be made, but must be listed in a monthly update narrative in the Progress Report with the purpose of explaining the purpose of the revision and description of the impact on the project schedule's critical path and project completion date.
  - v. Monthly Progress Reports should include:
    - 1. Completed and planned work
    - 2. Budget status
    - 3. Schedule status

4. Actual start dates for activities started
5. Actual finish dates for activities completed
6. The percentage of work completed and remaining duration for each activity started, but not yet completed
7. Current delays and plans showing how they will be rectified
8. Potential delays and plans to rectify
9. Tracking schedule (pdf & mpp/xer)

**d. Plan Development and Review Process**

- i. Engineer may not be compensated for any services performed without a written Notice-to-Proceed.
- ii. Each deliverable must be submitted for review and approval by the Owner.
- iii. The review process will take place electronically using a Bluebeam session to consolidate comments.
- iv. Each submittal shall include a cover letter from the Engineer stating who from the design team performed a Quality Assurance/Quality Control ("QA/QC") check. The QA/QC certification letter must be co-signed by the QA/QC reviewer and the Project Manager. The QA/QC reviewer may not be one of the design team members.
- v. Each submittal shall include a revisions log from the Engineer (exported from Bluebeam) that tracks each comment received during previous phases of work. For each comment, the log shall provide the original comment, the status, how it has been implemented into the plans, and approval by the Owner.
- vi. Unless otherwise specified by Owner, allow two (2) weeks for the Owner to review and provide written comments and/or approval for each submittal. When comments are received by the Engineer, the Engineer shall schedule a Comment Resolution Meeting with Owner in order to review the comments and clarify understanding of them prior to making design changes. If the Owner requires a resubmittal, submit electronically in Procore for the Owner to review and provide written comments and/or approval.

**FUNCTION CODE 160(150) – ROADWAY DESIGN**

**150.2. DESIGN SURVEY (15.2.1)**

**SURVEY**

**1. General**

- A. Surveys will be in accordance with the "Texas State Board of Land Surveying".
- B. Survey field notes will be submitted if requested.
- C. The Surveyor will Contact the One-Call System in advance of performing field surveys to ensure data collection includes ties to location of marked utilities. This task does not always allow for timing of markings with the survey activities. Reasonable attempts to coordinate with utility owners will be made to achieve efficiency in data collection.
- D. The Surveyor shall conduct a QA/QC review of each task performed.

## **2. Topographic Surveys for Engineering Design and Hydraulic Analysis**

- A. Data for the horizontal control will be based on Texas State Plane, South Central Zone, NAD 83 (93).
- B. Vertical Data will be based upon NAVD 88 Datum.
- C. Data collection will consist of spot elevations for improvements, edge of roadway, driveways, visible or marked utilities, drainage features, centerline of roadway, and grade breaks. Individual roadway cross sections will be taken at intervals not to exceed 100 feet. Individual trees with diameter 12 inches and larger will be identified and located within the area of survey.
- D. Profiles of intersecting driveways within the project limits will extend a sufficient distance beyond the existing right of way to ensure adequate data is available to determine tie-ins with proposed vertical alignment changes.
- E. Field surveys will provide the locations of all small signs, mailboxes, and other visible surface features. Sign text, color, dimensions, and standard sign design will be provided in accordance with the TMUTCD.
- F. Except for areas surveyed with LiDAR applications, survey shots will be assigned a unique point number which provides a positive identification of the point. Each point will be assigned a feature number or feature name using the TxDOT's standard feature table. An ASCII points file and a hard copy print out will be provided. Each line of the output data shall contain in this order: the point number, northing, easting, elevation, and the descriptive feature code.
- G. Apparent Right-of-Way - Perform sufficient property records research to identify apparent existing right-of-way of Bunton Creek Road (including 100' of side streets) and incorporate into DTM.
- H. Field surveys will locate horizontal crossings of power lines, telephone/cable lines, and visible above ground utilities and utility markings.
- I. Location of existing utilities will be shown on the 2D files using field marked information designated by the utility companies and from surface evidence surveyed on the ground.
- J. Surveyed data will be provided in a Microstation .dgn (V8) compatible two dimensional base map format. The survey shot point attributes will appear on separate levels.
- K. A Digital Terrain Model (DTM) will be provided in a Microstation .dgn (V8) GEOPAK compatible three-dimensional format.

## **3. Boundary Survey / Right-of-Way Establishment**

- A. Title work will be completed by others on all properties adjacent to the subject right-of-way in areas that need the right-of-way defined within the project limits. Title work will include, at minimum, owner name, vesting deed information, record information of legal lot, and all easements that affect the tract. Additionally, all record documents referenced in the title work shall be provided to the Surveyor.
- B. From record documents provided to the Surveyor, compile deed plots and create working map of parcels along right-of-way.
- C. Conduct fieldwork and perform Boundary Surveying within project area, locating monumentation and other items showing lines of occupation.
- D. Perform boundary analysis to determine the location of subject right-of-way.

