



June 2, 2016

Mr. Armando Garza, Jr., Chief Administrator  
**Attn: Ms. Erika Zamora, Director of Administrative Operations**  
Hidalgo County Precinct No. 2  
300 West Hall Acres  
Pharr, Texas 78589

**RE: Pct 2 Regional Linear Park Project  
Work Authorization No. 6**

Dear Mr. Garza,

Attached for your review and approval is Work Authorization No. 6 for the subject referenced project (Contract: C-15-046-03-03). This submittal is made to you in duplicate form for your further coordination with Commissioner Cantu.

A detailed description of the work to be provided under this work authorization is included in the attached Exhibit B.

Should you have any questions, please feel free to give me a call at (956) 585-1909.

Sincerely,

David A. Saenz, P.E., C.F.M.  
Project Manager

cc: Mr. Jacinto Garza, P.E. – L&G Engineering

**HIDALGO COUNTY**  
**Professional Engineering Services**  
**Contract # C-15-046-03-03**

**WORK AUTHORIZATION NO. 6**

**THIS WORK AUTHORIZATION** is made pursuant to the terms and conditions of Article I. 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 PS&E and Other Design Related Services for the Project.

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

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

**PART 2. ESTIMATED COST**

The estimated cost for services under this Work Authorization is **\$198,379.69**. This amount is based upon the costs outlined in the Estimated **Cost Proposal** attached hereto as ***EXHIBIT "D" Fee Schedule***.

**PART 3. PAYMENT**

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

**PART 4. FUNDING**

This Work Authorization No. 6 shall be funded through funding source:

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

Requisition Number \_\_\_\_\_

**PART 5. PERIOD OF SERVICE**

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

**PART 6. RESPONSIBILITIES AND OBLIGATIONS**

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

**PART 7. ACKNOWLEDGEMENT AND CONFIRMATION**

Acknowledgement and confirmation by Hidalgo County Precinct No. 2, Commissioner Eduardo Cantu as to content and detail of this **Work Authorization No. 6**.

**HIDALGO COUNTY  
COMMISSIONER PRECINCT NO. 2**

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**

**THE OWNER:  
HIDALGO COUNTY**

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

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

**ATTEST:**

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

**LIST OF ATTACHMENTS**

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

**EXHIBIT “A”**  
**Services to be Provided by the Owner**

The following provides an outline of the services to be provided by the **Owner** for Regional Linear Park Project within the limits of South San Antonio Avenue to Ridge Road in Hidalgo County hereinafter denoted as the **Project**.

**GENERAL:**

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

- 1) Provide the authorization to proceed with services through coordination with the project consulting and design Engineer.
- 2) Payment for work performed by the **Engineer** and accepted by the **Owner** in accordance with Article 3 of the Agreement.
- 3) Assistance to the **Engineer**, as necessary, to obtain the required data and information from other local, regional, State and Federal agencies the **Engineer** cannot easily obtain.
- 4) Provide any available relevant data the **Owner** may have on file concerning the **Project**.
- 5) Provide timely review and decisions in response to the **Engineer’s** request for information and/or required submittals and deliverables, in order for the **Engineer** to maintain the agreed upon work schedule prepared in accordance with Exhibit “C” attached to this Work Authorization.
- 6) Attend and participate in progress meetings as required and as coordinated and conducted by **Engineer**.

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

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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: \_\_\_\_\_

PROJECT/DESCRIPTION: PS&E and Other Design Related Services for the Hidalgo County Pct. 2 Linear Park Project

LENGTH: 2.57 Miles (Approx.)

HIGHWAY: Prop. Linear Park

LIMITS: From San Antonio Ave. to Ridge Road

**EXISTING FACILITY**

**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)
- Pedestrian Facility – Linear Park

ENGINEER shall mean L&G Consulting Engineers, Inc.

STATE shall mean Texas Department of Transportation (TxDOT).

COUNTY shall mean the Hidalgo County.

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

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**SECTION 7 - ROADWAY DESIGN CONTROLS**

(Function Code 160)

Services  
 Provided By:  
ENGINEER COUNTY

- |            |           |   |
|------------|-----------|---|
|            |           | 1. Geometric Design   |
| <u>YES</u> | <u>NO</u> | a. Horizontal and Vertical Alignment  |
| <u>NO</u>  | <u>NO</u> | 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) A complete explanation of the sequence and methods of stage construction, if proposed, including the initial and ultimate proposed treatment of crossovers and ramps.   |
|            |           | (4) 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.  |
|            |           | (5) 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.   |
|            |           | (6) Direction of traffic flow on all roadways.  |
|            |           | (7) The geometric of speed change (acceleration, deceleration, climbing) lanes.   |
| <u>NO</u>  | <u>NO</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. <b>No geometric design is to be performed until the COUNTY has given the engineer written approval of the preliminary schematic layout. (N/A)</b> |
|            |           | b. All geometric design shall be in conformance with the State's Design Division, Operations and Procedures Manual, except where variances are permitted in writing by the STATE.   |
|            |           | c. The schematic layout shall include basic information which is necessary for the proper review and evaluation including the items listed above in the checklist for schematic layout.   |
|            |           | d. Handling of traffic during construction shall be a consideration in the development of preliminary designs.  |

