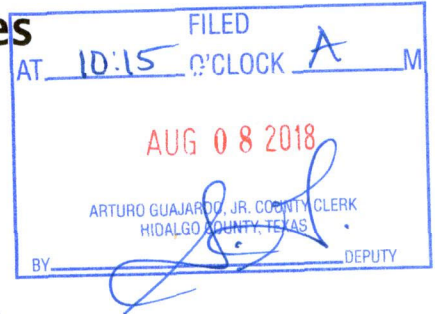


**HIDALGO COUNTY**  
**Professional Engineering Services**  
**Contract # C-18-195-07-31**  
**Work Authorization Form**  
**WORK AUTHORIZATION NO. 1**



**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 the preparation of the Environmental Assessment, Public Involvement, Schematic and Hydrologic Design for the Mile 6 project from Mile 11 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 **\$1,605,850.00**. 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. 1 shall be funded through funding source:

Account No. 8-1315-431-00-121-039-0-121

Requisition Number 376760 (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 Fuentes as to the content and detail of this Work Authorization No. 1.

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 07-31-18 as indicated below.

THE ENGINEER:  
L&G ENGINEERING

\_\_\_\_\_  
By: Jacinto Garza, P.E.  
President

THE OWNER:  
HIDALGO COUNTY

\_\_\_\_\_  
By: Ramon Garcia,  
County Judge

ATTEST:

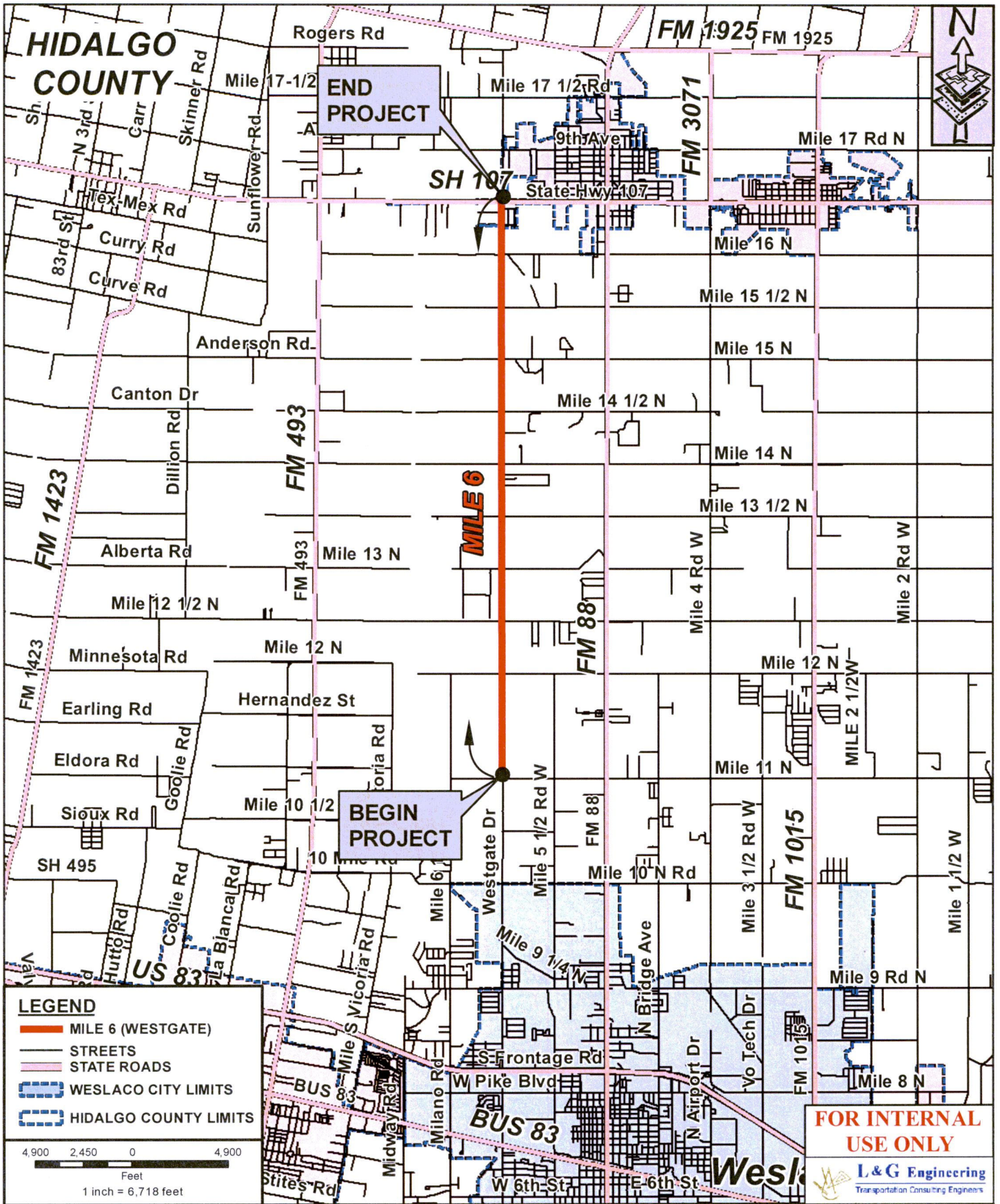
\_\_\_\_\_  
By: Arturo Guajardo, Jr., County Clerk