E. Finalized right-of-way linework will be incorporated into survey basemap.

**4. Right-of-Way Parcel Map Exhibits (Property Descriptions)**

- A. Title work will be completed by others on all properties adjacent to the subject right-of-way in areas that need the right-of-way defined within the project limits. Title work will include, at minimum, owner name, vesting deed information, record information of legal lot, and all easements that affect the tract. Additionally, all record documents referenced in the title work shall be provided to the Surveyor.
- B. For each parcel of land to be acquired, an Exhibit (Property Description) shall be prepared for each parcel or tract consisting of two (2) parts: (1) a metes and bounds description of the property and (2) a parcel plat. Each part of a Property Description shall be signed and sealed by a RPLS.
- C. Once finalized, boundary monumentation will be set to establish the new right-of-way

**150.4. DELIVERABLES FOR DESIGN SURVEYS**

The Surveyor shall prepare and submit the deliverables as specified in individual task orders for design surveys and construction surveys. The deliverables might be any combination of the following:

- A. Digital terrain models (DTM) and the triangular irregular network (TIN) files in a format acceptable by the Owner.
- B. Maps, plans, or sketches prepared by the Surveyor showing the results of field surveys.
- C. Computer printouts or other tabulations summarizing the results of field surveys.
- D. Digital files or media acceptable by the Owner containing field survey data (ASCII data files).
- E. Maps, plats, plans, sketches, or other documents acquired from utility companies, private corporations, or other public agencies, the contents of which are relevant to the survey.
- F. Field survey notes, as electronic copies.
- G. TxDOT Form 2462 for each primary and secondary control point. This form must be submitted in printed format on letter (i.e., A-size) and submitted electronically in PDF format.
- H. A digital copy of all computer printouts of horizontal and vertical conventional traverses, GPS analysis and results, and survey control data sheets.
- I. All OpenRoads files.
- J. Survey reports in a format requested by the Owner.

**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 benchmarks 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 benchmark, 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 RFP, CORS or major control densification.
9. Level 2 Survey means primary project control.
10. Level 3 Survey means secondary project control.
11. NGS – National Geodetic Survey
12. Type II Monument means a disk driven onto a length of 5/8-inch rebar with the hole filled flush with concrete.
13. Vertical Control Surveys means a survey performed for accurately determining the orthometric height (elevation) of permanent monuments to be used as benchmarks 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 Owner.
2. The Surveyor shall update existing control information and prepare new survey control data sheets, as directed by the Owner, 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 Owner, or based on acceptable methods conducted by the Surveyor, must meet the standards of accuracy required by the Owner.  
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 Owner or based on acceptable methods conducted by the Surveyor, must meet the standards of accuracy required by the Owner.  
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:
    - i. Bridges and other roadway structures: less than 0.02 feet.
    - ii. Utilities and improvements: less than 0.2 feet.
    - iii. Cross-sections and profiles: less than 0.2 feet.
    - iv. 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 Owner, 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:
  - i. An unscaled vicinity map showing the general location of the project in relation to nearby towns or other significant cultural features.
  - ii. 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.
  - iii. A table containing the primary control point values including the point number, northing, easting, elevation, stationing, and stationing offset values.
  - iv. 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, city, and highway name. 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.
  - v. 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 REQUIREMENTS

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

#### FUNCTION CODE 160(160) - ROADWAY DESIGN

##### ROADWAY DESIGN CONTROLS

##### **160.10. Pavement Design.**

The Engineer shall prepare pavement designs for this project in accordance with the latest edition of TxDOT's Pavement Manual. Proposed pavement designs include permanent pavement, interim condition transition pavement, and temporary detour pavement. The latest edition of TxDOT's Pavement Manual may be accessed at <http://www.txdot.gov/business/resources.html>.

The Engineer shall submit a signed and sealed pavement design report to the Owner. The pavement design report must be reviewed and approved by the Owner prior to its implementation. The

pavement design report must document assumptions and design considerations. The pavement design report must include the following:

- Cover sheet with roadway name, geographical limits, and signatures of persons involved in the preparation and approval
- Existing and proposed typical sections
- Soils map of the project area with a brief description of each type of soil located within the project area
- Design input values and output
- Conclusion consisting of recommended pavement design or designs based on the data, analyses, and procedures included in the report.
- Pavement design details specified for each location that includes structural layer materials, general specifications, and layer thicknesses
- Site conditions that might influence the design and performance of pavements
- May include if provided, relevant geotechnical data and drainage requirements including boring logs, laboratory soil test results, active or passive drainage system design, ground penetrating radar (GPR) data, falling weight deflectometer (FWD) data, dynamic cone penetrometer (DCP) data, pavement coring and report log (up to 15-foot depth), and soil classifications with Atterberg limits
- Results of the field explorations and testing of pavement sections
- Recommended pavement rehabilitation methods and designs for new pavements
- Design criteria used in determining pavement designs, including traffic loads, pavement material characterization, environmental conditions, and pavement design life
- Design summary from the program used to design (e.g., FPS 21, DARWin, TxCRCP - ME, MODULUS 6.1)
- 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
  - Traffic control plans required for subsurface geotechnical and pavement investigations
- Other considerations used in developing the pavement designs, including subgrade preparations and stabilization procedures

#### **160.11. Pedestrian and Bicycle Facilities.**

The Engineer shall coordinate with the Owner to incorporate pedestrian and bicycle facilities as required or shown on the project's schematic. All pedestrian and bicycle facilities must be designed in accordance with the latest Americans with Disabilities Act Accessibility Guidelines (ADAAG), the Texas Accessibility Standards (TAS), and the AASHTO Guide for the Development of Bicycle Facilities. The Engineer shall design the Owner's Vybe Trail if within the project limits. Certain Vybe details will be provided by the Owner.

#### **FUNCTION CODE 160(162) - ROADWAY DESIGN**

N/A

#### **FUNCTION CODE 160(163) - ROADWAY DESIGN**

## MISCELLANEOUS (ROADWAY)

The Engineer shall provide the following services:

### **163.1. Utility Engineering**

Utility Engineering includes the identification of utility conflicts, coordination, compliance with the UAR, and resolution of utility conflicts. The Engineer shall coordinate all activities with the Owner to facilitate the orderly progress and timely completion of the project design phase.

