

**HIDALGO COUNTY**  
**Professional Engineering Services**  
**Contract # C-17-204-10-30**  
**Work Authorization Form**  
  
**WORK AUTHORIZATION NO. 2**

THIS WORK AUTHORIZATION is made pursuant to the terms and conditions of Article 1 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 Engineering Services required for PS&E Development and Right-of-Way Map for Mile 10 from Mile 6 to FM 1015 project.

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 \$3,387,772.00. This amount is based upon the costs outlined in the Estimated Cost Proposal attached hereto as *EXHIBIT "D-1" - Estimated Man-hour Breakdown*.

**PART 3. PAYMENT**

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

**PART 4. FUNDING**

This Work Authorization No. 2 shall be funded through funding source:

Account No. \_\_\_\_\_

Requisition Number \_\_\_\_\_ (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 shall serve as a Notice to Proceed as per Article 3, Period of Service on the Agreement. This Work Authorization shall terminate upon completion of scopes of the work authorization, as identified on **EXHIBIT "C" - Work Schedule**.

**PART 6. RESPONSIBILITIES AND OBLIGATIONS**

This Authorization does not waive the parties' responsibilities and obligations provided under the Agreement.

**PART 7. ACKNOWLEDGEMENT AND CONFIRMATION**

Acknowledgment and confirmation by Hidalgo County Precinct No. 1, Commissioner David Fuentes as to the content and detail of this Work Authorization No. 2.

**HIDALGO COUNTY  
COMMISSIONER PRECINCT NO. 1**

BY: \_\_\_\_\_

**PART 8. ACCEPTANCE AND APPROVAL**

This Work Authorization is hereby accepted and approved by the Hidalgo County Commissioners Court and hereby executed and effective as of the date indicated below.

APPROVED BY COMMISSIONERS' COURT ON JANUARY 31, 2023  
Agenda Item No. 89387

Executive Office: \_\_\_\_\_

**THE ENGINEER:  
L&G ENGINEERING**

**THE OWNER:  
HIDALGO COUNTY**

  
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By: Jacinto Garza, P.E.  
President

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By: Richard Cortez,  
County Judge

ATTEST:

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**LIST OF EXHIBITS**

- Location Map
- Exhibit A - Services to be provided by Owner
- Exhibit B - Services to be provided by Engineer
- Exhibit C - Work Schedule
- Exhibit D-1 - Estimated Man-hour Breakdown

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By: Arturo Guajardo, Jr., County Clerk

**EXHIBIT "A"**  
**Services to be provided by the County**

1. The County will issue work authorization to initiate all required services and designate the authorized representative for the coordination of each work authorization.
2. The County will provide copies of all subdivision plats of record and/or in the subdivision process.
3. The County will provide the Engineer with ongoing guidance, timely reviews, and decisions necessary to complete services required by the work authorization in order to permit the Engineer to maintain an agreed-upon project schedule.
4. The County will process all acceptable requests for payment in a timely manner.

## 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: \_\_\_\_\_

LENGTH: 3.5 Miles

HIGHWAY: Mile 10

LIMITS: FROM MILE 6 to FM 1015

### 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
- 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

CITY shall mean the City of Weslaco

LPA shall mean Hidalgo County Pct. #1

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

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**SECTION 5 - RIGHT-OF-WAY DATA**

(Function Code 130)

Services

Provided By:

SURVEYOR CITY/COUNTY

**NOTE:** No work involving right-of-way (ROW) data is to be performed until the ENGINEER has given the SURVEYOR written approval of the final location of the proposed ROW lines as approved by TxDOT and the CITY.

**A. RIGHT-OF-WAY MAPPING:**

**1. PURPOSE:**

The purpose of right-of-way mapping is to prepare documents suitable for the acquisition of real property interests and the probable issuance of a title policy.

**2. DEFINITIONS:**

For purposes of this Contract, the following definitions shall apply:

- 2.1. Abstract Map – A drawing to scale prepared from record documents depicting proposed right-of-way lines, existing right-of-way lines, easement lines, and private property lines with relevant grantee names, recording data, and recording dates.
- 2.2. Closure/Area Calculation Sheet – A computer generated print-out of the area and the perimeter bearings, distances, curve data, and coordinates of an individual parcel of land to be acquired.
- 2.3. Access Denial Line – A line which indicates specific location where access to the roadway is denied.
- 2.4. Property Descriptions – A written metes and bounds description delineating the area and the boundary and describing the location of an individual parcel of land unique to all other parcels of land.
- 2.5. Owner – The most current title holder of record as determined by a study of the Real Property Records.
- 2.6. Parcel Plat – An 8 ½ inch by 11 inch drawing to scale depicting all the information shown on the right-of-way map regarding an individual parcel of land to be acquired.
- 2.7. Parent Tract – A unit or contiguous units of land under one ownership, comprising a single marketable tract of land consistent with the principle of highest and best use. A parent tract may be described by a single instrument or several instruments. A single parent tract cannot be severed by a public right-of-way, easement, or separate ownership which destroys unity of use.
- 2.8. Parent Tract Inset – A small line drawing, to an appropriate scale, of the parent tract perimeter placed upon the right-of-way map in the proximity of the respective parcel. Parent tract insets are used in cases where the parent tract cannot be shown to the same scale as the right-of-way map. Since parent tract insets are used to identify the limits and location of parent tracts, they should include public right-of-ways, utility easements and fee strips, and identifiable water courses which bound the parent tract.
- 2.9. Point of Beginning (P.O.B.) – A corner of the parcel of land to be acquired, located on the proposed right-of-way line and being the beginning terminus of the first course of the property description.
- 2.10. Point of Commencing (P.O.C.) – A monumented property corner which can be identified in the Real Property Records and is located outside the proposed right-of-way corridor. For title purposes, the point of commencing should be a monumented back corner of the parent tract. In the event a monumented back corner of the parent tract cannot be recovered, the nearest identifiable monumented property corner located outside the proposed right-of-way corridor may be used.

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

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Services

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SURVEYOR CITY/COUNTY

- 2.11. Preliminary Right-of-Way Layout/Abstract Map – A drawing to scale depicting proposed right-of-way lines, existing right-of-way lines, proposed pavement, access denial lines, the proposed centerline alignment, private property lines, easement lines, visible improvements, visible utilities, the station and offset from the centerline alignment to each Point of Curvature (PC), Point of Tangency (PT), and angle point in the proposed right-of-way lines and to each PC, PT, and angle point in the existing right-of-way lines in areas of no proposed acquisition. *(Reference Sample Attached)*
- 2.12. Right-of-Way Maps/Property Description/Parcel Plats – A series of 22 inch by 34 inch and 11 inch by 17 inch drawings to scale depicting the results of relevant elements of records research, field work, analysis, computation, and map making required to determine title, delineate areas and boundaries, locate and describe utilities and improvements to the extent necessary to appraise the value and negotiate the acquisition of individual parcels of private land for a proposed right-of-way project. *(Reference Sample Attached)*

**3. WORK TO BE PERFORMED:**

Y      N

**3.1. Preliminary Right-of-Way Layout/Abstract Map:**

An abstract map shall be prepared sufficient to determine the following:

- 3.1.1. Any and all interests of public record held in the land to be acquired.
- 3.1.2. The total record holdings of an owner contiguous to land to be acquired from that owner.
- 3.1.3. Any and all interests in land to be acquired held in common (shopping mall parking lots, subdivision reserves, etc.)
- 3.1.4. Any and all improvements proposed by other agencies which may have a bearing on project development.
- 3.1.5. All called monuments, bearings, and distances as per recorded information.
- 3.1.6. Preliminary Parcel numbering system.
- 3.1.7. Any and all utilities (permitted or of record)
- 3.1.8. Reference Sample provided.

