HIDALGO COUNTY
Professional Engineering Services
Contract # C-16-049-02-16
Work Authorization Form

WORK AUTHORIZATION NO. 2

THIS WORK AUTHORIZATION is made pursuant to the terms and conditions of Article 7 of the Agreement made by and between **HIDALGO COUNTY**, action herein by and through the **Commissioner's Court**, hereinafter called the "**Owner**," and, **L & G Consulting Engineers, Inc.** *d/b/a* **L & G Engineering**, professional engineers of Mercedes, Texas, hereinafter called "**Engineer**".

PART 1. SCOPE OF WORK
The purpose of this Work Authorization is for the **Engineer** to provide the PS&E, Design Surveys, Traffic Signal Warrants and Design, Permitted Utilities Coordination and Engineering Consultant Const. Management needed for the Mile 5 (FM 676) Project (from Taylor Road to Ware Road (FM 2220)).

The scope of services to be provided by the **Owner** is identified in ***EXHIBIT "A" – Scope of Services to be provided by the Owner*** attached hereto.

The scope of services to be provided by the **Engineer** is identified in ***EXHIBIT "B" – Scope of Services to be provided by the Engineer*** attached hereto.

PART 2. ESTIMATED COST
The estimated cost for services under this Work Authorization is **$1,088,648.18**. This amount is based upon the costs outlined in the Estimated **Cost Proposal** attached hereto as ***EXHIBIT "D" Fee Schedule.***

PART 3. PAYMENT
Compensation and payment to the Engineer for the services established under this Work Authorization shall be made in accordance with **Article 5 & 6** of the Agreement.

PART 4. FUNDING
This Work Authorization No. 2 shall be funded through funding source:
Account No. _____
Requisition Number 404095 **(MUST BE INCLUDED AFTER CC APPROVAL)**

PART 5. PERIOD OF SERVICE
This Work Authorization shall become effective on the date of final acceptance of the parties hereto, and terminate upon completion of scopes of the work authorization.

PART 6. RESPONSIBILITIES AND OBLIGATIONS
This Authorization does not waive the parties' responsibilities and obligations provided under the **Agreement**.

PART 7. ACKNOWLEDGEMENT AND CONFIRMATION
Acknowledgement and confirmation by **Hidalgo County Precinct No. 4,** Commissioner Ellie Torres, as to content and detail of this **Work Authorization No. 2**.

HIDALGO COUNTY
COMMISSIONER PRECINCT NO. 4

BY:_____

PART 8. ACCEPTANCE AND APPROVAL
This Work Authorization is hereby accepted, approved by Hidalgo County Commissioners' Court on _____ as indicated below.

THE ENGINEER:
L&G ENGINEERING

_____
By: Jacinto Garza, P.E.
President

THE OWNER:
HIDALGO COUNTY

_____
By: Richard Cortez,
County Judge

ATTEST:

_____
By: Arturo Guajardo, Jr., County Clerk

LIST OF ATTACHMENTS
Exhibit A – Services to be Provided by the Owner
Exhibit B – Services to be Provided by the Engineer
Exhibit C – Work Schedule
Exhibit D – Fee Schedule

EXHIBIT "A"
SCOPE OF SERVICES TO BE PROVIDED BY THE OWNER

The following provides an outline of the services to be provided by the **Owner** in the development of the PS&E for the necessary improvements to Mile 5 (FM 676) Project located within the County of Hidalgo and the City of McAllen, and within the limits of Taylor Road and Ware Road (FM 2220) in Hidalgo County hereinafter denoted as the **Project**.

GENERAL:

The **Owner** will provide to the **Engineer** the following:

1) Provide the authorization to proceed with services through coordination with the project consulting and design Engineer.

2) Payment for work performed by the **Engineer** and accepted by the **Owner** in accordance with Article 5 of the Agreement.

3) Assistance to the **Engineer**, as necessary, to obtain the required data and information from other local, regional, State and Federal agencies the **Engineer** cannot easily obtain.

4) Provide any available relevant data the **Owner** may have on file concerning the **Project**.

5) Provide timely review and decisions in response to the **Engineer's** request for information and/or required submittals and deliverables, in order for the **Engineer** to maintain the agreed upon work schedule prepared in accordance with Exhibit "C" attached to this Work Authorization.

6) Attend and participate in progress meetings as required and as coordinated and conducted by **Engineer**.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

SECTION 1-PROJECT DESCRIPTION

The services designated herein as "Services provided by the ENGINEER" shall include the performance of all engineering services for the following described facility:

COUNTY/CITY: Hidalgo County

CONTROL:

PROJECT/DESCRIPTION: PS&E, Design Survey, SUE Investigations, Traffic Signal Warrants & Design, Geotechnical Testing, Pavement Design, Compensable & Permitted Utility Coordination, Project Management & Construction Management

LENGTH: 1.0 Mile

HIGHWAY: Mile 5 (FM 676)

LIMITS: From Taylor Road to FM 2220 (Ware Road)

PROJECT CLASSIFICATION

(Place an "X" in only one Project Classification)

___ Surface Treatment
___ Overlay
___ Rehabilitation Existing Road (Scarify & Reshape)
___ Convert Non-Freeway to Freeway
___ Widen Freeway
_X_ Widen Non-Freeway
___ New Location Toll Freeway
___ New Location Non-Freeway
___ Interchange (New or Reconstruct)
___ Bridge Widening or Rehabilitation
___ Bridge Replacement
___ Upgrade to Standards - Freeway
___ Upgrade to Standards - Non-Freeway
___ Miscellaneous Studies (Use Function Code 110 for All Tasks)

ENGINEER shall mean L&G Engineering.

STATE shall mean Texas Department of Transportation.

COUNTY shall mean Hidalgo County.

LPA shall mean Hidalgo County

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

SECTION 6 - FIELD SURVEYING AND PHOTOGRAMMETRY

(Function Code 150)

Services Provided By:
SURVEYOR LPA

DESIGN AND CONSTRUCTION SURVEYS:

PURPOSE:

The purpose of a "design survey" is to provide field information in support of transportation systems design.

The purpose of a "construction survey" is to provide field data in support of highway construction.

DEFINITIONS:

A "design survey" is defined as the combined performance of research, field work, analysis, computation, and documentation necessary to provide detailed topographic (3-dimensional) mapping of a project site. A design survey may include, but need not be limited to, cross-sections or data to create cross-sections and Digital Terrain Models (DTM), horizontal and vertical location of utilities and improvements, detailing of bridges and other structures, review of right-of-way maps, establishing control points, etc.

A "construction survey" is defined as the combined performance of reconnaissance, field work, analysis, computation, and documentation necessary to provide the horizontal and vertical position of specific ground points to be used by the construction contractor for determining lines and grades.

1. Design Surveying

YES NO a. Primary Project Control – 3 to 5 miles spacing
Precision shall be 1 part in 20,000 or better, unless otherwise directed by the District Engineer.
(1) Establish horizontal control points
(2) Establish vertical control points

NOTE: ALL BEARING AND DISTANCE SHALL BE BASED ON THE STATE PLANE COORDINATE SYSTEM NAD 1983, SOUTH ZONE. ALL DISTANCES AND COORDINATES SHALL BE SURFACE AND MAY BE CONVERTED TO GRID BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.999960

YES NO b. Secondary Project Control – Surveyor shall recover and/or reset H&V Control Points as provided by the Engineer and create Survey Control Data Sheets for inclusion in the Construction Project Plans signed and sealed by an R.P.L.S.
(1) No traverse should exceed 25 angle points. Planimetrics shall be 20 ft Lt & Rt from the proposed ROW as per the schematic provided by the Engineer.
(2) The unadjusted angular error should not exceed 2 seconds per angle, plus 14 seconds.
(3) The unadjusted ratio of precision should be one part in 10,000 or better. (The ratio of precision is the total length of the traverse divided by the total error.)
(4) The unadjusted vertical error should not exceed 0.03 foot per mile of traverse.
(5) Project control base lines

NO NO (6) Photogrammetric ground control
(a) Establish horizontal control
(b) Establish vertical control points
(c) Place and maintain control point targets

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Services Provided By: SURVEYOR	LPA	
YES	NO	c. Other Design Surveying

(1) **The limit of the Design surveys shall be 500-ft before and after the limits of the project as identified by the Project Engineer on the schematic as well as the needed outfalls identified on the outfall schematic. Establish horizontal and vertical control.** Set H&V Control at 1000-ft intervals along the project proposed right-of-way. Provide x, y, z for each H&V Control. Provide an H&V Control along each outfall identified on the Hydrologic Map. The H&V Control shall be #5 I.R. 2-ft in depth set in concrete. **The surveyor shall provide an H&V Control Book (a Sample shall be provided by the Engineer to the Surveyor).** The Surveyor will provide a 3-pt reference sketch with ties to the BMs for inclusion the existing H&V Control Book. Establish benchmark circuit throughout the project with a tolerance of 0.03'/ft per mile error vertically.

(2) Complete topographic and cross section survey, data processing, and CADD mapping (2D & 3D) for the limits of the project.

(3) Locate all visible utilities, data processing and CADD mapping (2D & 3D) including irrigation lines. Follow sample provided by the Engineer.

(4) Field locate cross culverts, driveway culverts, inverts, irrigation lines, within the project limits, data processing and CADD mapping (2D & 3D).

(5) Right of Entry, Right of Way Research, and Appraisal District Records is the responsibility of the Surveyor.

(6) The Surveyor shall stake the proposed centerline on the existing fields as approved by Engineer before construction for the purpose of utility adjustments and project location.

(7) Profile and cross section intersecting streets for ties into project (500-ft. beyond the proposed ROW per schematic and 20-ft wider than the existing ROW of intersecting street).

(8) Cross section irrigation crossings for a distance of 20-ft beyond the proposed ROW at 100-ft intervals in a DTM file. Provide a complete description of irrigation appurtances as identified by the engineer sample layout "EXHIBIT E". The SURVEYOR will meet with the ENGINEER before he ties down any irrigation lines. Jointly the SURVEYOR and the ENGINEER will identify from records such as the Irrigation District Maps and the A&M Data of existing irrigation lines that will need to be tied down. The SURVEYOR will follow the sample given to him by the ENGINEER and tie the structures horizontally and vertically and include in the field books to be submitted.

(9) Tie Horizontally and Vertically the existing storm drain system that lies within the existing proposed ROW including the elevation of the outfall of said recovered existing storm drain systems.

(10) Tie to existing underground and overhead utilities (location, elevation and direction)

Horizontally – The surveyor shall call the 1-800 number for the utilities to be marked on the ground as well as any city water and sewer lines. He shall tie all visible utility crossings with name, address and Phone #'s of utility companies. The engineer will coordinate with the utility companies and jointly the Surveyor and the Engineer will identify which utilities were missed and need to be tied down.

