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August 20, 2024

Mr. Michael Johnson, PE
City Engineer
100 Hughes Road
Madison, AL 35758

**Re: Proposal for Professional Engineering Services
Royal Drive Extension Phase I
Madison, Alabama**

Dear Mr. Johnson,

CDG, Inc. (CDG) is pleased to submit this proposal for the design and plan development of the Royal Drive Extension Phase I from County Line Road east approximately 0.62 miles to Jetplex Lane. This project is part of a masterplan to extend Royal Drive east connecting to Sullivan Street in the future. We are excited to be a part of this first phase of the Royal Drive Extension and are eager to get started.

SCOPE OF WORK

Generally, the scope of work includes the extension of Royal Drive from County Line Road to Jetplex Lane, approximately 0.62 miles. The task associated with this scope of work includes field survey, environmental documentation, geotechnical services, hydraulic analysis and design, roadway design plans, and letting assistance and contract procurement.

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)
Field Survey	\$7,750
Environmental Documentation (Desktop Level)	\$22,470
Geotechnical Services	\$17,802
Hydraulic Analysis and Design	\$19,970
Roadway Design Plans	\$130,800
Letting Assistance and Contract Procurement	\$6,970
Total Project Cost	\$205,762

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, Inc.

Adam Crenshaw, CPESC, CFM
Project Manager

Matt Hawes, PE
Transportation Practice Leader

Enclosures: Attachment A – Scope of Work



Project Overview and Scope

CDG, Inc. (CDG) was recently contacted by the City of Madison to perform the design for the Royal Drive Extension Phase I. This phase of the project begins at County Line Road and continues east approximately 0.62 miles ending at Jetplex Lane. The design will be performed in two (2) stages to include a 2-lane immediate construction stage, and a 4-lane divided future construction stage. The project design and plans prep will be developed in this manner to be utilized for both stages mentioned above. This document outlines the tasks associated with completing the design as follows:

- Field Survey
- Environmental Documentation (Desktop Level)
- Geotechnical Services
- Hydraulic Analysis and Design
- Roadway Design Plans
- Letting Assistance and Contract Procurement

These tasks outlined below will be undertaken to complete the design of the roadway extension.

Field Survey

CDG will provide the 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:

- Survey limits generally include a 150' width starting at the intersection of County Line Road and Future Royal Drive continuing east approximately 0.62 miles to the intersection of Jetplex Lane and Future Royal Drive.
- Horizontal and vertical coordinate systems shall be referenced to the NAD 83 (Alabama State Plane Coordinates System) and NAVD 88 datums, respectively, and originated using the ALDOT CORS Network and/or OPUS static solutions.
- Data collection methods include traditional ground measurements, GPS, photogrammetry, and/or remote sensing (LIDAR).
- Temporary benchmarks shall be established at a minimum of two, or one pair, per site.
- Where applicable, the following items shall be located and identified as part of the topographical survey:
 - Sufficient property and right-of-way monumentation for boundary ties.
 - Natural and man-made surface features.
 - Adjoining roadways to include name, surface material, and right-of-way width based on field evidence and/or publicly available resources.
 - Visible sanitary sewer and storm drainage structures, to the extent of one structure outside the survey limits and include invert and top elevations along with pipe size and materials.



- Subsurface utilities crossing and serving the site located by observed evidence, markings provided through Alabama 811, maps provided by utility owners, and to the extent of Quality Level “C” as defined by ASCE 38-02.
- Existing surface contours at 1-foot intervals.

Environmental Documentation (Desktop Level)

The environmental documentation will include a high-level, desktop environmental overview of the proposed alignment location for the Royal Drive Extension Phases I and II that will include the following:

- A site visit to observe current conditions and uses of the adjacent parcels along the roadway corridor.
- Utilize EDR Lightbox reports to perform a review of federal, state, tribal and local regulatory databases including, but not limited to, underground storage tanks (USTs), above ground storage tanks (ASTs), known or suspected release cases, the storage of hazardous substances and disposal of hazardous wastes including petroleum products.
- Utilize EDR Lightbox reports to perform a review of historical records, such as historical aerial photographs, fire insurance maps (Sanborn Maps), historical city directories and historical topographic maps.
- Review databases to determine if State Historic Sites or National Registered Historic Places are present within or near the project area.
- Identification of known hazardous materials sites within or near the project area.
- Identification of known Stream/Wetlands where the proposed construction could result in the loss of 0.5 acres or more of waters of the U.S. (including wetlands and streams).
- Identification of Floodplain/Floodway where the proposed construction could result in the increase of more than 1 foot of water surface elevation in the base floodplain (100-year flood event). Also, assessing whether the proposed construction could increase the risk of damage to property and loss of human life or result in modification of a watercourse.
- Utilize the U.S. Fish and Wildlife Services database to identify any possible endangered species that the proposed construction could adversely affect.
- Determination of whether the proposed construction will require a noise study.
- Determine if the proposed construction will disturb previously undisturbed ground and if so, then tribal coordination will be required.
- Utilize the United States Department of Agriculture (USDA) databases and maps to create a report to determine the effect (if any) on the Natural Resources Conservation Services (NRCS) farmlands.
- Compile all the identified information into a report and supply this report to the City of Madison for review and approval.



- Meet with the City to go over the report and address any questions or concerns once there has been adequate time for review.

Geotechnical Services

The geotechnical evaluation will be performed for the proposed extension of Royal Drive from County Line Road to Jetplex Lane. Improvements include grading and new pavement buildup for a length of approximately 3,300 linear feet (0.62 miles). Proposed maximum cuts and fills were assumed to be on the order of 10 feet.

In general, the proposed evaluation will consist of a subsurface exploration, laboratory testing, engineering evaluation and preparation of a *Soil Survey and Materials Report*. Specifically, the proposed scope of services consists of the following.

- Site reconnaissance and geologic map review. We understand that access permission has been obtained for the proposed improvements. Therefore, costs associated with obtaining right-of-entry are not included in the proposed budget.
- Review of aerial imagery indicates that the roadway alignment is generally open and accessible to the drilling equipment. Therefore, access preparation costs are not included in the proposed budget.
- Boring locations will be established with a handheld GPS; therefore, they will be approximate. The locations can be surveyed for additional fees, if requested.
- Mobilization of an ATV or track-mounted drilling rig and 10 soil test borings located along the proposed alignment. Soil test borings will extend to depths of 15 feet below the existing ground surface or to refusal, whichever occurs first (total of 150'). Borings will contain Standard Penetration Tests at 2½-foot intervals in the upper 10 feet and on 5-foot centers thereafter.
- Laboratory testing will be performed to classify representative soils in accordance with AASHTO and USCS guidelines. The budget is based on performing 15 moistures, 4 Atterberg Limits and 4 Grain Size Analysis tests.
- We have assumed that 2 undisturbed and 1 bulk samples will be retrieved at appropriate locations throughout the project. One (1) Standard Proctor test is included to provide guidance for remolding of laboratory test samples. One (1) resilient modulus test will be performed on an undisturbed sample of potential subgrade soils.
- Recommendations for the proposed new buildup for Royal Drive. The design will be based on AASHTO methodology using site-specific resilient modulus test results and traffic data provided by others.
- A *Soil Survey and Materials Report* will be prepared following evaluation of the information gathered during the subsurface exploration and laboratory testing program. Specific items to be included as part of the report are noted below.
 - Project location maps (vicinity, geology, and sinkhole);
 - Boring location plan;
 - Site and project descriptions;



- Local geology and its implications for the proposed improvements;
- Subsurface conditions;
- Laboratory testing results;
- Groundwater measurements and water control recommendations;
- Subgrade preparation considerations including stabilization, removal of unsuitable materials and reuse of on-site soils from cut areas as improved roadbed; and
- Recommended pavement sections.

The subsurface exploration will be performed with a track or ATV-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. Additionally, the 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.

