

WORK AUTHORIZATION NO. 1 – DATA COLLECTION, ENVIRONMENTAL SERVICES, AND PRELIMINARY SCHEMATIC DESIGN SERVICES

ATTACHMENT A - SCOPE OF SERVICES

**LAREDO COLOMBIA SOLIDARITY INTERNATIONAL BRIDGE (LCSIB)
EXPANSION SCHEMATIC, ENVIRONMENTAL, PS&E & CONSTRUCTION PHASE
SERVICES**

Purpose

The City of Laredo (the “CITY”) would like to develop the expansion of the existing Colombia Solidarity International Bridge (LCSIB) facility in Laredo, Texas. For this project, the City requires professional services of LJA Engineering (the “CONSULTANT”) for the necessary tasks and subtasks to perform services related to complete the preparation of the schematic, environmental clearance, plans, specifications and estimate for the expansion of the bridge and the associated changes to the port facilities to accommodate the expansion. The scope includes the stated services starting at the United States Port of Entry and extending to the international boundary between the United States and Mexico at the center of the Rio Grande River, as well as coordination with the US and Mexican Federal Government, TxDOT, Laredo, and the State of Nuevo Leon. Below is a detailed description of services to be provided.

I. TASK 1 PROJECT MANAGEMENT

- A. The CONSULTANT will perform a monthly review of the progress of the Contract with respect to schedule, budget, and quality assurance/ quality control.
- B. The CONSULTANT will provide a monthly schedule update to the CITY with respect to the Work Authorization.
- C. The CONSULTANT will maintain all records and files related to the project throughout the duration of the project. Uploading of project files will be coordinated with the CITY.
- D. The CONSULTANT will provide a monthly progress report and invoice to the CITY with respect to the Contract.
- E. The CONSULTANT will perform bi-weekly internal discipline level coordination meetings, monthly team-wide meetings and monthly meetings with the CITY.

II. TASK 2 BI-NATIONAL & STAKEHOLDER PROJECT DEVELOPMENT MEETINGS, CONSULTATIONS & COORDINATION

A. BI-NATIONAL & STAKEHOLDER PROJECT DEVELOPMENT MEETINGS, CONSULTATIONS & COORDINATION

The CONSULTANT will contact, schedule, coordinate and attend project development meetings (including in-person and virtual). During these meetings potential bridge expansion alternatives will be identified and discussed. Another goal of these project development meetings will be to present, promote and gain support for the LCSIB Expansion Project. Participants at these project development meetings will include relevant U.S. Agencies (federal, state, and local) private sector stakeholders, and consultants and relevant Mexican Agencies (federal, State of Nuevo Leon, and local) and consultants. These activities may also require and include travel and site visits to the LCSIB and other locations necessary to conduct said project development in-person meetings. The

CONSULTANT will prepare necessary meeting materials that may be required to conduct said project development meetings, such as agendas, meeting notes, meeting presentations, etc.

The CONSULTANT will conduct early and continuing consultations with the primary government agencies that are involved in the international crossing permitting process. Principal among those at the federal level, beyond the Department of State (DOS) itself are:

- U.S. Customs and Border Protection (CBP)
- U.S. General Services Administration (GSA)
- U.S. Federal Highway Administration (FHWA)

Other federal agencies that will be contacted as necessary include the U.S. International Boundary and Water Commission (USIBWC) and the U.S. Coast Guard. In addition, several Texas State agencies will be consulted regarding expansion of the LCSIB such as the Texas Department of Transportation (TxDOT) and the Texas Secretary of State (TSS). Also, if the opportunity arises, the CONSULTANT will provide a briefing to any member or staff member of the Texas Legislature. A list of the possible agencies that the CONSULTANT will provide support to the CITY in coordination include the following:

- City of Laredo City Council
- Laredo Metropolitan Planning Organization
- TxDOT TP&P Division
- TxDOT Laredo District
- TxDOT International Relations Office
- Texas Department of Public Safety
- Office of the Governor
- Department of State (Mexican Border Affairs Coordinator)
- Federal Highway Administration (Southern Border Affairs Coordinator)
- General Services Administration (Headquarters, Regional, and McAllen offices)
- Customs & Border Protection (Laredo Field Office & Facilities Group DC and Euless)
- International Boundary & Water Commission/CILA
- Government of Nuevo Leon
- Secretariat of Communications and Transportation (Mex SCT)
- Secretariat of Exterior Relations (SRE)
- Institute of Management and Appraisal of National Assets (INDAABIN)

In addition to specific project development meetings, this item also includes necessary consultation and coordination communications such as telephone calls, emails, and other non-scheduled virtual meetings.

In addition, the CONSULTANT will prepare and distribute up to **sixty (60) monthly project status updates to selected project stakeholders**. The monthly updates will include completed, current, and future project development items.

B. FUNDING OPPORTUNITY SUPPORT

The CONSULTANT will support the CITY for the duration of the design development of the project to explore other federal funding opportunities that become available and are applicable to the Project. Examples include the following:

1. Congressional Earmarks
2. BUILD Grant
3. INFRA Grant
4. Etc.

C. PARTICIPATION AT U.S.-MEXICO BINATIONAL BRIDGES AND BORDER CROSSINGS GROUP (BBBXG), U.S.-MEXICO JOINT WORKING COMMITTEE (JWC) AND OTHER APPLICABLE MEETINGS/CONFERENCES

The CONSULTANT will continue to attend and actively participate in any scheduled BBBXG, JWC, Legislative and other meetings/conferences that will advance the LCSIB Expansion Project. These activities may also require the CONSULTANT to expend travel and related expenses to multiple and currently undefined locations. The CONSULTANT will prepare and present presentations as necessary and requested by the CITY. For this phase, **the CONSULTANT will attend up to two (2) BBBXG meetings, up to two (2) JWC meetings and up to eleven (11) other applicable meetings.**

III. TASK 3 SCHEMATIC, ENVIRONMENTAL, PLANS, SPECIFICATIONS, ESTIMATE AND CONSTRUCTION PHASE SERVICES Noting that the US component of the bridge expansion will be receiving federal monies from the Federal Highway Administration (FHWA) for construction through the LMPO, the development of the project will need to be in compliance of Title 23 CFR (Highways); thus, the project will require compliance oversight by the Texas Department of Transportation (TxDOT).

A. Design Criteria.

The CONSULTANT shall prepare all designs and work in accordance with the latest version (at time of work authorization execution) of applicable TxDOT procedures, specifications, manuals, guidelines, standard drawings, and standard specifications or previously approved special provisions and special specifications, which include:

1. TxDOT Project Development Process Manual, published by TxDOT;
2. *PS&E Preparation Manual*, published by TxDOT;
3. *Roadway Design Manual*, published by TxDOT;
4. Policy on Geometric Design of Highways and Streets, published by the American Association of State Highway and Transportation Officials' (AASHTO);
5. *Hydraulic Design Manual*, published by TxDOT;
6. *Bridge Design Manual-LRFD*, published by TxDOT;
7. *Bridge Project Development Manual*, published by TxDOT;
8. *Geotechnical Manual*, published by TxDOT;
9. *Texas Manual on Uniform Traffic Control Devices (TMUTCD)*, published by TxDOT;
10. Highway Capacity Manual (HCM), published by the Transportation Research Board (TRB);
11. Highway Safety Manual (HSM), published by AASHTO;
12. *Highway Illumination Manual*, published by TxDOT;

13. *Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges* (latest Edition), published by TxDOT;
14. *Traffic and Safety Analysis Procedural Manual (TASP)*, published by TxDOT;
15. *TxDOT Survey Manual*, published by TxDOT;
16. Access Management Manual, published by TxDOT; and
17. other TxDOT-approved manuals and guides.

When design criteria are not identified in these manuals, the CONSULTANT shall notify the State and request direction.

The CONSULTANT shall follow the TxDOT Laredo District guidelines in preparing the schematic and environmental documentation.

The CONSULTANT shall design the project according to the latest TxDOT's design criteria. The CONSULTANT shall supply project-specific design criteria (e.g., typical sections, estimate, design exceptions) to be inserted into the design elements form for discussion at the design concept conference (DCC).

B. ROUTE AND DESIGN STUDIES

1. Schematic Design Work Outline.

- a. Develop Base Maps
The CONSULTANT shall develop the base maps to be used for the analysis and proposed schematic layout from existing construction and right of way (ROW) plans as available. The CONSULTANT shall re-establish the existing centerline horizontal alignments for all roadways, identify existing ROW and easements, property owners, and the approximate location of major utilities based on a utility CONSULTANT investigation in the preparation of base maps.
- b. Planimetrics and Aerial Mapping
The CONSULTANT shall obtain planimetrics, digital terrain modeling (DTM), and aerial photographs from the State, if available.
- c. Analyze Existing Conditions
Using collected data and base maps, the CONSULTANT shall develop an overall analysis of the existing conditions to develop the schematic design. The analysis will include the following:
 - i. ROW and easement determination
 - ii. Horizontal alignment
 - iii. Vertical alignment
 - iv. Pavement cross slopes and pavement type
 - v. Soil exploration
 - vi. Geotechnical testing
 - vii. Intersection design and analysis (if applicable)
 - viii. Sight distance
 - ix. Large guide signs and roadside signing (if applicable)
 - x. Level of service
 - xi. Safety (i.e., crash data)

- xii. Locations of critical constraints
- xiii. Drainage
- xiv. Traffic control and construction phasing sequence

d. Schematic Alternatives

The CONSULTANT shall identify and analyze schematic alternatives to minimize potential adverse operational impacts, crash impacts, ROW impacts, environmental impacts, major utility conflicts, structural impediments, or exceptions to the State and FHWA design criteria.

e. Deliverable Schematic

The CONSULTANT shall evaluate and document the following in the analysis to optimize the design:

- i. Efficient use of the allocated ROW
- ii. Control of access (COA) and driveway locations
- iii. Roadway and intersection geometry
- iv. Cross sections
- v. Bicycle and pedestrian design
- vi. Drainage and hydraulic design
- vii. Stopping sight distance
- viii. Level of service
- ix. Safety
- x. Traffic and signal operations
- xi. Construction, ROW, easement, and utility costs
- xii. Construction sequencing
- xiii. Traffic control during construction
- xiv. Roadside safety appurtenances
- xv. Large guide signage (if applicable)
- xvi. Environmental mitigation (e.g., noise walls, storm water best management practices (BMPs))
- xvii. Bridge layouts and clearance
- xviii. Accommodation of ultimate corridor configuration.
- xix. Accommodation of future cross street expansion as described in local thoroughfare plan (if applicable)
- xx. Avoidance of utility lines (if feasible)
- xxi. Impact of construction delays from utility relocations

f. Data Collection

The CONSULTANT shall conduct field reconnaissance and collect data as necessary to complete the schematic design. Data must include the following information. Items 1 through 8 must be obtained from the CITY, if available. Items 9 through 13 must be obtained from other agencies as required.

- i. Available corridor major investment studies
- ii. Design data from record drawings of existing and proposed facilities
- iii. Existing and future design year traffic data
- iv. Historical crash data

- v. Roadway inventory information, including the number of lanes, speed limits, pavement widths and rating, bridge widths and ratings, and ROW widths
- vi. Aerial photos, planimetric mapping, and DTM
- vii. Environmental data
- viii. Previously prepared drainage studies
- ix. Adopted land use maps and plans (if available)
- x. Federal Emergency Management Agency (FEMA) flood boundary maps and flood insurance studies and models
- xi. Public and private utility information
- xii. Plat research for adjacent properties (if available)
- xiii. Local major thoroughfare plan

g. Roadway Design Criteria

The CONSULTANT shall develop the roadway design criteria based on the *TxDOT Roadway Design Manual* and *AASHTO Policy on Geometric Design of Highways and Streets* guidelines. The design criteria must include the following roadway design elements: design speed, lane and shoulder widths, pavement structure and slopes, horizontal curvatures, horizontal and vertical clearances, range of vertical profile grades, and side slopes. If there is a discrepancy between the two sources, the *TxDOT Roadway Design Manual* will govern unless otherwise directed by the CITY.

h. Preliminary Design Conference

The CONSULTANT shall prepare and submit a preliminary Design Summary Report (DSR) to the CITY for review and approval and shall attend an initial kick-off meeting to establish and agree on fundamental aspects, basic features, concepts, and design criteria. This meeting will be coordinated with any adjacent roadway projects to ensure continuity with the design of the adjacent roadway projects.

2. Schematic Design – General Tasks.

a. Right of Entry

The CONSULTANT shall obtain right of entry when required and prepare and maintain a spreadsheet and KML or KMZ file of the information.

b. ROW Property Base Map

The CONSULTANT shall obtain information on existing ROW, easements, and property information from as-built plans, ROW maps, and tax records. The CONSULTANT shall prepare a base map depicting the information.

c. Typical Sections

The CONSULTANT shall develop both existing and proposed typical sections that depict the number and type of lanes, shoulders, median width, curb offsets, cross slope, border width, clear zone widths, and ROW limits.

d. Environmental Constraints

The CONSULTANT shall evaluate and document impacts to environmentally sensitive sites (as identified by the CONSULTANT and verified by the State) during the schematic design process. Environmentally sensitive sites include

natural, cultural, and the human environment. Examples are historic and archeological resources, burial grounds, neighborhood communities and residential areas, farmland, floodplains, wetlands, endangered species, rare habitats, wildlife corridors, wildlife crossings, parks and nature preserves, geologic features, undeveloped areas, and significant trees.

e. Preliminary Drainage

The CONSULTANT shall use data from as-built plans and FEMA maps to locate drainage out falls and to determine existing storm sewer and culvert sizes, design flows, and water surface elevations for use in the design of roadway geometry.

i. Hydrologic Analysis

a) Drainage Areas

The CONSULTANT shall delineate the drainage area boundaries for each structure or system including temporary drainage structures within, or contributing to, the project area using United States Geological Survey (USGS) or suitable topographic maps, available LiDAR elevation data, and other appropriate information.

b) Runoff Computations

The CONSULTANT shall:

(a) Compute the peak runoff for the full range of frequencies (50%, 20% 10%, 4%, 2%, and 1% annual exceedance probability (AEP)) using an approved methodology. The CONSULTANT shall select the methodology depending on the size of watershed and site conditions for each of the following:

- Ditches
- Culverts
- Bridges
- Storm drains
- Temporary drainage for phased construction

(b) Determine an appropriate hydrologic check method and compute peak runoff rates for discussion and inclusion in the drainage report.