Vertically – The engineer shall identify all utilities that are potential conflicts and that need to be tied vertically. The engineer will advise the surveyor in writing of the needed vertical ties and the surveyor will tie the lines vertically once the surveyor has coordinated the exposure and provide the information to the engineer.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Services Provided By: SURVEYOR	LPA	
YES	NO	(11) Cross section and profile all outfall channels identified on the Hydrologic Map for a distance of 200-ft beyond the proposed ROW upstream and downstream at 100-ft intervals. The SURVEYOR will provide a complete 2D/3D File including utilities of the outfalls identified.
		(12) Driveways and Turnouts
		(a) Inventory commercial entrances, public roads and side streets separately.
		(b) Obtain centerline station. (Width at ROW, PAV'T and existing radius.
		(c) Inventory by type (dirt, caliche, gravel or paved). If paved, indicate condition in terms of no patches, has patches or has potholes.
		(d) Obtain width at R.O.W. line.
		(e) Obtain elevations at both edges of the driveway or turnout in line with the side drain.
NO	YES	(13) ROW staking (Existing and Proposed @ 1,000 ft. stations PC's PT's and Angle points as per ROW Map)
YES	NO	(14) Soil core hole staking at bridge class structures.
NO	NO	(15) Determine changes in topography from voids and outdated maps due to development, erosion, etc.
YES	NO	(16) Profiles of existing drainage facilities.
YES	NO	(17) Measurement of hydraulic opening under existing bridges.
YES	NO	(18) Obtain elevations of manholes and valves of utilities
YES	NO	(19) Provide temporary signs, traffic control, flags, safety equipment, etc.
YES	NO	(20) Ties to existing bridges railroad rail elevations or culverts that may conflict with new construction.
NO	NO	(21) Bridge widening top of deck and/or top of cap elevations at the Profile Grade Line (PGL) and the edges of slab at bent locations.
YES	NO	(22) Inventory signs, mailboxes, and driveways
YES	NO	(23) Locate wetlands.
YES	NO	(24) Locate existing right-of-ways.

d. Construction Surveys:
In performing construction surveys, the following will be requested by the ENGINEER on an as needed basis, but need not be limited to:

NO	NO	(1) Stake existing and/or proposed right-of-ways.
NO	NO	(2) Stake existing and/or proposed baseline/centerline.
NO	NO	(3) Stake proposed bridge structures.
NO	NO	(4) Stake proposed drainage structures, such as manholes, culverts, etc.
NO	NO	(5) Set grade stakes.
NO	NO	(6) Recover and check existing control points.
NO	NO	(7) Establish additional control points.
NO	NO	(8) Check elevations and locations of structures.
NO	NO	(9) Determine and resolve conflicts associated with survey data.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Provided By:
SURVEYOR LPA

NO NO **2. Photogrammetric Products**
- a. Uncontrolled Photography
  - (1) Contact Prints
  - (2) Mosaics
  - (3) Digital ortho plots
- b. Mapping
  - (1) Planimetric Maps
  - (2) Contour Maps
  - (3) Cross Sections
  - (4) Profiles
  - (5) Digital Terrain Models (DTM)

3. UTILITY SUBSURFACE INVESTIGATION:
Utility Quality Levels are in cumulative order (least to greatest) as follows

NO NO 3.1. Quality Level C - Existing Records: Utilities are plotted from review of available existing records that will be generated by the Engineer on the schematic and provided to the surveyor for his further creation of a Utility Map which will be turned in as a deliverable as part of this work order.

NO NO 3.2. Quality Level B - Surface Visible Feature Survey: The Surveyor shall gather the field tied Utility Information and compare it to the existing records (if any) as provided by the Engineer and correlate with surveyed surface-visible features. The surveyor shall create a Utility Layout Map or plan layout 2D, showing the limits of the proposed project and limits of the work area required for this work authorization; including highway stations, limits within existing or proposed right of way. Correlate utility owner records with designating data and resolve discrepancies using professional judgment. A color-coded composite utility facility plan with utility owner names, quality levels, line sizes and subsurface utility locate (test hole) locations. The Layout Map will include all utilities that have been field tied – 2D Horizontal Utilities. This Layout will be provided to the Engineer and a meeting held with Engineer to identify which utilities will need to be tied down vertically. A note must be placed on the designate deliverable only that states "lines sizes are from best available records". All above ground appurtenance locations must be included in the deliverable to the Engineer. This information will be provided in the latest version of Micro Station or Geopak used by the State. The electronic file will be delivered on C.D. or DVD. A hard copy is required and must be signed, sealed, and dated by the Surveyor. Note: Determine and inform the Engineer of the approximate utility depths at critical locations. This depth indication is understood by the Engineer to be approximate only and is not intended to be used for preparing the construction plans.

YES NO 3.3. Subsurface Utility Locate (Test Hole) Service (Quality Level A), **THE SURVEYOR SHALL ESTIMATE LOCATING VERICALLY 25 UTILITES PER MILE OR AS IDENTIFIED BY THE ENGINEER.** Locate shall mean to obtain precise horizontal and vertical position, material type, condition, size and other data that may be obtainable about the utility facility and its surrounding environment through exposure by non-destructive excavation techniques that ensures the integrity of the utility facility. Subsurface Utility Locate (Test Hole) Services (Quality Level A) are inclusive of Quality Levels B and C. The Surveyor shall:

3.3.1 Review the requested test hole locations that have been identified by the Engineer and Coordinate with utility owner inspectors as may be required by law or utility owner policy.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Services Provided By:
SURVEYOR LPA

3. *Utility Subsurface (continued)*

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

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

3.3.3 Excavate test holes in such a manner as to prevent any damage to wrappings, coatings, cathodic protection or other protective coverings and features. Water excavation can only be utilized with written approval from the appropriate State District Office.

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

3.3.5 Provide complete restoration of work site and landscape to equal or better condition than before excavation.

3.3.6 Plot utility location position information on the Utility Layout sheet and identify the vertical elevation and sealed by the responsible Surveyor. This information will be provided in the latest version of Micro Station or Geopak format used by the State. The electronic file will be delivered on C.D or DVD.

4. **DELIVERABLES:**

The deliverables to be specified in individual work authorizations for design surveys and construction surveys may be any combination of the following:

YES NO 4.1. Digital Terrain Models (DTM) in a format acceptable by the ENGINEER.

YES NO 4.2. Final H&V Field Book Binder with all pertinent information obtained in the field for Design Surveys. Maps, plans, or sketches prepared by the SURVEYOR showing the results of field surveys.

YES NO 4.3. Computer printouts or other tabulations summarizing the results of field surveys.

YES NO 4.4. Digital files or media acceptable by the ENGINEER containing field survey data.

YES NO 4.5. Maps, plats, plans, sketches, or other documents acquired from utility companies, private corporations, or other public agencies, the contents of which are relevant to the survey.

YES NO 4.6. Field survey notes, as electronic and/or hard copies.

YES NO 4.7. A H&V Control Book identifying the basis of the Primary and Secondary Control and an 8 ½ inch by 11 inch survey control data sheet for each construction control point which shall include, but need not be limited to, a location sketch, a physical description of the point including a minimum of two reference ties, surface coordinates, a surface adjustment factor, elevation, and the horizontal and vertical datums used. Survey control data sheets shall be signed and sealed by the supervising Registered Professional Land Surveyor.

Services Provided By:
SURVEYOR LPA

4. *Deliverables (continued)*

YES NO 4.8. Final set of 11 inch by 17 inch Survey Control data sheets sign and seal by the RPLS per TxDOT guidelines.

YES NO 4.9. A digital and/or hard copy of all computer printouts of horizontal and vertical conventional traverses, GPS analysis and results, data including property descriptions with field notes and plats, right-of-way maps, and survey control data sheets to include in the H&V Field Book Binder.

YES NO 4.10. Survey reports in a format requested by the ENGINEER.

YES NO 4.11. Items indicated under the Automation Requirements Section 6.

5. GENERAL REQUIREMENTS:

5.1. Design surveys and construction surveys shall be performed under the supervision of a Registered Professional Land Surveyor currently registered with the Texas Board of Professional Land Surveying.

5.2. Horizontal ground control used for design surveys and construction surveys, furnished to the SURVEYOR by the ENGINEER or based on acceptable methods conducted by the SURVEYOR, shall meet the standards of accuracy required by the STATE.

5.3. Reference may be made to standards of accuracy for horizontal control traverses, as described in the FGCS Standards and Specifications for Geodetic Control Networks, latest edition, the TxDOT Survey Manual, latest edition, the TxDOT GPS Manual of Practice, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

5.4. Vertical ground control used for design surveys and construction surveys, furnished to the SURVEYOR by the ENGINEER or based on acceptable methods conducted by the SURVEYOR, shall meet the standards of accuracy required by the ENGINEER.

5.5. Reference may be made to standards of accuracy for vertical control traverses, as described in the FGCS Standards and Specifications for Geodetic Control Networks, latest edition, the TxDOT Survey Manual, latest edition, the TxDOT GPS Manual of Practice, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

5.6. Side shots or short traverse procedures used to determine horizontal and vertical locations shall meet the following criteria:

- Side shots or short traverses shall begin and end on horizontal and vertical ground control as described above.
- Standards, procedures, and equipment used shall be such that horizontal locations relative to the control may be reported within the following limits:
- Bridges and other roadway structures: less than 0.1 of one foot.
- Utilities and improvements: less than 0.2 of one foot.
- Cross-sections and profiles: less than 1 foot.
- Bore holes: less than 3 feet.
- Standards, procedures, and equipment used shall be such that vertical locations relative to the control may be reported within the following limits:
- Bridges and other roadway structures: less than 0.02 of one foot.
- Utilities and improvements: less than 0.1 of one foot.
- Cross-sections and profiles: less than 0.2 of one foot.
- Bore holes: less than 0.5 of one foot.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Services
Provided By:
SURVEYOR LPA

5. AUTOMATION REQUIREMENTS:

6.1 Planimetric design files (DGN) shall be fully compatible with the State's *Micro Station V8* graphics program without further modification or conversion.

6.2 Electronically collected and processed field survey data files shall be fully compatible with the State's *CADD* systems without further modification or conversion. All files shall incorporate only those feature codes currently being used by the STATE.

6.3 Digital Terrain Models (DTM) shall be fully compatible with the STATE's GEOPAK system without further modification or conversion. All DTM files shall be fully edited and rectified to provide a complete digital terrain model with all necessary break lines.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER
ADDITIONAL RESPONSIBILITIES

A. TRAFFIC CONTROL:

The SURVEYOR shall control traffic in and near surveying operations adequately to comply with provisions of the latest edition of the TxDOT Manual on Uniform Traffic Control Devices – Part VI and the latest edition of the Occupational Safety Manual both of which can be found on the TxDOT internet site.

In the event field crew personnel must divert traffic or close traveled lanes, a Traffic Control Plan based upon principles outlined in the latest edition of the TxDOT Manual on Uniform Traffic Control Devices – Part VI shall be prepared by the SURVEYOR and approved by the ENGINEER prior to commencement of field work. A copy of the approved plan shall be in the possession of field crew personnel on the job site at all times and shall be made available to the ENGINEER for inspection upon request.

B. INVOICING:

Payment requests shall include a SURVEYOR's invoice. With each payment request, the SURVEYOR shall submit a project status report which will, as a minimum, include the percentage of total work complete as of the date of the payment request and a description of current work activity. The percentage of total work complete shall not be based simply on the percentage of funds expended, but shall be based on the best judgment of the SURVEYOR as to the percentage of actual work complete.

