

EXHIBIT 'A'
SCOPE OF SERVICES

TO BE PROVIDED BY HALFF ASSOCIATES, INC.
TO COLLIN COUNTY FOR
DALLAS NORTH TOLLWAY SOUTHBOUND FRONTAGE ROAD
US380 to FM428

A. PROJECT DESCRIPTION

The COUNTY proposes to construct two (2) permanent southbound lanes of the Dallas North Tollway (DNT) frontage road (SBFR) between US380 and FM428 through the towns of Prosper and Celina including their respective ETJ's (collectively referred to as "CITY"). Total project length is approximately 6.2 miles. Services by the CONSULTANT shall include all aspects of the work set forth in the following scope of services. Surveying and Design Engineering shall generally include the following items:

- Survey for design including existing ground spot elevations taken along the DNT west ROW line at not less than 100' stations for the purpose of confirming roadway profile. Existing NTTA topographic mapping will be used for determination of earthwork quantities and project grading plans. Existing improvements will be surveyed at points where the proposed project makes connection to same. Survey for right of way/easement acquisition will be performed for proposed parcels adjacent to the existing west right of way line. It is assumed that there will not be more than twelve (12) separate parcels with exhibits/legal descriptions. Horizontal and Vertical datums will be the same as that used for the previous DNT NBFR design and construction.
- Roadway paving, grading and drainage for a two-lane SBFR that connects to the existing SBFR approximately 600' north of US380 and ends prior to a connection with FM428. Design a temporary one-lane crossover connection between the existing NBFR and the proposed SBFR for traffic connections at FM428. Design for cross street connections with the existing NBFR will be performed at Lovers Lane, First Street, Prosper Trail, Frontier Parkway and Light Farms Way. A temporary 500' 2-lane connection extending Light Farms Way to existing County Road #50 will also be included.
- Structural design for a bridge crossing over Doe Branch, bridge length not to exceed 1,000 linear feet. Design will include retaining walls along the existing west ROW line as necessary for the embankment of bridge abutments. Bridge shall include standard railing designs and substructure components.
- Geotechnical subsurface investigations, laboratory testing and design recommendations for bridge design, retaining wall design and pavement subgrade treatment.
- Hydraulic modeling for approximately 2,000 LF reach of Doe Branch and channel/overbank grading designs for maintaining appropriate 100-year water surface

elevations upstream of the project. Hydrology and stream flow values will be based on models used for the hydraulic model performed for the NBFR design. Documentation for and processing of a FEMA CLOMR/LOMR is not included.

- Environmental documentation and permitting for required Section 404 permits. Prior natural resource evaluations and environmental assessment work for the existing DNT extension corridor from US 380 to FM 428 included field surveys from 2002, 2006, and 2008. Halff will rely on the results and conclusions from these reports.
- Prepare an exhibit that includes a plan view and profile view for the modification of the Outer Loop and DNT interchange that allows for an at-grade connection of the frontage roads in “box” configuration. DNT ramping modifications between the Outer Loop and CR#7 (including profiles), DNT ML profile adjustment and southbound frontage road profiles will be shown.

B. TASK DESCRIPTIONS

1. Project Management

- a) CONSULTANT shall manage the work and keep the COUNTY apprised of the status of coordination efforts and any issues which could delay anticipated schedule. CONSULTANT shall respond to requests for information from the COUNTY as needed and for items commonly anticipated to be associated with this project scope. CONSULTANT shall occasionally visit the site during the design phase to make observations for changes in the DNT corridor, existing structures and adjacent property conditions.
- b) CONSULTANT shall coordinate with other agencies, including NTTA, CITY and/or consulting firm representatives to obtain updated information as necessary and to inform them of project specific information as approved by the COUNTY.
- c) CONSULTANT shall coordinate with utility companies as directed by Collin County to provide utility conflict analysis with the proposed improvements and provide electronic file data for relocation design.
- d) CONSULTANT shall submit plans and required permit information for TDLR review using an approved specialist and make necessary revisions to the plans to address accessibility comments.
- e) CONSULTANT shall prepare an exhibit detailing DNT main lane and frontage road changes at the interchange with the Outer Loop for the purpose of establishing a frontage road intersection “box” on the ground level and DNT mainlanes on the next level. Information will be prepared in the form of 11x17 exhibits for coordination and review with NTTA and will include NB and SB DNT frontage road profiles, two (2) ramp profiles and modifications to the DNT main lane profile, each for the area between Outer Loop and County Road 7 overpass. All information will be provided to the COUNTY in electronic format for the use of the Outer Loop design consultant to further

develop the Outer Loop main lane profile and revised direct connector ramp alignments and profiles as necessary.

