

**DESIGN-BUILD
RFP CONTRACT BOOK 1
INSTRUCTIONS TO
DESIGN-BUILDERS (ITDB)
TENNESSEE DEPARTMENT OF TRANSPORTATION**

**SR-222 Reconstruction and Widening
Haywood County- TENNESSEE**

CONTRACT NUMBER: DB2301



July 10, 2023

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STANDARD INSTRUCTIONS TO DESIGN-BUILDERS

A. SCOPE OF SOLICITATION / PROJECT DESCRIPTION

1. INTRODUCTION

This **Contract Book 1 (ITDB - Instructions to Design-Builders)** is issued by the Tennessee Department of Transportation (TDOT) soliciting a single-phase Request for Proposals (“RFPs”) submittal package, including Statements of Qualifications (“SOQs”) from entities (“Design-Builders”) interested in submitting proposals for the **SR-222 Reconstruction and Widening, Haywood County, Tennessee** (the “Project”). The Project will be funded with state dollars, thereby requiring that the Design-Builders adhere to all pertinent state and local requirements. The Department hereby invites such Design-Builders to submit competitive sealed proposals (“Proposals”) for design and construction of the Project as more specifically described in this RFP. Design-Builders should not rely on only the limited information contained in this **Contract Book 1 (ITDB - Instructions to Design-Builders)** but should review and understand the specific information and requirements in the RFP.

Proposals are invited from any qualified entities (“Design-Builders”) as specified within this RFP. The proposal will be evaluated based on the set criteria for Design-Builders and other qualifications. The Design-Builder procurement process will be completed in a single-phase for this project.

The Design-Builder is advised to familiarize itself with the provisions of Tennessee Code Annotated, Section 67-6-209, entitled "Use of Property Produced or Severed from the Earth-Exemptions", which relates to the payment of taxes on the use of tangible personal property severed from the earth. This tax is in addition to those levied for other tangible personal property.

The Design-Builder must have at their disposal the necessary equipment to put on the Project when instructions are issued to begin work and to do the work within the time specified.

This **Contract Book 1 (ITDB - Instructions to Design-Builders)** contains Prequalification Requirements, Technical Proposal, Price Proposal, and other submittal requirements, a description of the procurement process to be used, Technical Proposal evaluation criteria, and other instructions to Design-Builders. This **Contract Book 1 (ITDB - Instructions to Design-Builders)** shall be used by Design-Builders in conjunction with the other Contract Documents for the generation and submission of responsive Technical Proposals, sealed Price Proposals, and other required pre-award submittals.

Submittal of a Price Proposal and the execution by Design-Builders of the signature sheets contained in the RFP, shall constitute the Design-Builder’s acknowledgement and understanding of the procurement process, submittal requirements, and evaluation criteria contained herein.

The Contract will include **Contract Book 1 (ITDB - Instructions to Design-Builders)**, **Contract Book 2 (Design-Build Contract)**, and **Contract Book 3 (Project Specific Information)**, **Design-Builder Standard Guidance** and all referenced documents, including, but not limited to, the listing in the **Contract Book 2 (Design-Build Contract)** are to set forth the rights and obligations of the Parties and the terms and conditions governing completion of the work.

The Design-Builder's obligations shall include without limitation the following:

- furnishing all design services, quality management, materials, equipment, labor, transportation, and incidentals required to complete the Project according to the approved Plans, the Department's Standard Specifications, as amended, and terms of the Contract;
- performing the construction work according to the lines, grades, typical sections, dimensions, and other details shown on the approved Plans, as modified by Change Order or other written directive issued by the Department;
- performing all work determined by the Department to be necessary to complete the Contract;
- contacting the Department's Alternative Delivery Office for any necessary clarification or interpretation of the Contract prior to proceeding with the affected work;
- completing all Project components identified in the Contract and performance of all work described in accordance with all Contract requirements. The Design-Builder shall determine the full Project requirements through comprehensive examination of the Contract and the Project Site; and
- designing, furnishing, constructing, and installing all components of the Project, except for those components, if any, as may be stipulated within the **Contract Book 3 (Project Specific Information)** to be furnished and/or installed by the Department or others.

The Design-Builder shall be fully and totally responsible for the accuracy and completeness of all work performed under the Contract and shall indemnify and hold the Department harmless for any additional costs and all claims against the Department which may arise due to errors or omissions of the Department in the provided reference materials on the TDOT Design Build Website, and of the Design-Builder in performing the work.

A. Letter of Intent to Propose

The Design-Builder shall submit a letter of Intent to Propose to TDOT Program Manager (steve.sellers@tn.gov) by the date and time as specified in Section A.5 of this Book or the technical proposal and bid will not be accepted. The letter of Intent to Propose should include the Design-Build Team (Contractor and Consultant) and the Point of Contact for the Team.

B. Prequalification

Each prospective construction firm participating with a Design-Builder is required to file a document entitled "Prequalification Questionnaire." This submittal is required by the State of Tennessee, Department of Transportation under the provisions of Tennessee Code Annotated Section 54-5-117 and Tennessee Department of Transportation Rule 1680-05-03, Prequalification of Contractors.

- a. Prospective Design-Builders who wish to submit a proposal (including an SOQ) to the Department must be listed as prequalified by the Construction Division at [Contractor Prequalification - Construction Division - TDOT - TN.gov](https://www.tn.gov/contractors) by **4:00 PM Central Time** on the due date for the Proposal.
- b. Any Major Participant seeking to be approved under this RFP solicitation must also be qualified within their discipline or service type either by the Design Division or the Construction Division, as applicable, for each branch office participating on this Project by **4:00 PM Central Time** on the due date for the Proposal.
- c. In addition to the Design-Builder and all Major Participants, the Design-Builder must identify the right-of-way (ROW) acquisition firm they plan to utilize in the RFP for “Level 2” personnel. Any ROW Acquisition firm seeking to be approved under this RFP solicitation must be identified in the Proposal and be qualified within their discipline or service type by the Design Division (see the following website for additional information [Consultant Information \(tn.gov\)](https://www.tn.gov/consultants) for each branch office participating on this Project by **4:00 PM Central Time** on the due date for the Proposal.

C. Major Participants

As used herein, the term “Major Participant” means any of the following entities:

- a. All general partners or joint venture members of the Design-Builder;
- b. All individuals, persons, proprietorships, partnerships, limited liability partnerships, corporations, professional corporations, limited liability companies, business associations, or other legal entity, however organized, holding (directly or indirectly) a **twenty percent (20%)** or greater interest in the Design-Builder; and
- c. The lead engineering/design firm(s).

D. Project Goals

The following goals have been established for the Project:

- a. Minimize inconvenience to the public during construction.
- b. Provide a management system or approach that ensures the requirements of the Project will be met or exceeded.
- c. Provide a high-quality project that minimizes future maintenance.
- d. Provide a solution consistent with TDOT Roadway Design Standards.
- e. Adhere to local, state, and federal environmental regulations and/or permits that are required in executing and/or completing the Project.
- f. Incorporate Best Management Practices to control sediment, storm water runoff/discharge, or other environmental parameters that are established for the Project.
- g. Implement innovative solutions to maximize the return on taxpayer investment by reducing costs or improving quality of the transportation systems.
- h. Early construction of turning lanes into Blue Oval entrances.
- i. Complete construction as quickly as possible.
- j. Provide a visually pleasing finished product.

E. Design-Builder Information

To allow receipt of any addenda or other information regarding the RFP, each Design-Builder is solely responsible for ensuring that TDOT's Alternative Delivery Program Manager (TDOT PM), as described in Section A.3, has the contact person's name and e-mail address. If an entity intends to submit a proposal as part of a team, the entire team is required to submit a single Proposal as a single Design-Builder.

F. Non-Discrimination in Employment

The Design-Builder will be required to follow Special Provision 1290.

2. PROJECT INFORMATION

Project Description: **SR-222 Reconstruction and Widening**

This project will consist of the design and reconstruction of existing SR-222 from near proposed SR-468 to near Campground Road in Haywood County, Tennessee. The project will include construction of the new 4-lane roadway, intersection improvements, utility coordination and relocations, removal of portions of the existing roadway, right-of-way acquisition, environmental permitting, and widening the existing box culverts. Traffic will be maintained on the existing roadway.

Additionally, the Design-Builder shall be responsible for:

- Acquiring any additional easements required for the construction of the Project outside of the Simplified Functional Set of Plans. Any easement required to construct the Project shall be in the name of Tennessee Department of Transportation;
- Coordinating the construction/relocation of private utilities with the appropriate owners, except that TDOT will perform the utility coordination based on the Simplified Functional Set of Plans in the preparation of the utilities' relocation plans and contracts;
- Development and implementation of the Traffic Control and Pavement Marking Plans;
- Development and implementation of all erosion prevention and sediment control designs;
- Compliance with environmental permits, which will be obtained by the Department based on the Simplified Functional Set of Plans. Should the Design-Builder's activities be in violation of the environmental permits, law and/or regulations and therefore cause fines and/or penalties to be assessed against the Department, said fines and/or penalties will be deducted from monies due the Design-Builder;
- Following all reference guidance as stated in **Design-Build Standard Guidance**;
- Following all Specific Technical requirements as stated in **Contract Book 3 (Project Specific Information)**; and
- Coordination and communication with all stakeholders, including but not limited to:
 - Tennessee Department of Transportation (Headquarters Project Management & Construction, Region 4, and Structures Division);
 - Haywood County;
 - Ford Motor Company;

- Local Property Owners;
- Local Businesses;
- Tennessee Valley Authority (TVA);
- West Tennessee Megasite Authority; and
- Utility Companies.

3. RFP COMMUNICATION

The Department's Alternative Delivery Program Manager is the single point of contact for the Department for the duration of the procurement process, together with address, phone number, fax number, and e-mail address, as set out in Section C.2 of Contract Book 2.

a. CORRESPONDENCE

All correspondence and submittals must be submitted electronically via email to the Department's Alternative Delivery Program Manager as set out in Section C.2 of **Contract Book 2 (Design-Build Contract)**.

Any Department designated contact person specified in the **Design-Build Standard Guidance** for a specific technical area will be disclosed to the contracted Design-Builder within the Initial Notice to Proceed (NTP).

b. OTHER MEANS OF COMMUNICATION

The Design-Builders intending to submit proposals may also communicate with the Department's Alternative Delivery Program Manager by phone or e-mail (or if the Alternative Delivery Program Manager is unavailable, as a secondary contact, the Director of Alternative Delivery by telephone at 615-350-8332). Official communications will only be disseminated in writing by the Department.

c. COMMUNICATIONS WITH DESIGN-BUILDER; DESIGN-BUILDER'S SINGLE POINT OF CONTACT AND ADDRESS

The Department's Alternative Delivery Program Manager shall be the Design-Builder's single point of contact for all communications during the procurement process prior to the Proposal Due Date. The Design-Builder's single point of contact for communications during the procurement process shall be the only contact person to request information.

4. THE DEPARTMENT'S DISSEMINATION OF INFORMATION

a. INFORMAL COMMUNICATIONS

The Department may post informal advance notices of Addenda and information on the Project website and may also utilize e-mail alerts (from Steve.Sellers@tn.gov). However, the Design-Builders may not rely on oral communications, or on any other information or contact that occurs outside the official communication process specified herein. Official communications will only be disseminated in writing, by e-mail or via the website by the Department.

In the event the Department determines that a change of RFP or Contract terms or specifications are warranted, the Department will issue formal written clarifications or Addenda.

b. RESPONSES TO FORMAL REQUESTS

Questions on or modification of provisions of the RFP or any Addenda can be pursued through submittal of Form QR. The Department will provide responses to all:

- Requests for QPL product determination;
- Requests for answers; and
- Requests for change of Contract terms or specifications.

Information that the Department issues to the Design-Builders in writing responding to the questions submitted on Form QR will be posted to the website for all Design-Builders to view.

c. ADDENDA

If the Department determines that a formal request raises an issue that should be resolved by amending a RFP provision, specification or Contract term, the Department will do so by issuing a formal Addendum clearly identifying the change as amending, revising, or modifying the RFP provision, specification, or Contract term in question.

The Department may issue Addenda up to five (5) Calendar Days prior to the Proposal Due Date unless the Department extends the Proposal Due Date concurrent with issuance of the Addendum.

d. REQUESTS FOR QPL PRODUCT DETERMINATION

The Design-Builder may request a product in lieu of a Qualified Products List (QPL) product by identifying the product category included on the QPL. The product request shall provide sufficient manufacturer product information, together with supporting documentation such as industry studies and test results, and product demonstration, if relevant, as may be reasonably necessary to enable the Department to make a determination as to the inclusion of said product on the Department's QPL. The Design-Builder shall not submit any proprietary items, unless specified in accordance with 23 CFR 635.411 and approved by the Department prior to the request.

The Department may reject any request without recourse by the Design-Builder. The Department has no obligation but to review the product and shall not be liable for failure to accept or act upon any request. The Department shall be the sole judge of the acceptance or rejection of a product. If an agreement has not been reached by five (5) Calendar Days prior to the Proposal Due Date, the product shall be deemed rejected.

e. QUESTIONS

The Design-Builders may provide questions on RFP provisions, Contract provisions, and specifications that the Design-Builder considers unclear or incomplete. To be

considered, the questions must identify the unclear language or omission, or the specific discrepancies between identified provisions that result in ambiguity. All requests shall be submitted to the Department's Alternative Delivery Program Manager and will only be accepted in the format of Form QR in electronic format by e-mail (to steve.sellers@tn.gov). Any questions to addenda issued after the question deadline will be considered and answers issued if time allows.

f. REQUESTS FOR CHANGE OF CONTRACT TERMS OR SPECIFICATIONS

The Design-Builders may submit a request for change of Contract terms or specifications setting out the language for which change is sought and indicating the document title, page, and subsection where the language is located. To be considered, the request must include the reason for the requested change, supported by factual documentation, and the proposed change. All requests shall be submitted to the Department's Alternative Delivery Program Manager and will only be accepted in the format of Form QR in electronic format using MS Word by e-mail (to steve.sellers@tn.gov).

g. PROHIBITED DESIGN-BUILDER COMMUNICATIONS

No member of a Design-Builder's organization (employees, agents, Principal Participants, the Designer, Key Personnel, or the Technical Manager) may communicate with members of another Design-Builder's organization to give, receive, or exchange information, or to communicate inducements, that constitute anti-competitive conduct in connection with this procurement.

The Design-Builders shall not contact stakeholder staff regarding the RFP content or the requirements for the Project. Stakeholder staff includes employees of the Department, and employees of any city(ies) and county(ies) in which the Project or any part of it is located.

Prohibited communications do not include contact with regulatory/county/city officials for the limited purpose of obtaining information regarding available detour routes, conditions associated with such use, or regulatory/county/city guidelines, and communications with city/county owned utilities.

The Design-Builder shall not contact the regulatory agencies directly. Any questions the Design-Builder may have for the regulatory agencies during the proposal phase shall be sent to TDOT who will communicate these to the agencies.

5. PROCUREMENT SCHEDULE/SUBMITTAL DEADLINES

The Procurement Schedule and submittal deadlines are set out below. The Department will not consider requests on any submittal received by the Department after the deadline for its submittal date stated below. The Department will not consider requests on any submittals pertaining to an Addendum after the deadline established in the Addendum.

Release RFP	7/10/2023
Deadline for Letter of Intent to Propose	7/21/2023; 4:00 PM Central
Deadline for Submittal of Alternate Technical Concepts	7/28/2023
Deadline for Response to Alternate Technical Concepts	8/4/2023
Deadline for Submittal of Question Requests, and Requests for QPL Determination	8/11/2023
Anticipated Deadline for Issuance of Last Addendum	8/18/2023
Technical Proposal and Price Proposal Due Date and Time	9/1/2023, 10:00 AM Central Technical Proposal emailed to TDOT/PM Price Proposal through Bid Express
Price Proposal Opening	9/15/2023
Anticipated Award of Design-Build contract, or rejection of all proposals	9/29/2023
Anticipated Issuance of Initial Notice to Proceed	10/16/2023

The Department will not consider any late Proposals. Proposals received after the Proposal Due Date will be returned unopened. The Department will not consider any Proposal modifications submitted after the Proposal Due Date. Nor will the Department acknowledge Proposal withdrawals submitted after the Proposal Due Date. Any such attempted withdrawal will be ineffective.

If a Design-Builder submits a Proposal after the Due Date and the Department chooses to issue a new, revised, or modified RFP, the Proposal will be considered non-responsive to the requirements set forth herein.

6. **CONTRACT DOCUMENTS**

- Contract Book 1 (ITDB - Instructions to Design-Builders);
- Contract Book 2 (Design-Build Contract);
- Contract Book 3 (Project Specific Information);
- Design-Build Standard Guidance and Addendum;
- The Department's Standard Specifications;
- The Department's Supplemental Specifications;
- The Department's Design Guidelines, and Addendum;
- The Department's Construction Circular Letters;
- The Department's Standard Drawings;
- The Department's Design Procedures for Hydraulic Structures;
- The Department's Drainage Manual;

- The Department's Materials and Tests Standard Operating Procedures;
- FHWA scour publication HEC-18, FHWA publication HEC-21 or HEC-22;
- Exhibit A (Technical Proposal), including any ATCs;
- Change Orders;
- Force Account Work Orders;
- Written Orders and Authorizations Issued by the Department;
- All Other Programmatic Plans or any other documents; and
- All Material Included by Reference in any of the above Documents.

7. COMPLETION DATES

- Contract Completion Time – The Design-Builder shall specify the number of Calendar Days after receipt of the Initial Notice to Proceed required for completion of the project within their Price Proposal. Completion of the project is completion of all work to be done under the Contract, except for plant/vegetation establishment, and the Department has provided final acceptance as stated in the Department's Standard Specifications. The number of Calendar Days specified by the Design-Builder in their Price Proposal will be placed in the Contract prior to execution of this Design-Build Contract.
- Interim Completion Dates – To be determined by the Critical Path Method (CPM) Schedule.

8. CRITICAL PATH METHOD (CPM)

The Technical Proposal CPM Schedule shall follow the applicable categories within the Schedule of Items and other cost control systems, including the Payment Progress Process.

The CPM Schedule shall include all major activities of work required under the Contract, in sufficient detail to evaluate design and construction process. The Design-Builder shall provide adequate time in the schedule for all parties involved with the Project to complete their work, including inspections, procurement activities, and testing. The Design-Builder's plan, as presented in the CPM, shall adhere to all Contract requirements. The Design-Builder shall include in the CPM schedule the work of subcontractors, vendors, suppliers, utilities, railroads, permitting agencies, the Department, and all other parties associated with the Project. Failure by the Design-Builder to include any element of its work or the work of others required for completion of the Project will not excuse the Design-Builder from completing the Project by the Contract Completion Date(s).

The scheduling compatible software employed by the Design-Builder shall be with the current and any future scheduling software employed by the Department. The Department's current software in use is Primavera Program Manager (v 18.0). The software shall be compatible provided in an electronic file version of the Project Schedule that can be loaded or imported by the Department using the Department's scheduling software with no modifications, preparation or adjustments.

The CPM Schedule shall show the order in which the Design-Builder proposes to carry on the work, the time frame within which it will start the major items of work and the critical features of such work (including procurement of materials, plant, and equipment),

and the contemplated time frames for completing the same. For the purposes of developing the CPM Schedule, the Design-Builder shall use ten (10) business days for the Review and Approvals performed by the Department. The CPM Schedule shall include, at a minimum, the following items:

- Controlling items of work, major work, and activities to be performed;
- Seasonal weather limitations;
- Land disturbance restrictions;
- Phase duration or milestone events, based on selected option as applicable; and
- Specified contract completion time (defined above) from Price Proposal.

The purpose of this scheduling requirement is to ensure adequate planning and execution of the work and to evaluate the progress of the work. The CPM Schedule proposed shall meet or exceed minimum Contract requirements, as determined by the Department in its sole discretion, where all Design-Builder risks are mitigated with schedule logic. The Design-Builder is and shall remain solely responsible for the scheduling, planning, and execution of the work in order to meet the Project Milestones, the Intermediate Contract Times, and the Contract Completion Date(s).

Within ten (10) business days after award of the Contract, the Design-Builder shall assign a percentage of the Pay Item Cost to each activity in the proposed CPM that reflects an accurate percentage value to each activity based on estimated costs plus associated profit and overhead. The profit and overhead assigned by the to the individual activities starting shall be equal to or less than the mark-up applied to the work when establishing the Contract Lump Sum Price. The schedule shall be in a suitable scale to indicate graphically the total percentage of work scheduled to be completed at any time.

Review and Comment by the Department shall not be construed to imply approval of any particular method or sequence of construction or to relieve the Design-Builder of providing sufficient materials, equipment, and labor to guarantee completion of the Project in accordance with all Contract requirements. The Department Review and Comment shall not be construed to modify or amend the Contract, Interim Completion Dates, or the Contract Completion Date. The updated CPM Schedule may be utilized to facilitate the Department's Quality Assurance (QA) activities.

If at any time the design of the project potentially affects the approved FHWA NEPA document, the Design-Builder shall cease work and contact the Department Alternative Delivery Office.

The Department's acceptance of any schedule does not relieve the Design-Builder of responsibility for the accuracy or feasibility of the schedule, does not modify the Contract, will not be construed as an endorsement or validation of the Design-Builder's plan, and does not guarantee that the Project can be performed or completed as scheduled. the Department's acceptance of the Design-Builder's schedules in no way attests to the validity of the assumptions, logic constraints, dependency, relationships, resource allocations, resource availability, manpower and equipment, or any other aspect of the means and methods of performing the work.

The Design-Builder shall produce a schedule that does not contain open-ended activities, except for the first and last activity in the schedule.

9. SUBMITTALS

Design-Build submittals will be based on the approved CPM Schedule. All submittals must be stamped into the Department designated contact office before 12:00 p.m. CST to start the review period that day. If submittals are received after 12:00 p.m. CST, the review period will begin on the following business day. The review period includes only the Department's workdays.

Submittals shall be transmitted in a logical order and in accordance with the submittal schedule. All submittals shall be stamped by a Professional Engineer licensed in Tennessee.

B. PREPARATION OF PROPOSAL

1. METHOD OF PROCUREMENT

The Contract will be for Design-Build services to be paid on a lump sum basis for each Pay Item Number. The Department may award the Contract to the Design-Builder that submits a responsive Proposal that is determined by the Department to offer the lowest Adjusted Price considering the evaluation factors set forth in this ITDB.

The procurement process will be completed in a single-phase selection method. The Statement of Qualification (SOQ) will be part of the Technical Proposal Package. Evaluation of Proposals will be based on information submitted in the Proposals or otherwise available to the Department, and will involve pass/fail factors from the SOQ, technical responses, and price, as further detailed below.

The Design-Builder shall comply with the Proposal preparation instructions set out in this **Contract Book 1 (ITDB - Instruction to Design-Builders)**, the **Contract Book 2 (Design-Build Contract)**, the **Contract Book 3 (Project Specific Information)**, the **Design-Build Standard Guidance** and any other Contract Documents released for this procurement.

2. STATEMENT OF QUALIFICATION (SOQ) INFORMATION

This section describes specific information that must be included in the Statement of Qualification (SOQ). The SOQ shall be formatted following the outline presented in Section D: TECHNICAL RESPONSE CATEGORIES AND SCORING.

Design-Builders should provide basic introductory information regarding the company (or joint venture) in order for TDOT to evaluate their minimum qualification to complete the Project successfully within the target timeline. The SOQ package shall include:

- a. An Introductory letter (Letter of Interest) addressed to the Design-Build Program Manager, as stated in Response Category I. The introductory letter shall be limited to one (1) page. This introductory letter shall be signed and should include:
 1. An expression of the Design-Builder's interest in being selected for the project.
 2. Identification of the prequalified ROW and Utility Coordination firms the Design-Builder will utilize.
 3. A confirmation statement of the commitment for Key Personnel and Major

Participants identified in the submittal to the extent necessary to meet TDOT's quality and schedule expectations.

4. A certification that any member of the Design-Builder or Major Participant did not have contact or receive information regarding this Project from TDOT other than the personnel allowed in Section A.3.
- b. The business name, address, business type (e.g., corporation, partnership, or joint venture), business information, and roles of the Design-Builder and each Major Participant in **Form A**. Authorized representatives of the Design-Builder organization must sign **Form A**. If the Design-Builder is a joint venture, all joint venture members must sign **Form A**. Each joint venture member must certify the truth and correctness of the contents of the SOQ.
- c. A copy of the prequalification listing showing all the firms required by Section A.1.B (Prequalification).
- d. Identification of one contact person for the Design-Builder and one contact person for the lead design firm and his or her address, telephone and fax numbers, and e-mail address. TDOT will send all Project-related communications to these contact people on behalf of the Design-Builder during the procurement process.
- e. Legal and Financial
 1. Organizational Conflict of Interest
 - i. Identify all relevant facts relating to past, present, or planned interest(s) of the Design-Builder's (including the Major Participants, proposed Design-Builder members, and their respective chief executives, directors, and Key Personnel of the Project) which may result in, or could be viewed as, an organizational conflict of interest in connection with this RFP. This includes preparation of TDOT reports, surveys, preliminary plans and similar low-level documents that may be incorporated into the RFP. All documents and reports must be identified, and assurances made that the information was delivered to a TDOT representative and whom.
 - ii. If a person or entity has participated in preparing the NEPA document for the proposed project, the Design-Builder must request a review of participation from the TDOT Alternative Delivery Office for a determination of a conflict of interest prior to submittal of the proposal.
 - iii. Please refer to the TDOT's Rule Chapter 1680-05-04, Procedures for the Selection and Award of Design-Build Contracts. This is located at: [https://www.tn.gov/content/dam/tn/tdot/construction/design-build_projects/DB_Rules%20\(1\).pdf](https://www.tn.gov/content/dam/tn/tdot/construction/design-build_projects/DB_Rules%20(1).pdf).
 - iv. Disclose: (a) any current contractual relationships with TDOT (by identifying the TDOT contract number and project manager); (b) present or planned contractual or employment relationships with any current TDOT employee; and (c) any other circumstances that might be

considered to create a financial interest in the contract for the Project by any current TDOT employee if the Design-Builder is awarded the contract. The Design-Builder must also disclose any current contractual relationships where the Design-Builder is a joint venture. The foregoing is provided by way of example and shall not constitute a limitation on the disclosure obligations.

- v. For any fact, relationship, or circumstance disclosed in response to this Section, identify steps that have been or will be taken to avoid, neutralize, or mitigate any organizational conflicts of interest.
- vi. In cases where Major Participants on different Design-Builder organizations belong to the same parent company or are affiliated with it, each Design-Builder must describe how the participants would avoid conflicts of interest through the qualification and proposal phases of the Project.
- vii. Participation in developing this RFP by a Principal Participant, Designer, or Major Participant shall be deemed an organizational conflict of interest disqualifying affected Design-Builders.
- viii. The Design-Builder shall include in its subcontracts a completed Conflict of Interest statement from each Subcontractor the Design-Builder will utilize on the Project. The Design-Builder shall provide each Subcontractor with the Department's "Conflict of Interest Guidelines, and Disclosure Process" attached hereto.
- ix. If none existing, state "None."
- x. At the end of this section within the Proposal, please place the following statement in this section and provide signature, print name and title. *"The undersigned hereby certifies that, to the best of his or her knowledge and belief, no interest exists that is required to be disclosed in this Conflict-of-Interest Disclosure Statement, other than as disclosed above."*
- xi. If the Design-Builder finds that a Principal Participant, Design Professionals, or any Key Personnel listed in its SOQ is no longer eligible to be part of its organization or team for this procurement due to a conflict of interest (as defined in 23 CFR 636), if the Design-Builder's organization has changed since submittal of the Design-Builder's Proposal, or if additional potential conflicts of interest have developed since the Design-Builder's submittal of its Proposal, the Design-Builder should submit a new Form COI making a full disclosure of all potential 23 CFR 636 organizational conflicts of interest other than those already disclosed in the SOQ part of the Proposal. Also see Design-Build Standard Guidance, and the COI Guidelines provided with Form COI regarding State conflict of interest standards and disclosure regarding former the

Department employees.

2. Legal Structure

- i. If the Design-Builder organization has already been formed, provide complete copies of the organizational documents that allow, or would allow by the time of contract award, the Design-Builder and Major Participants to conduct business in the State of Tennessee. If the Design-Builder organization has not yet been formed,

3. ALTERNATIVE TECHNICAL CONCEPTS – SUBMITTAL REQUIREMENTS AND AUTHORIZATION TO USE

a. INFORMATION

To accommodate innovation that may or may not be specifically allowed by the RFP Documents, the Design-Builder has the option of submitting Alternative Technical Concepts.

An Alternative Technical Concept (ATC) is a private query to the Department that requests a variance to the requirements of the RFP or other Contract Documents that is equal or better in quality or effect, as determined by the Department in its sole discretion, and that have been used elsewhere under comparable circumstances.

The Design-Builder may include an ATC in the Proposal only if the ATC has been received by the Department by the deadline identified in this **Contract Book 1 (ITDB - Instruction to Design-Builders)** and it has been approved by the Department).

The submittal original deadline applies only to initial ATC submittals. Resubmittal of an ATC that has been revised in response to the Department's requests for further information concerning a prior submittal shall be subsequently received as directed by the Department.

An ATC shall in no way take advantage of an error or omission in the RFP. If, at the sole discretion of the Department, an ATC is deemed to take advantage of an error or omission in the RFP, the RFP will be revised without regard to confidentiality.

By approving an ATC, the Department acknowledges that the ATC may be included in the design and RFC (Readiness-for-Construction) plans; however, approval of any ATC in no way relieves the Design-Builder of its obligation to satisfy (1) other Contract requirements not specifically identified in the ATC submittal; (2) any obligation that may arise under applicable laws and regulations; and (3) any obligation mandated by the regulatory agencies as a permit condition.

A proposed ATC is not acceptable if it merely seeks to reduce quantities, performance, or reliability, or seeks a relaxation of the contract requirements. ATCs shall be submitted by the Design-Builder and pre-approved in writing by the Department. All Technical Proposals must include the Department's pre-approval letters for consideration of the ATCs.

b. SUBMITTAL REQUIREMENTS

Each ATC submittal shall include one (1) electronic copy by email or USB flash drive and shall use Form ATC located in **Contract Book 3 (Project Specific Information)**. Each ATC shall include the following information:

- 1) Description. A detailed description and schematic drawings of the configuration of the ATC or other appropriate descriptive information, including, if appropriate, product details (i.e., specifications, construction tolerances, special provisions) and a traffic operational analysis, if appropriate;
- 2) Usage. Where and how the ATC would be used on the Project;
- 3) Deviations. References to all requirements of the RFP that are inconsistent with the proposed ATC, an explanation of the nature of the deviations from said requirements, and a request for approval of such variance(s);
- 4) Analysis. An analysis justifying use of the ATC and why the variance to the requirements of the RFP should be allowed;
- 5) Impacts. Discussion of potential impacts on vehicular traffic, environmental impacts identified, community impact, safety and life-cycle Project impacts, and infrastructure costs (including impacts on the cost of repair and maintenance);
- 6) History. A detailed description of other projects where the ATC has been used, the success of such usage, and names and telephone numbers of project owners that can confirm such statements;
- 7) Risks. A description of added risks to the Department and other entities associated with implementing the ATC; and
- 8) Costs. A description of the ATC implementation costs to the Department, the Design-Builder, and other entities (right-of-way, utilities, mitigation, long term maintenance, etc.).

The ATC, if approved, shall be included in the Price Proposal if the Design-Builder elects to include it in their Technical Proposal. The Design-Builder shall not request more than six ATCs.

c. REVIEW OF ATCs

A panel will be selected to review each ATC, which may or may not include members of the Design-Build Review Committee. The Design-Builder shall make no direct contact with any member of the review panel, except as may be permitted by the Department's Alternative Delivery Program Manager. Unapproved contact with any member of the review panel will result in a disqualification of that ATC.

The Department may request additional information regarding a proposed ATC at any time. The Department will return responses to, or request additional information from, the Design-Builder within ten (10) business days of the original submittal. If additional information is requested, the Department will provide a response within ten (10) business days of receipt of all requested information.

Under no circumstances will the Department be responsible or liable to the Design-Builder or any other party as a result of disclosing any ATC materials, whether the disclosure is deemed required by law, by an order of court, or occurs through

inadvertence, mistake or negligence on the part of the Department or their respective officers, employees, contractors, or consultants.

d. THE DEPARTMENT'S RESPONSE

The Department will review each ATC and will respond to on Form ATC as shown in **Contract Book 3 (Project Specific Information)** with one of the following determinations:

- 1) The ATC is approved;
- 2) The ATC is not approved;
- 3) The ATC is not approved in its present form, but may be approved upon satisfaction, in the Department's sole discretion, of certain identified conditions that shall be met or certain clarifications or modifications that shall be made (conditionally approved);
- 4) The submittal does not qualify as an ATC but may be included in the Proposal without an ATC (i.e., the concept complies with the baseline requirements of the RFP Documents);
- 5) The submittal does not qualify as an ATC and may not be included in the Proposal; or
- 6) The ATC is deemed to take advantage of an error or omission in the RFP, in which case the ATC will not be considered, and the RFP will be revised to correct the error or omission.

e. ATC INCLUSION IN TECHNICAL PROPOSAL

The Design-Builder may incorporate one or more approved ATCs as part of its Technical and Price Proposals. If the Department responded to an ATC by stating that it would be approved if certain conditions were met, those conditions must be stipulated and met in the Technical Proposal. If the ATC is used in the submittal, the approved Form ATC shall be included in the Technical Proposal.

In addition to outlining each implemented ATC, and providing assurances to meet all attached conditions, the Design-Builder shall also include a copy of the ATC approval letter with approved form from the Department in the Technical Proposal within the Appendix, and these will not count towards the page limit maximum; however, the ATC must be discussed within the Technical Proposal Response Category for scoring.

Approval of an ATC in no way implies that the ATC will receive a favorable review from the Design-Build Review Committee. The Technical Proposals will be evaluated in regard to the evaluation criteria found in this **Contract Book 1 (ITDB - Instructions to Design-Builders)**, regardless of whether or not ATCs are included.

The Price Proposal shall reflect all incorporated ATCs. Except for incorporating approved ATCs, the Technical Proposal may not otherwise contain exceptions to, or deviations from, the requirements of the RFP.

4. SELECTION PROCEDURE

The Department will then utilize a **Meets Technical Criteria (A+B)** selection process for qualified Proposals and award a Contract to the responsible Design-Builder that demonstrates it meets the technical criteria and can deliver the best combination of price and time (A+B) in the design and construction of the Project.

Although the selection will be made on the bid proposal that qualifies as the lowest and best adjusted bid, the cost of the Contract will be the amount received as the Proposal Price “A” and will be placed in **Contract Book 2 (Design-Build Contract)** upon award.

Price Proposals will be calculated in accordance with the following method:

Total Contract (A+B) = A+ (B x TIME VALUE)

Where, A = Contract Amount

B = the number of Calendar Days (from the Initial Notice to Proceed) indicated by the time needed to complete the Project in the Design-Builder’s Price Proposal, which will become the contract completion time to be shown in the contract book.

TIME VALUE = Value associated with time of completion on this Project.

B: Calendar Days

Time Value Amount of one Calendar Day is **\$11,000** as stated in Special Provision 108B.

It is intended that all construction be completed by the earliest feasible date to minimize public inconvenience and enhance public safety. Should the total number of calendar days that the Design-Builder placed in the Proposal under the “B” portion of the Proposal to be deemed excessive, the Proposal will be rejected. To this end the Design-Builder shall pursue the work rigorously utilizing the necessary work week, work hours and/or work shift schedules to expedite the work. The total Contract (A+B) cost will be used by the Department to determine the Apparent Design-Builder, but reimbursement to the Design-Builder shall be based solely on the Proposal Price total “A” and any incentive or disincentive payment made in accordance with the Contract.

IMPORTANT: The number of Calendar Days “B” is to be placed in the Price Proposal. Failure to enter a value for “B” will make the Proposal irregular and will be cause for rejection.

Calendar days will be charged in accordance with the Contract and time charges will begin on the date shown on the initial NTP letter. Time charges will continue until work on the Project is complete, excluding punchlist items and vegetation establishment, in accordance with the Contract.

Notwithstanding any other provision of this Contract to the contrary, no time adjustments will be allowed for:

- Adverse weather conditions;
- The time required to Review and Approve Shop Drawings;

- The time required to review VECs;
- The time to process Change Orders or plan revisions requiring additional Review and Approval;
- The time to complete work not on the CPM Schedule; or
- Any delays typically encountered during a Project regardless of the source.

Time adjustments may be considered for:

- The time for plan revisions requiring additional Review and Approval if the Design-Builder was unable to work on the controlling item of work without revised plans or shop drawings;
- The time for ordering and delivery of materials for Extra Work directed by the Department that affects the CPM Schedule; and
- Delays encountered due to a catastrophic event, beyond the control of the Design-Builder, that the Department determines adversely affected the progress of work.

The Department reserves the right to reject any or all Proposals, to waive technicalities, or to advertise for new Proposals, if, in the judgment of the Department, the best interests of the public will be promoted thereby. In putting together their Proposals, the Design-Builder should keep in mind and address the Project goals stated herein.

C. RELATIVE WEIGHTS ALLOCATED TO TECHNICAL AND PRICE PROPOSALS

The selection method to be utilized for this Project is “Meets Technical Criteria (A+B)”. The Technical Proposal will be evaluated on the pass/fail and technical evaluation factors identified herein. A Proposal must achieve a **Pass** rating for Response Category I, II, III, and IV. The Department shall first determine whether the Proposals are responsive to the requirements of the RFP. Prior to making such determination, the Department may offer a Design-Builder the opportunity to provide supplemental information or clarify its Proposal. Each responsive Technical Proposal shall be evaluated based on the criteria provided herein. After evaluation of the Technical Proposal, the Department, as required by Department Rule 1680-05-04, Procedures for the Selection and Award of Design-Build Contract, will publicly open through Bid Express as stated in Section E.2b. and the Total Contract Amount (A+B) will be shown. Although the selection will be made on the bid proposal that qualifies as the lowest and best adjusted bid, the cost of the Contract will be the amount received as the Proposal Price “A” and will be placed in **Contract Book 2 (Design-Build Contract)** upon award.

D. TECHNICAL RESPONSE CATEGORIES AND SCORING

Proposal responses for Response Categories I through V will be evaluated using the rating guidelines set out in this **Contract Book 1 (ITDB - Instruction to Design-Builders)**.

EVALUATION FACTORS	POINTS
RESPONSE CATEGORY I	PASS/FAIL
RESPONSE CATEGORY II	PASS/FAIL
RESPONSE CATEGORY III	PASS/FAIL

RESPONSE CATEGORY IV	PASS/FAIL
TOTAL	

During the evaluation period, each Technical Proposal will be reviewed by the Department Design-Build Review Committee (DBRC) individually.

1. RESPONSE CATEGORY I: SOQ, Forms, and Others

This response category will provide a brief description addressing the requirements of the Project consistent with the evaluation criteria described in this RFP, especially in Chapter B2-3. This information will be used to identify the Design-Builder and its designated contacts and will be reviewed on a pass/fail basis.

The Response Category (RC) I package shall include:

a. SOQ CONTENTS

Contents of SOQ shall be arranged following the format presented in Section D: Response Categories I-IV. An SOQ will be responsive to this RFP if it appears to include all of the components of information required in the manner required by this RFP. TDOT reserves the right to request additional information from the Design-Builder in reference to this pass/fail review should the SOQ portion of the Proposal contain ambiguities.

TDOT will use the following criteria in evaluating the qualifications of a Design-Builder:

1) Design-Builder Experience

TDOT will evaluate the capabilities of the Design-Builder organization to effectively deliver the Project. Provide three (3) to five (5) project examples from the past 10 years and describe the experiences that could apply to this Project. This information shall be provided in format of Form B.

1. Experience on projects of similar scope and complexity.

If the Design-Builder is newly formed, please explain. In particular, demonstrate experiences in each of the following areas:

- a. Highway and highway structures;
- b. Highway reconstruction under traffic;
- c. Construction/reconstruction using innovative designs, methods and materials;
- d. Design and construction activity integration; and
- e. Construction in environmentally sensitive areas and Environmental compliance.

2. Owner/client references.

3. Experience with timely completion of comparable projects.

4. Experience with on-budget completion of comparable projects.

5. Experience with integrating design and construction activities.

6. Experience of Design-Builder members working together.

In addition to the Design-Builder Experience requirements listed above, also provide a brief statement of current workloads, including work previously awarded by TDOT. TDOT may elect to use the information provided above as a reference check.

b. FORMS

- 1) All required contract forms filled out. All Response Category forms, and any forms specified within a Response Category shall be placed within the appropriate response category below. If any Response Category item requires additional sheets, the form shall indicate at the bottom of the item, see additional sheets. Additional forms can be used but are not necessary if only one item requires additional sheets.
- 2) Form A: The business name, address, business type (e.g., corporation, partnership, or joint venture), business information, and roles of the Design-Builder and each Major Participant.
- 3) Form B: A general description of the experience on projects of similar scope and complexity that the Design-Builder and each Major Participant has managed, designed, and/or constructed.
- 4) Form C: Acknowledgement of Clarification and Addenda

c. OTHERS

- 1) An Introductory Letter – addressed to the Design-Build Program Manager.
- 2) A copy of prequalification listing.
- 3) Identification of one contact person for the Design-Builder and one contact person for the lead design firm.
- 4) Legal structure.
- 5) Bonding capacity.
- 6) City and State, where assigned staff will be located, particularly the location(s) of design staff.
- 7) List of DBEs Contacted and most likely to be utilized (include identification of the type of work considered).

2. RESPONSE CATEGORY II: DESIGN-BUILDER'S ORGANIZATION AND EXPERTISE

Submit as much of the following for Evaluation on the Response Category II form in **Appendix A**, which will be evaluated as a matter of responsiveness on a pass/fail basis (be as specific as possible):

a. ORGANIZATION

- 1) Project-Wide Organizational Chart, including Design and Construction Functions, Key Personnel, and Design Professionals.
 - Include responsibilities and reporting relationships or chain of command, clearly identifying the Program Manager and personnel who will be assigned to the various tasks identified in this RFP.

- 2) Description of those categories of work which the Design-Builder anticipates will be performed by the Design-Builder's own forces and those categories which will be performed by Subcontractors.
- 3) Plans and procedures for management of Subcontractors.
- 4) Key Personnel Organization

- a. "Level 1" personnel to staff these key functions listed below shall be identified in the required organizational charts (as described in the Section B.2.b.(2)) within the SOQ.

"Level 1" Personnel

- o Design-Builder's Project Manager
 - o Design Manager
 - o Construction Manager/Superintendent
 - o Traffic Control Supervisor
 - o Environmental Compliance Manager
- b. "Level 2" personnel will not be identified in the SOQ portion of the Proposal; however, the Department will require that personnel to staff these positions be identified in the required organizational chart identified within the RFP.

"Level 2" Personnel

- o Prequalified ROW Acquisition/Appraisals personnel
 - o Design Lead Engineer – Structures
 - o Design Lead Engineer – Roadway
 - o Design Lead Engineer – Geotechnical
 - o Erosion Prevention and Sediment Control Inspector
- c. Please provide the following information, at a minimum, in a table format for each of the Key Personnel listed below. Only Key Personnel information is necessary. Only submit information for one person per Key Personnel position. The Design-Builder may assign multiple positions to one person if allowed in this RFP.

The table shall include the:

- o Key Personnel Role;
- o Name of Individual to fill the roles and responsibilities;
- o Anticipated percent of each Individual's time that will be committed to the Project.
- o Number of total years of experience;
- o Number of years of experience on projects of similar size and scope;
- o Number of years of experience on Design-Build Projects;
- o Education;
- o Licenses or Certifications;
- o Include the length of employment with current employer and the

title, roles, and responsibilities on any of the Projects listed in Section B.2.b.(1) above.

- Additional qualifications as necessary.
- d. Resumes of Key Personnel shall be provided as *in the Appendix of the technical proposal behind a tab named – Resumes of Key Personnel.* Resumes of Key Personnel shall be limited to one page each and will not be counted towards the overall Proposal page limit. If an individual fills more than one position, only one resume is required.

The following provides a Key Personnel Role, brief job description and minimum requirements of this person assigned to the Project. Key Personnel will be evaluated, in part, based on the extent they meet and/or exceed such requirements. The Design-Builder's Project Manager and the Design Manager must be available to address any issues that arise for the duration of the Project. Any licenses or certifications that are required to meet the requirements of the RFP shall be in place by the time the first Notice to Proceed is issued.

7. Design-Builder's Project Manager

- a. Shall be responsible for overall design, construction, quality management, and contract administration for the Project. **The Project Manager must be available on the construction site as necessary for the duration of the Project.**
- b. Shall have full responsibility for the prosecution of the Work and shall have authority to bind the Design-Builder on all matters relating to the Project after award.
- c. Shall act as agent and be a single point of contact in all matters on behalf of Design-Builder after award.
- d. Shall have the authority to stop any and all work that does not meet the standards, specification, or criteria established for the Project.
- e. Shall be responsible for adherence to all environmental requirements and commitments if found on the Project, including erosion prevention and sediment control inspections as required by NPDES, if needed, and other environmental rules and regulations.
- f. Should have at least five (5) years (10 preferred) of experience managing on projects of similar scope and magnitude.

8. Design Manager

- a. The Design Manager will be responsible for ensuring that the overall Project design is completed and design criteria requirements are met.
- b. The Design Manager must work under the direct supervision of the

Design-Builder Project Manager.

- c. Must be a registered professional engineer in the State of Tennessee.
- d. Should have at least five (5) years (10 preferred) of recent experience in managing the design on projects of similar scope and magnitude.
- e. **Must not be assigned any other duties or responsibilities on the Project.**

9. Construction Manager/Superintendent

- a. The Construction Manager/Superintendent must be on-site whenever any construction activities are being performed. If construction activities are performed concurrently with multiple structure sites for the project, a Construction Manager/Superintendent must be on-site at each location where these activities are being performed. Approach to meeting this requirement must be included in the Project Management and Approach section of the response to the RFP.
- b. Shall be responsible for managing the Design-Builder's workmanship inspections, implement quality planning, and oversee the Design-Builder's construction quality control.
- c. **Must not be assigned any other duties or responsibilities on the Project.**
- d. Must have at least five (5) years (10 preferred) of recent experience in highway and/or bridge construction and testing.

10. Traffic Control Supervisor

- a. Will be required to attend the Traffic Control Supervisor (TCS) Training (See SP712B) and provide certificate of completion to TDOT prior to starting any work on this project.
- b. Should have at least five (5) years of recent experience in traffic engineer, traffic management on similar projects of similar scope and magnitude, and recent experience supervising construction work zones.

11. Environmental Compliance Manager

- (a) Shall have at least a B.S. degree in Civil Engineering or Natural Resources Manager/Science degree and demonstrated experience in managing others in environmental activities and experience with major highway projects.
- (b) Must have a current Certified Professional in Erosion and Sediment Control (CPESC) certification.
- (c) Shall work closely in the development of the Erosion Prevention and

Sediment Control Plan and SWPPP Plans, oversee its implementation in construction.

- (d) Must have recent experience in environmental compliance and be familiar with permitting requirements in Tennessee related to TDEC NPDES Construction General Permit, ARAP and Section 401, Corps of Engineers Section 404, and TVA Section 26a, watershed, ground water, contaminated materials, etc.
- (e) Shall have recent experience in at least five (5) years (10 preferred) in reviewing highway plans and specifications for compliance with regulatory permits and approvals, and in monitoring construction activities for adherence to regulations, approvals, and environmental performance.

b. PROJECT EXPERTISE

- 1) The Design-Builder shall identify all major subcontractors in the Technical Proposal.
- 2) Describe the overall strengths of the Design Team and their ability to fulfill the design requirements of this Project.

3. RESPONSE CATEGORY III: PROJECT CONTROLS AND MANAGEMENT

Submit as much of the following for Evaluation on the Response Category III. Forms in Appendix A will be evaluated as a matter of responsibility on a pass/fail basis (be as specific as possible). The objective is to identify an understanding of the management, technical, environmental, maintenance of traffic, and scheduling issues and risks, as well as the understanding of how the Design-Build process will contribute to the success of the Project, meeting TDOT's goals, and relationships of the team.

a. PROJECT UNDERSTANDING

- 1) Describe or outline the objectives, goals, and tasks to show or demonstrate the Design-Builder's view and understanding of the nature of the contract. Provide understanding of the Project Scope, especially considering the following items:
 - a. Discuss generally the tasks involved in this Design-Build Project. Identify any special issues or problems that are likely to be encountered. Demonstrate clearly and concisely the Design-Builder's understanding of the technical and institutional elements which the Design-Builder must address.
 - b. Understanding of safety concerns on the existing corridor.
 - c. Understanding of impacts on the adjacent communities and traveling public.
 - d. Understanding of ROW Requirements and Uniform Act.
 - e. Understanding of required interaction with utility companies
 - f. Understanding of environmental requirements, permitting needs and strategy.
 - g. Understanding of safety concerns during construction.

- 2) Discuss the understanding of any major issues that need to be addressed and your solution, including approach to meeting or exceeding Project Goals.
- 3) Identify potential risk factors and methods for dealing with them.
- 4) Identify innovative approaches to minimize any impacts to the right-of-way. Describe any temporary impacts and associated minimization approaches.

b. SCHEDULE MANAGEMENT

- 1) CPM Time Schedule (to be submitted in color) meeting the requirements established in the Contract, and consistent with the Department's Project Sections, and Pay Items identified. See Section A.7 and A.8 of this **Contract Book 1 (ITDB - Instruction to Design-Builders)**.
- 2) Describe or outline the assumptions upon which the CPM Schedule was based, risks, constraints, contingencies, sequence of work, the controlling operation or operations, intermediate completion dates, milestones, project phasing, anticipated work schedule and estimated resources that impacted the schedule.
 - a) The CPM Schedule shall indicate how the Design-Builder intends to:
 - Divide the Project into work segments to enable optimum construction performance and explain the planned sequence of work, the critical path, proposed phasing of the Project, and any other scheduling assumptions made by the Design-Builder;
 - Develop and implement plans and procedures to ensure timely deliveries of materials to achieve the Project schedule;
 - Identify categories of work that the Design-Builder anticipates will be performed by Design-Builder's own direct labor force, those categories that will be performed by Subcontractors, those categories that will be performed by project-specific teams, and those categories that will be performed by existing teaming arrangements; and
 - An explanation of Design-Builder's methodology for updating the CPM Schedule.
 - b) Describe your internal procedures for developing, monitoring, and maintaining project schedules.
 - c) The Design-Builder may adjust the list to reflect planned sequences and methods more accurately, although the level of detail shall be similar to that reflected in the list of required Pay Items in the Schedule of Items.
- 3) Submit a description of Pay Item Breakdowns including the physical features and activities included in the Pay Item, and all work included in the Pay Item Totals as reflected on the Schedule of Items, for example but not limited to:

105-01.20 Design-Build Construction Stakes, Lines & Grades

- Field Survey
- Construction Staking

105-01.55 Design-Build Design Services

(All Design Activities shall be included in this item.)

- Definitive Design and Reviews
- Readiness-for-Construction Plans and Reviews, Specification and quantity estimates

- Working Drawings
- As-Built Plans and Reviews

105-08.20 Design-Build Contract Management

- Project Administration
- Project progress (scheduling)
- Contract progress submittals for payment

109-04.50 Design-Build ROW Services

- Appraisal
- Acquisition
- Public meetings, if required

203-01.95 Design-Build Grading and Roadways

- Road and Drainage excavation
- Borrow excavation (rock)
- Borrow excavation (other than solid rock)
- Undercutting
- Guardrail

203-50 Construction of Haul Road

- Maintenance/Access Road
- Haul Road

204-05.50 Design-Build Geotechnical

- Borings
- Geotechnical Investigations
- Any Sinkholes

209-01.50 Design-Build Environmental Management

- EPSC measures, EPSC installation
- EPSC inspections
- Permit Acquisitions

301-50.50 Design-Build Pavement

- Any aggregate base
- Any Bituminous Plant Mix Base (HM) (A, BM-2, etc.)
- Any Bituminous Concrete Surface (HM) (D, E)
- Treated Permeable Base Or Lean Concrete Base
- Any Portland Cement Concrete Pavement (\leq 10 in. Thickness)
- Any Portland Cement Concrete Pavement ($>$ 10 in. Thickness)
- Tack, Prime coat

604-10.82 Design-Build Bridge Aesthetics

- Bridge
- Pylons

604-10.95 Design-Build Bridges

- Components (steel, deck drains, etc.)
- Bridge
- Bridge Repairs

- Inspections
- Removal of Existing Structure

604-50.50 Design-Build Minor Structures (Other)

- Removal of Existing Buildings and Improvements
- Box Culvert
- Retaining Walls
- Endwalls
- Wingwalls
- Temporary structures

610-10.50 Design-Build Drainage

- Catch Basins
- Storm Drainage System
- Side drain
- Under drain

712-01.75 Design-Build Maintenance of Traffic

- Work Zone Safety Plan
- Barrier Rail
- Changeable Message Sign
- Traffic Control
- Project photography and videography (including equipment and time-lapse video)

714-40.75 Design-Build Utilities

- Coordination
- Relocation
- Lighting

713-15.25 Design-Build Signing

- Footings
- Installation
- Removal and Disposal

716-99.50 Design-Build Striping/Pavement Markings

- Material
- Raised Pavement Markers
- Snowplowable Raised Pavement Markers

717-99.95 Design-Build Mobilization

4) Issues Resolution Plan

c. PROJECT MANAGEMENT

- 1) Provide a description of significant functional relationships among participants and how the proposed organization will function as an integrated Design-Builder, including:
 - Describe how design personnel will interface with the construction personnel.

- Describe communication and coordination between the Department and the Design-Builder. Include the approach for change management during construction for design-initiated, field-initiated, and the Department-initiated changes.
- Describe existing design and/or construction quality management plan(s) that the Design-Builder may have already developed, and how it (they) will be implemented into work performed. Describe coordination of design and construction activities to ensure consistency in quality. Explain how independence of quality staff and function will be maintained.
- Describe approach to budget management, i.e., how the Design-Builder plans to manage costs under this Contract while fulfilling required tasks and assuring quality of work.
- Describe the process for constructability, durability, maintainability, safety, aesthetics and environmental mitigation in the design and construction processes.
- Describe the process for coordinating design and construction functions, including both design and construction components and all Subcontractor activities. Include a brief description (Construction Management Plan) of how the Design-Builder proposes to deal with unexpected disruptions (e.g., weather- or accident-related).
- Describe the process (Design Review Plan) on how the Design-Builder will facilitate and implement Design Reviews as required under the Contract. Describe how the Designer and the design staff will be involved during construction. Also include the Design-Builder's Construction Staging and Phasing Plan, indicating timing and sequencing of major activities for the Project.
- Describe the process of the plan (Diversity Plan) to ensure projected subcontracting plan is applied at all tiers. Describe how the Design-Builder will achieve the DBE goal set forth on this project. Participation shall be accomplished by including certified DBEs in any part of the Contract work that is necessary to complete the Contract obligation. A certified DBE may participate as a Design-Builder, subcontractor, joint venture member, material supplier, material manufacturer, or professional service provider. Identify DBE and EEO representatives and their roles and responsibilities and identification of specific strategies and approaches that will be taken by the Design-Builder to meet the requirements of the Affirmative Action and Equal Employment Opportunity provisions described in **Design-Build Standard Guidance**.
- Describe the Design-Builder's ability to implement a quality management system for this Project. This shall include methods in place for addressing contract modifications and schedule recovery, and an internal quality program even though TDOT will be implementing the Construction, Engineering, and Inspection (CE&I).
- Describe how the Design-Builder will provide qualified construction supervision and meet the requirements for the construction Manager/Superintendent.

- Describe how the Design-Builder will develop and implement a safe and effective maintenance of traffic plan.
- Describe the Design-Builder's stakeholder management approach, including Haywood County.
- Discuss any equipment or other resources the Design-Builder has which will enhance their ability to accomplish this Project.

d. ENVIRONMENTAL COMPLIANCE

- 1) Identify any potential environmental impacts on the Project.
- 2) Describe the process for environmental compliance.
- 3) Describe the approach to Erosion Prevention and Sediment Control for the Project.
- 4) Describe the understanding of the overall approach to permitting and ability to obtain the required permit application/modification within the allowed timeframe.
- 5) Identify innovative approaches to minimize any impacts in environmentally sensitive areas.

e. INNOVATION

- 1) Identify any design or construction solutions that the Design-Builder considers innovative and how those solutions will better serve the Project. Include a description of ideas that were considered whether implemented or not. If this is an alternate technical concept, include only approved ATCs.
- 2) Identify any potential innovative traffic control and how those solutions will better serve the Project. Describe any temporary impacts and associated with innovations.
- 3) Will these innovations add to, subtract from or have no effect on the costs?

4. RESPONSE CATEGORY IV: TECHNICAL SOLUTIONS

Submit as much of the following for Evaluation on form Response Category IV form in **Appendix A** (be as specific as possible):

- a. It is not the intent of the Department for the Design-Builder to submit design plans. The details submitted shall be of sufficient detail to illustrate color, texture, pattern, emblems, proportion, corridor consistency, complementing details, or other such visual effects. For those details used in multiple locations, typical details will suffice with the locations for their use noted in narrative or graphic form.
- b. Conceptual plans, drawings, etc. within the Technical Proposal (these plans are in addition to and are separate from the ROW Acquisition sheets required in **Contract Book 3 (Project Specific Information)**) shall include at a minimum the following:
 - Show plan view of design concepts with key elements noted.
 - Show preliminary drawing of bridge elements.
 - Identify preliminary horizontal and vertical alignments of all roadway elements.
 - Show typical sections for the mainline of the Project.
 - Identify drainage modifications and designs to be implemented.
 - Identify the appropriate design criteria for each feature if not provided.
 - Identify all bridge types to be constructed, including any special design features or construction techniques needed.

- Identify any deviations or proposed design exceptions, from the established design criteria that will be utilized. Explain why the deviation is necessary.
 - Describe any geotechnical investigations to be performed by the Design-Builder.
 - Describe how any utility conflicts will be addressed and any special utility design considerations. Describe how the design and construction methods minimize the Department's utility relocation costs.
 - Describe how the design will affect the right-of-way acquisition costs.
 - Identify types of any retaining walls and /or noise walls if applicable.
- c. The Technical Proposal shall include half-size plan sheets depicting those elements required by the RFP.
 - d. Describe any traffic control requirements that will be used for each construction phase.
 - e. Describe how traffic will be maintained as appropriate and describe understanding of any time restrictions noted in the RFP.
 - f. Describe the safety considerations specific to the Project.
 - g. Discuss overall approach to safety.
 - h. Describe any proposed improvements that will be made prior to or during construction that will enhance the safety of the work force and/or traveling public both during and after the construction of the Project.
 - i. Provide detailed Traffic Analysis and Mitigation Report as described in RFP Form Response Category V: Technical Solution.

E. PROPOSALS

1. MINIMUM CONTRACT REQUIREMENTS

The RFP Contract Documents constitute the minimum Contract requirements established by the Department. Please refer to the **Contract Book 2 (Design-Build Contract)** for the order of precedence established in the Contract. Therefore, those portions of the Proposal that meet or exceed minimum Contract requirements established by the Department, as determined by the Department in its sole discretion, will themselves become minimum Contract requirements upon Contract execution.

The award of the Contract does not in any way imply that the Department will modify, relax, or relieve the Contract Documents in favor of the details of the Technical Proposal submitted by the Design-Builder.

a. TOTAL PROPOSAL SUBMITTAL

The Proposal consists of the Statement of Qualification (SOQ), Technical Proposal, the Price Proposal, and all required Contract Documents. The SOQ and Technical Proposal shall be submitted electronically to the TDOT Alternative Delivery Program Manager via email, clearly identified, labeled, and addressed as follows:

- **Recipient: TDOT Alternative Delivery Program Manager: Mr. Steve Sellers (steve.sellers@tn.gov)**
- **Receiving From: Design-Builder's designated point of contact's email. This email address will be used to communicate further, if needed.**

- **Date of submittal in the email body;**
- **Email subject: “DB2301: SR-222 Reconstruction and Widening – “Design-Build Team” – Technical Proposal”.**

As an alternative to email, the Technical Proposal may be hand-delivered to the TDOT Alternative Delivery Program Manager, as specified in, Section C.2 of **Contract Book 2 (Design-Build Contract)** via a thumb (flash) drive.

The submittal package shall include the following:

- Statement of Qualification
- Technical Proposal Package (including required forms) and all other required Contract Documents.

Text for all documents can be single spaced, Times New Roman, 12-point font shown in English units. Font size on tables and figures may be of any size so long as it is easily readable. Pricing shall be in US currency, in current dollars and cents. In each case in which a form is required to be submitted, it will be found in the **Contract Book 2 (Design-Build Contract)** or in **Contract Book 3 (Project Specific Information)** and its use is mandatory. Technical Proposals shall be organized and formatted as specified herein. Each Technical Proposal Response Category shall be preceded by a simple tab divider identifying the Response Category (e.g., “Response Category I,” “Response Category III Design-Builder’s Organization and Expertise,” etc.) with each appropriate Response Category Form.

SOQ and Technical Proposal shall be composed on 8-½ inch x 11-inch page layout. Drawings or sketches shall be composed on 11-inch x 17-inch and/or 8 ½-inch x 11-inch page layout. Schedule plots shall be on 8-½-inch x 11-inch or 11-inch x 17-inch page layout.

The Technical Proposal should present information clearly and concisely. Text or other information that is difficult to read may be disregarded, potentially resulting in either a lowered score or rejection of the Proposal as non-responsive.

All Technical Proposal responses shall be easily reproducible by normal black and white photocopying machines. Color photographs, renderings and brochures shall be adequately bound and suitably protected for handling and circulation during review.

One (1) electronic copy of the Technical Proposals and the ROW Acquisition sheets required in **Contract Book 3 (Project Specific Information)**, shall be submitted in Adobe.pdf format via email or flash drive to the TDOT Alternative Delivery Program Manager, organized and numbered consistent with the required organization.

Price Proposals shall be submitted using Internet bidding with electronic bid bond. The Design-Builder shall not submit a hardcopy Price Proposal to the Department. The Internet bid and electronic bid bond executed by the Design-Builder and their Surety will be considered as a complete Price Proposal and will be posted on the website at the time of the public opening. Letters recognizing the addenda to the RFP and amendments to the electronic bidding file will be posted on the Bid Express website. Design-Builder must acknowledge addenda by completing the Technical Proposal Signature Page (Form TPSP) found in RFP **Contract Book 2 (Design-Build Contract)** and placed within your Technical Proposal. Also, by submitting

the EBS (Bidx) bid file within your Price Proposal you are also acknowledging all addenda associated with the Price Proposal. It is the bidder's responsibility to notify all affected manufacturers, suppliers and subcontractors of any change. Failure to acknowledge receipt of Addenda or to apply any applicable amendments to the electronic bidding file is grounds for rejection. The electronic bid "A" shall be the Total Bid Amount using any approved ATC's.

There will be items of work that will have numerous alternates. The Design-Builder will be required to bid on only one alternate for each construction item. The proper procedure for entering alternate bids is to enter prices for the intended alternate item(s) of construction and leave the undesired alternate item(s) of construction blank.

1) SOQ and TECHNICAL PROPOSAL

Place the required Technical Proposal forms, except the Response Category Forms, in Technical Proposal Response Category II after a tab labeled "Forms."

Technical Proposal Response Category I – The Statement of Qualification part of the Technical Proposal shall be limited to 20 pages.