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

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Services Provided By:		
<u>ENGINEER</u>	<u>COUNTY</u>	
<u>NO</u>	<u>NO</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. 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>g. 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.</li> </ul>
<u>N/A</u>	<u>N/A</u>	3. Exhibit for Airway/Highway Clearance Permits
<u>YES</u>	<u>NO</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>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>YES</u>	<u>N/A</u>	
<u>YES</u>	<u>N/A</u>	<ul style="list-style-type: none"> <li>The location and minimum number of soil core holes required for this project are as follows: (To be determined when schematic is being completed)</li> </ul>

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

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Services

Provided By:

ENGINEER   COUNTY

- |  |  |
|--|--|
| <u>YES</u> <u>NO</u><br><br><u>NO</u> <u>NO</u><br><u>YES</u> <u>NO</u><br><u>NO</u> <u>NO</u><br><u>YES</u> <u>NO</u><br><u>YES</u> <u>NO</u><br><u>N/A</u> <u>N/A</u><br><u>N/A</u> <u>N/A</u> | <p>5. Pavement Design (<i>continued</i>)</p> <p>c. Embankment and Subgrade (<i>continued</i>)</p> <p style="padding-left: 20px;">(2) Identify, interpret and summarize geologic features that affect engineering design (PI, Sulfate content, % of lime)</p> <p>d. Traffic Data for Pavement Design by STATE</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 style="padding-left: 20px;">(1) Core Hole Survey (Show cost estimate with Function Code 110)</p> <p style="padding-left: 40px;">(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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**EXHIBIT "B"**  
**SCOPE OF SERVICES TO BE PROVIDED BY THE ENGINEER**

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

Services  
Provided By:  
ENGINEER COUNTY

- |            |            |  |
|------------|------------|--|
| <u>YES</u> | <u>NO</u>  | 1. Signing and Markings Layout <ul style="list-style-type: none"> <li>a. Requirements (Separate Layout) <ul style="list-style-type: none"> <li>(1) Roadway layout</li> <li>(2) Center line with station numbering</li> <li>(3) ROW lines</li> <li>(4) Culverts and other structures that present a hazard to traffic</li> <li>(5) Location of utilities, if not shown on plan and profile</li> <li>(6) Existing signs to remain, to be removed, to be relocated</li> <li>(7) Proposed signs (illustrated and numbered)</li> <li>(8) Existing overhead sign bridges to remain, to be revised, removed or relocated</li> <li>(9) Proposed overhead sign bridges indicating location by plan layout (electrical details need not be shown on this layout)</li> <li>(10) Proposed markings (illustrated and quantified) which include pavement markings, object markings and delineation</li> <li>(8) Quantities of existing pavement markings to be removed</li> <li>(9) Proposed delineators and object markers</li> </ul> </li> </ul> |
| <u>YES</u> | <u>NO</u>  | 2. Summary of Small Signs Tabulation   |
| <u>N/A</u> | <u>N/A</u> | 3. Summary of Large Signs Tabulation including all Guide Signs   |
| <u>YES</u> | <u>NO</u>  | 4. Sign Detail Sheets <ul style="list-style-type: none"> <li>a. All signs except route markers</li> <li>b. Design details for large guide signs</li> <li>c. Dimensions of letters, shields, borders, corner radii etc.</li> <li>d. Designation of shields attached to guide signs</li> <li>e. Designation of arrow used on exit direction signs</li> </ul>   |
| <u>NO</u>  | <u>N/A</u> | 5. Traffic Signals <ul style="list-style-type: none"> <li>a. Development of Justification (Warrant) Data <ul style="list-style-type: none"> <li>(1) Location Map<br/>Relationship of proposed installation to other traffic signals, highways, business areas and traffic generators</li> <li>(2) Photographs as appropriate</li> <li>(3) Accident data as appropriate</li> <li>(4) Vehicle volumes (provided by TxDOT) <ul style="list-style-type: none"> <li>(a) Existing</li> <li>(b) Estimated</li> <li>(c) Projected</li> <li>(d) Pedestrian</li> </ul> </li> <li>(5) Traffic Survey - Count Analysis</li> <li>(6) Recommendation based on above data</li> </ul> </li> </ul>  |
| <u>NO</u>  | <u>N/A</u> | b. Layout <ul style="list-style-type: none"> <li>(1) Title Sheet (when applicable) <ul style="list-style-type: none"> <li>(a) Describe the location</li> <li>(b) Type of installation</li> <li>(c) Area map with project limits for each location</li> <li>(d) Index of sheets</li> </ul> </li> </ul>  |

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

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Services  
 Provided By:  
ENGINEER COUNTY

