

## **PROFESSIONAL SERVICES AGREEMENT**

This Professional Services Agreement ("Agreement") by and between Tarrant County (County) and Transystems Corporation dba Transystems Corporation Consultants (Consultant), located at 500 W 7<sup>th</sup> Street, Suite 1100, Fort Worth, Texas becomes effective on the date of approval in Tarrant County Commissioners Court.

### **SCOPE OF SERVICES**

Consultant agrees to perform the services set forth in the attached Exhibit A in a timely and professional manner, consistent with industry and professional standards, and in accordance with all applicable laws and the terms of this Agreement. Consultant warrants that all engineering services to be performed under this contract will be performed by a licensed engineer or licensed engineers with the professional skill and care ordinarily provided by competent engineers practicing in Texas and under the same or similar circumstances and professional license and that such services will be performed as expeditiously as is prudent considering the ordinary professional skill and care of said engineer or engineers. If any services, functions or responsibilities not specifically described in Exhibit A are required for the proper performance and provision of these services, they shall be deemed to be included with Exhibit A.

### **ACCESSIBILITY OF DOCUMENTS**

Consultant agrees that documents prepared by Consultant in the performance of the Scope of Services shown in Exhibit A may be made available to the public, including land developers, upon request.

### **TERM AND RENEWAL OPTIONS**

Upon approval of this contract by the Tarrant County Commissioners Court, Consultant is authorized to begin the provision of services as described in the attached Exhibit A. Consultant agrees to complete the services requested by the County in accordance with the schedule shown in Exhibit C.

### **PAYMENT AND INVOICING**

Compensation to Consultant for the services described in the attached Exhibit A shall not exceed \$3,551,575.72 in the hourly rates as shown in the attached Exhibit B for the services under this Agreement, upon approval by the County.

Consultant is to advise the County of additional services that may be required to complete any services requested under this Agreement prior to those additional services being performed that are not part of this Agreement, and must obtain prior approval, in writing, by the County before those additional services are performed and invoiced.

- a. If in the execution of services, the County may request Consultant to remove a service, prior to Consultant's performance of that service. Consultant agrees that the County will not be held responsible for costs associated with those services that were removed.

- b. Payments will be made monthly in arrears, on a net 30-day basis. The fee is to be inclusive of all travel costs.
- c. Invoices are to be detailed and reference the fees as shown in the attached Exhibit B. A summary of the work performed during the invoiced period should accompany the invoice submittal.
- d. Submit invoices to: Tarrant County Auditor's Office, Attention: Accounts Payable, 100 E. Weatherford St., Suite 506, Fort Worth, Texas 76196, phone: 817-884-1205, or email to: [SAP-Invoices@tarrantcountytx.gov](mailto:SAP-Invoices@tarrantcountytx.gov) and [jijackson@tarrantcountytx.gov](mailto:jijackson@tarrantcountytx.gov). Invoices should reference the Purchase Order number.

## COMPLIANCE WITH LAWS

1. In providing the services required by this Agreement, Consultant must observe and comply with all applicable federal, state, and local statutes, ordinances, rules, and regulations, including, without limitation, workers' compensation laws, minimum and maximum salary and wage statutes and regulations, and non-discrimination laws and regulations. Consultant shall be responsible for ensuring its compliance with any laws and regulations applicable to its business, including maintaining any necessary licenses and permits.

### 2. **Chapters 2271, 2252, and 2274 Texas Government Code Verification.**

(a) *Boycott of Israel Prohibited.* In compliance with Section [2271.001](#) et seq. of the Texas Government Code, Consultant verifies that neither it nor any of its affiliates currently boycott Israel and neither it nor any of its affiliates will boycott Israel during the term of this Agreement. "Boycott Israel" is defined in Section [808.001\(1\)](#) of the Texas Government Code.

(b) *Scrutinized Business Operations Prohibited.* In compliance with Section [2252.151](#) et seq. of the Texas Government Code, Consultant warrants and represents that: (1) neither Consultant nor any of its affiliates engages in scrutinized business operations in Sudan; (2) neither Consultant nor any of its affiliates engages in scrutinized business operations in Iran; and (3) neither Consultant nor any of its affiliates engages in scrutinized business operations with designated foreign terrorist organizations. "Scrutinized business operations in Sudan" is defined in Section [2270.0052](#) of the Texas Government Code. "Scrutinized business operations in Iran" is defined in Section [2270.0102](#) of the Texas Government Code. "Scrutinized business operations with designated foreign terrorist organizations" is defined in Section [2270.0152](#) of the Texas Government Code. Consultant further represents and warrants that neither Consultant nor any of its affiliates appears on any of the Texas Comptroller's [Scrutinized Companies Lists](#).

(c) *Boycott of Certain Energy Companies Prohibited.* In compliance with Section [2276.002](#) of the Texas Government Code (added by 87th Legislature, S.B. 13), Consultant verifies that neither it nor any of its affiliates currently boycott energy companies and neither it nor any of its affiliates will boycott energy companies during the term of this Agreement. "Boycott energy company" is defined in Section [809.001\(1\)](#) (added by 87th Legislature, S.B. 13) and means, without an ordinary business purpose, refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations with a company because the company: (A) engages in the exploration, production, utilization, transportation, sale, or manufacturing of fossil fuel-based energy and does

not commit or pledge to meet environmental standards beyond applicable federal and state law; or (B) does business with a company described by subsection (A).

(d) *Discrimination against Firearm Entities or Firearm Trade Associations Prohibited.* In compliance with Section [2274.002](#) of the Texas Government Code (added by 87th Legislature, S.B. 19), Consultant verifies that neither it nor any of its affiliates have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and neither it nor any of its affiliates will discriminate during the term of the Agreement against a firearm entity or firearm trade association. “Discriminate against a firearm entity or firearm trade association” is defined in Section [2274.001\(3\)](#) (added by 87th Legislature, S.B. 19) and means, with respect to the entity or association, to: (i) refuse to engage in the trade of any goods or services with the entity or association based solely on its status as a firearm entity or firearm trade association; (ii) refrain from continuing an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association; or (iii) terminate an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association; the term *does not include*: (i) the established policies of a merchant, retail seller, or platform that restrict or prohibit the listing or selling of ammunition, firearms, or firearm accessories; and (ii) a company’s refusal to engage in the trade of any goods or services, decision to refrain from continuing an existing business relationship, or decision to terminate an existing business relationship: (aa) to comply with federal, state, or local law, policy, or regulations or a directive by a regulatory agency; or (bb) for any traditional business reason that is specific to the customer or potential customer and not based solely on an entity’s or association’s status as a firearm entity or firearm trade association.

3. **Legal Compliance.** Each party shall comply with the provisions of all applicable laws relating to the performance of its obligations under this Agreement. Each party is responsible for obtaining its own legal advice concerning its compliance with applicable laws.

4. **Prohibition of Political Activity.** None of the funds provided under this Agreement shall be used for influencing the outcome of any election, or the passage or defeat of any legislative measure. This prohibition shall not be construed to prevent the Parties’ compliance with the Texas Public Information Act. No funds provided under this Agreement may be used directly or indirectly to hire employees or in any other way fund or support candidates for the legislative, executive, or judicial branches of government, the State of Texas, or the government of the United States. None of the funds provided under this Agreement shall be paid to any official or employee who violates any of the provisions of this Section.

5. **Form 1295 Certificate of Interested Parties.** Consultant acknowledges and agrees that it has fully, accurately, and completely disclosed all interested parties in the Form 1295 electronically filed with the Texas Ethics Commission, at <https://www.ethics.state.tx.us/filinginfo/1295/>, as required by law, and that the attached signed copy attached as **Exhibit G** is a full and true copy of said filed form.

6. **Conflict of Interest.** Consultant assures that it is in compliance with the requirements of [Chapter 176](#) of the Texas Local Government Code and has filed or will promptly file the Conflict of Interest Questionnaire (CIQ Form) with the Tarrant County Clerk no later than

the 7th business day after the date Consultant becomes aware of facts that require the form to be filed. Completed forms are to be sent to:

Tarrant County Transportation Services  
Attn: Joseph Jackson, County Engineer  
100 East Weatherford Street, Room 401  
Fort Worth, Texas 76196

## INSURANCE REQUIREMENTS

Consultant shall take out, pay for and maintain always during the prosecution of the work under the contract, the following forms of insurance, in carriers acceptable to and approved by Tarrant County:

- a. Worker's Compensation/Employer's Liability
  - 1. Worker's Compensation – statutory
  - 2. Employer's Liability - \$500,000
- b. Commercial General Liability:
  - 1. Bodily injury/Personal injury/Property damage - \$1,000,000 per occurrence/\$2,000,000 aggregate
- c. Auto Liability:
  - 1. Combined Single Limit (CSL) - \$500,000 per occurrence
- d. Contractual Liability – same limits as above
- e. Professional Liability Insurance - \$1,000,000 each claim with minimum \$2,000,000 aggregate

## FINANCIAL RESPONSIBILITY

Consultant is responsible for its incurred expenses in performing this contract unless otherwise noted. To the extent permitted by the Constitution and the laws of the State of Texas, Consultant indemnifies and holds harmless the County against any and all claims, lawsuits, settlements, judgments, costs, penalties and expenses, including attorney's fees, for damage caused by or resulting from an act of negligence, intentional tort, intellectual property infringement, or failure to pay a subcontractor or supplier committed by the Consultant, its agent, or another entity over which the Consultant exercises control.

## AGENCY-INDEPENDENT CONTRACTOR

Neither Consultant nor any employee thereof is an agent of the County and neither the County nor any employee thereof is an agent of Consultant. This agreement does not and shall not be construed to entitle either party or any of their representative employees, if applicable, to any benefits, privilege, or other amenities of employment of the other part.

## ASSIGNMENT

Neither party may assign this contract.

### THIRD PARTY BENEFICIARY EXCLUDED

This party does not incur to the benefit of any specific third party. The parties to this contract do not consent to the waiver of sovereign or government immunity under Texas state or federal law to the extent either party may have that immunity under law.

### ENTIRE AGREEMENT

The Contract documents consist of the following:

- This Agreement
- Request for Qualifications 2022-044 Bid Documents and Consultant Response
- Consultant Proposal
- Any exhibits attached hereto, conditions of the contract (special, supplementary and other conditions), all addenda issued prior to execution of this Agreement and all modifications issued subsequent thereto.

To the extent of an ambiguity among the various documents, the Request for Qualifications 2022-044 will prevail. These documents collectively form the Contract, and all are fully a part of the Contract as if attached to this Agreement or repeated herein.

This Agreement may not be modified, altered, changed or amended in any respect, unless in writing and signed by both parties. For avoidance of doubt, this Agreement may not be modified orally.

The law of the State of Texas governs this contract. Venue for any action regarding this contract must be in the district courts of Tarrant County, Texas.

This agreement is effective upon the date of approval in Tarrant County Commissioners Court.

### TERMINATION

Either party may terminate this contract by:

- a. Providing written notice to the other party at least thirty (30) days prior to the date of termination;
- b. Providing in the written notice the date of termination; and
- c. Sending the written notice by certified mail return receipt requested to the party at its address.

