

HIDALGO COUNTY
Professional Engineering Services
Contract # C-12-314-01-29
Work Authorization Form

Work Authorization No. 2

THIS WORK AUTHORIZATION is made pursuant to the terms and conditions of Article 1 of the Agreement made by and between the **HIDALGO COUNTY**, acting herein by and through Commissioner's Court, hereinafter called the "**Owner**," and, **R. GUTIERREZ ENGINEERING CORPORATION**, professional engineers of Pharr, Texas, hereinafter called "**Engineer**".

PART 1. SCOPE OF WORK

The purpose of this Work Authorization is for the **Engineer** to provide professional engineering and surveying services and for the reconstruction and widening of Thomas Road from a rural two-lane roadway to an urban four-lane roadway. Turn lanes will be provided at major intersections. The limits of the project are from FM 2061 (Jackson Road) on the west to FM 2557 (Stewart Road) on the east, a distance of approximately 3.65 miles.

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

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

PART 2. ESTIMATED COST

The estimated cost for services under this Work Authorization is not to exceed **\$1,029,585**. A detailed breakdown of the amount to be paid is more particularly described in **Attachment D – Proposed Fee**. The actual amount payable for services under this Work Authorization will be in accordance with Article 6.

PART 3. PAYMENT

Payment to the **Engineer** for the services established under this Work Authorization shall be made in accordance with Article 9.

PART 4. FUNDING

This Work Authorization shall be funded through funding source:

Account No. 3-1315-431-00-122-085-0-731/841

Requisition No. #238543 (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 terminate upon completion of the scope of services of the work as provided in Article 4.

PART 6. RESPONSIBILITIES AND OBLIGATIONS

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

PART 7. ACCEPTANCE AND ACKNOWLEDGEMENT

This Work Authorization is hereby accepted and acknowledged as indicated below and effective as of ___ day of _____, 2013.

ENGINEER:

R. Gutierrez Engineering Corporation

By: Ramiro Gutierrez
Name: Ramiro Gutierrez, P.E.
Title: President

OWNER:

COUNTY OF HIDALGO

By: Hector Palacios
Name: Hector "Tito" Palacios
Title: Commissioner Pct. No. 2

By: Ramon Garcia
Name: Ramon Garcia
Title: County Judge

ATTEST:

By: Arturo Guajardo, Jr.
Name: Arturo Guajardo, Jr.
Title: Hidalgo County Clerk

APPROVED BY
COMMISSIONERS' COURT
ON: 6/25/13

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 – Proposed Fee

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EXHIBIT A

Services to be Provided by the Owner

The following provides an outline of the services to be provided by the **Owner** in the development of the **Project**.

General

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

- (1) Payment for work performed by the **Engineer** and accepted by the **Owner** in accordance with Article 5 and Article 6, both of this Agreement.
- (2) Obtain professional services required for the project that are not included as part of this Work Authorization or authorize a Supplemental Agreement to this Work Authorization for obtaining the necessary professional services not included as part of this Work Authorization.
- (3) Assistance to the **Engineer**, as necessary, to obtain the required data and information from other local, regional, State and Federal agencies that 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.
- (6) Attend and participate in progress meetings as required and as coordinated and conducted by the **Engineer**.
- (7) Assist **Engineer** with obtaining permission to enter on properties for the purpose of surveying and engineering investigations for the project.

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EXHIBIT "B"

Services to be provided by the ENGINEER

SCOPE OF SERVICES

General

The project will consist of reconstruction and widening of Thomas Road from a rural two-lane roadway to an urban four-lane roadway. Turn lanes will be provided at major intersections. The limits of the project are from FM 2061 (Jackson Road) on the west to FM 2557 (Stewart Road) on the east, a distance of approximately 3.65 miles. The work to be furnished under this Authorization for Professional Services shall be as follows:

- I. **General Management / Coordination**
- II. **Preliminary Engineering and Schematic Development**
- III. **Environmental Assessment & Public Involvement**
- IV. **Plans, Specifications & Estimate**

The work shall consist of professional engineering services for the development of the project. The work is described in more detail as follows:

I. **GENERAL MANAGEMENT / COORDINATION**

- 1) The **Engineer** shall design, develop and prepare all documents in English units.
- 2) The **Engineer** shall develop/submit a work schedule with milestone activities and/or deliverables identified.
- 3) The **Engineer** shall utilize Microstation computer graphics system. Roadway design will be developed using GEOPAK.
- 4) The **Engineer** shall be required to meet with designated Client's representatives, utility companies, adjacent and affected landowners as required for coordination during the development of the project.
- 5) The **Engineer** shall coordinate and conduct a meeting with TxDOT to determine and review any preliminary planning under development by TxDOT for adjoining and adjacent roadways, including: advanced project development activities for FM 2061, US 281, and FM 2557 as well as any other proposed project activities within the area.
- 6) The **Engineer** shall coordinate and conduct a meeting with the Hidalgo County Regional Mobility Authority to determine and review any project development being undertaken by the RMA within the project vicinity.
- 7) The **Engineer** shall be required to prepare the minutes for any meeting as required for documentation purpose.
- 8) Right of Entry: It will be the responsibility of the **Engineer** to secure permission, short of litigation, to enter private property for purposes of survey, environmental and engineering investigations. The **Engineer** will, at all times, contact the property owner prior to any entry onto the owner's property.
- 9) The **Engineer** shall perform quality control and assurance (QC/QA) on all deliverables associated with this project.
- 10) The **Engineer's** Project Manager will continually review the quality and progress of the various tasks assigned to all firms within the project team. Quality review will include technical requirements.

II. PRELIMINARY ENGINEERING & SCHEMATIC DESIGN

In general, the scope of services will include all management and engineering activities required for the final work activities to complete *Preliminary Engineering and Schematic Design* of the Project. More specifically, the work activities to be provided will include:

Route and Design Studies

- 1) The **Engineer** shall develop and assemble Preliminary Construction Cost Estimates.
- 2) The **Engineer** shall develop Roadway Design Criteria; prepare the Design Summary Report.
- 3) The **Engineer** shall coordinate and conduct a Design Concept Conference; prepare meeting announcements / invitations, agenda, and final notes; invite stakeholders and reviewing agencies as approved by **Client**.
- 4) The **Engineer** shall determine minimum right-of-way and easement requirements using the proposed typical sections and preliminary cross-sections.
- 5) The **Engineer** shall adjust the proposed typical sections to accommodate refinements in design of the proposed alternative. Such refinements may include widening of pavement for turn lanes, changes in side slopes to reduce right-of-way requirements, use of retaining walls to minimize right-of-way and environmental impacts, addition of the proposed pavement design section, and other changes in the roadway typical section.
- 6) The **Engineer** shall establish the existing horizontal alignment of the existing roadway.
- 7) The **Engineer** shall establish the proposed horizontal alignments for 3 alternatives to be considered.
- 8) The **Engineer** shall determine the drainage outfall requirements for the proposed alternatives.
- 9) The **Engineer** shall determine the additional right-of-way requirements for the proposed alternatives.
- 10) The **Engineer** shall provide an ENGINEERING SUMMARY REPORT outlining the various design alternatives considered with reasons for selection of the preferred alternative. All of the engineering analysis and methodology used in determining the preferred alternative will be documented in the report.

Development of level of service analysis, turning movement counts or traffic counts are not included in the scope.

Field Survey

The **Engineer** shall provide the following (within the limits of the project)

FIELD SURVEYING

- (1) Work shall assure compliance and adherence to all rules, regulations and policies as set forth by the Texas Board of Professional Land Surveyors.
- (2) The **Engineer** shall provide all traffic control, labor and equipment for the Traffic Control Plan (TCP) while performing services under this work authorization. The **Engineer's** Surveyor shall comply with the regulations of the most recent edition of the "Texas Manual on Uniform Traffic Control Devices".

