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December 6, 2022

Ms. Michelle Dunson, PE
Deputy City Engineer
100 Hughes Road
Madison, AL 35758

**Re: Proposal for Professional Engineering Services
Intersection Design at County Line Road and Royal Drive
City of Madison
Madison County, Alabama**

Dear Ms. Dunson,

CDG, Inc. (CDG) is pleased to submit this proposal for the intersection analysis and design at County Line Road and the Royal Drive extension. We understand the importance of this project to the City and how it will help create better connectivity for the FEDEX expansion masterplan.

SCOPE OF WORK

Generally, the scope of work includes two (2) phases of work as follows:

- Phase 1 – Intersection Analysis
- Phase 2 – Intersection Design

Additionally, it is the intention to analyze, design and develop a plan set appropriate for letting the project if the City desires. This scope includes traffic analysis, field survey, geotechnical evaluation, traffic signal design, and design plans. We understand the project will be funded by the City of Madison and will satisfy Madison City Engineering standard specifications and details.

More specifically, CDG will provide engineering services as outlined in the "Attachment A – Scope of Work" document attached to this proposal letter.



Budget

CDG proposes to complete the noted scope of services according to the schedule below, to be paid periodically as work progresses:

Scope of Work	Proposed Fee (Lump Sum)
Phase 1 – Intersection Analysis	\$7,600
Phase 2 – Intersection Design	
Field Survey	\$4,600
Geotechnical Investigation	\$16,750
Intersection Design Plans	\$26,000
Letting Assistance & Contract Procurement	\$3,300
Sub-Total Phase 2	\$50,650
Total Project Cost	\$58,250

We appreciate the opportunity to submit this proposal and are very excited to work with you on this project. If you have any questions, please don't hesitate to call.

Sincerely,
CDG Engineers & Associates, Inc.

A blue ink signature of Adam Crenshaw, written in a cursive style.

Adam Crenshaw, CPESC, CFM
Project Manager

A blue ink signature of Matt Hawes, written in a cursive style.

Matt Hawes, PE
Transportation Practice Leader

Enclosures: Attachment A – Scope of Work



Project Overview and Scope

CDG, Inc. (CDG) has been contacted by Madison City (City) to design a new intersection at County Line Road and Royal Drive. The new intersection will tie to the future extension of Royal Drive as part of the FEDEX master plan to expand distribution centers in the area. It is anticipated that there will be two (2) phases to the Royal Drive extension. The two (2) phases are as follows:

1. Short term two (2) lane extension to County Line Road.
2. Long term four (4) lane with divided median to County Line Road.

To minimize rework of the intersection in the future, the intersection will be designed to accommodate both phases mentioned above. The scope of the requested intersection design will be performed in two (2) phases as follows:

Phase 1 – Intersection Analysis

CDG recommends undertaking an intersection analysis prior to detailed design to determine potential options for the intersection traffic control method. These options will be reviewed from a capacity and safety perspective and discussed with the City to obtain agreement before proceeding with the detailed design.

Phase 2 – Intersection Design

The intersection will be designed around the selected intersection control. For purposes of this proposal, we have assumed the intersection will be signal controlled. If an alternative concept is chosen by the City, an adjustment in compensation may be necessary. Based on preliminary conversations with the City of Madison, we anticipate the intersection design to include the following:

- Establish horizontal and vertical alignments for connection to Royal Drive extension.
- Develop a signal layout sheet to include all the necessary signal items that would be required for a four-legged, mast-arm intersection including video detection and pedestrian signal heads.
- Signal timings will be based on the suggested timings in accordance with the ALDOT Traffic Signal Design Guide & Timing Manual dated June 2015. The City will make field adjustment during construction based on field observation following signal activation.
- Pedestrian cross walks, sidewalk ramps and connections will follow ADA guidelines.
- Design a signalized intersection in anticipation of a future five lane roadway connection to Royal Drive.
- It is anticipated the new intersection will align with the SCS commercial entrance on the west side of County Line Road and be a part of the signal phasing.
- Controller cabinet to be base mounted.