APPROVED BY  
COMMISSIONERS' COURT  
ON: 7/31/18 *AK*

**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



## MILE 6 (WESTGATE DRIVE) LOCATION MAP

FROM MILE 11 TO SH 107  
APPROX. TOTAL PROJECT LENGTH 5.5 MILES



**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**

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**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: 0921-02-XXX

PROJECT/DESCRIPTION: Professional Engineering Services

LENGTH: 5.5 MILES

HIGHWAY: MILE 6W

LIMITS: FROM Mile 11 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**

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**SECTION 2 – FEASIBILITY STUDIES**

(Function Code 102)

Services Provided By:		
<u>ENGINEER</u>	<u>LPA</u>	
<u>YES</u>	<u>NO</u>	Preliminary Design Values <i>The Engineer will work with the Owner to establish basic design concepts, project controls and general scope of Projects.</i>
<u>YES</u>	<u>NO</u>	Preliminary Route Locations on Uncontrolled Mapping <i>The Engineer will evaluate various alternatives (route locations, alignment shifts, geometry) for the Project.</i>
<u>YES</u>	<u>NO</u>	Uncontrolled Mapping (w/Contours & GIS Info) <i>The Engineer will investigate the existing routes and coordinate with the Owner on establishing the best-fit alignments and mapping proposed geometry for Projects. Preliminary Location Exhibit will be developed.</i>
<u>NO</u>	<u>NO</u>	Preliminary Traffic Evaluations & Trends <i>The Engineer will investigate existing traffic models and trends for the proposed Projects and adjacent roadways tying into the proposed Projects.</i>
<u>YES</u>	<u>NO</u>	Preliminary Hydrologic Map <i>The Engineer will develop a Hydrologic Map for the Projects. Hydrologic Maps will be based on LIDAR and GIS information.</i>
<u>YES</u>	<u>NO</u>	Preliminary ROW Requirements <i>The Engineer will research and identify affected property owners on the Projects utilizing the latest appraisal district file information from Hidalgo County Appraisal District and information from Carson Maps.</i>
<u>YES</u>	<u>NO</u>	Preliminary Cost Estimates <i>The Engineer will calculate preliminary construction cost estimates for the location and geometry of the Projects.</i>
<u>YES</u>	<u>NO</u>	Preliminary Environmental Analysis (for fatal flaws) <i>The Engineer will perform Preliminary Environmental Constraint Mapping to determine if any fatal flaws exist along the proposed alignment.</i>
<u>YES</u>	<u>NO</u>	Project Fact Sheet with Est. Local Cost vs. Total Project Cost <i>The Engineer will produce a Project Fact Sheet providing summaries of all pertinent items in this scope of services (as required) and providing estimated local costs vs. total project costs for the Projects.</i>
<u>YES</u>	<u>NO</u>	Meetings, Coordination & Support for Project Development <i>The Engineer shall provide coordination services and shall assist in meetings and workshops with TxDOT, Hidalgo County, Hidalgo County Drainage District No. 1 and Hidalgo County Irrigation Districts, and all other affected parties. The Engineer shall serve as representative for the Owner in coordination items. The Engineer shall coordinate with the Owner’s staff on all Project related items.</i>

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

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**SECTION 3 - ROUTE AND DESIGN STUDIES**

(Function Code 110)

Services  
Provided By:  
ENGINEER LPA

<u>YES</u>	<u>NO</u>	1. Route Location Studies
<u>N/A</u>	<u>N/A</u>	2. Level of Service Analysis
<u>NO</u>	<u>NO</u>	3. Traffic Evaluations and Projections
<u>YES</u>	<u>NO</u>	4. Develop Roadway Design Criteria
<u>YES</u>	<u>NO</u>	5. Preliminary Cost Estimates
<u>YES</u>	<u>NO</u>	6. Design Schematic (See Section 7, page 7-1 for schematic layout requirements)
<u>YES</u>	<u>NO</u>	7. Preliminary Right-of-Way Requirements
<u>NO</u>	<u>NO</u>	8. Design Concept Conference
		9. Soil Core Hole Drilling
<u>N/A</u>	<u>N/A</u>	a. Pavement (See Section 7, pages 7-2 thru 7-3 for requirements)
<u>N/A</u>	<u>N/A</u>	b. Retaining Walls (See Section 10, page 10-1 for requirements)
<u>N/A</u>	<u>N/A</u>	c. Miscellaneous Structures (See Section 10, page 10-3 for requirements)
<u>N/A</u>	<u>N/A</u>	d. Bridges (See Section 11, page 11-2 thru 11-3 for requirements)

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

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**SECTION 4 - ADDITIONAL 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.

