

EXHIBIT "E"

Work Authorization Form

Hidalgo County Contract No. _____

WORK AUTHORIZATION NO. 1

THIS WORK AUTHORIZATION is made pursuant to the terms and conditions of Article 7 of the **Agreement** made by and between the **HIDALGO COUNTY**, acting herein by and through the **Commissioner's Court**, hereinafter called the "**Owner**", and **TEDSI Infrastructure Group, Inc.**, professional engineers of Mission, Texas, hereinafter called the "**Engineer**".

PART 1. Scope of Work. The purpose of this Work Authorization is to provide Professional Engineering, Right Of Way Mapping and Topographic services for construction of HCMDS Phase II - Lateral J-09 from North Main Drain to County Road 3601 as indicated below::

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

PART 2. Estimated Cost. The estimated lump sum cost for services under this Work Authorization is \$ 1,086,900. This amount is based upon the costs outlined in the *Estimated Cost Proposal* attached hereto as **ATTACHMENT "D"**.

PART 3. Payment. Lump Sum compensation and payment to the **Engineer** for the services established under this Work Authorization shall be made in accordance with Articles 5, 6, and 7 of the **Agreement**.

PART 4. Period of Service. This Work Authorization shall become effective on the date of final acceptance of the parties hereto, and shall remain open until all work associated with this Work Authorization is completed. An estimated time associated with this work is identified in the *Work Schedule* attached hereto as **ATTACHMENT "C"**.

PART 5. Responsibilities and Obligations. This Work Authorization does not waive the parties' responsibilities and obligations provided under the **Agreement**.

PART 6. Acceptance and Acknowledgement. This Work Authorization is hereby accepted and acknowledged as indicated below and effective as of _ day of _____, 2010.

**THE ENGINEER:
TEDSI INFRASTRUCTURE GROUP, INC.**

BY:



Jesse Salinas, (Principal)

**THE OWNER:
HIDALGO COUNTY**

BY:

Oscar L. Garza, Jr., (County Commissioner)

LIST OF ATTACHMENTS

ATTACHMENT "A" -	Services to be Provided by the Owner
ATTACHMENT "B" -	Services to be Provided by the Engineer
ATTACHMENT "C" -	Work Schedule
ATTACHMENT "D" -	Estimated Cost Proposal

ATTACHMENT "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 **Work Authorizations**.

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

- 1) Prepare and execute a Purchase Order with Hidalgo County Purchasing Department
- 2) Authorization to the Engineer to begin work.
- 3) Payment for work performed by the engineer.
- 4) Assistance to the Engineer, as necessary, to obtain required data and information from other local, regional, and state agencies that the Engineer cannot easily obtain.
- 5) Secure required Environmental permits from regulatory agencies
- 6) Acquire additional Right of Way identified by the Engineer
- 7) Provide any available relevant data that may on file concerning the Project.
- 8) Provide timely review and decisions in response to the Engineers request for information and/or submittals and deliverables.
- 9) Attend and participate in progress meetings as required and as coordinated and conducted by the Engineer.
- 10) Advertise and award, as assisted and recommended by the Engineer, construction contracts for the PS&E developed by the Engineer.
- 11) Attend pre-bid and pre-construction conferences coordinated and conducted by the Engineer.
- 12) Review and approve monthly and final estimates, developed by the Engineer, for payment to the Contractor. Compensate and pay the Contractor for work performed as identified in the approved monthly and final estimates.
- 13) Provide assistance to Engineer where necessary and possible with Owner information/resources to ensure project is completed within timely/efficient basis.
- 14) Provide Engineer with Geotechnical Data for pavement design and thickness.

