

## ATTACHMENT A – SCOPE OF SERVICES

The project time is critical.

**The home office indirect cost rate shall be applicable to all services except as otherwise designated hereafter.**

The Consultant shall provide engineering and related services to design a roundabout at the intersection of Downing Pines Road, Mane Street and Short Constitution Drive in Ouachita Parish, Louisiana. It is anticipated that the Consultant shall make appropriate design considerations for an asphalt roundabout and ensure the maintenance of traffic during all phases of construction.

The services to be performed by the Consultant are described more specifically as follows:

### **TASK 1: PROJECT MANAGEMENT**

The Consultant shall schedule a kick-off meeting with the Project Manager, Entity Responsible Charge and project team according to the Schedule of Deliverables. The Consultant is responsible for setting up the project kick-off meeting. Agenda items for this meeting shall include the review points and durations, time-frame assumptions built into the project schedules, deliverables, procedures to follow, the Measures of Effectiveness (MOEs) to be compared for traffic analyses, invoicing procedures, progress reporting, and rating criteria. The agenda shall be provided to the Project Manager and Entity Responsible Charge one (1) week prior to the meeting. The Consultant is responsible for meeting minutes, which shall be provided to the Project Manager and Entity Responsible Charge within three (3) business days following the meeting.

Project management will include progress reporting, coordinating with stakeholders, including Monroe MPO and DOTD, as well as ensuring quality control and quality assurance. The Consultant is responsible for project tracking and shall ensure all tasks are completed on schedule. All correspondence shall include applicable state project numbers, along with the project names, route number, parish, and federal aid project numbers. The Consultant shall provide the Project Manager and Entity Responsible Charge with a monthly project schedule (in Microsoft Project) and progress report including the estimated and actual date of completion of each task to be performed. The report may include a discussion of the previous month's progress, problems that were encountered, unresolved issues, and anticipated work for the next month. The Consultant shall coordinate with and provide the Project Manager and Entity Responsible Charge with monthly updates. It is anticipated that the Consultant shall have periodic coordination meetings with the Project Manager, Entity Responsible Charge and other subject matter experts during the course of the project to review the project status and address any concerns.

**Deliverables:** Submittal of monthly project schedule, progress report and invoices, meeting minutes.

**TASK 2: TOPOGRAPHIC SURVEY**

This project is located in Ouachita Parish in West Monroe, Louisiana, near the intersection of I-20 and Downing Pines Road. A detailed description of the survey limits are outlined below.

The first portion of this project shall begin at a point along Downing Pines Rd, near the intersection of Constitution Drive and Downing Pines Rd, and continue in a southeasterly direction along Downing Pines Rd for a linear distance of approximately 1540 feet. The second portion of this project shall begin at a point at the intersection of Downing Pines Rd and Mane St, and continue in a southwesterly direction along Mane St for a linear distance of approximately 600 feet. The third portion of this project shall begin at a point at the intersection of Downing Pines Rd and Short Constitution Drive, and continue in a northwesterly direction along Short Constitution Drive for a linear distance of approximately 1500 feet. The width of the DTM and survey shall vary. Please see attached survey request sketch for detailed limits of survey.

A complete Topographic survey including all utilities with depths and all drainage is required, along with finish floor elevations of all buildings that fall within the survey limits. This project shall be completed in accordance with the Location and Survey Manual and all current accepted Location and Survey Automation procedures. Control shall be established following the guidelines in the latest edition of the Locations and Survey manual. Deliverables are to be submitted in Microstation/Inroads format.

A drainage map shall be required. Please refer to the Location and Survey Photogrammetry Unit for detailed instructions of what is required on the drainage map.

Permission of land owners shall be acquired by the Consultant before entering any property associated with this description.

All work is to be done in English units of measurement.

**TASK 3: TRAFFIC ENGINEERING AND RELATED SERVICES**

**Study Overview**

The purpose of this Intersection Control Evaluation (ICE) Study is to establish an integrated, systematic, and performance-based approach to evaluating alternative intersection control and configurations at the intersection of Downing Pines Road at Mane Street/Short Constitution Drive in Monroe, Louisiana.

The project will evaluate three (3) intersection improvement alternatives that meet the purpose and need of the project.

The Study will include the following scope of work.

### **Initial Data Collection**

All counts should be collected according to the standard engineering practice on a Tuesday, Wednesday, or Thursday, when schools are in session (not during summer vacation, or during holidays). If counts are being taken and weather becomes a factor during the time of counts, note such conditions as well as any accidents that may have occurred.

The seven (7) day, 24-hour counts will be used to establish the peak periods. Locations of seven (7) day, 24-hour Bi-directional Classification Counts:

1. Downing Pines Road north of Mane St./Short Constitution Dr.

*Deliverables:*

1. *Appendix A – Initial Data Collection*
  - a. *Electronic submittal containing the 7-day 24-hour raw counts. The count locations shall be shown on an aerial map.*
  - b. *Peak Period Determination Chart with explanation*
  - c. *Any documentation, justification, etc. for any count discrepancies*
  - d. *QA/QC Documentation*

### **Final Data Collection**

48-hour counts with vehicle classifications shall be taken at all intersection approaches to help verify TMCs and demand. (24-hour classification counts will be acceptable).