(c) Obtain any existing FEMA effective hydrologic data if available. Verify FEMA data prior to utilizing FEMA models.

(d) Determine if area drains are needed due to site conditions and determine additional ROW or easements required as a result.

(e) Prepare (11"x17") drainage area maps and hydrologic data sheets for the project for inclusion in the plans, specifications, and estimate (PS&E) and the drainage report.

ii. Hydraulic Analysis

The CONSULTANT shall:

a) Model the existing conditions using an appropriate method for each structure or system type, including the following:

- (a) Ditches
 - (b) Culverts
 - (c) Bridges
 - (d) Storm drain systems
 - (e) Detention and retention systems
 - (f) Pump systems
- b) Model the proposed conditions using an appropriate method for the structure or system type, for the full range of frequencies (50%, 20% 10%, 4%, 2%, 1%, and 0.2% AEP). Evaluate the design with the objective of reducing flooding potential, protecting structures from erosion and scour, mitigating potential impacts on flood levels and flow rate, and minimizing impacts to Waters of the United States. Prepare hydraulic models for the following:
- a) For ditches, determine the ditch typical section with the hydraulic capacity to convey the calculated design storm event.
 - (b) Culverts
 - (c) Bridges
 - (d) For storm drain systems, determine trunk-line sizes, lateral sizes, outfall sizes, and inlet locations to accommodate the proposed design storm event and taking into account the hydraulic grade line of the system. Verify that storm drains can be developed for gravity flow to outfalls based on the proposed roadway profile.
 - (e) For detention facilities, determine alternate flow routes, detention and retention, to relieve system overload. Evaluate the amount of the total detention storage to control runoff for the approved design frequency based on hydrograph routing for the full range of frequencies (50%, 20%, 10%, 4%, 2%, 1%, and 0.2% AEP). Determine if on-site detention volume is available. When oversized storm drains are used for detention, the CONSULTANT shall evaluate the hydraulic grade line throughout the entire system, within project limits, for the design frequency or frequencies. The CONSULTANT shall coordinate with the CITY any proposed changes to the detention systems. The CITY will assess the effects of such changes on comprehensive drainage studies.
 - (f) For pump systems, determine pump requirements and specifications to meet design criteria approved by the CITY.
 - (g) Develop plans for temporary drainage facilities that are necessary to allow staged construction of the project and to conform with the phasing of adjacent construction projects without significant impact to the hydraulic capacity of the area.
- c) Develop the following FEMA models (if applicable) and perform floodplain impact analysis.
- a) Corrected existing hydraulic model
 - b) Updated FEMA model
 - c) Floodway models, with defined floodways only

- d) Develop a 3D model of the proposed drainage structures using the drainage utility (DU) capabilities of the OpenRoads product.
 - e) Complete a preliminary scour analysis and preliminary geomorphology and geomorphology of bridges and bridge class structures and provide the CITY with the potential scour depths, envelope, and any recommended countermeasures including bridge design modifications and revetment.
- iii. Hydraulic Computation Sheets
- a) Prepare (11" x 17") preliminary hydraulic data sheets for each bridge or FEMA Zone A/AE drainage structure for inclusion in the drainage report. At locations where there are existing and proposed structures and systems, provide a comparison of the input parameters and hydraulic results in tabular format for the existing and proposed structures and systems.
 - b) Coordinate with bridge designers and depict scour envelopes for inclusion in the drainage report and submission to the district bridge engineer.
- iii. Preliminary Drainage Study
- The CONSULTANT shall conduct a preliminary drainage study to determine and evaluate the adequacy of the ROW needed to accommodate the proposed roadway and drainage system. The drainage study must:
- a) identify the impacts to abutting properties and the 100-year floodplain due to proposed highway improvements
 - b) identify the water surface elevations for the 2, 5, 10, 25, 50, and 100-year storm events
 - c) identify and locate outfalls
 - d) provide drainage outfall descriptions
 - e) provide overall drainage area maps, sub-drainage area map, and storm water detention facilities.
- iv. Preliminary Drainage Report
- The CONSULTANT shall prepare a preliminary drainage report to document the findings of the preliminary drainage study. The drainage report, which must be signed and sealed by a professional CONSULTANT licensed in Texas, must include applicable hydrologic and hydraulic models (e.g., HEC-1 and HEC-2, HEC-RAS, HEC-HMS, XP-SWMM). The models must be approved by the local TxDOT district hydraulic engineer prior to generating any reports. If requested, the CONSULTANT shall prepare a final drainage study in accordance with one or more of the following: TxDOT Hydraulic Design Manual, local TxDOT district criteria, and any other specific guidance provided by the CITY. If requested by the CITY, the CONSULTANT shall evaluate the adequacy of the existing drainage structures; otherwise, the CONSULTANT shall not evaluate the adequacy of the existing drainage structures.

g. Traffic Data and Projections

The CONSULTANT shall obtain the base year traffic data from TxDOT and develop the opening-year, design-year (opening year +20), and pavement design year (opening year + 30) travel forecasts, and related traffic analysis in coordination with the TxDOT Transportation Planning and Programming Division (TPP). The developed traffic projections must be utilized for design and environmental analysis. The CONSULTANT shall develop traffic forecasts for the main lanes, ramps, cross streets, interchanges, intersections, and frontage roads for no-build and build alternatives. These projections must include graphic representations of the anticipated daily movements along the corridor (suitable for inclusion in the design schematic and environmental document) and the traffic analysis for highway design table. The CONSULTANT shall prepare a traffic projections methodology memo, based on the information provided in the traffic analysis package. The CONSULTANT shall review the proposed methodology with the State and refine it based on these discussions. The CONSULTANT shall submit the traffic volumes developed by the CONSULTANT to TPP for review and approval. The CONSULTANT shall revise the traffic volumes based on TPP's comments.

h. Traffic and Operational Analysis

The CONSULTANT shall review and analyze traffic data (including percent trucks, design hourly volume, and directional distribution), existing roadway features (including ramp locations, weaving sections, number of lanes, offset to obstructions, lane widths, frontage road operations, and intersection operation and geometry), traffic flow patterns, and transit and traffic operations. The CONSULTANT shall conduct capacity analysis studies for designated locations and sections of roadway and make recommendations for improving traffic flow. The CONSULTANT shall use the HCM to analyze and make appropriate recommendations. The analysis must be done for existing/base year, opening year, design year (opening+20 year), and interim year (if needed) for existing and future conditions. Results of this analysis must be incorporated into the schematic design. The CONSULTANT shall develop and submit to TxDOT a traffic and operational analysis report summarizing all analysis performed. If microsimulation is used, the CONSULTANT shall develop and calibrate an existing condition traffic model. The calibration memo must be included in the traffic analysis report. The analysis must be performed using the latest versions of TxDOT-approved software (e.g., HCS, Synchro, VISSIM, CORSIM, SIDRA).

3. Cost Comparative Study (EXCLUDED)

4. Bridge Layout

The CONSULTANT shall:

- a. Prepare a bridge layout plan sheet for each bridge and submit a 3D bridge model utilizing OpenBridge Modeler (OBM). When the 3D bridge model is referenced into the 3D corridor, the bridge must align, both vertically and horizontally, in the bridge location of the 3D corridor. The 3D bridge model must consist of 3D elements for slab, beams, abutments, wingwalls, caps, columns, and foundations. Quantities and geometry from OBM 3D bridge model must be verified by other means.

- b. Prepare a bridge layout plan sheet for each bridge class culvert and prepare a 3D model using OpenRoads Designer.

5. Bridge Detail Summary (EXCLUDED)

6. Retaining Walls

The CONSULTANT shall prepare preliminary retaining wall concepts to be shown on schematics, typical sections, and cross sections.

- a. The CONSULTANT shall determine if any additional walls are required and verify the need for and length of the retaining wall as shown on the ultimate schematic.
- b. The CONSULTANT shall compute and tabulate retaining wall quantities for preliminary design milestone plans submittal.

7. Large Guide Signs (EXCLUDED)

8. Renderings and Traffic Simulation. (EXCLUDED)

9. Preliminary Construction Sequence. (EXCLUDED)

10. Data Collection and Field Reconnaissance.

The CONSULTANT shall collect, review, and evaluate data described below. The CONSULTANT shall notify the State in writing whenever the CONSULTANT finds disagreement with the information or documents.

- a. Data, if available from the City of Laredo, including as-built plans, existing schematics, right of way maps, utility engineering investigation mapping, existing cross sections, existing planimetric mapping, environmental documents, existing channel and drainage easement data, existing traffic counts, accident data, bridge inspection records, , identified endangered species, identified hazardous material sites, current unit bid price information, current special provisions, special specifications, and standard drawings.

Documents for existing and proposed development along proposed route from local municipalities and local ordinances related to project development.

Utility plans and documents from appropriate municipalities and agencies

Flood plain information and studies from the Federal Emergency Management Agency (FEMA), the United States Army Corps of Engineers (USACE), local municipalities, and other governmental agencies.

Conduct field reconnaissance and collect data including a photographic record of notable existing features.

11. Design Criteria.

The CONSULTANT shall develop the roadway design criteria based on the controlling factors specified by the State. In addition, the CONSULTANT shall prepare the Design Summary Report (DSR) and submit it electronically.

12. Preliminary Cost Estimates.

The CONSULTANT shall prepare a preliminary cost estimate for the project, including the costs of construction, required ROW and associated improvements, and eligible utility adjustments. Current State unit bid prices must be used in preparation of the estimate.

The CONSULTANT shall develop a PS&E phase preliminary cost estimate using the average low bid unit price. The CONSULTANT shall estimate the total project cost including preliminary engineering, final engineering, right of way (ROW) acquisition, environmental compliance and mitigation, construction, utility relocation, and construction engineering inspection (CEI).

13. Engineering Summary Report. (EXCLUDED)

14. Design Concept Conference. (EXCLUDED)

15. Agency Coordination and Public Involvement. (EXCLUDED)

16. Support or Attendance at Value Engineering Study (EXCLUDED)

17. Deliverables for Route and Design Studies.

In conjunction with the performance of the services included the CONSULTANT shall provide the following draft and final documents and associated electronic files as applicable:

- a. Draft and final copies of the engineering summary report
- b. Right of Entry Documentation, in format as requested by the CITY.
- c. Draft and final copies of the traffic and operational analysis report and safety analysis report for non-interstates
- d. Draft and final copies of the geometric schematic layouts on 11-inch x 17-inch cut sheets or rolls, as requested by the CITY
- e. Draft and final copies of the conceptual design schematics roll plots.
- f. Draft and final copies of the geometric alternatives and geometric schematic layouts (1 inch = 100 feet)
- g. KMZ or KML file of conceptual design schematic created from applicable DGN files for reviewing in Google Earth
- h. Alternatives Comparison Matrices
- i. Draft and final copies of the design schematic profile rolls
- j. Draft and final copies of the design schematic cross-sections on 11-inch x 17-inch cut sheets or roll plot format, as requested by the CITY
- k. Copy of the preliminary cross-sections in a roll plot format or 11-inch x 17-inch format, as requested by the CITY
- l. Electronic 3D model copy of the preliminary cross-sections created using OpenRoads tools.
- m. Copies of the preliminary construction sequence layouts in a roll plot or 11-inch x 17-inch format, as requested by the CITY
- n. Copies of the preliminary construction sequence typical sections in 11-inch x 17-inch format
- o. Electronic copy of the 3D rendering and traffic simulation for the reasonable build alternatives
- p. Electronic files shall be furnished to the CITY on a USB flash drive.
- q. Traffic data schematics
- r. Traffic projections methodology memo
- s. Average daily corridor traffic projections report
- t. Line schematics with traffic data shown.
- u. Documentation of public involvement activities
- v. Utility plan – electronic file in latest version of MicroStation fully compatible with OpenRoads civil design system

- w. Design exception and design waiver documents
- x. One final paper copy and an electronic copy of the preliminary drainage study
- y. Electronic submittal of the hydrologic and hydraulic model digital files from the drainage study
- z. Hard copy of a draft hydraulic report for review and comment
- aa. Culvert and bridge hydraulic data sheets and preliminary culvert layouts
- bb. Preliminary Drainage report – one hard copy of the preliminary drainage report, one electronic copy of the entire drainage report in PDF format, and computer files of hydrologic and hydraulic modeling with appropriate labeling of location, CSJ, and submittal date
- cc. Bridge cost comparative study, in a format as requested by the CITY.
- dd. Bridge Layouts
- ee. Bridge and bridge class culvert layouts, in a format as requested by the CITY.
- ff. Bridge typical sections, in a format as requested by the CITY.
- gg. OBM (OpenBridge Modeler) 3D Model of Bridges
- hh. Retaining wall layouts
- ii. Retaining wall cost analysis
- jj. Traffic control plans
- kk. Traffic control typical sections
- ll. Traffic control and construction sequence narrative
- mm. Cost estimates for each milestone submittal
- nn. KMZ or KML file of conceptual design schematic created from applicable DGN files for reviewing in Google Earth
- oo. Final schematic 3D model created using OpenRoads software.
- pp. Draft and final copies of traffic analysis report
- qq. Catalog of documents collected.
- rr. Preliminary and Final DSR
- ss. Preliminary cost estimate
- tt. Documentation of DCC

C. SOCIAL, ECONOMIC, AND ENVIRONMENTAL STUDIES AND PUBLIC INVOLVEMENT

1. GENERAL REQUIREMENTS – SOCIAL/ ECON/ENV STUDIES – SOCIAL, ECONOMIC, AND ENVIRONMENTAL STUDIES AND PUBLIC INVOLVEMENT.

- a. Environmental Services Requirements.
Each environmental service provided by the CONSULTANT must have a deliverable. Deliverables must summarize the methods used for the environmental services and the results achieved. The summary of results must be sufficiently detailed to provide satisfactory basis for thorough review by the State, and where applicable, the Federal Highway Administration (FHWA), and other agencies with regulatory oversight. All deliverables must meet regulatory requirements for legal sufficiency and adhere to the requirements for reports enumerated in TxDOT's National Environmental Policy Act of 1969 (NEPA) Memorandum of

Understanding (MOU) for federal projects and the Texas Administrative Code, Title 43, Part 1, chapter 2 for State projects.