- (e) Space for official signatures
  - (2) Estimate and quantity sheet (when applicable)
    - (a) List of all bid items
    - (b) Bid item quantities
    - (c) Specification item number
    - (d) Paid item description and unit of measure
  - (3) Basis of estimate sheet (list of materials)
  - (4) General notes and specification data sheet
  - (5) Condition diagram
    - (a) Highway and intersection design features
    - (b) Roadside development
    - (c) Traffic control including illumination
  - (6) Plan sheet(s)
    - (a) Existing traffic control that will remain (signs and markings)
    - (b) Existing utilities
    - (c) Proposed highway improvements
    - (d) Proposed installation
    - (e) Proposed additional traffic controls
    - (f) When applicable, proposed conduit for Railroad interconnect with standard details for runs under tracks.
    - (g) Proposed illumination attached to signal poles.
  - (7) Notes for plan layout
  - (8) Elevation sheet(s) (span wire design)
  - (9) Phase sequence diagram(s)
    - (a) Signal locations
    - (b) Signal indications
    - (c) Phase diagram
    - (d) Signal sequence table
    - (e) Flashing operation (normal and emergency)
    - (f) Preemption operation (when applicable)
    - (g) Interval timing, cycle length and offset
  - (10) Construction detail sheets(s)
    - (a) Poles (TxDOT standard sheets)
    - (b) Detectors
    - (c) Pull Box and conduit layout
    - (d) Controller Foundation standard sheet
  - (11) Marking details (when applicable)
  - (12) Barricade and warning sign standard sheet and any special details for work zone traffic control for special conditions
  - (13) Aerial or underground interconnect details (when applicable)
- c. General Requirements
- (1) Contact local utility company
    - (a) Confirm power source
    - (b) Discuss route of aerial or underground interconnect cable (when applicable)
    - (c) Adjustment of overhead utility lines
  - (2) Prepare governing specifications and special provisions list
  - (3) Prepare project estimate
- d. Summary of Quantities

<u>NO</u>	<u>N/A</u>
<u>NO</u>	<u>N/A</u>
<u>N/A</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>

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

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**SECTION 10 - MISCELLANEOUS (ROADWAY)**

(Function Code 163)

Services  
 Provided By:  
ENGINEER COUNTY

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

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

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Services  
 Provided By:  
ENGINEER COUNTY

- |  |   |
|--|---|
| <u>YES</u> <u>NO</u>                         | 2. Traffic Control Plan, Detours and Sequence of Construction<br>Traffic Control Plans (TCP) are required for all projects. A detailed TCP shall be developed when traffic handling during construction involves complications for which a feasible solution is not covered by the Texas MUTCD or the current Barricade and Construction (BC) Standards. The following items are required on all Traffic Control Plan Layouts:<br>a. The sequence of construction and method of handling traffic during each phase.<br>b. The existing and proposed traffic control devices that will be used to handle traffic during each construction sequence. Include signals, regulatory signs, warning signs, construction warning signs, guide signs, route markers, construction pavement markings, channelizing devices, portable changeable message signs, flashing arrow boards, barricades, barriers, etc.<br>c. The proposed traffic control devices (stop signs, signals, flag person, etc.) at grade intersections during each construction sequence.<br>d. Where detours are provided, typical cross sections shall be shown.<br>e. Road construction work hours shall be developed after an investigation of the traffic volumes has been performed.                  |
| <u>YES</u> <u>NO</u><br><u>YES</u> <u>NO</u> | 3. Illumination<br>a. Illumination Layout and/or Circuit Layout<br>b. Final Roadway Illumination and Electrical Circuit Layouts (if needed)<br>(1) Roadway layout showing pavement edges, shoulders, curbs, retaining walls, etc.<br>(2) Center line with station numbering.<br>(3) ROW lines.<br>(4) Symbol legend. Use department standard symbols for lighting and electrical.<br>(5) Culverts and other structures that present a hazard to traffic.<br>(6) Location of underground utilities, if not shown on plan profile.<br>(7) Location of overhead electrical lines, both crossing and parallel to ROW.<br>(8) Existing sign lighting circuits and roadway illumination to remain, to be removed, to be relocated.<br>(9) Existing service poles, electrical circuits, ground boxes, etc.<br>(10) Contact electric utility for service pole locations, voltage characteristics.<br>(11) Location of proposed sign lighting circuits and roadway illumination.<br>(12) Proposed electrical circuits.<br>(13) Tabulation of all quantities including proposed, existing to be relocated, existing to be removed. The layout sheet quantities and lighting summary shall be shown. Tabulations to include estimated quantity with a column for final quantities. |
| <u>YES</u> <u>NO</u>                         | c. General Guidelines for Illumination (If applicable)<br>The ENGINEER shall submit to the COUNTY, well in advance of PS&E due date, the roadway illumination and electrical circuit layout sheets for review by the STATE. Two copies of the layout sheets are to be submitted. One copy will be returned to the Engineer showing corrections that are to be made by the ENGINEER. When final plan submission is made, the ENGINEER shall provide a written statement regarding completion of the corrections.   |
| <u>YES</u> <u>NO</u><br><u>YES</u> <u>NO</u> | 4. Miscellaneous Drafting/Standards<br>a. Erosion Control<br>b. Landscape Development   |
| <u>YES</u> <u>NO</u>                         | 5. Compute and Tabulate Quantities  |
| <u>NO</u> <u>NO</u>                          | 6. Special Utility Details (Irrigation lines)   |