Turning Movement Counts (TMCs) with classifications and demand shall be conducted at each approach of the intersection of Downing Pines Road and Mane St./Short Constitution Drive during the AM and PM peak periods. Counts for all movements will include vehicular, pedestrian, and bicycle.

### Growth Rate Determination

The Growth Rate shall be determined using the MPO Travel Demand Model. These models will be the currently approved base year model and the future fiscally constrained model.

*Deliverables:*

*All data should be submitted electronically noted below:*

1. *Chapter 1 – Explanation of the methodology for collecting data.*
2. *Appendix B – Final Data Collection*
  - a. *Growth Rate Determination – Justification of growth rate determination and any sources that were used to obtain the growth rate(s).*
  - b. *Any documentation, justification, explanation for any count discrepancies. All locations shall be correct and easily followed*
  - c. *Volume check: Provide raw count figures with balanced volumes differences*
  - d. *Raw Turning Movement Counts (TMCs) and 48 hour counts all with classifications*

## ENTITY CONTRACT NO. 4400032380

- e. Demand Calculation table*
- f. Maps*
- g. Raw Turning Movement Counts (TMCs) with Demand shown separately*
- h. Final Existing Volumes (year 2026)*
- i. No Build Volumes (year 2046)*
- j. Peak Period Observations*
- k. Geometric Field Checklist*
- l. QA/QC Checklist and documentation – signed and dated*

### **Existing Safety Analysis**

The Consultant shall pull all crash history within the limits of this study (intersection crashes) for the latest five (5) years of available certified data for the project study area (2020-2024). A crash summary analysis for five (5) years shall show trends of crash rates, location, and severity using the Louisiana Crash Tool.

If a consistent trend is present throughout the five (5) years of data, the trend information shall be submitted to DOTD prior to performing any detailed crash analysis. After DOTD concurrence of the trend information, a detailed crash analysis shall be performed for one (1) year of typical data, in which all crash reports will be read in detail. If a consistent trend cannot be determined through the five (5) years of data, a detailed crash analysis shall be performed for all five (5) years for the project study area.

The detailed crash analysis shall consist of a review of the crash reports in detail to determine the type of collision based on the reporting officer's description. A report shall be submitted to DOTD Highway Safety Section for any crash reports within the latest year of data (one (1) year) that are found to be erroneous. The Consultant shall prepare QA/QC documentation for the review and approval of DOTD.

The Consultant shall also pull the latest five (5) years of pedestrian and bicycle crashes within the limits of the study area. Also, summarize any trends, if found, for pedestrians and bicyclists.

Crashes shall be pulled as far as the existing analysis is showing queuing for all intersections.

#### Deliverables:

- 1. Appendix C – Existing Safety Analysis*
  - a. Louisiana Crash Tool*
  - b. Crash Report Documentation – crash history, corrected component of crashes and provide individual summary of crash report narratives*
  - c. Collision Diagram*
  - d. Crash Analysis Summary - summary of crash reports explaining results*
  - e. Existing Safety Analysis QA/QC Checklist*

### **Existing and No Build Analysis**

The Consultant shall analyze existing and projected traffic conditions using software approved by the DOTD Traffic Engineering section. The existing year is 2026. The future year is 2046. The analyses shall include the following MOEs per movement:

- V/C ratios
- 95<sup>th</sup> percentile queue lengths
- Critical movement control delay (sec/veh)

Analysis results must be verified with the collected field data to ensure validity and accuracy. All defaults must be justified and documented.

### **Tier 1 Analysis**

The Consultant shall perform a Tier 1 Analysis of the Existing and No Build Analysis results to identify alternatives for further investigation that address the purpose and need while considering project constraints. All alternatives must be compiled in a matrix format for examination.

Alternatives selected for inclusion in the Comparison Matrix will be ranked using high-level criteria such as, but not limited to, Operations, Right Of Way (ROW), Cost, and Environmental Impacts. Criteria used should be quantified with thresholds that allow for a scored comparison between all alternatives and will vary depending on the defined problem. All alternatives considered shall include documentation explaining why they were recommended for advancement to Tier 2 or removed from further consideration. Depending on complexity, this could be a Notes column in the Evaluation Matrix or several paragraphs of explanation.

All alternatives will be compiled in a table format with a description and/or figure of each alternative and its associated ranking within the defined criteria. Selected alternatives should be based on a comparative evaluation using the total ranking.