Technical Proposal Response Categories II through IV – Proposal responses to Response Categories II through IV shall be limited to the combined maximum total of 100 pages, not including section dividers and tabs, certain contract forms (Response Category Forms will be counted toward the total page count). The forms provided for response shall be used for the information requested. All information submitted in Response Categories II through IV will be counted in calculating page count, regardless of format or medium, including all materials attached to section dividers and tabs.

2) PROPOSAL PRICE

Design-Builders are cautioned that the total of price proposed in the Price Proposal "Schedule of Items" (the "A") shall become the Contract Amount upon Contract execution and shall constitute total compensation to the selected for performing the Contract, including but not limited to all minimum Contract requirements. Therefore, the fact that a selected Design-Builder's Technical Proposal may contain elements that do not meet or exceed all minimum Contract requirements, as determined by the Department in its sole discretion, shall not entitle the selected Design-Builder to receive compensation in excess of the amount of the Proposal Price as a condition of performing the minimum Contract requirements or any other Contract obligation. Nor shall such fact entitle the selected Design-Builder to perform below minimum Contract requirements or fail to perform any other Contract obligation.

2. PROPOSAL OPENING

a. TECHNICAL PROPOSALS

The Department's Alternative Delivery Director and the Design-Build Review Committee will open the Technical Proposal Package from each Design-Builder. They will determine responsiveness and the Pass/Fail rating for RC I through RC IV. Responsive and Passing Technical Proposals that meet all minimum criteria will be opened at the Proposal Due Date and time set out in this **Contract Book 1 (ITBD - Instruction to Design-Builders)** Section A.5, page 8. All technical proposals deemed non-responsive or failing to meet the minimum criteria will be notified prior to the public opening of the price proposals.

b. PRICE PROPOSALS; PUBLIC OPENING

Upon concluding its evaluation and pass/fail determination of the Technical Proposals, the Department will make all responsive fee proposals open to public through the Bid Express website on the date and time set out in above in Section A.5, page 8.

Total bid amounts at the time of the opening of the Price Proposals are not guaranteed to be correct and no final award of the Contract will be made until the Price Proposals have been evaluated in accordance with Section F. below.

On all projects which are financed in whole or in part by funds received through Federal agencies and other third parties, the awarding of Contracts by the Department will be subject to approval or concurrence by the party or parties through which funds are received. The Department reserves the right to reject any Proposal that is not acceptable to any such third party set out above, although such bid proposal would otherwise qualify as the best Proposal in accordance with the Contract. It shall be the responsibility of the Department to determine which projects are so financed in part by third parties, such information being available upon request from the Department.

3. PROPOSAL STIPEND

A stipend of **\$15,000** will be awarded to each eligible Design-Builder that provides a responsive, but unsuccessful, Proposal. If a contract award is not made, all Design-Builders that submit a responsive Proposal shall receive the stipend. If the Department chooses to continue the process by revising, modifying, or issuing a new RFP, or issuing a Best and Final Offer, the stipend will only be paid to each eligible Design-Builder responding to the additional request and/or requirement. The Department's Alternative Delivery Program Manager will notify the Design-Builder of the opportunity to request to invoice for the stipend from each eligible Design-Builder within thirty (30) days after the award of the Contract or the decision not to award. If the Design-Builder requests and accepts the stipend, the Department reserves the right to use any ideas or information contained in the Design-Builder's Proposal in connection with any contract awarded for the Project, or in connection with any subsequent procurement, with no obligation to pay additional compensation to the unsuccessful Proposers. Alternatively, unsuccessful

Design-Builders shall submit a written declination of the stipend and retain any rights to its Proposal and the unique ideas and information contained therein.

The decision to issue a new RFP, a modified/revised RFP, or a “Best and Final Offer” indicates the Department’s decision to continue with the potential; award of the Contract; therefore, the stipend will only be offered after the conclusion of the entire procurement process.

F. PRICE PROPOSAL EVALUATION

1. PRICE PROPOSAL EVALUATION METHODOLOGY

a. PRICE REALISM AND REASONABLENESS

The Department will make a preliminary evaluation of the Price Proposal to determine if the prices set forth reflect price realism and price reasonableness in comparison with the Department’s cost estimate. In making this evaluation, the Department may require review of price documents. In such case, the Design-Builder shall make itself available upon the Department’s request to conduct a joint review of the Price Documents. If the Department concludes that the Price Proposal does not reflect Price Realism or Price Reasonableness, the Department will consider the Price Proposal non-responsive.

b. UNBALANCED PRICING

The Department will prepare a cost estimate prior to accepting Price Proposals. This will be used as a basis for a preliminary evaluation of the Price Proposals to determine if any of the prices are significantly unbalanced to the potential detriment of the Department. An unbalanced Proposal is considered to be one containing lump sum which does not reflect reasonable actual costs plus a reasonable proportionate share of the Design-Builder’s anticipated profit, overhead costs, and other indirect costs for the performance of the items in question in comparison with the Department’s cost estimate.

G. TECHNICAL PROPOSAL RESPONSE CATEGORIES AND REQUIRED TECHNICAL PROPOSAL CONTENT

Additional information or requirements for each Response Category, or modifications to the Response Category instructions and requirements set out below, will be identified in the **Contract Book 3 (Project Specific Information)**. **Design-Builders are therefore advised to download this Contract Book 1 (ITDB - Instruction to Design-Builders) and the Contract Book 3 (Project Specific Information) and read them together.**

Regardless of the pass/fail determination assigned to any Technical Proposal evaluation factor or Response Category, and notwithstanding the fact that a Proposal is selected for award, only those portions of Sections II through IV of the Technical Proposal that meet or exceed the Department’s minimum Contract requirements, as determined by the Department in its sole discretion, shall be incorporated into the resulting Contract. Those portions that do not meet or exceed the stipulated criteria, as determined by the Department in its sole

discretion, shall not be incorporated into the resulting Contract or modify any of the terms and conditions of the Contract.

1. RESPONSE CATEGORY I through IV

The submittals required under Response Category I through IV will be evaluated as a matter of responsiveness on a pass/fail basis. Submit responses for each element of Category I through IV using the required forms as instructed acknowledging receipt of RFP, all Addenda and responses to questions, if any, issued by the Department.

a. COVER LETTER

The Design-Builder shall provide with its Technical Proposal a cover letter (maximum two pages) indicating its desire to be considered for the Project and stating the official names and roles of all Principal Participants, the Designer, and Program Manager. The Design-Builder shall identify a single point of contact and the address and telephone and fax numbers and e-mail address to which communications should be directed. An authorized representative of the Design-Builder's organization shall sign the letter. If the Design-Builder is a joint venture or general partnership, authorized representatives of all Principal Participants shall sign the letter.

The Design-Builder shall attach to the cover letter the Acknowledgment of Receipt acknowledging receipt of RFP, all Addenda and responses to questions, if any, issued by the Department.

b. FORMS

Form Question Request (QR), Form Alternate Technical Concepts (ATC), Forms A-B, and Response Category Forms are in **Appendix A**. All other contract forms are located within **Contract Book 2 (Design-Build Contract) Appendix C**.

c. EVIDENCE OF CORPORATE EXISTENCE; CERTIFICATE OF AUTHORITY

Submit the following, as applicable:

- A Certificate of Good Standing issued by the Design-Builder's state of residence; or
- For entities not residents of the State of Tennessee, a Certificate of Authority to transact business in Tennessee.

d. EVIDENCE OF AUTHORITY TO ENTER INTO JOINT VENTURE; EXECUTE JOINT-VENTURE AGREEMENT

If the Design-Builder is a joint venture; submit a copy of the joint venture agreement. Also, for each joint venturer submit the partnership agreement or corporate resolution authorizing it to enter the joint venture and authorizing named individuals to execute the joint venture agreement on the joint venturer's behalf.

e. EVIDENCE OF PROPOSAL SIGNATORY AUTHORITY

Submit bylaws, or the corporate resolution, partnership agreement, or joint venture agreement evidencing authority of each signatory to the Technical Proposal Signature

Page and Proposal Firm Offer to execute it on behalf of the Design-Builder. NOTE: If the Design-Builder is a joint venture or partnership, each joint venture or partner must sign the Technical Proposal Signature Page (Form TPSP).

H. PRICE PROPOSAL RESPONSE CATEGORIES AND REQUIRED PRICE PROPOSAL CONTENT

Submit responses for each element below, using the required forms where instructed. All prices quoted shall be in U.S. currency.

1. PRICE PROPOSAL CONTENTS

Design-Builders shall include each of the following in the Price Proposal:

- Electronic Price Proposal (including specified Contract Completion Time); and
- Electronic Proposal Security in the amount of five (5%) percent of the Proposal Price. Proposal Security may be submitted in the form of a Proposal Bond or Proposal Guarantee issued by an insured institution or certified check payable to the Department of Transportation.

2. INSTRUCTIONS REGARDING PREPARATION OF SCHEDULE OF ITEMS

Design-Builders shall complete and submit in compliance with the following instructions:

- a. Provide a lump-sum price for each Pay Item Total in each Pay Item. The lump-sum price shall represent the total price to complete and integrate all work represented by that Pay Item into the Project, inclusive of associated overhead, labor, materials, equipment, tools, transportation, and Project administration. These are not bid items and will be used as a basis in developing the cost-loaded CPM after award.
- b. Utilize the same titles, contents, and limits as are shown on Schedule of Items.
- c. Price Proposal supporting documentation may be requested by the Department.

I. FORMS

The following forms are required to be used in preparation of the Proposal. They are located within **Contract Book 2 (Design-Build Contract)** and **Appendix A**. The Design-Builders shall download the forms and complete them in accordance with the instructions contained in the forms and the text of this **Contract Book 1 (ITDB - Instruction to Design-Builders)** or the **Contract Book 2 (Design-Build Contract)** in which the forms are referenced.

1. DESIGN-BUILDER QUESTIONS

- FORM QR, Question Request Form.
- Form A: Design-Builder Information
- Form B: Design-Builder Experience
- Form C: Acknowledgement of Clarification and Addenda

2. TECHNICAL PROPOSAL FORMS

- Response Category Forms II through IV

- ATC Form
- Form AT, Attestation Re Personnel Used in Contract
- Form COI, Conflict of Interest Disclosures
- Form TPSP, Technical Proposal Signature Page Form

3. BONDS AND FORMS TO BE SUBMITTED BY THE APPARENT DESIGN-BUILDER

- Form CP&PB, Contract Payment and Performance Bond (submitted after award of the Contract)
- Form LC, Lobbying Certificate

J. PROPOSAL MEETINGS

The Department may elect to hold meetings with all Design-Builders. The Design-Builders are strongly encouraged to attend and will be expected to bring (a) appropriate members of its anticipated Key Personnel, and if required by the Department, (b) senior representatives of the proposed Designer and proposed Technical Manager. The Department shall provide sufficient time to the Design-Builders for travel and preparation for the meetings.

The information received by the Department will be part of the procurement process and will not be disclosed by the Department until award of the Contract, at which time the information will be subject to disclosure except as to information that is subject to exemption from disclosure under the Tennessee Open Records Law.

1. MANDATORY PRE-PROPOSAL MEETINGS

The Department will hold one or more mandatory pre-proposal meetings with all Design-Builder's prior to the Proposal Due Date, to provide additional opportunity for questions and comments. Failure of a Design-Builder to attend any such meetings will result in elimination from the procurement process for this project, and any Proposal submitted by that Design-Builder will be rejected. The decision to hold pre-proposal meetings will be disclosed by the Department no later than the date shown in Section A.5 for the anticipated deadline for issuance of the last addendum

The Department will respond, orally or in writing, to Design-Builders' questions, if any, raised at the meetings. In the event the Department determines that formal answers or change of the RFP, specifications or Contract terms is warranted, the Department will issue formal written clarifications or Addenda in accordance with the terms of **Contract Book 2 (Design-Build Contract)**.

2. ORAL PRESENTATIONS AFTER SUBMISSION OF PROPOSALS

The Department may elect, in its sole discretion, to require each Design-Builder to make a one-on-one oral presentation regarding the Technical Proposal. The oral presentations will be mandatory, and failure of a Design-Builder to appear and make the presentation will result in elimination of that Design-Builder from consideration. The Department will give no further consideration to that Design-Builder's Proposal, and that Design-Builder will be ineligible for a stipend. If the Department elects to require oral

presentations, the Department will notify the Design-Builders in writing, by e-mail or letter, of the dates, times and locations, requirements and protocols for the oral presentation.

The oral presentation will be an opportunity for the Design-Builders to present and explain their Technical Proposals and respond to the Department's requests for clarification, but such presentations will not be a substitute for, nor be a means to modify or augment, any part of the Technical Proposal. The oral presentations will be used by the Department to assist in the evaluation of the Technical Proposals, and the information from the oral presentations may be used by the Department to evaluate the Technical Proposal pass/fail determination.

K. CHANGES IN DESIGN-BUILDER'S ORGANIZATION AFTER SUBMITTAL OF THE PROPOSAL

Key Personnel identified in the SOQ part of the Technical Proposal shall not be modified without written approval of the Department. Any request for modification shall be sent to the Department Alternative Delivery Program Manager. Failure to comply with this requirement may justify for removing the Design-Builder from further consideration for this Project.

The Design-Builder must submit any request of information about the proposed Principal Participant or team member as part of Changes in Key Personnel Authorization, including legal and financial information and Technical Evaluation (pass/fail) information. If a Major Participant is being added, deleted, or substituted, the Proposer must submit such additional information as may be required by the Department to demonstrate that the changed organization still meets or exceeds the RFP criteria.

L. MODIFYING A PROPOSAL PRIOR TO OPENING OF PRICE PROPOSALS

Modifying the proposal will not be allowed.

M. WITHDRAWING A PROPOSAL

1. BY WRITTEN NOTICE

A Design-Builder may withdraw its Proposal prior to the Proposal Due Date by submitting written notice to the Department's Alternative Delivery Program Manager on the Design-Builder's letterhead signed by an authorized representative. The notice must include the name and telephone number of the Design-Builder's representative, who may be contacted for any further correspondence.

2. IN PERSON

A Design-Builder may withdraw its Proposal in person prior to the Proposal Due Date upon presentation of identification and evidence of authorization to act for the Design-Builder.

3. SUBSEQUENT PROPOSAL SUBMITTAL NOT PRECLUDED

Withdrawal of a Proposal will not preclude a Design-Builder from subsequently submitting a new Proposal, so long as that new Proposal is properly submitted and received by the Department's Alternative Delivery Program Manager prior to the Proposal Due Date.

If the Design-Builder withdraws their Proposal and the Department chooses to issue a new, revised, or modified RFP after the Proposal Due Date (as stated in Section T), the Design-Builder must state within their withdrawal written notice their request to be considered eligible to submit a Proposal in this instance. If the written notice does not state this request, the Design-Builder will no longer be considered eligible for the Project.

N. PROPOSALS RESPONSIVENESS, RESPONSIBILITY AND REJECTION

1. SUBSTANTIAL COMPLIANCE REQUIRED

The Department may in its discretion reject any Proposal that does not substantially comply with the requirements set forth in the RFP, including this **Contract Book 1 (ITDB – Instruction to Design-Builders)**, and applicable public procurement procedures.

2. RESPONSIVENESS

The Department has determined that failure to properly submit the following items (all contract forms are located in **Contract Book 2 (Design-Build Contract)**) and in **Contract Book 3 (Project Specific Information)** will render the Proposal non-responsive:

- Statement of Qualification;
- Technical Proposal;
- Technical Proposal Response Category Forms;
- Technical Proposal approved ATC Form, if utilizing ATC (in Appendix);
- Electronic Bid Price Proposal Schedule of Items;
- Electronic Proposal Bond or Electronic Proposal Guarantee; and
- USB drive with the Technical Proposal and the ROW Acquisition sheets.

3. COMPLETENESS

The following items must be properly submitted for a complete Proposal:

- Technical Proposal Forms (In RC Category I)
 - Forms A, B, C
 - Form QR (This is the most current FORM QR with all Department answers);
 - Form ATC;
 - Form COI;
 - Form TPSP;
 - Form LC (Submit blank if not applicable);

4. UNINTENTIONALLY INCOMPLETE OR OMITTED PROPOSAL RESPONSES

Unless the Department, in its discretion, determines that a submitted Proposal is not in substantial compliance with RFP requirements, unintentionally incomplete, qualified, or omitted responses to the Technical Proposal, unlike the omission of any required submittals above, will be dealt with as a matter of Proposal pass/fail determination as opposed to responsiveness.

5. THE DEPARTMENT'S RIGHT TO SEEK CLARIFICATION; WAIVER

As permitted by law, the Department's Point(s) of Contact may seek clarification of or discuss any response with the Design-Builder, in the Department's sole discretion, and the Department may waive minor informalities and irregularities if it deems it to be in the best interest of the Department and/or the public.

As permitted by law, the Department's Alternative Delivery Program Manager may hold meetings and conduct discussions and correspondence with one or more of the Design-Builders responding to this RFP to seek an improved understanding and evaluation of the responses to this RFP.

6. RESPONSIBILITY AND REJECTION OF PROPOSALS

The Department reserves the right to reject any proposal that it determines not to be in substantial compliance with the requirements of the RFP.

REJECTION IN THE PUBLIC INTEREST

The Department may reject all Proposals for good cause upon a finding that to do so is in the public interest.

O. CONFIDENTIALITY

Documents submitted pursuant to this RFP will be subject to the Tennessee Open Records Act, T.C.A. § 10-7-501, et. seq. Information submitted will be kept confidential until award by the Department, unless otherwise required by law. The State shall not be liable for disclosure or release of information when authorized or required by law to do so. The State shall also be immune from liability for disclosure or release of information.

P. PROPOSAL BOND

1. REQUIREMENTS

- Each Proposal must be accompanied by a Design-Builders bidder's bond, in an amount of equaling not less than five (5%) percent of the Proposal Price submitted electronically through Bid Express.
- If the Design-Builders bidder's bond is offered as guaranty, the bond must be made by a surety company, acceptable to the Department, that is qualified and authorized to transact business in the State of Tennessee and listed on the United States Department of Treasury Financial Management Service list of approved bonding companies.

Q. APPARENT DESIGN-BUILDER REQUIRED SUBMITTALS

Within ten (10) Calendar Days of the date of the delivery of the Contract by the Department, the apparent Design-Builder shall provide the Department, in writing the following:

1. PAYMENT AND PERFORMANCE BOND

A Contract Payment and Performance Bond, in the amount of 100 percent of the Contract Amount on the form furnished by the Department (Form CP&PB).

2. INSURANCE CERTIFICATES

Insurance certificates evidencing the required insurance coverage. (Refer to the **Design-Build Standard Guidance**).

3. EVIDENCE OF AUTHORITY

- The names of all signatories to the anticipated Contract, their capacities and the names of their respective principals if not already provided.
- Corporate Resolutions or Bylaws evidencing the authority of each named signatory to act for its principal in executing the Contract and binding the principal to the terms of the Contract, if not already provided.

4. LICENSES

Evidence that the apparent Design-Builder and its personnel are properly licensed to perform the work, unless previously provided. See *TDOT Standard Specification* Section 102.11.

5. ATC BREAKDOWN COST SAVINGS

Price Proposal ATC Breakdown, only if an approved ATC was submitted (format will be a one-page summary of the Contract Amount including the original cost for Base Technical Concept cost minus ATC cost savings).

R. MODIFICATION OF CONTRACT

The Department may make modifications to the Contract as it may determine, in its sole discretion, to be necessary to fully incorporate the terms of the apparent best evaluated Design-Builder's Proposal, to correct any inconsistencies, ambiguities, or errors that may exist in the Contract, and to clarify Contract terms, including technical requirements and specifications, if any. If, in the Department's sole discretion, it determines that the parties will be unable to reach a mutually acceptable Contract, the Department may terminate discussions with the apparent best evaluated Design-Builder. The Department will then continue the process of discussion with the next best evaluated Design-Builder until the Department either successfully executes a Contract or cancels the procurement.

The Department may investigate the qualifications of any Design-Builder under consideration, may require confirmation of information furnished by a Design-Builder, and may require additional evidence of qualifications to perform the Work described in this RFP.

S. MODIFIED OR NEW RFP ISSUANCE

The Department reserves the right, in its sole discretion, to:

- Reject any or all Proposals;
- Issue a new RFP;
- Cancel, modify, or withdraw the RFP in its entirety;
- Solicit subsequent “Best and Final Offer” (BAFO) from Design-Builders (See Chapter 1680-5-4 *Procedures for the Selection and Award of Design-Build Contracts*); or
- Modify the RFP process (with appropriate notice to Design-Builders).

A BAFO is a change to a design-builder’s technical and/or price proposal made at the request of, or as allowed by, the Department within a best and final offer RFP after the solicitation closing date when all price proposals exceed an acceptable range of the Department’s estimate. In the event initial price proposals exceed an acceptable range of the Department’s estimate, the Department may choose to make amendments to the details of the RFP and request a Best and Final Offer within a new RFP called a “Best and Final Offer” RFP.

Alternately, the Department reserves the right to redistribute a new or modified RFP for the project, outside the issuance of a BAFO RFP, to the eligible firms if in the judgment of the Department that the best interest of the Department or the public will be promoted.

This may occur at any time prior to the execution by the Department of the Design-Build Contract, without incurring any obligations or liabilities.

T. CONTRACT EXECUTION; DELIVERY OF REQUIRED DOCUMENTS

1. BY APPARENT DESIGN-BUILDER

The Apparent Design-BUILDER must execute three (3) originals of the Contract and return the executed originals, together with (a) the rest of the Contract (Technical (*Exhibit A*) and Price Proposals) and (b) the Apparent Design-BUILDER required submittals set out above in this **Contract Book 1 (ITDB - Instruction to Design-Builders)**, to the Department within ten (10) Calendar Days of the date of the delivery of the Contract by the Department, or within such longer period as the Department may set in writing prior to or during the response period established herein. The apparent best evaluated Design-BUILDER’s failure to execute and deliver a duly executed Contract and required submittals to the Department within the response period, will result in (a) forfeiture of the Proposal Guaranty as liquidated damages payable to the Department, and (b) the Department’s commencement of discussions with the second best evaluated Design-BUILDER. If the apparent best evaluated Design-BUILDER is a joint venture or general partnership, each joint venture member or partner must sign the Contract on behalf of both itself and the Design-BUILDER.

2. BY THE DEPARTMENT

If the Department fails to execute the Contract and deliver to the apparent best evaluated Design-BUILDER an original of the Contract within forty-five (45) Calendar Days

following receipt of the apparent best evaluated Design-Builder's duly-executed Contract and other required submittals, the Design-Builder shall have the right to withdraw the Proposal without penalty. Nothing in this **Contract Book 1 (ITDB - Instruction to Design-Builders)** shall be construed to obligate the Department to enter into a Contract with any Design-Builder.

U. Bid Rigging

The following information applies to Federal-Aid construction projects:

To report bid rigging activities call: 1-800-424-9071

The U.S. Department of Transportation (DOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m. eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially, and caller anonymity will be respected.

APPENDIX A

CONTRACT BOOK 1 (ITDB - INSTRUCTIONS TO DESIGN-BUILDERS) FORMS

FORM NAME	FORM DESIGNATION
ALTERNATE TECHNICAL CONCEPTS (ATC) SUBMITTAL	FORM ATC
RFP QUESTION REQUEST	FORM QR
RESPONSE CATEGORY I	FORMS A, B
RESPONSE CATEGORY II	FORM RC II
RESPONSE CATEGORY III	FORM RC III
RESPONSE CATEGORY IV	FORM RC IV
RECEIPT OF ADDENDA/CLARIFICATIONS	FORM C
CONFLICT OF INTEREST	FORM COI
TECHNICAL PROPOSAL SIGNATURE PAGE	FORM TPSP
LOBBYING CERTIFICATE	FORM LC

ALTERNATE TECHNICAL CONCEPTS (ATC) SUBMITTAL

For TDOT use only		
The ATC:		
<input type="checkbox"/>	Is Approved	<input type="checkbox"/> Does not qualify as an ATC, but may be included in the Proposal without an ATC. <input type="checkbox"/> Is Conditionally approved with identified conditions attached.
<input type="checkbox"/>	Is Not approved	<input type="checkbox"/> Does not qualify as an ATC and may not be included in the Proposal. <input type="checkbox"/> Is Deemed to take advantage of an error or omission in the RFP and will not be considered. The RFP will be revised to correct this.

1. Design-Builder Name:

Name of Project: SR-222 Reconstruction and Widening, Haywood County (DB2301)

2. Description. A detailed description (attach schematic drawings) of the configuration of the ATC or other appropriate descriptive information (including, if appropriate, product details [i.e., specifications, construction tolerances, special provisions] and a traffic operational analysis, if appropriate).

3. Usage. Where and how the ATC would be used on the Project.

4. Deviations. References to all requirements of the RFP those are inconsistent with the proposed ATC, an explanation of the nature of the deviations from said requirements, and a request for approval of such variance(s).

5. Analysis. An analysis justifying use of the ATC and why the variance to the requirements of the RFP should be allowed.

6. Impacts. Discussion of potential impacts on vehicular traffic, environmental impacts identified, community impact, safety and life-cycle Project impacts, and infrastructure costs (including impacts on the cost of repair and maintenance)

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7. History. A detailed description of other projects where the ATC has been used, the success of such usage, and names and telephone numbers of project owners that can confirm such statements.

8. Risks. A description of added risks to TDOT and other entities associated with implementing the ATC.

9. Costs. A description of the ATC implementation costs to TDOT, the Design Builder, and other entities (right-of-way, utilities, mitigation, long term maintenance, etc.).

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Design-Build Project*



RFP QUESTION REQUEST FORM QR

PROJECT: SR-222 Reconstruction and Widening, Haywood County (DB2301)

DB CONTRACT No.: DB2301 DATE:

RFP Book No. and Section ID	Question	Reserved for Agency Response

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**RFP QUESTION REQUEST
FORM QR**



Form A

Design-Build Information

Design-Build Project: **SR-222 Reconstruction and Widening, Haywood County**

Design-Builder/Name of Company: _____

Year Established: _____ Federal Tax ID No.: _____

Name of Official Representative: _____

Contact Person: _____

Address: _____

Telephone No.: _____ Fax No.: _____

E-mail address: _____

Business Organization (check one):

Corporation (If yes, indicate the State and Year of Incorporation):

General Partnership

Joint Venture

Other (describe): _____

A. Business Address: _____

Office Performing Work: _____

Contact Telephone Number: _____

B. If the entity is a Joint Venture or General Partnership, indicate the name and role of each member company in the space below. Complete a separate Design-Build Information form for each member company and attach it to the SOQ. Also indicate the name and role of each other financially liable party and attach a separate form.

Name of Member Company	Role

UNDER PENALTY OF PERJURY, I CERTIFY THAT I AM THE COMPANY'S OFFICIAL REPRESENTATIVE AND THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, FOLLOWING REASONABLE INQUIRY, THE FOREGOING IS TRUE AND CORRECT.

BY: _____ PRINT NAME: _____

TITLE: _____ DATE: _____

A-1

Form B

Summary of Comparable Contracts in Past Ten (10) Years

1. Design-Builder/Company Name:	2. Name of Project: (DB2301)
3. Owner Contract No. or State Project No.:	4. Type (Check One): <input type="checkbox"/> Construction <input checked="" type="checkbox"/> Design-Build <input type="checkbox"/> Design
5. Name of Prime:	6. Company Role: (joint venture partner, subcontractor, etc.)
7. Owner (Name): _____ Address: _____ _____ Phone: _____ Contact Person: _____	8. Original Project Budget: \$ _____ Final Project Cost:\$ _____ Work Carried by Own Forces (%): _____
9. Original Project Schedule Milestones: _____ Project Completion Schedule Milestones: _____	
10. Project Description and Nature of Work Performed by Your Company:	

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SR-222 Reconstruction and Widening

Haywood County
Design-Build Project



RESPONSE CATEGORY II: ORGANIZATION

1. Design-Builder Name:
2. Name of Project: SR-222 Reconstruction and Widening, Haywood County (DB2301)
3. Describe responsibilities and reporting relationships or chain of command clearly identifying assignments of various tasks for Design and Construction Functions, Key Personnel and Design Professionals. Organizational Chart included.
4. Description of those categories of work which the Design Builder anticipates will be performed by the Design Builder's own forces and those categories which will be performed by Subcontractors.
5. Plans and procedures for management of Subcontractors

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RESPONSE CATEGORY II: PROJECT EXPERTISE

1. Design-Builder Name:
2. Name of Project: SR-222 Reconstruction and Widening, Haywood County (DB2301)
3. The Design-Builder is encouraged to identify all major subcontractors in the Technical Proposal as omission of this information may affect the evaluation under this evaluation criterion.
4. Describe the overall strengths of the Design Team and their ability to fulfill the design requirement of this Project.

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SR-222 Reconstruction and Widening

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RESPONSE CATEGORY III: PROJECT UNDERSTANDING

1. Design-Builder Name:
2. Name of Project: SR-222 Reconstruction and Widening, Haywood County (DB2301)
3. Describe or outline the objectives, goals, and tasks to show or demonstrate the Design Builder's view and understanding of the nature of the contract. Consider if the Scope of Services in this RFP is sufficient to attain the Department's goals and objectives.
4. Identify any potential right-of-way and Utility impacts or state no potential impacts. If impacts, identify innovative approaches to minimize any impacts to the right-of-way and/or to the Utility.

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*Haywood County
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RESPONSE CATEGORY III: SCHEDULE MANAGEMENT

1. Design-Builder Name:
2. Name of Project: SR-222 Reconstruction and Widening, Haywood County (DB2301)
3. Describe or outline the assumptions upon which the CPM Schedule was based, risks, constraints, contingencies, sequence of work, the controlling operation or operations, intermediate completion dates, Milestones, project phasing, anticipated work schedule and estimated resources that impacted the schedule.

CPM Schedule included in the Proposal.

The CPM Schedule shall indicate how the Design Builder intends to:

- Divide the Project into work segments to enable optimum construction performance and explain the planned sequence of work, the critical path, proposed phasing of the Project, and any other scheduling assumptions made by the Design Builder.
- Plans and procedures to insure timely deliveries of materials to achieve the Project schedule.
- Categories of work that Design Builder anticipates will be performed by Design Builder's own direct labor force, those categories that will be performed by Subcontractors, those categories that will be performed by project specific teams, and those categories that will be performed by existing teaming arrangements.

Provide an explanation of Design Builder's methodology for updating the CPM.

4. Describe Pay Item Breakdowns, including the physical features and activities included in the Pay Item, and all work included in the Pay Item Totals as reflected on the Schedule of Items.
5. Describe the Design Builder Issue Resolution Plan

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RESPONSE CATEGORY III: PROJECT MANAGEMENT

1. Design-Builder Name:
2. Name of Project: SR-222 Reconstruction and Widening, Haywood County (DB2301)
3. Describe how the Design Builder would bring experience, expertise, innovation, and “not business as usual” skills in leadership and technical ability.
4. Describe the administrative and operational structure that would be used to perform the proposed work, including:
 - Management plan to attain the necessary staff required.
 - Describe how design personnel will interface with the construction personnel.
 - Communicating and coordinating between TDOT and the Design Builder. Include the approach for change management during construction for design initiated, field initiated, and TDOT-initiated changes.
 - Describe existing design and/or construction quality management plan(s) that the Design Builder may have already developed, and how it (they) will be implemented into work performed. Describe coordination of design and construction activities to ensure consistency in quality. Explanation of how independence of quality staff and function will be maintained. Indicate the minimum number of inspectors that will be supplied at different stages during the Project duration.
 - Approach to managing costs under this Contract while fulfilling required tasks and assuring quality of work.
 - Describe or outline the process for constructability, durability, maintainability, safety, aesthetics and environmental mitigation in the design and construction processes

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RESPONSE CATEGORY III: PROJECT MANAGEMENT

- Describe or outline the process for coordinating design and construction functions, including both design and construction components and all Subcontractor activities. Include a brief description (Construction Management Plan) of the Design Builder proposes to deal with unexpected disruptions (e.g., weather- or accident-related).

- Describe or outline the process (Design Review Plan) on how the Design Builder will facilitate and implement Design Reviews as required under the Contract. Describe how the Designer and the design staff will be involved during construction. Also include the Design Builder's Construction Staging and Phasing Plan, indicating timing and sequencing of major activities for the Project.

- Describe or outline the process (Diversity Plan) of the plan to ensure projected subcontracting plan is applied at all tiers. Describe how the Design Builder will achieve the goal set forth on this project. Identify DBE and EEO representatives and their roles and responsibilities and identification of specific strategies and approaches that will be taken by the Design Builder to meet the requirements of the Affirmative Action and Equal Employment Opportunity provisions described in **DB Standard Guidance**.

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SR-222 Reconstruction and Widening

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RESPONSE CATEGORY III: ENVIRONMENTAL COMPLIANCE

1. Design-Builder Name:
2. Name of Project: SR-222 Reconstruction and Widening, Haywood County (DB2301)
3. Identify any potential environmental impacts.
4. Describe or outline the process for environmental compliance.
5. Describe or outline the approach to Erosion Prevention and Sediment Control for the Project.
6. Describe or outline the understanding of the overall approach to permitting and the comfort level with obtaining the required permit application/ modification within the allowed timeframe.
—
7. Identify innovative approaches to minimize any impacts in environmentally sensitive areas.
8. A description of instances on projects within the last three years where there has been success in meeting and/or exceeding environmental performance standards and permit conditions. If none, state none.
9. A description of instances on projects within the last three years where the Design-Builder, including Major Participants and Subcontractors have not met environmental performance standards and permit conditions. For each of these instances, describe the non-compliance act, the reason(s) the non-compliance act occurred, plans implemented to correct the non-compliance act and lessons learned from these instances, and internal procedures developed to ensure similar issues do not occur on future projects. If none, state none.

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RESPONSE CATEGORY III: INNOVATION

1. Design-Builder Name:
2. Name of Project: SR-222 Reconstruction and Widening, Haywood County (DB2301)
3. Identify any innovative design or construction solutions that the Design Builder considers innovative and how those solutions will better serve the Project. Include a description of ideas that were considered, whether implemented or not.
4. Identify any potential innovation in traffic control and how those solutions will better serve the Project. Describe any temporary impacts and associated with innovations.
5. Will these innovations add to, subtract from or have no effect on the costs?

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RESPONSE CATEGORY IV: TECHNICAL SOLUTION

1. Design-Builder Name:
2. Name of Project: SR-222 Reconstruction and Widening, Haywood County (DB2301)
3. Conceptual Plans, Drawings:
 - Plan View of design concepts with key elements noted included.
 - Preliminary horizontal and vertical alignments of all roadway elements included.
 - Typical Sections included.
4. Identify drainage modifications and designs to be implemented.
5. Identify the appropriate design criteria for each feature if not provided.
6. Identify all bridge types to be constructed, including any special design features or construction techniques needed.
7. Identify any deviations or proposed design exceptions, from the established design criteria that will be utilized. Explain why the deviation is necessary. Describe any geotechnical investigations to be performed by the Design-Builder.
8. Describe how any utility conflicts will be addressed and any special utility design considerations. Describe how the design and construction methods minimize TDOT's utility relocation costs. If none, state none.
9. Describe how the design will affect TDOT right-of-way costs. If none, state none.
10. Identify types of any retaining walls and /or noise walls if applicable. If none, state none.

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RESPONSE CATEGORY IV: TECHNICAL SOLUTION

11. Identify any aspects of the design or construction elements that are considered innovative. Include a description of alternatives that were considered, whether implemented or not. Attach a copy of any approved ATCs used in this Technical Proposal. If none, state none.

12. Describe any traffic control requirements that will be used for each construction phase. Describe how traffic will be maintained as appropriate and describe understanding of any time restrictions noted in the RFP. Specifically describe how business and residential access will be maintained, if applicable. Describe any required road closures and duration thereof.

13. Describe the safety considerations specific to the Project. Discuss overall approach to safety. Describe any proposed improvements that will be made prior to or during construction that will enhance the safety of the work force and/or traveling public both during and after the construction of the Project.

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Design-Build Project*



FORM C
RECEIPT OF ADDENDA/CLARIFICATIONS

Design-Build Project: SR-222 Reconstruction and Widening, Haywood County (DB2301)

Design-Builder's Name: _____

The undersigned acknowledges receipt of the addenda to the RFP as indicated below.

ADDENDA

Addendum/Clarification No.	_____	Dated	_____
Addendum/Clarification No.	_____	Dated	_____
Addendum/Clarification No.	_____	Dated	_____
Addendum/Clarification No.	_____	Dated	_____
Addendum/Clarification No.	_____	Dated	_____

Failure to acknowledge receipt of all addenda may cause the Proposal package to be considered non-responsive to the solicitation. Acknowledged receipt of each addendum must be clearly established and included with response to this RFP.

By: _____
Title: _____

Print Name: _____
Date: _____

CONFLICT OF INTEREST DISCLOSURE STATEMENT FORM COI

DB2301

Background

The integrated nature of Design-Build creates the potential for conflicts of interest. Disclosure, evaluation, and management of these conflicts and of the appearance of conflicts, require attention to State and federal Laws in the contracting process. The Tennessee Department of Transportation (“TDOT”) has developed *Conflict of Interest Disclose Guidelines* (“COI Disclosure Guidelines”). The COI Disclosure Guidelines are intended to summarize the key governing standards of State and Federal Laws, include definitions of key terms, and describe the COI Disclosure Process.

Federal Standards

Pursuant to 23 USC 112(b)(3), the Federal Highway Administration (FHWA) has promulgated administrative rules that affect federally-funded Design-Build procurements and related procurements. These rules, which are in 23 Code of Federal Regulations (CFR) Parts 635 and 636, are used as the basis for TDOT’s guidelines on the subject. The main rule on organizational conflicts of interest in Design-Build transactions is 23 CFR § 636.116. This rule affects not only Design-Build procurements, but also “any contract for engineering services, inspection or technical support in the administration of the Design-Build contract.”

These rules specifically regulate both organizational and individual conflicts of interest. The federal rules define “organizational conflict of interest” as follows:

“Organizational conflict of interest means that because of other activities or relationships with other persons, a person is unable or potentially unable to render impartial assistance or advice to the owner, or the person's objectivity in performing the contract work is or might be otherwise impaired, or a person has an unfair competitive advantage.” (23 CFR § 636.103)

Organizational Conflict of Interest Policy

TDOT may disqualify the Design-Builder if any of its Major Participants belong to more than one Design-Builder organization. If any Major Participants of different Design-Builder organizations belong to the same parent company, each Design-Builder must describe how the participants have avoided conflicts of interest during the procurement phase of the Project.

The Design-Builder agrees that, if after award, an organizational conflict of interest is discovered, an immediate and full disclosure in writing must be made to TDOT that must include a description of

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CONFLICT OF INTEREST DISCLOSURE STATEMENT FORM COI

the action that the Design-Builder has taken or proposes to take to avoid or mitigate such conflicts. If an organizational conflict of interest is determined to exist, TDOT may, at its discretion, cancel the Contract. If the Design-Builder was aware of an organizational conflict of interest prior to the award of the Contract and did not disclose the conflict to TDOT, TDOT may terminate the Contract for default.

Disclosure Pursuant to Section 636.116(2)(v)

In the space provided below, and on supplemental sheets as necessary, identify all relevant facts relating to past, present, or planned interest(s) of Design-Builder which may result, or could be viewed as, an organizational conflict of interest in connection with the RFP.

The Design-Builder shall disclose:

- a. any current contractual relationships with TDOT (by identifying TDOT contract number and project manager);
- b. present or planned contractual or employment relationships with any current TDOT employee;
- c. any current relationships between the Major Participants, Key Personnel, Design Professionals, or Subcontractors of the Design-Builder on other TDOT projects; and
- d. any other circumstances that might be considered to create a financial interest in the contract for the Project by any current TDOT employee if the Design-Builder is awarded the contract.

The foregoing is provided by way of example, and shall not constitute a limitation on the disclosure obligations.

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____

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CONFLICT OF INTEREST DISCLOSURE STATEMENT FORM COI

6. _____

7. _____

8. _____

Explanation

In the space provided below, and on supplemental sheets as necessary, identify steps that have been or will be taken to avoid, neutralize, or mitigate any organizational conflicts of interest described herein.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

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**CONFLICT OF INTEREST DISCLOSURE STATEMENT
FORM COI**

Certification

The undersigned hereby certifies that, to the best of his or her knowledge and belief, no interest exists that is required to be disclosed in this Conflict-of-Interest Disclosure Statement, other than as disclosed above.

Signature

Name

Title

Company Name

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*Haywood County
Design-Build Project*



TECHNICAL PROPOSAL SIGNATURE PAGE FORM TPSP

DESIGN-BUILDER: _____ TELEPHONE No. (____) _____

ADDRESS: _____

CONTRACTOR'S LICENSE No. _____

LICENSE CLASSIFICATION _____

PROJECT: SR-222 Reconstruction and Widening, Haywood County

DB CONTRACT No.: DB2301

TO THE TENNESSEE DEPARTMENT OF TRANSPORTATION:

FIRM OFFER; SCOPE OF FIRM OFFER. The Design-Builder hereby submits this its Firm Offer in response to that Request for Proposals (RFP) issued _____, 20____, as amended by Addenda

Addendum No.		Dated	
Addendum No.		Dated	
Addendum No.		Dated	
Addendum No.		Dated	
Addendum No.		Dated	
Addendum No.		Dated	

to execute the Contract, consisting of the Contract Documents, as those terms are defined in the **DB Standard Guidance**, within the time period stipulated in the Contract Documents if awarded the Contract, and upon Contract execution to perform the Contract in accordance with its terms. Such Firm Offer shall remain open for a minimum of 180 Calendar Days from the original Proposal Due Date, or for such longer period to which the Design-Builder may consent. Notwithstanding the foregoing, the Design-Builder's execution of the Contract shall constitute evidence that its Firm Offer was held open to date of Contract execution.

The following portions of the Design-Builder's Technical Proposal and Price Proposal (collectively, its "Proposal") are included in this Firm Offer in accordance with the criteria established in the Design-Build Contract and all associated Contract Documents:

Technical Proposal: Those portions of the Proposal that meet or exceed TDOT's minimum Contract requirements, as determined by TDOT in its sole discretion, shall be incorporated into the resulting Contract as if fully set forth therein, and shall constitute additional minimum Contract requirements. Upon incorporation, such portions of the Proposal shall amend the minimum Contract requirements they exceed. Those portions of the Technical Proposal that do not meet or exceed the minimum

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Haywood County
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Contract requirements established by TDOT shall **not** be incorporated into the Contract.

Price Proposal: The total of prices proposed in the Price Proposal “Schedule of Items” (the “Proposal Price”), shall be incorporated into the resulting Contract as if fully set forth therein.

EQUAL OPPORTUNITY CLAUSE. The Design-Builder, hereby certifies that **(CHECK ONE)** it has has not , participated in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 11246, 10925 and 11114 as amended, and that **(CHECK ONE)** it has has not , filed with the Office of Federal Contract Compliance Program all reports due under the applicable filing requirements.

PROPOSAL SECURITY. By submitting this Proposal, the undersigned Design-Builder hereby agrees to be bound by the award of the Contract and, if awarded the Contract on this Proposal, to execute the required Contract and the required Contract Payment and Performance Bond within ten (10) days after receipt of notice of the award. The undersigned Design-Builder submits herewith the required Proposal guaranty in an amount of not less than five (5%) percent of the total amount of the Price Proposal drawn to the order of the Tennessee Department of Transportation offered and agrees and consents that the Proposal guaranty shall immediately be at the disposal of the Department, not as a penalty, but as an agreed liquidated damage if the required Contract and Contract Payment and Performance Bond are not executed within ten (10) days from receipt of the notice of award.

DBE PROJECT UTILIZATION GOAL is 0%.

GOOD FAITH EFFORTS. The Design-Builder will either meet the DBE utilization goals identified herein or will make good-faith efforts to meet such goals. **(CHECK ONE)** YES NO or N/A .

DESIGN-BUILDER DBE STATUS. The Design-Builder affirms that the Design-Builder is certified as a DBE under Tennessee Law: **(CHECK ONE)** YES NO or N/A . The Design-Builder affirms that one or more joint-venture partners of the Design-Builder is certified as a DBE under Tennessee Law: **(CHECK ONE)** YES NO or N/A .

If the Design-Builder or a joint-venture partner of the Design-Builder is a DBE, answer the following:

Indicate both type of work to be performed by the DBE Design-Builder and **percent** of total Proposal Price represented by such work

Identify by name each joint venture partner certified as a DBE under Tennessee Law and include both type of work to be performed by each such joint venture partner and **percent** of total Proposal Price represented by such work

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SR-222 Reconstruction and Widening

Haywood County
Design-Build Project



DESIGN-BUILDER AFFIRMATIONS.

The undersigned Design-Builder, its authorized representative, acknowledges, represents, attests, warrants and certifies that:

- (1) By submitting this Proposal, the Design-Builder represents that it has carefully examined the Contract, which includes **Contract Book 1 (ITBD - Instruction to Design-Builders), Contract Book 2 (Design-Build Contract), Contract Book 3 (Project Specific Information)** and all referenced documents, the **DB Standard Guidance**, ;has carefully examined any Plans provided by the Department, the Standard Specifications for Road and Bridge Construction (January 1, 2021) adopted by the State of Tennessee, Department of Transportation, with subsequent revisions which are acknowledged to be a part of this Proposal, the Special Provisions, the Standard Drawings, the Proposal Form, the Form of Contract, All Contract Documents and Addenda; and thoroughly understands their stipulations, requirements, and provisions. The Design-Builder, acting through its authorized representatives, has read and understands, and agrees to be bound by and comply with all RFP instructions, terms and conditions, together with all Addenda, if any, issued.
- (2) The Design-Builder, acting through its authorized representatives, has made a proper examination of the Project Site work described herein and all work locations and has become familiar with local conditions and the character and extent of the work.
- (3) The Design-Builder, acting through its authorized representatives, has read and understands, and agrees to be bound by and comply with the terms of the Contract identified, included, or incorporated by reference into the RFP before submitting its Proposal.
- (4) The Design-Builder has determined the quality and quantity of materials required; has investigated the location and determined the sources of supply of the materials required; has investigated labor conditions; and, has arranged for the continuous prosecution of the work herein described.
- (5) By submitting this Proposal, the Design-Builder agrees to provide all necessary equipment, tools, labor, incidentals, and other means of construction, to do all the work, and furnish all the materials of the specified requirements which are necessary to complete the work in accordance with the Plans, the Specifications and all Contract Documents, and agrees to accept as payment in full therefor described in the Contract that are set forth in this Proposal. Compensation for “Extra Work” which may be required by the Department in connection with the construction and completion of the work but which was not reflected in the Proposal scope at the time of bidding, will be made in the following manner: work will be compensated in accordance with the applicable Contract Documents.
- (6) The Proposal was prepared independently from all other Design-Builders, and without collusion, fraud, or other dishonesty.
- (7) Neither the Design-Builder nor anyone representing the Design-Builder offered or gave any advantage, gratuity, bonus, discount, bribe or loan of any sort to TDOT or its agents,

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SR-222 Reconstruction and Widening

Haywood County
Design-Build Project



- (8) employees, or anyone representing TDOT, or engaged in any other type of anti-competitive conduct at any time during this procurement.
- (9) If awarded the Contract, the Design-Builder shall utilize in performance of the Contract all resources indicated in its Proposal, including Major Participants, Key Personnel, and Design Professionals, to the extent within the Design-Builder's control and through application of the Design-Builder's best efforts.
- (10) If awarded the Contract, the Design-Builder shall make all Personnel, including Design Professionals, identified in its Proposal available at all times and places required under the terms of the Contract, and shall ensure that such Personnel devote all efforts necessary for all periods of time necessary or required under the terms of the Contract, to timely fulfill all Contract obligations.
- (11) The Design-Builder has the power and authority to enter into and perform the Contract to be awarded, and the Contract, when executed and delivered, shall be a valid and binding obligation enforceable according to its terms.
- (12) If the Design-Builder is a joint venture or partnership, each joint venturor or partner has signed this Technical Proposal Signature Page on behalf of both itself and the Design-Builder, and each joint venturor or partner and the Design-Builder shall be jointly and severally liable for performing all of the duties and meeting all of the obligations of the Design-Builder under the terms of the RFP, Proposal and Contract to be entered into.
- (13) The Design-Builder acknowledges that TDOT has the right to modify the Contract prior to execution to (a) correct typographical errors, (b) reconcile inconsistencies within and among the Contract Documents, (c) conform terminology used throughout the Contract, (d) include omitted terms clearly contemplated by the language in the Contract, (e) add terms required under State or federal law, and (f) incorporate those portions of the Technical Proposal and Price Proposal, as set forth under, if so, as may be authorized under applicable statutes and rules.
- (14) The Design-Builder intends its Proposal Price to constitute full compensation for performance of all Contract obligations, including those additional minimum Contract requirements proposed in the Technical Proposal and incorporated in the Design-Build Contract.
- (15) The Design-Builder agrees to be bound by and will comply in all respects with the terms of the resulting Contract upon award.
- (16) TDOT will not be liable for any expenses incurred by the Design-Builder in preparing and submitting its Proposal or in participating in the Proposal evaluation/selection process.
- (17) In the event the Design-Builder has engaged in unlawful anti-competitive conduct or behavior prohibited under the terms of the RFP during this procurement or lacks power or authority or fails for any reason to execute the Contract if awarded to it within the time period specified in the RFP or agreed to by the Parties, the Design-Builder shall forfeit its Proposal Security and be disqualified from further consideration for Contract award and eligibility for

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SR-222 Reconstruction and Widening

Haywood County
Design-Build Project



(18) receipt of a Proposal stipend.

(19) The Design-Builder certifies that it is not under the control of any person, firm, partnership, or corporation, which has or exercises any control of any other person, firm, partnership, or corporation, which is submitting a Proposal on this Contract.

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SR-222 Reconstruction and Widening

*Haywood County
Design-Build Project*



BEFORE ME APPEARING THE UNDERSIGNED AND BEING BY ME DULY SWORN, UPON HIS/HER OATH INDIVIDUALLY AND IN HIS/HER REPRESENTATIVE CAPACITY ON BEHALF OF THE DESIGN-BUILDER, DEPOSES AND STATES:

I, the undersigned, am a duly-authorized representative of the Design-Builder and have been authorized by the Design-Builder (a) to make in the name of and on behalf of the Design-Builder all acknowledgments, representations, attestations, warranties, and certifications contained herein and elsewhere in the Proposal, (b) to execute this Technical Proposal Signature Page and (c) by my signatures to bind the Design-Builder to the terms of its Proposal.

And further, that (a) the acknowledgments, representations, attestations, warranties, and certifications contained herein and elsewhere in the Proposal are true and correct, and (b) all copies of the Technical Proposal and Price Proposal submitted with the originals are true and correct copies of the originals. This is an official document that is required or authorized by law to be made under oath and is presented in an official proceeding. A person who makes a false statement in this certification is subject to the penalties of perjury.

_____ Sworn to and subscribed before me
Design-Builder (1) this _____ day of _____,

By: _____

_____ Notary Public
Printed Name and Title My commission expires _____
(Seal)

_____ Sworn to and subscribed before me
Design-Builder (2)* this _____ day of _____,

By: _____

_____ Notary Public
Printed Name and Title My commission expires _____
(Seal)

*NOTE: The signature and information for Design-Builder (2) is to be provided when there is a joint venture.

**THIS TECHNICAL PROPOSAL SIGNATURE PAGE MUST BE SIGNED IN BLUE INK. ANY ALTERATIONS, INTERLINEATIONS, OR ERASURES TO THE PROPOSAL MUST BE INITIALED ON THE ORIGINAL COPY IN INK BY THE SIGNATORY TO THIS TECHNICAL PROPOSAL COVER SHEET AND SIGNATURE PAGE.



LOBBYING CERTIFICATE FORM LC

PROJECT

DESCRIPTION: SR-222 Reconstruction and Widening, Haywood County

DB2301

The undersigned certifies, to the best of his or her knowledge and belief, that **CHECK ONE:**

- No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned,** to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of **ANY** Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan or cooperative agreement.
- If any funds other than Federal appropriated funds have been paid or will be paid** to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with **THIS** Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions [as amended by "Government-wide Guidance for New Restrictions on Lobbying," 61 Federal Regulations 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, et seq.)].

The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

[Note: Pursuant to 31 U.S.C. §1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each expenditure or failure.

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SR-222 Reconstruction and Widening

*Haywood County
Design-Build Project*



The Design-Builder, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Design-Builder understands and agrees that the provisions of 31 U.S.C. §3801, et seq., apply to this certification and disclosure, if any.

Date

Company Name

Signature

Name and Title

NOTE: DESIGN-BUILDER IS REQUIRED PURSUANT TO FEDERAL LAW TO INCLUDE THE ABOVE LANGUAGE IN SUBCONTRACTS OVER \$100,000 AND TO OBTAIN THIS LOBBYING CERTIFICATE FROM EACH SUBCONTRACTOR BEING PAID \$100,000 OR MORE UNDER THIS CONTRACT.

LC-2

SR-222 Reconstruction and Widening

*Haywood County
Design-Build Project*



**DESIGN-BUILD
RFP CONTRACT BOOK 2
CONTRACT**

TENNESSEE DEPARTMENT OF TRANSPORTATION

**SR-222 Reconstruction and Widening
Haywood County - TENNESSEE**

CONTRACT NUMBER: DB2301



July 10, 2023

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DESIGN-BUILD CONTRACT FORMSC



DESIGN-BUILD CONTRACT

THIS Design-Build Contract is entered into by and between the State of Tennessee, acting by and through the Department of Transportation (the “Department”) and----- (the “Design-Builder”), (collectively, the “Parties”) as of the Effective Date of the Contract.

RECITALS

WHEREAS, the Department requires the improvements for the project known as the **SR-222 Reconstruction and Widening, Haywood County- TENNESSEE Design-Build Project** (the “Project”) more particularly described in **Contract Book 1 (ITDB - Instructions to Design-Builders)** and **Contract Book 3 (Project Specific Information)**. The Project will be funded with state and federal dollars, thereby requiring that the Design-Builders adhere to all pertinent state, federal, and local requirements; and

WHEREAS, the parties intend for the Contract to be a lump-sum Design-Build contract obligating the Design-Builder to perform all work necessary to complete the Project by the deadlines specified herein, for the Contract Amount, subject only to certain specified limited exceptions. To allow the Department to budget for the Project and to reduce the risk of cost overruns, the Contract includes restrictions affecting Contractor’s ability to make claims for an increase to the Contract Amount or an extension of the Completion Deadlines. The Department may require additional related work within the general vicinity of the Project which, if required, shall be included in the Project and added to the Contract by Change Order; and

WHEREAS, the Department requires a Design-Builder competent to perform all work necessary to complete the Project in accordance with the terms and conditions of the Contract, and able to do so within the Contract Time allocated herein. If the Design-Builder fails to complete the Project within the time limitations set forth in the Contract, then the Department will suffer substantial losses and damages. The Contract therefore provides that a deduction shall be made from monies due the Design-Builder, not as a penalty, but as Liquidated Damages, as stated in **Contract Book 3 (Project Specific Information)**, if such completion is delayed; and

WHEREAS, Design-Builder asserts that it is competent and prepared to perform all work necessary to complete the Project in accordance with the terms and conditions of the Contract, and that it is able to do so within the Contract Time allotted herein; and

WHEREAS, the Department is authorized under Section 54-1-119 of the Tennessee Code Annotated to enter into this Contract;

NOW, THEREFORE, in consideration of the mutual promises contained herein, and for other good and valuable consideration, the Department and the Design-Builder agree as follows:

AGREEMENT

A. GENERAL CONTRACT PROVISIONS, DEFINED TERMS AND GENERAL SCOPE OF WORK

1. *INCORPORATION OF RECITALS*

The foregoing Recitals incorporated herein and made a part hereof for all purposes as if fully set forth constitute additional promises or representations of the Parties.

2. *CONTRACT DOCUMENTS*

The Contract Documents, made a part hereof for all purposes as if fully set forth, are intended to reflect the complete understanding of the Parties concerning their respective rights and responsibilities under the Contract.

3. *EFFECTIVE DATE*

The Contract shall become effective on the date on which each Party has signed this Contract and all approvals have been obtained (the “Effective Date”).

4. *THE CONTRACT*

The Contract, which includes this **Contract Book 2 (Design-Build Contract)** and all other Contract Documents, forms the entire agreement between the Parties.

5. *DEFINED TERMS AND ACRONYMS*

Defined terms and acronyms utilized in **Contract Book 1 (ITDB - Instructions to Design-Builders)**, this **Contract Book 2 (Design-Build Contract)**, **Contract Book 3 (Project Specific Information)** and in the other Contract Documents are either set forth in **Design-Build Standard Guidance**, or defined in the text accompanying the term.

6. *APPLICABLE VERSION OF LAW OR STANDARD*

All work shall be performed pursuant to the applicable law and in accordance with the standards in effect at the time of the RFP issuance, including addenda, unless otherwise specified in the Contract or by amendment.

7. *MINIMUM CONTRACT REQUIREMENTS*

a. **DEPARTMENT SUPPLIED**

Among the Contract, the Department has mandated certain Contract requirements from which the Design-Builder may not deviate in the scope of the work, except as instructed by the Department. The Department has also established certain minimum Contract requirements that set a minimum standard of performance or quality that the Design-Builder must meet or exceed in performance of the Contract.

b. DESIGN-BUILDER SUPPLIED

Design-Builder has established certain minimum Contract requirements located in *Exhibit A* (Design-Builder's Technical Proposal), consisting of those provisions of its Proposal that meet or exceed minimum Contract requirements established by the Department and upon which the Department has relied in awarding the Contract to the Design-Builder.

Any non-standard Department specification or provision shall be considered the Design-Builder-supplied Contract provisions and requires Department Review and Approval which will obligate the Design-Builder within this the Contract.

c. MANAGEMENT PLANS

A Transportation Management Plan is required, pursuant to the **Design-Build Standard Guidance**. A Quality Management Plan, Safety Plan, Environmental Compliance Plan or other management plans (e.g., a Project Management Plan), pursuant to the **Design-Build Standard Guidance**, have to be submitted under this Contract.

8. RIGHT- OF-WAY/UTILITY COORDINATION SERVICES

Right-of Way (ROW) acquisition and utility coordination services are expected under this Contract. See **Contract Book 3 (Project Specific Information)** for information on ROW services, ROW acquisition and ROW acquisition cost and/or utility coordination services required for the Design-Builder's Technical Proposal.

9. DESIGN SERVICES

The design services required under the Contract shall include, at a minimum, each of the following:

- Performance of all design services, including but not limited to roadway design, pavement design, geotechnical design, environmental design, drainage design, structural design, hydraulic/hydrologic design, traffic control and survey;
- Performance of all other engineering design services required under the Contract and/or otherwise necessary to complete the work in accordance with all Contract requirements; and
- All Design Documents and Design Reviews shall be provided by the Design-Builder and performed in accordance with the Design Review schedule established in the Critical Path Method (CPM) Schedule, and in accordance with all Contract requirements.

All design services to be performed under the Contract are appurtenant to construction services being provided by the Design-Builder.

a. LICENSE REQUIREMENTS; STANDARD OF CARE

Whether the Design-Builder is a design professional, has a design professional as a member or on staff, or will otherwise provide an outside source to perform the

services of a design professional, all design services (whether constituting the practice of architecture, the practice of engineering, the practice of surveying, or the practice of other design services) referred to in this Contract shall be provided by duly-licensed and competent design professionals employed or otherwise retained by the Design-Builder. The design professionals currently designated to provide such design services are listed in Subsection 3.4. All design services shall be performed by a design professional of the appropriate professional discipline in accordance with the degree of skill and care ordinarily used by competent practitioners of the same professional discipline under similar circumstances, taking into consideration the contemporary state of the practice and the project conditions.

b. DESIGN DOCUMENTS

The Design-Builder shall generate and provide to the Department all Design Documents. The Design-Builder shall make a comprehensive design check and Design Review at the following five (5) stages of design development, stated in more detail within **Design-Build Standard Guidance**:

- Definitive Design;
- Interim designs;
- Readiness-for-Construction Plans, Specification and quantity estimates;
- Working Plans;
- As Built Plans.

1) READINESS-FOR-CONSTRUCTION PLANS AND SPECIFICATIONS

Upon completion of the Definitive Design Reviews, Working Plan Design Reviews, Interim Design Reviews (if any), and Readiness-for-Construction Design Reviews, as specified in the **Design-Build Standard Guidance**, the Design-Builder shall finalize the Readiness-for-Construction Plans and Specifications. In performing these services, the Design-Builder shall meet the following requirements:

- Readiness-for-Construction Plans and Specifications shall comply with all applicable Laws and all Contract requirements.
- Readiness-for-Construction Plans and Specifications shall be a complete, fully coordinated, integrated package, without any significant modifications or further clarifications required.
- The Design-Builder shall file all documents required for the approval of Authorities having jurisdiction over the Project, shall obtain all necessary permits not obtained by the Department, and shall pay for all associated fees, including application, filing, plan review, and appeal fees.
- The Design-Builder shall provide the Department with written certification and all Design Documents required for the

Readiness-for-Construction certification, in accordance with **Design-Build Standard Guidance**.

- The Design-Builder shall submit to the Department all documentation and Design Quality Records required under **Design-Build Standard Guidance** (Section 5.2.11.(b)).
- The Design-Builder shall submit to the Department As-Built Plans and the Design-Builder Specifications, compiled and organized in accordance with all Contract requirements that incorporate all changes in the design and construction of the Project.
- The Design-Builder shall prepare and deliver to the Department all As-Built Plans, the Design-Builder Specifications, and other Design Documents, information, and data required under the Contract to be provided to the Department.

2) VALUE ENGINEERING COST PROPOSALS

During development of the Design Documents, the Design-Builder and the Department may collaborate on identifying, evaluating and implementing value engineering cost proposal (VECP) options in accordance with **Design-Build Standard Guidance**. The Design-Builder's development of the Design Documents and completion of the Readiness-for-Construction Plans and Specifications shall not preclude further identification and implementation by the Design-Builder and the Department of additional cost-reduction options during construction. VECPs adopted by the Department will be implemented through Change Orders pursuant to **Design-Build Standard Guidance**.

10. CONSTRUCTION SERVICES

The construction services required under the Contract shall include, at a minimum, each of the following:

- Performance of all construction services, including but not limited to construction and removal, if required, of temporary and/or permanent roadway, structures, and erosion prevention and sediment control, materials testing, signing, traffic control, paving and pavement markings;
- Protection of environmental resources, including plant and animal life and associated habitats; and
- Performance of all other construction services required under the Contract and/or otherwise necessary to complete the work in accordance with all Contract requirements

The Design-Builder shall provide all necessary work to furnish to the Department complete, fully functional road improvements, capable of being fully utilized for the purposes described in the Contract, and constructed in compliance with all Contract requirements. The Design-Builder shall perform the construction services as follows:

- The Design-Builder shall supervise and administer all construction activities in accordance with Contract requirements.
- In the event of the existence of any dispute between the Parties under the Contract, the Design-Builder shall continue to perform in accordance with the Contract terms and seek resolution in accordance with **Design-Build Standard Guidance**.
- The construction work shall be of good quality, free from faults and defects, and in conformance with all Contract requirements. At its own expense, the Design-Builder shall correct construction work that does not conform to these requirements.
- The Design-Builder shall utilize new materials and equipment in the work, unless otherwise specified in the Contract.
- The Design-Builder shall pay all taxes, fees, and costs associated with the acquisition of tools, equipment, materials, and the performance of the work, in accordance with **Design-Build Standard Guidance**.
- The Design-Builder shall comply with all applicable laws.
- The Design-Builder shall keep the work location and its vicinity free from accumulation of waste materials and rubbish caused by the Design-Builder's operations.
- The Design-Builder shall notify the Department when the work or an agreed upon portion thereof has been completed, in accordance with **Design-Build Standard Guidance**.
- The Design-Builder shall maintain, on the work location, a copy of all approved plans referenced in section A.7.c of Book 2, environmental permits, approved design documents, project records and the entire Contract and any other document required in accordance with **Design-Build Standard Guidance**.
- As the Project constitutes "Highway construction" utilizing Federal funds, the Design-Builder shall comply with any Federal requirements and appropriate Department Special Provisions as provided by **Design-Build Standard Guidance** and **Contract Book 3 (Project Specific Information)**, respectively. Consistent with **Design-Build Standard Guidance**, the Design-Builder shall be fully responsible for initiating, maintaining, and supervising safety precautions and programs in connection with the work, including but not limited to, taking reasonable precautions to ensure the safety of, and prevention of damage, injury, or loss to:
 - Employees of the Department present on or in the vicinity of a work location, employees of the Design-Builder and other persons performing work on or in the vicinity of a work location, and other persons, including the traveling public, who may be affected;
 - Materials and equipment to be incorporated into the Project;
 - Portions of the Project under construction or completed; and
 - Other property within or adjacent to a work location.