C. EASEMENTS, LETTERS OF PERMISSION, ETC.

The SURVEYOR shall be responsible for delineating easements. The SURVEYOR will be responsible for securing the necessary legal instruments and obtaining all Right-of-Entries (ROEs).

D. MEETINGS:

The ENGINEER shall setup the necessary meetings with the SURVEYOR in order to assure all field information is provided on-time and products are delivered in accordance with TxDOT's specifications. SURVEYOR must attend all meetings involving data provided if requested by ENGINEER.

E. PROJECT MANAGER/SURVEYOR COMMUNICATION:

The SURVEYOR shall designate one Texas Registered Professional Land Surveyor (RPLS) to be responsible throughout the project for project surveying coordination and all communications, including billing, with the ENGINEER.

F. OFFICE LOCATION:

The SURVEYOR will perform the services to be provided under this agreement out of a local office and have a crew available to perform requested tasks within 24 hours of request. The coordinating SURVEYOR's Project Manager (RPLS) shall be accessible at all times and working from the local office.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

SECTION 7 - ROADWAY DESIGN CONTROLS
(Function Code 160)

Services Provided By: ENGINEER	LPA	
		1. Geometric Design
YES	NO	a. Horizontal and Vertical Alignment (Preliminary based on office surveys)
NO	NO	b. Schematic Layout
		(1) The location of interchanges, main lanes, grade separations, frontage roads and ramps.
		(2) Develop vertical and horizontal alignment of main lanes, ramps and cross roads at proposed interchanges or grade separations. Frontage road alignment data need not be shown on the schematic; however, it should be developed in sufficient detail to determine ROW needs. The degree of horizontal curves and vertical curve data, including "K" values, shall also be shown for ease of checking.
		(3) For freeways, show the location and text of the proposed main lane guide signs. Lane lines and/or arrows indicating the number of lanes shall also be shown.
		(4) A complete explanation of the sequence and methods of stage construction, if proposed, including the initial and ultimate proposed treatment of crossovers and ramps.
		(5) The tentative ROW limits.
		(a) Provide a roadway Design System (RDS) or (GEOPAK) computer tape of the preliminary earthwork to verify ROW requirements.
		(b) Provide a graphics file containing the approved schematic.
		(6) The geometric (pavement cross slopes, lane and shoulder widths, slope rates for fills and cuts) of the typical sections of proposed highway main lanes, ramps, frontage roads, and cross roads.
		(7) The current and projected traffic volumes as provided by the TxDOT (20 year traffic projection, unless otherwise determined by the District Engineer).
		(8) The control of access lines if Interstate or designated under House Bill 179.
		(9) Direction of traffic flow on all roadways.
		(10) Location and width of median openings for highway without access control.
		(11) The geometric of speed change (acceleration, deceleration, climbing) lanes.
NO	NO	2. General Guidelines for Project Development
		a. Prior to preparing detailed plans for a proposed project, a preliminary schematic layout shall be prepared which indicates the general geometric features and location requirements peculiar to the project. An uncontrolled aerial mosaic will be provided for this use. Four copies of the schematic layout shall be submitted through the district to the Design Division for approval and subsequent coordination with the Federal Highway Administration (FHWA) where applicable. The layout shall be submitted for two-lane arterial highway projects on new locations and for all multi-lane highway projects. **No geometric design is to be performed until the COUNTY has given the engineer written approval of the preliminary schematic layout.**
		b. All geometric design shall be in conformance with the State's Design Division, Operations and Procedures Manual, except where variances are permitted in writing by the STATE.
		c. The schematic layout shall include basic information which is necessary for the proper review and evaluation including the items listed above in the checklist for schematic layout.
		d. Handling of traffic during construction shall be a consideration in the development of preliminary designs.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Services Provided By: ENGINEER	LPA	
NO	NO	2. General Guidelines for Project Development *(continued)*
		e. Upon approval of the schematic layout by Design Division (FHWA on Federal-aid projects), it shall be the basis for an exhibit at any required public hearing prior to final development of the project. If there are any changes to the schematic after the Design Division and FHWA approval and before the public hearing, four copies of the revised schematic, as displayed at the hearing, shall be submitted either prior to or accompanying the public hearing data. If there are no changes in the schematic as displayed at the hearing, only photographs of the schematic and other displays shall be submitted with the public hearing data.
		f. For all freeway construction projects, these schematics shall show the location and text of the proposed main lane guide signs. A schematic layout shall be submitted through the district to the Traffic Operations Division, Traffic Safety Section for approval and subsequent coordination with the FHWA. All signing shall be in conformance with the Texas MUTCD.
		g. On complex projects, informal contact through the district with the Design Division and FHWA personnel is encouraged with regard to development of preliminary design prior to official schematic submission.
		h. The engineer shall furnish a project tape that is compatible with the STATE's computer system, a project listing, and a cross section plot showing the original design sections containing the earthwork input and original cross sections for the project. **Accuracy of the earthwork design is of utmost importance since it is the basis for contractor payments and construction staking.**
NO	NO	3. Exhibit for Airway/Highway Clearance Permits
		4. Grading Design
YES	NO	a. Refine the horizontal and vertical alignment of main lanes, frontage roads, ramps, cross roads and direct connectors based upon the approved schematic layout. Determine vertical clearances at grade separations and overpasses, taking into account the appropriate super elevation rate.
YES	NO	b. Typical Sections
YES	NO	c. Design Cross Sections
YES	NO	d. Determine Cut and Fill Quantities
NO	NO	e. Slope Stability Analysis
NO	NO	f. Embankment Foundation Stability Analysis
NO	NO	g. Embankment Settlement Analysis
		5. Pavement Design
YES	NO	a. Prior to initiating detailed plan preparations for a project, a preliminary investigation shall be made to determine the approximate section and pavement type to be used for the pavement structure. The Flexible Pavement Design Manual for flexible pavement, "Appendix F" of the Design Division, Operations and Procedures Manual, and the current AASHTO Guide for the Design of Pavement Structures, may be used for this purpose.
YES	NO	b. The typical section shall also reflect proposed geometric including pavement cross slopes, lane and shoulder widths, and slope rates whenever this data have not been previously shown on a schematic submission.
		c. Embankment and Subgrade
		(1) Soil Core Holes (Show cost estimate with Function Code 110)
YES	NO	(a) Along center line
NO	NO	(b) Along center line of each roadway
		The location and minimum number of soil core holes required for this project are as follows: (To be determined when schematic is being completed)

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Services Provided By: ENGINEER	LPA	
		5. Pavement Design *(continued)*
		c. Embankment and Subgrade *(continued)*
YES	NO	(2) Identify,interpret and summarize geologic features that affect engineering design (PI, Sulfate content, % of lime)
YES	NO	d. Traffic Data for Pavement Design by STATE
YES	NO	e. Basic Design Criteria
YES	NO	f. Life Cycle Cost Analysis(es)
YES	NO	g. Cost Data
YES	NO	h. Pavement Material Properties
YES	NO	i. Rehabilitation Investigations
YES	NO	(1) Core Hole Survey (Show cost estimate with Function Code 110)
		(a) Determine type and depth of existing material, pavement, etc. The Engineer will determine whether to salvage ACP and FLEXBASE as well as their properties and provide this information to TxDOT.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

SECTION 8 - DRAINAGE
(Function Code 161)

Services Provided By: ENGINEER	LPA	
		All hydraulic design shall be in accordance with the TxDOT's Hydraulic Manual, except where variances are permitted in writing by the LPA.
		1. Hydrologic Studies, Discharges
NO	NO	a. Hydrologic Map showing drainage areas, contours and drainage Q's.
YES	NO	b. Drainage area maps showing existing conditions and proposed improvements.
YES	NO	c. Hydrologic data/discharge determination
		2. Hydraulic Drainage Study and Documentation
		a. Hydraulic computations
NO	NO	(1) Storm water detention available within the ROW (linear ft. along side drain ditch).
NO	NO	(2) Storm water detention required outside the ROW (as per HCDD#1)
YES	NO	(3) Culverts
YES	NO	(4) Bridge waterways
YES	NO	(5) Channels
YES	NO	(6) Storm sewers/inlets
NO	NO	(7) Pump stations
NO	NO	(8) Storm Water Management facilities
YES	NO	(9) Other
		(a) Irrigation Canals/Siphons
NO	NO	b. Hydraulic report(s)
NO	NO	c. Federal Emergency Management Agency (FEMA) floodway requirements
YES	NO	d. Determine impact of proposed drainage plan on the following receiving stream(s)
		(1) Hidalgo County Drainage District Outfalls
		(2) All Irrigation District Outfalls impacted
		3. Layout, Structural Design and Detailing of Drainage Features
		a. Culverts
YES	NO	(1) New culverts
NO	NO	(2) Culvert widening and/or lengthening
YES	NO	(3) Culvert replacements
		b. Storm sewers
YES	NO	(1) New storm sewers
YES	NO	(2) Modify existing storm sewers
YES	NO	(3) Inlets
YES	NO	(4) Manholes
YES	NO	(5) Trunk lines
NO	NO	c. Pump stations
NO	NO	d. Subsurface drainage at retaining walls
NO	NO	e. Outfall channel(s) within the ROW
YES	NO	f. Outfall channel(s) outside the ROW
NO	NO	g. Detention Pond(s) within the ROW
NO	NO	h. Detention Pond(s) outside the ROW
YES	NO	i. Summary of Quantities
NO	NO	j. Storm Water Management facilities
YES	NO	4. Storm Water Pollution Prevention Plan (SW3P)
YES	NO	5. Scour Evaluation - Waterway Structures only (to be completed by Bridge Engineer under FC 170.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

SECTION 9 - SIGNING, MARKINGS AND SIGNALIZATION
(Function Code 162)

Services Provided By: ENGINEER	LPA		
YES	NO	1.	Signing and Markings Layout
			a. Requirements (Separate Layout)
			(1) Roadway layout
			(2) Center line with station numbering
			(3) ROW lines
			(4) Culverts and other structures that present a hazard to traffic
			(5) Location of utilities, if not shown on plan and profile
			(6) Existing signs to remain, to be removed, to be relocated
			(7) Proposed signs (illustrated and numbered)
			(8) Existing overhead sign bridges to remain, to be revised, removed or relocated
			(9) Proposed overhead sign bridges indicating location by plan layout (electrical details need not be shown on this layout)
			(10) Proposed markings (illustrated and quantified) which include pavement markings, object markings and delineation
			(12) Quantities of existing pavement markings to be removed
			(13) Proposed delineators and object markers
			b. For projects involving freeway to freeway or other types of directional interchanges, projects including left-hand ramps or connections, the following information must be provided:
			(1) The location of interchanges, main lanes, grade separations, frontage roads and ramps
			(2) complete explanation of the sequence and methods of stage construction, where applicable, which would include the initial and ultimate proposed treatment of crossovers and ramps
			(3) The number of lanes in each section of proposed highway and the location of changes in numbers of lanes
			(4) The projected traffic volumes as provided by the STATE (20 year traffic projection, unless otherwise determined by the District Engineer)
			(5) Tentative ROW limits
			(6) Direction of traffic flow on all roadways
			(7) Main lane, ramp, frontage road, and necessary cross road profiles at proposed interchanges or grade separations
YES	NO	2.	Summary of Small Signs Tabulation
YES	NO	3.	Summary of Large Signs Tabulation including all Guide Signs
YES	NO	4.	Sign Detail Sheets
			a. All signs except route markers
			b. Design details for large guide signs
			c. Dimensions of letters, shields, borders, corner radii etc.
			d. Designation of shields attached to guide signs
			e. Designation of arrow used on exit direction signs