#### *Deliverables:*

1. *Appendix D – Existing and No Build Analysis*
  - a. *Software reports/Output for Existing and No Build Conditions (only relevant sheets)*
  - b. *Electronic files of analyses*
  - c. *Analysis results of MOEs on a map with road name, control type, and north arrow of the corridor (11X17)*
  - d. *Queue map of intersection (field vs software- if there is a difference explain)*
  - e. *Intersection description (for TMC location)*
  - f. *Detailed description of intersection, nearby land use and issues for those not familiar with area*
  - g. *Aerial of intersection (showing existing lane configuration, peak hour TMCs, commercial/residential drives and any other notable feature such as but not limited to bus stops, crosswalks, train crossings etc.)*
  - h. *Summary of peak period observations (queues, issues, etc.)*



- ii. *11 x 17 Map(s) showing queues on an aerial comparing all alternatives and No Build alternative (pdf)*
  - iii. *Electronic copy of Analysis for Operations*
  - iv. *Software Reports/Output for Analysis of Intersections – Only relevant reports with inputs and Measures of Effectiveness (MOE) are needed. (pdf)*
  - v. *Intersection Summaries – Intersection with Turning Movement Counts (TMCs) and/or modifications:*
  - vi. *A detailed description of new and modified intersection (paint a picture)*
  - vii. *Aerial of intersection showing proposed lane configuration, proposed and existing Right of Way (ROW), and proposed and existing Control of Access (COA).*
  - viii. *Safety Analysis (showing an existing crash diagram with alternatives drawn and the potential crashes that may be eliminated with that alternative*
  - ix. *MOE Table of Results*
  - x. *Summary Table of Results compared to No Build and all other Alternatives*
  - xi. *Critical Geometry Layout (of entire intersection) (11X 17, pdf, CADD OR KMZ files (not a line and grade)*
  - xii. *Documentation of any default changes from No Build to Alternative Analysis*
  - xiii. *Comparative Evaluation Matrix with documentation and calculations*
  - xiv. *QA/QC Documentation*
2. *Introduction of Final Report*
  3. *Chapter 3 – Alternative Analysis Summary*
  4. *Executive Summary*

**Final Report**

*Deliverable:*

*Sealed Report (Draft must be approved before final submission).*

*Minimum 2 Electronic Copies*

**TASK 4: GEOTECHNICAL INVESTIGATION AND DESIGN SERVICES**

The geotechnical portion of this project will consist of furnishing geotechnical investigation services and foundation design for the proposed structures. Hereafter, all sites are referred to as bridge sites, regardless of whether the final design includes a bridge or box culvert.

<b>Project No.</b>	<b>District</b>	<b>Intersection Description</b>	<b>Deep Borings</b>	<b>Subgrade Borings</b>
H.016019	05	Downing Pines Rd & Short Constitution Dr	3	8

The number of borings is estimated based on the roundabout and roadway layout and conforms to typical DOTD practice and AASHTO requirements. A shallow subgrade soil survey boring shall be made along each roadway leading to the roundabout. The Consultant shall notify DOTD immediately if it becomes evident that a particular site requires geotechnical investigation and/or engineering efforts that are beyond this scope, including additional borings.

## **GEOTECHNICAL INVESTIGATION**

The Consultant shall perform a geotechnical investigation consisting of soil borings, laboratory testing, optional cone penetrometer test (CPT) soundings, soil classification, site characterization, and soil boring logs. In addition to the referenced ASTM designations, refer to *FHWA Geotechnical Engineering Circular No. 5 (GEC 5)* for best practices pertaining to geotechnical site characterization.

### **Field Investigation – Shallow Subgrade Soil Survey**

A subgrade soil survey boring shall be made within 100 feet of the roundabout along each approach roadway, and equally spaced subgrade borings shall be made along Short Construction Drive. Subgrade soil survey borings can be made utilizing continuous-flight augers, pneumatic, or direct-push sampling. The depth of each boring should be at least 8 feet below the finished roadway elevation or natural ground, whichever is greater, with additional sampling and testing requirements for areas of cut/fill greater than ten (10) feet. Three excessive fill areas have been identified where, deep soil borings to a depth of 60 feet are required. Two 60-foot borings are proposed along the new alignment from the roundabout to Short Constitution Drive and one boring at the roundabout right turning lane from Mane Street to Downing Pines Road.

### **Laboratory Testing**

All laboratory testing shall conform to applicable ASTM and AASHTO test designations.

#### ***Shallow Subgrade Soil Surveys***

The different layers of the soil strata shall be identified every foot or strata break at the discretion of the lab engineer of record using the AASHTO classification system (ASTM D3282, AASHTO M 145) and the following tests:

- Atterberg Limits (ASTM D4318) – 100% of all cohesive samples; and
- Moisture content (ASTM D2216) – all samples;
- Grain size testing (ASTM D1140 and ASTM D6913) – as needed to classify granular soils;
- Hydrometer tests (ASTM D7928) – 75% of samples;
- Consolidation Testing (ASTM D2435) – 2 Tests per boring (in the fill areas)
- Percent Organics (ASTM D2974) – as needed; and
- pH (ASTM G51) and resistivity (AASHTO T 288) – as needed, at applicable pipe crossings.

Dry preparation methods (ASTM D421) shall be used where applicable to test shallow subgrade soil survey samples.

## **GEOTECHNICAL ENGINEERING DESIGN**

The following geotechnical design elements are anticipated for this project. Should the project scope change from these assumptions, DOTD should be notified immediately.

**Soil Boring Logs**

Shallow Subgrade soil survey borings shall be presented in a tabular format containing all test results and classified using the AASHTO soil classification method.

