

**SUPPLEMENTAL AGREEMENT NO. 1
TO
ENGINEERING SERVICES AGREEMENT OF
OCTOBER 26, 2021
FOR
FORT BEND COUNTY TOLL ROAD AUTHORITY**

This Supplemental Agreement is signed in multiple counterparts to be effective on the date approved by the Fort Bend County Commissioners Court, and modifies the ENGINEERING SERVICES AGREEMENT dated October 20, 2021 (the “Agreement”) between the Fort Bend County Toll Road Authority (FBCTRA), a Texas Local Government Corporation (the “Authority”), and GC Engineering, Inc., (the “Engineer”).

The Agreement is hereby modified as follows:

1. The first sentence in Section 1 is replaced with the following sentence:

“The Engineer shall render professional services to FBCTRA related to the Project as defined in the Scope of Services in Attachment A and Attachment A-1.

2. Section 2.a is replaced with the following paragraphs:

“The Maximum Compensation under this Agreement is \$1,904,752.00. The amount paid under this Agreement may not exceed the Maximum Compensation without an approved supplemental agreement.

Compensation for the performance of services within the Scope of Services described in Attachment A will be paid as a lump sum amount not to exceed \$254,119.00, as shown in Attachment B.

Compensation for the performance of services within the Scope of Services described in Attachment A-1 will be paid as a lump sum amount not to exceed \$1,650,633.00, as shown in Attachment B-1.

The Engineer shall furnish satisfactory documentation of such work (e.g. timesheets, billing rates, classifications, invoices, etc.) as may be required by FBCTRA.”

This Supplemental Agreement does not alter, modify, or otherwise change any part of the Agreement, except as specifically stated in this Supplemental Agreement.

Supplemental Agreement No. I
To Agreement of October 20, 2021

IN WITNESS WHEREOF, this Supplemental Agreement is hereby executed as of October 16, 2023

FORT BEND COUNTY TOLL ROAD AUTHORITY,
a Texas local government corporation

By: _____

Name: James D. Rice

Title: Chairman

GC Engineering, Inc.
ENGINEER

By: _____

Name: A. MAHENDRA RODRIGO

Title: Principal

EFFECTIVE DATE

THIS AGREEMENT IS EFFECTIVE ON THE DATE IT IS APPROVED BY THE FORT BEND COUNTY COMMISSIONERS COURT, AND IF NOT SO APPROVED SHALL BE NULL AND VOID.

DATE OF COMMISSIONERS COURT APPROVAL: _____

AGENDA ITEM NO.: _____



ATTACHEMNT A-1

SCOPE OF WORK

**Engineering Design for Fort Bend Parkway Toll Road
Segment B-3
from approximately 1,600 feet east of Sienna Ranch Road to Sienna Levee
Fort Bend County Toll Road Authority
Fort Bend County, Texas
FBCTRA Project No. 101-1028**

INTRODUCTION

Fort Bend County Toll Road Authority (Client) requested that **GC Engineering, Inc. (GCE or the Engineer)** provide preliminary and final engineering design services for the Fort Bend Parkway Toll Road (**FBPTR**) Extension from approximately 1,600 feet east of Sienna Ranch Road (**SRR**) to Sienna Plantation Improvement District Levee, for an approximate length of 4,100 feet (0.78 miles). The work shall also include construction of a new bridge structure over SRR, addition of a northbound left turn lane on SRR, and traffic signal modification at SRR intersection. Project location is shown in **Figure 1**.

The project scope for engineering design shall include the following:

- The typical section shall consist of a 4-lane divided roadway, with 12-foot-wide lanes with 12' outside shoulders, and a 10-foot wide inside shoulder. The total width of roadway including traffic barriers shall be approximately 96 feet.
- The construction shall take place within the approximately 300 feet wide existing Right-of-Way (ROW).
- The proposed bridge over SRR is anticipated to be a 3-span structure supported on deep foundations.
- Provide entrance and exit ramps (total 4 ramps) at SRR intersection.
- A Northbound (NB) left turn lane shall be added on SRR at FBPTR and SRR intersection.
- Southbound right turn deceleration lane addition at SRR intersection,
- Retaining walls to accommodate grade differences with proposed ramps/frontage roads and mainlanes.
- The design speed for the main lanes shall be 70 mph, and
- Sidewalks shall be provided along SRR.

GENERAL REQUIREMENTS

GCE shall prepare work in accordance with the latest version of applicable FBCTRA / TxDOT's procedures, specifications, manuals, guidelines, standard drawings, standard specifications or previously approved special provisions and special specifications to include: the PS&E Preparation Manual, Roadway Design Manual, Hydraulic Design Manual, the Texas Manual on



Uniform Traffic Control Devices (TMUTCD), Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, 2014, and other FBCTRA / TxDOT approved manuals. When design criteria are not identified in FBCTRA / TxDOT manuals, GCE shall notify the FBCTRA / TxDOT and refer to the American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Street, (latest Edition). In addition, GCE shall follow the guidelines shown in Developing PS&E for a particular District which GCE may download from the TxDOT's website. GCE shall prepare each Plan, Specification, and Estimate (PS&E) package in a form suitable for letting through the FBCTRA / TxDOT's construction contract bidding and awarding process.

GCE shall coordinate its contract document preparation with the Client, as necessary. GCE shall provide the following:

- A. Plans, Specifications and Estimates (PS&E) and Cross-sections.
- B. PS&E submittal packages at 30%, 60%, 90%, and final milestones for review by the Client.
- C. Provide Project planning and control including quality management.

SCOPE OF SERVICES

The scope of services is as follows:

FUNCTION CODE 102 - FEASIBILITY STUDIES

1) Data Collection and Field Reconnaissance.

GCE shall collect, review, and evaluate data described below:

1. Approved construction plans for the adjacent section of the toll road to the east, Fort Bend Parkway Toll Road Segment B-2, from Sienna Parkway to Sienna Ranch Road. Project No. 101-1027.
2. Data, if available, from the Client, including "as-built plans", existing schematics, right-of-way maps, SUE mapping, existing cross sections, existing planimetric mapping, existing channel and drainage easement data, existing geotechnical information, existing traffic counts, accident data, current special provisions, special specifications, and standard drawings, etc.
3. Documents for existing and proposed development along proposed route from local municipalities and local ordinances related to project development.
4. Utility plans and documents from appropriate municipalities and agencies.
5. Readily available floodplain information and studies from the Federal Emergency Management Agency (FEMA), local municipalities, and other governmental agencies in addition to that provided by the Client.
6. Conduct field reconnaissance and collect data including a photographic record of notable existing features.



2) Project kick-off meeting

GCE shall plan and attend a kick-off meeting prior to initiation of the project design. The following shall be discussed and agreed on:

1. Roadway, bridge, retaining wall, and drainage design parameters to be used for the project, if any,
2. Engineering constraints,
3. Project development schedule,
4. Other issues as identified by the Client,
5. Identify Design Exceptions and/or waivers, if applicable, and
6. Preliminary Construction Cost Estimate.

3) Develop Roadway, Bridge, and Hydraulic Design Criteria

GCE shall design the project according to the latest design criteria by the Client. GCE shall develop a project specific design criteria (typical sections, estimate, design exceptions, etc.).

FUNCTION CODE 130 – RIGHT-OF-WAY DATA

1) Right-of-Way (ROW) Map (subconsultant DAI)

ROW survey work shall be performed by GCE's subconsultant, Doucet & Associates, Inc. (DAI). GCE shall administer the ROW work by DAI and coordinate with the Client.

The scope of work for ROW tasks by DAI is enclosed in **Appendix 1**.

2) Utility Layout / Utility Coordination

Utility Coordination shall include communication and utility coordination meetings with individual utility companies.

A. Prepare Utility Layout

- a. Prepare Utility Layout. GCE shall prepare a utility layout using the approved schematic for use in contacting utility companies. GCE shall obtain as-builts and/or future plans for the following facilities in the project area including, but not limited to:
 - i. Roadway.
 - ii. Water lines.
 - iii. Sanitary sewer lines.
 - iv. Storm drain lines.
 - v. Underground and/or overhead telephone lines.
 - vi. Power & Light underground and/or overhead lines.
 - vii. Gas lines.
 - viii. Fiber Optic.



- ix. DOW Product Pipeline crossing of FBCTR between the Levee and Sienna Ranch Road.
 - x. Si Energy Pipeline.
 - xi. Other utilities known to serve the project area.
 - xii. Easements (utility and others).
- b. Plot utility Locations. Information secured above shall be plotted for later use in field-determining actual utility locations.

B. Utility Coordination

- a. Coordinate with utility companies and prepare meeting minutes. GCE shall prepare the design to avoid utility conflicts as much as possible.
- b. Provide initial project notification letters to affected utility companies, owners, and other concerned parties.
- c. Provide the Client and affected utility companies and owners a Utility Contact List for the project with information such as: (i) Owner's Name; (ii) Contact Person; (iii) Telephone Numbers; (iv) Emergency Contact Number; (v) E-mail addresses; (vi) as well as pertinent information concerning their respective affected utilities and facilities, including but not limited to: size, number of poles, material, and other information which readily identifies the utilities companies' facilities.
- d. Design and coordinate proposed electrical meter connection (Service Outlet Locations (SOLs)).
- e. Obtain Letters of No Objection (LONO) from utility companies within the corridor.
- f. Attend utility coordination meeting with the Client and prepare meeting minutes.

FUNCTION CODE 145 – MANAGING CONTRACTED

1) Project Management

The purpose of this task is to provide the overall management of this project. Project files will be set up and overall coordination of the team and communication with the Client and other Team Members will be maintained.

- 1. Provide general coordination with the Project Team Members concerning administrative and technical issues. Report and coordinate with Client on design issues and requests for information from adjacent project's Design Engineers. Provide coordination with Client's consultants for the insertion of plan sheets prepared under separate contract, if any.



GCE shall coordinate the Segment B-3 field work with the adjacent Fort Bend Parkway Toll Road, Segment B-2 construction contractor, James Construction Group, LLC.

2. Prepare and submit monthly progress reports and invoices to the Client for review and approval. The invoices will include the progress report, invoice, and the schedule – as described below. The progress report will list outstanding issues that need resolution, as well as progress of the tasks and estimated completion dates for the work.
3. Prepare an overall Project schedule detailing the progression of the work for the project. This schedule will include review dates by the Client, submittal dates for deliverables, and estimated time frame to complete the work. The schedule will be updated monthly and included in the progress report. Changes or adjustments in the schedule caused by delays due to unforeseen task difficulties or lengthy review times will be shown and reported to the Client.
4. Attend coordination and progress review meetings (12 meetings assumed). Prepare and distribute meeting minutes within five (5) working days after the meeting.

FUNCTION CODE 160 - ROADWAY DESIGN

1) Field Surveying and Photogrammetry (subconsultant DAI)

Field surveying work shall be performed by DAI. GCE shall administer the survey work by DAI and coordinate with the Client.

The scope of work for surveying tasks by DAI is enclosed in **Appendix 1**.

2) Roadway Design Controls

GCE shall perform the roadway design and develop design drawings, using the CADD standards as required by the Client, which will be included in the contract documents for construction. The following tasks describe the work to be performed:

A. Geometric Design

Utilizing the approved schematic plan, GCE shall refine the horizontal and vertical alignments for the FBPTR and typical sections to meet Project requirements. GCE shall develop a geometric project layout (Layout), for the full length of the project to be reviewed and approved by the Client prior to GCE proceeding with the 30% milestone submittal package.

The Layout must consist of a planimetric file of existing features and the proposed improvements within the existing and proposed ROW. The Layout must also include the following features:

- existing and proposed ROW,
- existing and proposed horizontal and vertical alignment and profile grade line,
- cross culverts,



- lane widths,
- cross slopes,
- ditch slopes,
- pavement structure,
- clear zone, dedicated right turn lanes, corner clips,
- retaining walls (if applicable) guard rail (if applicable),
- and water surface elevations for various rainfall frequencies, etc.
- Existing major subsurface and surface utilities must be shown on the Layout.

GCE shall develop the proposed alignment to avoid the relocation of existing utilities as much as possible. GCE shall consider Americans with Disabilities Act (ADA) requirements when developing the Layout. The Layout must be prepared in accordance with the current Roadway Design Manual. GCE shall provide horizontal and vertical alignment of the project layout for main lanes and cross streets.

The project layout must be coordinated with the Client and adjacent Engineers, if any. GCE shall also provide proposed and existing typical sections with the profile grade line (PGL), lane widths, cross slopes, ROW lines, ditch shapes, pavement structures and clear zones depicted, etc.

