

## **EXHIBIT “A”**

### **SCOPE OF SERVICES**

#### **Collin County Outer Loop Segment 3 Schematic Design FM 2478 to US 75**

##### **Purpose**

The Scope of Work to be performed by the ENGINEER under this contract will consist of the preparation of preliminary engineering, alignment refinement, right-of-way (ROW) mapping, and the detailed design schematic for the ultimate build-out of the Collin County Outer Loop facility along Segment 3 approximately 9 miles from FM 2478 to US 75 (the “Project”) utilizing existing approved corridor alignments and previous design concepts completed within the project limits. The alignment refinement study area will be based on the existing *Technically Approved Alignment (CH2M Hill, August 2012)*.

##### **Details**

- The Engineer will prepare a detailed design schematic exhibit (Plan and Profile) consisting of future frontage roads, mainlanes, ramps, and interchanges. ROW limits will be determined based on an approved corridor typical section and proposed geometric design.
- Design Criteria for the project shall comply with TxDOT 4R guidelines for freeways.
- This Project will be developed utilizing English units of measure and all final schematic exhibits will be provided in roll format.
- The work described in this scope of services will include the following major work tasks: Assembly and Review of Data; Corridor Section Evaluation; Diagrammatic Corridor Refinement; Schematic Development; Hydrologic and Hydraulic Investigation; Environmental Studies; Public Involvement; Project Management; Survey and Right-of-Way; and Utility Investigation.

### **BASIC SERVICES**

#### **BS1. ASSEMBLY AND REVIEW OF DATA**

##### A. Collection of Data, Reports, and Maps

The determination of data requirements, availability, and sources will be coordinated with the COUNTY. Once the data needs and sources are identified, the ENGINEER will contact the appropriate agencies and organizations to obtain the data. Data to be collected will include, but not be limited to:

- Previous studies, exhibits, design, and reports.
- Stakeholder planning documents (zoning information, thoroughfare maps, preliminary plats, design schematics).
- Utility plans and documents from appropriate municipalities and utility companies.
- Readily available plan sets for crossing or abutting sections within the Project Limits.
- Readily available flood plain information and studies from the Federal Emergency Management Agency, FEMA, the Corps of Engineers and/or other governmental agencies.

- The ENGINEER will obtain electronic and/or hard copies from the COUNTY: GIS Data, drainage reports, mapping, survey, and improvement plans within the scoped area. The ENGINEER will acquire from the COUNTY any aerial mapping and soil data for the designated area.
- Topographic contours (2') and georeferenced aerial photos obtained from the North Central Texas Council of Governments (NCTCOG).
- Obtain desktop level environmental constraints mapping from NCTCOG based on existing environmental databases.

#### B. Field Reconnaissance

The ENGINEER will perform a corridor site visit to obtain field notes and digital photos along the project corridor. This will include both environmental and engineering staff.

#### C. Review of Data/Base File Creation

The ENGINEER will review the data collected and from this information will:

- Integrate additional data into the study file as it becomes available.
- Develop base CAD files (Microstation V8i) that will be utilized for corridor evaluation including, but not limited to, 2007 2' NCTCOG topographic contours converted from GIS base file; 2015 NCTCOG georeferenced aerial imagery; existing utilities from visual analysis and additional research; FEMA flood plain limits converted from GIS; parcels and right-of-way converted from the latest Collin County Appraisal District GIS database.
- Initial environmental constraints (from NCTCOG) mapping will be utilized to refine corridor limits to minimize impacts to known environmentally sensitive areas.

Note: 2' NCTCOG GIS contours will be converted to CAD and utilized to create a 3D topographic existing ground surface for use in the corridor evaluation process. The surface will be utilized to create conceptual profile alignments and geometrics to refine corridor location and limits. After the corridor evaluation is completed, the project will be flown to create design-level survey from aerial photogrammetry and augmented with field survey to fill voided areas (see survey section). The final corridor geometrics will be confirmed and refined, as needed, to best match the design-level survey and to meet the latest TxDOT Roadway Design Manual standards.

#### Task BS1 Deliverables

1. Field Notes and Site Photographs

#### **BS2. CORRIDOR SECTION EVALUATION**

The ENGINEER will take the previously approved ultimate Outer Loop corridor design criteria/typical section and provide up to two (2) alternate corridor typical sections for COUNTY consideration along with a technical memorandum describing the alternatives and associated design criteria. Alternate sections will determine feasibility and alternate solutions for the location of the mainlanes, frontage roads, ramps, and future rail/transit facilities.

The COUNTY will provide selection and approval of any alternate design criteria and typical corridor section.

The ENGINEER shall apply appropriate Roadway Design Criteria based on TxDOT 4R guidelines

and prepare a Design Criteria Tabulation for the project and will submit to the COUNTY for approval. The ENGINEER will use the design criteria to identify the maximum and minimum values for all design elements including drainage criteria and will identify the project preferred values.

Coordination meetings with the County and Stakeholders are included in **Task BS8**.