Vertical and Horizontal Control

- (1) Project Control and Baseline (Set in location clear of proposed improvements)
 - a) Establish Horizontal and Vertical Control Benchmarks by setting permanent benchmarks with an Aluminum disk on a 5/8" iron rod set in concrete, every 1000' throughout the limits of the project. Establish elevations on set points within the specifications of the TSPS Category 8. If applicable, NGS first order benchmarks shall be incorporated into the level loops utilizing the NAVD88 Datum elevations. 11" x 17" mylar Signed and Sealed, RPLS, control data sheets shall be created for the newly establish BMs and included in the deliverables.
 - b) Stake existing centerline
 - i) Set 2' #5 iron rods at every 1000 ft, at all angle points, PC's, PT's and all intersecting roadways. Center points to be set are every 1000 feet.

- ii) Reference all angle points, PC's, PT's, and at 1000 foot interval stations with iron pins on the right of way line (on both sides).
- iii) Stationing shall correspond with the design centerline. Stationing shall be painted at 500-foot stations on the pavement using traffic paint.

Digital Terrain Model (DTM)

- (1) Obtain cross sections every 100 ft at whole stations. Cross sections to extend 10 ft outside of proposed right of way. Obtain additional survey information as necessary to accurately develop a digital terrain model (DTM).

Topographic Survey

- (1) Topographic Survey (All work will be to 10 foot outside of the proposed ROW)
 - a) Obtain driveway cross sections. Cross sections to extend 10 ft outside of proposed right of way.
 - b) Update Inventory public access, commercial, and private driveways by type (dirt, caliche, gravel, concrete or paved).
 - c) Side Drains
 - i) Obtain approximate roadway centerline station.
 - ii) Obtain size, length, description of structure, and conditions.
 - iii) Obtain F.L. elevations at both ends and offsets to driveway or turnout centerline.
 - iv) Label descriptions (size and length) on each side drain.
- (2) Culverts:
 - a) Obtain size of drainage structure, type, skewed angle, and material. Label and describe each structures (for example if it's an irrigation or drainage culvert) size and length.
 - b) Locate and obtain inlet and outlet flow lines elevations at structures, top of headwall, aprons, edge of pavement, and center line.
 - c) Obtain profile and cross sections of upstream and downstream ravines on man-made channels leading from and to the existing or proposed structure. These profiles and cross sections shall extend from inlet and outlet flow lines to distance of 500 ft. beyond the right of way or as directed by the **Engineer**.
 - d) Determine type of wingwall (i.e. flared wingwall, parallel, etc...) and safety end treatments (pipe runners, safety end treatments, barrier rail, etc. For barrier rail include type of end treatments, location, type, length, and height.
 - e) Obtain pictures of culverts barrels and outlet and inlet view to right of way line.
- (3) Fence, Mailboxes, and Sign Inventory:
 - a) Locate and obtain mailboxes inventory (type-identify as single, double or multiple) for all mailboxes within R.O.W. and at all intersection locations. Include photographs.
 - b) Locate and obtain sign inventory (type) for all signs within R.O.W. and at all intersection locations. Include pictures.

Miscellaneous

- (1) Miscellaneous
 - a) Locate any topographic feature within the project area (All work will be to 10 foot outside of the proposed ROW) in addition to the items specifically mentioned above.
 - b) This item requires the surveyor to pick up any items that may be an obstruction for the proposed construction or may require special attention during the development of construction plans (ex: oil and gas on proposed right of way, etc.)
 - c) ASCII files shall be provided to the State. These files shall be retrieved from GPS/Data Collector and shall be compatible with Microstation.
 - d) Field books, containing all information gathered in the field, this information shall be to the surveyor's best knowledge, accurate and complete.
 - e) Survey in miscellaneous items not indicated above that are within the existing and proposed right of way.

RIGHT OF WAY SURVEY

Utility Coordination/Inventory

- 1) Utility (All work will be to 10 foot outside of the proposed ROW)
 - a) The **Engineer** shall meet with Utility providers periodically to coordinate the work efforts and resolve any utility related problems. The **Engineer** shall prepare the minutes for these meetings and forwarded to the Client. The **Engineer** shall address the following issues and any other items deemed necessary during the Utility Coordination meetings:
 - i) Activities completed since last meeting
 - ii) Problems encountered.
 - iii) Late activities.
 - iv) Activities required by the next progress meeting.
 - v) Solutions for unresolved and/or anticipated problems.
 - vi) Information or items required from other agencies/consultants.
 - b) If a reimbursable utility relocation exists, the **Engineer** shall request conveyance documents from the utility provider.
 - c) The **Engineer** shall notify the Utility companies in writing and request the following information in writing:
 - i) Project letting date and request they relocate prior to letting.
 - ii) Develop their relocation plan according to Utility Accommodation Policy Manual.
 - iii) Forward their relocation plan to the **Engineer**.
 - iv) Request in writing when relocation of utilities will be complete.
 - v) Upon immediate completion of relocation, request they forward as-built plans to the Client.
 - d) The **Engineer** shall develop the typical sections, alignment, and preliminary cross sections addressing the utility location and shall forward these to the respective utility company.
 - e) The **Engineer** shall update all files and plans based on the utility company responses.
 - f) The **Engineer** shall identify all utility conflicts on the plans and prepare layouts and profiles of existing utility crossings showing conflicts of utilities with proposed improvements. The **Engineer** shall forward these layouts to the Client and the utility companies. During design process, the **Engineer** shall field verify all visible utility conflicts.
 - g) The **Engineer** shall verify the proposed relocation plan submitted by the Utility companies to assure their design is according to Utility Accommodation Policy Manual. Upon the **Engineer's** review and concurrence with the proposed relocation plan, they shall forward their recommendation for approval to the State.
 - h) Contact "One Call" to request marking of underground utilities
 - i) Request existing utility information from local utility companies
 - j) The **Engineer** will perform any surveying necessary to for horizontal location of located, "Flagged", underground utilities and visible overhead utilities.
 - k) The **Engineer** will obtain measure downs on utilities as follows
 - i) Top of key on gas line values
 - ii) Top of key on water line values
 - iii) Flowline, size of tie-ins and direction of flow for sanitary sewer manholes
 - iv) Flowline, size pipe for irrigation systems
 - v) Flowline and size of system for inverted siphons.
 - l) The **Engineer** will develop a Utility Communications Folder for each utility. This folder will document the utility coordination, and include all correspondence with the affected utility company and the city & county officials. This includes all communication by sub-providers and the Client. It will be the Client's responsibility to ensure the **Engineer** is provided with communication initiated or received by the Client.
 - m) Subsurface Utility Engineering **is not** included in the scope of work.

Right-of-Way

- 2) Right of Way
 - a) The **Engineer** shall obtain the most current existing adjoining right of way information information as follows:
 - i) Plats
 - ii) Deeds
 - iii) Ownership information
 - b) The **Engineer** shall survey in the exiting roadway right of way and adjoining parcel lines in the project coordinate system.
 - c) Microstation file shall be provided to show the following:
 - i) Existing roadway right of way
 - ii) Adjoining parcel property lines
 - iii) Legal information
 - iv) Ownership information
 - d) The **Engineer** shall stake all proposed right of way and drainage easement necessary for preparation and construction of this project as required to finalize the acquisition process and as required for utility relocations.
 - e) Right of Way Map (NOT SEALED) Development – The **Engineer** will provide the Right of Way Maps in accordance with the TxDOT Checklist below:
 - i) General
 - (1) Graphics files will be in Microstation and Word software.
 - (2) Photos of proposed ROW staking included.
 - (3) Field notes and Parcel Plats are numbered continuous.
 - (4) Scale shall be 1"=50' for 34" x 22" plans and 1"=100" for 11" x 17" plans
 - ii) Title Sheet Requirements
 - (1) Title and description of project including county, limits, etc.
 - (2) Vicinity map with begin and end sta.
 - (3) Equations and Exceptions
 - (4) Index
 - (5) Legend
 - (6) Title block completely filled out with Construction and R.O.W. CSJs'
 - (7) List all Major Utilities from Station to Station
 - iii) Individual Map Sheet Requirements
 - (1) Sheet size 34" X 22"
 - (2) Text legible when reduced to half-scale.
 - (3) Title block completely filled out with R.O.W. CSJ
 - (4) Matchlines
 - (5) Project layout sheet
 - iv) Existing information:
 - (1) R.O.W. lines
 - (2) Whole property or whole property inset
 - (3) Roadways
 - (4) Survey, county, and city limit lines shown and labeled
 - (5) Improvements shown and labeled (see below)
 - (6) Monumentation i.e. P.C., P.T., Break Points
 - (7) North arrow
 - (8) Scale
 - (9) Property lines
 - (10) Property descriptions i.e., lot, block, tract, subdivision, etc.
 - (11) Identify existing and proposed access denial locations (if applicable)
 - v) Proposed information:
 - (1) Type II Monumentation i.e. P.C., P.T., Break Points and 1500' intervals

