

HIDALGO COUNTY
Professional Engineering Services
Contract # C-18-196-08-14
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 the Phase I (Part II) Engineering Services required for the preparation of Environmental Documents, Field Surveys for Design & Construction of Outfalls and Schematic update for the FM 1015 project from Mile 12 to SH 107.

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 \$548,550.30. 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

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

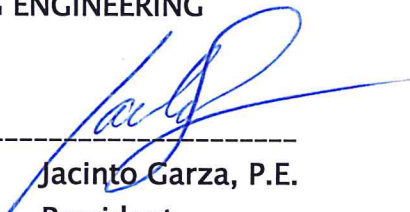
**HIDALGO COUNTY
COMMISSIONER PRECINCT NO. 1**

BY: _____

PART 8. ACCEPTANCE AND APPROVAL

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

**THE ENGINEER:
L&G ENGINEERING**

By:  Jacinto Garza, P.E.
President

**THE OWNER:
HIDALGO COUNTY**

By: Richard Cortez,
County Judge

ATTEST:

By: Arturo Guajardo, Jr., County Clerk

LIST OF 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

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 of 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 on-going 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.

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

SECTION 1-PROJECT DESCRIPTION

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

COUNTY/CITY: HIDALGO COUNTY

CONTROL: 1228-03-041

PROJECT/DESCRIPTION: PHASE I (PART II) – EA, PUBLIC INVOLVEMENT
SCHEMATIC DESIGN FOR ROADWAY AND OUTFALLS

LENGTH: 4.5 MILES

HIGHWAY: FM 1015

LIMITS: FROM MILE 12 TO SH 107

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.

LPA (Local Public Agency) shall mean THE COUNTY OF HIDALGO.

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

**SECTION 4 - SOCIAL, ECONOMIC AND ENVIRONMENTAL STUDIES
AND PUBLIC INVOLVEMENT**
(Function Code 120)

Services
Provided By:
ENGINEER LPA

1. Environmental Reports

All Environmental Reports shall be in accordance with 43 Texas Administrative Code (TAC) 2.40-2.51, Code of Federal Regulations, Title 23, Part 771 and Highway Design Operations and Procedures Manual, Part II-B.

a. Environmental Assessments

- | | | |
|------------|------------|---|
| <u>N/A</u> | <u>N/A</u> | (1) An Environmental Assessment shall be prepared, anticipating a Categorical Exclusion. |
| <u>YES</u> | <u>N/A</u> | (2) An Environmental Assessment shall be prepared in accordance with 23 USC 327 and the 2014 TxDOT-FHWA Memorandum of Understanding, anticipating a Finding of No Significant Impact. |
| <u>N/A</u> | <u>N/A</u> | (3) An Environmental Assessment shall be prepared, anticipating the need for a Draft Environmental Impact Statement. |
| <u>N/A</u> | <u>N/A</u> | (4) A Consultation Reevaluation Memorandum and a Documented Reevaluation Checklist, shall be prepared in accordance with 23 CFR 771.129, anticipating Approval. |

b. Environmental Impact Statement

- | | | |
|------------|------------|---|
| <u>N/A</u> | <u>N/A</u> | (1) A Draft Environmental Impact Statement shall be prepared. After appropriate interagency and public reviews within time limits prescribed by the Code of Federal Regulations, Title 23, Part 771 and 43 Texas Administrative Code 2.40-2.51, a Final Environmental Impact Statement shall be prepared. |
| <u>N/A</u> | <u>N/A</u> | (2) A Section 4(f) Statement (Department of Transportation Act) shall be provided by the ENGINEER. The format and content of the statement is found in FHWA Technical Advisory T6640.8A. |

2. Public Involvement

All public involvement procedures shall be in accordance with 43 Texas Administrative Code (TAC) 2.40-2.51, Code of Federal Regulations Title 23, Part 771 and Highway Design Operations and Procedures Manual, Part II-B.