- |            |            |   |
|------------|------------|---|
| <u>N/A</u> | <u>N/A</u> | a. Environmental Assessments  |
|            |            | (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>YES</u> | <u>N/A</u> | a. A public meeting shall be scheduled, coordinated and conducted.   |
| <u>YES</u> | <u>N/A</u> | b. Technical assistance for one public meeting, preparation of, and maintenance of contact lists, minutes of meeting, exhibit preparation, and other tasks outlined by the LPA, shall be provided.   |
| <u>YES</u> | <u>NO</u>  | c. A meeting with affected property owners shall be scheduled, coordinated & conducted, as necessary.  |
| <u>YES</u> | <u>NO</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. All notices and mail outs shall be prepared and other tasks as outlined by the LPA shall be provided |
| <u>YES</u> | <u>N/A</u> | d. 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. |
| <u>YES</u> | <u>NO</u> | b. Biological Technical Report: A biological form and technical report shall be prepared in accordance with the STATE'S Biological Guidelines. The report shall include water resources, and threatened and endangered species.   |

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

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Services Provided By:		
<u>ENGINEER</u>	<u>LPA</u>	
<u>YES</u>	<u>N/A</u>	c. Cultural Resources: Historical and archeological studies shall be completed in accordance with the STATE’S guidelines.
<u>YES</u>	<u>N/A</u>	(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.
<u>YES</u>	<u>N/A</u>	(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.
<u>YES</u>	<u>N/A</u>	d. Community Impact Analysis: A community impact analysis shall be prepared in accordance with the STATE’S Community Impact Guidelines.
<u>YES</u>	<u>N/A</u>	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.
<u>YES</u>	<u>N/A</u>	f. Indirect and Cumulative Impacts Analysis: An indirect and cumulative impacts analysis shall be prepared in accordance with the STATE’s guidelines.
<u>YES</u>	<u>N/A</u>	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.
<u>YES</u>	<u>N/A</u>	h. Water Resources: A Water Resources technical report shall be prepared in accordance with the STATE’s water guidelines.
<u>YES</u>	<u>N/A</u>	<b>4. Environmental Scoping</b> The ENGINEER shall initiate the environmental scoping process and complete an environmental scoping document/risk assessment in coordination with TxDOT.
<u>YES</u>	<u>N/A</u>	<b>5. General Guidelines for Preparation of Environmental Documents</b> a. All technical reports shall be submitted electronically to TxDOT through their FTP site. b. The administratively complete document shall 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

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**SECTION 6 - ADDITIONAL 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. **All survey work needs to use the TxDOT Pharr District Geodetic Control Network.**

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>YES</u> | <u>N/A</u> | <b>1. Design Surveying</b>   |
|            |            | 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.<br>(1) Establish horizontal control points<br>(2) Establish vertical control points<br>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  |
| <u>YES</u> | <u>N/A</u> | 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.<br>(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.<br>(2) The unadjusted angular error should not exceed 2 seconds per angle, plus 14 seconds.<br>(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.)<br>(4) The unadjusted vertical error should not exceed 0.03 foot per mile of traverse.<br>(5) Project control base lines |
| <u>N/A</u> | <u>N/A</u> | (6) Photogrammetric ground control<br>(a) Establish horizontal control<br>(b) Establish vertical control points<br>(c) Place and maintain control point targets  |

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

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Services  
Provided By:  
SURVEYOR LPA

YES      N/A

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 (1000-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 appurtenances 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 LPA