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

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Services

Provided By:

ENGINEER    COUNTY

- |  |  |
|--|--|
| <p><u>N/A</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>N/A</u>      <u>N/A</u></p> <p><u>YES</u>      <u>NO</u></p> <p><u>N/A</u>      <u>N/A</u></p> <p><u>YES</u>      <u>N/A</u></p> <p><br/></p> <p><u>N/A</u>      <u>N/A</u></p> <p><br/></p> <p><u>N/A</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>N/A</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>N/A</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>7. Miscellaneous Structures</p> <p>a. Type of Structure*</p> <p>(1) Overhead Sign Bridges (O.S.B.)<br/> Modifications or special O.S.B. designs shall be prepared using the same design assumptions that are used for the standard O.S.B structures.</p> <p>(a) New O.S.B. structure(s)</p> <p>(b) Structural evaluation of existing O.S.B. structure(s) that are to remain in place or to be relocated.</p> <p>(2) High Mast Illumination Poles (HMIP)</p> <p>(3) Traffic Signal Supports</p> <p>(4) Conventional Illumination Poles (if applicable)</p> <p>(5) Sound Barrier Walls</p> <p>b. Checklist for Layouts (if required)</p> <p>(1) Reference appropriate O.S.B. standard</p> <p>(2) Drilled shaft size and length</p> <p>(3) Soil strength used for design {indicate basis and boring(s) used}</p> <p>(4) Design height</p> <p>(5) Tower heights</p> <p>(6) Leg spacings</p> <p>(7) Design wind speed</p> <p>c. Foundation Studies (Show cost estimate with Function Code 110)<br/> The soils exploration requirements for miscellaneous structures on this project are as follows: (To be provided by the Engineer on an as-needed basis)</p> <p>8. Agreements</p> <p>a. Utility Agreements</p> <p>b. Exhibits for Utility Agreements</p> <p>c. Railroad Agreements</p> <p>d. Railroad Exhibits</p> <p>(1) Railroad Underpasses</p> <p>(2) Railroad Overpasses</p> <p>(3) Railroad Grade Crossing (Replanking)</p> <p>(4) Railroad Grade Crossing Warning Systems (Signals)</p> <p>(5) Other Miscellaneous Sketches for Railroads</p> <p>e. Traffic Signal Agreements</p> <p>f. Exhibits for Traffic Signal Agreements</p> <p>9. Estimate</p> <p>10. Specifications and General Notes</p> |
|--|--|

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

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**SECTION 11 - BRIDGE DESIGN**  
(Function Code 170)

Services  
Provided By:  
ENGINEER COUNTY

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

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

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

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

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Services

Provided By:

ENGINEER COUNTY

- N/A      N/A      2. Preparation of Bridge Layouts (each bridge)
- a. Bridge Layouts (PLAN)
    - (1) Horizontal curve information or bearing of centerline.
    - (2) Including horizontal, vertical, and template information of all roadways or railroads crossed.
    - (3) Bearing of center line or reference line.
    - (4) Skew angle(s).
    - (5) Slope for header banks and approach fills.
    - (6) Control stations at beginning and ending of bridge (with deck elevation), intersections, etc.
    - (7) Approach pavement and crown width.
    - (8) Bridge roadway width and curbs, face of rail, shoulders, or sidewalks.
    - (9) Approach slab and curb returns.
    - (10) Limits and type of riprap.
    - (11) Proposed features under structure.
    - (12) Location of profile grade line.
    - (13) North arrow.
    - (14) Typical bridge roadway section including preliminary proposed beam types and spacings.
    - (15) Cross slope and super elevation data.
    - (16) Minimum horizontal clearances when applicable.
      - (a) Dimensions to features that control clearances. (Calculate and indicate points of minimum vertical and horizontal clearances.
    - (17) Location of soil core holes (station and offset), shown on layout.
    - (18) Bent stations and bearings.
    - (19) Retaining wall locations.
    - (20) Traffic flow directional arrows.
    - (21) Railing types shown.
    - (22) Joint types and seal size, if used.
    - (23) Beam line numbers consistent with span details.
    - (24) Critical horizontal clearances (location of railroad tracks, nearby structures and utilities).
    - (25) Bearings of utilities.
  - b. Bridge Layouts (ELEVATION)
    - (1) Type of foundation.
    - (2) Finished grade elevations at beginning and end of bridge.
    - (3) Overall length of structure.
    - (4) Length, type of spans and units.
    - (5) Type of railing.
    - (6) Minimum calculated vertical clearance(s).
    - (7) Existing and proposed ground lines clearly marked.
    - (8) Grid elevations and stations.
    - (9) Bent numbers encircled.
    - (10) Stationing of bridge compatible with grid stations.
    - (11) Standard title.
    - (12) Profile grade data.
    - (13) Type of riprap.
    - (14) Soil Core Hole information with penetrometer test data shall be shown on the bridge layout at correct station, elevation and scale.
    - (15) Fixed/expansion condition of all bents.
    - (16) Column "H" heights.
    - (17) Number, size and length of foundations.

