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Nashville, Tennessee 37203
tel: 615-320-3161

October 14, 2019

Mr. Paul Holzen, Director
Franklin Engineering Department
109 3rd Avenue South
Franklin, TN 37064

Re: Proposal for Jordan Road Reconstruction Design

Dear Mr. Holzen:

We are pleased to respond to your request for professional engineering services for the Jordan Road project. This project will provide for the total reconstruction of the existing Jordan Road from the intersection with Mallory Lane to the intersection with Aspen Grove Road. Work on the project shall include complete design for the roadway improvements including drainage upgrades, modifications to the existing horizontal and vertical alignments, replacement of the bridge over the South Prong of Spencer Creek, intersection improvements at Jordan Road and Aspen Grove Road, and all required signage and pavement markings.

Following is a detailed scope of services for the requested work which is based on our past design work and project understanding and September 30, 2019 scoping meeting. All work shall conform to the current version of the City of Franklin and TDOT roadway standards and specifications.

1. Field Survey

CDM Smith will perform an updated survey of the entire project corridor due to the elapsed timing and potential changes since the original design was completed in August 2009. The following detailed tasks will be provided to ensure it is suitable for the final redesign of the project:

- Establish project control tied to State Plane Grid. We will utilize Trimble R8 GPS receiver for the base project control and utilize Trimble S6 Robotic Total Station surveying equipment for additional traverse control throughout the project.
- We will utilize the GPS and Robotic Total Station to provide detailed field survey of existing pavement, curbs, driveways, sidewalks, and adjacent buildings, and locate existing utility and drainage facilities and features within 100' each side of the centerline of Jordan Road.
- We will obtain cross section data of South Prong of Spencer Creek for the Hydraulic Analysis, 2 sections upstream and downstream of the existing drainage structure.
- Research property ownership and deeds for the estimated 9 tracts to establish existing property lines and right of way. This will also be used for the final right of way acquisition table for the required property acquisition for construction.
- Field survey existing property corners along the project corridor. If sufficient monumentation along the right-of-way cannot be recovered, we will search for additional property corners along the rear property lines.



- Calculate existing property lines and right-of-way lines utilizing the property corners and right-of-way monuments found in the field and develop property maps that identify ownership with bearing and distance labels.
- Utilize available GIS utility information and contact Tennessee One Call to assist with locating underground utilities. The underground utilities will be surveyed based on above ground evidence, Tennessee One Call markings, and GIS information. This proposal does not include subsurface utility investigation or utility line potholing.
- Prepare survey base mapping utilizing Microstation CADD software and Geopak Surveying software. This mapping will include 2D planimetrics and a 3D digital terrain model.

2. **Hydraulic Analysis**

The current effective FIRM and FIS profile show the existing culvert does not contain the 100-year or 500-year storm event. In addition, the effective FIS shows this tributary (South Prong of Spencer Creek) to be a studied stream with a Zone AE classification and an established floodway. The FIS states there was hydraulic and hydrologic analysis performed on the stream section in 1995 and the floodplain boundaries were updated with new topography in 2006. A HEC-RAS model is assumed to be available as stated within the effective FIS section "Countywide Analysis".

The analysis to be provided as part of the scope of work will involve a two-step process. First, our team will complete an analysis for a No-Rise Certification. Jordan Road appears to be a local road within the City of Franklin limits. Therefore, the assumption is the City of Franklin's floodplain manager will be the only approving authority for this task. However, if a No-Rise is not attainable, then a Conditional Letter of Map Revision (CLOMR) application must be developed and submitted to FEMA for approval. A CLOMR application will require a supplement and is not included in this proposal.

The analysis for a "no-rise" certification will follow FEMA and City of Franklin guidelines. The hydraulic design analysis for roadway bridges or culverts will be based on TDOT's Design Procedures for Hydraulic Structures, 2004.

2.1. **Obtain current model from FEMA**

CDM Smith will research and obtain the current effective model (or available data) from FEMA that will serve as the basis for the proposed modeling effort. It is assumed the obtained model will match the effective FIS and FIRM with minimal updates. The vertical datum will be verified from field survey and compared with the obtained hydraulic model. If a significant difference in elevation is observed, a correction factor will be applied to the results.

2.2. **Update Hydraulics of FEMA Effective Model**

Task 1 of this proposal includes the capture of new cross sections via field survey. The FEMA effective model will be updated using the new cross sections. In addition, CDM Smith will perform a comparison of the hydrology of the effective model (i.e. flows from 2006) with current stream flow estimates acceptable by FEMA, such as StreamStats. If a significant difference is found, then CDM Smith will discuss with the City of Franklin to determine if a CLOMR approach should be performed. If such an effort is required, CDM Smith will present an amendment to the City for consideration.

