

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 16-089

**APPROVAL OF WORK AUTHORIZATION NO. 5 WITH PARSONS
BRINCKERHOFF, INC. FOR GENERAL ENGINEERING CONSULTANT SERVICES
RELATED TO THE 183A PHASE III PROJECT**

WHEREAS, by Resolution 16-034 dated June 15, 2015, the Board of Directors authorized the Executive Director to negotiate and execute on behalf of the Mobility Authority an agreement with Parsons Brinckerhoff, Inc. for general engineering consultant services; and

WHEREAS, on July 1, 2016 the Mobility Authority entered into an agreement with Parsons Brinckerhoff, Inc. for general consulting civil engineering services; and

WHEREAS, the Executive Director and Parsons Brinckerhoff, Inc. have agreed to proposed Work Authorization No. 5 for general engineering consultant services for the 183A Phase III Project; and

WHEREAS, the Executive Director estimates the reasonable fees associated with the services to be provided under Work Authorization No. 5 to be in an amount not to exceed \$1,173,117.85, including contingency; and

WHEREAS, the services to be provided under in Work Authorization No. 5 shall be substantially complete by December 31, 2017. However, Work Authorization No. 5 will not expire until all tasks associated with the Scope of Services are completed; and

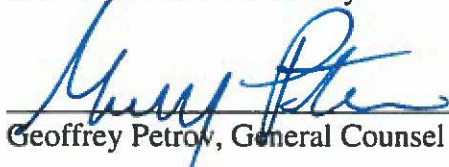
WHEREAS, the Executive Director recommends that the Board approve proposed Work Authorization No. 5, a copy of which is attached to this resolution as Exhibit A.

NOW THEREFORE, BE IT RESOLVED, that the Board approves an amount not to exceed \$1,173,117.85 for the services described in Work Authorization No. 5; and

BE IT FURTHER RESOLVED, that the Board authorizes the Executive Director to finalize and execute proposed Work Authorization No. 5 with Parsons Brinckerhoff, Inc., in the form or substantially the same form as Exhibit A.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 30th day of November, 2016.

Submitted and reviewed by:


Geoffrey Petrov, General Counsel

Approved:


Ray A. Wilkerson
Chairman, Board of Directors

Exhibit A

APPENDIX D

WORK AUTHORIZATION

WORK AUTHORIZATION NO. 05

This Work Authorization is made as of this 30st day of November, 2016, under the terms and conditions established in the AGREEMENT FOR GENERAL CONSULTING ENGINEERING SERVICES, dated as of July 1, 2016 (the “Agreement”), between the Central Texas Regional Mobility Authority (“Authority”) and **Parsons Brinckerhoff, Inc.** (“GEC”). This Work Authorization is made for the following purpose, consistent with the services defined in the Agreement:

183A Phase III – Environmental Assessment and Schematic Design

Section A. - Scope of Services

A.1. GEC shall perform the following Services:

Please reference Attachment A – Scope of Work

A.2. The following Services are not included in this Work Authorization, but shall be provided as Additional Services if authorized or confirmed in writing by the Authority.

N/A

A.3. In conjunction with the performance of the foregoing Services, GEC shall provide the following submittals/deliverables (Documents) to the Authority:

Please reference Attachment A – Scope of Work

Section B. - Schedule

GEC shall perform the Services and deliver the related Documents (if any) according to the following schedule:

Services defined herein shall expire on December 31st, 2017 or when all tasks associated with the Scope of Services are complete as defined by the Authority.

Section C. - Compensation

C.1. In return for the performance of the foregoing obligations, the Authority shall pay to the GEC the amount not to exceed **\$1,020,102.48** based on a Cost Plus fee listed in Attachment B – Fee Estimate. Compensation shall be in accordance with the Agreement.

The Authority and the GEC agree that the budget amounts contained in Attachment B-Fee Estimate for the GEC are estimates and that these individual figures may be redistributed and/or adjusted as necessary over the duration of this Work Authorization. The GEC may alter the compensation distribution between tasks or work assignments to be consistent with

the Services actually rendered within the total Work Authorization amount. The GEC shall not exceed the maximum amount payable without prior written permission by the Authority.

C.2. Compensation for Additional Services (if any) shall be paid by the Authority to the GEC according to the terms of a future Work Authorization.

Section D. - Authority's Responsibilities

The Authority shall perform and/or provide the following in a timely manner so as not to delay the Services of the GEC. Unless otherwise provided in this Work Authorization, the Authority shall bear all costs incident to compliance with the following:

N/A

Section E. - Other Provisions

The parties agree to the following provisions with respect to this specific Work Authorization:

N/A

Except to the extent expressly modified herein, all terms and conditions of the Agreement shall continue in full force and effect.

Authority:

**CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY**

By: _____

Name: Mike Heiligenstein

Title: Executive Director

Date: _____

GEC:

Parsons Brinckerhoff, Inc.

By: _____

Name: Mario Medina, P.E.

Title: Vice President

Date: _____

SERVICES TO BE PROVIDED BY THE ENGINEER

I. INTRODUCTION

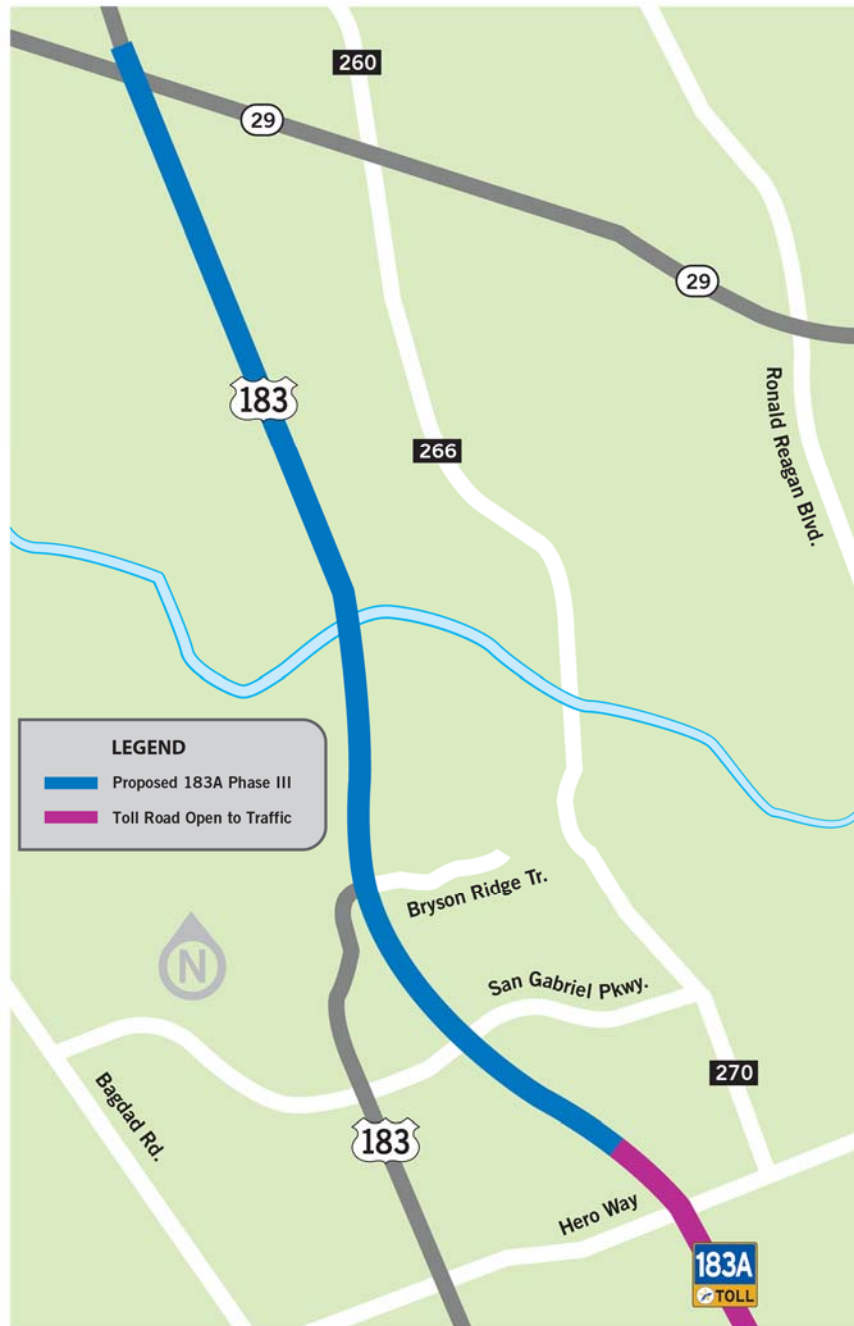
The ENGINEER shall perform work generally consisting of alternatives development and evaluation, environmental studies, public involvement, preliminary engineering, design, field survey, hydraulic studies, and schematic development for the Central Texas Regional Mobility Authority's (Mobility Authority) proposed US 183A Phase 3 Project (Project) located in Williamson County, Texas. Work to be performed under this contract shall be in compliance with applicable environmental laws, rules and regulations governing the development of transportation projects including but not limited to 23 CFR 771, the Federal Highway Administration's (FHWA) Technical Advisory 6640.A, the Texas Department of Transportation's (TxDOT) Environmental and Public Involvement rules, and TxDOT and/or FHWA guidance in effect at the time of contract execution.