ATTACHMENT “B”
Services to be Provided by the Engineer

INDEX

CLASSIFICATION OF SERVICES (*Basic or Special*)
EXPANDED DESCRIPTION OF SERVICES:

I. ENGINEERING MANAGEMENT (EM)

(B) Preliminary Engineering

- (1) Preliminary Concept Conference
- (2) Management/Coordination of Engineering Activities
- (3) Implementation of QC/QA Program
- (4) Preparation of “*Preliminary Engineering Report*”
- (5) Coordination with all Reviewing Agencies

(C) Final Design

- (1) “*Design Policy & Procedures Manual*”
- (2) Design Concept Conference
- (3) Management/Coordination of Engineering Activities
- (4) Implementation of QC/QA Program

III. PRELIMINARY ENGINEERING, DESIGN AND CONSTRUCTION

(A) Preliminary Engineering

- (1) Preliminary Field Surveying
- (2) Data Collection
- (3) Geographical Information System
- (4) Hydrologic Analysis
- (5) Hydraulic Analysis
- (6) Flood Plain Mapping
- (7) Alternate Solutions & Recommendations
- (8) Final Report – “*Preliminary Engineering Report*”

(B) Final Design

- (1) Right-of-Way Data
- (2) Design Field Surveying
- (3) Geotechnical Investigations
- (4) Permitting
- (5) Channel / Drainage Design
- (6) Roadway Design
- (7) Bridge Design
- (8) Plans, Specifications, and Estimates (PS&E)

CLASSIFICATION OF SERVICES. In accordance with Article 2.2 of this Agreement, the services to be provided by the **Engineer** shall be classified as either *Basic Services* or *Special Services*. The expanded descriptions of the services identified later in this exhibit and to be provided by the **Engineer** are classified as follows:

Management:

I. ENGINEERING MANAGEMENT (EM)

(B) Preliminary Engineering

- (1) Preliminary Concept Conference
- (2) Management / Coordination of Engineering Activities
- (3) Implementation of QC/QA Program
- (4) Preparation of “*Preliminary Engineering Report*”

Basic
Basic
Basic
Basic

Hidalgo County Drainage District No. 1 / TEDSI Infrastructure Group
“*Master Drainage System Phase II – Lateral Drain Outfall System*”

- | | |
|--|--------------|
| (5) Coordination with all reviewing agencies (FEMA, USACE, etc.) | <i>Basic</i> |
| (C) Final Design | |
| (1) <i>“Design Policy & Procedures Manual”</i> | <i>Basic</i> |
| (2) Design Concept Conference | <i>Basic</i> |
| (3) Management / Coordination of Engineering Activities | <i>Basic</i> |
| (4) Implementation of QC/QA Program | <i>Basic</i> |

Engineering:

III. PRELIMINARY ENGINEERING, FINAL DESIGN & CONSTRUCTION

(A) Preliminary Engineering:

- | | |
|--|--------------------------|
| (1) Preliminary Field Surveying (using Lidar/ provided by Owner) | <i>Provided by Owner</i> |
| (2) Data Collection | <i>Basic</i> |
| (3) Geographical Information System | <i>Basic</i> |
| (4) Hydrologic Analysis | <i>Basic</i> |
| (5) Hydraulic Analysis | <i>Basic</i> |
| (6) Flood Plain Mapping | <i>Basic</i> |
| (7) Alternate Solutions /Recommendations for Final Design | <i>Basic.</i> |
| (8) Final Report – <i>“Preliminary Engineering Report”</i> | <i>Basic</i> |

(B) Final Design:

- | | |
|---------------------------------------|----------------|
| (1) Right-of-Way Data and ROW Map | <i>Special</i> |
| (2) Design Field Surveying | <i>Special</i> |
| (3) Permitting | <i>Basic</i> |
| (4) Channel / Drainage Design | <i>Basic</i> |
| (5) Roadway Design | <i>Basic</i> |
| (6) Bridge Design | <i>Basic</i> |
| (7) Plans, Specifications & Estimates | <i>Basic</i> |

EXPANDED DESCRIPTIONS OF SERVICES. The expanded descriptions of the services to be provided by the Engineer are described on the following pages.

I. ENGINEERING MANAGEMENT (EM)

The following outline provides a summary for the *basic* and *special services* to be provided by the **Engineer** under services of this Agreement. The contractual services will be outlined in each Work Authorization as outlined in Article 7.