#### **A. Coordination of Engineering Activities**

##### **1. Utility Layout:**

The Utility Engineer must maintain a utility layout in the current approved version of OpenRoads Civil Design system used by the Owner. This layout must include all existing utilities which are to remain in place or be abandoned, and all adjusted utilities. This layout must be utilized to monitor the necessity of relocation and evaluate alternatives. The Utility Engineer must utilize the layout of existing utilities as prepared, if available, and make a determination of the following:

- a. Facilities in conflict with the proposed project that are to be relocated.
- b. Facilities to be removed or abandoned in place.
- c. Facilities that are going to be moved underground.
- d. Facilities to remain in service and in place because of roadway design adjustments and meeting the current UAR.
- e. If there are additional facilities which require relocation, the Engineer shall coordinate this information with the Owner immediately upon discovery.
- f. For facilities with unknown owner that require utility accommodation, the Utility Engineer must coordinate with the Owner for possible hot tap and removal. Engineer shall furnish all documents and exhibits to the Owner. When construction sequence and adjustments will be included in the PS&E package; the Utility Engineer must coordinate with the PS&E design engineer for the construction sequence in regard to the utility adjustments. The Utility Engineer must include this in the PS&E package.

#### **B. Public and Individual Meetings with Utility Companies**

As required, to facilitate utility conflict identification and resolution, the Engineer shall:

1. 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 construction.
2. Schedule all utility coordination meetings and ensure compatibility with the schedule of the Owner.
3. Set agenda for all coordination meetings as directed by the Owner.
4. Establish and promote the desired agenda and methodologies for utility construction within the project limits. Typical strategies include Avoid- Minimize-Accommodate (AMA). The agenda and methodologies may allow the construction of utilities as a part of the highway contract.

5. Orientation: Prepare and present, in collaboration with the Owner, instruction and orientation sessions as required. The instruction must introduce the SUE Plans, the proposed utility layout, processes, demonstrate the technology, and facilitate the preparation of work orders, billings, and contract related documentation as it pertains to utility adjustment work.
6. Initial Project Meeting following the Notice of Proposed Construction (NOPC): Attend an initial meeting and an on-site inspection (when appropriate) to ensure familiarity with existing conditions and project requirements and prepare a written report of the meeting.
7. Work Plan: Develop a work plan including a list of the tasks to be performed, a schedule, and an estimate. The work plan must satisfy the requirements of the project and must be approved by the Owner prior to commencing work.
8. Progress Meetings: Meet with the Owner and, if applicable, design consultants, periodically to coordinate the work effort and resolve problems. Prepare a written report of all progress meetings and provide the report to the Owner. During the progress meetings, the Utility Engineer must review:
  - a. Activities completed since the last meeting
  - b. Problems encountered.
  - c. Late activities.
  - d. Activities required by the next progress meeting.
  - e. Solutions for unresolved and/or anticipated problems.
  - f. Information or items required from other agencies/consultants.

C. Review of Utility's Proposed Adjustments

1. Evaluate alternatives: The Utility Engineer must evaluate alternatives in the adjustment of utilities balancing the needs of both the Owner and the Utility. The Utility Engineer must use the AMA strategy as part of evaluating the alternatives.
2. Review estimates and schedules: The Utility Engineer must review the utility adjustment estimates for reasonableness of cost and the timely scheduling of the adjustment.
3. The Utility Engineer must review plans for compliance with UAR, Buy America materials, and proposed location data.
4. The Utility Engineer must ensure that utility owners are receiving updates for project design development so that utility owners are reviewing the most current plans, quality and accuracy of utility adjustment data, as well as compliance of UAR, as it pertains to the plans. The responsibility for compliance, quality, and accuracy of utility adjustment plans will remain with the utility company.
5. The Utility Engineer must ensure compliance with the regulations of the most recent edition of the TMUTCD. The Utility Engineer must obtain approval from the Owner concerning the proposed method of handling traffic prior to allowing commencement of work.

- D. The Engineer shall not provide services under this contract that are for the sole benefit of a party or parties other than the Owner. The Engineer shall not invoice the Owner for any such services.

The Utility Engineer must:

1. Identify potential conflicts using the AMA process and the design.
  - a. Avoid – work with designers to avoid conflicts.
  - b. Minimize – Cost analyzed of safe available options to minimize cost and project delay.
2. Document all activities.
3. Track all ROW acquisitions to assist with scheduling accommodations.

E. Deliverables:

The Engineer shall submit the following deliverables to the Owner:

1. Identification of utility conflicts.
2. Composite DGN file showing all utilities with abandoned, removed, and added utilities.

### **163.3. Geotechnical Borings and Investigations**

The Engineer shall determine the location of proposed soil borings for retaining walls, slope stability and pavement design in accordance with the latest edition of TxDOT's Geotechnical Manual. The Owner 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 Owner review comments they shall perform soil borings (field work), soil testing and prepare the boring logs in accordance with the latest edition of the State's Geotechnical Manual and State District's procedures and design guidelines.

- A. The Engineer shall perform all geotechnical work in accordance with the latest version of TxDOT's Geotechnical Manual. All testing shall be performed in accordance with the latest version of TxDOT's Manual of Test Procedures. American Society for Testing Materials (ASTM) test procedures can be used only in the absence of Owner and TxDOT procedures. All soil classification shall be done in accordance with the Unified Soil Classification System.
- B. If applicable, the Engineer shall perform any retaining wall analyses to include 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.
- C. If applicable, the Engineer shall perform soil borings, rock coring, coring for pavement removal items, piezometric readings, testing and analysis to include slope stability analysis, settlement analysis, and foundation design recommendations for retaining walls,. Engineers shall call 811 and the City of Kyle Public Works Department (512-262-3024) for utility information prior to digging. Traffic control is required for any work that is performed for geotechnical borings and investigations within the right-of-way limits.
- D. The Engineer shall provide a signed, sealed and dated geotechnical report which contains, but is not limited to, soil boring locations, boring logs, laboratory test results, generalized subsurface conditions, ground water conditions, piezometer data
- E. If applicable, the Engineer shall perform scour analysis to include Grain Size distribution curves with D50 value.