The Project Limits are anticipated to extend from 0.5 miles north of State Highway (SH) 29 south to Hero Way.

The ENGINEER shall complete the following tasks:

- A comprehensive investigation and documentation of appropriate environmental components.
 - Draft and Final Environmental Assessment (EA)
 - Draft and Final Finding of No Significant Impact (FONSI)
- Public involvement
- Design surveying and aerial mapping
- Pertinent hydrologic and hydraulic engineering
- Traffic engineering and level of service analysis
- Development of a geometric schematic for the preferred alternative

Location Map



II. PROJECT MANAGEMENT AND ADMINISTRATION

The ENGINEER shall perform project administration and coordination duties, including contract administration, project management, meeting minutes of all meetings and telephone conversations, and other related administrative tasks associated with the project, including:

A. PROJECT MANAGEMENT AND ADMINISTRATION

Task 1: Progress Reports and Invoices

For the Project, prepare monthly invoices and progress reports for the work tasks and provide evidence of work accomplished during the time period since the previous report. Monthly progress reports shall be submitted and shall include: activities completed, initiated, or ongoing during the reporting period; activities planned for the coming period; problems encountered and actions to remedy them; overall status, including a tabulation of percentage complete by task; and updated project schedules.

Task 2: Record Keeping and File Management

The ENGINEER shall maintain all records and files related to the project throughout the duration of the services. e-Builder will be used for all records and files.

Task 3: Correspondence

Prepare written materials, letters, survey forms etc. used to solicit information or collect data for the project and submit them to the Mobility Authority for review and approval prior to use or distribution. A letter of transmittal shall accompany each document submittal to the Mobility Authority. At a minimum, the letter of transmittal shall include the Project Name, State CSJ number, County, and project limits.

Task 4: Schedule

Prepare a detailed, graphic schedule linking Work Authorization tasks, subtasks, critical dates, milestones, deliverables and the required reviews using the latest version of Primavera. The project schedule shall be in a format which depicts the order and inter-dependence of the various tasks, subtasks, milestones, and deliverables for each of the tasks identified therein. Progress shall be reviewed monthly for conformance to the contracted Work Schedule and should these reviews indicate a substantial change in progress, a recovery plan will be developed by the ENGINEER and provided to the Mobility Authority.

B. COORDINATION

The ENGINEER shall schedule and attend meetings to coordinate among project team members and the Mobility Authority. The ENGINEER shall be responsible for

project coordination for the review of deliverables with relevant project team members including TxDOT and agencies. The ENGINEER shall attend monthly progress/coordination meetings with the Mobility Authority. In preparation for each meeting, the ENGINEER shall prepare and distribute a Meeting Agenda which shall include a brief description of the meeting objectives, a list of the topics to be covered and who shall facilitate the discussion of each topic. When action items arise from the meeting discussion, an assignment of responsibility, a priority level and due date for each action item shall be made immediately and distributed amongst the team. The ENGINEER shall prepare all meeting minutes. This task includes a team project kick-off meeting.

Deliverables

- Monthly invoices and progress reports
- Detailed graphic schedules for each project
- Meeting agendas and minutes

III. ROUTE AND DESIGN STUDIES

Task 1: Alternatives Development and Analysis

Subtask A: Design Criteria

The ENGINEER shall use design criteria as set forth in Roadway Design Manual, Bridge Design Manual, Hydraulic Design Manual, and other deemed necessary State approved manuals. In addition, the ENGINEER shall prepare the Design Summary Report, (DSR). The ENGINEER shall prepare all work in accordance with the latest version of applicable State procedures, specifications, manuals, guidelines, standard drawings, standard specifications or previously approved special provisions and special specifications to include: the Roadway Design Manual, Hydraulic Design Manual, the Texas Manual on Uniform Traffic Control Devices (TMUTCD), Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, 2014, and other State approved manuals. When design criteria are not identified in State manuals, the ENGINEER shall notify the Mobility Authority and refer to the American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Street, (latest Edition). In addition, the ENGINEER shall follow the guidelines shown in the PS&E Preparation Manual which the ENGINEER may download from the TxDOT website. The ENGINEER shall obtain written concurrence from the Mobility Authority prior to proceeding with a design if any questions arise during the design process regarding the applicability of the design criteria.

Deliverables

- Draft Design Summary Report

Subtask B: Design Concept Conference

The ENGINEER shall organize and conduct a Design Concept Conference (DCC) in accordance with TxDOT's Project Development Process Manual. In preparation for the DCC, the ENGINEER shall finalize the Design Summary Report (DSR) to serve as a checklist for the minimum required design considerations.

Deliverables

- Meeting agenda and exhibits for DCC
- Final Design Summary Report

Subtask C: Preliminary Alternatives Development

The ENGINEER shall prepare one (1) plan and profile for the preliminary alternative based on the original ramping and crossover locations. The ENGINEER shall prepare plan view exhibits for additional alternatives showing differences in grade separation locations and/or ramp configurations. One typical section shall be prepared for the preliminary alternative to accompany the line diagram.

In assessing various preliminary alternatives (including the No-Build Alternative), the following design and engineering considerations shall be documented, as appropriate:

- a. Constructability
- b. Conceptual Design including special design considerations at various locations
- c. Construction Costs
- d. Engineering Costs
- e. Utility impacts
- f. Operation and Maintenance
- g. Level of Service for mainlanes, ramps, and frontage roads
- h. Environmental constraints as collected under **IV, Task 1, Subtask A** – below

The ENGINEER shall screen the preliminary alternatives based on the design and engineering considerations to a reduced number of reasonable alternatives, with the potential of one alternative, in addition to the No Build, carried into the environmental analysis

Subtask D: Alternatives Finalization and Analysis

- a. The ENGINEER shall integrate environmental stewardship and sustainability strategies into the reasonable alternative. Environmental stewardship and sustainability strategies are developed to address such issues as improved quality of access to goods and services, improved air quality, noise reduction, improved water quality, protection of habitat and open space, historic preservation, increased social equity, economic development, and a satisfying quality of life, in addition to local goals consistent with the overall project purpose and need.
- b. The ENGINEER shall perform the associated environmental analyses of the reasonable alternative and shall combine this data with the engineering and

traffic assessments into a draft Reasonable Alternatives Evaluation Matrix.

Deliverables

- Plan/Profile of the base alternative, exhibits of alternate grade separation(s) and/or ramping configurations, and typical section of the Reasonable Alternative(s) (hard copies and electronic files)
- Handouts for project team coordination meeting- Reasonable Alternative(s)
- Summaries of project team coordination meeting – Reasonable Alternative(s)
- Draft and Final Reasonable Alternatives Evaluation Matrix (Final shall be incorporated into EA)

Task 2: Preliminary Cost Estimates

The ENGINEER shall develop a preliminary construction cost estimate, total project cost estimate, and operations and maintenance estimate for all reasonable build alternatives using most current relevant industry unit prices.

Deliverables

- Preliminary cost estimates

Task 3: Design Schematics

For the Preferred Alternative, the ENGINEER shall:

- a. The ENGINEER will develop the geometric design that will include the refinement of the proposed typical sections and a fully calculated geometric design that includes all necessary horizontal and vertical alignments.
- b. The ENGINEER will develop preliminary design cross sections at 200' increments and at other intermediate locations as necessary (such as drainage channels, retaining wall limits, bridge limits, etc.). The cross sections will be used to identify the preliminary ROW requirements and assist in locating proposed retaining walls, bridge locations, etc. Earthwork quantities derived from the cross sections will be used in the development of the preliminary construction cost estimate.
- c. The ENGINEER will prepare a geometric schematic plan and profile drawing in accordance with the Chapter 1, Section 3, of the State's *Roadway Design Manual*. The limits of the geometric schematic shall be based on the logical termini with appropriate transitions on each end. The ENGINEER shall deliver 3 copies of the schematic design to the Mobility Authority for approval.
- d. The ENGINEER will perform basic preliminary engineering to determine general bent placements and structure depths for all bridge widening and new bridges including direct connections.

- e. If required by the noise analysis, the ENGINEER will develop preliminary designs for noise barriers for use in the Noise Workshops:
1. Assess the feasibility of each proposed location and recommend a construction type most appropriate for each site.
 2. Identify issues associated with proposed barriers and drainage constraints.
 3. Assess the feasibility of aesthetic treatments and collect sample cost estimates for various aesthetic treatments
 4. Identify limits of clearing and impacts associated with proposed barriers.
 5. Provide preliminary quantities and construction cost estimates for each proposed barrier.
 6. Prepare typical details for aesthetic concept development.
 7. Revise details for preferred aesthetic treatments and wall types.
 8. Develop preliminary wall layouts

Deliverables

- Geometric schematic for preferred alternative utilizing the TxDOT Austin District Schematic Checklist (in both DGN and PDF formats).
- Preliminary design cross sections in both electronic and roll format
- Preliminary quantities, construction cost estimates, total project cost estimates, and operations and maintenance estimates
- Preliminary wall layouts.
- Preliminary bridge layouts.