- The Design-Builder shall be liable for damage to or loss of property at work locations and on private property affected by the Design-Builder's activities, pursuant to **Design-Build Standard Guidance**. This subparagraph shall in no way affect the applicability or coverage of the bonds and insurance required under Section 7.0 of Book 2 of this Contract.
- The Design-Builder shall deliver to the Department all notices regarding completion of the work pursuant to **Design-Build Standard Guidance**.
- The Design-Builder shall perform all other construction work required to complete the Project in conformance with all Contract requirements, including Legal Requirements.

11. QUALITY MANAGEMENT SERVICES

Quality Management services will include performance, at a minimum, of all activities and obligations, including preparation of all documentation, described in **Design-Build Standard Guidance**, and as otherwise necessary to ensure that the work is performed in accordance with all Contract requirements.

12. PROJECT MANAGEMENT SERVICES

Project management services shall be integrated with the design services and construction services described herein and, in the Contract, and shall include, at a minimum, the following:

- Project controls (including risk management, scheduling, reporting and document management).
- Construction management;
- Contract management;
- Safety management; and
- Traffic management.

B. GENERAL STANDARDS FOR PERFORMANCE OF THE WORK

1. GOOD FAITH

The Design-Builder shall provide and perform all design services, quality management, project management, and construction services in good faith and as expeditiously as is consistent with the applicable standards of skill and care ordinarily exercised by members of the profession under similar conditions and circumstances, and the orderly prosecution of the work.

2. PERFORMANCE STANDARDS

Where specific performance standards for any aspect of the work have been established in the Department Special Provisions as stated in Appendix B, pursuant

to **Contract Book 3 (Project Specific Information)**, the work shall be performed so as to meet or exceed such standards.

3. CRITICAL PATH METHOD (CPM) SCHEDULE

The CPM Schedule establishes the schedule and deadlines for Contract performance, with which the Design-Builder must comply. The CPM Schedule, as it may be modified during the course of the Project pursuant to the **Design-Build Standard Guidance**, shall anticipate and accommodate such periods of time shown in **Contract Book 1 (ITDB - Instructions to Design-Builders)** as may be required for the Department’s review of Design Documents, and for approval by Authorities having jurisdiction over the Project of any required submissions, including but not limited to, applications for permits and environmental impact evaluations. Since time is of the essence in the Design-Builder’s successful completion of its assignment, the Design-Builder agrees to begin work on each work location immediately after receiving authorization from the Department to proceed with its work efforts.

4. REVIEW AND COMMENT, OR ACCEPTANCE

The Department’s consideration, Review and Comment, or Acceptance of any matters, or the Department’s authorization of any action, will not be deemed or construed as relieving the Design-Builder of its sole responsibility for, and its complete and exclusive control over the means, methods, sequences and techniques for, performance of the work in accordance with the terms of the Contract.

5. EXTRA WORK TO BE PROVIDED BY THE DESIGN-BUILDER

The Design-Builder shall perform Extra Work in accordance with **Design-Build Standard Guidance**.

C. RELATIONSHIP AND ROLES OF THE PARTIES

1. INDEPENDENT ENTITY

The Design-Builder is an independent entity and not an officer, employee, or agent of the Department.

2. DEPARTMENT REPRESENTATIVE AND CONTACT INFORMATION

The Department’s representative for this Project is

Mr. Steve Sellers, P.E.
CONSTRUCTION DIVISION REPRESENTATIVE
TENNESSEE DEPARTMENT OF TRANSPORTATION
505 DEADERICK STREET, SUITE 700
NASHVILLE, TN 37243

Address:



- Design Lead Engineer - Structures: _____
- Design Lead Engineer - Roadway: _____
- Design Lead Engineer – Geotechnical: _____
- Erosion Prevention/Sediment Control Inspector: _____

c. Right-of-Way Acquisition Firms

The Design-Builder shall have separate firms for appraisals, appraisal reviews, and acquisition/negotiation. These firms must be on the Department’s ROW Office’s pre-qualified list:

- Appraisal Firm: _____
- Review Appraisal Firm: _____
- Acquisition/Negotiation Firm: _____

5. SUBSTITUTION OF KEY PERSONNEL AND/OR DESIGN PROFESSIONALS

The Parties agree that each Key Personnel, design professional and Subcontractor is unique, and that the Department has relied upon their qualifications in selecting the Design-Builder to perform the Contract. Therefore, the Design-Builder shall not replace any Key Personnel or design professional during the term of the Contract. Notwithstanding the foregoing, in those limited circumstances in which the Department elects to consider substitutions, the process shall be governed by the provisions of **Design-Build Standard Guidance**. In the event the Department approves a substitution request, the Department retains the right to strictly enforce this Section C.5 in the event of future requests for substitution. No individual substitution approval or pattern of substitution approvals shall constitute a waiver of this requirement. Should the Department, in its sole discretion, elect to authorize a substitution, such authorization shall not relieve the Design-Builder of its sole responsibility under the Contract to complete all work and deliver the Project in accordance with all Contract requirements.

D. DATE OF COMMENCEMENT AND COMPLETION OF SERVICES

1. TIME FOR PERFORMANCE

The Contract shall take effect on the Effective Date and shall be performed by the Parties according to its terms, unless earlier terminated, until Final Acceptance by the Department in accordance with **Design-Build Standard Guidance**.

2. **COMMENCEMENT OF SERVICES**

The Design-Builder is authorized to commence the work within the Contract for post award submittals pursuant to **Design-Build Standard Guidance**. The Design-Builder shall not perform any services beyond post award submittal until the issuance of first Notice to Proceed (NTP) and for each subsequent phase requiring a Review and Approval NTP.

3. **CONTACT COMPLETION DATE**

The Design-Builder shall complete all work to be done under the Contract, except for plant/vegetation establishment, by no later than **November 30, 2025**, or no later than the Contract Completion Date to be determined in accordance with the paragraph below, whichever is earlier.

The Design-Builder's Price Proposal shall specify the number of calendar days following the Notice to Proceed within which the Design-Builder will complete the Project. The Design-Builder's proposed number of calendar days following the NTP will establish the Contract Completion Date for this Contract, subject to the requirement that the Contract Completion Date shall be no later than November 30, 2025.

E. **COMPENSATION**

1. **CONTRACT AMOUNT**

The Department agrees to compensate the Design-Builder for all work performed under the Contract for a fixed price of \$_____ (the "Contract Amount"). The Contract Amount includes the entire cost of completing the Project in accordance with all Contract requirements as contemplated by the Parties under the Contract, and further includes all contingencies and the Design-Builder's overhead and profit. The Contract Amount shall be payable in accordance with **Design-Build Standard Guidance**.

2. **PROGRESS PAYMENTS**

The Department shall make progress payments to the Design-Builder in accordance with **Design-Build Standard Guidance**. Progress payments shall be based upon the Design-Builder's Schedule of Items submitted with the Price Proposal, which shall include the cost of all work. The Department's payment of progress payments shall not be deemed by either Party to constitute Acceptance or Approval of any Pay Item covered by such payment, or a waiver of a claim or demand for repair of any defects therein.

3. **ADJUSTMENTS TO THE CONTRACT AMOUNT**

The Contract Amount shall only be adjusted through issuance of properly-authorized Change Orders.

4. **PAYMENTS FOR EXTRA WORK**

The Department will make payments for Extra Work in accordance with the provisions of **Design-Build Standard Guidance**.

5. **DEDUCTIONS FROM MONIES DUE**

The Department may deduct from monies due or to become due the Design-Builder, as follows:

- Amounts representing price adjustments authorized under the provisions **Design-Build as specified in Contract Book 3 (Project Specific Information)**;
- Amounts representing recoupment of damages, including but not limited to Liquidated Damages, as stated in **Contract Book 3 (Project Specific Information)**;
- Amounts assessed by Authorities (e.g., fines and penalties) for which the Design-Builder is responsible under the terms or the Contract or by law;
- Amounts the Department is compelled by court order or other legal mandate to withhold and/or tender to Authorities or third parties; and
- Any other amounts authorized under the Contract or by law to be deducted.

F. **CHANGES IN THE WORK**

Changed work and Extra Work shall be authorized by the Department only under the circumstances set forth in, and pursuant to the terms of, the **Design-Build Standard Guidance**. The Design-Builder shall not begin performance of any Changed Work or Extra Work until the Department has issued a properly authorized Change Order, and the Design-Builder shall perform all such work strictly in accordance with the terms of the Change Order.

G. **INSURANCE AND BONDING REQUIREMENTS**

1. **INSURANCE REQUIREMENTS**

During the term of the Contract, the Design-Builder shall maintain in full force, at its own expense, from insurers holding a current certificate of authority to transact the business of insurance in the State of Tennessee, all of the insurance coverages required under **Design-Build Standard Guidance**.

The Design-Builder, being an independent contractor, agrees to maintain errors and omissions insurance in such an amount (**\$ 1,000,000.00 minimum**) and form as are agreeable to the Department.

2. BONDING REQUIREMENTS

During the term of the Contract, the Design-Builder shall, at its own expense, maintain in full force a Performance and Payment Bond in the full Contract Amount by a surety company, acceptable to the Department, that is qualified and authorized to transact business in the State of Tennessee and listed on the United States Department of Treasury Financial Management Service list of approved bonding companies. The Parties understand and agree that the obligation of the Design-Builder's Surety for the faithful performance of the Contract shall include not only all construction, but also the performance of all design services under the Contract.

3. INDEMNIFICATION

The Design-Builder shall, at all times, observe and comply with all applicable federal, state and local laws, ordinances and regulations and shall indemnify and hold harmless the State of Tennessee and all of its officers, agents and servants against any claim of liability or assessment of fines or penalties arising from or based upon the Design-Builder's and/or its employees' or agents' violations of any such law, ordinance or regulation.

The Design-Builder shall hold harmless and indemnify the Department for all claims and damages which result from the failure of the Design-Builder to perform its engineering and design duties in conformance with the reasonable standard of care within the State of Tennessee. Said indemnification shall include, but not be limited to, costs for the redesign of plans and the preparations of new specifications as well as the costs for repairs to the construction work itself.

The Design-Builder shall be responsible for any and all injury or damage to persons or to property arising from the prosecution of the work and due to any act, omission, neglect or misconduct in its manner or method of prosecuting the work or due to its non-execution of the work or due to defective work or materials. The Design-Builder shall indemnify and hold harmless the State of Tennessee, the Department, and all of its officers, agents, and employees from all suits, actions or claims of any character arising from the Design Builder's acts or omissions in the prosecution of the work; use of unacceptable materials in constructing the work; infringement of patent, trade mark or copyright; or claims for workers' compensation.

If any such suit, action or claim is filed, the Department may retain from the monies due to the Design-Builder under this Contract a sum deemed sufficient by the Department to protect the Department from loss therefrom. Upon resolution of the suit, action or claim, any remaining retained funds will be released.

These requirements of indemnification shall be a continuing obligation of the Design-Builder and shall survive the termination of the Contract regardless of cause.

H. OWNERSHIP AND USE OF WORK PRODUCT OF THE DESIGN-BUILDER

All work product of the Design-Builder arising from performance of the Contract shall be the exclusive property of the Department, as more particularly provided for under the **Design-Build Standard Guidance**.

Plans, specifications and any maps prepared or obtained under the terms of this Contract shall be delivered to and become the property of the Department pursuant to the **Design-Build Standard Guidance**. Basic design notes and sketches, charts, computations, all original drawings, and other data prepared or obtained under this Contract shall be made available, upon request, to the Department without restriction or limitation of their use.

I. PROJECT RECORDS

1. *FINANCIAL AND OTHER PROJECT RECORDS*

The Design-Builder shall maintain complete Project Records as described in the **Design-Build Standard Guidance**, in the manner required under the terms of the Contract. The Design-Builder shall keep full and detailed accounts and exercise such controls as may be necessary for proper financial management of the Project. The accounting and control systems shall be satisfactory to the Department.

2. *RECORD RETENTION PERIOD*

The Design-Builder shall retain and preserve all Project Records for a period as stated in the **Design-Build Standard Guidance**, after final payment or for such longer period as may be required by law (the "Record Retention Period").

3. *ACCESS TO RECORDS*

The Department, the Department's representatives, and FHWA shall be afforded reasonable and regular access to the Project Records for the duration of the Contract and the Record Retention Period. This requirement to make Project Records available to the Department shall be a continuing obligation of the Design-Builder and shall survive the termination of the Contract regardless of cause.

4. *SUBCONTRACT RECORD RETENTION REQUIREMENTS*

The Design-Builder shall require each Subcontractor to retain its Project Records for the Record Retention Period, and to provide equivalent access to Project Records to the Department, the Department's representatives, and FHWA. The Design-Builder shall require each Subcontractor to include in lower-tier subcontracts the same Project Record retention and access requirements.

5. *LOCATION*

The Design-Builder shall maintain all Project Records at the locations required under the terms of the Contract for the duration of the Contract. Subsequent to Contract

completion, the Project Records shall be maintained for the Record Retention Period with suitable security, protection against damage and casualty loss, and access to the Department.

J. TERMINATION OR SUSPENSION

1. **TERMINATION FOR CONVENIENCE AND NO FAULT; PAYMENT**

The Contract may be terminated for convenience by the Department in accordance with Department's Standard Specifications, as amended. In such case, the Department will make payment in accordance with the **Design-Build Standard Guidance**. However, the amount to be paid to the Design-Builder shall in no event exceed the Contract Amount.

2. **TERMINATION FOR CAUSE; AMOUNTS PAYABLE**

The Contract may be terminated by the Department for default in accordance with Department's Standard Specifications, as amended, and **Design-Build Standard Guidance**. In addition to the acts listed in the above documents the following shall also be considered defaults for which the Contract may be terminated:

- The Design-Builder or its Design Professionals no longer hold the licenses or certificates required to perform the work or any portion thereof;
- The Design-Builder so fails to perform any agreed-upon portion of the work or Contract item or applicable standard of care as to materially affect the Design-Builder's performance under the Contract in accordance with its terms, and such breach, default or failure is not cured within the requirements of the **Design-Build Standard Guidance**; or
- The Design-Builder made knowing or reckless misrepresentations, concealed facts, or failed to disclose information in Design-Builder's Proposal. Such shall constitute fraudulent inducements, and shall entitle the Department to recover reliance damages, in addition to any other available remedies to which it may show itself entitled.

In case of termination for cause, the Department will make payment consistent with the payment provisions included in the **Design-Build Standard Guidance** and at the Department's option, including payment for materials left on hand, in accordance with Department Standard Specifications, as amended.

3. **CONTRACT NOTICE OF CONTRACT TERMINATION**

The Department may terminate the Contract, in whole or in part, immediately upon notice to the Design-Builder, or at such later date as the Department may establish in such notice, in accordance with Department Standard Specifications, as amended.

4. QUALITY OF THE WORK

In the event of the Department's termination of the Contract, regardless of reason, the Design-Builder shall remain responsible for the quality of the work performed through the date of termination.

5. LITIGATION

In the event of litigation instigated by the Design-Builder in accordance with the Contract or by the Department for breach of contract or fraudulent inducement, the Department may pursue both recoupment and set-off in addition to its other available remedies.

K. ENUMERATION OF CONTRACT

The Contract includes the following:

- 1. CONTRACT BOOK 1 (INSTRUCTIONS TO DESIGN-BUILDERS - ITDB);**
- 2. CONTRACT BOOK 2 (DESIGN-BUILD CONTRACT);**
- 3. CONTRACT BOOK 3 (PROJECT SPECIFIC INFORMATION);**
- 4. DESIGN-BUILD STANDARD GUIDANCE AND ADDENDA;**
- 5. THE DEPARTMENT STANDARD SPECIFICATIONS;**
- 6. THE DEPARTMENT SUPPLEMENTAL SPECIFICATIONS;**
- 7. THE DEPARTMENT DESIGN GUIDELINES, AND ADDENDA;**
- 8. THE DEPARTMENT CONSTRUCTION CIRCULAR LETTERS;**
- 9. THE DEPARTMENT STANDARD DRAWINGS;**
- 10. THE DEPARTMENT MATERIAL AND TEST STANDARD OPERATING PROCEDURES;**
- 11. EXHIBIT A (APPROVED TECHNICAL PROPOSAL);**
- 12. CHANGE ORDERS;**
- 13. FORCE ACCOUNT WORK ORDERS;**
- 14. WRITTEN ORDERS AND AUTHORIZATIONS ISSUED BY THE DEPARTMENT;**
- 15. ALL OTHER PROGRAMMATIC PLANS OR ANY OTHER DOCUMENTS; IN ANY FORM, REQUIRED TO BE SUBMITTED TO THE DEPARTMENT PURSUANT TO THE TERMS OF THE CONTRACT.**
- 16. ALL MATERIAL INCLUDED BY REFERENCE IN ANY OF THE ABOVE DOCUMENTS.**

L. ORDER OF PRECEDENCE

All Contract Documents are intended to be complementary. Conflicts, if any, will be resolved utilizing the following descending order of precedence.

- 1. CONTRACT BOOK 3 (PROJECT SPECIFIC INFORMATION) AND ADDENDA;**

2. **CONTRACT BOOK 2 (DESIGN-BUILD CONTRACT);**
3. **CONTRACT BOOK 1 (INSTRUCTIONS TO DESIGN-BUILDERS - ITDB);**
4. **THE DEPARTMENT SUPPLEMENTAL SPECIFICATIONS;**
5. **THE DEPARTMENT CONSTRUCTION CIRCULAR LETTERS;**
6. **THE DEPARTMENT STANDARD SPECIFICATIONS;**
7. **THE DEPARTMENT DESIGN GUIDELINES AND ADDENDA;**
8. **THE DEPARTMENT STANDARD DRAWINGS;**
9. **DESIGN-BUILD STANDARD GUIDANCE;**
10. **ALL OTHER PROGRAMMATIC PLANS OR ANY OTHER CONTRACT DOCUMENTS;**
11. **ALL MATERIAL INCLUDED BY REFERENCE IN ANY OF THE ABOVE DOCUMENTS.**

M. DESIGN-BUILDER CERTIFICATIONS AND DISCLOSURES

1. NONDISCRIMINATION

The Design-Builder shall follow the nondiscrimination provisions as provided in this **Contract Book 2 (Design-Build Contract)**.

2. DBE COMPLIANCE

The Design-Builder shall follow the DBE provisions as provided in the Special Provisions provided in this **Contract Book 2 (Design-Build Contract)**. The Design-Builder shall comply with the Department DBE requirements in the **Design-Build Standard Guidance**, and shall require that all Subcontractors so comply. The Design-Builder shall include the Department DBE requirements in all subcontracts.

3. ILLEGAL IMMIGRANTS

The Design-Builder shall follow the Illegal Immigrant provisions as provided in this **Contract Book 2 (Design-Build Contract)**.

4. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS - PRIMARY COVERED TRANSACTIONS

The Design-Builder shall follow the debarment, suspension, and other responsibility matters provisions as provided in this **Contract Book 2 (Design-Build Contract)**.

5. CERTIFICATION FOR GRANTS, LOANS, AND COOPERATIVE AGREEMENTS.

The Design-Builder shall follow the provisions as provided in this **Contract Book 2 (Design-Build Contract)**.

The Design-Builder agrees that if any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Contract, the Design-Builder shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

6. DBE GOALS AND TARGETS

There is no DBE goal for this Project. If a goal is stated, the Design-Builder shall follow the DBE provisions as provided in **Contract Book 2 (Contract)**.

N. MISCELLANEOUS PROVISIONS

1. EMPLOYMENT OF DEPARTMENT WORKERS

The Design-Builder shall not engage, on a full, part-time, or other basis during the period of this Contract, any professional or technical personnel who are or have been at any time during the period of the Contract in the employ of the Department, except regularly retired employees, without the written consent of the Department.

2. COVENANT AGAINST CONTINGENT FEES

The Design-Builder warrants that it has not employed or retained any company or person other than a bona fide employee working solely for the Design-Builder to solicit or secure this Contract, and that it has not paid or agreed to pay any company or person, other than a bona fide employee working solely for the Design-Builder, any fee, commission, percentage, brokerage fee, gifts, or any other consideration, contingent upon or resulting from the award or making of this Contract. For breach or violation of this warranty, the Department shall have the right to deduct from the Contract Amount or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gifts, or contingent fee.

3. ENERGY POLICY AND CONSERVATION ACT

Under this Contract, the Design-Builder shall give due consideration to and, as applicable, comply with the standards, orders, and requirements relating to energy efficiency contained in the Department energy conservation plans issued in compliance with the Energy Policy and Conservation Act (P.L. 94-165).

4. ADDITIONAL EMPLOYMENT REGULATIONS

The Design-Builder shall comply with the Vocational Rehabilitation Act of 1973 as approved by Congress on September 26, 1973, herein incorporated by reference, which prohibits employment discrimination against physically handicapped persons. Further, the Design-Builder shall comply with Section 2012 of the Vietnam Era Veterans Readjustment Act of 1974 which requires the Design-Builder to take affirmative action to employ and advance in employment qualified veterans of the Vietnam Era.

5. ***COPYRIGHTING***

The Design-Builder shall be prohibited from copyrighting any papers, reports, forms or other material which is a part of any work under this Contract without written approval from the Department. Publication rights to any documents produced are reserved by the Department.

6. ***GOVERNING LAW; JURISDICTION; VENUE***

The Design-Builder is assumed to be familiar with and observe and comply with those Federal, State, and local laws, ordinances, and regulations in any manner affecting the conduct of the work and those instructions and prohibitive orders issued by the Department and Federal Government regarding fortifications, military and naval establishments and other areas. The Design-Builder shall observe and comply with those applicable laws, ordinances, regulations, instructions, and orders in effect as of the date of this Contract.

This Contract shall be governed by and construed in accordance with the laws of the State of Tennessee. The Design-Builder agrees that it will be subject to the exclusive jurisdiction of the courts of the State of Tennessee in actions that may arise under this Contract. The Design-Builder acknowledges and agrees that any rights or claims against the Department or its employees hereunder, and any remedies arising there from, shall be subject to and limited to those rights and remedies, if any, available under TCA § 9-8-101 through 9-8-407.

7. ***CONTRACT INTERPRETATION***

Notwithstanding anything in the Contract to the contrary, no field explanations or interpretations provided by the Department at any meetings, and no comments by the Department on Design Documents or Construction Documents, shall be deemed, construed or interpreted to (a) amend, supersede or alter the terms, requirements, limitations or meaning of any Contract Document or (b) release or relieve the Design-Builder from full responsibility for the design of the Project in accordance with the Contract. However, written interpretive engineering decisions from the designated Department contact person(s) pursuant to the Contract may be relied upon to provide information, and interpretations of ambiguous or uncertain requirements set forth in the Contract.

8. ***NOTICES***

Notices to be given hereunder shall be given in writing by personal delivery, facsimile, e-mailing or mailing the same, postage prepaid, to the Design-Builder or the Department at the addresses or numbers set forth in Sections C.2 and C.3, or as either Party may hereafter indicate pursuant to this Section. Any notice delivered by facsimile and email shall be deemed to be received when confirmation of successful transmission is generated by the transmitting machine. Any notice so mailed, personally delivered, facsimile or e-mail transmission shall be the sole responsibility of the Design-Builder to track and confirm receipt by the Department and shall be

confirmed by telephone notice to the Department for the Project. Any notice shall be effective as to the Design-Builder upon delivery into the possession of one of the Design-Builder's designated management personnel, and as to the Department, upon delivery to TDOT's Alternative Delivery Program Manager. Regular, day-to-day communications may be transmitted through one of the methods set forth above, in person, by e-mail, or by other similar electronic transmission.

9. DISCLOSURE OF TAX IDENTIFICATION NUMBER

The Design-Builder shall provide its federal tax ID number to the Department. The Tax Identification Number provided pursuant to this authority will be used for the administration of State, Federal and local tax law.

10. SEVERABILITY

The Parties agree that if any term or provision of the Contract is declared by a court of competent jurisdiction to be illegal or otherwise invalid, the validity of the remaining terms and provisions shall not be affected, and the rights and obligations of the Parties shall be construed and enforced as if the Contract did not contain the particular term or provision held to be invalid.

11. NO WAIVER

The failure of the Department to enforce any provision of the Contract shall not constitute a waiver by the Department of that provision or any other provision of the Contract.

12. MEDIA CONTACTS; CONFIDENTIALITY

Unless otherwise specifically authorized in writing, the Design-Builder shall provide no news release, press release, or any other statement to a member of the news media regarding this Project without the Department's prior written authorization. The Design-Builder shall require this clause within all Subcontractors agreements.

13. ORGANIZATIONAL CONFLICTS OF INTEREST

The Design-Builder shall identify all relevant facts relating to past, present, or planned interest(s) of the Design-Builder's (including the Major Participants, proposed Design-Builder members, and their respective chief executives, directors, and Key Personnel) which may result, or could be viewed as, an Organizational Conflict of Interest in connection with this Project.

The Design-Builder shall disclose:

- a. any current contractual relationships with the Department (by identifying the Department contract number and project manager);
- b. any present or planned contractual or employment relationships with any current Department employee;
- c. any current relationships between the Major Participants, Key Personnel. and/or Design Professionals of the Design-Builder on other Department projects; and

- d. any other circumstances that might be considered to create a financial interest in the contract for the Project by any current Department employee if the Design-Builder is awarded the contract.

The Design-Builder must also disclose any current contractual relationships where the Design-Builder is a joint venture. The foregoing is provided by way of example, and shall not constitute a limitation on the disclosure obligations.

For any fact, relationship, or circumstance disclosed in this Section N.13, the Design-Builder must identify steps that have been or will be taken to avoid, neutralize, or mitigate any Organizational Conflicts of Interest.

In cases where Major Participants on different Design-Builder organizations belong to the same parent company, each Design-Builder must describe how the participants would avoid conflicts of interest through the qualification and proposal phases of the Project. All Organizational Conflicts of Interest shall be addressed on Form COI.

14. THE DEPARTMENT'S INSURANCE

The State of Tennessee is self-insured and such insurance shall cover the Department's operations and activities under the Contract.

15. JOINT VENTURES AND PARTNERSHIPS

If the Design-Builder is a joint venture or a partnership, each joint venture member or partner is executing this Contract on behalf of both itself and the Design-Builder, and each joint venture member or partner and Design-Builder shall be jointly and severally liable under this Contract.

16. MERGER CLAUSE

The Contract constitutes the entire Contract between the Parties on the subject matter addressed herein. The terms of this Contract cannot be waived or amended, in any manner whatsoever, except by written instrument signed by the Parties and containing all required State of Tennessee approvals. Any waiver, if made, shall be effective only in the specific instance and for the specific purpose given. There are no understandings, agreements, or representations, oral or written, regarding this Contract except as contained or incorporated by reference herein.

The Design-Builder’s authorized representative, by his/her signature below, hereby acknowledges that he/she has read this Contract, understands it, and can affirm that the Design-Builder agrees to be bound by its terms and conditions. This Contract may be executed in several counterparts, each of which shall be an original, and all of which shall constitute but one and the same instrument.

IN WITNESS WHEREOF, the Parties have executed this Contract, which shall be effective as of the Effective Date.

**DESIGN-BUILDER
NAME:** _____

Company Officer Signature Printed Name and Title Date

**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION**

This Contract is accepted this _____ day of _____, _____, and
is effective on the _____ day of _____, _____.

Howard H. Eley, Commissioner

John H. Reinbold, General Counsel
Approved as to Form and Legality

APPENDIX A

SUPPLEMENTAL SPECIFICATIONS TO THE STANDARD SPECIFICATIONS

The following, revised as noted, incorporates the Supplemental Specifications by reference for bidding purposes and will be printed with the contract after award. These Supplemental Specifications may be obtained from the Department’s website:

<https://www.tn.gov/tdot/tdot-construction-division.html>

Supplemental Specifications to the Standard Specifications Revision Date

Supplemental Specification to Section 100 -----	06/01/2023
Supplemental Specification to Section 400 -----	12/19/2022
Supplemental Specification to Section 500 -----	12/19/2022
Supplemental Specification to Section 600 -----	12/19/2022
Supplemental Specification to Section 700 -----	12/19/2022
Supplemental Specification to Section 900 -----	01/30/2023

STATE

(Rev. 9-7-21)

(Rev. 12-15-21)

(Rev. 12-19-22)

(Rev. 6-1-23)

OF

TENNESSEE

January 1, 2021

Supplemental Specifications – 100SS

of the

Standard Specifications for Road and Bridge Construction

January 1, 2021

Subsection 102.09, (pg. 17), 12-19-22; **Rejection of Proposals**; Revise No. 10:

10. The apparent low bidder fails to complete and submit the Department form “Certification Regarding Subcontractor Bid Quotes” (Bidders List) electronically before the close of business (4:30 PM Central Time) within five (5) calendar days after the date on which bids are required to be submitted.

Subsection 104.03.B & C, (pg. 23-24), 9-7-21; **Contract Change Notification; B & C**; Revise subsections:

B. Written Acknowledgement by Engineer

The Engineer will provide written acknowledgement of the Contractor’s written notice within ten (10) calendar days.

C. Written Response by Engineer

The Engineer will provide a written response within the specified number of calendar days based on the requested contract change:

1. For requested changes to the contract time in excess of one hundred eighty (180) days or requested changes that alter the original contract amount by more than \$200,000, the Engineer will respond within thirty (30) days of receiving the Contractor's written notice.
2. For requested changes to the contract time in excess of ninety (90) days but less than or equal to one hundred eighty (180) days, or requested changes that alter the original contract amount by more than \$100,000 but less than or equal to \$200,000, or by more than ten percent (10%) of the original contract, whichever is less, the Engineer will respond within twenty-one (21) days of receiving the Contractor's written notice.
3. For all other requested changes to the contract, the Engineer will respond within fourteen (14) calendar days of receiving the Contractor's written notice.

The written response to the Contractor's written notice will include one of the following:

1. Confirmation that a change is necessary in accordance with **104.02**, and direction on how the Work will proceed.
2. A denial of the request for a change, which will include references to the Contract as to why the condition does not represent a change.
3. A request for additional information stating the specific information needed and the date by which it must be received. The Engineer will respond to the additional information provided within fourteen (14) calendar days.

When a change is necessary, the Engineer will make appropriate adjustments to the Contract price and time, if warranted, in accordance with **108.07**, **109.04**, **109.05.A**, and **109.06**. If the Contractor disagrees with the Engineer's decision or does not agree with the Contract adjustments, the Contractor may pursue the issue as a claim in accordance with **105.16**.

Subsection 106.06.A.1, (pg. 61), 12-15-21; **Field Laboratory, Type A**; Revise No. 1:

1. Scales of appropriate capacity and design to weigh the required samples. Scales are to be sensitive to within 0.1% of the sample to be weighed. Provide standard weights for scale calibration. Scale calibration shall be completed annually, by an independent source.

Subsection 107.13, (pg. 75), 1-9-23; **Legal Responsibilities of the Contractor**; Add New 3rd Paragraph:

The Contractor certifies that it is not currently engaged in, and covenants that it will not, for the duration of the Contract, engage in a boycott of Israel, as that term is defined in Tenn. Code Ann. § 12-4-119. This certification does not apply to a Contract with a value of less than two hundred fifty thousand dollars (\$250,000) or if the Contractor has fewer than ten (10) employees.

Subsection 107.20, (pg. 78), 12-19-22; **Certified Payrolls**; Revise Subsection:

As specified by Minimum Wage Scales for Federal-Aid and State Funded Construction contract provisions, submit and certify payrolls for each week in which any contract work is performed. All payrolls shall be submitted electronically through the website using AASHTOWare Project Civil Rights & Labor (CRL) software.

Register for payroll access and develop a method of import prior to the Preconstruction Conference. Ensure each subcontractor, including all Disadvantaged Business Enterprises (DBE), certified Small Business Enterprises (SBE), and DBE or SBE haulers, has registered in CRL for payroll access and developed their method of import prior to commencing Work.

Assume all responsibility for ensuring all payrolls and all subcontractor payrolls are submitted and certified electronically in CRL for each week in which any contract work is performed. If all payrolls are not received in this timeframe, the progress payment shall be withheld until all necessary payrolls have been received.

Once Work begins for the Contractor or subcontractor, if in any week the Contractor or subcontractor does not perform Work, check the box “No Work Until Further Notice” in CRL.

Subsection 108.01, (pg. 79, 80), 12-15-21; **Subletting of Contract**; Revise Item list:

- Item 105-01 – Construction Stakes, Lines and Grades
- Item 202-01 – Removal of Asbestos
- Item 203-40 – Rock Anchors, Anchor Blocks, Tie Back Anchors
- Item 209 – Project EPSC
- Item 411-12 - Scoring
- Item 411-33 – Stamped Asphalt
- Item 501-03 – Concrete Shoulder Rumble Strip
- Item 503-01 – Grinding Concrete Pavement
- Item 602-03 – Steel Structures
- Item 602-04 – Steel Structures
- Item 602-10.81 – Heat Straightening
- Item 603-02 – Repainting Steel Structures
- Item 603-05 – Containment and Disposal of Waste
- Item 604-04.01 – Applied Texture Finish (New Structures),
- Item 604-04.02 – Applied Texture Finish (Existing Structures)
- Item 604-04.10 – Graffiti Protection
- Item 604-04.20&.21 – Painting or Staining Concrete Surfaces
- Item 604-04.62 – Clean and Texture Finish Median Barrier
- Item 604-05.31 – Bridge Deck Grooving (Mechanical)
- Item 604.07 – Retaining Wall
- Item 604-42.01 – Underwater Divers
- Item 606-26.05 – Core Drilling for Piles (Abandoned)
- Item 617 – Bridge Deck Sealant
- Item 619 – Polymer Modified Concrete Overlay
- Item 624 – Retaining Wall
- Item 625-01.08,10,11 – Inclinometer, Camera Drilled Shaft Inspections
- Item 705 – Guardrail

- Item 706 – Guardrail Adjusted, Removed and Reset
- Item 707 – Fences
- Item 712 – Temporary Traffic Control
- Item 713 – Highway Signing
- Item 714 – Roadway and Structure Lighting
- Item 716 – Pavement Markings
- Item 721 – Landscape and Irrigation
- Item 724 – Landscape Lighting
- Item 725 – ITS items
- Item 730 – Traffic Signals
- Item 740 – Geosynthetics
- Item 79* – Utilities
- Item 801 – Seeding
- Item 802 – Landscape Plantings
- Item 803 – Sodding
- Item 805 – Erosion Control
- Item 806 – Project Mowing

Subsection 108.01, (pg. 79, 80), 12-19-22; Subletting of Contract; Add to & Revise Item list:

- Item 108-03 – CPM Project Schedule
- Item 203-11 – Scaling and Trimming
- Item 203-40 – Anchors
- Item 406 – High Friction Surface Treatment
- Item 617 – Bridge Deck Sealant and Thin Epoxy Overlay

Subsection 108.03.A, B, & C, (pg. 81,82,85,87,88), 9-7-21; Contract Change Notification; A & B; Revise Heading, C.1.c; Add new No.vi, C.3; Revise last paragraph, C.4; Revise last paragraph & add sentence:

A. Project Durations Less Than 9 Months

B. Project Durations 9 Months to 24 Months

C.1.c Narrative report in PDF file format fit to 8.5x11 inch paper and including:...

- vi. The quantity and estimated daily production rate for controlling activities;
- vii. Description of the calendars including identification of workdays per week, holidays, number of shifts per day, and number of hours per shift;
- viii. Description of how the schedule accommodates adverse weather days for each month; and

- ix. Description of execution plan, including number and type of crews, a list of subcontractors' crews, and expected equipment, but not limited to large equipment transport and delivery, transportation permits for oversized/overweight loads, and availability.

3. Baseline CPM Schedule.

The Engineer and Contractor will review the draft baseline CPM schedule at a meeting specific for the review of the schedule. The Engineer will accept the draft baseline CPM schedule, provide review comments, or request additional information. Make appropriate adjustments or provide additional information within 14 calendar days. The Engineer's acceptance is based solely on whether the baseline schedule meets the requirements of **108.03**. Review comments made by the Engineer on the initial schedule will not relieve the Contractor from compliance with the Contract. The Contractor is responsible for scheduling, sequencing, and prosecuting the Work to comply with the Contract requirements.

4. Schedule Updates.

Submit the updated schedule electronically to the Engineer in accordance with the requirements of this subsection. The Engineer reserves the right to reject any schedule updates because of changes in relationships between activities on the critical path, inadequate or inaccurate narrative updates, or other deficiencies in the schedule updates as required in this subsection.

The Department will measure and pay for CPM Project Schedule in accordance with **108.11** and **108.12** respectively.

Subsection 108.03.C, (pg. 84, 87-88), 6-1-23; Prosecution of Construction, Project Durations Greater Than 24 Months or When Required By Contract; Revise 1st Paragraph, C.4; Revise 1st and Relocate last Paragraph:

Develop a Critical Path Method (CPM) project execution schedule and subsequent updates as required or as specifically requested by the Engineer. Generate the CPM schedule using Primavera Project Management (P6) scheduling software. The Department will measure and pay for CPM Project Schedule in accordance with 108.11 and 108.12 respectively.

C.4. Schedule Updates. Update the CPM schedule on a quarterly (3 months)~~monthly~~ basis to show current progress. Include the following with each update:

~~The Department will measure and pay for CPM Project Schedule in accordance with 108.11 and 108.12 respectively.~~

Subsection 108.03.D, (pg. 88-89), **6-1-23; Schedule Revisions**; Revise 1st Paragraph and Revise No. 2:

The Engineer will determine the progress of the Contract by either the time versus money straight line method or the schedule updates submitted by the Contractor. If actual construction falls behind the plan of operations or schedule by more than 15% or 60 calendar days, whichever is less, ~~submit~~offer for approval a revised schedule that reflects timely completion. ~~Otherwise, t~~The Engineer may request a revision of the ~~ed~~ schedule at any time if a critical circumstance regarding the scheduling, sequencing, or prosecution has changed with planning or progress of the Work. Circumstances that may lead to such a request include the following:

- 2. A difference of 60 calendar days between the actual sequence or duration of work and that depicted in the schedule; ~~or~~

Subsection 108.09, (pg. 95), 12-19-22; **Failure to Complete Work on Time**; Revise **Table 108.09-1**:

Table 108.09-1: Liquidated Damages for Failure to Complete the Work on Time

Original Contract Amount (\$)			Daily Charge (\$/day)
0	to	500,000	500.00
> 500,000	to	1,000,000	600.00
> 1,000,000	to	2,000,000	800.00
> 2,000,000	to	10,000,000	1,000.00
>10,000,000	to	20,000,000	1,600.00
>20,000,000			2,500.00

Subsection 108.11, (pg. 99), 9-7-21; Method of Measurement; Add subsection 108.11:

108.11 Method of Measurement

The Department will measure construction CPM Project Schedule as a percentage of the lump sum price bid for the completion of the work specified in **108.03.C** and partial payment will be made according to the schedule in Table 108.11-1.

Table 108.11-1: Payment Schedule for CPM Project Schedule

Estimate Number or Percent of Total Contract Amount of Previous Estimate	Total Percent of CPM Project Schedule Lump Sum Bid Item
Estimate # 1	20%
Estimate # 3	40%
20%	50%
40%	60%
60%	70%
80%	80%
95%	100%

Subsection 108.11, (pg. 99), 6-1-23; Method of Measurement; Revise Table 108.11-1:

Table 108.11-1: Payment Schedule for CPM Project Schedule

Estimate Number Requirement or Percent of Total Contract Amount of Previous Estimate	Total Percent of CPM Project Schedule Lump Sum Bid Item
Estimate # 1 Initial Project Schedule	2 10%
Estimate # 3 Baseline CPM Schedule	40%
20%	50%
40%	60%
60%	70%
80%	80%
95%	100%

Subsection 108.12, (pg. 99), 9-7-21; **Method of Measurement**; Add subsection **108.12**:

108.12 Basis of Payment

The Department will make partial payments for CPM Project Schedule on the basis of a percentage of the lump sum price bid in accordance with the schedule shown in Table 108.11-1.

If the Contractor fails to provide monthly schedule updates or address the Engineer's comments regarding the monthly schedule update, within 10 calendar days following the progress estimate pay period cutoff date, the Engineer will withhold payment for CPM Project Schedule and may withhold up to an additional 5% of the monthly estimate payment, until such time as an acceptable update has been provided.

No additional payments will be made for schedule revisions as requested per **108.03.D**.

Such payment is full compensation for meeting all requirements of **108.03.C** and **D**.

Subsection 108.12, (pg. 99), **6-1-23**; **Method of Measurement**; Add new 2nd Paragraph and Revise existing 2nd and 3rd Paragraphs:

If the Contractor fails to provide an Initial Project Schedule or a Baseline CPM schedule, or address the Engineer's comments regarding the Initial Project Schedule or Baseline CPM schedule, within 10 calendar days following the progress estimate pay period cutoff date, the Engineer will withhold payment for CPM Project Schedule and may withhold up to an additional 10% of that month's estimate payment, until such time as an acceptable Initial Project Schedule or Baseline CPM schedule has been provided and accepted.

If the Contractor fails to provide ~~quarterly~~ monthly CPM schedule updates, or address the Engineer's comments regarding the ~~quarterly~~ monthly schedule update, within 10 calendar days following the progress estimate pay period cutoff date, the Engineer will withhold payment for CPM Project Schedule and may withhold up to an additional 5% of ~~that~~ the month's ~~ly~~ ly estimate payment, until such time as an acceptable update has been provided and accepted.

No additional payments will be made for Engineer requested schedule revisions as requested per **108.03.D**.

S T A T E

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Subsection 403.04, (pg. 286), 12-15-21; **Preparing Surface**; Revise Paragraph:

Prepare the designated surface as specified in **405.05**. Ensure that the surface is dry when applying tack coat.

Subsection 403.05.C, (pg. 286), 12-15-21; **Fog Sealing**; Revise 1st Paragraph:

When the Contract requires bituminous material for fog sealing of shoulders, provide emulsified asphalt meeting **403.02** or an item from QPL 40A. Apply diluted emulsified asphalt at a rate of 0.10 to 0.15 gallons per square yard based on a dilution rate of one part emulsified asphalt to one part water. This application may require two equal increments if run-off occurs. Apply fog seal when the ambient air temperature or the surface temperature is a minimum of 50°F.

Subsection 407.06.B, (pg. 324), 12-19-22; **Material Transfer Devices (MTDs)**; Revise 2nd Paragraph:

The MTD shall have a minimum storage capacity of 15 tons and shall be equipped with mixing augers in the bottom of the storage hopper that are capable of remixing or re-blending the material as the material is removed from the storage hopper. The mixing augers shall be operational and used at all times during placement of the asphalt mixes. The MTD shall have a rear discharge conveyor that swivels ~~a minimum of 150 degrees~~ to allow feeding the paving machine from the front, side or rear.

Subsection 407.09, (pg. 326-327), 12-15-21; **Weather Limitations**; Revise No. 2 & 3:

- 2. The bituminous plant mix is placed according to the temperature limitations specified in Table 407.09-1 and when weather conditions otherwise allow the pavement to be properly placed, compacted, and finished. Placement may proceed if either the air or surface temperature is met except for 411-TL, 411-TLD, 411-TLE, and 411-OGFC mixtures.

Measurement of the surface temperature shall be done on pavement that is shaded from direct sunlight unless no shaded location exists. If paving based on the air temperature, stop work once the air temperature falls below the minimum threshold. Do not start paving if the surface temperature does not meet the requirements and the air temperature is forecast to fall below the minimum temperature within 4 hours of starting work.

Table 407.09-1: Temperature Limitations

Compacted Thickness	Minimum Air or Surface Temperature (°F)	
	Unmodified mixes (PG 64, 67)	Modified mixes (PG 70, 76, 82)
	≤ 1.5 inches	45
> 1.5 inches to < 3.0 inches	40	50
≥ 3.0 inches	35	45

- 3. For 411-TL, 411-TLD, 411-TLE, and 411-OGFC mixtures, placement shall proceed only when the pavement surface temperature and the air temperature are a minimum of 55° F and rising. Stop paving if the air temperature falls below 55°F immediately. Placement of these mixtures is restricted to the period between April 1 and October 31.

For all other mixtures, do not place bituminous plant mix, with a compacted thickness of 1.5 inches or less, between November 30 and April 1. Do not place bituminous plant mix, with a compacted thickness greater than 1.5 inches, between December 15 and March 16. If the temperature meets the above requirements, outside of normal paving season, a request for a seasonal limitation waiver may be submitted for Departmental consideration. Requests shall be submitted in writing at least one week before the anticipated need.

Subsection 407.15.A, (pg. 334), 12-19-22; **Compaction, General**; Revise Table 407.15:

Table 407.15 – Roller Requirements by Mix Type

Mix Type	Roller Requirements
307-A, 307-B, 307-BM-2, 307-C, 307-CW (except surface)	3 Rollers (Intermediate roller shall be Pneumatic)
307-AS, 307-ACRL, 411-D, 411-E, 307-CW (surface), 313-Asphalt Treated Permeable Base	3 Rollers (unspecified)
411-TL, 411-TLD, 411-TLE (when lift thickness > 1 inch)	3 Rollers (unspecified)
411-TL, 411-TLD, 411-TLE, 307-CS (when paved as a continuous layer)	2 Rollers (unspecified)
411-OGFC	2 Rollers (both rollers shall be static steel double drum, 10 Ton minimum)
Any mix used for scratch paving	2 Rollers (breakdown shall be pneumatic)

Subsection 407.15.C, (pg. 336-337), 12-15-21; **Test Strips**; Revise 1st Paragraph:

Construct test strips for all mixtures that require density testing to establish rolling patterns, to accommodate the Department to calibrate nuclear gauges, to verify that the base course or surface course mixture meets the density requirements of the specifications, and for mix design and production verification as required. Adjustments to the roller pattern may be made at the direction of the Engineer for mixtures that do not require density testing.

Subsection 407.20.C.3, (pg. 346-347), 12-15-21; **Loss on Ignition (LOI)**; Revise 2nd & Remove 4th Paragraph:

If the percent of LOI in the aggregate differs by plus or minus 2% from the LOI indicated in the JMF, the Department will make a payment deduction in the price bid for the mix applied to the entire days production, not as a penalty but as liquidated damages. The percent of total payment to be deducted will be 5 times the percent that the LOI exceeds the JMF tolerance of plus or minus 2%.

Subsection 411.03.B, (pg. 353), 12-15-21; **Proportioning**; Revise Table 411.03-01:

Table 411.03-1: Proportions of Total Mixture, Percent by Weight

Surface Course	Effective Combined Mineral Aggregate	Asphalt Cement
Grading D	93.0 – 94.3	5.7 – 7.0 ⁽¹⁾
Grading E ⁽²⁾	93.0 – 94.3	5.7 – 7.0 ⁽¹⁾
Grading E (shoulders)	93.5 – 94.0	6.0 – 6.5 ⁽¹⁾
Grading TL	92.5 – 94.3	5.7 – 7.5 ⁽¹⁾
Grading TLD	93.0 – 94.3	5.7 – 7.0 ⁽¹⁾
Grading TLE	93.0 – 94.3	5.7 – 7.0 ⁽¹⁾
Grading TLE (shoulders)	93.5 – 94.0	6.0 – 6.5 ⁽¹⁾
Grading OGFC	92.0 – 94.0	6.0 – 8.0 ⁽¹⁾

⁽¹⁾ If the effective combined specific gravity of the aggregate exceeds 2.80, the above proportions may be adjusted as directed by the Engineer. The upper limit for flow values shall not apply to mixes with modified asphalt liquids.

⁽²⁾ The minimum allowable asphalt cement content for 411E low volume mixtures is 5.3%.

Subsection 411.03.C.1, (pg. 358), 12-15-21; **Recycled Asphalt Pavement**; Revise 2nd Paragraph:

All mixes shall contain at least 80% virgin asphalt, except for 411E Shoulder and 411TLE Shoulder Mixtures, which shall have at least 65% virgin asphalt.

Subsection 414.03.B, (pg. 367), 12-19-22; **Micro-Surfacing**; Revise Table 14.03-3:

Table 414.03-3: Micro-Surfacing

Test	Requirement
Mixing Time Test, seconds at 77 °F (T-102)	120 min
Mix Time, at 50 and 100 °F	(informational)
Set Time Tests: 30 minutes (T-139)	12 kg-cm min
Early Rolling Traffic Time: 60 minutes (T-139)	20 kg-cm min
Wet Stripping Test, % coating (T-114)	90% min
Wet Track Abrasion Test, loss in g/ft ² (T-100)	75 max 6 days 50 max 1 hour
Measurement of Excess Asphalt (T-109)	50 grams/ft ² max Sand Adhesion, 1,000 Cycles at 125 lbs
Classification Compatibility (T-144)	11 pt. min
Loss on Ignition (LOI) Test, 407.03.E.3	(informational)

Subsection 414.06.B, (pg. 377), 12-19-22; **Quality Control**; Add Subsection 5:

5. Aggregate Gradation. Prior to the start of production and at a minimum of once per day of production, perform a washed gradation (AASHTO T 27 with AASHTO T 11) of the stockpiled aggregate to ensure the gradation meets the mixture control tolerances of Table 903.12-2.

Subsection 415.03, (pg. 382), 12-19-22; **General Requirements**; Revise 1st Paragraph:

Coordinate operations so that vertical longitudinal faces do not exceed ~~1-1/4 inches in~~ height requirements indicated by plans in areas to be used by public traffic. Taper transverse faces in a manner approved by the Engineer to avoid creating a traffic hazard. Perform cold planing in the direction of traffic.

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Subsection 501.13, (pg. 399), 12-19-22; **Testing Concrete**; Revise 2nd Paragraph:

The Engineer will determine the 28-day compressive strength of the concrete under construction by conducting tests during the progress of work in accordance with **604.15**. The method of making and curing test specimens will be in accordance with AASHTO ~~R 100F-23~~. Furnish the concrete necessary for the Engineer to conduct the field tests and provide a storage facility with watertight tanks of satisfactory size and number to accommodate the cylinder specimens. The Engineer may allow concrete that fails to meet the specified strength to remain in place, but the Department will pay for such concrete at a reduced price as specified in **604.31** to compensate for the loss of strength. Any reduction in payment because of low strength will be in addition to any reduction in payment related to deficiencies in pavement thickness or rideability.

STATE**OF****TENNESSEE**

(Rev. 12-15-21)

(Rev. 12-19-22)

January 1, 2021

Supplemental Specifications – 600SS**of the****Standard Specifications for Road and Bridge Construction****January 1, 2021****Subsection 602.04.A**, (pg. 429), 12-15-21; **Shop Inspection**; Revise A:

Fabricators of steel bridges shall hold the following certifications in accordance with the AISC Certification Program – Bridge QMS Certification:

1. As a minimum, all fabricators shall be certified in the category of Certified Bridge Fabricator – Intermediate Bridge (IBR) with applicable supplemental requirements.
2. Fabricators of advanced type bridges, as defined in the AISC Standard for Steel Bridges, shall be certified in the category of Certified Bridge Fabricator – Advanced (ABR) with applicable supplemental requirements.
3. Fabricators of diaphragms, cross-frames, floor beams, stringers (rolled beams) and laterals shall be certified in the category of Certified Bridge Fabricator – Intermediate Bridge (IBR), as a minimum.
4. Fabricators of bridge bearings, expansion joints, sign structures and other metal highway components as listed in the AISC standard shall hold certification under the AISC Certification Program – Bridge Component QMS Certification (CPT). As an alternative, fabricators of bridge bearing or expansion joints may hold certification under the Bridge QMS Certification in the category of Certified Bridge Fabricator – Intermediate Bridge (IBR).

Subsection 604.03.A.1.a, (pg. 502), 12-19-22; Design and Production Parameters; Revise Table 604.03-1 and 4th paragraph:

Table 604.03-1: Composition of Various Classes of Concrete

Class of Concrete	Min 28-Day Compressive Strength (psi)	Min Cement Content (pound per cubic yard)	Maximum Water/Cement Ratio (pound/pound)	Air Content % (Design ± production tolerance)	Slump (inches)
A	3,000	564	0.45	6 ± 2	3 ± 1 ⁽¹⁾
D, DS ^(2,3)	4,000	620	0.40	7 ⁽³⁾	8 max ⁽⁴⁾
L ^(3, 45)	4,000	620	0.40	7 ⁽³⁾	8 max ⁽⁴⁾
S (Seal)	3,000	682	0.47	6 ± 2	6 ± 2
X ⁽⁵⁶⁾					

- ⁽¹⁾ For slip forming, the slump shall range from 0 to 3 inches.
- ⁽²⁾ Use Class D concrete in all bridge decks except box and slab type structures unless otherwise shown on the Plans. Use Class DS concrete in bridge decks with polish-resistant aggregate described in 903.03 and 903.24.
- ⁽³⁾ Design Class D, Class DS, and Class L concrete at 7% air content. Acceptance range for pumping and other methods of placement is 4.5-7.5%. Sampling will be at the truck chute.
- ~~⁽⁴⁾ Water reducing admixtures are acceptable; however, do not exceed the maximum water/cement ratio in order to achieve the required slump.~~
- ⁽⁴⁵⁾ The unit weight of air dried Class L concrete (lightweight concrete) shall not exceed 115 pounds per cubic foot as determined according to ASTM C567.
- ⁽⁵⁶⁾ Plan specific requirements

Include chemical admixtures in the concrete mixture based on the ambient air temperature and expected weather conditions.

If using ~~chemical admixtures, a Type A, F, or G water reducer, then~~ the allowable slump shall be a maximum of 8 inches. Do not exceed the water cement ratio.

Subsection 604.03.A.1.d, (pg. 504), 12-19-22; Add Subsection d:

d. Performance Engineered Mixtures (PEM) Design and Production Parameters

Proportion the concrete based on a water-cement ratio that does not exceed the maximum shown in Table 604.03-3. The fine aggregate shall not exceed 50% by volume calculation of the total aggregate volume. The volume of paste shall not exceed 25%. The Contractor may elect to use PEM as an alternate/option in replacement of Class A concrete.

Document mixture adjustments, for moisture corrections, on the daily concrete report. Ensure that the adjusted mix complies with all the performance criteria specified in Table 604.03-3.

Table 604.03-3: Composition of Performance Engineered Concrete

Class of Concrete	Min 28-Day Compressive Strength (psi)	Min Cement Content (pound per cubic yard)	Maximum Water/Cement Ratio (pound/pound)	Air Content % (Design ± production tolerance)
PEM _(1,2,3,4,5)	3,000 ⁽¹⁾	-	0.45	6 ± 2

- ⁽¹⁾ Or as shown on the Plans or approved shop drawings.
- ⁽²⁾ Air Content must be accompanied with the Super Air Meter (SAM) number AASHTO T 395 for data collection only.
- ⁽³⁾ Resistance of Concrete to Rapid Freezing and Thawing AASHTO T 161 for data collection only.
- ⁽⁴⁾ Surface Resistivity Indication of Concrete’s Ability to Resist Chloride Ion Penetration AASHTO T 358 for data collection only.
- ⁽⁵⁾ Determining the Reactivity of Concrete Aggregates and Selecting Appropriate Measures for Preventing Deleterious Expansion in New Concrete Construction ASTM R80 for data collection only.

All Standards of Practice for Developing Performance Engineered Concrete Pavement Mixtures AASHTO R 101 are for data collection only.

Include chemical admixtures in the PEM mixture based on the ambient air temperature and expected weather conditions. Dosage rates for any admixtures incorporated into the concrete shall be stated during the mix design submittal process. All admixtures shall be compatible and incorporated into the concrete in accordance with the manufacturer’s recommendations. Concrete mixtures utilizing multiple admixture manufacturers shall prove compatibility in accordance with the Departmental procedures.

Subsection 604.03.A.2, (pg. 504-505), 12-19-22; **Mix Design Submittal**; Revise 1st and 3rd Paragraphs, and Add 6th Paragraph:

- 2. Mix Design Submittal.** Submit, for approval, the proposed design in accordance with Departmental procedures at least 14 days prior to use. Develop the design using saturated surface dry aggregate weights. The design shall be prepared in an approved testing laboratory by a TDOT Certified Concrete Mix Design Technician ~~or a Professional Engineer licensed by the State of Tennessee.~~ The TDOT Certified Concrete Mix Design Technician ~~or Professional Engineer licensed by the State of Tennessee~~ shall certify that the information contained on the design submittal is correct and is the result of information gained from the actual trial batch. Build trial batches for design no more than 90 days before submitting the design. The trial batch shall produce an average compressive strength to indicate that the specified 28-day strength can be obtained in the field. Make all strength determinations using equipment meeting the requirements of, and in the manner prescribed by, AASHTO T 22. The design shall provide concrete of the strength specified in all applicable Special Provisions, Plans, and Specifications. The approved mix design will expire at the end of each calendar year or if it does not meet the minimum 28-day strength requirements. Assume responsibility for all costs of concrete design, preparation, and submittal.

Self-consolidating concrete (Classes SCC, SH-SCC, and P-SCC) shall be verified prior to placement either at the ready mix, precast, or prestressed facility. The concrete producer shall notify Regional Materials and Tests a minimum of 1 business day prior to performing a trial batch verification of the submitted design, ~~in the presence of Regional Materials and Tests.~~ The trial batch will ensure that all batched quantities and target admixture dosage rates are acceptable and meet specification prior to design approval. All quantities and identified admixture target dosage rates shall meet the tolerances specified in **604.11**.

Performance engineered concrete (Class PEM) shall be verified prior to placement. The concrete producer shall perform trial batching in the presence of a Headquarters Materials and Tests representative. All quantities and admixture dosage rates shall meet the tolerances specified in 604.11. Gradations shall be submitted with each request.

Subsection 604.03.A.3, (pg. 506), 12-19-22; Partial Cement Replacement with Fly Ash or Slag Cement; Revise 3rd Paragraph, Table 604.03-03, and 4th Paragraph:

When designing Portland cement concrete with Type I or Type II cement modified by the addition of fly ash and/or slag cement, meet the maximum cement replacement rates (by weight) and minimum substitution ratios (by weight) specified in Table 604.03-~~43~~ for the applicable type of modifier.

Table 604.03-~~43~~: Type I or Type II Cement Modified by Fly Ash or Slag Cement

Modifier	Maximum Cement Replacement Rate % (by weight)	Minimum Modifier Cement Substitution Rates (by weight)
Slag Cement (Grade 100 or 120)	35.0	1:1
Class "F" Fly Ash	25.0	1:1
Class "C" Fly Ash	25.0	1:1

The Contractor may use ternary cementitious mixtures (mixtures with Portland cement, slag cement, and fly ash) for Class A, Class D, ~~and Class DS,~~ Class PEM concrete provided that the minimum Portland cement content is 50%. The maximum amount of fly ash substitution in a ternary cementitious mixture shall be 20%. The Department will allow Type IS cement with ternary cementitious mixtures. When using a Type IS cement, do not use any additional slag cement as a partial replacement for the hydraulic cement. The Department will allow a maximum of 20% fly ash as a partial hydraulic cement replacement in Class A concrete using only Type IS cement.

Subsection 604.03.B, (pg. 507-510), 12-19-22; **Quality Control and Acceptance of Concrete**; Revise 2nd and 5th Paragraphs, Add Sentence after 5th Paragraph, Revise Nos. 7,8,10,11, and 9th Paragraph:

The minimum size of a batch shall be 2.5 cubic yards. If less than 2.5 cubic yards is needed, the concrete must be provided by a Volumetric Continuous Mixer as specified in 604.04.C.

The concrete producer shall develop for the Engineer's approval and maintain at the plant a plant-specific Process Control Plan that shall apply to all Department contracts for the calendar year. Communicate all changes made to the Process Control Plan during the year to the Regional Materials and Tests Supervisor. Develop for the Engineer's approval a placement site Process Control Plan stating the procedures for sampling, testing, and inspection of the concrete. Maintain a record of all tests and inspections performed at the facility and placement site. Provide these documents to the Engineer upon completion of the Project for inclusion in the Project records. Provide a binder of current records in accordance with Departmental procedures.~~Keep records current and make them available to the Engineer for review at any time.~~

No water shall be added in the field for Class PEM concrete.

7. Conduct slump (~~AASHTO T 119~~) or slump flow (~~ASTM C1611~~) and air tests (~~AASHTO T 152~~). For Class PEM provide the Super Air Meter (SAM) number for informational purposes only.
8. Conduct yield tests (~~AASHTO T 121~~). If yield varies more than plus or minus 2% from that shown on the design, stop all batching operations until the problem has been identified and corrected or a new concrete design has been obtained. Additionally for Class PEM only, determine Unit Weight by AASHTO T 121.
10. Conduct tests for concrete and ambient air temperatures AASHTO T 309.
11. Provide a daily report to the Engineer that identifies the date, Contract and Project, Item number(s), batch weights, aggregate gradations, moisture corrections, admixtures, slump, air content, temperatures, and similar pertinent information.

The Department or its representative will be responsible for performing all acceptance tests. A TDOT Concrete Field Testing Technician or ACI equivalent will sample and test in accordance with Departmental 604.04 510 procedures. The Department will ensure the Contractors initial curing conditions are properly maintained during the initial curing period as specified in 722.09 and also be responsible for properly curing and transporting all acceptance cylinders are transported according to AASHTO R 100T-23.

Subsection 604.04.A.1, (pg. 511), 12-19-22; **Batching Plant, Multi-Aggregate Feed System, and Equipment, General**; Revise 2nd Paragraph:

All producers of concrete shall be on the Department's Producer List. ~~and be actively certified by the National Ready Mixed Concrete Association (NRMCA) Plant Certification Program.~~

Subsection 604.04.B.3, (pg. 513), 12-19-22; **Truck Mixers and Truck Agitators**; Revise 1st Paragraph:

~~Truck mixers shall be certified by the National Ready Mix Concrete Association (NRMCA) Delivery Vehicle Certification Program Option A or Option B. Each truck shall display the NRMCA certification card.~~ Ensure that truck mixers used for mixing and hauling concrete, as well as the truck agitators used for hauling central-mixed concrete, meet all the applicable requirements specified in **604.04.B.1**. Truck mixers shall have a manufacturer's plate indicating the various uses for which the equipment is designed, the gross volume of the drum, and the minimum and maximum speed of rotation of the drum or blades for charging, mixing and agitating. Equip truck mixers with an approved device for recording the number of revolutions of the drum or blades

Subsection 604.15.A, (pg. 532), 12-19-22; **Compressive Strength Tests of Concrete, General**; Revise 2nd Paragraph:

The frequency of testing for compressive strength to determine when forms may be removed, or when a structure may be put into service, shall be as requested by the Contractor or as deemed necessary by the Engineer in accordance with **604.15.C** or **604.15.D**.

Subsection 604.15.B, (pg. 532-533), 12-19-22; **Concrete Acceptance Cylinders**; Revise 1st, Remove 2nd and Revise 3rd, 5th, and 6th Paragraphs:

The Department will test the specimens for compressive strength according to AASHTO T 22. Provide the necessary concrete for making test specimens and adequate curing and storage facilities specified in 722.09 at no additional cost to the Department. Provide hourly temperature data for each day the specimens were kept in the initial curing environment.