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Services Provided By: ENGINEER	LPA	
		5. Traffic Signals
		a. Development of Justification (Warrant) Data
YES	NO	(1) Location Map Relationship of proposed installation to other traffic signals, highways, business areas and traffic generators
YES	NO	(2) Photographs as appropriate
YES	NO	(3) Accident data as appropriate
		(4) Vehicle volumes (provided by TxDOT)
YES	NO	(a) Existing
YES	NO	(b) Estimated
YES	NO	(c) Projected
YES	NO	(d) Pedestrian
YES	NO	(5) Traffic Survey - Count Analysis
YES	NO	(6) Recommendation based on above data
YES	NO	b. Layout
		(1) Title Sheet (when applicable)
		(a) Describe the location
		(b) Type of installation
		(c) Area map with project limits for each location
		(d) Index of sheets
		(e) Space for official signatures
		(2) Estimate and quantity sheet (when applicable)
		(a) List of all bid items
		(b) Bid item quantities
		(c) Specification item number
		(d) Paid item description and unit of measure
		(3) Basis of estimate sheet (list of materials)
		(4) General notes and specification data sheet
		(5) Condition diagram
		(a) Highway and intersection design features
		(b) Roadside development
		(c) Traffic control including illumination
		(6) Plan sheet(s)
		(a) Existing traffic control that will remain (signs and markings)
		(b) Existing utilities
		(c) Proposed highway improvements
		(d) Proposed installation
		(e) Proposed additional traffic controls
		(f) When applicable, proposed conduit for Railroad interconnect with standard details for runs under tracks.
		(g) Proposed illumination attached to signal poles.
		(7) Notes for plan layout
		(8) Elevation sheet(s) (span wire design)
		(9) Phase sequence diagram(s)
		(a) Signal locations
		(b) Signal indications
		(c) Phase diagram
		(d) Signal sequence table
		(e) Flashing operation (normal and emergency)
		(f) Preemption operation (when applicable)
		(g) Interval timing, cycle length and offset

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Services Provided By: ENGINEER	LPA	
		5. Traffic Signals *(continued)*
YES	NO	b. Layout *(continued)*
		(10) Construction detail sheets(s)
		(a) Poles (TxDOT standard sheets)
		(b) Detectors
		(c) Pull Box and conduit layout
		(d) Controller Foundation standard sheet
		(11) Marking details (when applicable)
		(12) Barricade and warning sign standard sheet and any special details for work zone traffic control for special conditions
		(13) Aerial or underground interconnect details (when applicable)
		c. General Requirements
		(1) Contact local utility company
YES	NO	(a) Confirm power source
YES	NO	(b) Discuss route of aerial or underground interconnect cable (when applicable)
NO	NO	(c) Adjustment of overhead utility lines
YES	NO	(2) Prepare governing specifications and special provisions list
YES	NO	(3) Prepare project estimate
YES	NO	d. Summary of Quantities

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

SECTION 10 - MISCELLANEOUS (ROADWAY)
(Function Code 163)

Services Provided By: ENGINEER	LPA	
		1. Retaining Walls
		a. Structural Details
NO	NO	(1) Cast-in-Place Cantilever at _____ locations. (TxDOT Standard Retaining Wall)*
NO	NO	(2) Tiedback Retaining Wall at _____ location. (TxDOT standard retaining wall)
NO	NO	(3) Specialized Retaining Wall at _____ locations (Unique Design).*
		b. Alternate Patented Retaining Walls at all locations. (Layouts Only)**
NO	NO	(1) Mechanically Stabilized Earth
NO	NO	(2) Concrete Block Wall Systems
NO	NO	c. Retaining Wall Layout (PLAN)
		(1) Designation of reference line
		(2) Beginning and ending retaining wall stations
		(3) Station of each retaining wall joint***
		(4) Offset from reference line
		(5) Horizontal curve data
		(6) Number of retaining wall panels and lengths***
		(7) Total length of wall
		(8) Indicate face of wall
		(9) All wall dimensions and alignment relations (alignment data as necessary)
		(10) Soil core hole locations
NO	NO	d. Retaining Wall Layout (ELEVATION)
		(1) Top of wall elevations at each joint or intervals***
		(2) Existing and finished ground line elevations
		(3) Height of stem at each joint***
		(4) Wall panel designations***
		(5) Top of footing elevations***
		(6) Limits of measurement for payment****
		(7) Type, limits and anchorage details of railing (If applicable)
		(8) Top and bottom of wall profiles and soil core hole data plotted at correct station and elevation. The plot shall be at the same scale as the wall profile. Ground water elevations and the observation date shall be shown.
NO	NO	e. Foundation Studies (Show cost estimate with Function Code 110)
NO	NO	(1) The soil core holes shall be obtained at approximately 200 foot intervals along retaining wall alignments. The core holes shall extend 25 feet below the footing elevation.
NO	NO	f. Stability Analysis (the ENGINEER shall estimate this task as part of his bid to complete the work).
NO	NO	g. Estimate
NO	NO	h. Summary of Quantities
NO	NO	i. Typical X-section.
NO	NO	j. General Guidelines for Retaining Walls
		(1) The ENGINEER shall make final design calculations and final detail drawings in accordance with standard requirements of the Texas Department of Transportation. **The designer and checker shall check all calculations and initial each page.**
		(2) The ground water level should be observed at the water strike.
		(3) For purposes of uniformity statewide, soil core hole data shall be shown on layouts as illustrated in the Bridges and Structures Foundation Exploration and Design Manual.
		(4) Foundation exploration shall conform to the requirements set forth in Administrative Circular No. 25-84, Administrative Circular 33-87 and Administrative Circular No. 25-92.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Services Provided By: ENGINEER	LPA	
YES	NO	2. Traffic Control Plan, Detours and Sequence of Construction Traffic Control Plans (TCP) are required for all projects. A detailed TCP shall be developed when traffic handling during construction involves complications for which a feasible solution is not covered by the Texas MUTCD or the current Barricade and Construction (BC) Standards. The following items are required on all Traffic Control Plan Layouts: a. The sequence of construction and method of handling traffic during each phase. b. The existing and proposed traffic control devices that will be used to handle traffic during each construction sequence. Include signals, regulatory signs, warning signs, construction warning signs, guide signs, route markers, construction pavement markings, channelizing devices, portable changeable message signs, flashing arrow boards, barricades, barriers, etc. c. The proposed traffic control devices (stop signs, signals, flag person, etc.) at grade intersections during each construction sequence. d. Where detours are provided, typical cross sections shall be shown. e. Road construction work hours shall be developed after an investigation of the traffic volumes has been performed.
		3. Illumination
NO	NO	a. Preliminary Roadway Illumination Layout and Circuit Layout (1) For projects involving freeway to freeway or other types of directional interchanges and projects including left-hand ramps or connections, provide the following: (a) The location of interchanges, main lanes, grade separations, frontage roads and ramps (b) A complete explanation of the sequence and methods of stage construction, where applicable, which would include the initial and ultimate proposed treatment of crossovers and ramps (c) The number of lanes in each section of proposed highway and the location of changes in the number of lanes (d) The projected traffic volumes as provided by the STATE (20 year traffic projection unless otherwise determined by the district engineer) (e) Tentative ROW limits (f) Direction of traffic flow on all roadways (g) Main lane, ramp, frontage road, and necessary cross road profiles at proposed interchanges or grade separations
NO	NO	b. Final Roadway Illumination and Electrical Circuit Layouts (1) Roadway layout showing pavement edges, shoulders, curbs, retaining walls, etc. (2) Center line with station numbering. (3) ROW lines. (4) Symbol legend. Use department standard symbols for lighting and electrical. (5) Culverts and other structures that present a hazard to traffic. (6) Location of underground utilities, if not shown on plan profile. (7) Location of overhead electrical lines, both crossing and parallel to ROW. (8) Existing sign lighting circuits and roadway illumination to remain, to be removed, to be relocated. (9) Existing service poles, electrical circuits, ground boxes, etc. (10) Contact electric utility for service pole locations, voltage characteristics. (11) Location of proposed sign lighting circuits and roadway illumination. (12) Proposed electrical circuits. (13) Tabulation of all quantities including proposed, existing to be relocated, existing to be removed. The layout sheet quantities and lighting summary shall be shown. Tabulations to include estimated quantity with a column for final quantities.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Services Provided By: ENGINEER	LPA	
		3. Illumination *(continued)*
NO	NO	c. General Guidelines for Illumination (If applicable) The ENGINEER shall submit to the COUNTY, well in advance of PS&E due date, the roadway illumination and electrical circuit layout sheets for review by the STATE. Two copies of the layout sheets are to be submitted. One copy will be returned to the Engineer showing corrections that are to be made by the ENGINEER. When final plan submission is made, the ENGINEER shall provide a written statement regarding completion of the corrections.
		4. Miscellaneous Drafting/Standards
YES	NO	a. Erosion Control
NO	NO	b. Landscape Development
YES	NO	5. Compute and Tabulate Quantities
YES	NO	6. Special Utility Details (Irrigation lines)
		7. Miscellaneous Structures
		a. Type of Structure*
		(1) Overhead Sign Bridges (O.S.B.) Modifications or special O.S.B. designs shall be prepared using the same design assumptions that are used for the standard O.S.B structures.
NO	NO	(a) New O.S.B. structure(s)
NO	NO	(b) Structural evaluation of existing O.S.B. structure(s) that are to remain in place or to be relocated.
NO	NO	(2) High Mast Illumination Poles (HMIP)
NO	NO	(3) Traffic Signal Supports
NO	NO	(4) Conventional Illumination Poles
NO	NO	(5) Sound Barrier Walls
NO	NO	b. Checklist for Layouts
		(1) Reference appropriate O.S.B. standard
		(2) Drilled shaft size and length
		(3) Soil strength used for design {indicate basis and boring(s) used}
		(4) Design height
		(5) Tower heights
		(6) Leg spacings
		(7) Design wind speed
NO	NO	c. Foundation Studies (Show cost estimate with Function Code 110) The soils exploration requirements for miscellaneous structures on this project are as follows: (To be provided by the Engineer on an as-needed basis)
		8. Agreements
NO	NO	a. Utility Agreements
NO	NO	b. Exhibits for Utility Agreements
NO	NO	c. Railroad Agreements
		d. Railroad Exhibits
NO	NO	(1) Railroad Underpasses
NO	NO	(2) Railroad Overpasses
NO	NO	(3) Railroad Grade Crossing (Replanking)
NO	NO	(4) Railroad Grade Crossing Warning Systems (Signals)
NO	NO	(5) Other Miscellaneous Sketches for Railroads
YES	NO	e. Traffic Signal Agreements
YES	NO	f. Exhibits for Traffic Signal Agreements
YES	NO	9. Estimate
YES	NO	10. Specifications and General Notes