Task 4: Traffic Engineering Studies

The ENGINEER shall conduct the traffic engineering studies for the Reasonable Alternatives Analysis, safety analysis and future traffic demand for the Purpose and Need statement, traffic analyses for various environmental efforts and Operations Analysis for the schematic design.

The ENGINEER shall:

- a. Prepare level of service and traffic operations analysis to evaluate mainlane, frontage road, ramp and intersection operations
- b. Prepare traffic projections to support the air quality analysis, MSAT analysis, and traffic noise analysis.
- c. Develop existing and projected turning movements for each intersection for inclusion on the geometric schematic.
- d. Prepare safety analysis using TxDOT Crash Record Inventory System (CRIS) data for the preceding three full years.

Deliverables

- Traffic pattern diagrams for reasonable alternatives
- Safety analysis
- Traffic projections for the design year
- Turning movement projections at intersections
- Level of service analysis
- Microstation files or GIS shape files of traffic volume maps

IV. SOCIAL, ECONOMIC AND ENVIRONMENTAL STUDIES AND PUBLIC INVOLVEMENT

The ENGINEER shall provide environmental and public involvement services necessary to produce an EA for the Project. The following analyses are not applicable:

- Wild and Scenic Rivers
- U.S. Coast Guard Section 9 Permit

Task 1: Preliminary Environmental Constraints

Subtask A: Constraints Identification

The ENGINEER shall perform a desktop review of environmental constraints within the study area. Constraints to be identified include but are not limited to:

- a. Cemeteries
- b. Parks, Preserves, Trails & Greenbelts
- c. Soils
- d. Edwards Aquifer Contributing Zones
- e. Hazardous material sites
- f. Historic Properties
- g. Archeological sites
- h. Williamson County Regional Habitat Conservation Plan Golden-cheeked Warbler & Black-capped Vireo habitat areas
- i. Data from the Texas Parks and Wildlife Department's Natural Diversity Database
- j. United States Fish and Wildlife Service's Critical Habitat Mapper
- k. National Wetland Inventory Data
- l. Floodplains
- m. National Hydrography Dataset
- n. Land uses identified through aerial photo interpretation
- o. Existing and planned development

The above information shall be mapped in Geographic Information System (GIS) and utilized for the evaluation of alternatives.

Subtask B: Project Scope for Environmental Review Document (EA)

The ENGINEER shall complete a draft Project Scope for Environmental Review Document for the EA using TxDOT's TXDOT

Scope Development Tool. The completed draft will be submitted to Mobility Authority and TxDOT (Austin District and ENV) for review and approval. A workshop with Mobility Authority and TxDOT (Austin District and ENV) may be required to complete the process. Upon approval, the ENGINEER shall draft an Environmental Classification Letter to be submitted to TxDOT for review and approval (Austin District and ENV).

Deliverables

- Constraints Map
- Scope Development Tool
- Project Scope for Environmental Review Document
- Environmental Classification Letter
- Meeting Minutes, if meetings related to this task are held.

Task 2: Environmental Process Initiation

Subtask A: Notification Letter

A project classification letter with the purpose of notifying TxDOT of the initiation of the NEPA process for the Project and asking for concurrence regarding document type shall be prepared and submitted to the Mobility Authority for review that shall include a description of proposed work, termini, length, general location and anticipated approvals. This letter shall include documentation to demonstrate logical termini for the Project.

Subtask B: Resource and Regulatory Agency Coordination

The ENGINEER shall identify and create a database of State, Federal and local resource agencies that may be contacted for input on the Project (as appropriate).

A letter shall be sent to the appropriate agencies in the database inviting them to be part of the Project. The letter shall contain project information, a project area map, a description of the process, and a deadline for agency responses. The ENGINEER shall track the responses received.

Subtask C: Technical Reports

The ENGINEER shall prepare a technical report for environmental subject areas determined to be of concern for the Project. The technical reports shall incorporate guidance provided during meetings with TxDOT, Mobility Authority, and resource agencies, as applicable. Technical reports shall document existing conditions, methods used, study areas evaluated, and direct impacts assessed for each subject area.

Subtask D: Purpose and Need Statement

A draft Purpose and Need will be developed for the project. The Draft Purpose and Need Statement, including backup documentation, shall be submitted to the Mobility Authority for review and subsequent submittal to and review by TxDOT (Austin District and ENV) prior to the first agency coordination meeting and the first public meeting. The Draft Purpose and Need statement shall be presented during the first public meeting to provide an “opportunity for involvement” by the public. The Purpose and Need statement shall be finalized after applicable comments are incorporated from the public meeting, and shall be incorporated into the EA.

Task 3: Environmental Analysis for inclusion in the EA

Subtask A: Analysis of Social and Economic Conditions (including relocations and disproportionate impacts):

- a. The ENGINEER shall use appropriate and most current data sources, such as U.S. Census Bureau population estimates, windshield surveys, maps, and aerial photographs to assess the existing conditions for socioeconomic conditions and land use in the study area. Potential social conditions to be documented include:
 1. Demographics (population, ethnic/racial distribution, income) based on the most recent American Community Survey data.
 2. Other populations (disabled, elderly).
 3. Land uses in the project area (community services, schools, etc.).
 4. Mobility patterns.
 5. Safety (data).
 6. Other potential resources identified during data collection studies.
- b. The ENGINEER shall identify the property owners and tenants, as appropriate, adjacent to the Project.
- c. The ENGINEER shall identify the racial, ethnic and income level of affected individuals and communities, as available, to be used in subsequent analysis of the potential for disproportionate impacts on any minority or low-income individuals or communities.
- d. The ENGINEER shall develop a project level Environmental Justice Toll Analysis.
- e. The ENGINEER shall develop mitigation measures for social, economic and community impacts.
- f. The ENGINEER shall use public contact and public involvement to gather information from individuals and communities regarding social impacts.

- g. The ENGINEER shall identify, by use of land use plans and windshield surveys, current land uses and any anticipated land uses.
- h. The ENGINEER shall evaluate travel modes and patterns in a study area in order to determine any impacts the project may have on access to homes, businesses and community services.
- i. The ENGINEER shall identify and evaluate the potential for impacts to disabled and elderly individuals and populations. The ENGINEER shall use the most current U. S. Census Bureau data and public contact to determine how the project may impact these individuals and populations.
- j. The ENGINEER shall ensure federally conducted programs and activities are meaningfully accessible to Limited English Proficiency (LEP) individuals as required by Executive Order 13166.

Deliverables

- Draft and final project-level Environmental Justice Toll Analysis
- Draft and final community impacts section of EA

Subtask B: Geology and Soils Impacts

The ENGINEER shall identify and describe the existing earth resources in the study area, including soils and geologic features.

The ENGINEER shall also identify farmland impacts in the study area in accordance with the Farmland Protection Policy Act (7 U. S. C. 4201 et. seq.).

Deliverables

- Geology and Soils Technical Memo

Subtask C: Environmental Justice

The ENGINEER shall perform an environmental justice analysis in accordance with requirements of Executive Order 12898 (on Environmental Justice).

Deliverables

- Environmental Justice Technical Memo

Subtask D: Consideration of Pedestrians and Bicycles

The ENGINEER shall identify considerations affecting pedestrians and bicycles in accordance with requirements of FHWA Technical Advisory TA-T6640.8A (1987) and include data from the CAMPO 2035 Plan for bike/pedestrian facilities.

Deliverables

- Findings will be summarized in the Environmental Assessment.

Subtask E: Air Quality Analysis

The ENGINEER shall perform an air quality analysis in accordance with the current approved version of the TxDOT Air Quality Guidelines. The ENGINEER shall download and review the current Environmental Compliance Toolkit for Air Quality from TxDOT's website.

Since the projected traffic volumes are not expected to exceed 140,000 ADT, the ENGINEER shall prepare a qualitative analysis technical memorandum on air quality.

Deliverables

- Air Quality Technical Memo

Subtask F: Traffic Noise Analysis

The ENGINEER shall perform a traffic noise analysis in accordance with the most current version of TxDOT's "Guidelines for Analysis and Abatement of Roadway Traffic Noise."