- (2) Survey and R.O.W. lines
- (3) Basis of bearings
- (4) Parcel bearings and distances correspond with traverse sheet
- (5) Outside ties (P.O.C.) corresponds with field notes
- (6) Point of beginning (P.O.B.) established on proposed R.O.W. line
- (7) Parcel tied to baseline
- (8) Baseline information shown i.e. Stationing, bearings, curve data, etc.
- (9) Conveyance information shown in tables i.e. parcel number, grantors name, amount of take, remainder etc.
- (10) Math checked on remainder
- vi) Improvements:
- vii) Improvements bisected or within 25' of proposed R.O.W. line are shown on map with stationing and distance from proposed R.O.W. line. Buildings are labeled and dimensioned.
- viii) Off-premise outdoor advertising signs within proposed R.O.W. are shown and labeled.
- ix) Utilities:
 - (1) All utilities within or crossing existing and proposed right of way are shown and labeled as to size, easement or fee width, and recording data of instrument.
 - (2) Location of underground storage tanks and/or filler caps are shown and labeled
- f) Field Notes
 - i) Heading
 - ii) County
 - iii) Highway
 - iv) Parcel number
 - v) R.O.W. CSJ
 - vi) Construction CSJ
 - vii) General Description or "preamble"
 - viii) Area of parcel to be acquired is shown in acreage (0.000) for rural land and/or square feet (to nearest whole sq. ft.) for urban land or smaller parcels
 - ix) Parent tract data is shown:
 - (1) Size of parent tract
 - (2) Survey data or lot, block, and subdivision
 - (3) Name of last recorded seller and buyer
 - (4) Date, volume and page or document number of last recorded conveyance
 - (5) Records and county of last recorded conveyance
 - x) Beginning Description
 - (1) Point of commencement is on outside tie and is described accurately by bearings and distances as it leads to the point of beginning.
 - (2) Point of beginning is on proposed R.O.W. line
 - xi) Particular Description
 - (1) Traverse calls are clockwise sequence
 - (2) Bearings and distances correspond exactly with map, parcel sketch, and traverse sheet
 - (3) Bearings are to nearest whole second and distances are to the nearest one-hundredth of a foot
 - (4) Calls are numbered
 - (5) Denial of access shall be described from beginning to end (if applicable)
 - xii) Closing Description
 - (1) Last call leads back to P.O.B.
 - (2) Restates area of parcel
 - (3) Establishes taking in existing road R.O.W. if applicable

- (4) Legal description is referenced to Plat
 - (5) Sealed and signed
 - (6) Include an access clause whether access is permitted or denied (if applicable)
 - (7) Shows P.O.B. and P.O.C.
 - (8) All data corresponds exactly with Map and Field Notes
 - (9) Sheet size is no larger than 8 1/2" x 11"
 - (10) Plat closely matches example provided
 - (11) Plat referenced to legal description
 - (12) Sealed and signed
 - (13) Include an access clause whether access is permitted or denied (if applicable)
- g) Traverse Sheet
- i) Computations show area to be acquired in sq. ft. or acres, whichever is applicable
 - ii) Computations show area that is existing road R.O.W. if applicable
 - iii) Traverse calls are in clockwise sequence
 - iv) Error of closure meets the following:

(1) Secondary rural	.0003
(2) Primary rural - secondary urban	.0002
(3) Urban or industrial	.00013

Final Design Schematic

- (1) The **Engineer** shall prepare a final design schematic of the **Client**-approved alignment in accordance with the approved Project Design Criteria.

Preliminary Hydrologic/Hydraulic Analysis and Design

The **Engineer** shall perform preliminary hydrologic / hydraulic analysis and design for the proposed improvements and proposed design of the **Project**. The design of drainage improvements shall conform to the **Project** design criteria. The hydrologic / hydraulic design shall in all respects combine the application of sound engineering principles, and TxDOT or other reviewing agency approval. The **Client** will provide the **Engineer** all existing drainage studies or reports that cover the proposed project vicinity and the **Engineer** will take into account the information provided by the reports when developing his proposed design.

Preliminary Hydrologic / Hydraulic Analysis and Design shall include:

- (1) **Hydrologic Analysis** – drainage are maps, hydrologic data / discharge determination, stage-discharge determination.
- (2) Preparation of a stormwater pollution prevention plan (SW3P) in accordance with EPA National Pollution Discharge Elimination System (NPDES) general permit requirements.
- (3) **Hydraulic Report** – documentation of hydrologic analysis and hydraulic computations.

III. ENVIRONMENTAL ASSESSMENT & PUBLIC INVOLVEMENT

In general, the scope of services shall consist of environmental related services required *to acquire a Finding of No Significant Impact (FONSI) for Thomas Road from FM 2061 (Jackson Road), east to FM 2557 (Stewart Road) in south Pharr and San Juan, Texas.*

Task 1 – Project Management and Coordination

The work for this task includes the following:

- A. The SUBCONSULTANT Project Manager will coordinate with the Engineer; direct and coordinate the day-to-day activities and various elements associated with the development of EA.
- B. The SUBCONSULTANT Project Manager will prepare a graphic project schedule indicating tasks, critical dates, milestones, deliverables and TxDOT review requirements. The project schedule will depict the order of the various tasks, milestones, and deliverables. SUBCONSULTANT will submit monthly Invoices and progress reports to the Engineer.
- C. SUBCONSULTANT will prepare for and attend project scoping meeting with TxDOT Pharr District
- D. SUBCONSULTANT will prepare right-of-entry letters and coordinate with property owners for access to properties where acquisition is required.
- E. The SUBCONSULTANT Project Manager will provide ongoing quality assurance and quality control to ensure completeness of product and compliance with TxDOT procedures.

Task 2 – Scoping Documents and Classification Letter

In compliance with TxDOT's new environmental rules (new statutory requirements passed by the 82nd Texas Legislature) related to the environmental review process for transportation projects, which were effective April 16, 2012, a scoping meeting must be held and a "project scope" must be agreed to at the outset, which provides an outline for a collaborative agreement between the project sponsor and TxDOT regarding the specific requirements and expectations for the preparation of the environmental document and related services. The project scope also establishes the basis for all subsequent activities and reviews related to the project. SUBCONSULTANT will participate in a scoping meeting with the Client, TxDOT Pharr District and the Engineer. SUBCONSULTANT will provide environmental input and take notes during the scoping meeting and will finalize and distribute the scoping meeting documents to team members for submittal to TxDOT Pharr District.

SUBCONSULTANT will prepare a Classification Letter for submittal to TxDOT Pharr for submittal to TxDOT ENV to receive concurrence on the appropriate level of environmental documentation. The letter will consist of background information, purpose and need, description of the proposed improvements, right-of-way requirements, previous studies, waters of the U.S. issues, potential environmental issues including threatened and endangered species, hazardous materials, potential for controversy, and public involvement activities. A project location map on an aerial depicting the project limits would also be provided.

Task 3 – Environmental Assessment

An Environmental Assessment (EA) will be prepared in accordance with 23 CFR 771.117, the Federal Highway Administration's (FHWA) Technical Advisory T6640.8A, TAC -Title 43, Part 1, Chapter 2, TxDOT Environmental Affairs Division's Standards of Uniformity (SOU). The EA will follow a format

specified on TxDOT's website. The deliverable under this work scope shall be a, where a Finding of No Significant Impact is expected for this project.

The work for this task includes the following:

(A) Data Collection Process and Field Visit

SUBCONSULTANT will research readily available environmental information from appropriate local, state, and federal agencies relative to the project area. A field visit will be conducted in support of the EA document and to visit the existing and proposed areas of ROW identified for the project. Right-of-entry will be secured, if possible before any environmental investigations are performed. If right-of-entry cannot be secured, SUBCONSULTANT will do a "best attempt" to look over the fence.