- F. 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 Owner and TxDOT standards.
- G. Foundation Studies: The Engineer shall coordinate with the Owner to determine the location of soil borings to be drilled along the retaining wall alignments. The soil borings shall extend a minimum of 30 feet below the footing elevation or deeper as soil conditions warrant. Spacing of soil borings shall not exceed 200 feet. The Engineer shall provide a boring layout for the Owner's review and comment.
- H. The Engineer shall incorporate soil boring data sheets prepared, signed, sealed, and dated by the Geotechnical Engineer. The soil boring sheets shall be in accordance with WINCORE software as can be found on the Texas Department of Transportation (TxDOT) website.

F. Deliverables

- 1. Geotechnical/Pavement Design Report
- 2. DGN files containing drilling log data from Geotechnical analysis

**163.13. Testimony for Right of Way Hearings.**

N/A – Refer to Section 130.4A & 130.4B.



ATTACHMENT B  
FEE SCHEDULE  
Method of Payment:  
LUMP SUM AND UNIT COSTS

PROJECT NAME: Bunton Creek Rd  
PROJECT LIMITS: Lehman Rd to Porter Cv

TASK DESCRIPTION	BGE, Inc.	BGE Survey	Dianna Tinkler	Corsair	CobbFendley	TOTAL COSTS BY FC
FEASIBILITY STUDIES (FC 102 (110))	\$ 366,802.00		\$ -		\$ 27,154.00	\$ 393,956.00
SOCIAL, ECONOMIC AND ENVIRONMENTAL STUDIES AND PUBLIC INVOLVEMENT (FC 120 (120))	\$ 33,527.00		\$ -		\$ -	\$ 33,527.00
RIGHT-OF-WAY DATA (FC 130 (130))	\$ 118,975.00		\$ -		\$ -	\$ 118,975.00
MANAGING CONTRACTED/DONATED PE (FC 145 (145,164))	\$ 68,340.00		\$ -		\$ -	\$ 68,340.00
ROADWAY DESIGN SURVEY (FC 160 (150))	\$ -	\$ 195,783.00	\$ -	\$ -	\$ -	\$ 195,783.00
MISCELLANEOUS (ROADWAY) (FC 160 (163))	\$ -		\$ -	\$ 43,903.33	\$ -	\$ 43,903.33
						\$ -
SUBTOTAL LABOR EXPENSES	\$ 587,644.00	\$ 195,783.00	\$ -	\$ 43,903.33	\$ 27,154.00	\$ 854,484.33
DIRECT EXPENSES (FC 164)	\$ 7,137.00		\$ -	\$ 10,069.50	\$ 237.50	\$ 17,444.00
UNIT COST EXPENSES (FC 164)	\$ 2,000.00		\$ 26,800.00	\$ 39,689.00	\$ -	\$ 68,489.00
TOTAL	\$ 596,781.00	\$ 195,783.00	\$ 28,140.00	\$ 98,344.92	\$ 28,761.08	\$ 947,810.00
	63.0%	20.7%	3.0%	10.4%	3.0%	100%

ATTACHMENT B  
FEE SCHEDULE  
Method of Payment:  
LUMP SUM AND UNIT COSTS

# BGE, Inc.

**PROJECT NAME: Bunton Creek Rd**  
**PROJECT LIMITS: Lehman Rd to Porter Cv**

TASKS	SHTS	Principal/ Director	Senior Project Manager	Project Manager	Senior Engineer	Project Engineer	QC Manager	Senior Env Specialist	Env Specialist	Design Engineer	Graduate Engineer	Senior Engineering Tech	Engineering Tech	TOTAL HOURS	TOTAL COST
		\$310.00	\$275.00	\$255.00	\$250.00	\$215.00	\$285.00	\$240.00	\$125.00	\$175.00	\$140.00	\$195.00	\$138.00		
														\$0.00/Hr.	
FC 102 (110) Feasibility Studies														0	
110.2 Schematic Design - General Tasks															
A. ROW Property Base Maps					2	4				4		8		18	\$ 3,620.00
B. Typical Sections			2		2	8				18	18	4		52	\$ 9,220.00
C. Environmental Constraints (see FC 120)															
D. Drainage & Detention					5		8			24	120	16	32	205	\$ 32,066.00
Water Quality					8	16				42		42		108	\$ 20,980.00
E. ROW Requirements (90, 100%)			4		4	12				8		12		40	\$ 8,420.00
F. Construction Sequence (see FC 110.8)															
G. Design Exceptions			2		2	12				24				40	\$ 7,830.00
H. Traffic Data and Projections						20					12			32	\$ 5,980.00
I. Traffic and Operational Analysis															
Roadway Capacity Analysis						8								8	\$ 1,720.00
Intersection Operational and Capacity Analysis			1		2	36								39	\$ 8,515.00
Traffic Report			1		2	36					8			47	\$ 9,635.00
Traffic Site Visits, Photos for Report- AM/PM Peak Hour Observations (scope section 110.1.F.5)						12					12			24	\$ 4,260.00
J. Safety Analysis						28					24			52	\$ 9,380.00
K. Bicycle and Pedestrian Accommodations			4		4	8				16	16	4		52	\$ 9,640.00
L. Relocate Overhead Utilities Underground (See FC 130.6 and Cobb Fendley)															
M. Roundabout Analysis					4	16				68	92			180	\$ 29,220.00
110.4 Geometric Design Schematic															
Geometric Design Updates (based on survey, updated utilities, title info., etc.) (50,90, 100%)			18		24	24				120	80	40		306	\$ 56,110.00
110.5 Cross Sections															
Update 3D model, cross sections, earthwork volumes (50, 90, 100%)			8		12	24				60	48	32		184	\$ 33,820.00
110.6 Retaining Walls															
Refine limits and location of proposed retaining walls (50, 90, 100%)			2		2	6				18	12	8		48	\$ 8,730.00
110.8 Preliminary Construction Sequence															
Conceptual Phase Layouts (50, 90, 100%)			6		14	8				18		4		50	\$ 111.00
Construction Sequence Typical Sections (90, 100%)			10		18	22				54		10		114	\$ 23,380.00
110.12 Agency Coordination & Public Involvement															
A. Conduct/Attend up to 8 Property Owner, Stakeholder, and Agency Meetings & 2 Public Outreach Efforts			42			48				48	48			186	\$ 36,990.00
B. Prepare Exhibits for up to 8 Property Owner, Stakeholder, and Agency Meetings & 2 Public Outreach Efforts			42			48				48	48			186	\$ 36,990.00
110.14 Preliminary Construction Estimates															
Updated construction cost estimate (50, 90 and 100%)			3		6	8				14	18	6		55	\$ 10,185.00
SUBTOTAL	0	0	145	0	111	404	8	0	0	584	556	186	32	2,026	\$ 366,802.00