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

SECTION 11 – PROJECT MANAGEMENT
(Function Code 164)

Meetings, Coordination & Support for Project Management

The Engineer shall meet and coordinate with the Texas Department of Transportation, Hidalgo County Metropolitan Planning Organization, Hidalgo County and the Hidalgo County Drainage District No. 1 and all other affected parties. The Engineer shall serve as representative for the Owner in coordination items. The Engineer shall coordinate with the Owner's staff on all Project related items.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

SECTION 12 - BRIDGE DESIGN
(Function Code 170)

Services Provided By: ENGINEER	COUNTY		NUMBER REQUIRED
		1. Preparation of Structural Details	
		a. New Structure(s)	
NO	NO	(1) Underpass(es)	
NO	NO	(2) Overpass(es)	
NO	NO	(3) Main Lanes	N/A
NO	NO	(4) Direct Connector(s)	N/A
NO	NO	(5) Ramp Bridge(s)	N/A
YES	NO	(6) Waterway Structure(s)**	1
NO	NO	(7) Pedestrian Structure(s)	N/A
NO	NO	(8) Utility Structure(s)	N/A
NO	NO	(9) Railroad Underpass(es)	N/A
NO	NO	(10) Railroad Overpass(es)	N/A
NO	NO	(11) Bridge Classification Culvert(s)**	N/A
NO	NO	(11) Alternate Structural Designs	N/A
NO	NO	(12) Alternate Foundation Design	N/A
		Total New Structures =	1
		b. Existing Structure(s)	N/A
NO	NO	(1) Bridge Widening, Rehabilitation and/or Modification of Existing Structure(s)	
YES	NO	(2) Bridge Replacement	1
NO	NO	(3) Raising Bridge Elevation	N/A
NO	NO	(4) Bridge Classification Culvert(s) Widening and/or Modification of Existing Structures(s)	N/A N/A
NO	NO	(5) Railroad Overpass(es)	N/A
NO	NO	(6) Railroad Underpass(es)	N/A
		Total Existing Structures =	1

* Contour plots of bridge gores are required for projects involving ramps within the main bridge in order to ensure project transition. The Template data and vertical alignment necessary to generate the contour plots are also required.

** In the early stages of a project, it sometimes cannot be determined whether a Waterway Bridge Structure or a Bridge Classification Culvert (20' minimum length) will be required. Therefore, the ENGINEER should be aware that either of these two types of bridges may be reclassified later in the project for the other type when more information is known that would dictate a change in structure classification.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Services Provided By: ENGINEER	COUNTY	
YES	NO	2. Preparation of Bridge Layouts (each bridge)

a. Bridge Layouts (PLAN)
- (1) Horizontal curve information or bearing of centerline.
- (2) Including horizontal, vertical, and template information of all roadways or railroads crossed.
- (3) Bearing of center line 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), intersections, etc.
- (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) Cross slope and super elevation data.
- (16) Minimum horizontal clearances when applicable.
  - (a) Dimensions to features that control clearances. (Calculate and indicate points of minimum vertical and horizontal clearances.
- (17) Location of soil core holes (station and offset), shown on layout.
- (18) Bent stations and bearings.
- (19) Retaining wall locations.
- (20) Traffic flow directional arrows.
- (21) Railing types shown.
- (22) Joint types and seal size, if used.
- (23) Beam line numbers consistent with span details.
- (24) Critical horizontal clearances (location of railroad tracks, nearby structures and utilities).
- (25) Bearings of utilities.

b. Bridge Layouts (ELEVATION)
- (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) Type of railing.
- (6) Minimum calculated vertical clearance(s).
- (7) Existing and proposed ground lines clearly marked.
- (8) Grid elevations and stations.
- (9) Bent numbers encircled.
- (10) Stationing of bridge compatible with grid stations.
- (11) Standard title.
- (12) Profile grade data.
- (13) Type of riprap.
- (14) Soil Core Hole information with penetrometer test data shall be shown on the bridge layout at correct station, elevation and scale.
- (15) Fixed/expansion condition of all bents.
- (16) Column "H" heights.
- (17) Number, size and length of foundations.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Services Provided By: ENGINEER	COUNTY	
YES	NO	2. Preparation of Bridge Layouts (each bridge) *(continued)* c. Additional layout requirements for waterway structures and bridge classification culverts. (1) Design and 100-year peak discharges. (2) Design and 100-year high water (HW) (Recorded HW and date if available) (3) Natural and through-bridge velocities for design and 100-year floods. (4) Calculated backwater for design and 100-year floods. (5) Direction of flow for waterway crossings. (6) Contours for water crossing.
NO	NO	3. Bridge Classification Culvert, Estimate, Quantities, and Specifications (each bridge)
YES	NO	4. Foundation Studies (Show cost estimate with Function Code 110) The minimum number of soil core holes shall be obtained in accordance with Section 1-301 of the Bridges and Structures Foundation Exploration and Design Manual. Soil core holes shall be obtained at approximately (300 foot) intervals along bridge alignments. Texas cone penetrometer (TCP) tests shall be conducted in all soil types encountered at a maximum of (10 foot) intervals. If single column bents with single drilled shafts are planned, TCP values should be taken at close intervals in the upper (15 feet).
YES	NO	5. Bridge Total Quantities and Cost Estimates (each bridge)
YES	NO	6. Bridge Special Provisions and Specifications (each bridge)
YES	NO	7. Bearing seat elevations for each beam or girder. Top of cap elevations for non-beam type structures.
YES	NO	8. General Guidelines for Bridge Design a. The ENGINEER shall prepare a bridge layout of each bridge structure for Company's review and approval. The bridge layout shall be in conformance with the Bridges and Structures, Operation and Planning Manual and the Bridges and Structures, Detailing Manual. Soil core hole data is not required for submission of the preliminary bridge layout. **No bridge design work is to be performed until the COUNTY has given the engineer written approval of the preliminary bridge layout.** Several months may be required, after the preliminary bridge layout is submitted, for the district to obtain approval and/or permits from the following: • TxDOT Design Division, when applicable: - Railroad Companies - FHWA - U.S. Army Corps of Engineers - U.S. Coast Guard - Bureau of Reclamation - Texas Parks and Wildlife - Others Therefore, the bridge layout should be submitted at the earliest possible date and the ENGINEER's design schedule should reflect this. b. All bridge superstructure and substructure design will be reviewed by the Design Division for purposes of verifying structural integrity and optimization of design. c. The final bridge layout shall be in conformance with the Bridges and Structures, Operation and Planning Manual and the Bridges and Structures Detailing Manual.

Services Provided By:
ENGINEER COUNTY

8. General Guidelines for Bridge Design *(continued)*

d. The ENGINEER shall make final design calculations and final detail drawings in accordance with standard requirements of the Texas Department of Transportation. All bridge design shall be in conformance with the Texas Department of Transportation Bridges and Structures Operation and Planning Manual, the current American Association of State Highway and Transportation Officials or American Railway Engineers Association Specifications for railway structures, Standard Specifications for Highway Bridges, including applicable interim specifications, and the Bridges and Structures, Foundation Exploration and Design Manual. The ENGINEER shall furnish design calculations to the Design Division. **The designer and checker shall check all calculations and initial each page.**

e. Structural steel or prestressed concrete shop drawings, form work drawings and false work drawings are not part of the design requirements. However, contract plans shall be in sufficient detail to permit the preparation of complete shop details for fabrication and erection.

f. Elements of the bridge (abutments, bents, slabs, etc.) shall be detailed to a metric scale of 1:20 (1/2 inch equals one foot architect scale) or 1:50 (1/4 inch equals one foot architect scale) to provide clear legible drawings when the drawings are reduced. Lettering shall be a minimum size of 4 millimeters (5/32 inch) height for hand lettering and 140 for lettering by computer-aided design and drafting (CADD).

g. Standard drawings for beams, diaframs, railings, armor joints, riprap, etc., shall be furnished to the ENGINEER upon request. These standards shall not be redrawn by the ENGINEER nor shall his title block be transferred to the standard drawings. Modifications to the standards, if necessary, shall be clearly identified and designated by "MOD" in the standard title. Specific special drawings prepared by the ENGINEER shall not be identified as standards.

h. Bridge layout sheets shall have the same vertical and horizontal scale. Usually a metric scale of 1:100 (1 inch = 10 feet) or 1:200 (1 inch = 20 feet) is used. Sections of existing and proposed structures usually have a metric scale of 1:50 (1 inch = 5 feet). Soil core holes shall be positioned and labeled on the bridge layout plan view. The core hole data shall be plotted at the correct station, at the same vertical scale, and at the proper elevation unless otherwise approved by the Design Division.

i. APPENDIX C, "GENERAL PLAN CHECKLIST", on pages C-1 thru C-5, more specifically relates various sheet types, details, summaries, standards, etc.

j. For purposes of uniformity statewide, soil core hole data shall be shown on layouts as illustrated in the Bridges and Structures Foundation Exploration and Design Manual.

k. Geometry and structural design errors found after acceptance of bridge plans shall be promptly corrected by the consultant at no cost to the Company.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

SECTION 13 - CONSTRUCTION PHASE SERVICES
(Function Code 320)

Services Provided By: ENGINEER	LPA	
NO	NO	**CONSTRUCTION MANAGEMENT SERVICES:**

The ENGINEER will provide engineering, geotechnical testing and support services for and during the construction of the Project or portions of the Project approved by the LPA. Specific (basic and special) services for CONSTRUCTION MANAGEMENT AND SUPPORT by the ENGINEER will include the following:

Construction Bidding:

1) The ENGINEER will furnish the LPA the necessary copies of approved plans, specifications, notices to bidders, and proposals as prepared under PS&E.

2) The ENGINEER will assist the LPA on the tabulation of bids, recommendations to the Owner as to the proper action on all bid proposals received, and the preparation of formal contract documents for the award of each construction contract.

Construction Contract Administration and Inspection:

3) In general, the ENGINEER will provide the management and engineering support/data required for consultation and advisement to the LPA and act as the LPA's representative as provided in the General Condition of the Construction Contract.

4) The ENGINEER will coordinate and conduct a pre-construction conference (if required).

5) Defects and Deficiencies. The ENGINEER will use his best efforts to protect the LPA against defects and deficiencies in the work of the Contractor. The ENGINEER will promptly notify the LPA of any such defect or deficiency, and take all steps possible to require the Contractor to correct the defect or deficiency.

6) Contractor Payment. The ENGINEER will review quantities as submitted by the Contractor and will coordinate with the LPA for the preparation of the monthly and final estimates for payment to the Contractor.