NOTICES

**Tarrant County**

Joseph Jackson, P.E., CFM  
Tarrant County Transportation Services  
100 E. Weatherford, Suite 401  
Fort Worth, Texas 76196

**Transsystems Corporation dba Transsystems  
Corporation Consultants**

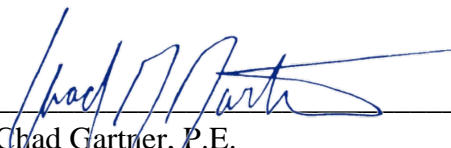
Chad Gartner, P.E.  
500 West 7<sup>th</sup> Street, Suite 1100  
Fort Worth, Texas 76102

**TARRANT COUNTY**

**TRANSYSTEMS CORPORATION DBA  
TRANSYSTEMS CORPORATION  
CONSULTANTS**

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Tim O'Hare  
County Judge



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Chad Gartner, P.E.  
Principal, Senior Vice President

**REVIEWED AS TO FORM:**

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Criminal District Attorney's Office\*

\*By law, the Criminal District Attorney's Office may only advise or approve contracts or legal documents on behalf of its clients. It may not advise or approve a contract or legal document on behalf of other parties. Our review of this document was conducted solely from the legal perspective of our client. Our approval of this document was offered solely for the benefit of our client. Other parties should not rely on this approval, and should seek review and approval by their own respective attorney(s).

**CERTIFICATION OF AVAILABLE FUNDS IN THE AMOUNT OF \$3,551,575.72:**

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Auditor's Office

**EXHIBIT A**  
**GENERAL SCOPE OF SERVICES**  
**FOR**  
**ENGINEER DESIGN PROFESSIONAL SERVICES**

**Project Description**

Facility	FM 2871
Location (City, County)	City of Fort Worth, Tarrant County, Texas
Length (miles)	2.90 Miles
Limits (Station)	From US 377 to Approximately 0.5 miles north of I-20

The work to be performed by the Design Engineer under this contract consists of providing engineering services required for the preparation of Plans, Specifications and Estimate (PS&E) for the following improvements:

- Widening FM 2817 to a 4-lane divided roadway including shared use paths.
- Grade separation of FM 2871 and UPRR including 1200' long bridge
- 7 new traffic signals
- Bridge Class Culvert 4 – 9' x 9' on Veale Ranch Parkway
- Approximately 4800 LF of retaining walls
- Approximately 500 LF of temporary retaining walls/temporary shoring for phase construction
- Realignment of Veale Ranch Parkway and Aledo Access Road
- Surveys for proposed right of way and/or easements including the preparation of proposed right of way and/or easement documents.

The existing traffic capacity and number of main lanes must be maintained at all times during construction of the proposed improvements, with any exceptions to be approved by Tarrant County.

The Design Engineer shall provide calculations, designs, plans, required details and quantities to include roadway design, grading, paving, traffic rail, drainage, signing, pavement markings, traffic control plans, storm water pollution prevention plans, bridges, retaining walls, removal plans, specifications, cost estimates, and all incidentals as required. The Design Engineer shall prepare the plans to the TxDOT current standards and specifications.

The Design Engineer shall identify, prepare exhibits and complete all necessary forms for Design Exceptions and/or Waivers within project limits prior to the 30% Submittal. These exceptions shall be provided to Tarrant County for coordination and processing of approvals. If subsequent changes require additional exceptions, the Design Engineer shall notify Tarrant County as soon as possible after identification.

The Design Engineer shall coordinate the development of the PS&E with local entity(s) having jurisdiction or interest in the project (e.g. TxDOT, city, county, municipal utility district, etc.).

The Design Engineer shall collect, review, and evaluate the available existing data pertaining to the project and prepare the Plans, Specifications and Estimates in accordance with the requirements and policies of Tarrant County.

The Design Engineer shall be responsible for identifying and delineating required temporary construction easements in areas outside the existing ROW. Tarrant County shall secure the necessary legal instruments. If, as the plans are further developed, it becomes apparent that easements or additional right of way is required within or abutting the Project, the Design Engineer shall immediately determine its extent and recommend to Tarrant County the limits of said easements or additional right of way required.

### **Items To Be Furnished By Tarrant County**

Tarrant County will furnish to the Design Engineer the following items:

- Schematic designs and approved environmental checklist documents
- Available benchmark elevations and descriptions for vertical control
- Existing facilities construction documents and “as-builts”.
- Available interface data for any projects adjacent to, crossing, and/or within limits
- Existing geotechnical information/including wall studies, if available
- Available right-of-way maps
- Available Aerial Ortho imagery from NCTCOG
- Sample Invoice and Progress Report
- Assistance will be provided to the Design Engineer to obtain the required data and information from other local, regional, TxDOT and federal agencies
- Projected traffic volumes calculated for the preparation of the schematics and estimated future growth rates to be used by the Design Engineer to calculate Equivalent Single Axle Wheel Loads (ESALs) for use in the development of the pavement designs.
- Timely review and decisions necessary for the Design Engineer to maintain the contracted project schedule
- FM 2871 existing topographic survey and design surface files developed by TxDOT
- FM 2871 existing and proposed ROW files, maps and CAD files used for property acquisition.

The services designated herein as “Services provided by the Engineer” shall include the performance of all professional engineering services for the above described project. In no way limiting the complete character of the services to be performed by the Design Engineer, the following is given as indication of the extent of those services and of the procedures contemplated.

## **1) PROJECT MANAGEMENT**

### **a) Project Control and Management**



The Design Engineer will be responsible for the day-to-day activities of managing the project within the project schedule. Specific activities include ongoing reassessments of contract and schedule adherence.

The Design Engineer will develop a project filing system, both for data in hard copy format and for electronic data. This filing system, which will be maintained in the Design Engineer's offices for the life of the project, will be designed so that files can be easily located and retrieved. This filing system will also provide that electronic files are frequently backed up, with duplicate copies stored at a secure, off-site location.

**b) Status Reports and Invoicing**

Monthly status reports will be prepared and submitted to Tarrant County. The status reports will contain a concise report of project progress and contract fulfillment. The report will address technical progress, contract progress, and management-related topics. Monthly invoicing will be part of the status report package.

**c) Project Schedule / Work plan**

The Design Engineer will prepare a project schedule in Microsoft Project detailing project tasks, critical dates, deliverables, and Tarrant County review durations. When necessary, the Design Engineer will update the project schedule as part of monthly status reporting. If substantial revisions to the schedule are anticipated, these revisions will be discussed at the next progress/coordination meeting.

**d) Quality Assurance and Control**

The Design Engineer shall implement their Quality Assurance/Quality Control program prior to submitting plans to Tarrant County for each of the milestones. The program involves a quality review process consisting of checked, back checked, corrected, and verified review stages for each milestone deliverable. The Design Engineer is responsible for design errors and/or omissions in the plans and specifications and the scope described herein that become evident before, during or after construction of the project. The Design Engineer's responsibility for all questions arising from design errors and/or omissions will be determined by Tarrant County and all decisions shall be final and binding. This would include, but not necessarily be limited to:

- All design errors and/or omissions resulting in additional design work to correct the errors and/or omissions in the plans and specifications and the scope described herein;
- Preparation of design documents and detail drawings necessary for a field change due to design errors and/or omissions; and
- Revisions of original tracings to the extent required for a field change due to design errors and/or omissions.

The Design Engineer shall promptly make necessary revisions or corrections in the plans and specifications and the scope described herein resulting from the Design Engineer's errors, omissions or negligent acts without additional compensation. Acceptance of the work by Tarrant County will not relieve the Design Engineer of the responsibility for subsequent correction of such errors or omissions in the plans and specifications and the scope described herein or for clarification of ambiguities.

## **2) MEETINGS:**

### **a) Kick-off Meeting**

The Design Engineer will meet with Tarrant County to begin the exchange of data to be provided to the Design Engineer as identified under "Items to be Furnished by Tarrant County." Also during this meeting, reporting requirements, as they relate to invoicing and task status, will be reviewed and agreed upon. The Design Engineer will discuss with Tarrant County the template for submittal of invoices and progress reports.

### **b) Submittal Review Meetings**

The Design Engineer will facilitate four (4) project status/technical meetings occurring at the conclusion of the 30%, 60%, 90%, and 100% submittal phases. The date, time, and location for these meetings will be determined by Tarrant County. The Design Engineer will prepare agendas, materials, and meeting notes for each of these meetings.

In addition, the Design Engineer will be required to participate in external agency meetings to resolve design issues. The Design Engineer will further coordinate plan developments with the City(s), TxDOT, and other public or private entities having an interest in the project. Assume three stakeholder meetings.

## **3) SURVEYING / SUE:**

### **3.1.) Field Surveying:**

- Topographic file for the FM 2871 corridor will be provided by Tarrant County. Topographic information used by TxDOT for schematic design will be used for the base files during design.
- If supplemental topographic survey is needed to update or provide data for obscured areas, the Design Engineer will submit a supplemental to this contract and will proceed once supplemental is approved by Tarrant County.
- Existing and proposed right of way information including right of way mapping, CAD files, property acquisition information and any acquisition agreements shall be provided by Tarrant County.

- If additional right of way services is needed, the Design Engineer will submit a supplemental to this contract and will proceed once supplemental is approved by Tarrant County.

### **3.2.) Subsurface Utilities Exploration (SUE)**

**3.2.1.)** SUE is a branch of Civil Engineering that involves mapping existing subsurface utilities and depicting those utilities to certain quality levels. These different quality levels can be defined as follows per ASCE 38-02 “Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data”:

- Quality Level “D”: Information derived from existing records and/or oral recollections,
- Quality Level “C”: Information obtained by surveying and plotting visible above-ground utility features and by using professional judgment in correlating this information to quality level D information.
- Quality Level “B”: Information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities (aka Designating).
- Quality Level “A”: Precise horizontal and vertical location of utilities obtained by the actual exposure and subsequent measurement of subsurface utilities, usually at a specific point (aka Locating).

**3.2.2.)** Verify existing SUE data and perform a document search with agencies, utility owners, and railroad owner for all utility lines (Quality Level B).

**3.2.3.)** Update utility plans with any new Quality level B findings.

**3.2.4.)** Perform Quality Level A test holes at various utility crossings or as directed. Assume 10 locations.

## **4) GEOTECHNICAL and PAVEMENT DESIGN**

All geotechnical work should be performed in accordance with the latest version of TxDOT’s Geotechnical Engineering Criteria:

- The Design Engineer shall determine the location of proposed soil borings for pavement design, bridge design, and retaining wall. Tarrant County will review and provide recommendation for a boring layout submitted by the Design Engineer showing the general location and depths of the proposed borings. Once the Design Engineer receives Tarrant County’s recommendations, they shall perform soil borings (field work), soil

testing and prepare the soil borings in accordance with TxDOT's procedures. Borings are anticipated to be as follows:

- Bridge: 1 per each abutment and not less than 1 for every two bents per structure. Approximate depth 80 feet or at least 20 feet into bedrock. Estimated 7 borings for 1,250 LF of bridge with 10 interior bents.
  - Retaining Walls: 1 per 200' of wall length. Approximate depth 25 to 45 feet. Estimated 31 borings for 9 retaining fill/cut walls and 4,625 LF of wall.
  - Roadway/Subgrade: 1 per 400' of new roadway centerline excluding areas where roadway fill is anticipated to exceed 15'. Approximate depth 20 feet. Estimated 38 borings with ½ borings on existing roadway and ½ borings on widening over 15,000 LF of the alignment.
  - Bridge Class Culvert: 1 boring at the bridge class culvert. Approximate 25 feet deep
- Perform soil borings, testing and analysis to include global stability analysis, settlement analysis and foundation design recommendations for retaining walls, along storm sewer alignment, bridge, pavement structure, pavement subgrade stabilization embankments and any temporary soil retaining systems.
  - The Design Engineer shall provide pavement structure designs, and pavement subgrade stabilization, and embankment designs. The proposed pavement cross section shall include pavement type and structure, and pavement subgrade. The proposed pavement sections shall consider existing pavement and subgrade conditions, future maintainability, constructability, and the advantages and disadvantages of similar and dissimilar pavement cross sections.
  - Provide a signed, sealed (by the Geotechnical Engineer) and dated geotechnical report which contains soil boring locations, logs of borings, laboratory test results and design capacity curves including skin friction and point bearing for piling and drilled shaft foundations, and provide L-PILE parameters for lateral analysis of drill shafts. If scour analysis needs to be done, then Grain Size distribution curves with D50 value and consolidation summary report should be provided.
  - Sign, seal, and date soil boring data sheets to be used in the PS&E package. The preparation of soil boring data sheets are to be in accordance with TxDOT standards.