- a. The ENGINEER shall identify representative receivers that might be impacted by highway traffic noise and may benefit from feasible and reasonable noise abatement.
- b. The ENGINEER shall determine existing and predicted noise levels for representative receivers, as follows:
 1. The ENGINEER shall perform computer modeling of existing noise levels and predicted (future) noise levels. Computer modeling shall be accomplished with the FHWA Traffic Noise Model (TNM), Version 2.5 (or most current version), in areas where there is an existing roadway/traffic.
 2. The ENGINEER shall identify impacted receivers in accordance with State's absolute and relative impact criteria.
 3. The ENGINEER shall consider and evaluate all required noise abatement measures for impacted receivers in accordance with the feasible and reasonable criteria.
 4. The ENGINEER shall propose noise abatement measures that are both feasible and reasonable.
- c. The ENGINEER shall prepare a report documenting the results and methods used in the traffic noise analysis.
- d. If there are noise impacts and barriers are reasonable and feasible, the ENGINEER shall conduct Noise Workshops (if necessary):

1. The ENGINEER will conduct an initial internal workshop to review the location, length, height, utilities, ROW, constructability, vegetation impacts, etc. associated with each barrier. Participants will include the ENGINEER, the Mobility Authority, TxDOT, and the GEC.
2. The ENGINEER will conduct up to four (4) noise workshops:
 - a. Develop talking points
 - b. Identify and document information to be communicated to the public (mailings, notices, advertising, etc.)
 - c. Develop a workshop agenda
 - d. Develop necessary exhibits such as:
 - i. aerial maps illustrating proposed barrier locations and property lines
 - ii. Graphics illustrating proposed barrier types (up to five)
 - iii. Graphic display of proposed surface treatments and colors
 - iv. Perspective drawings for example walls for workshops (up to five)
 - v. Develop voting information and ballots
 - vi. Produce handouts for noise workshop participants
 - vii. Develop PowerPoint presentation
 - e. Identify and propose for approval locations for the four (4) workshops. The ENGINEER will make recommendations of locations that are a convenient distance to the proposed barrier location, attempt to identify meeting locations that are free of charge, and recommend up to four (4) facilities for approval.
3. The ENGINEER will notify property owners of the workshops:
 - a. Prepare a draft notification packet for review and approval by the Mobility Authority.
 - b. Notification packets will be sent via certified mail, return receipt requested, to adjacent property owners 30 days prior to the workshop
 - c. If a return receipt is not received within 15 days of the mailing, a phone call will be placed to the property owner of record.
 - d. Provide and place door-hangers on the adjacent properties 7 days prior to the workshop.
4. The ENGINEER will notify other interested parties and local elected officials:
 - a. Notify relevant elected officials
 - b. Notify City representatives
 - c. Notify other interested parties and neighborhood associations.
 - d. Post the schedule and meeting materials on the project website maintained by the Mobility Authority
5. The ENGINEER will compile documentation of workshop attendance. The ENGINEER will:
 - a. Record the attendance of property owners who are eligible to vote on the noise barrier.
 - b. Provide property owners with a name badge that clearly identifies their status as an eligible voter.

- c. Record the attendance of other individuals, which may include representatives of neighborhood associations, community groups, agency staff, or elected officials.
 - d. Take photographs to document the meetings.
6. The ENGINEER will develop a draft summary of the results of the noise workshop process to document the outcome and provide design information to the design team. Upon review and approval of the draft summary, the ENGINEER will provide a Final Summary Report.

Deliverables

- Draft and final noise workshop notification packets
- Draft and final noise workshop exhibits, handouts, talking points/ PowerPoint presentation, advertisements, voting materials
- Draft and final Noise Analysis Technical Memo
- Noise workshops draft and final Summary Report

Subtask G: Water Quality Studies

The ENGINEER shall determine whether the proposed project has the potential to affect water quality as it relates to each reasonable alternative, addressing the following:

- a. TCEQ/TxDOT MOU.
- b. Surface water resources – identification of threatened and impaired water bodies as listed in the TCEQ's 2014 303(d) list.
- c. Sources of public drinking water and assess any potential impacts.
- d. Edwards Aquifer (Recharge Zone and Contributing Zone) impacts
- e. Texas Pollutant Discharge Elimination System program.
- f. Geologic Assessment (can be added if needed)
- g. Input from Stakeholders

Deliverables

- Findings will be summarized in the Environmental Assessment.

Subtask H: U.S. Army Corps of Engineers Permits/Waters of the U.S.

- a. Section 401 of the Clean Water Act (33 U.S.C. 1341). For each reasonable alternative being considered, the ENGINEER shall determine whether the proposed project requires a Section 401 water quality certification.

- b. Section 404 of the Clean Water Act (33 U.S.C. 1344). For each reasonable alternative being considered, The ENGINEER shall perform a Waters of the U.S. assessment based on the constraints map data and published data and field reconnaissance of the reasonable alternatives. For the Preferred Alternative, the ENGINEER shall determine whether the proposed project requires a Section 404 permit (Nationwide or Individual) and if necessary, shall perform coordination with the USACE. The ENGINEER will be required to prepare and submit any necessary 404 permitting.
- c. Draft Final and Final Report. The ENGINEER shall produce a draft report of Waters of the U.S. The ENGINEER shall submit four copies of the draft report to the Mobility Authority for review and approval. In the final report, ENGINEER shall address Mobility Authority comments on the draft report. The ENGINEER shall submit four copies of the final report to the Mobility Authority for review and approval.

Deliverables

- USACE 404 Permitting documentation (NWP is anticipated)
- Waters of the US report, draft and final

Subtask I: Vegetation and Wildlife Habitat

The ENGINEER shall identify and assess the potential for water body modifications and the existing conditions of wildlife habitat in the study area in accordance with the requirements of TXDOT's MOU with TPWD.

Deliverables

- Findings will be summarized in the Environmental Assessment.

Subtask J: Invasive Species Studies

The ENGINEER shall address invasive species in accordance with the requirements of Executive Order 13112.

Deliverables

- Findings will be summarized in the Environmental Assessment.

Subtask K: Beneficial Landscaping

The ENGINEER shall discuss beneficial landscaping in accordance with the requirements of Executive Memorandum of April 26, 1994.

Deliverables

- Findings will be summarized in the Environmental Assessment.

Subtask L: Floodplain Impacts

The ENGINEER shall determine whether the proposed project has the potential to affect floodplains. Studies for floodplain impacts shall follow the requirements of Executive Order 11988 and 23 C.F.R. 650, Subpart A.

Deliverables

- Findings will be summarized in the Environmental Assessment.

Subtask M: Threatened or Endangered Species

- a. The ENGINEER shall examine all available existing commercial and scientific data to determine the likelihood that protected species, their habitat, or designated critical habitat (per 50 C.F.R. 17.94-95) could be impacted by the proposed project. Existing data shall include the records of the TPWD Natural Diversity Database, USFWS records or files, and any other records available to the public.
 1. Surveys for Habitat of Protected Species. For the purposes of this contract, protected species shall include:
 - a) All species listed by the USFWS as threatened or endangered or proposed for listing as threatened or endangered (50 C.F.R. 17.11-12);
 - b) All species that are candidates for review for listing by USFWS as threatened or endangered (per most recently updated list in Federal Register);
 - c) Species listed as threatened or endangered species by TPWD (State of Texas Threatened and Endangered Species Listings, TPWD);
 - d) Species protected by the Migratory Bird Treaty Act (50 C.F.R. 10.13).
- b. The ENGINEER shall conduct early coordination with TxDOT and the USFWS to determine the most appropriate regulatory process (§7, §10 or a combination) for clearance under the Endangered Species Act if habitat for listed species will be affected.
- c. Incorporating the results of b. above (if required), prepare Biological Evaluation (BE) for the proposed project.
- d. Habitat Analysis. For inclusion in the BE and for use in coordination with TPWD the ENGINEER shall perform an analysis/characterization of habitat for the study area. If the ENGINEER encounters protected species or habitat for protected species, the ENGINEER shall notify the Mobility Authority immediately. In accordance with Provision (4)(A)(ii) of the TxDOT – TPWD MOU, some habitats may be given consideration for non-regulatory mitigation during project planning (at the TxDOT Austin District's discretion).

Deliverables

- Biological Evaluation

Subtask N: Archeological Studies

The ENGINEER shall perform an archeological background study for the proposed project Archeological survey, testing or data recovery, if required, would be covered under a separate supplemental work authorization

Deliverables

- Archeological background study.

Subtask O: Historic Resource Studies

The ENGINEER shall perform historic resource project coordination request. If required, a Historic Resources Survey Report (HRSR) would be prepared under a supplemental work authorization.

Deliverables

- Historic project coordination request.

Subtask P: Initial Site Assessment of Hazardous Materials

- a. The ENGINEER shall perform an initial site assessment (ISA) for potential hazardous materials impacts. The ISA shall determine the potential for encountering hazardous materials in the study area. The hazardous materials ISA is outlined by TxDOT and is in accordance with the American Society for Testing and Materials (ASTM) Environmental Site Assessment standard practices (ASTM E 1527 and ASTM E 1528) or equivalent (i.e., satisfies "due diligence" and "appropriate inquiry" requirements under the Comprehensive Environmental Response and Compensation Liability Act (42 USC 9601(35)(B)). The following components of the hazardous materials ISA shall be reviewed, assessed, and/or documented to an appropriate project-specific level:
 1. Existing and previous land use information from readily available resources (topographic maps, available aerial photos, right-of-way maps, files and other information;
 2. Initial site/corridor field surveys by a hazardous materials expert;
 3. A regulatory agency database search (list search) and/or review of regulatory agency files.
- b. The ENGINEER shall produce and submit to the Mobility Authority an ISA for hazardous materials. The ISA shall include, when applicable, full list search reports, copies of agency file information, recommendations, and any other supporting information gathered by the ENGINEER. The ENGINEER also shall include a discussion of hazardous materials impacts based on the ISA suitable for inclusion in the EA.