7) The ENGINEER will provide Project site inspection of the authorized construction contract as follows:

   a) Project Engineer. The ENGINEER will provide visits by the Project Engineer or a competent representative of the ENGINEER to the site of construction for the purpose of monitoring the Contractor's progress and conformance to the construction contract plans and specifications.

   b) Resident Engineer and/or Construction Inspector(s). The ENGINEER will furnish the services of a Resident Engineer and/or Construction Inspector(s) for on the site inspection construction to monitor/inspect the Contractor's daily progress and conformance to TxDOT's PS&E specifications.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

YES NO **Miscellaneous Technical Activities:**

8) Shop Drawings. The ENGINEER will review and check all shop or working drawings furnished by the Contractor.

9) Change Orders. When applicable the ENGINEER will prepare the engineering data, including plan sheet drawings, specifications, and estimates, for the preparation of construction contract change orders, which may be required due to actual field conditions encountered or new requirements directed by the LPA.

10) Request for Information (RFI). The ENGINEER will respond to any RFI's from TxDOT during construction operations.

11) Project site visits. The ENGINEER will perform project site visits on a monthly basis or as requested.

NO NO **CONSTRUCTION MATERIAL TESTING:**

The ENGINEER will provide the LPA with construction material testing services for the Project. The services to be provided include sampling and testing of all construction materials as required by the project plans and specifications. All sampling frequencies and test procedures will be performed in general accordance with the Texas Department of Transportation TEX methods (or ASTM methods as required) as outlined in the Guide Schedule for Sampling and Testing (11/07). The construction material testing includes, but is not limited to the following:

(a) Sampling and laboratory testing of soils and base materials proposed for use in the construction of Project (Roads/Bridges/Misc.) to determine compliance of these materials with project plans and specifications.
(b) Field density testing of soils and base materials to ensure proper compaction as required by project plans and specifications.
(c) Field sampling and testing of fresh concrete, and laboratory testing of hardened concrete to determine compliance with project plans and specifications.
(d) Field compaction testing of asphalt to ensure proper compaction during lay down operations.
(e) Field inspection, sampling and laboratory testing of asphalt materials to determine their material properties and their compliance with project plans and specifications.
(f) The ENGINEER will be responsible for concrete batching as well as the asphalt testing at the plants to insure delivery of acceptable material to the job site.
(g) Any additional laboratory testing as required/requested by the LPA and the project plans and specifications.
(h) Providing accurate and timely reports to the LPA and all/other recipients as designated by the LPA.
(i) The ENGINEER will verify the concrete and asphalt designs to assure it is in accordance with TxDOT specifications to be developed by the contractor.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

ADDITIONAL RESONSIBILITIES

Easements, Letters of Permission, Etc.

The ENGINEER shall be responsible for delineating easements. The ENGINEER will be responsible for securing the necessary legal instruments.

Coordination of Utilities

The ENGINEER shall furnish the LPA prints of a project layout which will be distributed by ENGINEER to various utility companies to determine which utilities are in the limits of the project. These shall be preliminary layouts. Upon completion of the preliminary drainage plans and U&D sheets, the ENGINEER shall distribute to the various utility companies and request return. Upon return of these prints, the ENGINEER will schedule a meeting with the various utility companies to discuss potential conflicts and conformance with the State's Utility Accommodation Policy. The ENGINEER is responsible for coordination with the various utility companies for exposing potential conflicts and field ties to uncover utilities in potential conflict areas.

Meetings

Meetings will be held with the FHWA, State Officials, local governments, property owners, utility owners, railroad companies, other consulting firms, etc., as needed or required by the LPA. The ENGINEER shall coordinate through the LPA for the development of this project with any local entity having jurisdiction or interest in the project (i.e., city, county, etc).

Specifications, Special Provisions, Special Specifications

Use the State's standard specifications or previously approved special provisions and/or special specifications. If a special provision and/or special specification is developed for this project, it shall be in the State's format and incorporate references to approved State test procedures.

Project Manager/Engineer Communication

The ENGINEER shall designate one Texas Registered Professional Engineer to be responsible throughout the project for project management and all communications, including billing, with the LPA**'s** Director. Any replacements to the ENGINEER's designated Project Manager/Engineer must be approved by the LPA.

Engineering documents produced for the department's engineering projects shall be signed, sealed and dated or CADD sealed in accordance with Administrative Order No. 5-89 and Administrative Circular No. 26-91.

Design Responsibilities

The ENGINEER is responsible for design errors and/or omissions that become evident before, during or after construction of the project. The ENGINEER's responsibility for all questions arising from design errors and/or omissions will be determined by the LPA and all decisions shall be final and binding. This would include, but not necessarily be limited to:

1. All design errors and/or omissions resulting in additional design work to correct the errors and/or omissions.
2. Preparation of design documents and detail drawings necessary for a field change due to design errors and/or omissions.
3. Revision of original tracings to the extent required for a field change due to design errors and/or omissions.

The ENGINEER shall promptly make necessary revisions or corrections resulting from the ENGINEER's errors, omissions or negligent acts without additional compensation. Acceptance of the work by the LPA will not relieve the ENGINEER of the responsibility for subsequent correction of any such errors or omissions or for clarification of any ambiguities.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Document and Information Exchange

Data, Plan Sheets, General Notes and/or Specifications provided to the LPA shall be furnished on 8GB USB flash drives. Each 8 GB flash drive shall have a file titled Table of Contents. The Table of Contents shall indicate the locations of files within the directory structure of the documentation.

General Notes and specifications shall be provided in MS Office 2007 format. Plan sheets shall be provided in Microstation DGN or GEOPAK GPK format. PDF copies of plan sheets shall also be provided.

Two copies of the documentation shall be provided to the LPA.

If required, the ENGINEER shall provide to the LPA, a CD that contains all the plan sheets for the project. The graphics tape shall be compatible with the LPA's computer system.

CD Tape Required (YES or NO): YES

Proposal Time

The time indicated in the proposal and the contract shall include time necessary for reviews, approval, etc.

Office Location

The ENGINEER will perform the services to be provided under this agreement out of their office or offices listed below:

Service	Office Location
PS&E	Mission Office
Design Surveying	Mission Office

The work effort will be managed out of the Mercedes (City)

office located at 2100 West Expressway 83 (Address),

Mercedes (City), Texas (State).

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

APPENDIX A - PLAN SHEET SEQUENCE PROCEDURE

1. Title Sheet
   Detailed Index of Sheets

2. Typical Sections

3. General Notes and Specifications Data

4. Estimate and Quantity Sheets

5. Storm Water Pollution Prevention Plan (SW3P) Sheets

6. Traffic Control Plans
   a. Sequence of Construction Layouts
   b. Detour Plan/Profile/Typical Sections/Quantities

7. Roadway Layouts
   a. Roadway Plan/Profile Sheets
   b. Intersection Plan/Profile Sheets
   c. Intersection Layouts
   d. Alignment Layouts/Data
   e. Ramp Layouts/Profiles
   f. Connection Roads/U-turns Layouts/Profile

8. Roadway Details
   a. Concrete Pavement Details/Standards
   b. Concrete Pavement Terminal Anchorage Details/Standards
   c. Bridge Approach Details/Standards
   d. Bridge Terminal Anchorage Details/Standards
   e. Roadway/Median Barrier Details/Standards
   f. Curb Details
   g. Driveway Details/Typical Sections/Standards

9. Signing Layouts and Marking Layouts

10. Traffic Signal Layouts

11. Lighting Layouts

12. Illumination Detail Standards (HMID, HMIF, HMIP, RID)

13. Utility Layouts/Profiles

14. Drainage Area Maps and Hydraulic Data
    a. General Drainage Area Maps
    b. Stage-Discharge Curves
    c. Main Cross-Drainage Culvert/Bridge Hydraulic Data
    d. Drainage Area Maps/Culverts/Storm Sewer
    e. Hydraulic Data/Culverts/Inlets/Storm Sewer/Pumps

15. Detailed Drainage Plans
    a. Drainage Plan/Profile Sheets (Storm Sewer Plan/Profile Sheets)
    b. Channel Plan/Profiles/Typical Sections
    c. Box Culvert Plan/Profile
    d. Pipe Sewer/Culvert Cross Sections

APPENDIX A - PLAN SHEET SEQUENCE PROCEDURE (Continued)

16. Drainage Structural Details/Standards
    a. Inlet Details/Standards
    b. Manhole Details/Standards
    c. Junction Box Details/Standards
    d. Safety End Treatment Details/Standards
    e. Box Culvert Details/Standards
    f. Culvert Wingwall Details/Standards
    g. Excavation-Backfill Diaphrams
    h. Riprap Details/Standards
    i. Temporary Pollution and Erosion Control Details

17. Pumphouse Layouts

18. Pumphouse Details

19. Pumphouse Standard Details

20. Bridge Layouts/Profile/Typical Sections*

21. Bridge Details*
    a. Summary of Bridge Quantities
    b. Abutments
    c. Interior Bents
    d. Spans
    e. Special details for the specific bridge

22. Bridge Standard Details*

23. Bridge Railing Standards

24. Retaining Wall Layouts/Profiles**

25. Retaining Wall Details**

26. Retaining Wall Standard Details**

27. Guard Fence/Standards and Signal Pole Standards

28. Signal/Electrical Details/Standards and Signal Pole Standards

29. Signing/Markers/Striping Details/Standards

30. Barricade/Construction/Beacon Standards

31. Miscellaneous Standards
    a. Chain Link Fence Standards
    b. Bridge End Detail/Standards
    c. Roadway Clearance Details/Standards
    e. Attenuator Standards

NOTE: Variations of these plan sheet sequence guidelines may be permitted if approved in writing by the LPA.

EXHIBIT "B"
SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

APPENDIX B - PLAN PREPARATION PROCEDURES

1. Title Sheet
   The ENGINEER shall be responsible for completing the title sheet as required and formatted by the STATE and as discussed in Part V of the Highway Design, Operations and Procedures Manual. Refer to Section K - Plans, 1 - Title Sheets, page 5-24, for the procedure to be used regarding all plans prepared by the ENGINEER.

2. Project Layout
   The project layout shall clearly depict the entire project as it is proposed and will usually be drawn at a scale of 1 inch=100 feet or 1 inch=200 feet, depending on the size of the project.

3. Typical Sections
   See Part IV of the Highway Design, Operations and Procedures Manual.

4. Sequence of Work Sheets (Traffic Control Plan)
   Clarity and completeness should be the rule to follow in preparing these sheets, with particular attention given to location of construction signs and barricades, lane widths, protection of drop offs, etc. For a reference guide use the Texas Department of Transportation, Texas Manual on Uniform Traffic Control Devices. Usual scale of 1 inch=100 feet and/or 1 inch=50 feet for special locations. A narrative sequence shall be included in the special provisions for the project. Staging of structural elements shall be considered. Provisions for drainage shall be considered, included and indicated during all stages of construction operations.

5. Removal Item Sheets
   These sheets indicate removal of existing facilities necessary to the proposed construction. (1 inch=40 feet) (use same scale as plan/profile sheets).

6. Summary Sheets
   Summary Sheets are required to indicate type, quantity and/or location of work for individual items of the proposed project.

7. Alignment Layout Sheets
   These sheets indicate the horizontal alignment with curve data and coordinates usually tabulated thereon. On some projects, depending on size, this information may be included on the plan profile sheets. Usual scale (1 inch=100 feet) or (1 inch=40 feet).