ATTACHMENT B  
FEE SCHEDULE  
Method of Payment:  
LUMP SUM AND UNIT COSTS

BGE, Inc.

PROJECT NAME: Bunton Creek Rd  
PROJECT LIMITS: Lehman Rd to Porter Cv

TASKS	SHTS	Principal/ Director	Senior Project Manager	Project Manager	Senior Engineer	Project Engineer	QC Manager	Senior Env Specialist	Env Specialist	Design Engineer	Graduate Engineer	Senior Engineering Tech	Engineering Tech	TOTAL HOURS	TOTAL COST
		\$310.00	\$275.00	\$255.00	\$250.00	\$215.00	\$285.00	\$240.00	\$125.00	\$175.00	\$140.00	\$195.00	\$138.00		
														\$0.00/Hr.	
FC 120 (120) Social, Economic and Environmental Studies and Public Involvement														0	
Task 1- Environmental Permits, Issues and Commitments									32					32	\$ 4,000.00
Task 2 A.- Research Design and Texas Antiquities Permit Application							4		12				13	29	\$ 4,434.00
Task 2 B.- Cultural Resources Investigation							3		80				26	109	\$ 14,443.00
Task 2 C.- Archeological Survey Report							4		54				20	78	\$ 10,650.00
														0	
SUBTOTAL	0	0	0	0	0	0	11	0	178	0	0	0	59	248	\$ 33,527.00
FC 130 (130) Right-of-Way Data														0	
130.1 Right of Entry Outreach 1 by BGE (20 parcels assumed) (See also, Subconsultant Tinkler Fee)						2					30			32	\$ 4,630.00
Title abstract information (See Subconsultant Tinkler Fee)															
130.4 ROW Hearing Services															
A. ROW Hearing Services (8 parcels)			80			40				48				168	\$ 39,000.00
B. Expert Witness Services (8 parcels)			80											80	\$ 22,000.00
130.6 Utility Adjustment Coordination														0	
Coordination with City of Kyle related to utilities through the corridor, including with the Utility Department (2 meetings)			2		8	12	0	0	0	12	0	0		34	\$ 7,230.00
Coordination with GBRA (2 meetings)			4		4	8	0	0	0	8	0	0		24	\$ 5,220.00
Prepare alternatives for relocation of GBRA / Kyle meter station/ meter station			1		6	20	0	0	0	0	0	24		51	\$ 10,755.00
Develop schematic level location of GBRA / Kyle take point/ meter station			2		4	12	0	0	0	0	0	12		30	\$ 6,470.00
Coordination Meeting with County Line SUD (1 meeting)					4	4	0	0	0	0	0	0		8	\$ 1,860.00
Refinement of Utility Layout and Utility Conflict Matrix			2		8	16		0	0	40	0	24		90	\$ 17,670.00
Additional Undergrounding Evaluation/Alternatives				4		8		0	0	8	0			20	\$ 4,140.00
														0	
SUBTOTAL	0	0	171	4	34	122	0			116	30	60	0	537	\$ 118,975.00
FC 145 (145,164) Managing Contracted/Donated PE															
145.2 Project Management and Administration														0	\$ -
Monthly progress reports (included with invoice below)														0	\$ -
Develop and maintain project schedule			4			12								16	\$ 3,680.00
GEC Weekly Meetings (Assumes 42 - 1/2 hr meetings) and documentation			42			42								84	\$ 20,580.00
Internal meetings, subconsultant coordination			8		24	16				16				64	\$ 14,440.00
Invoicing, Progress Reports, Project schedule			4		8	4								16	\$ 3,960.00
Perform QC / QA and provide documentation (reports, 50, 90 and 100% schematic)					48		48							96	\$ 25,680.00
SUBTOTAL	0	0	58	0	80	74	48			16	0	0	0	276	\$ 68,340.00
FC 160 (150) Roadway Design Survey														0	
150.2 Design Surveys (Provided by BGE and shown in separate tab "BGE Survey")														0	\$ -
														0	
SUBTOTAL	0	0	0	0	0	0	0			0	0	0	0	0	\$ -
LABOR TOTALS	0	0	374	4	225	600	67	0	178	716	586	246	91	3,087	\$ 587,644.00

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ATTACHMENT B  
FEE SCHEDULE  
Method of Payment:  
LUMP SUM AND UNIT COSTS

BGE, Inc.