(B) Environmental Investigations and Assessments

- 1) Need and Purpose of the Project. This task will be based on existing roadway design elements and constraints, current and projected traffic volumes, traffic accident data, and proposed typical sections, schematics, and intersection configurations. As this data is developed, the information will be incorporated into appropriate EA sections describing the need for the project, the objectives and issues eliminated from further study. The project description section will include text and graphics illustrating the proposed project design.
- 2) Alternatives Analysis.
 - This task will include text and graphics illustrating the different alternatives considered prior to selecting the preferred.
 - It will also describe the reasonable alternatives and those eliminated from further study.
- 3) Affected Environment and Environmental Consequences. For each of the categories listed below, the necessary background and field reconnaissance will be performed to include in the EA. Data will be provided on a regional scale, but will be specific to the project study area and alternatives that received primary consideration during the planning process. A study corridor will be identified which adequately provides the resource information used in the decision – making process and assist in determining which issues should be eliminated from further study.
 - a) Land Use and Public Facilities. The effects of project alternatives will be characterized in light of land use trends, plans, and policies within the study area. This effort will entail close coordination with local and regional planning bodies and will include an analysis of potential secondary effects of the proposed improvements. Potential effects on public and community facilities will also be identified and discussed.
 - b) Social and Economic Impacts, Environmental Justice and Limited English Proficiency. As applicable, this task will address potential changes to local neighborhoods or communities and the effects on community cohesion relating to travel patterns, access, and public safety, particularly as those changes may differently affect various social groups and minorities. This information will include race/ethnicity, limited English proficiency, income, and other relevant data. The assessment will conform to FHWA guidance for compliance with Executive Order 12898, Environmental Justice. Project alternatives will also be evaluated with respect to potential effects on local economic development, secondary growth effects, tax revenues, public expenditures, employment and income, and access effects on local agricultural and commercial enterprises. The assessment will also address potential economic effects upon adjacent businesses due to changes in traffic patterns during and after construction.

- c) Traffic Noise – Since this project would increase the number of through-traffic lanes and portions would be on new location, a traffic noise analysis would be required. Construction noise would also be addressed. SUBCONSULTANT will follow the Noise SOUs and will conduct a traffic noise analysis for the build alternative. The objective of the noise analysis will be to 1) model existing and predicted future design year noise levels at various locations along the proposed project; 2) evaluate the possible impact of traffic noise at these locations; and 3) discuss and evaluate possible mitigation measures to reduce or eliminate potential noise impacts. Predictions of traffic noise levels will be performed in accordance with the current and applicable state and federal regulations, standards, and guidelines using the Federal Highway Administration (FHWA) Traffic Noise Model (TNM) software. Traffic data is required and should consist of the existing (estimated time of completion [ETC]) and projected design year (existing plus 30 years) peak hour volumes for cars, medium trucks, and heavy trucks traveling on the mainlanes. Traffic data needed to complete this item will be supplied by TxDOT and should include average annual daily traffic count's (AADT), design hourly volumes predicted for lanes, traffic mix, directional traffic split for the design hour, and speeds. This information will be provided for existing year (ETC) and 320-year proposed AADT. The potential noise impact on sensitive receptors will be assessed in accordance with the FHWA - Federal-Aid Highway Program Manual, Volume 7, Chapter 7, Section 3.

The noise analysis will consist of the following tasks.

Subtask 1 – Determine Receptor Locations

Identify noise-sensitive land uses and activities that currently exist in the proposed project area and where development is planned, designed, and programmed. Determine receptor locations based on noise-sensitive land uses and activities identified. Where possible, the preliminary engineering layout will include adjacent land use information, to include existing and planned (platted) subdivisions, residences, commercial facilities, parks, etc. This scope assumes that no more than 10 noise receiver locations will be modeled.

Subtask 2 – Model Existing and Predicted Future Noise Levels

SUBCONSULTANT will model existing and future worst-case noise levels at selected locations along the Build alternative using TNM 2.5 software. This scope does not include field measurements for existing noise levels. Traffic data information will be provided by the design engineers for this analysis. SUBCONSULTANT will assess potential impacts of future noise levels on sensitive land uses including analysis and documentation of the results.

Subtask 3 – Noise Abatement Measures

If the predicted noise levels at the sensitive receptors approaches or exceeds FHWA's Noise Abatement Criteria, or substantially exceeds existing noise levels, SUBCONSULTANT will provide a preliminary evaluation of alternative noise abatement measures for reducing or eliminating future traffic noise impacts. Should the noise analysis determine that noise abatement measures are warranted, a noise barrier analysis and a noise workshop would be an additional service.

Subtask 4 – Prepare Traffic Noise Section of EA

SUBCONSULTANT will review and analyze the results of the noise analysis, then prepare the traffic noise section of the EA.

- d) Air Quality. Since the Average Annual Daily Traffic is expected to be below 140,000 vehicles per day, an air quality analysis will not be required, however, a mobile source air toxics (MSAT) qualitative analysis will be required. The qualitative analysis will include:
- i) Brief MSAT description and discussion of national trend data projecting substantial overall reductions in emissions due to stricter engine and fuel regulations issued by EPA;
 - ii) Comparison of the expected effect of the project on traffic volumes, vehicle mix, or routing of traffic, and the associated assumed changes in MSATs;
 - iii) An assessment of schools, licensed day cares, elder care facilities, and hospitals located within 100 and 500 meters of the ROW;
 - iv) Discussion of information that is incomplete or unavailable for a project-specific assessment of MSAT impacts, in compliance with CEQ regulations (40 CFR 1502.22(b)); and
 - v) Summary of current studies regarding the health impacts of MSATs, in compliance with 40 CFR 150.22(b)
- e) Soils/Prime Farmlands - Soils in the area of the proposed project will be described according to the Natural Resources Conservation Service (NRCS). To ensure compliance with the Farmland Protection Policy Act (FPPA), SUBCONSULTANT will consider proposed project impacts, and if necessary coordinate with the NRCS and complete the Farmland Conversion Impact Rating Form CPA-106 and submit it to the NRCS for review. The NRCS map for Hidalgo County will be reviewed, and the NRCS list of prime farmland soil types will be reviewed to determine if the proposed project area is potentially subject to the FPPA. If there is a potential for adverse impacts to FPPA lands, the EA will discuss alternative measures to avoid or minimize the impacts.
- f) Bicycle and Pedestrians - SUBCONSULTANT will document any impacts to bicycle and pedestrian facilities and services in the area.
- g) Section 4(f) Resources - SUBCONSULTANT will review available data and perform on-site investigations to ascertain the presence of potential Section 4(f) lands, including public parks, recreation lands, and wildlife and waterfowl refuges that may be impacted by the proposed project. This scope of work does not include a Section 4(f) analysis.
- h) Wetlands - Coordination was previously initiated with USACE. A copy of the letter will be included in an appendix in the EA. A permit from the USACE is not required.
- i) Water Quality - The ambient conditions of streams and water bodies that are likely to be impacted by the proposed project, and the identification of the potential for impacts to these water bodies will be assessed. SUBCONSULTANT will obtain data from the water quality division of the Texas Commission on Environmental Quality (TCEQ) and the U.S. Environmental Protection Agency (EPA) under the Federal Clean Water Act and the Safe Drinking Water Act regarding principal or sole-source aquifers and wellhead protection areas.