Task BS2 Deliverables

1. Technical Memorandum of up to two (2) alternate corridor typical sections including any applicable exhibits.
2. Design Summary Report (DSR)

**BS3. DIAGRAMMATIC CORRIDOR REFINEMENT**

The ENGINEER will utilize information described in **Task BS1** to update the existing *Technically Approved Alignment (CH2M Hill, August 2012)* corridor map based on revisions to the *Technically Approved Alignment* since it was approved in 2012 (corridor alignment, property boundaries/ownership, available stakeholder planning data, utilities, etc.).

A. FM 2478 (Custer Road) to US 75

The ENGINEER will coordinate and determine a corridor alignment based on the current approved location of the ultimate FM 2478 overpass and fixed location of the ultimate US 75 interchange. The alignment will be based on the technically approved alignment but may vary to better fit existing property boundaries and to avoid displacements where practical. The alignment refinement exercise will be conducted with input from the cities of McKinney, Anna, Melissa, and Weston, along with other stakeholders along this corridor.

Alternate corridor evaluation will include the following:

1. High-Level Environmental Constraints Evaluation
2. Identification of impacts in each of the following categories:
  - a. Enhanced Mobility and Safety
    - i. Accessibility
    - ii. Safety
  - b. Cost Effectiveness
    - i. Construction Cost
    - ii. ROW Acquisition Impact
    - iii. Utility & Infrastructure
  - c. Engineering Feasibility
    - i. Compatibility with Other Projects
  - d. Environmental Impacts
    - i. Previous Public Input
    - ii. Socio-Economic & Neighborhood Impacts
    - iii. Noise Impacts

- iv. Natural Impacts
  - v. Cultural Impacts
  - vi. Stakeholder Input
  - vii. Hazardous Materials
3. Preparation of Scoring Matrix for each impact (shown above)

#### B. Interchange Evaluation

The ENGINEER will discuss and provide concept alternatives for potential grade separated interchanges at CR 126, FM 543, CR 204, CR 206, CR 281, and CR 286 based on available traffic data and coordination with stakeholders. This concept analysis will not include any design but will determine feasibility of interchange type (e.g. Diamond, Directional, Box, etc.).

#### C. Outer Loop Corridor Alternatives Exhibit

The ENGINEER will provide a corridor exhibit map in roll format showing the following information:

1. Best available aerial imagery along the corridor
2. Property boundaries and legal descriptions based on GIS data provided by COUNTY and surveyed data from Segment 3 (FM 2478 to US 75). Zoning information will be shown if available.
3. Existing features: Existing roadways, floodplains, streams, developments, and major structures.
4. Future features: Planned thoroughfares, utility corridors/improvements, and approved plats.
5. Approved corridor alignment (500' typical width) based on the previously approved corridor.
6. Approximate location(s) of future interchange(s).
7. Up to two (2) alternate corridor alignments (500' typical width) based on approved corridor design criteria (one alignment being the *Technically Approved Alignment* (August 2012)).
8. Technical report providing an evaluation of any alternate corridor alignments including socioeconomic, environmental, cost, development feasibility, and design implications of each. Evaluation will be based on best available data and any previous stakeholder input.

The ENGINEER will provide a diagrammatic ramping concept exhibit in roll format showing the following information:

1. Stick diagram of proposed Outer Loop corridor and major current and future cross streets.
2. Stick diagram showing proposed ramping configuration based on spacing and control of access criteria defined in the TxDOT Roadway Design Manual or as directed by the COUNTY.

#### D. Final Outer Loop Corridor Exhibit

Based on COUNTY review of the Outer Loop Corridor Alternatives Exhibit and any stakeholder input, the ENGINEER will refine and provide a final corridor exhibit map in roll format showing the following information:

1. Best available aerial imagery along the corridor
2. Property boundaries and legal descriptions based on GIS data provided by COUNTY and surveyed data from Segment 3a (DNT to East of Preston Road). Zoning information will be

shown if available.

3. Existing features: Existing roadways, floodplains, streams, developments, and major structures.
4. Future features: Planned thoroughfares, utility corridors/improvements, and approved plats.
5. Approved corridor alignment (500' typical width) based on the previously approved corridor and any corridor alignment adjustments based on stakeholder and COUNTY coordination.
6. Approximate location(s) of future interchange(s).

Based on COUNTY review of the draft diagrammatic ramping concept and any stakeholder input, the ENGINEER will provide a final diagrammatic ramping concept exhibit in roll format showing the following information:

1. Stick diagram of proposed Outer Loop corridor and major current and future cross streets.
2. Stick diagram showing proposed ramping configuration based on spacing and control of access criteria defined in the TxDOT Roadway Design Manual or as directed by the COUNTY.

#### E. Public Meeting & Hearing

For additional public involvement related tasks, see section BS7. Public Involvement

The ENGINEER will provide a response to any stakeholder comments to the COUNTY, including engineering backup figures and/or exhibits.

#### F. Corridor Presentation

The ENGINEER will prepare a technical PowerPoint presentation and present a refined corridor alignment for COUNTY approval.

#### Task BS3 Deliverables

1. Preliminary Corridor Exhibit Map
2. Technical Report of Alternate Corridors
3. Final Corridor Exhibit Map
4. All design files and deliverable in electronic format (PDF, DOC, DGN, DWG, etc.)