Deliverables

- Hazardous Materials ISA checklist and supporting attachments

Subtask Q: Visual Impacts

The ENGINEER shall identify visual impacts in accordance with the requirements of FHWA Technical Advisory TA-T6640.8A (1987).

Deliverables

- Visual impacts summary

Subtask R: Indirect Impacts

The Council on Environmental Quality (CEQ) regulations requires that all federal agencies consider the indirect effects of any proposed action. The ENGINEER shall identify indirect impacts in accordance with the requirements of FHWA Technical Advisory TA-T6640.8A (1987), NCHRP's Report 466: Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects (2002), NCHRP's Report 25-25, Task 22: Forecasting Indirect Land Use Effects of Transportation Projects (2007), and TxDOT's Indirect Impacts Analysis Guidance (July 2016) or most current version at contract execution. The ENGINEER will organize and conduct a collaborative judgment process with expert individuals. The ENGINEER shall document the indirect impacts analysis in a technical report. The results included in the technical report will also be used in the EA.

Deliverables

- Indirect Impacts Technical Report

Subtask S: Cumulative Impacts

The Council on Environmental Quality (CEQ) regulations requires that all federal agencies consider the cumulative effects of any proposed action. The ENGINEER shall identify cumulative impacts in accordance with the requirements of FHWA Technical Advisory TA-T6640.8A (1987), CEQ's handbook, Considering Cumulative Effects Under the National Environmental Policy Act (1997) and TxDOT's Cumulative Impacts Analysis Guidelines (July 2016) or most current guidance at contract execution. The ENGINEER shall document the cumulative impacts analysis in a technical report. The results included in the technical report will also be used in the EA.

Deliverables

- Cumulative Impacts Technical Report

Subtask T: Construction Impacts

The ENGINEER shall prepare a general discussion of construction impacts for each reasonable alternative for inclusion in the environmental document.

Deliverables

- Findings will be summarized in the Environmental Assessment.

Subtask U: Section 4(f)/Section 6(f) Evaluations

The ENGINEER shall identify Section 4(f) properties in the study area in accordance with 49 USC 303 and assess the potential for project-related impacts on those properties. The properties identified shall include all property types listed in 23 C.F.R. 771.135 (49 USC 303). Potential impacts on the Bryson Farmstead (NRHP) shall be evaluated and a determination of potential constructive use completed.

The ENGINEER shall also identify any land use that has applied funds from the Land & Water Conservation Fund Act (LWCFA), 16 U.S.C. §§ 4601-4 to 4601-11 (commonly referred to as Section 6(f), as the provision was originally contained in Section 6(f)(3) of the LWCFA, Public Law 88-578 of 1962, before codification); and the Urban Park and Recreation Recovery Act (UPARRA), 16 U.S.C. §§ 2501 to 2514 restrict the future use of parklands or open spaces that have been improved with funds received through the LWCFA and UPARRA (collectively, "Section 6(f) resources").

- a. The ENGINEER shall use existing engineering data, archeological and historical studies, and parks records to determine whether 4(f)/6(f) properties may be present. If in the ENGINEER's opinion there is insufficient archeological, historic or engineering data upon which to base a determination of 4(f)/6(f) status, the ENGINEER shall contact the Mobility Authority to obtain further direction on how to proceed.
- b. The ENGINEER shall organize and analyze existing data to enable TxDOT to make a determination of applicability in conformance with FHWA 4(f) Policy Paper (Sept. 24, 1987) and FHWA Technical Advisory T6640.8A (Oct. 30, 1987).

Task 4: Environmental Document Preparation**Subtask A: Draft Environmental Assessment (EA)**

- a. The ENGINEER shall prepare an EA which shall include discussions of purpose and need, existing and proposed design, alternative descriptions, alternatives analysis, air quality assessment, noise computer modeling, historical/archeological assessment, wildlife and endangered species review, right-of-way, displacements, socioeconomic analysis and environmental justice impacts, water quality, wetlands, floodplains, aesthetics/visual effects, and construction impacts as well as indirect and cumulative impacts. Assume the EA will evaluate the No-Build Alternative and Preferred Alternative.
- b. The ENGINEER shall prepare exhibits including, but not limited to, the following: vicinity map, floodplain map, existing and proposed typical sections,

- line diagrammatic schematic, noise receiver location map, wetlands inventory map, USGS map, site photographs and hazardous sites map, as appropriate.
- c. Exhibits in the document shall be limited in size to 8 1/2" x 11" or 11" x 17" for ease of reproduction.
 - d. The ENGINEER shall schedule and attend a review meeting to be held with the Mobility Authority for the Project. The purpose of the review is for the ENGINEER to receive comments from the Mobility Authority and TxDOT (Austin District and ENV).
 - e. The ENGINEER shall revise the EA, addressing those comments obtained from the Mobility Authority, TxDOT Austin District, TxDOT ENV, and Agency review.

Deliverables

- Draft EA
- Revised EA per review comments (6 review cycles)

Note: The ENGINEER agrees that all efforts utilized during the development of technical reports under this section are also considered preliminary work products for the development of the EA document, and that applicable work product generated during technical reports shall be utilized during the development of the EA to prevent duplication of effort.

Subtask B: Final EA

- a. After the public hearing, the ENGINEER shall update the environmental document. The ENGINEER shall address the engineering and environmental issues raised at the public hearing and effect disposition of same. This action is an important part of the study process and shall involve evaluating suggestions received as a result of the hearing. This shall be done in coordination with the Mobility Authority, TxDOT Austin District, and TxDOT ENV.
- b. The ENGINEER shall revise the draft environmental document to discuss changes to the preferred alternative in response to agency and public hearing comments, as required.
- c. The ENGINEER shall review the draft impacts section and revise this section to reflect the preferred alternative and pertinent comments received during the hearing. As appropriate, the ENGINEER shall include a summary of further agency comments and a discussion of results of agency coordination.
- d. The ENGINEER shall prepare and list public hearing comments and responses. This summary shall be included as an appendix to the environmental document, as appropriate.

- e. The ENGINEER shall submit the revised draft EA for Mobility Authority, TxDOT Austin District, and TxDOT ENV review.
- f. The ENGINEER shall revise the Final EA document to respond to Mobility Authority, TxDOT, and Agency comments. Following final revisions, the ENGINEER shall provide to the Mobility Authority hard copies and electronic copies in native and PDF format of the Final EA on e-Builder.

Deliverables

- Draft Final EA (digital only)
- Revised FINAL EA per review comments (digital and 4 hard copies)

Subtask C: FONSI/Final Approval

The ENGINEER shall prepare and submit to the Mobility Authority the Draft FONSI, as appropriate, for their use in obtaining final clearance of the Project. The Draft FONSI shall be submitted to the Mobility Authority following the submission and review of the Final EA.

Deliverables

- One electronic copy (in native and PDF format) of a Draft FONSI

Task 5: Environmental Support Services**Subtask A: Administrative Record (AR)**

The ENGINEER shall establish, track, organize and manage the project's administrative record, which is the written record supporting the agency's decisions. The documents and materials shall be organized in chronological order by date and indexed. The index should include a brief description of each document. The index should be updated on a regular basis and a copy of the index provided to the Mobility Authority monthly. The administrative record shall be maintained by the ENGINEER throughout the duration of this work authorization. Documentation and materials to be compiled as part of the AR include:

- a. Privileged and non-privileged documents and materials (once the AR is compiled, protected documents and materials shall be retracted or removed from the record. The index shall identify the documents or materials, reflect that they are being withheld, and state on what basis they are being withheld.)
- b. Draft and final documents and materials
- c. Technical information, sampling results, survey information, engineering reports or studies
- d. E-Mail messages and attachments

- e. Correspondence and attachments
- f. Documented communications among organizations involved in the project
- g. Policies, guidelines, directives, and manuals relevant to the development of project NEPA documentation
- h. Modeling results and factual data
- i. Public involvement materials, communications, comments, and other information that documents public participation in the project
- j. Meeting minutes or transcripts
- k. Maps, drawings, and displays
- l. Photographs
- m. Field and personal notes (under special circumstances)
- n. Primary Sources

An index and a database of documents contained within the AR shall be created and maintained in chronological order by the ENGINEER. The index shall have a cover page that shall include the title of the project, date that the AR was originally compiled, date(s) AR was updated. In addition, the index would have a brief introduction and preface that explains the contents of the index, how it was organized, how to use the index, as well as a brief project description. The majority of the index would comprise a matrix that contains the following information for each item within the AR:

- a. Temporary number that corresponds to a number placed on the item
- b. Date of document or material development
- c. Author of document or material
- d. Recipient of document or material
- e. Title or Description of document or material
- f. Number of Pages

A permanent number may be placed on the documents when the AR is complete or is reviewed by appropriate personnel.

Each information item (see above) with regards to each AR item shall be designated

as a separate field within the database. The database and index shall be burned onto a DVD and placed within the AR along with a hardcopy of the index (matrix). The database can be used to prepare a variety of reports with regards to the AR sorted by any of the fields.

