BOARD OF SUPERVISORS **MADISON COUNTY, MISSISSIPPI**

Department of Engineering
Tim Bryan, P.E., PTOE, County Engineer

3137 South Liberty Street, Canton, MS 39046
Office (601) 855-5582 FAX (601) 859-5857

MEMORANDUM

November 26, 2024

To: Casey Brannon, Supervisor, District I
Trey Baxter, Supervisor, District II
Gerald Steen, Supervisor, District III
Karl Banks, Supervisor, District IV
Paul Griffin, Supervisor, District V

From: Tim Bryan, P.E., PTOE
County Engineer

Re: Professional Services Agreement
Weisenberger Road from Highway 51 to Parkway East

The Engineering Department requests approval of the design contract with Neel Schaffer Inc for the design of the Weisenberger Road from Highway 51 to Parkway East Project for a fee not to exceed $1,428,952.00 and to authorize the Board President to sign the contract.

AGREEMENT FOR PROFESSIONAL SERVICES

BETWEEN

Madison County

AND

NEEL-SCHAFFER, INC.

This is an Agreement made on _____, 2024, between the Madison County Board of Supervisors, Madison County, Mississippi, the **OWNER**, and **NEEL-SCHAFFER, INC.**, the **ENGINEER.**

The **OWNER** intends to improve the Weisenberger Road from the intersection of MS Hwy 51 to Parkway East, which is described in more detail in **Exhibit A, *Project Description*,** and hereinafter called the "**Project**."

Exhibit B contains the "**Scope of Design Phase Services**" while the "**Project Schedule**" is contained in **Exhibit C**. Compensation is detailed in **Exhibit D**," **Payment to Engineer**". This AGREEMENT does not include the following services:

- Right of Way Maps, Deeds and Descriptions.
- Appraisals and Right of Way Acquisition services.

The **OWNER** and the **ENGINEER,** in consideration of the mutual covenants herein, agree with respect to the performance of professional engineering services by the **ENGINEER** relative to the **Project** and the payment for these services by the **OWNER** as set forth herein.

SECTION 1 — BASIC SERVICES OF ENGINEER

1.1 **ENGINEER** shall provide for **OWNER** professional engineering services for all phases of the **Project** to which this **Agreement** applies as hereinafter provided. These services will include serving as **OWNER**'s professional engineering representative for the **Project**, providing consultation and advice and furnishing customary engineering services.

1.2 By execution of this **Agreement**, **OWNER** authorizes **ENGINEER** to provide Basic Services for the Design Phase of the **Project** in accordance with **Exhibit B, "Scope of Design Phase Services."**

SECTION 2 — ADDITIONAL SERVICES OF ENGINEER

If authorized in writing by **OWNER**, **ENGINEER** shall provide, or obtain from other qualified persons or firms, Additional Services which are not included as part of the Basic Services specified in Section 1. Additional Services shall include, but are not limited to, the following:

2.1. Services resulting from significant changes in the general scope, extent or character of the **Project** designed or specified by **ENGINEER** or its design including, but not limited to, changes in size, complexity, **OWNER's** schedule, character of construction or method of financing; and revising previously accepted studies, reports, design documents or Contract Documents when such revisions are required by changes in laws, rules, regulations, ordinances, codes or orders enacted subsequent to the preparation of such studies, reports or documents, or are due to any other causes beyond **ENGINEER's** control.

2.2. Preparing documents for alternate bids requested by **OWNER** for Contractor's work which is not executed or documents for out-of-sequence work.

2.3. Services resulting from the award of more than one separate prime contract for construction, materials or equipment for the **Project** unless multiple awards were contemplated and included as part of Basic Services in Section 1.

2.4. Assistance in connection with rebidding or renegotiating contracts for construction which involve modifying the Contract Documents to revise the **Project's** general scope, extent or character as necessary to reduce or increase the Construction Cost to bring it within the cost limit.

2.5. Preparing to serve or serving as a consultant or witness for **OWNER** in any litigation, arbitration or other legal or administrative proceeding involving the **Project**.

2.6. Services in making revisions to Contract Documents occasioned by the acceptance of

substitutions proposed by Contractor; and services after the award of the construction contract in evaluating and determining the acceptability of an unreasonable or excessive number of substitutions proposed by Contractor.

2.7. Services resulting from significant delays in Project schedule which occurred through no fault of **ENGINEER**.

2.8. Additional or extended services during construction made necessary by (a) work damaged by fire or other cause during construction; (b) a significant amount of defective, neglected or delayed work of Contractor or supplier; (c) protracted or extensive assistance in the startup or utilization of any equipment or system; (d) acceleration of the progress schedule involving services beyond normal working hours; and (e) default or bankruptcy by Contractor.

2.9. Services during out-of-town travel required of **ENGINEER** other than visits to the **Project** site or **OWNER's** office.

2.10. Additional Services in connection with the **Project**, including services which are to be furnished by **OWNER** in accordance with Section 3 and services not otherwise provided for in Basic Services as specified in Section 1 of this **Agreement**.

SECTION 3 — OWNER's RESPONSIBILITIES

OWNER shall do the following in a timely manner so as not to delay the services of **ENGINEER** and bear all costs incident thereto:

3.1. Designate in writing a person to act as **OWNER's** representative with respect to the services to be rendered under this **Agreement**. Such person shall have complete authority to transmit instructions and receive information, with respect to **ENGINEER's** services for the **Project**.

3.2. Provide all criteria and full information as to **OWNER's** requirements for the **Project**, including design objectives and constraints; space, capacity and performance requirements; and flexibility, expendability, and any budgetary limitations. Also furnish copies of additional design and construction standards which **OWNER** will require to be included in the Contract Documents.

3.3. Assist **ENGINEER** by placing at **ENGINEER's** disposal available information pertinent to the **Project** including previous reports; geotechnical information; utility locations; property descriptions, zoning, deed and other land use restrictions; and any other data relative to design or construction of the **Project**. **ENGINEER** shall not be liable for any claims for injury or loss arising from errors, omissions or inaccuracies in documents or other information provided by the **OWNER**.

3.4. Arrange for access to and make all provisions for **ENGINEER** to enter upon public and private property as required for **ENGINEER** to perform services under this **Agreement**.

3.5. Examine studies, reports, sketches, drawings, specifications, proposals and other documents presented by **ENGINEER** and render in writing decisions pertaining thereto within a reasonable time so as not to delay the services of **ENGINEER**.

3.6. Acquire property for easements and rights-of-way required for construction of the **Project**.

3.7. Give prompt written notice to **ENGINEER** whenever **OWNER** observes or otherwise becomes aware of any development that affects the scope or timing of **ENGINEER's** services, or any defect or nonconformance in the work of the **ENGINEER** or of any Contractor.

SECTION 4 — PERIOD OF SERVICE

4.1. The provisions of this Section 4 and the various rates of compensation for **ENGINEER's** services provided for elsewhere in this **Agreement** have been agreed to in anticipation of the orderly and continuous progress of the **Project** through completion of all phases to which this **Agreement** applies. Specific periods of time and/or completion dates for rendering services are set forth in **Exhibit C, "Project Schedule."**

4.2. If **OWNER** requests modifications or changes in the scope, extent or character of the **Project**, or if periods of time and/or completion dates are exceeded through no fault of **ENGINEER**, the period of service and amount of compensation for **ENGINEER's** services shall be adjusted equitably.

4.3. In the event that the work designed or specified by **ENGINEER** is to be performed under more than one prime construction contract, the period of service and/or amount of compensation for **ENGINEER's** services shall be adjusted equitably unless multiple awards were contemplated and included as part of Basic Services in Section 1.

SECTION 5 — PAYMENTS TO ENGINEER

5.1. **Methods of Payment**. **OWNER** shall pay **ENGINEER** for Basic Services rendered under Section 1 and Additional Services rendered under Section 2 in accordance with the provisions of **Exhibit D, "Payments to Engineer."**

5.2. **Times of Payment**. **ENGINEER** shall submit monthly statements for Basic and Additional Services rendered. For lump sum and percentage methods of payment, statements will be based upon **ENGINEER's** estimate of the proportion of the total services actually completed at the time of billing. For cost-plus-fixed-fee method of payment, the amount of fixed fee billed will be based on the proportion of the

costs incurred at the time of billing to the maximum allowable costs established for this **Agreement**. **OWNER** shall make prompt monthly payments in response to **ENGINEER's** monthly statements.

5.3. **Delinquent Payments**. The **OWNER** recognizes time is critical with respect to payment of the **ENGINEER's** statements, and that timely payment is a material part of the consideration of this **Agreement**. **ENGINEER's** statements shall be due and payable within 30 calendar days of statement date. If **OWNER** objects to all or any portion of an invoice, **OWNER** shall notify the **ENGINEER** within 14 calendar days of the invoice date, identify the cause of the disagreement and pay when due that portion of the statement not in dispute. If **OWNER** fails to make any payment due **ENGINEER** for services and expenses, excepting any portion of the statement in dispute, within 60 calendar days after receipt of **ENGINEER's** statement, the amounts due **ENGINEER** shall include a charge at the rate of one percent per month from the 60th day unless special arrangements have been previously made and agreed to by both parties in writing. Payment will be credited first to interest and then to principal. In the event of a disputed or contested billing, only that portion so contested may be withheld from payment, and the undisputed portion will be paid.

5.4. **Termination Payment**. In the event of termination by **OWNER** or **ENGINEER** under Paragraph 6.2, **OWNER** shall pay **ENGINEER** for services and expenses provided to date of termination in accordance with the methods of payment specified in Paragraph 5.1.

5.5. **Records of Costs**. Records of costs pertinent to **ENGINEER's** compensation will be kept in accordance with generally accepted accounting principals. **ENGINEER** is only obligated to maintain these records for a period of three years following date of final payment for services rendered under this **Agreement**.

SECTION 6 — GENERAL TERMS AND CONDITIONS

6.1. **Construction Cost.**

6.1.1. **Opinions of Cost**. Since **ENGINEER** has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions, **ENGINEER's** opinions of probable Construction Cost provided for herein are to be made on the basis of experience and qualifications and represent **ENGINEER's** best judgment as an experienced and qualified professional, generally familiar with the construction industry; but **ENGINEER** cannot and

does not guarantee that proposals, bids or actual Construction Cost will not vary from opinions of probable cost prepared by **ENGINEER**.

6.1.2. **Construction Cost Budget**. If a Construction Cost budget is established by written agreement between **OWNER** and **ENGINEER** and specifically set forth in this **Agreement** as a condition thereto, the following will apply:

6.1.2.1. The acceptance by **OWNER** at any time during the provision of services under this **Agreement** of a revised opinion of probable Construction Cost in excess of the then established budget will constitute a corresponding revision in the Construction Cost budget to the extent indicated in such revised opinion.

6.1.2.2. Any Construction Cost budget so established will include a contingency of 10 percent unless another amount is agreed upon in writing.

6.1.2.3. **ENGINEER** will be permitted to determine what materials, equipment, component systems and types of construction are to be included in the Contract Documents and to make reasonable adjustments in the extent of the **Project** to bring it within the budget.

6.1.2.4. If proposals or bids have not been obtained within six months after completion of the Design Phase, the established Construction Cost budget will not be binding on **ENGINEER**, and **OWNER** shall consent to an adjustment in such cost limit commensurate with any applicable change in the general level of prices in the construction industry between the date of completion of the Design Phase and the date on which proposals or bids are sought.

6.1.2.5. Use of an estimated or actual Construction Cost of the project as a basis of payment to the **ENGINEER** shall not be construed to mean that a Construction Cost budget has been established for the **Project**.

6.2. **Termination**. The obligation to provide further services under this **Agreement** may be terminated by either party upon 30 calendar days' written notice in the event of substantial failure by the other party to perform in accordance with the terms hereof through no fault of the terminating party.

6.3. **Suspension**. Upon 14 calendar days' written notice to the **ENGINEER**, the **OWNER** may suspend the **ENGINEER's** work. Suspension for any reason exceeding 60 calendar days shall, at the **ENGINEER's** option, make this **Agreement** subject to re-negotiation or termination as provided for elsewhere in this **Agreement**. Any suspension shall extend the period of service in a manner that is satisfactory to both the **OWNER** and the **ENGINEER**.

6.4. **Ownership and Reuse of Documents**.

6.4.1. Contract Documents and reports prepared by **ENGINEER** pursuant to this **Agreement**

shall be the property of the **OWNER**. **ENGINEER** shall have the right to retain copies of all documents for his files.

6.4.2. Contract Documents prepared or furnished by **ENGINEER** and **ENGINEER's** independent professional associates and consultants, pursuant to this **Agreement** are instruments of service with respect to the **Project**. These documents are not intended or represented to be suitable for reuse by **OWNER** or others on extensions of the **Project** or on any other project. Any reuse without written verification or adaptation by **ENGINEER** for the specific purpose intended will be at **OWNER**'s sole risk and without liability or legal exposure to **ENGINEER**, or to **ENGINEER's** independent professional associates or consultants. **OWNER** shall indemnify and hold harmless **ENGINEER** and **ENGINEER's** independent professional associates and consultants from all claims, damages, losses and expenses including attorneys' fees arising out of or resulting therefrom. Any such verification or adaptation will entitle **ENGINEER** to further compensation at rates to be agreed upon by **OWNER** and **ENGINEER**.

6.5. **Insurance**.

6.5.1. The **ENGINEER** maintains workers' compensation insurance coverage and unemployment compensation coverage in an amount as required by state law; comprehensive general liability insurance with maximum limits of $500,000/$1,000,000; automotive liability insurance with maximum limits of $500,000/ $500,000; and professional liability insurance with an annual limit of $500,000.

6.6. **Personnel and Facilities**. The **ENGINEER** has, or will secure at his own expense, personnel, equipment and other materials and supplies required to perform the services under this **Agreement** within the period of service set forth in Section 4. **ENGINEER** may subcontract a portion of these services, but these Subcontractors shall be subject to written approval by the **OWNER**. Such personnel shall not be employees of nor have contractual relationship with the **OWNER**.

6.7. **Accounting System**. The **ENGINEER** shall maintain an accounting system which accounts for costs in accordance with generally accepted accounting principles. The **OWNER** reserves the right to audit the **ENGINEER's** accounts which relate to services provided under this **Agreement**.

6.8. **Successors and Assigns**. Neither **OWNER** nor **ENGINEER** shall assign any interest in this **Agreement** without the prior written consent of the other and in no case shall assignment relieve assignor from liability under this **Agreement**. This **Agreement** shall bind the successors and legal representatives of both parties. Nothing in this

Agreement shall give any rights or benefits to anyone other than **OWNER** and **ENGINEER**.

6.9. **Relationship**. The **OWNER** has retained **ENGINEER** to provide professional services. These parties have not entered into any joint venture or partnership with the other. The **ENGINEER** is not to be considered the agent of the **OWNER**.

6.10. **Standard of Care**. The **ENGINEER** will ~~strive~~ to perform services under this Agreement in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other representation, express or implied, and no warranty or guarantee is included or intended in this Agreement, or in any report, opinion, document or otherwise.

6.11. **Indemnification**.

6.11.1. To the fullest extent permitted by law, the **ENGINEER** agrees to hold harmless and indemnify **OWNER** from and against liability arising out of **ENGINEER's** negligent performance of professional services under this **Agreement**. To the fullest extent provided by law, the **OWNER** agrees to hold harmless and indemnify **ENGINEER** from and against liability arising out of **OWNER**'s negligence.

6.11.2. The **OWNER** shall not be liable to the **ENGINEER** and the **ENGINEER** shall not be liable to the **OWNER** for any special, incidental or consequential damages, including, but not limited to, loss of use and loss of profit, incurred by either party due to the fault of the other, regardless of the nature of this fault, or whether it was committed by the **OWNER**, or the **ENGINEER** or their employees, agents or subcontractors.

6.12. **Recovery of Dispute Resolution Costs**. In the event that legal action is brought by either party against the other, the prevailing party shall be reimbursed by the other for the prevailing party's legal costs, in addition to whatever other judgments or settlement amounts, if any, may be due.

6.13. **Compliance with Codes and Standards**. The **ENGINEER's** professional services shall incorporate those publicly announced federal, state and local laws, regulations, codes and standards that are applicable at the time the services are rendered. In the event of a change in a law, regulation, et al., the **ENGINEER** shall assess its impact. If~~, in the,~~ the impact is such to significantly affect the **ENGINEER's** compensation or the period of service, then the compensation and/or period of service can be renegotiated.

6.14. **Force Majeure**. Neither **OWNER** nor **ENGINEER** shall be liable for faults or delays caused by any contingency beyond his control, including, but not limited to, acts of God, wars, strikes, walkouts,

fires, natural calamities, or demands or requirements of governmental agencies.

6.15. **Separate Provisions**. If any provisions of this **Agreement** are held to be invalid or unenforceable, the remaining provisions shall be valid and binding.

6.16. **Hazardous Materials.**

6.16.1.1. When hazardous materials are known, assumed or suspected to exist at a project site, **ENGINEER** is required to take appropriate precautions to protect the health and safety of his personnel, to comply with the applicable laws and regulations and to follow procedures deemed prudent to minimize physical risks to employees and the public. **OWNER** hereby warrants that, if he knows or has any reason to assume or suspect that hazardous materials may exist at the project site, he will inform **ENGINEER** in writing prior to initiation of services under this **Agreement**.

6.16.1.2. Hazardous materials may exist at a site where there is no reason to believe they could or should be present. **OWNER** agrees that the discovery of unanticipated hazardous materials constitutes a changed condition mandating a renegotiation of the scope of work or termination of services. **ENGINEER** agrees to notify **OWNER** as soon as practically possible should unanticipated hazardous materials or suspected hazardous materials be encountered.

6.17. **Subsurface Conditions and Utilities**.

6.17.1. The **OWNER** recognizes that a comprehensive sampling and testing program implemented by trained and experienced personnel of **ENGINEER**, or **ENGINEER's** subconsultants, with appropriate equipment may fail to detect certain hidden conditions. The **OWNER** also recognizes that actual environmental, geological and geotechnical conditions that **ENGINEER** properly inferred to exist between sampling points may differ significantly from those that actually exist.

6.17.2. **ENGINEER** will locate utilities which will affect the **Project** from information provided by the **OWNER** and utility companies and from **ENGINEER's** surveys. In that these utility locations are based, at least in part, on information from others, **ENGINEER** cannot and does not warrant their completeness and accuracy.

6.18. **Anticipated Change Orders**. **OWNER** recognizes and expects that a certain amount of imprecision and incompleteness is to be expected in Contract Documents; that all details of a completed project are not intended to be covered in the Contract Documents; that a certain amount of errors, omissions, ambiguities and inconsistencies are to be expected in Contract Documents; that contractors are expected to furnish and perform work, materials and equipment that may reasonably be inferred from the Contract

Documents or from the prevailing custom or trade usage as being required to produce the intended result whether or not specifically called for; and that a certain amount of Change Orders are to be expected. –In no case will **OWNER** make claim against **ENGINEER** for costs incurred if the Change Order work is a necessary part of the **Project** for which **OWNER** would have incurred costs if work had been included originally in the Contract Documents unless **OWNER** can demonstrate that such costs were higher through issuance of the Change Order than they would have been if originally included in the Contract Documents in which case any claim of **OWNER** against **ENGINEER** will be limited to the cost increase and not the entire cost of the Change Order.

6.19. **Value Engineering.** If the **OWNER** retains the services of a **VALUE ENGINEER (VE)** to review the Contract Documents prepared by the **ENGINEER**, it shall be at the **OWNER's** sole expense and shall be performed in a timely manner so as not to delay the orderly progress of the **ENGINEER's** services. The OWNER shall promptly notify the ENGINEER of the identity of the **VE** and shall define the **VE's** scope of services and responsibilities for the **ENGINEER**. All recommendations of the **VE** shall be given to the **ENGINEER** for review, and adequate time will be provided to the **ENGINEER** to respond to these recommendations. If the **ENGINEER** objects to any recommendations made by the **VE**, it shall so state in writing to the **OWNER**, along with the reasons for objecting. If the **OWNER** requires the incorporation of changes in the Contract Documents to which the **ENGINEER** has objected, the **OWNER** agrees, to the fullest extent permitted by law, to waive all claims against the **ENGINEER** and to indemnify and hold harmless the **ENGINEER** from any damages, liabilities or costs, including reasonable attorneys' fees and costs of defense, which arise in connection with or as result of the incorporation of such changes required by the **OWNER**. In addition, the **ENGINEER** shall be compensated for services necessary to incorporate recommended **VE** changes into reports, drawings, specifications, bidding or other documents. The **ENGINEER** shall be compensated as Additional Services for all time spent to prepare for, review and respond to the recommendations of the **VE**. The **ENGINEER's** time for performance of its services shall be equitably adjusted.

6.20. **Affirmative Action.** During the performance of this **Agreement,** the **ENGINEER** agrees to take affirmative action to ensure that applicants are employed, and employees are treated during employment, without regard to their race, color, religion, sex or national origin.

6.21. **Conflicts**. In the event of a conflict between the main text of this **Agreement** and any appendix thereof, provisions of the main text shall govern.

6.22. **Governing Law**. The laws of the State of Mississippi will govern the validity of this **Agreement**, its interpretations and performance, and remedies for any claims related to this **Agreement**.

6.23. **Separate Provisions**. If any provisions of this **Agreement** are held to be invalid or unenforceable, the remaining provisions shall be valid and binding.

6.24. The **ENGINEER** authorizes Stan Wright, P.E., Registered Professional Engineer No. 27065 in the State of Mississippi, to act on his behalf for this **Project**.

SECTION 7 — DEFINITIONS

As used herein, the following words and phrases have the meanings indicated, unless otherwise specified in various sections of this Agreement:

7.1. **Addenda**. Written or graphic instruments issued prior to the opening of bids which clarify, correct or change the bidding documents or the Contract Documents.

7.2. **Agreement**. This contract including all exhibits and documents included by reference.

7.3. **Application for Payment**. The form accepted by **ENGINEER** which is to be used by Contractor in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

7.4. **Bid**. The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the construction work to be performed.

7.5. **Change Order**. A document recommended by **ENGINEER** which is signed by Contractor and **OWNER** and authorizes an addition, deletion or revision in the construction work, or an adjustment in the contract

price or the contract time, issued on or after the effective date of the construction contract.

7.6. **Contract Documents**. The drawings and specifications, addenda, and other documents required to obtain bids from contractors for construction of the **Project**.

7.7. **Contractor**. The person, firm or corporation with whom **OWNER** has entered into a contract for construction of the **Project**.

7.8. **Construction Cost**. Total cost of entire **Project** to **OWNER** not including **ENGINEER's** compensation and expenses, cost of land and rights-of-way, or compensation for or damages to properties, unless this **Agreement** so specifies; nor will it include **OWNER's** legal, accounting, insurance counseling or

auditing services, or interest and financing charges incurred in connection with the **Project** or the cost of services to be provided by others to **OWNER** pursuant to Section 3 of this **Agreement**.

7.9. **Direct Labor Costs**. Salaries and wages paid to **ENGINEER's** personnel engaged directly on the **Project**, including engineers, draftsmen, technicians, designers, surveyors, resident project representatives and other technical and administrative personnel; but does not include indirect payroll related costs or fringe benefits.

7.10. **Drawings**. The drawings which show the character and scope of the **Project** and which have been prepared or approved by **ENGINEER** and are referred to in the Contract Documents.

7.11. **Reimbursable Expenses**. Actual expenses incurred by **ENGINEER** directly in connection with providing services for the **Project**. These include, but are not limited to, transportation and subsistence; reproduction and printing; communications; postage and express mail; equipment rental; and expense of computers and other specialized equipment.

7.12. **Resident Project Representative**. The authorized representative of **ENGINEER** who is assigned to the construction site or any part thereof for the purpose of observing the performance of the work of the Contractor.

7.13. **Shop Drawings**. All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for Contractor to illustrate some portion of the work and all illustrations, brochures, standard schedules and other information prepared by a Supplier and submitted by Contractor to illustrate material or equipment for some portion of the **Project**.

7.14. **Specifications**. Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the **Project** and certain administrative details applicable thereto.

7.15. **Subcontractor**. An individual, firm or corporation having a direct contract with Contractor or with any other subcontractor for the performance of a part of the **Project** at the site.

7.16. **Supplier** A manufacturer, fabricator, supplier, distributor, material man or vendor of products or equipment used in construction of the project.