~~Concrete cylinders submitted for testing beyond 28 days shall comply with the design strength requirements specified in 604.03 or the Plans.~~

If the acceptance cylinders fail to meet the specified strengths, the Contractor must provide QC data from ~~companion cylinders that meet or exceed the required strength, and TDOT Materials and Test shall perform a nondestructive test using a Swiss Hammer on the concrete to prove required strength is achieved the batching operation for the suspect concrete delivered and a letter of intent to core the suspect location,~~ and then the Contractor may drill core samples from the hardened concrete as verification of concrete strength instead of using the concrete cylinders. Companion cylinders shall be made from the same sample as the acceptance cylinders. If When these requirements are met, the Contractor may then elect to drill a minimum of two or maximum of three concrete core samples per set of cylinders from the hardened concrete. The ~~Cores~~ contractor shall be obtained the cores in accordance with Departmental procedures. Obtaining the concrete cores and repairing the concrete core holes shall be at no cost to the Department.

The Engineer will not accept ~~concrete cylinders and~~ cores submitted for testing beyond 56 days.

The average compressive strength of all the two cores taken to represent the failing concrete acceptance cylinders will be considered to be the acceptance strength of record for the in-place concrete. Any core that fails to meet the standard for cores in the Departmental procedures will be discarded untested and not considered in the average compressive strength. In accordance with **604.31**, the Engineer will accept at a reduced pay concrete that meets the required strengths specified in **604.03** or the Plans for the respective class.

Subsection 604.15.C, (pg. 534), 12-19-22; **Compressive Strength Tests of Concrete, Early Break Cylinders**; Revise 1st Paragraph:

Make and cure all test specimens according to AASHTO ~~R 100T-23~~, and the applicable procedures therein defined for Field Cured Specimens, unless otherwise specified by the Engineer. The Department will test the specimens for compressive strength according to AASHTO T 22. Provide the necessary concrete for making test specimens at no additional charge to the Department.

Subsection 604.15.D, (pg. 534), 12-19-22; **Compressive Strength Tests of Concrete, Maturity Method**; Add Subsection D:

D. Maturity Method

Strength of concrete in-place may be estimated by the Standard Practice for Estimating Concrete Strength by the Maturity Method AASHTO T 325 and Departmental procedures for critical activities. (open pavement to traffic, removing forms, post tension, shipping, cold weather). The Department will break a set of cylinders made from the pour in question to verify the strength-maturity relationship, the concrete will be accepted on the basis of the 28 day strength as defined by the strength-maturity relationship. If the cylinders break within 10% of the estimated strength based on the strength-maturity relationship, the concrete will be accepted on the basis of the 28 day strength as defined by the strength-maturity relationship. If the cylinders break outside of the 10% tolerance, the 28 day cylinders will be broken and the concrete will be accepted per 604.15.B.

Subsection 604.19, (pg. 541), 12-19-22; **Removal of Forms and Falsework**; Revise 3rd Paragraph:

~~The Contractor may~~ Release and remove falsework and supports under concrete structures only when the following conditions are met:

1. Representative specimens of the concrete, made and cured in accordance with **604.15.C**, attain a compressive strength of 3,000 pounds per square inch ~~or when Strength Maturity relationship indicates the concrete has achieved 3000 pounds per square inch and has been verified per 604.15.D.~~
2. The concrete has been in place a minimum of 7 days, not counting days of 24 hours each in which the temperature falls below 40 °F, or 21 calendar days, whichever occurs first.

Subsection 604.31, (pg. 557), 12-19-22; **Basis of Payment**; Revise 6th & 7th Paragraphs and Revise Equation:

Where concrete mixture does not meet the specified strength but is allowed to be included in the permanent construction as specified in **604.20** ~~or eores the acceptance strength of record fails~~ to meet the strengths specified in **604.15**, the Department will use the following equation to determine the percent price deduction for the invoiced price of the defective concrete mixture. payment of contract bid price.

$$PDP = 100 - (3 \times Ds) \times IP \times Q$$

Where:

~~PDP = Percent Price Deduction by the Dollar Payment~~

~~Ds = Percent Below Specified Strength~~

$$Ds = \left[\frac{(\text{Specified Strength} - \text{Actual Strength})}{\text{Specified Strength}} \right] \times 100$$

~~IP = Invoice Price by the Cubic Yard~~

~~Q = Quantity of Defective Concrete by the Cubic Yard~~

~~The Department will base the percent payment on the unit price of the item as bid, i.e., volume [cubic yards], length [feet], each, or other designated bid unit.~~

~~The price deduction shall only apply to the invoiced delivery cost of the defective concrete mixture. The deduction shall not apply to incidental items associated with the bid items such as labor, reinforcing steel, etc. Supply the Engineer with a certified invoice from the producer for the defective concrete mixture. The certified invoice will be for the cost of the concrete mixture with taxes and fees delivered to the project.~~

~~Payment of the calculated percentage includes cost of incidental items such as reinforcing steel when included in the price bid for the item.~~

Subsection 607.02.B, (pg. 579), 12-15-21; **Materials, Pipe Culverts, Cross Drains, Side Drains, & Storm Drains**; Remove 1st Sentence:

B. Pipe Culverts, Cross Drains, Side Drains, & Storm Drains

~~Where Pipe Culverts (Cross Drains & Median Drains) are specified, provide them in accordance with the following:~~

Subsection 607.07, (pg. 582), 12-15-21; **Joining Pipe**: Revise 5th paragraph.

HDPE, PP, SRTRP, and PVC pipe shall be joined in accordance with ASTM D3212 and meet the performance requirements for water-tight. Install joints so that the connection of pipe sections, for a continuous line, will be free from irregularities in the flow line.

Subsection 615.09, (pg. 624), 12-19-22; **Proportioning and Mixing of Concrete**; Revise 5th Paragraph:

Make concrete test specimens for Class P and Class P-SCC, in accordance with AASHTO ~~R 100T-23~~ and ASTM C1758 respectively, to determine the adequacy of the concrete design and the minimum time at which the stress may be applied to the concrete. Cure the test specimens used to determine the time at which stress may be applied in the same manner and under the same conditions as the bridge members. The initial curing of specimens to determine the design strength of the concrete shall be specified above with additional curing water, as provided in AASHTO ~~R 100T-23~~. The compressive strength of the concrete will be ~~determined from the average strength of at least two representative test specimens made and cured as specified above and tested in accordance with AASHTO T 22 estimated using the Maturity Method in accordance with 604.15.D.~~ The frequency of sampling and testing will be in accordance with Departmental procedures.

Subsection 619.04.A, (pg. 652-653), 12-15-21; **Volumetric Continuous Mixers**; Revise No. 3 & Ticket List:

3. The volumetric mixing plant shall be operated and calibrated by a Volumetric Mixer Operator with a TDOT Concrete Field Testing Technician Certification or equivalent. In the presence of the Engineer, perform the calibration of gate settings according to the manufacturer's recommendations for the mix design to be used before starting work. The calibration procedure shall account for the moisture content of the aggregates. The yield shall be maintained within a tolerance of plus or minus 1% and verified using a minimum 2 cubic feet container every 50 cubic yards. Recalibrations will be necessary when indicated by the yield checks, and at any other times the Engineer deems necessary to ensure proper proportioning of the materials.

Each load of concrete produced by a volumetric continuous mixing plant shall be accompanied by a Concrete Delivery Ticket. The ticket shall include as a minimum the following:

- a. Date
- b. Contract number
- c. County
- d. Class of concrete
- e. Concrete design number
- f. Number of cubic yards
- g. Load number
- h. Truck number
- i. Maximum water allowed by design
- j. Total water added
- k. Water-cementitious materials ratio
- l. Time loaded
- m. Time discharged
- n. Signature of producer's Volumetric Mixer Operator

Subsection 619.04.A, (pg. 653), 12-19-22; **Volumetric Continuous Mixers**; Revise Ticket List:

Each load of concrete produced by a volumetric continuous mixing plant shall be accompanied by a Concrete Delivery Ticket. The ticket shall include as a minimum the following:

- a. Date
- b. Contract number
- c. County
- d. Class of concrete
- e. Concrete design number
- f. Number of cubic yards
- g. Load number
- h. Truck number
- i. Maximum water allowed by design
- j. Total water added
- k. Water-cementitious materials ratio
- ~~l. Time loaded~~
- l. Time discharged
- m. Signature of producer's Volumetric Mixer Operator

Subsection 622.03.A, (pg. 665), 12-19-22; **Proportioning and Quality Assurance of Shotcrete, Proportioning**; Revise 3rd Paragraph:

Shotcrete shall meet the performance requirements specified in Table 622.03-1 and meet the requirements for cement replacement in 604.03.A.3.

Subsection 623.02.C.1, (pg. 673), 12-15-21; **Modular Roadway Expansion Joints, Fabrication and Construction**; Revise No. 1:

1. Construct the expansion joint systems as shown on the shop drawings. Meet the tolerance requirements included in AASHTO specifications. Perform all welding according to AWS specifications and by certified welders only. Ensure that fabricators are certified under the AISC Certification Program – Bridge Component QMS Certification (CPT). As an alternative, fabricators of bridge bearing or expansion joints may hold certification under the Bridge QMS Certification in the category of Certified Bridge Fabricator - Intermediate Bridge (IBR).

Subsection 623.03.C.2, (pg. 676, 677), 12-15-21; **Strip Seal Expansion Joints, Fabrication and Construction**; Revise No. 2:

2. Shop drawings shall also supply information regarding material specifications, geometry, a table of variable temperature and dimensions, and a bill of material. The maximum joint opening shall be 4 inches. Construct the expansion joint systems in accordance with the details shown on the shop drawings. Tolerance requirements shall be in accordance with AASHTO Specifications. Perform all welding in accordance with AWS specifications and by certified welders only. Ensure that fabricators are certified under the AISC Certification Program – Bridge Component QMS Certification (CPT). As an alternative, fabricators of bridge bearing or expansion joints may hold certification under the Bridge QMS Certification in the category of Certified Bridge Fabricator - Intermediate Bridge (IBR).

STATE

OF

TENNESSEE

(Rev. 12-15-21)

January 1, 2021

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Supplemental Specifications – 700SS

of the

Standard Specifications for Road and Bridge Construction

January 1, 2021

Subsection 702.02, (pg. 688), 12-19-22; **Materials, Revise 4th Paragraph:**

The Department will make compressive strength test specimens in accordance with AASHTO R 100T-23.

Subsection 705.06, (pg. 697-698), 12-19-22; **Installation of Posts; Revise 1st, 2nd, Nos. 1,2,3, & 4 and 4th Paragraphs:**

Before beginning any excavation or driving any guardrail post, determine the location of all underground electrical, drainage, and utility lines in the vicinity, and conduct work ~~so as~~ to avoid damaging these facilities. Dig or drill holes to the depth shown on the Plans and/or the approved Shop Drawings and to a size that will allow proper setting of the posts and sufficient room for backfilling and tamping. ~~Alternatively, the Contractor may d~~Drive posts using approved methods and equipment, provided the posts are erected in the proper position and are free of distortion, burring, or other damage.

If solid rock is encountered while installing guardrail posts to the minimum depth required. The installation of guardrail posts shall meet requirements that are detailed in the Departments Standard Drawings or approved Shop Drawings for drilling post holes.:

- ~~1. Within 18 inches of the ground surface, drill an oversized or elongated hole 24 inches into the rock. Set the post at the roadside edge of the hole, and backfill the hole with the cutting spoils.~~
- ~~a. If using wooden posts, either drill a single oversized hole 23 inches in diameter, or three overlapping holes 10 inches in diameter, to a length of 23 inches.~~
- ~~b. For steel posts, drill a single oversized hole, 20 inches in diameter, or three overlapping holes 8 inches in diameter, to a length of 20 inches.~~

~~2.—Below 18 inches of the ground surface, drill holes 12 inches into the rock or to the depth shown on the Plans. The holes shall be 8 inches in diameter for steel posts, and 12 inches in diameter for wood posts.~~

~~3.—If solid rock is encountered~~ ~~W~~When installing end terminals using tubes, install posts 1 and 2 to full depth or a minimum of 36 inches into the solid rock. Backfill the holes around the steel tube with the cutting spoils.

~~4.—~~See approved shop drawings for additional information concerning post depth and hole size.

Backfill dug holes with selected earth or other suitable materials in layers not to exceed 4 inches in thickness. Thoroughly tamp each layer. After backfilling and tamping is complete, hold the posts or anchors securely in place.

Subsection 705.06, (pg. 698), 12-15-21; Installation of Posts; Add new 7th Paragraph:

When an underground structure or utility prevents proper post installation for a run of guardrail, posts may be omitted along the run of guardrail only as detailed in the Department’s Standard Drawings. A post will not be omitted from any end terminal or transition. If the conditions noted for omitting posts cannot be used, then the use of a guardrail footing or weak post attachment to culvert may be used as detailed in the Department’s Standard Drawings

Subsection 705.10, (pg. 700), 12-15-21; Basis of Payment; Add new 7th Paragraph:

When posts are omitted from a run of guardrail, payment shall be as noted in the Standard Drawings.

- a. For 1 post being omitted, the Department will pay the contract unit price for W Beam Guardrail (Type 2) MASH TL-3.
- b. For 2 or 3 posts being omitted, the Department will pay for the linear feet of nested W Beam rail as detailed in the Standard Drawings at a rate equal of 1.5 times the contract unit price for W Beam Guardrail (Type 2) MASH TL-3.
- c. If a guardrail footing or attachment to culvert was used, the Department will pay for work as noted in the Standard Drawings.

Subsection 710.06, (pg. 723), 12-19-22; Aggregate Underdrains (with Pipe); Revise 1st Paragraph:

Excavate the trench to receive the pipe at the locations shown on the Plans or as directed by the Engineer. If the Plans do not show dimensions, construct the width of the trench to be not less than ~~the outside diameter of the pipe plus~~ 12 inches. Make the trench deep enough to intercept the water-bearing strata and to allow installation of the pipe and cover material. Unless otherwise shown on the Plans, spread a 2-inch layer of aggregate on the bottom of the trench, compact it, and bring to a uniform grade.

Subsection 712.02, (pg. 731-732), 12-15-21; Materials; Revise List:

Aluminum.....	916.02
Paint.....	910.02
Cold Rolled Carbon Steel -16 gauge	ASTM A1008
Non-metallic Drums and Barricades	QPL
Reflective Sheeting.....	916.06

Subsection 712.02.B, (pg. 732), 12-15-21; Temporary Pavement Marking Material; Revise 1st Paragraph:

Unless otherwise specified, the material for pavement marking shall be either temporary pavement marking tape listed on the Department’s QPL, or reflectorized paint with raised reflective pavement markers placed as shown on the Plans

Subsection 712.02.E, (pg. 733), 12-15-21; Portable Impact Attenuators; Revise Heading & 1st Paragraph:

E. Temporary Work Zone Crash Cushions

Temporary work zone crash cushions shall be in accordance with the Plans and Specifications, meet the requirements for the appropriate test level, and meet the requirements of and be listed on the Department’s QPL or Standard Drawings.

Subsection 712.04.B, (pg. 735-736), 12-15-21; THP Troopers and Uniformed Law Enforcement Officers; Revise 2nd Paragraph:

When a THP Trooper is not available, the Contractor may provide a Uniformed Law Enforcement Officer if approved by the Engineer and the Regional Safety Coordinator or Regional Operations Office. All Uniformed Law Enforcement Officers shall provide a marked Federal, State, County, City, or Metropolitan government law enforcement vehicle equipped with blue lights and have the authority to write traffic tickets and make arrests within the project site. The Uniformed Law Enforcement Officer shall maintain a detailed written log of enforcement activities and shall submit the log to the Engineer for verification each month.

Subsection 712.06, (pg. 743), 12-15-21; Temporary Marking; Revise Heading, Add No. 2, & Revise No. 1 & 3:

712.06 Temporary Pavement Marking

Unless otherwise specified, install temporary pavement marking as follows:

1. Provide 4-inch wide pavement marking (line) for center, edge, lane and barrier lines as shown on the Plans for projects that will have traffic maintained overnight. For temporary pavement markings (line) on intermediate layers of pavement, use reflective tape, reflectorized paint, and raised pavement markers, or a combination thereof as shown on the Plans or as required by the Engineer, and install meeting **716, 910.02, 919.04**, or Department's QPL at the end of each day's work. Short, unmarked sections will not be allowed. Preserve established no-passing zones, if any, on the existing pavement; if no-passing zones have not previously been established, establish them before beginning the work. Mark two-lane, two-way highways with 10-foot long center lines applied on 40-foot centers and appropriate no-passing barrier lines.
2. When required, provide temporary pavement markings at intersections for temporary pavement markings on intermediate layers of pavement. The Department will require temporary intersection pavement markings to be reflectorized paint, or removable pavement marking meeting **716, 910.02, 919.04**, and or Department's QPL.
3. Where required on the completed permanent pavement surface, meet **716.03**.

Subsection 712.09, (pg. 744, 745), 12-15-21; Method of Measurement; Revise No. 5, 7, 8 & Add 9:

5. Warning Lights and Flashing Arrow Boards by the unit, Changeable Message Signs per each for the type designated. Payment will be based on the maximum number in place at one time.
7. Temporary Work Zone Crash Cushion based on the initial installation of each. No additional payment will be made for removal, moving, and reinstalling at other locations on the Project as directed by the Engineer. Payment will be based on the maximum number in place at one time.
8. Temporary pavement marking (line) for edge, center, lane and barrier lines will be measured as listed in the plans, complete in place and accepted, as Painted Pavement Marking (Line) regardless of whether the lines are painted, taped markings, or raised pavement markers, or a combination of the above as shown on the Plans or as required by the Engineer. Only the marked line will be measured for payment.
9. Temporary pavement markings at intersections will be measured as listed in the plans complete in place and accepted as Painted Pavement Marking (Description) or Removable Pavement Marking (Description)

Subsection 712.10, (pg. 746, 747), 12-15-21; Basis of Payment; Revise Item List & Paragraphs 4, 5, 9, Remove Paragraph 8:

<i>Item</i>	<i>Pay Unit</i>
Traffic Control	Lump Sum
Portable Barrier Rail	Linear Feet
Temporary Work Zone Crash Cushion	Each
Signs	Square Feet
Flexible Drums	Each
Temporary Barricades (Type)	Linear Feet
Removable Pavement Marking (Description)	Linear Feet
Changeable Message Sign Unit	Each
Arrow Board (Type C)	Each
Barrier Rail Delineator	Each
Temporary Flexible Tubular Delineator	Each

Payment for Temporary Work Zone Crash Cushion will be made at the contract price, complete in place, with total payment based on the maximum number in place at one time as specified in **712.09**.

Payment for Signs (Construction) is full compensation for providing sign panels with proper sheeting and legend, erecting on proper supports, furnishing all mounting hardware, covering when not in use, relocating, handling, and maintaining until Project completion. Vertical Panels will be paid as Signs (Construction).

Payment for Removable Pavement Marking items shall be full compensation for the installation, maintenance, and removal of the marking line when it is no longer required.

Subsection 716.03.B, (pg. 790), 12-15-21; Application; Revise No. 3 & Add No. 4:

3. **Temporary Pavement Marking (Line).** When thermoplastic is used on the final pavement surface, the Contractor may use reflectorized paint for the center, edge, lane and barrier lines installed meeting **716.07** and **910** at the end of each day’s work and then install the permanent pavement marking after the paving operation is completed. Short, unmarked sections are not allowed. The Department will not directly measure and pay for temporary markings for the final surface and will consider the costs thereof to be incidental to the item for the permanent thermoplastic pavement markings (line).
4. **Temporary Pavement Markings at Intersections.** When required, temporary pavement markings at intersections are to be installed with reflectorized paint meeting **716.07** and **910**. The Department will measure and pay as noted in **712.09** and **712.10**,

Subsection 716.07.A, (pg. 793), 12-15-21; Application; Revise 11th Paragraph:

When reflectorized paint is required for temporary or final marking, install the paint meeting **910.02** at the end of each day’s work. Do not leave any short, unmarked sections.

Subsection 717.03, (pg. 799-800), 12-19-22; Basis of Payment; Revise Subsection:

The Department will pay for Mobilization on a lump sum basis.

The Department will make partial payments for Mobilization based on the amount bid for mobilization and the total original contract amount for all items of work. with the first and second partial pay estimates paid on the Contract. Payment will be made at the rate of 50% of lump sum price for Mobilization on each of these partial pay estimates provided the amount bid for Mobilization does not exceed 5% of the total amount bid for the Contract. If the amount bid for the item of Mobilization exceeds 510% of the total amount bid for the Contract, the Department will pay 2-1/2% of the total amount bid on each of the first partial payment estimates, and that portion exceeding 510% on the last partial pay estimate. Payments will be made according to Table 717.03-1.

Table 717.03-1: Payment Schedule for Mobilization

<u>Payment Estimate Number or Completion of Contract</u>	<u>Payment Amount whichever is least</u>	<u>Accumulated Payment whichever is least</u>
<u>Estimate # 1</u>	<u>25% Lump Sum Item or 2.5% Contract Price</u>	<u>25% Lump Sum Item or 2.5% Contract Price</u>
<u>5% of Contract (Excluding previous mobilization payments and stockpile payments per 109.09)</u>	<u>25% Lump Sum Item or 2.5% Contract Price</u>	<u>50% Lump Sum Item or 5.0% Contract Price</u>
<u>10% of Contract (Excluding previous mobilization payments and stockpile payments per 109.09)</u>	<u>25% Lump Sum Item or 2.5% Contract Price</u>	<u>75% Lump Sum Item or 7.5% Contract Price</u>
<u>50% of Contract (Including previous mobilization payments and stockpile payments per 109.09)</u>	<u>25% Lump Sum Item or 2.5% Contract Price</u>	<u>100% Lump Sum Item or 10.0% Contract Price</u>
<u>Last Partial Pay Estimate</u>	<u>Portion Exceeding 10%</u>	<u>Portion Exceeding 10%</u>

If 50% or more of the total original contract amount is completed by the payment of Estimate #1, a payment of 75% of the price bid for Mobilization will be made on Estimate #1. The remainder of the price bid for Mobilization will be paid on the following estimate.

As an exception to the above, where the Work covered by the Contract is limited exclusively to the resurfacing of an existing pavement, including projects involving the milling off of a portion of the existing pavement prior to the laying down of new asphalt cement concrete layer(s), the Department will pay the entire lump sum price for the item of Mobilization, less the retainage provided for in Title 54-5-121, TCA, with the first partial pay estimate paid on the Contract, provided the amount bid for Mobilization does not exceed 5% of the total amount bid for the Contract. If the amount bid for the item of Mobilization exceeds 5% of the total amount bid for the Contract, the Department will pay 5% of the total amount bid for the Contract on the first partial pay estimate, and the portion exceeding 5% on the last partial pay estimate.

Subsection 722.06.E, (pg. 803), 12-19-22; Interior Utility Services; Revise Subsection E:

E. Telephone, ~~Answering Machine,~~ and ~~Internet Facsimile Machine~~

Provide telephone service with ~~an answering machine~~ voicemail and two incoming phone lines.; Provide internet service with wifi and two data ports for wired connections. ~~a facsimile machine, and two incoming phone lines.~~

Subsection 722.09, (pg. 805), 12-19-22; Concrete Cylinder Storage; Revise 1st Paragraph:

Provide a storage facility (shed/building) for temporary storage of concrete acceptance cylinders. The storage facility shall be of sufficient size and construction to protect the concrete cylinders from the elements and damage. Obtain the Engineer's approval of the storage facility location. Department personnel ~~will control~~ shall have access to the storage ~~facility~~ shed/building. Equip the storage ~~facility~~ shed with a concrete curing environment consisting of a box or water curing tank with a heating/circulating system of sufficient size to properly cure all acceptance cylinders before transferring for final storage and testing. Provide a temperature measuring device capable of recording the conditions inside the curing environment. The curing ~~environment~~ box or curing tank and heater/circulator shall comply with AASHTO M 201, and proper curing of the cylinders shall be in accordance with AASHTO ~~R 100T-23~~. Temperature data for the curing environment shall be kept for the duration of the projects and made available to the Department upon request. The Department will not accept any concrete without the Engineers approval of the storage facility. The storage facility shall be equipped with a measuring device that will record the minimum and maximum temperatures inside of the curing area.

STATE

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Supplemental Specifications – 900SS
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Standard Specifications for Road and Bridge Construction
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Subsection 901.01, (pg. 900), 12-19-22; Hydraulic Cement; Revise List, 2nd, and 3rd Paragraphs:

- Portland Cement.....AASHTO M 85
- ~~Blended Hydraulic Cement Portland blast furnace slag cement (Type IS)~~ AASHTO M 240
- ~~Portland pozzolan cement (Type IP)AASHTO M 240~~
- ~~Portland limestone cement (Type IL).....AASHTO M 240~~

The maximum allowable equivalent alkalis ~~is 0.60%~~ for ~~all Portland cements~~ is 0.60 % and ~~blended cements when~~ used in ~~roadways concrete riding surfaces~~ with aggregates meeting the requirements of **903.24. This includes Class CP, A Paving, and DS concrete mixtures.**

Use Type I, Type IL, Type IP, or Type IS cement unless otherwise specified. Do not mix different types or sources of cement.

Subsections Listed, (pg. varied), 12-19-22; Hydraulic Cement 901.01; Revise Following Subsections:

- 204.06.B, (pg. 156), Revise Materials List:**
- 304.02, (pg. 230), Revise Materials List:**
- 306.02, (pg. 238), Revise Materials List:**
- 309.02, (pg. 252), Revise Materials List:**
- 312.05, (pg. 266), Revise 1st Paragraph first sentence:**
- 313.02, (pg. 270), Revise Materials List:**
- 616.03, (pg. 635), Revise Materials List:**
- 619.02, (pg. 650), Revise Materials List:**
- 619.03, (pg. 651), Revise Table 619.03-1:**
- 619.13, (pg. 657), Revise 1st Paragraph first sentence:**
- 622.02, (pg. 664), Revise Materials List:**

Subsection 903.03, (pg. 904-905), 12-19-22; Coarse Aggregate for Concrete; Revise 2nd,4th,5th,6th and 7th Paragraphs:

Coarse aggregate for hydraulic cement concrete to be used in the finished riding surfaces of roadways shall meet requirements of 903.24 unless otherwise specified. Coarse aggregate in Portland cement concrete for bridge decks (except decks that will be overlaid with HFST or Asphalt Pavements during the same construction season) and overlays on interstates and four or more lane highways consisting of Size No. 57 shall meet 903.24 unless otherwise specified.

Coarse aggregate in Portland cement concrete pavements for finished riding surfaces of travel lanes including mainline pavements and ramps shall consist of Size No. 467. Ensure that either the Size No. 4 or Size No. 67 fractions meet **903.24**. ~~Ramps using Class A paving concrete or any riding surface travel lane consisting of Size No. 57 shall meet 903.24.~~

Coarse aggregate in two-lift composite pavements shall consist of Size No. 467 in the lower lift, graded as specified in **903.22**, ~~the coarse aggregate for the lower lift does not have to meet the requirements of 903.24~~. Coarse aggregate in the upper lift shall be Size No. 57 or 67 graded as specified in **903.22** and shall meet **903.24** riding surface requirements.

~~Coarse aggregate in Portland cement concrete bridge decks and overlays on interstates and four or more lane highways consisting of Size No. 57 shall meet 903.24~~

The coarse aggregates for travel lanes and bridge decks shall be crushed and consist of stone, slag, gravel, quartzite, gneiss, or combination thereof, ~~with an~~ The absorption of plus 4 material shall not to exceed 5% on any individual aggregate. Do not use uncrushed gravel, pea gravel, or any other uncrushed particles. Crushed gravel, if used, shall consist of siliceous washed particles after processing, of which at least 70% by count of the material retained on the No. 4 sieve contains a minimum of two fractured faces. One face shall be fractured for the approximate average diameter or thickness of the particle.

Subsection 903.11.C.3, (pg. 920), 12-19-22; Grading OGFC; Remove 2nd Paragraph:

~~Recycled asphalt pavement (RAP) milled from Department or other State Highway Agency projects shall be assumed to contain 75% polish resistant material.~~

Subsection 903.12.B, (pg. 921-922), 12-19-22; Aggregate for Micro-Surface; Revise 1st, 2nd Paragraphs, and Table 913.12-2:

The aggregate shall be crushed slag, crushed granite, or crushed stone (crushed stone as specified in **903.24**) meeting the gradation limits specified in Table 903.12-2 and the physical properties of ASTM D692, except the percent of fractured pieces shall be 100. The aggregate shall meet the quality requirements in **903.25**. The aggregate shall have a minimum sand equivalent, as determined in accordance with AASHTO T 176, of 65. Polish-resistant aggregates will not be required for leveling courses, provided they will be covered with riding surface mixtures. ~~The contractor shall provide a Type A laboratory as defined by 106.06 capable of verifying gradation at the location of stockpiled material where blending occurs~~ **Provide a Type A laboratory as defined by 106.06 capable of verifying gradation at the location of stockpiled material where blending occurs**

If blending aggregates from more than one source, use automated proportioning and blending equipment which has individual bins for each aggregate source used to produce a uniform stockpile meeting the job mix formula gradation. Proportion and blending equipment shall be calibrated at the beginning of production. All aggregate sources shall be polish-resistant as specified in **903.24**. ~~The contractor shall provide a Type A laboratory as defined by 106.06 capable of verifying gradation at the location where blending occurs~~

Table 903.12-2: Gradation Limits for Aggregate for Micro-Surface Based on Wash Gradation

Sieve	Design Master Range (Total Percent Passing)	Mixture Control Tolerances
3/8 inch	100	
No. 4	70-98	±6.0 ±5.0
No. 8	45-70	±5.0
No. 16	28-50	±5.0
No. 30	19-34	±4.0 ±5.0
No. 50	12-25	±4.0
No. 100	7-18	±2.0 ±3.0
No. 200	4-15	±2.0

Subsection 904.03 (pg. 931-934), 12-15-21; **Emulsified Asphalt**; Revise Table 904.03-1(c):

Table 904.03-1(c): Test Requirements for Emulsified Asphalt

Practices	AASHTO Test Method	CRS-2P	RS-2	RS-1	CRS-1
Saybolt-Furol Viscosity @ 77 °F, seconds	T59	n/a	n/a	20-100	n/a
Saybolt-Furol Viscosity @ 122 °F, seconds	T59	100-400	75-400	n/a	20-100
Storage Stability Test, 24- h, %	T59	1 Max	1 Max	1 Max	1 Max
5-day Settlement, %	T59	n/a	n/a	n/a	n/a
Particle Charge	T59	Positive	n/a	n/a	Positive
Sieve Test, %	T59	0.1 Max	0.1 Max	0.1 Max	0.1 Max
Residue by	T59	Evaporation	Distillation	Distillation	Distillation
Residue, %	T59	65 Min	63 Min	55 Min	60 Min
Demulsibility, %	T59	40 Min	60 Min	60 Min	40 Min
Distillate, %	T59	n/a	n/a	n/a	n/a
Oil Test, %	T59	n/a	n/a	n/a	3.0 Max
Stone Coating	T59	n/a	n/a	n/a	n/a
Float Test, seconds	T50	n/a	n/a	n/a	n/a
Penetration	T49	75-175	100-200	100-200	100-250
Elastic Recovery, % ⁽¹⁾	T301	50 Min	n/a	n/a	n/a
Ductility @ 77 °F, cm	T51	40 Min	40 Min	40 Min	40 Min
Ductility @ 40 °F, cm	T51	n/a	n/a	n/a	n/a
R&B Softening Point, °F	T53	125 Min	n/a	n/a	n/a
Original G*/sind @ 82 °C	T315	n/a	n/a	n/a	n/a

⁽¹⁾ Straight-sided mold, 20-cm elongation, 5min hold, 25 °C

Subsection 914.01, (pg. 977), 12-19-22; **Non-Reinforced Concrete Pipe**; Revise 2nd Paragraph:

Manufacture all non-reinforced concrete pipe to meet the Department’s procedure for the Manufacture and Acceptance of Precast ~~Concrete Products, Drainage Structures, Noise Wall Panels, and Retaining Wall Panels.~~

Subsection 916.06, (pg. 988), 12-15-21; **Reflective Sheeting**; Revise Subsection:

Provide reflective sheeting from the Department's QPL conforming to AASHTO M 268 and the supplementary requirements for fungus resistance of AASHTO M 268. The sheeting material shall have a pre-coated adhesive backing or a heat and pressure activated adhesive backing protected by a removable liner.

For all signs with a SILVER-WHITE and ORANGE background when used on temporary barricades and channelizing drums, provide reflective sheeting that meets or exceeds AASHTO M 268, Type B.

For all permanent panel signs with a SILVER-WHITE, YELLOW, RED, GREEN, BROWN, or BLUE background, provide reflective sheeting that meets or exceeds AASHTO M 268, Type D.

For overhead permanent signs attached to sign structures which overhang travel lanes and are not illuminated with sign lighting, provide reflective sheeting that meets AASHTO M 268, Type D.

For all other sign types, provide reflective sheeting that meets or exceeds AASHTO M 268, Type B.

For FLOURESCENT ORANGE background, provide reflective sheeting that meets or exceeds AASHTO M 268, Type B.

Subsection 916.07, (pg. 988,989), 12-15-21; **Legends, Borders, and Accessories**; Revise Subsection:

Provide letters, numerals, symbols, borders, and route markers conforming to the MUTCD.

A. Type "A" Class I (Demountable)

Provide silver-white letters, numerals, symbols, borders, and route markers of a pre-coated pressure sensitive or a tack-free heat-activated adhesive reflective sheeting permanently adhered to the sign panel.

For all permanent panel signs, provide reflective sheeting that meets AASHTO M 268, Type D.

Mechanically apply the reflective sheeting to the properly prepared sign panel with the equipment and in a manner prescribed by the sheeting manufacturer. Letters, numerals, symbols, borders, and route markers shall be 0.032 inch thick aluminum sheet of 3003 H14 Alloy or approved composite material. Properly degrease and etch aluminum, or treat with a light, tight, amorphous chromate type coating.

Supply each letter, numeral, symbol, and route marker with mounting holes, and secure to the sign surface with corrosion-resistant screws, bolts, or rivets.

B. Type "A" Class 2 Cut-Out (Direct Applied Reflective Sheeting Copy)

Provide silver-white cut-out letters, numerals, symbols, borders, and route markers of a pre-coated pressure sensitive or a tack-free heat-activated adhesive reflective sheeting.

For all permanent panel signs, provide reflective sheeting that meets AASHTO M 268, Type D.

For all other sign types, provide reflective sheeting that meets or exceeds AASHTO M 268, Type B.

Subsections Listed, (pg. varies), 12-19-22; **Replace Reflective with Retroreflective 916.06; Revise Following Subsections:**

916.05.H, (pg. 986), **Revise 2nd Paragraph:**

916.05.H.3, (pg. 986), **Revise 1st Paragraph:**

916.05.I, .1, .2, (pg. 987), **Revise Heading, 1st, 2nd Paragraphs:**

916.06, (pg. 988), **Revise Heading, 1st, 2nd, 3rd, 4th, 5th, 6th Paragraphs:**

916.07.A, (pg. 989), **Revise 1st and 2nd Paragraphs:**

916.07.B, (pg. 989), **Revise 1st, 2nd, 3rd Paragraphs:**

916.08, (pg. 989-999), **Revise 1st, 2nd, 3rd, 4th Paragraphs:**

919.04, (pg. 1012), **Revise Heading, 1st Paragraph, List:**

919.05.A, .B, (pg. 1012-1013), **Revise Heading, 1st Paragraphs:**

712.02, (pg. 732), **Revise Materials List:**

712.02.B, .G, (pg. 732-733), **Revise 1st Paragraphs:**

712.04, (pg. 734), **Revise 2nd Paragraph:**

712.04.H.2.a(2), .2.e, (pg. 740-741), **Revise 1st Paragraphs:**

712.06.1, .2, (pg. 743), **Revise 1st Paragraphs:**

713.04.A, (pg. 749), **Revise 1st Paragraph:**

713.04.F, (pg. 753), **Revise 3rd, 4th, 5th Paragraphs:**

713.06.3, (pg. 754), **Revise 1st Paragraph:**

716.01, (pg. 784), **Revise 1st Paragraph:**

716.02, (pg. 784), **Revise Materials List:**

716.03.B.2.b, (pg. 789), **Revise 8th Paragraph:**

716.03.B.3, .4, (pg. 790), **Revise 1st Paragraph:**

716.04, (pg. 790-791), **Revise Heading, 7th Paragraph:**

716.05, (pg. 791-792), **Revise Heading, 1st Paragraph:**

716.06, (pg. 792), **Revise 2nd Paragraph:**

716.07.A, (pg. 795), **Revise 11th Paragraph:**

716.08, (pg. 797), **Revise Last Paragraph:**

716.08.G, (pg. 797), **Revise Heading:**

910.02.C.2.e, (pg. 969), **Revise Heading:**

Revise Index (pg. 1053 & 1056), **Revise:** Reflective Pavement Markers, Reflective Sheeting, & Snowplowable Reflective Pavement Markers.

Subsection 918.01.B & D, (pg. 1003, 1004), 1-30-23; **Grass Seed, Seed Groups**;
Revise Tables 918.01-1, 2, 3, & 6:

Table 918.01-1: Group A (February 1-July 1)

Kind of Seed	Quantity, Percent by Weight
Kentucky 31 Fescue	80
Korean Lespedeza White Clover	15
Annual Rye Grass	5

Table 918.01-2: Group B (June 1-August 15)

Kind of Seed	Quantity, Percent by Weight
Kentucky 31 Fescue	75
Korean Lespedeza White Clover	15
German Millet	10

Table 918.01-3: Group B1 (April 15 - August 15)

Kind of Seed	Quantity, Percent by Weight
Bermudagrass (hulled)	70
Annual Lespedeza White Clover	30

Table 918.01-6: Temporary Seeding

Seed Group (Season)	Kind of Seed	Percent by Weight
Group D (January 1 – May 1)	Annual Rye Grass	33-1/3%
	Korean Lespedeza White Clover	33-1/3%
	Spring Oats	33-1/3%
Group E (May 1 – July 15)	Sorghum-Sudan Crosses ⁽¹⁾ or German Millet ⁽²⁾	100%
		100%
Group F July 15 – January 1	Cereal Rye	66-2/3%
	Annual Rye Grass	33-1/3%

⁽¹⁾ Dekalb Sudan SX11, Lindsey 77F, TN Farmer’s Co-op GHS-1 or GHS-2A.

⁽²⁾ German Millet, GaHi-1

Subsection 921.09, (pg. 1022), 12-19-22; Grout; Revise Subsection:

~~Mix grout in small quantities as needed, and do not retemper or use grout after it has begun to set. Unless otherwise specified or directed, provide grout consisting of one part Portland cement and two parts sand by volume, mixed with sufficient water to form a grout of proper consistency. Submit grout mix designs to the Department's Materials and Tests. Grout designs shall use hydraulic cement meeting Portland cement conforming to the requirements of 901.01 or an appropriate alternative from the Department's Qualified Products List, and Use sand conforming to the requirements of 903.02.~~ Use water that has been approved by the Engineer.

When non-shrinking or non-shrinking fast-setting grout is specified, either formulate it by incorporating an admixture, or use a pre-mixed grout. ~~Obtain the Engineer's approval of the formulation and the admixture or the premixed grout.~~ Mix and use the grout in accordance with the manufacturer's recommendations. ~~These special grouts will be classified~~ Grouts will be reviewed as follows:

~~Type I — Non-shrinking Grout~~

~~Type II — Non-shrinking, Fast-setting Grout~~

A. Non-Structural Grout

Grout specified without a strength requirement will be non-structural and shall have its design submitted per Departmental procedures. Mix grout in small quantities as needed, and do not retemper or use grout after it has begun to set. Unless otherwise specified or directed, provide grout consisting of one part Portland cement and two parts sand by volume, mixed with sufficient water to form a grout of proper consistency.

B. Structural Grout

Grout specified with a strength requirement will be structural grout and shall have its design submitted per Departmental procedures.

APPENDIX B
SPECIAL PROVISIONS

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T E N N E S S E E

Rev: October 10, 2016

January 1, 2021

SPECIAL PROVISION

REGARDING

EMPLOYING AND CONTRACTING WITH ILLEGAL IMMIGRANTS

The State shall endeavor to do business only with those contractors and subcontractors that are in compliance with the Federal Immigration and Nationality Act. This policy shall apply to all State Contractors including subcontractors. This policy statement is issued to establish implementation guidance to procuring state agencies and contractors reflecting the requirements of *Tennessee Code Annotated* §12-3-309 regarding the employment of illegal immigrants in the performance of state contracts.

1. The Contractor hereby attests, certifies, warrants, and assures that the Contractor shall not knowingly utilize the services of an illegal immigrant in the performance of this Contract and shall not knowingly utilize the services of any subcontractor who will utilize the services of an illegal immigrant in the performance of this Contract. The Contractor shall reaffirm this attestation, in writing, by submitting to the State a completed and signed copy of the “Attestation form” provided by the Department, semi-annually during the period of this Contract.
2. Prior to the use of any subcontractor in the performance of this Contract, and semi-annually thereafter, during the period of this Contract, the Contractor shall obtain and retain a current, written attestation that the subcontractor shall not knowingly utilize the services of an illegal immigrant to perform work relative to this Contract and shall not knowingly utilize the services of any subcontractor who will utilize the services of an illegal immigrant to perform work relative to this Contract.
3. The Contractor shall maintain records for its employees used in the performance of this Contract. Said records shall include a completed federal Department of Homeland Security Form I-9, *Employment Eligibility Verification*, for each employee and shall be subject to review and random inspection at any reasonable time upon reasonable notice by the State.

The Contractor understands and agrees that failure to comply with this section will be subject to the sanctions of *Tennessee Code Annotated* § 12-3-309 for acts or omissions occurring after January 1, 2007. This law requires the Chief Procurement Officer, Department of General Services, to prohibit a contractor from contracting with, or submitting an offer, proposal, or bid to contract with the State of Tennessee to supply goods or services for a period of one year after a

contractor is discovered to have knowingly used the services of illegal immigrants during the performance of this contract.

For the Purposes of this policy, “illegal immigrant” shall be defined as a non-citizen who has entered the United State of America without federal government permission or stayed in this country beyond the period allowed by a federal government-issued visa authorizing the non-citizen to enter the country for specific purposes and a particular time period.

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(Rev. 12-15-20)

January 1, 2021

SPECIAL PROVISION

REGARDING

TENNESSEE DEPARTMENT OF TRANSPORTATION STANDARD

SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION

Description

Any and all references concerning the January 1, 2015 Standard Specifications for Road and Bridge Construction shall be interpreted as the January 1, 2021 Standard Specifications for Road and Bridge Construction.

STATE

OF

TENNESSEE

September 10, 2020

January 1, 2021

SPECIAL PROVISION

REGARDING

PROHIBITION ON CERTAIN TELECOMMUNICATION AND VIDEO

SURVEILLANCE SERVICES OR EQUIPMENT

Installation of telecommunication and video surveillance equipment, services or systems shall contain no components from providers as listed in Title 2 Code of Federal Regulations (CFR) Part 200.216.

The prohibition on certain telecommunication and video surveillance services or equipment regulation in Title 2 CFR 200.216 shall apply to this contract. Take all necessary and reasonable steps in accordance with Title 2 CFR 200.216 to ensure that no prohibited telecommunication and video surveillance services or equipment are included in any of the work in this contract. As defined in Title 2 CFR 200.471, the regulation provides clarity that the telecommunications and video surveillance costs associated with Title 2 CFR 200.216 are unallowable for services and equipment from the providers.

It is prohibited from installing equipment, services, or systems that use covered telecommunications equipment or services from providers described in section 889 of the National Defense Authorization Act for Fiscal Year 2019 (NDAA 2019).

As described in section 889 of the NDAA 2019, “covered telecommunications equipment or services” means:

- Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities);
- Video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities);
- Telecommunications or video surveillance services provided by such entities or using such equipment; or
- Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country. The term “covered foreign country” means the People’s Republic of China.

Any prohibited equipment installed must be removed and replaced at the contactor’s expense with acceptable equipment.

STATE

OF

TENNESSEE

(Rev. 2-8-21)

January 1, 2021

SPECIAL PROVISION

REGARDING

WATER QUALITY AND STORM WATER PERMITS

Description

This work consists of the conditions that apply to all construction activities on the project pursuant to the following:

1. Section 404 of the Federal Clean Water Act (33 U.S.C. §1344), and all implementing regulations, including without limitation regulations of the U.S. Army Corps of Engineers governing permits for discharges of dredged or fill material into waters of the United States in 33 CFR Part 323; and
2. The Tennessee Water Quality Control Act (T.C.A. §69-3-101, et seq.) and all implementing regulations, including without limitation the Rules of the Tennessee Department of Environment and Conservation governing NPDES permits in Chapter 400-40-10, and Aquatic Resource Alteration permits in Chapter 400-40-7; and
3. Section 26a of the TVA Act of 1933 as amended (49 Stat. 1079, 16 U. S. C. sec. 831y1.) and all implementing regulations, including without limitation the regulations of the Tennessee Valley Authority governing construction in the Tennessee River System in 18 C.F.R., Part 1304; and
4. The Tennessee Wildlife Resources Agency Reelfoot Lake Watershed Management permit program (T.C.A. section 70-5-1,.) and all implementing regulations, including without limitation regulations authorizing any activity, practice, or project which has or is likely to have the effect of diverting surface or subsurface water from the Lake or have the effect of draining or otherwise removing water from Reelfoot Lake; and
5. Coast Guard Bridge Permit (USCG) (Section 9 of the Rivers and Harbors Appropriation Act of 1899) and all implementing regulations, including but not without limitation for projects which impact streams deemed navigable by the U.S. Coast Guard.

Responsibility

Assume all responsibilities of the permittee as indicated in the permit that relates to protection of the "waters of the United States" and/or "waters of the State of Tennessee."

Obtain any additional permits required by the Contractor for off-site waste and/or borrow areas and associated off project work areas.

Sign the Notice of Intent (NOI) form, provided by the Department, indicating acceptance of the stipulations contained in the permit. Submit the signed NOI to the TDOT HQ Construction Division by email within 10 calendar days after submittal of the contract proposal or the Department may at its discretion cancel the award with the Contractor forfeiting the bid bond.

Implement the provisions of the Water Quality (including, but not limited to, TDEC ARAP, USACE 404, TVA Section 26a, Coast Guard, TWRA) and Storm Water [including, but not limited to, National Pollution Discharge Elimination System (NPDES), Statewide Stormwater Management Plan (SSWMP)] Permits and requirements that pertain to construction activities.

Review of the permit provisions, including NPDES Permit provisions the site specific SWPPP, the contract plans, Standard Specifications and contract Special Provisions and find the permit requirements and erosion prevention and sediment control (EPSC) procedures to be reasonable, workable, and binding.

The Contractor shall not be released from the project site responsibilities under the NPDES permit provisions until the Notice of Termination (NOT) is submitted to TDEC by the TDOT Regional Operations Engineer. The NOT is a certification that the construction project is permanently stabilized, and all construction related discharges have ceased. This means that the use of EPSC measures to alleviate concerns of surface erosion and transport of sediment to surface water conveyances or to waters of the state is no longer necessary. Furthermore, it means that permanent controls, hard surfaces and/or vegetation, used on the project are deemed adequate to prevent erosion and sediment transport and no other potential sources of construction-related pollution are on the project.

The Contractor shall not be released from any warranty provided for EPSC plantings, including sod and trees. If the entire project is complete as outlined in **105.15** of the Standard Specifications, the tree plantings shall still be required to meet the requirements of **802** Standard Specifications.

NPDES Permit Required Action

Accompany the TDOT EPSC inspector or TDOT consultant on all EPSC inspections of the entire construction project including permitted locations and potentially impacted streams, and attend all QA/QC Project Assessments.

EPSC Inspections shall be conducted as required in the most current TN Construction General Permit.

EPSC inspections shall be performed on the schedule established in the TN Construction General Permit until the site is permanently stabilized to determine if the permit requirements are being met. Where sites or portion(s) of the construction project have been temporarily stabilized, the inspections only have to be conducted once per month until construction activity resumes. Written

notification of the intent to change the inspection frequency and the justification for such request must be submitted to the TDOT District Supervisor and the TDEC Central Office before proceeding.

A representative who holds a current TDEC “*Fundamentals of Erosion Prevention and Sediment Control Level I*” certification shall accompany the TDOT EPSC inspector on all required EPSC inspections. The project supervisor(s) shall also hold a current TDEC “*Fundamentals of Erosion Prevention and Sediment Control Level I*” certification. Proof of required personnel training for the individual(s) shall be provided to the TDOT District Supervisor prior to beginning of construction.

The TDOT EPSC inspector shall document all deficiencies on the required current TDOT EPSC Inspection Report form. Sign the TDOT EPSC Inspection Report form and any supporting documentation indicating that there is agreement with the report, recommendations and repair schedule as stated in the documentation.

Make necessary maintenance and repairs relative to deficiencies in these permit conditions or requirements within 24 hours after an inspection identifies the maintenance or repair need, and/or as directed by the TDOT District Supervisor, unless conditions make a particular activity impracticable. Any such conditions that make immediate repairs impracticable shall be documented on the inspection report and provided to the TDOT District Supervisor, and be accompanied by an expected repair schedule based on forecasted weather conditions.

Review the site specific SWPPP that will be made available prior to or at the pre-construction conference, for any additional EPSC requirements. Sign and submit two copies of the SWPPP signature page provided by the Department in the site specific SWPPP. Submit for review and approval any changes/revisions to the SWPPP to prevent erosion and sediment transport at any time after contract execution. Rejection of any submittals by the Department does not relieve the liability for appropriate Best Management Practices (BMPs).

If at any time during this contract, the requirements for the Water Quality Permits and/or the Storm Water Permits for Construction Related Activities are changed/revised/updated, the Contractor shall be notified in writing by the Department of such requirements. Comply with the new requirements within 30 days of the Department notification.

If at any time that sedimentation is occurring or has occurred in streams impacted by the project, immediately notify the TDOT District Supervisor to evaluate the EPSC measures employed. A determination of the cause for sedimentation will be made by the Department. Immediately repair or replace defective EPSC measures and install, as applicable, additional or other EPSC measures with the goal of eliminating future sedimentation. Once a remediation plan is provided by the Department, within 24 hours after notification, begin the remediation as required. Based on the cause of sedimentation, the Department will determine if the cost of remediation will be performed at the Contractor’s expense.

Failure to Comply

In the event a Notice of Noncompliance, Notice of Violation, Notice of Deficiency, or Order is issued by any State or Federal Agency on this project, any required corrective action and all fines

will be the sole responsibility of the Contractor as outlined in **107.01** of the Standard Specifications.

Failure to comply or take immediate corrective actions required within 24 hours, unless documented conditions make a particular maintenance or repair activity impracticable immediately, shall be reason for the TDOT District Supervisor to suspend all other work on the Project, except EPSC and traffic control. The Department will apply non-refundable deductions of monies from the Contract per calendar day from monies due to the Contractor for any EPSC work on the Project. This deduction can be made for each location, as determined by the TDOT District Supervisor, for each calendar day that the deficiency is allowed to remain and charged as item description "*Failure to Comply with Permit Deduction*". A deduction shall be made from monies due the Contractor, not as a penalty, but as liquidated damages, as indicated in **108.09** of the Standard Specifications.

If the necessary corrections/adjustments are not done in a timely manner as required, the Department will implement the provisions of **209.07** and **109.08** of the Standard Specifications that provides for the Department making repairs and recovering the costs thereof from the Contractor.

The Department will not participate in any payment or reimbursement for fines and will not authorize time extensions due to delays in project progress for work stoppage, to remedy the violations stated within the NOV, required by the TDOT District Supervisor as stated in **105.01** of the Standard Specifications.

Spill Prevention, Control, and Countermeasure

To help prevent the discharge of oil into navigable waters, the U.S. Environmental Protection Agency (EPA) developed the Spill Prevention, Control, and Countermeasure (SPCC) Program. The SPCC Program is under the authority of Section 311 (j)(1)(C) of the Federal Water Pollution Control Act (Clean Water Act) in 1974. The rule may be found at Title 40, Code of Federal Regulations (CFR), Part 112. Additional information regarding the preparation and requirements of a SPCC Plan can be found at: <http://www.epa.gov/oem/content/spcc/>.

If applicable based upon the total aggregate capacity of aboveground oil storage, develop a site specific SPCC Plan per EPA requirements. This plan shall be provided to the TDOT District Supervisor as part of the required submittals during the project Pre-Construction Meeting or at which time the conditions on the project site meet the applicable criteria. Shall be responsible for obtaining any other necessary local, state, and federal permits as applicable. The SPCC Plan and/or permits shall be kept on-site.

Comply with all aspects of the site specific SPCC Plan including but not limited to performing any required inspections as directed by the SPCC Plan as well as implementing material and spill management practices per the project's SWPPP. In the event, where a release containing a hazardous substance in an amount equal to, or in excess of a reportable quantity established under either 40 CFR 117 or 40 CFR 302 occurs during a 24 hour period, immediately notify the TDOT District Supervisor.

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T E N N E S S E E

July 10, 2023

County: Haywood

Contract No. DB2301

SPECIAL PROVISION

REGARDING

PROJECT COMPLETION AND LIQUIDATED DAMAGES

All lane closures and operations must be coordinated with existing construction contracts in the area.

All temporary lane closures and road closures on State Routes must be approved by the Department in advance. Requests for temporary lane closure approvals and state trooper requests must be sent to the Department at least seven (7) calendar days in advance.

There will be periods when the Contractor will not be allowed to have closures due to major events and holidays specified in subsection 104.04 of the Standard Specifications, or as directed by the Engineer.

No full closures on SR-222 will be allowed. On SR-222, one (1) lane in each direction shall be always kept open along with access to the Blue Oval SK site and Keeling Road. Construction affecting ingress/egress into the Ford Plant at STA 3067+03.39, STA 3093+22.31, and Keeling Road shall not be allowed from 5:30 a.m. to 9:00 a.m. and from 4:30 p.m. to 8:00 p.m. or future adjustments to the Ford/SK Innovations shift changes. For each hour, or portion thereof, in which a lane is closed to traffic inside of these restrictions, the contractor will be charged \$5,000 per hour per lane, not as penalty, but as liquidated damages.

Local road closures will not be allowed. For each hour, or portion thereof, in which any local road lane is closed, the contractor will be charged \$2,000 per hour per lane, not as a penalty, but as liquidated damages.

Maintenance

Failure to complete pothole mitigation as described in RFP Book 3 Section 11.2 within a 24-hour period will result in the sum of \$500 per occurrence per day (or portion thereof) being deducted from monies due the Contractor, not as a penalty, but as liquidated damages, until pothole mitigation is complete. Failure to temporarily delineate damaged safety apparatuses, such as, but not limited to, guardrail and attenuators that present a hazard to the traveling public within 24 hours of discovery or notification will result in the sum of \$500 per occurrence per day (or

portion thereof) being deducted from monies due the Contractor, not as a penalty, but as liquidated damages, until temporary delineation is complete. Failure to complete permanent repairs within 10 calendar days of discovery or notification will result in the sum of \$500 per occurrence per day (or portion thereof) being deducted from monies due the Contractor, not as a penalty, but as liquidated damages, until the permanent repair is complete. Failure to begin and provide continuous mowing cycles on operational roadways per the Design-Builders submitted and concurred maintenance plan within 2 weeks will result in the sum of \$500 per occurrence per day (or portion thereof) until the cycle has begun. See RFP Book 3 Section 12.0 for mowing requirements.

Environmental

As outlined in the NPDES CGP, the Department will perform the monthly Environmental Quality Assurance Project Compliance Assessments (QA Inspections) on this Project, which will include any waste and borrow areas. Failure to comply with the regulations and have repeat non-conformances on QA Inspections, Water Quality violations or a NOV, the Department shall increase the frequency of QA inspections to twice per month. The extra QA inspection shall occur until the project has been brought back into compliance for two consecutive QA inspections. Until QA inspections return to once a month, each additional QA inspection in the sum of \$1,000 shall be deducted from monies due the Contractor, not as a penalty, but as liquidated damages.

Operation of Turning Lanes at STA 3067+03.39 and STA 3093+22.31

Construction of Turning lanes as depicted in RFP Book 3 section 1.2 and shown in Book 3 Appendix C shall be operational by June 30, 2024. For each day, or portion thereof, in which these Intersections are not operational, the sum of \$5,000 per day shall be deducted from the contractor, not as penalty, but as liquidated damages.

Project Completion

Failure to complete all work specified in the contract on or before the completion date set forth in RFP Book 2 Section D-3, a sum of money equal to \$11,000 per Calendar Day after the Design-Builder's established completion date shall be deducted from monies due to the Design-Builder, not as a penalty, but as liquidated damages.

Where provisions of this Special Provision conflict with Subsection 108.09 of the Standard Specifications, as amended, and Contract Book 3, this Special Provision prevails.

STATE

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(Rev. 1-3-13)

January 1, 2021

SPECIAL PROVISION
REGARDING
PAYMENT ADJUSTMENT FOR FUEL

This special provision covers the method of payment adjustment for fuel price increases or decreases. Payment adjustments will be made in monthly increments based on the estimated fuel consumed on major items of work, the estimated price per gallon of fuel at the time of letting, and the percentage change of the Producer Price Index for Light fuel oils, Series ID Number WPU0573, published by the U.S. Department of Labor, Bureau of Labor Statistics.

The estimated price per gallon of fuel for this contract is **\$ 1.48**

The October 2020 Price Index (Ib) for light fuel oils shall be used for this contract. Adjustments will be based on the price index in effect for the month in which the item was installed.

Fuel consumption for payment adjustment shall be based on the following:

Item Number	Description of Work	Gallons	Unit of measure
		per unit	
203	Any Road and Drainage Excavation	0.25	Cubic Yard
203	Any Borrow Excavation (Rock)	0.36	Cubic Yard
203	Any Borrow Excavation (Other than Solid Rock)	0.25	Cubic Yard
203	Any Borrow Excavation (Rock)	0.16	Ton
203	Any Borrow Excavation (Other than Solid Rock)	0.11	Ton
203-05	Undercutting	0.25	Cubic Yard
203	Any Embankment (in-place)	0.25	Cubic Yard
303, 309, 312	Any Aggregate Base	0.79	Ton
313, 501	Treated Permeable Base or Lean Concrete Base	0.10	Square Yard
307	Any Bituminous Plant Mix Base (HM)	2.98	Ton
411	Any Bituminous Concrete Surface (HM)	2.98	Ton
501	Any Portland Cement Concrete Pavement		
	≤ 10 in. thickness	0.25	Square Yard
	> 10 in. thickness	0.30	Square Yard

No payment adjustment for fuel shall be made on any item of work which is not listed above.

No payment adjustment for fuel shall be made unless the price index varies 5% or more from the index indicated in this Special Provision.

Where the price index varies 5% or more, the payment adjustment will be made as follows:

$$PA = [(Ic \div Ib) - 1] \times Fe \times Fp$$

Where:

PA =Payment Adjustment (may be plus or minus)

Ic =Index for Current Month

Ib =Index for Bidding

Fe =Estimated Fuel in Gallons used based on above table and work paid for during adjustment month. $[\sum (\text{Pay quantity} \times \text{Gallons per unit}) = Fe]$

Fp = Fuel Price for Bidding

The Project Engineer will compute the payment adjustment for fuel on work sheets similar to the one attached and will furnish a copy of the calculations upon request to the prime contractor and approved subcontractors.

Upon the expiration of the allocated working time, as set forth in the original contract or as extended by Change Order, payment adjustments for fuel will continue to be made only when the "Index for Current Month" is **less** than the "Index for Bidding" and varies 5% or more.

Payment adjustment, for fuel provided after the expiration of the allocated working time and where the "Index for Current Month" **exceeds** the "Index for Bidding", will **not** be made until after the contract records have been approved by Final Records (FR)/Materials & Tests (MT) and a Final Estimate is ready to be processed. Upon contract record approval by FR/MT, fuel payment adjustments shall be calculated for each month where the allocated working time has expired, the "Index for Current Month" **exceeds** the "Index for Bidding", and the indices vary 5% or more. The calculation of the fuel payment adjustment shall be made using the "Index for Current Month" or the "Index for Contract Completion Date" in accordance with the following formulas:

The "Index for Contract Completion Date" is the fuel index in effect on the allocated Contract Completion date or the completion date as extended by Change Order.

"Index for Current Month" is **less** than "Index for Contract Completion Date"

$$PA = [(Ic \div Ib) - 1] \times Fe \times Fp$$

"Index for Current Month" is **greater** than "Index for Contract Completion Date"

$$PA = [(Icd \div Ib) - 1] \times Fe \times Fp$$

Where:

- PA = Payment Adjustment (may be plus or minus)
- Ic = Index for Current Month
- Ib = Index for Bidding
- Icd= Index for Contract Completion Date (or as extended by Change Order)
- Fe = Estimated Fuel in Gallons used based on above table and work paid for during adjustment month. $[\sum (\text{Pay quantity} \times \text{Gallons per unit}) = \text{Fe}]$
- Fp = Fuel Price for Bidding

Payment Adjustment for fuel will be made under:

Item No.	Description	Pay Unit
109-01.01	Payment Adjustment for Fuel	Dollar

Monthly Payment Adjustment for Fuel Worksheet

Project No. _____ Contract No. _____

County _____

Fuel Price (Fp) _____ Price Index Bidding (Ib) _____ Current Price Index (Ic) _____

Index for Contract Completion Date (or as extended by Change Order) (Icd) _____

Estimate Period: Work Performed _____ Adjustment Paid _____
(Month/Yr)

Item	Unit	Quantity	Fuel Factor		Total Fuel
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____
_____	_____	_____	X	_____	_____

Total Fuel for Month (Fe) _____

$$PA = [(Ic \div Ib) - 1] \times Fe \times Fp$$

$$PA = [(Icd \div Ib) - 1] \times Fe \times Fp$$

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(Rev. 05-16-16)
(Rev. 04-01-19)
(Rev. 11-08-19)
(Rev. 3-2-23)

January 1, 2021

SPECIAL PROVISION

REGARDING

PAYMENT ADJUSTMENT FOR BITUMINOUS MATERIAL

This Special Provision covers the method of payment adjustment for bituminous materials.

100% Virgin Bituminous Material

A payment adjustment will be made to compensate for increases and decreases of 5% or more in the contractor's bituminous material cost. The normal bid items in the contract covering the bituminous material shall not be changed. Payment adjustments (+/-) shall be paid under "Payment Adjustment for Bituminous Material" and calculated as described herein:

A "Basic Bituminous Material Index" will be established by the Tennessee Department of Transportation prior to the time the bids are opened. This "Basic Bituminous Material Index" is the average of the current quotations on P.G. 64-22 from suppliers furnishing asphalt cement to contractors in the State of Tennessee. These quotations are the cost per ton f.o.b. supplier's terminal.

The "Basic Bituminous Material Index" for this project is \$_____ per ton.

The "Monthly Bituminous Material Index" is also established on the first day of each month by the same method. A payment adjustment shall be made provided the "Monthly Bituminous Material Index" varies 5% or more (+/-) from the "Basic Bituminous Material Index".

Where the price index varies 5% or more (+/-), the payment adjustment will be made as follows:

$$PA = [Ic - Ib] \times T$$

Where:

- PA = Price Adjustment for Adjustment Month
- Ib = Basic Bituminous Material Index
- Ic = Monthly Bituminous Material Index
- T = Tons bituminous material for Adjustment Month

Payment adjustment will be applied to all asphalt cement, asphalt emulsion, or bituminous material used for paving on this project.