## **5) ENVIRONMENTAL STUDIES and PUBLIC INVOLVEMENT:**

- The Design Engineer shall include Environmental Permits, Issues & Commitments (EPIC) sheets required for the project.
- If required, the Design Engineer shall provide technical assistance, preparation of exhibits for, and minutes of meetings to inform the public of impacts to neighborhoods and businesses due to roadway shutdowns, detours, and access restrictions.

## **6) ROUTE and DESIGN STUDIES:**

- a) **Data Collection:** The Design Engineer shall collect, review, and evaluate data described below. The Design Engineer shall notify Tarrant County in writing whenever the Design Engineer finds disagreement with the information or documents:
  - i. Data, if available, from Tarrant County, TxDOT, and City(s), including “as-built plans”, existing schematic designs, right-of-way maps, SUE mapping, existing cross

- sections, existing planimetrics mapping, environmental documents, existing channel and drainage easement data, existing traffic counts, accident data, BRINSAP records, PMIS data, identified endangered species, identified hazardous material sites, hail route and their requirements and other environmental constraints and commitments, current unit bid price information, current special provisions, special specifications, and standard drawings.
- ii. Documents for existing and proposed development along proposed route from local municipalities and local ordinances related to project development.
  - iii. Utility plans and documents from appropriate municipalities and agencies.
  - iv. Readily available flood plain information and studies from the Federal Emergency Management Agency (FEMA), the U. S. Army Corps of Engineers, local municipalities and other governmental agencies in addition to that provided by Tarrant County.
- b) Field Reconnaissance:** The Design Engineer shall conduct field reconnaissance and collect data including a photographic record (to be maintained in the Design Engineer's office) of notable existing features.
- c) Roadway and Hydraulic Design Criteria:** The Design Engineer shall design the project according to Tarrant County's design criteria. The Design Engineer shall supply project specific design criteria (typical sections, estimate, design exceptions, etc.) to be inserted into the Design Elements for discussion at the DCC.
- d) Pre-Design Conference:** The Design Engineer, in cooperation with Tarrant County shall plan, attend and document a Design Concept Conference (DCC). Personnel from Tarrant County, and other agencies (as required) will participate. The conference will provide for a brainstorming session in which decision makers, stakeholders and technical personnel may discuss and agree on:
- i. Roadway and drainage design parameters
  - ii. Engineering and environmental constraints
  - iii. Project development schedule
  - iv. Other issues as identified.
- e) Schematic Revisions:** The Design Engineer shall review the schematic provided by Tarrant County to confirm their understanding of the project and to verify completeness and accuracy of the information. The Design Engineer shall refine the horizontal and vertical alignment of the design schematic for main lanes, cross streets and grade separation structures. The Design Engineer shall determine vertical clearances at grade separations and overpasses, taking into account the appropriate percent grade and super-elevation rate. Minor modifications in the alignment must be considered to provide optimal design.

Modifications must be coordinated with the Tarrant County, TxDOT and adjacent Engineers.

The County and TxDOT must approve the refined schematic prior to the Engineer proceeding to the 30% milestone submittal, and prior to starting on the bridge layouts.

**7) PROJECT LAYOUTS:**

The Design Engineer shall prepare roadway geometric layout plan drawings using TxDOT plan production guidelines. The drawings shall consist of a planimetrics file of existing features and files of the proposed improvements. Existing and proposed right-of-way lines shall be shown.

**8) PROPOSED TYPICAL SECTION SHEETS:**

Typical sections shall be required for all proposed and existing roadways and structures. Typical sections shall include width of travel lanes, shoulders, outer separations, border widths, curb offsets, and ROW. The typical section shall also include PGL, centerline, pavement structure, required and allowable longitudinal joints, side slopes, sodding/seeding limits, concrete traffic barriers and sidewalks, if required, station limits, common proposed/existing structures including retaining walls, riprap, limits of embankment and excavation, etc.

**9) TRAFFIC CONTROL PLAN, DETOURS, and SEQUENCE OF CONSTRUCTION:**

- The Design Engineer 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). The Design Engineer is to implement the current Barricade and Construction (BC) standards as applicable. The Design Engineer shall interface and coordinate phases of work, including the TCP, with adjacent Design Engineers, if applicable
- The Design Engineer shall maintain continuous access to abutters during all phases of the TCP. The Design Engineer shall develop an inventory of all abutters along its alignment. The Design Engineer shall prepare exhibits for and attend meetings with the public, as requested by Tarrant County.
- The Design Engineer shall make every effort to prevent detours and utility relocations from extending beyond the existing Right-of-way lines.
- The Design Engineer shall develop a temporary drainage plan to coincide with the proposed construction staging of the Design Engineer's project and phasing of adjacent projects. Temporary drainage (size, elevation) shall be shown in plan view on the TCP sheets.
- The Design Engineer 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, construction pavement markings, barricades, flag personnel, temporary traffic signals, etc.) to be used to handle traffic during each construction sequence. The Design Engineer shall show proposed traffic control devices at grade intersections during each construction phase (stop signs, flag person, signals, etc.). The Design Engineer shall show temporary roadways, ramps, structures (including railroad shoo-fly) and detours required to maintain lane continuity throughout the construction phasing.

- Where detours are required, the Design Engineer shall develop typical sections, calculate quantities, and show horizontal and vertical alignment information. The Design Engineer shall provide a detailed layout and arrangement of construction signs, construction pavement marking, traffic control devices (including temporary signals and signal heads), temporary drainage and temporary safety structures.
- The Design Engineer shall assist Tarrant County in coordinating mitigation of impacts to adjacent schools, emergency vehicles, pedestrians, bicyclists and neighborhoods.
- The Design Engineer shall assist Tarrant County in developing time of day lane closure restrictions and/or lane rental specifications.

#### **Assumptions**

- Scope includes 2 major phases of Traffic Control/Phasing.
- Phased Cross sections not included in scope.
- Assumes crossing of UPRR will be done in 2 Phases allowing traffic to be on existing roadway.

#### **10) REMOVAL PLANS:**

The Design Engineer shall prepare removal plans detailing the removal limits and quantities of existing pavement, rail and barrier, utilities, drainage structures, signs and sign structures, and various other removal items. The Design Engineer shall be required, whenever necessary, to contact the property owners and obtain any information that is needed so that the construction plans and specifications fully describe the work to be done.

#### **11) GEOMETRIC LAYOUTS:**

The Design Engineer shall prepare Geometric Layout sheets including beginning and ending stations of the proposed improvements, centerline stations, offsets, station equations, curve data, super-elevation tables, benchmarks, coordinates, and horizontal and vertical controls.

#### **12) ROADWAY DESIGN:**

**12.1 Roadway Design:** The Design Engineer shall provide roadway plan and profile drawings using TxDOT plan production guidelines. The drawings shall consist of a planimetrics file of existing features and files of the proposed improvements. Existing major subsurface and surface utilities shall be shown. Existing and proposed right-of-way

lines shall be shown. Plan and Profile to be shown on *separate* or *same* sheets (this depends upon width of pavement) for mainlanes, ramps, frontage roads, and direct connectors.

**12.2 Plan Preparation:** The Design Engineer shall prepare roadway plans, profiles, and typical sections for the proposed improvements. This scope of services and the corresponding cost proposal are based on the Design Engineer preparing plans to construct bridges, ramps, and cross streets at intersections. The roadway plans shall consist of the types and be organized in the sequence as described in TxDOT plan production guidelines.

**a) Plan View:** The plan view shall contain as minimum the following design elements:

- i) Calculated roadway centerlines for new ramps and cross streets. Horizontal control points shall be shown. The alignments shall be calculated using OpenRoads horizontal geometry tools.
- ii) Pavement edges for all improvements (ramps, cross streets, and driveways) and locations of rails, barriers, guard fences, attenuators, etc.
- iii) Lane and pavement width dimensions.
- iv) The geometrics of ramps and street extensions.
- v) Proposed structure locations, lengths, and widths.
- vi) Direction of traffic flow on all roadways. Lane lines and/or arrows indicating the number of lanes shall also be shown.
- vii) Control of access line, & ROW lines and easements.
- viii) Begin/end superelevation transitions and cross slope changes.
- ix) Limits of riprap, block sod, and aprons.
- x) Existing utilities and structures.
- xi) Benchmark information and references to survey control.
- xii) Radii callouts, curb location, CTB, guard fence, crash safety items and American with Disabilities Act Accessibility Guidelines (ADAAG) compliance items.

**b) Profile View:** The profile view shall contain the following design elements:

- i) Calculated profile grade for proposed ramps and cross streets. Vertical curve data, including “K” values shall be shown.
- ii) Existing and proposed profiles along the proposed centerline of the mainlanes, and the outside shoulder line of ramps.
- iii) Existing profiles at the ROW line and proposed profiles along the proposed centerline of the outside gutter line of the frontage roads.
- iv) Water surface elevations at major stream crossing for 10-, 25-, 50-, and 100-year storms, and 500-year storm for lake crossings.
- v) Calculated vertical clearances at grade separations and overpasses, taking into account the appropriate superelevation rate, superstructure depth and required clearance.
- vi) The location of igrade separations and ramps (shall include cross sections of any proposed or existing roadway, structure, or utility crossing).
- vii) Drawing vertical scale to be 1”=10’.



- c) **Grading Plans:** A plan scale of 1"=100' (at 11"x17") for grading work shall generally be used except where a larger scale may be required to satisfactorily delineate the work, such as bridges, interchanges, and street intersections. The Design Engineer shall prepare:
  - Contour layout sheets
  - Bridge End grading plan sheets
  - Median Grading Detail Sheets
  - Miscellaneous Roadway Detail Sheets;
- d) **Cross Sections:** The Design Engineer shall develop an earthwork analysis to determine cut and fill quantities and provide design cross sections at 50 feet intervals including ramps and cross streets. Additional cross sections may be required at break points, including ends of bridges. Cross sections and quantities shall consider existing pavement removals.
- e) **Vertical Clearances at Bridges:** The Design Engineer shall calculate the vertical clearances at the bridge underpasses.
- f) **Design Exceptions/Waivers:** Prepare a design exception report as required.
- g) **MBGF/Rail Length of Need:** The Design Engineer shall evaluate/calculate the MBGF Length of Need at the bridge ends. The Roadway Layout Plans shall reflect the appropriate length of MBGF/rail.

### 13) RETAINING WALLS:

The Design Engineer shall provide layouts (scale 1"=40'), elevations, quantity estimate, summary of quantities, typical cross sections, drainage and structural details of all retaining walls within the project. The Design Engineer shall determine if any additional walls are required and verify the need for and length of the retaining walls as shown on the conceptual designs. Retaining wall layouts will follow the general guidelines of the appropriate TxDOT District and Tarrant County.