### **BS4. SCHEMATIC DEVELOPMENT**

The ENGINEER will utilize the refined approved corridor alignment and diagrammatic ramping concept (**Task BS3**) and approved corridor section (**Task BS2**) to develop a detailed design schematic for the ultimate build-out of the Collin County Outer Loop from FM 2478 to US 75.

The Engineer will prepare a schematic layout to a scale of 1"=100' depicting the proposed improvements for the project. The schematic shall include: the location of interchanges, grade separations, retaining walls, frontage roads and ramps; the geometric (pavement cross slopes, lane and shoulder widths, slope rates for fills and cuts) of the typical sections of proposed highway ramps, frontage roads, and cross roads; the vertical and horizontal alignment of ramps, frontage roads, and cross roads at proposed interchanges or grade separations; the degree of horizontal curves and vertical curve

data, including “K” values, shall also be shown; the location and text of any newly proposed main lane guide signs; the lane lines and/or arrows indicating the number of lanes; the existing and proposed ROW limits; the existing and proposed drainage and construction easements; the control of access lines; the direction of traffic flow on all roadways; the geometrics of speed change (acceleration, deceleration, climbing) lanes; removal items, and major utility conflicts. The schematic will be prepared using the English system of units. All designs will be prepared in accordance with the latest versions of: Roadway Design Manual (TxDOT), A Policy on Geometric Design of Highways and Streets (AASHTO), Standard Specifications for Construction of Highways, Streets and Bridges (TxDOT), Highway Operations Manual of the Traffic Operations Manual (TxDOT), and Highway Capacity Manual (Transportation Research Board).

In preparing the schematic, the ENGINEER will:

#### A. General

1. Develop typical roadway sections for proposed mainlanes, frontage roads, ramps, major cross streets, and other locations with specific design features (bridges, retaining walls, and intersections). Typical sections for future cross streets will be based on best-available data provided by the COUNTY.
2. Produce plan & profile schematic exhibits on roll plots at a scale of 1” = 100’ showing proposed features, existing features, title block, and legend.
3. Develop a 3D corridor model of the mainlanes, ramps, and frontage roads and provide design of roadway templates and end conditions throughout the corridor according to the proposed design.
4. Evaluate potential utility conflicts based on Level C/D SUE data and label crossings on the schematic.

#### B. Mainlanes

1. Design preliminary horizontal alignments for mainlanes based on the approved corridor alignment (**Task BS3**). Any proposed deviation from this approved alignment will require COUNTY approval and re-design of a non-approved alignment is not included in this scope of services.
2. Design necessary superelevation rates and transition distances in accordance with the project DSR.
3. Design of preliminary profiles of mainlanes based on preliminary horizontal alignments (excluding at grade separated locations).
4. Design preliminary locations and limits of retaining walls (no retaining wall profiles will be provided – based on cross section data).
5. Show preliminary location of major cross culverts including preliminary sizing. Studied floodplain areas within the project corridor will be displayed based on available GIS data. (**Task BS5**).
6. Identify approximate major utility locations based on Level C/D subsurface utility engineering (SUE).
7. Design and show preliminary pavement markings.

#### C. Mainlane Ramps

1. Design preliminary horizontal alignments for mainlane ramps based on the approved corridor ramping scheme (**Task BS3**). Any proposed deviation from this approved alignment will require COUNTY approval and re-design of a non-approved alignment is not included in this scope of services.

2. Design necessary superelevation rates and transition distances in accordance with the project DSR.
3. Design of preliminary profiles of mainlane ramps based on preliminary horizontal alignments.
4. Design preliminary locations and limits of retaining walls (no retaining wall profiles will be provided – based on cross section data).
5. Show preliminary location of major cross culverts including preliminary sizing. Studied floodplain areas within the project corridor will be displayed based on available GIS data. (**Task BS5**).
6. Identify approximate major utility locations based on Level C/D subsurface utility engineering (SUE).
7. Design and show preliminary pavement markings.

#### D. Frontage Roads (Eastbound & Westbound)

1. Design preliminary horizontal alignments for the eastbound and westbound frontage roads based on the approved corridor alignment (**Task BS3**). Any proposed deviation from this approved alignment will require COUNTY approval and re-design of a non-approved alignment is not included in this scope of services.
2. Design necessary superelevation rates and transition distances in accordance with the project DSR.
3. Design of preliminary profiles of the eastbound and westbound frontage roads based on preliminary horizontal alignments.
4. Evaluate and show proposed control of access based on entrance and exit ramp locations.
5. Design preliminary locations and limits of retaining walls (no retaining wall profiles will be provided – based on cross section data).
6. Show preliminary location of major cross culverts including preliminary sizing. Studied floodplain areas within the project corridor will be displayed based on available GIS data. (*Refer to Task BS5*)
7. Identify approximate major utility locations based on Level C/D subsurface utility engineering (SUE).
8. Design and show preliminary pavement markings.
9. Determine preliminary right-of-way and easement limits and need including any necessary easements based on proposed geometric design. Property boundaries will be displayed based on surveyed property corners.
10. Determine and show control of access limits based on preliminary ramp locations using TxDOT's Access Management criteria or other provided by the COUNTY.