- j) Floodplains - National Flood Insurance Program (NFIP) maps will be reviewed to determine what portions of the proposed project area are encumbered by the base (100-year) floodplain. Floodplain encroachment will be described and mitigation measures will be discussed.
- k) Water Quality - The ambient conditions of streams and water bodies, which are likely to be impacted by the proposed project and identification of the potential for impacts to these water bodies will be assessed.
- l) Wild and Scenic Rivers – SUBCONSULTANT will determine if a river in the National Wild and Scenic River System is located in the study area or will be affected by the proposed Transportation Activity.
- m) Coastal Zone Management – SUBCONSULTANT will evaluate the proposed project relative to the jurisdictional boundary of the Texas Coastal Management Program.
- n) Water Resources. The effort will reflect the requirements of the National Pollutant Discharge Elimination System (NPDES) storm water general permit program for construction activities and the anticipated project Storm Water Pollution Prevention Plan (SW3P), particularly with respect to potential mitigation benefits to be achieved through the SW3P. Additionally, the 100-year floodplain, as delineated by FEMA, will be identified and the impacts of the proposed project will be assessed. Flood management effects will also be addressed through coordination with the local flood management agency.
- o) Wetlands and Waters of the U.S. The SUBCONSULTANT will perform jurisdictional identifications, including wetlands and evaluations in all areas potentially affected by the primary alternatives. If required, delineations of wetlands, approved jurisdictional determination forms and Individual Section 404 wetlands permit(s) and/or Nationwide Permit(s) requiring a Pre-discharge Notification or wetland mitigation planning will be added by supplemental agreement.
- p) Beneficial Landscape Practices - SUBCONSULTANT will address the Executive Memorandum related to Beneficial Landscape Practices.
- q) Invasive Species - SUBCONSULTANT will address the Executive Order related to Invasive Species.
- r) Essential Fish Habitat - The potential for the proposed project to impact essential fish habitat will be reviewed and discussed.
- s) Ecological Resources. SUBCONSULTANT will perform a characterization of project area ecological resources, including descriptions of vegetation, prime farmland and wildlife habitat resources. Ecologically sensitive resources, if any, will be identified and discussed in the EA. An assessment of the project area's potential to support federally threatened or endangered species will be conducted. This includes a data search of the Natural Diversity Database (NDD), an assessment of habitat in the project area for any listed species determined to be of potential occurrence and early coordination with the U.S. Fish and Wildlife Service. A list of all state and federally sensitive species of potential occurrence in the project area will be provided in the EA. If required, any required threatened or endangered species presence/absence surveys or biological assessments would be added by supplemental agreement.

t) Archaeological Resources.

- i) The archaeological investigations, the archaeologist will search site files and maps at the Texas Archeological Research Laboratory and the THC's Texas Archeological Sites Atlas on-line database for any previously recorded surveys and historic or prehistoric archaeological sites located in or near the proposed alignment. This will provide site and geographic information that will be essential to the discovery and interpretation of any undiscovered cultural resources along the proposed alignment. The archaeological field investigations will require a Texas Antiquities Permit. An SUBCONSULTANT principal archaeologist will prepare a permit application for submittal to the THC.
- ii) Once the background review is completed and the permit is obtained, the archaeologist will conduct an archaeological survey of the project area. The field survey will consist of one archaeologist walking the entire proposed project area with particular focus on any new, undisturbed right-of-ways and previously recorded sites. The survey will be of sufficient intensity to determine the nature, extent, and, if possible, potential significance of any cultural resources located within the proposed project area. During the survey, the archaeologist will be examining the ground surface and erosional profiles for cultural resources and excavating small shovel tests where appropriate to test for subsurface archaeological deposits or assess the geomorphic setting. Any discovered or previously documented sites will be document and plotted on USGS 7.5 minute topographic maps using hand-held Global Position System (GPS) units.
- iii) Once the field survey has been completed, the archaeologist will prepare a report of the investigations. The report will document previous investigations in the area, background cultural settings, the methodology used in the investigations, the presence and condition of any previously recorded sites revealed in the records review, the general nature of the survey area with respect to archaeological potential, and recommendations on the need for further work. Draft copies of the report will be submitted to TxDOT for their review and ultimately, for submittal to the THC for review. Additionally, text will be provided to incorporate into the EA.

u) Historical Resources

- i) For the historic portion of the project, since there are approximately four structures over the age of 50 years, a historian will conduct a literature review of the project area and present a research design to TxDOT Pharr/TxDOT ENV as described in ENV guidance procedures regarding historic resource surveys. This review includes examination of files at THC to identify historic properties that have been previously listed in the NRHP, designated as Recorded Texas Historical Landmarks, and/or are included in the Texas Historic Sites Inventory or other available local historical surveys. The historical will also check other available archival sources, such as historic maps or aerial photographs, to locate previously unidentified potential historic resources in the project's area of potential effect. A historic literature review will also be conducted to establish appropriate historical and cultural contexts for the project area. This information will be compiled along with a survey methodology as part of the research design that will be submitted to ENV and the THC for final determination of the APE and approval for the project to proceed.
- ii) Following completion of the preliminary research tasks, a SUBCONSULTANT historian will carry out a reconnaissance field survey of the proposed alignment to identify and record historic buildings, structures, and objects within the project's APE. The historians

will plot the location of each identified resource on a USGS (or similar) map, take photographs, obtain addresses, and gather physical data on the structure such as property type and subtype classifications, stylistic influences, construction dates, integrity issues and preliminary eligibility recommendations.

- iii) A summary reconnaissance report will be provided and will include the following:
- (1) A letter report containing an overview of the results of the reconnaissance survey. The letter report will describe the findings of the reconnaissance survey and recommend the need, if any, to conduct further survey efforts. The letter report will have sufficient detail and clarity to provide a basis for making determinations of NRHP eligibility.
 - (2) Photographic documentation for each identified historic resource. At a minimum, this documentation will include an oblique view of the primary facade and a side elevation of each resource, with the subject filling the frame. All photographs will be 3.5-x-5-inch or 4-x6-inch digital color prints. All photographs will be well focused and clearly depict architectural and other details relevant to an evaluation of the resource's character-defining features. Photographs will clearly identify project name, address (or location) of resource, and site ID number.
 - (3) An inventory of all identified resources provided in tabular form that lists their site ID numbers, locations, property and subtype classifications, stylistic influences, construction dates, integrity issues, and preliminary NRHP eligibility recommendations.
 - (4) A map or maps showing the location of each identified historic resource labeled with its appropriate site ID number. Outbuildings and landscape features will be reported as subsets of the main site ID number for a property. The project APE, major street names, and other directional landmarks will be clearly indicated on the map. Maps will be based on aerial photographs, USGS 7.5-minute quadrangle topographic maps, or similarly detailed maps.
 - (5) Proposed changes to the research design arising from the results of the reconnaissance survey, including contextual issues, comparative property information needs, data gaps, and other items necessary to finalize the evaluation and documentation phases of the project.
- v) Section 4(f). The assessment will include a review of the applicability of Section 4(f) of the DOT Act. A Section 4(f) Evaluation, should one be required, will be added as a supplemental agreement.
- w) Hazardous Materials. An electronic search of potential hazardous materials sites will be conducted followed by reconnaissance-level field investigations to verify the location of potential sites and collect additional preliminary information. A hazardous materials initial site assessment (ISA) will be prepared and submitted to the TxDOT Pharr District for their records. If required, a Phase I Environmental Site Assessments will be added by supplemental agreement. Information will be incorporated into the EA, along with a discussion of potential impacts, based on the best available information.
- x) Indirect and Cumulative Impacts. Because this project is an added capacity project, an indirect and cumulative impacts analyses will be performed in accordance with the requirements of FHWA Technical Advisory T 6640.8A (1987), Report 466: Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects (National Cooperative Highway Research Program 2002), TxDOT Guidance on Preparing Indirect and Cumulative Impact Analyses (2010), and related guidance from FHWA and TxDOT.

Task 4 – Deliverables and EA Review/Revisions

The information above will be compiled into a preliminary draft EA document. The EA text will be prepared on an IBM-compatible computer with Microsoft Word software and a CD will be provided. Exhibits will be limited to 8.5"x 11" format, if possible. SUBCONSULTANT will provide the following:

- Two (2) copies of the draft EA document (V1) to the TxDOT- Pharr District for review and comment. Upon receipt of comments, revisions will be made and the additional information needed to complete the items will be incorporated into the draft EA (V2).
- Six (6) copies of the draft EA document (V2) will be prepared and provided to the TxDOT-Pharr District for TxDOT-Environmental Affairs Division (ENV) review.
- After receiving comments from TxDOT-ENV, SUBCONSULTANT will revise the draft EA document and submit the revised drafts back to TxDOT-ENV for resource agency review (V3) (3 copies).
- Six (6) copies of the draft EA document (V4) will be prepared and provided to TxDOT-Pharr District for FHWA review (V4).
- After receiving comments from FHWA, SUBCONSULTANT will revise the draft EA document and submit the revised draft to the TxDOT- Pharr District for (V5) (6 copies).
- After public hearing, the Environmental Consultant will revise the draft EA document, as needed and submit final copies (V6) (6 copies).