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

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Services  
 Provided By:  
ENGINEER COUNTY

<u>N/A</u>	<u>N/A</u>	2. Preparation of Bridge Layouts (each bridge) <i>(continued)</i> c. Additional layout requirements for waterway structures and bridge classification culverts. (1) Design and 100-year peak discharges. (2) Design and 100-year high water (HW) (Recorded HW and date if available) (3) Natural and through-bridge velocities for design and 100-year floods. (4) Calculated backwater for design and 100-year floods. (5) Direction of flow for waterway crossings. (6) Contours for water crossing.
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<u>YES</u>	<u>NO</u>	3. Bridge Classification Culvert, Estimate, Quantities, and Specifications (each bridge)
<u>YES</u>	<u>NO</u>	4. Foundation Studies (Show cost estimate with Function Code 110) The minimum number of soil core holes shall be obtained in accordance with Section 1-301 of the Bridges and Structures Foundation Exploration and Design Manual. Soil core holes shall be obtained at approximately (300 foot) intervals along bridge alignments. Texas cone penetrometer (TCP) tests shall be conducted in all soil types encountered at a maximum of (10 foot) intervals. If single column bents with single drilled shafts are planned, TCP values should be taken at close intervals in the upper (15 feet).

<u>N/A</u>	<u>N/A</u>	5. Bridge Total Quantities and Cost Estimates (each bridge)
<u>N/A</u>	<u>N/A</u>	6. Bridge Special Provisions and Specifications (each bridge)
<u>N/A</u>	<u>N/A</u>	7. Bearing seat elevations for each beam or girder. Top of cap elevations for non-beam type structures.

<u>N/A</u>	<u>N/A</u>	8. General Guidelines for Bridge Design a. The ENGINEER shall prepare a bridge layout of each bridge structure for Company's review and approval. The bridge layout shall be in conformance with the Bridges and Structures, Operation and Planning Manual and the Bridges and Structures, Detailing Manual. Soil core hole data is not required for submission of the preliminary bridge layout. <b>No bridge design work is to be performed until the COUNTY has given the engineer written approval of the preliminary bridge layout.</b>
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Several months may be required, after the preliminary bridge layout is submitted, for the district to obtain approval and/or permits from the following:

- TxDOT Design Division, when applicable:
  - Railroad Companies
  - FHWA
  - U.S. Army Corps of Engineers
  - U.S. Coast Guard
  - Bureau of Reclamation
  - Texas Parks and Wildlife
  - Others

Therefore, the bridge layout should be submitted at the earliest possible date and the ENGINEER’s design schedule should reflect this.

- b. All bridge superstructure and substructure design will be reviewed by the Design Division for purposes of verifying structural integrity and optimization of design.
- c. The final bridge layout shall be in conformance with the Bridges and Structures, Operation and Planning Manual and the Bridges and Structures Detailing Manual.

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

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Services  
Provided By:  
ENGINEER COUNTY

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

- d. The ENGINEER shall make final design calculations and final detail drawings in accordance with standard requirements of the Texas Department of Transportation. All bridge design shall be in conformance with the Texas Department of Transportation Bridges and Structures Operation and Planning Manual, the current American Association of State Highway and Transportation Officials or American Railway Engineers Association Specifications for railway structures, Standard Specifications for Highway Bridges, including applicable interim specifications, and the Bridges and Structures, Foundation Exploration and Design Manual. The ENGINEER shall furnish design calculations to the Design Division. **The designer and checker shall check all calculations and initial each page.**
- e. Structural steel or prestressed concrete shop drawings, form work drawings and false work drawings are not part of the design requirements. However, contract plans shall be in sufficient detail to permit the preparation of complete shop details for fabrication and erection.
- f. Elements of the bridge (abutments, bents, slabs, etc.) shall be detailed to a metric scale of 1:20 (1/2 inch equals one foot architect scale) or 1:50 (1/4 inch equals one foot architect scale) to provide clear legible drawings when the drawings are reduced. Lettering shall be a minimum size of 4 millimeters (5/32 inch) height for hand lettering and 140 for lettering by computer-aided design and drafting (CADD).
- g. Standard drawings for beams, diaframs, railings, armor joints, riprap, etc., shall be furnished to the ENGINEER upon request. These standards shall not be redrawn by the ENGINEER nor shall his title block be transferred to the standard drawings. Modifications to the standards, if necessary, shall be clearly identified and designated by "MOD" in the standard title. Specific special drawings prepared by the ENGINEER shall not be identified as standards.
- h. Bridge layout sheets shall have the same vertical and horizontal scale. Usually a metric scale of 1:100 (1 inch = 10 feet) or 1:200 (1 inch = 20 feet) is used. Sections of existing and proposed structures usually have a metric scale of 1:50 (1 inch = 5 feet). Soil core holes shall be positioned and labeled on the bridge layout plan view. The core hole data shall be plotted at the correct station, at the same vertical scale, and at the proper elevation unless otherwise approved by the Design Division.
- i. APPENDIX C, "GENERAL PLAN CHECKLIST", on pages C-1 thru C-5, more specifically relates various sheet types, details, summaries, standards, etc.
- j. For purposes of uniformity statewide, soil core hole data shall be shown on layouts as illustrated in the Bridges and Structures Foundation Exploration and Design Manual.
- k. Geometry and structural design errors found after acceptance of bridge plans shall be promptly corrected by the consultant at no cost to the Company.