PROJECT NAME: Bunton Creek Rd  
PROJECT LIMITS: Lehman Rd to Porter Cv

TASKS	SHTS	Principal/ Director	Senior Project Manager	Project Manager	Senior Engineer	Project Engineer	QC Manager	Senior Env Specialist	Env Specialist	Design Engineer	Graduate Engineer	Senior Engineering Tech	Engineering Tech	TOTAL HOURS	TOTAL COST
		\$310.00	\$275.00	\$255.00	\$250.00	\$215.00	\$285.00	\$240.00	\$125.00	\$175.00	\$140.00	\$195.00	\$138.00		

OTHER DIRECT EXPENSES		# OF UNITS	COST/UNIT	UNIT	UNIT			
	MILEAGE	150	\$0.58	mile	mile			\$ 87.00
	PHOTOCOPIES B/W (11" X 17")	100	\$0.20	each	each			\$ 20.00
	PHOTOCOPIES B/W (8 1/2" X 11")	100	\$0.10	each	each			\$ 10.00
	PHOTOCOPIES COLOR (11" X 17")	100	\$1.25	each	each			\$ 125.00
	PHOTOCOPIES COLOR (8 1/2" X 11")	100	\$0.75	each	each			\$ 75.00
	LARGE FORMAT PLOTTING		\$1.25	per sq. ft.	per sq. ft.			\$ -
	Mileage (per mile)	1,800	\$0.63	mile				\$ 1,134.00
	Meals/Per Diem	4	\$59.00					\$ 236.00
	Hotel	4	\$130.00					\$ 520.00
	GPS	3	\$50.00					\$ 150.00
	Backhoe - operator and equipment (if needed)	2	\$2,200.00					\$ 4,400.00
	Miscellaneous (field supplies, cell phones, etc.)	3	\$15.00					\$ 45.00
	Printing (B&W)	200	\$0.10	each				\$ 20.00
	Printing (Color)	200	\$0.60	each				\$ 120.00
	Curation (Documents)	1	\$195.00	each				\$ 195.00
								\$ -
SUBTOTAL DIRECT EXPENSES (FC 164)								\$ 7,137.00

UNIT COST EXPENSES		# OF UNITS	COST/UNIT	UNIT	UNIT			
	Traffic Count Data	1	2000					\$ 2,000.00
								\$ -
SUBTOTAL UNIT COST EXPENSES (FC 164)								\$ 2,000.00

SUMMARY

TOTAL COSTS FOR PRIME PROVIDER	\$ 587,644.00
NON-SALARY (OTHER DIRECT EXPENSES) FOR PRIME PROVIDER	\$ 7,137.00
NON-SALARY (UNIT COST EXPENSES) FOR PRIME PROVIDER	\$ 2,000.00
SUBCONTRACTS (includes labor costs, direct expenses, and unit costs)	\$0.00 \$ 351,029.00
GRAND TOTAL	\$ 947,810.00

Bunton Creek Road Design Survey, Kyle, TX 08/21/2022						
TASKS	Crew Rate	RPLS	Senior Tech	Mobile Mapping Sub	Research Sub	Total
East of Lehman	\$175	\$195	\$135	\$18,000		
Design Survey (Apparent ROW-Apparent ROW)						
Prelim Research, Deed Plotting, Project Setup		2	40			\$5,790
Establish Horizontal and vertical control	40	2	4			\$7,930
One-Call locates, coordination with Mobile Mapping		2	6			\$1,200
Obtain Design Survey data	128		4			\$22,940
Mobile Mapping Effort				1		\$18,000
Prepare DGN and DTM		4	63			\$9,285
QA/QC and Final Deliverables		4	6			\$1,590
			Design Survey Sub Total:			\$66,700
Right-of-way/Parcel Descriptions (for 20 parcels)						
Deed Plotting, Working Deed ROW Map		8	40			\$6,960
Obtain Boundary Monumentation data	220					\$38,500
Boundary Anaylisis		40	60			\$15,900
Prepare Parcel maps		15	100			\$16,425
Prepare Parcel Descriptions		60	30			\$15,750
Address Comments		20	30			\$7,950
QA/QC		15	10			\$4,275
Set Monumentation once finalized	80					\$14,000
			Right-of-way/Parcels Total:			\$119,760
			Per Parcel Description:			\$5,988
Note: Does not included Right of Entry Coordination, or Easement Descriptions.						