GCE shall also attend necessary meetings to discuss the outcome of the evaluations of the study.

B. Roadway Design

GCE shall provide roadway plan and profile drawings using CADD standards as required by the Client. The drawings shall consist of a planimetric file of existing features and files of the proposed improvements. The roadway base map shall contain line work that depicts existing surface features obtained from the schematic drawing. Existing and proposed right-of-way lines must be shown. Plan and Profile must be shown on separate or same sheets (this depends upon width of pavement) for main lanes.

Proposed Typical Sections: Typical section sheets shall be developed for the project. Sections will be prepared for existing and proposed main lanes, ramps, cross streets, and structures as necessary to provide a thorough understanding to the contractor of the work intended. Typical section information shall include the following:

- a. Specific station limits;
- b. Profile grade line location;
- c. Widths of travel lanes;
- d. Width of shoulders;
- e. Pavement design;
- f. Longitudinal joint locations;
- g. Pavement cross-slopes;
- h. Traffic barriers;
- i. Sodding/seeding limits;
- j. Structures including bridge and retaining walls;
- k. Riprap;



- l. Limits of embankment and excavation; and
- m. Typical section number.

Plan and Profile sheets: Plan and Profile sheets shall be prepared to a scale of 1"=100' horizontal and 1"=10' vertical on 11"x17" format sheets.

The plan view shall contain, at a minimum, the following design elements:

- a. Calculated roadway center lines/base lines / Profile Grade Lines (PGL) for the mainlanes, ramps, and frontage roads, as needed. Horizontal control point information shall be shown;
- b. Calculated site triangles and storage bay lengths at Sienna Ranch Road.
- c. Pavement edges for improvements;
- d. Lane and pavement width dimensions;
- e. Proposed structure locations, lengths and widths;
- f. Direction of traffic flow on roadways. lane lines and/or arrows indicating the number of lanes shall also be shown;
- g. Control of access line, ROW lines and easements, as required;
- h. Limits of riprap, block sod, and seeding;
- i. Existing utilities and structures;
- j. Benchmark location;
- k. Radii callouts, curb location, guard rail, guard fence, crash safety items, as required; and
- l. Soil boring locations.

The profile view shall contain the following design elements:

- a. Calculated profile grade including grade, vertical curve data, and "K" values shall be shown;
- b. Existing natural ground profile at profile grade line;
- c. Calculated vertical clearances taking into account the appropriate superelevation rate, superstructure depth, and required clearance.

Roadway detail plan sheets: Detail sheets will be prepared that are associated with the roadway construction. Roadway detail sheets will be developed for special details that may be needed to define or clarify construction items for the contractors' understanding. These plan sheets may include, but are not limited to:

- a. Miscellaneous roadway details;
- b. Alignment data sheets;
- c. Pavement Design

Design Cross-Sections: Cross Sections shall be prepared at a maximum interval of 100 feet for determining final earthwork and other bid item quantities. The cross-sections shall be prepared at the beginning and end station of the Project and at even 100-foot stations. Each cross-section shall include, but is not limited to:

- a. Centerline location and station;
- b. Proposed ground line;



- c. Roadway side slopes;
- d. Elevations at centerline, edges of pavement, and tops of curb;
- e. Existing ground line;
- f. Roadway cross-slopes;
- g. Existing and/or proposed ROW limits;
- h. Cut and fill quantities at each cross-section; and
- i. Offset/elevation callouts for grade breaks, such as ditch high banks, flowlines and berms adjacent to the roadway.

C. Sidewalk Design – Sidewalks along Sienna Ranch Road

GCE shall design 10 to 12-foot-wide sidewalks on either side of Sienna Ranch Road for a length of approximately 400 feet from both sides from the FBCTR centerline. The work shall consist of sidewalk design, providing ADA ramps at roadway intersections, and connecting sidewalks to the driveways along Sienna Ranch Road.

Final TDLR inspection and approval of ADA and pedestrian items shall be provided by Accessibility Check (AC). GCE shall administer the TDLR work by AC and coordinate with the Client.

The scope of work for TDLR services by AC is enclosed in **Appendix 2**.

3) **Drainage**

A. Drainage Report (subconsultant BLAE)

Drainage Report shall be performed by Blackline Engineering (**BLAE**). GCE shall administer the drainage design work by BLAE and coordinate with the Client. It is anticipated that a Drainage Impact Analysis (**DIA**) is not required as the project is located within the Sienna Plantation Improvement District Levee (**SPLID**) and storm water management measures are already in place for the proposed project.

Upon receipt of the comments from the Client, Fort Bend County Drainage District (FBCDD), and SPLID, the Final Drainage Report shall be submitted to the Client and other relevant agencies for approval.

The scope of work for Preliminary and Final Drainage Report tasks by BLAE is enclosed in **Appendix 3**.

B. Drainage Design

Based on the findings in the Drainage Report for the Project, Drainage Design shall be performed. Drainage Design for the project shall be performed by iGET Services (iGET). GCE shall administer the drainage design work by iGET and coordinate with the Client.



The scope of work for Drainage Design tasks by iGET is enclosed in **Appendix 4**.

4) Signing and Pavement Marking and Signalization (Permanent)

A. Signing and Pavement Marking

GCE shall perform the preliminary and final design for signing and pavement markings and develop the drawings, specifications, and quantities. The work includes signing, pavement markings, and roadway delineation, as required. Coordination shall be required with the Client, and with adjacent project Engineers, as necessary, for overall signing, and pavement marking strategies.

Plan sheets (11"x17") shall be prepared at 1" =100' scale, usually double bank, to show roadway layout, center line with station numbering, signing locations, pavements markings, delineation, channelization devices, and striping for this project. Proposed signs shall be shown in schematic pictorial format and numbered.

- a. Determine the location and type of warning, regulatory, and guide signs required according to criteria furnished in the Texas MUTCD and prepare signing plans and details.
- b. Prepare plans and details for large guide signs in sufficient detail to be fabricated. Select sign foundations from TxDOT/Client standards.
- c. Delineators and object markers shall be shown for culverts and other structures, which present a hazard to traffic.
- d. Summaries of large and small signs shall be prepared in accordance with criteria established by the Client.

B. Sienna Ranch Road (SRR) Intersection Traffic Signal Modification

GCE shall prepare plans for the traffic signal modification at SRR intersection per Fort Bend County requirements. The work shall include:

- a. a left turn signal for NB traffic on SRR,
- b. a signal pole/arm for controlling traffic on Eastbound (EB) ramp of FBPTR at SRR, and
- c. pedestrian poles and other hardware, as required.

GCE shall develop quantities, general notes, specifications and incorporate appropriate Client's standards required to complete construction. Traffic signal poles, fixtures, signs, and lighting shall be designed per the Client recommendations and standards.

The following information shall be provided in the Traffic Signal Modification Plans:

1. Layout
 - a. Estimate and quantity sheet
 - i. List of bid items



- ii. Bid item quantities
 - iii. Specification item number
 - iv. Paid item description and unit of measure
 - b. Basis of estimate sheet (list of materials)
 - c. General notes and specification data.
 - d. Condition diagram
 - i. Roadway and intersection design features
 - ii. Roadside development
 - iii. Traffic control including illumination
 - e. Plan sheet(s)
 - i. Existing utilities
 - ii. Proposed roadway improvements
 - iii. Proposed installation
 - iv. Proposed traffic control
 - v. Proposed illumination attached to signal poles.
 - vi. Proposed power pole source
 - f. Notes for plan layout
 - g. Phase sequence diagram(s)
 - i. Signal locations
 - ii. Signal indications
 - iii. Phase diagram
 - iv. Signal sequence table
 - v. Flashing operation (normal and emergency)
 - vi. Preemption operation (when applicable)
 - vii. Contact responsible Agency to obtain interval timing, cycle length and offset
 - h. Construction detail sheets(s)
 - i. Poles (State standard sheets).
 - ii. Detectors.
 - iii. Pull Box and conduit layout.
 - iv. Controller Foundation standard sheet.
 - v. Electrical chart.
 - vi. Electrical meter location and establishment.
 - i. Marking details (when applicable)
 - j. Aerial or underground interconnect details (when applicable)
- 2. Summary of Quantities
 - a. Small signs tabulation
 - b. Large signs tabulation including guide signs
- 3. Sign Detail Sheets
 - a. Signs except route markers
 - b. Design details for large guide signs
 - c. Dimensioning (letters, shields, borders, etc.)
 - d. Designation of shields attached to guide signs



5) Traffic Management Systems (ITS)

Engineer shall install ITS conduit below the base layer of pavement structure. Engineer shall provide two separate 2" PVC conduit duct banks for tolling and ITS communication. An AWG #8 bare electrical conductor wire for detection shall be placed in spare trunk line. Type I/II Ground boxes with aprons shall be spaced at 700 feet along the Project corridor.

6) Miscellaneous (Roadway)

A. Retaining Wall Design

The purpose of this task is to prepare retaining wall plans and details.

GCE shall design retaining wall structures along FBPTR eastbound and westbound mainlanes. The design shall include MSE walls along bridge approaches as well as abutment walls. It is estimated that approximately 5,120 feet of retaining walls shall be required. The retaining wall plans shall include:

Retaining Wall Plan (1" = 100' scale in 11"x17" sheets);

- a. Designation of reference line.
- b. Beginning and ending retaining wall stations.
- c. Offset from reference line.
- d. Horizontal curve data.
- e. Total length of wall.
- f. Indicate face of wall.
- g. Wall dimensions and alignment relations (alignment data as necessary).
- h. Soil bore hole locations.
- i. Inlet locations.
- j. Underdrains and outlets to storm sewer.

Elevation (1" = 10' scale in 11"x17" sheets);

- a. Top of wall/coping elevations every 25 feet.
- b. Existing and finished ground line elevations.
- c. Limits of measurement for payment.
- d. Type, limits, of guard rail and/or coping (as applicable).
- e. Underdrain placement and outfalls.
- f. Required foundation improvements (as applicable).

Design Details.

- a. Use TxDOT standard details for Structural wall type, details and anchorage details of railing and coping.
- b. Drainage requirements - troughs, inlets, drain pipes/ junction boxes.
- c. No drain slots shall be allowed in rails along tops of walls.



Global Stability Analysis of retaining walls shall be performed by GCE's subconsultant, HTS Inc., Consultants (**HTS**). GCE shall administer the work by HTS and coordinate with the Client.

The scope of work for Global Stability Analysis of retaining walls by HTS is enclosed in **Appendix 5**.

B. Traffic Control Plan, Detours, Sequence of Construction

GCE shall prepare Traffic Control Plans (TCP) for the project. A detailed TCP shall be developed in accordance with the latest edition of the Texas Manual on Uniform Traffic Control Devices for Streets and Highways (Texas MUTCD). GCE is to implement the current Barricade and Construction (BC) standards as applicable. GCE shall interface and coordinate phases of work, including the TCP, with adjacent Engineers.

- i. GCE shall provide a written narrative of the construction sequencing and work activities per phase and determine the existing and proposed traffic control devices (regulatory signs, warning signs, guide signs, route markers, temporary pavement markings, barricades, flag personnel, temporary traffic signals, etc.) to be used to handle traffic during each construction sequence. GCE shall show proposed traffic control devices at grade intersections during each construction phase (stop signs, flag person, signals, etc.). GCE shall show temporary roadways, ramps, structures and detours required to maintain lane continuity throughout the construction phasing.
- ii. Where detours are required, GCE shall develop typical cross sections, calculate quantities, and show horizontal and vertical alignment information. GCE shall provide a detailed layout and arrangement of construction signs, construction pavement marking, traffic control devices (including temporary signals and signal heads).
- iii. Continuous, safe access to properties during phases of construction is mandatory. GCE shall develop TCP to preserve existing curb cuts. Approval from the Client is required for any elimination of existing access capacity.
- iv. GCE shall design temporary drainage to replace existing drainage disturbed by construction activities or to drain detour pavement. GCE shall show horizontal and vertical location of culverts and required cross sectional area of culverts.

C. Illumination

GCE shall refer to TxDOT's Highway Illumination Manual and other necessary State approved manuals for the illumination design. GCE shall provide a preliminary layout for initial review and approval by the Client.

GCE shall provide illumination layout plans, electrical circuit plans and details including meter location and establishment for street lighting and safety lighting at SRR Intersection and Ramps



G, H, J, & K. Work shall include the design of median barrier conduit and fittings for roadway illumination devices to accommodate future light pole assemblies, and underpass lighting at SRR intersection and sidewalks, and safety lighting.

GCE shall prepare exhibits as required to obtain agreements with adjacent municipalities. GCE shall tabulate quantities and provide summary sheets. Design shall be per State's criteria and specifications.