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

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**SECTION 12 - CONSTRUCTION PHASE SERVICES**  
(Function Code 320)

Services  
Provided By:  
ENGINEER COUNTY

YES      NO      **CONSTRUCTION MANAGEMENT SERVICES:**

The ENGINEER will provide general CONSTRUCTION MANAGEMENT AND SUPPORT services related to design implementation.

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

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**SECTION 14**  
**ADDITIONAL RESONSIBILITIES**

**Easements, Letters of Permission, Etc.**

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

**Coordination of Utilities**

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

**Meetings**

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

**Specifications, Special Provisions, Special Specifications**

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

**Project Manager/Engineer Communication**

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

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

**Design Responsibilities**

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

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

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

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

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**Document and Information Exchange**

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

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

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

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

CD Tape Required (YES or NO): YES

**Proposal Time**

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

**Office Location**

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

<u>Service</u>	<u>Office Location</u>
PS&E & Other Design Related Services	Mission Office

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

## **EXHIBIT “B-1”**

### **Services to be Provided by the Laboratory**

#### **GENERAL SCOPE OF WORK**

The work to be performed by the **Laboratory** under this Work Authorization shall consist of; Geotechnical Drilling and Miscellaneous Field Services, Geotechnical Laboratory Testing Services and Geotechnical Engineering Services for the Regional Linear Park Project (Phase I PS&E – Geo) hereinafter denoted as the **Project**.

The **Laboratory** shall provide all services required (as noted under this Work Authorization) for usage by the **Engineer** in the preparation of plans, specification and estimate, and related documents for the **Project**. The **Laboratory** shall maintain a direct line of communication and coordinate with the **Engineer** throughout the project.

The **Laboratory** shall furnish all equipment, materials, supplies, and incidentals as needed to perform the services required, except as otherwise specified to be provided by the **Engineer**.

Specific activities to be performed by the **Laboratory** include the following:

#### **I. Geotechnical Drilling Services and Miscellaneous Field Services**

The **Laboratory** will coordinate with the **Engineer** for verification of project vicinity map indicating general boring site locations.

The **Laboratory** will provide drilling/excavation and sampling of subsurface materials as follows in accordance with this Work Authorization and in conformance with ASTM guidelines:

- Tunnel Crossing Borings - Two (2) Borings will be drilled at approximate location of proposed tunnel crossing structure (Borings will be advanced to a depth of approximately 35 feet below the existing top of natural ground) – TCP Borings
- Pavement Borings - Six (6) Borings will be drilled along proposed alignment of project trail (Borings will be advanced to a depth of approximately 10 feet below the existing top of natural ground) – SPT Borings

The **Laboratory** will stake the boring locations and provide utility clearances prior to performing the field exploration portion of the project. The **Engineer** will be responsible to provide any necessary permits or authorization to access areas (right of entry) where borings are to be drilled. All borings will be located in the field by a representative of the **Laboratory**. All boring locations will be documented with GPS coordinates. Field survey and tie-down locations of all borings will be the responsibility of the **Engineer**.

The borings will be advanced to the specified depth(s) and in-situ soil testing will be performed in general accordance with ASTM and/or TxDOT Standard Test Procedures and Geotechnical Manual (ASTM D1586 – Standard Penetration Testing (SPT) and/or Tex-132-E – Texas Cone Penetration (TCP)). In addition, where applicable, thin-walled Shelby tube samples may be

Laboratory: L&G Consulting Engineers, Inc. (Lab Division)

Engineer: L&G Consulting Engineers, Inc.

collected (ASTM D1587 – Thin Walled Tube Sampling). The soils will be sampled as needed to verify subsurface materials and strata changes. Final drilling depths and elevations will be based on topographic conditions at the time of drilling operations.

All samples will be removed from the sample apparatus during drilling operations. The **Laboratory** will conduct various field tests on the recovered samples, visually classify the samples, and record the appropriate data on a field boring log. The samples will be appropriately packaged to minimize loss of natural moisture content and to reduce the possibility of damage during transportation to the soil testing laboratory facility.

Drilling services will include an initial water strike depth and a 24-hour water level reading at each boring location. Following completion of drilling and sampling, all boreholes will be backfilled with soil cuttings from the completed borings. If there is insufficient soil cuttings available, alternate fill will be used to backfill the completed boreholes.

This proposal does not include activities and corresponding costs that may be associated with the following:

- Providing an ATV mounted drill rig, dozer or special equipment to clear areas of vegetation and debris or re-grading the site to gain access to the boring locations;
- Re-grading the site or portions of the site after drilling activities are completed;
- Site safety meetings that may be required;
- Encountering hazardous or contaminated soils or substances during our field activities.

The **Laboratory** will notify the **Engineer** should these services become necessary to complete field exploration activities, and if approved by the **Engineer**, additional negotiated fee and scope will be incorporated through Supplemental Work Authorization.