Upon the expiration of the allocated working time, as set forth in the original contract or as extended by Change Order, payment adjustments for bituminous material will continue to be made when the "Monthly Bituminous Material Index" varies 5% or more (+/-) from the "Basic Bituminous Material Index".

The calculation of the bituminous payment adjustment shall be made using the "Monthly Bituminous Material Index" or the "Bituminous Material Index for Contract Completion Date" in accordance with the following formulas:

The "Bituminous Material Index for Contract Completion Date" is the Monthly Bituminous Material Index in effect on the allocated Contract Completion Date or on the completion date as extended by Change Order.

The "Monthly Bituminous Material Index" is **less** than the "Bituminous Material Index for Contract Completion Date".

$$PA = [Ic - Ib] \times T$$

The "Monthly Bituminous Material Index" is **greater** than the "Bituminous Material Index for Contract Completion Date".

$$PA = [Icd - Ib] \times T$$

Where:

- PA = Price Adjustment for Adjustment Month
- Ib = Basic Bituminous Material Index
- Ic = Monthly Bituminous Material Index
- Icd = Bituminous Material Index for Contract Completion Date (or as extended by Change Order)
- T = Tons

FOR REFERENCE ONLY

SiteManager or spreadsheet calculates the price adjustment based on the actual amount of asphalt cement (residue) in the emulsion using the following percentages:

- tack coats and shoulder sealants (e.g., SS-1, SS-1h, CSS-1, Css-1h) 63% residue
- prime coats (e.g., AE-P) 54% residue
- scrub seals and microsurfacing (e.g., CQS-1HP) 65% residue
- chip seals (e.g., CRS-2, CRS-2P) 69% residue
- hot in-place recycle (ARA-3P) 63% residue

Mixes Containing Recycled Bituminous Material

The quantity of virgin asphalt cement in tons subject to payment adjustment in recycled mixes shall be the product of the total tons of each mix multiplied by the difference between (1) the percent of asphalt cement specified for bidding purposes and (2) the percent of asphalt cement obtained from the recycled asphaltic material (RAP) used in each mix. No payment adjustment under this special provision for increases and decreases in the contractor's cost for virgin asphalt cement in recycled mixes will be allowed for asphalt cement content in excess of the percent specified for bidding purposes, as all payment adjustments for asphalt cement in the mix design of recycled mixes in excess of the percent of asphalt cement specified for bidding purposes will be made in accordance with the Standard Specifications.

No payment adjustment for bituminous material containing RAP shall be made unless the "Monthly Bituminous Material Index" varies 5% or more (+/-) from the "Basic Bituminous Material Index" indicated in this Special Provision.

Where the price index varies 5% or more (+/-), the payment adjustment will be made as follows:

$$PA = \frac{[Ic - Ib] \times [BA - RA]}{100} \times Tm$$

- PA = Price Adjustment for Adjustment Month
- Ib = Basic Bituminous Material Index
- Ic = Monthly Bituminous Material Index
- BA = Percent asphalt specified for bidding purposes
- RA = Percent asphalt obtained from recycled asphaltic material used in each mix
- Tm = Tons asphalt mix for adjustment month

Upon the expiration of the allocated working time, as set forth in the original contract or as extended by Change Order, payment adjustments for bituminous material containing RAP will continue to be made when the "Monthly Bituminous Material Index" varies 5% or more (+/-) from the "Basic Bituminous Material Index".

The calculation of the bituminous payment adjustment shall be made using the "Monthly Bituminous Material Index" or the "Bituminous Material Index for Contract Completion Date" in accordance with the following formulas:

The "Bituminous Material Index for Contract Completion Date" is the Monthly Bituminous Material Index in effect on the allocated Contract Completion Date or on the completion date as extended by Change Order.

The “Monthly Bituminous Material Index” is **less** than the “Bituminous Material Index for Contract Completion Date”.

$$PA = [Ic - Ib] \times \frac{[BA - RA]}{100} \times Tm$$

The “Monthly Bituminous Material Index” is **greater** than the “Bituminous Material Index for Contract Completion Date”.

$$PA = [Icd - Ib] \times \frac{[BA - RA]}{100} \times Tm$$

Where:

PA =	Price Adjustment for Adjustment Month
Ib =	Basic Bituminous Material Index
Ic =	Monthly Bituminous Material Index
Icd =	Bituminous Material Index for Contract Completion Date (or as extended by Change Order)
BA =	Percent asphalt specified for bidding purposes
RA =	Percent asphalt obtained from recycled asphaltic material used in each mix
Tm =	Tons asphalt mix for adjustment month

STATEOFTENNESSEE

(Rev. 12-01-02)

January 1, 2021

(Rev. 02-01-07)

(Rev. 10-20-07)

(Rev. 05-11-10)

(Rev. 10-8-18)

SPECIAL PROVISIONREGARDINGSECTION 411 – ASPHALTIC CONCRETE SURFACE (HOT MIX)

This provision sets up pavement smoothness requirements and how testing procedures, acceptance, and payment practices, will be handled by the Department.

Completed pavement surfaces of traffic lanes, including those on bridge deck surfaces on both the mainline and ramps between freeways that do not have stop or yield conditions shall be tested for smoothness with the Road Profiler in accordance with Department procedures.

For projects on all interstates and controlled access freeways that require the placement of BM or BM2 as a binder layer, the binder layer shall be tested for smoothness as soon as practicable after placement of the binder layer but prior to the placement of the final wearing surface. The binder layer shall have a maximum International Roughness Index (IRI) of 70 in./mi. Any lot, or fraction thereof, of the binder layer that is greater than 70 in./mi. shall be corrected prior to placement of the final surface mix. Ramps with posted speeds less than 45 MPH shall be excluded. All corrective action shall be approved by the Engineer and shall be completed at the Contractors expense including, but not limited to, grinding and asphalt leveling.

The Contractor shall be paid monies due for items in the surface mix based on the payment table below. Any lot (one mile or fraction thereof) of pavement where the Road Profiler's IRI value exceeds 80 inches per mile, as shown in the payment table below, will require corrective action. Any unacceptable lot(s) will be divided into 0.1-mile sub-lots for closer evaluation. The Contractor, at his discretion, shall choose those sub-lots, within the unacceptable lot, to correct in order to bring the overall lot into the acceptable smoothness range. However, the Contractor may not choose more than 3 sub-lots for repair, unless they are adjacent to each other and there are no more than 6 transverse joints. Otherwise, the entire lot will require corrective action. The minimum corrective action shall be the length of the entire sub-lot of 0.1 mile. The only acceptable corrective action is mill and inlay. Payment for the corrected one mile lot(s) will be based on the Road Profiler's International Roughness Index after corrective action has been taken.

Each lot of pavement will be tested by one pass of the Road Profiler. If corrective action is required, a second pass will then be made to determine the payment for the corrected lot(s).

Payment table for smoothness based on Road Profiler International Roughness Index values

SPECIFICATION			
411B			
Road Profiler Value IRI (IN/MI)	Percentage paid on bid price of surface items	Road Profiler Value IRI (IN/MI)	Percentage paid on bid price of surface items
Less than 35	110%	58	97%
35	110%	59	96%
36	109%	60	95%
37	108%	61	94%
38	107%	62	93%
39	106%	63	92%
40	105%	64	91%
41	104%	65	90%
42	103%	66	88%
43	102%	67	86%
44	101%	68	84%
45	100%	69	82%
46	100%	70	80%
47	100%	71	77%
48	100%	72	74%
49	100%	73	71%
50	100%	74	68%
51	100%	75	65%
52	100%	76	61%
53	100%	77	57%
54	100%	78	53%
55	100%	79	49%
56	99%	80	45%
57	98%	Greater than 80	Mill and Inlay*

* The mill and inlay shall be the thickness as specified on the plans for the surface layer.

STATE

OF

TENNESSEE

August 14, 2017
(Rev. 10-17-19)
(Rev. 11-5-21)

January 1, 2021

SPECIAL PROVISION

REGARDING

INTELLIGENT COMPACTION (IC) FOR HOT MIX ASPHALT (HMA)

Description

This work consists of the requirements for modification of standard HMA compaction equipment for the purpose of tracking and documenting location, and temperature. Compaction equipment and procedures shall meet all requirements listed in **407.07** and **407.15** except as modified herein.

Equipment

A. Rollers

Install Intelligent Compaction equipment meeting the requirements listed herein on the first (breakdown) and second (intermediate) roller in the roller train. Roller type(s) are to be as required in **Table 407.15 – Roller Requirements by Mix Type**. The IC systems may be either an integrated system or an added-on/retrofit systems.

B. Global Navigational Satellite System (GNSS)

Rollers shall be equipped with a GNSS units to monitor the equipment locations and track the number of roller passes utilizing the same reference system. GNSS system shall have a survey tolerance of not greater than 2.0 in in both the horizontal (x and y) directions.

GNSS receivers shall utilize the Universal Transverse Mercator (UTM) or Tennessee State Plane coordinate system. Once declared, the coordinate system utilized shall be the same for both rollers for the entire project.

GNSS data shall be in the following format:

1. Time: Military, local time zone, hhmmss.ss
2. GNSS: Latitude/Longitude, degrees/minutes; ddmm.mmmmmmmm or decimal degrees; dd.ddddddd
3. Grid: Meters, 0.001 m

C. Temperature Measurement

Rollers shall be equipped with non-contact temperature sensors for both the forward and reverse directions for measuring pavement surface temperatures. Temperature sensor shall be accurate to $\pm 3^{\circ}\text{F}$.

D. Integrated On-Board Documentation System

An on-board documentation system that is capable of displaying real-time color-coded maps of IC data as defined under Project IC Data.

The Intelligent Compaction System shall be capable of transferring the Project IC Data by means of cellular data upload to cloud storage during the day's production.

E. Cloud Storage and Cloud Computing

Provide a system of cloud storage and cloud computing. The cloud storage shall be sufficient to contain all Project IC Data associated with the contract and accessible to the Department. The cloud computing system shall support real-time visualization/mapping of the Project IC Data. Paving operations shall not begin until real-time access is granted to the Department.

Project IC Data is to be uploaded throughout the project in real-time if data cellular coverage allows, but not less than once per day otherwise. If cellular data coverage for uploading the data at the project site is unavailable, upload the data prior to the next day's production by other means.

Provide the Department with unlimited review access to the intelligent compaction records through cloud storage and cloud computing starting from the beginning of the project paving until project finalization.

Construction Requirements

A. Project IC Data

Track and record the Project IC Data for the contract. Project IC data shall consist of:

1. Location of the roller in real time,
2. Number of roller passes at a given gridded location,
3. Pavement surface temperatures associated with each roller pass, and
4. The roller speed associated with each roller pass.

All data is to be gridded in one foot by one foot grid.

At the end of the project, provide a copy of the final Project IC Data for each pavement layer in a separate digital file to the Department formatted in the most current version of Veta. Veta is available at www.intelligentcompaction.com.

Export the raw or gridded data:

1. Directly into Veta if a file format compatible with Veta is available, or
2. Through a direct transfer of data from cloud storage to Veta.

Ensure that the date/time stamp is reflective of the local time zone for both mapped and exported data.

B. System Failure

In the event that the intelligent compaction system does not work due to failure of the system, work may continue for the day's production. The Intelligent Compaction system must be operational prior to starting the next day's production.

Notify the Engineer if real time data cannot be uploaded to cloud storage due to lack of cellular data or satellite coverage. Notification must be made each day if real time uploading of data is unavailable. In instances where the file is not uploaded in real time to the cloud storage, it must be uploaded by other means prior to the next day's paving.

File Name

Name Veta project files (*.VETAPROJ) using filenames CNXXXX_ROUTE_HMA_YYY standardized format where XXXX is replaced by the contract number (e.g. Z999), YYY is replaced with the mix type (e.g. D, BM2, TLD, etc) and ROUTE is replaced with the five character State Route or Interstate designation (e.g. SR001 or I0040).

Method of Measurement & Basis of Payment

The Department will not measure and pay for Intelligent Compaction directly, and will consider such work incidental to other items of work relating to the placement of Asphalt.

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Rev. 03-17-15

January 1, 2021

Rev. 08-27-15

Rev. 12-7-15

Rev. 5-16-16

Rev. 5-14-18

SPECIAL PROVISION

REGARDING

RETAINING WALLS

General Description

This Special Provision covers the design requirements, submittal of wall design drawings and supporting calculations, materials, construction, measurement, and payment for earth retaining walls. The scope of work for retaining wall construction includes, but is not limited to, the following as required:

1. All grading necessary for wall construction,
2. Undercutting and backfilling of weak surficial zones, and or ground improvement as required by plans
3. Temporary Shoring/Wall
4. Compaction of wall foundations
5. General and local dewatering as required for proper execution of the work
6. Construction of leveling pads
7. Formwork, placement of reinforcing steel, placement and curing of concrete
8. Texture coating or architectural treatment
9. Placement of drainage materials
10. Installation of piling
11. Placement of soil reinforcing devices
12. Placement and compaction of backfill
13. Preparation and erection of wall units
14. Construction of any required caps, copings, or end sections

All items included in the construction of the retaining wall shall conform to this Special Provision, the *Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction*, henceforth referred to as the Standard Specifications, American Society for Testing Materials Standards (ASTM), Federal Highway Administration (FHWA) Technical Publications, the current edition of the *AASHTO LRFD Bridge Construction Specifications*, and the current *AASHTO LRFD Bridge Design Specifications* with interims, henceforth referred to as the AASHTO LRFD. The architectural treatment and/or texture finish of the walls shall be in accordance with the contract plans.

Design Criteria

The design of all types of earth retaining walls shall be in accordance with this Special Provision and the following Specifications as required:

1. AASHTO *LRFD Bridge Design Specifications* with interims
2. Publication no. FHWA-NHI-10-024, *Mechanically Stabilized Earth Walls and Reinforced Soil Slopes*
3. (FHWA Report No. FHWA-SA-99-018, 1999) *Geotechnical Engineering Circular No. 4, Ground Anchors and Anchored Systems*

The soil and/or rock properties and specific design values required for wall design are provided in the contract plans.

Submittal Requirements for Contractor/Supplier Prepared Design Plans

The Contractor shall utilize the information contained on the Retaining Wall Conceptual drawing as well as information shown elsewhere in the plans (i.e. utility sheets or traffic control/phasing sheets) to prepare his bid for the wall during the project bidding process and to prepare wall design plans during the construction of the project. The final design shall be submitted subsequent to contract award and a minimum of sixty (60) days prior to start of wall construction and shall include detailed design computations and all details, dimensions, quantities and cross sections necessary to construct the wall. Acceptable wall types will be identified on the concept drawing. Specific wall systems for the Acceptable Wall Types shall be selected from the Department's Qualified Products List (QPL 38) in effect at time of bid letting. In certain circumstances for a particular project, TDOT may elect to provide a complete, detailed wall design in the contract plans. The Contractor shall not bid for nor shall the Contractor submit plans for wall types and/or specific wall systems not listed as an Acceptable Wall Type on the Retaining Wall Conceptual Drawing and related drawings. If a specific wall design is provided for in the contract plans, the Contractor shall not bid for or submit plans for other wall types or design. (See Section 8 for the limited conditions under which other wall types or designs may be considered).

The plans shall be prepared to include but not be limited to the following items:

1. A plan and elevation sheet or sheets for each wall containing the following:
 - a. An elevation view of the wall showing grades at the top of the wall, every 50 feet along the wall and at all horizontal and vertical break points. Elevations at the top of leveling pads and footings, the distance along the face of the wall to all steps in the footings, and leveling pads, the designation as to the type of panel or module, the length, size and number of tiebacks, nails, mesh or strips and all the distances along the face of the wall to where changes in length of the reinforcing elements occur and the location of the original and final ground line should be shown. The Contractor shall be responsible for field verifying original ground elevations.
 - b. A plan view of the wall shall indicate the offset from the construction.

- c. centerline to the face of the wall at all changes in horizontal alignment, the limit of the widest module, tiebacks, nails, mesh or strip and the centerline of any drainage pipe which is behind, under, in front of or passes through the wall.
- d. Any general or special notes, standard or special drawings, or other unique provisions required for construction of the wall.
- e. All horizontal and vertical curve data affecting wall construction.
- f. Cross sections showing limits of construction and in fill sections, limits and extent of select granular backfill material placed above original ground.
- g. Limits and extent of reinforced soil volume
- h. Limits and extent of any ground improvements as required by the contract plans.
- i. Limits and extent of temporary shoring/retaining walls.

2. Details

- a. All structural details including reinforcing bar bending details. Bar bending details shall be in accordance with CRSI standards.
- b. All details for foundations and leveling pads, including details for steps in the footings or leveling pads.
- c. Wall Elevation drawings shall delineate the changes in wall design height with corresponding changes in reinforcement type and/or lengths for the design section.
- d. For each delineated wall design segment the Applied Factored Bearing Load at both the Service and Strength Limit States shall be shown.
- e. All modules and facing elements shall be detailed. The details shall show all dimensions necessary to construct the elements, all reinforcing steel in the element, and the location of reinforcement element attachment devices embedded in the facing.
- f. All details for construction of the wall around drainage facilities, overhead sign footings, abutment piles or other obstructions shall be clearly shown.
- g. All details for connections to traffic barriers, coping, parapets, noise walls and attached lighting shall be shown.
- h. All details for drainage behind wall or reinforced soil volume.
- i. If vehicular impact protection is required due to the wall system not satisfying the minimal design requirements of Section 5.0, details of the barrier wall and end terminals shall be shown on the Contractor/Supplier Design plans for the proposed wall.

3. Detailed design computations which clearly demonstrate compliance with design requirements provided in this specification.

4. Limits of design responsibility, if any.

5. Each design submittal shall include a detailed list of quantities for each wall unit. The quantities shall include but not be limited to: concrete cast in-place, pre-cast concrete, select backfill material, backfill material, reinforcing steel,

geomembrane/geogrid reinforcement, modular blocks, structural steel, pre-stressing steel, etc. If known, all materials sources shall be identified so acceptance and verification sampling and testing can be conducted. All quantities listed are for informational purposes only and do not necessarily constitute a pay item or quantity. All retaining walls shall only be paid for under the respective retaining wall bid item measured and described herein.

6. The Contractor's wall plans shall be signed, stamped and dated by a qualified registered Professional Engineer licensed in the State of Tennessee.

7. Submittals and Approval

Four sets of design drawings and detail design computations shall be submitted to the Structures Division. The computations shall include a detailed explanation of any symbols and computer programs used in the design of walls. Structures Division will submit two of their four copies to the Division of Materials and Tests.

Each design drawing shall contain in the title block the project number, county, structure name, structure number, station and contract number. Design drawings shall be submitted in sets with the drawing numbers running consecutively in each set, and if more than five (5) sheets in a set, shall be appropriately bound.

All designs and construction details will be checked by the Structures Division and the Materials and Tests Division against the pre-approved design drawings and procedures for that particular system. Review of the wall submittal will occur within 30 days of receipt. If there are design or plans issues requiring revisions then the Structures Division will inform the appropriate TDOT Construction Office and provide a listing of the required revisions. Depending on the required revisions the 30 day review timeframe may be extended. Approval of the detailed design and plans shall be made by the Structures Division and Materials and Tests Division. Notification to proceed shall be made by the Structures Division.

After approval, the Contractor shall submit additional sets of the design drawings (full size and half size) as determined by the Structures Division for Departmental distribution. Also, an electronic copy of the design drawings and detail design computations shall be submitted to the Structures Division and the Materials and Tests Division upon completion of the project.

8. Other Submission Requirements

As discussed in the previous sections, the Contractor shall bid for and, subsequently, (for the Contractor for which the project was awarded) prepare plans for and be prepared to construct the wall type(s) given on the Retaining Wall Conceptual Drawing or, under special circumstances, the specific wall type and design as provided by in the Contract Plans. The Contractor awarded the project may only under the circumstances discussed below request that a

wall type, wall system, or associated construction for a wall (i.e., foundation improvement requirements, construction sequence requirements, etc.) be changed, altered, or eliminated from those requirements set forth in the plans.

The Contractor may request the Department consider a change in the wall type, specific system, and associated construction through the submission of a Value Engineering Change Proposal (VECP) unless the contract prohibits submission of a VECP. Furthermore, any conditions of a VECP, such as a minimum cost savings required by the contract must be followed. The Department's agreement to review a VECP for a retaining wall shall in no way imply subsequent acceptance of the VECP or any part thereof. Any costs associated with preparation and submittal of a VECP shall be borne by the Contractor and no construction scheduling changes or time delays shall be caused by the Contractor's submission of the VECP and the Department's review of the VECP. If the proposed change involves a wall system not on the Approved Wall System list, then the contractor must coordinate with the system supplier to gain approval of the system and shall be aware of the approval requirements and time considerations for this approval process.

The Contractor may request the Department consider a change in the wall type, specific system, and/or associated construction if the Contractor determines that project conditions exist that substantially differ from those conditions upon which the decision to specify in the plans a particular wall type(s), wall system, or associated construction was made. An example of this would be where a soldier pile-lagging wall is specified as the only wall type due to right-of-way constraints not allowing for a typical wall type to be built, then subsequently it is determined TDOT can acquire or has sufficient right-of-way available to make another wall type feasible.

The request for consideration of changing of a wall type, system, or associated construction shall be made in writing and be submitted to the Construction Engineer. The Construction Engineer will distribute the request to the Regional Construction Engineer, Structures Division, Geotechnical Engineering Section, Design Division, and Right-of-Way Division, if applicable. The parties will review the request and provide recommended action (approval, rejection, alterations) to the Construction Engineer. If necessary, a plans revision will be made. Note that the Contractor's submission of a request does not imply acceptance by the Department and that the request process shall not be justification for a project schedule change or time extension. The Department reserves the right to require the Contractor to construct the wall as shown in the plans if there are no conditions that exist which render the contract plan wall requirement not constructible.

The Contractor must provide documentation in the request to demonstrate that the proposed change does not in any way cause additional cost to the wall and associated construction or to other aspects of the project. If the Contractor judges that a change involving wall construction must be made due to differing site conditions, the Contractor must follow procedures given in Sections 104.02 and 104.03 of TDOT Standard Specifications for Road and

Bridge Construction.

Requirements for retaining wall protection provided by the retaining wall system

When noted on the plans that a retaining wall is located in a hazard zone subject to vehicular impact, the Contractor shall be aware that retaining wall protection against vehicular collision for the wall may be required. If the retaining wall facing meets any one of the following criteria, an independent barrier wall shall be provided in front of the wall and included in the square foot cost of the wall:

1. Any retaining wall facing that is constructed of non-reinforced concrete (cast-in-place concrete gravity walls are exempt from this requirement and do not require protection).
2. Any dimension of a retaining wall facial panel that is less than 5'0" x 5'0" x 6" thick reinforced panel.
3. Any type of crib retaining walls.
4. A cast in place reinforced facing that has a thickness less than 6 inches.

Materials Approval

The materials used in the construction of the earth retaining walls shall conform to this Special Provision and/or the Standard Specifications. Prior to delivery of any material used in the retaining wall construction, the materials must be accepted in conformance with the specifications associated with the wall type being constructed.

Materials

Unless otherwise stated in specific retaining wall specifications, the materials used in the construction of earth retaining walls shall conform to the following specifications:

1. Concrete Class "A" shall be in accordance with Section 604 of the Standard Specifications.
2. Concrete Class "D" shall be in accordance with Section 604 of the Standard Specifications.
3. Reinforcing steel shall conform to ASTM A 615, Grade 60.
4. The sources for all backfill material shall be approved in conformance with the Standard Specifications before the material is delivered to the job site. Any select backfill material must be approved or tested for compliance prior to construction.
5. Lifting hooks and threaded inserts shall be of the size indicated on the working drawings.
6. When required, imbedded items must be galvanized in accordance with AASHTO M 232 or ASTM A 153.
7. Acceptance of materials furnished for work will be in accordance with the TDOT "Procedures for the Sampling and Testing, and Acceptance of Materials and Products (SOP 1-1) and certified test reports as specified in Section 106 – Control of Materials supplemented by routine tests run by the Department as defined in the various applicable sections of the Standard

Specifications.

8. Clearing and grubbing, removal of structures and obstructions, and excavation and undercutting shall be performed in accordance with the provisions of Sections 201, 202, and 203, respectively, of the Standard Specifications. Cost of these items, however, shall be included in the square foot price bid for retaining walls as shown in contract plans.
9. Reinforced Concrete Facing Panels - The panels shall be fabricated in accordance with the TDOT Procedure for the "Manufacture and Acceptance of Pre-cast Concrete Drainage Structures, Noise Wall panels, and Retaining wall panels."
10. Stone masonry shall be in accordance with Section 612 of the Standard Specifications.
11. All fabricated or precast retaining wall assemblies shall be selected from the TDOT's Qualified Products List.

All concrete, reinforcing steel, and backfill materials shall be tested at the specified frequencies in accordance with the TDOT "Procedures for the Sampling and Testing, and Acceptance of Materials and Products (SOP 1-1)".

Method of Measurement

The method of measurement shall be square foot area of the wall face, measured from the top of footing (or bottom of wall for walls without footings) to the top of the wall excluding any appurtenances in accordance with drawing number W-MSE-1 (in this document). Appurtenances are defined herein as barriers, fences, sign supports, noise wall support posts, and other fixtures. Coping, caps, end sections and moment slabs will **not** be considered appurtenances and are to be considered as part of the wall face.

Basis of Payment

The earth retaining wall, complete in place and accepted, shall be paid for at the contract square foot bid price. The bid price for walls shall include as required: grading and compaction of the wall foundation, undercutting and backfilling of weak surficial zones, installation of ground improvement, footing excavation, presplitting, sheeting, shoring, drilling, piles, lagging, grouting, concrete, reinforcing steel, reinforcement strips or mesh, tie strips or rods, fasteners, connectors, wire mesh baskets, prefabricated modular components, post tensioning, performance testing and evaluation, architectural treatment and/or texture finish, drainage system, water-stops and joint sealing material, coping, caps, end sections, moment slabs, and all miscellaneous material and labor for the complete installation of the wall. If the contractor's design requires the use of select granular backfill, the unit price bid for the wall shall be full compensation for any additional backfill costs due to the use of select backfill material.

If required for retaining wall protection against vehicle impact, the cost of the barrier wall and end terminals shall be included in the square foot cost of the wall.

Additional area of wall required due to unforeseen foundation conditions or other reasons and approved by the Engineer will be paid for on the basis of the unit price bid except as noted below.

The mechanically stabilized earth wall, complete in place and accepted as noted above, shall be paid for at the contract square foot bid price. No increase in unit price will be

paid for increases in wall height less than or equal to 10 feet as compared to the contract plans and wall heights. Wall height increases greater than 10 feet will be paid for by supplemental agreement.

The cast-in-place concrete cantilever or counterfort retaining wall, complete in place and accepted shall be paid for at the contract square foot bid price except as noted below.

If the actual driven quantity of concrete piles driven varies more than 10% from the estimated quantity based on the estimated lengths, an increase or decrease based on the contract bid price, or in the absence of a bid item, a unit price of twenty eight (28) dollars, per linear foot of additional or reduced pile length will be added or deducted accordingly from the price paid for the retaining wall. If the Engineer orders additional test piles, they will be paid for at the contract bid price, or in the absence of a bid item, a unit price of forty (40) dollars per linear foot. If the contractor changes friction pile types or sizes, additional load test(s) may be required at the Engineer's discretion and at the contractor's expense.

If the contractor uses a different type of pile than those that have estimated lengths shown on the contract plans, the price of the wall shall include all costs associated with piles and pile installation with no additional payment for any variation in pile lengths. All pile types and pile driving procedures, lengths, and bearings shall be in accordance with the Standard Specifications and shall be approved by the Engineer

The contractor shall show the estimated quantity of point bearing steel piles on the design drawings submitted for approval. If the actual quantity of steel piles driven differs more than 10% from this approved quantity because of variation in the rock line, the cost of the retaining wall will be increased or decreased accordingly based on the contract bid price, or in the absence of a bid item, a unit price of thirty five (35) dollars per linear foot, for the adjusted piling quantity .

If the Engineer orders changes in the work which alters the surface area of the wall without increasing the height of the wall, payment will be increased or decreased accordingly based on the square foot bid price. If the Engineer orders changes in the work which increases the height of the wall, the unit price bid for the wall sections that were increased up to a maximum of 10 feet will be adjusted according the following tables. Adjustments exceeding 10 feet will be made by supplemental agreement.

Specific Wall Construction and Materials Requirements

A. Cast-in-Place (CIP) Concrete Gravity Retaining Walls

1. Construction

The construction of the wall shall be in accordance with this Special Provision and the Standard Specifications.

B. Cast-In-Place (CIP) Concrete Cantilever And Counterfort Retaining Walls

2. Construction

The construction of the wall shall be in accordance with this Special Provision and the Standard Specifications. If the use of piles is anticipated, the foundation information shown on the contract plans shall include the skin friction (Fs) and end bearing (Qb) values, or the location of the rock line. Based on this information, estimated pile lengths shall be shown on the contract plans for fifty (50) and one hundred (100) tons ultimate bearing capacity for Size 1 concrete friction piles. The contractor shall estimate point bearing steel pile refusal lengths based on the given rock line information.

Concrete friction piles shall be installed to provide a minimum factor of safety of 2.0 if a load test is used and a minimum factor of safety of 3.0 if a load test is not used. Pile types, load test procedures, and driving equipment shall be in accordance with the Standard Specifications and shall be approved by the Engineer. The number and location of test piles and load tests shall be approved by the Engineer. Test pile lengths shall be ten (10) feet longer than the estimated pile lengths. Test piles shall be driven in accordance with the Standard Specifications, and shall be required at least every fifty (50) feet along the wall, unless otherwise approved by the Engineer. No pile shall be any farther than five hundred (500) feet from a load test, if a load test is used, unless otherwise approved by the Engineer. The length of production piles to be driven and the required bearing based on the driving equation shall be determined by the Engineer based on the required design bearing, the results of the test piles and load tests (if used), and applicable safety factors. Driven pile lengths and final bearings shall be approved by the Engineer.

Point Bearing Steel Piles shall be driven to refusal. Pile tips shall be used when indicated on the contract plans.

All reinforcing steel projecting from footing into the wall in the back face (fill side) shall be epoxy coated.

B. Concrete Crib Walls (See QPL 38 for Approved Manufacturer/Supplier)

1. Materials

The following items are the construction materials requirements necessary for crib wall design fabrication. All materials shall be approved prior to use.

- Pre-Cast Concrete Crib Units

The pre-cast crib units are to be made of Class D Portland cement concrete conforming to Section 604 of the Standard Specifications.

- **Crib Backfill**

All backfill material shall be tested prior to use and at the established frequencies in the TDOT “Procedures for the Sampling and Testing, and Acceptance of Materials and Products (SOP 1-1)”.

- The crib backfill material shall consist of an AASHTO classified A-1-a, A-1-b, or A-3 soil with the additional requirement no more than ten percent by weight pass the #200 sieve.
- The unit weight of the crib fill should be a minimum 115 lb. per cubic foot.
- Filter protection (geotextile) may be required.

- **Backfill Behind the Crib Type Structure**

All backfill material shall be tested prior to use and at the established frequencies in the TDOT “Procedures for the Sampling and Testing, and Acceptance of Materials and Products (SOP 1-1)”.

- If a filter blanket is placed behind the wall, native soil may be used as backfill behind the structure.
- Select fill, as defined in 4.2.1 of this document, can be used as backfill behind the structure. The backfill unit weight must be a minimum of 115 pcf. An internal angle of friction can be assumed equal to 35 degrees.

2. Fabrication of Precast Concrete Crib Units

- All pre-cast concrete shall be produced in an approved plant in accordance with the TDOT Procedure for the “Manufacture and Acceptance of Pre-cast Concrete Drainage Structures, Noise Wall panels, and Retaining wall panels”.

Out-of-state producers shall provide documentation of material quality before the manufacture of any pre-cast products (i.e. aggregate quality reports, cement/steel mill test reports, etc.)

The fabricator shall provide two precast modular units to the Engineer for approval.

- These approved precast modular units will serve as standard models. The finished exposed faces of the production precast modular units should be similar to the exposed faces of the model precast modular units.

- One of the model precast modular units should be kept at the production plant for relative comparison to future modular units. The other model should be kept on the construction site for comparison to the other delivered units.

- To assure uniform unit production steel forms must be used.
- The placement of reinforcing steel within the precast units should conform to the design placement shown in the shop drawings.

- Final acceptability of the precast units shall be determined on the basis of compression tests, production defects and tolerances, and visual inspection. The manufacturer shall furnish all sampling and testing facilities.
- Section 604 of the Standard Specifications states the units shall be steam or moist cured until developing the specified compressive strength set forth in the shop drawings. Any unit not developing the specified compressive strength shall be rejected.
- The precast units should not be delivered before samples have attained the required compressive strength of 4,000 psi (f'_c).
- Prior to shipment, the finished units are subject to visual inspection by the Engineer. Individual crib units may be rejected for any of the reasons listed below.
 - i. Variations in the exposed face texture relative to the approved model face texture.
 - ii. The length or height of the unit not satisfying the unit allowable tolerance limit of 3/16”.
 - iii. Honeycombed or open texture units which are not properly repaired.
 - iv. Individual defects which could affect the structural integrity of the unit Variations in the exposed face texture relative to the approved model face texture.
- TDOT will verify products before shipment in accordance with the TDOT Procedure for the “Manufacture and Acceptance of Pre-cast Concrete Drainage Structures, Noise Wall panels, and Retaining wall panels”. If products are manufactured out of state, TDOT may verify at the project site PRIOR to the placement of the units. The Contractor, or producer, shall notify the Regional Materials and Tests Division that products need to be verified.
- Upon delivery, the exposed surface of the precast units shall be examined. If the exposed faces of any of the units are below the standards of the approved model on site, the units shall be replaced or properly repaired until conforming to the appearance, strength, and durability of the approved model.
- The date of manufacture shall be clearly and permanently marked on one of the inside surfaces of each unit. Each shipment must be accompanied with a certification letter as stated in the TDOT Procedure for the “Manufacture and Acceptance of Pre-cast Concrete Drainage Structures, Noise Wall panels, and Retaining wall panels.”

3. Construction

- The Contractor should perform any soil improvement, such as undercutting and backfilling before foundation preparation.
- Compact the top 12” of soil on which the structure will rest to at least 95% of the maximum laboratory dry density as specified in AASHTO T-99.
- No Crib-type wall should be built upon frozen ground.
- Following excavation for the crib wall system, the Contractor shall notify the Engineer for approval of the footing depth and character of the foundation material. No crib wall system work shall proceed until approval has been granted.
- The correct batter of the wall shall not exceed ½” per 10 ft. of wall height.
- The crib backfill should be placed and compacted to at least 95% of the maximum

laboratory dry density (AASHTO T-99) in layers no thicker than 12”.

- Backfilling behind the crib system shall follow erection as closely as possible. The wall height should never be greater than three feet above the backfill.
- Any underdrain shall be placed in accordance with the details of the working plans.
- The Contractor shall furnish, install, operate, and maintain satisfactory dewatering systems as required to maintain the site in a dry and workable condition. These systems shall be continued as long as necessary. No separate measurement or payment will be made for dewatering.

C. Bin Wall (See QPL 38 for Approved Manufacturer/Supplier)

1. Materials

- Filler for horizontal joints between modular units shall be resin-bonded cork filler or closed cell foam, cross linked polyethylene polymer, conforming to test requirements of AASHTO M 153 or ASTM D 1752 (Type II) or equal. Filter fabric placed behind front vertical joints shall be at least 6” wide and conform to section 918.27 of the TDOT Standard Specifications).
- Backfill: All select granular material shall be free from shale and organic or otherwise deleterious material and conform to the following gradation limits:

<u>Sieve Size</u>	<u>Percent Passing</u>
6 inch	100
3 inch	75-100
No. 200	0-15

The Contractor, at his option, may produce the select granular material by processing the excavation from the project or from approved material from other sources. No direct payment will be made for producing the select granular material.

All backfill material shall be tested prior to use and at the established frequencies in the TDOT “Procedures for the Sampling and Testing, and Acceptance of Materials and Products (SOP 1-1)”.

- Bearing pads shall be rubber of size, and manufacture shown on shop drawings, with the following properties perpendicular to the pad thickness:
 - i. Compression- minimum ultimate strength 8000 psi
 - ii. Initial Cracking Strain- 40% of thickness
 - iii. Hardness (Shore A) – 75 +/- 5
 - iv. Tensile Strength- ASTM D 412, die “C”, 1000 psi +/- 100 psi
 - v. Tear Strength- ASTM D 624, die “B” – 360 psi minimum
- Acceptance of materials furnished for work will be in accordance with the TDOT “Procedures for the Sampling and Testing, and Acceptance of Materials and Products (SOP 1-1) and certified test reports as specified in Section 106 – Control of Materials supplemented by routine tests run by the Department as defined in the various applicable sections of the Standard Specifications.

2. Construction

- Bin Fabrication
 - All pre-cast concrete shall be produced in an approved plant in accordance with the

TDOT Procedure for the “Manufacture and Acceptance of Pre-cast Concrete Drainage Structures, Noise Wall panels, and Retaining wall panels”.

Out-of-state producers shall provide documentation of material quality before the manufacture of any pre-cast products (i.e. aggregate quality reports, cement/steel mill test reports, etc.)

Before proceeding with production, a model precast modular unit shall be provided by the fabricator for the Engineer’s approval to establish a guide and standard for the type of finish to be furnished on the exposed face. This model shall be kept at the fabricator’s plant to be used for comparison purposes during production. Formed surfaces other than the exposed face shall not require a special finish

○ Forms: Forms for the units shall be constructed of steel with dimensional tolerances that will assure the production of uniform units. Finish for the front face of the wall shall be in accordance with the finish specified on the contract plans.

- i. **Mixing and Placing Concrete:** The concrete mix as designed shall be proportioned and mixed in a batch mixer to produce a homogeneous concrete. The transporting, placement, and compaction of concrete shall be by methods that will prevent segregation of the concrete materials and the displacement of the reinforcement steel from its proper position in the form. Concrete shall be carefully placed in the forms and vibrated sufficiently to produce a surface free from imperfections such as honeycomb, segregation or cracking. Clear form oil of the same manufacture shall be used throughout the casting operation.
- ii. **Reinforcing Steel:** All reinforcing steel for the precast modules and other components shall be fabricated and placed in accordance with plans and Standard Specifications.

○ Testing and Inspection: Acceptability of the precast units at the casting yard shall be determined on the basis of compression tests and visual inspection during casting. The manufacturer shall furnish such facilities and assistance as is required to carry on the sampling and testing in an expeditious and satisfactory manner. The manufacturer shall document and provide all test data and certify in accordance with the TDOT Procedure for the “Manufacture and Acceptance of Pre-cast Concrete Drainage Structures, Noise Wall panels, and Retaining wall panels”.

- iii. **Curing:** The units shall be steam or moist cured as specified in Section 604 of the Standard Specifications for a sufficient length of time so that the concrete will develop the specified compressive strength. Any panel which does not reach specified strength within 28 days shall be rejected.

○ Compressive Strength: Compressive tests to determine the minimum strength requirements shall be made on cylinders. A minimum of six cylinders for determining when the units may be put into service will be made from each day’s production and cured in accordance with AASHTO T 23 or ASTM C 31. The 28 day compressive strength shall be at least 5000 psi. Compressive strength tests shall be in accordance with AASHTO T 22 or ASTM C 39.

○ Rejection: The quality of materials, the process of manufacture, and the finished units shall be subject to inspection by the Engineer prior to shipment. Precast units may be subject to rejection on account of failure to conform to the requirements set forth herein. Individual units may be rejected because of any of the following:

- Variations in the exposed face that substantially deviate from the approved model as to texture in accordance with precast concrete industry standards.

- Dimensions not conforming to the following tolerances:
 - Face of panel, length or height: plus/minus 3/16"
 - Deviation from square when measured on diagonal: 5/16" for modules up to 10' wide, 3/4" for larger units.
- Honeycombed or open texture not properly repaired.
- Defects which would affect the structural integrity of the unit.
- Shipment: The precast units shall not be shipped until they have achieved the required concrete strength (f'c) of 5000 psi. TDOT will verify products before shipment in accordance with the TDOT Procedure for the "Manufacture and Acceptance of Precast Concrete Drainage Structures, Noise Wall panels, and Retaining wall panels". If products are manufactured out of state, TDOT may verify at the project site PRIOR to the placement of the units. The Contractor, or producer, shall notify the Regional Materials and Tests Division that products need to be verified
 - Repairs at Plant: Before shipment, surfaces of all precast units shall be examined. If the exposed face of a unit is below the standard of the approved model then it shall be properly repaired to conform to the balance of the work with respect to appearance, strength and durability.
 - Handling and Storage: Handling devices, as required, shall be provided in each precast modular unit for the purpose of handling and placing. Care shall be taken during storage, transporting, hoisting and handling of all units to prevent cracking or damage. Units damaged by improper storing, transporting or handling shall be replaced or repaired to the satisfaction of the Engineer.
 - Marking: The date of manufacture and production lot number shall be clearly and permanently marked on the rear face of each unit.
- Erection:
 - i. Foundation Preparation: The foundation for the bin wall shall be graded to the elevations and dimensions shown on the contract plans. Prior to wall construction, the top 12 inches of the foundation shall be compacted to at least 95% of the maximum laboratory dry density as determined by AASHTO T 99. Any foundation soils found to be unsuitable or incapable of sustaining the required compaction shall be removed and replaced. After the excavation for each location of the bin wall has been performed, the Contractor shall notify the Engineer. No concrete leveling footing shall be placed until the depth of excavation and the character of the foundation material has been approved by the Geotechnical Engineering Section of the Division of Materials and Tests and permission has been given to proceed by the Engineer.
 - ii. At each unit foundation level, either a precast or cast-in-place footing and/or leveling pad shall be provided as shown on the shop drawings. The footings shall be given a wood float finish and shall reach the required compressive strength of 3000 psi, before placement of wall modules. The completed footing surface shall be constructed in accordance with grades and cross slopes shown on the shop drawings. When tested with a 10' straight edge, the surface shall not vary more than 1/8" in 10'. Any additional depth of footing required to level the top surface and bear on approved foundations shall be at the Contractor's expense.

- iii. The modular units shall be installed in accordance with the manufacturer's recommendations. Special care shall be taken in setting the bottom course of units to true line and grade. Joint filler and neoprene pads, when required, shall be installed in the horizontal joints. Joints at corners or angle points shall be closed as shown on the plans or in accordance with recommendation of the manufacturer.
- iv. All units above the first course shall interlock with the lower courses. Vertical joints shall be staggered with each successive course, or as shown on shop drawings. The vertical joint opening on the front face of the wall shall not exceed 3/4".
- v. The interior of each successive course of precast modular units shall be filled with select granular backfill. The maximum lift thickness shall be 2 feet and shall then be thoroughly consolidated with a vibratory tamping device.
- vi. Backfill behind the wall shall be compacted to at least 95 percent of the maximum laboratory dry density as defined in AASHTO T 99 to within one foot of the top of the wall. The top 12 inches shall be compacted to at least 100 percent of the maximum laboratory dry density.
- vii. When erecting a battered wall, placement of backfill behind the wall shall closely follow erection of successive courses of units. At no time shall the difference in elevation between the backfill and the top of the last erected course exceed seven feet.
- viii. The overall vertical tolerance of the wall shall not exceed 1/2 inch per 10 feet of wall as shown per plans.
- ix. Underdrain, if required, shall be placed in accordance with the details shown on the plans or shop drawings.
- x. Storm Drains: Where required, precast concrete wall units shall be provided with the appropriate storm drain openings cast into units at the appropriate elevation and locations indicated on drainage profiles. Catch basins shall be located so pipes will enter perpendicular (plan view) to the precast wall units or below the leveling footing as shown on the plans. Construction of catch basins and placement of storm drains must be coordinated with the bin wall construction.
- xi. Cooperation between contractors: Contractors must coordinate all phases of the work to prevent delays and expedite construction.
- xii. Dewatering: The Contractor shall furnish, install, operate, and maintain satisfactory dewatering systems as required to maintain the site in a dry and workable condition so as to permit grading and compaction of the wall foundation and proper erection and backfill of the wall. These systems shall include all equipment and materials and shall be continued as long as necessary. No separate measurement or payment will be made for dewatering.
- xiii. Technical Consultations: The fabricator will be required as a part of the contract to provide onsite technical expertise to the Contractor and/or the State upon request. Response to requests shall be required within five (5) days of the request. The cost of

furnishing such technical consultations shall be at no cost to the State.

- **On Site Inspection**

The quality of materials, the process of manufacture, and the finished member shall be subject to inspection and approval by the Engineer. Any bin wall units damaged prior to acceptance shall be repaired or reconstructed as directed by the Engineer. All costs of repairs or reconstruction shall be at the Contractor's expense.

D. Gabion Wall (See QPL 38 for Approved Manufacturer/Supplier)

1. General:

This section covers the furnishing, assembling, filling with stone and tying open wire mesh rectangular compartmented gabions placed on filter cloth or filter stone as specified herein, and in reasonably close conformity with the lines, grades, dimensions, and cross-sections shown on the plans or as directed by the Engineer, and the design, working drawings, materials, construction, measurement and payment for gabions.

Included in the scope of this section are: grading and compaction of the wall foundation, general and local dewatering as required for proper execution of the work, installation of wall drainage systems as specified on the plans, erection of units, the placement of stone within the units and compaction of the soils behind the units as well as the construction of any required reinforced concrete appurtenances such as caps, copings, or end sections as specified on the plans. For the purposes of this section, the gabions foundation shall include all areas underlying the gabion wall. All other items included in the construction of the retaining wall not specifically mentioned herein this manual shall conform to the applicable sections of the *Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction, January 1, 2015* and the current *AASHTO LRFD Bridge Design Specifications* with interims. Future reference to the *Tennessee Department of Transportation Standard Specification For Road And Bridge Construction- January 1, 2015* will be made as Standard Specifications.

2. Design Criteria

The current AASHTO LRFD Bridge Design Specifications with interims shall be used as the basis for design for the Gabion Wall utilized as a gravity type retaining wall.

3. Submittals

Working drawings and design calculations shall be submitted to the Engineer for review and approval at least 60 days before wall construction is to begin.

See Chapter I, Section 4.0 for contractor/supplier submittal responsibilities. The Contractor shall not start work on the bin wall until the working drawings have been approved by the Engineer. Approval of the Contractor's working drawings shall not relieve the Contractor of any responsibility under the contract for the successful completion of the work.

4. Materials

- **Gabion Wire Mesh**

Gabion basket units shall be fabricated from either a double twisted hexagonal wire mesh (metallic or PVC coated as required in contract plans) or welded wire mesh (metallic or PVC coated as required in contract plans) that meets property requirements described in:

ASTM Designation: A974 – 97 (Reapproved 2011) Standard Specification

for

Welded Wire Fabric Gabions and Gabion Mattresses (Metallic-Coated or Polyvinyl Chloride (PVC) Coated)

ASTM Designation: A975 – 11 Standard

Specification for

Double–Twisted Hexagonal Mesh Gabions and Revet Mattresses (Metallic-Coated Steel Wire or Metallic-Coated Steel Wire With Poly(Vinyl Chloride) (PVC) Coating

All other components of the gabion construction such as selvedge wire, lacing wire, spiral connectors, clips, galvanization, PVC coating shall be in accordance with the above specifications.

- Stone Fill

All stone fill shall be approved by the Engineer and shall be of suitable quality to ensure durability. When the stone is subjected to five alterations of sodium sulfate soundness testing, in accordance with AASHTO T-104, the weighted percentage of loss shall not be more than twelve percent. The inclusion of objectionable quantities of shale, dirt, sand, clay, rock fines, and other deleterious material will not be permitted. Stone fill shall be of well-graded mixture with sizes ranging between 4 inches and 10 inches in diameter, based on U.S. Standard square mesh sieves. No stone shall have minimum dimension less than 4 inches. Stone fill material selected for use in the gabions shall meet the minimum in-place density specified on the plans.

- Filter Cloth

All filter cloth shall meet the applicable requirements of Section 918.27, Sub- Section 27, of the Standard Specifications.

- Filter Stone

All filter stone shall meet the applicable requirements of Grading Size 68 or 57. See the Standard Specifications section 903.22.

5. Construction

- Clearing and Grubbing

Clearing and grubbing, removal of structures and obstructions, and excavation and undercutting shall be performed in accordance with the provisions of Sections 201, 202, and 203, respectively, of the Standard Specifications. Cost of these items, however, shall be included in the square foot price bid retaining walls as shown in contract plans.

- Foundation Preparation

Foundation preparation for the gabions shall be made to the required depth below the finished surface and to such a width as to permit the proper installation of the gabions. Prior to wall construction, the top 12 inches of the foundation shall be compacted to at least 95% of maximum laboratory dry density as specified in AASHTO T 99. All soft and unsuitable material shall be removed and replaced with suitable material, which shall then be compacted. The finished subgrade shall be smooth and uniform, with no protruding debris or rock formations. A Size 57 stone may be required to obtain the smooth uniform surface and shall be in reasonably close conformity with the dimensions and designs shown on the plans or established by the Engineer. No gabions shall be constructed upon frozen foundation material.

- Filter Cloth or Filter Stone

Upon final foundation preparation and acceptance by the Engineer, the filter cloth or filter stone shall be placed directly on the foundation at those locations shown on the plans or as directed by the Engineer. All end and side laps shall be a minimum of 18 inches for the filter cloth.

- Assembly (Fabrication)

Gabions shall be fabricated in such a manner that the sides, ends, lid, and diaphragms can be assembled at the construction site into rectangular baskets. Gabions shall be of single unit construction, i.e., the base, lid, ends, and sides shall be either woven into a single unit or one edge of these members connected to the base section of the gabion in such a manner that strength and flexibility at the point of connection is at least equal to that of the mesh. Gabion units shall be equally divided, by diaphragms of the same mesh and gauge as the body of the gabions, into cells whose length does not exceed the horizontal width. The gabion shall be furnished with the necessary diaphragms secured in proper position on the base in such a manner that no additional tying at this juncture will be necessary. All perimeter edges of the mesh forming the gabion shall be securely joined so that the joints formed by tying the selvages or installation of spiral ties have at least the same strength as the body of the mesh. Lacing wire or connecting wire shall be supplied in sufficient quantity for securely fastening all diaphragms and edges of the gabion.

- Assembly (Field)

- i. Empty gabion units shall be placed on the filter blanket when required on contract drawings and shall be assembled individually to the lines and grades indicated on the Plans. Or as directed by the Engineer, with the sides, ends, and diaphragms erected in such a manner to ensure the correct position. All adjoining empty gabion units must be connected by tie wire lacing along the perimeter of their contact surfaces in order to obtain a monolithic structure. Lacing of adjoining basket units shall be accomplished by continuous stitching with alternating single and double loops at intervals of not more than 5 inches. All lacing wire terminals shall be securely fastened. The use of expedient clip connections for this purpose or as final lid closing will not be permitted. After adjoining empty basket units are set to line and grade and common sides with adjacent units thoroughly laced, they shall be placed in tension and stretched to remove any kinks from the mesh and to a uniform alignment. The stretching of empty basket units shall be accomplished in such a manner as to prevent any possible unraveling and distortion.
- ii. Stone filling operations shall carefully proceed with placement by hand or machine so as

not to damage galvanized wire coating, to assure a minimum of voids between the stones, to prevent damage to the underlying filter blanket, and to ensure the maintenance of alignment throughout the filling process. The maximum height from which the stone may be dropped into the basket units shall be 36 inches. Along all exposed faces, the outer layer of stone shall be carefully placed and arranged by hand to ensure a neat and compact appearance. The last layer of stone shall be leveled with the top of the gabions to allow for the proper closing of the lid and to provide an even surface that is uniform in appearance.

- iii. Lids shall be stretched tight over the stone fill using crowbars or lid closing tools until the lid meets the perimeter edges of the front and end panels. The lid shall then be tightly laced with tie wire along all edges, ends and internal cell diaphragms by continuous stitching with alternating single and double loops at intervals of not more than 5 inches. Special attention shall be given to see that all projections or wire ends are turned into the baskets. Where shown on the drawings or as directed by the Engineer, or where a complete gabion unit cannot be installed because of space limitations, the basket unit shall be cut, folded and wired together to suit existing site conditions. The mesh must be cleanly cut and the surplus mesh cut out completely or folded back and neatly wired to an adjacent gabion face. The assembling, installation, filling, lid closing, and lacing of the reshaped gabion units shall be carried out as specified above.

- Backfill

Backfilling of the gabion wall shall follow erection as closely as possible and in no case should the height of the wall be greater than seven feet above the backfill. Underdrains, if required, shall be placed in accordance with the details shown on plans. Gabion walls backfill shall have a density of 100 pounds per cubic foot or as specified on contract plans and shall be compacted to at least 95 percent of the maximum laboratory dry density as defined in AASHTO T 99 to within one foot of the top of the wall. The top 12 inches shall be compacted to at least 100 percent of the maximum laboratory dry density. The backfill material shall consist of broken or crushed stone, gravel, sand, slag or other suitable coarse granular material to insure proper drainage. Shale, clay or cinders shall not be permitted as

backfill material. Prior to placement, the backfill material must be approved by the Engineer. The Contractor shall furnish, install, operate, and maintain satisfactory dewatering system as required to maintain the site in a dry and workable condition so as to permit grading and compaction of the wall foundation and proper erection and backfill of the wall. These systems shall include all equipment and materials, and shall be continued as long as necessary. No separate measurement or payment will be made for dewatering or dewatering systems.

All backfill material shall be tested prior to use and at the established frequencies in the TDOT “Procedures for the Sampling and Testing, and Acceptance of Materials and Products (SOP 1-1)”.

- Vertical Wall Tolerance

The overall vertical tolerance of the wall (plumbness from top to bottom) shall not deviate more than ½ inch per 10 feet of wall height from the contract drawings batter of the wall.

- On Site Inspection

The quality of materials, the process of manufacture, and the finished members shall be subject to inspection and approval by the Engineer. Any gabions damaged prior to acceptance shall be repaired or reconstructed as directed by the Engineer. All costs of repairs or reconstruction shall be at the Contractor’s expense.

E. Segmental, Precast Facing Mechanically Stabilized Earth (MSE) Wall (See QPL 38 for Approved Manufacturer/Supplier)

1. Materials

General - The Contractor shall make arrangements to purchase or manufacture the facing elements, reinforcing mesh or strips, attachment devices, joint filler, and all other necessary components. Materials not conforming to this section or the Standard Specifications or from sources not listed in the contract document shall not be used without written consent from the Engineer.

Out-of-state producers shall provide documentation of material quality before the manufacture of any pre-cast products (i.e. aggregate quality reports, cement/steel mill test reports, etc

- Reinforced Concrete Facing Panels - The panels shall be fabricated in accordance with the TDOT Procedure for the “Manufacture and Acceptance of Pre-cast Concrete Drainage Structures, Noise Wall panels, and Retaining wall panels.”
 - i. Acceptability of the precast units will be determined on the basis of compressive strength tests, production tolerances, and visual inspection. The Contractor, or the supplier, shall furnish facilities and perform all necessary sampling and testing in an expeditious and satisfactory manner as directed by the Engineer.
 - ii. The Portland cement shall be types 1, 2, or 3 and shall conform to the requirements of AASHTO M 85 (ASTM C 150). Concrete for precast panels shall be Class D (4000 psi) as specified in Section 604 of the TDOT Standard Specifications. Admixtures containing chlorides shall not be used.
 - iii. The panels shall be cast using steel forms. The front face of the panel (face exposed to view when installed in the wall) shall be cast against a steel form or architectural form liner. The back face is to be float finished. The concrete in each panel shall be placed without interruption and shall be consolidated by the use of an approved vibrator,

supplemented by such hand tamping as may be necessary to force the concrete into the corners of the forms and prevent the formation of stone pocket or cleavage planes. Clear form oil of the same type shall be used throughout the casting operation.

- iv. Unless otherwise indicated on the plans or elsewhere in the Standard Specifications, the concrete surface for the front face shall have a Class 1 finish as defined by Section 8.12 of AASHTO, Division II, and for the rear face a uniform surface finish. The rear face of the panel shall be float finished sufficiently to eliminate open aggregate pockets and surface distortions in excess of 1/4 inch. The panels shall be cast on a flat area. The strips or other galvanized attachment devices shall not contact or be attached to the face panel reinforcement steel.
- v. Curing and forms removal shall be in accordance with the requirements of Section 604.20 and 604.24 of the Standard Specifications, unless otherwise approved by the Engineer. The forms shall remain in place until they can be removed without damage to the panel.
- vi. The units shall be fully supported until the concrete reaches a minimum compressive strength of 1000 psi. The units may be shipped after reaching a minimum specified compressive strength of 4000 psi. TDOT will verify products before shipment in accordance with the TDOT Procedure for the "Manufacture and Acceptance of Pre-cast Concrete Drainage Structures, Noise Wall panels and Retaining wall panels". If products are manufactured out of state, TDOT may verify at the project site PRIOR to the placement of the units. The Contractor, or producer, shall notify the Regional Materials and Tests Division that products need to be verified.
- vii. Marking - The date of manufacture, the production lot number, and the piece mark shall be clearly scribed on an unexposed face of each panel.
- viii. Handling, Storage, and Shipping - All units shall be handled, stored, and shipped in such a manner as to eliminate the dangers of chipping, discoloration, cracks, fractures, and excessive bending stresses. Panels damaged during handling or storage at the casting plant shall be repaired at the plant as directed by the Engineer. Any panels damaged during handling, storing, or shipping may be rejected upon delivery at the option of the Engineer. Panels in storage shall be supported in firm blocking located immediately adjacent to embedded connection devices to avoid bending the connection devices.
- ix. Tolerances - All units shall be manufactured within the following tolerances:
 - Panel Dimensions - Position panel connection devices within 1 inch, except for all other dimensions within 3/16 inch.
 - Panel Squareness - Squareness as determined by the difference between the two diagonals shall not exceed 1/2 inch.
 - Angular distortion with regard to the height of the panel shall not exceed 3/16 inch in 5 feet.
 - Panel Surface Finish - Surface defects on smooth formed surfaces measured over a length of 5 feet shall not exceed 1/8 inch. Surface defects on the textured-finish surfaces measured over a length of 5 feet shall not exceed 5/16 inch.
- x. Steel - In accordance with the Standard Specifications.
- xi. Compressive Strength - Acceptance of the concrete panels, with respect to compressive strength, will be determined on the basis of production lots. A production lot is defined as a group of panels that will be represented by a single compressive strength sample and will consist of a single day's production as defined in the certify in accordance with the TDOT Procedure for the "Manufacture and Acceptance of Pre-cast Concrete

Drainage Structures, Noise Wall panels, and Retaining wall panels”.

- xii. During the production of the concrete panels, the Engineer will sample the concrete in accordance with AASHTO T 141 (ASTM C 172). A single compressive strength sample, consisting of a minimum of six (6) cylinders, will be randomly selected for every production lot.
- xiii. Cylinders for compressive strength tests shall be prepared in accordance with AASHTO T 23 (ASTM C 31) on 6" x 12" or 4" x 8" specimens. For every compressive strength sample, a minimum of two (2) cylinders will be cured in the same manner as the panels and tested for acceptance no later than twenty-eight (28) days. The average compressive strength of these two cylinders, when tested according with AASHTO T 22 (ASTM C 39), will determine the compressive strength of the production lot.
- xiv. If the Contractor wishes to remove forms or ship the panels prior to 28 days, a minimum of two (2) additional cylinders will be cured in the same manner as the panels. The average compressive strength of these cylinders when tested in accordance with AASHTO T 22, will determine whether the forms can be removed and the panels are acceptable.
- xv. Acceptance of a production lot will be made if the compressive strength test result is greater than or equal to 4,000 psi when tested for acceptance no later than 28 days.
- xvi. In the event that a production lot fails to meet the specified compressive strength requirements, the production lot shall be rejected. Such rejection shall prevail unless the manufacturer, at their own expense, obtains and submits cores for testing and the results show that the strength and quality of the concrete placed within the panels of the production lot is acceptable. The cores shall be taken from the panels within the production lot and tested in accordance with the specifications of AASHTO T 24 (ASTM C 42). Two cores per each cylinder that failed will be required. In addition, any or all of the following defects shall be sufficient cause for rejection:
 - Defects that indicate imperfect molding.
 - Defects indicating honeycombing or open texture concrete.
 - Defects in the physical characteristics of the concrete such as cracked or severely chipped panels.
 - Color variation on front face of panel due to excess form oil or other reasons.
 - Damage due to handling, storing or shipping.
- xvii. The Engineer shall determine whether spalled, honeycombed, chipped or otherwise defective concrete shall be repaired or rejected. Repair of concrete, if allowed, shall be done with a TDOT approved cementitious polymer patching mortar in a manner satisfactory to the Engineer. Repair to concrete surface which will be exposed to view after completion of construction must be approved by the Engineer.
 - Soil Reinforcing and Attachment Devices - All reinforcing and attachment devices shall be shop fabricated and carefully inspected to ensure they are true to size and free from defects that may impair their strength and durability.
- i. Reinforcing Strips - Reinforcing strips shall be hot rolled from bars to the required shape and dimensions. Their physical and mechanical properties shall conform to either AASHTO M 183 (ASTM A 36) or AASHTO M 223 (ASTM A 572) grade 65 or equal. Galvanization shall conform to the minimum requirements or AASHTO M 111

(ASTM A 123).

- ii. Tie Strips - The tie strips shall be shop- fabricated of hot rolled steel conforming to the minimum requirements of ASTM 570, Grade 50 or equivalent. Galvanization shall conform to AASHTO M 111 (ASTM A 123). Tie straps may be partially bent before shipment to the precast yard. Minimum bending radius shall be one inch. Final bending may be accomplished at the precast yard.
- iii. Reinforcing Mesh - Reinforcing mesh shall be shop fabricated of cold drawn steel wire conforming to the minimum requirements of AASHTO M 32 (ASTM A 82) and shall be welded into the finished mesh fabric in accordance with AASHTO M 55 (ASTM A 185). Galvanization shall be applied after the mesh is fabricated and conform to the minimum requirements of AASHTO M 111 (ASTM A 123).
- iv. Fasteners - Fasteners shall be high strength hexagonal cap screw bolts and nuts conforming to AASHTO M 164 (ASTM A 325). Galvanizing fastener elements, including washers, shall be in accordance with AASHTO M 232 (ASTM A 153). Bolts and nuts nominal diameter will be shown in the plans and supplied in accordance with the fasteners as specified previously.
- v. Steel Strap Connections - The steel strap connection bar and plate shall meet the same requirements as the reinforcing and tie strips specified above. Bolts, nuts, and washers shall conform to the requirements for the fasteners specified above. Coatings for connecting devices shall be as specified below.
- vi. Clevis Loop and Mesh Loop - Clevis loops and mesh loops shall be fabricated of cold drawn steel wire conforming to the requirements of AASHTO M 32 (ASTM A 82) and welded in accordance with AASHTO M 55 (ASTM A 185) and shall develop a minimum stress of $0.9 F_y$.
- vii. Connector Bar - Connector bar shall be fabricated of cold drawn steel wire conforming to the requirements of AASHTO M 32 (ASTM A 82).
- viii. Holes for bolts shall be punched in the location shown. Surfaces resulting from punching holes for bolts shall be galvanized in accordance with AASHTO M 111 (ASTM A 123). Those parts of the connecting devices which are threaded shall be galvanized in accordance with AASHTO M 232 (ASTM A 153). Alignment pins are to be hot dip galvanized.
- ix. All connecting devices shall be to the dimensions shown on the plans. Connecting members and soil reinforcement devices shall be assembled prior to galvanization. All connecting devices shall be true to size and free from defects that may impair their strength or durability.
- x. Any damage sustained to any part of the connecting devices, bolts or reinforcing devices during any phase of fabrication, storage or erection shall be repaired to the satisfaction of the Engineer at no increase in contract cost.
 - Geosynthetic Reinforcement Material- Where geosynthetic reinforcements are used for the construction of MSE walls the following requirements shall apply:
- i. Geotextiles and Thread for Sewing - Woven or nonwoven geotextiles shall consist only of long chain polymeric filaments or yarns formed into a stable network such that the filaments or yarns retain their position relative to each other during handling, placement, and design service life. At least 95 percent by weight of the long chain polymer shall be polyolefin or polyester. The material shall be free of defects and tears. The geotextile shall conform as a minimum to the properties indicated for Separation,

Medium Survivability indicated under AASHTO T 288. The geotextile shall be free from any treatment or coating that might adversely alter its physical properties after installation.