SECTION 8 — SPECIAL PROVISIONS AND EXHIBITS

8.1. This **Agreement** is subject to the following Special Provisions.

8.2. The following Exhibits are attached to and made a part of this **Agreement**.

8.2.1. Exhibit A, "Project Description."

8.2.2. Exhibit B, "Scope of Design Phase Services."

8.2.3. Exhibit C, "Project Schedule."

8.2.4. Exhibit D, "Payments to Engineer."

8.3. This **Agreement**, consisting of Pages 1 to 16, inclusive, together with the Exhibits identified above, constitute the entire agreement between **OWNER** and **ENGINEER** and supersede all prior written and oral understandings. This **Agreement** and said Exhibits may only be amended, supplemented, modified or canceled through a duly executed written instrument.

IN WITNESS WHEREOF, the parties hereto have made and executed this **Agreement** as of the day and year first written above.

OWNER: MADISON COUNTY	**ENGINEER: NEEL-SCHAFFER, INC.**
BY: _____	**BY:** _____
TITLE: _____	**TITLE:** _____
WITNESS: _____	**WITNESS:** _____
_____	_____

EXHIBIT A

PROJECT DESCRIPTION

Madison County is experiencing tremendous growth in all aspects of economic development. While growth is desired and brings with it many advantages for the overall area, it can bring traffic issues that must be addressed for both the current and projected county needs. The Gluckstadt Road, Weisenberger Road, and Yandell Road areas continue to experience rapid commercial and residential growth that has pushed roads beyond the limits of their capacity. This project has received federal funding and will be administered by MDOT through its LPA process.

The intent of the project, as we understand it, is to improve Weisenberger Road, through the study area, to provide to capacity efficiently convey design year traffic volumes. This project will consist of widening the existing roadway to a 5-lane section from 200 ft west of Highway 51 to Parkway East including any needed geometric improvements at both intersections. There is a bridge within this segment that will be widened as part of the project. There are two existing signalized intersections. They are located at the termini of the project, U.S. 51 and Parkway East. There is also an at-grade intersection with CN Railroad.

Engineering services required for this project include project management, environmental studies/permitting, capacity analysis, field surveys, geotechnical investigations, centerline soil profiles, conceptual plans, profile grades, plan-profile sheets, hydraulic design (bridge and roadway), bridge layouts, structural design of bridges and appurtenances, permanent signing plans and details, traffic signal plans, roadway right of way plans, final bridge and roadway construction plans (PS&E), utility coordination, CN Rail Coordination bidding services, and other roadway related services including coordination with engineers designing adjacent segment(s) of road.

The initial phase will be to prepare an environmental assessment which will include the assessment of all feasible and prudent alternatives, required environmental studies, coordination with stake holders, public involvement, conceptual design, and documentation in accordance with the policies and procedures of the Mississippi Department of Transportation (MDOT), the Federal Highway Administration (FHWA), and the National Environmental Policy Act (NEPA).

EXHIBIT B

SCOPE OF SERVICES

Weisenberger Road Improvements
Madison County
Project No. STP-6989-00(003)LPA/109648-7011000

The following engineering services shall be performed by the CONSULTANT on behalf of the Local Public Agency (LPA) in accordance with this CONTRACT at the direction of the LPA, unless otherwise modified by the Mississippi Department of Transportation (MDOT).

A project schedule is attached. Work progression is to proceed in accordance with the attached agreed project schedule. The following engineering services shall be performed by the CONSULTANT in accordance with this CONTRACT and the latest Project Development Manual (PDM) for the LPA at the time of the execution of this contract. Where this CONTRACT and the PDM differ, the PDM shall govern.

A monthly status report along with an updated project schedule is required. This report is to be submitted by the 7th of each month to the LPA for their signature and then submitted to the District LPA Coordinator. This monthly report is to be submitted by the CONSULTANT and will update the LPA on the status of the project. Recent milestones in plan development, such as the submittal of plans for review, shall be documented. Also, the target dates for the future milestones should be included.

Maps and Deeds are not included in this contract. An amendment will be required once Field Review Plans are complete and the number of parcels needed for Right of Way acquisition has been determined.

TYPICAL ITEMS/MATERIALS PROVIDED BY THE LPA:

Based upon availability, the LPA will provide within normal resources of the LPA, the following:

1. Maps, aerial photographs, and other cartographic items as may be available;

2. Available old construction plans, drawings, and maps pertinent to the project;

3. Copies of previous studies/analyses, environmental assessments, conceptual plan, and other information pertaining to the project;

4. Names, addresses, and telephone numbers of points of contact which may prove useful to the CONSULTANT in conducting this analysis;

5. A single point of contact within the LPA for day-to-day coordination of each CONTRACT;

6. Computer files (depending on availability) may include Computer Aided Design and Drafting (CADD) files, GIS data, or Survey Control Points set by other Surveyors on or near the project employed by the LPA;

GENERAL REQUIREMENTS:

As directed, the CONSULTANT shall provide engineering/technical assistance to perform specific assignments requiring needed expertise or staff resources unavailable to the LPA.

Manuals, guides, and specifications applicable to this CONTRACT shall be those approved and adopted by the MDOT and in effect on the effective date this CONTRACT unless otherwise specified in the CONTRACT or subsequently directed by the MDOT during the course of this CONTRACT.

The design of roadways shall be in compliance with the MDOT Roadway Design Manual, and supplemented with updated design policies as described in design memos, American Association of State Highway and Transportation Officials (AASHTO)'s Policy on Geometric Design Of Highways and Streets; AASHTO Guide for the Development of Bicycle Facilities; Draft ADA Public Right of Way Accessibility Guidelines (PROWAG); MDOT Standard Drawings (roadway and bridge), MDOT Roadway CADD Manual; MDOT Standard Specifications for Road and Bridge Construction; Manual on Uniform Traffic Control Devices (MUTCD); MDOT Access Management Policy; and MDOT Survey Manual. The latest edition of the aforementioned documents shall be used.

Hydraulic design shall conform to the MDOT's Roadway Design Manual, 23 CFR 625, 630 AND 650, 44 CFR Part 60.3(d)(3), the Floodplain Management Regulations for the State of Mississippi (Chapter 5, General laws of 1979, 1st Extraordinary session of the State, as amended) and Federal Emergency Management Agency (FEMA) regulations and any other State or Federal regulations as appropriate.

This project shall be performed using English units.

The CONSULTANT shall not begin work in any phase of this CONTRACT until a written NOTICE TO PROCEED (NTP) for that individual phase has been issued. The LPA reserves the right to not issue a NTP until work in the previous phase has been completed.

All preliminary plans shall be marked "PRELIMINARY, NOT FOR CONSTRUCTION" on each sheet. Once plans are complete, the "PRELIMINARY" markings shall be removed, and the Roadway Title sheet shall be signed and sealed/stamped by the CONSULTANT's engineer. If the scope of the CONSULTANT's work is limited to certain aspects of the plans, the scope shall be briefly noted near the seal/stamp (e.g., "ROADWAY AND LIGHTING ONLY" or "BRIDGE AND RETAINING WALL ONLY"). If multiple CONSULTANTS develop the plans, each firm shall sign and seal/stamp the title sheet.

It is the responsibility of the CONSULTANT to request and receive approval from the LPA's Project Manager prior to making any changes to plans developed under this contract. This requirement includes plans developed by any subconsultants.

Other provisions herein notwithstanding, in emergencies due to bridge damage, verbal NTP with a follow-up letter of authorization may be given to the CONSULTANT by the LPA, or designee, to assess the damage, make recommendations for remedial safety measures and obtain essential information for preparing an estimate of time and cost.

As a minimum, the Scope of Work shall be divided into three phases as follows:

ENVIRONMENTAL CLEARANCE

Part 1 - Project Management
Part 2 - Data Collection and Evaluation
Part 3 - Corridor Analysis/Alternatives
Part 4 - Public Involvement Program
Part 5 - Environmental Assessment Documentation

FINAL RIGHT-OF-WAY PLANS

Part 1 – Pre-Design Meeting
Part 2 – Field Survey
Part 3 – Bridge Hydraulic Recommendations
Part 4 – Conceptual Plans
Part 5 - Geotechnical
Part 6 – Field Inspection Plans
Part 7 – Final Right-of-Way Plans

FINAL PLANS

Part 1 – Pre-Design Meeting
Part 2 – 60% Structural Information Plans and Review
Part 3 – Constructability Review
Part 4 – Quality Control Plans
Part 5 – Office Review Plans
Part 6 – Final Plans

ENVIRONMENTAL CLEARANCE

This study shall meet the requirements of the National Environmental Quality Act 23 CFR-771 and FHWA TA 6640.8A and applicable executive orders. The Environmental Clearance centers on the first five major task items that are shown below which are to be performed in conjunction with Task 6, Roadway and Bridge Design, and Task 7, Survey.

Part 1 - Project Management
Part 2 - Data Collection and Evaluation
Part 3 - Corridor Analysis/Alternatives
Part 4 - Public Involvement Program
Part 5 - Environmental Assessment Documentation

Part 1 - PROJECT MANAGEMENT

1.1. Project Organization and Schedule

The Consultant (Neel-Schaffer, Inc.) will be responsible for internal project organization, including sub-consultant contracts and responsibilities, and coordination with governmental and agency personnel which will have input on the study. A task specific schedule outlining responsibilities and completion dates will be developed, expanding on the Study Flow Diagram, to ensure project completion on time and within budget. The project will be narrowed to one or two conceptual plans within 6 months of the first public scoping meeting. The one or two conceptual plans will be developed to the preliminary right-of-way stage (approximately 30% plans) within the following four-month time period. The one or two preliminary right-of-way plans will then be carried forward to a public hearing with a selection of one of the alternates for the final location approval.

1.2. Project Kickoff Meeting

The Consultant will meet with appropriate Madison County, Mississippi Department of Transportation (MDOT) and Federal Highway Administration (FHWA) staff. The purpose of the meeting will be to discuss the task-specific schedule; to establish ground rules and project expectations within the confines of the scope and fee; to exchange relevant information and documents; to initiate requests for other necessary data; and to explain administration of the contract. The Consultant will prepare an agenda for the meeting, provide a sign-in sheet, and following the meeting, prepare the meeting notes.

1.3. Monthly Progress Reports and Meetings

The Consultant will submit to the County brief monthly progress reports outlining the work completed to date and an updated schedule of the tasks remaining for completion the project. The Consultant will also be available to attend periodic, bimonthly progress meetings with County personnel to discuss project status and project issues.

1.4. Project Coordination

This task includes overall project management, liaison with the County, MDOT, sub-consultants, and team members, and written documentation as appropriate for all meetings which are not specifically addressed elsewhere in this Scope. Communications and coordination with other federal, state, and local agencies will be closely coordinated with the County. The Consultant will name a specific Project Manager for this EA to maintain efficient project coordination. The Project Manager will be responsible for project coordination and communication issues under this task which will be summarized in the monthly progress reports.

1.5. Final Product Submittal

Reference material utilized by the Consultant will be noted, and an accurate and complete bibliography will be part of the draft and final documents. Utilization of unpublished material or otherwise not easily accessible material will be specifically coordinated with the County prior to its use in the document. The Consultant will supply the County with hard and digital copies (AutoCAD and/or compatible files) of the final plan view of alignments on the aerial photography and the exhibits created for the public involvement. All mapping will be prepared in Mississippi State Plane Coordinates. Additional requirements for the final preliminary roadway, bridge, and right of way plans are outlined in Part B. Preliminary Roadway and Bridge Design of this scope.

Part 1 - ENVIRONMENTAL DATA COLLECTION AND EVALUATION

2.1 Socio-Economic Data

2.1.1 Land Use Data

Collect data regarding past and present land usage as well as future land use plans, proposed developments, zoning guidelines and observed growth trends. Land use will be determined in coordination with the appropriate local authority.

2.1.2 Cultural Features and Community Services

Through contact with local officials, research of tax rolls, and field inventory, identify the following in the project area. Information will be placed on base mapping for use in evaluating impacts.

- Medical facilities (hospitals, clinics, emergency rescue facilities, convalescent centers, ambulance facilities for the handicapped, etc.).
- Fire stations.
- Educational facilities (public and private) -- Identify bus routes, student walkways and school crossings.
- Religious institutions.
- Cemeteries (public and private).
- Public (government) buildings and civic facilities.
- 4(f) and 6(f) lands (parks, etc.).

2.1.3 Relocation Impact Data

2.1.3.1 Obtain information necessary to make assessments of the impacts of the alternatives.

- Note neighborhoods, economic, and racial/ethnic groups. This will include the racial/ethnic makeup of the neighborhoods, location/descriptions of neighborhoods, ages, and economic status of occupants; and the impact of the proposed facility on the neighborhood(s). The number, if any, of handicapped/disabled displacees and/or large families.

- Determine approximate number of residential, business, and nonprofit organization relocations. This will include the type of structure and age of displacement dwellings. An inventory of replacement dwellings including, but not limited to, the number and types of homes available, size, age and asking price. This information will detail how all displacees can be relocated to Decent, Safe, and Sanitary Housing and what properties are available within Jackson metro area to purchase for commercial, non-profit, and residential relocations.

- A list by name of businesses and product or function and non-profit organizations listed by name and function, affected by the proposed plan. Details concerning the number of employees presently working; the potential for loss of jobs and the plan to relocate or close down these businesses and non-profit organizations. Also included will be information about businesses for sale and commercial tracts for sale in the project area. This information will include asking price, location, size, and type of property.

2.1.3.2 Relocation Plan Documentation

- A relocation plan will be generated from the information collected and will address any major miscellaneous personal property moves, such as parts of large businesses or other concerns that are not classified as business relocations.

The CONSULTANT will prepare an estimate of the length of time required to conduct the acquisition/relocation phase of the project and the ROW facilities required to accomplish the purchase. The CONSULTANT will prepare and provide the County with mapping which shows the required takes including an estimate of the right-of-way costs. This information will be summarized in a Relocation Report to be included in the Pre-Draft EA Report.

2.1.4 Census Tracts and Socio-economic Data

Obtain and convert Census data for evaluation of the following characteristics of the study area:

- Population
- Household income levels
- Age
- Minorities
- Household size
- Number and type of housing units
- Employment characteristics
- Housing value and rent estimate
- Retail activity and value
- Housing and commercial vacancies

2.2 Farmlands

In accordance with the Farmland Protection Policy Act of 1984, determine if farmlands are prime, unique, statewide, or of local importance. Coordinate with appropriate NRCS officials and complete Form AD1006.

2.3 Visual Effects and Aesthetics

2.3.1 Existing Landscape

Conduct a visual inventory of the existing landscape with respect to its visual character and visual quality. Determine the view-shed and, where possible, separate the study area into smaller identifiable geographic areas (landscape units) for explanation purposes.

2.3.2 Existing Visual Character

Identify the topographical features of the area. Identify the water resources and determine their type and relative visual importance to the study area. Identify the vegetative elements within the study area and determine the type and magnitude of vegetative cover. Identify

the type, magnitude and, where appropriate, the uses associated with the manmade development in the study area.

2.3.3 Existing Visual Quality

Identify visually sensitive resources. Identify the different viewer groups in the study area.

2.4 Contaminated Sites & Hazardous Materials

2.4.1 Phase I Environmental Site Assessment

- A Phase I Environmental Site Assessment (ESA) will be performed on the alternatives in accordance with ASTM E1527-21. The Site Reconnaissance will include a walk-through and drive-through inspection of the designated project alternatives to the extent that they are accessible. The identification of potential recognized environmental conditions (REC), historic recognized environmental conditions (HREC), and controlled recognized environmental conditions (CREC) will be corroborated through other sources, and the present status of these conditions will be ascertained to the extent practicable.

- A review of available historic maps, aerial photographs, and telephone directories will compliment, and possibly corroborate, the data obtained from the agencies and/or observed during the site investigation. Historic quadrangle maps and aerial photographs will be reviewed, as appropriate: MS Dept. of Archives and History; MARIS, and USDA Natural Resources Conservation Service District Offices. Sanborn Fire Insurance Maps and telephone directories will be reviewed, as available.

- Locations of sites and facilities (e.g., hazardous waste sites, solid waste sites, locations of oil and gas wells, water wells, etc.) will be identified in the Phase I ESA either in text or on base mapping to provide adequate information regarding specific sites. A digital file for these sites will be prepared.

2.4.2 Documentation of RECs, HRECs, and CRECs

The results of the ESA will be included in the Environmental Assessment. Concurrence with determination will be coordinated with appropriate personnel of MDOT and MDEQ.

2.5 Natural Features Data

2.5.1 Wetlands

- The CONSULTANT will identify wetlands falling partially or wholly within the project boundaries or which may be affected by the project. Information referenced may include infrared photography, National Wetlands Inventory (NWI) maps, quadrangle maps, soil maps, etc. Referenced information will not substitute for an on-site field determination that will be made. Wetlands will be identified using the routine method set forth in the Corps of Engineer's 1987 manual.

- The CONSULTANT will classify wetlands utilizing U.S. Fish and Wildlife Service's "Classification of Wetlands and Deepwater Habitats of the United States. 1979".

- The CONSULTANT will identify Corps of Engineers jurisdictional limits on aerial photography.

- The CONSULTANT will participate in one (1) field review with the Corps of Engineers, if required. The report will be included in the Pre-Draft EA.

2.5.2 Other Waters and Streams

Other waters falling under the jurisdiction of the USACE will be identified, classified, quantified, and located.

Streams with the potential for being impacted will be identified with an assessment of their physical and functional characteristics. GIS coordinates or acceptable mapping of the locations shall be provided along with a 'Best Professional Judgment' approach for potential impacts and requirement for mitigation.

2.5.3 Impaired Water Bodies

The CONSULTANT will identify water bodies that are on the 303(d) list of impaired water bodies.

2.5.4 Outstanding Waters

The CONSULTANT will identify any Outstanding Waters in the project area (designated scenic or high quality streams, etc.).

2.5.5. Soils

The CONSULTANT will obtain information to generally describe the soils composition along the developed alternative(s) using county soil survey maps and other information from the Natural Resources Conservation Service.

2.5.6. Floral Communities

The CONSULTANT will obtain information by field survey to describe generally the natural communities in the project area and, more specifically, to describe the area within the proposed right-of-way limits in terms of recognized vegetative community types.

2.5.7. Faunal Communities

The CONSULTANT will make note of fauna observed in the field while collecting other information. Outline what species might be expected to be found based on flora.

2.5.8. Terrain

The CONSULTANT will generally describe the morphology of the land in the project area and the underlying geology, if significant.

2.6. Threatened and Endangered Species (TES)

A survey for all TES will be performed with appropriate coordination with USF&W and MDWFP. The CONSULTANT will:

- Identify "critical habitat" through contacts and field inspections.
- Identify known, recorded occurrences of endangered and/or threatened species by contacts and field inspection.
- Perform a concentrated field search of high probability areas.
- Assess the potential for proximity and secondary impacts.

2.7. Permit Requirements

Determine the extent, existence, and location of possible sites or actions requiring permits from one or more of the regulatory agencies with jurisdiction.

2.8. Water Quality

Collect data on the existing water quality of water bodies and local aquifers within the project area.

2.9 Floodplains/Floodways

Identify the locations and extent of any project area floodplains and floodways.

2.10. Noise Study

The CONSULTANT will prepare Highway Traffic Noise Studies which shall fulfill all requirements contained in 23 CFR 772, or changes thereto as they may occur, and shall be prepared in the following phases:

Identify all existing and planned activities or land uses that may be affected by traffic noise from all alternates of the proposed project. Every house, school, park, business, etc. within approximately 122 meters (400 feet) of the outside pavement edge of all alternates of the proposed project should be identified.

Measure the existing noise levels for existing activities and developed land uses. At least 1 noise level measurement should be made for every 15 to 20 land uses identified and for every substantial change in highway traffic.

Determine the existing, design year no build, and design year build noise levels at each noise sensitive activity or land use identified along all alternates of the proposed project using a method meeting the requirements of 23 CFR 772.

Compare the design year predicted noise levels for the no build alternative and the build alternative at each noise sensitive activity or land use with the existing noise levels and with the noise abatement criteria levels given in Table 1 of 23 CFR 772 and make a subjective description of the noise impact at each noise sensitive activity or land use.

Examine and evaluate alternative noise abatement measures for reducing or eliminating the noise impact on existing activities, developed lands and undeveloped lands for which development is planned.

Identify those lengths of highway (separately for each side of the highway) and those individual land uses where noise abatement measures are not feasible and reasonable.

Prepare Noise Report Documents with a map showing the location of all identified activities and land uses with tables showing the measured and predicted noise levels at each activity and land use. The number of copies and medium of the documents will be prescribed by the Assignment instrument.

2.11. Air Quality

It has been agreed upon by the COUNTY and the CONSULTANT that a detailed air quality assessment is not required for this project. Should analysis for air quality become required under the EA, the CONSULTANT and the COUNTY will enter into a Supplemental Agreement to modify the scope of services and fees accordingly. An MSAT qualitative evaluation will be included in the Environmental Assessment.

2.12. Cultural Resources

2.12.5. Phase I Survey

- A Phase I cultural resources survey of the entire preferred alignment shall be conducted. For the other alternatives considered, all areas falling within areas of high probability shall be surveyed, an approximate 30% coverage of the total area. For this scope, it is assumed that a Phase I Survey will be conducted over the area covered by the new alignment right-of-way footprints which are assumed to be 350' for the main line and less for any connector roads. The survey will be conducted under the Guidelines for Archaeological Investigations of MDOT and the Mississippi Department of Archives and History (MDAH). Crewmembers will walk transects spaced 30 m (app. 98 ft.) apart and systematically examine all areas of exposed ground. In areas where over 30% of the ground surface is covered by vegetation, they will excavate shovel tests at 30 m (app. 98 ft.) intervals along each transect. The shovel tests will be excavated to sterile subsoil or a maximum depth of 50 cm (app. 20 in.), and the fill from each test will be screened through ¼ in. hardware cloth. Each alternate will be investigated for the potential for avoidance and a determination will be made as to whether sites are eligible or ineligible for nomination to the National Register of Historic Places (NRHP).

- If archaeological sites are discovered during the survey they will be subjected to a consistent set of investigative techniques. These will include surface collecting and additional shovel testing at 5 to 10 m (app. 16 ft to 33 ft) intervals in order to identify the site's horizontal and vertical limits. Photographs, drawings, and a sketch map of each site will also be made. All sites will be evaluated to the extent possible with survey level data. Sites that require additional data will be recommended for test excavation.

- Structures within 75 m (app. 246 ft) of the preferred alternate that are potentially over 50 years old will be photographed and, if possible, a sketch of their floor plan will be

made. Information will also be recorded on the building materials and construction techniques used in the structure.

- Upon completion of the fieldwork, all artifacts will be washed, catalogued, and analyzed according to the requirements of the MDOT and MDAH. Archaeological site forms and standing structure forms will be completed and submitted to the MDAH. The archaeologist will make every effort to access existing structures to recommend whether or not the structure/land is eligible or not eligible to be included in the NRHP.

2.12.6. Phase II and III Archeology

Any NRHP test excavations (Phase II or Phase III investigations) will be considered as additional services or recovery operation and the CONSULTANT and MDOT will enter into a Supplemental Agreement to modify the scope of services and fees accordingly.

2.12.7. Native American Consultation

Provide the cultural resources report for the Federal Highway Administration to conduct consultation with the Native American Tribes for potential impacts to sites deemed culturally important..

2.12.8. Cultural Resources Survey Report

- A summary of the report will be included in the Pre-Draft EA.

- It has been assumed that all significant cultural resources will be avoided by the project. If some resources cannot be avoided, then Section 106 Adverse Effect Documentation and Section 4(f) Documentation will have to be prepared along with a Memorandum of Agreement. These tasks, plus the actual mitigation, are considered outside the scope of the present work. If Section 106 or 4(f) documentation is necessary to complete the EA or mitigation plans requested, then the CONSULTANT and the COUNTY will enter into a supplemental agreement to modify the scope of services and fee accordingly.

2.13. Secondary and Cumulative Effects

Data related to secondary and cumulative effects of the project upon social, economic, and environmental resources will be obtained.

3. CORRIDOR AND ALTERNATIVE ANALYSIS

3.1. Data Collection and Evaluation

- The Consultant shall collect data necessary for the development of alignments. This activity consists of collecting various types of information and materials relative to engineering evaluation within the study area. The information should include data necessary to perform adequate evaluations of the location and design of the alternatives and identify constraints.