#### E. Intersections, Interchanges & Grade Separated Locations

The ENGINEER will evaluate the County Thoroughfare Plan at the following crossing facilities to determine the need for frontage road intersections and ultimate grade separations. For those that are planned 4-lane and greater, design preliminary locations of bridge crossings including preliminary sizing and limits:

- a. CR 126
- b. Honey Creek (waterway bridge)
- c. FM 543 (anticipated grade separation)
- d. CR 204
- e. CR 206
- f. CR 281

- g. East Fork Trinity River (proposed waterway bridge)
- h. CR 286

At each location the ENGINEER will:

1. Design preliminary horizontal alignments for the interchanges and grade-separated locations based on the approved corridor alignment and interchange concepts (**Task BS3**). Any proposed deviation from this approved alignment will require COUNTY approval and re-design of a non-approved alignment is not included in this scope of services.
2. Design of preliminary profiles for the interchanges and grade-separated locations based on preliminary horizontal alignments and vertical clearance requirements.
3. Determine preliminary bridge configuration including overall length, span lengths, and an assumed structure depth. Bridge sizing will not include bridge layouts and will be based on needed span length, an assumed substructure depth, and proposed profile.
4. Design preliminary locations and limits of retaining walls (no retaining wall profiles will be provided – based on cross section data).
5. Show preliminary location of major cross culverts including preliminary sizing. Studied floodplain areas within the project corridor will be displayed based on available GIS data. (*Refer to Task BS5*)
6. Identify approximate major utility locations based on Level C/D subsurface utility engineering (SUE).
7. Design and show preliminary pavement markings.
8. Determine preliminary right-of-way and easement limits and need including any necessary easements based on proposed geometric design. Property boundaries will be displayed based on surveyed property corners.

The proposed ultimate interchange design located at the intersection of the Outer Loop with FM 2478 (Custer Road) and the Outer Loop and US 75 will be provided by others and is not included in this scope of work. For this location the ENGINEER will coordinate the determined design with the COUNTY'S engineer and integrate into the schematic exhibit. Any design work at these interchanges, as described in Items 1-8 above, is not included in this scope of work.

#### F. Project Delivery

The schematic will be provided to the County for review at the following stages of completion:

- a. Concept (30%) – Plan view only
- b. Preliminary (60%) – Plan & Profiles Developed; Cross Sections Provided; Cost Estimate Provided
- c. Pre-Final (90%) – Full deliverable; Cost Estimate Provided
- d. Final (100%) – Full deliverable; Cost Estimate Provided

Prior to each submission, the ENGINEER will:

1. Log any previous County or stakeholder comments in a Comment Response Log spreadsheet and provide a resolution for each comment.
2. Provide a Quality Control (QC) review of plans, calculations, documents, and other supporting design data based on the Project Quality Management Plan (PQMP).
3. Provide a Quality Assurance (QA) audit of the QC review to assure all comments were addressed and/or resolved.
4. Complete a Certificate of Compliance with Quality Procedures (COCQP) form to document the QA/QC process was followed.



5. Coordinate production of the milestone deliverable including printing, compiling electronic files, and preparation of a transmittal letter.

#### G. Project Update Presentations

The ENGINEER will prepare and present up to two (2) technical PowerPoint presentations during the schematic design providing a briefing on project schedule, design development, and future tasks.

#### Task BS4 Deliverables

1. Concept Schematic (30%)
2. Preliminary Schematic, Cross Sections, and Estimate (60%)
3. Pre-Final Schematic, Cross Sections, and Estimate (90%)
4. Final Schematic, Cross Sections, and Estimate (100%)
5. QA/QC Documentation for each milestone deliverable
6. Technical PowerPoint Presentation
7. Final Electronic Design Files placed on DVD

### **BS5. HYDROLOGIC AND HYDRAULIC INVESTIGATION**

The Engineer shall perform the following tasks in the preparation of the schematic layout:

#### A. Minor Drainage

1. Drainage Area Mapping  
Delineate drainage area boundaries based on United States Geological Survey (USGS) contour maps, North Central Texas Council of Governments (NCTCOG) contour maps or other suitable topographic maps, if available.
2. Calculate Discharges  
Determine conveyance paths, channel slopes, time of concentration, and runoff coefficients and Soil Conservation Service (SCS) curve numbers and other factors as required to determine frequency-discharge relationships using hydrologic models.
3. Size Cross Drainage Structures  
Determine approximate cross drainage structure sizes denoting size, type, orientation, flowlines, tailwater, and headwater conditions. Approximate sizing will be shown on the schematic along with needed drainage easements. HY-8 culvert analysis software will be used to size minor culvert crossings.

#### B. Major Drainage

1. Obtain and Review Available FEMA Data & Reports  
The ENGINEER will obtain available Flood Insurance Studies (FIS), Flood Insurance Rate Maps (FIRMs), Letters of Map Revisions (LOMR), and electronic data readily available from FEMA for Honey Creek and East Fork Trinity River.
2. Drainage Area Mapping  
Delineate drainage area boundaries based on United States Geological Survey (USGS) contour

maps, North Central Texas Council of Governments (NCTCOG) contour maps, FEMA data, or other suitable topographic maps, if available.

3. Calculate Discharges

Determine conveyance paths, channel slopes, time of concentration, and runoff coefficients and Soil Conservation Service (SCS) curve numbers and other factors as required to determine frequency-discharge relationships using hydrologic models. If discharge data is available from FEMA, calculated discharges will be used as a check.