Task 5 – Public Meeting

SUBCONSULTANT will plan, coordinate, and conduct one Public Meeting for the project, which will be held in either an open house format, followed by a formal presentation and oral comment period or an open house only without the formal presentation. The Engineer's staff will be present at the Public Hearing to receive comments from the public and other attendees. The tasks to be performed will include the following:

- SUBCONSULTANT will update and maintain the project mailing list and prepare a Public Meeting notice to inform adjacent property owners and other interested persons of the Public Meeting.
- Identify and secure the venue for the Public Meeting and coordinate the logistics in support of the hearing.
- Update and maintain a mailing list that includes, but is not limited to adjacent property owners, special interest groups, elected officials and others identified by TxDOT to be used for the hearing notice.
- Prepare, publish, and distribute hearing notices and obtain affidavits of publication, in accordance with TxDOT and FHWA requirements. Notices will be published in English and Spanish in the local newspapers at 30 days and 10 days prior to the Public Meeting to notify the public in advance of the hearing.
- Prepare sign-in sheets, comment forms, handouts, and pre-printed nametags for staff.
- Identify and make arrangements for equipment needs (e.g., easels, chairs, tables, and audio-visual) including transportation, set-up, and break down.
- Provide and coordinate Public Meeting informational and directional signs (registration/sign-in, written comment station, and directional arrows for traffic flow).
- Provide two personnel to conduct the Public Meeting.
- Provide English to Spanish Translation Services (written and oral).
- Prepare graphics related to the environmental study.

- Provide a Summary and Analysis Report that will include copies of notices, photographs, handouts, sign-in sheets, comment forms, letters, and a transcript of comments made during the Public Meeting. There will be one Public Meeting summary report. Four bound copies and one electronic copy in PDF format of the summary report will be prepared.

Task 6 – Public Hearing

SUBCONSULTANT will plan, coordinate, and conduct one Public Hearing for the project. The EA prepared by SUBCONSULTANT will be available at the Public Hearing for the public to review and comment. The Public Hearing will be held in either an open house format, followed by a formal presentation and oral comment period or a formal presentation and oral comment period without the open house. The Engineer's staff will be present at the Public Hearing to receive comments from the public and other attendees. The tasks to be performed will include the following:

- SUBCONSULTANT will update and maintain the project mailing list and prepare a Public Hearing notice to inform adjacent property owners and other interested persons of the Public Hearing.
- Identify and secure the venue for the Public Hearing and coordinate the logistics in support of the hearing.
- Update and maintain a mailing list that includes, but is not limited to adjacent property owners, special interest groups, elected officials and others identified by TxDOT to be used for the hearing notice.
- Prepare, publish, and distribute hearing notices and obtain affidavits of publication, in accordance with TxDOT and FHWA requirements. Notices will be published in English and Spanish in the local newspapers at 30 days and 10 days prior to the Public Hearing to notify the public in advance of the hearing.
- Prepare sign-in sheets, comment forms, handouts, and pre-printed nametags for staff.
- Identify and make arrangements for equipment needs (e.g., easels, chairs, tables, and audio-visual) including transportation, set-up, and break down.
- Provide and coordinate Public Hearing informational and directional signs (registration/sign-in, written comment station, and directional arrows for traffic flow).
- Provide two personnel to conduct the Public Hearing.
- Provide a court reporter for the Public Hearing.
- Provide English to Spanish Translation Services (written and oral).
- Prepare graphics related to the environmental study.
- Provide a Summary and Analysis Report that will include copies of notices, photographs, handouts, sign-in sheets, comment forms, letters, and a transcript of comments made during the Public Hearing. Public Hearing comments and responses will be compiled to properly record the hearing. There will be one Public Hearing summary report. Four bound copies and one electronic copy in PDF format of the summary report will be prepared.

IV. PLANS, SPECIFICATIONS & ESTIMATE

In general, this phase will include all management and engineering activities required for the *final design and preparation of construction drawings and supporting documents* for the **Project**. Specific work activities to be provided by the **Engineer** will include:

- 1) The **Engineer** shall prepare and submit work under this task in accordance to the PS&E Preparation Manual. The location of project should depict the entire project with beginning and ending (Station Numbers/Reference Markers) for each noted CSJ. Mapping landmarks (side streets, creeks, etc.) along with North Arrow and a scale should be shown to help relate the physical location of the project.
- 2) The **Engineer** shall use the Design Speed, the Funding Category, Average Daily Traffic, ADT, Roadway Classification, Location Type, and the appropriate Design Criteria to develop the typical sections as set forth in the Roadway Design Manual, PS&E Preparation Manual and other Stgate approved manuals deemed necessary to prepare and submit the work under this task. The existing typical section should be shown with current roadway (pavement, right of way, etc.) characteristics. The proposed typical sections should be shown below the existing typical section with all related pertinent (pavement, right of way, etc.) information for the proposed roadway construction.
- 3) For Roadway, Bridge and Traffic quantities, the **Engineer** shall prepare and submit work under this task in accordance to the PS&E Preparation Manual and other State approved manual deemed necessary. All summaries shall be consolidated per CSJ, City or County participation, etc. Any quantities shown "For Contractor Information Only" should be shown as such.

Final Roadway Design Controls

The **Engineer** shall prepare the roadway design for the **Project**. The design of the roadway shall conform to the approved **Project** design criteria. The roadway design shall in all respects combine the application of sound engineering principles, and shall be submitted to the applicable city, county, state, and/or federal agencies for approval.

Roadway design controls shall include:

- (1) Geometric design – horizontal and vertical alignments, intersection geometrics to be incorporated onto plan and profile sheets.
- (2) Geometric and grading design – development of typical roadway sections through horizontal and vertical alignment determination and roadway cross sections; to be placed incorporated into plan details as typical section sheets.
- (3) Grading design – existing and design cross sections, cut/fill quantities, slope stability analysis, embankment foundation stability and settlement analysis.
- (4) Earthwork Quantities – obtained from grading design.
- (5) Pavement design, including associated data collection, cost data, pavement material properties, and pavement drainage.
- (6) Miscellaneous supplemental plan details.

Signing & Pavement Markings

The **Engineer** will perform traffic operations design for the proposed improvements of the **Project**. The design of traffic operations improvement shall conform to the **Project** design criteria. These designs shall in all respects combine the application of sound engineering principles. Traffic operations design and analysis shall include:

Signing

- (1) The **Engineer** shall determine location and type of warning, regulatory and guide signs as required by the Texas Manual on Traffic Control Devices (TxMUTCD) and TxDOT's Sign Crew Field Book and standards for work under this task.
- (2) The **Engineer** shall design all signage according the latest version of the TxMUTCD, Supplemental to the TxMUTCD, and TxDOT's Signs and Markings Manual. All designs shall be based on the final proposed roadway design.
- (3) The **Engineer** shall perform an inventory of all existing signage throughout the project limits, including those limits that are considered incidental to the project limits.
- (4) Any signs no longer used by the State shall be taken out and replaced by an accepted TxMUTCD sign.

Permanent Pavement Markings

The **Engineer** shall design all permanent pavement markings in accordance with the Texas MUTCD. All such design shall be based on the final proposed roadway design.

Signalization

- (1) The **Engineer** shall develop a warrant study. Data collection and preparation shall include a location map, photographs, accident data, vehicle volumes, traffic survey, and a final recommendation based on the warrant study.
- (2) The **Engineer** shall prepare design details that include a condition diagram, signal and traffic control device inventory, supplemental traffic control (signing, markings, illumination, etc.), phase sequence diagrams, construction details (poles, detectors, pull box and conduit layouts, controller foundation), aerial or underground details.
- (3) Design of flashing beacons and/or traffic signals not specifically indicated in Attachment D is not included. Additional locations will be added by supplemental agreement.