Y      N

**3.2. Right-of-Way Map:**

The SURVEYOR shall field locate property corners, existing right-of-way markers, improvements, visible utilities, verify and update the planimetric file, if provided, and as directed by the ENGINEER.

A right-of-way map shall be prepared for each proposed right-of-way project. A right-of-way map shall include a title sheet, an index sheet, a survey control index sheet, a horizontal and vertical control data sheet, and sufficient plan sheets to cover the proposed project, or as directed by the ENGINEER. The STATE has developed standard title sheets, index sheets, and plan sheets, copies of which the SURVEYOR shall request and secure for all purposes of this Contract. Plan sheets shall include, but need not be limited to, the following items of information. By mutual agreement between the Texas Board of Professional Land Surveying and the TxDOT, right-of-way maps need not be signed and sealed by a Registered Professional Land Surveyor.

- 3.2.1. Proposed right-of-way lines shall be delineated with appropriate bearings, distances, and curve data. Curve data shall include the radius, delta angle, arc length, and long chord bearing and distance.
- 3.2.2. Existing right-of-way lines shall be delineated with appropriate bearings, distances, and curve data to the extent necessary to describe the individual parcels of land to be acquired. Curve data shall include the radius, delta angle, arc length, and long chord bearing and distance.

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

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Services  
Provided By:  
SURVEYOR CITY/COUNTY  
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3.2 *Right-of-Way Map Continued (continued)*

- 3.2.3. The proposed project baseline alignment shall be delineated with appropriate bearings, distances, and curve data. Curve data shall include the station of the curve Point of Intersection (PI), radius, delta angle, arc length, tangent length, long chord bearing and distance, and the N and E coordinates of the curve PI. All alignment PCs, PTs, and even 500 foot stations shall be labeled as to station.
- 3.2.4. Proposed paving lines combined with relevant existing paving lines shall be shown to the extent necessary to compile a complete picture of proposed traffic movements. Proposed paving on the final mylars submitted to the ENGINEER shall be shaded with a dot pattern or highlighted by some other means acceptable to the ENGINEER.
- 3.2.5. Access denial lines shall be shown sufficiently to indicate areas where access is to be denied and where access is to be permitted if required by the ENGINEER.
- 3.2.6. Private property lines shall be delineated with appropriate bearings, distances, and curve data to the extent necessary to describe the individual parcels of land to be acquired. Curve data shall include the radius, delta angle, arc length, and long chord bearing and distance.
- 3.2.7. Porción lines, subdivision lines and survey lines shall be shown and identified by name and Porción number.
- 3.2.8. County lines and city limit lines shall be located and identified by name.
- 3.2.9. A north arrow shall be shown on each sheet, and, if possible, located in the upper right corner of the sheet.
- 3.2.10. Monumentation set or found shall be shown and described as to material and size.
- 3.2.11. A station and offset shall be shown for each PC, PT, and angle point in the proposed right-of-way lines. Stations and offsets shall be with respect to the proposed centerline alignment.
- 3.2.12. Intersecting and adjoining public right-of-ways shall be shown and identified by name, right-of-way width, and recording data.
- 3.2.13. Railroads shall be shown and identified by name, right-of-way width, and recording data.
- 3.2.14. Utility corridors shall be identified as to easement or fee and recording information shall be identified.
- 3.2.15. Easements and fee strips shall be shown and identified by width, owner, distance of easement to a property corner of the parent track, and recording data.
- 3.2.16. Building lines or set-back lines shall be shown and identified.
- 3.2.17. Visible improvements located within the proposed right-of-way corridor or within 50 feet of a proposed right-of-way line shall be shown and identified.
- 3.2.18. Structures shall be identified as commercial or residential, by number of stories, and as to type (brick, wood frame, etc.).
- 3.2.19. Structures which are severed by a proposed right-of-way line shall be dimensioned to the extent necessary to completely delineate the severed parts.
- 3.2.20. Parking areas, billboards, and other on-premise signs which are severed by a proposed right-of-way line shall be dimensioned to the extent necessary to delineate that portion of the parking area, billboard, or sign which is located within the proposed right-of-way corridor.

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

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3.2 *Right-of-Way Map Continued (continued)*

- 3.2.21. In cases where structures are located outside the proposed right-of-way corridor and within 25 feet of a proposed right-of-way line, the shortest distance between the structure and the proposed right-of-way line shall be shown and field verified.
- 3.2.22. Visible utilities located within the proposed right-of-way corridor or within 50 feet of a proposed right-of-way line shall be shown and identified.
- 3.2.23. The location of underground utilities and fuel storage tanks situated within the proposed right-of-way corridor or within 50 feet of a proposed right-of-way line shall be determined and shown as required by the ENGINEER. The visible location of stand pipes, vents and filler caps in conjunction with available design and as-built drawings may be used to determine a most probable location and size in the event an actual location is indeterminable.
- 3.2.24. Points of commencing and points of beginning shall be shown and labeled. Points of beginning shall be shown with their respective N and E surface coordinates. As an exception, a point of commencing will not be required in the case of a total taking without a remainder.
- 3.2.25. Each parcel of land to be acquired shall be identified by a parcel number which shall appear in the ownership tabulation and on the right-of-way map in the proximity of the respective parcel. If the SURVEYOR is unfamiliar with the criteria used by the STATE to assign parcel numbers, he shall seek the assistance of the ENGINEER at the time the abstract map is complete. THE SURVEYOR SHALL SEEK ASSISTANCE FROM THE ENGINEER IN DEVELOPING AN OWNERSHIP TABULATION TABLE.
- 3.2.26. An ownership tabulation shall be shown which shall include the parcel number, existing area of the parent tract, lot(s) and block(s) constituting the parent tract when applicable, owner's name, type of conveyance, film code, county clerk's file number, taking area, and remaining area of the parent tract located left and/or right of the centerline alignment. Types of conveyance, film code and file numbers refer to conveyances into the STATE and will be added to the right-of-way map by the STATE at a later date. Several blank lines shall be provided in the tabulation block to facilitate future map additions.
- 3.2.27. A parent tract inset shall be shown for each parent tract which cannot be shown to scale on the right-of-way map. The use of broken scale lines should be avoided. When parent tract insets are used, the point of commencing with the appropriate bearing and distance to the point of beginning may be shown on the parent tract inset.
- 3.2.28. A note shall be included on the title sheet and each map sheet stating the source of bearings, coordinates, and datum used.
- 3.2.29. Appropriate notes shall be included on the title sheet and each map sheet stating the following:
  - a. Month(s) and year abstracting upon which the map is based.
  - b. Month(s) and year field surveys were conducted upon which the map is based.
  - c. Month and year the map was completed by the SURVEYOR.
- 3.2.30. The right-of-way CSJ number, if available, shall be shown on each right-of-way map sheet.

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

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Services

Provided By:

SURVEYOR CITY/COUNTY

3.3. Exhibits:

An Exhibit shall be prepared for each parcel or tract consisting of a property description and a parcel plat.

Y

N

3.3.1. Property Description:

A property description shall be prepared for each parcel of land to be acquired. Standard formats for property descriptions, copies of which the SURVEYOR shall request to the ENGINEER and secure for all purposes of this Contract. Property descriptions shall include, but need not be limited to, the following items of information.