8. Plan Profile Sheet
   Clarity and completeness should be the rule to follow in preparation of these sheets. Usual scale (1 inch=40 feet or 1 inch=50 feet) or (1 inch=20 feet), depending on project complexity.

9. Drainage Area Maps
   Usual scale (1 inch=100 feet) and/or (1 inch=200 feet) supplemented by large scale area maps as necessary.

10. Drainage Plan Profile Sheets
    These sheets may be required on some projects to clearly depict location of inlets, storm sewer lines, and profile of storm sewer lines and laterals. Usual scale (1 inch=40 feet or 1 inch=50 feet) or (1 inch=20 feet). Storm sewer design does include redesign of storm sewers imposed by utility constraints developing after initial reviews by the STATE and consequential redesign and adjustments.

11. Runoff, Inlet, Storm Sewer and Culvert Sheets
    Use standard sheets.

APPENDIX B - PLAN PREPARATION PROCEDURES (Continued)

12. Culvert Cross Sections and Details
District standard reproducible sheets can be furnished (one each) to the ENGINEER for modification of special designs.

13. Manhole and Inlet Details
District standard reproducible sheets can be furnished (one each) to the ENGINEER.

14. Miscellaneous Detail
Curb, Sidewalk, Driveways, etc.

15. Intersection Details

16. Marking Layouts and/or Details
Layouts of the entire project with markings depicted thereon. Usual scale 1:500 (1 inch=40 feet or 1 inch=50 feet). On some projects typical details might suffice.

17. Structural Details
Bridge layout sheets shall have the same horizontal and vertical scale. Usually (1 inch = 10 feet) (1 inch = 20 feet). Sections of existing and proposed structures usually have a scale of (1 inch = 5 feet). Elements of the bridge (abutments, bents, slabs, etc.) shall be detailed to a (1/2 inch = 1 foot) or (1/4 inch equals 1 foot) architect scale to provide clear legible drawings when reduced. Letters shall be a minimum size of 4 millimeters (5/32 inch) height for hand lettering and 140 for lettering by computer-aided design and drafting (CADD).

18. Overhead Sign Bridge Layouts
A maximum of four structures may be shown on each layout sheet. The reference to the appropriate overhead sign bridge (OSB) standard and the following requirements shall be shown on the layout:
(1) Drilled shaft size and length
(2) Soil strength used for design {indicate basis and boring(s) used}
(3) Design height
(4) Tower height
(5) Leg spacings and
(6) Design wind speed.
The wind speed design map need not be included in the project plans. Designation of tower member size and anchor bolt size shall not be shown. For OSBs which require special design, the design shall be in accordance with the AASHTO sign specifications (see Item 22 of References on page 49) and to the same loading requirements as for normal standard structures. Structures (special or standard) which will have changeable message signs shall be analyzed by the ENGINEER.

APPENDIX C - GENERAL PLAN CHECKLIST

Services Provided By: ENGINEER	LPA	
___	___	Title Sheet
___	___	Project Layout
___	___	Sequence of Work
___	___	Detour Layouts & Profiles
___	___	Construction Pavement Markings
___	___	Signing & Barricades
___	___	Construction Sign & Beacons
___	___	Typical Sections
___	___	Shaping & Finishing Sections
___	___	Slopes Adjacent to Shoulders
___	___	Estimate & Quantities
___	___	General Notes & Specification Data
___	___	Grading Summary
___	___	Miscellaneous Summaries (See following "SUMMARIES" heading)
___	___	Horizontal Curve Data & Alignment Layouts
___	___	Drainage Summaries
___	___	Structure Summaries
___	___	Erosion Control Summary & Details
___	___	Plan/Profile Sheets
___	___	Erosion Control Summary & Details
___	___	Pavement Contours
___	___	Superelevation Transition (If Required)
___	___	Grading Contours
___	___	Guard Fence Layouts
___	___	Storm Water Pollution Prevention Plans (SW3P)
___	___	Drainage Area Maps
___	___	Hydraulic Data
___	___	Drainage Sheets
___	___	Bridge Hydrology Sheets
___	___	Inlet & Manhole Details
___	___	Utility Support Details
___	___	Culvert Cross Sections & Details
___	___	Special Culvert Designs
___	___	Special Drainage Details
___	___	Chain Link Fence Locations
___	___	Ramp Details Sheet
___	___	Removal Item Sheet - Including detours
		(Shown in detour summary, No payment for removal; subsidiary to construction detours)
___	___	Pavement Details
___	___	Pavement Standard Modification for Concrete Shoulder
___	___	Concrete Pavement Continuously Reinforced (CPCR)
___	___	Concrete Pavement Contraction Design (CPCD)
___	___	Concrete Pavement Details - Jointed Reinforced (Steel Bars) (CPJR)
___	___	Bridge Approach Slab Details
___	___	Vehicle Attenuator Details
___	___	Miscellaneous Details
___	___	Wheelchair Ramps
___	___	Pavement Marking Details
___	___	Modified Standards
___	___	List of Standards
___	___	Permanent Signing Plans & Quantities

APPENDIX C - GENERAL PLAN CHECKLIST *(continued)*

Services Provided By: ENGINEER	LPA	
___	___	Permanent Lighting Plans, Quantities & Standards
___	___	Bridge Layout(s)
___	___	Bridge Details
___	___	Retaining Wall Layout(s)
___	___	Retaining Wall Details
___	___	Pumphouse Details
___	___	Underdrain Details (Retaining Walls)
___	___	Culvert Standards
___	___	Soil Profile
___	___	Temporary Traffic Signals
___	___	Design Cross Sections
___	___	Estimate
___	___	List of Standard Specification, Special Provisions & Special Specifications
___	___	Detour Special Provisions (If Required)
___	___	Construction Time Estimate
___	___	Critical Path Method (CPM)
___	___	Unit Price Documentation

Miscellaneous

___	___	Conduit Requirements
___	___	Traffic signal Requirements

Summaries **(ALL BELOW YES FOR ENGINEER AND NO FOR COUNTY UNLESS NOTED OTHERWISE)**

___	___	Salvaging and Placing Topsoil
___	___	Prepare ROW
___	___	Remove Old Structures
___	___	Scarify Existing Pavement
___	___	Remove Old Concrete Curb of Curb and Gutter (C&G)
___	___	Remove Old Concrete Pavement
___	___	Remove Old Concrete Riprap
___	___	Remove Metal Beam Guard Fence
___	___	Galvanized steel Beam Guard Fence (12Ga) (GSBGF)
___	___	Temporary Guard Fence (TEMPGF)
___	___	Summary of Concrete Flumes
___	___	Curbs
___	___	Adjust Manholes & Inlets
___	___	Underdrains
___	___	Base and Pavement
___	___	Large Structure
___	___	Concrete Riprap (RR8 & RR9)
___	___	Temporary Portable Concrete Barrier (PCBR)
___	___	Concrete Traffic Barrier
___	___	Vehicle Attenuator
___	___	Guard Rail Energy Absorbing Terminal (Great System)
___	___	Pavement Markings & Blast Cleaning (Thermoplastic)
___	___	Retaining Walls
___	___	Large Structure Summaries
___	___	Small Structure Summaries

APPENDIX C - GENERAL PLAN CHECKLIST *(continued)*

Services Provided By: ENGINEER	LPA	**Summaries**	**(ALL BELOW YES FOR ENGINEER AND NO FOR COUNTY UNLESS NOTED OTHERWISE)**
___	___		Earthwork (Roadway & Channel) & Channel Details
___	___		Culverts
___	___		Detours
___	___		Seeding or Mulch Sod - Quantity Only
___	___		Inlet & Manholes
___	___		Sidewalks
___	___		Construction Pavement Markings
___	___		Driveways
___	___		Concrete Median
___	___		Storm Sewers
___	___		Head Walls & Safety End Treatments
___	___		Curb Openings
___	___		Manholes
___	___		Chain Link Fence, Remove & Replace Chain Link Fence
___	___		Remove & Relay Reinforced Concrete Pipe (RCP) or Pipe Sewer

CLIENT: Hidalgo County Precinct #4

EXHIBIT "C" PROJECT DEVELOPMENT SCHEDULE

MILE 5

FROM: TAYLOR RD. TO: FM 2220 (WARE RD.)

TASK AND DESCRIPTION	FIRM	2017	2018				2019												2020												2021												2022			
			Q1	Q2	Q3	Q4	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Q1	Q2	Q3	Q4
Phase I: EA, Public Involvement, Schematic																																													
Public Involvement																																													
Develop Alternatives & Matrix	L&G																																												
Advertise & Conduct Public Meeting	L&G																																												
Select TPA	L&G																																												
Advertise & Conduct Public Hearing	L&G																																												
Schematic																																													
Develop Schematic & Submit Schematic	L&G																																												
Hydrologic Map	L&G																																												
TxDOT Review & Revisions	TxDOT																																												
TxDOT Schematic Approval	TxDOT																																												
Environmental Document																																													
Draft Environmental Document (Process Technical Reports)	L&G																																												
Submit Final Draft Document (Administratively Comp. Doc.)	L&G																																												
Agency Review & Revisions	TxDOT																																												
Environmental Decision	TxDOT																																												
Phase II: PS&E & Construction Oversight																																													
PS&E																																													
Design Survey	L&G																																												
Permitted Utility Coordination	L&G																																												
Outfall Coordination with HCDD #1	L&G																																												
30% PS&E Completion	L&G																																												
60% PS&E Completion	L&G																																												
90% PS&E Completion	L&G																																												
95% PS&E Completion	L&G																																												
100% Final Submittal	L&G																																												
TxDOT Plan Set Approval	L&G																																												
Const Oversight																																													
Let Project (Est. Earliest Date: 1st Quarter 2022)	TxDOT																																												
Construction Duration (12 months)	TxDOT																																												
Phase III: ROW Map & Acquisition																																													
ROW Map																																													
Prepare ROW Map	County																																												
TxDOT/County Internal Review	TxDOT/County																																												
ROW Acquisition (Est. 48 Parcels)																																													
ROW Release (Dependent on Availability of Funds)	TxDOT/County																																												
Project Administration	TxDOT/County																																												
Compensable Utility Oversight	TxDOT/County																																												
Coordination with County & TxDOT	TxDOT/County																																												
Title Commitments	TxDOT/County																																												
Appraisal Reports	TxDOT/County																																												
Appraisal Review Reports	TxDOT/County																																												
Appraisal Update Reports	TxDOT/County																																												
Approved Values by TxDOT/County	TxDOT/County																																												
Acquisition Negotiation Offers	TxDOT/County																																												
Title Curative Process	TxDOT/County																																												
Title Commitment Updates	TxDOT/County																																												
Payments for Parcels	TxDOT/County																																												
L&G Condemnation Support Process	TxDOT/County																																												
Eminent Domain Proceedings by TxDOT	TxDOT/County																																												
Title Insurance Policies	TxDOT/County																																												
Consumation of Outstanding Cases	TxDOT/County																																												