For these services, the **Engineer** shall manage the **Project Team**, consisting of various sub-providers, in the development of the **Project** as defined and more particularly described in **EXHIBIT “B1”** attached to this Agreement. The services will include the following:

- (B) Preliminary Engineering.** The **Engineer** will ultimately deliver the final recommendations for the design of the project in the *“Preliminary Engineering Report”*. (Specific requirements for *engineering* activities are outlined later in this exhibit under II - Preliminary Engineering, Design and Construction.) The **Engineer** shall *manage* and coordinate the activities of the **Project Team** in the collection of geographical information and *engineering* data, the selection of computer software, and the distribution of **Project** information and status to the **Owner** and **Project Team** throughout the development of the *“Preliminary Engineering Report”*. Specific *management*

I. *EM* (continued)

tasks to be provided by the **Engineer** will include:

- (1) **Preliminary Concept Conference.** The **Engineer** will coordinate and conduct a preliminary concept conference (PCC) with the **Owner**, and any other stakeholders approved by the **Owner**. At the PCC, the **Engineer** will outline the issues and aspects involved in the development of the "**Preliminary Engineering Report**", identify existing conditions and design requirements, and present the approach to the development of the report for approval by the **Owner**.
 - (2) **Management/Coordination of Engineering Activities.** The **Engineer** shall *manage* and coordinate the **Project Team** in the preparation of specific *engineering* work activities, tasks, special services for the final development of the "**Preliminary Engineering Report**", including Field Surveying, Data Collection, the development of a Geographical Information System, Hydrologic/Hydraulic Analysis, Flood Plain Mapping, Alternate Solutions, and Final Recommendations (more particularly defined with the *engineering* activities identified in this exhibit under II - Preliminary Engineering, Design and Construction (**Preliminary Engineering**)).
 - (3) **Implement QC/QA Program.** The **Engineer** will monitor and perform the QC/QA program developed to ensure the quality of the "**Preliminary Engineering Report**", and its compliance with standards of sound *engineering* principles and the agreed-upon design criteria established at the PCC.
 - (4) **Final Report: "**Preliminary Engineering Report**".** The **Engineer** will provide, to the **Owner**, five (5) bound, color copies of the "**Preliminary Engineering Report**", including all attachments, exhibits, preliminary layouts, sketches, profiles, and cost estimate.
 - (5) **Coordination with various agencies.** The development of the "**Preliminary Engineering Report**" may require documentation and/or coordination with various agencies. The **Engineer** will act as a liaison for the **Owner**, and will attend any meetings, and develop / prepare any required correspondence, documentation, and/or applications to satisfy the applicable Federal, State, and local regulations.
- (C) **Final Design.** After the **Owner** has approved the **Engineer's** final recommendations as shown in the "**Preliminary Engineering Report**" and the recommendations meet all Federal, State, and County permitting requirements, the **Engineer**, will coordinate the activities of the **Project Team** during the final design of the **Project** by developing and preparing all policies and procedures, managing the sub-providers activities and performance, and performing quality control and quality assurance for all design documents associated with the **Project**. One of the primary deliverables for the **Engineer** to provide the **Owner** is a complete and approved set of plans, specifications, and estimate (PS&E) for each phase of construction of the **Project**. Specific *management* work activities to be provided by the **Engineer** will include:
- (1) "**Design Policy & Procedures Manual**". The **Owner** will provide a policy and procedures manual for final design to be used by the **Project Team** in the development of the **Project**. The purpose of this will be to set policy with regards to the approved design criteria, and to provide consistency in the development of the documents for design, plans, specifications and estimates. Once the manual has been provided by the **Owner** it will be distributed by the **Engineer** to each member of the **Project Team**. The **Owner** will be responsible for updating and maintaining the manual and distributing any revisions throughout **Project** development.