- Periodic adjustments and updates to the data sets will be necessitated as ongoing changes to the alignments and additional corridors become a part of the study.

- Additional study areas resulting from this phase will be included in the data bank.

- Refer to Section C. SURVEY for surveying requirements. Adequate survey information shall be obtained from the field in order to accurately depict, evaluate or otherwise establish alignments for existing features as well as proposed alternatives.

3.1.5. Mapping

The Consultant will obtain mapping from the MDOT and other public sources and create base maps at a scale no smaller than 1" = 200' following existing roadway.

3.1.2 Geospatial Impact Analysis

3.1.6. Existing Local Roadways Characteristics

Data will include pertinent physical features and condition ratings that define the existing roadway segments under consideration. Some of this information is available from the MDOT. MDOT sources include project files, old plans, right-of-way maps, bridge books, bridge logs, computer programs, and old drainage maps as available. Other sources include field observation and personal interviews with officials and the general public.

3.1.7. Highway characteristics include, but are not limited to, those items described below:

- Typical Sections -- Number and width of each cross-section element, type of drainage system including outfall locations, and access features.

- Existing highway right-of-way -- Obtain available right-of-way information from the MDOT and/or from County and county offices.

- Other right-of-way -- Identify additional right-of-way at intersection locations, drainage easements, etc.

- Property lines -- Graphically establish property lines and adjacent property owners for the alternative alignments and critical areas along the existing roadway based on public tax records or through field reconnaissance.

- Alignment -- Establish horizontal and vertical alignment of the highway route from field survey with reference to existing plans as necessary to review sight distances.

- Pedestrian facilities -- Walkways, crosswalk, handicapped provisions, and school routes.

- Bicycle facilities -- Number, type, and width; designated or undesignated.

- Lighting -- Type, location, spacing, and maintenance responsibility.

- Intersection Layout – Channelization and turning lane arrangement.

- Traffic signals -- Identify existing traffic signal locations and obtain signal timing and phasing where available.

- Posted speed -- Identify posted speeds throughout project limits.

- Railroad crossing -- Check for any railroad abandonment plans. Determine the following: number of tracks and type, number of trains, speed, length of trains, passenger, freight, type of warning device, time of day, etc.

- Drainage system inventory -- Identify existing drainage systems listing types and discharge points, and location and size of major drainage structures.

3.1.8. Existing Roadway Bridges

- Typical section -- Lane width, overall clear width.

- Type structure -- Concrete, steel, loading.

- Condition -- Obtain structural rating of condition; obtain evaluation from MDOT.

- Span arrangement -- Number and length of spans.

- Channel data -- Alignment, width, depth, maintenance program.

- Bridge number.

- Geotechnical Information-- From existing bridges.

3.1.9. Accident Data (Highway)

The COUNTY will provide the following data for the previous three years for various highway segments as required, if available:

- Number of accidents -- type, location, etc.

- Fatalities – number

- Injuries – number

- Property damage -- cost

- Economic loss – cost

3.1.10. Utilities

The Consultant will identify from existing plans, permits, and field reconnaissance the following existing and proposed utilities that may influence location or design considerations. The Consultant will work with the COUNTY and commercial utility providers to develop estimates of the cost of utility relocations.

- Overhead -- Transmissions lines, microwave towers, etc.

- Underground – Major utilities such as power cables, pipelines, telephone, etc.

- Bridge Attachments.

3.2. Alternatives Traffic Assessment

The Consultant shall provide planning services for the development of a Traffic Study. The process will involve utilization of the TransCAD planning software and will provide traffic projections to the year 2030.

3.2.5. Previous Studies

The Consultant will utilize the previous TransCAD model that was developed during a previous feasibility study. This model will be used to further test the alternatives that will be developed during this environmental study. This model will be reviewed for any need to update since the feasibility study was conducted.

3.2.6. Traffic Counts

Some traffic count data may be required and will be provided from its own records, the records of MDOT and the other involved government agencies.

3.2.7. Identify Deficiencies

Once the model is verified the forecast traffic volumes will be analyzed by the Consultant with regard to the capacities of the highways. Measures of effectiveness will be summarized and utilized to help develop alternative scenarios.

3.2.8. Alternative Scenario Analyses

In consultation with the COUNTY, the Consultant will develop a list of potential alternatives which could alleviate the projected traffic deficiencies and demands. Measures of effectiveness will be used to compare alternative options.

3.3. Engineering and Concept Design of Alternatives

The Consultant will prepare concept plans and narrative for any alignments adjacent to the existing roadway and for the new facility alternatives.

3.3.5. Establish Design Criteria

The Consultant will establish the design criteria that describe the design data used for the project. These design criteria will include MDOT roadway design data for each roadway classification required for the project.

3.3.6. Geometry and Typical Sections

Horizontal geometry, vertical geometry, and typical sections will be developed in accordance with the established design criteria. Recommendations for location of the new

roadway and necessary existing roadway improvements will be illustrated on plan/profile exhibits at a horizontal scale of 1”=200’ and a vertical scale of 1”=20’. The exhibits will also indicate estimated required right of way for the improvements. Alignments will be developed in coordination with the County based upon the positive and negative attributes of the alignment locations.

3.3.7. Intersection Analysis and Schematic Layouts

Projected intersection traffic will be developed for planning level capaCounty analysis. This analysis will be used to determine the intersection configuration required for the design year.

3.4. Floodplain Analysis

National Flood Insurance Program (NFIP) maps and/or information developed by MDOT will be used to determine whether an alternative will encroach on the base (100-year) floodplain. Floodplain areas within the study area will be determined and mapped, and encroachment acreage will be quantified. The discussion will identify the number and extent of encroachments, potential for increased flood hazard, any support of incompatible floodplain developments, and their potential impacts. If the preferred alternative includes a floodplain encroachment having significant impacts, a finding that it is the only practicable alternative as referenced by 23 CFR 650, Sub-part A will be presented. Coordination with the Federal Emergency Management Agency (FEMA) and appropriate state and local agencies will be undertaken for each floodplain encroachment.

Drainage Review and Studies

Drainage areas will be reviewed and analyzed using existing plans and quadrangle maps. Major cross drain structures will be indicated on the plan/profile exhibits.

3.5. Alternatives Analysis

Each alternative will be developed to a comparable level of detail. The discussion will provide a clear understanding of each alternative's termini, location, costs, and major design features (number of lanes, right-of-way requirements, median widths, etc.), and provide the reader with a general understanding of each alternative's effects on its surroundings or the community. Maps and other appropriate visual aids, such as photographs, drawings, or sketches, which would assist the reader in better understanding the various alternatives will be used as needed. Each alignment will be described and analyzed in the report and, if required by the County, will be staked in the field as described in Section C. SURVEY.

Individual data collected in task 2 will be reviewed for additional assessment based on any refinement of location (culture resources, TES, water, relocations, etc.).

If more than two alignment alternatives are determined to be necessary, the Consultant and the County will enter into a Supplemental Agreement to modify the scope of services and budget accordingly.

Alternatives that are considered and then eliminated from further study will be summarized and documented.

4. PUBLIC INVOLVEMENT PROGRAM

4.1. Research Issues

This phase of the planning process will clarify issues and concerns and provide direction for the public involvement process. As part of the research phase the Consultant will perform the following tasks.

4.1.5. Conduct Stakeholder Interviews: Interview up to four key elected officials, local agencies, civic groups, and community leaders, as needed, to gather pertinent feedback and direction to ensure that the public involvement process addresses needs and desires of all constituencies.

4.1.6. The Consultant will work with the County to identify interview subjects and include the County in the interview process.

4.1.7. The Consultant will provide summary reports of community interviews to the County.

4.2. Public Involvement Plan Elements

The plan elements outlined below are tentative and are subject to revision based on the research and planning phases identified above.

4.2.5. Project Mailing Address

- The Consultant will provide a project mailing address for interested stakeholders to mail comments.
- Mailed comments received will be processed according to the protocol policy. Comments will be provided to the County on a monthly basis.
- The project mailing address will appear on all project materials.

4.2.6. Database

- The Consultant will develop an initial database of contacts using information supplied by the County, MDOT, the FHWA, and other organizations. In addition, the Consultant will enhance that list based on the research phase of this project and previous study activity.
- The Consultant will continue to refine and expand the database for the duration of the project. Expansion will include adding of names from attendees at the public meeting(s), various presentation activities, and anyone contacting the study team.

4.2.7. Outreach Activities

- The Consultant will work with local officials, schools, churches and various other agencies to facilitate involvement from residents in the Project Impact Area (PIA) in settings that are accessible and comfortable.

- The Consultant will organize and participate in one event.

- Outreach activity could include a meeting or project presentation(s) with various community or neighborhood leaders.

- For the meeting, the Consultant will provide exhibits, handouts, refreshments, name tags, and sign-in sheets.

4.2.8. Media Relations

Coordination of the Public Involvement efforts will include MDOT's External Affairs Division.

4.2.9. Dissemination of Information

- The Consultant will produce a one-page; color Fact Sheet to be distributed during outreach efforts and public meetings. The publication will also be distributed to public officials, elected officials, and interested stakeholders.

- The publication may be 8.5" x 11" or 11" x 17", depending on content and format, and will include a map of the area.

- Up to 100 copies will be produced.

4.3. Agency Coordination

The Consultant will prepare and submit to the County two separate draft Solicitation of Views letters, one for FHWA's signature and one for MDOT's signature. These letters will be for state and federal governmental agencies, public officials, elected officials, federally recognized tribes, and Council of Government's announcing the project and inviting them to share their concerns. The Consultant, in cooperation with the County, will develop the mailing lists for these letters.

4.3.5. Scoping Meetings

- The Consultant will prepare and submit a list of potential participants for the scoping meeting to the County for review, revision, and approval.

- The Consultant will arrange for one Scoping meeting, for the County and County officialsand resource agencies.

- The Consultant will prepare and submit to the County draft letters of invitation to the meeting.

- For the meeting, the Consultant will prepare exhibits, handouts, name tags, sign-in sheets, and provide refreshments.

- The Consultant will provide to the County summary reports of the meeting, first as a draft and then as a final.

4.4. Public Meetings and Hearings

- The Consultant will organize and promote one public meeting and one public hearing.

- The public hearing/meetings will be an open house format to allow attendees to review exhibits, discuss issues with project personnel, and provide written and verbal comments. A court reporter will be available at the hearing to transcribe comments that individuals may want to give verbally.

- The Consultant will assist the County in sending special letters of invitation to public officials, elected officials and other key stakeholders. The Consultant will prepare the letter(s) and submit to the County for distribution.

- Consultant will prepare nametags, sign-in sheets, exhibits, handouts, and comment cards for the meetings and public hearings. The Consultant will also provide refreshments at the meetings.

- The Consultant will provide summary documentation following the public meetings and hearings.

5. PREPARE ENVIRONMENTAL ASSESSMENT DOCUMENTATION

5.1. Studies and Text Preparation

5.1.5. Cover sheet

5.1.6. Summary

5.1.7. Table of Contents

5.1.8. Purpose of and Need for Action

Per County direction, the CONSULTANT shall develop the Purpose and Need using capacity, safety, and mobility.

5.1.8.1. Capacity

Develop and discuss the capacity of the existing system, the present level of service, and any deficiencies of the system in serving the motoring public. Include a discussion on the future level of service of the system once the proposed project is completed and how this action will affect traffic capacity throughout the network.

5.1.8.2. Safety

- Summarize and discuss data on accidents that have occurred in the study area. Prepare a table to illustrate accident types, frequency, percentage increase or decrease over a period of time, and the rate of accidents when compared with the statewide average for similar facilities.

- Develop and discuss existing roadway deficiencies and how the proposed project may correct or improve upon existing conditions.

5.1.8.3. Mobility

- Develop and discuss how the proposed project fits into the existing and future transportation system and what the contribution of the proposed action will be towards developing a sound transportation network. Also discuss how the proposed project will meet the essential needs of the system and the state.

- Develop and discuss the relationship of the proposed project to State, County, and urban transportation plans. Document that the proposed project is being developed with local input and is consistent with local goal-attainment policies.

- Prepare a brief history of how local, State, and Federal governmental plans support the proposed project.

- Develop and discuss the types of social and economic traffic generators, both existing and future, which exert travel demands on the proposed project. Prepare a map (exhibit) which identifies these generators in relation to the proposed project. A listing of existing and future development in the corridor will also be provided to increase understanding of growth potential.

- Prepare a discussion concerning the different types of transportation modes that interface with the proposed project and establish how the proposed project will complement these modes.

5.1.9. Study Alternatives

Incorporate the materials prepared under previous Tasks in order to quantify impacts.

5.1.9.1. Affected Environment

- The Affected Environment section will provide a concise description of the existing social, economic, and environmental setting of the area affected by the proposed action (all alternative proposals). The description will be general in nature and address the entire project area rather than providing a separate description of the area as it relates to each proposed alternative.

- Environmentally sensitive areas and natural and community features will be identified and discussed. However, this section will not, for security against vandalism, identify the specific locations of archaeological, threatened, and endangered species sites and data.

- The Affected Environment section will focus on significant community and environmental issues and values. Photographs, illustrations, and other graphics, in conjunction with narrative will be used to enhance the reader's understanding of the area. If there are other federal actions or activities taking place or proposed to take place in the area, then these will be identified and their interrelationships discussed.

5.1.9.2. Environmental Consequences

- Prepare graphics and write text portions which evaluate the environmental impacts which could result. Include, when appropriate, the following graphics:

    - Existing and future land use
    - Noise analysis receptor sites, location map
    - Wetland site location map
    - Base floodplain location map

- Analysis of build alternatives will be made. Among the items to be considered are social, economic, historic, cultural, recreational, archaeological, noise, air, wetlands, floodplains, farmland, endangered or threatened species and/or their habitat.

- Proposed conceptual mitigation measures will be developed by the CONSULTANT to reduce or alleviate impacts. The MDOT's Standard Specifications cover many impact situations and will be referenced as appropriate. Other appropriate mitigation measures not covered by the Standard Specifications will be developed by the CONSULTANT to handle those areas of special concern including but not limited to wetlands, wildlife habitat, aesthetics, noise, historical and archaeological sites, and tourism impacts.

- Proposed conceptual mitigation will be coordinated with the County prior to consultation with other agencies.

- Include discussion of potential impacts and proposed mitigation measures for the following areas of interest.

5.1.9.3. Land Use

Evaluate the project's relationship to and probable effects upon growth trends and land use in both the immediate area and a potential larger sphere of influence of the project, distinguishing between anticipated impacts due to the project and changes which would take place irrespective of the project.

5.1.9.4. Farmlands

Evaluate impacts to farmlands in accordance with provisions of the Farmland Protection Policy Act. Prepare a Farmland Conversion Impact Rating.

5.1.9.5. Social, Relocation, and Economic Impacts

- Discuss impacts on community service facilities both directly (relocation) and indirectly.

- Discuss impacts on the community and neighborhoods, economically and socially.

- Discuss and summarize relocation costs.

- Discuss potential relocation problems.

- Discuss and summarize total right-of-way costs.

- Discuss Environmental Justice.

5.1.9.6. Air Quality Impact (qualitative discussion per Tasks 2 &3)

5.1.9.7. Noise Impact – Prepare a qualitative discussion per Tasks 2 & 3 for the potential noise impacts to receptors for each of the 'build' alternatives.

5.1.9.8. Water Quality

- Evaluate potential water quality impacts resulting from construction and operation of the facility, such as sedimentation, nutrient loading, toxic substances, etc. Evaluate and coordinate potential involvement with any local aquifer system.

- Develop conceptual mitigation measures for any significant water quality impacts.

5.1.9.9. Permits

Identify potential permit activities.

5.1.9.10. Wetlands & Streams

- Assessment of the measures and considerations taken for avoidance and minimization in developing the build alternatives.

- Quantify and assess impacts to Corps of Engineers jurisdictional wetlands as mapped on aerial photography and substantiate proper "sequencing" according to Section 404(b) (1) Guidelines.

- Evaluate effects upon wetland and stream functions and values.

- The EA will include a "Wetlands Finding" providing a preliminary proposal on mitigation for unavoidable wetland and stream impacts

5.1.9.11. Impacts to Natural Biota, Water Bodies, Wild and Scenic Rivers, and High Quality Streams

- Evaluate effects of the alternatives on the floral and faunal communities.

- Determine the significance of identified impacts.

- Items of special or local interest will be noted and evaluated within the context of the project (for example large old trees, wildlife corridors, etc.).

- Identify the location and extent of water body modifications.

5.1.9.12. Floodplain and Floodway

Summarize and incorporate information prepared under Task 3 for each of the build alternatives.

5.1.9.13. Threatened and Endangered Species

Develop and incorporate a summary of the threatened and endangered species information collected and analyzed under Tasks 2 and 3.

5.1.9.14. Archaeological/Historical Impacts

Summarize and incorporate the information prepared under Task 2 and 3 with copies provided for distribution to MDAH and appropriate American Indian Tribes.

5.1.9.15. Hazardous Materials

Summarize and incorporate the findings and quantification of potential impacts for the build alternatives based on the information prepared under Task 2 and 3.

5.1.9.16. Visual Impacts

Develop and incorporate a summary of the visual impacts for the build alternatives based on the potential sites and other features identified and analyzed under Tasks 2 and 3.

5.1.9.17. Energy

Develop and incorporate a discussion in general terms of the construction and operational energy requirements and conservation potential of alternatives under consideration.

5.1.9.18. Construction Impacts

Develop and incorporate a discussion of those direct impacts related to the actual construction of the proposed project such as:

- Air quality impacts related to open burning and dust control;
- Noise impacts related to construction activities;
- Water quality impacts related to erosion control, sedimentation, and turbidity reduction;
- Traffic maintenance and detour routing;
- Maintenance of access to businesses and residences;
- Safety considerations;
- Public involvement and community interaction to ease disruptive effects;
- Disposal of construction material;

- Stock piling of construction material and fill; and
- Use of borrow areas and any mitigation measures proposed to reduce dredge and fill-related impacts.

5.1.9.19. 4(f)/6(f) Lands

The County does not believe that any alternative will involve 4(f) or 6(f) properties. If the CONSULTANT discovers any potential conflicts during data collection, the County will address the need for analysis at that time and determine if there are additional contractual needs.

5.1.9.20. Secondary and Cumulative Effects

Develop and incorporate a discussion of the potential for secondary and cumulative effects upon the social, economic, and environmental resources.

5.1.9.21. Comments and Coordination

- Documentation will be provided of coordination effort with the public, communities, businesses, elected officials, American Indians, regulatory agencies, and other stakeholders.

- A list of agencies, organizations, and persons to whom copies of the environmental document were provided will be included.

5.1.9.22. Appendices

As required, appendices will be prepared to present technical discussions, studies, memorandums, etc.

5.1.9.23. Exhibits

Drawings deemed necessary as a result of environmental studies and assessment of alternatives will be produced. Plan views of each alternative will be presented.

5.1.9.24. Tables

When necessary or appropriate, data will be presented in tabular form to facilitate comparisons or presentation of large data sets.

5.2. Coordination and Draft Document Preparation

5.2.5. Meetings

The CONSULTANT will coordinate and participate in scoping meetings with local officials and governmental agencies, one public meeting prior to completing the Pre-Draft EA and one public hearing after the Draft EA has been submitted.

5.2.6. Submit Pre-Draft EA (layout and copying).

The CONSULTANT will prepare and submit to MDOT twelve (12) hard copies of the Pre-Draft EA for review.

5.2.7. Project Team Review

The CONSULTANT shall attend a review meeting to be held by the MDOT. The purpose of the review is for the CONSULTANT to receive comments from the MDOT and the FHWA regarding the format and content of the Pre-Draft EA.

5.2.8. Submit the Draft EA

The Pre-Draft EA shall be revised, reflecting those comments obtained from the Project Team's Review. Five (5) copies of the Draft EA will be submitted to the MDOT for review and approval by the MDOT and the FHWA. The CONSULTANT should anticipate comments only on new material, on previous comments that might not have been addressed fully, or on text changes necessitated by a change in a part of the text previously unaddressed. The CONSULTANT then will prepare and submit twenty (20) hard copies and ten (10) electronic copies of the completed Draft EA to the MDOT for distribution for the public hearing.

5.3. Prepare the Final Environmental Assessment (EA)

Once the recommended alternative is selected and approved by the MDOT, in consultation with FHWA, the CONSULTANT will prepare the final environmental document.

5.3.5. Prepare and Submit Final EA / FONSI

Address the engineering and environmental issues raised at the public meeting. This action is an important part of the study process and shall involve appropriate staff personnel studying suggestions received as a result of the meeting. This will be done in coordination with the County and MDOT.

5.3.6. Revisions to Selected Alternative

- Revise draft environmental document to discuss changes to the selected alternative in response to agency and public hearing comments.

- Add to the final document a Commitment and Recommendation Section that describes commitment and recommendation measures by the County to minimize harm to the environment during final design and construction of the project.

- Review draft impacts section and revise to reflect selected alternate and pertinent comments received. Include a summary of further agency comments and discussion of results of any informal endangered species consultation with the U.S. Fish and Wildlife Service.

- Review and revise as necessary the Comments and Coordination section to reflect public meeting and general comments received.

5.3.7. List public meeting comments (summary) and responses as an appendix to the document.

5.3.8. Document (FONSI)

The CONSULTANT shall revise the draft document to respond to the MDOT's and the FHWA's comments and submit five (5) copies of the Final Document to the MDOT. Following MDOT approval, the CONSULTANT shall print and deliver to the MDOT thirty (30) hard copies and fifteen (15) electronic copy of the Final Environmental Assessment.5.4 Items/Materials Provided By The County

The County will provide based on availability and need:

- Maps, plats, aerial photographs, and other cartographic items as may be available within normal resources of the County.
- Permit documentation for specific locations of utility crossings
- Available construction plans, drawings, and maps pertinent to the project.
- Traffic growth rates, design and peak hour factors.
- Copies of County publications, regulations, and standards, as applicable. Examples include, but are not necessarily limited to, ordinances, standard design details, regulations, etc.
- Copies of previous studies/analyses, environmental assessments, conceptual plan, etc., pertaining to the project.
- Names, addresses, and telephone numbers of points of contact which may prove useful to the CONSULTANT in the conduct of the analysis.
- A single point of contact within the County for day-to-day coordination of each phase of the assignment.

SPECIFIC WORK REQUIREMENTS FOR FINAL RIGHT-OF-WAY PLANS

The required tasks shall be completed if requested in the Work Assignment:

Part 1 – PRE-DESIGN MEETING

The purpose of the Pre-Design Meeting is to discuss the specific design criteria for the Work Assignment and other matters as the parties deem necessary.

The CONSULTANT shall submit minutes of the Pre-Design Meeting to the Project Manager within two (2) weeks after the meeting, unless instructed otherwise. The minutes shall include, but are not limited to, a list of attendees and a detailed list of all design requirements discussed in the meeting.

For some Work Assignments, the Pre-Design Meeting may be included in the Scope of Work Meeting.

Part 2 – FIELD SURVEY

The CONSULTANT shall survey the project utilizing standard surveying practices as required to prepare plans in accordance with the current MDOT Design Manuals, MDOT Design Memos, MDOT Standard Drawings and Special Design Sheets. The work shall be performed in accordance with the current MDOT *Survey Manual*, unless specifically instructed otherwise in the Work Assignment, and with any additional instructions or requests as specified by the LPA:

Part 3 – BRIDGE HYDRAULIC RECOMMENDATIONS (Drainage Area > 1000 acres)

Bridge Hydraulic Studies and Recommendations shall be based upon hydraulic design that is in conformance with the publications listed in I. GENERAL REQUIREMENTS of this Scope of Work.

Major reference publications (latest editions and interim revisions) for hydraulic design of bridges and appurtenances are as follows:

A. FHWA publication *Hydraulic Design of Safe Bridges*, Hydraulic Design Series Number 7 (HDS-7)
B. FHWA publication *Hydraulic Design of Highway Culverts*, Hydraulic Design Series Number 5 (HDS-5)
C. FHWA publication *River Engineering for Highway Encroachments, Highways in the River Environment*, Hydraulic Design Series Number 6 (HDS-6)

Evaluation of bridge design alternatives shall consider the following:

A. Stream stability;
B. Backwater;
C. Flow distribution;
D. Stream velocities;
E. Scour potential;
F. Flood hazards;
G. Tidal dynamics where appropriate; and
H. Consistency with established criteria for the National Flood Insurance Program (NFIP).