**This task shall be compensation based on cost per unit of work.**

**TASK 5: HYDRAULIC EVALUATION OF EXISTING STRUCTURE**

This task includes a preliminary hydrologic and hydraulic (H&H) evaluation of the existing box culvert at the Main Street crossing. The objective of this assessment is to determine whether the existing culvert has adequate hydraulic capacity to be extended to accommodate the proposed roundabout (RAB) or if full replacement of the structure will be required.

- Hydrology
  - Determination of design flows using StreamStats and available FEMA Base Level Engineering (BLE) data.
- Hydraulics (HEC-RAS Model Development and Evaluation)
  - Development of terrain surfaces in HEC-RAS for both existing and proposed conditions
- Development and evaluation of hydraulic geometry for the following scenarios:
  - Existing conditions
  - Alternative 1: Extension of the existing structure
  - Alternative 2: New culvert/structure configuration
- Boundary Conditions Development– Utilizing StreamStats/ FEMA BLE
- Recommendation Memo
  - Technical memorandum summarizing modeling assumptions, results, and recommendations regarding extension versus replacement of the existing structure.

**Assumptions/Limitations**

- The existing structure and channel are not located within a FEMA regulatory floodway or floodplain; therefore, a No-Rise Study is not required.
- Detailed H&H analyses necessary for preliminary and final plan development will be provided under a supplemental agreement.

**SERVICES TO BE PERFORMED/ITEMS TO BE PROVIDED BY ENTITY**

If available, the entity will provide the following information as applicable:

- As-built plans for box culvert

**SERVICES TO BE PERFORMED / ITEMS TO BE PROVIDED BY DOTD**

If available, DOTD will provide the following information as applicable:

- Standard Plans and Special Details
- Access to Virtis input tables for On-System Bridges

**ENTITY CONTRACT NO. 4400032380**

- DOTD design and rating manuals, policies, and guidelines

**SERVICES TO BE PROVIDED BY SUPPLEMENTAL AGREEMENT**

The scope of services and compensation for the following services may be authorized by Supplemental Agreement:

- Preliminary Plans
- Final Plans
- Property Survey
- ROW Maps
- General Bridge Design Services
- As-designed, as-built, and condition bridge ratings
- Sampling and Non-destructive Testing
- Construction Support
- Embankment Slope Stability
- Embankment Settlement
- Earth Retaining Structures (ERS)
- Culverts
- Geotechnical Deliverables

**ADDITIONAL SERVICES**

The scope of services and compensation for the following additional services may be authorized by Supplemental Agreement:

- Environmental Clearance
- Environmental Permitting
- Subsurface Utility Engineering Services



Exhibit: Anticipated Survey Limits



ATTACHMENT B - QA/QC



# QUALITY MANAGEMENT PLAN

## DOWNING PINES RD: ROUNDAABOUT AT MANE ST

CONTRACT NO. 4400032380

NEEL-SCHAFFER, INC.

*“Solutions you can build upon”*

## TABLE OF CONTENTS

1. INTRODUCTION .....	3
1.1 Project Overview .....	3
1.2 Definition of Terms and Positions .....	3
2. PROJECT TEAM AND RESPONSIBILITIES .....	5
2.1 Responsibilities .....	5
2.2 File Management .....	5
2.3 CAD .....	5
2.4 Louisiana Department of Transportation and Development (LADOTD) Roles .....	5
3. DESIGN CRITERIA AND SOFTWARE .....	6
3.1 Design Criteria Report .....	6
3.2 Software .....	6
4. QUALITY MANAGEMENT PLAN .....	7
4.1 Quality Management Overview and Flowchart .....	7
4.2 Quality Control Process (QC) .....	7
4.3 Quality Assurance Process (QA) .....	8
5. ESTIMATED DELIVERABLES AND CERTIFICATIONS .....	9
5.1 Certifications and Forms .....	9
5.2 Sealing of Plans .....	9
APPENDIX .....	10
Design Criteria Checklist .....	11
Final Calculation Book Checklist .....	14
QA Information Package Checklist .....	15
QC/QA Certification .....	16
Consultant Submittal QC/QA Certification .....	17
Quality Audit Checklist .....	18
Sample Check Print Stamps .....	19

## 1. INTRODUCTION

NEEL-SCHAFFER, INC., is pleased to submit our QC/QA plan for Roadway Design Services as required by the Louisiana Department of Transportation and Development (LADOTD) in the Advertisement. This document constitutes as our proposed QC/QA Manual.

The team has a goal of providing timely, efficient, and high-quality Roadway Design Services to its clients. Successful completion of a project requires top-quality planning, teamwork, management, and a thorough review of all project documents. A projects overall probability of success improves with a solid beginning. Likewise, quality Roadway Design Services can prevent wasted time and funding as the project advances towards construction.