#### a) Layout Plan

- i) Designation of reference line
- ii) Beginning and ending retaining wall stations
- iii) Offset from reference line
- iv) Horizontal curve data
- v) Total length of wall
- vi) Indicate face of wall
- vii) All wall dimensions and alignment relations (alignment data as necessary)
- viii) Typical wall section(s)
- ix) Wall type(s)
- x) Soil core hole locations

**b) Elevation:**

- i) Top of wall elevations
- ii) Existing and finished ground line elevations
- iii) Vertical limits of measurement for payment
- iv) Type, limits and anchorage details of railing (only if Traffic Railing foundation standard is not being used on this project)
- v) Top and bottom of wall profiles and soil core hole data plotted at correct station & elevation. Groundwater elevations shall be shown.
- vi) Show all utilities within the parameters of the proposed walls. This identification should include utility type, size, material, depth, and all other pertinent information.
- vii) Designs shall illustrate all wall drains, wall drain clean outs, wall drain outfalls, wall flume outfalls, and all other pertinent wall drain information.
- viii) Foundation details as recommended in Geotechnical investigations.

**c) General Guidelines for Retaining Walls**

- i) The Design Engineer shall incorporate soil core hole data sheets prepared, signed, sealed, and dated by the Design Engineer. The soil boring sheets shall be in accordance with TxDOT WINCORE software as can be found on the Texas Department of Transportation website.
- ii) The Design Engineer shall make final design calculation and final detail drawings in accordance with standard requirements of Tarrant County.

**14) DRAINAGE DESIGN:**

- a. The Design Engineer will prepare a comprehensive drainage study and report of the project area. The report will include the following items:
  - i. Obtain existing HEC-2 or HEC-RAS models from applicable drainage authorities to the extent possible, for use in analysis and determination the existing 2, 5, 10, 25, 50, 100 and 500 year (if available), water surface elevations at water crossings along the project. This data will be utilized in the development of design roadway profiles.
  - ii. For drainage areas, the Design Engineer will make every effort to limit the outfalls into existing storm sewer to existing capacity flows, which will be determined by the Design Engineer. Alternate flow routes, if feasible, will be looked into for relieving storm sewer overload. The amount of the total detention storage to control storm sewer runoff for the design frequency will be determined, as well as a rough estimate of the available on-site volume.
  - iii. Drainage areas and flows for cross culvert drainage systems will be determined as part of the drainage report. Sizing of the drainage crossings and hydrologic information once determined, will be provided to Tarrant County.
  - iv. An impact analysis is required on water crossings as related to the TxDOT and FEMA criteria for the 100 year storm. The project required approach for impact prediction is as follows:
    - 1) Delineate drainage areas for the existing and proposed conditions.
    - 2) Identify the existing incoming drainage systems and the existing drainage system outfalls. Existing systems and drainage areas will be reviewed for

compatibility with TxDOT's proposed design criteria and proposed project conditions.

- 3) Construct a model of the existing storm drain system and the proposed storm drain system using inlet size and type, pipe size and length, junction type and flowline elevations.
- 4) Compute existing and proposed peak flows by using hydraulics and hydrologic methodology and computer models and develop ortho base mapping that shows maximum ponding depth values for the 10, 25, 50 and 100-year recurrence interval rainfall events.
- 5) Determine storage volumes necessary to contain the proposed conditions 50 - year event computations based on hydrograph calculations and peak flows obtained in the item above. Predict the level of ponding associated with a 100-year event using the proposed 50-year design in sag areas.
- 6) Analyze existing and proposed drainage system and quantify the increase in 100 year peak flows resulting from the roadway improvements.
- 7) Calculations shall be provided which quantify the cut and fill within the 100 year flood plain, if any occur.
- 8) Obtain current hydrologic and hydraulic computer models from government agencies and review and comment on the models.
- 10) Current models will be updated to existing condition using the available aerial photographs, and submitted to governmental agencies as the revised existing condition model.
- 11) The Design Engineer will prepare a report signed, sealed and dated by a registered/licensed Design Engineer, which shall include the preliminary findings of the storm sewer capacities, requirement for line rerouting, preliminary detention storage volumes and initial recommendations on how to mitigate the storm impact on the receiving streams. 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.

- b. Culvert and Storm Drain Design:** The Design Engineer shall develop design details that minimize the interference with the passage of traffic or incur damage to the highway and local property. The Design Engineer shall provide layouts, drainage area maps, and design of all drainage components. The Design Engineer shall design all conventional storm drainage and cross drainage in conformance with the latest edition of TxDOT *Hydraulic Manual*. The Design Engineer shall design all conventional storm drainage and cross drainage systems. When oversized storm drains are used for detention, the Design Engineer shall evaluate the hydraulic grade line throughout the whole system, within the project limits, for the design frequency(ies) and make necessary system adjustments for conformance to program criteria. The Design Engineer shall coordinate with Tarrant County any proposed changes to the detention systems. Tarrant County will

assess the effects of such changes on the comprehensive drainage studies. Should there be adjacent projects under design, the Design Engineer shall coordinate with Tarrant County and designers of adjacent projects such that all proposed drainage systems accommodate the proposed construction phasing plan.

The Design Engineer shall perform the following:

- i. Prepare culvert cross sections.
- ii. Identify areas requiring trench protection, excavation, shoring and de-watering.
- iii. Prepare drainage area maps.
- iv. Prepare plan/profile sheets for storm drain systems and outfall ditches.
- v. Select standard details from TxDOT's standards for items such as inlets, manholes, junction boxes and end treatment, etc.
- vi. Prepare details for non-standard inlets, manholes and junction boxes.
- vii. Prepare drainage details for outlet protection, outlet structures and utility accommodation structures.
- viii. Identify pipe strength requirements.
- ix. Prepare drainage facility quantity summaries.
- x. Identify potential utility conflicts and design around them, wherever possible.
- xi. Take into consideration pedestrian facilities, utility impacts, driveway grades, retaining wall, and concrete traffic barrier drainage impacts.
- xii. Identify existing and proposed ground elevation profiles at centerline of proposed pipe on storm sewer plan and profile sheets.
- xiii. Show utility locations on plan and elevation views.
- xiv. If applicable, prepare Hydraulic Data Sheets for Bridge Class Culvert(s).

- c. Storm Water Pollution Prevention Plans (SWP3):** The Design Engineer shall develop the SWP3, on separate sheets from (but in conformance with) the TCP, to minimize potential impact to receiving waterways. The SWP3 shall include text describing the plan, quantities, type, phase and locations of erosion control devices and any required permanent erosion control measures.

**d. Layout, Structural Design and Detailing of Drainage Features.**

The Design Engineer shall use standard details where practical. The Design Engineer shall perform layout, structural design and detailing for the following as required:

- i) Culverts: New culverts; culvert replacement, culvert extension.
- ii) Storm Sewers: New or modified storm sewers; inlets; manholes; trunk lines.
- iii) All access points including but not limited to accessible manholes, junction boxes, and inlets with removable grates. Placement of all accessible elements shall be placed within spacing limits as determined by TxDOT.
- iv) Inlets with grate details and trench drain facilities: All drainage features must be accessible for routine maintenance operations. Unless noted otherwise, slotted drains will not be allowed.
- v) Subsurface drainage at retaining walls.
- vi) Outfall channels within existing ROW

- vii) Bridge deck drainage systems for ponded width control, including internal drainage piping within the bents where required on structures.
- viii) Connections to existing storm drains, manholes, inlets, and culverts.

**e. Storm Water Treatment Systems.**

The Design Engineer will advise Tarrant County of any need for storm water treatment systems that may become necessary as a result of environmental permitting conditions. The design of post construction water treatment devices such as inlet filters, inline separators, detention/retention ponds, etc. is considered to be Additional Services.

**15) UTILITIES:**

- The Design Engineer shall identify all utility conflict points and provide preliminary design drawings early in the design phase to be used for coordination in utility agreement preparation. The Design Engineer shall show existing utilities, including those in conflict with construction on this project. The Design Engineer shall prepare plans to avoid or minimize utility adjustments, where feasible. The Design Engineer shall be responsible for sending out notices, with copies of exhibits and plans, including all milestone submittals. The Design Engineer shall determine prior to 30 percent milestone submittal where Level A Subsurface Utility Engineering (SUE) will be required for this project.
- Utility Coordination for relocation of existing utilities is not included and is considered to be Additional Services.
- The Design Engineer shall coordinate with and assist Tarrant County with obtaining new utilities and the relocation of any existing utilities, including those in conflict with construction on this project.

**Assumptions**

- The design of any public water and sanitary sewer relocations needed to facilitate the proposed improvements for this project is not included in this scope of work.
- If design of any public water and sanitary sewer relocations is needed, the Design Engineer will submit a supplemental to this contract and will proceed once supplemental is approved by Tarrant County.

**16) BRIDGE DESIGN:**

All proposed improvements shall be designed per the latest edition of TxDOT's Bridge Design Manual design methodology for Load and Resistance Factor Design (LRFD). In addition, proposed design of bridge crossing UPRR ROW shall be designed per the latest design requirement of UPRR and AREMA.

**a) Bridge Layout**

Prepare Bridge Layout plans and elevations for all bridge types listed below in accordance with the latest edition of the TxDOT's Bridge Design Manual, Bridge Design Guide, Bridge Project Development Manual and Bridge Detailing Manual. In addition,

the appropriate TxDOT District bridge layout checklist should be followed. Submit to Tarrant County for approval before proceeding to structural detail design. Coordinate with Tarrant County to determine the location of soil borings to be drilled by the Design Engineer.

- The Bridge layouts in Plan View shall contain the following information:
  - 1) Horizontal curve information or bearing of centerline
  - 2) Including horizontal, vertical and template information of all roadways or railroads crossed
  - 3) Bearing of centerline or reference line
  - 4) Skew angle(s)
  - 5) Slope for header banks and approach fills
  - 6) Control stations at beginning and ending of bridge (with deck elevation)
  - 7) Approach pavement and crown width
  - 8) Bridge roadway width and curbs, face of rail, shoulders or sidewalks
  - 9) Approach slab and curb returns
  - 10) Limits and type of riprap
  - 11) Proposed features under structure
  - 12) Location of profile grade line
  - 13) North Arrow
  - 14) Typical bridge roadway section including preliminary proposed beam types and spacings.
  - 15) Typical bridge section showing staged construction limits where applicable
  - 16) Cross slope and superelevation data
  - 17) Minimum horizontal and vertical clearance
  - 18) Location of soil core holes (station and offset)
  - 19) Bent stations and bearings
  - 20) Retaining wall locations
  - 21) Temporary Shoring Limits
  - 22) Traffic flow directional arrows
  - 23) Railing types shown
  - 24) Joint types and seal size, if used
  - 25) Beam line numbers consistent with span details
  - 26) Critical horizontal clearances (location of railroad tracks, nearby structures and utilities)
- Bridge Layouts in Elevation View should contain the following:
  - 1) Type of foundation
  - 2) Finished grade elevations at beginning and end of bridge
  - 3) Overall length of structure
  - 4) Length, type of spans and units

- 5) Overall length and type of railing
- 6) Minimum calculated vertical clearance(s)
  - a. Minimum horizontal clearance from the railroad track or other obstructions.
  - b. Railroad track top of rail elevation
- 7) Existing and proposed ground lines clearly marked
- 8) Grid elevations and stations
- 9) Bent numbers encircled
- 10) Standard Title
- 11) Profile grade data
- 12) Type of riprap
- 13) Soil Core Hole information with penetrometer test data
- 14) Fixed/expansion condition of all bents
- 15) Column "H" heights
- 16) Number, size and length of foundations

**b) Final Design Calculations and Details:** The Design Engineer shall make final design calculations and final detail drawings, per structure, in accordance with standard requirements of the TxDOT. All bridge design shall be in conformance with the latest edition of the TxDOT's Bridge Design Manual, Bridge Project Development Manual, Bridge Detailing Manual, and AASHTO LRFD Bridge Design Specifications, 9th edition as modified by TxDOT's Bridge Manual. The Design Engineer's designer and checker shall both check all calculations and initial each page. The Design Engineer shall submit for review all structural design calculations and quantity calculations.