- | | | |
|------------|------------|---|
| <u>N/A</u> | <u>N/A</u> | a. A public involvement meeting(s) and public hearing shall be scheduled, coordinated and conducted. |
| <u>N/A</u> | <u>N/A</u> | b. Technical assistance for one public meeting and one public hearing, preparation of a contact mailing list, notices in English/Spanish, and exhibit and preparation presentation shall be provided. |
| <u>N/A</u> | <u>N/A</u> | c. A meeting with affected property owners shall be scheduled, coordinated & conducted, as necessary and prepare meeting notes. |
| <u>YES</u> | <u>N/A</u> | d. A public hearing shall be held or an opportunity for a public hearing shall be Afforded, upon approval of the administratively complete document. Technical assistance shall be provided to TxDOT by preparing notices in English/Spanish, contact mailing list, and exhibit and presentation preparation. |
| <u>YES</u> | <u>N/A</u> | e. A Notice of Availability (NOA) shall be published by the LPA upon approval of the environmental decision. |

3. Technical Reports

All technical reports shall be prepared in accordance with TxDOT’s environmental rules and guidelines.

- | | | |
|------------|-----------|--|
| <u>YES</u> | <u>NO</u> | a. Air Quality Analysis
An air quality analysis shall be prepared in accordance with the STATE’S Air Quality Guidelines. The air quality analysis shall be provided as a Technical Report and a summary of the air quality results included in the administratively complete document for the project. |
|------------|-----------|--|

EXHIBIT "B"

SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER

Services

Provided By:

ENGINEER LPA

YES

NO

- b. Biological Technical Report

A biological form and technical report shall be prepared in accordance with the STATE'S Biological Guidelines. The report will include water resources, and threatened and endangered species.

YES

N/A

- c. Cultural Resources

Historical and archeological studies shall be completed in accordance with the STATE'S guidelines.

YES

N/A

- (1) Historic Structure Studies

A records search, project coordination request, and reconnaissance survey shall be performed, and documentation prepared regarding identification efforts, National Register eligibility and potential impacts to historic properties in accordance with the state's historic structure requirements.

YES

N/A

- (2) Archeological Studies

File searches, project coordination request, an archeological reconnaissance, and an archeological survey shall be conducted to determine if known archeological sites are present or have been designated State Archeological Landmarks; and to identify the need (if any) to perform additional archeological investigations.

YES

N/A

- d. Community Impact Analysis

A community impact analysis shall be prepared in accordance with the STATE'S Community Impact Guidelines.

YES

N/A

- e. Hazardous Materials: The consultant shall perform an Initial Site Assessment (ISA) for hazardous materials impact in accordance with the American Society for Testing and Materials (ASTM) 1528.93 (Transaction Screen Process) and a Hazardous Materials Technical Report, as needed.

YES

N/A

- f. Indirect and Cumulative Impacts Analysis

An indirect and cumulative impacts analysis shall be prepared in accordance with the STATE's guidelines.

YES

N/A

- g. Noise Analysis: A noise analysis shall be prepared, including predicted noise levels and the consideration and evaluation of noise mitigation, in accordance with the STATE'S Noise Guidelines. The noise analysis shall be provided as a Technical Report and a summary of the noise analysis results shall be included in the administratively complete document.

YES

N/A

- h. Water Resources: A Water Resources technical report shall be prepared in accordance with the STATE's water guidelines.

YES

N/A

4. **Environmental Scoping**

The ENGINEER shall initiate the environmental scoping process with TxDOT. An environmental scoping document and risk assessment will be completed in coordination with TxDOT.

YES

N/A

5. **General Guidelines for Preparation of Environmental Documents**

- a. All technical reports will be submitted electronically to TxDOT through their FTP site.

- b. The administratively complete document will be prepared in accordance with the content and format of FHWA Technical Advisory T6640.8A and the TxDOT Administrative Code 43 TAC §2.44 and shall be submitted to TxDOT electronically through their FTP site.

- c. Upon completion and approval of the technical reports and checklists, the ENGINEER shall provide one (1) hard copy to the Client. All copies to TxDOT shall be in digital format. Exhibits in the environmental document shall be color copies and text shall be black and white.