- i. Quality Assurance/Quality Control Review
For each deliverable, all documents must be in accordance with:
 - a) Current Environmental Compliance Toolkit guidance, documentation requirements, and templates published by the TxDOT Environmental Affairs Division (ENV) and in effect as of the date of receipt of the documents or documentation to be reviewed;
 - b) Current state and federal laws, regulations, policies, guidance, agreements, and memoranda of understanding between TxDOT and other state or federal agencies; and
 - c) Guidelines contained in Improving the Quality of Environmental Documents, A Report of the Joint AASHTO/ACEC Committee in Cooperation with the Federal Highway Administration (May 2006) for:
 - Readability, and
 - Use of evidence and data in documents to support conclusions. Upon request by the State, the CONSULTANT shall provide documentation that the QA and QC reviews were performed by qualified staff.
- ii. The CONSULTANT shall maintain the project environmental record in TxDOT's Environmental Compliance Oversight System (ECOS), including project review, completing the work development plan screens, uploading documents, and completing activities as assigned by the District.
- iii. Deliverables must contain all data acquired during the environmental service and be written to be understood by the public. The format must meet all requirements as specified by the State and in accordance with the TxDOT *Writers Style Guide* published by TxDOT's Communications Division.
- iv. Electronic versions of each deliverable must be written in software that is fully compatible with the software currently used by the State and provided in the native format of the document for future use by the State. The CONSULTANT shall supplement all hard copy deliverables with electronic copies in searchable Adobe Acrobat (.pdf) format, unless another format is specified by the State. Each deliverable must be a single, searchable .pdf file that mirrors the layout and appearance of the physical deliverable. The CONSULTANT shall deliver the electronic files in a format acceptable to the State in both the document's native format and the PDF format.
- v. Submission of Deliverables
 - a) Deliverables must consist of documentation to support reevaluation, or a categorical exclusion (CE) determination, or documentation in support of an environmental assessment (EA) or an environmental impact statement (EIS), as applicable. Technical reports and documentation must be prepared to support the applicable environmental classification (e.g. CE, EA, or EIS).
 - b) All deliverables must comply with all applicable state and federal environmental laws, regulations, procedures, and TxDOT's Environmental Compliance Toolkits, documentation requirements, and templates.

- c) On the cover page of any environmental documentation, the CONSULTANT shall insert the following language in a way that is conspicuous to the reader or include it in a CE project record:
- d) “The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 17, 2025, and executed by FHWA and TxDOT.”
- e) The State will provide the State’s and other agency comments on draft deliverables to the CONSULTANT. When required, the CONSULTANT shall revise the deliverable:
 - To include any State commitments, findings, agreements, or determinations (e.g., wetlands, endangered species consultation, Section 106, or Section 4(f)), required for the transportation activity as specified by the State;
 - To incorporate the results of public involvement and agency coordination;
 - To reflect mitigation measures resulting from comments received or changes in the transportation activity; and
 - To include with the revised document a comment response form (matrix) in the format provided by the State.
- vi. The CONSULTANT shall provide photographs and graphics that clearly depict details relevant to an evaluation of the project area. Comparable quality electronic photograph presentations must be at least 1200 x 1600 pixel resolution. The State may request images/graphics be provided in another format or quality.

b. Environmental Assessment (EA) Content and Format Requirements.

The CONSULTANT shall provide an EA and ensure that:

- i. The EA meets the requirements of 23 C.F.R. § 771.119 and 43 Tex. Admin. Code Ch. 2 and the EA content is sufficiently detailed to meet regulatory requirements for legal sufficiency and current (at the time of creation) TxDOT ENV guidance and Environmental Compliance Toolkits.
- ii. When print copies are requested, the exhibits included in reports or EAs do not exceed 11 inches x 17 inches and are in color. Text pages must be 8.5 inch x 11 inch. Exhibits and text included in reports or EAs must be neat and reproducible via photocopying without loss of legibility. The EA documents must be reproduced on plain white paper unless otherwise approved in advance in writing by the State.
- iii. The EA must use quality maps and exhibits and must incorporate by reference and summarized background data and technical analyses to support the concise discussions of the alternatives and their impacts.

c. Categorical Exclusion (CE) Supporting Documentation Content and Format Requirements.

The documentation shall meet the requirements of 23 C.F.R. § 771.119 and 43 Tex. Admin. Code Ch. 2, as directed by the State, and in accordance with TxDOT's Environmental Toolkit and the applicable Federal and State's guidance. Documentation includes providing information about the project and the project area to the State for the completion of the Work Plan Development Screens in the Texas Environmental Compliance Oversight System (ECOS) to determine what technical studies are required. Additionally, an open-ended (d) list categorical exclusion classification request form must be prepared to classify the project as an open ended (d) list CE, if needed.

d. Environmental Impact Statement (EIS) Content and Format Requirements.

The CONSULTANT shall provide an EIS and ensure that:

- i. The EIS meets the requirements of 23 C.F.R. § 771.119 and 43 Tex. Admin. Code § 2.84 and the EIS content is sufficiently detailed as directed by the State, and in accordance with TxDOT's Environmental Toolkit and the applicable Federal and State's guidance.
- ii. When print copies are requested, the exhibits included in reports or EISs do not exceed 11 inches x 17 inches and are in color. Text pages must be 8.5 inch x 11 inch. Exhibits and text included in reports or EISs must be neat and reproducible via photocopying without loss of legibility. Except as noted in specifications in this attachment, EISs must be reproduced on plain white paper unless otherwise approved in advance by the State in the work authorization.
- iii. The EIS must use quality maps and exhibits and must incorporate by reference and summarize background data and technical analyses to support the concise discussions of the alternatives and their impacts.
- iv. The format must meet all requirements as specified by the State and comply with the TxDOT Writers Style Guide published by TxDOT's Communications Division.

e. Environmental Technical Analyses and Documentation Requirements.

- i. Definition of technical analyses and documentation for environmental services. In general, technical analyses and documentation for environmental services might include a report, checklist, form, or analysis detailing resource-specific studies identified during the process of gathering data to make an environmental decision.

The State may determine what technical reports and documentation are necessary for any given project. The CONSULTANT shall prepare all technical reports and documentation for the State with sufficient detail and clarity to support environmental determinations. All technical reports must be in accordance with TxDOT's Environmental Compliance Toolkits, documentation requirements, and templates. The environmental document must reference the technical reports.

Environmental technical reports and documentation must include appropriate NEPA or federal regulatory language in addition to the purpose and methodology used in delivering the service. Technical reports and forms must

- use templates and documentation standards as applicable and include sufficient information to determine the significance of impacts.
- ii. The CONSULTANT shall provide the requested environmental technical analyses and documentation at the work authorization level, that may include:
- a) Section 4(f) Evaluations**
The CONSULTANT shall provide a Section 4(f) evaluation conforming to the appropriate TxDOT Section 4(f) checklist for exceptions, de minimus, and programmatic evaluations. For individual Section 4(f) evaluations, the format and outline will be approved by the State beforehand. All Section 4(f) evaluations must meet the requirements set forth in TxDOT's Environmental Compliance Toolkits. The 4(f) Section of the environmental document states the reason a Section 4(f) evaluation is being completed. The 4(f) Section of the environmental document discusses the presence of all Section 4(f) properties located in the project area.
- b) Section 6(f) Evaluation**
The CONSULTANT shall determine if Land and Water Conservation Fund Act funds were used for the Section 4(f) property in accordance with the regulatory requirements and TPWD guidelines and document.
- c) Environmental Public Involvement (23 C.F.R. § 771.111) 43 TAC § 2**
The CONSULTANT shall:
- Develop a public involvement plan specifying all activities to be performed and alternatives to be discussed during public involvement activities. Public involvement activities must be carried out in compliance with Attachment A, Article 38, sections J and K of this contract. The plan must discuss outreach strategies for both the general public and targeted strategies for environmental justice and limited English proficiency populations
 - Compile, maintain, and update a mailing list of people, agencies, and organizations interested in the transportation activity
 - Make all arrangements for public meetings and hearings, including the site of the meetings, mailing and publishing notices, preparation of exhibits, provision for taping or transcription of proceedings, security, and any other arrangements as directed by the State. The CONSULTANT shall not hold public meetings or hearings in the absence of State personnel
 - Submit all legal notices to the State's project manager for review no less than six weeks prior to publication
 - Arranging a meeting with the State to review all exhibits and other materials to be used prior to public meetings or hearings
 - Obtain approval in writing by the State's project manager for all legal notices, exhibits, and other materials
 - Provide personnel to staff meetings and hearings; including, people to perform registration, make presentations, and answer questions. Staffing levels of personnel identified at the work authorization level.

- Not distribute acknowledgement or response letters without prior approval by the State's project manager
- Not distribute the newsletter without prior approval by the State
- Provide materials and information regarding the transportation activity to the State's project manager to be posted on the State-developed website.
- Ensure the website conforms to state law, Texas Department of Information Resources requirements, TxDOT policies and procedures, and TxDOT Brand Guidelines.

iii. Community Impacts Analysis

Community impacts include environmental justice, limited English proficiency, and other issues as addressed in TxDOT environmental guidance. The CONSULTANT shall provide community impact assessments including environmental justice analysis in accordance with Attachment A, Article 38, Sections J and K of this contract. The report must follow guidance provided in TxDOT's Community Impacts Assessment Toolkit.

iv. Induced Growth Impact Analysis and Cumulative Impacts Analysis

The CONSULTANT shall meet the requirements of NEPA and the most current version of TxDOT's *Guidance on Preparing Impact Analyses and Cumulative Impacts Analysis Guidelines* in TxDOT's Environmental Compliance Toolkits. The extent of the analyses will be provided in the work authorization.

v. Air Quality Studies

The CONSULTANT shall complete all required technical reports and the air quality section of all environmental documents in accordance with the current version of the TxDOT's Environmental Handbook for Air Quality and Air Quality Toolkit. The State's project manager may determine what technical reports and documentation are required for any given project.

vi. Noise Analysis Technical Reporting

The CONSULTANT shall use TxDOT's .DGN file coordinate system for all traffic noise modeling, so that all design files and traffic noise modeling software coordinate systems are the same.

The CONSULTANT shall provide TxDOT with all .DXF files used for the traffic noise model.

The CONSULTANT shall review all proposed noise barrier locations as part of the traffic noise modeling process.

The CONSULTANT shall not begin identification of noise sensitive land uses unless TxDOT's Environmental Affairs Division's Historical Studies Branch (ENV-Historical Studies) has approved a Project Coordination Request (PCR).

vii. Water Resources Analysis and Documentation

The CONSULTANT shall provide environmental documentation, conduct field surveys, and provide analysis of watercroc resources for compliance with

state and federal regulations as described in the *Environmental Guide: Volume 2 Activity Instructions*, <http://ftp.dot.state.tx.us/pub/txdot-info/env/toolkit/060-06-gui.pdf>, and the associated forms, templates, and guidance found in the Water Resources section of the Natural Resources Toolkit, <https://www.txdot.gov/inside-txdot/division/environmental/compliance-toolkits/natural-resources.html>. The applicable water resource studies must be determined at the work authorization level. In the case that field surveys are required, then the CONSULTANT shall contact TxDOT's Project Manager for clearance prior to starting fieldwork. TxDOT will verify that approved methods and appropriately permitted and experienced staff will be used.

- viii. **Biological/Natural Resources Management Analysis and Documentation**
 - a) The CONSULTANT shall provide environmental documentation, conduct field surveys, and provide analysis of biological natural resources for compliance with state and federal regulations as described in the *Environmental Guide: Volume 2 Activity Instructions*, <http://ftp.dot.state.tx.us/pub/txdot-info/env/toolkit/060-06-gui.pdf>, and the associated forms, templates, and guidance found in the Natural Resources Toolkit, <https://www.txdot.gov/inside-txdot/division/environmental/compliance-toolkits/natural-resources.html>. The applicable natural resource studies must be determined at the work authorization level. In the case that field surveys are required, then the CONSULTANT shall contact TxDOT's Project Manager for clearance prior to starting work. TxDOT will verify that approved methods and appropriately permitted and experienced staff will be used.
- ix. **Initial Site Assessment (ISA) with Hazardous Materials Project Impact Evaluation Report**

The CONSULTANT shall provide ISA with Hazardous Materials Project Impact Evaluation Report in accordance with Statement of Work for Hazardous Materials Processes related to NEPA in the TxDOT Hazardous Materials Management Toolkit (<http://www.txdot.gov/inside-txdot/division/environmental/compliance-toolkits/haz-mat.html>).
- x. **Archeological Documentation Services**

The CONSULTANT shall complete all archeological studies to satisfy the current TxDOT Archeological Sites and Cemeteries Toolkit. An archeological background study must be performed prior to field work. If the CONSULTANT was provided with a background study by the State, a new background study is not required.