## **17) TRAFFIC ITEMS:**

### **a) Illumination:**

The Design Engineer shall provide illumination layout plans, electrical circuit plans and details for roadway lighting at major intersections where traffic signal are being designed. (7 Intersections) Lighting poles, fixtures, and attachment details shall be designed per TxDOT standards. Continuous roadway lighting is not included in this scope of work.

### **b) Signing:**

The Design Engineer shall prepare drawings and specifications for all small signs. The Design Engineer shall coordinate with Tarrant County for overall temporary, interim, and final signing strategies and placement of signs outside contract limits. Large guide signs are not anticipated in this project and design/detailing is not included in this scope of work. The proposed signs shall be illustrated and numbered on plan sheets. Sign foundation shall be selected from TxDOT Standards.

The Design Engineer shall provide the following information on sign/pavement marking layouts:

- i) Roadway layout.
- ii) Center line with station numbering.
- iii) ROW lines.
- iv) Designation of arrow used on exit direction signs.
- v) Culverts and other structures that present a hazard to traffic.
- vi) Existing signs to remain, to be removed, or to be relocated.
- vii) Proposed signs (illustrated and numbered).
- x) Storm drain and utilities that could pose conflicts with the foundation(s).

**c) Pavement Markings:**

The Design Engineer shall detail permanent and temporary pavement markings and channelization devices on plan sheets. The Design Engineer shall coordinate with Tarrant County for overall temporary, interim, and final pavement marking strategies. Pavement markings shall be selected from the latest TxDOT standards.

The Design Engineer shall provide the following information on sign/pavement marking layouts:

- i) Proposed markings (illustrated and quantified) which include pavement markings, object markings and delineation.
- ii) Quantities of existing pavement markings to be removed.
- iii) Proposed delineators and object markers.
- iv) The location of grade separations and ramps.
- v) The number of lanes in each section of proposed highway and the location of changes in numbers of lanes.
- vi) ROW limits.
- viii) Direction of traffic flow on all roadways.

**d) Signal Design:**

The Design Engineer shall detail existing and proposed traffic signals on plan sheets. Traffic signals shall be designed per the latest TxDOT criteria and standards.

Design Engineer will develop the traffic signal design as follows.

- i) Data Collection
  - The Design Engineer will obtain pertinent information from Tarrant County, TxDOT and City to aid in coordination of the proposed improvements may influence the project. ENGINEER will also identify and seek to obtain data for existing conditions that may impact the project including; utilities, agencies



(TxDOT and railroads), City Master Plans, and property ownership as available from the Tax Assessor's office.

- Collect new 24-hour turning movement counts at the 7 project intersections.
- ii) The Design Package shall include, but not be limited to, the following:
  - Plan sheets showing existing and proposed horizontal roadway alignments, existing and proposed ROW, existing and proposed sidewalks, existing and proposed curbs, existing and proposed medians, proposed lane dimensions and lane arrows, existing drainage structures, and city owned and franchise utilities.
  - Traffic signal existing conditions and removals layout sheet.
  - Traffic signal proposed conditions layout sheet showing the location of proposed signal poles and mast arms, ground boxes, controller cabinet, and electrical service meter.
  - Traffic Signal Equipment Detail Sheets
  - Traffic Signal Summary Charts

#### **18) PERMITS:**

- a) If applicable, the Design Engineer shall determine if the Airway-Highway Clearance requirement and agreements have been met in accordance with the latest FAA form 7460-1 "Notice of Proposed Construction or Alteration".
- b) All permit requirements and environmental requirements will be incorporated by the Design Engineer into the Design Engineer's plans and specifications as applicable and required.
- c) The Engineer shall prepare required exhibits for permits necessary for Tarrant County to obtain for construction.
- d) The Engineer shall assist Tarrant County in preparation of Railroad permit for UPRR review and approval.

##### **Assumptions**

- Scope assumes that the Design Engineer will not obtain any permits from the City(s) and or State for the project. Permits for construction and approval will be obtained at a future date once construction funding and time line is available.

#### **19) MISCELLANEOUS DETAILS:**

Design Engineer will be responsible for developing miscellaneous construction details, modifications to the TxDOT standards, and all incidentals as required.

##### **Assumptions**

- Scope assumes that 3 miscellaneous details and 2 TxDOT standard modification will be used in the project.

**20) QUANTITY SHEETS:**

Checked quantities for each pay item of work included in the proposal form for the construction contract shall be tabulated on a general summary sheet. The Design Engineer shall prepare item summaries, to be included in the plans, for the various items of the construction contract. The general summary sheet or sheets shall conform to TxDOT standards. Each item summary shall include the pay item number, unit of payment, plan sheet number, station limits or locations, and any special notes. All quantities shall be summarized on the general summary sheet.

**21) ESTIMATE:**

Prepare estimates of construction costs based on preliminary and final construction plans for the Project. The initial estimate of construction cost shall be prepared and submitted at the 30-percent plan completion stage. An estimate shall also be prepared and submitted at the 60-percent, 90-percent and 100-percent completion stage and a final estimate prepared upon plan completion and acceptance by Tarrant County. One additional estimate may be requested at any time during the plan development process.

**22) SPECIFICATIONS:**

Prepare preliminary and final drafts of supplemental specifications, special provisions, notices, proposal, quantities, estimates, and other information necessary for the preparation of construction contract documents, including alternate bids. Standard Specifications, General Notes, and Special Provisions for the Project will be provided by Tarrant County; the Design Engineer shall modify the Standard Specifications, General Notes, and Special Provisions to fit its designs, plans, and construction requirements. All revisions of specifications, special provisions, special specifications, or general notes must be submitted with the 90-percent complete plans in marked-up or draft copy format. The Design Engineer will compile and prepare the proposal book. Tarrant County will sign and seal the proposal book sealing page for Special Provisions. The Design Engineer will sign and seal the proposal book sealing page for all other specifications, special provisions, and general notes.

**Assumptions**

- Technical specifications and special provisions will be based on the latest TxDOT Standard Specification.
- Project general notes, contract documents and bid format will be provided by Tarrant County

**23) DELIVERABLES:**

- All design calculations, including electronic computations, shall be neatly recorded on 8-1/2" x 11" sheets, fully titled, numbered, signed by the maker, checked, and indexed. A copy of these computations, fully checked, shall be submitted with the bidding documents.

- QA/QC verification documents, including electronic copies of check prints will be submitted with each submittal.
- All prints of plans necessary for the development of the bidding and final construction plans and specifications, including prints required to be submitted for the approval of TxDOT and Tarrant County, shall be clear and legible and shall be furnished at the expense of the Design Engineer. Final plans, specifications, and contract documents for the bidding process shall be printed and dispersed by Tarrant County. Provide the number of copies as required by Tarrant County's review process.
- PDF files of the final signed and sealed plans shall be delivered to Tarrant County in a VECTOR format that is editable. Scanned or no-editable PDF files will not be accepted. The Design Engineer shall flatten the PDF files and remove all security features.
- Any changes to the plans after final submittal for letting shall be noted with revision blocks, and the affected sheets (signed and sealed originals) shall be submitted to Tarrant County for distribution. Revisions will be numbered sequentially for each sheet.
- Upon completion of all work to be performed by the Design Engineer, all drawings, tracings, plans, calculations, estimates, specifications, and other items shall be delivered to Tarrant County.
- The Design Engineer will deliver, without limiting the provisions of the Agreement between the Design Engineer and Tarrant County, all electronic files and/or records developed for this project including Microstation files, a final 3D model utilizing Bentley's OpenRoads 3D Design technology, cross-sections in ASCII format, and all other supporting documentation prior to bidding and at construction completion (two separate submittals).
- This scope assumes electronic PDF (Vector format) and four (4) printed sets of plans, reports and associated documents at each submittal per QMS.
- Signed and sealed Geotechnical and Pavement Design Report.
- Signed and sealed Drainage Report.
- Large guide sign Signing and ITS Schematic.
- Design Summary Memorandum.

**24) AGREEMENTS (RAILROAD, ETC.) AND LAYOUTS:**

- The Design Engineer shall prepare each railroad or other agency agreement, exhibit, and layout sheet in accordance with the requirements of each railroad and as directed by Tarrant County. The Design Engineer shall coordinate with each railroad or agency and Tarrant County to determine submittal requirements, processing schedules, and exhibit formats. The Design Engineer shall submit each exhibit to the State for review and processing.

The Engineer shall prepare exhibits for the following locations:

1. FM 2871 over UPRR – New Grade Separation

**25) ADDITIONAL SERVICES:**

**A. Construction Phase Support Services**

At the request of Tarrant County, the Design Engineer shall provide miscellaneous services to address post PS&E submittal issues. The Design Engineer shall provide necessary engineering service to include revising plan sheets for change orders, reviewing change orders, reviewing product submittals, and analyzing construction schedules and related engineering work and providing recommendations to Tarrant County during the construction phase of the project.

- Specific services to be performed by the Design Engineer include:
- Review Change Orders
- Revise Change Order plan sheets
- Answer Contractors' Request for Information (RFI's)
- Shop Drawing verification
- Design Report revisions
- Meetings and presentations
- Other requests by Tarrant County and the Contractor(s)
- Miscellaneous field surveys (as needed)
- Provide additional Subsurface Utility Engineering (SUE) in order to locate utilities (as needed)

**B.** The services listed below are not part of this scope of services but may be requested of the Design Engineer by Tarrant County, as Tarrant County may determine to be necessary to provide complete construction plans and bidding documents for usual items of construction.

- I. Provide assistance to Tarrant County, the construction manager selected by Tarrant County in matters relating to the clarifications or supplementation of plans and specifications during the construction period for the Project which is not a part of this Scope of Services.
- II. In general, it is contemplated that the utility companies will prepare the necessary plans and estimates, complete the relocation of its facilities, and be reimbursed for this expense directly by Tarrant County if warranted, except when Tarrant County is requested to prepare utility plans. Should this not prove feasible in certain cases, Tarrant County may direct or authorize the Design Engineer to prepare the designs, create the specifications, and prepare utility relocation or adjustment plans and include such relocations in its construction plans, and the Design Engineer will be compensated according to the Extra Work provisions of the Agreement. The utility companies may request the inclusion of their construction plans and specifications in plans issued by Tarrant County for construction of the project. If so, Tarrant County will require the Design Engineer to include such utility relocation plans, in logical numbered sequence, within the construction plans and specifications it is preparing and tabulate utility quantities in the construction plan quantity summary and bidding

documents. To include this work the Design Engineer will be compensated according to the Extra Work provisions of the Agreement. In addition to preparing the plans and data required, the Design Engineer shall be required to participate in negotiations with the utility companies for the maintenance, relocation, and restorations of all utilities.