- ii. Geogrids - The geogrid shall be a regular network of integrally connected polymer tensile elements with aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil or rock. The geogrid structure shall be dimensionally stable and able to retain its geometry under manufacture, transport and installation.
- iii. Required Properties - The specific geosynthetic material(s) shall be preapproved by the Department and shall have certified long-term strength (T_{al}) as determined by:

Long-Term strength (T_{al}) based on $T_{al} =$
 $T_{ULT}/(RF_D)*(RF_{ID})*(RF_{CR})$ where RF_{CR} is developed from
creep tests performed in accordance with ASTM D 5262, RF_{ID}
obtained from site installation damage testing and RF_{ID} from hydrolysis or oxidative
degradation testing extrapolated to 75 or 100 year design life.

- Ultimate Strength (T_{ULT}) based upon minimum average roll values (MARV) (lb/ft), ASTM D4595.
 - Pullout Resistance Factor developed in accordance with Chapter 3 of chapter 3 of FHWA-SA-96-071.
- iv. Certification - The Contractor shall submit a manufacturer’s certification that the geosynthetics supplied meet the respective index criteria set when the geosynthetic was approved by the Department, measured in full accordance with all test methods and standards specified and as set forth in this document.

The manufacturer’s certificate shall state that the furnished geosynthetic meets the requirements of this document as evaluated by the manufacturer’s quality control program. The certificates shall be attested to by a person having legal authority to bond the manufacturer. In case of dispute over validity of value, the Engineer can require the Contractor to supply test data from a Department approved laboratory to support the certified values submitted.

- v. Manufacturing Quality Control: The geosynthetic reinforcement shall be manufactured with a high degree of quality control. The manufacturer is responsible for establishing and maintaining a quality control program to ensure compliance with the requirements of this document. The purpose of the QC testing program is to verify that the reinforcement geosynthetic being

supplied to the project is representative of the material used for performance testing and approval by the Department.

Conformance testing shall be performed as part of the manufacturing process and may vary for each type of product. As a minimum, the following index tests shall be considered as applicable for an acceptable QA/QC program:

<u>Property</u>	<u>Test Procedure</u>
Specific Gravity (HDPE only)	ASTM D 1505
Wide Width Tensile	ASTM D 4595; GRI:GG1
Melt Flow (HDPE and PP only)	ASTM D 1238
Intrinsic Viscosity (PET only)	ASTM D 4603
Carboxyl End Group (PET only)	ASTM D 2455

- vi. Sampling, Testing, and Acceptance - Sampling and conformance testing shall be in accordance with ASTM D 4354. Conformance testing procedures shall be as established under 4.3.5. Geosynthetic product acceptance shall be based on ASTM D 4759.

The quality control certificate shall include:

- Roll numbers and identification
 - Sampling procedures
 - Result of quality control tests, including a description of test methods used
- vii. Select Granular Backfill Material for use with Geosynthetic Reinforcement – The backfill material shall conform to the requirements as stated below in Select Granular Backfill Material. except that the maximum size of the backfill shall be 3/4 inch, unless full scale installation damage tests are conducted in accordance with ASTM D 5818.
 - Joint Materials - Installed to the dimensions and thicknesses in accordance with the plans or approved shop drawings.
 - i. If required, provide flexible foam strips for filler for vertical joints between panels, and in horizontal joints where pads are used, where indicated on the plans.
 - ii. Provide in horizontal joints between panels preformed EPDM rubber pads conforming to ASTM D 2000 for 4AA, 812 rubbers, neoprene elastomeric pads having a Durometer Hardness of 55 ± 5, or high density polyethylene pads with a minimum density of 59 lb/ft³ in accordance with ASTM D 1505.
 - iii. Cover all joints between panels on the back side of the wall with a geotextile meeting the minimum requirements for filtration applications as specified by AASHTO M 288. The minimum width and lap shall be 12 inches. Adhesive used to attach the filter fabric to the back of the panels shall be approved by the wall supplier.
 - Select Granular Backfill Material - All backfill material used in the Mechanically Stabilized Earth structure volume, as shown on the plans, shall be reasonably

free (maximum of 0.1%) from organic and otherwise deleterious materials, and it shall be approved by the Engineer prior to use. The material shall conform to the following gradation limits and be tested at the established frequencies in the TDOT “Procedures for the Sampling and Testing, and Acceptance of Materials and Products (SOP 1- 1)”. The Contractor shall also provide test data from an approved laboratory certifying that the material meets the following:

- i. Gradation as determined by AASHTO T 27.

Sieve Size	Percent Passing
4 inches	100
3/8 inch	0-75
No. 4	0-25
No. 8	0-10
No. 16	0-5

Note: Size Nos. 1 through 78 as listed in order of Table 1 Standard Sizes of Processed Aggregate in Section 903.22 of Standard Specifications meet the above gradation requirements.

- ii. In addition, the backfill must conform to all of the following requirements:
 - Soundness - The material shall be substantially free from shale or other soft, poor durability particles. The material shall have a sodium sulfate loss of less than 12 percent after five (5) cycles determined in accordance with AASHTO T 104.
 - The material shall exhibit an angle of internal friction of not less than 34 degrees as determined by the standard direct shear test AASHTO T 236 on the portion finer than the No. 4 sieve, using a sample of the material compacted to 95 percent of AASHTO T 99. No testing is required for backfills where 80 percent of sizes are greater than 3/8 inch.
 - Electrochemical requirements - The backfill shall meet the following criteria:

REQUIREMENTS	TEST METHOD
ph = 5-10	AASHTO T 289 – 91
Resistivity > 3000 ohm centimeters ¹	AASHTO T 288 – 91
Chlorides < 100 parts per million	AASHTO T 291 – 91
Sulfates < 200 parts per million	AASHTO T 290 – 91
Organic Content < 1 %	AASHTO T 267 – 86

1. If the resistivity is greater or equal to 5000 ohm centimeters the chloride and sulfates requirements may be waived.

- Unit weight- The unit weight of the backfill material (at optimum condition) shall meet the requirements of the approved shop drawings or plans.
- Concrete Leveling Pad, Traffic Barrier and Coping - The concrete shall conform to the requirements of the Standard Specifications for Class A concrete.
- Acceptance of Material - The Contractor shall furnish the Engineer a Certificate of Compliance certifying the above materials comply with the applicable contract specifications. A copy of all test results performed by the Contractor necessary to assure contract compliance shall be furnished to the Engineer.

Acceptance will be based on the TDOT “Procedures for the Sampling and Testing, and Acceptance of Materials and Products (SOP 1-1)”.

2. Construction

- a. Foundation Preparation - The foundation for the MSE wall shall be graded level for a minimum width equal to the width of the reinforced volume and leveling pad plus one (1) foot, or as shown on the plans, using the top of the leveling pad as the grade elevation. Prior to wall construction, the foundation shall be compacted to 95 percent of optimum density, as directed by the Engineer. Any foundation soils found to be unsuitable shall be removed as directed by the Engineer and replaced with select granular backfill material compacted to 95 percent of AASHTO T 99. The contractor shall conduct any ground improvements required by the contract plans as part of foundation preparation.

At each panel foundation level, a precast reinforced or a cast-in-place unreinforced concrete leveling pad of the type shown on the plans shall be provided. The concrete shall be Class “A” concrete with compressive strength of 3000 psi (28 day strength). The leveling pad shall be cured a minimum of 12 hours before placement of wall panels.

- b. Wall Erection - Where a proprietary wall system is used, a field representative shall be available during the erection of the wall to assist the fabricator, Contractor, and Engineer. If there is more than one wall of the same type on the project, this requirement will apply to construction of the initial wall only. After construction of the initial wall, the representative will be available on an as-needed basis, as requested by the Engineer, during construction of the remainder of the walls. Wall erection shall be in conformance with the latest edition of the MSE wall construction manual as published by the wall supplier. For erection, panels are handled by means of a lifting device set into the upper edge of the panel. Precast concrete panels shall be placed such that a final vertical face will be obtained.

It shall be the responsibility of the Contractor to consult with the designer/supplier and to utilize the proper methods necessary to achieve a vertical face for the final wall. Panels should be placed in successive horizontal lifts as backfill placement proceeds. As backfill material is placed behind the panels, the panels shall be maintained in position by means of temporary wedges or bracing according to the wall supplier’s recommendations. External bracing shall also be required for this initial lift. The wedges shall remain in place until the fourth layer of panels is placed, at which time the bottom layer of wedges shall be removed. Each succeeding layer of wedges shall be removed as the succeeding panel layers are placed. When the wall is completed, all wedges shall be removed. No wedges shall be used as a means of leveling panels on leveling pads. Wedges placed below

the ground line on the front face of the wall shall be removed before this area is backfilled.

Tolerances and alignment shall be as follows:

- i. Horizontal and vertical joint openings between panels shall be uniform. The maximum allowable offset in any panel joint shall be 3/4 inch.
- ii. Vertical tolerance (plumbness) and horizontal alignment tolerances as the wall is constructed shall not exceed 3/4 inch when measured along a 10 foot straightedge.

The overall vertical tolerance of the wall (plumbness from top to bottom) in its final position shall not exceed 3/4 inch per 10 feet of wall height.

Cast-in-place concrete shall be placed on top of wall panels to allow precast coping elements on top of the wall to be brought to proper grade.

Prior to placing any select backfill material on any soil reinforcement device, all connections to the panels shall be completed.

- c. Backfill Placement - Backfill placement shall closely follow the erection of each lift of panels. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials including panels, soil reinforcements, and connections, or misalignment of the facing panels or reinforcing elements. Any wall materials which may become damaged or disturbed during backfill placement, or due to wall settlement prior to completion of the project shall be either removed and replaced at the Contractor's expense or corrected, as directed by the Engineer. Any misalignment or distortion of the wall facing panels due to placement of backfill outside the limits of this section shall be corrected, as directed by the Engineer at the Contractor's expense. Backfill placement methods near the facing shall assure that no voids exist directly beneath the reinforcing elements.

Backfill shall be compacted to 95 percent of the maximum density as determined by AASHTO T 99. When the backfill supports a spread footing of a bridge or other structural load, the top 5 feet shall be compacted to 100 percent of the maximum density. For backfills containing more than 30 percent retained on the $\frac{3}{4}$ inch sieve, a method compaction consisting of a minimum of 2 passes of a steel drum roller or truck equipment equivalent or larger than a Caterpillar D-6 Bulldozer shall be used.

The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. Backfill materials shall be placed at a moisture content not more than 2 percentage points less than or equal to the optimum moisture content. Backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniformly acceptable throughout the entire lift. The optimum moisture content shall be determined in accordance with AASHTO T 99.

At each soil reinforcement device level, backfill shall be compacted to the full length of reinforcement devices and be sloped to drain away from the wall before placing and attaching the next layer of reinforcement devices. The compacted backfill shall be level with the connecting device before the reinforcement device can be connected. Compaction within three feet of the back face of the wall facing panel shall be achieved with at least three (3) passes of a light weight mechanical tamper, roller, or vibratory system.

Unless otherwise indicated on the plans or directed by the Engineer, soil reinforcement devices shall be placed at 90 degrees to the face of the wall. The maximum lift thickness before compaction shall be ten (10) inches and shall closely follow panel erection. The Contractor shall decrease this

lift thickness, if required, to obtain the specified density.

At the end of each day’s operation, the Contractor shall slope the last level of backfill away from the wall facing to rapidly direct runoff or rainwater away from the wall face. In addition, the Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

F. Prefabricated Modular Block Facing Mechanically Stabilized Earth (MSE) Wall (See QPL 38 for Approved Manufacturer/Supplier)

1. Materials

General - The contractor shall make arrangements to purchase or manufacture the facing elements, reinforcing mesh or strips, attachment devices, joint filler, and all other necessary components. Materials not conforming to this section or from sources not listed in the contract document shall not be used without written consent from the Engineer.

- Concrete Modular Block Facing - The concrete modular blocks shall be either hollow or solid concrete structural retaining wall units, machine made from Portland cement, water, and mineral aggregates with or without the inclusion of other materials. The units are intended for use in the construction of mortarless, modular block retaining (MBW) walls.
- i. Cementious Materials - Materials shall conform to the following:
 - Portland Cement - AASHTO M 85 (ASTM C 150).
 - Blended Cements – Type IP -AASHTO M 240 (ASTM C 595).
 - Pozzolans – Class C or Class F fly ash -AASHTO M 295 Blast Furnace Slag Cement – grade 100 or 120- AASHTO M 302 (ASTM C 989).
- ii. Aggregates - Aggregates shall conform to the following specifications, except that grading requirements shall not necessarily apply:
 - Normal Weight Aggregates – TDOT Standard Specification sections 903.01 and 903.03.
 - Lightweight Aggregates - TDOT Standard Specification section 903.19.
- iii. Other Constituents - Air-entraining agents, coloring pigments, integral water repellants, finely ground silica, and other constituents shall be previously established as suitable for use in concrete MBW units and shall conform to applicable AASHTO Standards or, shall be shown by test or experience to be not detrimental to the durability of MBW units or any material customarily used in masonry construction.
- iv. Physical Requirements. Prior to delivery to the work site, the units shall conform to the following physical requirements:

1. Minimum	required compressive	strength =	4,000
	psi (Average 3 coupons)		
2. Minimum	required compressive	strength =	3,500 psi

(Individual coupon)

3. Maximum water absorption = 5%
4. Maximum number of blocks per lot = 2,000

Also, prior to delivery, TDOT will conduct verification testing on the modular blocks in accordance with the TDOT “Procedures for the Sampling and Testing, and Acceptance of Materials and Products (SOP 1-1)

If products are manufactured out of state, TDOT may verify at the project site PRIOR to the placement of the units. The Contractor, or producer, shall notify the Regional Materials and Tests Division that products need to be verified.

- v. Tolerances. Blocks shall be manufactured within the following tolerances:
 - The length and width of each individual block shall be within 1/8 inch of the specified dimension. Hollow units shall have a minimum wall thickness of 1-1/4 inch.
 - The height of each individual block shall be within 1/16 inch of the specified dimension.
 - When a broken face finish is required, the dimension of the front face shall be within 1 inch of the theoretical dimension of the unit.
 - Finish and Appearance. All units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or significantly impair the strength or permanence of the construction. Minor cracks (e.g. no greater than 1/32 inch in width and no longer than 25 % of the unit height) incidental to the usual method of manufacture or minor chipping resulting from shipment and delivery, are not grounds for rejection.

The face or faces of units that are to be exposed shall be free of chips, cracks or other imperfections when viewed from a distance of 30 feet under diffused lighting. Up to five (5) percent of a shipment may contain slight cracks or small chips not larger than 1 inch.

Color and finish shall be as shown on the plans and shall be erected with a running bond configuration.

- If pins are required to align MBW units, they shall consist of a non-degrading, polymer or galvanized steel and be made for the express use with the MBW units supplied.
- Cap units shall be cast to or attached to the top MBW units in strict accordance with the manufacturer’s requirements and the adhesive manufacturer’s recommended procedures. The Contractor shall provide a written 10 year warranty acceptable to the Department that the integrity of the materials used to

attach the cap blocks will preclude separation and displacement of the cap blocks for the warranty period.

- vi. **Sampling and Testing.** Acceptance of the concrete block with respect to compressive strength and absorption will be determined on a lot basis. The lot will be randomly sampled in accordance with ASTM C 140. Compressive strength and absorption tests shall be performed by the manufacturer and submitted to the Department. Compressive strength test specimens shall be cored or shall conform to the saw-cut coupon provisions of section 6.2.4 of ASTM C 140. Blocks represented by test coupons that do not reach an average compressive strength of 4,000 psi or an individual strength of 3500 psi, or have less than 5 % absorption will be rejected.
- vii. **Rejection.** Blocks shall be rejected because of failure to meet any of the requirements specified above. In addition, any or all of the following defects shall be sufficient cause for rejection.
 - Defects that indicate imperfect molding.
 - Defects indicating honeycomb or open texture concrete.
 - Cracked or severely chipped blocks.
 - Color variation on front face of block due to excess form oil or other reasons.

Blocks may also be rejected if TDOT verification test results do not comply with the requirements specified above.

- **Unit Fill -** The unit fill and drainage aggregate shall be a well graded crushed stone or granular fill meeting the following gradation:

U.S. Sieve Size	Percent Passing
1 inch	100-75
3/4 inch	50-75
No. 4	0-60
No. 40	0-50
No. 200	0-5

- **Geosynthetic Reinforcement Material -** The following requirements shall apply for geosynthetic reinforcement material:
 - i. **Geotextiles and Thread for Sewing -** Woven or nonwoven geotextiles shall consist only of long chain polymeric filaments or yarns formed into a stable network such that the filaments or yarns retain their position relative to each other during handling, placement, and design service life. At least 95 percent by weight of the long chain polymer shall be polyolefin or polyester. The material shall be free of defects and tears. The geotextile shall conform as a minimum to the properties indicated for Separation, Medium Survivability indicated under AASHTO T 288. The geotextile shall be free from any treatment or coating that might adversely alter its physical properties after installation.
 - ii. **Geogrids -** The geogrid shall be a regular network of integrally connected polymer tensile elements with aperture geometry sufficient to permit significant mechanical interlock with

the surrounding soil or rock. The geogrid structure shall be dimensionally stable and able to retain its geometry under manufacture, transport and installation.

- iii. Required Properties - The specific geosynthetic material(s) shall be pre-approved by the Department and shall have certified long-term strength (T_{al}) as determined by:

Long-Term strength (T_{al}) based on $T_{al} =$
 $T_{ult}/(RF_D)*(RF_{ID})*(RF_{CR})$ where RF_{CR} is developed from

creep tests performed in accordance with ASTM D 5262,
 RF_{ID} obtained from site installation damage testing and RF_{ID} from hydrolysis or oxidative degradation testing extrapolated to 75 or 100 year design life.

- Ultimate Strength (T_{ULT}) based upon minimum average roll values (MARV) (lb/ft), ASTM D4595.
 - Pullout Resistance Factor developed in accordance with chapter 3 of FHWA-SA-96-071.
- iv. Certification - The Contractor shall submit a manufacturer's certification that the geosynthetics supplied meet the respective index criteria set when the geosynthetic was approved by the Department, measured in full accordance with all test methods and standards specified and as set forth in this section of the TDOT Earth Retaining Structures Manual. The manufacturer's certificate shall state that the furnished geosynthetic meets the requirements of this document as evaluated by the manufacturer's quality control program. The certificates shall be attested to by a person having legal authority to bond the manufacturer. In case of dispute over validity of values, the Engineer can require the Contractor to supply test data from a Department approved laboratory to support the certified values submitted.
- v. Manufacturing Quality Control: The geosynthetic reinforcement shall be manufactured with a high degree of quality control. The manufacturer is responsible for establishing and maintaining a quality control program to ensure compliance with the requirements of the TDOT Earth Retaining Structures Manual. The purpose of the QC testing program is to verify that the geosynthetic being supplied to the project is representative of the material used for performance testing and approval by the

Department.

Conformance testing shall be performed as part of the manufacturing process and may vary for each type of product. As a minimum the following index tests shall be considered as applicable for an acceptable QA/QC program:

<u>Property</u>	<u>Test Procedure</u>
Specific Gravity (HDPE only)	ASTM D 1505
Wide Width Tensile	ASTM D 4595; GRI:GG1
Melt Flow (HDPE and PP only)	ASTM D 1238
Intrinsic Viscosity (PET only)	ASTM D 4603
Carboxyl End Group (PET only)	ASTM D 2455

- vi. Sampling, Testing, and Acceptance - Sampling and conformance testing shall be in accordance with ASTM D 4354. Conformance testing procedures shall be as established under section 4.3.5. Geosynthetic product acceptance shall be based on ASTM D 4759.

The quality control certificate shall include:

- Roll numbers and identification
- Sampling procedures
- Result of quality control tests, including a description of test methods used.

- vii. Select Granular Backfill Material for use with Geosynthetic Reinforcement - The backfill material shall conform to the requirements as stated below in Select Granular Backfill Material except that the maximum size of the backfill shall be 3/4 inch, unless full scale installation damage tests are conducted in accordance with ASTM D 5818.

All backfill material shall be tested prior to use and at the established frequencies in the TDOT “Procedures for the Sampling and Testing, and Acceptance of Materials and Products (SOP 1- 1)”.

- Soil Reinforcing and Attachment Devices - Where steel reinforcing and attachment devices are used in the construction of the MSE wall the following requirements shall apply.

- i. Reinforcing Strips - Reinforcing strips shall be hot rolled from bars to the required shape and dimensions. Their physical and mechanical properties shall conform to either AASHTO M 183 (ASTM A 36) or AASHTO M 223 (ASTM A 572) grade 65 or equal. Galvanization shall conform to the minimum requirements or AASHTO M 111 (ASTM A 123).
- ii. Tie Strips - The tie strips shall be shop-fabricated of hot rolled steel conforming to the minimum requirements of ASTM A 570, Grade 50 or equivalent. Galvanization shall conform to AASHTO M111. Tie straps may be partially bent before shipment to the precast yard. Minimum bending radius shall be one inch. Final bending may be accomplished at the precast yard.
- iii. Reinforcing Mesh - Reinforcing mesh shall be shop fabricated of cold drawn steel wire conforming to the minimum requirements of AASHTO M 32 (ASTM A 82) and shall be welded into the finished mesh fabric in accordance with AASHTO M 55 (ASTM A 185). Galvanization shall be applied after the mesh is fabricated and conform to the minimum requirements of AASHTO M 111

- iv. Fasteners - Fasteners shall be high strength hexagonal cap screw bolts and nuts conforming to AASHTO M 164 (ASTM A 325). Galvanizing fastener elements, including washers, shall be in accordance with AASHTO M 232 (ASTM A 153). Bolts and nuts nominal diameter will be shown in the plans and supplied in accordance with the fasteners as specified previously.
- v. Steel Strap Connections - The steel strap connection bar and plate shall meet the same requirements as the reinforcing and tie strips specified above. Bolts, nuts, and washers shall conform to the requirements for the fasteners specified above. Coatings for connecting devices shall be as specified below.
- vi. Clevis Loop and Mesh Loop - Clevis loops and mesh loops shall be fabricated of cold drawn steel wire conforming to the requirements of AASHTO M 32 and welded in accordance with AASHTO M 55 and shall develop a minimum stress of $0.9 F_y$.
- vii. Connector Bar - Connector bar shall be fabricated of cold drawn steel wire conforming to the requirements of AASHTO M 32.

Holes for bolts shall be punched in the location shown. Surfaces resulting from punching holes for bolts shall be galvanized in accordance with AASHTO M 111. Those parts of the connecting devices which are threaded shall be galvanized in accordance with AASHTO M 232. Alignment pins are to be hot dip galvanized.

All connecting devices shall be to the dimensions shown on the plans. Connecting members and soil reinforcement devices shall be assembled prior to galvanization. All connecting devices shall be true to size and free from defects that may impair their strength or durability.

Any damage sustained by any part of the connecting devices, bolts or reinforcing devices during any phase of fabrication, storage or erection shall be repaired to the satisfaction of the Engineer at no increase in contract cost.

Select Granular Backfill Material - All backfill material used in the Mechanically Stabilized Earth structure volume, as shown on the plans, shall be reasonably free (maximum of 0.1%) from organic and otherwise deleterious materials, and it shall be approved by the Engineer prior to use. The material shall conform to the following gradation limits and be tested

at the established frequencies in the TDOT “Procedures for the Sampling and Testing, and Acceptance of Materials and Products (SOP 1-1)”. The Contractor shall also provide test data from an approved laboratory certifying that the material meets the following:

i. Gradation as determined by AASHTO T 27.

Sieve Size	Percent Passing
4 inches	100
3/8 inch	0-75
No. 4	0-25
No. 8	0-10
No. 16	0-5

Note: Size Nos. 1 through 78 as listed in order of Table 1 Standard Sizes of Processed Aggregate in Section 903.22 of Standard Specifications meet the above gradation requirements.

ii. In addition, the backfill must conform to all of the following requirements:

- Soundness - The material shall be substantially free from shale or other soft, poor durability particles. The material shall have a sodium sulfate loss of less than 12 percent after five (5) cycles determined in accordance with AASHTO T 104.
- The Plasticity Index (P.I.), as determined by AASHTO T 90, shall not exceed 6.
- The material shall exhibit an angle of internal friction of not less than 34 degrees as determined by the standard direct shear test AASHTO T 236 on the portion finer than the No. 4 sieve, using a sample of the material compacted to 95 percent of AASHTO T 99. No testing is required for backfills where 80 percent of sizes are greater than 3/8 inch.
- Electrochemical requirements - The backfill shall meet the following criteria:

REQUIREMENTS	TEST METHOD
ph= 5-10	AASHTO T 289 – 91
Resistivity > 3000 ohm centimeters ¹	AASHTO T 288 – 91
Chlorides < 100 parts per million	AASHTO T 291 – 91
Sulfates < 200 parts per million	AASHTO T 290 – 91
Organic Content < 1%	AASHTO T 267 – 86

1. If the resistivity is greater or equal to 5000 ohm centimeters the chloride and sulfates requirements may be waived.

- Unit weight- The unit weight of the backfill material (at optimum condition) shall meet the requirements of the approved shop drawings or plans.
- Concrete Leveling Pad, Traffic Barrier and Coping - The concrete shall conform to the requirements of the Standard Specifications for Class A concrete.
- Acceptance of Material - The contractor shall furnish the Engineer a Certificate of Compliance certifying the above materials comply with the applicable contract specifications. A copy of all test results performed by the Contractor necessary to assure contract compliance shall be furnished to the Engineer.

2. Construction

- a. Wall Excavation - Unclassified excavation shall be in accordance with the requirements of the Standard Specifications and in reasonably close conformity with the limits and construction lines shown on the plans. Temporary excavation support as required shall be the responsibility of the Contractor.
- b. Foundation Preparation - The foundation for the MSE wall shall be graded level for a minimum width equal to the width of the reinforced volume and leveling pad plus one (1) foot, or as shown on the plans, using the top of the leveling pad as the grade elevation. Prior to wall construction, the foundation shall be compacted to 95 percent of optimum density, as directed by the Engineer. Any foundation soils found to be unsuitable shall be removed as directed by the Engineer and replaced with select granular backfill material compacted to 95 percent of AASHTO T 99 methods. The contractor shall conduct any ground improvement required by the contract plans as part of foundation preparation.

At each block foundation level, a precast reinforced or a cast-in-place unreinforced concrete leveling pad of the type shown on the plans shall be provided. The concrete shall be Class A concrete with compressive strength of 3000 psi (28 day strength). The leveling pad shall be cured a minimum of 12 hours before placement of wall panels.

- c. Wall Erection - Where a proprietary wall system is used, a field representative shall be available during the erection of the wall to assist the fabricator, Contractor, and Engineer. If there is more than one wall of the same type on the project, this requirement will apply to construction of the initial wall only. After the initial wall, the representative will be available on an as-needed basis, as requested by the Engineer, during construction of the remainder of the walls. Wall erection shall be in conformance with the latest edition of the MSE wall construction manual as published by the wall supplier.

It shall be the responsibility of the Contractor to consult with the designer/supplier and to utilize the proper methods necessary to achieve a vertical face for the final wall. Blocks should be placed in successive horizontal lifts as backfill placement proceeds per the manufacturer's recommendations.

Cast-in-place concrete shall be placed on top of wall panels to allow precast coping elements on top of the wall to be brought to proper grade.

Prior to placing any select backfill material on any soil reinforcement device, all connections to the blocks shall be completed.

- d. Backfill Placement - Backfill placement shall closely follow the erection of each lift of blocks. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials including blocks, soil reinforcements, and connections, or misalignment of the facing blocks or reinforcing elements. Any wall materials which may become

damaged or disturbed during backfill placement, or due to wall settlement prior to completion of the project shall be either removed and replaced at the Contractor's expense or corrected, as directed by the Engineer. Any misalignment or distortion of the wall facing blocks due to placement of backfill outside the limits of this section shall be corrected, as directed by the Engineer. Backfill placement methods near the facing shall assure that no voids exist directly beneath the reinforcing elements.

Backfill shall be compacted to 95 percent of the maximum density as determined by AASHTO T 99. When the backfill supports a spread footing of a bridge or other structural load, the top 5 feet shall be compacted to 100 percent of the maximum density. For backfills containing more than 30 percent retained on the $\frac{3}{4}$ inch sieve, a method compaction consisting of a minimum of 2 passes of a steel drum roller or tracked equipment equivalent or larger than a Caterpillar D-6 Dozer shall be used.

The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. Backfill materials shall have a placement moisture content less than or equal to the optimum moisture content. Backfill material with placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniformly acceptable throughout the entire lift. The optimum moisture content shall be determined in accordance with AASHTO T 99.

At each soil reinforcement device level, backfill shall be compacted to the full length of reinforcement devices and be sloped to drain away from the wall before placing and attaching the next layer of reinforcement devices. The compacted backfill shall be level with the connecting device before the reinforcement device can be connected. Compaction within three feet of the back of the wall facing shall be achieved with at least three (3) passes of a light weight mechanical tamper, roller, or vibratory system.

Unless otherwise indicated on the plans or directed by the Engineer, soil reinforcement devices shall be placed at 90 degrees to the face of the wall. The maximum lift thickness before compaction shall be ten (10) inches and shall closely follow modular block erection. The Contractor shall decrease this lift thickness, if required, to obtain the specified density.

At the end of each day's operation, the Contractor shall slope the last level

of backfill away from the wall facing to rapidly direct runoff or rainwater away from the wall face. In addition, the contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

G. Anchored Wall (See QPL 38 for Approved Manufacturer/Supplier)

Part A - Part A covers specifications for permanent ground anchor walls exclusive of the ground anchors.

1. Design Criteria

Unless otherwise directed the Contractor shall select the type of wall element to be used. The wall shall be designed for shear, moment, and lateral and axial capacity in accordance with AASHTO LRFD procedures. The Contractor shall be responsible for determining the length of the wall element and required section necessary to resist loadings due to earth, and water forces while controlling ground movements. Structure design life and corrosion protection requirements for sheet-piles and soldier beams will be provided on the contract drawings. Soil properties, safety factors, anchor tendon corrosion protection requirements, wall finish and color requirements, and appurtenance locations are given in the contract plans or specifications.

The Contractor shall be familiar with the requirements for ground anchors described in Part B, "Ground Anchors". The contractor shall incorporate all dimensional and location restrictions on ground anchor locations, spacing, and length of anchor bond length and unbonded length that may affect the design of the wall system covered by this section.

- The wall system shall be designed to resist maximum anticipated loadings calculated for the effects of any special loadings shown on the contract plans.
- The wall shall be designed to ensure stability against passive failure of the embedded portion of the vertical wall elements (below the base of excavation).
- The axial load carrying capacity of the embedded portion of the vertical wall elements (below the base of the excavation) shall be evaluated.. The wall shall be designed to resist vertical loads including vertical anchor forces and the weight of the lagging and the vertical wall elements. Relying on transfer of vertical load into the soil behind the wall by friction shall not be permitted, unless approved by the Engineer.
- Permanent facing shall be precast or cast-in-place reinforced concrete. Architectural facing treatments, if required, shall be as indicated on the contract drawings. The facing shall extend a minimum of 2.0ft below the gutter line or, if applicable, the ground line adjacent to the wall unless otherwise indicated on the contract drawings.
- The Contract Plans will provide minimum requirements of design elements in order to provide global stability requirement such as minimum embedment of vertical pile elements or minimum lengths of unbonded (free-length) zone for anchors. The wall design shall provide these minimum requirements.
- Wall Drainage. The wall drainage system shall operate by gravity and

shall be capable of relieving water pressures on the back face of the wall under anticipated worst case water pressure conditions. When drainage systems are incorporated into the specific design, hydrostatic head on the back of the wall shall not exceed 6 inches above the elevation of the drainage collection pipe.

2. Materials

The Contractor shall not deliver materials to the site until the Engineer has approved the submittals outlined in section 3.0. The Contractor shall protect the materials from the elements by appropriate means. Prestressing steel strands and bars shall be stored and handled in accordance with the manufacturer's recommendations and in such a manner that no damage to the component parts occurs. All steel components shall be stored under cover and protected against moisture.

- Soldier Beam and Structural Steels
 - i. Steel Soldier Beams - Steel soldier beams shall be of the type and weight indicated on the approved working drawings. Steel soldier beams shall conform to the requirements of AASHTO M 183 (ASTM A 36) or AASHTO M 223 (ASTM A 572) unless otherwise specified.
 - ii. Steel Sheet Piles - Steel sheet piles shall be of the type and weight indicated on the approved working drawings. Steel sheet piles shall conform to the requirements of AASHTO M 202 (ASTM A 328) or AASHTO M 270 (ASTM A 709) Grade 50.
 - iii. Steel Plate - Steel used to fabricate steel studs and other devices shall conform to the requirements of AASHTO M 169 (ASTM A 108)
 - iv. Steel Tube - Steel tube shall conform to the requirements of ASTM A 500.
 - v. Reinforcing Steel - Reinforcing steel shall conform to ASTM A 615. The required Grade of all reinforcing shall be shown on the plans.
- Concrete
 - i. Cement - Portland cement shall be Type I or II and shall conform to AASHTO M 85.
 - ii. Structural Concrete - Structural concrete shall conform to the requirements of Section 604 of the TDOT Standard Specifications Structural concrete shall be Class A with a minimum 28-day compressive strength of 3000 psi, unless otherwise noted on the contract drawings.
 - iii. Lean-Mix Concrete Backfill - Lean-mix concrete backfill shall consist of Type I or Type II Portland cement, fine aggregate and water. Each cubic yard of lean-mix concrete backfill shall consist of a minimum of one sack (94lbs) of Portland cement.

- iv. Precast Concrete - Precast concrete elements such as panels shall be made by an approved plant in accordance with the TDOT Procedure for the “Manufacture and Acceptance of Pre-cast Concrete Drainage Structures, Noise Wall panels, and Retaining wall panels”.

Out-of-state producers shall provide documentation of material quality before the manufacture of any pre-cast products (i.e. aggregate quality reports, cement/steel mill test reports, etc.)

Unless otherwise shown on the contract drawings, Portland cement concrete used in precast elements shall conform to Class D with a minimum 28-day compressive strength of 4000 psi

- Drainage Materials

- i. Drainage Aggregate - Drainage aggregate to be used as a drainage medium shall conform to section 903.17 of the Standard Specifications.
- ii. Preformed Permeable Geocomposite Drains – The preformed permeable geocomposite drains shall be continuous and a minimum of one (1) foot wide. The drains shall be placed in sections with a minimum overlap of one (1) foot and be spliced to assure continuous drainage.
- iii. Pipe and Perforated Pipe - Pipe and perforated pipe shall conform to section 610 of the Standard Specifications.

- Lagging

- i. Temporary Timber Lagging - Temporary timber lagging shall be construction grade rough cut and shall be a minimum of 3 inches thick. Where necessary, the Contractor shall provide certification that the timber conforms to the grade, species, and other specified requirements. If the timber is to be treated with a preservative, a certificate of compliance shall be furnished.
- ii. Permanent Timber Lagging – Permanent timber lagging shall conform to all requirements of section 2.d.i. and shall be constructed from structural stress-graded lumber.

3. Construction

- General Considerations

- i. Wall elements for anchored walls designed and constructed in accordance with this manual shall be either continuous interlocking sheet-piles or steel soldier beams that are either driven or placed in pre-drilled holes that are subsequently backfilled with lean mix or structural concrete.

- Excavation

- i. Excavation below a level of anchors shall be limited to 2 feet below the anchor level and shall not commence below this level until anchors at that level have been installed, load tested, locked

off and accepted by the Department. Placement of timber lagging shall immediately follow excavation in the front of the wall.

- Driven Sheet Pile and Soldier Beam Installation.
 - i. Driven sheet piles and soldier beams shall be driven to the specified minimum tip elevation shown on the approved working drawings. The Contractor shall select a sheet pile or soldier beam section that satisfies all design criteria. The Contractor shall select a driving method and pile driving and ancillary equipment consistent with the expected ground conditions at the site. The sheet-pile or soldier beam shall be driven to the specified minimum tip elevation or to the approved elevation based on bearing capacity without damaging the sheet pile or soldier beam. The interlocks between adjacent sheet piles shall not be damaged. Equipment shall be used to permit the impact energy to be distributed over the tops of the sheet pile or soldier beam.
- Soldier Beam Installation in Pre-drilled Holes
 - i. Excavations required for soldier beam placement shall be performed to the dimensions and elevations on the approved working drawings. The methods and equipment used shall be selected by the Contractor.
 - ii. The Contractor shall ensure that the sidewalls of the pre-drilled holes (i.e. shafts) do not collapse during drilling. Uncased shafts may be used where the sides and the bottom of the shaft are stable and may be visually inspected prior to placing the soldier beam and concrete. Casing or drilling muds shall be used where the sides of the shaft require additional support.
 - iii. The Contractor shall provide equipment for checking the dimensions and alignment of each shaft excavation. The dimensions and alignment shall be determined by the Contractor but shall be observed by the Inspector. The Inspector will check the alignment of the drilling equipment at the beginning of shaft construction and periodically thereafter. Final shaft depth shall be measured after final cleaning by the Contractor.
 - iv. Loose material shall be removed from the bottom of the shaft. No more than 2 feet of standing water shall be left in the bottom of the shaft prior to beginning soldier beam installation.
 - v. The soldier beam shall be placed in the shaft without difficulty and aligned prior to general placement of concrete. The Contractor may place up to 2 feet of concrete at the bottom of the shaft to assist in aligning the soldier beam. The soldier beam shall be blocked or clamped in place at the ground surface, prior to placement of concrete.
 - vi. For shafts constructed without casing or drilling muds, concrete (either structural or lean-mix backfill) may be placed by free-falling the concrete from the ground surface down the shaft and

around the soldier beam. If casing is used, the placement of concrete shall begin prior to casing removal. Remove the casing while the concrete remains workable. For shafts constructed using slurry, concrete shall be placed using the tremie method from the bottom of the shaft. The tremie pipe shall be withdrawn slowly as the level of the concrete rises in the shaft and the level of the tremie pipe outlet shall never exceed the height of the slurry.

- Wall Tolerances
 - i. Soldier beams shall be placed at the locations shown on the approved working drawings and shall not deviate by more than 1 foot along the horizontal alignment of the wall. The wall shall not deviate from the vertical alignment shown of the contract drawings by more than 4 inches in each plane.
 - ii. The soldier beam or sheet pile tip shall be installed to within 1 foot of the specified tip elevation shown on the approved working drawings.
 - iii. Whenever a soldier beam deviates in location or plumbness by more than the tolerance given in these guidelines, the Contractor, at his option, may provide corrective measures such as 1) rebuilding soldier beams; 2) redesigning soldier beam; 3) adjust soldier beam spacing by adding additional soldier beams; 4) redesigning concrete facing; 5) building up the soldier beam section, or 6) other methods.
- Welding and Splicing
 - i. Splicing of sheet piles or soldier beams shall not be permitted, unless approved by the Department. All structural welding of steel and steel reinforcement shall be performed by certified welders qualified to perform the type of welding shown on the shop drawings. All sheet piles or soldier beams shall be cutoff to a true plane at the elevations shown on the approved working drawings. All cutoff lengths shall remain the property of the Contractor and shall be properly disposed.
- Timber Lagging Installation
 - i. Timber lagging shall be placed from the top-down in sufficiently small lifts immediately after excavation to prevent erosion of materials into the excavation. Prior to lagging placement, the soil face shall be smoothed to create a contact surface for the lagging. Large gaps behind the lagging shall be backfilled and compacted prior to applying any loads to the ground anchors.
 - ii. A gap shall be maintained between each vertically adjacent lagging board for drainage between adjacent lagging sections. In no case shall lagging be placed in tight contact to adjacent lagging.
- Drainage System Installation
 - i. The Contractor shall handle preformed permeable geocomposite drains in such a manner as to ensure the geocomposite drain is not damaged in any way. Care shall be taken during placement of the geocomposite drain not to entrap dirt or excessive dust in the geocomposite drain that could cause clogging of the drainage system. Delivery, storage, and handling of the geocomposite drains shall be as provided in the plans or based on manufacturer's recommendations.
 - ii. Drainage geocomposite strips shall be placed and secured tightly against the timber lagging with the fabric facing the lagging. A continuous sheet of drainage geocomposite that spans between adjacent soldier beams shall not be allowed. Seams and overlaps between adjacent composites shall be made according to the special provisions or manufacturer's recommendations and specifications. Repairs shall be performed at no

additional cost to the Department and shall conform to the plans or manufacturer's recommendation.

- iii. Where drainage aggregate is used to construct a vertical drain behind the permanent wall and in front of the lagging, the drainage aggregate shall be placed in horizontal lifts. The construction of the vertical drain should closely follow the construction of the precast facing elements. Care should be exercised to ensure that connection devices between wall elements and facing elements are not damaged during the placement of the drainage aggregate.
- iv. Perforated collector pipe shall be placed within the permeable material to the flow line elevations and at the location shown on the approved working drawings. Outlet pipes shall be placed at the low end of the collector pipe and at other locations shown or specified in the approved working drawings.
- Concrete Facing Installation

For permanent cast-in-place and precast concrete facings, concrete manufacture, handling, placement, and finishing shall conform to the requirements in Section 8 "Concrete Structures" of the AASHTO - *LRFD Bridge Construction Specifications with Interims*. Connections used to secure the facing to wall elements shall conform to the details shown on the approved working drawings. The exposed surface of the concrete facing shall receive a Class I finish as specified in Section 8 "Concrete Structures," unless a special architectural treatment is specified.

Part B, Anchored Wall (See QPL 38 for Approved Manufacturer/Supplier) – Part B covers specifications for the design, construction and testing of Permanent Ground Anchors.

1. Description

The work covered under this section includes the furnishing of all materials, labor, tools, equipment, and other incidental items for the designing, detailing, and construction of permanent ground anchors. All other items included in the construction of the permanent ground anchors not specifically mentioned herein shall conform to all applicable sections of the *Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction*, henceforth referred to as the Standard Specifications, the current *AASHTO LRFD Bridge Design Specifications* with latest revisions, the current *AASHTO LRFD Bridge Construction Specifications* with interims, and the latest version of Post Tensioning Institute (PTI) Standards, including: 1. *PTI, "Post Tensioning Manual"*, 2. *PTI "Specification for Unbonded Single Strand Tendons"*, 3. *PTI "Recommendations for Prestressed Rock and Soil Anchors."*

Unless otherwise noted the Contractor shall select the ground anchor type, drilling method, grouting method, and grout pressures, determine the ground anchor capacity, bond length, free stressing (unbonded) length, and anchor diameter. The Contractor shall be responsible for installing ground anchors that will develop the load-carrying capacity indicated on the approved working drawings in accordance with the testing subsection of this section. The anchor tendon shall be protected from corrosion as shown on the approved working drawings and in accordance with the requirements of this specification.

2. Design Criteria

- Unless otherwise directed the Contractor shall select the type of tendon to be used. The tendon shall be sized so the design load does not exceed 60 percent of the specified minimum tensile strength of the prestressing steel. The lock-off load for the tendon shall be chosen based on anticipated time or activity dependent load changes, but shall not exceed 70 percent of the specified minimum tensile stress of the prestressing steel. The prestressing steel shall be sized so the maximum test load does not exceed 80 percent of the specified minimum tensile strength of the prestressing steel.
- The Contractor shall be responsible for determining the bond length necessary to develop the design load indicated on the approved working drawings. The minimum bond length shall be 15 feet for strand tendons in rock and 10 feet for bar tendons in rock. The minimum bond length shall be 15 feet for strand and bar tendons in soil. The minimum tendon bond length shall be 10 feet.
- The free stressing length (unbonded length) for rock and soil anchors shall not be less than 10 feet for bar tendons and 15 feet for strand tendons. The free stressing length shall extend at least 5 feet or 20 percent of the height of the wall, whichever is greater, behind the critical failure surface. The critical failure surface shall be evaluated using slope stability or similar procedures.

3. Submittals

Requirements for submittals are as outlined above and also include the following:

- Contractor qualifications as outlined in Part A, of these anchored wall design and construction requirements.
 - The working drawings and design submission shall include the following:
 - a) A ground anchor schedule giving:
 - Ground anchor number
 - Ground anchor design load
 - Type and size of tendon
 - Minimum total anchor length
 - Minimum bond length
 - Minimum tendon bond length
 - Minimum unbonded length
 - b) A drawing of the ground anchor tendon and the corrosion protection system including details for the following:
 - Spacers and their location
 - Centralizers and their location
 - Unbonded length corrosion protection system
 - Bond length corrosion protection system
 - Anchorage and trumpet
 - Anchorage corrosion protection system
- Certificates of Compliance for the following materials , if used. The certificate shall state that the materials or assemblies to be provided will fully comply with the requirements of the contract.

- a) Prestressing steel, strand or bar
 - b) Portland cement
 - c) Prestressing hardware
 - d) Bearing plates
 - e) Corrosion protection system
- The Contractor shall submit to the Engineer for review and approval or rejection mill test reports for the prestressing steel and the bearing plate steel. The Engineer may require the Contractor to provide samples of any ground anchor material intended for use on the project. The prestressing steel and bearing plates shall not be incorporated in the work without the Engineer's approval.
 - The Contractor shall submit to the Engineer for review and approval or rejection calibration data for each test jack, load cell, primary pressure gauge and reference pressure gauge to be used. Testing cannot commence until the Engineer has approved these calibrations.
 - The Contractor shall submit to the Engineer within twenty calendar days after the completion of the ground anchor work a report containing the following:
 - a) Prestressing steel manufacturer's mill test reports for the tendons incorporated in the installation
 - b) Grouting records indicating the cement type, quantity injected and the grout pressures
 - c) Ground anchor test results
 - d) As-built drawings showing the location and orientation of each ground anchor, anchor capacity, tendon type, total anchor length, bond length, unbonded length, and tendon bond length as installed and locations of all instruments installed by the Department.
 - Existing Conditions – Prior to beginning work, the Department shall provide utility location plans to the Contractor. The Contractor is responsible for contacting a utility location service to verify the location of underground utilities before starting work. The Contractor shall survey the condition of adjoining properties and make records and photographs of any evidence of settlement or cracking of any adjacent structures. The Contractor's report of this survey shall be delivered to the Department before work begins.

4. Materials

- General
 - a) The Contractor shall not deliver materials to the site until the Engineer has approved the submittals outlined in Section 3.0.
 - b) The Contractor shall protect all materials from theft, vandalism, and the elements by appropriate means. Prestressing steel strands and bars shall be stored and handled in accordance with the manufacturer's recommendations and in such a manner that no damage to the component parts occurs. All steel components shall be protected from the elements at all times. Cement and additives for grout shall be stored under cover and protected against moisture.
- Anchorage Devices
 - a) Stressing anchorages shall be a combination of either steel bearing plate with wedge plate

and wedges, or a steel bearing plate with a threaded anchor nut. The steel bearing and wedge plate may also be combined into a single element. Anchorage devices shall be capable of developing 95 percent of the specified minimum ultimate tensile strength of the prestressing steel tendon. The anchorage devices shall conform to the static strength requirements of Section 3.1.6 (1) and Section 3.1.8 (1) and (2) of the latest edition of the PTI *“Guide Specifications for Post-Tensioning Materials.”*

- b) The bearing plate shall be fabricated from steel conforming to AASHTO M 183 or M 222 specifications, or equivalent, or may be

a ductile iron casting conforming to ASTM A 536.

- c) The trumpet shall be fabricated from a steel pipe or tube or from PVC pipe. Steel pipe or tube shall conform to the requirements of ASTM A 53 for pipe or ASTM A 500 for tubing. Steel trumpets shall have a minimum wall thickness of 0.1 inch for diameters up to 4 inches and 0.2 inch for larger diameters. PVC pipe shall conform to ASTM A 1785, Schedule 40 minimum. PVC trumpets shall be positively sealed against the bearing plate and aligned with the tendon to prevent cracking during stressing.
- d) Anchorage covers shall be fabricated from steel or plastic with a minimum thickness of 0.1 inch. The joint between the cover and the bearing plate shall be watertight.
- e) Wedges shall be designed to preclude premature failure of the prestressing steel due to notch or pinching effects under static and dynamic strength requirements of Section 3.1.8 (1) and 3.1.8 (2) of the PTI "*Post Tensioning Manual*." Wedges shall not be reused.
- f) Wedges for epoxy coated strand shall be designed to be capable of biting through the epoxy coating and into the strand. Removal of the epoxy coating from the strand to allow the use of standard wedges shall not be permitted. Anchor nuts and other threadable hardware for epoxy coated bars shall be designed to thread over the epoxy coated bar and still comply with the requirements for carrying capacity.

- Prestressing Steel

- a) Ground anchor tendons shall be fabricated from single or multiple elements of one of the following prestressing steels:
 - Steel bars conforming to AASHTO M 275
 - Seven-wire, low relaxation strands conforming to AASHTO M 203
 - Compact, seven-wire, low-relaxation strands conforming to ASTM A 779
 - Epoxy coated strand conforming to ASTM A 882
 - Epoxy coated reinforcing steel bars conforming to ASTM A 775
- b) Centralizers shall be provided at maximum intervals of 10 feet with the deepest centralizer located 1 foot from the end of the anchor and the upper centralizer for the bond zone located no more than 5 feet from the top of the tendon bond length. Spacers shall be used to separate the steel strands of strand tendons. Spacers shall be provided at maximum intervals of 10 feet and may be combined with centralizers.

- Prestressing Steel Couplers

Prestressing steel bar couplers shall be capable of developing 100 percent of the minimum specified ultimate tensile strength of the prestressing steel bar. Steel strands used for a soil or rock anchor shall be continuous with no splices, unless approved by the Engineer.

- Centralizers

- a) Centralizers shall be fabricated from plastic, steel or material, which is non-detrimental to the prestressing steel. Wood shall not be used. The centralizer shall be able to support the tendon in the drill hole and position the tendon so a minimum of 2 inches of grout cover is provided and shall permit grout to freely flow around the tendon and up the drill hole.
- b) Centralizers are not required on pressure injected anchors installed in coarse grained soils when the grouting pressure exceeds 145 psi or on hollow stem-augured anchors when they are grouted through the auger with grout having a slump of 9 inches or less.

- Spacers

Spacers shall be used to separate elements of a multi-element tendon and shall permit grout to freely flow around the tendon and up the drill hole. Spacers shall be fabricated from plastic, steel or material, which is non-detrimental to the prestressing steel. Wood shall not be used. A combination centralizer- spacer may be used.

- Tendon Bond Length Encapsulations

When the contract plans require the tendon bond length to be encapsulated to provide additional corrosion protection, the encapsulation shall be fabricated from one of the following:

- a) High density corrugated polyethylene tubing conforming to the requirements of AASHTO M 252 and having a minimum wall thickness of 0.06 inch except pre-grouted tendons, which may have a minimum wall thickness of 0.04 inch.
- b) Deformed steel tubing or pipes conforming to ASTM A 52 or A 500 with a minimum wall thickness of 0.2 inch.
- c) Corrugated, polyvinyl chloride tubes manufactured from rigid PVC compounds conforming to ASTM D 1784, Class 13464- B.
- d) Fusion-bonded epoxy conforming to the requirements of AASHTO M 284.

- Heat Shrinkable Sleeves

Heat shrinkable sleeves shall be fabricated from a radiation cross-linked polyolefin tube internally coated with an adhesive sealant. Prior to shrinking, the tube shall have a nominal wall thickness of 0.025 inch. The adhesive sealant inside the heat shrinkable tube shall have a nominal thickness of 0.02 inch.

- Sheath

A sheath shall be used as part of the corrosion protection system for the unbonded length portion of the tendon. The sheath shall be fabricated from one of the following:

- a) A polyethylene tube pulled or pushed over the prestressing steel. The polyethylene shall be Type II, III or IV as defined by ASTM D 1248 (or approved equal). The tubing shall have a minimum wall thickness of 0.06 inch.
- b) A hot-melt extruded polypropylene tube. The polypropylene shall be cell classification B55542-11 as defined by ASTM D 4101 (or approved equal). The tubing shall have a minimum wall thickness of 0.06 inch.
- c) A hot-melt extruded polyethylene tube. The polyethylene shall be high density Type III as defined by ASTM D 1248 (or approved equal). The tubing shall have a minimum wall thickness of 0.06 inch.
- d) Steel tubing conforming to ASTM A 500. The tubing shall have a minimum wall thickness of 0.2 inch.
- e) Steel pipe conforming to ASTM A 53. The pipe shall have a minimum wall thickness of 0.2 inch.
- f) Plastic pipe or tube of PVC conforming to ASTM D 1784 Class 13464-B. The pipe or tube shall be Schedule 40 at a minimum.
- g) A corrugated tube conforming to the requirement of the tendon bond length encapsulation Subsection 4.g. above.

- Bondbreaker

The bondbreaker shall be fabricated from a smooth plastic tube or pipe having the following properties: (1) resistant to chemical attack from aggressive environments, grout, or corrosion inhibiting compound; (2) resistant to aging by ultraviolet light; (3) fabricated from material non-detrimental to the tendon; (4) capable of withstanding abrasion, impact, and bending during handling and installation; (5) enable the tendon to elongate during testing and stressing; and (6) allow the tendon to remain unbonded after lockoff.

- Cement Grout

Type I, II, III or V Portland cement conforming to AASHTO M 85 shall be used for grout. The grout shall be a pumpable neat mixture of cement and water and shall be stable (bleed less than 2 percent), fluid, and provide a minimum 28-day compressive strength of at least 3000 psi measured in accordance with ASTM C 109 at the time of stressing.

- Admixtures

Admixtures which control bleed, improve flowability, reduce water content, and retard set may be used in the grout subject to the approval of the Engineer. Admixtures, if used, shall be compatible with the prestressing steels and mixed in accordance with the manufacturer's recommendation. Expansive admixtures may only be added to the grout used for filling sealed encapsulations, trumpets, and anchorage covers. Accelerators shall not be permitted.

- Water

Water for mixing grout shall be potable, clean, and free of injurious quantities of substances known to be harmful to Portland cement or prestressing steel.

- Corrosion Inhibiting Compound

The corrosion inhibiting compound placed in either the free length or the trumpet areas shall be an organic compound (i.e. grease or wax) with appropriate polar moisture displacing, corrosion inhibiting additives and self-healing properties. The compound shall permanently stay viscous and be chemically stable and nonreactive with the prestressing steel, the sheathing material, and anchor grout.

- Grout Tubes

Grout tubes shall have an adequate inside diameter to enable the grout to be pumped to the bottom of the drill hole. Grout tubes shall be strong enough to withstand a minimum grouting pressure of 145 psi. Post-grout tubes shall be strong enough to withstand post-grouting pressures.

5. Construction

1. Tendon Storage and Handling

- Tendons shall be handled and stored in such a manner as to avoid damage or corrosion. Damage to the prestressing steel, the corrosion protection, and/or the epoxy coating as a result of abrasions, cuts, nicks, welds or weld splatter will be cause for rejection by the Engineer. The prestressing steel shall be protected if welding is to be performed in the vicinity.

Grounding of welding leads to the prestressing steel is forbidden. Prestressing steel shall be protected from dirt, rust, or other deleterious substances. A light coating of rust on the steel is acceptable. If heavy corrosion or pitting is noted, the Engineer shall reject the affected tendons.

- The Contractor shall use care in handling and storing the tendons at the site. Prior to inserting a tendon in the drill hole, the Contractor and the Inspector shall examine the tendon for damage to the encapsulation and the sheathing. If, in the opinion of the Inspector, the encapsulation is damaged, the Contractor shall repair the encapsulation in accordance with the tendon supplier's recommendations. If, in the opinion of the inspector, the smooth sheathing has been damaged, the Contractor shall repair it with ultra-high molecular weight polyethylene tape. The tape should be spiral wound around the tendon to completely seal the damaged area. The pitch of the spiral shall ensure a double thickness at all points.
- Banding for fabricated tendons shall be padded to avoid damage to the tendon corrosion protection. Upon delivery, the fabricated anchors or the prestressing steel for fabrication of the tendons on site and all hardware shall be stored and handled in such a manner to avoid mechanical damage, corrosion, and contamination with dirt or deleterious substances.
- Lifting of the pre-grouted tendons shall not cause excessive bending, which can debond the prestressing steel from the surrounding grout.
- Prestressing steel shall not be exposed to excessive heat (i.e. more than 446° F).

b. Anchor Fabrication

- Anchors shall be either shop or field fabricated from material conforming to part 4 of this section and as shown in the approved working drawings and schedules.
- Prestressing steel shall be cut with an abrasive saw or, with the written approval of the prestressing steel supplier, an oxyacetylene torch.
- All of the tendon bond length, especially for strand, must be free of dirt, manufacturer's lubricants, corrosion-inhibitive coatings, or other deleterious substances that may significantly affect the grout- to-tendon bond or the service life of the tendon.
- Pre-grouting of encapsulated tendons shall be done on an

inclined, rigid frame or bed by injecting the grout from the low end of the tendon.

c. Drilling

- Drilling methods shall be left to the discretion of the Contractor, whenever possible. The Contractor shall be responsible for using a drilling method to establish a stable hole of adequate dimensions, within the tolerances specified. Drilling methods may involve, amongst others, rotary, percussion, rotary/percussive or auger drilling; or percussive or vibratory driven casing.
- Holes for anchors shall be drilled at the locations and to the length, inclination and diameter shown on the approved working drawings. The drill bit or casing crown shall not be more than 0.12 inch smaller than the specified hole diameter. At the ground surface the drill hole shall be located within 1 foot of the location shown on the approved working drawings. The drill hole shall be located so the longitudinal axis of the drill hole and the longitudinal axis of the tendon are parallel. In particular, the ground anchor hole shall not be drilled in a location that requires the tendon to be bent in order to enable the bearing plate to be connected to the supported structure. At the point of entry the ground anchor shall be installed within plus/minus three (3) degrees of the inclination from horizontal shown on the approved working drawings. At the point of entry the horizontal angle made by the ground anchor and the structure shall be within plus/minus three (3) degrees of a line drawn perpendicular to the plane of the structure unless otherwise shown on the approved working drawings. The ground anchors shall not extend beyond the right-of-way or easement limits shown on the contract drawings.

d. Tendon Insertion

- Tendons shall be placed in accordance with the approved working drawings and details and the recommendations of the tendon manufacturer or specialist anchor contractor. The tendon shall be inserted into the drill hole to the desired depth without difficulty.

Each anchor tendon shall be inspected by Department field personnel during installation into the drill hole or casing. Damage to the corrosion protection system shall be repaired, or the tendon replaced if not repairable. Loose spacers or centralizers shall be reconnected to prevent shifting during insertion. Damaged fusion bonded epoxy coatings shall be repaired in accordance with the manufacturer's recommendations. If the patch is not allowed to cure prior to inserting the tendon in the drill hole, the patched area shall be protected by tape or other suitable means.

e) The rate of placement of the tendon into the hole shall be controlled such that the sheathing, coating, and grout tubes are not damaged during installation of the tendon. Anchor tendons shall not be subjected to sharp bends. The bottom end of the tendon may be fitted with a cap or bullnose to aid its insertion into the hole, casing or sheathing.

- Grouting
- The Contractor shall use a neat cement grout or a sand-cement grout. The cement shall not contain lumps or other indications of hydration. Admixtures, if used, shall be mixed in accordance with the manufacturer's recommendation.

- The grouting equipment shall produce a grout free of lumps and undispersed cement. A positive displacement grout pump shall be used. The pump shall be equipped with a pressure gauge to monitor pressures. The pressure gauge shall be capable of measuring pressures of at least 145 psi or twice the actual grout pressure used by the Contractor, whichever is greater. The grouting equipment shall be sized to enable the grout to be pumped in one continuous operation. The mixer should be capable of continuously agitating the grout.
- The grout shall be injected from the lowest point of the drill hole. The grout may be pumped through grout tubes, casings, hollowstem-augers, or drill rods. The grout can be placed before or after insertion of the tendon. The quantity of the grout and the grout pressures shall be recorded. The grout pressures and grout takes shall be controlled to prevent excessive heave or

- After the tendon is installed, the drill hole may be filled in one continuous grouting operation except that pressure grouting shall not be used in the free length zone. The grout at the top of the drill hole shall not contact the back of the structure or the bottom of the trumpet.
- If the ground anchor is installed in a fine-grained soil using drill holes larger than 6 inches in diameter, then the grout above the top of the bond length shall be placed after the ground anchor has been tested and stressed. The Engineer will allow the Contractor to grout the entire drill hole at the same time if the Contractor can demonstrate that their particular ground anchor system does not derive a significant portion of its load-carrying capacity from the soil above the bond length portion of the ground anchor.
- If grout protected tendons are used for ground anchors anchored in rock, then pressure grouting techniques shall be utilized. Pressure grouting requires that the drill hole be sealed and that the grout be injected until a minimum 50 psi grout pressure (measured at the top of the drill hole) can be maintained on the grout for at least five (5) minutes.
- The grout tube may remain in the hole on completion of grouting if the tube is filled with grout.
- After grouting, the tendon shall not be loaded for a minimum of three (3) days.

f. Anchorage Installation

- The anchor bearing plate and the anchor head or nut shall be installed perpendicular to the tendon, within plus/minus three (3) degrees and centered on the bearing plate, without bending or kinking of the prestressing steel elements. Wedge holes and wedges shall be free of rust, grout and dirt.
- The stressing tail shall be cleaned and protected from damage until final testing and lock-off. After the anchor has been accepted by the Engineer, the stress tail shall be cut to its final length according to the tendon manufacturer's recommendations.
- The corrosion protection surrounding the unbonded length of the tendon shall extend up beyond the bottom seal of the trumpet or 4 inches into the trumpet if no trumpet seal is provided. If the protection does not extend beyond the seal or sufficiently far

enough into the trumpet, the Contractor shall extend the corrosion protection or lengthen the trumpet.

- The corrosion protection surrounding the unbonded length of the tendon shall not contact the bearing plate or the anchor head during testing and stressing. If the protection is too long, the Contractor shall trim the corrosion protection to prevent contact.

g. Corrosion Protection

- Protection Requirements

Corrosion protection requirements shall be determined by the Department and shall be shown on the contract plans. The corrosion protection systems shall be designed and constructed to provide reliable ground anchors for temporary and permanent structures.

- Anchorage Protection
 - All stressing anchorages permanently exposed to the atmosphere shall receive a grout-filled cover, except, for restressable anchorages where a corrosion inhibiting compound must be used. Stressing anchorages encased in concrete at least 2 inches thick do not require a cover.
 - The trumpet shall be sealed to the bearing plate and shall overlap the unbonded length corrosion protection by at least 4 inches. The trumpet shall be long enough to accommodate movements of the structure and the tendon during testing and stressing. On strand tendons, the trumpet shall be long enough to enable the tendon to make a transition from the diameter of the tendon along the unbonded length to the diameter of the tendon at the wedge plate without damaging the encapsulation.
 - The trumpet shall be completely filled with grout, except re-stressable anchorages must use corrosion inhibiting compounds. Compounds may be placed any time during construction. Compound filled trumpets shall have a permanent seal between the trumpet and the unbonded length corrosion protection. Grout must be placed after the ground anchor has been tested and stressed to the lock-off load. Trumpets filled with grout shall have either a temporary seal between the trumpet and the unbonded length corrosion protection or the trumpet shall fit tightly over the unbonded length corrosion protection for a minimum of 4 inches.