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

SECTION 6 - FIELD SURVEYING AND PHOTOGRAMMETRY

(Function Code 150)

Services
Provided By:
SURVEYOR LPA

DESIGN AND CONSTRUCTION SURVEYS:

PURPOSE:

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

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

DEFINITIONS:

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

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

1. Design Surveying

YES NO

- a. Primary Project Control – 3 to 5 miles spacing
Precision shall be 1 part in 20,000 or better, unless otherwise directed by the District Engineer.
- (1) Establish horizontal control points
 - (2) Establish vertical control points

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

YES NO

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

YES NO
NO NO

- (a) Establish horizontal control
- (b) Establish vertical control points
- (c) Place and maintain control point targets

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

Services
Provided By:
SURVEYOR LPA

YES NO

c. Other Design Surveying

- (1) **The limit of the Design surveys shall be 500-ft before and after the limits of the project as identified by the Project Engineer on the schematic. Establish horizontal and vertical control. Set H&V Control at 1000-ft intervals along the project proposed right-of-way. Provide x, y, z for each H&V Control. Provide an H&V Control along each outfall identified on the Hydrologic Map. The H&V Control shall be #5 I.R. 2-ft in depth set in concrete. The surveyor shall provide an H&V Control Book (a Sample shall be provided by the Engineer to the Surveyor). The Surveyor will provide a 3-pt reference sketch with ties to the BMs for inclusion the existing H&V Control Book. Establish benchmark circuit throughout the project with a tolerance of 0.03'/ft per mile error vertically.**
- (2) Complete topographic and cross section survey, data processing, and CADD mapping (2D & 3D) for the limits of the project.
- (3) Locate all visible utilities, data processing and CADD mapping (2D & 3D) including irrigation lines. Follow sample provided by the Engineer.
- (4) Field locate cross culverts, driveway culverts, inverts, irrigation lines, within the project limits, data processing and CADD mapping (2D & 3D).
- (5) Right of Entry, Right of Way Research, and Appraisal District Records is the responsibility of the Surveyor.
- (6) The Surveyor shall stake the proposed centerline on the existing fields as approved by Engineer before construction for the purpose of utility adjustments and project location.
- (7) Profile and cross section intersecting streets for ties into project (500-ft. beyond the proposed ROW per schematic and 20-ft wider than the existing ROW of intersecting street).
- (8) Cross section irrigation crossings for a distance of 20-ft beyond the proposed ROW at 100-ft intervals in a DTM file. Provide a complete description of irrigation appurtances as identified by the engineer sample layout "EXHIBIT E". The SURVEYOR will meet with the ENGINEER before he ties down any irrigation lines. Jointly the SURVEYOR and the ENGINEER will identify from records such as the Irrigation District Maps and the A&M Data of existing irrigation lines that will need to be tied down. The SURVEYOR will follow the sample given to him by the ENGINEER and tie the structures horizontally and vertically and include in the field books to be submitted.
- (9) Tie Horizontally and Vertically the existing storm drain system that lies within the existing proposed ROW including the elevation of the outfall of said recovered existing storm drain systems.
- (10) Tie to existing underground and overhead utilities (location, elevation and direction)

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

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

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

Services
 Provided By:
SURVEYOR LPA

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| <u>YES</u> | <u>NO</u> | (11) Cross section and profile all eight (8) outfall channels identified on the Hydrologic Map (approx. 2.5 Mi.) for the distances shown to be cleaned and widened at 100-ft intervals. The SURVEYOR will provide a complete 2D/3D File including utilities of the outfalls identified. |
| <u>YES</u> | <u>NO</u> | (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>YES</u> | <u>NO</u> | (13) ROW staking (Existing and Proposed @ 1,000 ft. stations PC's PT's and Angle points as per ROW Map) |
| <u>NO</u> | <u>NO</u> | (14) Soil core hole staking at bridge class structures. |
| <u>NO</u> | <u>NO</u> | (15) Determine changes in topography from voids and outdated maps due to development, erosion, etc. |
| <u>YES</u> | <u>NO</u> | (16) Profiles of existing drainage facilities. |
| <u>NO</u> | <u>NO</u> | (17) Measurement of hydraulic opening under existing bridges. |
| <u>YES</u> | <u>NO</u> | (18) Obtain elevations of manholes and valves of utilities |
| <u>YES</u> | <u>NO</u> | (19) Provide temporary signs, traffic control, flags, safety equipment, etc. |
| <u>YES</u> | <u>NO</u> | (20) Ties to existing bridges railroad rail elevations or culverts that may conflict with new construction. |
| <u>NO</u> | <u>NO</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>YES</u> | <u>NO</u> | (22) Inventory signs, mailboxes, and driveways |
| <u>NO</u> | <u>NO</u> | (23) Locate wetlands. |
| <u>YES</u> | <u>NO</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>NO</u> | <u>NO</u> | (1) Stake existing and/or proposed right-of-ways. |
| <u>NO</u> | <u>NO</u> | (2) Stake existing and/or proposed baseline/centerline. |
| <u>NO</u> | <u>NO</u> | (3) Stake proposed bridge structures. |
| <u>NO</u> | <u>NO</u> | (4) Stake proposed drainage structures, such as manholes, culverts, etc. |
| <u>NO</u> | <u>NO</u> | (5) Set grade stakes. |
| <u>NO</u> | <u>NO</u> | (6) Recover and check existing control points. |
| <u>NO</u> | <u>NO</u> | (7) Establish additional control points. |
| <u>NO</u> | <u>NO</u> | (8) Check elevations and locations of structures. |
| <u>NO</u> | <u>NO</u> | (9) Determine and resolve conflicts associated with survey data. |