An archeological survey (reconnaissance or intensive) must satisfy state and federal regulations. The applicable archeological survey will be determined at the work authorization level. The CONSULTANT shall contact TxDOT's Environmental Affairs Division's Archeological Studies Branch (ENV-ARCH) for approval prior to starting field and survey work. ENV-ARCH will verify that approved methods and appropriately permitted and experienced staff will be used.

- xi. **Historic Resource Identification, Evaluation, and Documentation Services**

The CONSULTANT shall complete all historic resource identification, evaluation, and documentation services in compliance with TxDOT's Environmental Compliance Toolkits. All services, except the historic resource PCR, must have prior approval by TxDOT's Environmental Affairs Division's Historical Studies Branch (ENV-HIST) to be performed. The historic resource PCR must be accepted by ENV-HIST prior to survey field work.

xii. Floodplain Impacts

The CONSULTANT shall document any Regulatory Zone requirements, and International Boundary Water Commission (IBWC) requirements (transportation activity within the floodplain of the Rio Grande) if the project is within the area covered by these regulations. Studies for floodplain impacts must fulfill the requirements of Executive Order 11988 and 23 C.F.R. subpt. 650.A. Documentation must:

- a) Briefly describe the watershed characteristics of the study area in terms of land uses and changes in land use that affect stream discharge.
- b) Briefly describe the streams in the study area, including evidence of stream migration, down cutting, or aggradations.
- c) Identify the presence and nature (e.g., zone A, zone AE, zone AE with floodway) of any FEMA mapped floodplains; including the panel number.
- d) Indicate the existence of any significant development associated with the mapped area and identify the jurisdiction responsible for the floodplain.
- e) Identify the locations where an alternative might encroach on the base (100-year) floodplain (encroachments), where an alternative might support incompatible floodplain development, and the potential impacts of encroachments and floodplain development. This identification must be included in the text and on a map.
- f) Include a list of all jurisdictions having control over floodplains for each alternative.
- g) Where an encroachment or support of incompatible floodplain development results in impacts, the CONSULTANT shall provide more detailed information on the location, impacts, and appropriate mitigation measures. In addition, if any alternative (1) results in a floodplain encroachment or supports incompatible floodplain development having significant impacts, or (2) requires a commitment to a particular structure size or type, the report must include an evaluation and discussion of practicable alternatives to the structure or to the significant encroachment. The report must include exhibits which display the alternatives, the base floodplains and, where applicable, the regulatory floodplains.
- h) For each alternative encroaching on a designated or regulatory floodplain, provide a preliminary indication of whether the encroachment is consistent with or requires a revision to the regulatory floodplain. If the preferred alternative encroaches on a regulatory floodplain, the report must discuss the consistency of the action with the regulatory floodplain. In addition, the report must document coordination with FEMA and local flood plain administrator or state agencies with jurisdiction indicating that a revision is acceptable or that a revision is not required.

- i) If the preferred alternative includes a floodplain encroachment having significant impacts, the report must include a finding that it is the only practicable alternative as required by 23 C.F.R. subpt. 650.A. The finding must refer to Executive Order 11988 and 23 C.F.R. subpt. 650.A. In such cases, the report must document compliance with the Executive Order 11988 requirements and must be supported by the following information:
 - The reasons why the proposed action must be located in the floodplain;
 - The alternatives considered and why they were not practicable; and
 - A statement indicating whether the action conforms to applicable state or local floodplain protection standards

xiii. Stormwater Permits (Section 402 of the Clean Water Act)

The CONSULTANT shall:

- a) describe the need to use the TPDES General Permit, TX 150000. The text must describe how the project will comply with the terms of the TPDES, including the Stormwater Pollution Prevention Plan; and
- b) describe the need for Municipal Separate Storm Sewer System (MS4) notification. List MS4 participating municipalities.

2. Informal Meetings. (EXCLUDED)

3. Public Involvement. (EXCLUDED)

4. Field Investigations (EXCLUDED)

5. Environmental Permits Issues and Commitments (EPIC) Sheets. (EXCLUDED)

6. Review Environmental Documentation. (EXCLUDED)

7. Prepare Environmental Documentation.

- a. *TxDOT Scoping* - The CONSULTANT will prepare a detailed project description in consultation with CITY for use by the TxDOT Core Team and for discussion during the scoping meeting. The CONSULTANT will prepare for and attend one kickoff meeting with the CITY, as well as one environmental scoping meeting with TxDOT and the CITY to identify potential issues, required agency coordination, and to confirm technical studies and documentation that will be required to environmentally clear the project. This task also includes conducting follow up items after the CITY kickoff and TxDOT scoping meetings including revisions to scoping documents. An environmental constraints map will be produced for use in the environmental scoping process. The CONSULTANT shall prepare the environmental documentation for the project to support a categorical exclusion (CE) determination, or the preparation of an environmental assessment (EA) or an environmental impact statement (EIS), as applicable.
- b. *Technical Studies and Reporting* - Technical reports and other similar documentation for environmental services may include a report, checklist, form, or analysis detailing resource-specific studies identified during the process of gathering data to make an environmental decision. Technical reports and documentation are produced before an environmental document (e.g., EA) is prepared in order to identify issues early in the project review process. Technical reports and associated documentation shall be prepared by the CONSULTANT with sufficient detail and clarity to support environmental determination(s). All

technical reports must be compliant with FHWA guidance, and policy. The environmental document (e.g., EA) must reference the technical reports.

Environmental technical reports and documentation must include appropriate NEPA or federal regulatory language in addition to the purpose and methodology used in delivering the service. Technical reports and forms must include sufficient information to determine the significance of impacts, if any. The following technical studies will be conducted to support the preparation of an EA:

- i. Template for Environmental Impact Statement (EIS) to EA Classification Approval: Used to request approval to prepare an EA for an FHWA project for which an EIS is normally required under 23 CFR 771.115(a). The CONSULTANT will prepare memo in consultation with the CITY and available information.
- ii. Purpose and Need: The CONSULTANT will describe the proposed project and transportation problem(s) or other needs that the proposed project is intended to address. The CONSULTANT will prepare this memo in consultation with CLIENT and available information.
- iii. Alternatives Analysis: The CONSULTANT will prepare an Alternatives Analysis to evaluate reasonable options for meeting the project's purpose and need while minimizing potential environmental impacts. This task will include identifying and describing the range of feasible alternatives, including the "No Build" alternative, and assessing their relative environmental, social, and engineering considerations. The analysis will be documented in accordance with applicable guidance and will provide the foundation for selecting the preferred alternative for further study and coordination.
- iv. Farmland: The CONSULTANT shall identify farmland impacts for the proposed project. Identification of farmland impacts shall be in accordance with the Farmland Protection Policy Act (7 USC 4201 et. seq.). Farmland impacts shall be reported in the EA as the proposed project area may be located within agricultural areas designated as prime farmlands. If required, Natural Resources Conservation Service (NRCS) Form AD-1006, "Farmland Conversion Impact Rating" would be completed, processed with the NRCS and included in the EA as appropriate.
- v. Utility Relocation: The CONSULTANT shall identify whether or not utility relocations would be necessary as a result of the proposed project. If the need for utility relocations is identified, the impacts resulting from the removal or adjustment of any utilities within the existing/proposed project right-of-way (ROW) would be considered and discussed in the EA.
- vi. Community Impacts: The CONSULTANT shall conduct a Community Impact Assessment, including displacements, changes to access and travel patterns, changes to community cohesion, Environmental Justice analysis and Limited English Proficiency analysis. The CONSULTANT shall conduct an analysis sufficient to meet requirements of TA 6640.8A.
- vii. Visual/Aesthetic Impacts: The CONSULTANT shall examine any visual or aesthetic impacts that may include impacts to any landscaping, decorative, or other features that may be affected by the proposed project.

- viii. Air Quality Analysis: The CONSULTANT shall conduct an air quality analysis, including a Mobile Source Air Toxics (MSAT) qualitative analysis, if needed. The National Ambient Air Quality Standards for Maverick County shall be assessed. The Texas Commission on Environmental Quality (TCEQ) air quality designations shall be reviewed for the region/area of the proposed project (e.g., attainment, non-attainment, etc.). The effects (positive or negative) of the proposed project on local air quality shall be evaluated, including the potential for fugitive dust particulate emissions during construction activities.
- ix. Noise Analysis: The CONSULTANT shall complete a traffic noise analysis using the FHWA Traffic Noise Model® (TNM®) files, version 2.5. Noise analyses shall be conducted for the preferred Build Alternative only. The existing and predicted (future) traffic data and information required for inclusion in the TNM® shall be developed by the CONSULTANT. The CONSULTANT shall prepare all necessary noise analyses and technical reporting.
 - a) Noise Analysis Technical Reporting Requirements. The noise analysis technical reporting might include:
 - Computer modeling of existing and predicted noise levels;
 - Field measurements of existing noise levels for validation purposes and validation of existing model;
 - Determining predicted noise impact contours for undeveloped property;
 - Barrier analysis for impacted receivers as appropriate.
 - b) Noise Analysis General Requirements.
 - The CONSULTANT shall use TxDOT's .DGN file coordinate system for all traffic noise modeling, so that all design files and traffic noise modeling software coordinate systems are the same.
 - The CONSULTANT shall provide TxDOT with all .DXF files used for the traffic noise model.
 - The CONSULTANT shall review all proposed noise barrier locations as part of the traffic noise modeling process.
- x. Water Resources: The CONSULTANT shall document compliance with laws and regulations concerning the management of water resources. Additionally, the CONSULTANT shall determine whether the proposed project requires any of the following permits related to water resources:
 - a) Texas Pollutant Discharge Elimination System (TPDES)
 - b) State water quality certification under Section 401 of the Clean Water Act (CWA)
 - c) Nationwide Permit under Section 404 of the CWA
- xi. Surface Water: The CONSULTANT shall assess surface water features within the project area (e.g., irrigation canals, open water, drainage ditches, etc.). Surface drainage and the water quality of surface waters, streams, creeks or washes would be additionally assessed as needed. Impacts to surface waters

would be assessed for the preferred Build Alternative in the EA. The TCEQ Section 303(d) list of impaired waters would be reviewed to evaluate the potential for the proposed project to adversely affect impaired waters.

- xii. Floodplains: Executive Order 11988 requires federal agencies to determine whether a proposed action occurs within a floodplain. Executive Order 11988 directs each federal agency to take action 1) to reduce the risk of losses associated with floods, 2) to minimize the impact of floods on human health and safety, and 3) to preserve the beneficial values of floodplains. The ENGINEER shall evaluate the project area regarding Federal Emergency Management Agency (FEMA) designated/mapped areas, flood event impacts, flood control measures, encroachments of the 100-year floodplain, developed areas in or near the 100-year floodplain, local watersheds, and drainageways.

The CONSULTANT shall determine whether the proposed project is located within any FEMA mapped floodplains. The EA shall document the floodplains, if any, that could be potentially impacted by the proposed project.

- xiii. Groundwater: The CONSULTANT shall evaluate the project area regarding groundwater availability and allocation. This evaluation shall include the identification of local public drinking water systems.
- xiv. Waters of the US, including Wetlands: Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the US, including wetlands. The US Army Corps of Engineers (USACE) administers the permitting program for actions under Section 404 of the CWA. The CONSULTANT shall prepare the delineation of waters of the US, including wetlands, for areas within the preferred Build Alternative. The delineation would be conducted in accordance with the 1987 Corps of Engineers Wetland Delineation Manual and the appropriate Regional Supplement to the Corps of Engineers Wetland Delineation Manual.

The CONSULTANT shall collect background data (i.e., aerial/color infrared aerial photographs, topographic data, etc.) prior to the field investigation. If ROE/field access is not authorized on all proposed ROW parcels, the CONSULTANT shall utilize other available resources such as the NRCS Web Soil Survey, aerial photography, topographic maps, and National Wetlands Inventory (NWI) data, etc., to delineate wetlands within the preferred Build Alternative or related areas.

The wetland delineation would consist of staking and mapping identified waters of the US, including wetlands and other special aquatic sites. Under normal circumstances, wetlands must possess three essential characteristics: hydrophytic vegetation, wetland hydrology, and hydric soils. Indicators of these characteristics would be documented in the wetland areas, as well as in the nearby upland areas, to determine the presence (or absence) of wetland characteristics. Waters of the US shall be delineated in the field and recorded

using Trimble® Geo7X Global Positioning System (GPS) technology. Areas extending beyond the project ROW shall be noted but not delineated during the field investigation. Wetland data forms shall be completed at vegetative community changes within the project ROW as well as in other areas to determine the geographical boundary of a wetland or the ordinary high-water mark of a stream/creek.

The CONSULTANT shall draft a water features delineation report which summarizes the methods and results of the delineation activities as well as associated mapping (i.e., vicinity, site location, topography, aerial photograph, LiDAR, soils, floodplains, NWI, etc.), site photographs, wetland data point locations, acreage summary tables, and other supporting data (e.g., antecedent precipitation data).

The CONSULTANT shall draft a Surface Water Analysis Form, including analysis of:

- a) Section 404 of the Clean Water Act
- b) Section 303(d) of the Clean Water Act
- c) General Bridge Act/Section 9 of the Rivers and Harbors Act
- d) Section 10 of the Rivers and Harbors Act
- e) Section 401 of the Clean Water Act
- f) Executive Order 11990, Protection of Wetlands

The CONSULTANT shall draft the Section 404/10 Impacts Table prepared in accordance with TxDOT ENV's Section 404/10 Impacts Table and Instructions – Preparing a Section 404/10 Impacts Table.