D. Storm Water Pollution Prevention Plans (SW3P)

GCE shall develop SW3P, on separate sheets from (but in conformance with) the TCP, to minimize potential impact to receiving waterways. The SW3P shall include text describing the plan, quantities, type, phase and locations of erosion control devices, and required erosion control measures including construction entrances and exits. This shall include Notices of Intent (NOI), Notices on Termination (NOT), two Construction Site Notices as required in accordance with the current Texas Commission on Environmental Quality, TPDES General Permit for storm water discharges associated with construction activities.

7) Preparation and Submittal of PS&E

The drawing and specification packages shall include design plans, specifications and estimates to construct the Project. The deliverables for the PS&E design package shall include electronic design drawings in portable document format (pdf) format and technical specifications, and are detailed as follows:

- A. Preparation of construction plans per FBCTRA aesthetic requirements.
- B. Preparation of quantities, construction cost estimates, and construction schedule for the Project.
- C. Preparation of General Notes and Specifications list.
- D. Provide submittals for interim progress reviews by Client including the 30%, 60%, 90% and final completion Milestone for the PSE package. The submittals shall include:
 - a. The 30% submittal shall include legible 11"x17" construction drawings in a Portable Document File (PDF) format.
 - b. The 60% submittal shall include legible 11"x17" construction drawings in a PDF format. 30% submittal comments addressed, applicable standard drawings shown on the index of sheets, a listing of "Governing Specifications and Special Provisions" and a 60% construction cost estimate.
 - c. The 90% submittal shall include legible 11"x17" construction drawings in a PDF format. 60% submittal comments addressed, applicable standard drawings shown on the index of sheets, a complete set of Engineer-prepared Special Specifications, Special Provisions and Reference Specifications, a listing of "Governing



- Specifications and Special Provisions,” an edited “Bid Proposal Form,” and a construction 90% cost estimate as a PDF.
- d. The Final submittal. The Final submittal shall include signed sealed and dated plan sheets in a pdf for inclusion into the Final PSE submittal, 90% submittal comments addressed, and a 90% construction cost estimate as a PDF. At project letting, project files (including reports, calculations, exhibits, etc.) in their native format shall be delivered via flash drive to FBCTRA/GEC.
 - e. GCE shall provide peer review documentation for milestone deliverables. For each deliverable, GCE 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. Client’s project manager may require GCE to submit internal mark-up (red-lines) or comments developed as part GCE’s quality control step. When internal mark-ups are requested by the Client in advance, the Client, at its sole discretion, may reject the actual deliverable should GCE fail to provide the evidence of quality control. GCE shall clearly label each document submitted for quality assurance as an internal mark-up document.

8) Bridge Design

The proposed bridge over Sienna Ranch Road is anticipated to be a 3-span structure supported on deep foundations. GCE shall prepare design plans and detailing including:

A. Bridge Layouts

- a. Prepare bridge layout plans and elevations for the bridge location listed above, in accordance with the latest edition of the TxDOT’s *Bridge Design Manual*, *Bridge Project Development Manual*, and *American Association of State Highway and Transportation Officials Load and Resistance Factor Design (ASHTO LRFD) Bridge Design Specifications*. Bridge layouts shall be at 1” = 40’ scale (11”x17” plan sheets). Each bridge layout sheet shall include bridge typical sections, structural dimensions, abutment and bent locations, superstructure and substructure types, soil boring logs, and utilities.
- b. GCE shall prepare proposed bridge typical sections for each span.

B. Design Calculations and Details

- a. Highway bridge structure shall be designed for Highway Load 93 (HL 93) loading. Bridge design shall be in conformance with the latest edition of TxDOT’s *Bridge Design Manual*, *Bridge Project Development Manual*, and *ASHTO LRFD Bridge Design Specifications, 7th Edition*.
- b. GCE shall perform the following tasks: perform calculations for design of bridge abutments and bents; perform calculations for bridge slab design; perform calculations to determine elevations of bridge substructure and super structure elements; perform calculations for bridge concrete beam design; prepare



necessary foundation details and plan sheets; prepare plan sheets for abutment and bent design; prepare plan sheets for additional abutment and bent details; prepare framing plan and slab plan sheets; compute and prepare tables for slab and bearing seat elevations, dead load deflections, etc.; and design beams and prepare beam design tables and plan sheets.

- c. The bridge shall be designed using pre-stressed concrete I-beams or Tx-girders.
- d. GCE shall maximize the use of TxDOT standard bridge elements when possible.
- e. No drain slots shall be allowed in rails/barrier.
- f. Prepare drainage details for bridge drainage system.

C. Bridge Quantities Summary

- a. GCE shall provide quantities for the bridge. GCE shall incorporate these quantities onto summary sheets to be included in the plan set.

ASSUMPTIONS

The proposal presented is based on the following assumptions:

- 1. The project does not require acquisition of additional ROW, proposed work shall be performed within the existing ROW.
- 2. The scope of services does not include preparation of utility agreement assemblies which include; utility agreements, joint use agreements, and advanced funding agreements.
- 3. GCE shall attempt to avoid conflicts with the 30" Dia. Gas pipeline by DOW in the proposed design. GCE shall determine the likelihood of conflicts during the 30% design. Should gas line relocation be necessary, GCE shall provide coordination as well as other services required, as out of scope services.
- 4. The scope of services does not include environmental, archeological studies, and permitting.
- 5. The scope of services does not include drainage impact analysis and storm water detention pond design.
- 6. Pre-Bid and Construction Services shall be provided as a separate supplemental agreement.
- 7. No TxDOT permits are required for the project.
- 8. General Notes and Private Utility Notes will be included as separate 8-1/2"x11" sheets as part of the bid package and will not be included in the plans.

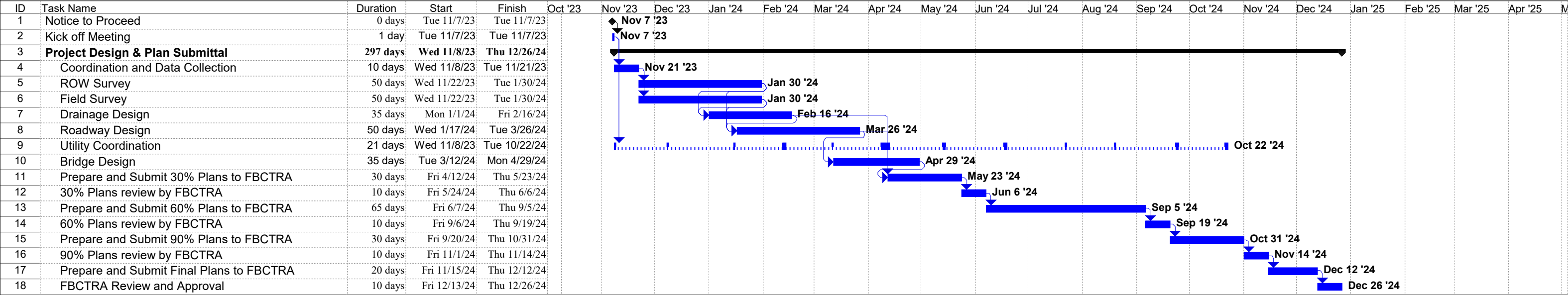
Project Schedule (Attachment A-1)

Engineering Design for Segment B-3

Extension of FBPTR from Sienna Ranch Road to Sienna Plantation Improvemnt District Levee

Fort Bend County Toll Road Authority

For Bend County, TX





10190 Katy Freeway, Suite 110
Houston, Texas 77043
Office: 346.250.4425
Fax: 512.583.2601

Doucetengineers.com
TBPLS Firm No. 10194551

May 9, 2023

Chandi S. Rodrigo, P.E.
GC Engineering, Inc.
2505 Park Avenue
Pearland, TX 77581
Ph: (346) 773-4406
Fax: (281) 412-4623

SCOPE OF WORK for RIGHT-OF-WAY DATA AND TOPOGRAPHIC SURVEY

For Extension of Fort Bend Parkway Toll Road
from approx. 1,600 feet east of Sienna Ranch Road to 100' west of
Sienna Plantation Improvement District Levee

Dear Ms. Rodrigo,

Doucet & Associates, Inc. ("Doucet") is pleased to submit this proposal for surveying services for the above referenced project.

PROJECT

It is our understanding that GC Engineering, Inc. (client) is requesting a right-of-way and design survey for Extension of Fort Bend Parkway Toll Road located Fort Bend County, Texas.

SCOPE OF SERVICES

Doucet proposes to provide GC Engineering, Inc. (Client) the following surveying work shall be performed per TxDOT and Fort Bend County (County) requirements:

Survey Limits are as follows:

Fort Bend Parkway Toll Road: The survey shall be along Fort Bend Parkway Toll Road from 2,000' east of Sienna Ranch Road east ROW to 100' west of Sienna Plantation Improvement District west toe of slope of the Levee. The total approximate length of the survey limits is 4,900 feet along Fort Bend Parkway Toll Road. The width of the survey limits shall extend minimum 20-feet outside the existing ROW (total approx. width is 340').

Sienna Ranch Road: The survey for Sienna Ranch Road will be performed along from approximately 100 feet south of the intersection of Old Point Drive/Tivoli Lane to approximately 100 feet north of the intersection of Pecan Estates Drive/Aqua Falls. The total approximate length is 2,500 feet along Sienna Ranch Road. In addition, the survey shall include entire limits of intersections at both locations as indicated above. The width of the survey limits shall extend minimum 20-feet outside existing ROW. Project location is shown in Figure 1 (dated 5/8/2023).

A. Task 1 -Function Code 130 -Right-of-Way Data (Task 704)

Doucet shall review available existing Right-of-Way (ROW) information and prepare a ROW map for the project area outlined in Fig. 1. The mapping products shall conform to the current Fort Bend County (County) and TxDOT survey

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EXPERIENCE YOU NEED.
PEOPLE YOU TRUST.



requirements. The ROW map shall include an overall layout index sheet, a survey control index sheet, a horizontal and vertical control data sheet, and sufficient plan sheets to cover the proposed project, or as directed by the Fort Bend County Toll Road Authority (FBCTRA).

Doucet will conduct record research to show all easements and other encumbrances within the project limits.

B. Task 2 – Function Code 160 – Roadway Design Survey (Task 705)

Doucet will perform design survey of the project area outlined in Figure 1. Doucet will coordinate right-of-entry and design survey will be conducted twenty (20) feet beyond the existing right-of-way. The survey will be performed in accordance with TSPS Standards for a Category 6 Condition II Topographic survey and will be based on NAD 83 (2011) using NAVD88 (2001 adjustment) and coordinated to match horizontal and vertical reference from segment 2. Level B SUE shall be performed for entire project limits where utilities exist based on one-call utility markings and record drawings.

Level A SUE is assumed at locations along DOW (area outlined in yellow, within Exhibit “A”) and Si Energy pipelines. We have assumed 6 test hole locations for the scope of this project.

I. FIELD SURVEYING FOR DESIGN SURVEYS

FIELD SURVEYING

Doucet shall verify the benchmark coordinates and establish the horizontal and vertical control for the project. Doucet shall provide supplemental field surveying services necessary to verify the Digital Terrain Model (DTM), produce topographic maps, establish the project baseline on the ground, locate and tie existing utilities to the project baseline, tie the soil boring locations, and update topography. Coordinate geometry shall be based on and tied into State plane surface coordinate system.

Doucet shall determine Project Baseline:

The project base line must be coincidental with, or parallel to, the stationed “Design Center Line.” Base line control points shall be established using 15M (ASTM) (5/8 inch) iron rods, 36 inches long, at P.C.’s, P.I.’s and P.T.’s of horizontal curves and at 1000 feet maximum intervals on tangents. Baseline control points shall be offset with set iron rods on both sides near the existing ROW lines at a measured distance.

Horizontal and Vertical GPS Surveys:

The coordinate location and/or elevation of center panel points based on GPS surveys conducted by Doucet shall meet standards of accuracy as set forth below. Reference may be made to standards of accuracy for First Authorization surveys as described in the Federal Geodetic Control Committee publication entitled Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques, reprinted with corrections August 1, 1989. DATUM: All coordinates shall be based on the Texas State Plane Coordinate System South Central Zone NAD 83 (1993 adjustment), with coordinates given in feet, and may be converted to Grid by multiplying by a combined adjustment factor of 0.9998657. All elevations shall be based on the North American vertical datum (NAVD) of 1988 (2001 adjustment). Doucet shall tie-in to existing benchmarks shown in the Survey Control Index sheets 68 to 72 of 456 of Construction plans dated May 25, 2021, for Fort Bend Parkway Toll Road Segment B-2 project.