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

Services
 Provided By:
SURVEYOR LPA

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|------------|-----------|--|
| <u>NO</u> | <u>NO</u> | <p>2. Photogrammetric Products</p> <p>a. Uncontrolled Photography</p> <p style="margin-left: 20px;">(1) Contact Prints</p> <p style="margin-left: 20px;">(2) Mosaics</p> <p style="margin-left: 20px;">(3) Digital ortho plots</p> <p>b. Mapping</p> <p style="margin-left: 20px;">(1) Planimetric Maps</p> <p style="margin-left: 20px;">(2) Contour Maps</p> <p style="margin-left: 20px;">(3) Cross Sections</p> <p style="margin-left: 20px;">(4) Profiles</p> <p style="margin-left: 20px;">(5) Digital Terrain Models (DTM)</p> |
| <u>YES</u> | <u>NO</u> | <p>3. <u>UTILITY SUBSURFACE INVESTIGATION:</u>
 <u>Utility Quality Levels</u> are in cumulative order (least to greatest) as follows</p> <p>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.</p> |
| <u>YES</u> | <u>NO</u> | <p>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.</p> |
| <u>YES</u> | <u>NO</u> | <p>3.3. <u>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.</u> 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:</p> <p>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.</p> |

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

Services
 Provided By:
SURVEYOR LPA

3. *Utility Subsurface (continued)*
 - 3.3.2 Measure and record the following data on an appropriately formatted test hole data sheet that has been sealed and dated by the Engineer:
 - Elevation of top and/or bottom of utility tied to the datum of the furnished plan.
 - Identify a minimum of two benchmarks utilized. Elevations shall be within an accuracy of 15mm (.591 inches) of utilized benchmarks.
 - Elevation of existing grade over utility at test hole location.
 - Horizontal location referenced to project coordinate datum.
 - Outside diameter of pipe or width of duct banks and configuration of non-encased multi-conduit systems.
 - Utility facility material(s).
 - Utility facility condition.
 - Coating/Wrapping information and condition.
 - Unusual circumstances or field conditions.
 - 3.3.3 Excavate test holes in such a manner as to prevent any damage to wrappings, coatings, cathodic protection or other protective coverings and features. Water excavation can only be utilized with written approval from the appropriate State District Office.
 - 3.3.4 Back fill all excavations with appropriate material, compact backfill by mechanical means, and restore pavement and surface material. The Engineer shall be responsible for the integrity of the backfill and surface restoration for a period of three years. Install a marker ribbon throughout the backfill.
 - 3.3.5 Provide complete restoration of work site and landscape to equal or better condition than before excavation.
 - 3.3.6 Plot utility location position information on the Utility Layout sheet and identify the vertical elevation and sealed by the responsible Surveyor. This information will be provided in the latest version of Micro Station or Geopak format used by the State. The electronic file will be delivered on C.D or DVD.