- xv. USACE Permit Application: Permit applications prepared for the proposed project may include the following:
 - a) Section 10 of the Rivers and Harbors Act (33 USC 403). The ENGINEER shall determine whether the proposed project requires a Section 10 permit and shall prepare and submit a permit application to the USACE and obtain the permit. Section 404 of the Clean Water Act (33 USC 1344). The CONSULTANT shall determine whether the proposed project requires a Section 404 permit (Regional General or Nationwide or Individual Permit (IP)).
- xvi. Rivers and Harbors Act Section 9/US Coast Guard Bridge Permit Application: Section 9 of the Rivers and Harbors Act of 1899 defines the requirements for the approval to construct dams, dikes, bridges, or causeways in navigable waters; this approval authority rests with the USACE. The CONSULTANT shall work with both the USACE and the US Coast Guard (USCG) to prepare a bridge permit application (33 USC 401) as the proposed project crosses the Rio Grande, a navigable international waterway. Bridge permit applications shall comply with the USCG Commandant Publication P16591.3D, Bridge Permit Application Guide. Supporting documentation (e.g., environmental

documentation, plan sheets, navigation impact report, etc.) shall be provided by the CONSULTANT as part of the application. NEPA documentation and USACE permitting shall be submitted to the USCG prior to USCG approval of the bridge permit application.

- xvii. Archaeological Background Study: The Background Study will consist of a comprehensive review of records that pertain to the proposed Area of Potential Effect (APE). Specifically, during the Background Study, the CONSULTANT Archaeologist will consult the available resources from the Texas Historical Commission (THC), site files, and maps will be examined to gather more detailed information regarding the APE and its immediate vicinity. In addition, aerial photos, topographic maps, geologic maps, and soil survey maps will also be reviewed to provide information on land use, topography, soils, vegetation, geology, and levels of development within the project vicinity.

The goal of the Background Study is to determine the likelihood that the project will impact significant historic cultural resources (prehistoric and historic archeological sites). Significant historic cultural resources may consist of standing structures and/or prehistoric cultural deposits that have the potential to be listed on the National Register of Historic Places (NRHP) and to be formally designated as State Antiquities Landmarks (SAL). The Background Study will result in the production of a report, summarizing the resources consulted, the findings of the review, and recommendations regarding any additional field investigations that may be warranted prior to the inception of the development activities. The document will be submitted to the CITY to submit for review. Once the CITY has reviewed the report, and all comments addressed, the CONSULTANT will produce a final version of the Background Study to submit to TxDOT.

The CONSULTANT will perform basic archival research on the THC's Texas Historic Sites Atlas and Texas Archeological Sites Atlas online databases, the General Land Office (GLO), the National Park Service's (NPS) online National Register Information System (NRIS), TxDOT's Historic Resources Aggregator online database, and/or other relevant archives for information on previous cultural resources investigations conducted in the vicinity of the project area and previously recorded archeological sites, cemeteries, and historic properties within and in the vicinity of the project area. Research will include reviewing historical aerial imagery, Webb County Central Appraisal District data, and other available documentation to identify areas where undocumented historic-age resources may be located. Desktop archival studies will examine a 1.0-mile radius surrounding the project area on the US side of the US-Mexico border only.

Desktop archival studies will identify the following previously recorded cultural resources: prehistoric and historic-age archeological sites, historic properties and districts listed on the NRHP and/or designated as State Antiquities Landmarks (SAL), historic properties determined to be eligible for

listing in the NRHP but which have not been formally nominated, Registered Texas Historic Landmarks (RTHL), and cemeteries.. Historic-age resources are defined as cultural resources of at least 50 years of age.

- xviii. Archaeological Pedestrian Survey: If it is determined after review of the background study that additional work is needed for compliance with Section 106 of the NHPA and the ACT, the **CONSULTANT** will consult with the THC and TxDOT to generate a Texas Antiquities Permit application and scope of work (SOW) that will clearly outline the methods of investigations for the proposed project. The application and SOW will be submitted to the reviewing agencies for review and permit issuance.
- a) Define the APE of the proposed project based on applicable federal and state agency guidelines, taking into account the horizontal extent of the construction footprint, the vertical depth of ground-disturbing impacts, and potential indirect (e.g., viewshed) effects beyond the construction footprint.
 - b) Perform an intensive archeological survey, consisting of pedestrian walkover with surface inspection and systematic shovel testing and mechanical trenching (as needed), at a level of intensity sufficient to meet or exceed the Texas State Minimum Archeological Survey Standards (TSMAS) and guidelines established by the CTA unless field conditions warrant excavation of more or fewer shovel tests.
 - c) Document any cultural resources encountered to a sufficient degree to make recommendations of the significance of the resources in terms of their eligibility for inclusion in the NRHP and for designation as SALs.
 - d) Inspect the locales of any previously recorded archeological sites within the project area, assess their current condition, and document the sites to a sufficient degree to make recommendations of the significance of the resources in terms of their eligibility for inclusion in the NRHP and for designation as SALs.
 - e) Complete and submit State of Texas Archeological Site Data Forms (for new archeological sites) or State of Texas Archeological Site Update Forms (for previously recorded archeological sites) to the Texas Archeological Research Laboratory (TARL). Permanent site trinomials will be obtained from TARL for any new archeological sites documented within the project area during the survey.
 - f) Assess the significance of any cultural resources within the project area in terms of their potential eligibility for inclusion in the NRHP and for designation as SALs.
 - g) Develop a draft technical report detailing the project background, environmental and cultural setting of the project area, research goals and survey methods, survey results, recommendations for any cultural resources documented during the survey, and a bibliography of references cited suitable for review by the THC and any other applicable regulatory agencies.
 - h) Submit a preliminary review copy of the archeological draft report describing the results of the survey in electronic (PDF) format to the client

or review. Following approval of the draft report by the client, the CONSULTANT will submit an electronic copy of the report to the THC and any other applicable regulatory agencies for review and comment. The CONSULTANT will coordinate review with the regulatory agencies unless the client would prefer to coordinate agency review directly.

- i) Respond to any comments on the draft report offered by the THC and any other applicable regulatory agencies and produce a final report.
- j) Submit the final report to the client and the THC.
- k) Prepare summary of findings for the NEPA documentation and provide required documentation for NEPA document.

xix. Historic Resource Identification, Evaluation and Documentation Services: The CONSULTANT shall provide historic resource identification, evaluation, and documentation services. In compliance with TxDOT's Environmental Compliance Toolkits, the Engineer shall provide the following historic resource services/deliverables:

- a) Historic Resources PCR,
- b) Historic Resources Research Design, and
- c) Historic Resource Survey Report, including windshield, reconnaissance, or intensive level documentation.

All services, except the historic resource PCR, will have prior approval by TxDOT's Environmental Affairs Division's Historical Studies Branch (ENV-HIST) to be performed. The historic resource PCR will be accepted by ENV-HIST prior to survey field work.

xx. Section 4(f)/(6f): The CONSULTANT shall, in accordance with 23 CFR 771.135 (49 USC 303), US Department of Transportation Act, identify properties within the proposed project area that are protected by Section 4(f) of the US Department of Transportation Act of 1966. Such Section 4(f) properties include parkland, recreational area, wildlife refuges, and historic properties. Section 4(f) Evaluations, if required, would be conducted under a separate work authorization.

- a) The CONSULTANT shall identify areas of parkland within the proposed project area that are protected by Section 6(f) of the Land and Water Conservation Act. Such Section 6(f) properties were acquired, or developed and funded, through monies of the Land and Water Conservation Fund of 1965. The ENGINEER shall not conduct activities to replace impacted Section 6(f) properties under this work authorization. Section 6(f) property replacement activities, if required, would be conducted under a separate work authorization.
- b) The CONSULTANT shall document the proposed project's compliance with Chapter 26 of the Texas Parks and Wildlife Code.

xxi. Protected Species Habitat Evaluation: This task includes an assessment of habitat for rare, threatened, and endangered species and U.S. Fish and Wildlife Service (USFWS) designated critical habitat. The CONSULTANT will research readily available environmental information from appropriate local, state, and federal agencies relative to the Project Area. This will include

a review of desktop resources such as U.S. Geological Survey (USGS) topographic maps, aerial photography, Texas Parks and Wildlife Department (TPWD) Natural Diversity Database (TXNDD) Element of Occurrence Records (EOR), TPWD Rare Resources by County lists, and USFWS designated critical habitat field visit will be conducted in support of the assessment. The vegetation of the Project Area will be characterized, as will the ecological setting in accordance with TPWD map publications, including *The Vegetation Types of Texas*. This field data will aid in determining the potential presence of habitat suitable for state and federally listed species and critical habitat in the proposed Project Area. The CONSULTANT will evaluate all pertinent ecological data in order to adequately complete the Species Analysis Form and Species Analysis Spreadsheet. If requested by TxDOT, the CONSULTANT will complete the Form: *Documentation of Texas Parks and Wildlife Department Best Management Practices*. This work will be conducted by a qualified biologist.

- a) Threatened and Endangered Species - For the purposes of this work authorization, protected species shall include:
- Species listed by the US Fish and Wildlife Service (USFWS) as threatened or endangered or proposed for listing as threatened or endangered (50 CFR 17.11-12);
 - Species that are candidates for review or listing by the USFWS as threatened or endangered (per most recently updated list in the Federal Register);
 - Species listed by the Texas Parks and Wildlife Department (TPWD) as threatened or endangered as reflected in the Annotated List of Rare Species for Webb County; and
 - Species protected by the Migratory Bird Treaty Act (50 CFR 10.13).

The CONSULTANT shall examine existing data to determine the likelihood that protected species, their habitat or designated critical habitat (per 50 CFR 17.94-95) could be impacted by the proposed project and shall report the findings in the EA. Existing data shall include the records of the TPWD Natural Diversity Database. The ENGINEER shall not conduct species-specific presence/absence surveys for protected species or critical habitat. If required, presence/absence and/or critical habitat surveys would be conducted under a supplemental work authorization if needed.

- xxii. Hazardous Materials Initial Site Assessment (ISA): the CONSULTANT will conduct a Hazardous Materials Initial Site Assessment (ISA) that will comply with the Federal Highway Administration's (FHWA's) policy pertaining to hazardous materials as discussed in FHWA's Supplemental Hazardous Waste Guidance (January 15, 1997). The ISA report will be submitted in the format typically required by TxDOT for their highway projects. The objective of the ISA is to: 1) identify and assess potentially contaminated sites early in project development; 2) coordinate early with federal/state/local agencies to assess the contamination and the cleanup needed; and 3) determine and implement measures early to avoid or minimize involvement with substantially

contaminated properties. The ISA will include following components at a minimum:

- i. *Review of Existing Data and Records*
The CONSULTANT will review reasonably ascertainable pertinent records and resource materials that are practically reviewable within the cost and time constraints of the ISA. Federal, state, local, and facility records will be evaluated for environmentally significant information regarding the Project Area and documented facilities or incidents within the approximate minimum search distance established by the environmental professional in accordance with the FHWA required search radii provided by a qualified database provider. Regulatory files from the Texas Commission on Environmental Quality (TCEQ) will not be reviewed as part of this scope of work.
- ii. *Project Corridor Reconnaissance*
The CONSULTANT will perform reconnaissance activities in an attempt to identify *environmental concerns (ECs)* in connection with the transportation corridor. The environmental professional will visually and physically observe the full extent of the Project Area for environmental hazards or conditions related to past or ongoing land use activities and operations. The adjoining properties, structures, and potential recognizable environmental hazards and conditions along the corridor shall be observed visually from all adjacent public thoroughfares, roads, or access points.
- iii. *ISA Report Preparation*
The CONSULTANT will prepare an ISA report including applicable figures and appendices (e.g. Project Location Map, USGS Topographic Map, Aerial Photograph, and Site Photographs). Requirements for addressing hazardous materials as they relate to the environmental process will be done in accordance with TxDOT's Environmental Handbook for Hazardous Materials. This report will include discussions of resolved issues as they relate to the project and recommendations for unresolved issues that will require additional assessment if warranted. Pending CLIENT's approval and incorporation of any comments, final version of the report will be prepared for submittal to TxDOT. The report will be provided electronically in PDF format.

Some technical reports may or may not be required; an analysis of the baseline research for the proposed project study area shall aid in determining the need for selected technical reports. All environmental documents shall be submitted to the CITY electronically though a reasonable number of hard copies shall be accommodated upon request. Prior to developing an environmental document, the CONSULTANT shall produce and submit draft and final versions of necessary technical reports including the following:

Deliverables:

- a. Air Quality Analysis (if required)
- b) Archeological Survey Report
- c) Chapter 26, Parks and Wildlife Code

- d) Community Impacts Assessment
- e) Farmland Protection Policy Act Forms
- f) Hazardous Materials Initial Site Assessment
- g) Historic Resources Survey Report (HRSR)
- h) Section 6(f) Land and Water Conservation Fund Act coordination (if required)
- i) Species Analysis Spreadsheet
- j) Surface Water Analysis
- k) Stormwater impacts
- l) U.S. DOT Section 4(f) Analysis (if required)
- m) Public Involvement (Public Meeting and Public Hearing)
- m) Traffic Noise Analysis Technical Report
- n) Waters of the US Delineation Report
- o) Documentation of Public Meeting
- p) Documentation of Public Hearing

Environmental Assessment - **(EXCLUDED)**

- c. Quality Assurance and Quality Control (QA and QC) Review **(EXCLUDED)**
- d. Resource Agency Coordination - **(EXCLUDED)**
- e. Draft and Final FONSI - **(EXCLUDED)**
- g. Permits - **(EXCLUDED)**
 - i. Mussel Survey and USFWS **(EXCLUDED)**
- h. Exclusions - The following environmental services are specifically excluded from this scope of work and, if required, shall be subject to a separate work authorization as Special Services:
 - i. Archeological data recovery and monitoring.
 - ii. Audio/visual equipment rental.
 - iii. Bicycle/pedestrian connectivity study.
 - iv. Biological Assessment preparation.
 - v. Construction Emissions Mitigation Plan.
 - vi. Disposal or transportation of any hazardous waste that is encountered during site investigations.
 - vii. Emergency Response Control Pollution Plan.
 - viii. Environmental permitting.
 - ix. Historic American Buildings (HABS)/Historic American Engineering Record (HAER) documentation.
 - x. Hazardous materials investigations (Phase II/III) beyond the level of an ISA (ASTM E1527-21).
 - xi. Human remains evaluation/coordination/removal.
 - xii. Incidental Take Permit activities.
 - xiii. Meetings with Affected Property Owners.
 - xiv. Mobile Source Air Toxics (MSAT) quantitative analysis.
 - xv. NRHP nominations.
 - xvi. Phase II hazardous materials due diligence/site assessments.