- |                                   |   |
|-----------------------------------|---|
| <p><u>YES</u>      <u>N/A</u></p> | <p>(11) Cross section and profile all <b>nine (9)</b> outfall channels identified on the Hydrologic Map <b>for the distances shown to be cleaned and widened</b> at 100-ft intervals. Profile all outfall channels for approximately 1320 ft. to determine slope of outfall. The SURVEYOR will provide a complete 2D/3D File including utilities of the outfalls identified.</p>  |
| <p><u>YES</u>      <u>NO</u></p>  | <p>(12) Driveways and Turnouts</p> <p>(a) Inventory commercial entrances, public roads and side streets separately.</p> <p>(b) Obtain centerline station. (Width at ROW, PAV'T and existing radius.</p> <p>(c) Inventory by type (dirt, caliche, gravel or paved). If paved, indicate condition in terms of no patches, has patches or has potholes.</p> <p>(d) Obtain width at R.O.W. line.</p> <p>(e) Obtain elevations at both edges of the driveway or turnout in line with the side drain.</p> |
| <p><u>NO</u>      <u>NO</u></p>   | <p>(13) ROW staking (Existing and Proposed @ 1,000 ft. stations PC's PT's and Angle points as per ROW Map)</p>  |
| <p><u>NO</u>      <u>NO</u></p>   | <p>(14) Soil core hole staking at bridge class structures.</p>  |
| <p><u>NO</u>      <u>NO</u></p>   | <p>(15) Determine changes in topography from voids and outdated maps due to development, erosion, etc.</p>  |
| <p><u>YES</u>      <u>NO</u></p>  | <p>(16) Profiles of existing drainage facilities.</p>   |
| <p><u>NO</u>      <u>NO</u></p>   | <p>(17) Measurement of hydraulic opening under existing bridges.</p>  |
| <p><u>YES</u>      <u>NO</u></p>  | <p>(18) Obtain elevations of manholes and valves of utilities</p>   |
| <p><u>YES</u>      <u>NO</u></p>  | <p>(19) Provide temporary signs, traffic control, flags, safety equipment, etc.</p>   |
| <p><u>YES</u>      <u>NO</u></p>  | <p>(20) Ties to existing bridges railroad rail elevations or culverts that may conflict with new construction.</p>  |
| <p><u>NO</u>      <u>NO</u></p>   | <p>(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.</p>   |
| <p><u>YES</u>      <u>NO</u></p>  | <p>(22) Inventory signs, mailboxes, and driveways</p>   |
| <p><u>NO</u>      <u>NO</u></p>   | <p>(23) Locate wetlands.</p>  |
| <p><u>YES</u>      <u>NO</u></p>  | <p>(24) Locate existing right-of-ways.</p>  |
- 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:
- |                                   |   |
|-----------------------------------|---|
| <p><u>N/A</u>      <u>N/A</u></p> | <p>(1) Stake existing and/or proposed right-of-ways.</p>                        |
| <p><u>N/A</u>      <u>N/A</u></p> | <p>(2) Stake existing and/or proposed baseline/centerline.</p>                  |
| <p><u>N/A</u>      <u>N/A</u></p> | <p>(3) Stake proposed bridge structures.</p>                                    |
| <p><u>N/A</u>      <u>N/A</u></p> | <p>(4) Stake proposed drainage structures, such as manholes, culverts, etc.</p> |
| <p><u>N/A</u>      <u>N/A</u></p> | <p>(5) Set grade stakes.</p>  |
| <p><u>N/A</u>      <u>N/A</u></p> | <p>(6) Recover and check existing control points.</p>                           |
| <p><u>N/A</u>      <u>N/A</u></p> | <p>(7) Establish additional control points.</p>                                 |
| <p><u>N/A</u>      <u>N/A</u></p> | <p>(8) Check elevations and locations of structures.</p>                        |
| <p><u>N/A</u>      <u>N/A</u></p> | <p>(9) Determine and resolve conflicts associated with survey data.</p>         |

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

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Services  
Provided By:  
SURVEYOR LPA

<u>N/A</u>	<u>N/A</u>	<p><b>2. Photogrammetric Products</b></p> <p>a. Uncontrolled Photography</p> <p style="padding-left: 20px;">(1) Contact Prints</p> <p style="padding-left: 20px;">(2) Mosaics</p> <p style="padding-left: 20px;">(3) Digital ortho plots</p> <p>b. Mapping</p> <p style="padding-left: 20px;">(1) Planimetric Maps</p> <p style="padding-left: 20px;">(2) Contour Maps</p> <p style="padding-left: 20px;">(3) Cross Sections</p> <p style="padding-left: 20px;">(4) Profiles</p> <p style="padding-left: 20px;">(5) Digital Terrain Models (DTM)</p>
		<p><b>3. <u>UTILITY SUBSURFACE INVESTIGATION:</u></b> <u>Utility Quality Levels</u> are in cumulative order (least to greatest) as follows</p>
<u>YES</u>	<u>N/A</u>	<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>N/A</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>N/A</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>

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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. *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>N/A</u> | 4.1. Digital Terrain Models (DTM) in <b>Microstation V8i (Select Series 4) format.</b>   |
| <u>YES</u> | <u>N/A</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>N/A</u> | 4.3. Computer printouts or other tabulations summarizing the results of field surveys.   |
| <u>YES</u> | <u>N/A</u> | 4.4. Digital files or media acceptable by the ENGINEER containing field survey data.   |
| <u>YES</u> | <u>N/A</u> | 4.5. Maps, 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>N/A</u> | 4.6. Field survey notes, as electronic and/or hard copies.   |
| <u>YES</u> | <u>N/A</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 |

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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.

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YES      N/A  
YES      N/A  
YES      N/A  
YES      N/A

4. *Deliverables (continued)*

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

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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.

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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.