The extent of hydrologic studies shall be determined based on the functional highway classification, the applicable federal and state requirements, and the flood hazards at the site.

The following flood flows shall be investigated, as appropriate, in the hydrologic studies:

A. To assess flood hazards and meeting floodplain management requirements: typically the 100-year flood;
B. To assess risks to highway users and damage to the bridge and its roadway approaches: the overtopping flood and/or the design flood for bridge scour;
C. To assess potential flood damage at high risk sites: a check flood of a magnitude selected by the owner, as appropriate for the site conditions and the perceived risk;
D. To investigate the adequacy of bridge foundations to resist scour for a flood greater than design: the check flood for bridge scour;
E. To satisfy agency design policies, standards, and criteria: design floods for waterway opening and bridge scour for the various functional classes of highways;

F. To calibrate water surface profiles and to evaluate the performance of existing structures: historical floods; and
G. To evaluate environmental conditions: low or base flow information, and in estuarine crossings, the tidal range.

Investigation of the effect of sea level rise on tidal ranges shall be specified for structures spanning marine/estuarine resources.

The hydraulic analysis shall utilize analytical models and techniques that have been approved by Hydraulics Branch and that are consistent with the required level of analysis. The analysis shall be performed using a nationally recognized and readily available computer program for determination of design requirements.

Studies shall be carried out to evaluate the stability of the waterway and to assess the impact of construction on the waterway. The studies shall include consideration of items stated in the *AASHTO Drainage Manual*, *AASHTO LRFD Bridge Design Specifications*, FHWA publication *Stream Stability at Highway Structures,* Hydraulic Engineering Circular No. 20 (HEC-20), and any other guidelines as specified.

The design process for sizing the bridge waterway shall include:

A. The evaluation of flood flow patterns in the main channel and floodplain for existing conditions compared to unconstricted conditions; and
B. The evaluation of trial combinations of highway profiles, alignments, and bridge lengths for consistency with design objectives.

Bridge scour and proposed foundations shall follow the *AASHTO LRFD Bridge Design Specifications*, *AASHTO Drainage Manual*, FHWA publication *Evaluating Scour at Bridges,* Hydraulic Engineering Circular No. 18 (HEC-18), USGS Water Resources Investigations Report 94-4241, *Scour at Selected Bridge Sites in Mississippi*, and any other guidelines as specified. The design flood, check flood, and overtopping flood of lesser recurrence interval when applicable shall be considered and discussed with the Hydraulics Branch Project Manager.

If the project is located in or across a FEMA Regulatory Floodway or base flood elevations have been determined as shown on the NFIP maps, the CONSULTANT shall obtain the step-backwater hydraulic model for the specified stream and community from FEMA. Modification of this input data will be required to demonstrate that the proposed development will not impact the pre-project base flood elevations, regulatory floodway elevations, or regulatory floodway widths.

The hydraulic studies and assessments of bridge sites shall include a conceptual submittal, preliminary submittal, and final submittal.

The CONSULTANT shall prepare and submit Hydraulic Studies and Bridge Recommendations in accordance with the format required by the Hydraulics Branch for its review and comment.

The Conceptual Hydraulic Study and Bridge Recommendations submittal shall include the following at a minimum:

A. CONCEPTUAL HYDRAULIC BRIDGE RECOMMENDATIONS: Conceptual Hydraulic Bridge Recommendations shall be on the appropriate MDOT forms as required. Hydraulic capacity shall be a primary consideration in setting the bridge length. The bridge must provide enough capacity to:

1. Avoid excessive backwater in order to prevent adverse floodplain impacts; and
2. Prevent excessive velocity and shear stress within the bridge waterway.

Span arrangements and spill-through abutment setbacks from the tops of channel banks shall be set in accordance with the MDOT Design Memos, Floodplain Management Regulations for the State of Mississippi, *AASHTO LRFD Bridge Design Specifications*, and FHWA guidance.

B. HYDRAULIC MODELS: Hydraulic modeling approaches shall be selected based on FHWA guidance.

1. Natural Channels with Narrow to Moderate Floodplains (One-Dimensional Flow): Natural channels or streams that can be represented by a series of cross sections taken perpendicular to the assumed flow direction shall be analyzed utilizing Hydrologic Engineering Center – River Analysis System (HEC-RAS). Hydraulic one-dimensional models shall include an unconstricted conditions model, existing conditions model, proposed conditions models, and any other models as required. All unnecessary plans shall be deleted, and a plan description for all alternatives shall be provided. A detailed project description, which shall include project name, stream name, county and state, and submittal date, shall also be provided. Design and CONSULTANT information shall be provided, including:

    a. CONSULTANT name;
    b. Modeler name or initials;
    c. Status of model;
    d. Date of last modification;
    e. Program and version used;
    f. Vertical and horizontal datum and units; and
    g. Horizontal projection if geo-referenced in the detailed project description.

    The hydraulic models for bridges shall extend so the flow is fully expanded both upstream and downstream of the flow constriction, as well as far enough downstream to eliminate the influence of boundary conditions on model results.

2. Complex Floodplains (Two-Dimensional Flow): Natural channels or streams that cannot be represented by a series of cross sections taken perpendicular to the assumed flow direction (uniform velocity cannot be assumed in the direction of flow or if depths and velocities vary rapidly with time) shall be analyzed utilizing a nationally recognized and readily available finite element method computer program. Two-dimensional models are recommended for complex waterway and/or complex bridge hydraulic analyses. Hydraulic two-dimensional models shall include an unconstricted conditions model, existing conditions model, proposed conditions models, and any other models as required.

    The two-dimensional hydraulic models for bridges shall extend so the flow is fully expanded both upstream and downstream of the flow constriction, as well as selecting a location where flow is reasonably one-dimensional.

C. STREAM STABILITY ANALYSIS AND CONCEPTUAL STREAM AND SCOUR COUNTERMEASURE DESIGN: Stream stability and lateral migration tendencies shall be included in design considerations and based upon conformance with:

1. FHWA publication *Evaluating Scour at Bridges,* Hydraulic Engineering Circular No. 18 (HEC-18);
2. FHWA publication *Stream Stability at Highway Structures,* Hydraulic Engineering Circular No. 20 (HEC-20);
3. FHWA Publication No. FHWA-HRT-05-072, *Assessing Stream Channel Stability at Bridges in Physiographic Regions*, July 2006; and
4. *AASHTO LRFD Bridge Design Specifications*.

The determination of countermeasure requirements shall be based on the FHWA publication *Bridge Scour and Stream Instability Countermeasures*, Hydraulic Engineering Circular No. 23 (HEC-23). Further requirements shall be based on the FHWA publication *Design of Riprap Revetment*, Hydraulic Engineering Circular No. 11 (HEC-11). Documentation, details, and drawings shall be provided for the conceptual design.

D. HYDRAULIC REPORT: Hydraulic Reports shall include, at a minimum:

1. A narrative that describes the project scope;
2. Statements defining any additional source of information including cross sections, topographic data, and other supporting information;
3. Design alternatives;
4. Analysis considerations;
5. Supporting documentation that describes the analysis procedures, including unconstricted conditions, existing conditions, and proposed conditions;
6. Documentation of all modifications made to models to correctly represent the existing conditions as well as proposed conditions;
7. Recommendations and details;
8. Tables comparing water surface elevations between the models demonstrating that the proposed project meets current local, state, and federal regulations;
9. Tables comparing velocities between the models demonstrating the effects to the natural floodplain values;
10. Documentation of stream stability and lateral migration tendencies of affected channel reaches;
11. Documentation of recommended measures to minimize impacts and restore and preserve the natural and beneficial floodplain values (23 CFR 650.111);
12. Documentation of grade changes when replacing existing structures;
13. Aerial photography and topographic maps with the proposed alignments and span arrangements, including flood zones and any additional items identified in the Work Assignment; and
14. Photographs.

Data collected, hydraulic model output, bridge layout drawings, no-rise certifications, and any other pertinent information shall be included. The Hydraulic Report shall be signed, sealed, and dated by the CONSULTANT'S engineer.

E. PARTIAL CONCEPTUAL BRIDGE LAYOUT DRAWINGS: Plan drawings shall include the following:

1. Magnitudes of the design and base floods with corresponding water surface elevations;
2. Span arrangements and bridge stations (Elevation and Foundation Plans);
3. Minimum finish grade elevations;

4. Design and drainage data;
5. Typical sections; and
6. Any other information as instructed by the Hydraulics Branch.

F. "NO-RISE/NO-IMPACT" CERTIFICATION: If the project is located in or across a FEMA Regulatory Floodway or base flood elevations have been determined as noted on the NFIP maps, the CONSULTANT shall obtain the step-backwater hydraulic model for the specified stream and community from FEMA. The CONSULTANT shall complete a "No-Rise/No-Impact" certification and report. The report shall contain all needed documentation and technical data required by a "No-Rise/No-Impact" certification for review by Hydraulics Branch. The step-backwater hydraulic model shall be modified to demonstrate the proposed development will not impact the pre-project base flood elevations, regulatory floodway elevations, or regulatory floodway widths. The certification shall be signed, sealed, and dated by the CONSULTANT'S engineer.

G. CLOMR and LOMR APPLICATIONS: In the event a "No-Rise/No-Impact" is impracticable or not possible, or a longitudinal encroachment of the roadway embankment will occur within the floodway, an application for revisions to the NFIP maps shall be required at the discretion of the Hydraulics Branch Project Manager. The CONSULTANT shall be required to prepare for submittal an application for Conditional Letter of Map Revision (CLOMR), Letter of Map Revision (LOMR), and the required supporting data and documentation to the participating community and FEMA. The certification shall be signed, sealed, and dated by the CONSULTANT'S engineer.

All pertinent hydraulic data, documentation, and the Hydraulic Report shall be included in the submittal. The Hydraulic Report shall be signed, sealed, and dated by the CONSULTANT'S engineer. Recommendations and plans shall be provided as separate PDFs outside of the Hydraulic Report. The following file naming format shall be used:

File name: FMS_ROUTE_County_Print Type_MM-DD-YYYY.pdf

Examples:
100774-001000_SR57_Jackson_CONCEPTrecs_07-01-2021.pdf
100774-001000_SR57_Jackson_CONCEPTplans_07-01-2021.pdf

If a project involves multiple bridge sites, the recommendation forms shall be combined into one (1) multi-page PDF, and the plans shall be combined into a separate one (1) multi-page PDF.

The CONSULTANT shall allow approximately four (4) weeks for review by the Hydraulics Branch, or as instructed by the Hydraulics Branch Project Manager. Upon completion of the review, comments shall be provided to the CONSULTANT. The CONSULTANT shall address the comments and provide updated Conceptual Recommendations, analyses, documentation, and plans for subsequent review.

A site visit, normally conducted in conjunction with the Conceptual Field Review, will be required prior to completion of the Preliminary Hydraulic Study and Bridge Recommendations. Proposed bridge layouts as approved by the Hydraulics Branch shall be staked prior to the site visit to determine if the span arrangements are sufficient. Conceptual layouts for bridges (except detour bridges and box bridges) shall be available for these site visits.

The CONSULTANT shall prepare and submit Preliminary Hydraulic Studies and Bridge Recommendations based on the approved conceptual plan, including any changes from the site

visit, to Hydraulics Branch for review and comment. The studies and recommendations shall be submitted in the format set forth by the Hydraulics Branch.

The Preliminary Hydraulic Study and Recommendations submittal shall include, at a minimum:

A. PRELIMINARY HYDRAULIC BRIDGE RECOMMENDATIONS: The Preliminary Hydraulic Bridge Recommendations shall be on the appropriate MDOT forms as required.

B. DETOUR BRIDGE RECOMMENDATIONS AND COMPUTATIONS: The Detour Bridge Recommendations shall be completed in accordance with MDOT Design Memos, and recommendations provided on the appropriate MDOT forms as required. Computations, including a hydraulic model and any additional items indicated in the Work Assignment, shall be included for the detour bridge design.

C. HYDRAULIC MODELS: Updated hydraulic models shall include all items that were required for the Conceptual Recommendations submittal and shall include any changes from the site visit.

D. HYDRAULIC REPORT: Hydraulic Reports shall include all items that were required for Conceptual Recommendations submittal and shall include any changes from the site visit. Documentation from the site visit shall be added, including statements for any revisions and any additional items indicated in the Work Assignment**.** All revised and new analyses shall be provided, including scour and guide bank design calculations and any other calculations as applicable. The Hydraulic Report shall be signed, sealed, and dated by the CONSULTANT's engineer.

E. PARTIAL PRELIMINARY BRIDGE LAYOUT DRAWINGS: Updated plan drawings shall include the following:

    1. Magnitudes of the design and base floods with corresponding water surface elevations;
    2. Span arrangements and bridge stations (Elevation and Foundation Plans);
    3. Minimum finish grade elevations;
    4. Design and drainage data;
    5. Typical sections;
    6. Scour elevations for design and check floods;
    7. Riprap details;
    8. Guide banks;
    9. Stream and/or scour countermeasures; and
    10. Any other information as instructed by the Hydraulics Branch.

F. SCOUR CALCULATIONS: Calculations of the potential bridge scour shall be prepared in accordance with MDOT Design Memos, in addition to the FHWA publication *Evaluating Scour at Bridges,* Hydraulic Engineering Circular No. 18 (HEC-18), and USGS Water Resources Investigations Report 94-4241 *Scour at Selected Bridge Sites in Mississippi*, and the results included on the elevation and foundation layouts of the bridge plans. HEC-RAS bridge scour design shall not be the sole source of calculations and shall be verified outside of HEC-RAS using HEC-18 and appropriate equations. MDOT procedures shall be followed in setting scour elevations.

G. GUIDE BANK DESIGN: Guide bank design shall be based on the FHWA publications *Hydraulic Design of Safe Bridges,* Hydraulic Design Series Number 7 (HDS-7) and *Bridge*

Scour and Stream Instability Countermeasures, Hydraulic Engineering Circular No. 23 (HEC-23) – Volume 2 Design Guideline for Guide Banks. MDOT standards shall be used for guide bank lengths, and special design will be required for all other lengths.

H. STREAM STABILITY ANALYSIS AND PRELIMINARY STREAM AND SCOUR COUNTERMEASURE DESIGN: Stream stability and lateral migration tendencies shall be included in design considerations and based upon conformance with FHWA publication *Evaluating Scour at Bridges*, Hydraulic Engineering Circular No. 18 (HEC-18), and FHWA publication *Stream Stability at Highway Structures,* Hydraulic Engineering Circular No. 20 (HEC-20). The determination of countermeasure requirements shall be based on the FHWA publication *Bridge Scour and Stream Instability Countermeasures*, Hydraulic Engineering Circular No. 23 (HEC-23). Further requirements shall be the FHWA publication *Design of Riprap Revetment*, Hydraulic Engineering Circular No. 11 (HEC-11). Documentation, details, and drawings shall be provided for the preliminary design.

I. BRIDGE DECK DRAINAGE: Bridge deck drainage shall be based on the FHWA publication *Design of Bridge Deck Drainage*, Hydraulic Engineering Circular No. 21 (HEC-21).

J. "NO-RISE/NO-IMPACT" CERTIFICATION: If the project is located in or across a FEMA Regulatory Floodway, or base flood elevations have been determined as noted on the NFIP maps, the CONSULTANT shall obtain the step-backwater hydraulic model for the specified stream and community from FEMA. The CONSULTANT shall complete a "No-Rise/No-Impact" certification and report. The report shall contain all needed documentation and technical data required by a "No-Rise/No-Impact" certification for MDOT's review. The step-backwater hydraulic model shall be modified to demonstrate the proposed development will not impact the pre-project base flood elevations, regulatory floodway elevations, or regulatory floodway widths. The certification shall be signed, sealed, and dated by the CONSULTANT'S engineer.

K. CLOMR and LOMR APPLICATIONS: In the event a "No-Rise/No-Impact" is impracticable or not possible, or a longitudinal encroachment of the roadway embankment will occur within the floodway, an application for revisions to the NFIP maps shall be required at MDOT's discretion. The CONSULTANT shall be required to prepare for submittal an application for CLOMR, LOMR, and the required supporting data and documentation to the participating community and FEMA. The certification shall be signed, sealed, and dated by the CONSULTANT'S engineer.

The Hydraulic Report shall be signed, sealed, and dated by the CONSULTANT'S engineer. Recommendations and plans shall be provided as separate PDFs outside of the Hydraulic Report. The following file naming format shall be used:

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100774-001000_SR57_Jackson_PRELIMplans_07-01-2021.pdf

If a project involves multiple bridge sites, the recommendation forms shall be combined into one (1) multi-page PDF, and the plans shall be combined into a separate one (1) multi-page PDF.

The CONSULTANT shall allow approximately four (4) weeks for review by the Hydraulics Branch, or as instructed by the Hydraulics Branch Project Manager. Upon completion of the review, comments shall be provided to the CONSULTANT. The CONSULTANT shall address the comments and provide updated preliminary studies and recommendations for subsequent review.

Proposed bridge layouts shall be staked prior to the Field Inspection. Preliminary plans for bridges (except box bridges) shall be available for the Field Inspection. If changes result from the Field Inspection or MDOT's review, the CONSULTANT shall provide revised Hydraulic Studies and Recommendations, revised hydraulic analysis, and revised bridge drawings as appropriate.

The CONSULTANT shall prepare and submit Final Hydraulic Studies and Bridge Recommendations, and shall account for any changes from the Field Inspection to the Hydraulics Branch for review and approval. **Documentation from the Field Inspection shall be added to the report, including statements for any revisions and any additional items indicated in the Work Assignment**. The studies and recommendations shall be submitted in the format set forth by the Hydraulics Branch.

One (1) complete set of the Final Hydraulic Studies, design/analysis computations, supporting data, and reports shall be submitted to the Hydraulics Branch after all changes from the Field Inspection and MDOT's review have been made. This submittal shall include:

A. Computer input and output;
B. Scour computations;
C. Guide bank analysis;
D. Survey data;
E. Supporting drawings;
F. All correspondence with governmental and regulatory agencies regarding levees and water crossings; and
G. Any additional items indicated in the Work Assignment.

In the event a FEMA Regulatory Floodway is involved, the CONSULTANT shall also submit a copy of the following as appropriate:

A. FEMA flood study data;
B. Topographic maps showing revised floodway and floodplain boundaries (when instructed by the Hydraulics Branch);
C. No-Rise/No-Impact certification;
D. CLOMR application (when instructed by the Hydraulics Branch);
E. LOMR (when instructed by the Hydraulics Branch); and
F. All correspondence with FEMA and the Community Floodplain Administrator.

The Hydraulic Report shall be signed, sealed, and dated by the CONSULTANT'S engineer. Recommendations and plans shall be provided as separate PDFs outside of the Hydraulic Report. The following file naming format shall be used:

File name: FMS_ROUTE_County_Print Type_MM-DD-YYYY.pdf

Examples:
100774-001000_ SR57_Jackson _FINALrecs_07-01-2021.pdf
100774-001000_ SR57_Jackson _FINALplans_07-01-2021.pdf

If a project involves multiple bridge sites, the recommendation forms shall be combined into one (1) multi-page PDF, and the plans shall be combined into a separate one (1) multi-page PDF.

Part 4 – CONCEPTUAL PLANS

If specified in the Work Assignment, the CONSULTANT shall prepare and submit Conceptual Plans that include:

A. ROADWAY PLANS

1. Unless instructed otherwise by the Project Manager, Conceptual Roadway Plans will be limited to the Title Sheet(s), Typical Sections, and Plan-Profile Sheets. If specified in the Work Assignment, a Preliminary Traffic Control Plan and phase construction details shall be included to ensure that traffic can be maintained and the project is constructable as proposed. If specified in the Work Assignment, conceptual permanent signing and striping plans shall be required.

2. For Work Assignments that include grade separations, the CONSULTANT may be required to conduct an over/under analysis at each grade separation to determine the most cost-effective solution as to which route is to be bridged. Factors to be considered include, but are not limited to, Right-of-Way acquisition, maintenance of traffic, bridge cost, existing elevations at both proposed roadways, and constructability.

3. For Work Assignments that include design of new or reconstructed interchanges, the CONSULTANT shall include all applicable horizontal and vertical alignment information of the interchange.

4. For Work Assignments that require local road improvements to be made as a result of the primary purpose of the project, the CONSULTANT shall investigate all local roads within the project limits to determine the appropriate approach to reconstructing the local roads to an acceptable design while keeping additional costs to a minimum. Factors to be considered include, but are not limited to, intersection sight distance, angle of intersection, offset intersections, and crossover spacing.

5. For Work Assignments that include local roads to be reconstructed as the primary purpose of the project, the CONSULTANT shall investigate the local roads to determine the appropriate approach to reconstruct the local roads to an acceptable design to meet the goals of the project. Factors to be considered include, but are not limited to, intersection sight distance, angle of intersection, offset intersections, and crossover spacing.

6. For Work Assignments that include lighting, the CONSULTANT shall provide a lighting plan to determine the most effective means of lighting the roadway to achieve the desired lighting levels. The Conceptual Plans shall show the location of the proposed lighting assemblies and provide information for MDOT's review. Height of poles, number of luminaires, type of lamps, and any special features required shall be indicated on the plans. The CONSULTANT shall ensure the proposed layout satisfies the AASHTO and FHWA requirements for the type of roadway being lit.

B. BRIDGE PLANS

1. Unless instructed otherwise by MDOT, Conceptual Bridge Plans shall include the following:

    a. Plan elevation sheets;
    b. Span arrangements;
    c. Pier/foundation schematics;
    d. Shoring requirements adjacent to existing streets and railroads;
    e. Typical Sections;
    f. Finish grade profiles;
    g. Vertical and horizontal clearances;
    h. Retaining walls;
    i. Design data, drainage data; and
    j. Any other information as instructed by the Bridge Division Project Manager.

2. When applicable, Conceptual Bridge Plans for railroad grade separations, including preliminary studies for shoring requirements, shall be submitted to the Bridge Division Project Manager to submit to the railroad company for review at this time. Studies (including cost analyses) of other concepts, shoring requirements at existing streets and railroads, and conceptual changes required during this review are covered by this Scope of Work.

Along with the Conceptual Plans, the CONSULTANT shall submit CADD files, KMZ file, and a signed copy of the current Phase A checklist located under Quality Control Checklists on the MDOT website.

Conceptual Plans shall be submitted to MDOT for review and approval. The CONSULTANT shall allow approximately four (4) weeks for review by MDOT, or as instructed by the Project Manager. After MDOT completes its review, MDOT shall do one of the following: provide a list of changes required, or meet with the CONSULTANT for a Conceptual Plan Review to discuss the necessary changes.

If a Conceptual Plan Review is held, the CONSULTANT shall submit minutes of the meeting to the Project Manager within two (2) weeks after the conclusion of the meeting, unless instructed otherwise by the Project Manager. The minutes shall include, but are not limited to, a list of attendees, a list of all significant changes to the plans, and a list of all action items by both the CONSULTANT and MDOT.

Part 5 - GEOTECHNICAL

1. CENTERLINE SOIL PROFILE

    The CONSULTANT shall investigate subsurface soil and geological conditions along the project route as required to provide the necessary design criteria for structure foundations, pavement support criteria, and embankment stability as required by MDOT.

    Design Criteria for pavement support shall be determined from a Centerline Soil Profile. The specific objective of this study is to determine the quality and type of soils located along the project. The Centerline Soil Profile shall be completed prior to the submittal of the Preliminary Right-of-Way Plans so the plans reflect slope

requirements in areas that contain high-volume-change soils, as well as fill and cut areas that will require benching foreslopes and/or backslopes.

The CONSULTANT shall perform necessary field and laboratory work to develop and provide the complete soil profile along the centerline of survey. The soil survey shall be performed by the CONSULTANT in such a manner as necessary to produce a report similar in content and format commonly developed by MDOT's District Materials laboratories, and in accordance with MDOT SOP TMD-20-14-00-000, "Centerline Soil Profiles and Standard Design Procedures for Construction of Roadways through High Volume Change Soils."

The CONSULTANT shall identify the types of soils along the proposed alignment, evaluate their potential use as fill materials, and locate any undesirable low strength surface soils that may require undercutting or other remedial measures for construction. From the Centerline Soil Profile, a tentative base design will be formed by MDOT and any undesirable strata shall be noted for special consideration by the MDOT Project Engineer in charge of the actual construction.