All property descriptions shall be signed and sealed by a Registered Professional Land Surveyor. The property description shall begin with a general description which shall include as a minimum:

- a. State, County, and Survey within which the proposed parcel of land to be acquired is located.
- b. A reference to unrecorded and recorded subdivisions by name, lot, block, and recording data to the extent applicable.
- c. A reference by name to the grantor and grantee, date and recording data of the most current instrument(s) of conveyance describing the parent tract. Use execution dates in deed references as opposed to recording or filing dates. In any case, the property description shall make clear which date is being used.

The property description shall continue with a metes and bounds description which shall include as a minimum:

- d. A point of commencing.
- e. A point of beginning with the appropriate N and E surface coordinates.
- f. A series of courses, identified by number and proceeding in a clockwise direction, describing the perimeter of the parcel of land to be acquired, and delineated with appropriate bearings, distances, and curve data.

Curve data shall include the radius, delta angle, arc length, and long chord bearing and distance. Each course shall be identified either as a proposed right-of-way line, and existing right-of-way line, or a property line of the parent tract. Each property line of the parent tract shall be described with an appropriate adjoiner call.

- g. A description of all monumentation set or found shall include, as a minimum, size and material.
- h. A reference to the source of bearings, coordinates, and datum used.

Y

N

3.3.2. Parcel Plat:

A parcel plat shall be prepared for each parcel of land to be acquired. The STATE has developed standard formats for parcel plats, copies of which the SURVEYOR shall request from the ENGINEER and secure for all purposes in this Contract. Parcel plats shall include each and every item of information shown on the right-of-way map which concerns the individual parcel. All parcel plats shall be signed and sealed by a Registered Professional Land Surveyor.

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

Services  
 Provided By:  
SURVEYOR CITY/COUNTY

**4. DELIVERABLES:**

In preparing right-of-way maps, the following is an outline of the work to be submitted (records should be delivered in a binder):

- |          |          |  |
|----------|----------|--|
| <u>Y</u> | <u>N</u> | 4.1. An Abstract Map of the current record title holders included in the Preliminary Map showing the proposed schematic and existing right-of-way as per General Specifications defined in 2.11.   |
| <u>Y</u> | <u>N</u> | 4.2. A Right-of-Way map for the project limits under cover of Title Sheet, Index Sheet, Control Data Sheet, and Exhibits of the property descriptions and parcel plats as per General Specifications defined in 2.12, 3.2 and 3.3.<br><u>ROW Map Submittal Requirements:</u><br>4.2.1. Two (2) paper sets of half-size ROW maps (11"x 17")<br>4.2.2. One (1) paper set of the full-size ROW maps (22"x 34")<br>4.2.3. Four (4) sets of original metes & bounds descriptions (field notes) with parcel plats (signed & sealed by the surveyor). <i>Do not include traverse sheet.</i><br>4.2.4. City requires one (1) electronic copy of the ROW Map on a CD, and One (1) copy of the DGN electronic file on a CD from the surveyor- Both the electronic copy of the ROW Map and the DGN file can be on one CD.<br><u>IF Roadway is ON-SYSTEM and after Administrative Approval of the ROW Maps by Division (REVISIONS) Submittal Requirements:</u><br>4.2.5. Two (2) paper sets of the half-size of the affected ROW map sheets (11"x17"), detailing the <u>revision</u><br>4.2.6. One (1) paper set of the full-size of the affected ROW map sheets (22"x 34"), detailing the <u>revision</u><br>4.2.7. Four (4) sets of any <u>revised</u> original metes & bounds descriptions (field notes) with parcel plats (signed & sealed by the surveyor). <i>Do not include traverse sheet.</i><br>4.2.8. Division needs one (1) electronic copy of the <u>revised</u> ROW Map sheets on a CD, and<br>4.2.9. One (1) copy of the DGN electronic file on a CD from the surveyor- detailing the <u>revision</u> -Both the electronic copy of the <u>revised</u> ROW Map sheets and the DGN file can be on one CD. |
| <u>Y</u> | <u>N</u> | 4.3. Set a #5 Iron Rod 2-ft. in depth on the proposed right-of-way lines at intersecting property lines, and at all PCs, PTs, angle points, intersecting right-of-way lines of side streets, and at 1,000 foot stations of the proposed centerline alignment.  |
| <u>Y</u> | <u>N</u> | 4.4. Set a #5 Iron Rod 2-ft. in depth on the existing right-of-way lines in areas of no acquisition at all PCs, PTs, angle points, and 1,000 foot stations, and as directed by the ENGINEER of the proposed centerline.  |
| <u>N</u> | <u>N</u> | 4.5. A SURVEYOR's report, outlining the approach, reasons or basis for the existing right-of-way determination, and conclusions made.  |
| <u>Y</u> | <u>N</u> | 4.6. Records used to establish ownership.  |
| <u>Y</u> | <u>N</u> | 4.7. ROW and parcel filed notes signed and sealed by a RPLS.   |
| <u>Y</u> | <u>N</u> | 4.8. Computation sheets of survey closures, ground surveys, etc. used to develop plats and meets and bound information.  |
| <u>Y</u> | <u>N</u> | 4.9. Items indicated under the Automation Requirements Section 6.  |
| <u>Y</u> | <u>N</u> | 4.10. Completed (Attached) Checklist with submittal of ROW Map etc.  |
| <u>Y</u> | <u>N</u> | 4.11. Set #5 Iron Rod 2 -ft. in depth at all corners of a proposed parcel.   |

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

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Services  
Provided By:  
SURVEYOR CITY/COUNTY

**5. GENERAL REQUIREMENTS:**

For purposes of this Contract, the following general requirements shall apply:

Y

N

- 5.1. Copies of instruments of record submitted to the ENGINEER shall be indexed by parcel number.
- 5.2. Coordinates appearing on right-of-way maps, on parcel plats, and in property descriptions shall be surface coordinates based on the Texas State Plane Coordinate System. The combined adjustment factors (sea level factor x scale factor) which have been developed by the STATE for its use are as follows:
  - 5.2.1. In (List Applicable Counties): Counties (----- Zone), grid coordinates are multiplied by a combined adjustment factor of 1.xxxxxx to obtain surface coordinates. For work in Counties other than those listed, the ENGINEER will provide the combine adjustment factor.
- 5.3. Line and curve tables may be used when necessary.
- 5.4. The number of centerline alignment stations to be shown on a single plan sheet shall be restricted to the extent necessary to allow approximately 4 inches between match lines and sheet borders for future details and notes.
- 5.5. A minimum 4 inch by 4 inch space shall be reserved at the bottom right corner of each map sheet for future revision notes.

**6. AUTOMATION REQUIREMENTS:**

In addition to standard hard copy plots and mylar copies, the following will be required electronically:

Y

N

- 0.1. Right-of-way maps and parcel plats shall be prepared using a *Micro Station* software graphics system capable of producing graphics files that can be plotted and viewed without further modification or conversion using the State's *Micro Station V8* graphics system.
- 0.2. It is the intent of the ENGINEER to secure graphics files which have elements of equal integrity, singularity, and attributes as elements prepared using the State's *Micro Station V8* graphics system.
- 0.3. For purposes of clarity, consistency, and ease of utilization, the SURVEYOR shall request and secure standards relevant to right-of-way mapping to the extent necessary to ensure that the needs of the ENGINEER are met. This includes, but may not be limited to, TxDOT seed file and corresponding units.def file, TxDOT font resource file, TxDOT GEOPAK SMD file, TxDOT DGNLIB, associated cell libraries and custom line styles, and other files as deemed appropriate for the project.
- 0.4. Graphics files furnished to the ENGINEER by the SURVEYOR shall be submitted on a Compact Disk CD, DVD or USB, in a format compatible with the STATE's computer system. The SURVEYOR shall confer with the ENGINEER regarding acceptable media and formats before making submissions. The SURVEYOR shall request and secure a Consultant File Index form provided by the ENGINEER, to be completed by the SURVEYOR, and to be submitted to the ENGINEER along with the graphics files.
- 0.5. Property descriptions shall be prepared using a computer word processing system capable of producing data files readable using *Microsoft Office Word Version 2007* word processing software.
- 0.6. Data files furnished to the ENGINEER by the SURVEYOR shall be submitted in ACSII format on a CD, DVD or USB.
- 0.7. Provide to the ENGINEER electronic copies of all instruments of record acquired pursuant to a work authorization.
- 0.8.