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SECTION 7 - ADDITIONAL ROADWAY DESIGN CONTROLS

(Function Code 160)

Services  
Provided By:  
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|------------|------------|--|
| <u>YES</u> | <u>N/A</u> | 1. Geometric Design  |
| <u>YES</u> | <u>N/A</u> | a. Horizontal and Vertical Alignment ( <del>Preliminary based on office surveys</del> )  |
|            |            | 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>YES</u> | <u>N/A</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.   |

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| <u>YES</u> | <u>N/A</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>NO</u>  | <u>N/A</u> | 3. Exhibit for Airway/Highway Clearance Permits   |
| <u>YES</u> | <u>N/A</u> | 4. Grading Design <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> <li>b. Typical Sections</li> <li>c. Design Cross Sections</li> <li>d. Determine Cut and Fill Quantities</li> <li>e. Slope Stability Analysis</li> <li>f. Embankment Foundation Stability Analysis</li> <li>g. Embankment Settlement Analysis</li> </ul>  |
| <u>YES</u> | <u>N/A</u> |   |
| <u>NO</u>  | <u>N/A</u> |   |
| <u>NO</u>  | <u>N/A</u> |   |
| <u>N/A</u> | <u>N/A</u> |   |
| <u>N/A</u> | <u>N/A</u> |   |
| <u>N/A</u> | <u>N/A</u> |   |
| <u>NO</u>  | <u>NO</u>  | 5. Pavement Design <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> <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> <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>N/A</u> | <u>N/A</u> |   |
| <u>N/A</u> | <u>N/A</u> |   |

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The location and minimum number of soil core holes required for this project are as follows: (To be determined when schematic is being completed)

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|---|---|
| <p><u>N/A</u>      <u>N/A</u></p> <p><u>YES</u>      <u>N/A</u></p> <p><u>YES</u>      <u>N/A</u></p> <p><u>NO</u>       <u>NO</u></p> <p><u>YES</u>      <u>N/A</u></p> <p><u>N/A</u>      <u>N/A</u></p> <p><u>N/A</u>      <u>N/A</u></p> <p><u>NO</u>       <u>NO</u></p> | <p>5. Pavement Design (<i>continued</i>)</p> <p>c. Embankment and Subgrade (<i>continued</i>)</p> <p>    (2) Identify, interpret and summarize geologic features that affect engineering design (PI, Sulfate content, % of lime)</p> <p>d. Traffic Data for Pavement Design</p> <p>e. Basic Design Criteria</p> <p>f. Life Cycle Cost Analysis(es)</p> <p>g. Cost Data</p> <p>h. Pavement Material Properties</p> <p>i. Rehabilitation Investigations</p> <p>    (1) Core Hole Survey (Show cost estimate with Function Code 110)</p> <p>        (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.</p> |
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**SECTION 9 - SIGNING, MARKINGS AND SIGNALIZATION**

(Function Code 162)

Services

Provided By:

ENGINEER   CITY/COUNTY

- |           |            |   |
|-----------|------------|---|
| <u>NO</u> | <u>N/A</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>NO</u> | <u>N/A</u> | 2. Summary of Small Signs Tabulation  |
| <u>NO</u> | <u>N/A</u> | 3. Summary of Large Signs Tabulation including all Guide Signs  |
| <u>NO</u> | <u>N/A</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  |