Provide an electronic copy of the AR on a DVD and e-Builder and the documents not already in electronic format will be scanned. The scanned documents will be legible.

Deliverables

- Indexed Project Record (to be submitted monthly)
- Indexed and numbered Administrative Record, electronic file and hard copy

Task 6: Public Involvement

The ENGINEER shall perform public involvement activities in accordance with 43 TAC 2.40 – 2.50 as well as with the current version of TxDOT's environmental procedures manual.

Subtask A: Public Involvement Plan

The ENGINEER shall develop a public involvement plan to facilitate meaningful participation to ascertain stakeholder input on initiatives to promote environmental stewardship and sustainability planning as part of the environmental decision-making process. Involvement must be early, inclusive, continuous and tailored to address the identified needs within the project area including LEP needs. The public involvement plan should include an education component to explain to the public the concepts and purpose of environmental stewardship and project sustainability.

Deliverables

- Public Involvement Plan

Subtask B: Stakeholder Engagement

- a. The ENGINEER shall compile, maintain and update a mailing list of people, agencies and organizations interested in the proposed project. The Mobility Authority shall provide the ENGINEER with relevant data available to the Mobility Authority.
- b. The ENGINEER shall provide content for inclusion on a Project Website or Public Engagement forum. Content could include, but not be limited to:
 1. Project description information
 2. Upcoming events and activities
 3. Project Reports and documentation
 4. Project newsletters and fact sheets
 5. Frequently Asked Questions
 6. Links to audio and video recordings of project events such as open houses and hearings

7. Links to related websites
 8. Public engagement forum questions and responses
- c. Project Fact Sheets
The ENGINEER will:
1. Prepare Fact Sheets to provide more in depth information on special project topics than can be provided in the project newsletter (e.g. explanation of alternatives, noise analysis and mitigation options, etc.). The fact sheets will be no longer than two (2) two-sided pages with appropriate graphics.
 2. Mail fact sheets to community members upon request.
 3. Make the fact sheets available in PDF format on the project website and at public involvement activities including neighborhood and public meetings, project presentations, and noise workshops.
- d. Frequently Asked Questions (FAQs)
The ENGINEER will prepare FAQs, with responses, for approval by the Mobility Authority, TxDOT Austin District, TxDOT ENV and FHWA and posting on the project website.
- e. Community Engagement
1. Develop and maintain a list of potential community members (neighborhood associations, special interest groups, business associations, etc.) to contact for informal meetings/discussions.
 2. Send project information to community groups and offer to meet with them.
 3. Respond to requests from community members for meetings with project staff.
 4. Conduct up to 5 meetings with community groups to discuss the Project.
 5. Coordinate with the Mobility Authority and TXDOT on meeting logistics.
 6. Maintain a complete correspondence file for the stakeholder meetings, including printed and electronic letters and other correspondence.
 7. Prepare a neighborhood meeting summary for each meeting.
- f. The ENGINEER shall make all arrangements for up to one (1) Public Meeting/Open House, and one (1) Public Hearing (2 events total). Each Public Meeting/Hearing shall be coordinated and held in accordance with the following:
1. The ENGINEER shall secure the meeting/hearing location, date and time (includes securing a/v equipment, chairs/tables, podium, etc.) In the interest of the community outreach and cost, the ENGINEER should ideally pursue non-commercial, community sites for the Public Meetings/Hearings when possible.
 2. The ENGINEER shall prepare and publish legal notices and Display Advertisements for each meeting/hearing. The ENGINEER shall prepare and distribute meeting notices for distribution to the contacts on project databases. The ENGINEER shall provide the Mobility Authority draft copies

- of legal notices and display ads at least three (3) weeks prior to first publication date.
3. The ENGINEER shall prepare meeting/hearing handouts, agendas, name tags, sign-in sheets, speaker cards, comment cards and Power Point presentations with accompanying speech (a version for each meeting/hearing). Up to four (4) different line diagrams and up to fourteen (14) exhibit boards shall be prepared by the ENGINEER per meeting/hearing.
 4. The ENGINEER shall provide a translator (if needed), audio/video equipment (projector, screen, microphones, podium, etc.) (if needed).
 5. The ENGINEER shall provide a court reporter for each Public Meeting/Hearing.
 6. The ENGINEER shall compile and prepare responses to comments at each Public Meeting/Hearing.
 7. The ENGINEER shall make up to four (4) rounds of revisions on all meeting materials. The ENGINEER shall obtain the Mobility Authority's approval on all materials prior to production or publication.
- g. The ENGINEER shall arrange and attend up to two (2) pre-meetings (a pre-meeting prior to the public meeting and the hearing) with the Mobility Authority and TxDOT to review all exhibits and other materials to be used at public meetings or hearings.
- h. The ENGINEER shall provide personnel to staff up to two (2) meetings/hearings including three (3) public involvement and coordination staff to perform registration, make presentations, and answer questions.
- i. The ENGINEER shall develop and submit to the Mobility Authority up to two (2) Public Meeting/Hearing Summary Reports and a Summary and Analysis of each public hearing that document the activities for each meeting/ hearing conducted. These reports shall contain the outreach, notifications, and contacts conducted prior to the meetings/hearings; meeting/hearing details such as presentations, attendance, and pertinent details regarding the meeting/hearing; and a comment and response section that documents comments received before, during and after the meeting/hearing, and a response to each. The Public Meeting Summary Report and Public Hearing Summary and Analysis shall be sufficiently detailed to provide a full record of officially submitted comments from the meetings/hearings.

Deliverables

- Updated project database/ mailing list
- Website content as described above
- List of potentially interested community groups
- Up to five (5) community meeting summary reports
- Two (2) Public Meeting/Hearing Summary and Analysis Reports

Subtask C: Elected Official/Agency Involvement and Coordination

This task is to assure coordination with local and regional jurisdictions and agencies related to the Project; to actively solicit their participation in the planning and decision process for the project. The ENGINEER will work with the Mobility Authority to identify public agencies and jurisdictions that should be included in the Project outreach program.

The ENGINEER will:

- a. Work with the Mobility Authority and TxDOT to identify elected officials at the local, regional, and federal levels who need to be briefed at key points in the project (e.g. city council members, board members of regional agencies, and federal elected representatives).
- b. Work with the Mobility Authority to prepare briefings of elected officials on a regular basis, in advance of major project related community events or activities.
- c. Prepare a briefing summary report to summarize all briefings.

Deliverables

- Updated project elected officials database/mailing list
- Briefing Summary Report

Subtask D: Media Outreach and Coordination

- a) The ENGINEER will work with the Mobility Authority to keep the public informed about the project.
- b) Issues Management. The ENGINEER will develop an advanced list of potential significant issues of public interest or concern and prepare contingencies for dealing with each issue and pre-prepared language or response outlines for each issue.
- c) Crisis Communications. The ENGINEER shall work with the Mobility Authority to assist in communications of a crisis nature requiring rapid response times, in particular to the local news media.

Subtask E: Context Sensitive Solutions (CSS)

The ENGINEER will coordinate CSS activities into the project as necessary. This includes coordination with adjacent Williamson County projects.

IV. FIELD SURVEYING AND PHOTOGRAMMETRY

Task 1: Field Survey

Surveying services shall include use of geodetic methods to establish horizontal and vertical control network of the preferred alternative. Survey limits of the project, as will be from the northbound eastern edge of the frontage road to the southbound western edge of the frontage road from 0.5 miles north of SH 29 south to Hero Way and extending 500 feet from the centerline down cross streets. All survey activities shall be coordinated with TxDOT for access to the right of way.

- a. The ENGINEER shall perform each survey in accordance with the TxDOT's latest practices, specifications, procedures and standards. Each survey shall meet or exceed the standards set in the Professional Land Surveying Practices Act, General Rules of Procedures and Practices promulgated by the Texas Board of Professional Land Surveying (TBPLS), the latest edition of the Texas Society of Professional Surveyors (TSPS) Manual of Practice for Land Surveying in the State of Texas, current Federal Geodetic Control Subcommittee's (FGCS) Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques, FGCS Standards and Specifications for Geodetic Control Networks, the State GPS Manual of Practice, and, the State Survey Guide, latest edition. Each survey shall be conducted in an organized and workman-like manner and shall be subject to the approval of the Mobility Authority.
- b. The ENGINEER shall use The North American Datum of 1983 (NAD83), Texas State Plane Coordinate System (SPCS) Central Zone, NAD83 CORS Adjustment, based upon state monuments. All coordinates and distances shown shall be project surface values expressed in units of survey feet. The project grid-to-surface combined adjustment factor shall be determined by the ENGINEER. The ENGINEER shall submit the proposed scale factor, in writing, to the Mobility Authority and TxDOT for approval. The ENGINEER shall base elevations on North American Vertical Datum 88 (NAVD88), unless otherwise directed by the Mobility Authority.
- c. The ENGINEER shall certify work performed under this contract as true and correct according to FGCS Standards, the State Survey Guide, latest edition, the State GPS Manual of Practice, latest edition or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.
- d. Survey standards for services that relate to surveying for engineering projects that are non-boundary related may be determined by the Mobility Authority, construction specifications, or design specifications.