To best serve the LADOTD, NEEL-SCHAFFER has developed this Quality Control / Quality Assurance (QC/QA) plan. Since the LADOTD is one of our primary clients, we have incorporated the QC/QA requirements of the LADOTD into this plan to produce quality roadway design documents. According to the LADOTD's Construction Plans Quality Control / Quality Assurance Manual, a quality set of plans should have the following characteristics (The 5 C's): complete, consistent, clear, correct, and constructible. Our goal is to meet the following requirements to achieve the desired result of a quality Roadway Design Service.

- LADOTD Roadway Design Procedures and Details
- The LADOTD Engineering Directives and Standards (EDSMs)
- The American Association of State Highway and Transportation Officials (AASHTO) Policy on Geometric Design of Highways and Streets
- AASHTO Roadside Design Guidelines.

The following QC/QA plan is proposed specifically for the Downing Pines Rd: Roundabout at Mane St and may be modified slightly upon the specified scope of the program and input from the LADOTD. The QC/QA Plan has been made to assure LADOTD that the Design Team understands the complexities associated with the program and are prepared to produce an accurate and complete submittal. The process ensures that quality Roadway Design Services will be provided, thus, minimizing issues.

### 1.1 Project Overview

The project requirements are to provide engineering and related services to design a roundabout at the intersection of Downing Pines Road, Mane Street, and Short Constitution Drive. The project may include Topographic Surveys, Traffic Control Design, Traffic Signal Analysis and Design, Preliminary and Final Roadway Design, Plan development and Cost Estimates, Hydraulic Analysis and Design, and Road Design Services During the Environmental Process.

### 1.2 Definition of Terms and Positions

The following sections provide the standard definitions of each position.

**Quality Control (QC):** Procedures for checking the accuracy and consistency of the roadway design documents, calculations and the design drawings, detecting and correcting omissions and errors before the documents are finalized.

**Quality Assurance (QA):** Procedures for reviewing the work to ensure the quality control procedures are in place and effective in preventing mistakes, and consistency in the development of roadway design documents. This includes the actions, procedures, and methods employed at the management and senior technical levels to observe and ensure that prudent quality procedures are in place and are being carried out and that the desired result of a quality product is achieved.

**Designer:** Engineer directly responsible for the development of roadway design plans, design calculations, conceptual drawings, and cost estimates. Must be either a licensed professional engineer or engineer intern.

**Design Checker:** Engineer responsible for performing a full technical review of the roadway design, study reports, design calculations, conceptual drawings, and cost estimates. Must be either a licensed professional engineer or engineer intern, however, if the designer is an engineer intern the design checker must be a professional engineer.

**Detailer:** Individual responsible for preparing drawings. This individual(s) is responsible for the development of the drawings through the use of required CAD technology.

**Reviewer:** Engineer or related professional responsible for ensuring that the QC process has been followed as outlined. The Reviewer is responsible for ensuring that submittals are complete and in accordance with applicable LADOTD practices, policies and procedures.

**Engineer of Record:** The engineer of record is the engineer responsible for supervision and/or preparation of roadway design plans, study reports, design calculations, conceptual drawings, and preliminary cost estimates. The engineer of record ensures the QA/QC certification is signed by all responsible parties. The engineer of record must be licensed by the State of Louisiana as a professional engineer and must have commensurate experience in the design of similar projects.

**Team Leader:** Project manager or task assignee responsible for overseeing the project and staff on the project. Responsible for conducting audits and ensuring quality control plans are adhered to for each discipline.

**Constructability Review:** A design review performed by the Contractor or appropriate construction services personnel to assess the feasibility of the proposed design from a construction perspective. For the purposes of this project and in accordance with the LADOTD provided scope of work, this will require a review of the design plans.

**Design Criteria:** Document agreed to by the LADOTD and Consultant prior to design that establishes the design guidelines and procedures to be used for the design of the project.

## **2. PROJECT TEAM AND RESPONSIBILITIES**

### **2.1 Responsibilities**

It is the sole responsibility of the NEEL-SCHAFFER, INC. staff performing work to be familiar with and implement the requirements of this QC/QA Plan. Conformance to the LADOTD directives, policies, guidelines and this QC/QA Plan will provide verifiable documentation that the work, as completed by our team meets or exceeds the quality standards set forth for this program. LADOTD is not responsible for performing QC/QA of our work.

NEEL-SCHAFFER, INC., shall have the responsibility for performing all services under this contract.

### **2.2 File Management**

All design plans, calculations, reports, and related documents; and CAD drawings will be created and modified on local servers and then uploaded to LADOTD ProjectWise folders with PDF copies for each submittal.

### **2.3 CAD**

All drawings shall be performed in MicroStation V8i SS2 and be CAD conformed to LADOTD standards.

### **2.4 Louisiana Department of Transportation and Development (LADOTD) Roles**

Quality control is the sole responsibility of the design team. NEEL-SCHAFFER shall be responsible for completing quality control in accordance with this document prior to all submissions. The LADOTD role shall be limited to providing comments on the substance provided and not reviewing the plans for errors and omissions.

### **3. DESIGN CRITERIA AND SOFTWARE**

The following sections discuss the Design Team's procedures for Design Criteria and Software determination.

#### **3.1 Design Criteria Report**

Once a notice to proceed has been issued, the design criteria report will be completed based on the current design guidelines, design technical memorandums, and current design specifications.