2. Data Collection

- a) CONSULTANT shall collect, review and distribute all available construction plan and existing right-of-way information pertinent to this scope of work for use in determining project alignment, costs and/or other constraints. CONSULTANT shall organize and provide all information gathered to the COUNTY in digital format. CONSULTANT will rely upon provided plans for the accuracy of improvements that cannot be verified by other means as provided for in the scope of work.
- b) CONSULTANT shall prepare and maintain a project design criteria list based on review of COUNTY, NTTA and CITY design manuals and/or construction standards to define the basis for SBFR design and cost information.
- c) CONSULTANT will perform SUE in accordance with ASCE CI/ASCE 38-02 "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data." This standard defines the following Quality Levels:
 - i. Quality Level A: Precise horizontal and vertical location of utilities obtained by the actual exposure and surveyed measurement of subsurface utilities. Minimally intrusive excavation equipment is typically used to minimize the potential for utility damage.
 - ii. Quality Level B: Information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities.
 - iii. Quality Level C: Information obtained by surveying and plotting visible above-ground utility features and by using professional judgment in correlating this information to Quality Level D information.
 - iv. Quality Level D: Information derived from existing records or oral recollections. CONSULTANT will perform up to four (4) Level A utility locates not to exceed a bury depth of 10' each and up to 15,000 linear feet of Level B and C locates, excluding overhead electric/communication along the west ROW which will be located by Level D observations and survey.

Exclusions:

- 1) Utility relocation designs and/or adjustments.
- 2) Work on private property and mapping of private utilities.

3. Geotechnical Engineering

- a) CONSULTANT shall perform a field investigation program for the purpose of determining design values for subgrade stabilization, potential subgrade movements, bridge design, retaining wall design and contractor bid information. Boring program shall generally consist of:

- i. Soil Borings will be taken at approximately 2,500 feet for subgrade and pavement design (approximately 6 borings to a depth of 15 feet below existing grade for pavement subgrade only and 7 borings to a depth of 15' below existing grade for culvert and pavement subgrade),
- ii. Soil Borings will be taken at approximately 200' intervals for bridge foundation design (approximately 5 borings penetrating 20 feet into intact rock and 2 borings for wall foundation design to a depth 35 feet below existing grade,
- iii. Soil borings will be taken at each cross street location for traffic signal foundation design (3 borings to a depth of 20' below existing grade).
- b) CONSULTANT will prepare boring logs classifying all depths and types of soils encountered and provide readings on water table values at the time of drilling.
- c) CONSULTANT will provide recommendations for subgrade stabilization using sampling and testing methods generally recognized and/or used by TxDOT for determining PI reduction, pH, sulfate content and potential vertical movement. Pavement designs shall be based on traffic volumes provided by Collin County.

Exclusions:

- 1) Testing for hazardous materials.
- 2) Construction material testing.

4. Environmental

The project will involve the placement of fill material in waters of the United States that will require authorization from the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act (Section 404). It is anticipated that the extent of impacts will be such that the project will require authorization via individual permit. However, the scope also includes provisions for a pre-application meeting with the USACE to exhaust any possibilities that the project could be authorized via nationwide permit. The following provides a general outline of the permit components involved in getting Section 404 authorization

- a) Jurisdictional Determination – CONSULTANT will delineate all waters of the United States between the western edge of right-of-way and the existing northbound frontage road (ultimate). This will serve as a baseline assessment for determining project impacts.
- b) Alternatives Analysis – The USACE must permit the least damaging practicable alternative. CONSULTANT will identify alternatives considered to the preferred alternative, and demonstrate that the proposed project is the least damaging practicable alternative.
- c) Threatened and Endangered Species – CONSULTANT will demonstrate the effect (or lack thereof) of the project to federal-listed species whose range is known to include Collin County. CONSULTANT will conduct an absence/presence survey for State

listed aquatic species (primarily Mollusks) to satisfy Texas Parks and Wildlife assessment requirements. It is not anticipated that the project will have any effect on listed species.

- d) Mitigation Credit Assessment– CONSULTANT will conduct a functional assessment consistent with USACE Fort Worth District to determine necessary mitigation requirements through the use of regional mitigation banks in the DFW area. The project scope does not include the preparation of a permittee-responsible (i.e.; onsite or near-site) compensatory mitigation plan. CONSULTANT will assist the County with any correspondence or sharing of information between the bank sponsor and the County, and ensure that the USACE receives proper notification once credits have been acquired.
- e) Permit Preparation and Public Review/Comment – CONSULTANT will compile all permit documentation and submit to USACE for approval. CONSULTANT will prepare a public notice for the USACE which will be submitted to adjacent property owners along the corridor. A standard step in the review process is providing a summary report to USACE that responds to comments that may be received from landowners and/or reviewing agencies. Public Notice publication costs are not included.