- III. Municipal Utilities: The Design Engineer shall prepare detail plans, specifications, quantities and estimate for municipal water and sanitary sewer relocations and adjustments to be incorporated into the PS&E package. The quantities and estimate for pertinent bid items shall be broken out separately. This work shall be handled as a supplemental agreement to the contract.
- IV. Franchise utility relocation coordination for the project is not included. This work shall be added at the request of Tarrant County and handled as a supplemental agreement.
- V. The following tasks may be used only upon written authorization from Tarrant County:
  - Provide additional structural plans beyond those identified at project initiation.
  - Provide additional roadway/drainage plans beyond those identified at project initiation.
  - Provide miscellaneous plans, details, etc. beyond those identified at project initiation.
  - Perform Level A Subsurface Utility Engineering (SUE) identified prior to 60 percent milestone submittal.
  - Other miscellaneous professional services as may be reasonably requested by Tarrant County at its sole discretion.

**EXHIBIT B**  
**TASK SUMMARY BREAKDOWN**  
**Design Services for**  
**Tarrant County FM 2817 - 0.5 mi North of I-20 to US 377**

Task No.	Task Description	TranSystems		Beyond		Rios	
		Design	Expenses	Design	Expenses	Design	Expenses
1.0	PROJECT MANAGEMENT	\$93,510.00					
2.0	MEETINGS	\$22,240.00					
3.0	SURVEYING / SUE					\$294,211.72	
4.0	GEOTECHNICAL and PAVEMENT DESIGN			\$693,234.00			
5.0	ENVIRONMENTAL STUDIES and PUBLIC INVOLVEMENT	\$14,120.00					
6.0	ROUTE and DESIGN STUDIES	\$103,120.00					
7.0	PROJECT LAYOUTS	\$46,150.00					
8.0	PROPOSED TYPICAL SECTION SHEETS	\$49,780.00					
9.0	TRAFFIC CONTROL PLAN, DETOURS, and SEQUENCE OF CONSTRUCTION	\$208,640.00					
10.0	REMOVAL PLANS	\$41,940.00					
11.0	GEOMETRIC LAYOUTS	\$53,120.00					
12.0	ROADWAY DESIGN	\$351,800.00					
13.0	RETAINING WALLS	\$126,860.00					
14.0	DRAINAGE DESIGN	\$344,450.00					
15.0	UTILITIES	\$18,340.00					
16.0	BRIDGE DESIGN	\$421,320.00					
17.0	TRAFFIC ITEMS	\$360,660.00					
18.0	PERMITS	\$0.00					
19.0	MISCELLANEOUS DETAILS	\$18,250.00					
20.0	QUANTITY SHEETS	\$31,160.00					
21.0	ESTIMATE	\$17,720.00					
22.0	SPECIFICATIONS	\$25,110.00					
23.0	DELIVERABLES	\$64,640.00					
24.0	AGREEMENTS (RAILROAD, ETC.) AND LAYOUTS	\$151,200.00					
25.0	ADDITIONAL SERVICES						
<b>Totals</b>		<b>\$2,564,130.00</b>	<b>\$0.00</b>	<b>\$693,234.00</b>	<b>\$0.00</b>	<b>\$294,211.72</b>	<b>\$0.00</b>

	<b>Project Total</b>	<b>\$3,551,575.72</b>
	<b>MWBE Total</b>	<b>\$987,445.72</b>
	<b>MWBE Percentage</b>	<b>28%</b>

City of Fort Worth, Texas  
Attachment B - Level of Effort Supplement  
PMO Official Release Date: 8.09.2012

**Level of Effort Spreadsheet**  
**TASK/HOUR BREAKDOWN**  
**Design Services for**  
**Tarrant County FM 2817 - 0.5 mi North of I-20 to US 377**

Task No.	Task Description	Labor (hours)									Total Labor Cost	Expense				Total Expense Cost	Task Sub Total
		Project Director	Quality Manager	Project Manager	Sr Project Engineer	Project Engineer	Engineer in Training	Sr Technician	Jr Technician	Administrative		Subconsultant		Travel	Reproduction		
	Rate	\$390	\$265	\$265	\$205	\$165	\$135	\$150	\$135	\$110		MBE/SBE	Non-MBE/SBE				
1.0	PROJECT MANAGEMENT	0	80	238	0	24	0	0	0	48	\$93,510	\$0	\$0	\$0	\$0	\$0	\$93,510
a	Project Control and Management (4hr/wk - 12mths)			208							\$55,120					\$0	\$55,120
b	Status Reports and Invoicing (12mths)			24						48	\$11,640					\$0	\$11,640
c	Project Schedule / Work plan (12mths)			6		24					\$5,550					\$0	\$5,550
d	Quality Assurance and Control		80								\$21,200					\$0	\$21,200
2.0	MEETINGS	0	32	32	0	32	0	0	0	0	\$22,240	\$0	\$0	\$0	\$0	\$0	\$22,240
a	Kickoff Meeting		4	4		4					\$2,780					\$0	\$2,780
b	Submittal Review Meetings										\$0					\$0	\$0
1	30% Submittal		4	4		4					\$2,780					\$0	\$2,780
2	60% Submittal		4	4		4					\$2,780					\$0	\$2,780
3	90% Submittal		4	4		4					\$2,780					\$0	\$2,780
4	100% Submittal		4	4		4					\$2,780					\$0	\$2,780
5	StakeHolder Meetings (Assume 3)		12	12		12					\$8,340					\$0	\$8,340
5.0	ENVIRONMENTAL STUDIES and PUBLIC INVOLVEMENT	0	0	8	0	40	40	0	0	0	\$14,120	\$0	\$0	\$0	\$0	\$0	\$14,120
	EPIC Sheets (4 Sheets)			8		40	40				\$14,120					\$0	\$14,120
6.0	ROUTE and DESIGN STUDIES	0	0	44	68	140	172	100	120	0	\$103,120	\$0	\$0	\$0	\$0	\$0	\$103,120
a	Data Collection			4	4	24	24				\$9,080					\$0	\$9,080
b	Field Reconnaissance			8	8	8	8				\$6,160					\$0	\$6,160
c	Roadway and Hydraulic Design Criteria			4	4	16	20				\$7,220					\$0	\$7,220
d	Pre-Design Conference			4	12	12					\$5,500					\$0	\$5,500
e	Schematic Revisions			24	40	80	120	100	120		\$75,160					\$0	\$75,160
7.0	PROJECT LAYOUTS	0	0	22	0	48	80	0	160	0	\$46,150	\$0	\$0	\$0	\$0	\$0	\$46,150
	Horizontal Alignment Sheets (16 Sheets - 1000' per)			20		40	60		140		\$38,900					\$0	\$38,900
	Alignment Data Sheets (4 Sheets)			2		8	20		20		\$7,250					\$0	\$7,250
8.0	PROPOSED TYPICAL SECTION SHEETS	0	0	16	0	44	88	140	40	0	\$49,780	\$0	\$0	\$0	\$0	\$0	\$49,780
	Existing FM 2871 (2 Sheets)			4		8	16		20		\$7,240					\$0	\$7,240
	Exisging Side Streets (2 Sheets)			4		8	16		20		\$7,240					\$0	\$7,240
	Proposed FM 2871 (4 Sheets)			4		16	32	80			\$20,020					\$0	\$20,020
	Propsoed Side Streets (3 Sheets)			4		12	24	60			\$15,280					\$0	\$15,280
9.0	TRAFFIC CONTROL PLAN, DETOURS, and SEQUENCE OF CONSTRUCTION	0	0	86	6	208	404	300	376	0	\$208,640	\$0	\$0	\$0	\$0	\$0	\$208,640
	Traffic Control Narrative (3 Sheets)			2	6	24			16		\$7,880					\$0	\$7,880
	Traffic Control Typical Sections (8 Sheets)			16		40	64	80			\$31,480					\$0	\$31,480
	Traffic Control Phase 1 (16 Sheets - 1000' per)			24		40	80	80	120		\$51,960					\$0	\$51,960
	Traffic Control Phase 2 (16 Sheets - 1000' per)			24		40	80	80	120		\$51,960					\$0	\$51,960
	Local Street Detour Map (4 Sheets)			8		24	60	60			\$23,180					\$0	\$23,180
	Standards (TCP and BC)			4		8	40		40		\$13,180					\$0	\$13,180
	Temporary Shoring Layout (8 Sheets)			8		32	80		80		\$29,000					\$0	\$29,000
10.0	REMOVAL PLANS	0	0	16	20	40	80	0	120	0	\$41,940	\$0	\$0	\$0	\$0	\$0	\$41,940
	Removal Sheets (19 Sheets - 800' per)			16	20	40	80		120		\$41,940					\$0	\$41,940
11.0	GEOMETRIC LAYOUTS	0	0	8	0	40	120	80	120	0	\$53,120	\$0	\$0	\$0	\$0	\$0	\$53,120
	Plan View Layouts (19 Sheets - 800' per)			8		40	120	80	120		\$53,120					\$0	\$53,120
12.0	ROADWAY DESIGN	0	0	116	96	436	524	320	820	0	\$351,800	\$0	\$0	\$0	\$0	\$0	\$351,800
12.1	Roadway Design (Modeling)			24	80	120					\$42,560					\$0	\$42,560
12.2	Plan Preperation										\$0					\$0	\$0
a	Plan View (30 Sheets - 500' per)			24		80	120	120	320		\$96,960					\$0	\$96,960
b	Profile View (30 Sheets - 500' per)			24		60	100	120	240		\$80,160					\$0	\$80,160
c	Grading Plan (7 Intersections)				16	40		80	60		\$29,980					\$0	\$29,980
d	Cross Sections			20		80	200		200		\$72,500					\$0	\$72,500
e	Vertical Clearance at Bridges			4		8	32				\$6,700					\$0	\$6,700
f	Design Exceptions/Waivers			16		32	48				\$16,000					\$0	\$16,000
g	MBGF/Rail Length of Need			4		16	24				\$6,940					\$0	\$6,940

Level of Effort Spreadsheet  
TASK/HOUR BREAKDOWN  
Design Services for  
Tarrant County FM 2817 - 0.5 mi North of I-20 to US 377