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

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Services  
Provided By:  
SURVEYOR CITY/COUNTY

**7. GENERAL SPECIFICATIONS:**

For purposes of this Contract, the following general specifications for right-of-way mapping shall apply:

Y

N

- 7.1. Completed right-of-way maps shall be submitted to the ENGINEER on single or double matte mylar, 22 inches by 34 inches in size with a 21 inch by 32 inch printed border positioned ½ inch from the top, bottom, and right edge of the sheet. Two copies on 11 inch by 17 inch paper will also be supplied to the ENGINEER.
- 7.2. Parcel plats shall be submitted to the ENGINEER on 8 ½ inch by 11 inch bond paper with respective borders of 7 ½ inches by 10 inches, positioned ½ inch from the top, bottom, and right edge of the sheet. Match lines shall be used where more than one sheet is required.
- 7.3. Right-of-way maps shall be drawn to a scale of 1 inch = 50 feet. An appropriate scale other than 1 inch = 50 feet may be used on some proposed right-of-way projects upon prior approval by the ENGINEER.
- 7.4. Since right-of-way maps are reduced in size by one-half for archiving purposes, the smallest size lettering acceptable on a right-of-way map shall be 1/10 of one inch (Leroy #100). A right-of-way map which contains any lettering smaller than 1/10 of one inch will not be accepted by the ENGINEER.
- 7.5. Parcel plats shall be drawn to a preferred scale of 1 inch = 50 feet. An appropriate scale other than 1 inch = 50 feet may be used on some proposed right-of-way projects upon prior approval by the ENGINEER. In the case of a very large parcel which would be difficult to show with clarity on a single 8 ½ inch by 11 inch sheet, the SURVEYOR shall use multiple 8 ½ inch by 11 inch sheets with matching lines.
- 7.6. The smallest size lettering acceptable on a parcel plat shall be 0.06 of an inch (Leroy #60).
- 7.7. Property descriptions shall be submitted on 8 ½ inch by 11 inch bond paper.
- 7.8. The ENGINEER has encountered a number of mylar products which are considered unacceptable. The SURVEYOR shall confer with the ENGINEER regarding mylar products he intends to use which have not been previously used on State projects.
- 7.9. Zip-A-Tone or other similar stick-on products shall not be used on right-of-way maps or parcel plats.

**8. ADHERENCE TO STANDARDS:**

For purposes of clarity, consistency, and ease of understanding, the CITY/COUNTY, as an acquiring agency of private property for public use, has adopted the STATE standards and formats for right-of-way mapping which have proven to facilitate the processes of negotiation, appraisal, relocation assistance, and condemnation. It shall be the responsibility of the SURVEYOR to adhere to these standards and formats to every extent possible to ensure that the needs of the acquiring agency are met.

SAMPLES ATTACHED FC 130: (FURNISHED UPON REQUEST FROM THE PROJECT ENGINEER)

- PRELIMINARY Right-of-Way Layout / Abstract Map
- Right-of-Way Map, Field Notes, Parcel Sketches and Area Computation Sheets



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

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- Scale
- Property lines
- Property descriptions i.e., lot, block, tract, subdivision, etc...
- Identify existing and proposed access denial locations (*if applicable*)

Proposed information:

- #5- 2-ft iron road set monumentation i.e. P.C., P.T., Break Points and 1000' stations at proposed ROW lines and where existing ROW line is the proposed ROW.
- Survey and R.O.W. lines
- Basis of bearings
- Parcel bearings and distances correspond with traverse sheet
- Outside ties (P.O.C.) corresponds with field notes
- Point of beginning (P.O.B.) established on proposed R.O.W. line
- Parcel tied to baseline
- Baseline information shown i.e. Stationing, bearings, curve data, etc...
- Conveyance information shown in tables i.e. parcel number, grantors name, amount of take, remainder etc.
- Math checked on remainder

Improvements:

- Improvements bisected or within 25' of proposed R.O.W. line are shown on map with stationing and distance from proposed R.O.W. line. Buildings are labeled and dimensioned.
- Off-premise outdoor advertising signs within proposed R.O.W. are shown and labeled.

Utilities:

- All utilities within or crossing existing and proposed right of way are shown and labeled as to size, easement or fee width, and recording data of instrument.
- Location of underground storage tanks and/or filler caps are shown and labeled

FIELD NOTES - Heading

- County
- Highway
- Parcel number
- R.O.W. CSJ
- Construction CSJ

General Description or "preamble"

- Area of parcel to be acquired is shown in acreage (0.000) for rural land and/or square feet (to nearest whole sq. ft.) for urban land or smaller parcels

Parent tract data is shown:

- Size of parent tract
- Survey data or lot, block, and subdivision
- Name of last recorded seller and buyer
- Date, volume and page or document number of last recorded conveyance
- Records and county of last recorded conveyance

Beginning Description

- Point of commencement is on outside tie and is described accurately by bearings and distances as it leads to the point of beginning.
- Point of beginning is on proposed R.O.W. line

Particular Description

- Traverse calls are clockwise sequence
- Bearings and distances correspond exactly with map, parcel sketch, and traverse sheet
- Bearings are to nearest whole second and distances are to the nearest one-hundredth of a foot
- Calls are numbered
- Denial of access shall be described from beginning to end (*if applicable*)

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

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**Closing Description**

- Last call leads back to P.O.B.
- Restates area of parcel
- Establishes taking in existing road R.O.W. if applicable
- Legal description is referenced to Plat
- Sealed and signed
- Include an access clause whether access is permitted or denied (*if applicable*)

**PARCEL SKETCH:**

- Shows P.O.B. and P.O.C.
- All data corresponds exactly with Map and Field Notes
- Sheet size is no larger than 8 1/2" x 11"
- Plat closely matches example provided
- Plat referenced to legal description
- Sealed and signed
- Include an access clause whether access is permitted or denied (*if applicable*)
- Existing utility lines and easements (deed reference, if available);

**TRAVERSE SHEET**

- Computations show area to be acquired in sq. ft. or acres, whichever is applicable
- Computations show area that is existing road R.O.W. if applicable
- Traverse calls are in clockwise sequence
- Error of closure meets the following:

Secondary rural	.0003
Primary rural - secondary urban	.0002
Urban or industrial	.00013

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

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**SECTION 6 - FIELD SURVEYING AND PHOTOGRAMMETRY**

(Function Code 150)