5. Surveying

Upon approval of preliminary design plans, the CONSULTANT shall survey, render field notes, and prepare individual parcel exhibits for any additional ROW and/or easements needed for the Project. Exhibits shall include a standard signed and sealed exhibit and a reprint of the boundary information on color aerial photography. It is anticipated that the scope will include not more than four (4) Right-Of-Way documents and not more than four (4) Easement documents. Individual parcel exhibits shall be in both hard copy (8 1/2" x 11") and pdf format and shall be sealed, signed and dated by a Registered Professional Land Surveyor.

- a) Survey field efforts shall include:
 - i. Recover project control and establish new control as needed.
 - ii. Locate boundary corners for parcels that will have R.O.W. and/or Easement takes.
 - iii. On-the-ground design surveying to supplement existing aerial topographic mapping, to include: profile (approx. 100-foot interval) along proposed west right-of-way line, detailed survey at major culverts, driveways, creeks or wetland areas, street intersections and similar critical features, along and/or crossing the project that will connect to or be directly impacted by the proposed construction.
- b) Survey office efforts shall include:
 - i. Deed and right-of-way document research.
 - ii. Processing of field survey ties.

- iii. Calculating boundaries for proposed R.O.W. and Easement takes.
- iv. Preparation of Exhibits and Metes and Bounds Descriptions for proposed R.O.W. and Easement Takes.
- v. Coordination between Engineer and Field Staff to ensure all necessary design surveying needs are met.

Exclusions:

- 1) Boundary Surveying, except as needed for tracts with proposed R.O.W and Easement takes.
- 2) Obtaining Right-of-Entry.
- 3) Title Commitments and/or Easement Research from same.

6. Drainage Studies

The project includes one bridge crossing of Doe Branch and is also anticipated to include eight (8) bridge class culvert crossings. All culvert crossings, bridge class or otherwise, shall be designed using the hydrologic and hydraulic data derived in the NBFR construction plans and are intend to be only that amount of culvert which is necessary to provide conveyance under the proposed SBFR project. CONSULTANT will coordinate with COUNTY, CITY and NTTA to confirm the culvert sizing and limits of construction for this project. CONSULTANT will be compensated with additional fees for the lengthening of culvert limits across the DNT right of way and/or for the preparation of revised hydrologic and hydraulic studies. CONSULTANT will use the hydrologic models for fully developed conditions provided by Carter Burgess, dated 9 January 2004, for Light Ranch as previously used for the design of the NBFR improvements at Doe Branch.

- a) CONSULTANT will coordinate with the COUNTY and CITY to prepare hydraulic models for Doe Branch that have been approximately modified from the existing NBFR bridge design models to reflect proposed construction of all DNT improvements as shown on NTTA's schematic plans and to incorporate new channels immediately adjacent to the DNT right of way corridor. Other tasks to be performed include the following:
 - i. Convert the current effective conditions hydraulic model to HEC-RAS v. 4.1.0, if currently in HEC-2 format.
 - ii. Modify the proposed conditions model used for NBFR design and insert cross sections to create a revised existing conditions hydraulic model.
 - iii. Compare revised existing conditions results to prior model results from NBFR design.
 - iv. Modify revised existing conditions model to create a proposed conditions model, incorporating proposed design conditions and updated cross section data for the area immediately downstream of DNT based on channel section topographic survey.

- v. Prepare a hydraulic study in the form of a memorandum to delineate hydraulic impacts (water surface elevation, valley storage, and velocity) to ensure the project meets COUNTY, CITY and NTTA criteria.
 - vi. Modify proposed conditions model per COUNTY and CITY comments on preliminary design changes.
 - vii. Create digital copy of models and hydraulic study and provide to COUNTY, CITY and NTTA.
- b) CONSULTANT will prepare documentation and coordinate submittal to FEMA for a Doe Branch Letter of Map Revision (LOMR). The LOMR will be prepared and submitted after acceptance by COUNTY of the completed construction. CONSULTANT will perform required as-built surveys of the constructed conditions within the project limits and make necessary modifications to the proposed Doe Branch hydraulic model.

Exclusions:

- 1) FEMA review and map modification fees are not included.