Hydraulic Analysis and Design

The proposed project alignment is located just west of Bradford Creek with some unknown tributaries to the north. The Royal Drive Extension is all new construction so a hydraulic analysis will be performed for the proposed roadway layout as follows:

- 2-Lane immediate construction
 - Develop a hydrologic model to assess existing and proposed flows along the proposed alignment.
 - Utilize the hydrologic model to perform a hydraulic analysis for the design and control of the proposed storm system.
 - The types and sizes of proposed structures will be assessed for efficiency.
 - Proposed ditches, utilized for routing, will be analyzed to assess the appropriate ditch lining to effectively manage the flow velocities. Linings to be considered would be:
 - Grassed
 - Riprap
 - Concrete
- 4-Lane divided future construction



- Develop a hydraulic model to assess how the 2-lane immediate construction can be expanded for future construction.
- Perform a hydraulic analysis utilizing the hydrologic model for the future development to control the proposed storm system.
- The types and sizes of proposed structures will be assessed for efficiency.
- Proposed ditches, utilized for routing, will be analyzed to assess the appropriate ditch lining to effectively manage the flow velocities. Linings to be considered would be:
 - Grassed
 - Riprap
 - Concrete
- Prepare a Hydraulic report with the input and output information used in the development of the hydrologic and hydraulic models to support the drainage recommendations.
- Submit the Hydraulic report to the City of Madison for review and approval.

Roadway Design Plans

CDG will complete roadway design plans for the extension of Royal Drive Phase I starting at County Line Road and continuing east to Jetplex Lane approximately 0.62 miles. The design will be performed in two (2) parts, first, immediate use 2-lane roadway and second, future planned 4-lane divided roadway sections. The scope of design plan preparation is anticipated to be as follows:

- Design a grade, drain, base, pave, signing, and striping project for the Royal Drive extension Phase I, from County Line Road to Jetplex Lane, approximately 0.62 miles. It is anticipated that the plan assembly will include the following sheets:
 - Title Sheet
 - Index Sheet
 - Standard Drawing Reference Sheet
 - Legend and Abbreviations Sheet
 - Geometric Layout
 - Project Notes Sheet
 - Temporary Traffic Control Plan Notes Sheet
 - Traffic Signal Plan Notes Sheet
 - Typical Section Sheets
 - Summary Of Quantities Sheets
 - Plan and Profile Sheets
 - Paving Signing and Striping Sheets
 - Existing Utility Sheets
 - Proposed Utility Sheets



- Erosion and Sediment Control Sheets
- Temporary Traffic Control Sheets
- Drainage Cross Section Sheets
- Roadway Cross Sections
- Earthwork Summary Sheet
- Prepare designs and detailed contract plans at a horizontal scale of 1" = 50' and vertical scale of 1" = 5', completely dimensioned for roadway construction. Cross sections will be plotted at a horizontal and vertical scale of 1" = 10'.
- Drainage design will include both open system and closed system assessments to determine which best serves the new construction project.
- Lighting Design
 - A lighting design will be provided using arm-mounted LED luminaires on new poles in Madison, AL along both sides of approximately 0.62 miles of the proposed Royal Drive extension. Additional scope items include:
 - Coordination with owners, contractors, facility operators, utilities, building officials and other engineering disciplines as necessary to finish the design.
 - Selection of detailed pole locations to coordinate with roadway plans.
 - Design of lighting systems in accordance with the City of Madison requirements.
 - Electrical plans and specifications, including large-scale plans, where necessary to indicate pole locations.
 - Shop drawing and submittal review.
 - Resolution of routine construction-period issues.
- Prepare estimates of probable construction cost for review and consideration by the City of Madison.
- Plans will be provided to utility owners within the area on an incremental basis that follow plan reviews to identify any potential conflict with existing facilities.
- Prepare a Construction Best Management Practices Plan (CBMPP) and assist the City with preparing a Notice of Intent (NOI) to satisfy the National Pollutant Discharge Elimination System (NPDES) requirements of the Alabama Department of Environmental Management (ADEM). NPDES application fees will be the responsibility of the City as applicant.
- Facilitate plan review(s) by City of Madison as necessary for the project. Plan reviews are expected to consist of a 30% review, 60% review, and 90% review.
- Attend meetings as required, including one (1) project scoping meeting, one (1) 30% review meeting and field inspection, one (1) 60% review meeting and field inspection and one (1) 90% review meeting and field inspection.



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:

- Right-of-Way map, Tracts Sketches, Deeds and Deed Closure Diagrams;
- Right-of-Way negotiations (to be provided by the City of Madison);
- Traffic analysis;
- Utility analysis and design;
- Environmental Documentation (above Desktop Level);
- Environmental Field Studies;
- Negotiations for impacts to personal property within the clear zone;
- FEMA flood studies or flood plain map revisions;
- Construction engineering and inspection services;