4. Develop Hydraulic Models

Develop water surface profile models of open channels for existing/pre-project and proposed design conditions in accordance with Collin County drainage criteria and to meet Federal Emergency Management Agency (FEMA) requirements, as necessary. All relevant conveyance features, (channels, culverts, slab bridges, encroachments) will be included in the hydraulic analysis using HEC-RAS, HEC-2, HY-8, or other models as approved by Collin County. A preliminary HEC-RAS model will be developed for Honey Creek and East Fork Trinity River.

5. Develop Alternative Drainage Schemes

Based on the results of the discharge calculations and water surface profile models, develop alternative schemes to alleviate potential adverse drainage issues associated with the highway construction. Determine optimum drainage scheme to be used for schematic design.

6. Identify Easement Requirements

The Engineer shall identify any required drainage easements needed to accommodate drainage facilities at inlet and discharge points along the route.

7. Prepare Drainage Report

Upon completion of the hydraulic analyses and alternative evaluations of potential improvements, the ENGINEER shall prepare a Drainage Report. A preliminary report will be submitted with the 60% schematic deliverable and the final report will be submitted with the 100% schematic submittal. The report shall include the following sections:

- i. INTRODUCTION: location, study objectives, general stream and watershed information, and other pertinent facts.
- ii. HYDROLOGY: watershed description, soil and land use information, source of hydrologic data and methodology/models used to develop flow data, pertinent input data and parameters for hydrologic analyses; summary table of results for full range of peak discharges for 10-, 25-, 50-, and 100-year events.
- iii. HYDRAULICS: overview of hydraulic modeling process, including data sources, specific model uses, descriptions of existing drainage structures, discussion of design alternatives and the results of respective hydraulic modeling for the scenarios evaluated; hydraulic model output data including existing, hydraulic data sheet, and proposed conditions summary tables.
- iv. SUMMARY OF CONCLUSIONS / RECOMMENDATIONS: summary of study objectives, alternatives being considered, opinions of probable costs and identification of preferred design alternatives.
- v. PHOTOGRAPHS, FIGURES AND APPENDICES: all items necessary to support the analysis.
- vi. COMPACT DISK: computer files of hydrologic and hydraulic modeling with appropriate labeling of location, CSJ, and submittal date.
- vii. FINALIZED DOCUMENT: one (1) copy of final report with CD (CD to include a PDF of the entire report).

Task BS5 Deliverables

1. Preliminary Drainage Report
2. Final Drainage Report

**BS6. ENVIRONMENTAL STUDIES**

The ENGINEER will provide electronic CAD shapefiles to the North Central Texas Council of Governments (NCTCOG) at the 60% schematic milestone and again, if necessary, at the 90% milestone. These shape files will delineate the limits of the proposed ROW as well as the embankment fill limits. It is assumed that the local environmental document (prepared by NCTCOG) will be finalized in conjunction with the final 100% milestone of the design schematic. Wetlands delineation mapping, threatened and endangered species research, and cultural resource investigations are included in this scope of services.

Coordination with NCTCOG

The ENGINEER will attend up to two (2) coordination meetings with the North Central Texas Council of Governments (NCTCOG) through the duration of the environmental document preparation. These meetings will be scheduled by the ENGINEER and meeting minutes will be provided to the COUNTY.

After collecting preliminary constraints mapping from NCTCOG, a draft constraints map will be developed by the ENGINEER. A field visit will be performed by environmental staff to verify and augment the constraints mapping with any significant environmental constraints.

**BS7. PUBLIC INVOLVEMENT**

The ENGINEER shall plan, coordinate, execute and conduct Public Involvement to consist of one (1) Open House/Public Meeting and one (1) Open House/Public Hearing. The ENGINEER shall execute the logistics with selecting and securing the Open House/Public Meeting/Hearing site with the COUNTY. The ENGINEER shall identify local media publications and prepare all COUNTY-approved Public Meeting/Hearing notices and mail individual notices of same per the Project Mailing List prepared by the ENGINEER. The ENGINEER shall publish and pay for legal notices in local media publications. The ENGINEER shall prepare sign-in sheets, comment sheets, and other materials for Open House/Public Meeting/Hearing as necessary, as well as provide informed, affable personnel to support the Open House/Public Meeting/Hearing. The ENGINEER shall compile comments received at the Open House/Public Meeting and document the same in the form of a Public Meeting Summary. The ENGINEER shall compile comments received at the Open House/Public Hearing and document the same in the form of a compact, bound Summary and Analysis Report containing comment cards, letters, attendance sheets, and summary of verbal and written input. This report shall include photographs of informational displays, displayed schematics, handouts, and questionnaires distributed at the public hearing; comment cards, letters, and attendance sheets, and any non-transcript verbal input. This Report shall be supplemented by one computer disc containing the Microsoft PowerPoint presentation and other materials prepared for the Public Hearing. The COUNTY shall provide a court-reporter transcript for the Open House/Public Hearing. All public involvement shall abide by 43 TAC 11.80-11.90, CFR Title 23, Part 771.