- xvii. Project newsletter or project website development.
- xviii. Section 4(f) and/or Section 6(f) evaluations.
- xix. Security officer(s) for public meeting.
- xx. Species-specific Subject Matter Experts for individual critical habitat or species analyses.
- xxi. Storm Water permits.
- xxii. Storm Water Pollution Prevention Plan/ Texas Pollutant Discharge Elimination System (TPDES).
- xxiii. Wild and scenic river assessments.
- xxiv. Spill Prevention, Control and Countermeasure (SPCC).

D. RIGHT-OF-WAY – SURVEY ACTIVITIES.

1. Right of way Map Review.

The CONSULTANT shall review and evaluate the proposed or existing right of way map to verify that all construction staging and alignment considerations have been taken into account. The CONSULTANT shall notify the CITY in writing if it is necessary to obtain additional construction easements or rights of entry and shall provide justification for such action. The CONSULTANT shall identify and delineate any temporary construction easements in areas outside the CITY's right of way.

2. Right of Way (ROW) Mapping.

The Surveyor shall provide ROW mapping services including the following tasks.

a. Boundary Survey

This includes the performance of surveys to establish existing land boundaries.

The Surveyor shall prepare:

- i. boundary surveys within the project limits (only within the United States);
- ii. an existing ROW Abstract Map base drawing using researched property and easement deeds.
- iii. GIS files (if requested); and
- iv. Note—the Surveyor is not licensed to perform boundary surveys in Mexico.
- v. Purpose: The purpose of traditional boundary mapping is:
 - a) To prepare mapping documents suitable for use in the acquisition of real property and the issuance of a title policy.
 - b) To prepare a map of a resurvey of existing boundary where it is necessary to update or redefine boundary lines.
- vi. Definitions: In this attachment, the following definitions shall apply:
 - a) Abstract Map means a scale drawing prepared from record documents depicting public or private property lines with relevant grantee names, recording data, and recording dates.
 - b) Owner means the current title holder of record as determined by the Real Property Records.

- c) Parent Tract means a unit or contiguous units of land under single ownership, comprising a single marketable tract of land consistent with the principle of highest and best use.
- d) A parent tract may be described by a single instrument or several instruments.
 - 1) Point of Beginning or POB means a corner of the parcel of land to be acquired and being the beginning terminus of the first course of the written property description or plat.
 - 2) Point of Commencing or POC means a monumented property corner identifiable in the real property records.
- vii. Procedure: All standards, procedures, and equipment used by the Surveyor must be such that, at a minimum, the results of the survey is in compliance with the precision and accuracy requirements set forth by the Texas Board of professional Engineers and Land Surveyors (TBPELS) rules.
- i. Abstracting

The Surveyor shall obtain copies of all existing ownership documents for the parent tracts along with all subdivision plats and recorded documents defining existing easements within, along or intersecting the existing ROW, and prepare an abstract map. Tasks include:

 - i. Identify all easements and property interests for pipelines and other utilities that fall within the proposed route and GSA Facility site
 - ii. Boundary verification of existing property corners and Parent Tracts
 - iii. Right-of-Way retracement (FM 255) - Collect and draw into base drawing provided and researched TxDOT Right-of-Way maps

The Surveyor shall prepare an Abstract Map sufficient to determine the following:

 - i. All interests of public record held in the land to be acquired.
 - ii. The total record holdings to be acquired from an owner contiguous to a land.
 - iii. All interests in land held in common to be acquired (shopping mall parking lots, subdivision reserves, etc.)
 - iv. All improvements proposed by other agencies that might have a bearing on project development.
 - v. All called monuments, bearings, and distances in recorded information.
- j. ROW Field Surveys

The Surveyor shall locate and set additional horizontal and vertical control points, as necessary, at a maximum spacing distance of 1,500 feet; field locate property corners, existing ROW markers, improvements, and visible utilities; verify and update the planimetric file; and, as directed by the CITY, perform the following:

 - i. Obtain right of entry to survey private property and prepare a spreadsheet of the information and KML or KMZ file of the information.

- ii. Locate existing horizontal and vertical control and verify the control information, locate property corners, and update the planimetric information with any missing visible improvements or visible utilities.
- iii. The Surveyor shall base all field work and calculations on the current controls and datum provided by the CITY.

k. Final Deliverables

The Surveyor shall prepare final deliverables.

- i. The Surveyor shall set appropriate monuments on the proposed ROW lines at intersecting property lines, and at all points of curvature (PC), points of tangency (PT), angle points, intersecting ROW lines of side streets, and at 1,500-foot stations.
- ii. The Surveyor shall set appropriate monuments on the existing ROW lines in areas of no acquisition at all PCs, PTs, angle points, and 1,500-foot stations, and as directed by the CITY.
- iii. The Surveyor shall set appropriate monuments at intersecting property lines with the new ROW lines.
- iv. The Surveyor shall prepare the final ROW (ArcGIS) database template "ROW_Parcels Edits" populated with the final parcels, final alignment, and project control points in ArcGIS 10.6.1 format or the current version in use by the CITY.
 - a) Prepare Parcel Plats and Property Descriptions & Set Proposed Property Corners for two (2) parcels.
- v. Delineate the proposed corridor and GSA Facilities on Abstract Map and on the ground for GSA approval.
- vi. The Surveyor shall prepare final, signed, sealed, and dated Property Descriptions.

l. Quality Assurance and Quality Control (QA and QC)

The Surveyor shall conduct a QA and QC review and prepare a check list for each task performed.

The Surveyor shall prepare a surveyor's report regarding their survey procedures, findings, and decisions made.

3. Deliverables for Right of Way – Survey Activities.

- a. Scanned copies of the ownership documents
- b. One paper copy of the abstract map and the associated MicroStation graphics files
- c. Spreadsheet showing property owners and right of entry information
- d. Scanned copies of the field notes, control data sheets and a graphics file of all field survey data

- e. One paper copy of the preliminary property descriptions and an electronic copy in PDF format
- f. Preliminary ROW (ArcGIS) database template populated with the preliminary parcels, alignment, and project and project control points in the current version of ArcGIS in use by TxDOT
- g. Two paper sets of the final property descriptions, signed and sealed by an RPLS, and the associated electronic files in PDF and Word formats
- h. Bentley MicroStation parcel plat graphics files and master reference files (MRF)
- i. Final ROW (ArcGIS) database template populated with the final parcels, final alignment, and project control points in the current version of ArcGIS in use by TxDOT
- j. Two 22" x 34" paper copies and one 11" x 17" paper copy of the preliminary ROW map and the associated MicroStation and GIS graphics files
- k. One 22" x 34" paper copy of the initial ROW map and the associated MicroStation and GIS graphics files
- l. Two 22" x 34" paper copies and one 11" x 17" paper copy of the final ROW map and the associated MicroStation and GIS graphics files
- m. PDF of the final ROW map
- n. Two 8.5" x 11" paper copies of the ROW project cover sheet and the associated Word document file.
- o. Documentation stating that the appropriate monuments were set on the existing and proposed ROW lines
- p. A copy of TxDOT's ROW map checklist signed by the surveyor
- q. A copy of the surveyor's report signed by the surveyor

E. RIGHT-OF-WAY – UTILITY ACTIVITIES

1. Utility Engineering Investigation Subsurface Utility Engineering (SUE).

The Consultant shall perform:

- a. SUE Quality Level D involves preliminary site visit, research to determine utility owners, contacting the utility companies to request the existing utility records, and drawing the information obtained into a utility base map and the following:
 - i. Perform records research from all available resources. Sources might include: Texas811, Railroad Commission of Texas (Texas RRC), verbal recollection, as-built information from plans, plats, permits and any other applicable information provided by the utility owners or other stakeholders.
 - ii. Document utility owners and contact information
 - iii. Create a utility drawing of information gathered
- b. SUE Quality Level C involves correlating the Quality Level D information obtained from existing utility record investigation with the visible surface features

obtained from a topographic survey. Limitations of a C&D investigation include utilities that have been sold or abandoned with no record or surface features.

- i. In combination with existing Quality Level D information, utilize surveyed above-ground utility features and professional judgement to upgrade Quality Level D information to Quality Level C. For those utilities unable to be upgraded, retain as Quality Level D.
 - ii. Gather and depict overhead utilities information. Sag elevations of lowest utility must be documented at road crossings, per best practices document
 - iii. Gather storm and sanitary sewer information from Level D and upgrade to Level C as possible, unless otherwise directed by the CITY
 - iv. Include mapping of underground vaults
 - v. Create composite utility drawing of information gathered
- c. SUE Quality Level B involves the designation, recording, and marking the horizontal location of the existing utility facilities using non-destructive surface geophysical techniques, per APWA color standards. When data is reliable, cover shots indicating top of utility will be included at every 100 feet. Limitations of designation include signal bleed over due to congested utilities or utilities made of non-conductive material such as PVC or concrete. Where designation is not effective, probing will be attempted. Probing utilizes a metal probe to pierce the ground in attempt to contact the utility and can give an approximate depth of cover, however the utility cannot be visually verified. The Level B SUE marks will then be surveyed in using survey control provided by and added to the utility base map, with utilities distinguished by quality level. Quality Level B incorporates information from Quality Levels C & D.
- i. Compile as-built information from plans, plats, and other location data as provided by the utility owners
 - ii. Coordinate with utility owner when utility owner's policy is to designate their own facilities at no cost for preliminary survey purposes. Examine utility owner's work to ensure accuracy and completeness
 - iii. Designate, record, and mark the horizontal location of the existing utility facilities and their service laterals to existing buildings using non-destructive surface geophysical techniques. No storm sewer facilities are to be designated unless authorized by the CITY. Use a non-water base paint, utilizing the American Public Works Association (APWA) color code scheme, on all surface markings of underground utilities.
 - iv. Correlate utility owner records with designating data and resolve discrepancies using professional judgment. Prepare and deliver to the CITY a color-coded composite utility facility plan with utility owner names, quality levels, line sizes and subsurface utility locate (test hole) locations. Deliver the electronic file in a format acceptable to the CITY. Submit a hard copy of the utility facility plan that has been signed, sealed, and dated by the CONSULTANT to the CITY.

When requested by the CITY, overlay the designated utility information on the CITY's design plans.

- v. Determine and inform the CITY of the approximate utility depths at critical locations as determined by the CITY
 - vi. Provide a monthly summary of work completed and in process with adequate detail to verify compliance with agreed work schedule
 - vii. Close-out permits as required and provide documentation of close-out to the CITY.
 - viii. Clearly identify all utilities that were discovered from quality levels C and D investigation that cannot be depicted in quality level B standards. These utilities must have a unique line style and symbology in the designate (Quality Level B) deliverable.
 - ix. Comply with all applicable State policy and procedural manuals
- d. SUE Quality Level A test holes will be excavated via non-destructive vacuum excavation. In order to perform the field work, the following will also be completed: contact Texas One Call agency to notify of digging intent and perform on-site field inspection and designate the desired utility to determine exact location. Air-vacuum excavation will be utilized to determine orientation, size, depth, material and condition of the intended utility. The test holes will then be surveyed in using survey control. Signed and sealed Test Hole Data Sheets will be produced for the excavated locations, depicting top, side and plan views, and detailing survey information as well as size, material and depth of utilities found.
- i. Review requested test hole locations and advise the CITY in the development of an appropriate locate (test hole) work plan relative to the existing utility infrastructure and proposed highway design elements.
 - ii. Coordinate with utility owner inspectors as required by law or utility owner policy.
 - iii. Measure and record the following data on an appropriately formatted test hole data sheet that has been sealed and dated by the CONSULTANT:
 - a) Elevation of top and bottom of utility tied to the datum of the furnished plan
 - b) Minimum of two benchmarks utilized. Elevations must be within an accuracy of 15mm (.591 inches) of utilized benchmarks
 - c) Elevation of existing grade over utility at test hole location
 - d) Horizontal location referenced to project coordinate datum
 - e) Outside diameter of pipe or width of duct banks and configuration of non-encased multi-conduit systems
 - f) Utility facility material
 - g) Utility facility condition

- h) Pavement thickness and type
- i) Coating/wrapping information and condition
- j) Unusual circumstances or field conditions
- iv. Excavate test holes in such a manner as to prevent any damage to wrappings, coatings, cathodic protection, and other protective coverings and features. Water excavation must not be utilized without prior written approval from the appropriate TxDOT district office.
- v. Back fill all excavations with appropriate material, compact backfill by mechanical means, and restore pavement and surface material. The CONSULTANT is responsible for the integrity of the backfill and surface restoration for a period of three years. Install a marker ribbon throughout the backfill.
- vi. Furnish and install a permanent above ground marker (as specified by the CITY, directly above center line of the utility facility.
- vii. Neatly cut and remove existing pavement material. Provide complete restoration of worksite and landscape to equal or better condition than before excavation. If a worksite and landscape is not appropriately restored, the CONSULTANT shall return to correct the condition at no extra charge to the CITY.
- viii. Submit plans, profiles, and test hole data sheets to the CITY. Conduct a review of the findings with the CITY.
- ix. Close-out permits as required
- x. Plot utility location position information to scale and provide a comprehensive utility plan signed and sealed by the responsible engineer.