- Unbonded Length Protection
 - a) Corrosion protection of the unbonded length shall be provided by a combination of sheaths, sheath filled with a corrosion inhibiting compound or grout, or a heat shrinkable tube internally coated with a mastic compound, depending on the tendon class. The corrosion inhibiting compound shall completely coat the tendon elements, fill the void between them and the sheath, and fill the interstices between the wires of 7-wire strands. Provisions shall be made to retain the compound within the sheath.
 - b) The corrosion protective sheath surrounding the unbonded length of the tendon shall be long enough to extend into the trumpet, but shall not come into contact with the stressing anchorage during testing. Any excessive protection length shall be trimmed off.
 - c) For pre-grouted encapsulations and all Class I tendons, a separate bond breaker or common sheath shall be provided for supplemental corrosion protection or to prevent the tendon from bonding to the grout surrounding the unbonded length.

- Unbonded Length/Bond Length Transition

The transition between the corrosion protection for the bonded and unbonded lengths shall be designed and fabricated to ensure continuous protection from corrosive attack.

- Tendon Bond Length Protection for Grout Protected Tendons (Class II)

- a) Cement grout can be used to protect the tendon bond length in non-aggressive ground when the installation methods ensure that the grout will remain fully around the tendon. The grout shall overlap the sheathing of the unbonded length by at least 1 inch.
- b) Centralizers or grouting techniques shall ensure a minimum of 0.5 inch of grout cover over the tendon bond length.

- Tendon Bond Length Protection for Encapsulated Tendons (Class I)

- a) A grout-filled, corrugated plastic encapsulation or a grout-filled, deformed steel tube shall be used. The prestressing steel can be grouted inside the encapsulation prior to being placed.
- b) Centralizers or grouting techniques shall ensure a minimum of 0.5 inch of grout cover over the encapsulation.

- Epoxy

A fusion-bonded epoxy may be used to provide a layer of protection for the steel tendon in addition to the cement grout.

- Coupler Protection

- a) On encapsulated bar tendons (Class I), the coupler and any adjacent exposed bar sections shall be covered with a corrosion-proof compound or wax-impregnated cloth tape. The coupler area shall be covered by a smooth plastic tube, complying with the requirements set forth in 4.9, overlapping the adjacent sheathed tendon by at least 1 inch. The two joints shall be sealed each by a coated heat shrink sleeve of at least 6 inches in length, or approved equal. The corrosion-proof compound shall completely fill the space inside the cover tube.
- b) Corrosion protection details for strand couplers, if specifically permitted, shall be submitted for approval of the Engineer.

- h. Stressing, Load Testing, and Acceptance

- General

Each ground anchor shall be tested. No load greater than ten (10) percent of the design load can be applied to the ground anchor prior to testing. The maximum test load shall be no less than 1.33 times the design load and shall not exceed 80 percent of the specified minimum ultimate tensile strength of the prestressing steel of the tendon. The test load shall be simultaneously applied to the entire tendon. Stressing of single-element tendons shall not be permitted.

- Stressing Equipment

- a) The testing equipment shall consist of:

- a) A dial or vernier scale capable of measuring to the nearest .001 inch shall be used to measure the ground anchor movement. The movement measuring device shall have a minimum travel equal to the theoretical elastic elongation of the total anchor length at the maximum test load and it shall have adequate travel so the ground anchor movement can be measured without resetting the device at an interim point.
- b) A hydraulic jack and pump shall be used to apply the test load. The jack and a calibrated primary pressure gauge shall be used to measure the applied load. The jack and primary pressure gauge shall be calibrated by an independent firm as a unit. The calibration shall have been performed within forty-five (45) working days of

the date when the calibration submittals are provided to the Engineer. Testing cannot commence until the Engineer has approved the calibration. The primary pressure gauge shall be graduated in 100 psi increments or less. The ram travel shall be at least 6 inches and preferably not be less than the theoretical elongation of the tendon at the maximum test load. If elongations greater than 6 inches are required, re-stroking can be allowed.

- c) A calibrated reference pressure gauge shall also be kept at the site to periodically check the production (i.e. primary pressure) gauge. The reference gauge shall be calibrated with the test jack and primary pressure gauge. The reference pressure gauge shall be stored indoors and not subjected to rough treatment.
- d) The Contractor shall provide an electrical resistance load cell and readout to be used when performing an extended creep test.
- e) The stressing equipment shall be placed over the ground anchor tendon in such a manner that the jack, bearing plates, load cells and stressing anchorage are axially aligned with the tendon and the tendon is centered within the equipment.
- f) The stressing equipment, the sequence of stressing and the procedure to be used for each stressing operation shall be determined at the planning stage of the project. The equipment shall be used strictly in accordance with the manufacturer's operating instructions.
- g) Stressing equipment shall preferably be capable of stressing the whole tendon in one stroke to the specified test load and the equipment shall be capable of stressing the tendon to the maximum specified test load within 75 percent of the rated capacity. The pump shall be capable of applying each load increment in less than 60 seconds.

- h) The equipment shall permit the tendon to be stressed in increments so that the load in the tendon can be raised or lowered in accordance with the test specifications, and allow the anchor to be lift-off tested to confirm the lock off load.
- i) Stressing equipment shall have been calibrated, within an accuracy of plus or minus two (2) percent, a maximum of 45 days prior to use. The calibration certificate and graph shall be available on site at all times. The calibration shall be traceable to the National Institute of Standards and Technology (NIST).
- Load Test Setup
 - a) Dial gauges shall bear on the pulling head of the jack and their stems shall be coaxial with the tendon direction. The gauges shall be supported on an independent, fixed frame, such as a tripod, which will not move as a result of stressing or other construction activities during the operation.
 - b) Prior to setting the dial gauges, the Alignment Load (AL) shall be accurately placed on the tendon. The magnitude of the AL depends on the type and length of the tendon.
 - c) Re-gripping of strands, which would cause overlap wedge bites, or wedge bites on the tendon below the anchor head, shall be avoided.
 - d) Stressing and testing of multiple element tendons with single element jacks is not permitted.
 - e) Stressing shall not begin until the grout has reached adequate strength.
- Performance Tests
 - a) Five (5) percent of the ground anchors or a minimum of three (3) ground anchors, whichever is greater, shall be performance tested in accordance with the procedures described in this section. The Engineer shall select the ground anchors to be performance tested. The remaining ground anchors shall be tested in accordance with the proof test procedures as outlined in 5.h. below.
 - The performance test shall be made by incrementally loading and unloading the ground anchor in accordance with the schedule provided in section 5.h. The load shall be raised from one increment to another immediately after recording the ground anchor movement. The ground anchor movement shall be measured and recorded to the nearest

0.001 inch with respect to an independent fixed reference point at the alignment load and at each increment of load. The load shall be monitored with the primary pressure gauge. The reference pressure gauge shall be placed in series with the primary pressure gauge during each performance test. If the load determined by the reference pressure gauge and the load determined by the primary pressure gauge differ by more than ten (10) percent, the jack, primary pressure gauge and reference pressure gauge shall be recalibrated at no expense to the Department. At load increments other than the maximum test load, the load shall be held just long enough to obtain the movement reading.

- The maximum test load in a performance test shall be held for ten (10) minutes. A load cell shall be used to monitor small changes in load during constant load-hold periods.
- The jack shall be adjusted as necessary in order to maintain a constant load. The load-hold period shall start as soon as the maximum test load is applied and the ground anchor movement, with respect to a fixed reference, shall be measured and recorded at 1 minute, 2, 3, 4, 5, 6, and 10 minutes. If the ground anchor movement between one (1) minute and ten (10) minutes exceeds .04 inch, the maximum test load shall be held for an additional 50 minutes. If the load hold is extended, the ground anchor movement shall be recorded at 15, 20, 30, 40, 50 and 60 minutes.
- Steps for the Performance Test – The steps for the performance test are detailed in the table on the following page:

Step	Loading	Applied Load	Record and Plot Total Movement (d_{ti})	Record and Plot Residual Movement (d_{ri})	Calculate Elastic Movement (d_{ei})
1	Apply alightment load (AL)				
2	Cycle 1	0.25DL	d_{t1}		$d_{t1} - d_{r1} = d_{e1}$
		AL		d_r	
3	Cycle 2	0.25AL	d_2		$d_{t2} - d_{r2} = d_{e2}$
		0.50DL	d_{t2}		
		AL		d_{r2}	
4	Cycle 3	0.25DL	d_3		$d_{t3} - d_{r3} = d_{e3}$
		0.50DL	d_3		
		0.75FL	d_3		
		AL		d_{r3}	
5	Cycle 4	0.25DL	d_4		$d_{t4} - d_{r4} = d_{e4}$
		0.50DL	d_4		
		0.75DL	d_4		
		1.00DL	d_{t4}		
		AL		d_{r4}	
6	Cycle 5	0.25DL	d_5		$d_{t5} - d_{r5} = d_{e5}$
		0.50DL	d_5		
		0.75DL	d_5		
		1.00DL	d_5		
		1.2DL	d_5		
		AL		d_{r5}	
7	Cycle 6	0.25DL	d_6		
		0.50DL	d_6		
		0.75DL	d_6		
		1.00DL	d_6		
		1.2DL	d_6		
		1.33DL	d_{t6} , zero reading for creep test		
8	Hold load for 10 minutes while recording movement at specified times. If the total movement measured during the load hold exceeds the specified maximum value then the load hold should be extended to a total of 60 minutes.				
9	Cycle 6 cont=d	AL		d_{r6}	Cycle 6: $d_m - d_{r6} = d_{e6}$
Notes: AL = Alignment Load, DL = Design Load, d_i = total movement at a load other than maximum for cycle, i = number identifying a specific load cycle.					

- Proof Tests

The proof test shall be performed by incrementally loading the ground anchor in accordance with the following schedule. The load shall be raised from one increment to another immediately after recording the ground anchor movement. The ground anchor movement shall be measured and recorded to the nearest 0.001 inch with respect to an independent fixed reference point at the alignment load and at each increment load. The load shall be monitored with the primary pressure gauge. At load increment other than the maximum test load, the load shall be held just long enough to obtain the movement reading.

Proof Test Schedule

Step	Load
1	AL
2	0.25DL
3	0.50DL
4	0.75DL
5	1.00DL
6	1.20DL
7	1.33DL
8	Reduce to lock-off load
9	AL (optional)
10	Adjust to lock-off load

- The maximum test load in a proof test shall be held for (10) minutes. The jack shall be adjusted as necessary in order to maintain a constant load. The load-hold period shall start as soon as the maximum test load is applied and the ground anchor movement with respect to a fixed reference shall be measured and recorded at 1, 2, 3, 4, 5, 6, and 10 minutes. If the ground anchor movement between one (1) minute and ten (10) minutes exceeds 0.04 inch, the maximum test load shall be held for an additional 50 minutes. If the load hold is extended, the ground anchor movements shall be recorded at 15, 20, 30, 40, 50, and 60 minutes.
- Extended Creep Tests
 - a) The Department shall determine if extended creep testing is required and select those ground anchors that are to be creep tested. If creep tests are required, at least two (2) ground anchors shall be tested. The stressing equipment shall be capable of measuring and maintaining the hydraulic pressure within 50 psi.
 - b) The extended creep test shall be made by incrementally loading and unloading the ground anchor in accordance with the performance test schedule provided in 5.8.5. At the end of each

loading cycle, the load shall be held constant for the observation period indicated in the creep test schedule below.

The times for reading and recording the ground anchor movement during each observation period shall be 1, 2, 3, 4, 5,

6, 10, 15, 20, 25, 30, 45, 60, 75, 90, 100, 120, 150, 180, 210,

240, 270 and 300 minutes as appropriate for the load increment. Each load-hold period shall start as soon as the test load is applied. In a creep test, the primary pressure gauge and reference pressure gauge will be used to measure the applied load and the load cell will be used to monitor small changes in load during constant load-hold periods. The jack shall be adjusted as necessary in order to maintain a constant load.

- c) The Contractor shall plot the ground anchor movement and the residual movement measured in an extended creep test. The Contractor shall also plot the creep movement for each load hold as a function of the logarithm of time.

Extended Creep Test Schedule

Load	Observation period (min)
AL	
0.25DL	10
0.50DL	30
0.75DL	30
1.00DL	45
1.20DL	60
1.33DL	300

- **Ground Anchor Acceptance Criteria**

A performance-tested or proof-tested ground anchor with a 10 minute load hold shall be acceptable if the: (1) ground anchor resists the maximum test load with less than 0.04 inch of movement between 1 minute and 10 minutes; and (2) total elastic movement at the maximum test load exceeds 80 percent of the theoretical elastic elongation of the unbonded length.

a) A performance-tested or proof-tested ground anchor with a 60 minute load hold shall be acceptable if the: (1) ground anchor resists the maximum test load with a creep rate that does not exceed 0.08 inch in the last log cycle of time; and (2) total elastic movement at the maximum test load exceeds 80 percent of the theoretical elastic elongation of the unbonded length.

b) A ground anchor subjected to extended creep testing is acceptable if the: (1) ground anchor resists the maximum test load with a creep rate that does not exceed 0.08 inch in the last log cycle of time; and (2) total elastic movement at the maximum test load exceeds 80 percent of the theoretical elastic elongation of the unbonded length.

c) The initial lift-off reading shall be within plus or minus five (5) percent of the designated lock-off load. If this criterion is not met, then the tendon load shall be adjusted accordingly and the initial lift-off reading repeated.

- Procedures for Anchors Failing Acceptance Criteria

a) Anchors that do not satisfy the minimum apparent free length criteria shall be either rejected and replaced at no additional cost to the Department or locked off at no more than 50 percent of the maximum acceptable load attained. In this event, no further acceptance criteria are applied.

b) Re-groutable anchors which satisfy the minimum apparent free length criteria but which fail the extended creep test at the test load may be post grouted and subjected to an enhanced creep criterion. This enhanced criterion requires a creep movement of not more than 0.04 inch between 1 and 60 minutes at test load. Anchors which satisfy the enhanced creep criterion shall be locked off at the design lock-off load. Anchors which cannot be post grouted or regroutable anchors that do not satisfy the enhanced creep criterion shall be either rejected or locked off at 50 % of the maximum acceptable test load attained. In this event, no further acceptance criteria are applied. The maximum acceptable test load with respect to creep shall correspond to that where acceptable creep movements are measured over the final log cycle of time.

c) In the event that the anchor fails, the Contractor shall modify the design and/or construction procedures. These modifications may include, but are not limited to, installing additional anchors, modifying the installation methods, reducing the anchor design load by increasing the number of anchors, increasing the anchor length, or changing the anchor type. Any modification of design or construction procedures shall be at no change in the contract price. A description of any proposed modifications must be submitted to the Engineer in writing. Proposed modifications shall not be implemented until the Contractor receives written approval from the Engineer.

- Anchor Lock-Off

a) After testing has been completed, the load in the tendon shall be such that after seating losses (i.e. wedge seating); the specified lock-off load has been applied to the anchor tendon.

b) The magnitude of the lock-off load shall be specified in the approved working drawings, or as determined by the designer.

c) The wedges shall be seated at a minimum load of 50% F_{pu} . If the lock-off load is less than 50% F_{pu} , shims shall be used under the wedge plate and the wedges seated at 50% F_{pu} . The shims shall then be removed to reduce the load in the tendon to

the desired lock-off load. Bar tendons may be locked off at any load less than 70% F_{pu} .

- Anchor Lift-Off Test

After transferring the load to the anchorage, and prior to removing the jack, a lift-off test shall be conducted to confirm the magnitude of the load in the anchor tendon. This load is determined by reapplying load to the tendon to lift off the wedge plate (or anchor nut) without unseating the wedges (or turning the anchor nut). This moment represents zero time for any long time monitoring.

SPECIAL PROVISION

REGARDING

HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS

Scope

These design requirements shall apply to **713**-Highway Signing, **714**-Roadway and Structure Lighting, and **730**-Traffic Signals of the current Standard Specifications.

Description

The design of the supports for overhead sign bridges and butterfly configurations, high mast lighting, luminaires, CCTV camera poles, and traffic signal strain poles and mast arm structures shall be in accordance with the American Association of Highway and Transportation Officials (AASHTO) LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 1st edition, with addenda.

General Conditions

All overhead sign bridges and butterfly sign structures, traffic signal strain poles and mast arm structures and high mast light poles 90-feet or greater in height, shall be designed using the Fatigue Category 1 provisions found in the subject specifications except that, design for galloping-induced fatigue and truck-induced gust fatigue, are excluded. Fatigue designs are not required for luminaire poles less than 55-feet in height, span-wire poles, or roadside sign poles.

In lieu of designing for galloping-induced fatigue in mast arm pole assemblies, a 60-inch by 16-inch by 0.125 gauge aluminum or galvanized steel panel shall be installed horizontally near the end of the mast arm with the long axis of the panel collinear with the long axis of the mast. The panel shall be mounted at such a height as to provide a least a 6-inch clearance from the top of the signal assembly or sign blank located on the mast arm within the length of the anti-galloping panel. The panel and attachment hardware shall be shown on the shop drawings, and is considered an item included in the price bid for the mast arm assembly.

Additionally, all mast arm connections to the support pole shall be accomplished using a wrap-around ring stiffener assembly.

The design coordination instructions are as follows:

- a. The Basic Wind Speed shall be 120 mph for Extreme 1 Limit State.
- b. The Design Life shall be 50 years resulting in a 1,700 year Recurrence Interval.

S T A T E

O F

T E N N E S S E E

(Rev. 10-08-2015)
(Rev. 09-06-2016)
(Rev. 09-11-2018)
(Rev. 10-02-2019)
(Rev. 10-09-2020)
(Rev. 09-30-2021)

January 1, 2021

SPECIAL PROVISION

REGARDING

REMOVAL AND DISPOSAL OF LITTER

Description. This work shall consist of removal and disposal of litter from the entire highway rights-of-way where accessible (fence to fence where applicable), including shoulders and excluding the travel lanes on designated interstate and state routes.

Definitions.

Litter. Any object or group of objects foreign to the right-of-way which has been discarded or abandoned and is or may become visible from the edge of the roadway or shoulder as a result of mowing, vegetation management, maintenance operations, or traffic. Examples under this definition include but are not limited to paper, plastic, bottles, cans, wood, tires, portions of tire, and metal products.

Continuous Operation. The uninterrupted performance of work on successive working days until the completion of all of the items of work specific to litter removal in the contract are approved by the Engineer.

Working Day. A calendar day, exclusive of State recognized holidays, which weather or other conditions not under the control of the Contractor, will permit litter operations to proceed for at least five (5) hours of the day with the normal working force engaged in performing the controlling item or items of work which are normal to progress at the time, as determined by the Engineer.

Equipment. The contractor shall furnish all necessary equipment for the satisfactory performance of the work. All vehicles used on the project will be equipped with at least two 6" diameter flashing amber lights, visible in both directions and with a covering device to prevent the litter from being blown from the vehicle.

Work Schedule. The litter removal for each section of road shall be accomplished on a schedule that will assure that the spacing between the beginnings of each cycle is constant

throughout the entire life of the contract. For example, if there are twenty-six (26) cycles to be accomplished they are to be started and completed every two weeks. The maximum cycle time allowed for sections with fewer than twelve (12) cycles shall be thirty (30) calendar days. For contracts which require fewer than twelve (12) cycles the Engineer will notify the Contractor in writing at least five (5) working days prior to the beginning of each litter cycle. Work shall begin on the date specified by the Engineer and shall be a continuous operation. Each litter cycle shall begin at the same location and proceed as established in the preconstruction conference or as directed by the Engineer (see Section 105.06 of the January 1, 2021 Standard Specifications). The contractor shall supply sufficient resources to accomplish the work during the allotted cycle time.

Time and Frequency Litter. The number of litter cycles will be indicated in the Special Notes and will correspond to the mowing schedule. One litter cycle will be reserved for winter pick-up (if needed) and scheduled at the discretion of the Engineer. In addition, the Engineer may eliminate an entire cycle or require a partial litter cycle at certain locations. A litter cycle will be considered complete when litter has been removed from the right-of-way specified in the Special Notes and all quantities associated with litter removal have been accepted as complete by the Engineer.

Litter removal operations on controlled access roads in Davidson, Hamilton, Knox, and Shelby shall not be performed during rush hour traffic from 6:00 A.M to 9:00 A.M and 3:00 P.M to 6:00 P.M. However, the contractor shall be allowed to work in the direction opposite to rush hour traffic during these times.

Litter removal shall be performed only during the hours of daylight Monday through Friday, or as directed by the Engineer. If work is performed on Saturday and/or Sunday, the Contractor will be charged a Working Day.

Litter Removal and Disposal. All litter shall be bagged and removed daily from the right-of-way. All litter accumulated each cycle by the Contractor will be removed from the right-of-way to a Class I dumpsite facility. All fees associated with disposal of litter removed from the state right-of way shall be included in the unit price bid for litter (item no. 719-02). The Contractor shall supply the Engineer with copies of dump tickets for each load deposited at the qualified dumpsite facility.

Acceptance of Work. The Department may accept a portion of the project before the entire project is completed. Such portion(s) shall be of reasonable length as determined by the Engineer, and shall be clean and free of litter when the inspection is made.

Additional Work. The Contractor may be required to remove litter in areas not specifically detailed in the Special Notes under the direction of the Engineer. Additional work shall be limited to the counties and systems which are designated in the Special Notes. Payment will be made at the contract unit price for litter removal (item no. 719-02).

Traffic Control. The Contractor shall maintain work zone traffic control and all traffic control devices for litter removal operations according to the requirements contained herein, the State of Tennessee's currently adopted edition of the Manual on Uniform Traffic Control Devices (MUTCD) defined under the Rules of Tennessee Department of Transportation Chapter 1680-3-1, and the Standard Specifications. Although Traffic Control may be included in the cost of other items, the contractor will be responsible for submitting certifications per Materials & Tests Division Standard Operating Procedures.

Warning Signs. The Contractor shall furnish portable signs in accordance with the "Manual on Uniform Traffic Control Devices" to notify the traveling public of litter operations. The Contractor shall place these signs on the highway during litter operations and remove them immediately after the operation ceases. Signs at the beginning point shall be forty-eight inches (48") by forty-eight inches (48") in size; diamond-shaped with black letters on an orange background with a black border with eight-inch high letters. These signs shall be dual mounted, one on each shoulder, for both directions of travel.

Safety Requirements. The Contractor shall comply with OSHA standards, including the use of Class 3 reflective shirts or vests at all times.

Notification to the Engineer shall be made immediately of any personal injury, accidents involving contractor's equipment, or accidents involving the motoring public.

While equipment is not in use, it shall be parked or stored off the pavement or shoulder of the highway in an inconspicuous place more than thirty (30) feet from edge of pavement or as directed by the Engineer.

The Contractor shall be required to have the company name and phone number on all work zone support vehicles on the left and right sides in a location that is visible to the public. The lettering for the company name and phone number shall consist of a reflectorized material with a minimum height of three inches (3") or five inches (5") in height if non- reflectorized.

Method of Measurement. Litter pickup and disposal will be measured by the centerline mile. Measurement will be made longitudinally along the centerline of the project including bridges, and such single measurement shall include removal and disposal of all litter on interchanges; State maintained crossroads and service roads within the lateral limits of the rights-of-way excluding the travel lanes.

Basis of Payment. Removal and disposal of litter will be paid for at the contract unit price per centerline mile which shall be full compensation for mobilization and performance of the work in accordance with the stipulations, provisions and requirements contained herein.

All costs for traffic control as defined above shall be included in the unit bid price for litter removal Item No. 719-02.

STATE

OF

TENNESSEE

(Rev. 12-18-95)

January 1, 2021

SPECIAL PROVISION

REGARDING

TEMPORARY TRAFFIC CONTROL (SIGNALIZATION)

Delete **Subsection 730.01** of the Standard Specifications and substitute the following:

730.01 - Description of Work - This work shall consist of furnishing, erecting, and maintaining all signalization equipment and materials installed in accordance with the provisions of the current edition of the "Manual for Uniform Traffic Control Devices for Streets and Highways", Federal Highway Administration, and these Specifications, or as specified by the plans or directed by the Engineer for the purpose of safely directing traffic through construction zones.

Material and equipment, while not required to be new, shall nevertheless, be in good condition and ready for use. If the Contractor elects to use a traffic signal controller that is not new, certification shall be submitted that the equipment has been tested to the original manufacturers' specifications and is in good working condition, and that all applicable NEMA environmental standards are met.

All equipment necessary for the satisfactory performance of this work shall be on hand and approved before the work will be permitted to begin. All construction requirements for this work shall be as prescribed in **Section 712 - Temporary Traffic Control**.

Delete **Subsection 730.03** of the Standard Specifications and substitute the following:

730.03-Submittal Data Requirements - Within 30 days after the issuance of the work order, the Contractor shall submit to the Engineer and to the Division of Materials and Tests one collated set of the manufacturer's descriptive literature and technical data which fully describes the types of signal equipment he proposes to use. A copy of the transmittal letter for this submittal shall be provided to the Engineer. Descriptive literature shall include the manufacturer, models, etc. and be adequate to determine if the equipment or material meets the requirements of the Plans and specifications. These sets of submittal data shall include a list of the materials submitted along with descriptive material for, but not limited to, the following items:

Controller
Cabinet and Exhaust Fan
Detectors
Signal Heads including Lamp Information and Mounting Hardware
Loop Wire and Loop Sealant
Shielded Detector Cable
Signal Cable
Cable for Span Wire, Guys, etc.
Pull Boxes
Conduit
Coordination Equipment
Wood Poles

In addition to the above, the Contractor shall submit to the Engineer a notarized letter certifying that all traffic signal materials listed in the submittal are in conformance with the Plans and Specifications.

If the signal equipment has been approved previously by the Department, a certified letter referencing the Contract and a statement confirming that the equipment has been tested in accordance with **Section 730.01**, may be submitted in lieu of the two (2) sets of the manufacturers descriptive material described above. The submittal sets shall also include detailed scale drawings of any non-standard or special equipment and of any proposed deviation from the Plans. If requested to do so, the contractor shall submit for approval sample articles of any materials proposed for use. The Department will not be liable for any materials purchased, labor performed, or delay to the work prior to such approval.

Add the following after the fifth paragraph of **Subsection 730.24**:

If polycarbonate signal heads are provided, they shall be the same in appearance as metal signals except the lenses, housings, doors and visors shall be molded of polycarbonate resin and shall withstand 70 ft-lb impact without fracture or permanent deformation. The color of the signal shall be Federal yellow and shall be homogenous throughout. Reflectors shall be "ALZAK" process coated aluminum or approved equal material and shall conform to the latest revised specifications of the ITE Technical Report No. 1.

Delete 6 (K.) under Controller Cabinets in **Subsection 730.25** and substitute the following:

- K. All cabinet housing solid-state controllers shall be supplied with a signal conflict monitor which meets the NEMA standards. The signal conflict monitor (SCM) shall be wired to sample the following cabinet functions:
 - 1. Each phase Red/Yellow/Green/Walk display.
 - 2. Controller plus 24 volt output.
 - 3. Controller Voltage Monitor function.

The following conditions shall be sensed by the monitor and the SCM shall place the cabinet in the Flash Mode:

1. Absence of an active AC input on a channel.
2. Green/Yellow both active on a channel.
3. Yellow/Red both active on a channel.
4. Green/Green active on conflicting channels.
5. Green/Walk active on conflicting channels.
6. Green/Yellow active on conflicting channels.
7. Absence of the 24 VDC required to operate the load switches.
8. Controller Voltage Monitor circuit indicates a controller malfunction.
9. Defeatable per channel operation that times the Phase Yellow Clearance interval. If the Phase Yellow Clearance is less than 3.0 seconds, the intersection shall be placed in the FLASH mode.

The SCM shall be wired in the cabinet in such a manner that the cabinet will provide ONLY FLASH operation if the SCM is not properly mounted.

The SCM shall be provided with front panel indicators to display the following:

1. AC power is active.
2. Channel active indicators.
3. Failed status.
 - a. Plus 24 VDC I.
 - b. Plus 24 VDC II.
 - c. Conflict.
 - d. Controller Voltage Monitor.
 - e. Absence of Signal.
 - f. Power Failure after conflict.

The SCM shall have a defeatable "Start in Flash Period" which shall be user adjustable over the range of 4-10 seconds. This circuitry shall guarantee a minimum flash operation period of the intersection when power is applied to the monitor.

The monitor shall be provided with a front-panel reset switch and power fuse.

The type of monitor required shall be as specified previously, but in no case will a cabinet be acceptable which has phase red/yellow/green/ or walk displays which are not monitored by the SCM.

The signal monitor sampling inputs shall be terminated at the point in the cabinet which is closest to the field termination point.

Add the following after the fourth paragraph of **Subsection 730.29**:

Microwave Vehicle Detector

Microwave vehicle detectors shall be self-contained units capable of emitting a low power microwave beam over one or more lanes of traffic. The microwave vehicle detector shall have the following requirements:

1. Shall have directional detection capability with a detection range of 5 to 50 meters (16 to 160 feet) measured from the detector over the approach traffic lane.
2. Shall have pan and tilt adjustability.
3. Shall have a detection delay of a minimum of one third of a second before an output is generated.
4. Shall be housed in an aluminum enclosure.

Hold for 730V.

STATE

OF

TENNESSEE

(Rev. 01-08-2015)
(Rev. 09-06-2016)
(Rev. 06-26-2017)
(Rev. 10-02-2019)
(Rev. 09-25-2020)
(Rev. 10-09-2020)
(Rev. 09-30-2021)

January 1, 2021

SPECIAL PROVISION

REGARDING

RIGHTS-OF-WAY MOWING

Description. This work shall consist of mowing of the rights-of-way for vegetation control in accordance with the Plans, Specifications and as directed by the Engineer. A mowing cycle shall be one complete mowing of the areas along state highways and interstates designated within this contract and shall be completed within twenty (20) working days that are suitable for mowing.

Definitions.

Continuous Mowing Operation. A Continuous Mowing Operation is an operation conducted for a minimum of five (5) hours per day over a twenty (20) working day cycle which consists of one or more mechanical mowers working independently or in coordination to cut vegetation on state rights-of-way deemed Mowable Acres by the Engineer.

Working Day. A calendar day, exclusive of State recognized holidays, which weather or other conditions not under the control of the Contractor, will permit a continuous mowing operation with the normal working force engaged in performing the controlling item or items of work which are normal to progress at the time, as determined by the Engineer.

Mowable Acres. All areas within rights-of-way where mechanical mowers and finish mowers can cut vegetation and safely traverse slopes without significant damage to existing ground.

Mowing. The work associated with cutting or trimming vegetation primarily consisting of, but not limited to, grasses and invasive weeds to provide a consistent and aesthetically pleasing standing vegetation height of four (4) inches.

Swath Mowing. The work associated with cutting one fifteen (15) foot wide swath of vegetation parallel to the edge of pavement on each shoulder and one fifteen (15) foot wide swath of vegetation parallel to the edge of pavement in each direction within the median. For medians less than sixty (60) feet, the entire median will be mowed (see sheet 7 for Typical Mowing Diagram).

Mechanical Mower. A commercial quality piece of equipment which is capable of mowing vegetation in excess of two (2) acres per hour at least five (5) hours per day.

Finish Mower. A commercial quality piece of equipment specifically designed to address mowing of vegetation around roadside obstacles or areas not accessible to conventional mowers in an attempt to prevent damage and provide a consistent vegetation height by means other than a mechanical mower. The cost associated with this work shall be included in the unit price bid for mowing 806-01, swath mowing 806-02.13 or sidewalk finish mowing 806-02.14. Finish mowers do not meet the requirements for mechanical mowers as described in this special provision and cannot be utilized for continuous mowing operations on state highways or interstates.

Hand Trimming. The work associated with cutting or trimming vegetation in proximity to roadside obstacles or in areas not accessible to mechanical mowers in an attempt to prevent damage and provide a consistent vegetation height by means other than a mechanical mower.

Roadside Obstacles. Items located within the right of way, both natural and man-made which may include but are not limited to trees, signposts, delineator posts, light posts, steel beam guardrail, and associated posts, cable barrier rail, barrier walls, retaining walls, utility poles, catch basins, fallen rock, bridge end abutments, mailboxes, established/planted trees and shrubs, landscaped beds, and wildflower areas.

General. All mowing operations shall be performed to the satisfaction of the Engineer. Standing vegetation shall be cut to a height of four (4) inches while maintaining a consistent vegetation profile within all mowing limits adjacent to the roadway. The Contractor shall mow only those areas that are designated as mowable acres, including, if present, a minimum of five (5) feet up the back slope from the bottom of the ditch, and five (5) feet behind all guardrails as shown in The Typical Mowing Diagram on sheet 7. The actual dimensions and mowing limits shall be discussed at the pre-construction conference. Vegetation including small trees, shrubs, and bushes with a stem diameter of up to two (2) inches which are inside of and encroaching upon the established mowing limits shall be cut by the Contractor using a mower or hand trimming methods as directed by the Engineer. Areas that were recently cleared or chipped will be included in mowable acres. Extreme care shall be taken not to damage the trees, plants, and shrubs, which are designated by the Engineer to remain. Hand trimming may be required as directed by the Engineer for areas of vegetation inside the designated mowable acres which are not accessible to mechanical mowers. As work progresses, mowing and trimming shall be conducted in such a manner to provide a consistent standing vegetation height in all mowing limits adjacent to the roadway (see sheet 7 for Typical Mowing Diagram). The Contractor shall mow as close as practicable to all roadside obstacles. Hand trimming is required atop earth berms, within all rip rap areas, and around all roadside obstacles.

Guardrail and cable barrier rail located on interstates will be sprayed by TDOT personnel except for those located in the following counties: Davidson, Hamilton, Knox, and Shelby. Spraying by TDOT does not relieve the Contractor from hand trimming if needed. The Contractor shall not apply herbicides on state rights-of-way.

The Department reserves the right to perform spot mowing with its own forces on all State right-of-way as necessary. Minor quantity adjustments may be made due to the Tennessee Department of Transportation's Wildflower Program, Adopt a Plot Program, designated research areas, environmental no-mow areas, and Adopt A Highway Program.

Time and Frequency Mowing. A notice to begin work will be issued to the Contractor at least five (5) working days prior to the date the mowing cycle is to begin. Work shall begin on the date specified in the notice. Mowing operations shall proceed in the same route sequence as performed during litter operations. The contractor shall submit a planned mowing sequence, hand trimming sequence and schedule to the Engineer for approval before each mowing cycle begins. Any deviations from the approved mowing sequence or schedule may be allowed at the discretion of the Engineer. A failure to begin mowing operations on the date specified in the notice will result in the assessment of liquidated damages (see SP108B). The mowing cycle shall be twenty (20) working days suitable for mowing unless otherwise documented in the Special Notes.

The number of mowing cycles will be indicated in the Special Notes, but may be increased or decreased by one mowing cycle to coincide with extreme weather conditions. Also, the Engineer may require a partial mowing cycle at certain locations.

Mowing shall be performed during daylight hours Monday through Friday. Work may be allowed on Saturday at the discretion of the Engineer. If the approved mowing schedule is not maintained, the Engineer may require work to be performed on Saturday and/or Sunday. If work is performed on Saturday and/or Sunday, the Contractor will be charged a Working Day.

Mowing Operations. Work shall begin for each mowing cycle on the date specified in the notice to begin work. Once a mowing cycle begins, the Contractor shall maintain a Continuous Mowing Operation until the mowing is complete. A mowing cycle will be considered complete when all mowing and hand trimming is completed to the satisfaction of the Engineer. Hand trimming shall be performed in the same sequence as mowing operations.

Hand trimming is to be completed within the twenty (20) working day cycle. Failure to complete hand trimming within five (5) working days of the termination of mechanical mowing represents a failure to maintain a continuous mowing operation.

When mowing within twelve (12) feet of the edge of pavement or shoulder, mechanical mowers shall not discharge vegetation and debris toward the roadway. When mowing is required in proximity to the roadway, any vegetation or debris deposited on the roadway as a result of the mowing operation will be removed immediately from edge of pavement to edge of pavement, or between curb and gutter, whichever applies, Any cost associated with the removal of vegetation clippings, foreign objects, or gravel that is deposited on the roadway, the shoulder,

or in a curb and gutter section as a result of the mowing operation shall be included in the unit price bid for mowing (item no. 806-01) swath mowing (item no. 806-02.13) or sidewalk finish mowing (item no. 806-02.14).

Swath mowing shall follow as closely as practical to the boundary between the shoulder of the roadway and the point at which vegetation begins. In cases where a continuous swath cannot be maintained on ramps, at bridges, and when encountering assets of the state, the swath shall deviate away from the edge of pavement then terminate, or the swath shall deviate away from, then back to the edge of pavement in as tight a space as practical. Any vegetation that cannot be cut by the mower between the edge of pavement and the edge of the swath shall be cut using hand trimming, and the cost shall be included in the unit price bid for swath mowing (item no. 806-02.13). All interchanges and ramps will be mowed completely during a Swath mowing operation.

The Contractor shall mow in the direction of traffic when less than thirty (30) feet from the paved surface.

Equipment. Prior to beginning work, the Contractor shall provide the Engineer with a schedule of equipment which will be used to accomplish work under the terms of the contract. The Contractor shall certify to the Engineer that the equipment to be used on this project is suitable for mowing along public highways. All equipment used for mowing operations shall be utilized as described by the manufacturer's recommendations and maintained in safe operating conditions. Mowing on slopes that exceed the equipment manufacturers specifications shall not be allowed. Any equipment that the Engineer determines to be unsuitable for use or hazardous to highway users shall not be used. The Contractor shall provide sufficient equipment and accessory items necessary for efficient operation and the completion of the mowing cycle in the designated time. Any special equipment requirements will be noted in the Special Notes. Zero-turn mowers are considered finish mowers and can be utilized for mowing around roadside obstacles but do not meet the requirements for continuous mowing operations under the terms of this special provision. The cost associated with this work shall be included in the unit price bid for mowing (item no. 806-01, swath mowing (item no. 806-02.13), or sidewalk finish mowing (item no. 806-02.14)

All rotary mowers must be equipped with safety chains to prevent damage to property caused by flying debris propelled out from under the mower. No disc type mowers will be allowed. Chains shall be a minimum of 5/16 inch in size, and links spaced side by side around the mower's front, sides, and rear. Chains shall be spaced at no less than twelve (12) strands of chain per foot and shall be laced horizontally one row from the bottom with 1/4" steel cable secured by cable clamps on each end. When sitting on level ground, at a level deck height of seven (7) inches, the chains shall be long enough to drag the ground. Flaps or semi-rigid guards will not be allowed as a substitute for chains. Maximum cutting widths for rigid frame rotary mowers shall be 120 inches (10 ft.). Maximum cutting widths for all other mower types shall not exceed 180 inches (15 ft.) without the approval of the Engineer.

Safety Requirements. Mechanical mowers and finish mowers shall be equipped so as to conform to prevailing Occupational Safety Health Act (OSHA) Standards, including flashing amber lights and slow-moving equipment emblems.

The Contractor shall comply with OSHA standards, including the use of Class 3 reflective shirts or vests at all times.

Notification to the Engineer shall be made immediately of any personal injury, accidents involving contractor's equipment, or accidents involving the motoring public.

While equipment is not in use, it shall be parked or stored off the pavement or shoulder of the highway in an inconspicuous place more than thirty (30) feet from edge of pavement or as directed by the Engineer. Under no circumstances shall mechanical mowers or finish mowers be parked or stored in medians. When batwing mowers are being moved from one site to another under their own power with the mowers raised, the mower shall be disengaged.

Handheld, pushed, or riding trimmers using string or blades are not considered mechanical mowers and cannot be considered as part of a continuous mowing operation under the terms of this special provision.

The Contractor shall be required to have a mechanical leaf blower on site to address any vegetation or debris deposited on state routes. The cost associated with this work shall be included in the unit price bid for mowing 806-01 or swath mowing 806-02.13.

The Contractor shall be required to have the company name and phone number on all tractors and work zone support vehicles on the left and right sides in a location that is visible to the public. The lettering for the company name and phone number shall consist of a reflectorized material with a minimum height of three inches (3") or five inches (5") in height if non-reflectorized.

Equipment Cleaning. The Contractor will be required to clean any piece of equipment moved into Tennessee if the equipment is moving from an area infested with invasive species of concern listed below:

- Cogon Grass

Prior to moving equipment into Tennessee, the Contractor shall notify the Engineer of the location of the equipment's most recent operation. The Contractor shall not move any equipment that last operated in an area infested with an invasive species of concern into Tennessee without having cleaned such equipment of seeds, soil, vegetative matter, and other

debris that could contain or hold seeds. If the Contractor cannot verify the location of its most recent operation, then the Contractor shall assume that the location is infested with invasive species of concern.

Prior to moving from an area identified as infested with invasive species of concern to, or through Tennessee, the Contractor shall clean such equipment of seeds, soil, vegetative matter, and other debris that could contain or hold seeds, and shall notify TDOT prior to moving any equipment subject to the cleaning requirements set forth above. The Contractor shall advise TDOT of its cleaning measures and make the equipment available for inspection. TDOT shall have two (2) days, excluding weekends and state holidays, to inspect and approve for use equipment after it has been made available. After satisfactory inspection, the Contractor may move the equipment as planned. Equipment shall be considered clean when a visual inspection does not disclose seeds, soil, vegetative matter, and other debris that could contain or hold seeds. The Contractor shall not be required to disassemble equipment.

Traffic Control. The Contractor shall maintain traffic and all traffic control devices for mobile mowing operations according to the requirements contained herein, the State of Tennessee's currently adopted edition of the Manual on Uniform Traffic Control Devices (MUTCD) defined under the Rules of Tennessee Department of Transportation Chapter 1680-3-1, and the Standard Specifications. Although Traffic Control may be included in the cost of other items, the Contractor will be responsible for submitting certifications per Materials & Tests Division Standard Operating Procedures. Under no circumstances shall a mower cross the pavement edge line without complying with Mobile Operations requirements found in the MUTCD.

Warning Signs. The Contractor shall furnish portable signs in accordance with the "Manual on Uniform Traffic Control Devices" to notify the traveling public of the operations of mowing equipment. The Contractor shall place these signs on the highway during the operation of mowers and remove them immediately after the operation ceases. Signs at the beginning point shall be 48" by 48" in size; diamond-shaped with black letters on an orange background with a black border with eight- inch high letters. These signs shall be dual mounted, one on each shoulder, for both directions of travel.

Damage to Property. The Contractor shall carry on the operation in such a manner that does not damage the existing ground areas, trees, shrubs, guardrail, utilities, delineators, or other structures. The Contractor shall not mow during wet conditions where turf damage or ruts would occur. In the event damage occurs to the right-of-way because of mowing operations, the Contractor shall replace or repair same, at own expense, in like kind, and as directed by the Engineer. Notify the Engineer immediately when any property damage occurs. If damaged property resulting from the Contractor's operations has to be repaired or replaced by the Department, the cost of such work shall be deducted from monies due to the Contractor.

The Contractor shall take all necessary precautions to prevent damage to passing vehicles and to both public and private property. This shall include roadside obstacles, vehicles and any other property which may be damaged by the mowing operation. Payment for work may be withheld until the damaged property has been repaired or replaced.

The Contractor shall respond to all claims of damage from the public within seventy-two (72) hours after notification of damage. Failure to settle claims for damages in a timely manner may result in actions by the Department to preclude the Contractor from performing work on future projects.

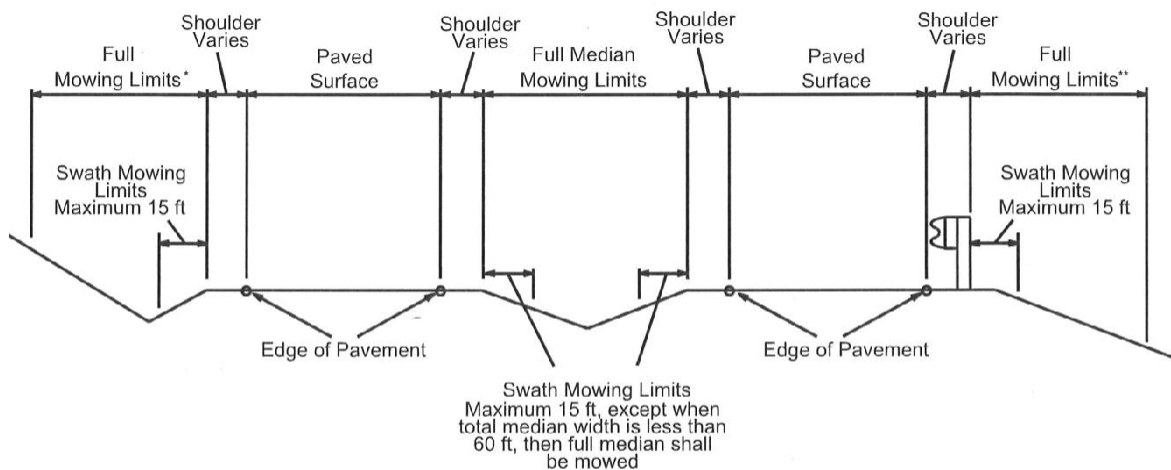
Additional Work. The Contractor may be required to mow in areas not specifically detailed in the Special Notes under the direction of the Engineer. Additional work shall be limited to the counties and systems which are designated in the Special Notes. Payment for additional work will be made at the contract unit price for mowing (item no. 806-01), swath mowing (806-02.13), or sidewalk finish mowing (item no. 806-02.14).

Method of Measurement. Mowing shall be measured by the acre based on the quantities shown in the Special Notes for each mowable area. Each mowing cycle or partial cycle will be measured separately. A mowing cycle includes the mowing of all tabulated areas shown in the Special Notes one time.

Basis of Payment. The accepted quantities of mowing will be paid for at the contract unit price per acre. All costs for traffic control as defined above shall be included in the unit bid price for mowing Item No. 806-01, swath mowing Item No. 806-02.13, or sidewalk finish mowing (item no. 806-02.14).

TYPICAL MOWING DIAGRAM

(NOT TO SCALE)



NOTES:

* Cut a minimum of 5 ft up the back slope from the bottom of the ditch, or as directed by the engineer.

** Cut a minimum of 5 ft behind all guardrail, or as directed by the engineer.

STATE

OF

TENNESSEE

(Rev. 9-7-22)

January 1, 2021

CERTIFICATION REGARDING
DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS
PRIMARY AND LOWER TIER COVERED TRANSACTIONS

The prospective Primary and/or Lower Tier participant certifies, by signing and submitting this proposal, to the best of its knowledge and belief, that it and its principals:

Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal, State or local department or agency.

Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.

Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in the preceding paragraph of this certification; and

Have not within a three- year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal; and

Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

Where the prospective Primary and/or Lower Tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

(Exceptions to the above are to be submitted on a separate sheet with the bid proposal)

For any exception noted, indicate to whom it applies, initiating agency, and dates of action. Providing false information may result in criminal prosecution or administrative sanctions.

STATE**OF****TENNESSEE**

| (Rev. 5-1-95)

January 1, 2021

SPECIAL PROVISION**REGARDING****LABOR (STATE PROJECTS ONLY)**

The contractor will be required to comply with the provisions of Title 12, Chapter 4, Part 4, Tennessee Code Annotated, relative to payment of prevailing wages and also the following rules and regulations as established by the Tennessee Department of Labor:

- (1) Classify all laborers and mechanics conformably with schedule of classification in the contract.
- (2) Apprentices may be employed only under a bona fide apprenticeship program, registered with the Bureau of Apprenticeship, U.S. Department of Labor.
- (3) Wages rates must be posted in a prominent place on the site of construction and must be made available to all mechanics and laborers employed on the project at all times.
- (4) Pay all laborers and mechanics unconditionally and not less often than once each week the full wages earned.
- (5) Pay hourly rates which are not less than those listed for the class of labor being employed.
- (6) Pay overtime compensation as required by any applicable federal or state laws, rules or regulations.
- (7) Make no deductions from wages other than those authorized by law.
- (8) The contractor shall submit each week in which any contract work is performed a certified copy of all payrolls to the contracting agency. The address and social security number of each employee shall be shown the first time the employee appears on a payroll, and on any subsequent payroll when the employee's address changes.

The certifications will affirm that the payrolls are correct and complete, that the wage rates contained therein are not less than those determined by the Commissioner of Labor, and that the classifications set forth for each laborer and mechanic conform with the work performed. The contractor will make his employment records available for inspection by representatives of the contracting agency and the Department of Labor and will permit such representatives to interview employees during working hours on a project.

Failure to submit payrolls within one week or to resubmit corrected payrolls within one week after notification may be reason to withhold progress payments.

The rates of pay for each classification of labor employees on this project as set out by the Labor Department of the State of Tennessee and made a part of this proposal contract, shall remain unchanged for the life of this contract.

Watchman and clerical employees are not to be covered by the Wage Scale, therefore, may be paid at or above the National Wage and Hour Law Rates.

S T A T E

O F

T E N N E S S E E

(Rev. 9-7-22)

January 1, 2021

SPECIAL PROVISION

REGARDING

NON-DISCRIMINATION IN EMPLOYMENT

Bidders are cautioned as follows:

By signing this bid, the bidder will be deemed to have signed and agreed that all persons, firms or corporations supplying goods, material, equipment or service of any kind to the State of Tennessee will not discriminate against any employee or applicant for employment on the basis of race, color, religion, sex, sexual orientation, gender identity, national origin, age or disability and further, that while under contract with the State will show proof upon request that all employment practices including, but not limited to, promotion, rates of pay, transfers, recruitment, recruitment advertising, terminations, layoffs and training and apprenticeship programs are not discriminatory in nature.

Each contractor shall be required to post in conspicuous places, available to all employees and applicants for employment, notices of non-discrimination.

STATEOFTENNESSEETENNESSEE DEPARTMENT OF TRANSPORTATION2023 MINIMUM WAGE SCALES FOR STATE FUNDED CONSTRUCTION

January 1, 2023

Tenn. DOL Decision No. T-40290

CLASSIFICATION (ENGLISH)	CLASSIFICATION (SPANISH)	Basic Hourly Rates	Craft No.
Blaster	Proveedor do Explosivos	26.29	1
Bricklayer	Ladrillero	18.95	2
Carpenter / Leadsperson	Carpintero o Lider	24.35	3
Class "A" Operators	Operador Clase A	27.37	4
Class "B" Operators	Operador Clase B	24.99	5
Class "C" Operators	Operador Clase C	26.22	6
Class "D" Operators	Operador Clase D	24.71	7
Concrete Finisher	Terminador de Cemento	22.61	8
Drill Operator (Caisson)	Operador de Perfordora	38.56	9
Electrician	Electricista	35.59	10
Farm Tractor Operator (Power Broom)	Operador de Tractor de Rancho	17.23	11
Ironworkers (Reinforcing)	Herrero	23.00	12
Ironworkers (Structural)	Herrero de Estructura	22.45	13
Large Crane Operator	Operador de la Grua	28.78	14
Mechanic (Class I) Heavy Duty	Mecanico Clase 1	30.48	15
Mechanic (Class II) Light Duty	Mecanico Clase 2	28.22	16
Painter / Sandblaster	Pintor o Lajador	35.05	17
Skilled Laborer	Obrero Diestro	23.09	18
Survey Instrument Operator	Operador de Agrimensor	29.44	19
Sweeping Machine (Vacuum) Operator	Operador de Barredora	23.96	20
Truck Driver (2 axles)	Camionero (2 ejes)	22.63	21
Truck Driver (3/4 axles)	Camionero (3 o 4 ejes)	23.19	22
Truck Driver (5 or more axles)	Camionero (5 o más ejes)	27.97	23
Unskilled Laborer	Obrero no Diestro	20.69	24
Worksite Traffic Coordinator	Coordinar de Trafico en el Lugar de Trabajo	27.59	25

CLASSIFICATION**CRAFT NO.****SKILLED LABORER:****18**

Air Tool Operator, Asphalt Raker, Chain Saw Operator, Concrete Mixer Operator (less than 1 yard), Concrete Rubber/Edger, Fence Erector, Form Setter (Steel Road), Guardrail Erector, Mechanic's Helper (Tire Changer or Oiler), Mortar Mixer, Nozzleman or Gun Operator (Gunite), *Pipelayer, Sign Erector

CLASS "A" OPERATORS:**04**

Backhoe/Hydraulic Excavator (3/4 yard and over), Crane (less than 20 tons see Crane Operator below), End Loader (3 yards and over), Motor Patrol (Finish), Pile Driver, Dragline

CLASS "B" OPERATORS:**05**

Backhoe/Hydraulic Excavator (less than 3/4 yard), Bull Dozer or Push Dozer, End Loader (less than 3 yards), Motor Patrol (Rough), Tractor (Crawler/Utility), Scraper, Shovel, Trenching Machine

CLASS "C" OPERATORS:**06**

Asphalt Paver, Concrete Finishing Machine, Concrete Paver, Scale, Spreader (Self-Propelled), Concrete Grinder, Asphalt Milling Machine, Boring Machine Operator (Horizontal)

CLASS "D" OPERATORS:**07**

Bobcat, Central Mixing Plant, Concrete Pump, Concrete Saw, Curb Machine (Automatic or Manual), Dozer or Loader (Stockpile), Drill (Piling), Mulcher or Seeder, Rock Drill (Truck Mounted), Roller (Asphalt), Roller (Compaction Self-Propelled), Soil Stabilization Machine, Tractor (Boom & Hoist), Bituminous Distributor Machine, Pump, Track Drill, Striping Machine Operator, Ditch Paving Machine

CRANE OPERATOR:**14**

Means one who operates boom-type equipment equal to or greater than 20 tons to hoist and move materials, raise and lower heavy weights and perform other related operations; may oil, grease or otherwise service and make necessary adjustments to equipment as needed; and may perform other related duties. (Note: The equipment is used for such work as pouring concrete and setting steel. This work is subject to strict inspection and must conform closely to specifications. The equipment may also be used for other miscellaneous tasks for which crane or stick-type equipment is required which may include hoist operations and pile driving operations.)

***Skilled Laborer - Pipelayer Classification**

For any work where prevailing wage rates apply which is located five feet or more outside the actual building if building construction is involved:

AND

- (a) which consists of the building, rebuilding, locating, relocating or repairing any street, highway, bridges, water lines, sewer lines, gas lines, force mains or other related utilities**

OR

- (b) which involves the construction or upgrading of industrial parks or sites and is located outside the five-foot limitation.**

The classification of pipelayer shall be applicable and the description of work under this classification shall be as follows:

Lays, connects, inspects and tests water lines, force mains, gas lines, sanitary or storm sewers and drains, underground telephone and electric ducts or other utilities manufactured from clay, concrete, steel, plastic, cast iron pipe or other similar materials.

May smooth bottom of trench to proper elevation by scooping with a shovel; receives pipe lowered from top of trench; inserts spigot end of pipe into bell end of last laid pipe; adjusts pipe to line and grades, caulks and seals joint with cement or other sealing compound; may connect threaded or flanged joint pipe; may assemble and place corrugated metal or plastic pipe and performs other related duties.

Additional Information :

Wage Rates : <https://www.tn.gov/workforce/employees/labor-laws/labor-laws-redirect/wages-breaks/prevaling-wage.html>

Poster Page : <https://www.tn.gov/workforce/general-resources/major-publications0/major-publications-redirect/posters-redirect/required-posters.html>

Note: Adobe Acrobat Reader is required to download & print. If you do not have this software a link is provided at the bottom of the Poster Page for a free download.

Tenn. Dept. of Labor & Workforce Development (Labor Standards Division) : (615) 741-2858.

APPRENTICESHIP REGULATIONS:

Under T.C.A., §12-449, the Prevailing Wage Commission has promulgated Rule 0800-3-2-.04 which provides that:

"Apprentices shall mean those persons registered individually under a bona fide apprenticeship program registered with the Bureau of Apprenticeship and Training in the United States Department of Labor. The state agency contracting officer shall require the contractor or sub-contractor using the apprentice to submit evidence of his indenture and/or apprenticeship registration when the apprentice's name first appears on a submitting payroll."

AUTHORITY: T.C.A., §12-449. Administrative History: Original Rule filed June 4, 1976. Effective: July 14, 1976.

APPENDIX C

CONTRACT BOOK 2 (DESIGN-BUILD CONTRACT) FORMS

FORM NAME	FORM DESIGNATION
ATTESTATION RE PERSONNEL USED IN CONTRACT PERFORMANCE	FORM AT
CONFLICT OF INTEREST DISCLOSURE STATEMENT	FORM COI
CONTRACT PAYMENT AND PERFORMANCE BOND	FORM CP&PB
LOBBYING CERTIFICATE	FORM LC
TECHNICAL PROPOSAL SIGNATURE PAGE	FORM TPSP

**ATTESTATION RE PERSONNEL USED IN CONTRACT
PERFORMANCE
FORM AT**

DESIGN-BUILD CONTRACT NUMBER:	DB2301
LEGAL ENTITY NAME:	
FEDERAL EMPLOYER IDENTIFICATION NUMBER: (or Social Security Number)	

The Entity, identified above, does hereby attest, certify, warrant, and assure that the Entity shall not knowingly utilize the services of an illegal immigrant in the performance of this Contract and shall not knowingly utilize the services of any subcontractor who will utilize the services of an illegal immigrant in the performance of this Contract.

**SIGNATURE &
DATE:**

NOTICE: This attestation **MUST** be signed by an individual empowered to contractually bind the Design-Builder. If said individual is not the chief executive or president, this document shall attach evidence showing the individual’s authority to contractually bind the Design-Builder.

AT-1

CONFLICT OF INTEREST DISCLOSURE STATEMENT

FORM COI

DB2301

Background

The integrated nature of Design-Build creates the potential for conflicts of interest. Disclosure, evaluation, and management of these conflicts and of the appearance of conflicts, require attention to State and federal Laws in the contracting process. The Tennessee Department of Transportation (“TDOT”) has developed *Conflict of Interest Disclose Guidelines* (“COI Disclosure Guidelines”, TDOT Policies 101-05 and 303-01). The COI Disclosure Guidelines are intended to summarize the key governing standards of State and Federal Laws, include definitions of key terms, and describe the COI Disclosure Process.

Federal Standards

Pursuant to 23 USC 112(b)(3), the Federal Highway Administration (FHWA) has promulgated administrative rules that affect federally funded Design-Build procurements and related procurements. These rules, which are in 23 Code of Federal Regulations (CFR) Parts 635 and 636, are used as the basis for TDOT’s guidelines on the subject. The main rule on Organizational Conflicts of Interest in Design-Build transactions is 23 CFR § 636.116. This rule affects not only Design-Build procurements, but also “any contract for engineering services, inspection or technical support in the administration of the Design-Build contract.”

These rules specifically regulate both organizational and individual conflicts of interest. The federal rules define “organizational conflict of interest” as follows:

“Organizational conflict of interest means that because of other activities or relationships with other persons, a person is unable or potentially unable to render impartial assistance or advice to the owner, or the person's objectivity in performing the contract work is or might be otherwise impaired, or a person has an unfair competitive advantage.” (23 CFR § 636.103)

Organizational Conflict of Interest Policy

TDOT may disqualify the Design-Builder if any of its Major Participants belong to more than one Design-Builder organization. If any Major Participants of different Design-Builder organizations belong to the same parent company, each Design-Builder must describe how the participants have avoided conflicts of interest during the procurement phase of the Project.

COI-1

The Design-Builder agrees that, if after award, an Organizational Conflict of Interest is discovered, an immediate and full disclosure in writing must be made to TDOT that must include a description of the action that the Design-Builder has taken or proposes to take to avoid or mitigate such conflicts. If an Organizational Conflict of Interest is determined to exist, TDOT may, at its discretion, cancel the Contract. If the Design-Builder was aware of an Organizational Conflict of Interest prior to the award of the Contract and did not disclose the conflict to TDOT, TDOT may terminate the Contract for default.

Disclosure Pursuant to 23 CFR Section 636.116(a)(2)(v)

In the space provided below, and on supplemental sheets as necessary, identify all relevant facts relating to past, present, or planned interest(s) of Design-Builder which may result, or could be viewed as, an Organizational Conflict of Interest in connection with the RFP.

The Design-Builder shall disclose:

- a. any current contractual relationships with TDOT (by identifying TDOT contract number and project manager);
- b. any present or planned contractual or employment relationships with any current TDOT employee;
- c. any current relationships between the Major Participants, Key Personnel, Design Professionals, or Subcontractors of the Design-Builder on other TDOT projects; and
- d. any other circumstances that might be considered to create a financial interest in the contract for the Project by any current TDOT employee if the Design-Builder is awarded the contract.

The foregoing is provided by way of example, and shall not constitute a limitation on the disclosure obligations.

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____

6. _____
7. _____
8. _____

Explanation

In the space provided below, and on supplemental sheets as necessary, identify steps that have been or will be taken to avoid, neutralize, or mitigate any organizational conflicts of interest described herein.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Certification

The undersigned hereby certifies that, to the best of his or her knowledge and belief, no interest exists that is required to be disclosed in this Conflict of Interest Disclosure Statement, other than as disclosed above.

Signature

Name

Title

Company Name

COI-4

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
CONTRACT PAYMENT AND PERFORMANCE BOND
FORM CP&PB

DB2301

Be it known that _____, as Design-Builder, and _____, as Surety(ies), all authorized to do business in the State of Tennessee, hereby bind themselves to the State of Tennessee, Department of Transportation, and other potential claimants, for all obligations incurred by the Design-Builder under its contract with the State of Tennessee, Department of Transportation, for the construction of the above identified contract; in the full contract amount of _____ (\$_____).

The obligations of the Design-Builder and Surety(ies) under these payment and performance bonds shall continue in full force and effect until all materials, equipment and labor have been provided AND all requirements contained in the Contract Documents, plans and specifications have been completed in a timely, thorough and workmanlike manner. The parties agree that these bonds are statutory in nature and are governed by the provisions contained in Title 54, chapter 5 of the Tennessee Code Annotated relating to bonds required of contractors and that those provisions constitute a part of this bond.

By this instrument, the Design-Builder and Surety(ies) specifically bind themselves, their heirs, successors, and assigns, *in solido*, under the following bonds:

Payment Bond. To the Tennessee Department of Transportation and all "Claimants," as contemplated by T.C.A. Title 54, chapter 5, in the full contract amount of

_____, in order to secure the payment in full of all timely claims under the Project.

Performance Bond. To the Tennessee Department of Transportation in the full contract amount of _____

_____,

CP&PB-1

in order to secure the full and faithful performance and timely completion of the project according to its scope, plans and specifications, inclusive of overpayments to the contractor and liquidated damages as assessed.

Upon receipt of notice that the Design-Builder is in default under the contract, the Surety(ies) shall undertake to complete performance, without regard to cost. If the Surety(ies) fail or refuse to complete performance of the contract, the Department may then proceed with the work in any lawful manner that it may elect until it is finally completed. When the work is thus finally completed, the total cost of the same will be computed. All costs and charges incurred by the Department in completing the work will be deducted from any monies due or which may become due to the Design-Builder. If the total costs of completion exceeds the sum which would have been payable under the Contract, then the Principal and the Surety(ies), *in solido*, shall be liable for and shall pay to the Department the amount of such excess.

In witness whereof we have signed this instrument as dated.

Design-Builder (1) _____

By: _____ Date: _____

Printed Name and Title

Design-Builder (2)* _____

By: _____ Date: _____

Printed Name and Title

Surety 1 _____

Surety 2* _____

CP&PB-2

By: _____

Attorney-in-Fact

Printed Name and Title

Agency Name

Street Address

City/State/Zip

(Seal)

By: _____

Attorney-in-Fact

Printed Name and Title

Agency Name

Street Address

City/State/Zip

(Seal)

Subsequent correspondence/communication from TDOT with respect to monthly progress reports and/or the contract bonds should be directed to:

Surety 1 _____

By: _____

Attorney-in-Fact

Printed Name and Title

Agency Name

Surety 2* _____

By: _____

Attorney-in-Fact

Printed Name and Title

Agency Name

CP&PB-3

Street Address

Street Address

City/State/Zip

City/State/Zip

*NOTE: The signature and information for Design-Builder (2) and Surety (2) is to be provided when there is a joint venture.