## **II. Geotechnical Laboratory Testing Services**

Geotechnical Laboratory Testing will be performed by the **Laboratory** on the samples recovered during the field study to evaluate their physical and engineering properties. Laboratory testing will be performed in general accordance with ASTM and/or TxDOT Standard Test Procedures. Testing shall include the following test procedures:

- (1) Atterberg Limits (ASTM D4318 or Tex-104-E, 105-E, 106-E)  
This procedure will be used to aid in the classifying of the soil and to provide information on the potential vertical rise and contraction of the soil. Test data furnished will include Liquid Limit, Plasticity Index, and Linear Shrinkage test results.
- (2) Gradation (-200) (ASTM D1140 or Tex-111-E)  
This procedure will be used to aid in the classifying of the soil. A No. 200 sieve will be used to distinguish fine grained material as well as for cohesive soils.

Laboratory: L&G Consulting Engineers, Inc. (Lab Division)  
Engineer: L&G Consulting Engineers, Inc.

- (3) Lab. Determination of Moisture in Soils (ASTM D2216 or Tex-103-E)  
This procedure will aid in determining the in-situ moisture of the soil to be able to evaluate the potential vertical rise and contraction of the soil.
- (4) Particle Size (Sieve) Analysis with Hydrometer (ASTM D422)  
This procedure will aid in determining the complete gradation (full gradation curve) of a soil sample including hydrometer for tail-end portion of gradation curve. Full gradation curve can be utilized to extract D50 and D90 soil particle diameters for use in scour analysis and prediction for foundation design.
- (5) Sulfate Content of Soil (ASTM C1580 or Tex-145-E)  
This procedure will identify the soluble sulfate content of soil by using the colorimetric method. The results of this procedure are typically utilized to determine whether or not a subgrade material can be lime treated for stabilization or if other methods of stabilization will need to be proposed. The presence of extreme amounts of soluble sulfates will exclude lime treatment as a stabilization option. Additionally, high presence of sulfates in soils can mark a necessity for the use of Sulfate Resistant Concrete (> than 1000 ppm).
- (6) Lime Series Testing (Tex-121-E)  
This procedure involves establishing a relationship between plasticity of soils, percentage lime and pH through the addition of hydrated lime at predetermined proportions. Results of this test will determine the required percent lime treatment for pavement subgrade.

### III. Geotechnical Engineering Services

The **Laboratory** will utilize information gathered from the field and laboratory testing to provide the **Engineer** with Geotechnical Engineering results and analyses for the **Project**. The findings and conclusions derived from the results and analyses will be presented in a written engineering report and provided to the **Engineer** (three (3) copies). The report will include a boring location plan, boring logs with laboratory classification of recovered soil samples at the boring locations and subsurface water conditions encountered. The report will provide analyses and/or engineering recommendations as follows:

1	Structural Evaluation of Borings / Calc. Shear Strength Models / Soil Profiles
2	Bearing Suitability at Structure Locations (Tunnel Crossing)
3	Slope Stability Analysis - General Typ. Section at Crossing
4	Pavement Analysis & Recommendations (Trail)
5	Channel/Tunnel Recommendations - Geometry, Geotech Issues, Limits, Const.
6	Geotechnical Report (Including Soil Survey/Geog./All Analyses)
7	Meetings/Coordination

Laboratory: L&G Consulting Engineers, Inc. (Lab Division)

Engineer: L&G Consulting Engineers, Inc.

**“EXHIBIT B-1”**

Page 3 of 4

The report will provide general comments and applicable recommendations regarding construction methods, sequences, and potential difficulties that may arise during overall construction as it relates to the soil aspects of this project. This information may serve to guide both geometric modeling and foundation selection and design as well as provide assistance in the preparation of specifications for the project.

**EXHIBIT C**  
**PROJECT DEVELOPMENT SCHEDULE**  
**Regional Linear Park Project**  
**Section: From San Antonio Ave. to Ridge Road**  
**Length = 2.57 miles**

TASK AND DESCRIPTION	FIRM	2016									2017							
		MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	
<b>PS&amp;E &amp; Other Design Related Activities</b>																		
PS&E Development	L&G		■	■	■	■	■	■										
Geotechnical	L&G			■	■													
Hydrology & Hydraulics	L&G		■	■	■													
TxDOT Comment Incorporation to PS&E	L&G							■	■									
Permitted Utilities Coordination to Adjust	L&G				■	■	■	■										
Eng Consultant Construction Management	L&G								■	■	■	■	■	■				



**Exhibit D-1  
FEE SCHEDULE**



**Geotechnical Engineering, Report & Summary**

L&G Consulting Engineers, Inc. (Division: L&G ENGINEERING LAB)