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I. *EM* (continued)

Items to be identified in the “*Design Policy & Procedures Manual*” provided by the **Owner** will include, but not be limited to, the following:

- (a) Project Description and Final Recommendations of the “*Preliminary Engineering Report*”
 - (b) Environmental
 - (c) Correlation and Agreement with Other Agencies
 - (d) Application of Design Standards (City, County, State, AASHTO)
 - (e) Requirements for Preliminary Submittals
 - (f) Basic Design Criteria
 - (g) Preparation for Plans, Specifications, and Estimate (PS&E) Submittals
 - (h) Formats for Supporting Documents
 - (i) CADD Standards
 - (j) Specifications
- (2) **Design Concept Conference (DCC).** The **Engineer** shall coordinate and conduct a design concept conference with the **Owner** and **Project Team**. At the DCC, the **Engineer** will distribute the “*Design Policy & Procedures Manual*” provided by **Owner** and discuss the **Project** Development Schedule with the **Project Team**.
- (3) **Management/Coordination of Engineering Activities.** The **Engineer** shall *manage* and coordinate the **Project Team** in the development of the documents for final design, including: Right of Way Data, Design Field Surveying, Geotechnical Investigations, Permitting, Channel/Drainage Design, Roadway Design, Bridge Design, PS&E, and other miscellaneous design and plan preparation items (more particularly defined with the engineering activities identified in this exhibit under II – Preliminary Engineering, Design and Construction (**Final Design**)).
- (4) **Implement QC/QA Program.** The **Engineer** shall monitor and perform the QC/QA program developed to ensure the quality of the documents associated with Right of Way Data (Mapping), Design Field Surveying, Geotechnical Investigations, Permitting, Channel/Drainage Design, Roadway Design, Bridge Design, PS&E, and other miscellaneous design and plan preparation items (more particularly defined with the *engineering* activities identified in this exhibit under II – Preliminary Engineering, Design and Construction (**Final Design Engineering**)). These designs shall in all respects combine the application of sound *engineering* principles with a high degree of economy and shall be submitted to the applicable City, County, State, and/or Federal agencies for approval.

III. Preliminary Engineering, Final Design & Construction (continued)

III. PRELIMINARY ENGINEERING, DESIGN & CONSTRUCTION

The services listed below to be provided by the **Engineer** are a summary of the services; the actual contractual services will be identified in each work authorization as outlined in Article 7 of the Agreement. The services shall be divided into three phases with *engineering* work activities, as follows:

(A) **Preliminary Engineering.** For this phase, the **Engineer** will ultimately deliver the "*Preliminary Engineering Report*". The "*Preliminary Engineering Report*" shall be based on the **Engineer's** review and comments on the "*Raymondville Drain Outfall Study*" (to be provided by the **Owner**). Should the review and comments by the **Engineer** indicate deficiencies in the "*Raymondville Drain Outfall Study*", or in the **Turner, Collie and Braden, Inc. Engineer Report – "Flood Protection Plan"**, dated September 1997, corrections of such deficiencies shall be the responsibility of the **Owner**, or deemed by the **Owner** as additional work to be performed by the **Engineer** and compensated in accordance with Articles 8 and 9 of this Agreement. Subsequently, the **Engineer** will prepare the "*Preliminary Engineering Report*" in sufficient detail to indicate clearly the problems involved and the alternate solutions available to the **Owner**; to include preliminary layouts, sketches, and cost estimates for the **Project**, and to set forth clearly the **Engineer's** recommendations. Specific *engineering* work activities, tasks, and/or special services to be provided by the **Engineer** will include:

(1) **Preliminary Field Surveying**

- (a) The **Engineer** shall establish benchmark identifications, if not already provided by the **Owner**.
- (b) The **Engineer** shall obtain data for existing drainage facilities and/or structures, including size, type, and flowline (upstream & downstream) elevations of structures.
- (c) The **Engineer** shall obtain profiles of intersecting roadways that cross existing and proposed channels.
- (d) The **Engineer** shall obtain flood plain and cross-sections (along with appropriate overbank data), and establish reach lengths, as required.

(2) **Data Collection**

- (a) The **Engineer** shall perform site visits for field reconnaissance.
- (b) The **Engineer** shall identify and obtain data to include, but not be limited to:

Previous Studies:

- (i) Available previous hydraulic and/or engineering studies
- (ii) Previous documentation and/or studies for Federal Emergency Management Agency (FEMA) floodway requirements.