Attachment A – Scope of Work

Intersection Design at County Line Road and Royal Drive
Project No. R929122556
Madison City
Madison County, Alabama

- Revise the existing traffic stripe on County Line Road for the addition of the new intersection. It is anticipated that this section will be milled to remove any existing striping and overlayed.
- Any additional ROW needed for the intersection design is anticipated to be donated to the City of Madison from the Developer.

A more specific outline of the anticipated scope of work is as follows:

Intersection Analysis

CDG will provide an analysis of potential traffic control options for the new intersection. General tasks will include:

- Traffic data collection to be provided by the FEDEX developer and the City of Madison.
- Supplemental traffic data, if needed, will be generated based on the area characteristics using the Institute of Transportation Engineers (ITE), *Trip Generation, 10th Edition*.
- Traffic signal warrant analysis according to the methods outlined in the *Manual on Uniform Traffic Control Devices for Street and Highways 11th Edition* (MUTCD).
- Review up to two (2) types of intersection traffic control, including but not limited to, traffic signalization and stop control for Royal Drive. CDG will provide a high-level capacity analysis for each traffic control alternative.
- Meet with the City to review potential options for the intersection.
- Write and present a memo of recommendation based on the findings.

Field Survey

CDG will provide supplemental topographic and location survey of the subject area in accordance with the Standards of Practice for Land Surveying in the State of Alabama. This survey is anticipated to include the following:

- All existing right-of-way lines and property lines within the limits of the scope will be established using publicly available deeds and plats. No boundary survey is anticipated and therefore is not included in this scope of work.
- Visible sanitary sewer and storm drainage structures will be traced one structure outside the project area with invert, top and pipe size dimensions gathered.
- All man-made improvements within the project scope area will be located.
- Both above ground and below ground utilities will be located based on Alabama 811. Utility location services to be in accordance with Quality C of ASCE 38-02 or better.
- The Survey shall be tied to the Alabama State Plane Coordinate System NAD83 (East Zone) and Elevations will be referenced to NAVD88 Datum, 2011 geode model 12A.



Geotechnical Services

The project consists of intersection improvements along County Line Road at the anticipated extension of Royal Drive in Madison, Alabama. We understand improvements associated with the intersection include construction of a stub-out pavement buildup and four (4) new poles for signalization. Significant earthwork is not anticipated (cuts and fills of less than 5 feet).

Our services will be provided in general conformance to the Alabama Department of Transportation (ALDOT) *State of Alabama Geotechnical Manual* (dated September 9, 2021). In general, the proposed evaluation consists of a subsurface exploration, laboratory testing, engineering evaluation and preparation of a *Materials and Signal Pole Foundation Report*. Specifically, our proposed scope of services consists of the following.

- Site reconnaissance and geologic map review.
- Proposed boring locations will be established in the field through the use of a Trimble R-2 GNSS device capable of sub-meter horizontal accuracy.
- Mobilization of an ATV or track-mounted drilling rig and soil test borings at the proposed signal pole locations. Borings will contain Standard Penetration Tests (SPT) at 2½-foot intervals in the upper 10 feet and on 5-foot centers thereafter. Four signal pole (4) borings will be performed and will extend to a depth of 20 feet each. One (1) roadway boring will be performed to a depth of 10 feet.
- A piezometer will be installed at one (1) signal pole boring to determine a stabilized depth to groundwater.
- Laboratory testing will be performed to classify representative soils in accordance with AASHTO and USCS guidelines. Eight (8) Atterberg Limits and eight (8) Grain Size Distribution tests will be performed.
- A *Materials and Signal Pole Foundation Report* will be prepared following the subsurface investigation and laboratory testing program. Specific items to be included as parts of the report are noted below.
 - Project location maps (vicinity, geology, and sinkhole);
 - Boring location plan;
 - Site and project description;
 - Local geology and its impact on the proposed development;
 - Subsurface conditions, including groundwater;
 - Laboratory testing results;
 - Recommendations for removal and reuse or stabilization of unsuitable materials;
 - A recommended new pavement section. The section is expected to match that of a plan set for a FedEx ground facility;
 - LPILE parameters table for Signal Pole borings;