Total Hours	468	172	393	1	0	
Total + 5% Adjustment	\$85,995	\$35,217	\$55,708	\$18,900		\$195,783

PRIME PROVIDER:

ATTACHMENT B  
FEE SCHEDULE  
Method of Payment:  
LUMP SUM AND UNIT COSTS

Contract No. \_\_\_\_\_  
Work Authorization No. \_

Dianna Tinkler

PROJECT NAME: Bunton Creek Rd  
PROJECT LIMITS: Lehman Rd to Porter Cv

TASKS	SHTS	Project Manager	Project Engineer II	Senior Tech I	Category	Category	Category	Category	Category	Category	Category	Category	Category	TOTAL HOURS	TOTAL COST
		Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)		
														\$0.00/Hr.	
LABOR TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$ -

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OTHER DIRECT EXPENSES		# OF UNITS	COST/UNIT	UNIT	
	MILEAGE		0.58	mile	\$ -
	RENTAL CAR (Includes taxes and fees; Insurance costs will notbe reimbursed)		\$65.000	day	\$ -
	RENTAL CAR FUEL		\$100.00	day	\$ -
	Air Travel - In State - Short Notice (Coach)		\$420.00	Rd/Trip/perso	\$ -
	Lodging/Hotel (Taxes/fees not included)		\$96.000	day/person	\$ -
	Lodging/Hotel (Taxes/fees)		\$30.000	day/person	\$ -
	Meals (Excluding alcohol & tips) (Overnight stay required)		\$50.000	day/person	\$ -
	OVERNIGHT MAIL - OVERSIZED BOX		\$40.000	each	\$ -
	PHOTOCOPIES B/W (11" X 17")		\$0.200	each	\$ -
	PHOTOCOPIES B/W (8 1/2" X 11")		\$0.100	each	\$ -
	PHOTOCOPIES COLOR (11" X 17")		\$1.25	each	\$ -
	PHOTOCOPIES COLOR (8 1/2" X 11")		\$0.75	each	\$ -
	PLOTS (COLOR ON BOND)		\$1.25	per sq. ft.	\$ -
					\$ -
					\$ -
					\$ -
					\$ -
					\$ -
SUBTOTAL DIRECT EXPENSES (FC 164)					\$ -

UNIT COST EXPENSES		# OF UNITS	COST/UNIT	UNIT	
	Run Titles	20	\$500.000	Each	\$ 10,000.00
	Right of Entry	12	\$1,400.00	Each	\$ 16,800.00
					\$ -
SUBTOTAL UNIT COST EXPENSES (FC 164)					\$ 26,800.00

SUMMARY

TOTAL COSTS FOR SUBCONSULTANT 1	\$ -
NON-SALARY (OTHER DIRECT EXPENSES) FOR SUBCONSULTANT 1	\$ -
NON-SALARY (UNIT COST EXPENSES) FOR SUBCONSULTANT 1	\$ 26,800.00
GRAND TOTAL + 5% Adjustment	\$0.00 \$ 28,140.00

PRIME PROVIDER:

ATTACHMENT B  
FEE SCHEDULE  
Method of Payment:  
LUMP SUM AND UNIT COSTS

Contract No. \_\_\_\_\_  
Work Authorization No. \_

CORSAIR CONSULTING LLC

PROJECT NAME: Bunton Creek Rd  
PROJECT LIMITS: Lehman Rd to Porter Cv

TASKS	SHTS	SUPPORT ENGINEER	SENIOR ENGINEER	PROJECT ENGINEER	DESIGN ENGINEER	ENGINEER IN TRAINING	ENGINEERIN G TECH	ADMIN CLERICAL	TOTAL HOURS	TOTAL COST
		\$203.20	\$186.81	\$121.26	\$140.93	\$99.63	\$64.24	\$58.99		
									\$0.00/Hr.	
FC 160 (163) Miscellaneous (Roadway)									0	
									0	
Coordinate Soil Bore Locations/Utility Call-ins				2		8	4		14	\$ 1,296.52
Field Personnel During Drilling					4	20			24	\$ 2,556.32
Sample Classification, Laboratory Coordination and Boring Log Generation			2	4		42			48	\$ 5,043.12
Preliminary Geotechnocal Report with Pavement and Retaining Wall Recommendations			15	25	45	90			175	\$ 21,142.20
Final Geotechnocal Report with Pavement and Retaining Wall Reccomendations			5	15	25	45			90	\$ 10,759.55
Prepare Boring Log Sheets, Stamp and Seal			2			4			6	\$ 772.14
Invoicing/Admin		8						12	20	\$ 2,333.48
									0	\$ -
									0	\$ -
									0	\$ -
									0	
SUBTOTAL	0	8	24	46	74	209	4	12	377	\$ 43,903.33
LABOR TOTALS	0	8	24	46	74	209	4	12	377	\$ 43,903.33

		2.1%	6.4%	12.2%	19.6%	55.4%	1.1%	3.2%
OTHER DIRECT EXPENSES		# OF UNITS	COST/UNIT	UNIT				
	LODGING/HOTEL (TAXES/FEEES NOT INCLUDED)	2	\$96.000	day/person				\$ 192.00
	LODGING/HOTEL - TAXES AND FEES	2	\$45.00	day/person				\$ 90.00
	MEALS (EXCLUDING ALCOHOL & TIPS) (OVERNIGHT STAY REQUIRED)	2	\$50.00	day/person				\$ 100.00
	Mileage	500	\$0.575	mile				\$ 287.50
	Mobilization and Demobilization of Drilling Rig (Trips over 100 miles from office to site)	500	\$6.00	mile				\$ 3,000.00
	Traffic Control Services, Arrow Boards and Attenuator trucks -(Includes labor, equipment and fuel)	2	\$3,200.00	day				\$ 6,400.00
SUBTOTAL DIRECT EXPENSES (FC 164)								\$ 10,069.50

PRIME PROVIDER:

ATTACHMENT B  
FEE SCHEDULE  
Method of Payment:  
LUMP SUM AND UNIT COSTS

Contract No. \_\_\_\_\_  
Work Authorization No. \_

CORSAIR CONSULTING LLC

PROJECT NAME: Bunton Creek Rd  
PROJECT LIMITS: Lehman Rd to Porter Cv

TASKS	SHTS	SUPPORT ENGINEER	SENIOR ENGINEER	PROJECT ENGINEER	DESIGN ENGINEER	ENGINEER IN TRAINING	ENGINEERING TECH	ADMIN CLERICAL	TOTAL HOURS	TOTAL COST
		\$203.20	\$186.81	\$121.26	\$140.93	\$99.63	\$64.24	\$58.99		
									\$0.00/Hr.	
UNIT COST EXPENSES		# OF UNITS		COST/UNIT	UNIT					
	Soil Boring/Rock Coring with TCP (<60 feet)	70	\$45.000	LF					\$	3,150.00
	Soil Boring/Rock Coring without TCP (<60 feet)	180	\$35.000	LF					\$	6,300.00
	Determining Moisture Content in soil materials	126	\$14.000	each					\$	1,764.00
	Atterberg Limits (Determining Moisture Content, Liquid Limit, Plastic Limit)	126	\$95.000	each					\$	11,970.00
	Determining the amount of material in soils finer than No. 200	126	\$65.000	each					\$	8,190.00
	Unconfined Compressive Strength (Soil)	6	\$65.000	each					\$	390.00
	Borehole Bentonite Grouting	250	\$10.00	LF					\$	2,500.00
	Determining Sulfate Content in Soils - Colorimetric Method	20	\$95.00	each					\$	1,900.00
	Consolidated Undrained (CU) Triaxial Compression Test for undisturbed Soils - Single Stage	1	\$1,500.000	set of 3					\$	1,500.00
	One Dimensional Consolidation Properties of Soils	1	\$425.000	each					\$	425.00
	California Bearing Ratio (Single Sample without MD Curve)	2	\$450.000	each					\$	900.00
	Modified Proctor Test	2	\$350.000	each					\$	700.00
SUBTOTAL UNIT COST EXPENSES (FC 164)									\$	39,689.00

SUMMARY

TOTAL COSTS FOR SUBCONSULTANT 1	\$43,903.33
NON-SALARY (OTHER DIRECT EXPENSES) FOR SUBCONSULTANT 1	\$10,069.50
NON-SALARY (UNIT COST EXPENSES) FOR SUBCONSULTANT 1	\$39,689.00
GRAND TOTAL + 5% Adjustment	\$0.00 \$98,344.92



CobbFendley

PROJECT NAME: Bunton Creek Rd  
PROJECT LIMITS: Lehman Rd to Porter Cv

TASKS	SHTS	Senior Project Manager	Project Engineer II	Senior Tech I	Category	Category	Category	Category	Category	Category	Category	Category	Category	TOTAL HOURS	TOTAL COST
		\$238.00	\$163.00	\$135.00	Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)	Rate (\$)		
														\$0.00/Hr.	
FC 102 (102) Feasibility Studies														0	
OH to UG Relocation PER															
Project Team Meetings (Assume 6)		6	6											12	\$ 2,406.00
Coordination with PEC (1 meeting)		2	2											4	\$ 802.00
Coordination with LCRA (1 meeting)		2	2											3	\$ 601.50
Coordination with 3 Telecom Attachers (1 meeting each)		5	5											9	\$ 1,804.50
Site Visit		4	4											8	\$ 1,604.00
Schematic		12	24	60										96	\$ 14,868.00
Quantities and Estimates		2	8	8										18	\$ 2,860.00
QAQC and Comment Responses		2	4	8										14	\$ 2,208.00
														0	\$ -
														0	
SUBTOTAL	0	34	54	76	0	0	0	0	0	0	0	0	0	164	\$ 27,154.00
LABOR TOTALS	0	34	54	76	0	0	0	0	0	0	0	0	0	164	\$ 27,154.00

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OTHER DIRECT EXPENSES			# OF UNITS	COST/UNIT	UNIT		
		MILEAGE	250	0.58	mile		\$ 145.00
		RENTAL CAR (Includes taxes and fees; Insurance costs will notbe reimbursed)		\$65.000	day		\$ -
		RENTAL CAR FUEL		\$100.00	day		\$ -
		Air Travel - In State - Short Notice (Coach)		\$420.00	Rd/Trip/perso		\$ -
		Lodging/Hotel (Taxes/fees not included)		\$96.000	day/person		\$ -
		Lodging/Hotel (Taxes/fees)		\$30.00	day/person		\$ -
		Meals (Excluding alcohol & tips) (Overnight stay required)		\$50.00	day/person		\$ -
		OVERNIGHT MAIL - OVERSIZED BOX		\$40.00	each		\$ -
		PHOTOCOPIES B/W (11" X 17")	100	\$0.20	each		\$ 20.00
		PHOTOCOPIES B/W (8 1/2" X 11")	100	\$0.10	each		\$ 10.00
		PHOTOCOPIES COLOR (11" X 17")	50	\$1.25	each		\$ 62.50
		PHOTOCOPIES COLOR (8 1/2" X 11")		\$0.75	each		\$ -
		PLOTS (COLOR ON BOND)		\$1.25	per sq. ft.		
							\$ -
SUBTOTAL DIRECT EXPENSES (FC 164)							\$ 237.50

UNIT COST EXPENSES			# OF UNITS	COST/UNIT	UNIT		
							\$ -
							\$ -
							\$ -
							\$ -
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							\$ -
							\$ -
SUBTOTAL UNIT COST EXPENSES (FC 164)							\$ -

SUMMARY

TOTAL COSTS FOR SUBCONSULTANT 1	\$27,154.00
NON-SALARY (OTHER DIRECT EXPENSES) FOR SUBCONSULTANT 1	\$237.50
NON-SALARY (UNIT COST EXPENSES) FOR SUBCONSULTANT 1	\$0.00
GRAND TOTAL + 5% Adjustment	\$0.00 \$28,761.08