Prior to the beginning of the field exploration, the CONSULTANT shall submit the proposed plan of work to MDOT for review and approval. As a general rule, soil borings should be spaced a maximum of two hundred (200) feet apart along the centerline and drilled to a depth of three (3) feet below the proposed subgrade line in cut sections or natural ground in fill sections. The spacing and depth of soil borings should vary if unusual conditions are encountered such as rock layers, water strata, or weak deposits (muck or unstable material). The auger method of drilling for disturbed samples is generally suitable for identification of the materials obtained.

Additional laboratory tests and analyses that are not specified in TMD-20-14-00-000 shall be performed by the CONSULTANT. These tests and analyses include the following:

a. Estimated California Bearing Ratio (CBR), from charts supplied by MDOT;
b. Volume Change, AASHTO T 92 or Mississippi Test Method MT-92;
c. pH, Mississippi Test Method MT-30 or AASHTO T 289; and
d. Soil Resistivity, Mississippi Test Method MT-47 or AASHTO T 288.

The CONSULTANT shall prepare a report of the findings of the soil survey. This report shall include recommendations for handling unsuitable or undesirable soils, copies of the laboratory test results on MDOT form TMD-683 or equivalent, and the Centerline Soil Profile. The Centerline Soil Profile shall show the limits of each soil type identified, with each type labeled as follows:

a. An identification number to reference it to the laboratory test results;
b. AASHTO classification;
c. Unified Soils classification;
d. Estimated CBR; and
e. % Volume Change (if applicable).

2. GEOTECHNICAL INVESTIGATION AND REPORT

The necessary field investigation, laboratory testing, and engineering services shall be conducted by the CONSULTANT in accordance with this Work Assignment at the direction of the Geotechnical Branch of Materials Division, unless instructed otherwise. The Geotechnical Investigation may consist of the following:

a. Subsurface investigations, consisting of borings on land or over water;
b. Undisturbed Sampling;
c. Standard Penetration Testing;
d. Cone Penetrometer (CPT) Sampling/Soundings;
e. Shear wave velocity profiling;
f. Laboratory testing of disturbed and undisturbed samples;
g. Engineering analyses as defined in the Work Assignment;
h. Geotechnical Report, which contains the results of the subsurface field investigation, seismic site classification, recommended response spectra, liquefaction potential assessment, laboratory testing, and preliminary bridge and/or wall foundation recommendations;
i. Geotechnical design including geotechnical seismic design of bridge and/or retaining wall foundations, embankments, and/or slopes;
j. Preparation of necessary plan sheets and Special Provisions for inclusion in the final construction plans. Plan sheets shall be produced in a manner such that minimal modification by MDOT is required;
k. Geotechnical substructure report, which contains results of all structure-specific engineering analyses (described in the following sections), conclusions and recommendations, and all supporting data;
l. PDA field data collection and data reduction (CAPWAP and WEAP);
m. Static load test of piling including setup, monitoring, and analysis; and
n. Recommendations and final drawings for subsurface drainage, surface drainage, retaining wall, ground anchor, soil nail, buttress, and/or other stabilization feature design and layout.

The CONSULTANT shall be responsible for obtaining permits, licenses, and/or authority from public agencies required for conducting operations under the Work Assignment, including payment of any charges for the same, and shall not work or use public property without such authority, licenses, or permits. The CONSULTANT shall also obtain any necessary permits to transport equipment over or across public thoroughfares. When applicable, the CONSULTANT shall also notify private landowners and obtain access and permission to enter or work on their property. MDOT shall be notified in writing within five (5) working days of any landowner's refusal to grant access to his or her property.

All foundation investigation work that includes drilling, sampling, soils classification, laboratory testing, and all other work in connection therewith shall follow procedures outlined in the current *AASHTO LRFD Bridge Design Specifications*.

a. Subsurface Investigation

For a Work Assignment calling for a subsurface investigation, the CONSULTANT shall prepare a layout of its proposed boring program to be submitted to the Geotechnical Branch for approval. This layout shall indicate boring locations and tentative termination depths and shall be prepared as soon as possible after the initial horizontal alignment and bridge end abutment locations have been established in the field by MDOT. Borehole spacing along the alignment(s) shall not exceed two hundred (200) feet.

If subsurface conditions warrant, and the Work Assignment dictates, the CONSULTANT shall be required to perform additional geotechnical borings to analyze slope stability at bridge approach or roadway embankment locations. These borings shall generally not exceed fifty (50) feet in depth and may only be performed by approval of MDOT.

Piezometers (open standpipe or vibrating wire) shall be set in the field along the alignments for monitoring of the groundwater table as the Work Assignment dictates. Piezometer locations shall be noted on the boring program layout submitted for approval. Generally, piezometers shall be necessary only at locations in which footings (pile-supported or spread) or drilled shafts will be utilized or for the determination of liquefaction potential.

Soil samples shall be obtained in each boring. These samples shall be taken at intervals necessary to produce a continuous log. The sampling interval shall not exceed five (5) feet to a depth of sixty (60) feet, and ten (10) foot intervals beyond that depth. At a minimum, one boring shall be completed at each bridge site where sampling for the top twenty (20) feet below final ground line is performed on two (2)-foot sample intervals. One boring completed to a minimum depth of one hundred (100) feet below existing ground shall be required for determination of site classification and seismic design as the Work Assignment dictates.

Casings for borings shall be allowed only with MDOT approval.

Undisturbed soil samples shall be obtained in cohesive soil zones in accordance with AASHTO T207. Standard Penetration Tests (SPT) shall be conducted in cohesionless soil zones in accordance with AASHTO T206. A calibrated automatic SPT hammer shall be required statewide unless otherwise authorized by the Geotechnical Branch. Hammer calibrations shall have been performed in accordance with ASTM D4633 within three (3) years of the date of starting drilling operations. Field recorded SPT N-values shall be corrected to N_{60} and reported as N_{60} along with hammer efficiency or energy ratio (ER, kinetic energy/potential energy) on the final soil boring logs. Corrections for rod length, borehole diameter, and use of a liner may also be made as appropriate. The N_{60} values corrected for rod length, borehole diameter, and liner shall be reported as $N(1)_{60}$. The corrections are significant for evaluation of liquefaction potential. Rotary wash drilling techniques using bentonite drilling fluid shall

be required for drilling below the water table unless otherwise authorized by the Geotechnical Branch.

Continuous rock cores shall be obtained in any rock strata greater than six (6) inches thick. Any rock strata less than six (6) inches thick shall be identified by collecting and analyzing cuttings. Drilling in rock shall comply with AASHTO T255. All rock cores shall be delivered to the Geotechnical Branch.

CPT shall be performed in accordance with ASTM D5778 – Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils. Soil samples are not obtained with the CPT. For this reason, CPT soundings will be augmented with conventional borings in close proximity for correlation purposes.

A detailed log of each boring shall be prepared in the field in general accordance with ASTM D5434. A generalized soil profile for each structure site shall be developed and drawn, showing at a minimum the ground line profile, soil zone stratification, locations of the borings, and results of the standard penetration tests (N_{60}). If the Work Assignment does not involve laboratory testing, this profile shall be submitted along with the boring logs and soil or rock samples to the Geotechnical Branch of Materials Division. A digital copy of the final soil boring log(s) shall be provided in gINT format at the time the Final Geotechnical Report is submitted.

b. Laboratory Testing

The CONSULTANT shall perform the following:

Laboratory testing of the soil or rock samples obtained during a field exploration shall be performed to adequately determine necessary classification and design parameters. The following soil/rock characteristics shall be determined from laboratory testing:

i. Plasticity;
ii. In situ moisture content;
iii. Unit weight;
iv. Grain size;
v. Shear strength;
vi. Angle of internal friction;
vii. Rock quality designation (RQD); and
viii. Compressibility.

A sufficient number of tests shall be performed on representative samples from each strata designated in the field exploration to adequately determine shear strength, settlement potential, grain size distribution, seismic design properties, and bearing capacity. All testing and sampling are to be performed in accordance with AASHTO, ASTM, or MDOT procedures and industry standards.

Unconfined Compression (UC, AASHTO T208) and Unconsolidated-Undrained (UU, AASHTO T296) triaxial compression tests

shall be used to determine the shear strength characteristics of cohesive soils. A wide range of confining pressures shall be used with representative samples from each zone to develop a Mohr's failure envelope. Consolidated-undrained (CU, AASHTO T297) triaxial compression tests and 3-point direct shear tests (AASHTO T236) shall be performed when required by the Geotechnical Branch.

Consolidation tests shall be performed on representative samples of all potentially compressible soil strata. The in-situ void ratio, saturation percentage, specific gravity, over-consolidation ratio, and coefficients of compression and vertical drainage shall be determined for these tests.

The angle of internal friction for each sand zone shall be determined by performing triaxial tests at three (3) relative densities. The relative densities shall be 15, 50, and 85 percent. Three (3) confining pressures shall be utilized at each relative density. These pressures are 20, 40, and 60 psi. A total of nine (9) sand triaxial tests (points) will be run per set in order to define the failure envelope at 15, 50, and 85 percent relative densities.

c. Engineering Analyses

Foundation conditions shall be analyzed together with typical bent loads and elevations furnished by the Geotechnical Branch to develop feasible foundation support systems and general foundation designs that follow current AASHTO requirements.

Following completion of the laboratory testing, all soils and rock encountered shall be described and presented on a final boring log, and each strata shall be classified both geologically and also in accordance with the Unified Soil Classification System (USCS), ASTM D2487. Geologic classification of the generalized soil profile shall delineate the differing geologic formations encountered. Substrata within each geologic formation shall be grouped by the physical properties of the soil or rock samples obtained from the borings as determined by the laboratory testing.

Ultimate pile or drilled shaft bearing capacity curves that present capacity as a function of depth shall be developed for various sizes and types of driven piles or drilled shafts. The curves are to be developed for all bent locations and shall take into account estimated scour depth, if available. The sizes and types of piles, bent locations, and estimated depth of scour are to be provided by MDOT. Construction considerations pertaining to driving piles shall be provided in regard to achieving minimum tip elevations provided by MDOT.

The feasibility of drilled shaft foundations and spread footing foundations shall be examined. General construction considerations and capacity curves for acceptable sizes of shafts and footings shall be provided for those locations the CONSULTANT determines are suited for these types of foundations. If a complete design is requested, loads to be used in the analysis will be provided by MDOT.

Each approach embankment shall be evaluated as to slope stability (static and seismic) and anticipated settlement.

Seismic considerations regarding foundations will address recommended seismic site classification, liquefaction potential, and pseudo-static seismic slope stability where required.

Findings shall be provided to the Geotechnical Branch.

d. Designs

For Work Assignments involving designs indicated below, the following shall be required:

i. Retaining Walls – MDOT shall provide the alignment and grade of any proposed retaining walls. The CONSULTANT shall design Mechanically Stabilized Earth (MSE) and similar gravity walls for internal, external, and global stability at various locations along the length of the wall. Conventional cantilever walls shall be designed against sliding, overturning, and bearing capacity failure. The CONSULTANT will be required to provide structural details in addition to any geometric details necessary for MDOT to develop construction plans.

Walls in cut slopes shall first be evaluated as to recommended type (MSE, cantilever, tieback, or soil nailed). Once the selection is made by MDOT, the CONSULTANT shall furnish a generic wall design along with recommendations and considerations for construction.

ii. Foundations – Driven piles (and/or drilled shafts) shall be evaluated for axial compression and uplift capacity. A lateral pile capacity analysis may be required and will be indicated in the Work Assignment. When a lateral capacity analysis is not required, the CONSULTANT shall provide recommended soil parameters necessary to complete a lateral capacity analysis. If drilled shafts are chosen as the foundation type, the CONSULTANT will be required to complete the axial capacity and lateral load analysis based on current FHWA and/or AASHTO guidelines. In addition, for sites requiring a load test, the CONSULTANT shall design an out-of-position test shaft to be load-tested for the purpose of determining the ultimate capacity of the test shaft.

iii. Embankments – Embankments shall be designed such that a minimum factor of safety of 1.3 exists against slope failure (1.4 in critical applications). The use of berms, geosynthetics, buttresses, stabilizing piles, or other methods for increasing the margin of safety against instability shall be considered by the CONSULTANT in the embankment design.

Bridge approach embankments that are determined to settle more than two (2) inches due to the existence of compressible materials

below the ground surface shall be designed by the CONSULTANT with regard to mitigation of the settlement. Specified waiting periods, surcharging, wick drain designs, and/or special abutment pile designs shall be considered by the CONSULTANT.

iv. Cut slopes – The CONSULTANT shall design any cut slopes identified by MDOT for a minimum long-term factor of safety of 1.40. Temporary backslopes for construction shall be designed for a minimum factor of safety of 1.20.

e. Geotechnical Seismic Design Requirements

i. Foundation Stiffness matrices (where required), including individual pile stiffness, pile group stiffness, footing stiffness, and abutment stiffness, will be developed using the procedures outlined in FHWA NHI-11-032 Geotechnical Engineering Circular No. 3, dated March 2011, *LRFD Seismic Analysis and Design of Transportation Geotechnical Features and Structural Foundations,* and the current *AASHTO LRFD Bridge Design Specifications*.

ii. Seismic site classification and corresponding recommended response spectra for both period and displacement will be determined per the current *AASHTO LRFD Bridge Design Specifications*.

iii. Liquefaction potential (where required) will be assessed per the current *AASHTO LRFD Bridge Design Specifications*.

iv. A preliminary lateral pile analysis using LPile 2018 or later developed by Ensoft, Inc. (or equivalent p-y based commercial software package) is to be performed at each bridge or retaining wall site, and the corresponding output curves are to be included in the Geotechnical Substructure Report.

v. Pseudo-static seismic slope stability analyses (where required) shall follow the current *AASHTO LRFD Bridge Design Specifications*.

Part 6 – FIELD INSPECTION PLANS

A. The CONSULTANT shall prepare and submit Field Inspection Plans, which includes Roadway Plans and Roadway Hydraulics, as applicable:

1. ROADWAY PLANS

a. The Roadway Plans shall contain, at a minimum:

i. Title Sheet;
ii. Typical Sections;

iii. Plan-Profile Sheets showing all geometrics, profile grades, special ditches, construction limits, existing and proposed Right-of-Way limits, size and location of all drainage structures, existing and proposed driveways, and all public and private utility locations;
iv. Erosion Control Plan (ECP) Sheets with contours;
v. Riparian Buffer Sheets; and
vi. Cross Section Sheets showing accurate templates at each cross section, all ditches, proposed driveways, and proposed and existing side drain and cross drain structures. The drainage structure cross sections shall not be in a separate cross section file. Phase construction details shall be shown on the cross sections.

b. Along with the Field Inspection Plans, the CONSULTANT shall submit a signed copy of the current Phase A checklist located under Quality Control Checklists on the MDOT website.

c. The proposed Final Right-of-Way limits shall be adjusted as necessary from the Preliminary Right-of-Way and will be based on the normal border width, which will represent the actual proposed Right-of-Way for the project, pending approval by MDOT.

d. If specified in the Work Assignment, the CONSULTANT shall include the following: preliminary earthwork quantities, preliminary permanent directional signing layout sheets, preliminary pavement marking sheets, and any traffic control that will be required during construction.

2. ROADWAY HYDRAULIC DESIGN (Drainage Area < 1000 acres)

a. <u>HYDRAULIC ANALYSIS AND DESIGN REQUIREMENTS</u>

The CONSULTANT shall base the design on the most effective and economical methods that allow runoff waters to be passed through and removed from the roadway. Drainage installations should not create hazardous conditions for traffic operations, nor should they adversely affect conditions of adjoining properties.

Roadway hydraulic design, including hydrology, channels, culverts, energy dissipators, storm drainage systems, and storage facilities, shall be in conformance with the publications listed in I. GENERAL REQUIREMENTS of this Scope of Work and those listed below.

The current editions of the major reference publications for hydraulic design of highways are as follows (in addition to any other publications that are applicable to engineering industry standards):

i. FHWA publication *Hydraulic Design of Highway Culverts,* Hydraulic Design Series Number 5 (HDS-5);
ii. FHWA publication *Hydraulic Design of Energy Dissipators for Culverts and Channels,* Hydraulic Engineering Circular No. 14 (HEC-14);
iii. FHWA publication *Design of Roadside Channels with Flexible Linings,* Hydraulic Engineering Circular No. 15 (HEC-15); and

iv. FHWA publication *Urban Drainage Design Manual,* Hydraulic Engineering Circular No. 22 (HEC-22).

The hydraulic design shall be performed using a nationally recognized and readily available computer program specifically developed for aiding in the design of roadway drainage structures, culverts, and/or storm water conveyance systems and containments. Acceptable software for drainage design applications may include HY-8 Culvert Hydraulic Analysis Program, FHWA Hydraulic Toolbox, HEC-RAS, PondPack, StormCAD, StreamStats, HEC-HMS, WMS, and SMS.

For any project located in or across a FEMA Regulatory Floodway, or where base flood elevations have been determined as shown on the NFIP maps, the CONSULTANT shall obtain the step-backwater hydraulic model for the specified stream and community from FEMA. Modification of this input data will be required to demonstrate that the proposed hydraulic improvements or structure(s) will not impact the pre-project base flood elevations, regulatory floodway elevations, or regulatory floodway widths.

For structures with drainage areas less than 1000 acres, the design flood for encroachments by through lanes of interstate highways shall not be less than the flood with a two (2) percent chance of being exceeded in any given year, per 23 CFR 650.115.

For storm drainage systems that collect, convey, and discharge stormwater flowing within and along the highway Right-of-Way, the storm sewer system design shall be completed in accordance with the requirements and format set forth herein. The storm drainage system shall be designed so the post-construction peak flow rate at any point where runoff leaves the project Right-of-Way shall be less than or equal to the pre-construction conditions, when applicable.

For temporary drainage structures and/or culverts that may be necessary for detour roads or other non-permanent locations, the temporary hydraulic design shall be completed in accordance with current MDOT policies and requirements, MDOT Design Memos, and any other guidance as applicable.

The sediment basin design shall be completed in accordance with current MDOT policies and requirements, MDOT Design Memos, and any other guidance as applicable.

b. <u>HYDRAULIC PLANS REQUIREMENTS</u>

Pursuant to the hydraulic structure recommendations, drainage details for all culverts and cross drains, including any that are necessary for detour roads and any other non-permanent locations, storm drainage systems, and sediment basins, shall be provided and placed accordingly in the drainage design file and referenced into the Plan-Profile Sheets.

For urban projects, the storm sewer design shall be depicted on separate Left and Right 1” = 20’ Plan-Profile Sheets.

The following Plan-Profile Sheet information shall be provided at a minimum:

i. The plan view shall show all existing and proposed structures in the proper location, and include corresponding labels as to length, size, and type. Any existing drainage structures that conflict with proposed work shall be labeled to be removed. For storm drainage systems, an identifying structure tag (with corresponding tag in profile view) and a directional flow arrow on all pipes shall be included. For sediment basins, the location and type shall be shown.

ii. The profile view shall show the structures in the proper location, and shall be drawn to proper flow lines and dimensions. Pipe slopes and any special ditch slopes shall be labeled.

iii. A detailed description of each structure shall be provided in the profile view, including, but not limited to:

aa. Station;
ab. Type;
ac. Size;
ad. Length;
ae. Drainage area;
af. Flowlines;
ag. Skews;
ah. Inverts; and
ai. Dimensions when applicable, openings with pipe sizes, etc.

iv. For silt basins, the following shall be included:

aa. Station;
ab. Basin type;
ac. Drainage area; and
ad. Dam length and height.

v. For flat-bottom ditches, the following shall be included:

aa. Location;
ab. Station range of special ditch;
ac. Bottom widths;
ad. Side slopes; and
ae. Armoring when applicable.

Cross sections shall include all existing, proposed, and temporary structures, labeled and drawn to proper flowlines and dimensions, in the cross section file provided by Roadway Design Division. A cross section shall be included at all drainage structure locations. The drainage structure cross sections shall not be in a separate cross section file.

c. HYDRAULIC CALCULATIONS AND REPORT REQUIREMENTS

A Hydraulic Report shall be provided on all Roadway projects. The format of the Roadway Hydraulics Design submittals shall be in report style, including, when applicable:

i. Table of contents;
ii. Introduction and methodology;
iii. Design criteria;
iv. Hydrology;
v. Culvert Design Form(s);
vi. Coverage area map including sub- and overall drainage areas;
vii. Cross drains analyses;
viii. Side drains analyses;
ix. Ditch analyses;
x. Storm system analyses; and
xi. Sediment basin analyses.

For projects with storm sewer systems, a chart shall be included with detailed information of the system, including, but not limited to:

i. Structure type;
ii. Station;
iii. Drainage area;
iv. Flow rate;
v. Velocity;
vi. Intercepted flow;
vii. Bypass flow;
viii. Spread as applicable; and
ix. Flow into each pipe in the system.

HYDRAULIC MODELS AND CALCULATIONS: Hydraulic models for projects affected by a FEMA Regulatory Floodway shall be provided when applicable. Input and output from software and any other calculations used in hydraulic design shall be provided.

“NO-RISE/NO-IMPACT” CERTIFICATION: If the project is located in or across a FEMA Regulatory Floodway, or base flood elevations have been determined as noted on the NFIP maps, the CONSULTANT shall obtain the step-backwater hydraulic model for the specified stream and community from FEMA. The CONSULTANT shall complete a “No-Rise/No-Impact” certification and report. The report shall contain all needed documentation and technical data required by a “No-Rise/No-Impact” certification for MDOT’s review. The step-backwater hydraulic model shall be modified to demonstrate that the proposed hydraulic improvements or structure(s) will not impact the pre-project base flood elevations, regulatory floodway elevations, or regulatory floodway widths. The certification shall be signed, sealed, and dated by the CONSULTANT’S engineer.

CLOMR and LOMR APPLICATIONS: In the event a “No-Rise/No-Impact” is not possible, or a longitudinal encroachment of the roadway embankment will occur within the floodway, an application for revisions to

the NFIP maps shall be required at the discretion of MDOT. The CONSULTANT shall be required to prepare for submittal an application for CLOMR, LOMR, and the required supporting data and documentation to the participating community and FEMA. The certification shall be signed, sealed, and dated by the CONSULTANT'S engineer.

SUBMITTAL REQUIREMENTS

A. General Submittal Requirements

The CONSULTANT shall submit concurrently the following no later than four (4) weeks prior to the Field Inspection, unless otherwise instructed by the Project Manager:

1. Field Inspection Plans;
2. Draft Final Roadway Hydraulic Report;
3. Current Phase A Checklist located under Quality Control Checklists on the MDOT website; and
4. Updated CADD files and KMZ file.

Any other incidental drawings needed to show pertinent topographical features or special treatments shall be included with the Field Inspection Plans. Any remedial measures required by the COMMISSION's Standard Operating Procedure (SOP) TMD-20-14-00-000, "Centerline Soil Profiles and Standard Design Procedures for Construction of Roadways Through High Volume Change Soils" must be identified and incorporated into the design of Final Right-of-Way Plans.

The CONSULTANT shall allow four (4) weeks for review by MDOT, or as instructed by the Project Manager.

Representatives of the appropriate divisions of MDOT and the CONSULTANT shall attend the Field Inspection at a date mutually agreed upon by both parties.

The CONSULTANT shall submit minutes of the Field Inspection to the Project Manager within two (2) weeks after the conclusion of the Field Inspection, unless instructed otherwise by the Project Manager. The minutes shall include, but are not limited to, a list of attendees, a list of all significant changes to the plans, and a list of all action items by both the CONSULTANT and MDOT. The CONSULTANT may also be required to complete the field inspection report template provided by MDOT.

B. Hydraulics Submittal Requirements

The CONSULTANT shall prepare and submit the Draft Final Roadway Hydraulic Report in accordance with the format required by the Hydraulics Branch and as described herein for its review and comments.

The Roadway Hydraulic submittal shall include the following:

1. Drainage MicroStation files (Plan-Profile Sheets and cross sections);
2. Hydraulic Report;
3. Supporting drawings;
4. All correspondence with governmental and regulatory agencies regarding levees and water crossings; and

5. Any additional items indicated in the Work Assignment.

In the event a FEMA Regulatory Floodway is involved, the CONSULTANT shall also submit a copy of the following as appropriate:

1. FEMA flood study data;
2. Topographic maps showing revised floodway and floodplain boundaries (when instructed by the Hydraulics Branch);
3. No-Rise/No-Impact certification;
4. CLOMR application (when directed by the Hydraulics Branch);
5. LOMR (when directed by the Hydraulics Branch); and
6. All correspondence with FEMA and the Community Floodplain Administrator.