The ENGINEER shall provide a design survey for the preferred alternative route. This work may include right-of-entry, establishing control, leveling control, performing an aerial flight, aerial mapping, mobile mapping and locating obscured areas.

- a. The ENGINEER shall notify the Mobility Authority prior to performing the work if:

1. Sufficient primary control monumentation previously set cannot be found.
 2. The work is delayed due to weather or other circumstances beyond the ENGINEER's direct control.
- b. The ENGINEER shall perform design in compliance with the following technical requirements:
1. Design survey shall be performed under the direct supervision of a Registered Professional Land Surveyor currently registered with the Texas Board of Professional Land Surveying. All survey work shall conform to the TxDOT Survey Manual latest addition and the TxDOT GPS Manual latest addition.
 2. Horizontal and Vertical ground control established by conventional methods conducted by the ENGINEER shall meet standards of accuracy as set forth in the TxDOT Survey Manual and the TSPS Manual of Practice for Land Surveying in the State of Texas to the category and condition delineated. The ENGINEER shall run vertical control using digital levels only unless otherwise approved by the Mobility Authority.
 3. Horizontal and/or vertical ground control used for design surveys based on GPS surveys shall meet standards of accuracy as set forth in the Federal Geodetic Control Committee publication entitled Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques, reprinted with corrections August 1, 1989, or the TxDOT GPS Manual of Practice, latest edition, as specified.
 4. Side shots or short traverse procedures used to determine horizontal and vertical locations shall meet the following criteria:
 - i. Side shots or short traverses shall begin and end on horizontal and vertical ground control as described in the TSPS Manual of Practice for Land Surveying in the State of Texas to the category and condition delineated.
 - ii. The ENGINEER shall use standards, procedures and equipment such that horizontal locations relative to the control may be reported within the following limits:
 - a. Bridges and other roadway structures less than 0.1 of one foot.
 - b. Utilities and improvements less than 0.2 of one foot.
 - c. Cross-sections and profiles less than 1 foot.
 - d. Bore holes less than 3 feet.
 - iii. The ENGINEER shall use standards, procedures and equipment such that vertical locations relative to the control may be reported within the following limits:
 - a. Bridges and other roadway structures less than 0.05 of one foot.
 - b. Utilities and improvements less than 0.1 of one foot.
 - c. Cross-sections and profiles less than 0.1 of one foot.
 - d. Bore holes less than 0.1 of one foot.

Deliverables

- Design survey for Preferred Alternative

Task 2: Mobile Mapping

The purpose of mobile mapping is to provide planimetric digital mapping (DGN) and digital terrain modeling (DTM) in support of roadway design.

Subtask A: Mobile Mapping

Provide Mobile LiDAR mapping appropriate for detailed design. The mapping corridor will be limited to the edges of the existing pavement and include all existing striping.

- a. TxDOT standards shall be utilized.
- b. Translate all vector data to GEOPAK, ESRI, and MICROSTATION and project the data to GRID and SURFACE coordinates as required.
- c. Horizontal ground control provided shall meet standards of accuracy required by the Mobility Authority and as described in the FGCS Standards and Specifications for Geodetic Control Networks, latest edition, the Texas Department of Transportation Survey Manual, latest edition, the Texas Department of Transportation GPS Manual of Practice, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.
- d. Vertical ground control provided shall meet standards of accuracy required by the State and as described in the FGCS Standards and Specifications for Geodetic Control Networks, latest edition, the Texas Department of Transportation Survey Manual, latest edition, the Texas Department of Transportation GPS Manual of Practice, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

Deliverables

- Calibrated .LAS files.
- Certification that the data was captured on the date indicated, signed by the data provider.

Subtask B: DGN and DTM Files

- a. Prepare DGN files covering the specific work location, meeting standards and specifications as required.
- b. Prepare DTM files covering the specific work location, meeting standards and specifications as required.

Deliverables

- 2D DGN and 3D DTM files on a medium and in a format acceptable to the

Mobility Authority, delivered in e-Builder.

Task 3: Level Control

The ENGINEER shall verify and adjust the control vertically with digital differential leveling. The ENGINEER shall perform leveling throughout the entire limits or length of the Preferred Alternative. Primary and secondary control points shall be tied together to establish adjusted vertical control for the project. The ENGINEER shall base the adjusted vertical datum on the values derived for the adjusted primary control.

Task 4: Water Crossing Sections

The ENGINEER shall survey cross sections of waterbody crossings (at approximate 500' intervals) up to 2000' right and left from the proposed ROW of the preferred alternative alignment.

Deliverables

- Cross section survey for water crossings.
- Two copies of the Surveyor's project field books.

VI. DRAINAGE & WATER QUALITY

Task 1: General

- a. Unless otherwise specified, the current online State Hydraulics Design Manual shall serve as the basis for all drainage policy, procedures, guidelines, report, and plan sheet documentation required for this project. The manual can be downloaded from the TxDOT's website. Likewise, the Austin District Hydraulics Engineer (DHE) shall be consulted for guidance on policy, regulations, standards, and District preferences. Local drainage criteria shall not be used for the project without the prior approval of the Mobility Authority.
- b. Computation of floodplain impacts generally requires flood routing and the use of a unit hydrograph methodology that takes into consideration the effects of infiltration, storage, timing parameters, etc. The NRCS curve number method is preferred, but other unit hydrograph techniques could also be used. Coordination with the Mobility Authority and the DHE is required on the hydrologic method to be used if different than the NRCS curve number method for areas 200 acres or larger and the Rational Method for areas less than 200 acres.

- c. Detail ditch and/or storm sewer analysis is generally not expected at this level, which concentrates on addressing environmental and schematic drainage concerns. However, the effects on streams from addition of impervious cover, encroachments, changes in roadway horizontal and vertical alignments, and changes in topography, as a result of the roadway project, must be determined.

Task 2: Hydrology and Hydraulics – Non-FEMA Regulated Crossings

It is anticipated there will be up to 15 Non-FEMA crossings within the project limits. The ENGINEER will obtain and fully utilize all available data including past drainage plans and reports. This data will serve as the baseline for the cross-drainage modeling effort and will be utilized as much as possible.

- a. Not including FEMA regulated crossings, the ENGINEER shall model the hydrology of all crossing structures along the preferred alternative.
- b. The ENGINEER shall model the hydraulics of all crossing structures using appropriate software. The full range of storm frequencies should be evaluated in the analysis, from the 50 percent to the 1 percent annual exceedance probability storm event.
- c. Not including FEMA regulated stream crossings, all cross-drain structures (culverts and bridges) shall be identified and evaluated for the preferred alternative only. The following considerations shall be included in the proposed hydraulics analysis and design:
 1. Proposed roadway profile and encroachment
 2. Degree of upstream and downstream development
 3. Proposed alignment/roadway features that could create increases in water surface elevations outside of the State right of way
 4. Proposed alignment/roadway features that could create increases in water velocities and erosion impacts. Evaluation of soil types and erosion potential is included here.
 5. Impacts and mitigation alternatives.
- d. For the preferred alternative, the ENGINEER shall analyze ditches and channels adequately enough to establish proposed project ROW and necessary easements.
- e. The ENGINEER shall provide a preliminary construction cost estimate for all drainage structures for the preferred alternative only.

Deliverables

- Input and output files in electronic format of all hydrologic and hydraulic modeling software used in the project.
- Hydraulic Analysis for inclusion in design
- Preliminary cost estimate for all drainage structures for the preferred alternative.

Task 3: Hydrology and Hydraulics – FEMA Regulated Crossings

All FEMA regulated streams will be modeled for the preferred alternative only. It is anticipated there will be up to 3 FEMA crossings within the project limits.

Existing basin conditions are the normal design criteria used by TxDOT. The use of ultimate basin conditions on this project shall be considered on a case by case basis, and after an assessment performed by TxDOT and the Mobility Authority. Therefore, coordination with the Mobility Authority and the DHE shall be required if the ENGINEER deems necessary to use ultimate basin conditions.

- a. The ENGINEER shall coordinate with the floodplain administrator (FPA) of Williamson County and other appropriate jurisdictions to obtain hydrologic and hydraulic information on the FEMA regulated streams that cross this project. The ENGINEER and its staff shall not represent themselves to the FPA as having decision-making authority on behalf of The Mobility Authority. This task includes acquisition of the hydrologic and hydraulic models for the pertinent streams.
- b. For Zone AE stream crossings, the ENGINEER shall review the effective hydrological model for recent changes in development and update to a current effective model if necessary.
- c. For Zone A stream crossings, the ENGINEER shall create a current effective hydrological model (by using a unit hydrograph methodology such as the NRCS Curve Number Method.)
- d. For Zone A and Zone AE stream crossings, the ENGINEER shall create a proposed hydrological model by updating the effective or current hydrologic model to account for the proposed project changes. Proposed project changes could include additional impervious cover, potential sub-basin area changes, potential changes to timing parameters, etc. In those basins along the project where the hydrologic analysis for the proposed conditions determines that the runoff drains into the stream before the main flood peak on the stream arrives, no additional hydrologic analysis of the stream shall be required and the current or effective hydrological model shall be used.