Miscellaneous

The **Engineer** shall provide the following miscellaneous roadway items:

Traffic Control Plan

- (1) The **Engineer** will develop a conceptual traffic control plan (TCP), roll plot, and narrative. This information will be submitted to the **Client** and TxDOT for review. The **Engineer** shall make a presentation to the District Traffic Control Safety Review Committee to obtain approval of the TCP prior to development of plan sheets. Modifications requested by TxDOT or **Client** after approval will be considered additional work and be added by supplemental agreement.
- (2) The **Engineer** shall notify the State if they plan on requesting a speed reduction at the work zones. The **Engineer** shall prepare the request form using the latest approved Strip Map within the project limits in conjunction with the Traffic Standards for this request. If the project limits is within the city limits, the request shall be coordinated with the State and the local municipality at the early design process.
- (3) The **Engineer** shall provide the State with a hardcopy and accompanying electronic file of a schedule and Critical Path Method for project duration for each phase of construction.
- (4) The **Engineer** shall describe the type of work to be performed for each phase of sequence of construction and any special instructions (ex: storm sewer, culverts, bridges, railing, illumination, signals, retaining walls, signing, paving surface sequencing or concrete placement, ROW restrictions, utilities, etc.) that the contractor should be made aware to include limits of construction, obliteration, and shifting or detouring of traffic prior to the proceeding phase.
- (5) The **Engineer** shall include the work limits, the location of channelizing devices, positive barrier, location & direction of traffic, work area, stations, pavement markings, and other information deemed necessary for each phase of sequence of construction.

- (6) If the **Engineer** determines that a standard is not applicable to address the entire project, then the **Engineer** shall prepare layouts for each respective phase of sequence of construction to illustrate any necessary additional construction details not covered by the Standards to address work limits for each sequence in stations, channelizing devices, barricades, positive barrier, tapers, buffer zones, TCP signage, signs, work zone pavement markings, work area, location & direction of traffic, locations for pedestrian crossings, and other information deemed necessary for each phase of sequence of construction. The **Engineer** shall develop the layouts by referring to the TxDOT standards, latest version of the TxMUTCD for non-TCP signage that may be needed as part of the TCP signage for intersections. The layouts shall address construction of detours, access to business, homes, side streets, and driveways, and reroute of traffic to other roads.
- (7) The **Engineer** will address drainage issues that are a result of changes in horizontal and vertical profiles by specifying the location and size of the temporary drainage structures.
- (8) The **Engineer** shall prepare the plan and profile sheets and cross sections for all detours.
- (9) The **Engineer** will develop TCP plans as double stacked, 1" = 100'. TCP plans will be developed for a two phase approach to traffic control.

Irrigation Structure Adjustments and Relocations

- (1) The **Engineer** shall develop and prepare the design details for the adjustment and/or relocation of existing Hidalgo County Irrigation District No. 2 facilities that are in conflict with the proposed road construction improvements. Details shall include replacement and/or extension of existing pipe, relocation of existing irrigation vents, wells and gates, and shall include summary sheet and standard details. All plans involving irrigation facilities shall be as approved by the Hidalgo County Irrigation District No. 2.

Roadway Details

- (1) The alignment sheet(s) include the following for complex projects and/or where it is not desirable to show the following information on the plan and profiles sheet(s): include the project limits for the entire project, label curve data bearings/coordinates for each alignment, computer generated data may be graphically place on the sheet(s) and if applicable the State Plane Coordinates System should be noted on this sheet(s).
- (2) The Benchmark Data sheet shall be developed in tabulated form and accompanied by surveyor's sketch showing the Station Number from respective alignment, Offset, and Elevation and Physical Description.
- (3) The **Engineer** shall design the plan (horizontal) and profile (vertical) including roadway transitions based on the controlling criteria previously defined and as set forth in the previously listed. The **Engineer** shall develop the alignment for the project in GEOPAK format. Plan and Profile sheets will be developed at 1" = 100'.
- (4) The **Engineer** shall identify and notify the State all locations not meeting the set criteria. In addition, the **Engineer** shall provide alternatives and a recommendation to address these design issues.
- (5) The **Engineer** shall develop and verify all cross sections in preparation of the proposed traffic control plan, drainage, utilities, right-of-way, and access onto adjacent properties. In addition, the cross sections shall be drained to maintain the natural watershed unless otherwise directed by the State.
- (6) The **Engineer** shall determine all cut and fill quantities.
- (7) The **Engineer** shall design all intersections to accommodate the design vehicles turning radius. The ADA-wheelchair ramps shall be designed in accordance to the TDLR compliance and the latest TxDOT's Pedestrian Ramp Standards in conjunction with the requirement of the latest version of the TxMUTCD as it relates location of the traffic signals pedestrian heads, signage, and pavement markings.
- (8) The **Engineer** shall design all longitudinal barriers (railing and guardrail), raised median, fencing, bus bays, parking areas, mailboxes, and shoulder texturing in accordance to the criteria set forth in

the roadway design manual and standards. Miscellaneous Details Sheet(s) may be developed to illustrate any necessary additional construction details not covered by the Standards.

Drainage Details

- (1) The **Engineer** shall use the Roadway Design Manual, Hydraulic Manual, PS&E Preparation Manual, and other State approved manuals deemed necessary to prepare and submit the work under this section.
- (2) The **Engineer** shall use the above-listed manuals to prepare and submit the work under this task. The hydraulic calculations shall have the following based on previously approved County drainage study:
 - (a) Description, Material, Size, and Entrance (headwall)
 - (b) Design discharges, Flow per barrel, barrel slope, and Manning n-value
 - (c) Inlet flow line, allowable headwater, roadway (shoulder) elevation, calculated inlet headwater elevation
 - (d) Outlet flow line, tailwater for design frequency/frequencies, type of flow, critical depth, and calculated friction losses, calculated outlet water elevation
 - (e) Controlling headwater elevation, outlet velocity, and recommended countermeasures to maintain an acceptable outlet velocity
- (3) The **Engineer** shall show the location of culverts and ditches on the roadway plan view.
- (4) The **Engineer** shall use TxDOT standards preferably at all times. Modification to inlets, pipe connection, bedding details, and other elements pertaining to drainage details shall be included under this work task. The BCS sheet must be submitted for all box culverts within the project limits. This sheet must be signed and sealed by the **Engineer**.

Storm Water Pollution Prevention Plan (SW3P)

- (1) The **Engineer** shall submit and prepare separate SW3P sheets when soil is to be disturbed as part of the erosion control measures during each phase of the sequence of construction. The general plan for the SW3P on this project is to enclose the area under construction including existing and proposed inlets with erosion control devices and provide a stabilized construction entrances at points where traffic will be entering or leaving the construction site.
- (2) The **Engineer** shall also design structures or features to control erosion and suspended sediments for post-construction. A standardized General Note will serve as the SW3P where there is to be no soil disturbance (seal coats, overlays, etc.) in the project.
- (3) The **Engineer** shall refer to the Hydraulic Design Manual, TxDOT standards, TxDOT Storm Water Management Guidelines, the Environmental Manual, and District Environmental Staff for guidance on work under this task.
- (4) Erosion Control measures shall conform to one or more of the approved TxDOT / Texas Natural Resources Conservation Commission (TNRCC) / US Environmental Protection Agency (EPA) / US Army Corps of Engineers (USACE) Best Management Practices.
- (5) The appropriate Best Management Practice(s) shall be listed on the Environmental Issues, Permits, and Commitments (EIPC) sheet to be included as a Plan Sheet and shall be followed by the Engineer and Contractor to completion.
- (6) Plan sheets will be develop separate from TCP as 1"=100', double stacked.

Cross Sections

- (1) For the Final Submission, the **Engineer** shall furnish the final cross section plots, showing both the original terrain and the design cross sections, showing the roadway template, at a vertical scale of 1"= 10' and a horizontal scale of 1"= 10'. The design cross sections shall indicate the slope rate on the side slopes. The **Engineer** shall use GeoPak software and provide the state with the applicable files. Cross sections are to show proposed pavement thickness, top of subgrade, finish grade of side bar ditches with slopes and location of right of way. Indicating other features within

the cross sections is not part of the scope of work, ie. Underground utilities, storm sewer lines, top soil, etc.