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| <p><u>YES</u></p> <p><u>YES</u></p> <p><u>YES</u></p> <p><u>YES</u></p> <p><u>NO</u></p> <p><u>NO</u></p> <p><u>YES</u></p><br><p><u>NO</u></p> | <p><u>N/A</u></p> <p><u>N/A</u></p> <p><u>N/A</u></p> <p><u>N/A</u></p> <p><u>N/A</u></p> <p><u>N/A</u></p> <p><u>N/A</u></p><br><p><u>N/A</u></p> | <p>5. Traffic Signals</p> <p>a. Development of Justification (Warrant) Data</p> <p>(1) Location Map<br/>       Relationship of proposed installation to other traffic signals, highways, business areas and traffic generators</p> <p>(2) Photographs as appropriate</p> <p>(3) Accident data as appropriate</p> <p>(4) Vehicle volumes</p> <p>(a) Existing</p> <p>(b) Estimated</p> <p>(c) Projected</p> <p>(d) Pedestrian</p> <p>(5) Traffic Survey - Count Analysis</p> <p>(6) Recommendation based on above data</p><br><p>b. Layout</p> <p>(1) Title Sheet (when applicable)</p> <p>(a) Describe the location</p> <p>(b) Type of installation</p> <p>(c) Area map with project limits for each location</p> <p>(d) Index of sheets</p> <p>(e) Space for official signatures</p> <p>(2) Estimate and quantity sheet (when applicable)</p> <p>(a) List of all bid items</p> <p>(b) Bid item quantities</p> <p>(c) Specification item number</p> <p>(d) Paid item description and unit of measure</p> <p>(3) Basis of estimate sheet (list of materials)</p> <p>(4) General notes and specification data sheet</p> <p>(5) Condition diagram</p> <p>(a) Highway and intersection design features</p> <p>(b) Roadside development</p> <p>(c) Traffic control including illumination</p> <p>(6) Plan sheet(s)</p> <p>(a) Existing traffic control that will remain (signs and markings)</p> <p>(b) Existing utilities</p> <p>(c) Proposed highway improvements</p> <p>(d) Proposed installation</p> <p>(e) Proposed additional traffic controls</p> <p>(f) When applicable, proposed conduit for Railroad interconnect with standard details for runs under tracks.</p> <p>(g) Proposed illumination attached to signal poles.</p> <p>(7) Notes for plan layout</p> <p>(8) Elevation sheet(s) (span wire design)</p> <p>(9) Phase sequence diagram(s)</p> <p>(a) Signal locations</p> <p>(b) Signal indications</p> <p>(c) Phase diagram</p> <p>(d) Signal sequence table</p> <p>(e) Flashing operation (normal and emergency)</p> <p>(f) Preemption operation (when applicable)</p> <p>(g) Interval timing, cycle length and offset</p> <p>(h)</p> |
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|-----------|------------|---|
| <u>NO</u> | <u>N/A</u> | <p>5. Traffic Signals (<i>continued</i>)</p> <p>b. Layout (<i>continued</i>)</p> <p>(10) Construction detail sheets(s)</p> <p style="padding-left: 20px;">(a) Poles (TxDOT standard sheets)</p> <p style="padding-left: 20px;">(b) Detectors</p> <p style="padding-left: 20px;">(c) Pull Box and conduit layout</p> <p style="padding-left: 20px;">(d) Controller Foundation standard sheet</p> <p>(11) Marking details (when applicable)</p> <p>(12) Barricade and warning sign standard sheet and any special details for work zone traffic control for special conditions</p> <p>(13) Aerial or underground interconnect details (when applicable)</p> |
| <u>NO</u> | <u>N/A</u> | <p>c. General Requirements</p> <p>(1) Contact local utility company</p> <p style="padding-left: 20px;">(a) Confirm power source</p> <p style="padding-left: 20px;">(b) Discuss route of aerial or underground interconnect cable (when applicable)</p> <p style="padding-left: 20px;">(c) Adjustment of overhead utility lines</p> <p>(2) Prepare governing specifications and special provisions list</p> <p>(3) Prepare project estimate</p>  |
| <u>NO</u> | <u>N/A</u> |   |
| <u>NO</u> | <u>N/A</u> |   |
| <u>NO</u> | <u>N/A</u> |   |
| <u>NO</u> | <u>N/A</u> | d. Summary of Quantities  |

TASK AND DESCRIPTION	FIRM	2018						2019													
		JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
<b>W.A. No. 1: EA, Pub Inv, Schematic</b>																					
<b>Public Involvement</b>																					
Develop Alternatives & Matrix	L&G																				
Advertise & Conduct Public Meeting	L&G																				
Select TPA	L&G																				
<b>Schematic</b>																					
Design Survey	L&G																				
Update Schematic	L&G																				
Hydrologic Map	L&G																				
TxDOT Review & Revisions	TxDOT																				
TxDOT Updated Schematic Approval	TxDOT																				
<b>Environmental Document</b>																					
Field Visits, Submit Technical Reports, etc...	L&G																				
Submit Final Draft Document	L&G																				
Environmental Decision	TxDOT																				

L&G FUNCTION  
 ENVIRONMENTAL ASSESSMENT WORK  
 TXDOT FUNCTION

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

MILE 6 PROJECT ~ from Mile 11 to SH 107

	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
<b>CONTRACT RATE</b>												
	215.34	180.42	171.69	139.88	197.88	116.40	78.57	84.39	58.20			
<b>WORK AUTHORIZATION NO. 1 - WITH HIDALGO COUNTY</b>												
<b>PHASE I - EA, PUBLIC INVOLVEMENT &amp; SCHEMATIC DESIGN</b>												
1	40	62		62					26,464	190,464		\$ 30,000.00
2			270				202	280	9,336	761,336		\$ 86,400.00
3	24	24	80	30	24	22	16	80	7,868	307,868		\$ 43,200.00
4											\$ 27,333.60	\$ -
5	10	10	42				10	24	2,481	78,481		\$ 10,166.43
6	40	72		34		232			4,957	290,957		\$ 36,000.02
7	40	72		594			958		2,684	1666,684		\$ 180,000.03
8	40	72		594			958		2,684	1666,684		\$ 180,000.03
9	8	16		80				28	2,440	134,440	\$ 21,711.28	\$ 18,288.77
10	48	48		400		692	692		2,617	1882,617	\$ 245,060.00	\$ 209,940.03
11	80	88		682		682			7,892	1539,892	\$ 10,540.00	\$ 208,210.03
12				36		26			3,198	65,198	\$ 65,759.00	\$ 8,241.00
13	24	95		290			345,994			754,994		\$ 90,000.01
14	24	32		255	180	60			14,392	565,392		\$ 90,000.01
15	16	24		100		160		50	7,096	357,096		\$ 45,000.01
<b>SUB-TOTAL</b>	<b>354</b>	<b>543</b>	<b>392</b>	<b>3157</b>	<b>204</b>	<b>1874</b>	<b>3181,994</b>	<b>462</b>	<b>94,109</b>	<b>10262,103</b>	<b>\$ 370,403.88</b>	<b>\$ 1,235,446.37</b>