L&G FUNCTION
ENVIRONMENTAL ASSESSMENT WORK
TXDOT FUNCTION
HIDALGO COUNTY FUNCTION

Exhibit "D"
BUDGET
LUMP SUM RATE BASIS OF PAYMENT

Work Authorization No._____

	A	B	C	D	E	F	G	H	I	J	K
1	**Highway: 5 Mile Road**						**R.O.W. Surveying Services, L.L.C.**				
2	**County:** Hidalgo County, Texas										
3	**Limits:** Taylor Rd. to FM 2220 (Ware Rd)										
4	**Description of Work:** Design Survey										
5	**TASK AND DESCRIPTION**	**Survey**		**Survey**	**4-man**	**3-man**	**2-man**		**Admin/**	**Total**	**Cost**
6	**FC 130 ROW Map / FC 150 Field Surveying**	**PM**	**RPLS**	**Technician**	**Survey Crew**	**Survey Crew**	**Survey Crew**	**SUE/per unit**	**Clerical**	**Hours**	
7	**HOURLY RATE**	**$124.00**	**$125.00**	**$82.00**	**$175.00**	**$155.00**	**$130.00**	**$500.00**	**$50.00**		
11	**PHASE 1 - FC 150 Field Surveying (Control Hz & Vt)**										
12	A. Primary Project Control										
13	a. Establish Primary Control	0	2	2	0	6	0	0	0	10	$ 1,344.00
14	B. Secondary Project Control										
15	a. Set additional secondary control points as needed	0	4	6	0	5	0	0	0	15	$ 1,767.00
16	b. Horizontal values established with RTK or VRS	0	2	8	0	6	0	0	0	16	$ 1,836.00
17	c. Vertical values established with digital level	0	2	4	0	6	0	0	0	12	$ 1,508.00
18	Subtotal Hours	0	10	20	0	23	0	0	0	53	
19	Subtotal Cost - Phase 1	$0.00	$1,250.00	$1,640.00	$0.00	$3,565.00	$0.00	$0.00	$0.00		**$ 6,455.00**
20	**PHASE 2 - DTM Topography and Cross sections (Total Length including side streets, 1000' Drain, and 1000' Irrigation Crossings=+/-1.0 miles)**										
21	C. Setting Benchmarks										
22	1. Setting Benchmarks @ 1000'(ft) intervals	0	0	0	0	16	0	0	0	16	$ 2,480.00
23	2. Topographic & Crossections	0	0	8	0	24	0	0	0	32	$ 4,376.00
24	3. Locate Visible Utilities	0	0	8	0	20	0	0	0	28	$ 3,756.00
25	4. Cross Culverts, Driveway Culverts, Inverts	0	0	8	0	12	0	0	0	20	$ 2,516.00
26	5. Right of Entry, ROW Research, Aprraisal Dist. Records	0	2	6	0	0	0	0	10	18	$ 1,242.00
27	6. Proposed Centerline on Existing Pavement Pre-Construction for Utilities	0	2	6	0	8	0	0	0	16	$ 1,982.00
28	7. Profile and Cross section Intersecting Streets	0	0	6	0	8	0	0	0	14	$ 1,732.00
29	8. Irrigation Crossings	0	0	10	0	20	0	0	0	30	$ 3,920.00
30	9. Existing Storm Drain H&V	0	0	2	0	6	0	0	0	8	$ 1,094.00
31	10. Tie Existing Underground and Overhead Utilities Coordinate with Engineer (No SUE)	0	2	2	0	6	0	0	0	10	$ 1,344.00
32	11. Additional Field Surveying										
33	a. Irrigation Lines	0	2	3	0	8	0	0	0	13	$ 1,736.00
34	b. Outfalls	0	2	3	0	8	0	0	0	13	$ 1,736.00
35	c. Driveways and Turnouts	0	0	3	0	4	0	0	0	7	$ 866.00
36	15. Profiles of Existing Drainage Facilities	0	0	3	0	6	0	0	0	9	$ 1,176.00
37	17. Obtain Elevations of Manholes and Valves of Utlities	0	0	3	0	4	0	0	0	7	$ 866.00
38	18. Provide temp. signs, traffic control, flags, safety equip. etc.	0	0	0	0	4	0	0	0	4	$ 620.00
39	19. Ties to Existing Bridges or Culverts that may be in conflict with new construction	0	0	3	0	8	0	0	0	11	$ 1,486.00
40	21. Inventory Signs, mailboxes, and driveways	0	0	3	0	2	0	0	0	5	$ 556.00
41	22. Survey Control Data Sheets per TxDOT	0	2	3	0	0	0	0	0	5	$ 496.00
42	23. Recover and Establish Existing CL and ROW	0	0	0	0	0	0	0	0	0	$ -
43	24. Coordinate with the Engineer for Existing CL Stationing	0	2	0	0	0	0	0	0	2	$ 250.00
44	25. Right of Way Restaking (Pre Construction)	0	4	4	0	8	0	0	0	16	$ 2,068.00
45	26. SUE Level A Data Sheets	0	0	0	0	0	0	0	0	0	$ -
46	Subtotal Hours	0	18	84	0	172	0	0	10	284	
47	Subtotal Cost - Phase 2	$0.00	$2,250.00	$6,888.00	$0.00	$26,660.00	$0.00	$0.00	$500.00		**$ 36,298.00**
48	**PHASE 3- SUBSURFACE UTILITY ENGINEERING**										
49	1. Hydro Excavation SUE Level A (30 holes at $500 each)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	30.00	$0.00	$0.00	
50	Total Cost-Phase 3	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$15,000.00	$0.00	$0.00	**$ 15,000.00**
51	**PHASE 4 - FINAL REPORT & DELIVERABLES**										
52	A. CADD file (2D & 3D) for limits of project	0	0	10	0	0	0	0	0	10	$ 820.00
53	B. Final Report and Deliverables	0	2	10	0	0	0	0	0	12	$ 1,070.00
54	Subtotal Hours	0	2	20	0	0	0	0	0	22	
55	Subtotal Cost - Phase 4	$0.00	$250.00	$1,640.00	$0.00	$0.00	$0.00	$0.00	$0.00		**$ 1,890.00**
56	**PROJECT MANAGEMENT & OVERSIGHT**										
57	A. Meeting & Coordination w/ Engineers	0	4	0	0	0	0	0	2	6	$ 600.00
58	B. QC/QA Survey	0	4	8	0	0	0	0	2	14	$ 1,256.00
59	Subtotal Hours	0	8	8	0	0	0	0	4	64	
60	Subtotal Cost - PM & Oversight	$0.00	$1,000.00	$656.00	$0.00	$0.00	$0.00	$0.00	$200.00	0	**$1,856.00**
61	**Total Fee FC 150**	**$0.00**	**$4,750.00**	**$10,824.00**	**$0.00**	**$30,225.00**	**$0.00**	**$0.00**	**$700.00**	0	**$46,499.00**
62	**Total SUE**							$15,000.00			**$15,000.00**
63	**Total Fee FC 130 & FC 150 & SUE**										**$61,499.00**

EXHIBIT B "FEE SCHEDULE" - WARRANT STUDIES'

Along FM 676 (Mile5 North Road): From Taylor Road to FM 2220 (Ware Road)

Ergonomic Transportation Solutions, Inc.

WARRANT STUDIES				MANHOURS				
				Project Manager	Traffic Engineer	CADD/ Designer	Administrative Assistant	Total
TASK								
	1	Collect Data and Conduct Field Investigations			8	8		16
	2	Assess Collected Data			2	2		4
	3	Accident Analysis			12			12
	4	Collision Diagram			1	2		3
	5	Intersection Exhibits			4	12		16
	6	Signal Warrant Analysis		2	32	4		38
	7	Photo Album				4		4
	8	Recommendations		2	2			4
	9	Traffic Signal Warrant Study Report		2	16	8	4	30
		Subtotal		**6**	**77**	**40**	**4**	**127**

Total Sheets/Labor Hours		**6**	**77**	**40**	**4**	**127**	
Contract Rates		$ 68.00	$ 34.00	$ 23.00	$ 19.00		
Direct Salary Cost		$ 408.00	$ 2,618.00	$ 920.00	$ 76.00	$	4,022.00
Overhead Multiplier	165.260%	$ 674.26	$ 4,326.51	$ 1,520.39	$ 125.60	$	6,646.76
Fixed Fee	12.50%	$ 135.28	$ 868.06	$ 305.05	$ 25.20	$	1,333.59
Total Labor Costs		**$ 1,217.54**	**$ 7,812.57**	**$ 2,745.44**	**$ 226.80**	**$**	**12,002.35**

Ergonomic Transportation Solutions, Inc. Expenses

EXPENSES

Printing Reproduction	$	-
Travel	$	600.00
Delivery	$	-
Collect 12 hr Turning Movement Counts (Outsourced)	$	2,500.00
Total Expenses	**$**	**3,100.00**

ETSI Total Cost **$ 15,102.35**

EXHIBIT C "FEE SCHEDULE" - TRAFFIC SIGNAL DESIGN
Along Mile 5 North Road: From Taylor Road to FM 2220 (Ware Road)

Ergonomic Transportation Solutions, Inc.

TRAFFIC SIGNAL DESIGN			MANHOURS						
			No. of sheets (estimated)	Project Manager	Senior Transp. Engineer	Transportation Engineer	CADD Designer	Administrative Assistant	Total
TASK									
	1	General Notes	n/a	1	2	6		4	13
	2	Basis of Estimate	1	1	2	6	6		15
	3	Condition Diagram	2	2	4	16	24		46
	4	Proposed Signal Plan Layout	2	8	24	40	40		112
	5	Signal Phasing/Timing	n/a	2	2	6	6		16
	6	Electrical Schedules	2	2	6	24	24		56
	7	Int..Signs, Pav.Markings, Curb Ramps	n/a	2	4	12	12		30
	8	Standard Sheets List	12		2	8	8		18
	9	Specifications and Cost Estimate	1	1	2	8	8		19
	10	Coordination and Meetings	n/a	12					12
		Subtotal	**20**	**31**	**48**	**126**	**128**	**4**	**337**

Total Sheets/Labor Hours	**20**	**31**	**48**	**126**	**128**	**4**	**337**
Contract Rates		$ 68.00	$ 46.00	$ 34.00	$ 23.00	$ 19.00	
Direct Salary Cost		$ 2,108.00	$ 2,208.00	$ 4,284.00	$ 2,944.00	$ 76.00	$ 11,620.00
Overhead Multiplier	165.260%	$ 3,483.68	$ 3,648.94	$ 7,079.74	$ 4,865.25	$ 125.60	$ 19,203.21
Fixed Fee	12.50%	$ 698.96	$ 732.12	$ 1,420.47	$ 976.16	$ 25.20	$ 3,852.90
Total Labor Costs		**$ 6,290.64**	**$ 6,589.06**	**$ 12,784.21**	**$ 8,785.41**	**$ 226.80**	**$ 34,676.11**

Ergonomic Transportation Solutions, Inc. Expenses

EXPENSES		
Printing Reproduction	$ 35.00	
Travel	$ 650.00	
Deliveries	$ 60.00	
Total Expenses		**$ 745.00**

ETSI Total Cost **$ 35,421.11**