Miscellaneous Drafting, Standards, and Details

- (1) The **Engineer** shall prepare a title sheet indicating, at a minimum, project limits, project location map, name of **County** and **County's** acknowledgement/acceptance, facility identification, specification reference, **Engineer's** seal, signature, and date.
- (2) The **Engineer** shall determine appropriate standard drawings (clearly identifying agency of prepared standard) to be incorporated into the plans, and sign / seal any modifications to any agency or industry-approved standards.
- (3) The **Engineer** shall develop any details to clarify any construction requirements of the plan drawings.

Plans, specifications, and Estimates (PS&E)

- (1) The **Engineer** shall prepare contract drawings, specifications and estimates for construction of the **Project** authorized by the **Client**.
- (2) All final plans sheets shall be developed, by the **Engineer**, on 11"x17" reproducible, 4 mil, double-matte, white, opaque film.
- (3) Graphics files will be developed in Microstation design file format, and shall plot consistent with the reproducible plots submitted.
- (4) **Plan Sheets.** Plan sheets shall include, but not be limited to, title sheet, typical sections, sequence of construction, traffic control, specification data (including schedules for minimum sampling and testing), estimate and quantity, plan-profile, utilities and drainage, channel details (as applicable), roadway details (as applicable), drainage details (as applicable), hydraulic details, and standards. (Standards may be used from government and agency entities, but must be signed and dated by the Project Engineer of responsible supervision as being applicable to the Project.
- (5) **Specifications.** Whenever possible, the **Engineer** shall use the TxDOT 2004 Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges. Other specifications may be developed by the **Engineer**, but must incorporate, to the extent possible, references to standard requirements of AASHTO design and AASHTO testing procedures.
- (6) **Estimates.** The **Engineer** shall prepare detailed cost estimates and proposals of authorized construction, which shall include summaries of bid items and quantities based, insofar as practicable, on the unit price system of bidding. The **Engineer** shall not be required to guarantee the accuracy of those estimates.

Project Management

The **Engineer** shall provide the following management activities in the development of the **Project**.

Internal Coordination

- (1) The **Engineer's Project Manager** shall provide internal coordination for the development of **Project** progress reports and budget reports, responses to requests for information, and review/preparation of billing and invoicing, as well as coordination with all Project Team members in the development of the project, including quality control / quality assurance, internal project meetings and providing technical assistance. The **Engineer** will provide status reports to the **Client** as requested. It is estimated that these progress reports shall take place approximately once a month.

Progress Meetings

- (1) The **Engineer** shall formally meet with the **Client** at 30%, 60%, 75%, and 100% submittal (reference the schedule of milestone deliverables below). The **Engineer** shall prepare minutes for

each progress meeting, and provide a copy to the **Client**. It is also expected that the **Engineer** will present the project's status reports at to the **Client** approximately once a month.

Coordination with TxDOT & the Hidalgo County MPO

- (1) The **Engineer** shall assist the **Client** with coordination of the project with both the **Texas Department of Transportation (TxDOT)** and the **Hidalgo County Metropolitan Metropolitan Organization (MPO)**. The project will be presented and discussed with both these organizations for the purpose of obtaining construction funding for the project. The **Engineer** will prepare reports, presentations, drawings, figures, estimates or other documentation as may be requested by these organizations and attend meetings with these organizations as may be requested by them for the purpose of facilitating the authorization of funding for the project's construction.

Quality Control / Quality Assurance

- (1) The **Engineer** shall perform quality control and assurance (QC/QA) on all deliverables with an independent engineer, within the **Engineer's** firm, who will assure that the project constructability requirements (details, specifications, plan notes, etc.) are met at each milestone submittal.

SUB-CONSULTANT AGREEMENT AND SERVICES

R. Gutierrez Engineering Corporation will obtain sub-consultant services for this professional services agreement. Services that are anticipated include:

- Environmental Assessment and Public Involvement
- Geotechnical Investigations

These services are included in the scope as defined and are included in the lump sum fee.

Work Authorization No. 2

EXHIBIT C **Work Schedule**

The schedule for the work in this Work Authorization shall commence on the date of execution of this Work Authorization and continue for:

(1) a period which may reasonably be required for the design and construction for the Project including the various parts, phases, any extra work and any required additions thereto; or

(2) a period extending 12 months after the completion of the services called for in Phases/Parts I, II, III and IV as described in Exhibit B of this Work Authorization, which ever may be pertinent, in case construction is not commenced.

The final acceptance by the Owner of each phase/part of work on the Project shall serve as evidence of completion of that phase of work on the Project.

WORK AUTHORIZATION NO. 2

EXHIBIT D
ENGINEERING FEE ESTIMATE

I. GENERAL MANAGEMENT/COORDINATION				
DIRECT LABOR:	Estimated Hours	Hourly Rate	Estimated Cost	Totals
Principal	121	\$86.54	\$10,471	
Project Manager	173	\$57.70	\$9,982	
Senior Engineer	171	\$43.27	\$7,399	
Engineer	93	\$33.66	\$3,130	
Graduate Engineer	93	\$23.08	\$2,146	
Senior Engineer Tech	0	\$25.97	\$0	
CADD-Design Tech	0	\$21.64	\$0	
3 Person Survey Crew	4	\$42.00	\$168	
Clerical	83	\$18.27	\$1,516	
Sub-Total:				\$34,814
INDIRECT COSTS:	Rate	x Base =	Estimated Cost	
Overhead Cost	1.73	\$34,814	\$60,228	
Profit	0.15	\$95,042	\$14,256	
Indirect Cost Total:				74,484
GENERAL MANAGEMENT/COORDINATION FEE TOTAL:				109,298
PRELIM ENGINEERING & SCHEMATIC DESIGN				
DIRECT LABOR:	Estimated Hours	Hourly Rate	Estimated Cost	Totals
Principal	37	\$86.54	\$3,202	
Project Manager	117	\$57.70	\$6,751	
Senior Engineer	211	\$43.27	\$9,130	
Engineer	295	\$33.66	\$9,930	
Graduate Engineer	327	\$23.08	\$7,547	
Senior Engineer Tech	316	\$25.97	\$8,207	
CADD-Design Tech	316	\$21.64	\$6,838	
3 Person Survey Crew	544	\$42.00	\$22,848	
Clerical	38	\$18.27	\$694	
Sub-Total:				\$75,147
INDIRECT COSTS:	Rate	x Base =	Estimated Cost	
Overhead Cost	1.73	\$75,147	\$130,004	
Profit	0.15	\$205,151	\$30,773	
Indirect Cost Total:				160,776
PRELIM ENGINEERING & SCHEMATIC DESIGN FEE TOTAL:				235,923
FINAL ENGINEERING & SCHEMATIC DESIGN (G&S)				
DIRECT LABOR:	Estimated Hours	Hourly Rate	Estimated Cost	Totals
Principal	42	\$86.54	\$3,635	
Project Manager	147	\$57.70	\$8,482	
Senior Engineer	258	\$43.27	\$11,164	
Engineer	492	\$33.66	\$16,561	
Graduate Engineer	568	\$23.08	\$13,109	
Senior Engineer Tech	1,744	\$25.97	\$45,292	
CADD-Design Tech	1,744	\$21.64	\$37,740	
3 Person Survey Crew	0	\$42.00	\$0	
Clerical	8	\$18.27	\$146	
Sub-Total:				\$136,128
INDIRECT COSTS:	Rate	x Base =	Estimated Cost	
Overhead Cost	1.73	\$136,128	\$235,502	
Profit	0.15	\$371,631	\$55,745	
Indirect Cost Total:				291,247
PROJECT FEE SUB-TOTAL:				772,596

WORK AUTHORIZATION NO. 2

EXHIBIT D
ENGINEERING FEE ESTIMATE

	Quantity	Unit	x Rate =	Estimated Cost
OTHER DIRECT COSTS:				
Environmental Document	1	LS	\$122,463.00	\$122,463
Public Meetings	1	LS	\$24,327.75	\$24,328
Public Hearing	1	LS	\$26,197.75	\$26,198
R.O.W. Map & Parcels (30 Parcels)	30	EA	\$2,800.00	\$84,000
Other Direct Cost Total:				256,989
PROJECT FEE TOTAL:				1,029,585

Note: Traffic Counts to be provided by TxDOT & Geotechnical Investigation to be provided by Hidalgo County