2. Utility Adjustment Coordination. (EXCLUDED)

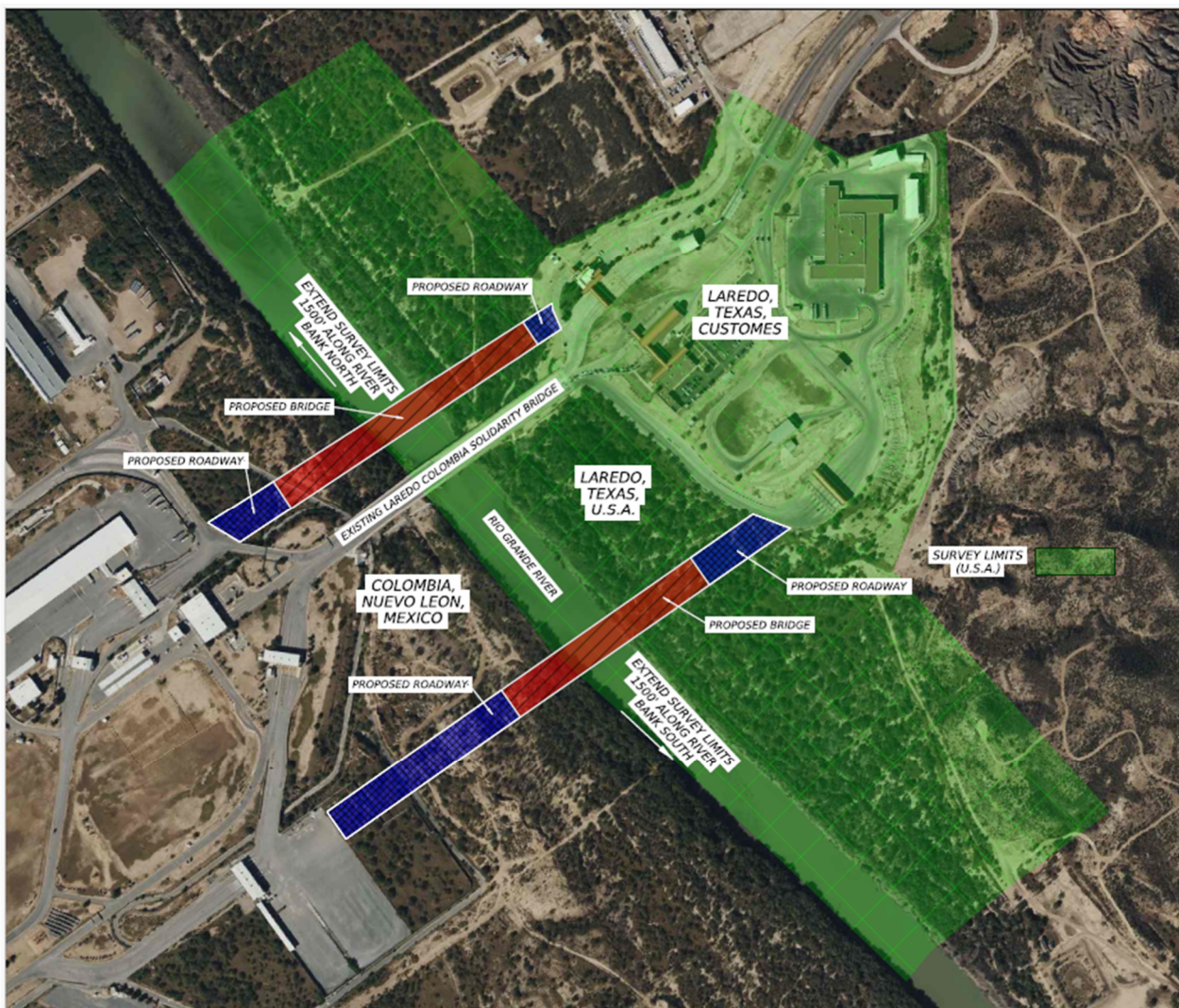
3. Utility Adjustment Monitoring and Verification. (EXCLUDED)

4. Final Deliverables

- a. A utility drawing showing the information gathered during the utility engineering investigation, including all underground utilities and all above ground appurtenance locations
- b. Documentation of utility coordination communication with external entities
- c. Minutes from all meetings with utility owners
- d. Initial project notification letters
- e. Utility contact list
- f. Utility agreement assemblies
- g. Utility adjustment cost records
- h. Monthly status reports
- i. Notification of demobilization

- j. As-installed utility drawings and GPS file
- k. Digital CADD file in Bentley Open Roads Designer (ORD) format in 1:1 model space suitable for 1-inch = 20-feet drawings with call outs showing the SUE Quality Levels D, C & B differentiated by symbology and the SUE Quality Level A Test Hole location(s) with summarized utility information.
- l. Signed and sealed Quality Level A Test Hole Data Sheets for excavated locations.
- m. Utility Conflict Matrix and Utility Conflict Analysis.
- n. Existing Utility Layout Sheets.
- o. Utility Coordination Correspondence documentation.

F. DESIGN SURVEYS AND CONSTRUCTION SURVEYS



Project Location – Survey Limits

- i. **Survey Tasks to be Completed.**
 - a. Design Surveys

- i. The CONSULTANT shall perform design surveys for roadway segments the area of the US Port of Entry that must tie to the new bridges.
- ii. The CONSULTANT shall perform tasks including the following:
 - a) Aerial LiDAR and Photogrammetric Imagery will be collected of approximately 300 acres lying on each side of the Rio Grande River to create a 1-foot interval contour map. Obscured areas will be surveyed using GPS, terrestrial scanning, conventional total station and digital level methods.
 - b) Obtain or collect data to create cross-sections and digital terrain models (DTMs)
 - c) Locate existing above-ground utility appurtenances and sanitary-sewer manhole details
 - d) Locate topographical features and existing improvements
 - e) Provide details of existing bridge structures, including bridge limits, bents, columns, retaining walls, and natural ground elevations.
 - f) Provide details of existing drainage features, (e.g., culverts, manholes, inlets)
 - g) Locate all waters of the United States (WOTUS), including wetlands.
 - h) Stake and collect Bridge Soil Borings locations
 - i) Tie in visible and apparent utilities (Above ground visible utilities marked by 811 One Call) Water, Sewer, Telephone, Electric, Etc.
 - j) ROW Staking of Proposed Route for Environmental purposes with 48" Wooden Lathes
 - k) Establish additional and verify existing control points. Horizontal and Vertical control ties must be made and tabulated, to other control points in the vicinity, which were established by other sources such as, the National Geodetic Survey (NGS), and the Federal Emergency Management Agency (FEMA), and other entities as directed by the CITY
 - l) Perform ground truthing cross-sections and measure validation points
 - m) Locate existing right of way
 - 1) The Surveyor shall resurvey the existing ROW where it is necessary to update or redefine ROW lines. All standard surveying procedures must be adhered to including record research, recovering existing monuments, and replacing monuments as appropriate. The Surveyor shall prepare an abstract map, preliminary map, final map, GIS graphics file, and a Surveyor's report. The final map must also include a monument table showing the property monuments that were found and set, and certified by the Surveyor. The Surveyor shall prepare maps either in standard map sheets format or roll map format as requested by the TxDOT district.
 - n) Review right of way maps and conveyance documents for easements and other property interests
 - o) Locate boreholes
 - p) Perform hydrographic surveys, according to details requested by the TxDOT district.

- 1) Hydrographic Survey of the Rio Grande River shall consist of cross-sections at 100 ft intervals along center of the river. Cross-sections will be taken for minimum distance of 600 ft upstream & downstream of the proposed international bridge crossings. This will be done using a Boat and Staff.
- q) Verify the condition and usefulness of existing control points including verification of the values. Establish additional control as needed. Tie to other control points in the project vicinity including points established by the National Geodetic Survey (NGS), the Federal Emergency Management Agency (FEMA), and any other local entities as directed by the CITY.
- r) Prepare a survey control index sheet and horizontal and vertical control sheets, which must be signed, sealed and dated by the professional engineer in direct responsible charge of the surveying and the responsible RPLS for insertion into the plan set

ii. Mapping Services to be Provided.

The Surveyor shall provide the following mapping services as requested by the CITY:

- a. Mobile and Aerial Lidar
The Surveyor shall prepare planimetric design (DGN), digital terrain model (DTM), and triangulated irregular network (TIN) MicroStation graphics files covering the specific work location, meeting standards and specifications as required.
- b. Mapping Tasks to be Completed
The Surveyor shall perform the following tasks as requested for each mapping service.
 - i. Horizontal and Vertical Control for Aerial Mapping
 - a) The Surveyor shall prepare and submit an aerial ground control layout showing the proposed aerial ground control points, for approval by the CITY.
 - b) The Surveyor shall establish and determine the coordinates of the aerial ground control points.
 - c) The Surveyor shall establish and determine the elevations of the aerial control points.
 - d) The Surveyor shall place aerial ground control target material at the established points and maintain until the photographs from the flight are approved.
 - e) The Surveyor shall prepare, to scale, a survey control index sheet for the aerial control points.
 - f) The Surveyor shall be prepared to locate additional points, as determined by the American Society for Photogrammetry and Remote Sensing (ASPRS) certified Photogrammetrist, if any panel points are not visible from the air.
 - ii. Prepare Planimetric and DTM Data

The Surveyor shall perform the following tasks for each requested mapping service:

- a) The Surveyor shall provide low altitude aerial mapping to cover an area 1,200 feet wide centered on the roadway unless otherwise specified, with cross flights as directed by the CITY.
The Surveyor shall follow all standards and specifications in accordance with established guidelines and recommended or approved by the CITY.
- b) The Surveyor shall prepare planimetric design (DGN), digital terrain model (DTM), and triangulated irregular network (TIN) Bentley MicroStation graphics files and orthophotography files covering the specific work location, meeting standards and specifications as required.
 - 1) The Surveyor shall collect supplemental planimetric and DTM survey data.
 - 2) The Surveyor shall update aerial 2D and 3D mapping with ground surveys.
 - 3) The Surveyor shall maintain the current DGN level structure and legend used by TxDOT.
 - 4) The Surveyor shall maintain the current DTM level structure and legend used by TxDOT.
 - 5) The Surveyor shall use file features and level structures in compliance with TxDOT's current photogrammetry mapping legend.
 - 6) The Surveyor shall locate, and field check random points.
- c) The Surveyor shall conduct quality assurance and quality control (QA/QC) for each task performed and prepare a Surveyor's Report.

iii. **Horizontal and Vertical Control for Field Surveying**

a. Tasks to be Completed

The Surveyor shall perform the following tasks:

- i. The Surveyor shall establish horizontal and vertical control points, including offsite points. The Surveyor shall prepare signed survey control data sheets, a survey control index sheet, and a composite layout of the horizontal and vertical controls, and as directed by the CITY.
- ii. Set aerial control targets - The Surveyor shall set primary offsite control points in pairs, approximately 2 miles apart outside of the project area.
- iii. Set 6 Primary TYPE II Stamped Brass Disks and 6 Secondary Light Duty Control Monuments - The Surveyor shall set secondary control points approximately 6 inches below ground at a maximum distance of 1,500 feet apart.
- iv. The Surveyor shall establish horizontal and vertical control from the TxDOT Virtual Reference Station (VRS) Network, and as directed by the CITY.

- v. Digital Level Loop on all Control Points - Verify Existing Horizontal and Vertical survey control. The Surveyor shall tie and tabulate horizontal and vertical control to other control points and datums in the vicinity established by other sources such as the National Geodetic Survey (NGS), the Federal Emergency Management Agency (FEMA), TxDOT VRS Network, and as directed by the CITY.

4. Deliverables

- a. Design and Construction Surveys.
 - i. TxDOT Form 2462 for each primary and secondary control point. This form must be submitted electronically in PDF format and in the original format of its creation. This must be signed and sealed by the responsible RPLS.
 - ii. Digital Terrain Models (DTM) and the Triangular Irregular Network (TIN) files in a format acceptable by the CITY.
 - iii. Maps, plans, or sketches prepared by the CONSULTANT showing the results of field surveys
 - iv. Computer printouts or other tabulations summarizing the results of field surveys
 - v. Digital files or media acceptable by the CITY containing field survey data (ASCII Data files)
 - vi. Maps, plats, plans, sketches, or other documents acquired from utility companies, private corporations, or other public agencies, the contents of which are relevant to the survey
 - vii. Field survey notes, as electronic and hard copies
 - viii. An 8 ½ -inch by 11-inch survey control data sheet for each control point
 - ix. A digital and hard copy of all computer printouts of horizontal and vertical conventional traverses, GPS analysis and results, and survey control data sheets
 - x. All GEOPAK GPK files and OpenRoads files
 - xi. Survey reports in a format requested by the CITY
- b. Aerial Mapping Using a Non-Metric Camera and Unmanned Aircraft System (UAS).

The Photogrammetrist or Mapping Scientist must submit the following:

- i. Digital orthophotography delivered on USB flash-drive or hard-drive in Tagged Image File format (TIF) compatible with Bentley MicroStation software and including georeferenced world files.
- ii. A photo index map in DGN and KMZ format showing the location of each digital image frame. The index map must be overlaid on a base map to provide general location information.
- iii. An orthophoto index map in DGN, KMZ, and PDF format showing the location of each orthophoto panel. The PDF format index map must be overlaid on a base map to provide general locational information.
- iv. An analytical triangulation report signed and sealed by the Photogrammetrist or Mapping Scientist providing a narrative of the aerial photography project and processing results. The report must include the number of flight strips, overall

number of photo frames, the number of ground control points used, the use of airborne GPS and IMU data, and the results of the fully weighted least-squares bundled adjustment. The Photogrammetrist or Mapping Scientist must include a description and results of the analytical triangulation.