Existing Conditions Models (ECM) will be created to use as a basis for comparison to the proposed roadway improvements. The ECMs will incorporate additional surveyed cross-sections located at and around the project site, as well as any adjustments necessary to Manning's n values to duplicate existing conditions. A Proposed Conditions Model (PCM) will be developed to represent the proposed roadway improvements (including a proposed bridge or culvert) and to determine a "no-rise" to the base flood elevations from the effective FIRM.

2.3. Produce report discussing methods used and changes to the models

Upon completion of tasks 1 and 2, CDM Smith will prepare a report for submittal to the City of Franklin describing the methods used and changes performed to produce hydraulic models representing the existing and proposed conditions for the project. The report will document any changes to the existing conditions to establish a "No-Rise" to the FEMA base flood elevations, floodway elevations and floodway top widths resulting from the proposed roadway improvements. A No-Rise Certification form will be signed and submitted with the final report.

3. Update 2010 Design

Design plans were developed for the City of Franklin in 2010; and with the passage of time, several design standards have changed or been updated. Additionally, the surrounding area has been undergone additional site development after the plans were completed. This scope of this work includes the effort required to bring the design into compliance with current City of Franklin and TDOT standards and complete the 30% Preliminary Roadway Plans, the Final Right-of-Way Plans and the Final Construction Plans, detailed. The details of the work are as follows:

Update Design

The typical section for the extension of Jordan Road will consist of one 12-foot travel lane in each direction, curb and gutter, a 6-foot sidewalk on the north and south sides, a 4' bike lane on the north and south sides, and a turn lane at the intersection with Aspen Grove.

CDM Smith will update the design for Jordan Road to meet the current City of Franklin and TDOT standards and design guidelines. Plans will be at a scale of 1"=50' in English units, and CDM Smith will utilize the current Microstation V8i and Geopak software in preparation of the design plans. Updates to the design plans will consist of the following tasks:

- Review drainage design to be in concurrence with current City of Franklin standards, including catch basin types and minimum depths, and update pipe outlet location.
- Revise slab bridge design using TDOT standard LRFD designs and drawings.
- Update design based on any changes required based on the new survey data.
- Update erosion control design to meet current TDEC standards, including multi-phase design, outfall tables and current erosion control measures. Update acquisition table to include table for Disturbed Areas.
- Revise curb ramps to meet current TDOT and ADA standards.
- Revise proposed sidewalk to the minimum 6-foot width outside of the curb width.
- Update guardrail to meet current TDOT standards and offsets.
- Revise striping at the intersection of Aspen Grove.
- Update pavement schedule to current TDOT items and standard drawings

Update Final Right-of-Way Plans

CDM Smith will update the Final Right-of-Way Plans to current City of Franklin and TDOT standards and Design Guidelines, consisting of the following tasks:

- Incorporate Utility design comments
- Incorporate comments from the City of Franklin
- Update survey for current property information and recent development and revise the acquisition table, utility owners and utility notes, ROW notes, Property Maps, Present Layout Sheets and ROW Detail sheets.
- Update title sheet, plan sheet borders, project labels, and sheet titles as needed.
- Submittal of Plans for Final Right-of-Way.

Final Right-of-Way Plans will consist of the following sheets:

Title Sheet, Index and Legend, Typical Sections and Pavement Schedule, Right-of-Way Notes, Utility Notes and Utility Owners sheet, Property Maps and Right-of-Way Acquisition Tables, Present Layout Sheets, Right-of-Way Detail Sheets, Proposed Layout Sheets, Proposed Profile Sheets, Drainage Maps, Culvert sections, Erosion Prevention & Sediment Control Plans, Roadway Cross-sections.

These changes will be incorporated into the plans, and Final Right-of-Way Plans will be issued along with a preliminary construction cost estimate.

Update Final Construction Plans

CDM Smith will update the Final Construction Plans to current Franklin and TDOT standards and Design Guidelines, consisting of the following tasks:

- Incorporate comments from the City of Franklin
- Update item numbers to meet current TDOT standards
- Update the General Notes
- Update the Index and Standard Drawing sheet
- Revise Tabulated Quantities Tables

Final construction plans will consist of the following sheets:

Title Sheet, Roadway Index and Standard Drawings, Roadway Quantities, Bridge Quantities, Typical Sections and Pavement Schedule, General Notes, Tabulated Quantities, Detail Sheets, Right-of-Way Notes, Utility Notes and Utility Owners sheet, Property Maps and Right-of-Way Acquisition Tables, Present Layout Sheets, Proposed Layout Sheets, Proposed Profile Sheets, Drainage Map, Culvert section, Erosion Prevention & Sediment Control Plans, Traffic Control Plans, Signing and Pavement Marking plan, Sign Schedule Sheet, and Roadway Cross-sections.