DOUCET

All traverses conducted by Doucet shall be tied to the National Geodetic Survey system, either directly or indirectly as follows:

Doucet shall make sufficient measurements to existing National Geodetic Survey monuments to assess the angular, horizontal, and vertical closure of each traverse to the extent applicable.

Doucet shall make sufficient measurements to monuments established by the County to assess the angular, horizontal, and vertical closure of each traverse to the extent applicable. All monuments established by the County for purposes of aerial photography control are based on the National Geodetic Survey system.

Locate previously set benchmarks established by County (County Datum); establish benchmark circuit (run levels) throughout the Project; establish additional benchmarks at intervals not to exceed 1,000 feet for the limits of the Project; tie benchmarks (station/offset) to Project baseline. Benchmarks shall be 20M (ASTM) (3/4-inch) diameter, 48 inches long, located near the existing ROW line at a measured distance. All benchmark circuits shall be tied to the County's elevation datum. Perform the benchmark circuits in accordance with good surveying practices. Doucet shall verify the closure and submit adjustments to the County for approval prior to beginning the field surveys.

HORIZONTAL GROUND CONTROL

The coordinate location of the traverse points shall be based on traverses conducted by Doucet meeting standards of accuracy as set forth below. Reference may be made to standards of accuracy for Second Order, Class II, horizontal control traverses as described in the Federal Geodetic Control Committee publication entitled Standards and Specifications for Geodetic Control Networks, reprinted February 1991.

- a. Azimuth closure shall not exceed 4.5 seconds times the square root of the number of traverse segments.
- b. Position closure after azimuth adjustment shall not exceed 1 in 20,000.
- c. In cases where a traverse approaches but does not entirely meet these standards of accuracy and Doucet has assured itself that gross errors, mistakes, and blunders have been eliminated, Doucet shall submit the traverse data for further review by County. County will make a determination as to the acceptability of the traverse as an exception to the standard and will notify Doucet accordingly.

VERTICAL GROUND CONTROL

Elevations established on the benchmarks shall be conducted by Doucet meeting standards of accuracy as set forth below. Reference may be made to standards of accuracy for third order vertical control traverses as described in the Federal Geodetic Control Committee publication entitled Standards and Specifications for Geodetic Control Networks, reprinted February 1991.

- a. Vertical closure shall not exceed 0.05 feet times the square root of the distance in miles.
- b. In case where a traverse approaches but does not entirely meet these standards of accuracy and Doucet has assured itself that gross errors, mistakes, and blunders have been eliminated, Doucet shall submit the traverse data to County for further review by County. County will make a determination as to the acceptability of the traverse as an exception to the standard and will notify Doucet accordingly.
- c. Document field work and submit field data to the County.

SURVEY CONTROL INDEX SHEETS

Doucet shall prepare a Survey Control Index Sheet and a Horizontal and Vertical Control Sheet, signed, sealed and dated by the professional engineer in direct responsible charge of the surveying and the responsible Registered Professional Land Surveyor (RPLS) for Insertion into the plan set. The Survey Control Index Sheet shows an overall



DOUCET

view of the project control and the relationship or primary monumentation and control used in the preparation of the project; whereas the Horizontal and Vertical Control sheet identifies the primary survey control and the survey control monumentation used in the preparation of the project. Both the Survey Control Index Sheet and the Horizontal and Vertical Control Sheet should be used in conjunction with each other.

The following information should be shown on the Survey Control Index Sheet:

- Overall view of the project and primary control monuments set for control of the project.
- Identification of the control points
- Baseline and/or centerline
- Graphic (Bar) Scale
- North Arrow
- RPLS signature, seal, and date.

The following information should be shown on the Horizontal and Vertical Control Sheet:

- Location for each control point, showing baseline and/or centerline alignment and North arrow.
- Station and offset (with respect to the baseline or centerline alignments) of each identified control point.
- Basis of Datum for horizontal control (base control monument/benchmark name/number, datum).
- Basis of Datum for the vertical control (base control monument, benchmark name, number, datum)
- Date of current adjustment of the datum
- Monumentation set for Control (Description, and Location ties)
- Surface Adjustment Factor and unit of measurement
- Coordinates (SPC Zone and surface or grid)
- Relevant metadata
- Graphic (Bar) Scale
- RPLS signature, seal, and date

1. Secure right-of-entry (short of litigation), as needed for the project and Doucet shall not commit acts which will result in damages to private property and Doucet will make every effort to comply with the wishes and address the concerns of private property owners.
2. Locate improvements and obtain cross-sections at 100-foot intervals, and at critical locations.
3. ROW staking for additional field topography related to design work.
4. Determine any changes in topography from outdated maps due to development, erosion, etc.
5. Determine type of existing material, existing pavements, etc.
6. Obtain top of manhole and flowline elevations, type, and size, etc. of manholes, inlets, and valves of utilities.
7. Tie down soil boring locations by station, offset and surface elevation.
8. Establish elevations and locations of physical features including buildings, structures, signs, power poles, curbs, driveways, water meters, manholes, pedestals, ponds, light poles, fence, signs, etc.
9. Identify pavement limits including but not limited to back of curb, face of curb, driveway, sidewalk, ADA ramps, etc. will be located.
10. Tie to existing underground and overhead utilities (location, elevation, size, and direction).
11. All visible existing utilities including but not limited to manholes, inlets, culverts, water meter, valve, fire hydrant, etc. will be located.
12. Identify and locate pipe flow line elevations, size, material and directions of sanitary sewer pipes, and storm sewer pipes. Identify and locate top of rim or top of grate of inlet/manhole.
13. Texas one-call system will be notified and identify marked utilities information on survey. Also, provide contact information and correspondence with the utility companies.
14. Perform utility research and gather record drawings within project limits. Delineate underground utility lines in the plan view from available record drawings and surveyed information. Coordinate with private utility companies and County for record drawings.



15. Trees to be located will be limited to 4" diameter and larger on natural vegetation. Ornamental trees or Landscape trees with a diameter of 2" and larger will be located. Wooded/brushed areas will be limited to an outlined area only, only trees 18" and larger diameter will be located in these areas.
16. Provide Profile view along the baseline and cross streets. The profile view shall locate ground profiles along the project baseline, top of curbs, flowline of ditch, Right-of-Way (min. 5 ground profiles) and underground utilities which are 4-inch and larger diameter pipes.
17. Perform datum ties as required (HCFCD, COH, FEMA, etc.). If required, establish an elevation base on the County's datum to other public entities published benchmarks.
18. The Engineer's Surveyor using wetlands delineation information provided by the County shall stake and fence the areas containing wetlands. Doucet is to provide information back to the Engineer in an electronic file to be incorporated onto the P&P sheets. This staking and fencing at the wetland areas shall be handled under separate agreement.
19. Doucet shall control traffic in and near surveying operations adequately to comply with the latest edition of the Texas Manual on Uniform Traffic Control Devices. In the event field personnel must divert traffic or close traveled lanes, a Traffic Control Plan shall be prepared by Doucet and approved by the County prior to commencement of field work. A copy of the approved plans shall be in the possession of field personnel on the job site at all times and shall be made available to County personnel upon request.
20. All standards, procedures and equipment used by Doucet shall be such that the results of survey will be in accordance with Board Rule 663.15, as promulgated by the Texas Board of Professional Land Surveyors.
21. If at any time during the contract period, Doucet encounters unforeseen circumstances which may materially affect the scope, complexity or character of the work authorized by the County, Doucet shall notify the County in writing immediately with a complete description of the circumstances encountered.

DIGITAL PLANIMETRIC MAPPING (DGN) AND DIGITAL TERRAIN MODELING (DTM)

1. Doucet shall prepare DGN files covering the specific work location, meeting the county and TxDOT standards and specifications.
2. Doucet shall prepare DTM files covering the specific work location, meeting the county and TxDOT standards and specifications.
3. Doucet shall provide DGN and DTM/TIN files on a medium and in a format acceptable to the County.
4. The County's Photogrammetry Mapping Legend as supplemented by Doucet.

OTHER DELIVERABLES

1. Provide Topographic survey in .dgn file format.
2. Provide Profile in .dgn file format, including utilities. Use Horizontal scale 1"= 40' and Vertical scale 1"=10'.
3. Provide ASCII point text file.
4. Provide word file with Benchmark and Temporary benchmark information.
5. Survey Control Index Sheet, Horizontal and Vertical Control Data Sheets.
6. Provide Utility company contacts list.
7. Latest Aerial image files (if available)
8. Provide topographic survey in pdf format in 11"x17" size.
9. Provide available record drawings for the project.

CADD STANDARDS

1. All objects shall have color and line weight setting as "by layer".
2. No objects shall be in layer "0".

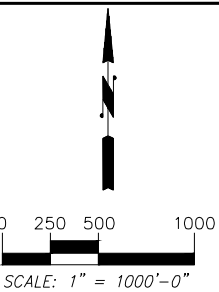
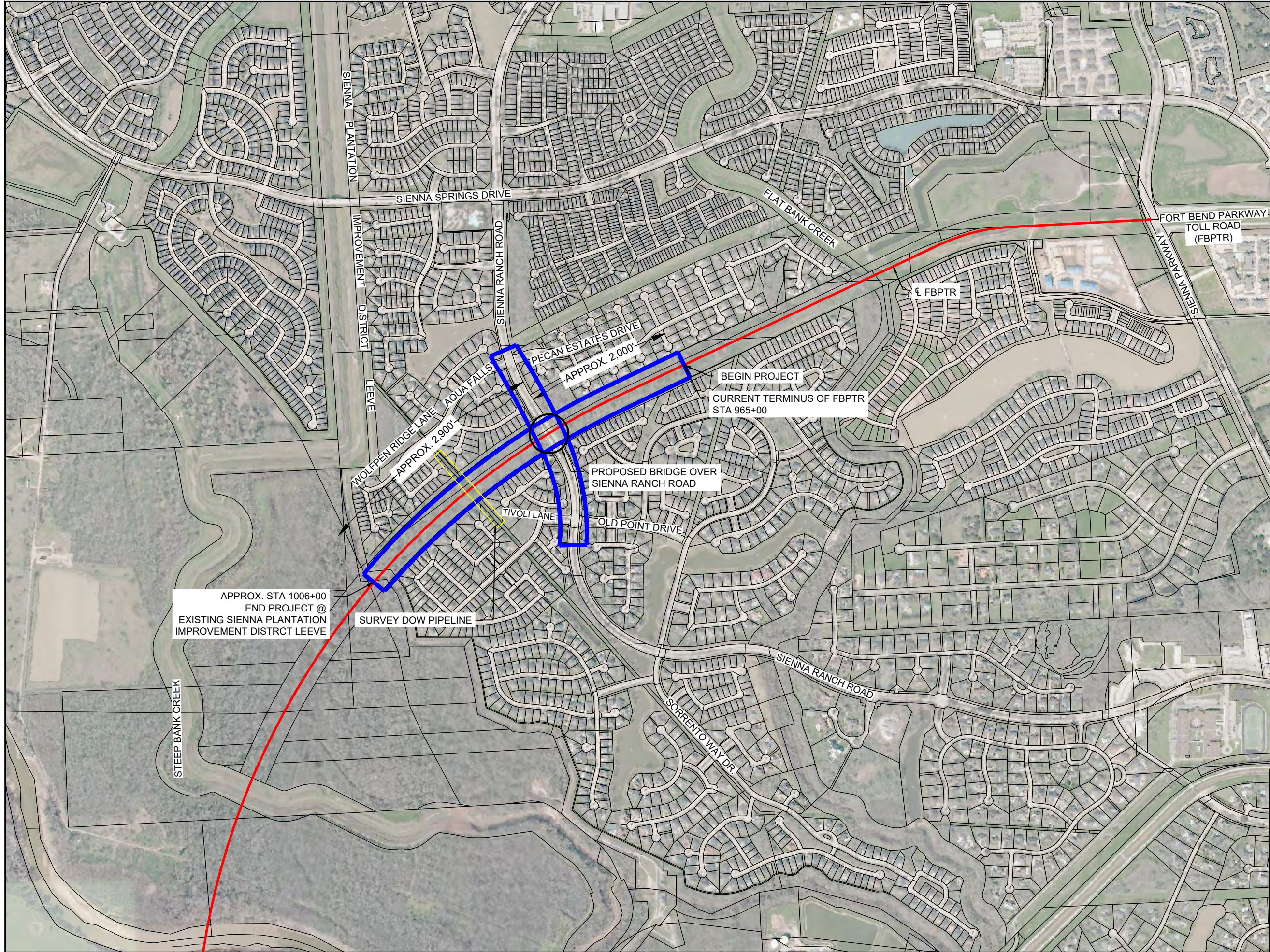


DOUCET

3. Provide a list/description of all abbreviations used on the survey.
4. Provide Legend of the Survey objects.
5. All text shall be separated from object layer. Example layer names "storm", "storm-text"
6. All text size shall be legible to 1:40 scale drawing. The rotation of text shall be according to the baseline stationing in ascending order from left to right in plan sheet.
7. Use latest Fort Bend County Toll Road Authority (FBCTRA) CADD standards.
8. Provide Topographic survey in .dgn file format.
9. Provide Profile in .dgn file format. Use Horizontal scale 1"=40' and Vertical scale 1"=10'.
10. Provide Digital Terrain Model (DTM) for the project limits.
11. Provide ASCII point text file.
12. Provide word file with Benchmark and Temporary benchmark information.
13. Provide Utility company contacts list.
14. Latest Aerial image files (if available)
15. Provide topographic survey in pdf format in 11"x17" size.
16. Provide Survey Control Index sheets, signed and sealed by Registered Professional Land Surveyor in pdf format and in 11"x17" size.
17. Provide Right of Way Map, signed and sealed by RPLS in pdf format in 11"x17" size.
18. Provide Survey Control Data Sheet (Horizontal and vertical control data), signed and sealed by RPLS in pdf format in 11"x17" size.