Site Access, Traffic Control and Utility Location

We have assumed that CDG will be allowed access to the limits of the planned construction for the subsurface exploration and other field work. Time associated with obtaining right-of-entry is not included in the proposal. Traffic control is not expected to be required; therefore, we have not included costs for it. Additionally, costs or time associated with clearing or other site access preparation are not included; therefore, borings will be performed at accessible portions of the site.

The subsurface exploration will be performed with a rubber-tire or rubber-track mounted drilling rig. However, if surface obstructions, steep terrain or soft, wet soil conditions limit access, it may be necessary to use special equipment (dozer) at additional cost to reach the boring locations. Special equipment will not be engaged without your prior approval.

We will endeavor to minimize our impact to the site, including the use of protective plywood or pads when crossing existing sidewalk/paths. Borings will be backfilled with soil cuttings. This proposal does not include costs associated with additional site restoration.

CDG will take appropriate precautions to avoid underground utility lines including contacting the line location service (811). Additionally, we request that the client provide plans or mark in the field the location of buried utility lines if present. CDG cannot be responsible for damage to unmarked or unmapped utility lines.

Intersection Design Plans

- Develop an intersection layout sheet for the intersection design at County Line Road and Royal Drive.
- Intersection design to include all the necessary signal items that would be required for a four (4) legged intersection with mast arm poles, video detection, and pedestrian signals.
- Develop traffic control phasing for signal construction as necessary.
- Develop quantities associated with the intersection design to be included in the opinion of probable cost estimate.
- This plan assembly will include the following sheets:
 - Title Sheet
 - Index Sheet
 - Standard Drawing Reference Sheet
 - Legend and Abbreviations Sheet
 - Geometric Layout
 - Traffic Signal and ITS Legend Sheet
 - Typical Section Sheet
 - Project Notes
 - Temporary Traffic Control Plan Notes Sheet



Attachment A – Scope of Work

Intersection Design at County Line Road and Royal Drive
Project No. R929122556
Madison City
Madison County, Alabama

- Traffic Signal Plan Notes Sheet
- Summary of Quantities Sheets
- Plan and Profile Sheets
- Utility Sheets
- Traffic Signal Sheet
- Erosion and Sediment Control Sheets
- Temporary Traffic Control Sheets
- Cross Section Sheets (As Needed)
- Prepare designs and detailed contract plans at a horizontal scale of 1" = 50' and vertical scale of 1" = 5', completely dimensioned for roadway construction.
- Prepare construction cost estimates for review and consideration by Madison City as the project progresses through the design phases.
- Plans will be provided to utility owners within the area to identify any potential conflict with existing facilities.
- Facilitate plan review(s) by Madison City, as necessary for the project. Plan reviews are expected to consist of a 30% review and 90% review.
- Attend meetings as required, including one (1) project scoping meeting, one (1) 30% review and field inspection, and one (1) 90% review meeting and field inspection.
- Prepare specifications and contract documents suitable for receipt of bids by the City.

Letting Assistance and Contract Procurement

- Assist the City with advertising the project for bids and fielding questions from contractors about the plans as needed.
- Assist with and attend the local letting of the subject project by the City.
- Assist with project award and contract procurement.
- Attend the preconstruction meeting.

Exclusions

This scope of work does not include:

- Traffic Signal pole and foundation design (Provided by the Contractor);
- Environmental Field Studies or Documentation;
- Right-of Way Document Preparation;
- Right-of-Way negotiations;
- Negotiations for impacts to personal property within the clear zone;
- Utility relocation design;
- Construction observation/inspection services;
- NPDES Application or fees;