The following file naming format shall be used:

File name: FMS_ROUTE_County_Print Type_MM-DD-YYYY.dgn

Examples:
100774-001000_SR57_Jackson_HYD_Culvert_Summary_07-01-2021.dgn
100774-001000_SR57_Jackson_HYD_Drainage_07-01-2021.dgn
100774-001000_SR57_Jackson_HYD_XS_07-01-2021.dgn
100774-001000_SR57_Jackson_HYD_TEMP_Drainage_07-01-2021.dgn

Documentation from the Field Inspection shall be added to the Draft Final Roadway Hydraulic Report, including statements for any revisions and any additional items indicated in the Work Assignment.

Part 7 – FINAL RIGHT-OF-WAY PLANS

Following the Field Inspection, the CONSULTANT shall make all approved plan changes as instructed by the Project Manager. After completion of all changes requested by MDOT, the CONSULTANT shall submit the Draft Final Right-of-Way Plans and Draft Final Right-of-Way Cross Section for review.

The CONSULTANT shall submit concurrently the following after the Field Inspection:

A. Draft Final Right-of-Way Plans;
B. Draft Final Roadway Hydraulic Design Report; and
C. Current Phase A Checklist located under Quality Control Checklists on the MDOT website.

The Draft Final Right-of-Way Plans shall contain, at a minimum:

A. Title Sheet;
B. Typical Sections;
C. Right-of-Way Revision Sheet;
D. Plan-Profile Sheets showing all geometrics, profile grades, special ditches, construction limits, proposed Final Right-of-Way limits, size, length, flow lines, and location of all drainage structures, existing and proposed driveways, and all public and private utility locations;
E. ECP Sheets including contours;
F. Right-of-Way and Easement Coordinate Sheets; and

G. Cross Section Sheets showing accurate templates at each cross section, all ditches, proposed driveways, and proposed and existing side drain and cross drain structures. The drainage structure cross sections shall not be in a separate cross section file. Phase construction details shall be shown on the cross sections.

The CONSULTANT shall allow approximately four (4) weeks for review by MDOT, or as instructed by the Project Manager. After MDOT completes its review, MDOT shall provide a list of changes required, or meet with the CONSULTANT for a Draft Final Right-of-Way review to discuss the necessary changes.

Upon completion, the revised Final Hydraulic Studies, Recommendations, and Hydraulic Report shall be signed, sealed, and dated by the CONSULTANT'S engineer.

SPECIFIC WORK REQUIREMENTS FOR FINAL PLANS

Part 1 – PRE-DESIGN MEETING

The purpose of the Pre-Design Meeting is to discuss any updated procedures or policies MDOT may have enacted that would impact the development of Final Plans for the project.

The CONSULTANT shall submit minutes of the Pre-Design Meeting to the Project Manager within two (2) weeks after the meeting, unless instructed otherwise. The minutes shall include, but are not limited to, a list of attendees and a detailed list of all design requirements discussed in the meeting.

For some Work Assignments, the Pre-Design Meeting may be included in the Scope of Work Meeting, and therefore will not be included in the CONSULTANT'S fee proposal.

Part 2 – SIXTY PERCENT (60%) STRUCTURAL INFORMATION PLANS AND REVIEW

Unless otherwise specified in the Work Assignment, when approximately sixty percent (60%) of the structural design and detailing has been completed, the CONSULTANT shall submit a PDF set of all bridge sheets to Bridge Division for review. The CONSULTANT shall allow approximately four (4) weeks for the review by Bridge Division, or as instructed by the Project Manager, after which time the Bridge Division Project Manager will provide the CONSULTANT a list of corrections/comments to be addressed.

Part 3 – CONSTRUCTABILITY REVIEW

The CONSULTANT may be requested by the Project Manager to perform a constructability review of the design of all roadway and bridge features to ensure safe and efficient maintenance of traffic, sufficient drainage, and the safety of construction workers during construction.

The CONSULTANT shall perform constructability design and analysis of all bridge and retaining structures, which includes, but is not limited to:

A. Consideration of deflection;
B. Girder transport and delivery;
C. Strength of steel and concrete and stability during girder erection, concrete deck pouring sequence, or other critical stages of construction;

D. Permissible locations of temporary falsework and girder splice connections; and
E. Consideration of retaining structure type, height, and location.

The CONSULTANT shall design and detail bridges in a manner that allows fabrication and erection to be performed without undue difficulty or distress, and that ensures that locked-in construction force effects are within tolerable limits.

The CONSULTANT shall include one complete set of Erection Plans for each complex bridge structure based on the constructability design and analysis. The Erection Plans shall include:

A. Temporary falsework locations and reactions; and
B. A sequence of construction and deck placement schedule.

The CONSULTANT shall verify that the locations of temporary falsework and girder splices do not interfere with other structures or impact other phases of construction. The CONSULTANT shall consider climatic and hydraulic conditions that may affect construction. General access of required construction equipment during construction phases shall also be considered.

Where constraints are imposed on the method of construction by environmental considerations or for other reasons, attention shall be drawn to those constraints in the Erection Plans and Final Plans.

The CONSULTANT shall allow approximately four (4) weeks for review by MDOT, or as instructed by the Project Manager, after which time the CONSULTANT shall be advised by the Project Manager of any needed plan changes through one or more of the following:

A. A scheduled discussion meeting;
B. Marked-up plans provided to the CONSULTANT; and/or
C. Email or other correspondence.

The CONSULTANT may be asked to perform constructability design and analysis of bridge and retaining structures designed by other CONSULTANTS and/or MDOT. This review shall include, but is not limited to, the following:

A. Consideration of deflection;
B. Girder transport and delivery;
C. Strength of steel and concrete and stability during girder erection, concrete deck pouring sequence or other critical stages of construction;
D. Permissible locations of temporary falsework and girder splice connections; and
E. Consideration of retaining structure type, height, and location.

Part 4 – QUALITY CONTROL PLANS

The CONSULTANT shall provide a Quality Control Review of the plans, which shall include all items required in the Final Right-of-Way Plans (excluding the Right-of-Way Revision Sheet) and all other information as applicable, such as, but not limited to, the following:

A. Title Sheet;
B. Detailed Index Sheet(s);
C. General Notes Sheet(s);
D. Typical Section Sheet(s);
E. Summary of Quantities Sheet(s);

F. Estimated Quantities Sheet(s);
G. Plan-Profile Sheet(s);
H. Intersection Detail Sheet(s);
I. Traffic Control Plan;
J. Complete Form Grade Sheet(s) for interchange ramps, loops, and/or channelized intersections at 25-foot intervals and at critical locations as needed;
K. Permanent Directional Signing Sheets that include layouts, details (signs and overhead assemblies), and estimated quantities;
L. Erosion Control Plan Sheets;
M. Riparian Buffer Sheet(s);
N. Detailed Pavement Marking Sheets;
O. Right-of-Way and Easement Coordinate Sheet(s);
P. Other Special Design Sheets as necessary for the construction of the project;
Q. Final Cross Section Sheets; and
R. All quantity calculations, notes, and data used to develop the plans.

The Quality Control Review shall include, but not be limited to, the following:

A. A detailed check of all bridge and roadway quantities;
B. Confirmation that all appropriate pay items are included;
C. A review of Design Memos to ensure Phase B plan elements are in accordance with current policies;
D. A detailed check that all necessary sheets (including Standard Drawings and Special Design Sheets) are listed on the Detailed Index Sheet and included in the plans;
E. A detailed check that all appropriate General Notes are included;
F. A detailed check that all project numbers are shown in correct location and are correct; and
G. A detailed check that all sheet numbers are correct.

The CONSULTANT shall submit to the Project Manager a PDF of the Quality Control Plans that shows all errors that were found marked in red ink along with the corrections that were made. Each correction shall be highlighted in a color that is visible in the PDF to show the correction has been made to the plans. All relevant notes of the CONSULTANT must be visible in the PDF. A cover letter to this submittal shall also be included with the following certification:

> **"A thorough check of the plans has been performed in accordance with the requirements as described in this section. All necessary corrections and comments have been accurately addressed and incorporated into the plan set."**

Part 5 – OFFICE REVIEW PLANS

The Office Review Plan requirements are the same as the Quality Control Plan requirements (see Part 4 –QUALITY CONTROL PLANS); however, all Final Plans for all non-roadway elements (bridge, signals, lighting, ITS, etc.) shall also be included with the Office Review Plans. After the Office Review Plans (100% plan development, pending final review) are complete, the CONSULTANT shall submit them for review by MDOT. PDF files of the plans and detailed quantity calculations including construction cost estimate, notes, and data used to develop the plans shall also be submitted, as well as the updated CADD files and KMZ file.

Representatives of the appropriate divisions of MDOT and the CONSULTANT shall attend the Office Review.

Along with the Office Review Plans, the CONSULTANT shall submit a signed copy of the current Phase B checklist located under Quality Control Checklists on the MDOT website. The Office Review Plans shall be checked by the CONSULTANT prior to submittal to MDOT.

The CONSULTANT shall allow approximately four (4) weeks for review by MDOT, or as instructed by the Project Manager. The Office Review Plans, construction cost estimate, CADD files, KMZ file, and quantity calculations shall be submitted no later than four (4) weeks prior to the scheduled Office Review, unless otherwise approved by the Project Manager, to allow time for copies to be distributed and plans to be reviewed by the appropriate divisions of MDOT.

In the Office Review, MDOT and the CONSULTANT shall review and mark the plans with all required changes. The CONSULTANT shall make all approved plan changes as instructed by the Project Manager.

The CONSULTANT shall submit minutes of the Office Review to the Project Manager within two (2) weeks after the conclusion of the Office Review, unless instructed otherwise by the Project Manager. The minutes shall include, but are not limited to, a list of attendees, a list of all significant changes to the plans and/or colored PDF of the marked-up plans, and a list of all action items by both the CONSULTANT and MDOT. The CONSULTANT may also be required to complete the office review report template provided by MDOT.

Part 6 – FINAL PLANS

The Final Plans shall include all items required in the Office Review Plans, and all other information as applicable, including, but not limited to, the following:

A. ROADWAY PLANS

1. Title Sheet;
2. Detailed Index Sheet(s);
3. Summary of Plan Revisions Sheet(s);
4. General Notes Sheet(s);
5. Typical Sections Sheet(s);
6. Summary of Quantities Sheet(s);
7. Estimated Quantities Sheet(s);
8. Plan-Profile Sheet(s);
9. Intersection Detail Sheet(s);
10. Traffic Control Plan;
11. Complete Form Grade Sheet(s) for interchange ramps, loops, and/or channelized intersections at 25-foot intervals and at critical locations as needed;
12. Permanent Directional Signing Sheet(s) that include layouts, details (signs and overhead assemblies);
13. Standard regulatory and warning signs;
14. Erosion Control Plan Sheet(s);
15. Riparian Buffer Sheet(s);
16. Detailed Pavement Marking Sheet(s) that are not covered by Standard Drawings;
17. Traffic Signal Plans that include details;
18. ITS Plans that include details;
19. Lighting Plans that include lighting layouts, legend, lighting notes, detail sheets, and Special Provisions;
20. Right-of-Way and Easement Coordinate Sheet(s);

21. Roadway Design Standard Drawings;
22. Other Special Design Sheets as necessary for the construction of the project;
23. Final Cross Section Sheets; and
24. All calculations, notes, and data used to develop the plans.

B. BRIDGE PLANS

1. Detailed Index Sheet(s);
2. Summary of Quantities Sheet(s);
3. Summary of Plan Revisions Sheet(s);
4. Layout Sheet(s) including:

    a. Plan and elevation;
    b. Complete geometric controls (as approved by Bridge Division);
    c. Grades (as approved by Bridge Division);
    d. Clearances;
    e. Topographic features (original and final);
    f. Design data;
    g. Estimated Quantities;
    h. General Notes;
    i. Special notes;
    j. Pile notes and bearing requirements;
    k. Erosion Control Plan Sheets; and
    l. All other pertinent details.

5. Generalized Soil Profile(s);
6. Substructure Details;
7. Superstructure Details;
8. Railing Details;
9. Miscellaneous Details;
10. Pile Details; and
11. Notes, quantities, and all other necessary details.

A generalized soil profile will generally be compiled from field boring data and listed on separate sheets for the convenience of those involved in construction.

Detail sheets for substructure and superstructure shall show all details necessary for their construction and shall include, but not be limited to, the following:

1. All dimensions convenient to construction;
2. Sufficient cross section details;
3. Beam sizes, types, and spacing;
4. Elevations;
5. Crown details;
6. Reinforcing details;
7. Pile bearing requirements, types and sizes;
8. Prestressing data where required;
9. Notes; and
10. Proper cross-referencing.

Railing details, piling details, miscellaneous details, and suitable Special Provisions as are available shall be furnished by the Bridge Division Project Manager. All other details and Special Provisions that may be required shall be prepared by the CONSULTANT.

The CONSULTANT shall make all necessary design computations and prepare the Final Plans for bridge construction, quantity estimates, and required Special Provisions in accordance with the approved preliminary drawings and design data. The Final Plans shall be checked by the CONSULTANT prior to submittal to MDOT.

C. BRIDGE LOAD RATING

The CONSULTANT'S structural evaluation of bridges shall be performed in accordance with the requirements set forth in the current version of the following:

1. MDOT *Bridge Safety Inspection Policy and Procedure Manual*;
2. NBIS;
3. AASHTO *Manual for Bridge Evaluation*;
4. AASHTO *Standard Specifications for Highway Bridges* or the AASHTO *LRFD Bridge Design Specifications*, when applicable; and
5. Other manuals, guides, and specifications specified by MDOT during the course of the Work Assignment.

The CONSULTANT shall perform load ratings of all bridges. The load ratings shall be performed in accordance with the Bridge Design and Rating manuals listed in I. GENERAL REQUIREMENTS.

1. Load Factor Rating
   The load capacity of each bridge shall be rated in terms of the AASHTO "HS" design vehicle at both the inventory and operating rating levels and the Mississippi Legal Load Trucks, Fixing America's Surface Transportation Act (FAST Act) Emergency Vehicles, and any other trucks specified by MDOT during the course of the Work Assignment at the operating rating level. The posting of bridges for maximum loads shall be based on the operating rating using the Mississippi Legal Load Trucks and FAST Act Emergency Vehicles.

2. Load and Resistance Factor Rating
   The load capacity of each bridge shall be rated in terms of the AASHTO LRFD HL-93 design vehicle at both the inventory and operating levels and the Mississippi Legal Load Trucks, Fixing America's Surface Transportation Act (FAST Act) Emergency Vehicles, and any other trucks specified by MDOT during the course of the Work Assignment at the legal load rating level. The posting of bridges for maximum loads shall be based on the legal load rating using typical Mississippi Legal Load Trucks and FAST Act Emergency Vehicles.

A systematic procedure shall be followed in the load rating of bridges so the information may be retained and utilized in the routing of permit loads. The CONSULTANT shall provide a Bridge Load Rating Report of all bridges, which will include a summary showing all load ratings in a tabulated form, calculations, supporting documentation, and electronic copies of all computer program input files (original format and PDF). The Bridge Load Rating Report shall be signed, sealed, and dated by the CONSULTANT'S engineer. A PDF set of the Load Rating Report shall be submitted to Bridge Division at the time Final

Plans are submitted. Input files from all load rating software shall be included in the submittal.

D. TRAFFIC ENGINEERING PLANS

Unless stated otherwise in the Work Assignment, the following specific requirements are typical for this phase:

1. TRAFFIC SIGNAL DESIGN

a. Traffic Signal Plans

Design of Traffic Signal Plans shall include the following:

i. Layout of traffic signal poles;
ii. Vehicle detection and controllers;
iii. Type of poles to be used;
iv. Geometric roadway changes, if necessary;
v. Pavement marking details;
vi. Signing details;
vii. Surveys;
viii. Equipment and component design;
ix. Recapitulation of quantities;
x. Design of interconnected traffic signal systems, including adaptive traffic signal control systems when applicable;
xi. Design/method of interconnection; and
xii. Peak hour turning movement counts.

b. Signal Timing Plans

Signal system phase times, cycle lengths, and intersection offsets shall be developed using approved timing analyses software at the direction of the State Traffic Engineer or designee. Initial equipment assessments (included, but not limited to: signal controllers, detection, and communications equipment) will be required as well as before and after travel time studies. A final report detailing the equipment assessment, travel time studies, and quantified environmental benefits is also required. Traffic signal preemption timing plans at railroad crossings will be developed and implemented as directed by the State Traffic Engineer or designee. Timing information will be reduced to spreadsheet format to facilitate data entry by, or under the direction of, the State Traffic Engineer or designee.

2. PERMANENT SIGNING PLANS AND DETAILS

Permanent signing plans and details for new construction projects shall be developed in accordance with the requirements of the most recent edition of the MUTCD and MDOT signing policies and practices and at the direction of the State Traffic Engineer or designee.

E. SUBMITTAL

After completion of all changes requested by MDOT, the CONSULTANT shall submit the Draft Final Plans and Draft Final Cross Sections for review. The CONSULTANT shall allow approximately four (4) weeks for review by MDOT, or as instructed by the Project Manager, after which time MDOT shall do one of the following:

1. Advise the CONSULTANT of the necessary changes;
2. Meet with the CONSULTANT for a Draft Final Plans Review to discuss the necessary changes; or
3. Advise the CONSULTANT that no corrections are needed and Final Plans and Final Cross Sections are ready to submit.

The CONSULTANT shall make any corrections required as a result of MDOT's review of the Draft Final Plans.

Unless otherwise specified in the Work Assignment, after all changes have been made, the CONSULTANT shall submit the Final Plans, including the following, if applicable:

1. All survey notes;
2. All design calculations;
3. Special Provisions;
4. Estimates of cost and revised quantity computations;
5. Complete sets of structural design computations;
6. Bridge Load Rating Report;
7. Structure quantity estimates; and
8. All notes or other data used in development of the plans, including Raw Data and ASCII coordinate files.

The design computations shall be legible, neat, orderly, and properly identified and referenced. All analysis computations and pertinent sketches are understood to be part of the design computations.

Final Plans shall be submitted as PDF images as described in I. GENERAL REQUIREMENTS > C. PDF Images. All related electronic files used in development of the plans, including all input and output files (original format and PDF), shall be submitted with the Final Plans.

UTILITIES/ CN COORDINATION:

The CONSULTANT will locate approximate locations of telephone, electricity, gas, water, cable, sewer and other utilities which will affect the PROJECT from information provided by the LPA and private utility companies and from CONSULTANT'S surveys.

The CONSULTANT will coordinate with the LPA and representatives of utility companies to mitigate the relocation or adjustment of utility conflicts.

The CONSULTANT will schedule progress meetings as required to effectively coordinate with the LPA. The CONSULTANT will be responsible for preparing the minutes of these progress meetings.

The CONSULTANT will coordinate with CN Railroad in regards to the at grade intersection on Weisenberger Road

PS&E ASSEMBLY:

Submittal and authorization of the PS&E Assembly is the final stage of project development. The LPA must obtain authorization of the PS&E Assembly prior to advertising the project.

The CONSULTANT shall submit to MDOT all necessary documentation as set forth in the latest edition of the Project Development Manual for Local Public Agencies.

BID DOCUMENT PREPARATION:

The CONSULTANT shall prepare all special provisions pertinent to the intent of the plans. Once the PS&E Assembly has been approved by MDOT and the authorization to advertise for bids has been obtained, the CONSULTANT shall be notified to advise the LPA that the legal notice for advertising for bids can be submitted for publication. The CONSULTANT shall issue plans and proposals to prospective bidders during the advertising period and shall attend the letting and assist in tabulation and evaluation of bids.

Exhibit C Weisenberger Road Improvements Schedule

01-Nov-24
Begin Project

01-Jun-30
Complete Project

Task ID	Task Name	Start Date	End Date	Duration (In Days)
1 - Environmental				
1.1	Environmental Assessment incl Survey , 30% Plans, Preliminary Hydraulics, RR Coordination	12/1/2024	6/1/2026	
2 - Geotechnical Investigation		6/1/2026	8/31/2026	
3- Engineering Design				
3.1	Phase A Right-of-Way Plans	3/1/2026	12/1/2026	
3.2	Phase B Final Construction Plans	12/1/2026	9/1/2027	
4 - Right-of-Way Acquisition				
4.1	Title Work	12/1/2026	2/1/2027	
4.2	Preparation of Maps and Deeds	12/1/2026	3/1/2027	
4.3	Appraisals	3/1/2027	6/1/2027	
4.4	Right-of-Way Acquisition	6/1/2027	1/31/2028	
5 - Utility Relocations				
5.1	Utility Relocation	9/1/2027	3/1/2029	
6 - Bid, Advertise and Award Construction Contract		3/1/2029	6/1/2029	
7 - Construction		6/1/2029	6/1/2030	

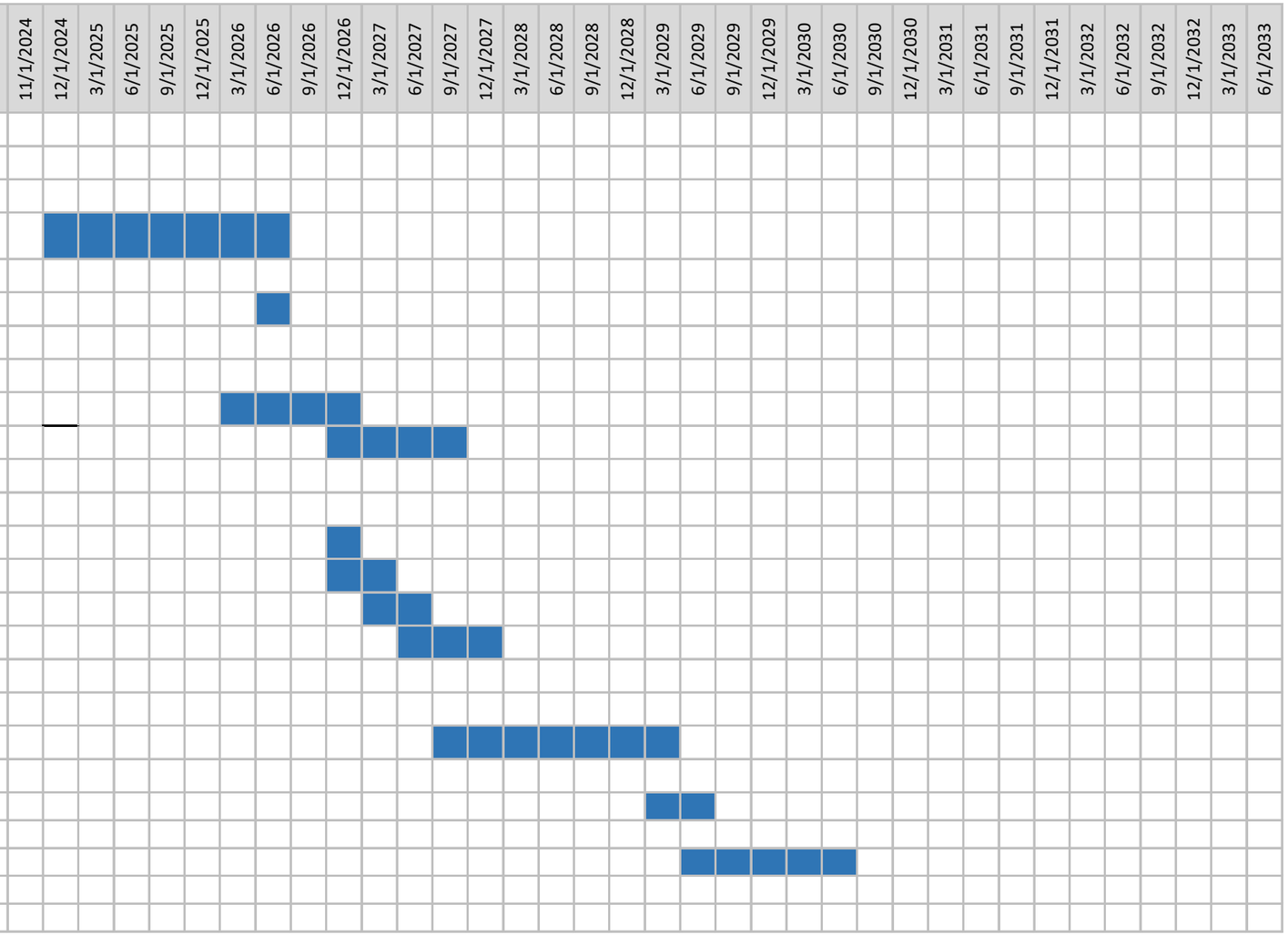

EXHIBIT D

PAYMENTS TO ENGINEER

1.1 Payments to Engineer

Owner will pay **ENGINEER** for Services rendered under Section 1, as supplemented by Exhibit B, "Scope of Services", the following amounts:

1.1.1 For Basic Services a *Cost plus fixed fee of $1,428,952.00*

1.1.2 For Additional Services. ***OWNER*** *shall pay* ***ENGINEER*** *for Additional Services rendered under Section 2 on the basis of* ***ENGINEER's*** *Direct Labor Costs times a factor of 2.49 plus a fee equal to 12% of the total labor amount and Reimbursable Expenses. Payments to* ***ENGINEER*** *for Additional Services shall be made in accordance with paragraph 5.2 of this* ***Agreement****.*

1.1.3 Payments to **ENGINEER** by **OWNER** are not contingent on any factor except **ENGINEER's** ability to provide services in a manner consistent with that standard of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions.