- v. DGN files for the planimetric and DTM mapping.

c. Horizontal and Vertical Control for Aerial Mapping.

The Surveyor shall submit the following:

- i. A final aerial control point layout in DGN and KML format showing the location of the primary control and target points labeled with their respective alpha-numeric designation.
- ii. A plot and computer graphics of an B-size index map showing an overall view of the project and the relationship of primary monumentation and control used in the preparation of the project, signed and sealed by a RPLS, and as directed by the CITY.
- iii. A plot and computer graphics of a B-size horizontal and vertical control sheet showing the primary survey control monumentation used in the preparation of the project, signed and sealed by a RPLS, and as directed by the CITY.
- iv. An A-size data sheet for each aerial ground control point, which must include a location sketch, a physical description of the point, surface coordinates, elevation, and datums used.
- v. A USB flash drive containing the graphics files and scanned images of the control data sheets.
- vi. A written statement describing the datum used along with copies of all relevant NGS and data sheets.
- vii. A written tabulation of all aerial control points with their respective alpha-numeric designations and horizontal and vertical coordinates.

d. Planimetric and DTMs

The Surveyor shall provide the following:

- i. Certification that the photographs or LiDAR imagery were taken on the date indicated, signed by the airplane pilot or aerial photographer.
- ii. The DGN, DTM, and TIN files on a medium and in a format acceptable to the CITY, delivered on USB flash-drive or hard-drive.
 - a) Orthophotography (created using the DTM) delivered on USB flash drive, or hard-drive in tiff format (3 banded) with world files.
 - b) TxDOT's photogrammetry mapping legend and supplements.
 - c) Updating existing 2D planimetric CAD file,
 - d) Updating existing 3D DTM (surface model with contours),
 - e) 2D - ROW retracement file,
 - f) a TIN file,

- g) Ascii (X, Y, Z) text file of all the collected survey points and
- h) PDF copy of the field notes.
- i. A tabulation showing the field-check points.
- ii. Quality Assurance and Quality Control (QA/QC) and Statement of Map Accuracy.
 - a) Statement of map accuracy.
 - b) A surveyor's report signed and sealed by an RPLS.
- e. Horizontal and Vertical Control

The Surveyor shall provide the following:

 - i. Develop project overall Survey Control Index Sheet. Each survey control monument will have both horizontal and vertical coordinates that will be referenced to official Benchmarks and Datum points on the Texas State Plane South Zone (NAD 83) and (NAVD 88) datum as derived from the TxDOT VRS Real Time Network (RTN). RPLS Signed and Sealed 8 1/2" x 11" Survey Control Data Sheets and an 11" x 17" Survey Control Map will also be created and included in the submittal.
 - ii. A B-size plot and MicroStation graphics files of the index map showing an overall view of the project and the relationship of the primary monuments and control points established for the project, signed and sealed by a registered professional land surveyor (RPLS), and as directed by the CITY.
 - iii. One A-size data sheet for each control point which shall include, but need not be limited to, a location sketch, a physical description of the point, surface coordinates, the elevation, and the datum used.
 - iv. A USB flash-drive containing the graphics files and scanned images of the control data sheets.
 - v. A written statement describing the datum used, signed and sealed by a RPLS, along with copies of all relevant NGS and TxDOT data sheets.

G. ROADWAY DESIGN (EXCLUDED)

H. DRAINAGE DESIGN (EXCLUDED)

I. SIGNING, PAVEMENT MARKINGS (PERMANENT) (EXCLUDED)

J. MISCELLANEOUS ROADWAY (EXCLUDED) (EXCLUDED)

K. TRAFFIC MANAGEMENT SYSTEMS (PERMANENT) (EXCLUDED)

L. BRIDGE DESIGN

- 1. Bridge Design (EXCLUDED)
- 2. Bridge Layout. (EXCLUDED)
- 3. Bridge Structural Details (EXCLUDED)
- 4. Bridge Detail Summary (EXCLUDED)
- 5. Independent Analysis (EXCLUDED)
- 6. Bridge Assessment of the Existing Colombia/Laredo International Bridge

The CONSULTANT shall:

- a. Perform a document review of as-builts, bridge inspection reports, and previous bridge repair plans.
- b. Coordinate and perform a field assessment of the United States portion of the existing bridge to locate and quantify defects requiring repairs. Field assessment will be performed from ground level and from top of deck. No specialized access equipment is expected to be required for this work.
- c. Evaluate options for containment of environmentally hazardous materials. Options will consider environmental impacts and potential locations for containment vaults.
- d. Perform a load rating of the superstructure in accordance with the TxDOT Bridge Inspection Manual considering both the existing and proposed conditions.
- e. Prepare a field assessment report with recommendations and preliminary cost estimate for bridge repairs. The field assessment report will include a location map indicating recommended repairs, photos of defects, and prioritization of repair recommendations following TxDOT's Bridge Inspection Manual.

7. Bridge Repair Details for Existing Colombia/Laredo International Bridge

The CONSULTANT shall:

- a. Prepare a bridge layout indicating location of repairs on the United States portion of the bridge.
- b. Prepare estimated quantities for repair plans.
- c. Prepare a bridge repair summary indicating defect and corresponding repair.
- d. Prepare rail repair details.
- e. Prepare bridge deck repair details.
- f. Prepare details for armor joint repairs.
- g. Prepare details for sidewalk cover plate repair.
- h. Prepare details for drain cleaning specifications.
- i. Prepare typical concrete repair details for bent caps and columns.
- j. Prepare details for backfilling and erosion protection at north channel bank.
- k. Prepare sequence of construction for phasing of work.
- l. Prepare details for backfilling or repairing undermined concrete slope protection.
- m. Prepare details for containment structure for environmentally hazardous materials

8. Deliverables for Bridge Design

- a. Bridge cost comparative study
- b. Bridge and culvert layouts
- c. Bridge typical sections
- d. 3D bridge model
- e. Bridge design calculations
- f. Bridge special provisions and special specifications
- g. Bridge detail sheets
- h. Bridge standards
- i. Summary of bridge quantities
- j. Bridge cost estimate
- k. Independent analysis report (if required by work authorization)
- l. Bridge Condition Assessment Report
- m. Bridge Repair Details

M. POST DESIGN PHASE SERVICES (EXCLUDED)

N. MILESTONE DESIGN DELIVERABLES

1. 30% Plans Submittal.

- a. Three hard copy sets and an electronic set of 11" x 17" plan sheets for the CITY review.
- b. Estimate of construction cost
- c. Engineer's internal QA and QC markup set
- d. Updated Design Summary Report, Form 1002 and Design Exceptions with existing and proposed typical sections, location map, and design exception exhibits
- e. A preliminary 3D corridor model, in the most current format, created using Bentley's OpenRoads tools, and with enough detail to verify the design of the 30% plan sheets
- f. If applicable, a preliminary 3D bridge model utilizing OpenBridge Modeler (OBM), and with enough detail to verify the design of the 30% plan sheets. When the 3D bridge model is referenced into the 3D corridor, the bridge must align, both vertically and horizontally, in the bridge location of the 3D corridor.
- g. Any other additional information required by the CITY.

2. Between 30% Submittal and 60% Submittal.

- a. Three hard copy sets and an electronic set of 11" x 17" bridge and retaining wall layouts including bridge typical sections for the CITY review. External stability analysis for retaining walls
- b. Engineer's internal QA and QC marked up set
- c. One set of a roll format TCP phasing layouts, one .pdf of plan sheets for TCP concept, and the completed significant project procedures form (TxDOT Form 2229) to present at the TCAT for the CITY review
- d. One set of a roll format of illumination plan concept for CITY review
- e. For division hydrologic and hydraulic review of existing and proposed bridges and bridge class culverts, five sets of 11" x 17" preliminary bridge and bridge class culvert plan and profile sheets, hydrology & hydraulics sheets, scour analysis, project title sheet, and project layout sheet

- f. A preliminary 3D corridor model, in the most current format, created using Bentley's OpenRoads tools, and with enough detail to verify the design of the bridge and retaining wall layouts.
- g. If applicable, a preliminary 3D bridge model utilizing Bentley's OpenBridge Modeler (OBM), and with enough detail to verify the design of the bridge and retaining wall layouts.
- h. Any other additional information required by the CITY.

3. 60% Plans Submittal.

- a. Three hard copy sets and an electronic set of 11" x 17" plan sets for the CITY review.
- b. Estimate of construction cost.
- c. Updated Design Summary Report and Form 1002.
- d. Engineer's internal QA and QC marked up set.
- e. One set of a roll format TCP phasing layouts, one .pdf of plan sheets for TCP concept, and significant project procedures form (State Form 2229) to present at the TCAT for the CITY review.
- f. A preliminary 3D corridor model, in the most current format, created using Bentley's OpenRoads tools, and with enough detail to verify the design of the 60% plan sheets. The level of detail of the surface and subsurface features must be at the direction of the CITY.
- g. If applicable, a preliminary 3D bridge model utilizing OpenBridge Modeler (OBM), and with enough detail to verify the design of the 60% plan sheets. When the 3D bridge model is referenced into the 3D corridor, the bridge must align, both vertically and horizontally, in the bridge location of the 3D corridor. The 3D bridge model must consist of 3D elements for slab, beams, abutments, wingwalls, caps, columns, and foundations. The level of detail of the bridge elements must be at the direction of the CITY.
- h. Any other additional information required by the CITY.

4. Between 60% and 90% Submittal

- a. Seven hard copy sets and an electronic set of all bridge plan sheets and hydrologic and hydraulic plan sheets and models.
- b. A preliminary 3D corridor model, in the most current format, created using Bentley's OpenRoads tools, and with enough detail to verify the design of the Bridge layouts
- c. A preliminary 3D bridge model utilizing Bentley's OpenBridge Modeler (OBM), and with enough detail to verify the design of the of the Bridge Layouts.

5. Review Submittal (90%).

- a. Three hard copy sets and an electronic set of 11" x 17" plan sheets for the CITY review
- b. Estimate of construction cost in Excel
- c. Updated Design Summary Report, if required and Form 1002
- d. Marked up general notes
- e. Construction schedule

- f. New special specifications and special provisions if applicable
 - g. CONSULTANT's internal QA and QC marked up set
 - h. Other supporting documents
 - i. A detailed 3D corridor model, in the most current format, created using Bentley's OpenRoads tools, and with enough detail to verify the design of the 90% plan sheets. The level of detail of the surface and subsurface features must be at the direction of the CITY.
 - j. If applicable, a 3D bridge model utilizing OpenBridge Modeler (OBM), and with enough detail to verify the design of the 90% plan sheets. When the 3D bridge model is referenced into the 3D corridor, the bridge must align, both vertically and horizontally, in the bridge location of the 3D corridor. The 3D bridge model must consist of 3D elements for slab, beams, abutments, wingwalls, caps, columns, and foundations. The level of detail of the bridge elements must be at the direction of the CITY.
 - k. Any other additional information required by the CITY.
- 6. District Review Submittal (95%).**
- a. Three hard copy sets and an electronic set of 11" x 17" plan sheets for the CITY review
 - b. Estimate of construction cost in Excel
 - c. List of governing specifications and special provisions in addition to those required
 - d. Marked up general notes
 - e. Form 1002
 - f. New special specifications and special provisions if applicable
 - g. Triple zero special provisions
 - h. Engineer sign, seal, and date supplemental sheets (8.5" x 11")
 - i. Contract time determination summary
 - j. Significant project procedures form
 - k. Right of way and utilities certification
 - l. Temporary road closure letters
 - m. Construction speed zone request
 - n. CONSULTANT's internal QA and QC marked-up set
 - o. Other supporting documents
 - p. A detailed 3D corridor model, in the most current format, created using Bentley's OpenRoads tools, and with enough detail to verify the design of the 95% plan sheets. The level of detail of the surface and subsurface features must be at the direction of the CITY.
 - q. If applicable, a 3D bridge model utilizing OpenBridge Modeler (OBM), and with enough detail to verify the design of the 95% plan sheets. When the 3D bridge model is referenced into the 3D corridor, the bridge must align, both vertically and horizontally, in the bridge location of the 3D corridor. The 3D bridge model must consist of 3D elements for slab, beams, abutments, wingwalls, caps, columns, and foundations. The level of detail of the bridge elements must be at the direction of the CITY.
 - r. Any other additional information required by the CITY.

7. Final submittal (100%).

- a. PDF portfolio of all plan sheets
- b. Revised supporting documents that address the 95% review comments
- c. A final 3D corridor model, in the most current format created using Bentley's OpenRoads tools. The level of detail of the surface and subsurface features will be at the direction of the CITY.
- d. A final 3D earthwork model in either .XML or .ICM format (as directed by the CITY) created using Bentley's OpenRoads tools. The level of detail of the surface and subsurface features will be at the direction of the CITY.
- e. If applicable, a final 3D bridge model utilizing OpenBridge Modeler (OBM). When the 3D bridge model is referenced into the 3D corridor, the bridge must align, both vertically and horizontally, in the bridge location of the 3D corridor. The 3D bridge model must consist of 3D elements for slab, beams, abutments, wingwalls, caps, columns, and foundations. The level of detail of the bridge elements must be at the direction of the CITY.
- f. The CONSULTANT shall prepare a letter report which includes the findings of the comparison of OBM 3D bridge model geometry and quantities verified by alternate methods. The report must include a detailed discussion of the differences and proposed enhancements and issues in OBM software.
- g. Any other additional information required by the CITY.

IV. TASK 4 ARCHITECTURAL & PLANNING SERVICES (EXCLUDED)