Task No.	Task Description	Labor (hours)									Total Labor Cost	Expense				Total Expense Cost	Task Sub Total
		Project Director	Quality Manager	Project Manager	Sr Project Engineer	Project Engineer	Engineer in Training	Sr Technician	Jr Technician	Administrative		Subconsultant		Travel	Reproduction		
		Rate	\$390	\$265	\$265	\$205	\$165	\$135	\$150	\$135	\$110	MBE/SBE	Non-MBE/SBE				
14.0	DRAINAGE DESIGN	0	0	168	40	358	500	396	688	0	\$331,570	\$0	\$0	\$0	\$0	\$0	\$331,570
a	Drainage Study			40		60	80				\$31,300					\$0	\$31,300
b	Culvert and Storm Drain Design										\$0					\$0	\$0
	Culvert Extension Sheets Plan & Profile (5 Sheets)			24		24	48	80			\$28,800					\$0	\$28,800
	New Cross Culvert Sheet Plan & Profile (1 Sheet)			4		6	12	16			\$6,070					\$0	\$6,070
	Storm Drain Plan & Profile Sheets (30 Sheets - 500' per)			40		100	160	180	420		\$132,400					\$0	\$132,400
	Drainage Area Map (16 Sheets - 1000' per)			8		24	80		120		\$33,080					\$0	\$33,080
	Runoff Computation Sheets (3 Sheets)			4			16		24		\$6,460					\$0	\$6,460
	Hydraulic Computation Sheets (6 Sheets)			4			32		48		\$11,860					\$0	\$11,860
c	Storm Water Pollution Prevention Plans (SWP3) (16 sheets - 1000' per)			8		24	48	120			\$30,560					\$0	\$30,560
d	Layout, Structural Design and Detailing of Drainage Features (3 Sheets)			16		24			40		\$13,600					\$0	\$13,600
e	Storm Water Treatment Systems (Additional Service - Not in Scope)										\$0					\$0	\$0
	TxDOT Drainage Standards					16	24		36		\$10,740					\$0	\$10,740
	Walnut Creek Bridge Modeling - FEMA Coordination			20	40	80					\$26,700					\$0	\$26,700
15.0	UTILITIES	0	0	16	0	20	80	0	0	0	\$18,340	\$0	\$0	\$0	\$0	\$0	\$18,340
	Utility Conflict Matrix			16		20	80				\$18,340					\$0	\$18,340
19.0	MISCELLANEOUS DETAILS	0	0	16	0	24	30	40	0	0	\$18,250	\$0	\$0	\$0	\$0	\$0	\$18,250
	3 Miscellaneous and 2 TxDOT Standard Mods			16		24	30	40			\$18,250					\$0	\$18,250
20.0	QUANTITY SHEETS	0	0	8	0	32	96	0	80	0	\$31,160	\$0	\$0	\$0	\$0	\$0	\$31,160
	30% Submittal (4 Sheets)			2		8	24		20		\$7,790					\$0	\$7,790
	60% Submittal (4 Sheets)			2		8	24		20		\$7,790					\$0	\$7,790
	90% Submittal (4 Sheets)			2		8	24		20		\$7,790					\$0	\$7,790
	100% Submittal (4 Sheets)			2		8	24		20		\$7,790					\$0	\$7,790
											\$0					\$0	\$0
21.0	ESTIMATE	0	0	8	0	16	96	0	0	0	\$17,720	\$0	\$0	\$0	\$0	\$0	\$17,720
	30% Submittal			2		4	24				\$4,430					\$0	\$4,430
	60% Submittal			2		4	24				\$4,430					\$0	\$4,430
	90% Submittal			2		4	24				\$4,430					\$0	\$4,430
	100% Submittal			2		4	24				\$4,430					\$0	\$4,430
22.0	SPECIFICATIONS	0	0	12	0	38	116	0	0	0	\$25,110	\$0	\$0	\$0	\$0	\$0	\$25,110
	30% Submittal			2		4	20				\$3,890					\$0	\$3,890
	60% Submittal			2		6	24				\$4,760					\$0	\$4,760
	90% Submittal			4		12	32				\$7,360						
	100% Submittal			4		16	40				\$9,100						
23.0	DELIVERABLES	0	0	32	0	64	160	160	0	0	\$64,640	\$0	\$0	\$0	\$0	\$0	\$64,640
	30% Submittal			8		16	40	40			\$16,160					\$0	\$16,160
	60% Submittal			8		16	40	40			\$16,160					\$0	\$16,160
	90% Submittal			8		16	40	40			\$16,160					\$0	\$16,160
	100% Submittal			8		16	40	40			\$16,160					\$0	\$16,160
24.0	AGREEMENTS (RAILROAD, ETC.) AND LAYOUTS	0	0	120	0	200	360	0	280	0	\$151,200	\$0	\$0	\$0	\$0	\$0	\$151,200
	25% UPRR Submittal (Occurs at approx 60% design completion)			20		40	80		80		\$33,500					\$0	\$33,500
	30% UPRR Submittal			20		40	80		80		\$33,500					\$0	\$33,500
	90% UPRR Submittal			40		60	100		60		\$42,100					\$0	\$42,100
	100% UPRR Submittal			40		60	100		60		\$42,100					\$0	\$42,100
25.0	ADDITIONAL SERVICES	0	0	0	0	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	Totals	0	112	966	230	1804	2946	1536	2804	48	\$1,642,410	\$0	\$0	\$0	\$0	\$0	\$1,642,410

Project Summary	
Total Hours	10,446
Total Labor	\$1,642,410
Total Expense	\$0
MBE/SBE Subconsultant	\$0
Non-MBE/SBE Subconsultant	\$0
5% Sub Markup	\$0
MBE/SBE Participation	0.0%
Total Project Cost	\$1,642,410



**Level of Effort Spreadsheet  
TASK/HOUR BREAKDOWN  
Design Services for  
Tarrant County FM 2817 - 0.5 mi North of I-20 to US 377**

Task No.	Task Description	Labor (hours)				Total Labor Cost	Expense				Total Expense Cost	Task Sub Total
		PM / Task Leader (E4)	Project Engineer (E3)	Design Engineer (E2)	Engineer in Training		Subconsultant		Travel	Reproduction		
							MBE/SBE	Non-MBE/SBE				
	Rate	\$265	\$205	\$165	\$135							
17.0	TRAFFIC ITEMS	76	272	672	1288	\$360,660	\$0	\$0	\$0	\$0	\$0	\$360,660
a	Illumination	12	16	48	128	\$31,660					\$0	\$31,660
b	Signing	12	32	64	240	\$52,700					\$0	\$52,700
c	Pavement Markings	12	24	80	200	\$48,300					\$0	\$48,300
d	Signal Design	40	200	480	720	\$228,000					\$0	\$228,000
Totals		76	272	672	1288	\$360,660	\$0	\$0	\$0	\$0	\$0	\$360,660

Project Summary	
Total Hours	2,308
Total Labor	\$360,660
Total Expense	\$0
MBE/SBE Subconsultant	\$0
Non-MBE/SBE Subconsultant	\$0
5% Sub Markup	\$0
MBE/SBE Participation	0.0%
<b>Total Project Cost</b>	<b>\$360,660</b>

**Level of Effort Spreadsheet  
TASK/HOUR BREAKDOWN  
Design Services for  
Tarrant County FM 2817 - 0.5 mi North of I-20 to US 377**

Task No.	Task Description	Labor (hours)				Total Labor Cost	Expense				Total Expense Cost	Task Sub Total
		Sr Technician	Structural Engineer IV	Structural Engineer III	Structural Engineer I		Subconsultant		Travel	Reproduction		
		Rate	\$150	\$280	\$220	\$130	MBE/SBE	Non-MBE/SBE				
<b>13.0</b>	<b>RETAINING WALLS</b>	<b>364</b>	<b>26</b>	<b>124</b>	<b>290</b>	<b>\$126,860</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$126,860</b>
	Layout Plan (includes temporary walls to construct bridge)	194	14	64	150	\$66,600					\$0	\$66,600
	Elevation	170	12	60	140	\$60,260					\$0	\$60,260
<b>14.0</b>	<b>DRAINAGE DESIGN</b>	<b>40</b>	<b>4</b>	<b>12</b>	<b>24</b>	<b>\$12,880</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$12,880</b>
a	Drainage Study					\$0					\$0	\$0
b	Culvert and Storm Drain Design					\$0					\$0	\$0
c	Storm Water Pollution Prevention Plans (SWP3)					\$0					\$0	\$0
d	Layout, Structural Design and Detailing of Drainage Features ( <a href="#">Veale Pkwy at Walnut Creek Culvert Layout</a> )	40	4	12	24	\$12,880					\$0	\$12,880
e	Storm Water Treatment Systems					\$0					\$0	\$0
<b>16.0</b>	<b>BRIDGE DESIGN</b>	<b>1076</b>	<b>244</b>	<b>488</b>	<b>648</b>	<b>\$421,320</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$421,320</b>
a	Bridge Layout	316	108	192	172	\$142,240					\$0	\$142,240
b	Final Design Calculations and Details	760	136	296	476	\$279,080					\$0	\$279,080
	<b>Totals</b>	<b>1480</b>	<b>274</b>	<b>624</b>	<b>962</b>	<b>\$561,060</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$561,060</b>

Project Summary	
Total Hours	3,340
Total Labor	\$561,060
Total Expense	\$0
MBE/SBE Subconsultant	\$0
Non-MBE/SBE Subconsultant	\$0
5% Sub Markup	\$0
MBE/SBE Participation	0.0%
<b>Total Project Cost</b>	<b>\$561,060</b>

Level of Effort Spreadsheet  
TASK/HOUR BREAKDOWN  
Design Services for SUE (Rios)  
Tarrant County FM 2817 - 0.5 mi North of I-20 to US 377

Task No.	Task Description	Labor (hours)										Total Labor Cost	Expense				Total Expense Cost	Task Sub Total
		Project Principal	Project Manager (Senior)	Project Manager	Engineer (Senior)	Engineer (Project)	Engineer in Training	Sr CADD Technician	Jr CADD Technician	SUE Manager	Admin				Travel	Reproduction		
		Rate	\$304	\$258	\$201	\$258	\$201	\$117	\$112	\$70	\$138	\$100	MBE/SBE	Non-MBE/SBE				
1.0	PROJECT MANAGEMENT	0	102	0	0	0	0	0	0	20	24	\$31,533	\$0	\$0	\$0	\$0	\$0	\$31,533
a	Project Control and Management		40							20		\$13,103					\$0	\$13,103
b	Status Reports and Invoicing		16								24	\$6,543					\$0	\$6,543
c	Project Schedule / Work plan		16									\$4,135					\$0	\$4,135
d	Quality Assurance and Control		30									\$7,753					\$0	\$7,753
2.0	MEETINGS	0	10	10	0	0	0	0	0	22	0	\$7,634	\$0	\$0	\$0	\$0	\$0	\$7,634
a	Kickoff Meeting		2	2						2		\$1,195					\$0	\$1,195
b	Submittal Review Meetings									20		\$2,767					\$0	\$2,767
1	30% Submittal		2	2								\$918					\$0	\$918
2	60% Submittal		2	2								\$918					\$0	\$918
3	90% Submittal		2	2								\$918					\$0	\$918
4	100% Submittal		2	2								\$918					\$0	\$918
5	StakeHolder Meetings (Assume 3)											\$0					\$0	\$0
3.0	SURVEYING / SUE	0	0	0	0	0	0	0	0	0	0	\$0	\$219,826	\$0	\$0	\$0	\$219,826	\$219,826
3.1	Field Surveying											\$0					\$0	\$0
3.1.1	Horizontal Ground Control											\$0					\$0	\$0
3.1.2	Vertical Ground Control											\$0					\$0	\$0
3.1.3	Right-of-Way and Easement Surveying											\$0					\$0	\$0
3.2	Subsurface Utilities Exploration (SUE)											\$0					\$0	\$0
	Level B - See Unit Rate Table											\$0	\$201,826				\$201,826	\$201,826
	Level A - See Unit Rate Table											\$0	\$18,000				\$18,000	\$18,000
24.0	AGREEMENTS (RAILROAD, ETC.) AND LAYOUTS	0	20	75	0	0	0	0	0	0	0	\$20,218	\$0	\$15,000	\$0	\$0	\$15,000	\$35,218
	Non-Intrusive RR ROE Application Fee and Coordination		10	20								\$6,597		\$1,500			\$1,500	\$8,097
	Intrusive RR ROE Application fee and Coordination (for QLA)		5	40								\$9,319		\$5,000			\$5,000	\$14,319
	RR Safety Training		5	5								\$2,295		\$2,500			\$2,500	\$4,795
	RR Flagging Services and coordination			10								\$2,007		\$6,000			\$6,000	\$8,007
	Totals	0	132	85	0	0	0	0	0	42	24	\$59,385	\$219,826	\$15,000	\$0	\$0	\$234,826	\$294,212

Project Summary	
Total Hours	283
Total Labor	\$59,385
Total Expense	\$234,826
MBE/SBE Subconsultant	\$219,826
Non-MBE/SBE Subconsultant	\$15,000
0% Sub Markup	\$0
MBE/SBE Participation	
Total Project Cost	\$294,212