Payments to **ENGINEER** by **OWNER** specifically are not contingent on **OWNER's** receipt of grants for the **Project** or **OWNER's** decision to suspend or cancel the **Project**.

Summary

Weisenberger Road
Madison County
Neel- Schaffer
1-Nov-2024

	Prime Consultant Man-Hours	Sub-Consultant Man-Hours	Total Man-Hours	Salary Cost	Overhead	FCCM	Total Labor Cost	Direct Cost	Fixed Fee	Prime Consultant Sub-Total	Prime Consultant Contract %	Sub-Consultant Sub-Total	Sub-Consultant Contract %	Total Cost
Environmental Clearance & Final ROW														
Pre-Design Meeting	14		14	$961.46	$1,425.94	$4.62	$2,392.02		$286.49	$2,678.51				$2,678.51
Burns Cooley Dennis		156	156									$46,907.30		$46,907.30
Headwaters												$28,000.00		$28,000.00
Maptech		694	694	$40,477.00	$60,031.44	$194.29	$100,702.73	$2,157.40	$12,061.01			$114,921.14		$114,921.14
Conceptual Plans RWD	300		300	$19,410.00	$28,786.97	$93.17	$48,290.14		$5,783.64	$54,073.78				$54,073.78
Conceptual Plans BRG	112		112	$7,616.00	$11,295.29	$36.56	$18,947.85		$2,269.35	$21,217.20				$21,217.20
Field Review Plans RWD	785		785	$47,125.00	$69,891.09	$226.20	$117,242.29		$14,041.93	$131,284.22				$131,284.22
Field Review Plans - BRG	96		96	$5,938.16	$8,806.89	$28.50	$14,773.55		$1,769.41	$16,542.96				$16,542.96
ENV Transproation Group	104		104	$5,899.90	$8,750.14	$28.32	$14,678.36	$1,000.00	$1,758.00	$17,436.36				$17,436.36
ENV Environmental Group	1,580		1,580	$77,898.88	$115,531.83	$373.91	$193,804.62	$1,000.00	$23,211.69	$219,252.31				$219,252.31
Bridge Hyd and FEMA	1,770		1,770	$89,205.52	$132,300.71	$428.19	$221,934.42		$26,580.75	$248,515.17				$248,515.17
Raodway Hydraulics	585		585	$28,123.19	$41,709.50	$134.99	$69,967.68		$8,379.92	$78,347.60				$78,347.60
Final ROW Plans	244		244	$16,330.00	$24,219.02	$78.38	$40,627.40		$4,865.88	$45,493.28				$45,493.28
Final ROW Total	**5,590**	**850**	**6,440**	**$338,985.11**	**$502,748.82**	**$1,627.13**	**$843,361.06**	**$4,157.40**	**$101,008.07**	**$834,841.39**	**81.47%**	**$189,828.44**	**18.53%**	**$1,024,669.83**
Final Plans														
Design Conference	12		12	$900.00	$1,334.79	$4.32	$2,239.11		$268.17	$2,507.28				$2,507.28
60% Plans - BRG	462		462	$28,880.06	$42,832.02	$138.62	$71,850.70		$8,605.45	$80,456.15				$80,456.15
Const. Review _ BRG	56		56	$4,401.44	$6,527.78	$21.13	$10,950.35		$1,311.51	$12,261.86				$12,261.86
Office Review RWD	796		796	$48,680.00	$72,197.31	$233.66	$121,110.97		$14,505.28	$135,616.25				$135,616.25
Office Review - BRG	496		496	$33,071.86	$49,048.88	$158.74	$82,279.48		$9,854.49	$92,133.97				$92,133.97
Signal-ITS	128		128	$9,238.72	$13,701.95	$44.35	$22,985.02		$2,752.88	$25,737.90				$25,737.90
Final Plans BRG	104		104	$7,549.24	$11,196.28	$36.24	$18,781.76		$2,249.46	$21,031.22				$21,031.22
Final Plans RWD	196		196	$11,500.00	$17,055.65	$55.20	$28,610.85	$2,500.00	$3,426.68	$34,537.53				$34,537.53
Final Plans Total	**2,250**		**2,250**	**$144,221.32**	**$213,894.66**	**$692.26**	**$358,808.24**	**$2,500.00**	**$42,973.92**	**$404,282.16**	**100.00%**			**$404,282.16**
Total	**7,840**	**850**	**8,690**	**$483,206.43**	**$716,643.48**	**$2,319.39**	**$1,202,169.30**	**$6,657.40**	**$143,981.99**	**$1,239,123.55**	**86.72%**	**$189,828.44**	**13.28%**	**$1,428,952.00**

Grand Total	$1,428,952.00

Pre-Design Meeting

Weisenberger Road
Madison County
Neel- Schaffer
1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Senior Engineer Manager	Engineer IV	Engineer Intern II	Senior Certified Engineering Technician	Administrative Secretary				
	Pre-Design Meeting									
	Prepare For & Attend Meeting	4	4		4	2				14
	Prepare Pre-Design Meeting Minutes									
	Initial Site Visit									
	Total Hours	4	4		4	2				**14**
	Hourly Rate	$90.00	$80.00	$45.00	$55.00	$30.73	$0.00	$0.00	$0.00	
	Salary Cost	$360.00	$320.00	$0.00	$220.00	$61.46	$0.00	$0.00	$0.00	**$961.46**
148.31%	Overhead									$1,425.94
0.48%	FCCM									$4.62
	Total Labor Cost									**$2,392.02**
	Prime Direct Costs Total									**$0.00**
12.00%	**Fixed Fee**									**$286.49**
	Phase A, Part _ Grand Total									**$2,678.51**

BCD - Geotech

Weisenberger Road
Madison County
Neel- Schaffer
1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Project Manager	Sr. Engineer	Project Engineer	Engineer	Draftsman	Technician	Clerical		
		Man-Hours								
	Geotechnical Field Investigation									
	Boring Layout			4.0		16.0	19.0			
	Coordinate Field Investigation	2.0		4.0						
	Coordinate Lab Investigation	2.0		4.0						
	Examine Samples		2.0	6.0						
	Data Assimilation/Log Preparation		2.0	8.0		31.0				
	Report Preparation	14.0	8.0	28.0				6.0		
	Total Hours	18	12	54		47	19	6		**156**
	Hourly Rate	$84.00	$70.00	$65.00	$42.00	$32.00	$30.00	$23.00	$0.00	
	Salary Cost	$1,512.00	$840.00	$3,510.00	$0.00	$1,504.00	$570.00	$138.00	$0.00	**$8,074.00**
173.25%	Overhead									$13,988.21
2.19%	FCCM									$176.82
	Total Labor Cost									**$22,239.03**

Field and Lab.	Qty.	Unit Price[1]	
Field Equip. Mob/Demob	300	$7.50	$2,250.00
Drilling in Roadway, 0-5 ft	70	$20.00	$1,400.00
Geotechnical Drilling, 70-150 ft	200	$28.55	$5,710.00
Pavement Coring	2	$75.00	$150.00
Split Spoon Sampling with Stand Pen Test	15	$25.00	$375.00
Undisturbed Sampling	15	$25.00	$375.00
Unconfined Compression Test T 208	10	$60.00	$600.00
Triaxial Compression Test (U/U) T 296	10	$90.00	$900.00
Sand Triaxial Test (3-pt)	6	$340.00	$2,040.00
Traffic Control	2	$1,400.00	$2,800.00
pH of Soils MT-30	2	$40.00	$80.00
Soil Resistivity MT-47	2	$75.00	$150.00
Atterberg Limits T 89 & T 90	34	$65.00	$2,210.00
Water Content T 265	58	$8.00	$464.00
% Finer Than The No. 200 Sieve T 11	10	$50.00	$500.00
Hydrometer	4	$160.00	$640.00
Shrinkage Factor (Volume Change)	2	$75.00	$150.00
Soluble Sulfate Ion In Soils & Water MT-58	8	$150.00	$1,200.00
		Total Direct Costs:	$21,994.00

	Sub Other Direct Costs			
	Prints	0	$0.00	$0.00
	Mileage	40	$0.67	$26.80
	Meals	0	$0.00	$0.00
	Lodging	0	$0.00	$0.00
	Sub Direct Costs Total			**$26.80**
12.00%	**Fixed Fee**			**$2,647.47**
	Phase A, Part _ Grand Total			**$46,907.30**

MT - Survey

Weisenberger Road
Madison County
Neel- Schaffer
1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Project Manager	LiDAR/Hydro Tech	Survey Tech	CAD Tech	3-Man Crew				
		Man-Hours								
	Design Meeting									
	Primary Horizontal and Vertical Control	**4**			**4**	**16**				24
	Secondary Control	4			4	8				16
	Conventional Mapping (25 Acres)	32		16	120	144				312
	Aerial/Mobile LiDAR Mapping (25 Acres)	8	4		8	8				28
	Hydraulic Mapping for Stream P and Bear Creek	16		8	64	72				160
	Determinng Existing Right-of-Way									
	Underground Utilities (MS ONE CALL)	8		8	40	56				112
	Hydraulic Structure at Parkway E	4		6	16	16				42
	Total Hours	76	4	38	256	320				**694**
	Hourly Rate	$59.00	$33.00	$27.50	$41.00	$76.00	$0.00	$0.00	$0.00	
	Salary Cost	$4,484.00	$132.00	$1,045.00	$10,496.00	$24,320.00	$0.00	$0.00	$0.00	**$40,477.00**
148.31%	Overhead									$60,031.44
0.48%	FCCM									$194.29
	Total Labor Cost									**$100,702.73**
	Prime Other Direct Costs									
	Prints							0	$0.00	$0.00
	Mileage							3,220	$0.67	$2,157.40
	Meals							0	$0.00	$0.00
	Lodging							0	$0.00	$0.00
	Prime Direct Costs Total									**$2,157.40**
12.00%	**Fixed Fee**									**$12,061.01**
	Phase A, Part _ Grand Total									**$114,921.14**

Conceptual Plans

Weisenberger Road
Madison County
Neel- Schaffer
1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Senior Engineer Manager	Engineer IV	Engineer Intern II	Senior Certified Engineering Technician	Administrative Secretary				
		Man-Hours								
1	Title Sheet				2					2
	Typical Sections									
3	Mainline (1"=5')or (1"=10')		4		8					12
1	Local Roads (1"=5')or (1"=10')									
	Plan Profile Sheets									
16	Create Sheets (1"=50')(1-Location 1"-20')		4		8					12
	Sheet Clean-Up and Organization				8					8
	Horizontal Alignment Design									
	Mainline		4		8					12
	Local Road		2		2					4
	Vertical Alignment Design									
	Mainline-New Alignment and/or Regrade Existing Lanes		2	2	4					8
	Intersection Design									
	Evaluate Sight Distance (**2 intersections**)			4	4					8
	Determine Turn Lane Configurations		2		2					4
	Establish Turning Radii & Channelization		2		4					6
	Cross Sections									
	Run Pattern Lines				2					2
	Cut Existing Cross Sections			2	2					4
	Evaluate/Run Shape Files			1	2					3
	Determine Proposed Template Criteria			1	2					3
	Generate Proposed Templates			1	2					3
	Determine Constructability Issues		4	1	2					7
	Conceptual Lighting									
	Develop Conceptual Lighting Layout									
	Conceptual Traffic Control Plan									
	Evaluate Construction Phasing		4		4					8
	Generate Conceptual TCP Sheets				4					4
	Miscellaneous Sheets									
	Conceptual Permanent Striping			2	4					6
	Conceptual Permanent Signing Plan			2	4					6
	Deliverables									
	Multi-Page PDF				2					2
	Completed Phase A Conceptual Checklist		2		2					4
	Conceptual Plan Review									
	Attend Conceptual Plan Review	4	4		8					16
	Revise Plans Per Conceptual Review			4	16					20
	Provide Conceptual Review Meeting Minutes		8							8
	QA/QC	4	16							20
	CN/Utility Coordination	8	60	40						108
	Total Hours	16	118	60	106					**300**
	Hourly Rate	$90.00	$80.00	$45.00	$55.00	$30.73	$0.00	$0.00	$0.00	
	Salary Cost	$1,440.00	$9,440.00	$2,700.00	$5,830.00	$0.00	$0.00	$0.00	$0.00	**$19,410.00**
148.31%	Overhead									$28,786.97

Conceptual Plans

Weisenberger Road
Madison County
Neel- Schaffer
1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project							Man-Hour Totals
		Senior Engineer Manager	Engineer IV	Engineer Intern II	Senior Certified Engineering Technician	Administrative Secretary			
		Man-Hours							
0.48%	FCCM								$93.17
	Total Labor Cost								**$48,290.14**
	Prime Direct Costs Total								**$0.00**
12.00%	**Fixed Fee**								**$5,783.64**
	Phase A, Part _ Grand Total								**$54,073.78**

Bridge Conceptual Plans

Weisenberger Road
Madison County
Neel-Schaffer
24-Oct-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Engineer Manager	Senior Engineer	Engineer	Engineer Intern	Senior Technician	Admin			
		Man-Hours								
	Plans									
	Layout		8		4					12
	Foundation plan		4		4					8
	Typical span cross-sections		8		4					12
	Bent elevation views & cross-sections		4		4					8
	Phase construction details (if needed)									
	Design									
	Coordination with hydraulic engineers		16							16
	Span arrangement		4		4					8
	Evaluate vertical & horizontal clearances		4		4					8
	Evaluate finish grades		4		4					8
	Preliminary member sizing		4		4					8
	Evaluate construction phasing (if needed)		8							8
	Submit Conceptual Plans (1 multi-page PDF)			2						2
	Attend Conceptual Plan Field Review	4	4		4					12
	Revise Plans Per Conceptual Plan Field Review				2					2
	Total Hours	4	68	2	38					112
	Hourly Rate	$90.89	$82.24	$69.49	$40.03	$37.79	$30.73	$0.00	$0.00	
	Salary Cost	$363.56	$5,592.32	$138.98	$1,521.14	$0.00	$0.00	$0.00	$0.00	**$7,616.00**
148.31%	Overhead									$11,295.29
0.48%	FCCM									$36.56
	Total Labor Cost									**$18,947.85**
	Prime Direct Costs Total									**$0.00**
12.00%	**Fixed Fee**									**$2,269.35**
	Phase A, Part 3 Grand Total									**$21,217.20**

Field Review RWD

Weisenberger Road
Madison County
Neel- Schaffer
11/1/2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Senior Engineer Manager	Engineer IV	Engineer Intern II	Senior Certified Engineering Technician	Administrative Secretary				
		Man-Hours								
	Title Sheet				1					1
	Typical Sections									
	Mainline			2	8					10
	Local Roads			2	8					10
	Cross-Sections									
	Adjust Cross Sections For Revised Bridge Recommendations				16					16
	Draw Drainage Structures On Cross-Sections			16	40					56
	Drain Roadside Ditches (including flat-bottom ditches)			8	32					40
	Draw Ramps On Cross-Sections			8	16					24
	Phase Construction Details		8	8	24					40
	Clean Water Diversion Ditches (If Required)		4	16	16					36
	Preliminary Earthwork Calculations		8	16	8					32
	Plan Profile Sheets									
	Sheet Clean-Up and Organization		8	16	40					64
	Add Notes, Bridges, & Pipes In Profile View		4	8	16					28
	Adjust Profile for Revised Bridge Recommendations		8	8	16					32
	Erosion Control Sheets									
	Copy Plan Profile Sheets and Turn Off Unnecessary Levels				16					16
	Place Contours From Merged Tin Files of Proposed and Existing			4	8					12
	Evaluate Need For Clean Water Diversion Ditches		8	8	4					20
	Develop Riparian Buffer Sheets		2	4	8					14
	Right-of-Way Determination									
	Reduce Proposed ROW From Pre-ROW To Actual Proposed ROW			4	8					12
	Place No-Access ROW/Intersection Sight Flares If Required				4					4
	Silt Basin Design & Placement			4						4
	Property Access Evaluation			4						4
	Evaluate Driveways for Easements			4	8					12
	Adjust Slope Stakes For Clean Water Diversion Ditches			4	4					8
	Miscellaneous Sheets									
	Form Grades			4	8					12
	Preliminary Permanent Striping				8					8
	Traffic Control Plan									
	Evaluate Construction Phasing		4		16					20
	TCP Sheets			4	16					20
	TCP Typical Sections				8					8
	Deliverables				4					4
	Field Inspection Plans (1 multi-page PDF)		4		2					6
	Completed Phase A Field Review Checklist									
	Roadway Hydraulic Report									
	Field Inspection									
	Attend Field Inspection		8	8	8					24
	Revise Plans Per Field Inspection			8	40					48
	Provide Field Review Meeting Minutes		4							4
	Complete MDOT Field Review Report Template		4							4
	Develop Construction Cost Estimate		4							4
	QA/QC	40								40
	CN/Utility Coordination	8	80							88
	Total Hours	48	158	168	411					**785**
	Hourly Rate	$90.00	$80.00	$45.00	$55.00	$30.73	$0.00	$0.00	$0.00	
	Salary Cost	$4,320.00	$12,640.00	$7,560.00	$22,605.00	$0.00	$0.00	$0.00	$0.00	**$47,125.00**
148.31%	Overhead									$69,891.09

Field Review RWD

	Weisenberger Road
	Madison County
	Neel- Schaffer
	11/1/2024

No. of Sheets	Task	Personnel Titles Assigned to Project							Man-Hour Totals
		Senior Engineer Manager	Engineer IV	Engineer Intern II	Senior Certified Engineering Technician	Administrative Secretary			
		Man-Hours							
0.48%	FCCM								$226.20
	Total Labor Cost								**$117,242.29**
	Prime Direct Costs Total								**$0.00**
12.00%	**Fixed Fee**								**$14,041.93**
	Phase A, Part _ Grand Total								**$131,284.22**

Bridge Field Review

Weisenberger Road
Madison County
Neel- Schaffer
11/1/2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Engineer Manager	Senior Engineer	Engineer	Engineer Intern	Senior Technician	Admin			
		Man-Hours								
	Plans									
	Layout		4		8					12
	Foundation plan		4		8					12
	Typical span cross-sections		4		8					12
	Bent elevation views & cross-sections		4		8					12
	Phase construction details (if needed)		8		4					12
	QA/QC									
	Submit Field Inspection Plans (1 multi-page PDF)		2							2
	Attend Field Inspection	8	8		8					24
	Provide Field Inspection Meeting Minutes		4							4
	Revise Plans Per Field Inspection		2		4					6
	Total Hours	8	40		48					**96**
	Hourly Rate	$90.89	$82.24	$69.49	$40.03	$37.79	$30.73	$0.00	$0.00	
	Salary Cost	$727.12	$3,289.60	$0.00	$1,921.44	$0.00	$0.00	$0.00	$0.00	**$5,938.16**
148.31%	Overhead									$8,806.89
0.48%	FCCM									$28.50
	Total Labor Cost									**$14,773.55**
	Prime Direct Costs Total									**$0.00**
12.00%	**Fixed Fee**									**$1,769.41**
	Phase A, Part 7 Grand Total									**$16,542.96**

NSI - Transportation Group ENV

Weisenberger Road
Madison County
Neel-Schaffer
1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Project Manager	Senior Engineer	Engineer III	Engineer II	Engineer I	Marketing Graphics Associate	Administrative Assistant		
		Man-Hours								
	PUBLIC INVOLVEMENT PROGRAM									
	Research Issues									
	Development of Public Involvement Video and Exhibits		4				16			20
	Initial Public Meeting	4	4		4	4				16
	Summary reports of Initial Public Meeting to MDOT.	2	2		2	2		8		16
	Agency Coordination	2								2
	Public Hearing	8	8		8	8		8		40
	Coordination and Draft Document Preparation									
	Meetings		4							4
	Submit Pre-Draft EA (layout and copying).		2							2
	Prepare the Final Environmental Assessment (EA)									
	Prepare and Submit Final EA / FONSI									
	Document (FONSI)		4							4
	Total Hours	16	28		14	14	16	16		**104**
	Hourly Rate	$110.00	$58.80	$57.25	$55.75	$45.50	$38.00	$29.25	$0.00	
	Salary Cost	$1,760.00	$1,646.40	$0.00	$780.50	$637.00	$608.00	$468.00	$0.00	**$5,899.90**
148.31%	Overhead									$8,750.14
0.48%										$28.32
	Total Labor Cost									**$14,678.36**
	Prime Other Direct Costs									
	Prints							5000	$0.20	$1,000.00
	Prime Direct Costs Total									**$1,000.00**
12.00%	**Fixed Fee**									**$1,758.00**
	Phase A, Part _ Grand Total									**$17,436.36**

NSI - Environmental Group

Weisenberger Road
Madison County
Neel-Schaffer
1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Senior Environmental Professional	Environmental Professional	Environmental Technician	Biologist	Senior Archaeologist	Administrative Assistant			
		Man-Hours								
	PROJECT MANAGEMENT									
	Project Organization and Schedule	16	16	16						48
	Project Kickoff Meeting	8	8	8	8	8				40
	Monthly Progress Reports and Meetings	36	36				36			108
	Project Coordination	36	36				40			112
	ENVIRONMENTAL DATA COLLECTION AND EVALUATION									
	Land Use Data			2						2
	Cultural Features and Community Services		16	16						32
	Relocation Plan Documentation	16	40	40						96
	Census Tracts and Socio-economic Data		8	24						32
	Farmlands		4	4	4					12
	Existing Landscape		4	4						8
	Threatened and Endangered Species (TES)	24	24	80						128
	Wetlands		16	64	64					144
	Threatened and Endangered Species (TES)		8	8	16					32
	Permit Requirements		4		4					8
	Water Quality			8	8					16
	Floodplains/Floodways		8	8						16
	Noise Study	8	40	40						88
	Air Quality		4							4
	Phase I Survey		8			30	60			98
	American Indian Coordination					4				4
	Cultural Resources Survey Report					16	24			40
	Secondary and Cumulative Effects	8	8	8						24
	PUBLIC INVOLVEMENT PROGRAM									
	Initial Public Meeting	16	16							32
	Summary reports of Initial Public Meeting to MDOT.	16	16							32
	Agency Coordination		16							16
	Public Hearing	16	16	24						56
	PREPARE ENVIRONMENTAL ASSESSMENT DOCUMENTATION									
	Hazardous Materials		40	16						56
	Comments and Coordination		24	24						48
	Appendices			24			16			40
	Exhibits			24						24
	Tables			8						8
	Coordination and Draft Document Preparation									
	Meetings		24	8			40			72
	Project Team Review	16	16							32
	Prepare the Final Environmental Assessment (EA)									
	Revisions to Selected Alternative		24	24			8			56
	Document (FONSI)	8	8							16
	Total Hours	224	488	482	104	58	224			**1580**
	Hourly Rate	$81.12	$63.00	$33.00	$41.00	$39.00	$29.25	$0.00	$0.00	
	Salary Cost	$18,170.88	$30,744.00	$15,906.00	$4,264.00	$2,262.00	$6,552.00	$0.00	$0.00	**$77,898.88**
148.31%	Overhead									$115,531.83
0.48%										$373.91
	Total Labor Cost									**$193,804.62**
	Prime Other Direct Costs									
	Prints							3000	$0.20	$600.00
	Mileage							200	$0.66	$131.00
								1	$750.00	$1,505.00
	Prime Direct Costs Total									**$2,236.00**
12.00%	**Fixed Fee**									**$23,211.69**
	Phase A, Part _ Grand Total									**$219,252.31**