4. Permitting

CDM Smith shall prepare, follow-up with, and submit on behalf of the City of Franklin for the following related construction permits required as part of the project. The City of Franklin will be

responsible for obtaining the appropriate checks, or other methods, of payment for all required application fees as necessary. The anticipated permits are as follows based on the previous work:

- Tennessee Department of Environment and Conservation (TDEC) Aquatic Resource Alteration Permit (ARAP) for one stream crossing
- Tennessee Department of Environment and Conservation Notice of Intent (NOI) for Construction Activity and a site-specific Storm Water Pollution Prevention Plan (SWPPP)
- US Army Corps of Engineers Section 404 permit

5. Coordination and Meetings

With any roadway improvement project, there is the anticipation of multiple review meetings to resolve issues that need to be coordinated. This proposal includes time to provide the following coordination and meetings:

- Meetings with City of Franklin staff related to roadway design, utilities coordination and property acquisition. This proposal assumes up to four meetings with the City staff with the following meetings currently being anticipated:
 - Two (2) progress meetings to review the roadway design and other project related issues. These will be coordinated with the City of Franklin staff.
 - A utility coordination meeting with all affected parties along the corridor. The anticipated utilities will be identified by the CDM Smith team and the City of Franklin will coordinate with and invite all utility attendees. CDM Smith will provide impacted utility companies up-to-date plan sets and electronic data to assist with the design of relocations.
 - Final project documents and pre-bid review meeting.

6. Contract Documents and Transmittal

CDM Smith will prepare a complete Final Design package consisting of Plans, Specifications and cost estimate for the work. This will also include all special notes for bidders and other applicable background documents that may be beneficial to the bidders (i.e. geotechnical investigation report, etc.) Upon completion of the contract documents, CDM Smith will transmit to the City of Franklin all project information, including electronic files in PDF format.

The electronic information shall include:

- Survey baseline and data (all applicable files)
- Contract documents (drawings and specifications)
- Quantity information and cost estimate

Assumptions:

- City of Franklin will close the roadway during construction so traffic control will not be necessary. If needed, the City will provide temporary traffic control during the field survey phase when working in travel lanes.
- City of Franklin will provide all known utility data to CDM Smith via GIS data download or applicable as-built documents. In addition, the City will provide approved plans for the planned development on the adjacent site by Boyle. CDM Smith will not be providing any subsurface scanning or potholing to locate utilities.

- The bridge design assumes a “no-rise” finding for the hydraulic analysis
- Existing geotechnical study from previous project shall be used for all geotechnical basis of design. No additional geotechnical investigation or subsurface borings are included in this scope of work.
- Property negotiation and acquisition will be conducted entirely by the City of Franklin.

Items not included in the current Scope of Services:

The following items are not included in the current scope of services for this proposal. Should these tasks be required; a scope and fee will be determined at that time. These items include:

- As this project is being developed without Federal funding, an environmental review and NEPA document is not required.
- Subsurface scanning or potholing of existing utilities.
- Realignment of bridge based on hydraulic analysis.
- Structural Design of retaining walls.
- Utility Relocation Design plans for any utilities besides Mallory Valley Utility District (water) and City of Franklin (sewer).
- Landscaping Design Plans.
- As-built Plans upon completion of the construction. If required, this would be part of a construction services amendment.
- Noise Barrier Study and Design.
- Traffic Signal Design.
- Roadway Lighting Design. All roadway lighting will be installed on the relocated power poles and coordinated with MTEMC directly by City of Franklin.

Schedule

CDM Smith anticipates completing the project according to the following schedule.

- We anticipate commencing with the field survey in December 2019. It will take approximately 8 weeks to complete all required field work and processing of data for base files.
- We anticipate that the hydraulic studies and report will require 3 weeks after receipt of all data.
- We anticipate completing Right-of-Way plans in early 2020. Assuming a reasonable timeframe for property acquisition, we expect the project can be advertised in Spring 2020.

Contractual

CDM Smith proposes to complete the defined plan updates and associated scope of work for the following lump sum fee:

TOTAL	\$120,000.00
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(Including all Field Survey, Hydraulic Analysis for No-Rise Certification, Utility Coordination and Layout and Design Updates required for a complete set of biddable Construction Documents.)

Monthly invoicing will be based on percent completion and shall include a project update. Should you find this proposal acceptable, please include this Exhibit as part of your standard contract for execution.

We truly appreciate the opportunity to present this proposal and trust that it meets your expectations. Please advise if additional information or clarification is needed. We are available as might be needed for in-person discussion as well.

Sincerely,
CDM Smith

A handwritten signature in blue ink, reading "Liza M. Joffrion". The signature is fluid and cursive, with the first name "Liza" being more prominent.

Liza Joffrion
Client Service Leader