4. **DELIVERABLES:**

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

- | | | |
|--|-------------------------------------|--|
| <u>YES</u>
<u>YES</u> | <u>NO</u>
<u>NO</u> | 4.1. Digital Terrain Models (DTM) in Microstation V8i (Select series 4) format. |
| <u>YES</u>
<u>YES</u>
<u>YES</u> | <u>NO</u>
<u>NO</u>
<u>NO</u> | 4.2. Final H&V Field Book Binder with all pertinent information obtained in the field for Design Surveys. Maps, plans, or sketches prepared by the SURVEYOR showing the results of field surveys. |
| <u>YES</u>
<u>YES</u> | <u>NO</u>
<u>NO</u> | 4.3. Computer printouts or other tabulations summarizing the results of field surveys. |
| <u>YES</u> | <u>NO</u> | 4.4. Digital files or media acceptable by the ENGINEER containing field survey data. |
| <u>YES</u> | <u>NO</u> | 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. |
| <u>YES</u> | <u>NO</u> | 4.6. Field survey notes, as electronic and/or hard copies. |
| <u>YES</u> | <u>NO</u> | 4.7. A H&V Control Book identifying the basis of the Primary and Secondary Control and an 8 ½ inch by 11 inch survey control data sheet for each construction control point which shall include, but need not be limited to, a location sketch, a physical description of the point including a minimum of two reference ties, surface coordinates, a surface adjustment factor, elevation, and the horizontal and vertical datums used. Survey control data sheets shall be signed and sealed by the supervising Registered Professional Land Surveyor. |

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

Services
Provided By:
SURVEYOR LPA

4. *Deliverables (continued)*

- | | | |
|------------|-----------|--|
| <u>YES</u> | <u>NO</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>YES</u> | <u>NO</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>YES</u> | <u>NO</u> | 4.10. Survey reports in a format requested by the ENGINEER. |
| <u>YES</u> | <u>NO</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

Services
Provided By:
SURVEYOR LPA

5. **AUTOMATION REQUIREMENTS:**

- 6.1 Planimetric design files (DGN) shall be fully compatible with the State's *Micro Station V8* graphics program without further modification or conversion.
- 6.2 Electronically collected and processed field survey data files shall be fully compatible with the State's *CADD* systems without further modification or conversion. All files shall incorporate only those feature codes currently being used by the STATE.
- 6.3 Digital Terrain Models (DTM) shall be fully compatible with the STATE's *GEOPAK* system without further modification or conversion. All DTM files shall be fully edited and rectified to provide a complete digital terrain model with all necessary break lines.

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

ADDITIONAL RESPONSIBILITIES

A. **TRAFFIC CONTROL:**

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

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

B. **INVOICING:**

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

C. **EASEMENTS, LETTERS OF PERMISSION, ETC.**

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

D. **MEETINGS:**

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

E. **PROJECT MANAGER/SURVEYOR COMMUNICATION:**

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

F. **OFFICE LOCATION:**

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

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

SECTION 7 - ROADWAY DESIGN CONTROLS
(Function Code 160)

Services
Provided By:
ENGINEER LPA

YES NO
YES NO

1. Geometric Design
 - a. Horizontal and Vertical Alignment
 - b. Schematic Layout
 - (1) Update schematic previously done on Work Authorization No. 1 based on comments as provided by TxDOT and FHWA.
 - (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.

YES NO

2. General Guidelines for Project Development
 - a. Prior to preparing detailed plans for a proposed project, a preliminary schematic layout shall be prepared which indicates the general geometric features and location requirements peculiar to the project. An uncontrolled aerial mosaic will be provided for this use. Four copies of the schematic layout shall be submitted through the district to the Design Division for approval and subsequent coordination with the Federal Highway Administration (FHWA) where applicable. The layout shall be submitted for two-lane arterial highway projects on new locations and for all multi-lane highway projects. **No geometric design is to be performed until the COUNTY has given the engineer written approval of the preliminary schematic layout.**
 - b. All geometric design shall be in conformance with the State's Design Division, Operations and Procedures Manual, except where variances are permitted in writing by the STATE.
 - c. The schematic layout shall include basic information which is necessary for the proper review and evaluation including the items listed above in the checklist for schematic layout.
 - d. Handling of traffic during construction shall be a consideration in the development of preliminary designs.

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

Services
Provided By:
ENGINEER LPA

- | | | |
|-----------|-----------|--|
| <u>NO</u> | <u>NO</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 (PI, Sulfate content, % of lime) |
| <u>NO</u> | <u>NO</u> | d. Traffic Data for Pavement Design by STATE |
| <u>NO</u> | <u>NO</u> | e. Basic Design Criteria |
| <u>NO</u> | <u>NO</u> | f. Life Cycle Cost Analysis(es) |
| <u>NO</u> | <u>NO</u> | g. Cost Data |
| <u>NO</u> | <u>NO</u> | h. Pavement Material Properties |
| <u>NO</u> | <u>NO</u> | i. Rehabilitation Investigations |
| <u>NO</u> | <u>NO</u> | (1) Core Hole Survey (Show cost estimate with Function Code 110) |
| | | (a) Determine type and depth of existing material, pavement, etc. The Engineer will determine whether to salvage ACP and FLEXBASE as well as their properties and provide this information to TxDOT. |