ASSUMPTIONS

- This proposal only includes those items identified in the scope of services above. Any work requested by the Project Team not identified herein shall be considered outside of scope, and shall require approval of a written work scope change order, prior to proceeding with any work.
- Additional services required by the Client that are not outlined above, will be billed to Client based on written amendments to this contract.



LEGEND

- PROJECT LIMITS
- EXISTING PARCELS
- FBPTR (APPROX. LOCATION)

SOURCE/DISCLAIMER:
AERIAL IMAGERY: 2021 AERIAL IMAGERY FROM AUTOCAD MICROSOFT BING MAPS DOWNLOAD DATE JULY 06, 2021.
EXISTING PARCELS: FORT BEND COUNTY YEAR 2020 PARCELS SHP FILE DOWNLOAD DATE JANUARY 22, 2021.

**EXTENSION OF FORT BEND PARKWAY
TOLL ROAD FROM APPROX. 1,600 FEET
EAST OF SIENNA RANCH ROAD TO
SIENNA PLANTATION IMPROVEMENT
DISTRICT LEEVE**

PROJECT LOCATION MAP



GC ENGINEERING, INC.
3505 PARK AVE.
PEARLAND, TEXAS 77581
Phone: (281) 412-7008
FAX: (281) 412-4623

FIGURE 1

MAY 8, 2023

August 21, 2023

A. Mahendra Rodrigo, PE
GC Engineering, Inc.
2505 Park Avenue
Pearland, Texas 77581

**PROPOSAL FOR PROFESSIONAL SERVICES
FORT BEND COUNTY-EXTENSION OF FORT BEND PARKWAY TOLL ROAD FROM
APPROXIMATELY 1,600 FEET EAST OF SIENNA RANCH ROAD TO SIENNA PLANTATION
IMPROVEMENT DISTRICT LEVEE DISTRICT WITHIN FORT BEND COUNTY, TEXAS**

Dear Mr. Rodrigo:

Per your request for an update proposal combining the services outlined in the original proposal and the supplemental proposal, Blackline Engineering, LLC ("BLACKLINE") is pleased to submit this Proposal for Professional Services ("Proposal") to GC Engineering, Inc. ("Client") for professional services related to the Fort Bend County-Extension of Fort Bend Parkway Toll Road from approximately 1,600 feet east of Sienna Ranch Road to Sienna Plantation Improvement District Levee District (SPLID) within Fort Bend County ("County"), Texas. BLACKLINE's understanding of the project, scope of services, schedule, and fee are presented below.

PROJECT UNDERSTANDING

WHEREAS, Client desires to enter into an agreement for the performance by BLACKLINE of services related to the preliminary drainage design of portions of the project (as outlined below).

BLACKLINE ENGINEERING SERVICES

Preliminary Drainage Design

1. The outfall for the storm drainage system design will discharge to Flat Bank Creek located to the east.
2. Storm water detention is not required for the project due to the fact that Fort Bend County Toll Road (FBCTR) Right-of-Way (ROW) is already incorporated in the Master Drainage Plan.
3. Drainage approvals will be obtained from the Fort Bend County Drainage District (FBCDD) and SPLID.
4. Drainage Impact Analysis (DIA) will not be required.
5. Conduct field trips to the project site to investigate and confirm data and assumptions and assess general drainage conditions as needed.
6. Provide schematic drainage analysis and support service to Prime Engineer, GC Engineering, Inc., including preparation of schematic analysis of existing conditions, investigation of drainage requirements in accordance to Atlas 14 criteria, conceptual design analysis of storm sewer and inlets, and preparation conceptual drainage area maps.
7. Conduct feasibility analysis of sidewalk and alternatives at Sienna Ranch Road.

8. Drainage calculations shall be prepared to provide for the ultimate roadway section. At a minimum the drainage items to be provided shall include the drainage area maps showing the drainage areas and inlet and storm sewer calculations for revised storm sewer flow elements. All drainage designs shall be prepared to conform to TxDOT and FBCTRA requirements.
9. Design and analyze the Eastbound & Westbound systems (including the existing system) will be calculated utilizing GEOPAK.
10. Drainage system design will be completed depicting locations of inlets, manholes, storm sewers, culverts, utilities, channel improvements, and ditch locations with flow lines as required.

Final Drainage Design

1. Blackline will revise/update the preliminary drainage design previously performed for the project per Texas Department of Transportation (State), Fort Bend County (County), and Fort Bend County Drainage District (FBCDD) design criteria and requirements.
2. Blackline will prepare a single drainage study and report for the project area. The report shall be divided into two phases:

The first phase will include the following items:

- a. Profile of natural ground along each proposed grade line of the roadway (by others).
 - b. Profile of tentative proposed grade line of the roadway with the assistance of the Client (by others).
 - c. Profile of the existing roadways that cross and connect the proposed roadway (by others).
 - d. Identify the existing drainage outfalls, and any other existing improvements that impact the proposed roadway including, but not limited to pipeline crossings or any other public/private utilities.
 - e. Identify the names of existing creeks, bayous and/or ditches within the project limits.
3. These profiles will be superimposed on a drawing along with the 2, 5, 10, 25, 50, and 100 year water surface elevations. The profile drawing will provide an overall view of the roadway/existing ground elevations with respect to the various storm design frequencies for the length of the project. This will enable Client, the County, FBCDD, and State to determine the most feasible proposed roadway profile. These profiles shall be submitted to the Client, the County, FBCDD, and State and approved before continuing with the preparation of the drainage report.

The second phase will include the following items:

1. Manhole head losses are to be computed as per the Client, the County, FBCDD, and State's direction. Also, THYSYS (WINSTORM) computations are not needed for hydraulic grade line investigations. The head losses will be computed with a pressure flow equation generally applicable to pipe running full flow. A hydraulic grade line starting at the outfall channel will be determined for each storm sewer system in order to obtain a design tailwater for each existing system. The design tailwater will be the starting basis for the design of the proposed storm sewer system.
2. For drainage areas, Blackline will limit the outfalls into storm sewer to existing capacity flows, which will be determined by Blackline. Alternative flow routes, if feasible, will be looked into for relieving storm sewer overload.

3. Drainage areas and flows for cross culvert drainage systems will be determined as part of the drainage report. Once determined, the sizing of the drainage crossings, hydrologic and hydraulics information will be provided to the State.
4. Blackline will prepare a report signed, sealed and dated by a registered/licensed engineer and shall include the preliminary findings of the storm sewer capacities and requirement for line rerouting. The report will also include preliminary sizing of the trunkline for the proposed gravity storm sewer within the limits of the project, conceptual and generic discussions of the alternatives considered, a comparative cost associated with each alternative and a recommended solution.
5. Recommendations at this point shall be generic and conceptual in nature, mainly for discussions with the State and the local government entities.

Guideline approach to the 100-year impact analysis:

An impact analysis is required on bayous, creeks and ditches as related to the County, FBCDD, and State criteria.

The State required approach for impact prediction is as follows:

- Drainage areas for the existing and proposed conditions.
- The Engineer will identify the existing drainage outfalls.
- Compute right of way corridor 100-year flood plain volumes for existing and proposed roadway elevations. A decrease in 100-year flood plain volumes is not allowed by the County, State or other governmental agencies, without adequate offsite mitigation.
- Compute existing and proposed peak flows by using hydraulics and hydrologic methodology and computer models.
- Analyze existing and proposed drainage system and quantify the increase in 100-year peak flows resulting from the roadway improvements.
- Hand calculations shall be provided which quantify the cut and fill within the 100-year flood plain, if any occur.
- Prepare conceptual 100-year sheet flow analysis for project utilizing existing and proposed conditions.
- Obtain current hydrologic and hydraulic computer models from government agencies and review and comment on the models.
- Current models will be updated to existing condition using the available State aerial photographs, and submitted to governmental agencies as the revised existing condition model.
- Analyze proposed roadway and outfall drainage improvements to quantify impacts to revised existing condition model.
- This contract does not include the detailed design of outfall improvements outside of the right of way, except for ditch outfall transitions of cross drainage culvert structures to the existing ditch. Furthermore, detention storage computations and mitigation volume for the 100-year storm will not be part of the scope and can be done as additional services, if requested.



Ref: iGET-231136-R0

August 29, 2023

Mahendra Rodrigo, PE
GC Engineering, Inc.
2505 Park Avenue Pearland,
Texas 77581

Sub: Lump Sum Proposal from iGET Services LLC for Culvert and Storm Sewer Design and Preparation of Drainage Plans for the Extension of Fort Bend Parkway Toll Road (FBPTR) Segment B-2

Dear Mahindra,

Per our discussions, and your email dated 8/23/2023, iGET Services LLC is pleased to provide the lump sum proposal for the Culvert and Storm Sewer Design Tasks, and preparation of Drainage Plans for the Extension of FBPTR Segment B-2, to serve approximately 4,000 lft of the roadway corridor.

PROJECT UNDERSTANDING

1. The outfall for the storm drainage system will discharge to Flat Bank Creek located to the east.
2. Storm water detention is not required for the project due to the fact that Fort Bend County Toll Road (FBCTR) Right-of-Way (ROW) is already incorporated in the Master Drainage Plan.
3. Drainage approvals will be obtained from the Fort Bend County Drainage District (FBCDD) and SPLID.
4. Conduct field trips to the project site to investigate and confirm data and assumptions and assess general drainage conditions as needed.
5. Design and analyze the Eastbound & Westbound systems (including the existing system).
6. Drainage system design will be completed depicting locations of inlets, manholes, storm sewers, culverts, utilities, channel improvements, and ditch locations with flow lines as required.
7. Drainage Report for the project will be performed by Blackline Engineering, LLC (BLAE). BLAE's drainage report will be utilized for the drainage design.
8. The Roadway Plan & Profile (P&P) drawings will be provided by the Prime Consultant, GC Engineering, for the storm sewer design.
9. FBPTR Project's storm sewer will be connected to the 48" storm sewer line already constructed as part of the Toll Road extension project east of Sienna Ranch Road (SRR) (Segment B).

iGET'S SCOPE OF DESIGN EFFORT

The following Drainage Design scope is envisaged:

- a. **Culvert and Storm Sewer Design** – iGET will develop design details that minimize the interference with the passage of traffic or incur damage to the highway and local property. Provide layouts, drainage area maps, and design of drainage components. Design all conventional storm drainage and cross drainage in conformance with the latest edition of State's Hydraulic Manual, FBCDD criteria, and any specific guidance provided by the Client. Storm drain design shall be performed using WinStorm. Cross drainage design shall be performed using HEC-RAS.
 - i. Cross-Drainage Structures - iGET will Determine drainage areas and flows for cross culvert drainage systems. iGET will determine the sizing of the drainage crossings. The scope may include extending, adjusting, or replacing non-bridge-class culvert crossing or crossings. iGET will develop designs that minimize the interference with the passage of traffic or cause damage to the highway and local property in accordance with the State's Hydraulic Design Manual, District criteria and any specific guidance provided by the State. Cross drainage design will be performed using HEC- RAS.
 - ii. Temporary drainage facilities – iGET will develop plans for temporary drainage facilities necessary to allow staged construction of the project and to conform with the phasing of adjacent construction projects without significant impact to the hydraulic capacity of the area. Drainage area maps will not be required for temporary drainage.
- b. **Preparation of Drainage Plans** – iGET will perform the following:
 - i. Identify areas requiring trench protection, excavation, shoring and de-watering.
 - ii. Prepare drainage area maps.
 - iii. Prepare plan/profile sheets for storm drain systems and outfall ditches.
 - iv. Select standard details from the Client, State or District's list of standards for items such as inlets, manholes, junction boxes and end treatment, etc.
 - v. Prepare details for non-standard inlets, manholes and junction boxes
 - vi. Prepare drainage details for outlet protection, outlet structures and utility accommodation structures.
 - vii. Prepare drainage details for bridge drainage system.
 - viii. Prepare drainage facility quantity summaries.
 - ix. Design around utility conflicts, wherever possible.