Land Records:

- (iii) Parcel mapping
- (iv) Property assessment
- (v) USGS topographic mapping

Property and Facility Management

- (vi) Land acquisition and disposition
- (vii) Building and property inventory

III. Preliminary Engineering, Final Design & Construction (continued)

Land Use Planning and Zoning

- (viii) General plan mapping
- (vix) Zoning mapping
- (x) Demographic mapping
- (xi) Economic development
- (xii) Linking to permitting systems
- (xiii) Existing aerial photographs and/or mapping

Engineering

- (xiv) Storm drain mapping
- (xv) Subdivision mapping
- (xvi) Street mapping

Public Safety

- (xvii) Emergency preparedness plans

Environmental Assessment (if required by Federal/State agencies)

- (xviii) Wetland mapping
- (xix) National Pollution Discharge Elimination System (NPDES) permitting
- (xx) Facility mapping
- (xxi) Vegetation mapping
- (xxii) Coastal zone management

Elections

- (xxiii) District Boundary definition

(3) **Geographical Information System**

The **Engineer** shall develop a Geographical Information System (GIS) utilizing Environmental Systems Research Institute, Inc. (ESRI) ArcView with 3-D Analyst and GIS StreamPro, where appropriate to be compatible with the existing GIS being developed in the “**Raymondville Drain Project**”. Import the collected data into ArcView for mapping purposes and presentations to facilitate the decision-making and analytical process for the development of the “**Preliminary Engineering Report**”. ArcView will also be used to export data to the USACE Hydrologic Center's computer program HEC-River Analysis System (HEC-RAS), which will be used to develop the **engineering** models required for the hydraulic analysis of each lateral channel (and associated tributaries) and the plotting of the resultant floodplains. Specifically, ArcView will be used to export this data to HEC-RAS where it will be combined with the field surveyed channel data in order to construct full flood plain cross sections that reflect accurate channel and overbank data for the HEC-RAS models.

Note: During the performance of the following hydrologic / hydraulic analysis and the development of the alternate solutions and final recommendation, the **Engineer** will address and incorporate any findings of the environmental documentation process.

(4) **Hydrologic Analysis**

- (a) The **Engineer** shall review and comment on the hydrologic analyses of portions of the Raymondville drainage watershed(s) that are located in Precinct No. 1 and No. 4.
- (b) The **Engineer** shall review and comment on the comparison of peak flow rates, identified in the Raymondville drainage watershed(s) that are located in Precinct No. 1 and No. 4, with any available data from the National Flood Insurance Program (NFIP) or other studies to determine consistency of results.

III. Preliminary Engineering, Final Design & Construction (continued)

(5) Hydraulic Analysis

- (a) The **Engineer** shall review and comment on the hydraulic analysis for each existing and proposed structure location utilizing the HEC-RAS computer program; utilizing Manning's Equation to compute water surface profiles with the inputs of cross-section data, roughness coefficients, and flow rates. Specific steps for the hydraulic analysis are outlined in tasks (b) through (g) below.
- (b) The **Engineer** shall create the terrain Triangulated Irregular Network (TIN), if not provided by the **Owner**. This will be developed from a combination of field survey, aerial photogrammetry, and topographic mapping data in the development of a point table. With this point table, an event theme will be created in ArcView, which will create the terrain TIN with 3-D Analyst.
- (c) The **Engineer** shall create 2-dimensional lines representing the channel centerline, high bank locations, flow path lines, and cross-section locations by locating the various and required poly lines over the terrain TIN develop the watershed layout over the base map
- (d) The **Engineer** shall create the HEC-RAS GIS import file (ASCII text file); this will involve the correlation of the alignment of the cross-sections with the terrain TIN by extracting the elevations from the terrain TIN and creating a 3-dimensional cross-section theme.
- (e) For verification of measured elevations, the **Engineer** shall edit the HEC-RAS GIS import file by selectively replacing the points taken from the terrain TIN at the channel with actual channel points obtained by the field survey.
- (f) The **Engineer** will review and comment on the accuracy of the HEC-RAS modeling of the existing and proposed structures within Precinct No. 1 and No. 4 facilities authorized in work authorizations as outlined in Article 7 of the Agreement, and compare the hydraulic results to the effective FIS and existing 100-year flood levels.
- (g) After the HEC-RAS model is satisfactory and the output deemed acceptable, the **Engineer** shall apply the GIS export function to create the HEC-RAS export file in preparation for the flood plain mapping.