Sub-Total Manhours Fee with Subconsultant Fee: \$ 1,605,850.25

\* TOTAL PROJECT FEE: \$ 1,605,850.00

**Cultural Resource Investigations**  
**Mile 6 Road: From Mile 11 to 13 ½ Mile Road (2.5 Miles)**  
**Hidalgo County, Texas**

<b>COST BREAKDOWN</b>										
<b>Mile 6: Mile 11 to Mile 13.5 (2.5 Miles) - Combined</b>										
<b>LABOR</b>	<b>PCR</b>	<b>Permit App/ Research Design</b>	<b>Fieldwork</b>	<b>Draft and Final Reports</b>	<b>Curation</b>	<b>Admin and Project Mgmt</b>	<b>Total</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Cost</b>
Principal	0	0	0	0	0	2	2	hr	\$ 216.00	\$ 432.00
Archeologist V/ Jr. Principal Investigator	0	0	0	0	0	2	2	hr	\$ 101.00	\$ 202.00
Archeologist IV	0	0	0	0	0	0	0	hr	\$ 91.00	\$ -
Archeologist III	0	4	24	6	4	0	38	hr	\$ 79.00	\$ 3,002.00
Archeologist II	1	4	24	4	0	0	33	hr	\$ 73.00	\$ 2,409.00
Archeologist I	0	0	0	0	8	0	8	hr	\$ 62.00	\$ 496.00
Historical Architect/ Senior Historian IV	0	0	0	2	0	2	4	hr	\$ 147.00	\$ 588.00
Architectural Historian III	0	0	0	24	0	0	24	hr	\$ 104.00	\$ 2,496.00
Historian II	0	0	0	0	0	0	0	hr	\$ 82.00	\$ -
GIS Specialist	0	1	0	10	1	0	12	hr	\$ 91.00	\$ 1,092.00
Administrative/ Document Production Supervisor	0	0	0	0	0	4	4	hr	\$ 88.00	\$ 352.00
Editor	0	0	0	6	0	0	6	hr	\$ 68.00	\$ 408.00
<b>TOTAL LABOR</b>										<b>\$11,477.00</b>
<b>EXPENSES</b>	<b>PCR</b>	<b>Permit App/ Research Design</b>	<b>Fieldwork</b>	<b>Draft and Final Reports</b>	<b>Curation</b>	<b>Admin and Project Mgmt</b>	<b>Total</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Cost</b>
Copies, b/w	0	10	50	450	100	20	630	each	\$ 0.10	\$ 63.00
Copies, color	0	10	10	350	100	20	490	each	\$ 1.00	\$ 490.00
Mileage	0	0	600	0	0	0	600	mile	\$ 0.56	\$ 336.00
Lodging (NTE)	0	0	4	0	0	0	4	night	\$ 88.00	\$ 352.00
Taxes, lodging (15%)	0	0	4	0	0	0	4	night	\$ 13.20	\$ 52.80
Meals	0	0	6	0	0	0	6	day	\$ 51.00	\$ 306.00
Curation					0.25		0.25	drawer	\$2,360.00	\$ 590.00
<b>TOTAL EXPENSES</b>										<b>\$ 2,189.80</b>
<b>TOTAL</b>										<b>\$13,666.80</b>

**Cultural Resource Investigations**  
**Mile 6 Road: From 13 ½ Mile Road to SH107 (3.0 Miles)**  
**Hidalgo County, Texas**