- x. Take into consideration pedestrian facilities, utility impacts, driveway grades, retaining wall and concrete traffic barrier drainage impacts.
- xi. Identify existing ground elevation profiles at the ROW lines on storm sewer plan and profile sheets.
- xii. Develop drainage design that minimizes the interference with the passage of traffic or cause damage to the highway and local property in accordance with the State's Hydraulic Design Manual, District criteria and any specific guidance provided by the State.
- xiii. Determine hydraulic grade line starting at the outfall channel for each storm drain design. Use the design water surface elevation of the outfall as the starting basis (tailwater) for the design of the proposed storm sewer system.

Drainage plans may include the following:

- i. Prepare Overall Drainage Area Watershed Maps from H&H Analysis
 - ii. Drainage Area Map
 - iii. Hydraulic Calculations
 - iv. Storm Sewer Plan & Profile (1"=100'H; 1"=10'V)
 - v. Storm Sewer Plan & Profile (Sienna Ranch Road) (1"=100'H; 1"=10'V)
 - vi. Storm Sewer Laterals
 - vii. Junction Box Details
 - viii. Drainage Standard Details
 - ix. Development of Non-Standard Structure Details
 - x. Coordination, Submittals, Responses, Mtgs, on Final Drainage Plans Approvals by FBCDD
 - xi. Drainage Plans Quantities and Estimates
- c. **Layout, Structural Design and Detailing of Drainage Features** – iGET will develop layouts for the following:
- i. Culverts: New culverts; culvert replacement.
 - ii. Storm Sewers: New or modified storm sewers; inlets; manholes; trunk lines.
 - iii. Incorporate subsurface drainage at retaining walls, to be done by others.
 - iv. Outfall channels within existing ROW.
 - v. Prepare storm sewer plan/profile drawings and special plan details, as needed, for the storm sewer system, laterals, junction boxes, etc. Identify and resolve potential utility conflicts during project design. Notify the Client as soon as any utility conflicts are determined for assistance.
 - vi. Use standard details where appropriate.



Excellence in Engineering, Consulting, Testing and Inspection

August 21, 2023

**GC Engineering, Inc.
2505 Park Avenue
Pearland, Texas 77581**

Attn: Mr. Chandi S. Rodrigo, P.E.

**Re: Proposal
Geotechnical Investigation
Proposed Fort Bend Parkway Toll Road Extension Project
1,600 Feet East of Sienna Ranch Road to the Sienna Plantation
Improvement District Levee
Retaining Walls
Fort Bend County, Texas**

HTS Proposal No.: 23-00160

Dear Mr. Rodrigo:

1.0 INTRODUCTION

HTS, Inc. Consultants (HTS) appreciates the opportunity to present this proposal to GC Engineering, Inc. (GCE) to perform a geotechnical verification study for the design and construction of the retaining walls proposed for the Fort Bend Parkway Toll Road Extension Project in Fort Bend County, Texas.

Based on the information provided, HTS understands that the project is currently under a detailed design phase. The purpose of this geotechnical study will be to verify the external and global stability of the proposed retaining walls for both approach slab and sidewalks based on the final wall configuration proposed for this project.

HTS performed a geotechnical investigation for the proposed project as per the HTS Proposal No. 21-05014 Revision 5 and the investigation reports were issued in 2022. HTS will utilize the subsurface soil information from the borings and laboratory testing completed for the previous study completed by HTS.

The remaining portions of this proposal present the proposed work scope, estimated costs, and an estimated schedule to provide geotechnical engineering services.

2.0 SCOPE OF WORK

The geotechnical study will be performed in accordance with the TxDOT and Fort Bend County Toll Road Authority requirements.

The scope of the verification study will include:

- Review drawings for the proposed retaining walls.
- Perform bearing capacity, settlement analyses (including time rate of settlement), and external stability analyses for the proposed retaining walls for both approach slab and sidewalks.
- Perform Global Stability Analyses for the proposed retaining walls for both approach slab and sidewalks.
- Submit a pdf file of the geotechnical verification study for further distribution at your discretion.

Note: Hard copies of the report will be provided upon request at an additional cost of \$30.00 per report.

3.0 COST AND SCHEDULE

HTS' estimated lump sum cost to complete the scope of work for the task described above is \$19,060.00. The estimated cost is provided in the attached Cost Estimate.

Total time to complete the geotechnical verification study and issuance of the report will be between 12 to 15 business days.

4.0 CLOSING REMARKS

We appreciate having the opportunity to present this proposal to GCE and look forward to being of service to you. Should you have any questions or require additional information, please do not hesitate to contact me at your convenience.

Respectfully submitted,

HTS, Inc. Consultants



Jubair Hossain, Ph.D., P.E.
President

Attachment: Cost Estimate

JH:rg

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ATTACHMENT B-1
(COMPENSATION - LUMP SUM)
Fort Bend Parkway Toll Road: Segment B-3
Approx 1600' East of Sienna Ranch Road to Sienna District Levee
FBCTRA Project No. 101-1028

Task Description	GC Engineering, Inc.	Doucet & Associates, Inc	Blackline Engineering, LLC	iGET Services, LLC	HTS, Inc.	Total
TOTAL	\$ 1,305,948.00	\$ 104,000.00	\$ 76,800.00	\$ 144,825.00	\$ 19,060.00	\$ 1,650,633.00

FUNCTION CODE 102 - FEASIBILITY STUDIES	\$28,026					\$28,026
FUNCTION CODE 130 – RIGHT-OF-WAY DATA	\$44,897	\$46,000				\$90,897
ROW Plans	\$4,600	\$46,000				
Utility Layout / Utility Coordination	\$40,297					
FUNCTION CODE 145 – MANAGING CONTRACTED	\$49,480					\$49,480
FUNCTION CODE 160 - ROADWAY DESIGN	\$1,176,725	\$58,000	\$76,800	\$144,825	\$19,060	\$1,475,410
1) Field Survey	\$5,800	\$58,000				
2) Roadway Design Controls	\$355,888					
3) Drainage						
A. Drainage Report	\$7,680		\$76,800			
B. Drainage Design	\$14,483			\$144,825		
4) Signing and Pavement Marking and Signalization (Permanent)	\$71,848					
5) Traffic Management Systems (ITS)	\$14,744					
6) Miscellaneous (Roadway)						
A. Retaining Wall Design	\$75,808					
Global Stability Analysis	\$1,906				\$19,060	
B. Traffic Control Plan, Detours, Sequence of Construction	\$53,696					
C. Illumination	\$42,776					
D. Storm Water Pollution Prevention Plans (SW3P)	\$21,448					
7) Preparation and Submittal of PS&E	\$292,696					
8) Bridge Design	\$217,952					
Direct Expenses						
1. Printing, Repro and Plotting (B/W Copies @ \$0.20/ea)	\$2,200					
2. Color Printing and Photocopying						
A. (8 1/2" x 11") (\$0.75/ea)	\$400					
B. (11" x 17") (\$1.50/ea)	\$1,300					
3. Roll Plots (\$20)(3'X8')	\$600					
5. Mileage (\$0.57/mile)	\$855					
6. Deliveries (At Cost)	\$600					
7. TDLR Inspection and Approval (Accessibility Check)	\$865					
ESTIMATED TOTAL DIRECT EXPENSES	\$6,820					



**Professional Engineering Services for Preliminary and Final Engineering Design for
Extension of Fort Bend Parkway Toll Road (FBPTR) from approximately 1,600 feet east of
Sienna Ranch Road (SRR) to Sienna Plantation Improvement District Levee
Fort Bend County Toll Road Authority (FBCTRA), Fort Bend County, Texas
Project Budget**

Task Description	Principal	Project Manager	Project Engineer	Civil Engineer	CAD Technician	Clerical	Total Man Hrs	Direct Labor	Subconsultant Coordination	Subs	Total
Rate	260	224	158	122	108	65					
<u>FUNCTION CODE 102 - FEASIBILITY STUDIES</u>											
1)Data Collection and Field Reconnaissance											
Obtain & Review Existing plans, documents, etc.		8	14	20	16		58	\$8,172			\$8,172
Conduct Field Reconnaissance	2	8	20	20	20		70	\$10,072			\$10,072
Data Collection Subtotal	2	16	34	40	36	0	128	\$18,244	\$0	\$0	\$18,244
2)Project kick-off meeting											
Project kick-off meeting	2	4	4			2	12	\$2,178			\$2,178
Project kick-off meeting Subtotal	2	4	4	0	0	2	12	\$2,178	\$0	\$0	\$2,178
3)Develop Roadway, Bridge, and Hydraulic Design Criteria											
Develop Project Design Criteria	2	4	16	30			52	\$7,604			\$7,604
Project Design Criteria Subtotal	2	4	16	30	0	0	52	\$7,604	\$0	\$0	\$7,604
FUNCTION CODE 102 Subtotal	6	24	54	70	36	2	192	\$28,026	\$0	\$0	\$28,026
<u>FUNCTION CODE 130 – RIGHT-OF-WAY DATA</u>											
1)Right-of-Way (ROW) Map											
ROW Plans (Doucet & Assoc., Inc.)							0	\$0		\$46,000	\$46,000
ROW survey Coordination							0	\$0	\$4,600		\$4,600
ROW Map Subtotal	0	0	0	0	0	0	0	\$0	\$4,600	\$46,000	\$50,600
2)Utility Layout / Utility Coordination											
Utility Inventory and Utility Layout and Utility Conflict Table Preparation	1	8	40	54	54		157	\$20,792			\$20,792



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Task Description	Principal	Project Manager	Project Engineer	Civil Engineer	CAD Technician	Clerical	Total Man Hrs	Direct Labor	Subconsultant Coordination	Subs	Total
Rate	260	224	158	122	108	65					
Utility Coordination	1	8	24	30	20		83	\$11,664			\$11,664
Design and coordinate proposed electrical meter connection (Service Outlet Locations (SOLs)).		4	12	8	4		28	\$4,200			\$4,200
Utility Coordination Meetings (2 meetings)	2	8	8			1	19	\$3,641			\$3,641
Utility Layout / Utility Coordination Subtotal	4	28	84	92	78	1	287	\$40,297	\$0	\$0	\$40,297
FUNCTION CODE 130 Subtotal	4	28	84	92	78	1	287	\$40,297	\$4,600	\$46,000	\$90,897
<u>FUNCTION CODE 145 – MANAGING CONTRACTED</u>											
1)Project Management											
Provide General Coordination	2	16	30	48	30		126	\$17,940			\$17,940
Monthly Progress Report (12 Month Duration)	2	12	12				26	\$5,104			\$5,104
Prepare and Maintain Project Schedule	2	6	20				28	\$5,024			\$5,024
Attend Coordination Meetings Once a Month for 12 Months (12 Meetings)	4	36	36			16	92	\$15,832			\$15,832
Prepare Meeting Minutes (12 Meetings)		6	12			36	54	\$5,580			\$5,580
FUNCTION CODE 145 Subtotal	10	76	110	48	30	52	326	\$49,480	\$0	\$0	\$49,480