EXHIBIT D-1 FM 1015 (from Mile 12 to SH 107)

ESTIMATED MAN-HOUR BREAKDOWN

	Senior Project Manager	Senior Engineer	Senior Environmental Scientist /Specialist	Project Engineer	Right-of-Way Administrator	Senior Engineer Tech	CADD Operator/ GIS Analyst	Environmental Planner / Specialist	Admin / Clerical	TOTAL HOURS	Sub-Contract Amounts / ROW COST	TOTAL LINE ITEM COST
CONTRACT RATE												
WORK AUTHORIZATION NO. 2 - WITH HIDALGO COUNTY												
PHASE I(PART II) - EA, PUBLIC INVOLVEMENT & SCHEMATIC DESIGN												
1			310				270	270	11,975	861,975	\$ 34,961.00	\$ 97,920.05
2				10		9			0,671	0,671	\$ 26,317.20	\$ 39.05
3		6							2,680	27,680	\$ 44,717.00	\$ 68,123.91
4	40	60		254		333	160		10,914	524,914	\$ 22,500.00	\$ 72,689.41
5	40			180		115			2,959	555,959	\$ 30,000.00	\$ 40,000.00
6	16	24		60					7,864	222,864		\$ 40,000.05
7	32	32	40	90	24		38		2,786	447,291		\$ 57,600.02
8	24	32	72	72	36		72	128	11,291	447,291		\$ 50,000.20
9	22	30	60	60	32		60	113	10,060	387,060		\$ 420,055.59
SUB-TOTAL	174	184	482	726	92	457	600	511	61,200	3028,414	\$ 128,495.20	\$ 420,055.59

Sub-Total Manhours Fee with Subconsultant Fee: \$

* TOTAL PROJECT FEE: \$ 548,550.30

* Rounded Figure

Exhibit D-1
AmaTerra Environmental 18-029
Cultural Resource Investigations
FM1015 Road Widening from Mile 12N to SH107,
Weslaco, Hidalgo County, Texas

COST BREAKDOWN											
FM1015 Road Widening Cultural Resource Investigations											
LABOR	PCR/ Background study	Permit App/ Research Design	Historic Fieldwork	Archeology Fieldwork	Draft and Final Reports	Curation	Admin and Project Mgmt	Total	Unit	Unit Price	Cost
Principal							2	2	hr	\$ 216.00	\$ 432.00
Project Manager							4	4	hr	\$ 142.00	\$ 568.00
Archeologist IV	6	4			10			20	hr	\$ 91.00	\$ 1,820.00
Archeologist III				30	30	2		62	hr	\$ 79.00	\$ 4,898.00
Archeologist II	10	4				8		22	hr	\$ 73.00	\$ 1,606.00
Archeologist I		2		30	6	4		42	hr	\$ 62.00	\$ 2,604.00
Architectural Historian IV	1				12			13	hr	\$ 147.00	\$ 1,911.00
Architectural Historian III	10	16	32		36			94	hr	\$ 104.00	\$ 9,776.00
Historian II	2	8			60			70	hr	\$ 82.00	\$ 5,740.00
GIS Specialist	4	2	2		12			20	hr	\$ 68.00	\$ 1,360.00
Administrative		2					4	6	hr	\$ 88.00	\$ 528.00
Editor					10			10	hr	\$ 58.00	\$ 580.00
TOTAL LABOR											\$ 31,823.00
EXPENSES	PCR	Permit App/ Research Design	Historic Fieldwork	Archeology Fieldwork	Draft and Final Reports	Curation	Admin and Project Mgmt	Total	Unit	Unit Price	Cost
Copies, b/w	30	50	30	30	300	200	20	660	each	\$ 0.10	\$ 66.00
Copies, color	20	25	10	10	150	150	20	385	each	\$ 1.00	\$ 385.00
Mileage			650	650				1300	mile	\$ 0.54	\$ 702.00
Lodging (NTE)			3	6				9	night	\$ 90.00	\$ 810.00
Taxes, lodging (15%)			3	6				9	night	\$ 14.00	\$ 126.00
Meals			3	6				9	day	\$ 51.00	\$ 459.00
Curation						0.25		0.25	dr.	\$2,360.00	\$ 590.00
TOTAL EXPENSES											\$ 3,138.00
TOTAL											\$ 34,961.00