In the basins where the proposed hydrologic analysis indicates a potential timing conflict between the main flood peak and the basin specific peak, additional hydraulic analysis shall be performed to determine increases in proposed water surface elevation along the stream. Runoff hydrographs representing the existing and increased impervious area roadway conditions, as well as other relevant project changes shall be used to determine impacts based on timing.

- e. For Zone AE stream crossings, the ENGINEER shall review the effective hydraulic model for recent changes in development and update to a current effective model if necessary.
- f. For Zone A stream crossings, the ENGINEER shall create a current effective hydraulic model using existing project parameters.
- g. For Zone A and Zone AE stream crossings, the ENGINEER shall create a proposed hydraulic model by updating the effective or current effective hydraulic model to account for the proposed project changes.
- h. If water surface elevations are increased outside of the State right-of-way, the ENGINEER shall determine the extent of the impact, and discuss and propose mitigation alternatives.
- i. The ENGINEER shall prepare a draft Hydraulics report to be reviewed by the Mobility Authority. The report shall adequately address environmental concerns related to floodplain impacts, as well as discuss assumptions, parameters, procedures, results, and recommendations. This report shall also present and discuss impacts and mitigation. After review, the ENGINEER shall address the comments and produce a final report.

Deliverables

- Hydrologic models for the preferred alternative
- Hydraulic models for the preferred alternative
- Draft hydraulics report
- Final hydraulics report.

Task 4: Water Quality

It is anticipated that the entire project limits will be located within the Edwards Aquifer Contributing Zone, thus requiring the proposed design to comply with TCEQ regulations with permanent Best Management Practices (BMP) features.

- a. The ENGINEER shall obtain and review past Water Pollution Abatement Plan (WPAP) submittals from TCEQ to understand previous permanent BMP design that currently existing within the project limits.
- b. The ENGINEER shall develop load calculations for the constituents of concern for the preferred alternative, as well as existing conditions to facilitate comparison of the two. Load calculations must consider existing BMP performance to ensure proposed construction impacts to existing BMPs are properly assessed in the total load calculations.
- c. The ENGINEER shall provide the type and locations for Best Management

Practices (BMP) for the preferred alternative. The BMPs evaluated should include Low Impact Development Practices as well as conventional end-of-pipe controls. At a minimum any recommended BMPs must comply with the requirements of the Edwards rules.

- d. The ENGINEER shall identify and document BMP's in the draft and final hydraulics reports and provide preliminary cost estimates.

Deliverables

- Calculations for load removal and BMP design
- Location of proposed BMPs
- Preliminary construction cost estimates for all permanent BMP features
- Summary of WQ design within final hydraulic report

In coordination with the Mobility Authority, the ENGINEER shall determine any necessary drainage easements for safely conveying drainage, providing detention and/or water quality BMPs for the preferred alternative.

ATTACHMENT B - Fee Estimate

Task Name - 183A Phase III	Sr. Engineering Mgr.	Sr. Supervising Engineer	Sr. Engineer	Supervising Engineer	Sr. Engineering Mgr.	CADD Mgr. II	Engineer I	Sr. Engineering Mgr.	Lead Planner	Sr. Supervising Engineer	Supervising Engineer	Public Involvement	Graphics Designer	Sr. Supervising Planner	Noise	NEPA	NEPA	NEPA	Air Quality	GIS - Planner I	Senior Scheduler	Admin/Clerical II	TOTAL	TOTAL
TASK / WORK DESCRIPTION																								
Task Name - 183A Phase III																								
2. Project Management and Administration	40	330																			20	40	430	\$86,152.05
3. Route and Design Studies																								
3.1 Alternatives Development and Analysis			80	40	4	80	80	20		40													344	\$46,281.64
3.2 Preliminary Cost Estimate			80				40	8															128	\$13,984.67
3.3 Design Schematics			200	160	4	40	260	40															704	\$84,654.05
3.4 Design Concept Conference			8	8				8															32	\$5,472.81
3.5 Traffic Engineering Studies							20			60	280												360	\$53,989.85
4. Social, Economic, and Environmental Studies and																								
4.1 Preliminary Environmental Constraints									36	8						16	20			32			112	\$13,791.30
4.2 Environmental Process Initiation									24	8						24							56	\$8,852.27
4.3 Environmental Analysis									192	62	50				226	100	72	200		18			920	\$131,122.47
4.4 Environmental Document Preparation									48	12										20			104	\$13,437.46
4.5 Environmental Support Services																							0	\$0.00
4.6 Public Involvement	8	20	40			80			8	12		500	60									40	768	\$89,363.53
5. Field Survey and Photogrammetry																								
5.1 Field Survey			40																				40	\$4,618.00
5.2 Aerial Mapping																							0	\$0.00
5.3 Aerial Photography Control Surveys																							0	\$0.00
5.4 Establish Primary Control																							0	\$0.00
5.5 Level Control																							0	\$0.00
5.6 Locate Existing ROW																							0	\$0.00
5.7 Supplemental Survey																							0	\$0.00
6. Drainage and Water Quality																								
6.2 Hydrology and Hydraulics (non-FEMA regulated)			40	20						16													76	\$11,393.56
6.3 Hydrology and Hydraulics (FEMA regulated)			8							8													16	\$2,641.47
6.4 Water Quality			16							8													24	\$3,565.07
TOTAL DIRECT LABOR																								
	48	350	512	228	8	200	400	76	308	242	330	500	60	0	226	140	104	212	0	70	20	80	4114	
<i>% Total by Classification</i>	1.17%	8.51%	12.45%	5.54%	0.19%	4.86%	9.72%	1.85%	7.49%	5.88%	8.02%	12.15%	1.46%	0.00%	5.49%	3.40%	2.53%	5.15%	0.00%	1.70%	0.49%	1.94%		
Labor Costs	\$ 3,865.44	\$ 26,600.00	\$ 21,171.20	\$ 13,636.68	\$ 654.00	\$ 9,508.00	\$ 11,652.00	\$ 5,088.20	\$ 14,528.36	\$ 18,612.22	\$ 16,665.00	\$ 19,235.00	\$ 2,701.20	\$ -	\$ 11,042.36	\$ 8,302.00	\$ 4,628.00	\$ 10,593.64	\$ -	\$ 1,619.10	\$ 1,322.20	\$ 2,160.00		
Overhead Rate	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.5382	1.7	1.7	1.7	
Overhead Costs	\$ 5,945.82	\$ 40,916.12	\$ 32,565.54	\$ 20,975.94	\$ 1,005.98	\$ 14,625.21	\$ 17,923.11	\$ 7,826.67	\$ 22,347.52	\$ 28,629.32	\$ 25,634.10	\$ 29,587.28	\$ 4,154.99	\$ -	\$ 16,985.36	\$ 12,770.14	\$ 7,118.79	\$ 16,295.14	\$ -	\$ 2,752.47	\$ 2,247.74	\$ 3,672.00		
Profit	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	
Profit Costs	\$ 981.13	\$ 6,751.61	\$ 5,373.67	\$ 3,461.26	\$ 166.00	\$ 2,413.32	\$ 2,957.51	\$ 1,291.49	\$ 3,687.59	\$ 4,724.15	\$ 4,229.91	\$ 4,882.23	\$ 685.62	\$ -	\$ 2,802.77	\$ 2,107.21	\$ 1,174.68	\$ 2,688.88	\$ -	\$ 437.16	\$ 356.99	\$ 583.20		
Total Loaded Labor	\$ 10,792.39	\$ 74,267.73	\$ 59,110.41	\$ 38,073.88	\$ 1,825.98	\$ 26,546.53	\$ 32,532.62	\$ 14,206.36	\$ 40,563.47	\$ 51,965.69	\$ 46,529.01	\$ 53,704.50	\$ 7,541.80	\$ -	\$ 30,830.49	\$ 23,179.35	\$ 12,921.47	\$ 29,577.65	\$ -	\$ 4,808.73	\$ 3,926.93	\$ 6,415.20	\$	\$ 569,320.20
<i>% Total by Class</i>	1.90%	13.04%	10.38%	6.69%	0.32%	4.66%	5.71%	2.50%	7.12%	9.13%	8.17%	9.43%	1.32%	0.00%	5.42%	4.07%	2.27%	5.20%	0.00%	0.84%	0.69%	1.13%		
Total Direct Expenses	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Total	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$

\$86,152.05

\$204,383.01

\$256,567.03

\$4,618.00

\$17,600.11

\$569,320.20

Additional Subconsultants (see attached detail):

McGray & McGray (Field Survey)	\$	147,748.00
CJ Hench (Traffic Counts)	\$	5,000.00
Cox McLain (Environmental)	\$	66,869.28
K. Friese (Drainage)	\$	184,405.00
Monkee Boy (Web Design)	\$	17,500.00
Whiddon Group (Utility)	\$	9,174.00
Total Work Authorization No. 5	\$	1,020,102.48