(6) Flood Plain Mapping

- (a) Utilizing the HEC-RAS GIS export file, and ArcView GIS StreamPro, the **Engineer** shall map the floodplain over the terrain TIN.
- (b) The **Engineer** shall compare the results by placing the resulting floodplain mapping over the existing Flood Insurance Rate Map (FIRM): scan the FIRM and bring into ArcView an image for this comparison.

(7) Alternate Solutions and Recommendations

- (a) The **Engineer** shall prepare preliminary cost estimates for each alternate solution and final recommendation.
- (b) The **Engineer** shall summarize each alternate solution in sufficient detail to indicate clearly the problems involved in order for the **Owner** to make the appropriate comparisons to the **Engineer's** final recommendations and provide the approval for the final design of the **Project**.

III. Preliminary Engineering, Final Design & Construction (continued)

(c) The **Engineer** shall provide a formal and clearly outlined recommendation regarding the final design of the **Project**.

(8) **Final Report**

The **Engineer** shall prepare five (5) bound, color copies of the final "***Preliminary Engineering Report***", including all attachments, exhibits, preliminary layouts, sketches, profiles, and cost estimates.

(B) Final Design. After the **Owner** has approved the **Engineer**'s final recommendations as shown in the "***Preliminary Engineering Report***" and the recommendations meet all Federal, State, and County regulations and requirements (including permitting), the **Engineer** will perform all required **engineering** activities to provide the **Owner** with a complete and approved set of plans, specifications, and estimate (PS&E) for each phase of construction of the **Project**. Specific **engineering** activities, tasks, and/or special services to be provided by the **Engineer** will include:

(1) **Right-of-Way Data (Special Services)**

The **Engineer** shall provide a right-of-way (ROW) map to the **Owner** that properly describes the ROW the **Owner** is to acquire. All procedures and tasks involved in the development of the ROW map will be in accordance with the **Owner**'s local operating procedures and the Texas Board of Professional Land Surveying Practices Act. Individual activities and/or requirements include:

- (a) Abstracting – The **Engineer** shall perform a preliminary title search and determine ownership information.
- (b) Surveying – The **Engineer** shall obtain the required survey data needed to establish existing and proposed right-of-way lines, channel centerline alignment, private property lines, county and/or city limits, and any topographic information not clearly indicated by the aerial photogrammetry.
- (c) The **Engineer** shall prepare the ROW map.
- (d) The **Engineer** shall prepare field note descriptions on 8-1/2 x 14" sheets, signed and sealed by a Registered Professional Land Surveyor, for each parcel of land to be acquired as shown on the ROW map.
- (e) The **Engineer** shall prepare parcel plats for each parcel of land to be acquired as shown on the ROW map. All parcel plats will be prepared on 8-1/2" x 14" sheets and signed and sealed by a Registered Professional Land Surveyor.
- (f) Any revisions required to the ROW map, and associated documents, shall be made by the **Engineer** promptly, and at no additional cost or expense to the **Owner**. The **Engineer** shall immediately furnish such revised right-of-way map, and associated documents, to the **Owner** at no additional cost or expense to the **Owner**.

(2) **Design Field Surveying (Special Services)**

The **Engineer** shall perform field surveys and provide field layouts and/or information necessary to collect information required in the final design of the **Project**. This may include,

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III. Preliminary Engineering, Final Design & Construction (continued)

but not be limited to, additional channel sections for the determination of final earthwork, roadway cross sections and profiles for intersecting roadways, soil bore staking, and right-of-way staking.