Task BS7 Deliverables

1. Public Meeting sign-in sheets, comment sheets, project information handout, and meeting summary report.
2. Public Hearing sign-in sheets, comment sheets, project information handout, PowerPoint presentation, and meeting summary report.

## **BS8. PROJECT MANAGEMENT**

The ENGINEER's project manager, in coordination with the County's Director of Engineering, will be responsible for directing and coordinating all activities and personnel associated with this project.

### A. Schedule, Progress Reports, and Invoices

The ENGINEER will prepare a simple graphic milestone schedule indicating completion dates of major work items, deliverables, and reviews.

The ENGINEER will submit monthly progress reports to the County. Invoices for all work completed during the period will be submitted monthly to the County. Monthly progress reports will include verbal description of all activities ongoing or completed during the reporting period, activities planned for the following month, problems encountered and action required to remedy them. The progress report will include a tabulation of percent complete by task.

The ENGINEER will prepare subcontracts for subconsultants, direct and monitor subconsultant activities, and review and recommend approval of subconsultant work and invoices.

### B. Progress Meetings

Attend an estimated six (6) project team meetings with Collin County. The purpose of these meetings is to discuss project status, plan upcoming events, and discuss and resolve any key project issues. Meeting minutes will be prepared by the ENGINEER and distributed for all meetings.

### C. Stakeholder Coordination Meetings

Attend miscellaneous coordination meetings with project stakeholders to include adjacent cities, utility companies, property owners, or Collin County Commissioners Court meetings or workshops. This has been estimated at a total of 18 meetings. The ENGINEER will prepare meeting minutes and distribute for all meetings.

### Task BS8 Deliverables

1. Monthly Progress Reports and Invoices
2. Design Schedule
3. Meeting Sign-In Sheets and Minutes (24 Meetings)

## **SPECIAL SERVICES**

### **SS1. SURVEY AND RIGHT-OFWAY**

#### General Standards

All surveys shall meet or exceed the standards set in the Professional Land Surveying Practices Act, the General Rules of Procedures and Practices promulgated by the Texas Board of Professional Land Surveying (TBPLS), and TxDOT's Survey Manual, latest edition, and shall be accomplished in an organized and workman-like manner, subject to the approval of the COUNTY.

TxDOT's Right-of-Way Procedures Preliminary to Project Release, Volume 1, (online at: <http://manuals.dot.State.tx.us/>) and TxDOT's Survey Manual, latest edition, will serve as a guide for the format and preparation of all right-of-way documents produced, including Right-of-Way maps, property descriptions (including parcel plats), and other Right-of-Way work products, unless otherwise directed by the COUNTY.

The North American Datum of 1983 (NAD83), Texas Coordinate System of 1983 (State Plane Coordinates), applicable to the zone or zones in which the work is performed, with values in U.S. Survey Feet, will be used as the basis for all horizontal coordinates derived, unless otherwise directed by the COUNTY.

Elevations will be based on the North American Vertical Datum 88 (NAVD88), unless otherwise directed by the COUNTY.

All GPS work, whether primary control surveys or other, shall meet or exceed the current TxDOT's GPS Manual of Practice, latest edition, to the order of accuracy specified in the categories listed below or in a work authorization. If the order of accuracy is not specified in this contract or in a work authorization, the work shall meet or exceed the order of accuracy specified in the publications listed in this paragraph.

All conventional horizontal and vertical control surveys shall meet or exceed the current, TxDOT's Survey Manual, latest edition, and the Texas Society of Professional Surveyors (TSPS) Manual of Practice for Land Surveying in the State of Texas, latest edition, to the order of accuracy specified, and in the categories listed below or in a work authorization. If the order of accuracy is not specified in this contract or in a work authorization, the work shall meet or exceed the order of accuracy specified in the publications listed in this paragraph.

In order to ensure accuracy and accountability of the services provided under this contract, the Surveyor may be required to certify work performed under this contract as true and correct according to, TxDOT's Survey Manual, latest edition, TxDOT's GPS Manual of Practice, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

The Surveyor shall provide temporary signing and traffic control in and around survey operations. All signs, flags and safety equipment shall be provided by the Surveyor. The COUNTY shall be notified at least 48 hours in advance of any lane closures.

The Surveyor shall provide all personnel, equipment, and survey supplies necessary for the

performance of the activities required by this agreement or by any work authorization.

Data (original and processed) shall be provided to the COUNTY on a compact disk or other approved medium and shall be in the following formats: Microsoft Word for word processing, MicroStation, Geopak V8i for graphics applications.

Variations from these software applications or other requirements listed above shall only be allowed if requested in writing by the Surveyor and approved by the COUNTY.

The Surveyor shall perform Quality Control/Quality Assurance on all procedures, field surveys, data, and products prior to delivery to the COUNTY. If, at any time, during the course of reviewing a submittal of any item it becomes apparent to the COUNTY that the submittal contains errors, omissions, and inconsistencies, the COUNTY may cease its review and return the submittal to the Surveyor immediately for appropriate action by the Surveyor. A submittal returned to the Surveyor for this reason is not a submittal for purposes of the submission schedule.

The Standards for services that are not boundary-related but that relate to surveying for engineering projects may be determined by the project Engineer, construction specifications, or design specifications.

#### Survey Location

Survey will be performed along the approved corridor determined in **Task BS3**.