7. Roadway Design

The CONSULTANT shall prepare and submit Design Plans for review and final construction documents using 11" X 17" format. 22" X 34" full-scale sheets will be provided at specific request only. Plans shall generally be prepared for 1"=100' on 11"x17" prints and 1"=60' or 1"=20' for specific areas requiring greater detail. Progress percentage Design Plans shall be approved by the COUNTY prior to the Engineer commencing with the preparation of the subsequent progress percentage Design Plans. Design Plans shall include, at a minimum, the following categories of information:

- Title Sheet
- Sheet Index
- Project Layout / Survey Control
- General Notes and Summary Quantity Tables
- Existing and Proposed Typical Sections
- Traffic Control Plan and Sequence Narrative
- Removal Plan
- Paving Plan/Profile
- Street Intersection Layouts with Contours
- Retaining Wall Layouts
- Offsite Drainage Area Map
- Roadway Drainage Area Map
- Runoff and Hydraulic Calculations
- Culvert and Storm Drain Plan/Profiles

- Erosion Control Layout
- Bridge Layout and Typical Sections
- Bridge Foundation and Framing Plans
- Bridge Abutment and Bent Details
- Bridge Slab Plan
- Signing and Pavement Markings
- Traffic Signal Plans
- Standard Drawings (no modifications anticipated to COUNTY, CITY, TxDOT, NTTA and/or NCTCOG standards)
- Earthwork Cross sections

Bridge design shall be accomplished using standard TX## precast concrete girders with approximate 80' spans to match the designs used for the existing NBFR bridge design at Doe Branch. Retaining walls will be incorporated in the abutment designs as necessary along the west right-of-way line and shall be based on TxDOT and/or approved contractor provided wall construction standard drawings. CONSULTANT shall be responsible for evaluating existing bearing capacities and global stability for proposed wall site conditions.

- Prepare bridge designs and construction drawings to include and be in accordance with the following:
 - i. Bridge Layout, sections and construction quantities.
 - ii. Bearing seat elevation calculations using TxDOT BGS software.
 - iii. Abutment designs and details according to AASHTO and the TxDOT Bridge Design and Detailing Manuals.
 - iv. Bent Cap designs and details according to AASHTO and the TxDOT Bridge Design and Detailing Manuals.
 - v. Girder designs and details according to AASHTO and the TxDOT Bridge Design and Detailing Manuals.
 - vi. Column designs and details according to AASHTO and the TxDOT Bridge Design and Detailing Manuals.
 - vii. Superstructure slab plans and typical sections including miscellaneous details
 - Prepare retaining wall drawings to include wall plan, layout and typical section. Wall plan and elevation layout shall be a scale of 1" = 100'. Provide design data necessary for contractor designed walls using mechanically stabilized means.
 - Prepare miscellaneous drainage structure designs and details that are not covered by standard design sheets.
- a) CONSULTANT shall prepare and submit plans for review at approximately 30%, 60% and 90% levels of completion. An estimate of probable construction cost shall be

submitted with each progress plan set. Final plans shall be submitted for COUNTY approval prior to signing and sealing.

- b) CONSULTANT will prepare the Bid Proposal with assistance from the COUNTY which will provide all necessary contracts, bonds and other special conditions in electronic format for use in the project bid and construction documents. CONSULTANT will assist COUNTY in preparation of executable construction documents prior to contract award.
- c) CONSULTANT will provide bid phase services as follows:
 - i. The CONSULTANT shall provide technical interpretation of the Bid Documents and shall prepare proposed responses to all contractors' questions and requests to be approved by the COUNTY. The responses may be in the form of addenda. The CONSULTANT shall conduct and document in writing a pre-bid meeting attended by potential contractors.
 - ii. The CONSULTANT shall assist the COUNTY in issuing Addenda to the Bid Documents and shall provide electronic files to be approved and distributed by the COUNTY.
 - iii. The CONSULTANT shall assist the COUNTY in review of all bids and evaluate them for responsiveness and bid amount and prepare bid tabulation for all responsive bidders. The bid tabulation shall be delivered to the COUNTY in Excel and PDF format. The COUNTY shall make the final decision on the award of the contract for construction and the acceptance or rejection of all bids.
 - iv. The CONSULTANT shall incorporate all addenda into contract documents and issue an original set of conformed project manual and plan sheets for record purposes. Not more than eight (8) copies of conformed documents shall be printed for construction distribution.

Exclusions:

- 1) Traffic counts and signal warrant studies.
- 2) Improvements to US 380 and FM428.
- 3) Sidewalk and pedestrian rail designs on bridge.
- 4) Special designs for aesthetic bridge elements.

9. Construction Phase Services – Not included at this time.