(3) **Permitting**

The **Engineer** shall furnish the necessary *engineering* data required to apply for regulatory permits from local, State, or Federal authorities.

(4) **Channel/Drainage Design**

The **Engineer** shall perform channel / drainage design for the proposed improvements to existing channels and/or facilities, as well as the proposed channels of the **Project**. The design of drainage improvements shall conform to the **Project** design criteria, and when possible, the standard designs required by the **Owner** (City, County, or State) of any associated roadways. These designs shall in all respects combine the application of sound *engineering* principles with a high degree of economy, and shall be submitted to the applicable City, County, State, and/or Federal agencies for approval.

(5) **Roadway Design**

The **Engineer** shall perform roadway design for any intersecting roadway approaches to the proposed improvements to the existing channels and/or proposed channels of the **Project**. The design of these roadways shall conform to the **Project** design criteria, and when possible, the standard designs required by the **Owner** (City, County, or State) of the associated roadway. These designs shall in all respects combine the application of sound *engineering* principles with a high degree of economy, and shall be submitted to the applicable City, County, State, and/or Federal agencies for approval.

(6) **Bridge Design**

(a) The **Engineer** shall perform bridge design required for any roadway crossings to the proposed improvements to the existing channels and/or proposed channels of the **Project**. The design of these bridges shall conform to the **Project** design criteria required by the **Owner** (City, County, or State), of the associated bridge structure and/or roadway, and the requirements set forth by the American Association of State Highway and Transportation Officials (AASHTO), "Standard Specifications for Highway Bridges". These designs shall in all respects combine the application of sound *engineering* principles with a high degree of economy, and shall be submitted to the applicable City, County, State, and/or Federal agencies for approval.

(b) Prior to performing structural detailing, the **Engineer** shall provide a bridge layout to the governing entity of the associated bridge structure and/or roadway for approval. Each bridge layout will include the required information set forth by the governing entity.

(7) **Plans, Specifications & Estimates (PS&E)**

(a) The **Engineer** shall prepare contract drawings, specifications and estimates for construction of the **Project** or portions of the **Project** as authorized by the **Owner**. These documents shall in all respects combine the application of sound *engineering* principles with a high degree of economy, and shall be submitted to the applicable City, County, State, and/or Federal agencies for approval.

(b) All final plan sheets shall be developed, by the **Engineer**, on 11" x 17" reproducible, 4 mil,

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III. Preliminary Engineering, Final Design & Construction (continued)

double-matte, white, opaque film.

- (c) Graphics files shall be developed by the **Engineer** in Microstation design file format, and must plot consistent with the reproducible plots submitted.
- (c) **Plan Sheets.** Plan sheets developed by the **Engineer** shall include, but not be limited to, title sheet, typical sections, sequence of construction, traffic control (as applicable), specification data (including schedules for minimum sampling and testing), estimate and quantity, plan-profile, channel details, roadway details (as applicable), bridge and culvert details, hydraulic details, and standards. (Standards may be used from governing entities, but must be signed and dated by the **Project Engineer** of responsible supervision as being applicable to the **Project**.)
- (d) **Specifications.** Whenever possible, the **Engineer** shall use the Texas Department of Transportation's 1993 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.
- (e) **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.

ATTACHMENT D

Work Authorization No. 1

Contract No. _____

J - 09 - 00 (8 Miles)

Estimated Construction Cost \$9,400,000

Basic Services:

Basic Services 9% \$846,000

Basic Engr. Services 90% \$761,400

- Less Feasibility Services \$100,000

Subtotal Engineering Services \$661,400

Subtotal Basic Topo Services \$188,000

**Total Basic Services this
WA \$849,400**

Additional Services:

Control Points & Benchmarks
30 points @ \$2,500/ea. \$75,000

ROW Parcels Donated
25 Parcels @ \$3,500/ea. \$87,500

ROW Parcels Purchased
15 Parcels @ \$5,000/ea. \$75,000

Total Additional Services \$237,500

**Total WA Lump Sum
Amount \$1,086,900**