#### Specific Work to Be Performed (Survey)

1. The Surveyor shall establish Horizontal and Vertical Control Monuments, consisting of a 5/8" capped iron rod set in concrete, at approximately 2000' intervals. The monuments shall be set outside the future construction limits, when possible. GPS RTK will be utilized to establish the horizontal locations and differential leveling will be utilized to establish vertical values. A Horizontal and Vertical Data Sheet shall be produced for each Monument. Each data sheet shall contain Grid and Surface horizontal coordinates, a Surface Adjustment Factor, an elevation and a locative sketch. Engineer shall supply this data to the County.
2. Provide cross-sections of any existing public roadways in the corridor with shots being taken at the ROW, ditch line, edge of shoulder, edge of travel lane and centerline.
3. Provide structure details of all visible cross culverts including flow line elevations, inside top of slab elevations, top of road profile and structural dimensions, and downstream channel cross sections within the project limits.
4. Locate existing visible improvements within the project limits, including but not limited to, manholes, water valves, concrete, fences, buildings and other visible utilities.
5. Surveyor shall obtain Right-of-Entry permission prior to physically accessing any private property. Surveyor will utilize public records to determine ownership data and secure permission to enter private property for purposes of performing Land Surveying. A right-of-entry (ROE) letter will be prepared on County letterhead and mailed to each property owner in the project limits. A written response will be requested either confirming or denying ROE. The Surveyor will make reasonable attempts to contact each landowner verbally prior to conducting any fieldwork if written correspondence is not successful. A log of all contact with landowners will be maintained.

6. Prepare a final design and topographic drawing in MicroStation, Geopak V8i showing all features located in the field, an ASCII coordinate file of the associated points located in the field and a hard copy of all field notes and field sketches.
7. Determine boundary lines and rights-of-way lines for approximately 100 parcels and/or rights-of-way that are within or adjacent to the technically preferred alignment.
8. Perform Aerial Mapping survey to produce a design grade topographic map supplemented with traditional land surveying methods within the obscured areas. The aerial survey will include a 700 foot wide path for topographic features, a 1500 foot wide path for ortho photos, at a flight scale of 1"=180' (0.1' yield on vertical accuracy on solid surfaces), mapping at a 1"=50' scale with 1.0 foot contours and color ortho photos at 0.2' pixel resolution in Mr. Sid format.
9. All Surveying shall be performed under the direct supervision of a Professional Land Surveyor licensed and in good standing with the State of Texas.
10. All Aerial Mapping shall be performed under the direct supervision of a Certified Photogrammetrist certified and in good standing with the American Society of Photogrammetry and Remote Sensing.

#### Deliverables (Survey)

1. ROE Contact Log, copies of ROE permission letters
2. DGN file containing planimetrics, contours, breaklines, and property lines and ownership information (combined with previous survey data along corridor)
3. Microstation GeoPak DTM file
4. ASCII file of points, field notes and field sketches
5. Control Monument Data Sheets
6. Mr. Sid Ortho Photos

#### Specific Work to Be Performed (Right-of-Way)

1. The Surveyor will prepare overall Parcel Exhibit Map. The Surveyor shall use the previously established Aerial mapping image as a backdrop for the new parcel configuration that comprises the length of the new Right-of-Way corridor. The overall Parcel Exhibit Map will show the new right-of-way lines, parcel boundaries, current ownership, bearings and distances and set or found monumentation for the new right-of-way corridor. Each 22"x 34" sheet will cover approximately 2300 feet of length of the new right-of-way corridor.
2. The Surveyor will prepare up to 65 Parcel Exhibits. These will show the individual configurations that comprise the new right-of-way corridor. These will show new right-of-way lines, parcel boundaries, current ownership, bearings and distances and set or found monumentation. They will be reviewed by COUNTY and ENGINEER representatives for correctness and parcel configuration. These will include area designations for any determined prescriptive easement areas within the boundaries of the Parcel Exhibits and shown for appraisal purposes. There are approximately 60 Parcels that need Right-of-Entry permission within the Right-of-Way corridor. If Right-of-Entry can't be obtained, the Surveyor will be unable to set the new Right-of-Way monuments on those Parcels. The Surveyor could prepare Parcel Exhibits omitting the new Right-of-Way monumentation to be set. New Right-of-Way monuments can be set after Collin County obtains title to these parcels.
3. The Surveyor will prepare up to 65 Metes and Bounds descriptions that describe the Parcel boundaries. These will be signed and sealed by a Texas Registered Professional Land Surveyor and will become part of each Parcel Exhibit and suitable for acquisition purposes. These will

be prepared after Parcel Exhibits have been reviewed and approved by others.

4. The Surveyor will use an outside Abstractor to abstract up to 100 parcels. The Abstractor will research for easements back for a period of fifty (50) years. Each current parcel deed could have multiple previous smaller tracts that comprise the current total acreage. In this event, each separate smaller tract will need Abstracting research for the previous fifty (50) years also.
5. The Surveyor will use the Abstractor findings to place the existing easements in relation to current parcel boundaries. This could include existing drainage easements, existing gas easements, existing electrical easements, existing right-of-way easements/dedications and other existing utility easements that may affect the right-of-way corridor alignment, placement of new easements and prescriptive right-of-way locations. This includes field crew time to locate additional utility appurtenances aiding in the placement of newly discovered existing easements.
6. All Surveying shall be performed under the direct supervision of a Professional Land Surveyor licensed and in good standing with the State of Texas.