The design criteria report will be submitted to LADOTD for review and approval at the beginning of each task order project. Any design assumptions made or design waivers and exceptions required shall be listed in the design criteria and referenced in the calculations and drawings as appropriate.

#### **3.2 Software**

The design team shall adhere to LADOTD policies regarding software by using only design software which is pre-approved by the LADOTD. Design and drafting software to be used on each task order project shall be listed in the design criteria. In the event software has not been pre-approved by the LADOTD, the team shall adhere to the following stipulations in order to seek LADOTD approval of the software to be used.

A synopsis of the software shall be submitted to the Engineer Administrator for approval prior to use. The synopsis shall include the name of the software and the developer, a general description of the functions, and an account of the requester's experience and the experience of other organizations or agencies that use the software.

## 4. QUALITY MANAGEMENT PLAN

### 4.1 Quality Management Overview and Flowchart

A specific Quality Control/Quality Assurance process has been established for this program. This shall include studies and design reviews among the designated team responsible for the related work.

As discussed previously, the project Team consists of NEEL-SCHAFFER staff. NEEL-SCHAFFER, INC. shall provide QA of the deliverables that may include safety and traffic studies, safety & traffic analysis, and design plans and engineer's estimates.

Detailed procedures for QC and QA are described in the following sections.

### 4.2 Quality Control Process (QC)

QC is defined as the basic checking procedures for ensuring accuracy and completeness. The following are the standard checking formats for hard copy documents (such as hand calculations, program input files and plans) and electronic documents (such as word documents) that should be implemented for the QC processes.

#### **Safety & Traffic Study Documents, Design Calculations, and Plan Details**

Quality control starts with each NEEL-SCHAFFER, INC., team member. Each team member is responsible for reviewing all documents they produce prior to the document being checked. It is the responsibility of the Designer to develop and check the details and plans produced by the Detailers.

A copy of the original documents are retained or documented for all review activities. For checking of design programs or analysis software, a printout of the input and output should be provided to the Design Checker. The Design Checker is responsible for checking the input and reviewing the output to verify the calculations. In certain cases, the checker shall make independent calculations to check the design and calculations.

The appropriate Design Checker shall review the Safety/Traffic analysis, calculations, Safety/Traffic study report and other related documents for correctness and completeness and verify that the documents are properly reflected in the final deliverables.

- Items needing correction are **marked in red**.
- Correct items are **highlighted in yellow**.
- Correct full paragraphs (or pages) marked with a **yellow diagonal** or check mark.
- For software calculations, the input 100% checked with the controlling values of output files verified with hand calculations.

When the Design Checker is complete, all calculations and plans should be highlighted and sent back to the designer. Any discrepancies are to be resolved prior to completion of the calculation package and noted.

Upon completion of the submittal by the appropriate team member and Design Checker, the Reviewer shall review the documents along with the details used to develop the documents. The Reviewer is responsible for checking the documents for completeness and accuracy prior to a submittal. The Reviewer shall document their review.

- Agreement shown with a **green check mark ✓**
- Disagreement discussed **are shown in Blue.**
- The review is sent back to the producer. Any disagreements are to be resolved prior to completion of the submittal.

All reviews and comments shall be recorded and documented by the EOR.

### **4.3 Quality Assurance Process (QA)**

QA is defined as the procedures used to verify that the QC procedures are followed and used effectively to provide accurate and complete submittals. During the QC/QA process, the Reviewer is responsible for insuring that the QC process is complete and that the safety analysis, design calculations, drawings, special revisions, and preliminary cost estimates are in accordance with LADOTD Design practices, policies and procedures.

The Reviewer provides the team members with any concerns or deficiencies observed in the design and plans. These issues are resolved prior to submittals.

Upon completion of the QA process, the EOR verifies that the QC/QA certification is signed by all responsible parties. The EOR also assembles all calculation packages (if applicable) to send to the LADOTD and verifies that the responsible parties are shown accurately on the plans and calculations. The EOR is responsible for sealing the pertinent calculation packages and plans (if required) prior to submittal to LADOTD.

## **5. ESTIMATED DELIVERABLES AND CERTIFICATIONS**

NEEL-SCHAFFER, INC. shall be responsible for the Deliverables and certifications required for the Quality Management Plan. This shall include making sure that the project certifications and forms are adhered to and signed, along with delivering the documents to the LADOTD at the required submittal milestones.

### **5.1 Certifications and Forms**

NEEL-SCHAFFER, INC. shall create pertinent QC/QA forms for each task order issued under this project, and shall require that the QC/QA process is followed and the forms are signed by the responsible parties. NEEL-SCHAFFER, INC. shall document and file these forms for each deliverable where required.

### **5.2 Sealing of Plans**

The Engineer of Record (EOR) is the Louisiana-licensed professional engineer who is assigned by the supervisor or team leader to seal the calculation and conceptual plans, if required.

However, the EOR provides the last level of QC/QA prior to the submittal of design plans and is responsible for making sure the calculations, and plans are in good order.