**ADDITIONAL FIELD SURVEYS AS IDENTIFIED ON  
THE EXHIBIT "D" BY THE SURVEYOR**

Services  
Provided By:  
SURVEYOR CITY/COUNTY

**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.

- |          |          |  |
|----------|----------|--|
| <u>Y</u> | <u>N</u> | <p><b>1. Design Surveying ( Recover and / or Re- Establish )</b></p> <p>a. Primary Project Control – 3 to 5 miles spacing<br/>Precision shall be 1 part in 20,000 or better, unless otherwise directed by the District Engineer.</p> <ul style="list-style-type: none"><li>(1) Establish horizontal control points</li><li>(2) Establish vertical control points</li></ul> <p>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</p>   |
| <u>Y</u> | <u>N</u> | <p>b. Secondary Project Control – Surveyor shall recover and/or reset H&amp;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.</p> <ul style="list-style-type: none"><li>(1) No traverse should exceed 25 angle points. Planimetrics shall be 20 ft Lt &amp; Rt from the proposed ROW as per the schematic provided by the Engineer.</li><li>(2) The unadjusted angular error should not exceed 2 seconds per angle, plus 14 seconds.</li><li>(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.)</li><li>(4) The unadjusted vertical error should not exceed 0.03 foot per mile of traverse.</li><li>(5) Project control base lines</li></ul> |
| <u>N</u> | <u>N</u> | <ul style="list-style-type: none"><li>(6) Photogrammetric ground control<ul style="list-style-type: none"><li>(a) Establish horizontal control</li><li>(b) Establish vertical control points</li><li>(c) Place and maintain control point targets</li></ul></li></ul>  |

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

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Services

Provided By:

SURVEYOR CITY/COUNTY

Y      N

- c. Other Design Surveying (Additional Surveys not gathered in WA#1)
- (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. 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). Reference missing voids as per CD provided by the Engineer.
  - (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**

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Services  
 Provided By:  
SURVEYOR CITY/COUNTY

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|----------|----------|--|
| <u>Y</u> | <u>N</u> | (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.  |
| <u>Y</u> | <u>N</u> | (13) ROW staking (Existing and Proposed @ 1,000 ft. stations PC's PT's and Angle points as per ROW Map)  |
| <u>Y</u> | <u>N</u> | (14) Soil core hole staking at bridge class structures.  |
| <u>Y</u> | <u>N</u> | (15) Determine changes in topography from voids and outdated maps due to development, erosion, etc.  |
| <u>Y</u> | <u>N</u> | (16) Profiles of existing drainage facilities.   |
| <u>Y</u> | <u>N</u> | (17) Measurement of hydraulic opening under existing bridges.  |
| <u>Y</u> | <u>N</u> | (18) Obtain elevations of manholes and valves of utilities   |
| <u>Y</u> | <u>N</u> | (19) Provide temporary signs, traffic control, flags, safety equipment, etc.   |
| <u>Y</u> | <u>N</u> | (20) Ties to existing bridges railroad rail elevations or culverts that may conflict with new construction.  |
| <u>Y</u> | <u>N</u> | (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.   |
| <u>Y</u> | <u>N</u> | (22) Inventory signs, mailboxes, and driveways   |
| <u>Y</u> | <u>N</u> | (23) Locate wetlands.  |
| <u>Y</u> | <u>N</u> | (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:

- |          |          |  |
|----------|----------|--|
| <u>N</u> | <u>N</u> | (1) Stake existing and/or proposed right-of-ways.                        |
| <u>N</u> | <u>N</u> | (2) Stake existing and/or proposed baseline/centerline.                  |
| <u>N</u> | <u>N</u> | (3) Stake proposed bridge structures.                                    |
| <u>N</u> | <u>N</u> | (4) Stake proposed drainage structures, such as manholes, culverts, etc. |
| <u>N</u> | <u>N</u> | (5) Set grade stakes.  |
| <u>N</u> | <u>N</u> | (6) Recover and check existing control points.                           |
| <u>N</u> | <u>N</u> | (7) Establish additional control points.                                 |
| <u>N</u> | <u>N</u> | (8) Check elevations and locations of structures.                        |
| <u>N</u> | <u>N</u> | (9) Determine and resolve conflicts associated with survey data.         |

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

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Services

Provided By:

SURVEYOR CITY/COUNTY

- N        N      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: (FINALIZE ANY ADDITIONAL AREAS NOT TIED DOWN IN WA #1)**  
Utility Quality Levels are in cumulative order (least to greatest) as follows
- N        N      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.
- N        N      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.
- N        N      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.
  - 3.3.2

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

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Services

Provided By:

SURVEYOR CITY/COUNTY

3. *Utility Subsurface (continued)*

- 3.3.3 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.
- 3.3.4 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.
- 3.3.5 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.
- 3.3.6 Provide complete restoration of work site and landscape to equal or better condition than before excavation.
- 3.3.7 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: (NOT SUBMITTED IN WA#1)**

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

- |  |          |          |          |          |   |          |   |
|--|----------|----------|----------|----------|---|----------|---|
| <table border="0"> <tr> <td style="text-align: center;"><u>Y</u></td> <td style="text-align: center;"><u>N</u></td> </tr> <tr> <td style="text-align: center;"><u>Y</u></td> <td style="text-align: center;"><u>N</u></td> </tr> </table>  | <u>Y</u> | <u>N</u> | <u>Y</u> | <u>N</u> | <p>4.1. Digital Terrain Models (DTM) in a format acceptable by the ENGINEER.</p> <p>4.2. Final H&amp;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.</p>   |          |   |
| <u>Y</u>   | <u>N</u> |          |          |          |   |          |   |
| <u>Y</u>   | <u>N</u> |          |          |          |   |          |   |
| <table border="0"> <tr> <td style="text-align: center;"><u>Y</u></td> <td style="text-align: center;"><u>N</u></td> </tr> <tr> <td style="text-align: center;"><u>Y</u></td> <td style="text-align: center;"><u>N</u></td> </tr> <tr> <td style="text-align: center;"><u>Y</u></td> <td style="text-align: center;"><u>N</u></td> </tr> </table> | <u>Y</u> | <u>N</u> | <u>Y</u> | <u>N</u> | <u>Y</u>  | <u>N</u> | <p>4.3. Computer printouts or other tabulations summarizing the results of field surveys.</p> <p>4.4. Digital files or media acceptable by the ENGINEER containing field survey data.</p> <p>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.</p> |
| <u>Y</u>   | <u>N</u> |          |          |          |   |          |   |
| <u>Y</u>   | <u>N</u> |          |          |          |   |          |   |
| <u>Y</u>   | <u>N</u> |          |          |          |   |          |   |
| <table border="0"> <tr> <td style="text-align: center;"><u>Y</u></td> <td style="text-align: center;"><u>N</u></td> </tr> <tr> <td style="text-align: center;"><u>N</u></td> <td style="text-align: center;"><u>N</u></td> </tr> </table>  | <u>Y</u> | <u>N</u> | <u>N</u> | <u>N</u> | <p>4.6. Field survey notes, as electronic and/or hard copies.</p> <p>4.7. A H&amp;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.</p> |          |   |
| <u>Y</u>   | <u>N</u> |          |          |          |   |          |   |
| <u>N</u>   | <u>N</u> |          |          |          |   |          |   |

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

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Services  
 Provided By:  
SURVEYOR   CITY/COUNTY

4. *Deliverables (continued)*

- |          |          |  |
|----------|----------|--|
| <u>Y</u> | <u>N</u> | 4.8. Final mylar set of 11 inch by 17 inch Survey Control data sheets sign and seal by the RPLS per TxDOT guidelines.  |
| <u>Y</u> | <u>N</u> | 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. |
| <u>N</u> | <u>N</u> | 4.10. Survey reports in a format requested by the ENGINEER.  |
| <u>Y</u> | <u>N</u> | 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

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Services  
Provided By:  
SURVEYOR CITY/COUNTY

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**

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**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

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SECTION 7 - ROADWAY DESIGN CONTROLS

(Function Code 160)