#### Deliverables (Right-of-Way)

1. DGN files containing bearings, distances, monumentation of each parcel configuration (with easements) required to reproduce the overall Parcel Exhibit Maps.
2. Three (3) copies of signed and sealed Parcel Exhibits that include the associated Metes and Bounds for one hundred (100) Parcels with PDF copies.
3. Two hard copies (22"x34" & 11"x17") and PDF copies of the overall Parcel Exhibit Map.

## **SS2. UTILITY INVESTIGATION**

### Introduction

The ENGINEER will perform the SUE work required for this project in general accordance with the recommended practices and procedures described in ASCE Publication CI/ASCE 38-02 (Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data). As described in the mentioned ASCE publication, four levels have been established to describe the quality of utility location and attribute information used on plans. The four quality levels are as follows:

- Quality Level D (QL"D") – Information derived from existing records.
- Quality Level C (QL"C") - QL"D" information supplemented with information obtained by surveying visible above-ground utility features (i.e. valves, hydrants, meters, manhole covers, etc.).
- Quality Level B (QL"B") – Two-dimensional (x, y) information obtained through the application and interpretation of non-destructive surface geophysical methods. Also known as "designating" this quality level provides the horizontal position of subsurface utilities within approximately one foot.
- Quality Level A (QL"A") – Also known as "locating", this quality level provides precise three dimensional (x, y, z) information at critical locations by exposing specific utilities. Non-destructive vacuum excavation equipment is used to expose the utilities at specific points which are then tied down by survey.

It is the responsibility of the SUE provider to perform due-diligence with regard to records research



(QL "D") and acquisition of available utility records. The due-diligence provided for this project will consist of contacting the applicable "one call" agency, visually inspecting the work area for evidence of utilities; and reviewing the available utility record information. Utilities that are not identified through these efforts will be here forth referred to as "unknown" utilities. The ENGINEER's personnel will perform a field visit to the defined work area to validate utility data collected and identify any "unknown" utilities. However, the ENGINEER is not responsible for designating and locating "unknown" utilities that were not detected during the record research and field surveying phase.

#### Scope of Work

The scope of work described may be modified, with COUNTY concurrence, during the performance of the SUE fieldwork if warranted by actual field findings.

For this project, the ENGINEER will provide QL"D" and "C" for the width of the approved corridor including along any proposed intersections.

The ENGINEER will perform all surveying that is required for collection of SUE field data.

#### Deliverables

As a QL"C" SUE deliverable, the ENGINEER will produce a SUE CAD file depicting the type and horizontal location of the designated utilities. The size and material type will be provided only if the information is indicated on available record drawings. The ENGINEER will utilize its standard utility line styles and symbology to produce the QL"C" deliverable of one CAD reference file in DGN format.

**EXHIBIT “B”**

FINAL DESIGN COMPLETION SCHEDULE

**Collin County Outer Loop Segment 3  
Schematic Design  
FM 2478 to US 75**

Refer to the attached schedule for deliverable/milestone dates. Actual deliverable/milestone dates may be subject to change based on delayed critical path task items that are outside of the control of the ENGINEER and/or the COUNTY. A revised project design schedule will be provided by the ENGINEER in the event that an adjustment is necessary.

**EXHIBIT "C"**

PAYMENT SCHEDULE

**Collin County Outer Loop Segment 3  
Schematic Design  
Denton County Line to FM 2478**

Payment will be made on a Lump Sum basis. Invoices will be transmitted to the County on a monthly basis based on a percentage of work completion up to that time, and payments to the Engineer will be made as follows:

A derivation of the total contract fee amount is attached.

**EXHIBIT "D"**

INFORMATION TO BE PROVIDED BY THE COUNTY

**Collin County Outer Loop Segment 3  
Schematic Design  
Denton County Line to FM 2478**

The COUNTY will furnish the Engineer the following items upon request, if available no later than 30 days from Notice to Proceed (NTP):

1. Assist the Engineer, as necessary, in order to obtain the required data and information from other local, regional, State and Federal agencies.
2. Assist in Coordinating Right of Entry for all properties within or adjacent to project limits.
3. Available existing and future right-of-way plans for entire project.
4. Perform all requirements of ROW acquisition including appraisals, negotiations, eminent domain, relocation and property management.
5. Assist the Engineer in negotiations with all local, state and federal agencies, utility companies and railroads for agreements and/or relocations required.
6. Assist the Engineer, as necessary, in order to obtain the following data:
  - Utility plans and documents from appropriate municipalities and utility companies.
  - Readily available plan sets for crossing sections and improvement plans within the Project Limits.
  - Readily available flood plain information, studies and models from the Federal Emergency Management Agency, FEMA, the Corps of Engineers and/or other governmental agencies.
  - Readily available GIS Data
  - Readily available drainage reports
  - Readily available aerial mapping and soil data for the designated area.
  - Prior environmental studies and reports
  - Topographic contours (2') (To be provided by the COUNTY)