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Project Budget**

Task Description	Principal	Project Manager	Project Engineer	Civil Engineer	CAD Technician	Clerical	Total Man Hrs	Direct Labor	Subconsultant Coordination	Subs	Total
Rate	260	224	158	122	108	65					
FUNCTION CODE 160 - ROADWAY DESIGN											
1)Field Surveying and Photogrammetry											
Field Survey (Doucet & Assoc., Inc.)							0	\$0		\$58,000	\$58,000
Field survey Coordination							0	\$0	\$5,800		\$5,800
Field Surveying and Photogrammetry Subtotal	0	0	0	0	0	0	0	\$0	\$5,800	\$58,000	\$63,800
2)Roadway Design Controls											
<u>A.Geometric Design</u>											
Prepare Geometric Project Layout	2	12	24	36	90		164	\$21,112			\$21,112
Meeting to finalize the design layout	1	4	4				9	\$1,788			\$1,788
Geometric Design Subtotal	3	16	28	36	90	0	173	\$22,900	\$0	\$0	\$22,900
<u>B.Roadway Design</u>											
Title Sheet (1 sheet)	1	2	4	4	8		19	\$2,692			\$2,692
Index of Drawings (3 sheets)	1	6	10	16	20		53	\$7,296			\$7,296
Project Layout (3 sheets)	1	6	12	24	26		69	\$9,236			\$9,236
Legend, Abbreviations, Key Notes (1 sheet)	1	4	6	10	12		33	\$4,620			\$4,620
Typical Sections (6 sheets)	2	16	30	72	80		200	\$26,268			\$26,268
Summary of Quantities (15 sheets)	2	24	60	120	120		326	\$42,976			\$42,976
Horizontal and Vertical Control Sheets (4 sheets)	1	4	8	20	24		57	\$7,452			\$7,452
Alignment Data Sheet (2 sheets)	1	4	8	16	20		49	\$6,532			\$6,532
Plan & Profile (Mainlanes, length 4,200') (1"=100'H; 1"=10'V) (5 Sheets)	3	20	40	80	120		263	\$34,300			\$34,300

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**Professional Engineering Services for Preliminary and Final Engineering Design for
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Project Budget**

Task Description	Principal	Project Manager	Project Engineer	Civil Engineer	CAD Technician	Clerical	Total Man Hrs	Direct Labor	Subconsultant Coordination	Subs	Total
Rate	260	224	158	122	108	65					
Plan & Profile (Ramps, 2@1,000' each) (1"=100'H; 1"=10'V) (2 Sheets)	2	8	24	60	72		166	\$21,200			\$21,200
Plan & Profile (SRR intersection) (1"=100'H; 1"=10'V)(2 Sheets)	1	8	30	48	40		127	\$16,968			\$16,968
Sight Triangels at Sienna Ranch Road	1	4	12	20	24		61	\$8,084			\$8,084
Roadway Cross Sctions (10 sheets)	3	32	72	110	120		337	\$45,704			\$45,704
Roadway Quantities and Summary Sheets	4	24	48	80	120		276	\$36,720			\$36,720
Removal Layout (1"=50') (2 Sheets)	1	6	12	20	24		63	\$8,532			\$8,532
Superelevation Data (1 Sheet)	1	4	6	12	18		41	\$5,512			\$5,512
Roadway Standard Details (30 Sheets)		4	8	20	26		58	\$7,408			\$7,408
Miscellaneous Details (3 Sheets)	1	2	6	20	20		49	\$6,256			\$6,256
Aesthetic Details (2 Sheets)	1	4	6	20	16		47	\$6,272			\$6,272
Soil Boring Log Plans		4	12	30	30		76	\$9,692			\$9,692
Roadway Design Subtotal	28	186	414	802	940	0	2,370	\$313,720	\$0	\$0	\$313,720
C.Sidewalk Design – Sidewalks along Sienna Ranch Road											
Sidewalk Design Plans (2 sheets)	1	6	20	40	60		127	\$16,124			\$16,124
Sidewalk Details (1 sheet)		1	4	8	8		21	\$2,696			\$2,696
TDLR Inspection and Approval (Accessibility Check)		2					2	\$448		\$865	\$1,313
Sidewalk Design Subtotal	1	9	24	48	68	0	150	\$19,268	\$0	\$865	\$20,133
Roadway Design Controls Subtotal	32	211	466	886	1,098	0	2,693	\$355,888	\$0	\$865	\$356,753



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Project Budget**

Task Description	Principal	Project Manager	Project Engineer	Civil Engineer	CAD Technician	Clerical	Total Man Hrs	Direct Labor	Subconsultant Coordination	Subs	Total
Rate	260	224	158	122	108	65					
3)Drainage											
<u>A.Drainage Report</u>											
Drainage Report (Blackline Engineering, LLC)							0	\$0		\$76,800	\$76,800
Drainage Report Coordination							0	\$0	\$7,680		\$7,680
Drainage Report Subtotal	0	0	0	0	0	0	0	\$0	\$7,680	\$76,800	\$84,480
<u>B. Drainage Design</u>											
Drainage Design (iGET Services)							0	\$0		\$144,825	\$144,825
Drainage Design Coordination							0	\$0	\$14,483		\$14,483
Drainage Design Subtotal	0	0	0	0	0	0	0	\$0	\$14,483	\$144,825	\$159,308
Drainage Subtotal	0	0	0	0	0	0	0	\$0	\$22,163	\$221,625	\$243,788
4)Signing and Pavement Marking and Signalization (Permanent)											
<u>A.Signing and Pavement Marking</u>											
Signing and Pavement Marking Layout (1"=100') (8 Sheets)	1	20	30	64	72		187	\$25,064			\$25,064
Traffic Standard Details (20 Sheets)		8	20	40	20		88	\$11,992			\$11,992
Signing, Pavement Marking Subtotal	1	28	50	104	92	0	275	\$37,056	\$0	\$0	\$37,056
<u>B.Sienna Ranch Road (SRR) Intersection Traffic Signal Modification</u>											
Traffic Signal Modification Plans (4 Sheets)	2	30	48	84	90		254	\$34,792			\$34,792
Signal Modification Subtotal	2	30	48	84	90	0	254	\$34,792	\$0	\$0	\$34,792
Signing and Pavement Marking Subtotal	3	58	98	188	182	0	529	\$71,848	\$0	\$0	\$71,848



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Fort Bend County Toll Road Authority (FBCTRA), Fort Bend County, Texas
Project Budget**

Task Description	Principal	Project Manager	Project Engineer	Civil Engineer	CAD Technician	Clerical	Total Man Hrs	Direct Labor	Subconsultant Coordination	Subs	Total
Rate	260	224	158	122	108	65					
5)Traffic Management Systems (ITS)											
Design and prepare ITS Plans (5 sheets)	2	4	16	32	40		94	\$12,168			\$12,168
ITS Standard Details (4 Sheets)		2	8		8		18	\$2,576			\$2,576
Traffic Management Systems (ITS) Subtotal	2	6	24	32	48	0	112	\$14,744	\$0	\$0	\$14,744
6)Miscellaneous (Roadway)											
<u>A. Retaining Wall Design</u>											
Retaining wall Alignment Data (2 Sheets)	1	4	12	20	20		57	\$7,652			\$7,652
Design Retaining Walls	1	6	12	24	8		51	\$7,292			\$7,292
Global Stability Analysis (HTS Consultants)							0	\$0	\$1,906	\$19,060	\$20,966
Retaining wall Plan & Profile (1"=100') (5,120' long) (6 locations) (6 Sheets)	3	16	36	100	116		271	\$34,780			\$34,780
Retaining wall Summary (1 Sheet)	1	6	6	16	16		45	\$6,232			\$6,232
Retaining wall Standard Details (6 Sheets)		4	8	20	24		56	\$7,192			\$7,192
Prepare Quantities	1	8	12	36	40		97	\$12,660			\$12,660
Retaining Wall Design Subtotal	7	44	86	216	224	0	577	\$75,808	\$1,906	\$19,060	\$96,774
<u>B. Traffic Control Plan, Detours, Sequence of Construction</u>											
Prepare Construction Staging Plan	1	2	8	12	8		31	\$4,300			\$4,300
Prepare Temporary Signal Phasing Plan on existing signals	1	4	10	8	16		39	\$5,440			\$5,440
Prepare Detour Plans	1	6	8	20	12		47	\$6,604			\$6,604



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Task Description	Principal	Project Manager	Project Engineer	Civil Engineer	CAD Technician	Clerical	Total Man Hrs	Direct Labor	Subconsultant Coordination	Subs	Total
Rate	260	224	158	122	108	65					
Prepare Provisions for Temporary Drainage Plan	1	8	12	6	16		43	\$6,408			\$6,408
TCP - Advance Warning Sign Layout (1 sheet)	1	4	6	20	16		47	\$6,272			\$6,272
TCP - Two phases at SRR (2 sheets)	1	10	12	48	50		121	\$15,652			\$15,652
TCP - Standard Details (18 sheets)		6	8	26	30		70	\$9,020			\$9,020
TCP, Detours, Sequence of Construction Subtotal	6	40	64	140	148	0	398	\$53,696	\$0	\$0	\$53,696
<u>C.Illumination</u>											
Preliminary Illumination Layout (1"=100') (5 Sheets)	1	8	20		48		77	\$10,396			\$10,396
Prepare Electric Conduit Plans	1	6	16		30		53	\$7,372			\$7,372
Prepare Electrical Circuit/Lighting Plans for SRR & Ramps.	4	12	80		40		136	\$20,688			\$20,688
Illumination Details (10 Sheets)		4	8		20		32	\$4,320			\$4,320
Illumination Subtotal	6	30	124	0	138	0	298	\$42,776	\$0	\$0	\$42,776
<u>D.Storm Water Pollution Prevention Plans (SW3P)</u>											
Storm Water Pollution Prevention Plan (1"=100') (6 Sheets)	1	8	20	60	54		143	\$18,364			\$18,364
Storm Water Pollution Prevention Details (4 Sheets)		3	6	12			21	\$3,084			\$3,084
SW3P Subtotal	1	11	26	72	54	0	164	\$21,448	\$0	\$0	\$21,448
Miscellaneous (Roadway) Subtotal	20	125	300	428	564	0	1,437	\$193,728	\$1,906	\$19,060	\$214,694



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Project Budget**

Task Description	Principal	Project Manager	Project Engineer	Civil Engineer	CAD Technician	Clerical	Total Man Hrs	Direct Labor	Subconsultant Coordination	Subs	Total
Rate	260	224	158	122	108	65					
7)Preparation and Submittal of PS&E											
30% Plan Submittal	8	60	140	200	176		584	\$81,048			\$81,048
60% Plan Submittal-Address 30% Plan Comments, Provide Responses and Submit 60% Construction Plans	8	64	120	160	140		492	\$70,016			\$70,016
90% Plan Submittal - Address 60% Plan Comments, Provide Responses and Submit 90% Construction Plans	6	54	84	100	100		344	\$49,928			\$49,928
Final Plan Submittal - Address 90% Plan Comments, Provide Responses and Submit Final Construction Plans	4	40	64	76	64		248	\$36,296			\$36,296
Prepare Engineers Construction Cost Estimate	4	36	62	76	64		242	\$35,084			\$35,084
Prepare Specifications and General Notes	2	12	30	50		24	118	\$15,608			\$15,608
Update Utility Conflict Table		4	6	20	4		34	\$4,716			\$4,716
PS&E Subtotal	32	270	506	682	548	24	2,062	\$292,696	\$0	\$0	\$292,696
8)Bridge Design											
Bridge Layout (1 Sheet)	1	8	24	20	16		69	\$10,012			\$10,012
Design Calculations	6	30	100	120	90		346	\$48,440			\$48,440
Bridge Quantities & Bearing Seat Elevations (1 Sheet)	1	8	24	36	24		93	\$12,828			\$12,828
Bridge Foundation Layout (1 Sheet)	1	12	24	30	32		99	\$13,856			\$13,856
Beam / Girder Design	1	16	30	48	24		119	\$17,032			\$17,032
Bridge Abutment Plan & Details (Abutment 1 & 4) (4 Sheets)	2	20	30	60	66		178	\$24,188			\$24,188
Bridge Bent Plan & Details (Bent 2 & 3) (4 Sheets)	1	20	30	70	64		185	\$24,932			\$24,932

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**Professional Engineering Services for Preliminary and Final Engineering Design for
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Task Description	Principal	Project Manager	Project Engineer	Civil Engineer	CAD Technician	Clerical	Total Man Hrs	Direct Labor	Subconsultant Coordination	Subs	Total
Rate	260	224	158	122	108	65					
Bridge Column Data (1 Sheet)	1	6	16	16	12		51	\$7,380			\$7,380
Bridge Framing Plan (2 Sheets)	1	8	20	32	30		91	\$12,356			\$12,356
Bridge Slab Plan & Details (4 Sheets)	1	12	30	60	66		169	\$22,136			\$22,136
Bridge Standard Details (24 Sheets)		16	20	36	30		102	\$14,376			\$14,376
Bridge Quantities Summary	1	6	8	30	36		81	\$10,416			\$10,416
Bridge Design Subtotal	17	162	356	558	490	0	1,583	\$217,952	\$0	\$0	\$217,952
FUNCTION CODE 160 Subtotal	106	832	1,750	2,774	2,930	24	8,416	\$1,146,856	\$29,869	\$299,550	\$1,476,275
Total Direct Labor	126	960	1,998	2,984	3,074	79	9,221	\$1,264,659	\$34,469	\$345,550	\$1,644,678



10190 Katy Freeway, Suite 110
Houston, Texas 77043
Office: 346.250.4425
Fax: 512.583.2601

Doucetengineers.com
TBPLS Firm No. 10194551

May 9, 2023

Chandi S. Rodrigo, P.E.
GC Engineering, Inc.
2505 Park Avenue
Pearland, TX 77581
Ph: (346) 773-4406
Fax: (281) 412-4623

Re: FBCTRA-Extension of Fort Bend Parkway Toll Road (FBPTR) Survey Fee

Dear Ms. Rodrigo,

Doucet & Associates, Inc. ("Doucet") is pleased to submit this fee proposal for Geospatial services for the above referenced project.