EXHIBIT D BUDGET

LUMP SUM RATE BASIS OF PAYMENT

R.O.W. Surveying Services, L.L.C.									
Highway: FM 1015 County: Hidalgo County, Texas Limits: 12 Mile to SH 107 Description of Work: ROW Map and Design Survey									
TASK AND DESCRIPTION	Survey PM	RPLS	Survey Technician	3-man Survey Crew	SUE/per unit	Admin/ Clerical	Total Hours	Cost	
FC 130 ROW Map / FC 150 Field Surveying	\$124.00	\$125.00	\$82.00	\$155.00	\$500.00	\$50.00			
HOURLY RATE									\$500.00
PHASE I - FC 130 (ROW MAP) Lump Sum per Parcel									
A. ROW Map, Parcel Description, Metes and Bounds Description, and Title Reports (137 parcels @ \$3,200.00/parcel)									
FC 130 Subtotal Cost									\$ -
PHASE 3 - DTM Topography and Cross sections OUTFALLS									
(Total Length incl Drain and Irrig. Crossings Approx. 2.5 Miles or 13,240 ft. @ 500 ft per Drain ditch and irrig. canal)									
1. Cross Culverts, Driveway Culverts, Inverts	1	0	40	44	0	1.54	86.54	\$ 10,301.00	
2. Irrigation Crossings	0	0	36	60	0	0	96	\$ 12,252.00	
3. Existing Storm Drain H&V	0	0	20	20	0	0	40	\$ 4,740.00	
4. Outfalls	0	16	20	40	0	0	76	\$ 9,840.00	
5. Profiles of Existing Drainage Facilities	0	0	16	16	0	0	32	\$ 3,792.00	
6. Obtain Elevations of Manholes and Valves of Utilities	0	0	16	16	0	0	32	\$ 3,792.00	
Subtotal Hours	1	16	148	196	0	1.54	362.54		
Subtotal Cost - Phase 2	\$124.00	\$2,000.00	\$12,136.00	\$30,380.00	\$0.00	\$77.00		\$ 44,717.00	
PHASE 4- SUBSURFACE UTILITY ENGINEERING									
1. Hydro Excavation SUE Level A (10 holes/Mile at 45 total \$500 each)	\$0.00	\$0.00	\$0.00	\$0.00	\$22,500.00	\$0.00	\$0.00	\$ -	
Total Cost-Phase 3	\$0.00	\$0.00	\$0.00	\$0.00	\$22,500.00	\$0.00	\$0.00	\$22,500.00	
Total Fee FC 150 Drainage Outfalls and Irrigation									\$44,717.00
Total SUE									\$22,500.00
Total Fee FC 150									\$67,217.00



EXHIBIT "D"
FEE PROPOSAL

FM1015 Outfalls Aerial Photography / Digital Terrain Model

TASKS	MANHOURS						Subtotal
	Project Manager	GIS / Sr. Eng-Technician	Unmanned Aircraft System (UAS) Pilot	Engineering Tech	Total		
1 Preliminary Field Reconnaissance Activities (FAA Controlled Airspace Request, Identification of flight areas, creation of flight plans, mapping of ground control points)	2		4	4	10	\$1,012	
2 Field Reconnaissance (UAS Aerial Imagery & Ground Control Data Collection for 27 Flights)	2		64	64	130	\$10,430	
3 Post Flight Data Processing and .DTM Creation (Upload data, catalog data, process data)	4	30	34	34	100	\$9,181	
4 Internal Meetings & Coordination	10	2	4	4	14	\$1,627	
		32	106	106	254		
Labor Hours	10	32	106	106	254		
Hourly Base Rates	\$ 60.00	\$ 36.00	\$ 25.00	\$ 24.00			
Contract Rate FY2018	\$ 192.20	\$ 115.32	\$ 80.08	\$ 76.88			
Total Labor Costs	\$ 1,922.00	\$ 3,690.24	\$ 8,488.48	\$ 8,149.28		\$ 22,250.00	

Direct Expenses

Aerial Drone Flight (\$250.00/hr) \$ 4,000.00
Mileage (\$0.56/mile) \$ 67.20

Total Direct Expenses \$ 4,067.20

B2Z Engineering Total Cost

\$ 26,317.20