THE RIOS GROUP, INC.				
SUE UNIT RATE LOE				
SERVICES TO BE PROVIDED	COST	UNIT	QTY	AMOUNT
<b>SUE Mobilization/Demobilization</b>				
This cost is intended to be an expense compensation per request for mobilizing/demobilizing personnel and equipment portal to portal. Vacuum excavation truck, equipment, travel time for 2-man crew, fuel. Mileage log to be provided.	\$5.00	mile		\$0.00
<b>SUE (Quality Level D)</b>				
Includes labor and equipment for records research and CADD (Including overhead utilities). For overhead utilities, measurement for payment will be LF per utility owner.	\$0.57	LF	72200	\$41,154.00
<b>SUE (Quality Level C)</b>				
Includes labor and equipment for records research, CADD, and surveying (including overhead utilities) per utility owner. For overhead utilities, measurement for payment will be LF per utility owner. (Apurtenance must be surveyed)	\$0.75	LF	5200	\$3,900.00
<b>SUE (Quality Level B - Utility Designation)</b>				
Includes labor and equipment for records research, designating, engineering, CADD, mapping and limited traffic control				
Includes labor and equipment for surveying and limited traffic control				
<b>Level B: (Total)</b>	\$1.80	LF	83318	\$149,972.40
<b>SUE (Quality Level A - Utility Locate, Test Holes)</b>				
Level A: 0 to 5 ft (Includes labor and equipment for engineering, CADD)				
(Includes labor and equipment for surveying and limited traffic control)				
(Includes labor and equipment for vacuum excavation and limited traffic control)				
<b>Level A: 0 to 5 ft (Total)</b>	\$1,350.00	each		\$0.00
Level A: > 5 to 8 ft (Includes labor and equipment for engineering, CADD)				
(Includes labor and equipment for surveying and limited traffic control)				
(Includes labor and equipment for vacuum excavation and limited traffic control)				
<b>Level A: &gt; 5 to 8 ft (Total)</b>	\$1,600.00	each	5	\$8,000.00
Level A: > 8 to 13 ft (Includes labor and equipment for engineering, CADD)				
(Includes labor and equipment for surveying and limited traffic control)				
(Includes labor and equipment for vacuum excavation and limited traffic control)				
<b>Level A: &gt; 8 to 13 ft (Total)</b>	\$2,000.00	each	5	\$10,000.00
Level A: > 13 to 20 ft (Includes labor and equipment for engineering, CADD)				
(Includes labor and equipment for surveying and limited traffic control)				
(Includes labor and equipment for vacuum excavation and limited traffic control)				
<b>Level A: &gt; 13 to 20 ft (Total)</b>	\$2,900.00	each		\$0.00
<b>SUBTOTAL QLA</b>				<b>\$18,000.00</b>
<b>Note: When the above unit prices are not utilized, the following appropriate rates will apply.</b>				
<u>Subsurface Utility Engineering (SUE) Field Services</u>				
One (1) Designating Person with equipment	\$150.00	hour	40	\$6,000.00
Two (2) Designating Person with equipment	\$200.00	hour		\$0.00
Two (2) Person Vacuum Excavation with equipment	\$360.00	hour		\$0.00
Coring and repairing the pavement includes labor, equipment, and materials	\$400.00	each	2	\$800.00
<b>SUBTOTAL QLB</b>				<b>\$201,826.40</b>
<b>Totals</b>				<b>\$219,826.40</b>
The unit costs shown include labor, overhead, and profit. Payment based on units completed. No partial payments.				

Level of Effort Spreadsheet  
TASK/HOUR BREAKDOWN  
Design Services for Geotechnical Services (Beyond)  
Tarrant County FM 2817 - 0.5 mi North of I-20 to US 377

Task No.	Task Description	Labor (hours)									Total Labor Cost	Expense				Total Expense Cost	Task Sub Total
		Project Director	Project Manager	Project Engineer	Engineer in Training	Sr Technician	Jr Technician	Senior Engineer	Jr Geologist	Administrative		Subconsultant		Travel	Reproduction		
		Rate	\$320	\$235	\$195	\$150	\$175	\$95	\$310	\$102		\$102	MBE/SBE				
4.0	GEOTECHNICAL and PAVEMENT DESIGN	22	100	292	748	8	260	144	284	40	\$303,468	\$389,766	\$0	\$0	\$0	\$389,766	\$693,234
	Boring Location Plan, Coordination, Planning, Utility Locates	2	8	24	40	8	32	8	32	8	\$24,200					\$0	\$24,200
	Field Work - Drilling/Logging/Data Collection	4	34	64	128		200	24	200	8	\$88,606	\$266,063				\$266,063	\$354,669
	Laboratory Testing - Assignment, Review, Create/Update Logs	4	14	36	140		28	8	28	4	\$40,994	\$123,703				\$123,703	\$164,697
	Pavement Design, PVR	2	12	42	122			40			\$42,350					\$0	\$42,350
	Draft Pavement Report	4	8	32	64			12	12	8	\$24,760					\$0	\$24,760
	Engineering Analysis - Bridge, Culvert and Retaining Walls	2	12	42	158			24			\$42,790					\$0	\$42,790
	Draft Geotechnical Report	4	10	48	80			20	12	8	\$33,230					\$0	\$33,230
	Finalizing Reports		2	4	16			8		4	\$6,538					\$0	\$6,538
Totals		22	100	292	748	8	260	144	284	40	\$303,468	\$389,766	\$0	\$0	\$0	\$389,766	\$693,234

Project Summary	
Total Hours	1,898
Total Labor	\$303,468
Total Expense	\$389,766
MBE/SBE Subconsultant	\$389,766
Non-MBE/SBE Subconsultant	\$0
0% Sub Markup	\$0
MBE/SBE Participation	
Total Project Cost	\$693,234

Geotechnical Unit Costs / Expenses

Item	Unit	Number	Unit Cost	Cost
Mileage	per mile	12600	\$ 0.67	\$ 8,442.00
Truck Drill Rig Mobilization	each	4	\$ 600.00	\$ 2,400.00
Track Drill Rig Mobilization	each	4	\$ 1,800.00	\$ 7,200.00
Pavement Coring Rig Mobilization	each	7	\$ 600.00	\$ 4,200.00
Mobilization of pavement FWD equipment	each	1	\$ 1,500.00	\$ 1,500.00
Traffic Control (Daily with Flaggers)	per day	20	\$ 4,000.00	\$ 80,000.00
Site Clearing with Tree/Brush Removal Equipment	per day	2	\$ 3,000.00	\$ 6,000.00
Geotechnical Field Work				
Soil Boring and SPT Testing every 5 feet (0-50 feet)	LF	2110	\$ 50.00	\$ 105,500.00
Soil Boring and SPT Testing every 5 feet (50-100 feet)	LF	35	\$ 58.00	\$ 2,030.00
Continuous Rock Coring (0-100 feet)	LF	175	\$ 65.00	\$ 11,375.00
Pavement Coring (6 inch diameter)	per inch	252	\$ 25.00	\$ 6,300.00
Pavement Core Patching	each	21	\$ 96.00	\$ 2,016.00
Shelby Tube Sampling	each	154	\$ 50.00	\$ 7,700.00
Texas Cone Penetration (Tex-132-E)	each	0	\$ 53.00	\$ -
Standby of Crew	per hour	40	\$ 350.00	\$ 14,000.00
Falling Weight Deflection (FWD) Non Destructive Testing	per day	2	\$ 3,700.00	\$ 7,400.00
Geotechnical Laboratory Testing				
Determining Moisture Content in Soil Materials (Tex-103-E)	each	429	\$ 32.00	\$ 13,728.00
Determining Liquid Limits of Soils (Tex-104-E)	each	232	\$ 58.00	\$ 13,456.00
Determining Plastic Soil Limits (Tex-105-E)	each	232	\$ 56.00	\$ 12,992.00
Calculating the Plasticity Index of Soils (Tex-106-E)	each	232	\$ 60.00	\$ 13,920.00
Determining the Amount of Material in Soils Finer than the 75 micrometer (No. 200) Sieve (Tex-111-E)	each	232	\$ 84.00	\$ 19,488.00
Particle Size Analysis of Soils Part 1 (Tex-110-E)	each	4	\$ 120.00	\$ 480.00
Particle Size Analysis of Soils Part 2 (Tex-110-E)	each	4	\$ 220.00	\$ 880.00
Soil Organic Content Using UV-Vis Method (Tex-148-E)	each	19	\$ 450.00	\$ 8,550.00
Determining Sulfate Content in Soils - Colorimetric Method (Tex-145-E)	each	42	\$ 150.00	\$ 6,300.00
Unconfined Compressive Strength (Soil) (ASTM D2166)	each	77	\$ 87.00	\$ 6,699.00
Unconfined Compressive Strength (Rock) (ASTM D2938)	each	21	\$ 150.00	\$ 3,150.00
Triaxial Compression Test for Undisturbed Soils (Tex-118-E)	each	4	\$ 400.00	\$ 1,600.00
One Dimensional Swell or Collapse of Soils, Methods A & B (ASTM D4546)	each	8	\$ 310.00	\$ 2,480.00
One-Dimensional Consolidation Properties of Soils Using Incremental Loading (ASTM D2436)	each	8	\$ 700.00	\$ 5,600.00
Direct Shear Test of Soils Under Consolidated Drained Conditions (ASTM D3080)	set of 3	4	\$ 1,100.00	\$ 4,400.00
Consolidated Undrained (CU) Triaxial Compression Test for Undisturbed Soils- Multiple Change (Tex-131-E)	set of 3	4	\$ 2,100.00	\$ 8,400.00
Laboratory Compaction Characteristics and Moisture-Density Relationship of Subgrade, Embankment Soils, and Backfill Material (Tex-114-E)	each	2	\$ 350.00	\$ 700.00
California Bearing Ratio (CBR) of Laboratory-Compacted Soils (Single Sample without MD Curve) (ASTM D1883)	test	2	\$ 440.00	\$ 880.00
			TOTAL:	\$ 389,766.00

-- 42 @ 2 vehicle @ 150 miles round trip for logging, staking, recon, support trucks  
-- weekly mobilizations, leave rig on site during the week (consider 50/50 track vs truck) 4 weeks  
-- weekly mobilizations, leave rig on site during the week (consider 50/50 track vs truck) 4 weeks  
-- one trip per mob for coring operations (21 locations)  
-- one trip for FWD analysis  
-- Traffic control estimated (~600 LF drilling + traffic control for FWD)  
-- site clearing for boring in areas with new alignment for cross street walls/culvert  
  
-- total of 1,680 lf estimated  
-- soil in bridge borings not rock coring (6 locations)  
-- 25 feet per bridge boring (7).  
-- Estimate 21 Locations at 12 inches deep each  
-- 8 locations anticipated in the pavement  
-- extra shelby tube samples, ~2 per boring  
  
-- 1 HR per day for traffic control/moving/clearing  
-- 2 days across existing pavement  
  
-- MC approx every 5 LF  
-- approx every 10 LF  
-- approx every 10 LF  
-- approx every 10 LF  
  
-- approx every 10 LF  
-- for D50 at culvert and bridges  
-- for D50 at culvert and bridges  
-- 1 every other pavement boring  
-- 1 per pavement boring, 1 every other bridge boring  
-- ~1 per boring  
-- 3 per bridge boring  
-- 1 every other bridge boring  
  
-- 1 every other pavement and bridge boring  
  
-- 1 every retaining walls structure  
  
-- 1 every other retaining walls structure  
  
-- 1 every other retaining walls structure  
  
-- 2 for the alignment  
-- 2 for the alignment

**Tarrant County**  
**FM 2871**  
**Exhibit C - Design Schedule**