			MANHOURS					
			Senior Project Manager	Senior Engineer	Project Engineer	CADD Operator	Admin/Clerical	Total
<b>Regional Linear Park Project (Phase I PS&amp;E - Geo)</b> <b>Client: Hidalgo County Pct. 2</b>								
<b>TASK</b>								
	1	Structural Evaluation of Borings / Calc. Shear Strength Models / Soil Profiles			2			2
	2	Bearing Suitability at Structure Locations (Tunnel Crossing)			4			4
	3	Slope Stability Analysis - General Typ. Section at Crossing			8			8
	4	Pavement Analysis & Recommendations (Trail)			4			4
	5	Channel/Tunnel Recommendations - Geometry, Geotech Issues, Limits, Const.		2	4			6
	6	Geotechnical Report (Including Soil Survey/Geog./All Analyses)	2	4	12	4	2	24
	7	Meetings/Coordination	2	2				4
		<b>Subtotal</b>	<b>4</b>	<b>8</b>	<b>34</b>	<b>4</b>	<b>2</b>	<b>52</b>
<b>Labor Hours</b>			<b>4</b>	<b>8</b>	<b>34</b>	<b>4</b>	<b>2</b>	<b>52</b>
Contract Rate (FY 16)			\$ 224.58	\$ 186.08	\$ 137.96	\$ 70.58	\$ 64.17	
<b>Total Labor Costs</b>			<b>\$ 898.32</b>	<b>\$ 1,488.64</b>	<b>\$ 4,690.64</b>	<b>\$ 282.32</b>	<b>\$ 128.34</b>	<b>\$ 7,488.26</b>

LINE ITEM EXPENSES

Printing Reproduction (Estimated 3 Reports x Approx. 25 Pages per Report) \$ 90.00

\*L&G Consulting Engineers, Inc. (Sub-Total for Geo. Field & Lab Services) \$ 15,587.92

\* - (Please see page 2, for detailed estimates of testing)

**Total Expenses \$ 15,677.92**

**L&G Laboratory Total Cost**

**\$ 23,166.18**

**Exhibit D-1**  
**Geotechnical Field and Laboratory Services**  
**Regional Linear Park Project (Phase I PS&E - Geo)**  
**Prepared for Hidalgo County Pct. 2**

	SERVICES		UNITS	UNITS	UNIT COST	TOTAL COST
<b>I.</b>	<b>Project Management / Review</b>					
	A. Principal / Project Manager / Review		Hours			
	B. Senior Engineer		Hours	1	\$ 186.08	\$ 186.08
	C. Typing and Clerical (Report)		Hours			
	D. Lodging		Day			
	E. Mileage		Mile			
	F. Air Travel		Trip			
<b>II.</b>	<b>Utility Clearances / Boring Locates</b>					
	A. Technician (Locate Borings)(Util Clr)		Hours	4	\$ 54.54	\$ 218.16
	B. Staff Engineer/Geologist/Scientist		Hours			
	C. Rebar (stakes with impalement covers)		Cost +12.5%			
	D. Vehicle Charge		Mile			
	E. Mileage		Mile	40	\$ 0.55	\$ 22.00
	F. Survey Locate Borings (X,Y,Z)		LS			\$ -
<b>III.</b>	<b>Field Exploration</b>					
A	Mobilization/Demobilization		Day	2	\$ 441.66	\$ 883.32
B	Field Exploration					
	1a. Soil Boring (Solid Stem)		Feet	130	\$ 31.08	\$ 4,040.40
	1b. Soil Boring (Mud Rotary)		Feet			\$ -
	2. TxDOT TCP Field Test (BL/ft)		Ea.	14	\$ 5.55	\$ 77.70
	3. Field Logger / Engineering Tech		Hour	20	\$ 54.54	\$ 1,090.80
	4. 24 Hr. Water Level Observations		Hour	2	\$ 54.54	\$ 109.08
	5. Piezometers		Each			\$ -
	6. Supp. Vehicle-Trailer, Tools Water Supply		Mile	80	\$ 1.65	\$ 132.00
	7. Vehicle Charge		Mile	120	\$ 0.55	\$ 66.00
C	Miscellaneous Field Services					
<b>IV.</b>	<b>Engineering Data Analysis / Report</b>					
	1. Staff Engineer		Hours			
	2. Project Engineer (Soil Classification)		Hours	4	\$ 137.96	\$ 551.84
	3. Project Engineer (Logs & Summaries)		Hours	4	\$ 137.96	\$ 551.84
	4. Moisture Content		Ea.	44	\$ 10.55	\$ 464.20
	5. Atterberg Limits		Ea.	24	\$ 79.66	\$ 1,911.84
	6. -200 Determination		Ea.	22	\$ 66.47	\$ 1,462.34
	7. Sieve Analysis (w/ Hydrometers)		Ea.	2	\$ 95.76	\$ 191.52
	8. UC Testing (w/ Unit Weight)		Ea.			\$ -
	9. Consolidation Testing		Ea.			\$ -
	10. Dry Unit Weight		Ea.			\$ -
	11. Soils Sulfate Content		Ea.	6	\$ 86.40	\$ 518.40
	12. Determination of Soil pH		Ea.			\$ -
	13. Lime Series Testing (5 Pt.)		Ea.	6	\$ 518.40	\$ 3,110.40
<b>Project Sub-Total (Geo Field and Lab)</b>						<b>\$ 15,587.92</b>