Services  
Provided By:  
ENGINEER CITY/COUNTY

- |                      |  |
|----------------------|--|
| <u>N</u><br><u>N</u> | 1. Geometric Design  |
|                      | a. Horizontal and Vertical Alignment   |
|                      | 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.   |
| <u>N</u><br><u>N</u> | 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. <b>No geometric design is to be performed until the COUNTY has given the engineer written approval of the preliminary schematic layout.</b> |
|                      | 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**

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Services  
 Provided By:  
ENGINEER CITY/COUNTY

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| <u>N</u> | <u>N</u> | 2. General Guidelines for Project Development ( <i>continued</i> )   |
|          |          | <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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. <b>Accuracy of the earthwork design is of utmost importance since it is the basis for contractor payments and construction staking.</b></li> </ul> |
| <u>N</u> | <u>N</u> | 3. Exhibit for Airway/Highway Clearance Permits  |
|          |          | 4. Grading Design  |
| <u>Y</u> | <u>N</u> | <ul style="list-style-type: none"> <li>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.</li> </ul>   |
| <u>Y</u> | <u>N</u> | b. Typical Sections  |
| <u>Y</u> | <u>N</u> | c. Design Cross Sections   |
| <u>Y</u> | <u>N</u> | d. Determine Cut and Fill Quantities   |
| <u>Y</u> | <u>N</u> | e. Slope Stability Analysis  |
| <u>Y</u> | <u>N</u> | f. Embankment Foundation Stability Analysis  |
| <u>Y</u> | <u>N</u> | g. Embankment Settlement Analysis  |
|          |          | 5. Pavement Design   |
| <u>Y</u> | <u>N</u> | <ul style="list-style-type: none"> <li>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.</li> </ul>   |
| <u>Y</u> | <u>N</u> | <ul style="list-style-type: none"> <li>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.</li> </ul>   |
|          |          | <ul style="list-style-type: none"> <li>c. Embankment and Subgrade                             <ul style="list-style-type: none"> <li>(1) Soil Core Holes (Show cost estimate with Function Code 110)                                     <ul style="list-style-type: none"> <li>(a) Along center line</li> <li>(b) Along center line of each roadway</li> </ul> </li> </ul> </li> </ul>  |
| <u>Y</u> | <u>N</u> | The location and minimum number of soil core holes required for this project are as follows: (To be determined when schematic is being completed)  |
| <u>Y</u> | <u>N</u> |  |

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

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Services

Provided By:

ENGINEER CITY/COUNTY

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| <u>Y</u> | <u>N</u> | 5. Pavement Design ( <i>continued</i> )  |
|          |          | c. Embankment and Subgrade ( <i>continued</i> )  |
|          |          | (2) Identify, interpret and summarize geologic features that affect engineering design<br>(PI, Sulfate content, % of lime)   |
| <u>Y</u> | <u>N</u> | d. Traffic Data for Pavement Design  |
| <u>Y</u> | <u>N</u> | e. Basic Design Criteria   |
| <u>Y</u> | <u>N</u> | f. Life Cycle Cost Analysis(es)  |
| <u>Y</u> | <u>N</u> | g. Cost Data   |
| <u>Y</u> | <u>N</u> | h. Pavement Material Properties  |
| <u>Y</u> | <u>N</u> | i. Rehabilitation Investigations   |
| <u>Y</u> | <u>N</u> | (1) Core Hole Survey (Show cost estimate with Function Code 110)   |
|          |          | (a) Determine type and depth of existing material, pavement, etc. The Engineer<br>will determine whether to salvage ACP and FLEXBASE as well as their<br>properties and provide this information to TxDOT. |



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

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**SECTION 9 - SIGNING, MARKINGS AND SIGNALIZATION**

(Function Code 162)

Services

Provided By:

ENGINEER CITY/COUNTY

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|----------|----------|---|
| <u>Y</u> | <u>N</u> | 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   |
| <u>Y</u> | <u>N</u> | 2. Summary of Small Signs Tabulation  |
| <u>N</u> | <u>N</u> | 3. Summary of Large Signs Tabulation including all Guide Signs  |
| <u>Y</u> | <u>N</u> | 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**

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Services  
Provided By:  
ENGINEER CITY/COUNTY

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|----------|----------|---|
| <u>N</u> | <u>N</u> | 5. Traffic Signals  |
| <u>N</u> | <u>N</u> | a. Development of Justification (Warrant) Data  |
| <u>N</u> | <u>N</u> | (1) Location Map  |
|          |          | Relationship of proposed installation to other traffic signals, highways, business areas and traffic generators |
| <u>N</u> | <u>N</u> | (2) Photographs as appropriate  |
| <u>N</u> | <u>N</u> | (3) Accident data as appropriate  |
| <u>N</u> | <u>N</u> | (4) Vehicle volumes (provided by TxDOT)   |
|          |          | (a) Existing  |
|          |          | (b) Estimated   |
|          |          | (c) Projected   |
|          |          | (d) Pedestrian  |
| <u>N</u> | <u>N</u> | (5) Traffic Survey - Count Analysis   |
| <u>N</u> | <u>N</u> | (6) Recommendation based on above data  |
| <u>Y</u> | <u>N</u> | 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**

**SECTION 10 - MISCELLANEOUS (ROADWAY)**

(Function Code 163)

Services  
 Provided By:  
ENGINEER CITY/COUNTY

- |          |          |   |
|----------|----------|---|
|          |          | 1. Retaining Walls  |
|          |          | a. Structural Details   |
| <u>N</u> | <u>N</u> | (1) Cast-in-Place Cantilever at ____ locations. (TxDOT Standard Retaining Wall)*  |
| <u>N</u> | <u>N</u> | (2) Tiedback Retaining Wall at ____ location. (TxDOT standard retaining wall)   |
| <u>N</u> | <u>N</u> | (3) Specialized Retaining Wall at ____ locations (Unique Design).*  |
|          |          | b. Alternate Patented Retaining Walls at all locations. (Layouts Only)**  |
| <u>N</u> | <u>N</u> | (1) Mechanically Stabilized Earth   |
| <u>N</u> | <u>N</u> | (2) Concrete Block Wall Systems   |
| <u>N</u> | <u>N</u> | 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   |
| <u>N</u> | <u>N</u> | 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.                         |
| <u>N</u> | <u>N</u> | e. Foundation Studies (Show cost estimate with Function Code 110)   |
| <u>N</u> | <u>N</u> | (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.   |
| <u>N</u> | <u>N</u> | f. Stability Analysis (the ENGINEER shall estimate this task as part of his bid to complete the work).  |
| <u>N</u> | <u>N</u> | g. Estimate   |
| <u>N</u> | <u>N</u> | h. Summary of Quantities  |
| <u>N</u> | <u>N</u> | i. Typical X-section.   |
| <u>N</u> | <u>N</u> | 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. <b>The designer and checker shall check all calculations and initial each page.</b> |
|          |          | (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**

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Services  
 Provided By:  
ENGINEER    CITY/COUNTY