Weisenberger Road Widening and CLOMR Analysis

Weisenberger Road
Madison County
Neel-Schaffer
1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Sr. Project Manager		Sr. Hydraulic Engineer	Hydraulic Engineer	Hydraulic Engineer Intern	Structural Engineering Intern	Clerical		
	Pre-Design Meeting	Man-Hours								
	Pre-Design Meeting	1		1	1	1				4
	Data Gathering: Office Data Search and Collection of Information: Collect Pertinent Bridge Information from MDOT and FEMA, Location map, topographic map, aerial photographs, etc.	4			12	16				32
	Field Investigation / Stream Reconnaissance to Supplement Existing Data (observe and record channel and floodplain characteristics, geological conditions, site photographs, substructure and site conditions, etc.)	8		8	8	8				32
	Channel Stability- Evaluation of Channel Stability Utilizing FHWA Stream Stability at Highway Structures (HEC 20) and FHWA Publication River Engineering for Highway Encroachments, Highways in the River Environment, Hydraulic Design Series Number 6.					4				4
FEMA	Flood History and Hydrologic Analysis including FEMA comparison	4		4	8	12				28
	Hydraulic Analysis- GIS-Terrain Development / Incorporating Survey			8	16	32				56
FEMA	Hydraulic Analysis- FEMA Effective and Corrected Effective Model Creation			8	32	52				92
FEMA	Hydraulic Analysis - FEMA Existing Model Updates			8	12	24				44
	Hydraulic Analysis - Design Existing Model Creation /Model Stabilization / Calibration			8	32	52				92
	Coordination with roadway and Structural Design	8		12	12	16				48
FEMA	Hydraulic Analysis - FEMA Proposed Model Creation	4		8	12	24				48
	Hydraulic Analysis - Design Proposed Model Creation	4		6	32	52				94
	Hydraulic Analysis - Internal QAQC	8		8	16	24				56
	Development of Partial 30%Bridge Layout Drawings (H&H data table and info)			2		4				6
	30% Report			4	16	40				60
FEMA	30% Comparison Tables and Floodway Analysis	1		4	6	16				27
	30% Exhibits			4	4	8				16
CLOMR	FEMA Narrative	1		2	4	16				23
CLOMR	MT-2 Application Forms	1		2	4	16				23
CLOMR	Hydraulic Model FEMA Submital	1		2	4	16				23
CLOMR	Certified Topographic Work Map	1		2	4	12				19
CLOMR	Annotated FIRM	1		2	4	12				19
CLOMR	Proposed/As-Built Plans	1		2	4	4				11
CLOMR	Floodway Notice	1		2	4	24				31
CLOMR	Property Owner Notification	1		2	4	24				31
CLOMR	ESA Compliance	1		2	4	4				11
CLOMR	Regulatory Requirements of 44	1		2	4	24				31
	Internal QAQC	8		2	12	12				34
	30% Submittal and addressing comments	4		2	12	24				42
CLOMR	Meetings and Response to FEMA during processing (assumes 4 meetings	24		16	40	52				132
	60% Revise / Update Proposed Conditions Models			8	16	24				48
	Evaluation of Scour Conditions and Calculation of Scour Depths based on MDOT design memos and FHWA publication "Evaluating Scour at Bridges", Hydrauilc Engineering Circular No. 18 (Hec 18)			2	16	24				42
	Guide Bank Design based on FHWA publications "Hydraulic Design of Safe Bridges", Hydraulic Design Series Number 7 (HDS-7)			2	4	8				14
	Stream Stability Analysis and Preliminary Stream and Scour Countermeasure Design. Based off "Evaluating Scour at Bridges", Hydrauilc Engineering Circular No. 18 (Hec 18) and "Evaluation of Channel Stability Utilizing FHWA Stream Stability at Highway Structures", Hydraulic Engineering Circular No.20 (HEC 20).					4				4
	Bridge Deck Drainage. Bridge deck drainage based on the FHWA publication "Design of Bridge Deck Drainage", Hydraulic Engineering Circular No. 21 (HEC-21)					4				4
	Internal QAQC- Model Review	4		2	4	12				22
	60% Report	4			20	24				48
	Development of Partial 60%Bridge Layout Drawings (H&H data table and info)	2				2				4
	Internal QAQC	4		4	4	12				24
	60% Submittal and addressing comments	2		2	14	16				34
	100% Revise / Update Proposed Conditions Models				14	16				30
	100 % Final Bridge Layout	1		1		4				6
	100% Final Report				2	12				14
	Internal QAQC`	1			2	4				7
	100% Submittal and addressing comments	1			2	5				8
LOMR	Final Construction As Builts Model Finalization	4		4	8	24				40
LOMR	FEMA Narrative	1			4	8				13

Weisenberger Road Widening and CLOMR Analysis

Weisenberger Road
Madison County
Neel-Schaffer
1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Sr. Project Manager		Sr. Hydraulic Engineer	Hydraulic Engineer	Hydraulic Engineer Intern	Structural Engineering Intern	Clerical		
	Pre-Design Meeting	Man-Hours								
LOMR	MT-2 Application Forms	1			4	8				13
LOMR	Hydraulic Model FEMA Submital	1			4	8				13
LOMR	Certified Topographic Work Map	1			2	4				7
LOMR	Annotated FIRM	1			2	4				7
LOMR	Proposed/As-Built Plans	1			1	2				4
LOMR	Floodway Notice	1			4	8				13
LOMR	Property Owner Notification	1			4	8				13
LOMR	ESA Compliance	1			1	2				4
LOMR	Regulatory Requirements of 44	1			4	8				13
LOMR	Meetings and Response to FEMA during processing (assumes 4 meetings with MT-2 reviewers and 3 AD letters/responses, 12 month process)	16		12	32	40				100
	General / Admin	16			8	12		16		52
	Total Hours	153		170	499	932		16		1770
	Hourly Rate	$80.44	$79.50	$68.75	$51.30	$42.00	$35.75	$29.25	$0.00	
	Salary Cost	$12,307.32	$0.00	$11,687.50	$25,598.70	$39,144.00	$0.00	$468.00	$0.00	**$89,205.52**
148.31%	Overhead									$132,300.71
0.48%	FCCM									$428.19
	Total Labor Cost									**$221,934.42**
12.00%	**Fixed Fee**									**$26,580.75**
	Phase A, Part 1 Grand Total									**$248,515.17**

CLOMR Analysis

Weisenberger Road
Madison County
Neel-Schaffer
1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Sr. Project Manager		Sr. Hydraulic Engineer	Hydraulic Engineer	Hydraulic Engineer Intern	Structural Engineering Intern	Clerical		
		Man-Hours								
	30% -Drainage (D.A. less than 1000 acres)									
	Calculate D.A. For Cross Drains, Inlets, Grates, Flumes, Side Drains, & Ditches			2	16	24				42
	Times of Concentration For Cross Drains, Inlets, Grates, Flumes, Side Drains, & Ditches			2	16	24				42
	Flow Rates For Cross Drains, Inlets, Grates, Flumes, Side Drains, & Ditches			2	16	32				50
	Complete Hydraulic Culvert Data Form			2	8	16				26
	Spread Calculations Hydraulic Toolbox for Inlets, Flumes, and Grates			2	12	24				38
	Drain Roadside Ditches (including flat-bottom ditches) Hydraulic Toolbox			2	8	12				22
	Hydraulic models HY-8			2	8	12				22
	Storm Drain Calculations			2	16	32				50
	Report	4		2	16	32				54
	Exhibits			2	12	16				30
	Alignment to Roadway plans and support of plan deveopment	4		2	12	16				34
	60% -Drainage (D.A. less than 1000 acres)									
	Updates for Storm Drain Calculations and other areas, analysis			2	24	32				58
	Alignment to Roadway plans and support of plan deveopment			2	8	8				18
	100% -Drainage (D.A. less than 1000 acres)									
	Updates Storm Drain Calculations			2	8	16				26
	Report			2	6	6				14
	Exhibits			1	2	2				5
	Alignment to Roadway plans and support of plan deveopment			2	2	2				6
	Field Inspection									
	Address Final Review Comments	8		8	8	24				48
	Prime Direct Cost									
	Subconsultant Direct Cost									
	Total Hours	16		41	198	330				585
	Hourly Rate	$80.44	$79.50	$68.75	$51.30	$42.00	$35.75	$29.25	$0.00	
	Salary Cost	$1,287.04	$0.00	$2,818.75	$10,157.40	$13,860.00	$0.00	$0.00	$0.00	**$28,123.19**
148.31%	Overhead									$41,709.50
0.48%	FCCM									$134.99
	Total Labor Cost									**$69,967.68**
12.00%	**Fixed Fee**									**$8,379.92**
	Phase A, Part 1 Grand Total									**$78,347.60**

Final ROW RWD

Weisenberger Road
Madison County
Neel-Schaffer
1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Senior Engineer Manager	Engineer IV	Engineer Intern II	Senior Certified Engineering Technician	Administrative Secretary				
		Man-Hours								
	Draft Final ROW Deliverables									
	Draft Final ROW Plans (1 multi-page PDF)				2					2
	Attend Draft Final ROW Meeting (if applicable)		4	4	4					12
	Address Draft Final ROW Comments		2		8					10
	Generate ROW & Easement Coordinate Sheets				8					8
	Survey/Maps/Deeds Deliverables									
	ROW Plans & Cross Sections For Use By SMD (2 multi-page PDF files)				2					2
	CADD Files				2					2
	Final ROW Deliverables									
	Address Revisions From SMD Acquisition Maps				24					24
	Generate Final ROW & Easement Coordinate Sheets				16					16
	Final ROW Plans & Cross Sections (2 multi-page PDF files)									
	Completed Phase A Final ROW Checklist									
	Hydraulic Design Calculations									
	Roadway Hydraulic Report									
	QA/QC		8							8
	CN/Utility Coordination		120	40						160
	Total Hours		134	44	66					**244**
	Hourly Rate	$90.00	$80.00	$45.00	$55.00	$30.73	$0.00	$0.00	$0.00	
	Salary Cost	$0.00	$10,720.00	$1,980.00	$3,630.00	$0.00	$0.00	$0.00	$0.00	**$16,330.00**
148.31%	Overhead									$24,219.02
0.48%	FCCM									$78.38
	Total Labor Cost									**$40,627.40**
	Prime Direct Costs Total									**$0.00**
12.00%	**Fixed Fee**									**$4,865.88**
	Phase A, Part _ Grand Total									**$45,493.28**

Final Plans Design Conference

Weisenberger Road
Madison County
Neel- Schaffer
1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Senior Engineer Manager	Engineer IV	Engineer Intern II	Senior Certified Engineering	Administrative Secretary				
		Man-Hours								
	Pre-Design Meeting									
	Prepare For & Attend Meeting	4	4		4					12
	Prepare Pre-Design Meeting Minutes									
	Initial Site Visit									
	Total Hours	4	4		4					12
	Hourly Rate	$90.00	$80.00	$45.00	$55.00	$30.73	$0.00	$0.00	$0.00	
	Salary Cost	$360.00	$320.00	$0.00	$220.00	$0.00	$0.00	$0.00	$0.00	**$900.00**
148.31%	Overhead									$1,334.79
0.48%	FCCM									$4.32
	Total Labor Cost									**$2,239.11**
12.00%	**Fixed Fee**									**$268.17**
	Phase B, Part _ Grand Total									**$2,507.28**

60% Structural Information Plans

Weisenberger Road	
Madison County	
0	
Neel- Schaffer	
1-Nov-2024	

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Engineer Manager	Senior Engineer	Engineer	Engineer Intern	Senior Technician	Admin			
		Man-Hours								
	Design									
	Deck		6	8	12					26
	Superstructure		16	32	16					64
	Substructure		16	24	8					48
	Drainage		4	2	2					8
	Plans									
1	Detailed Index		2	4	2					8
1	Summary of Quantities			2						2
1	General Notes & Estimated Quantities		8	12	2					22
2	Foundation Plan and Elevation		8	16						24
3	End Bents		8	12	24					44
3	Intermediate Bents		12	12	24					48
6	Span Details		8	16	24					48
1	Miscellaneous Span Details		2	4	4					10
1	Railing		2	2	4					8
2	Prestressed Beam Details		8	16	24					48
2	Misc. Prestressed Beam Details		4	12	4					20
1	Soil Profile				4					4
2	Erosion Control		2	4	8					14
	Submit 60% structural information plans (1 multi-page PDF)		2	6						8
	Project Management	8								8
	Site Visit									
	Total Hours	8	108	184	162					**462**
	Hourly Rate	$90.89	$82.24	$69.49	$40.03	$37.79	$30.73	$0.00	$0.00	
	Salary Cost	$727.12	$8,881.92	$12,786.16	$6,484.86	$0.00	$0.00	$0.00	$0.00	**$28,880.06**
148.31%	Overhead									$42,832.02
0.48%	FCCM									$138.62
	Total Labor Cost									**$71,850.70**
	Prime Direct Costs Total									**$0.00**
12.00%	**Fixed Fee**									**$8,605.45**
	Phase B, Part 4 Grand Total									**$80,456.15**

Bridge Constructability Review

	Weisenberger Road
	Madison County
	0
	Neel- Schaffer
	1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Engineer Manager	Senior Engineer	Engineer	Engineer Intern	Senior Technician	Admin			
		Man-Hours								
	Review Plans for Constructability		40							40
	Provide Modifications If Necessary			16						16
	Project Management									
	Total Hours		40	16						**56**
	Hourly Rate	$90.89	$82.24	$69.49	$40.03	$37.79	$30.73	$0.00	$0.00	
	Salary Cost	$0.00	$3,289.60	$1,111.84	$0.00	$0.00	$0.00	$0.00	$0.00	**$4,401.44**
148.31%	Overhead									$6,527.78
0.48%	FCCM									$21.13
	Total Labor Cost									**$10,950.35**
	Prime Direct Costs Total									**$0.00**
12.00%	**Fixed Fee**									**$1,311.51**
	Phase B, Part 3 Grand Total									**$12,261.86**

Office Review Plans RWD

Weisenberger Road	
Madison County	
0	
Neel- Schaffer	
1-Nov-2024	

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Senior Engineer Manager	Engineer IV	Engineer Intern II	Senior Certified Engineering Technician	Administrative Secretary				
		Man-Hours								
	Title Sheet				2					2
	Detailed Index			2	4					6
	General Notes			2	4					6
	Typical Sections									
	Add Paving Details & Notes			2	4					6
	Summary of Quantity Sheets			4						4
	Select Appropriate Pay Items			4						4
	Add Footnotes									
	Estimated Quantity Sheets									
	Earthwork (phased if necessary)			2						2
	Drainage Structures			2	4					6
	Permanent Erosion Control			2	2					4
	Traffic Control			2	2					4
	Pavement Marking (permanent and temporary)			2	2					4
	Removal Items			2	2					4
	Side Drains			2	2					4
	Guardrail			2	2					4
	Junction Boxes			2	4					6
	Box Culverts			2	4					6
	Bridge End Pavement			2	2					4
	Permanent Signing			2	4					6
	Hydraulic Design Data			2						2
	Incidental Construction Items			2						2
	Plan Profile Sheets (1"=20')									
	Sheet Clean-up and Organization			8	12					20
	Design & Place Permanent Erosion Control Items			4						4
	Place Earthwork Information (phased if necessary)			8						8
	Traffic Control Detail Sheets									
	Develop Phasing Narrative (if requested by MDOT)		16							16
	Construction Signing Detail				16					16
	TCP Sheets			8	16					24
	TCP Typical Sections			12	24					36
	Address Comments From MDOT TCP Check		8	8	24					40
	Special Design Sheets									
	Intersection Detail Sheets			8	16					24
	Pavement Marking Detail Sheets			4	16					20
	Form Grade Sheets		8	6	16					30
	"Standard" Special Design Sheets (if design commenced prior to August 2017)									
	Miscellaneous Detail Sheets			8	12					20
	Control Points Sheet									
	Box Culvert Sheets		4		12					16
	Standard Drawings									
	Determine Necessary Standards & Generate PDF (roadway & box culvert, 2 multi-page pdf files)				4					4
	Cross-Sections									
	Add Earthwork Quantities (phased if necessary)			8	16					24
	Phase Construction Details			8	8					16
	Deliverables									
	2 Multi-Page PDF Files For Plans & X-Sections									

Office Review Plans RWD

Weisenberger Road	
Madison County	
0	
Neel- Schaffer	
1-Nov-2024	

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Senior Engineer Manager	Engineer IV	Engineer Intern II	Senior Certified Engineering Technician	Administrative Secretary				
		Man-Hours								
	Phase B Office Review Checklist									
	Quantity Calculations (1 multi-page pdf)		12		16					28
	Office Review									
	Attend Office Review		4	4	4					12
	Provide Office Review Meeting Minutes		4							4
	Revise Plans Per Office Review			12	24					36
	Complete MDOT Office Review Report Template			4						4
	Quantity Calculations (Updates)		4	4	12					20
	Develop Construction Cost Estimate		8							8
	CN/Utility Coordination	16	120	40	40					216
	QA/QC		24							24
	Utility Permit Review		40							40
	Total Hours	16	252	196	332					**796**
	Hourly Rate	$90.00	$80.00	$45.00	$55.00	$30.73	$0.00	$0.00	$0.00	
	Salary Cost	$1,440.00	$20,160.00	$8,820.00	$18,260.00	$0.00	$0.00	$0.00	$0.00	**$48,680.00**
148.31%	Overhead									$72,197.31
0.48%	FCCM									$233.66
	Total Labor Cost									**$121,110.97**
	Prime Direct Costs Total									**$0.00**
12.00%	**Fixed Fee**									**$14,505.28**
	Phase B, Part _ Grand Total									**$135,616.25**

Office Review Plans Bridge

Weisenberger Road
Madison County
Neel- Schaffer
1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Engineer Manager	Senior Engineer	Engineer	Engineer Intern	Senior Technician	Admin			
		Man-Hours								
	Design									
	Deep Foundation Design		24	16						40
	Plans									
1	Detailed Index			2	4					6
1	Summary of Quantities			2	4					6
1	General Notes & Estimated Quantities		8	4	4					16
4	Foundation Plan and Elevation		12	16	8					36
3	End Bents		12	16	16					44
3	Intermediate Bents		12	8	8					28
6	Span Details		8	16	24					48
1	Miscellaneous Span Details		2	4	4					10
1	Railing			2	4					6
2	Prestressed Beam Details		8	16						24
2	Misc. Prestressed Beam Details		12	8						20
				4						4
1	Soil Profile				2					2
2	Erosion Control			2	4					6
	Estimated Quantity Calculations			24	32					56
	Load rating			24						24
	Special provisions									
	QA/QC		24	24						48
	Submit 1 Multi-Page PDF File of Plans		2	6						8
	Submit Quantity Calculations (1 multi-page PDF)		2	6						8
	Attend Office Review	4	4	4						12
	Provide Office Review Meeting Minutes		4							4
	Revise Plans Per Office Review		12	16						28
	Project Management	8					4			12
	Total Hours	12	146	220	114		4			**496**
	Hourly Rate	$90.89	$82.24	$69.49	$40.03	$37.79	$30.73	$0.00	$0.00	
	Salary Cost	$1,090.68	$12,007.04	$15,287.80	$4,563.42	$0.00	$122.92	$0.00	$0.00	**$33,071.86**
148.31%	Overhead									$49,048.88
0.48%	FCCM									$158.74
	Total Labor Cost									**$82,279.48**
	Prime Direct Costs Total									**$0.00**
12.00%	**Fixed Fee**									**$9,854.49**
	Phase B, Part 5 Grand Total									**$92,133.97**

ITS - Signal Plans

Weisenberger Road
Madison County
Neel- Schaffer
1-Nov-2024

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Senior Engineer Manager	Engineer III	Engineer Intern II	Senior Certified Engineering	Project Cordinator		Administrative Secretary		
		Man-Hours								
	Traffic Signal Design									
	Signal design (1 new)									
	Signal design (1 mod.)		16		40					56
			16		24					40
	Project Management									
	Quantities		16		16					
	Field/Office Review & Revisions									
	QC Review					8				8
	Draft Final		4		8					12
	Final		4		8					12
	Total Hours		56		96	8				128
	Hourly Rate	$90.00	$62.98	$45.00	$55.00	$53.98	$0.00	$0.00	$0.00	128
	Salary Cost	$0.00	$3,526.88	$0.00	$5,280.00	$431.84	$0.00	$0.00	$0.00	**$9,238.72**
148.31%	Overhead									$13,701.95
0.48%	FCCM									$44.35
	Total Labor Cost									**$22,985.02**
12.00%	**Fixed Fee**									**$2,752.88**
	Phase B, Part _ Grand Total									**$25,737.90**

Final Plans Bridge

Project Route/Termini	
County	
Project Number (External & FMS)	
Consultant Name	
Date	

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		Engineer Manager	Senior Engineer	Engineer	Engineer Intern	Senior Technician	Admin			
		Man-Hours								
	Draft Final Plans									
	Submit 1 Multi-Page PDF File For Draft Final Plans		2	6						8
	Address Draft Final Review Comments		6	16						22
	Final Plans									
	Submit 1 Multi-Page PDF File For Plans		2	6						8
	Submit CADD Files		2	6						8
	Submit Bridge Load Rating Calculations & Report (1 mult-page PDF)		2	6						8
	Submit Design Calculations (multi-page PDF)		2	8						10
	Submit all electronic input and output files		2	6						8
	Submit revised cost estimate and quantity calculations (multi-page PDF file)		2	6						8
	Submit QC plan set mark-ups including corrections (multi-page PDF file)		2	6						8
	Address Revisions/Addendums		6	6						12
	Project Management	2					2			4
	Total Hours	2	28	72			2			**104**
	Hourly Rate	$90.89	$82.24	$69.49	$40.03	$37.79	$30.73	$0.00	$0.00	
	Salary Cost	$181.78	$2,302.72	$5,003.28	$0.00	$0.00	$61.46	$0.00	$0.00	**$7,549.24**
148.31%	Overhead									$11,196.28
0.48%	FCCM									$36.24
	Total Labor Cost									**$18,781.76**
12.00%	**Fixed Fee**									**$2,249.46**
	Phase B, Part 6 Grand Total									**$21,031.22**

Final Plans RWD

Project Route/Termini	
County	
Project Number (External & FMS)	
Consultant Name	
Date	

No. of Sheets	Task	Personnel Titles Assigned to Project								Man-Hour Totals
		4	Engineer IV	Engineer Intern II	Senior Certified Engineering Technician	Administrative Secretary				
		Man-Hours								
	Draft Final Plan Deliverables									
	Multi-Page PDF File For Plans, Cross Sections, & Standard Drawings			4	4					8
	Draft Final Review									
	Attend Draft Final Plan Review									
	Address Draft Final Review Comments			8	16					24
	Final Plan Deliverables									
	Multi-Page PDF File For Plans, Cross Sections, & Standard Drawings			4	4					8
	Final Quantity Calculations (1 multi-page pdf)									
	Final Phase B Checklist		4							4
	QC Plan Set Mark-Ups (multi-page pdf file)		4	4						8
	Electronically Stamp and Sign Plans/Cross Sections			16						16
	Address 1st Order Revisions									
	QA/QC									
	PSE/Advertisement/Bidding	8	40	40	40					128
	Total Hours	8	48	76	64					**196**
	Hourly Rate	$90.00	$80.00	$45.00	$55.00	$30.73	$0.00	$0.00	$0.00	
	Salary Cost	$720.00	$3,840.00	$3,420.00	$3,520.00	$0.00	$0.00	$0.00	$0.00	**$11,500.00**
148.31%	Overhead									$17,055.65
0.48%	FCCM									$55.20
	Total Labor Cost									**$28,610.85**
	Prime Other Direct Costs									
	Prints							1	$2,500.00	$2,500.00
	Prime Direct Costs Total									**$2,500.00**
12.00%	**Fixed Fee**									**$3,426.68**
	Phase B, Part _ Grand Total									**$34,537.53**