## **APPENDIX**

The following items are included in the Appendix:

- Design Criteria Checklist
- Final Calculation Book Checklist
- QA Information Package Checklist
- QC/QA Certification
- Consultant Submittal QC/QA Certification
- Quality Audit Checklist
- Sample Check Print Stamps

## **Design Criteria Checklist**

Design Criteria for each project shall include, but not be limited to, the following sections.:

### \_\_\_\_\_ **Cover sheet**

The following information must be included on the cover sheet:

- LADOTD project number
- Project name
- Revision date
- The Supervisor or Team Leader's signature and date

### \_\_\_\_\_ **Governing Design and Construction Specifications and Other References**

A list of governing design and construction specifications and other references used for the project shall be included in this section. The edition number, interim revisions, and/or publication date must be specified for each reference.

### \_\_\_\_\_ **Design Assumptions and Design Expectations**

All design assumptions and required design waivers and exceptions received must be included in this section along with supporting documents.

### \_\_\_\_\_ **General Information**

The general information as listed below should be included in this section:

- Bridge information (no. of bridges, bridge clear width, length, no. of lanes, lane width, shoulder width, etc.)
- Road information (roadway classifications, design speed, traffic data, etc.)
- Vertical datum
- Vertical and horizontal clearances
- Hydraulic design information (design water elevations, scour depth and scour elevation, etc.)
- Other relevant information

### \_\_\_\_\_ **Design Factors**

The ductility factor  $\eta_D$ , redundancy factor  $\eta_R$ , and operational importance factor  $\eta_I$  shall be listed in this section.

### \_\_\_\_\_ **Design Loads**

All design loads (dead load, live load, wind load, thermal loads, vessel collision loads, seismic load, wave loads, etc.) used for the project shall be included in this section.

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### **Limit States**

All applicable limit states for this project shall be listed in this section.

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### **Bridge Barrier**

The design criteria, types, and test levels for bridge barriers shall be listed in this section. Standard plans and special details should be listed if they are utilized.

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### **Guardrail**

The design criteria, types, and test levels for guardrails shall be listed in this section. Standard plans and special details should be listed if they are utilized.

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### **Approach Slab**

Design criteria for approach slab shall be included in this section. Standard plans and special details should be listed if they are utilized.

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### **Deck and Deck Drainage**

All design criteria for deck and deck drainage design shall be included in this section. Standard plans and special details should be listed if they are utilized.

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### **Bearing**

All bearing types and design criteria for each bearing type shall be included in this section. Standard plans and special details should be listed if they are utilized.

---

### **Joint**

All joint types and design criteria for each type shall be included in this section. Standard plans and special details should be listed if they are utilized.

---

### **Superstructure**

All superstructure types and design criteria for each type shall be included in this section. Standard plans and special details should be listed if they are utilized.

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### **Substructure**

All substructure types and design criteria for each type shall be included in this section. Standard plans and special details should be listed if they are utilized.

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### **Piles and Drilled Shafts**

All pile types, sizes, and structural design criteria shall be included in this section. Standard plans and special details should be listed if they are utilized.

\_\_\_\_\_ **Geotechnical Design**

All geotechnical design shall be included in this section. Standard plans and special details should be listed if they are utilized.

\_\_\_\_\_ **Mechanical Design**

All mechanical design criteria shall be included in this section if applicable. Standard plans and special details should be listed if utilized.

\_\_\_\_\_ **Electrical Design**

All electrical design criteria shall be included in this section if applicable. Standard plans and special details should be listed if they are utilized.

\_\_\_\_\_ **As-Designed Bridge Rating Criteria**

All as-designed bridge rating criteria shall be included in this section.

## **Final Calculation Book Checklist**

The final calculation book for each project shall include, but not limited to, the following sections.:

\_\_\_\_\_ **Cover Sheet**

The following information must be included on the cover sheet:

- LADOTD project number
- Project name
- The title of “Final Calculation Book”
- The EOR’s seal with signature and date

\_\_\_\_\_ **Final Calculation Book Check List**

\_\_\_\_\_ **QC/QA Certifications**

\_\_\_\_\_ **Peer Review Resolution Agreement (if peer review is performed)**

\_\_\_\_\_ **Design Criteria**

\_\_\_\_\_ **Final Hydraulic Analysis Report from Hydraulic Engineer**

\_\_\_\_\_ **Final Geotechnical Analysis Report from Geotechnical Engineer**

\_\_\_\_\_ **Superstructure Design Calculations**

\_\_\_\_\_ **Substructure Design Calculations**

\_\_\_\_\_ **Quantity Calculations**

\_\_\_\_\_ **Special Provisions/NS-Items**

\_\_\_\_\_ **Preliminary Construction Cost Estimate**

\_\_\_\_\_ **As-Designed Rating Report**

\_\_\_\_\_ **List of All Final Electronic Design Files and File Locations (Server location & directory name)**

Consultants shall submit the final calculation book to LADOTD bridge task managers; the submittal shall be on a CD or Flash Drive or placed to a designated ProjectWise folder including the following information:

\_\_\_\_\_ **A PDF File of the Calculation Book**

\_\_\_\_\_ **All Electronic Design Files**

\_\_\_\_\_ **A PDF File of the As-Designed Rating Report Only**

## QA Information Package Checklist

Contract No.: 4400032380

Project Description: Downing Pines Rd: Roundabout at Mane St

\_\_\_\_\_ Calculation Book

\_\_\_\_\_ Plans

\_\_\_\_\_ Special Provisions

\_\_\_\_\_ Cost Estimate

\_\_\_\_\_ Other Documents \_\_\_\_\_

### QC/QA Certification

Contract No.: 4400032380  
 Project Description: Downing Pines Rd: Roundabout at Mane St

We, the undersigned designers, detailers, checkers and reviewers for this project, have reviewed and accepted the calculations, plans, quantities, special provisions, and cost estimate prepared for the project. We certify that the work for which we are responsible has been completed in accordance with the LADOTD procedures related to QC/QA.

Team Members	Name	PE Registration No.	Responsible Plan Sheets	Responsible Special Provisions	Construction Cost Estimate	Signature
<b>Designers</b>						
<b>Checkers</b>						
<b>Detailers</b>						
<b>Detail Checkers</b>						
<b>Reviewers</b>						
<b>EOR</b>						

**Consultant Submittal QC/QA Certification**

Contract No.: 4400032380  
Project Description: Downing Pines Rd: Roundabout at Mane St

I, the undersigned Supervisor or Team Leader for this project, certify that the information included in this submittal has been prepared in accordance with the QC/QA plan documents and LADOTD procedures related to QC/QA and the information presented is accurate and meets the requirements of this submittal. All CAD drawings meet LADOTD CAD standards.

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Submittal Description

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Supervisor or Team Leader Name

---

Signature

---

Date

### Quality Audit Checklist

<b>AUDITED AREA:</b>		<b>DATE(S) OF AUDIT:</b>	
<b>AUDITOR:</b>		<b>AUDIT:</b>	
AUDIT ITEM	METHOD OF VERIFICATION	CONFORMS	
		YES	NO
1. Have computer programs utilized been validated?	Review validation records.		
2. Are calculation check prints available?	Review originals and check prints.		
3. Were calculations checked prior to drawing checking?	Review check prints.		
4. Are drawing check prints available?	Review record set and check prints.		
5. Are check prints of specifications available?	Review record set and check prints.		
6. Is checking of input to computer programs being accomplished?	Review originals and check prints		
7. Are check prints of studies or report-type documents available?	Review check prints.		
8. Are procedures for marking up check prints being followed? Checker - Yellow/Red Backchecker – Green/Blue	Review check prints.		
10. Are check prints properly signed and dated?	Review check prints.		
11. Are plan reviews completed?	Review package to verify that comment sheets are available.		
12. Are the review comments incorporated into the final documents or disposed of as otherwise noted?	Review for verification that Design Reviews comments have been incorporated. Review for verification that comments from prior Design Reviews have been incorporated.		

13. Are check prints of graphic elements available?	Review check prints.		
14. Are all checklists validated?	Review check prints.		

### Sample Check Print Stamps

Stamp shown is for example purposes only and actual stamp used may vary.

**CHECKING PRINT**

**Checked by \_\_\_\_\_ Date \_\_\_\_\_**

**Back Checked by \_\_\_\_\_ Date \_\_\_\_\_**

**Corrected by \_\_\_\_\_ Date \_\_\_\_\_**

**Tracing Signed by \_\_\_\_\_ Date \_\_\_\_\_**

# ATTACHMENT D

## DBE FORM 1

Louisiana Department of Transportation and Development  
DBE Participation **Monthly** Report

Contract No.	44	Invoice No.	
State Project No. / Task Order No.	H.	Report period begin date	
Prime Consultant		Report period end date	

LA UCP Certified DBE Prime and/or Sub-Consultant	Services performed this period	\$ amount invoiced this period	\$ total invoiced to date
<b>Totals:</b>			

Authorized Prime Consultant signature			
Typed or printed name		Date	
Title		Phone No.	

DOTD Project Manager has reviewed this form: \_\_\_\_\_ date \_\_\_\_\_  
DOTD Project Manager signature

This report shall be submitted **monthly** to the DOTD Project Manager with the current month's invoice. Questions should be directed to the DOTD Compliance Programs Section at (225) 379-1382.

# ATTACHMENT E

## DBE FORM 2

Louisiana Department of Transportation and Development  
DBE Participation **Final** Report

Contract No.	44	DBE Goal %	
State Project No. / Task Order No.	H.	Contract amount	\$
Prime Consultant			

LA UCP Certified DBE Prime and/or Sub-Consultant	Services performed	Total dollar amount paid to DBE
<b>Total:</b>		\$

Authorized Prime Consultant signature			
Typed or printed name		Date	
Title		Phone No.	

DOTD Project Manager has reviewed this form: \_\_\_\_\_ date

DOTD Project Manager signature

This report shall be submitted with the **final** invoice to the DOTD Project Manager. Questions should be directed to the DOTD Compliance Programs Section at (225) 379-1382.