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| <u>Y</u> | <u>N</u> | 2. Traffic Control Plan, Detours and Sequence of Construction<br>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: <ol style="list-style-type: none"> <li>a. The sequence of construction and method of handling traffic during each phase.</li> <li>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.</li> <li>c. The proposed traffic control devices (stop signs, signals, flag person, etc.) at grade intersections during each construction sequence.</li> <li>d. Where detours are provided, typical cross sections shall be shown.</li> <li>e. Road construction work hours shall be developed after an investigation of the traffic volumes has been performed.</li> </ol>   |
| <u>N</u> | <u>N</u> | 3. Illumination <ol style="list-style-type: none"> <li>a. Preliminary Roadway Illumination Layout and Circuit Layout                         <ol style="list-style-type: none"> <li>(1) For projects involving freeway to freeway or other types of directional interchanges and projects including left-hand ramps or connections, provide the following:                                 <ol style="list-style-type: none"> <li>(a) The location of interchanges, main lanes, grade separations, frontage roads and ramps</li> <li>(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</li> <li>(c) The number of lanes in each section of proposed highway and the location of changes in the number of lanes</li> <li>(d) The projected traffic volumes as provided by the STATE (20 year traffic projection unless otherwise determined by the district engineer)</li> <li>(e) Tentative ROW limits</li> <li>(f) Direction of traffic flow on all roadways</li> <li>(g) Main lane, ramp, frontage road, and necessary cross road profiles at proposed interchanges or grade separations</li> </ol> </li> </ol> </li> <li>b. Final Roadway Illumination and Electrical Circuit Layouts                         <ol style="list-style-type: none"> <li>(1) Roadway layout showing pavement edges, shoulders, curbs, retaining walls, etc.</li> <li>(2) Center line with station numbering.</li> <li>(3) ROW lines.</li> <li>(4) Symbol legend. Use department standard symbols for lighting and electrical.</li> <li>(5) Culverts and other structures that present a hazard to traffic.</li> <li>(6) Location of underground utilities, if not shown on plan profile.</li> <li>(7) Location of overhead electrical lines, both crossing and parallel to ROW.</li> <li>(8) Existing sign lighting circuits and roadway illumination to remain, to be removed, to be relocated.</li> <li>(9) Existing service poles, electrical circuits, ground boxes, etc.</li> <li>(10) Contact electric utility for service pole locations, voltage characteristics.</li> <li>(11) Location of proposed sign lighting circuits and roadway illumination.</li> <li>(12) Proposed electrical circuits.</li> <li>(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.</li> </ol> </li> </ol> |
| <u>N</u> | <u>N</u> |   |

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

Services Provided By:		
<u>ENGINEER</u>	<u>CITY/COUNTY</u>	
<u>N</u>	<u>N</u>	3. Illumination ( <i>continued</i> )
		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.
<u>Y</u>	<u>N</u>	4. Miscellaneous Drafting/Standards
<u>Y</u>	<u>N</u>	a. Erosion Control
		b. Landscape Development
<u>Y</u>	<u>N</u>	5. Compute and Tabulate Quantities
<u>Y</u>	<u>N</u>	6. Special Utility Details (Irrigation lines)
<u>N</u>	<u>N</u>	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.
<u>N</u>	<u>N</u>	(a) New O.S.B. structure(s)
<u>N</u>	<u>N</u>	(b) Structural evaluation of existing O.S.B. structure(s) that are to remain in place or to be relocated.
<u>N</u>	<u>N</u>	(2) High Mast Illumination Poles (HMIP)
<u>Y</u>	<u>N</u>	(3) Traffic Signal Supports
<u>Y</u>	<u>N</u>	(4) Conventional Illumination Poles
<u>N</u>	<u>N</u>	(5) Sound Barrier Walls
<u>Y</u>	<u>N</u>	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
<u>Y</u>	<u>N</u>	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
<u>Y</u>	<u>N</u>	a. Utility Agreements
<u>Y</u>	<u>N</u>	b. Exhibits for Utility Agreements
<u>N</u>	<u>N</u>	c. Railroad Agreements
		d. Railroad Exhibits
<u>N</u>	<u>N</u>	(1) Railroad Underpasses
<u>N</u>	<u>N</u>	(2) Railroad Overpasses
<u>N</u>	<u>N</u>	(3) Railroad Grade Crossing (Replanking)
<u>N</u>	<u>N</u>	(4) Railroad Grade Crossing Warning Systems (Signals)
<u>N</u>	<u>N</u>	(5) Other Miscellaneous Sketches for Railroads
<u>N</u>	<u>N</u>	e. Traffic Signal Agreements
<u>N</u>	<u>N</u>	f. Exhibits for Traffic Signal Agreements
<u>Y</u>	<u>N</u>	9. Estimate
<u>Y</u>	<u>N</u>	10. Specifications and General Notes

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

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**Document and Information Exchange**

Data, Plan Sheets, General Notes and/or Specifications provided to the COUNTY 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 COUNTY.

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

<u>Service</u>	<u>Office Location</u>
PS&E	Mission Office
ROW Acquisition	Mission Office

The work effort will be managed out of the \_\_\_\_\_ Mercedes \_\_\_\_\_  
(City)  
office located at 2100 West Expressway 83 \_\_\_\_\_,  
(Address)  
Mercedes \_\_\_\_\_, Texas \_\_\_\_\_.  
(City) (State)

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

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**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

**EXHIBIT “B”**  
**SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER**

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**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 Diaphragms
  - 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 County.

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

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**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.

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

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**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.





**EXHIBIT "D-1"**  
**ESTIMATED MAN-HOUR BREAKDOWN**

**MILE 10 PROJECT ~ from Mile 6 to FM 1015**

		Senior Project Manager	Senior Engineer	Senior Environmental Scientist /Specialist	Project Engineer	Senior Engineer Tech	CADD Operator/GIS Analyst	Admin / Clerical	TOTAL HOURS	**Sub-Contract Amounts / ROW COST	* TOTAL LINE ITEM COST
<b>CONTRACT RATE</b>		215.34	180.42	171.69	139.68	116.40	78.57	58.20			
<b>WORK AUTHORIZATION NO. 2 - WITH HIDALGO COUNTY Pct. No. 1</b>											
<b>HASE II - ROW Map and Acquisition, and PS&amp;E (Section I)</b>											
Function Code	Description of Work										
130	Complete ROW Map Roadway	66	180		181	188		37	652	\$ 259,200.00	\$ 96,000.00
150	Additional field Surveys	26	133		134	128		38	459	\$ 20,990.00	\$ 65,410.00
164	Project Management	100	615		618	649		97	2079		\$ 300,000.00
160	PS&E Development Roadway	380	3283		3863	2975		412	10913		\$ 1,584,000.00
161	Hydrologic Model & Report for Roadway	26	128		110	120		34	418		\$ 60,000.00
164	Local letting submitta and engineering work	26	128		110	120		34	418		\$ 60,000.00
120	Additional work associated with EA clearance	12	35	65	51	64		15	242		\$ 35,500.00
160	PS&E Development Outfalls	178	642		648	686		85	2239		\$ 329,472.00
330	Geotechnical and Pavement Design for approval by TxDOT	20	85		73	90		29	297		\$ 42,000.00
162	Signal Design, Flashing Beacon Design & Temp Traffic Signal Designs	57	215		220	252		30	774	\$ 139,130.28	\$ 112,869.72
160	Engineering Fee to create 1 set of Plans and Submit through TxDOT	24	283		280	296		38	921		\$ 132,000.00
163	Permitted Utilities Coordination to adjust utilities on the Roadway	35	328		324	316		42	1045		\$ 151,200.00
<b>SUB-TOTAL</b>		<b>858</b>	<b>5742</b>	<b>65</b>	<b>6297</b>	<b>5568</b>	<b>0</b>	<b>816</b>	<b>19346</b>	<b>\$ 419,320.28</b>	<b>\$ 2,968,451.72</b>

\*\* See Sheets D-1, pages 2 & 3 of 3

Sub-Total Manhours Fee with Subconsultant Fee:	\$	3,387,772.00
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**\* TOTAL PROJECT FEE:**                      **\$ 3,387,772.00**