<b>COST BREAKDOWN</b>									
<b>Mile 6: Mile 13.5 to SH 107 (3.0 Miles) - Combined</b>									
<b>LABOR</b>	<b>Permit App/ Research Design</b>	<b>Fieldwork</b>	<b>Draft and Final Reports</b>	<b>Curation</b>	<b>Admin and Project Mgmt</b>	<b>Total</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Cost</b>
Principal	0	0	0	0	2	2	hr	\$ 216.00	\$ 432.00
Archeologist V/ Jr. Principal Investigator	0	0	0	0	2	2	hr	\$ 101.00	\$ 202.00
Archeologist IV	0	0	0	0	0	0	hr	\$ 91.00	\$ -
Archeologist III	4	24	6	4	0	38	hr	\$ 79.00	\$ 3,002.00
Archeologist II	4	24	4	0	0	33	hr	\$ 73.00	\$ 2,409.00
Archeologist I	0	0	0	8	0	8	hr	\$ 62.00	\$ 496.00
Historical Architect/ Senior Historian IV	0	0	2	0	2	4	hr	\$ 147.00	\$ 588.00
Architectural Historian III	0	0	24	0	0	24	hr	\$ 104.00	\$ 2,496.00
Historian II	0	0	0	0	0	0	hr	\$ 82.00	\$ -
GIS Specialist	1	0	10	1	0	12	hr	\$ 91.00	\$ 1,092.00
Administrative/ Document Production Supervisor	0	0	0	0	4	4	hr	\$ 88.00	\$ 352.00
Editor	0	0	6	0	0	6	hr	\$ 68.00	\$ 408.00
<b>TOTAL LABOR</b>									<b>\$11,477.00</b>
<b>EXPENSES</b>	<b>Permit App/ Research Design</b>	<b>Fieldwork</b>	<b>Draft and Final Reports</b>	<b>Curation</b>	<b>Admin and Project Mgmt</b>	<b>Total</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Cost</b>
Copies, b/w	10	50	450	100	20	630	each	\$ 0.10	\$ 63.00
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Mileage	0	600	0	0	0	600	mile	\$ 0.56	\$ 336.00
Lodging (NTE)	0	4	0	0	0	4	night	\$ 88.00	\$ 352.00
Taxes, lodging (15%)	0	4	0	0	0	4	night	\$ 13.20	\$ 52.80
Meals	0	6	0	0	0	6	day	\$ 51.00	\$ 306.00
Curation				0.25		0.25	drawer	\$2,360.00	\$ 590.00
<b>TOTAL EXPENSES</b>									<b>\$ 2,189.80</b>
<b>TOTAL</b>									<b>\$13,666.80</b>



**L&G Engineering**

**Traffic Projection for:** Mile 6, Weslaco, TX

**Sub-consultant:** C&M ASSOCIATES, INC.

**Schedule Duration:** Four Weeks after NTP

DESCRIPTION	Project Manager	Project Engineer III	Document Controller	Total Labor Hrs.	Remarks	Task Cost
Task 1. Review of existing information	8	16		24		\$ 3,877.84
Task 2. TDM model runs	16	32		48		\$ 7,755.68
Task 3. Prepare forecasts	8	16		24		\$ 3,877.84
Task 4. Documentation	8	16	4	28		\$ 4,199.92
<b>Subtotal</b>	<b>40</b>	<b>80</b>	<b>4</b>	<b>124</b>		<b>\$ 19,711.28</b>
<b>HOURS TOTAL</b>	<b>40</b>	<b>80</b>	<b>4</b>	<b>124</b>		
<b>LABOR RATE PER HOUR</b>	\$252.69	\$116.02	\$80.52			
<b>TOTAL DIRECT LABOR COSTS</b>	<b>\$ 10,107.60</b>	<b>\$ 9,281.60</b>	<b>\$ 322.08</b>	<b>\$ 19,711.28</b>		
<b>PERCENT LABOR UTILIZATION FOR TOTAL PROJECT (BASED ON FEE)</b>	51.28%	47.09%	1.63%	100.00%	CHECK	
<b>PERCENT LABOR UTILIZATION FOR TOTAL PROJECT (BASED ON MANHOURS)</b>	32.26%	64.52%	3.23%	100.00%	\$ 19,711.28	
<b>TOTAL DIRECT LABOR COST</b>						<b>\$ 19,711.28</b>
Traffic count (7 day, classification)						\$ 2,000.00
<b>TOTAL DIRECT EXPENSES*</b>						<b>\$ 2,000.00</b>
<b>GRAND TOTAL</b>						<b>\$ 21,711.28</b>

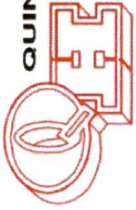
\* Direct expense will be charged based actual cost

**Traffic Projection for:**

Mile 6, Weslaco, TX

**Schedule**

Task Description	Timeline			
	Wk1	Wk2	Wk3	Wk4
Task 1. Review of existing information	■			
Task 2. TDM model runs	■	■		
Task 3. Prepare forecasts		■	■	
Task 4. Documentation			■	■



**QUINTANILLA, HEADLEY AND ASSOCIATES, INC.**

**Consulting Engineers ★ Land Surveyors**

Alfonso Quintanilla, P.E., R.P.L.S.  
 Engineering Firm Registration No. F-1513  
 Surveying Firm Registration No. 100411-00  
 Municipal & County Projects ★ Subdivisions ★ Surveys  
 124 E. Stubbs, Edinburg, Texas 78539  
 Phone 956/381-6480 Fax 956/381-0527  
 Email: [office@qhaengineering.com](mailto:office@qhaengineering.com)  
[www.qhaengineering.com](http://www.qhaengineering.com)

**Mile 6 - From 0.3 Mi. N. of Mile 11 to SH 107**

Project	Field Survey (RDWY)	Field Survey (OUTFALLS)	Sub-Surface Utility Engineering (S.U.E.)	Total Cost (FUNC 150)
Mile 6	\$158,100.00	\$86,960.00	\$10,540.00	\$255,600.00