PROJECT

It is our understanding that GC Engineering, Inc. (client) is requesting a right-of-way and design survey for Extension of Fort Bend Parkway Toll Road located Fort Bend County, Texas.

COMPENSATION

Client will pay Doucet for the Services in accordance with the associated scope of services of even date:

Description	Basis of Payment	Estimated Fee
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I. Geospatial

A. Task 1 -Function Code 130 -Right-of-Way Data (Task 704)	Lump Sum	\$	46,000.00
B. Task 2 – Function Code 160 – Roadway Design Survey (Task 705)	Lump Sum	\$	58,000.00
	Project Total:	\$	104,000.00

***Task 2 Fee includes assumed six (6) SUE Level "A" Test hole location at unit price of \$1,500.00/per test hole*

**ATTACHMENT 1 - DETAILED FEE BREAKDOWN
FORT BEND COUNTY TOLL ROAD AUTHORITY
FROM APPROX. 1,600-FT EAST OF SRR TO SPLID
BE PROJECT No.: 09300.0801.01**

TASK DESCRIPTION	PRINCIPAL	PROJECT MANAGER	PROJECT ENGINEER	GRADUATE ENGINEER	SENIOR DESIGNER	CAD TECH	ADMIN/ CLERICAL	TOTAL LABOR HRS. & COSTS
FC 161 - DRAINAGE								
REVISE/UPDATE PRELIMINARY DRAINAGE DESIGN	4							4
DATA COLLECTION	1	2		4				7
SCHEMATIC ANALYSIS OF EXISTING CONDITIONS AND INVESTIGATE DRAINAGE REQUIREMENTS	1	2		12				15
CONCEPTUAL DESIGN ANALYSIS STORM SEWER AND INLETS	2	8		24				34
CONCEPTUAL DRAINAGE AREA MAPS	1	2		8	4	24		39
FEASIBILITY ANALYSIS OF S/W AND ALTERNATIVES AT SIENNA RANCH ROAD	2	4		16	2	8		32
PRELIMINARY DRAINAGE REPORT (IF NECESSARY)	4	12		32	4	12		64
PHASE ONE								
PROFILE OF NATURAL GROUND ALONG EACH PROPOSED GRADE LINE OF THE ROADWAY (by others)								0
PROFILE OF PROPOSED GRADE LINE OF ROADWAY (by others)								0
PROFILE OF EXISTING ROADWAYS THAT CONNECT/CROSS PROPOSED ROADWAY (by others)								0
IDENTIFY EXISTING IMPROVEMENTS, CREEKS, BAYOUS, DITCHES, ETC.				8				8
PHASE TWO								
PROFILE WITH 2, 5, 10, 25, 50, & 100 YEAR WATER SURFACE ELEVATIONS		1	2	4		24		31
COMPUTE MANHOLE HEAD LOSSES, INCLUDING HYDRAULIC GRADE LINE		1	2	8				11
STORM SEWER DESIGN INCLUDING LIMITING OUTFALLS TO EXIST. FLOWS		1	2	24				27
DESIGN AND COMPUTE CULVERT CROSSINGS		1	2	16				19
DRAINAGE DETAILS		1	1			4		6
DRAINAGE STANDARD DETAILS		1	1			4		6
FINAL DRAINAGE STUDY REPORT								
ESTABLISH DRAINAGE AREAS FOR EXISTING AND PROPOSED CONDITIONS		1	1	24				26
IDENTIFY EXISTING DRAINAGE OUTFALL		1	1	6				8
COMPUTE EXIST. & PROPOSED R.O.W. CORRIDOR 100-YEAR FLOODPLAIN VOLUMES		1	1	8				10
COMPUTE EXIST. & PROPOSED PEAK FLOWS		1	1	8				10
CUT & FILL WITHIN 100-YEAR FLOODPLAIN		1	1	1				3
CONCEPTUAL SHEETFLOW ANALYSIS FOR EXIST. & PROPOSED CONDITIONS		1	1	8		8		18
OBTAIN AND REVIEW CURRENT H&H MODELS FROM AGENCIES FOR REVIEW AND COMMENT		4	1	16				21
UPDATE CURRENT MODELS WITH CURRENT EXIST. CONDITIONS		1	1	16				18
ANALYZE PROPOSED ROADWAY AND OUTFALL DRAINAGE IMPROVEMENTS TO QUANTIFY IMPACTS TO REVISED EXISTING		1	1	16				18
PREPARE FINAL DRAINAGE REPORT								
TEXT	2	1	4	32				39
TABLES		1	4	8				13
EXHIBITS		1	4	12		12		29
HOURS SUB-TOTALS	17	51	31	311	10	96	0	516
CONTRACT RATE PER HOUR	\$260.00	\$220.00	\$160.00	\$140.00	\$160.00	\$110.00	\$110.00	
TOTAL LABOR COSTS	\$4,420.00	\$11,220.00	\$4,960.00	\$43,540.00	\$1,600.00	\$10,560.00	\$0.00	\$76,300.00
% DISTRIBUTION OF STAFFING	3.29%	9.88%	6.01%	60.27%	1.94%	18.60%	0.00%	
REIMBURSIBLES (MILEAGE, TOLLS, COPIES, PRINTING, ETC.)								\$500.00
SUBTOTAL								\$76,800.00



APPENDIX – A

(Work Breakdown & Basis of Estimate)

Drainage Design for FBPTR Segment B-2 Fort Bend County, TX Prime Consultant: GC Engineering Sub Consultant: IGET Services, LLC August, 2023									
No. of Sheets	Description / Task	Estimated Manhours						Subtotal (hrs)	Subtotal (cost \$)
		Principal	Project Manager	Senior Design Engineer	QA/QC Engineer	EIT Designer	CAD Technician		
	Raw Salary	\$ 75.00	\$ 65.00	\$ 45.00	\$ 60.00	\$ 40.00	\$ 30.00		
	Raw Salary Multiplier (3.00)	\$ 225.00	\$ 195.00	\$ 135.00	\$ 180.00	\$ 120.00	\$ 90.00		
	Project Coordination								
	Project Meetings (6 + meetings)	4	12	6	0	12		34	\$ 5,490.00
	Site Visits		8	8	0	12		28	\$ 4,080.00
									\$ -
	Subtotal (hours) Project Coordination	4	20	14	0	24	0		-
	Subtotal (\$) Project Coordination	\$ 900.00	\$ 3,900.00	\$ 1,890.00	\$ -	\$ 2,880.00	\$ -		\$ 9,570.00
	Design Engineering								
	Culvert and Storm Sewer Design, Culvert Replacement	2	4	16	8	24		54	\$ 7,710.00
	Cross-Drainage Structures, Outfall Channels, and Details	2	8	16	8	16		28	\$ 7,530.00
	Temporary Drainage Facilities	2	8	16	8	16			\$ 7,530.00
	Preparation of Drainage Plans	2	4	8	2	16			\$ 4,590.00
	Structural Design, Retaining Walls (done by others)	2	8	16	2	16		44	\$ 6,450.00
	Utility Conflict Table and Coordination		1	8	2	12	4	27	\$ 3,435.00
	Prepare Specifications	1	2	8	2	16			\$ 3,975.00
	Prepare Construction Quantities / Opinion of Cost		4	8	4	8		24	\$ 3,540.00
	Subtotal (hours) Design Phase	11	39	96	36	124	4		-
	Subtotal (\$) Design Phase	\$ 2,475.00	\$ 7,605.00	\$ 12,960.00	\$ 6,480.00	\$ 14,880.00	\$ 360.00	239	\$ 44,760.00
	Construction Plans								
1	Index of Drawings, Legend & Abbreviations		1	2	1	4	8	16	\$ 1,845.00
2	General Notes		1	1	1	1	2	8	\$ 810.00
1	Overall Drainage Area Watershed Maps from H&H Analysis		1	4	1	4	8	18	\$ 2,115.00
6	Drainage Area Maps	1	6	36	8	36	72	159	\$ 18,495.00
6	Hdraulic Calculations		6	36	8	36	96	182	\$ 20,430.00
6	Storm Sewer Plan & Profile (1"=100'H; 1"=10'V) Profile Drawings	1	6	36	8	36	96	183	\$ 20,655.00
1	Storm Sewer Plan & Profile (Sienna Ranch Road) (1"=100'H; 1"=10'V)	1	1	4	2	4	8	20	\$ 2,520.00
1	Storm Sewer Laterals	1	2	6	2	8	8	27	\$ 3,465.00
1	Junction Box Details	1	2	6	2	8	8	27	\$ 3,465.00
6	Drainage Standard Details		1	1	2	4	10	18	\$ 2,070.00
4	Development of Non-Standard Structure Details	1	2	4	2	12	12	33	\$ 4,035.00
1	Quantity Estimate Sheet	1	1	4	1	4	4	15	\$ 1,980.00
	Coordination, Submittals, Responses, Mtgs, on Final Drainage Plans Approvals by FBCDD	2	8	16	2	16	24	68	\$ 8,610.00
	Drainage Plans Quantities and Estimates		2	4	1	4			\$ 1,590.00
	Subtotal (hours) Drawings	9	40	160	41	177	356		-
36	Subtotal (\$) Drawings	\$ 2,025.00	\$ 7,800.00	\$ 21,600.00	\$ 7,380.00	\$ 21,240.00	\$ 32,040.00	774	\$ 90,495.00

GRAND TOTAL = \$ 144,825.00



416 Pickering Street
Houston, Texas 77091

COST ESTIMATE

Proposal No.:

23-00160

Prepared By:

JH

Date:

08/21/23

Checked By:

RG

Date:

08/21/23

Page No.:

1 OF 1

GEOTECHNICAL VERIFICATION STUDY

ITEM	EST. QUANTITY	UNIT PRICE	EST. COST
A) Engineering Analysis and Report Preparation			
Senior engineer, P.E.	20 hours	\$ 183.00	\$ 3,660.00
Project engineer, P.E.	100 hours	\$ 149.00	\$ 14,900.00
Support personnel	10 hours	\$ 50.00	\$ 500.00
SUBTOTAL =			\$ 19,060.00
TOTAL COST =			\$ 19,060.00



CERTIFICATE OF INTERESTED PARTIES

FORM 1295

1 of 1

Complete Nos. 1 - 4 and 6 if there are interested parties.
Complete Nos. 1, 2, 3, 5, and 6 if there are no interested parties.

OFFICE USE ONLY CERTIFICATION OF FILING

1 Name of business entity filing form, and the city, state and country of the business entity's place of business.

GC Engineering, Inc.
PEARLAND, TX United States

Certificate Number:
2023-1081339

Date Filed:
10/09/2023

Date Acknowledged:
10/17/2023

2 Name of governmental entity or state agency that is a party to the contract for which the form is being filed.

FORT BEND COUNTY TOLL ROAD AUTHORITY

3 Provide the identification number used by the governmental entity or state agency to track or identify the contract, and provide a description of the services, goods, or other property to be provided under the contract.

101-1028

PROFESSIONAL ENGINEERING SERVICES FOR FORT BEND COUNTY PARKWAY TOLL ROAD FROM 1600 FT EAST OF SIENNA RANCH RD TO SIENNA PARKS & LEVEE IMPROVEMENT DISTRICT'S LEVEE, IN FORT BEND COUNTY TEXAS

4	Name of Interested Party	City, State, Country (place of business)	Nature of interest (check applicable)	
			Controlling	Intermediary

5 Check only if there is NO Interested Party.



6 UNSWORN DECLARATION

My name is Mahendra Rodrigo, and my date of birth is 05/22/1961.

My address is 15514 Turtle Oak Ct., Houston, TX, 77059, USA.
(street) (city) (state) (zip code) (country)

I declare under penalty of perjury that the foregoing is true and correct.

Executed in Brazoria County, State of Texas, on the 09 day of October, 2023.
(month) (year)

Signature of authorized agent of contracting business entity
(Declarant)