**Exhibit "D-1"**  
**BUDGET**  
**LUMP SUM RATE BASIS OF PAYMENT**

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

	A	B	C	D	E	F	G	H	I	J	K
1	Highway: Mile 10 N										
2	County: Hidalgo County, Texas										
3	Limits: Mile 6 West to FM 1015										
4	Description of Work: ROW Map and 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		
8	PHASE I - FC 130 (ROW MAP Mile 10) Lump Sum per Parcel										
9	A. ROW Map, Parcel Description, Metes and Bounds Description, ( 72 parcels @ \$3,600.00/parcel)										
10	FC 130 Subtotal Cost										\$ 259,200.00
11	PHASE 1 - FC 150 Field Surveying Mile 6 New Construction Topography										
12	A. Primary Project Control										
13	a. Establish Primary Control	0	1	4	0	4	0	0	0	9	\$ 1,073.00
14	B. Secondary Project Control										
15	a. Set additional secondary control points as needed	0	1	2	0	2	0	0	0	5	\$ 599.00
16	b. Horizontal values established with RTK or VRS	0	1	2	0	2	0	0	0	5	\$ 599.00
17	c. Vertical values established with digital level	0	1	2	0	2	0	0	0	5	\$ 599.00
18	Subtotal Hours	0	4	10	0	10	0	0	0	24	
19	Subtotal Cost - Phase 1	\$0.00	\$500.00	\$820.00	\$0.00	\$1,550.00	\$0.00	\$0.00	\$0.00		\$ 2,870.00
20	PHASE 2 - DTM Topography and Cross sections Mile 6 and other Mile 10 New Subdivision										
21	C. Setting Benchmarks										
22	1. Setting Benchmarks @ 1000'(ft) intervals	0	0	0	0	6	0	0	0	6	\$ 930.00
23	2. Topographic & Crosssections	0	0	2	0	6	0	0	0	8	\$ 1,094.00
24	3. Locate Visible Utilities	0	0	2	0	6	0	0	0	8	\$ 1,094.00
25	5. Right of Entry, ROW Research, Appraisal Dist. Records	0	0	0	0	6	0	0	0	6	\$ 930.00
26	6. Proposed Centerline on Existing Pavement Pre-Construction for Utilities	0	1	2	0	6	0	0	0	9	\$ 1,219.00
27	7. Profile and Cross section Intersecting Streets	0	0	2	0	6	0	0	0	8	\$ 1,094.00
28	SUE)	0	1	2	0	6	0	0	0	9	\$ 1,219.00
29	11. Additional Field Surveying										
30	a. Irrigation Lines	0	1	2	0	6	0	0	0	9	\$ 1,219.00
31	c. Driveways and Turnouts	0	0	2	0	6	0	0	0	8	\$ 1,094.00
32	14. Provide temp signs, traffic control, flags, safety equip. etc	0	0	2	0	6	0	0	0	8	\$ 1,094.00
33	15. Ties to Existing Bridges or Culverts that may be in conflict with new construction	0	0	2	0	6	0	0	0	8	\$ 1,094.00
34	16. Inventory Signs, mailboxes, and driveways	0	0	2	0	6	0	0	0	8	\$ 1,094.00
35	17. Survey Control Data Sheets per TxDOT	0	1	2	0	0	0	0	0	3	\$ 289.00
36	18. Recover and Establish Existing CL and ROW	0	0	0	0	0	0	0	0	0	\$ -
37	19. Coordinate with the Engineer for Existing CL Stationing	0	1	0	0	0	0	0	0	1	\$ 125.00
38	20. Right of Way Restaking (Pre Construction)	0	1	0	0	0	0	0	0	1	\$ 125.00
39	21. SUE Level A Data Sheets (10 holes per mile) 30 Pot holes	4	0	20	0	0	0	0	0	24	\$ 2,136.00
40	Subtotal Hours	4	6	42	0	72	0	0	0	124	
41	Subtotal Cost - Phase 1	\$496.00	\$750.00	\$3,444.00	\$0.00	\$11,160.00	\$0.00	\$0.00	\$0.00		\$ 15,850.00
42	PHASE 1 - FINAL REPORT & DELIVERABLES										
43	A. CADD file (2D & 3D) for limits of project	0	0	4	0	0	0	0	0	4	\$ 328.00
44	B. Final Report and Deliverables	0	2	4	0	0	0	0	0	6	\$ 578.00
45	Subtotal Hours	0	2	8	0	0	0	0	0	10	
46	Subtotal Cost - Phase 1	\$0.00	\$250.00	\$656.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		\$ 906.00
47	PROJECT MANAGEMENT & OVERSIGHT										
48	A. Meeting & Coordination w/ Engineers	0	4	0	0	0	0	0	2	6	\$ 600.00
49	B. QC/QA Survey	0	4	2	0	0	0	0	2	8	\$ 764.00
50	Subtotal Hours	0	8	2	0	0	0	0	4	14	
51	Subtotal Cost - PM & Oversight Phase 1	\$0.00	\$1,000.00	\$164.00	\$0.00	\$0.00	\$0.00	\$0.00	\$200.00	0	\$1,364.00
52	tra Survey for new Mile 6 and New Subdivisions) FC 150 Field Surveys	\$496.00	\$2,500.00	\$5,084.00	\$0.00	\$12,710.00	\$0.00	\$0.00	\$200.00	172	\$20,990.00
53											
54	Total Fee FC 130 & 150										\$280,190.00

EXHIBIT "D-1"

"FEE SCHEDULE" - FLASHING BEACON & TRAFFIC SIGNAL DESIGN  
 Along Mile 10 North Road: From Mile 6 West Road to FM 1015

ETSI GROUP LLC

FLASHING BEACON AND TRAFFIC SIGNAL DESIGN		MANHOURS						Total
		No. of sheets (estimated)	Project Manager	Senior Transp. Engineer	Transportation Engineer	CADD Designer	Administrative Assistant	
<b>TASK</b>								
1	General Notes	n/a	1	2	6		8	17
2	Basis of Estimate	1	2	4	10	10		26
3	Condition Diagram	7	8	12	32	32		84
4	Proposed Signal Plan Layout	10	24	84	132	132		372
5	Signal Phasing/Timing	n/a	2	6	12			20
6	Electrical Schedules	3	12	28	48	24		112
7	Intersection Signs, Pav. Markings	n/a	3	6	8	4		21
8	Standard Sheets List	12	2	12	12			26
9	Specifications and Cost Estimate	1	4	10	20	20		54
10	Coordination and Meetings	n/a	20					20
11	TEMPORARY TRAFFIC SIGNALS	6	18	36	84	84		222
12	Cross Street Ramp Design	8	16	24	52	52		144
<b>Subtotal</b>		<b>48</b>	<b>112</b>	<b>224</b>	<b>416</b>	<b>358</b>	<b>8</b>	<b>1118</b>
<b>Total Sheets/Labor Hours</b>		<b>48</b>	<b>112</b>	<b>224</b>	<b>416</b>	<b>358</b>	<b>8</b>	<b>1118</b>
Hourly Rates			\$ 223.81	\$ 173.08	\$ 113.40	\$ 74.60	\$ 59.68	
<b>Total Labor Costs</b>			<b>\$ 25,066.72</b>	<b>\$ 38,769.92</b>	<b>\$ 47,174.40</b>	<b>\$ 26,706.80</b>	<b>\$ 477.44</b>	<b>\$ 138,195.28</b>

Ergonomic Transportation Solutions, Inc. Expenses

EXPENSES

Printing Reproduction

\$ 50.00

Travel

\$ 850.00

Deliveries

\$ 35.00

**Total Expenses**

**\$ 935.00**

ETSI Total Cost

**\$ 139,130.28**