CP&PB-4

LOBBYING CERTIFICATE

FORM LC

PROJECT

DESCRIPTION: SR-222, Haywood County

DB2301

The undersigned certifies, to the best of his or her knowledge and belief, that **CHECK ONE**:

- No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned**, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of **ANY** Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan or cooperative agreement.
- If any funds other than Federal appropriated funds have been paid or will be paid** to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with **THIS** Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions [as amended by "Government-wide Guidance for New Restrictions on Lobbying," 61 Federal Regulations 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, et seq.)].

The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

[Note: Pursuant to 31 U.S.C. §1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each expenditure or failure.]

LC-1

The Design-Builder, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Design-Builder understands and agrees that the provisions of 31 U.S.C. §3801, et seq., apply to this certification and disclosure, if any.

Date

Company Name

Signature

Name and Title

NOTE: DESIGN-BUILDER IS REQUIRED PURSUANT TO FEDERAL LAW TO INCLUDE THE ABOVE LANGUAGE IN SUBCONTRACTS OVER \$100,000 AND TO OBTAIN THIS LOBBYING CERTIFICATE FROM EACH SUBCONTRACTOR BEING PAID \$100,000 OR MORE UNDER THIS CONTRACT.

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TECHNICAL PROPOSAL SIGNATURE PAGE

FORM TPSP

DESIGN-BUILDER: _____ TELEPHONE No. (____) _____

ADDRESS: _____

CONTRACTOR'S LICENSE No. _____

LICENSE CLASSIFICATION _____

PROJECT: SR-222, Haywood County (the "Project")

DB CONTRACT No.: DB2301

TO THE TENNESSEE DEPARTMENT OF TRANSPORTATION:

FIRM OFFER; SCOPE OF FIRM OFFER. The Design-Builder hereby submits this its Firm Offer in response to that Request for Proposals (RFP) issued _____, ____20____, as amended by Addenda

Addendum No.	_____	Dated	_____
Addendum No.	_____	Dated	_____
Addendum No.	_____	Dated	_____
Addendum No.	_____	Dated	_____
Addendum No.	_____	Dated	_____
Addendum No.	_____	Dated	_____

to execute the Contract, consisting of the Contract Documents, as those terms are defined in the **DB Standard Guidance**, within the time period stipulated in the Contract Documents if awarded the Contract, and upon Contract execution to perform the Contract in accordance with its terms. Such Firm Offer shall remain open for a minimum of 180 Calendar Days from the original Proposal Due Date, or for such longer period to which the Design-Builder may consent. Notwithstanding the foregoing, the Design-Builder's execution of the Contract shall constitute evidence that its Firm Offer was held open to date of Contract execution.

The following portions of the Design-Builder's Technical Proposal and Price Proposal (collectively, its "Proposal") are included in this Firm Offer in accordance with the criteria established in the Design-Build Contract and all associated Contract Documents:

Technical Proposal: Those portions of the Proposal that meet or exceed TDOT's minimum Contract requirements, as determined by TDOT in its sole discretion, shall be incorporated into the resulting Contract as if fully set forth therein, and shall constitute additional minimum Contract requirements. Upon incorporation, such portions of the Proposal shall amend the minimum Contract requirements they exceed. Those portions of the Technical Proposal that do not meet or

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exceed the minimum Contract requirements established by TDOT shall **not** be incorporated into the Contract.

Price Proposal: The total of prices proposed in the Price Proposal “Schedule of Items” (the “Proposal Price”), shall be incorporated into the resulting Contract as if fully set forth therein.

EQUAL OPPORTUNITY CLAUSE. The Design-Builder, hereby certifies that **(CHECK ONE)** it has has not , participated in a previous contract or subcontract subject to the equal opportunity clause, as required by Executive Orders 11246, 10925 and 11114 as amended, and that **(CHECK ONE)** it has has not , filed with the Office of Federal Contract Compliance Program all reports due under the applicable filing requirements.

PROPOSAL SECURITY. By submitting this Proposal, the undersigned Design-Builder hereby agrees to be bound by the award of the Contract and, if awarded the Contract on this Proposal, to execute the required Contract and the required Contract Payment and Performance Bond within ten (10) days after receipt of notice of the award. The undersigned Design-Builder submits herewith the required Proposal guaranty in an amount of not less than five (5%) percent of the total amount of the Price Proposal drawn to the order of the Tennessee Department of Transportation offered and agrees and consents that the Proposal guaranty shall immediately be at the disposal of the Department, not as a penalty, but as an agreed liquidated damage if the required Contract and Contract Payment and Performance Bond are not executed within ten (10) days from receipt of the notice of award.

DBE PROJECT UTILIZATION GOAL is 0 %.

GOOD FAITH EFFORTS. The Design-Builder will either meet the DBE utilization goals identified herein or will make good-faith efforts to meet such goals. **(CHECK ONE)** YES NO or N/A .

DESIGN-BUILDER DBE STATUS. The Design-Builder affirms that the Design-Builder is certified as a DBE under Tennessee Law: **(CHECK ONE)** YES NO or N/A . The Design-Builder affirms that one or more joint-venture partners of the Design-Builder is certified as a DBE under Tennessee Law: **(CHECK ONE)** YES NO or N/A .

If the Design-Builder or a joint-venture partner of the Design-Builder is a DBE, answer the following:

Indicate both type of work to be performed by the DBE Design-Builder and **percent** of total Proposal Price represented by such work

Identify by name each joint venture partner certified as a DBE under Tennessee Law and include both type of work to be performed by each such joint venture partner and **percent** of total Proposal Price represented by such work

DESIGN-BUILDER AFFIRMATIONS.

The undersigned Design-Builder, its authorized representative, acknowledges, represents, attests, warrants and certifies that:

- (1) By submitting this Proposal, the Design-Builder represents that it has carefully examined the Contract, which includes **Contract Book 1 (ITBD - Instruction to Design-Builders)**, **Contract Book 2 (Design-Build Contract)**, **Contract Book 3 (Project Specific Information)** and all referenced documents, including the **Design-Build Standard Guidance**, and that it has carefully examined any Plans provided by the Department, the Standard Specifications for Road and Bridge Construction (January 1, 2021) adopted by the State of Tennessee, Department of Transportation, with subsequent revisions which are acknowledged to be a part of this Proposal, the Special Provisions, the Standard Drawings, the Proposal Form, the Form of Contract, all Contract Documents and Addenda, and thoroughly understands their stipulations, requirements, and provisions. The Design-Builder, acting through its authorized representatives, has read and understands, and agrees to be bound by and comply with all RFP instructions, terms and conditions, together with all Addenda, if any, issued.
- (2) The Design-Builder, acting through its authorized representatives, has made a proper examination of the Project Site work described herein and all work locations and has become familiar with local conditions and the character and extent of the work.
- (3) The Design-Builder, acting through its authorized representatives, has read and understands, and agrees to be bound by and comply with the terms of the Contract identified, included, or incorporated by reference into the RFP before submitting its Proposal.
- (4) The Design-Builder has determined the quality and quantity of materials required; has investigated the location and determined the sources of supply of the materials required; has investigated labor conditions; and has arranged for the continuous prosecution of the work herein described.
- (5) By submitting this Proposal, the Design-Builder agrees to provide all necessary equipment, tools, labor, incidentals, and other means of construction, to do all the work, and furnish all the materials of the specified requirements which are necessary to complete the work in accordance with the Plans, the Specifications and all Contract Documents, and agrees to accept as payment in full therefor described in the Contract that are set forth in this Proposal. Compensation for "Extra Work" which may be required by the Department in connection with the construction and completion of the work, but which was not reflected in the Proposal scope at the time of bidding, will be made in the following manner: work will be compensated in accordance with the applicable Contract Documents.
- (6) The Proposal was prepared independently from all other Design-Builders, and without collusion, fraud, or other dishonesty.
- (7) Neither the Design-Builder nor anyone representing the Design-Builder offered or gave

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any advantage, gratuity, bonus, discount, bribe or loan of any sort to TDOT or its agents, employees, or anyone representing TDOT, or engaged in any other type of anti-competitive conduct at any time during this procurement.

- (8) If awarded the Contract, the Design-Builder shall utilize in performance of the Contract all resources indicated in its Proposal, including Major Participants, Key Personnel, and Design Professionals, to the extent within the Design-Builder's control and through application of the Design-Builder's best efforts.
- (9) If awarded the Contract, the Design-Builder shall make all Personnel, including Design Professionals, identified in its Proposal available at all times and places required under the terms of the Contract, and shall ensure that such Personnel devote all efforts necessary for all periods of time necessary or required under the terms of the Contract, to timely fulfill all Contract obligations.
- (10) The Design-Builder has the power and authority to enter into and perform the Contract to be awarded, and the Contract, when executed and delivered, shall be a valid and binding obligation enforceable according to its terms.
- (11) If the Design-Builder is a joint venture or partnership, each joint venturer or partner has signed this Technical Proposal Signature Page on behalf of both itself and the Design-Builder, and each joint venturer or partner and the Design-Builder shall be jointly and severally liable for performing all of the duties and meeting all of the obligations of the Design-Builder under the terms of the RFP, Proposal and Contract to be entered into.
- (12) The Design-Builder acknowledges that TDOT has the right to modify the Contract prior to execution to (a) correct typographical errors, (b) reconcile inconsistencies within and among the Contract Documents, (c) conform terminology used throughout the Contract, (d) include omitted terms clearly contemplated by the language in the Contract, (e) add terms required under State or federal law, and (f) incorporate those portions of the Technical Proposal and Price Proposal, as set forth under, if so, as may be authorized under applicable statutes and rules.
- (13) The Design-Builder intends its Proposal Price to constitute full compensation for performance of all Contract obligations, including those additional minimum Contract requirements proposed in the Technical Proposal and incorporated in the Design-Build Contract.
- (14) The Design-Builder agrees to be bound by and will comply in all respects with the terms of the resulting Contract upon award.
- (15) TDOT will not be liable for any expenses incurred by the Design-Builder in preparing and submitting its Proposal or in participating in the Proposal evaluation/selection process except for those Design-Builders who accept the stipend.
- (16) In the event the Design-Builder has engaged in unlawful anti-competitive conduct or behavior prohibited under the terms of the RFP during this procurement or lacks power or authority or fails for any reason to execute the Contract if awarded to it within the time period specified in the RFP or agreed to by the Parties, the Design-Builder shall forfeit its Proposal Bond and be disqualified from further consideration for Contract award and

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eligibility for receipt of a Proposal stipend.

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*SR-222 Reconstruction and Widening
Design-Build Project
Haywood County*



(17) The Design-Builder certifies that it is not under the control of any person, firm, partnership, or corporation, which has or exercises any control of any other person, firm, partnership, or corporation, that is submitting a Proposal on this Contract.

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*SR-222 Reconstruction and Widening
Design-Build Project
Haywood County*



BEFORE ME APPEARING THE UNDERSIGNED AND BEING BY ME DULY SWORN, UPON HIS/HER OATH INDIVIDUALLY AND IN HIS/HER REPRESENTATIVE CAPACITY ON BEHALF OF THE DESIGN-BUILDER, DEPOSES AND STATES:

I, the undersigned, am a duly-authorized representative of the Design-Builder and have been authorized by the Design-Builder (a) to make in the name of and on behalf of the Design-Builder all acknowledgments, representations, attestations, warranties, and certifications contained herein and elsewhere in the Proposal, (b) to execute this Technical Proposal Signature Page and (c) by my signatures to bind the Design-Builder to the terms of its Proposal.

And further, that (a) the acknowledgments, representations, attestations, warranties, and certifications contained herein and elsewhere in the Proposal are true and correct, and (b) all copies of the Technical Proposal and Price Proposal submitted with the originals are true and correct copies of the originals. This is an official document that is required or authorized by law to be made under oath and is presented in an official proceeding. A person who makes a false statement in this certification is subject to the penalties of perjury.

_____ Sworn to and subscribed before me
Design-Builder (1) this _____ day of _____,

By: _____

_____ Notary Public
Printed Name and Title My commission expires _____

(Seal)

_____ Sworn to and subscribed before me
Design-Builder (2)* this _____ day of _____,

By: _____

_____ Notary Public
Printed Name and Title My commission expires _____

(Seal)

*NOTE: The signature and information for Design-Builder (2) is to be provided when there is a joint venture.

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*****THIS TECHNICAL PROPOSAL SIGNATURE PAGE MUST BE SIGNED IN BLUE INK. ANY ALTERATIONS, INTERLINEATIONS, OR ERASURES TO THE PROPOSAL MUST BE INITIALED ON THE ORIGINAL COPY IN INK BY THE SIGNATORY TO THIS TECHNICAL PROPOSAL COVER SHEET AND SIGNATURE PAGE.***

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*SR-222 Reconstruction and Widening
Design-Build Project
Haywood County*



**DESIGN-BUILD
RFP CONTRACT BOOK 3
PROJECT SPECIFIC INFORMATION**

TENNESSEE DEPARTMENT OF TRANSPORTATION

**SR-222 Reconstruction and Widening
HAYWOOD COUNTY- TENNESSEE**

CONTRACT NUMBER: DB2301



July 10, 2023

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APPENDIX A: ENGINEERING ANALYSIS PAVEMENT DESIGN
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APPENDIX C: TURNING LANE(S) DETAILED CONCEPT

1.0 GENERAL

This *Contract Book 3 (Project-Specific Information)* contains the requirements and conditions by which the Design-Builder shall design and construct the Project, except for any portions of the work that may be stipulated within this *Contract Book 3 (Project-Specific Information)* to be performed by the Tennessee Department of Transportation (“TDOT” or “the Department”).

The order of precedence of *Contract Book 3 (Project-Specific Information)* with the other contract documents is described in *Contract Book 2 (Design-Build Contract)*. TDOT will utilize electronic contracts for this project.

The Definition of Terms corresponding with this *Contract Book 3 (Project-Specific Information)* can be found in the Tennessee Department of Transportation, *Standard Specifications for Road and Bridge Construction* (current edition) and/or the Department’s *Design-Build Standard Guidance: [Design-Build Standard Guidance 04-28-22 \(tn.gov\)](http://www.tn.gov)*.

1.1 PROJECT DESCRIPTION

The proposed project shall consist of the reconstruction and widening of SR-222 in Haywood County from near proposed SR-468 to near Campground Road along the existing alignment. The project will include construction of the new 4-lane roadway, intersection improvements, utility coordination and relocations, removal of portions of the existing roadway, right-of-way acquisition, environmental permitting, and widening the existing box culverts. Traffic shall be maintained on the existing roadway. Refer to Section 10.2 Temporary Lane / Road Closures for lane closure restrictions.

SR-222 will be utilized as an entrance into Ford Motor Company’s Blue Oval City Megasite. Approximately 5,800 employees will be commuting to and from the site each day, and the reconstruction and widening of SR-222 is necessary to accommodate the workers. There have been extensive communications and coordination with Ford to ensure this project will meet their needs as traffic increases.

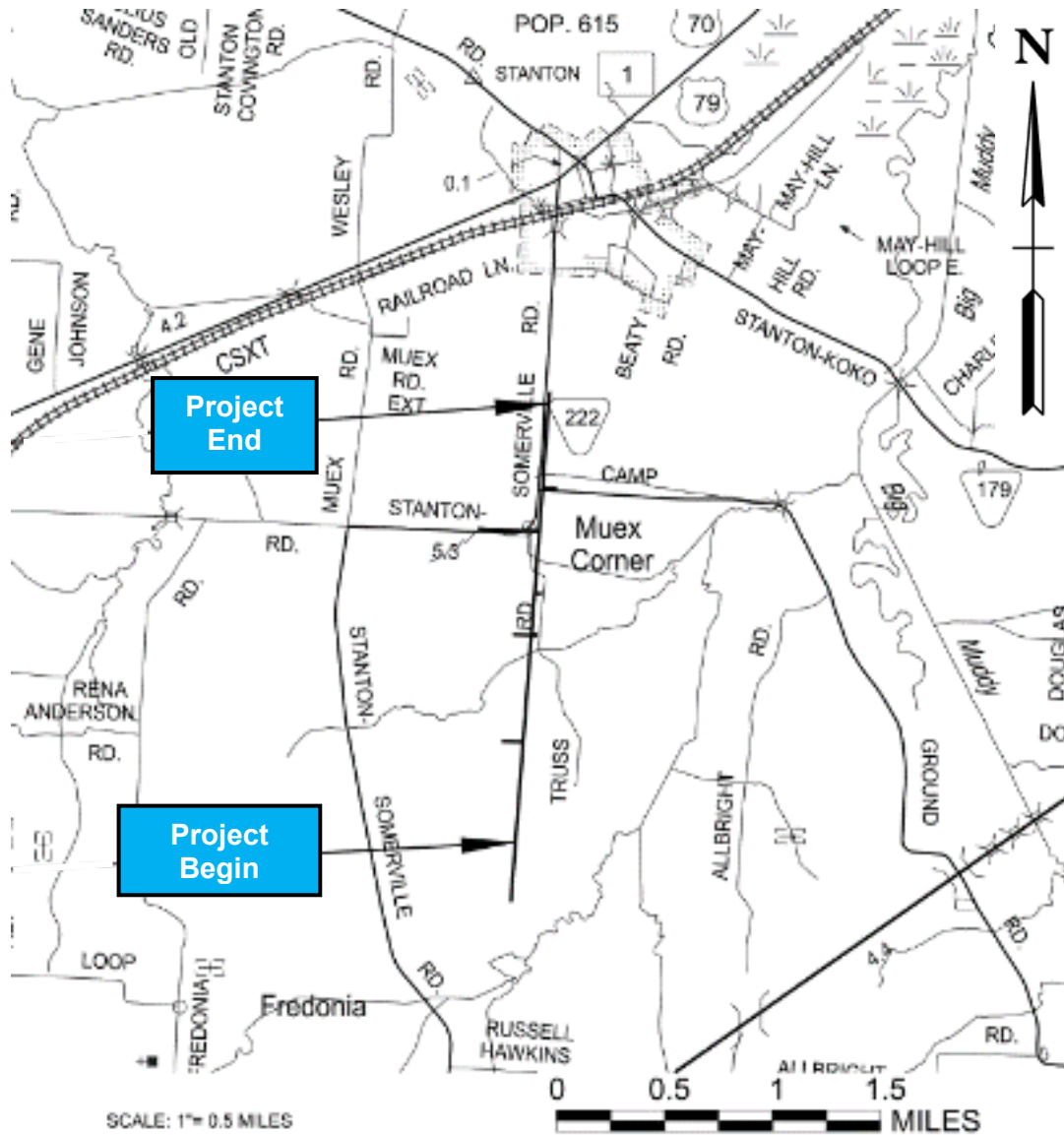
The work generally includes the design and construction of the structures and associated roadway, drainage, and transitions. The Design-Builder shall perform all surveying, design, environmental, and construction services necessary to construct roadway and structures for the Project. In performing scope of work for each Project site, the Design-Builder shall:

- Meet or exceed minimum design criteria for all improvements as defined in Appendix A;
- Remove and replace all guardrail necessary for reconstruction of the roadway approaches to the Project design criteria;
- Resurface or replace all existing asphalt pavement within the project limits;
- Modify existing drainage structures and install proposed drainage improvements within the Project limits;
- Proceed with utility coordination and relocation as stated in Section 7.0 of this Contract Book 3;
- Install new roadway signs and sign structures within the Project limits;
- Replace pavement markings within Project limits;
- Provide traffic control during construction in accordance with Section 9.2, Maintenance During Construction;
- Perform any additional environmental services and be responsible for costs required for obtaining all necessary environmental permits, including all compensatory mitigation, and meet the requirements of each environmental permit;
- Meet all environmental commitments and perform environmental services necessary to obtain approval of the Tennessee Environmental Evaluation Reports (TEER) for re-evaluations; and

- Utilize TN Stream Quantification Tool (TN SQT) to collect data on any streams that will require compensatory mitigation and/or relocation in accordance with TDEC guidance.

A more detailed description of the scope of work for the Project is included within the various sections of this Contract Book 3 (Project-Specific Information). An overview of the project is shown below in Figure 1.

FIGURE 1 - LOCATION MAP



1.2 PROJECT GOALS

The following goals have been established for the Project (**not listed in any specific order**):

- Minimize inconvenience to the public during construction.
- Provide a management system or approach that ensures the requirements of the Project will be met or exceeded.
- Provide a high-quality project that minimizes future maintenance.
- Provide a solution consistent with the Department's *Roadway Design Standards*.
- Adhere to local, state, and federal environmental regulations and/or permits that are required in executing and/or completing the Project.
- Incorporate the Project Delivery Network (PDN) to properly manage tasks and activities throughout the Project.
- Incorporate Best Management Practices (BMPs) to control sediment, storm water runoff/discharge, or other environmental parameters that are established for the Project.
- Implement innovative solutions to maximize the return on taxpayer investment by reducing costs or improving quality of the transportation system.
- Construction of temporary or permanent signalized turning lanes at STA 3067+03.39 and STA 3093+22.31 as quickly as possible and/or no later than June 30, 2024. (**See Appendix C**)
- Complete construction as quickly as possible and/or no later than November 30, 2025.
- Incorporate safety and positive drainage into all aspects of design and construction with the ultimate goal of zero incidents and accidents.
- Provide a visually pleasing finished product.

1.3 DEPARTMENT PROVIDED MATERIALS

Plans and/or the Department provided material are available for download on the Department's Project website: <https://www.tn.gov/tdot/tdot-construction-division/transportation-construction-alternative-contracting/design-build.html>.

The Department provided materials include:

- Survey Data Files, including ORD files;
- The TEER documentation, approved on April 18, 2023;
- Simplified Functional Plans (The Simplified Functional plans are supplied for information only; the scope of the project listed in the RFP takes precedence);
- Preliminary Hydraulic Grade Approval Letter, dated March 17, 2023;
- HEC-RAS Hydraulic Model Files (Note: The model is provided for informational purposes only; a new model, prepared and stamped by the Design-Builder, is required);
- Utilities Contact List;
- Simplified Functional Plans in dgn format and sheet files, which shall be available to the Design-Builder after the CAD Disclaimer form (provided on the project website) is submitted to TDOT;
- Traffic Data developed by the Department's Strategic Transportation Investments Division;

- Design-Build Draft Geotechnical Reports, dated February 27, 2023;
- Pavement Design (Note: Alternative pavement design will not be allowed), dated January 23, 2023;
- State Historic Preservation Office (SHPO) letter of opinion that there are no National Register of Historic Places (NRHP) listed or eligible archaeological properties affected, dated March 13, 2023;
- State Historic Preservation Office (SHPO) letter of opinion that there are no National Register of Historic Places (NRHP) listed or eligible historical/architectural properties affected, dated April 3, 2023;
- TDOT Waste and Borrow Manual (2017); and
- CAD Disclaimer Form.

Except as provided by the Department above, the Design-Builder shall verify existing survey and provide all updated surveys, mapping, plans, verification of existing utilities, investigation, and analysis required for completion of the work.

The Design-Builder shall adhere to all commitments stated in the environmental documents. The Design-Builder shall acknowledge that materials furnished by the Department are preliminary and provided solely to assist the Design-Builder in the development of the Project design. The Design-Builder shall be fully and totally responsible for the accuracy and completeness of all work performed under this Contract, and the Design-Builder shall hold the Department harmless and shall be fully liable for any additional costs and all claims against the Department that may arise due to errors, omissions, or negligence of the Design-Builder in performing the work required by this Contract.

1.4 PERMITS

The Department has procured or will procure the permits for the Design-Builder as stated in Section 8.8 of this Contract Book 3.

- The Department shall be solely responsible for and obtain any necessary environmental permits or approvals resulting from the Simplified Functional Plans. If any additional environmental permits are necessary, prior to completion of the Definitive Design Plans, the Design-Builder shall contact the Department's Alternative Contracting Office immediately for guidance. The Department's Region 4 Environmental Tech Office (ETO) and Headquarters Environmental Division Permitting Section shall be included in all correspondence and/or negotiations with agencies.
- The Design-Builder shall be solely responsible for and obtain any necessary environmental permits or approvals from state and/or local agencies regarding the operation of any Project-dedicated asphalt and/or concrete plants.
- Borrow and waste disposal areas shall be located in non-wetland areas and above the 100-year, Federal Emergency Management Agency floodplain. Borrow and waste disposal areas shall not affect any Waters of the State/U.S. unless these areas are specifically covered by an ARAP, 404, or NPDES permit, obtained solely by the Design-Builder.

1.5 DBE GOAL

There is no assigned DBE goal for this Project.

The Design-Builder is encouraged to pursue DBE participation in the project. If DBE participation is utilized, the Design Builder shall exercise all necessary steps as stated in the TDOT Disadvantaged Business Enterprise (DBE) Plan and shall comply with all requirements in 49 CFR Part 26.

1.6 LIQUIDATED DAMAGES

The Design-Builder shall complete the Project within the time limitations set forth in *Contract Book 2 (Design-Build Contract)* and Special Provision 108B.

If the Design-Builder fails to complete the Project within the time limitations set forth in the Contract, the Department will suffer substantial losses and damages. The Contract therefore provides that a sum shall be deducted from monies due the Design-Builder, not as a penalty, but as Liquidated Damages, if such completion is delayed.

The liquidated damage for non-compliance is **\$11,000 per Calendar Day***. This is also the Time Value used for calculation of selection and for failure to complete the work on time. It shall be calculated as follows:

If the Project is NOT completed in time “B”, then the following amount shall be deducted from the monies due the Design-Builder as:

$$(\text{Actual Time Charged} - B) \times \$11,000/\text{Calendar Day}^*$$

* Calendar Day amounts are applicable when the Contract Time is expressed on the Calendar Day or fixed date basis.

Any liquidated damages shall be addressed, not as a penalty, and computed as they occur with a separate item number subtracting from monies due the Design-Builder.

See Section 10.2 for Temporary Lane/Road Closure restrictions.

1.7 ON-THE-JOB/APPRENTICESHIP TRAINING

On-the-Job/Apprentice Training is required on this Project and shall be included in the bid document and special provision. For further information see Section 7.2.11 of the *Design-Build Standard Guidance*.

1.8 CONSTRUCTION ENGINEERING INSPECTION

The Department will be responsible for Construction Engineering Inspection (CEI) work and Quality Acceptance Testing.

1.9 CONTRACTOR RESPONSIBILITIES

Nothing in the Contract shall relieve the Design-Builder from their responsibilities toward the safety and convenience of the general public and the residents along the proposed construction area.

2.0 PROJECT MANAGEMENT

The Design-Builder shall prepare and administer a Project Management Plan (PMP) containing the Design-Builder’s approach to managing the design and construction activities of the Project in accordance with the *Design-Build Standard Guidance* and the specific requirements defined herein.

The PMP shall contain, at a minimum, the following component parts:

- Organizational Structure and Staffing Plan;
- Critical Path Method (CPM) Schedule;
- Quality Management Plan;
- Environmental Compliance Plan;
- Safety and Health Plan;
- Public Relations and Public Information Plan; and
- Records Management Plan.

Within 30 Days of Contract Award, the Design-Builder shall meet with the Department at the Post-Award Meeting to discuss development of the components of the PMP for Review and Approval by the Department prior to the start of any Work.

The Design-Builder shall use the Project Understanding and Approach, and the Project Management and Approach submitted with the Proposal as a foundation to prepare the PMP component plans. The Design-Builder shall implement all elements of the PMP.

The successful Design-Builder is required to utilize PlanGrid software for the project. The Design-Builder shall contact PlanGrid directly to obtain usage license and service information. Information about PlanGrid and contact information for purchasing licenses at TDOT's special rate can be found at the following link: <https://www.tn.gov/tdot/tdot-construction-division/transportation-construction-division-resources/plangrid.html>.

2.1 ORGANIZATIONAL STRUCTURE AND STAFFING PLAN

The Design-Builder shall prepare an Organization Structure and Staffing Plan for the purpose of ensuring that appropriate qualified staff are employed by the Design-Builder to perform the Work and are able to carry out the Work in a manageable and safe manner.

The plan shall identify the Key Personnel and key management staff including the Key Personnel level 1 and level 2 identified in the Statement of Qualifications (SOQ) and on the Response Category 2 form. See *Contract Book 1 (Design-Build Contract)*.

The Design-Builder shall provide an organizational chart that graphically represents the hierarchy and functional interaction of the Key Personnel and indicates the functional responsibilities of each. The organizational chart shall be part of the PMP.

The organization shall be monitored, and the chart updated and provided to the Department when changes to the Design-Builder's organizational chart occur.

Staffing Requirements

The Design-Builder shall provide to the Department, within 15 calendar days after the initial Notice to Proceed (NTP), a list of the contacts (and contact details) of Key Personnel on site and Key Personnel on call who are available 24 hours per day during the executions of the Work. See *Contract Book 1 (Instructions to Design-Builders)*.

The Design-Builder shall include a procedure for a structured and managed replacement of Key Personnel on the project team of the Design-Builder. See *Section K of Contract Book 1*.

Any licenses or certifications that are required to meet the requirements of the RFP shall be in place by the time the first NTP is issued. See *Section 2.a.8 of Contract Book 1*.

2.2 CRITICAL PATH METHOD (CPM) SCHEDULE

The Design-Builder shall prepare a cost-loaded Critical Path Method (CPM) Schedule, in accordance with Chapter 3 of the *Design-Build Standard Guidance* and the requirements herein, for review at the Post-Award Meeting.

The Design-Builder shall use the preliminary CPM Schedule submitted with the Proposal as a foundation to prepare a Project CPM Schedule and shall submit it to the Department for Review and Approval. Approval of the initial Project CPM Schedule by the Department shall be a condition of starting any Work. The Design-Builder shall submit an updated Project CPM Schedule on a monthly basis for the Department's Review and Approval. Failure to submit an updated Project CPM Schedule may result in the withholding of progress payments.

The Design-Builder shall provide a narrative with each CPM Schedule submittal, which shall include:

- A detailed description of the status of the Project and changes to the CPM Schedule;
- Identification of strategies for mitigation of Project risks or issues impacting the CPM Schedule describing constraints and discussing contingencies;
- How the proposed Project phasing and sequence of work and allocation of resources enables the Design-Builder to progress the work to achieve the Contract Completion Date;
- How the phasing ensures timely deliveries of materials to achieve the CPM Schedule milestones;
- Identification of categories of work performed by Design-Builder's own direct labor force and those performed by Subcontractors; and
- Pay Item activities and all work included in the Pay Item activities corresponding to totals as reflected on the Schedule of Items.

The Design-Builder shall include all Design Reviews submittals and any resubmittals in the CPM Schedule in order for the Department to appropriately allocate resources for performing the reviews and to track and document any possible schedule impacts.

TDOT and Federal Highway Administration (FHWA) Review Time

The Design-Builder shall allocate ten (10) Business Days (excluding State holidays) in the CPM Schedule for activities requiring the Department's Review and Approval, or Review and Comment. Any third-party submittals requiring review and approval from FHWA shall be allocated fifteen (15) Business Days (excluding Federal holidays) in the CPM Schedule for FHWA review. Department and FHWA review periods can be assumed to occur concurrently.

Monthly progress payment requests and CPM updates are due five (5) Business Days prior to estimate cutoff date.

The number of Plan Review submittals shall be limited to two (2) at any given time.

Schedule and Cost Control

The Design-Builder shall develop procedures for schedule and cost control on the Project, including the cost control and schedule management system to be used to control and coordinate the cost and schedule of the work.

The cost-control approach shall include a description of the proposed approach for calculating progress performance for preparing the monthly payment requests using the Pay Item activities, Schedule of Items, and CPM Schedule.

The Design-Builder shall include a procedure for re-scheduling of its work to achieve schedule recovery objectives and how these objectives shall be enforced with its work force and Subcontractors.

2.3 QUALITY MANAGEMENT PLAN

The Design-Builder shall prepare a Quality Management Plan (QMP) in accordance with Section 2.5 of the *Design-Build Standard Guidance* and the requirements herein. The QMP shall consist of a:

- Design Quality Management Plan; and
- Construction Quality Management Plan.

Design Quality Management Plan

The Design Quality Management Plan (DQMP) shall describe the quality roles and responsibilities of the Design-Builder's design quality management team and procedures for implementing the design work in accordance with Chapter 5 of the *Design-Build Standard Guidance*. The DQMP shall be submitted for the Department's Review and Approval prior to starting any design work. The DQMP shall describe the design development, submittal, and design review process for preparation of final signed and sealed construction plans used to construct the proposed improvements. The processes and procedures in the DQMP shall be developed in accordance with TDOT's *Design Guidelines* and Chapter 5 of the *Design-Build Standard Guidance* for the Department's Review and Approval prior to starting any design work.

The DQMP shall include Quality Control and Quality Assurance procedures for ensuring the quality of the design work and conformance with the requirements in the *Design-Build Standard Guidance*, including design-quality checks and certifications, and independent Design Reviews prior to submittal for the Department's Review and Approval.

The Design-Builder shall provide all Design Documents and perform Design Reviews in accordance with the Design Review schedule established in the Critical Path Method (CPM) Schedule, and in accordance with Contract requirements.

The Design-Builder shall be responsible for design Quality Control and ensuring that the design submittals and design reviews are performed in accordance with the DQMP and the Contract Documents. The Design-Builder shall provide a Design Quality Manager (DQM) to perform quality assurance activities and audits of the Quality Control activities and Quality Control program. The DQM shall be independent of the production work and shall certify to the Design-Builder and the Department that the design Work Product conforms to the requirements of the Contract Documents.

Construction Quality Management Plan

The Construction Quality Management Plan (CQMP) shall describe the quality roles and responsibilities of the Design-Builder's construction quality management team and procedures for implementing the construction work in accordance with Chapter 7 of the *Design-Build Standard Guidance*. The CQMP shall be submitted for the Department's Review and Approval prior to starting any construction work.

Although the Department will provide Construction Engineering and Inspection (CEI) and quality acceptance testing, the Design-Builder is responsible for ensuring the quality of the work and shall prepare procedures in the CQMP for quality control of materials and how the Design-Builder plans to inspect the project to ensure compliance with the Contract Documents.

The Design-Builder shall be responsible for Quality Control during construction and ensuring that Quality Control testing and inspections are performed in accordance with the CQMP and the Contract Documents. The Design-Builder shall provide a Construction Quality Manager (CQM) to oversee, manage, certify, and perform construction quality assurance and audit activities. The CQM shall independently review the submittals for the Department, and upon completion shall certify to the Department that the information is accurate and complete. The CQM shall certify that all Work Product has been checked and/or inspected by the CQM's quality staff, and that all work complies with the Contract Documents. The CQM shall also certify to the Department that the CQMP and all measures, protocols, and procedures provided therein are functioning properly and are being followed.

The Design-Builder shall guarantee and provide full cooperation in relation to CEI, audits, reviews, requests for information, etc.

2.4 ENVIRONMENTAL COMPLIANCE PLAN

The Design-Builder shall prepare an Environmental Compliance Plan (ECP) in accordance with Section 2.5.4 of the *Design-Build Standard Guidance*.

2.5 SAFETY AND HEALTH PLAN

The Design-Builder shall prepare a Safety and Health Plan in accordance with Section 2.5.5 of the *Design-Build Standard Guidance*.

2.6 PUBLIC RELATIONS AND PUBLIC INFORMATION PLAN

The Design-Builder shall comply with Section 7.4.5 of the *Design-Build Standard Guidance* and address the following the project-specific requirements:

Stakeholder Group Coordination

In coordination with TDOT, the successful Design-Builder shall set up external communications between the Design-Builder and the Department, the Department's staff, external stakeholders, third parties, the public, and other stakeholder groups. All communications to external groups must be pre-approved by TDOT.

The Design-Builder shall provide all information required for communication purposes. The communication activities are mainly intended for the Department and Department staff (internal stakeholders) but shall also focus on neighboring public and communities, companies and organizations, emergency services, Haywood County, environmental agencies and other external services.

The focus on the construction communication shall support the following goals:

- Ensure that the entire project is executed in the least disruptive and positive manner possible for the Department.
- Maintain the best possible long-term relations with all relevant external stakeholders.
- Ensure that the work is performed in the most effective and efficient way.

Complaint Processing

The Design-Builder shall process complaints that result from performing the work, whether received directly or through the Department to the Design-Builder, as soon as possible and react in a proactive way.

The Design-Builder shall notify the Department within two hours after receiving a complaint and inform what actions shall be taken in order to resolve the cause of the complaint.

The Design-Builder shall keep a complete and updated complaint register of all complaints received, addressed directly to the Design-Builder or through the Department.

Project Website

The Design-Builder shall coordinate with the Department and provide Project-related information to the Department for Review and Approval including:

- Contact information;
- Project maps;
- Current Project activities and progress;
- Timing of street or river closures and openings;
- Recommended route alternatives during closures, with maps;
- Newsletters and meeting materials; and
- Calendar of, and announcements for, meetings and special events.

Liaison with the Media

Unless otherwise specifically authorized in writing by the Department, the Design-Builder shall provide no news release, press release, or any other statement to a member of the news media regarding this Project without the Department's prior written authorization. The Design-Builder shall require this clause within all Subcontractors' agreements.

2.7 RECORDS MANAGEMENT PLAN

The Design-Builder shall describe procedures for managing and maintaining Project record documents in accordance with Sections 5.2.11 and Chapter 7 of the *Design-Build Standard Guidance* and the project-specific requirements herein.

The Department will perform a combination of audits, reviews, Inspections, etc. to assess whether the Design-Builder's integrated project management is functioning properly and determine whether its records and information are reliable and up to date.

Upon completion of the Project, the Design-Builder shall provide the Alternative Contracting Office a transmittal letter, an electronic copy (CAD and signed PDF's) of the As-Built Plans, and final foundation

type, including footing elevations and lengths of individual piles, prior to final payment of funds to the Design-Builder. In addition, the Design-Builder shall provide the TDOT Structures Division a final set of As-Built Plans for all structures (bridges, walls, foundations, etc.). The plans shall be delivered on USB flash drive (each sheet an individual PDF file).

The Tennessee-licensed Professional Engineer in charge of the development of the Project plans shall place their seal, including signature and date, on the right side of the title sheet. All plans' sheets shall contain the seal, including signature and date, of the Professional Engineer in charge of its development. Certified digital signatures shall be required for all plan submittals (refer to Section 4 of the TDOT *Design Guidelines*).

The As-Built Plans and the Design-Builder Specifications following construction completion shall incorporate any changes to the Readiness-for-Construction Design Review Plans and Specifications, changes made during construction as well as all utility locations within ROW as described in the *Design-Build Standard Guidance*.

3.0 ROADWAY SCOPE OF WORK

The roadway shall be designed to adhere to the latest editions of all appropriate TDOT *Roadway Standard Drawings*, TDOT *Roadway Design Guidelines* and *Instructional Bulletins*, TDOT *Drainage Manual*, TDOT *Traffic Design Manual*, TDOT *Design CADD Standards*, TDOT *Survey Manual*, and the Department-accepted American Association of State Highway and Transportation Officials (AASHTO), *Policy on Geometric Design of Highways and Streets*, and *Manual on Uniform Traffic Control Devices* (MUTCD).

OpenRoads Designer (ORD) shall be used in the development of 3D parametric modeling to provide model-centric design deliverables. If the Design-Builder uses ORD, the Design-Builder shall use ORD in accordance with requirements and guidelines provided on TDOT's website: www.tn.gov/tdot/roadway-design/tdot-cadd-support/tdot-openroads-designer.html.

3.1 DESIGN REQUIREMENTS

The proposed horizontal and vertical alignments of SR-222 shall be designed and constructed to meet or exceed a 60-mph design speed for a Major Collector Roadway and level terrain for a 4-lane facility.

Traffic lanes along SR-222 shall be 12 feet wide (see TDOT Typical Sections Standard Drawing(s) RD11-TS-2B and RD11-TS-6B).

All two-way left-turn lanes along SR-222 shall be 12 feet wide.

The shoulder widths along SR-222 shall be 12 feet (10 feet paved).

The median width shall be 24 feet with a raised portion of 20 feet (see TDOT Typical Sections Standard Drawing RD11-TS-6B).

Traffic lane widths on side roads shall be as follows: Stanton-Somerville Road 12 feet (see TDOT Typical Sections Standard Drawing RD11-TS-2). The shoulder width shall be 8 feet (6 feet paved). Traffic lane widths on Campground Road and Truss Road shall be 12 feet (see TDOT Typical Sections Standard Drawing RD11-TS-1).

The shoulders on Campground Road and Truss Road shall be 2 feet wide (0 feet paved).

The minimum clear zone along SR-222 shall be 30-32 feet for cut slopes and 28 feet for fill slopes at 6:1 slope. Any slopes steeper than 6:1 shall meet the clear zone criteria listed in TDOT Standard Drawings S-CZ-1.

All driveway or intersection connections to SR-222 shall be designed to meet minimum sight distance requirements.

Proposed ROW line shall be set at 10 feet (minimum) outside of the toe of proposed slope along SR-222. The ROW line shall be set as shown on the Simplified Functional plans. No land disturbance is allowed greater than 10 feet outside of planned slope lines.

All existing permanent signage within the project limits shall be replaced.

The Design-Builder shall be responsible for preparation of final signed and sealed construction plans used to construct the proposed improvements. They shall be prepared in accordance with TDOT's *Design Guidelines* and the previous design standards referenced in this section.

If the Design-Builder deems that additional ROW is needed outside of the proposed ROW shown on the TDOT-provided Simplified Functional plans, the Design-Builder shall be responsible for any and all additional environmental technical studies and re-evaluation of the TEER document (See Figure 2- ETSA Study Area Map). The Department is responsible for all ROW appraisals and acquisitions, Move-In State (MIS) utilities design coordination, and any permits necessary. Any increase in ROW by the Design-Builder must be approved by TDOT in the proposal phase and shall not require relocations. The Design-Builder is required to submit an Initial Right-Of-Way Acquisition Exhibit for approval in accordance with Section 6.0 (c.) in this RFP Contract Book 3. In addition to the conceptual plans required in Response Category IV in RFP Contract Book 1, the Design-Builder shall also submit ROW Acquisition sheets which shall be in the format of the Right-of-Way Acquisition and Property Map sheets in the Roadway Simplified Functional Plans provided by the Department.

The Design-Builder shall identify the need for any special roadway design details (i.e., any special drainage structures, rock embankment, retaining walls, concrete barrier designs, etc.) and shall provide special design drawings to the Department for Review and Approval.

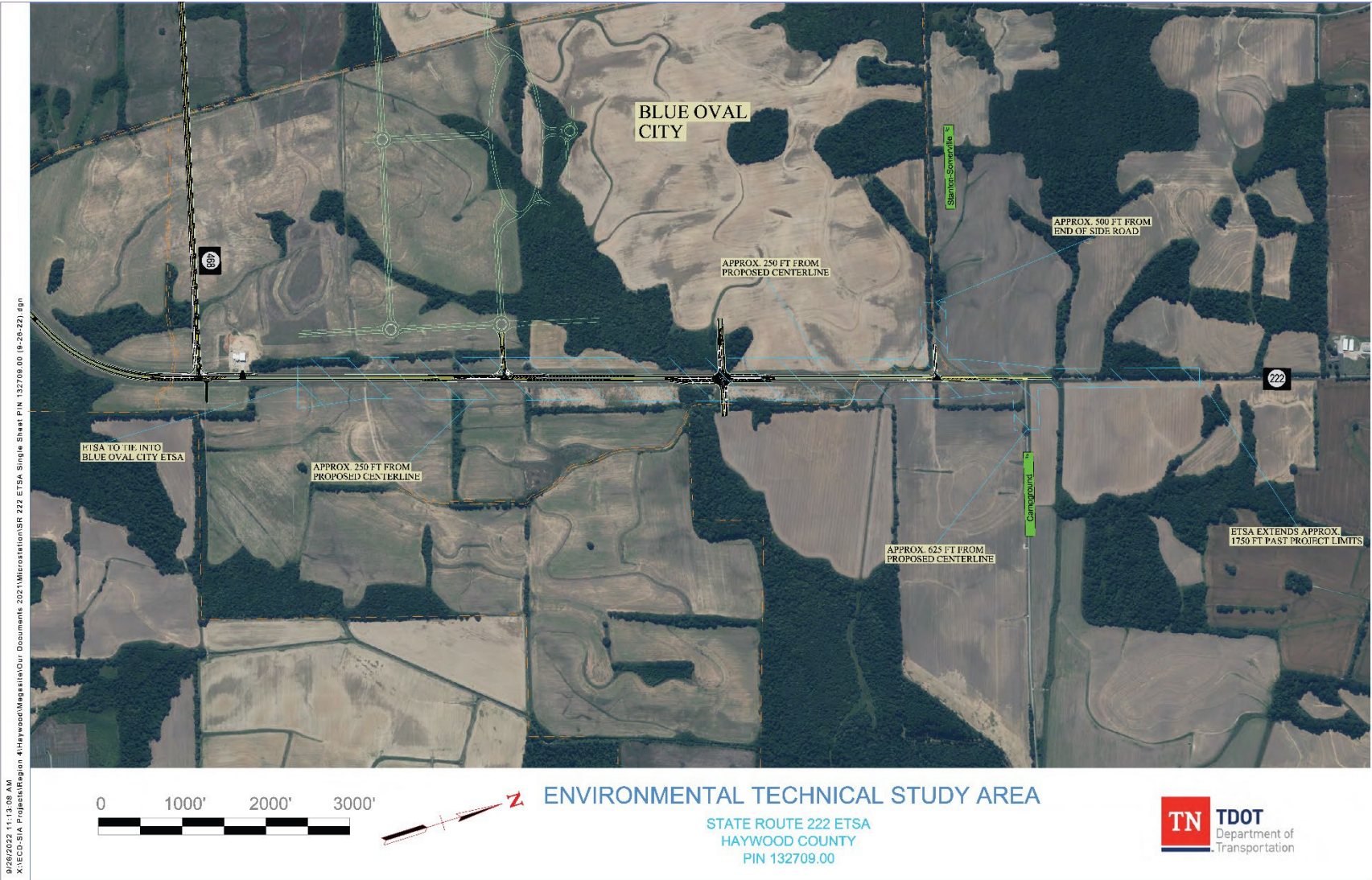
The Design-Builder shall ensure that all applicable "General and Special Notes" found in Section IX of the current edition of the TDOT *Roadway Design Guidelines* and TDOT *Instructional Bulletins (IBs)* applicable on the date the RFP is issued are adhered to during construction.

The geometric configurations of all roadway components shall be designed to provide adequate drainage and prevent hydroplaning (during construction and when complete). Cross slopes shall be in accordance with the requirements of the roadway typical section as shown in the Functional Plans. Design-Builder shall provide hydraulic calculations (including spread calculations) to the Department.

All permanent and temporary safety appurtenances (sign supports, guardrail, barrier rail, impact attenuators, etc.) shall meet current TDOT standards and shall have all required Department certification documents.

TDOT will perform the utility coordination in the design phase for this project as specified in Section 7.0. The Design-Builder shall verify the location of all utilities. Electric and Communications are Move-In State (MIS). Design-Builder shall refer to the utility scope of work in Section 7.0 for MIS requirements.

Figure 2 – ETSA Study Area Map



3.2 DEVIATIONS AND EXCEPTIONS

All proposed modifications require an Alternative Technical Concept (ATC) subject to Department approval. The Design-Builder shall not request more than eight ATCs.

To ensure compliance with the environmental technical study area, deviations from horizontal (greater than 10.0 feet) as shown on the Functional Plans will require an Alternative Technical Concept (ATC) with Department approval. The Design-Builder is responsible for any impacts resulting in deviations from the Simplified Functional Plans.

The Department shall be responsible for performing all ROW acquisition activities, including appraisals, Appraisal reviews, and acquisitions, and any required utilities coordination/relocation and acquisition of related permits.

The Department shall be responsible for acquiring environmental permits.

No design exceptions will be allowed without Department approval.

3.3 GUARDRAIL

The proposed guardrail, including any anchor system, shall be installed quickly to minimize traffic exposure to any hazard. Guardrail shall be removed and replaced in accordance with the January 2021 edition of TDOT *Standard Drawings* and TDOT *Standard Specifications*.

All permanent and temporary safety appurtenances (sign supports, guardrail, etc.) shall meet current TDOT standards and shall have all required Department certification documents.

The Design-Builder shall propose an AASHTO *Manual for Assessing Safety Hardware* (MASH) compliant TL-3 guardrail attachment to bridge ends (and retaining walls if applicable) detail. This attachment detail shall be submitted prior to installation for the Department's Review and Approval. All new guardrail and end terminals shall be MASH-compliant TL-3 and be on the Department's Qualified Products List.

3.4 DRAINAGE

The Design-Builder shall be responsible for design and construction of the entire stormwater management system within the Project limits, including bridges, stormwater conveyances (open-channel and closed-conduit), stormwater inlets, and stormwater collection systems. Drainage structures should account for the higher of existing flood flows or post-construction flows for Blue Oval City.

All stormwater runoff that flows through the Project, whether originating within or outside of the Project, must be accounted for in the design of the Drainage System.

The analysis, design, and construction of all components of the stormwater management system shall address the interim conditions during construction of the Project and the final design.

3.5 DRAINAGE DESIGN REQUIREMENTS

All drainage analysis and design shall be in accordance with the Department's *Drainage Manual*.

The Design-Builder shall use a 50-year design storm for all new (and existing to remain) storm sewer systems in accordance with the Department's Drainage Manual. However, any new culverts must be designed with a minimum of 5' vertical clearance for maintenance purposes. For any structure with a Q_{50} that exceeds 500 cfs, the *Design Procedures for Hydraulic Structures* (2012), shall be followed.

All drainage systems shall be designed to convey the 50-year storm without overtopping of any existing or proposed drainage or transportation elements.

The Design-Builder shall design culvert outfalls, channels, and ditches within the Project limits in accordance with requirements of the *Drainage Manual*. Appropriate energy dissipation devices shall be designed at culvert outlets to prevent scouring and appropriate channel linings shall be designed such that erosion within and downstream of the channels and ditches is minimized. Energy dissipation devices shall be designed to fit within the existing Right-of-Way.

The Design-Builder shall provide aggregate pipe underdrains as specified in the pavement design and shall provide appropriate outlets for the underdrains as specified by the TDOT *Standard Drawings*.

The Design-Builder shall re-establish drainage in situations where sedimentation has changed the flow line from the existing profile. No Work should be done to Waters of the State or US, which might appear to be a ditch, without proper permits.

The Design-Builder shall provide erosion control for the construction Project per the guidelines specified in the Department's *Drainage Manual*.

The Design-Builder shall design the drainage system to accommodate construction staging. Spread requirements for temporary traffic control may be reduced to a 5-year storm event; however, permanent conditions must meet the requirements of the Department's *Drainage Manual*. The design shall include temporary erosion control, sediment basins, and other Best Management Practices needed to satisfy NPDES, local municipality, and other regulatory requirements. All environmental approval commitments related to drainage design and erosion control shall be included as "notes" on the plans for each stage of construction.

3.6 EXISTING DRAINAGE SYSTEMS

The Design-Builder shall obtain the Department's approval during the Design-Build timeframe to utilize any existing stormwater system (any and all pipes, structures, ditches, detention/retention systems, or any other components necessary for the conveyance of stormwater) outside of the Project limits.

The design of stormwater management facilities shall be compatible with existing or any known proposed improvements to drainage systems on adjacent properties and shall preserve existing drainage patterns wherever possible.

If existing drainage patterns must be altered due to a temporary or permanent aspect of the design of the Project, the Design-Builder shall provide documentation of any/all impacts to upstream/downstream and/or adjacent properties and/or road crossings for approval prior to alteration of existing drainage patterns. Survey data shall be collected for all upstream/downstream/adjacent properties that are impacted, such as road crossing information, structure damage elevations, and channel cross sections (at a minimum), and shall be used in support of hydraulic calculations for the offsite drainage systems. Engineering analyses and certifications shall be provided to the Department and the local jurisdiction for approval prior to performing the alteration.

The Design-Builder shall obtain all applicable municipal drainage plans, watershed management plans, and records of citizen concerns. The Design-Builder shall obtain all pertinent existing storm drain plans, bridge hydraulic studies, and/or survey data, including data for all culverts, drainage systems, storm sewer systems, and bridge sites within the Project limits. The Design-Builder shall also identify existing drainage areas and calculate the estimated runoff to the highway drainage system.

If documentation is not available for certain components of the existing drainage system within the Project limits and these components are planned to remain in place, the Design-Builder shall investigate and video record or photograph these components to determine condition, size, material, location, and other pertinent information.

The re-use of existing drainage structures, pipes, etc. (except underdrains) within the Project limits is encouraged by the Department, provided that the facilities meet the requirements of the Contract and are not impacted by construction activities.

Damage to existing infrastructure due to the Design-Builder's operation shall be immediately repaired to maintain existing system capacity at all times. This permanent repair shall be at the Design-Builder's expense.

The Design-Builder shall inspect and verify that existing drainage systems to remain are clean, operable, and structurally adequate. Any repairs, replacements, debris removal, and/or deficiencies shall be corrected by the Design-Builder. The most current information available to the Department for the existing drainage systems for the Project include a field-run topographic survey of the existing horizontal and vertical alignments, storm pipe inverts, and pipe material type. (Note: The Design-Builder shall verify all existing survey information provided by the Department.)

The Design-Builder shall analyze existing storm drainage systems, culverts (boxes and cross pipes), and open channels impacted or affected by the Project design.

The Design-Builder shall replace or supplement any pipes or culverts that are deemed hydraulically or structurally deficient in the existing condition or as a result of this Project.

Only pipes within the defined Project limits are subject to be replaced or supplemented.

The Design-Builder shall replace damaged, destroyed, missing, or permanently attached castings on existing drainage structures. This shall include, but is not limited to, any structure located within the proposed roadway that is not already being modified or addressed within the proposed drainage work or a structure which is within the resurfacing limits, which is not being affected by any proposed drainage work.

3.7 HYDRAULIC DESIGN FILE REPORT FOR HYDRAULIC STRUCTURES

The Design-Builder shall prepare a Hydraulic Design File (HDF) Report and any other required documentation for all existing and/or proposed bridge-class structure crossing sites, and for culverts that convey at least 500 cubic feet per second for the design storm. All aspects of the drainage design must meet all criteria listed in the latest edition of the TDOT *Design Procedures for Hydraulic Structures*, the Department's *Drainage Manual*, and any Environmental Commitments identified.

All structures must include a hydraulic model from *Hydraulic Engineering Center – River Analysis System*, Volume 6 or later, unless prior approval has been received from TDOT Hydraulic Design Section. The hydraulic model should include “existing”, “proposed”, and “no project” conditions. The adjacent downstream crossing at Truss Road should be included in all hydraulic models due to its proximity to the project limits.

Additional required documentation may include, but not be limited to, the preparation and submittal of any CLOMR or LOMR required for community and/or FEMA coordination. The HDF Report shall further include the detailed calculations with electronic and printed copies of the computer software input and output files, as well as a discussion about hydrologic and hydraulic analyses and reasons for the design

recommendations. At a minimum, for each bridge-class crossing or structure conveying more than 500 cubic feet per second for the design storm, the HDF Report shall include:

- Correspondence in chronological order.
- Maps - located on a portion of the county map or city map, 7.5-minute USGS quadrangle (preferably color), and FEMA NFIP map.
- Hydraulic report summary.
- Photographs - See TDOT *Hydraulic Manual*, Chapter 10, for minimum requirements. Aerial photographs should be included if available.
- Analysis:
 - Discharge calculations.
 - Frequency discharge relationship.
 - Stage discharge relationship.
 - Supporting hydraulic information (previous flood studies, gauge data, etc.).
 - Existing structure analysis, with cross sections plotted (if applicable).
 - Natural water surface model with no bridge or road fill.
 - Proposed structure analysis, with cross sections plotted and any alternatives.
 - Existing, proposed, and no-bridge output tables.
 - Scour analysis, if applicable.
 - Deck drainage analysis.
 - On-site inspection report.
 - Other information.

Where multiple structures occur on a single project, the correspondence section should not be repeated. The cover of the design file should include the project description, PIN, and/or project number as indicated in Department schedules. Also, each stream crossing station, stream name, and associated bridge identification number (if available) should be indicated on the cover. Survey data should be included in the file for future reference.

The Hydraulic Design File will be reviewed, approved, and filed in the Hydraulic Design Section's files.

3.8 PAVEMENT MARKINGS

The Design-Builder shall prepare pavement marking plans for the Department's Review and Approval. Pavement markings shall be constructed for the initial phase of construction. The design and installation of permanent pavement markings shall be in strict accordance with the current edition of the *Manual on Uniform Traffic Control Devices (MUTCD)*, *TDOT Roadway Design Guidelines*, *TDOT Standard Drawings*, *TDOT Standard Traffic Operations Drawings*, *TDOT Traffic Design Manual*, and the current edition of the *TDOT Standard Specifications*. All pavement marking removal on final surfaces shall be accomplished by water blasting or another non-marring method. Any damage to the pavement surface caused by the selected method shall be removed and replaced at the Design-Builder's expense.

Permanent pavement line markings shall be thermoplastic installed to permanent standards at the end of each day's work. Short, unmarked sections shall not be allowed. Temporary pavement markings shall be paint or tape. On the final surface, the Design-Builder shall have the option of using temporary pavement markings installed to permanent standards at the end of each day's work and then installing the permanent markings after the paving operation is completed. All pavement markings beyond the immediate work area that are affected by the Work shall be reapplied to permanent standards.

3.9 SIGNING

The Design-Builder shall prepare signage plans for the Department's Review and Approval prior to ordering. Signs shall be constructed for the initial phase of construction. In addition, the Design-Builder shall ensure all signs beyond the project limits are consistent with new alignments and travel lanes.

The design and installation of permanent roadway signs shall be in strict accordance with the current edition of the MUTCD, *TDOT Roadway Design Guidelines* and *TDOT Standard Drawings*, the current edition of the *Standard Highway Signs*, the *TDOT Supplement to the Standard Highway Signs*, the current edition of the *TDOT Standard Specifications*, and *TDOT Traffic Design Manual*.

After the permanent sign locations have been staked, but prior to ordering any material for supports, there shall be a field review and acceptance by the Department.

All existing sign footings shall be removed six inches (6") below ground line.

The Design-Builder shall verify all support lengths at the site prior to erection.

All sign sheeting shall be Type 3 Prismatic or better. All existing signs that do not meet the retro-reflectivity requirements shall be replaced. All yellow reflective warning signs shall be fluorescent yellow.

All permanent signing plans; signing layouts, sign schedules, & miscellaneous detail sheets shall be reviewed by the Department prior to ordering and construction/installation.

All existing post-mounted signing shall be removed and replaced with new sign faces and new breakaway supports.

3.10 GROUND SURVEY

The ground survey including survey control is provided by the Department (see Project website).

The Design-Builder shall verify the ground survey and survey control before utilizing in the design of the Project. In addition, the Design-Builder shall be responsible for field surveys and support activities, such as, but not limited to, geotechnical investigations, ROW stakeout, construction stakeout, etc.

If the Design-Builder's design footprint extends beyond the limits of the survey provided by the Department, the Design-Builder shall be responsible for securing the necessary additional survey.

All field survey activities shall be performed in accordance with the latest version of the *TDOT Survey Manual* and any other applicable design standards previously referenced.

3.11 PAVEMENT DESIGN REPORT

The Pavement Design Report for this Project has been developed by the Department (See Appendix A) and according to the *TDOT Roadway Design Guideline*. Proposed asphalt pavements shall be constructed utilizing the pavement designs provided in this report and the *TDOT Roadway Design Guidelines*, unless otherwise approved in advance by the Department.

The Design-Builder's project pavement schedule shall include tack coat and prime coat. For application rates, see *TDOT Roadway Design Guidelines* and *TDOT Standard Specifications*.

4.0 STRUCTURES SCOPE OF WORK

The Design-Builder shall be responsible for the design and construction of all structures within the Project limits along SR-222 including:

- The box bridge at STA 3088+80.45 (see TDOT *Standard Drawings*, STD-17-100);
- The box culvert at STA 3113+27.32 (see TDOT *Standard Drawings*, STD-17-55); and
- The culvert extension at STA 3113+45.97 (see TDOT *Standard Drawings*, STD-17-26).

The culvert extension mentioned above is required for mitigation purposes. The Design-Builder shall be responsible for obtaining mitigation credits should the culvert design exceed the mitigation limits shown in the Simplified Function Plans.

The Design-Builder shall conduct and submit a load rating analysis for the existing bridge if the use of the existing bridge for construction activities exceeds normal highway loading. The load rating is to be submitted in AASHTOWare Bridge Rating software or a format to be concurred with by the Department. If the load rating analysis results in a substandard load capacity, the Design-Builder shall be responsible for performing any remedial action required on the bridge or modifying their construction means and methods to ensure that any portion of the bridge that will be open to live loads has sufficient load capacity.

Upon completion of the Project, the Design-Builder shall provide the TDOT Structures Division a final revised set of plans and final design calculations for all structures (bridges, walls, etc.). The plans shall be delivered on USB flash drive (each sheet an individual PDF file).

4.1 BOX BRIDGES/CULVERTS

All box and slab bridges constructed on the Project should be constructed in accordance with the notes and details shown on the TDOT *Standard Drawings* for LRFD Box Culverts (STD-17 series) unless approved by the Department. Special designs for box curbs will be allowed up to a height of three feet (3') to reduce culvert lengths. The Design-Builder shall provide details of special designs for heights beyond those depicted in the *Standard Drawings* for review. Slab bridges may only be constructed on bedrock or a foundation designed to be stable at 100-year and 500-year scour elevations.

The Design-Builder shall reference and adhere to the Department's *Standard Specifications for Road and Bridge Construction* (January 1, 2021 edition) for construction materials and methods.

The bridge shall be constructed while maintaining the minimum number of lanes open to traffic during construction as specified in this RFP.

4.2 RETAINING WALLS

Retaining walls are not anticipated on this project. If the Design-Builder utilizes retaining walls, they shall be built in accordance with Special Provision 624, Retaining Walls. The exposed face of the retaining wall shall have a cut stone form finish approved by TDOT. The addition of a retaining wall shall be submitted through an ATC. Mechanically Stabilized Earth (MSE) walls that can be partially inundated are not allowed.

5.0 GEOTECHNICAL ENGINEERING SCOPE OF WORK

The Design-Builder shall perform a design level geotechnical investigation to validate and augment the geotechnical information included in this RFP. The geotechnical firm performing this work shall be selected from the Department's pre-qualified list.

5.1 GEOTECHNICAL INVESTIGATIONS

The geotechnical exploration investigations shall be performed in accordance with the current TDOT *Geotechnical Guidelines* located on the Geotechnical Engineering Sections webpage on the Department's website:

<https://www.tn.gov/content/dam/tn/tdot/hq-materials-tests/geotech/GeotechnicalGuidelines.pdf>

The Design-Builder shall determine the amount and level of the geotechnical investigations to cover geotechnical risks associated with this Project.

The Design-Builder shall perform a slope analysis for all proposed slopes.

The Design-Builder shall be responsible for obtaining the borings for all structural support and foundation locations where subsurface information is not sufficient or is warranted by variability in the geology. All borings shall be deep enough to show a complete soil and rock profile to the depth of the foundation-supporting layer. Refer to Section 1: Geotechnical Projects with Structural Components, of the current TDOT *Geotechnical Guidelines*.

The Design-Builder shall collect appropriate field data and samples for geotechnical evaluation of embankments, subgrade, soils, culverts, bridge and retaining wall structures, storm water management structures and ponds, minor structures, including drainage pipes, and any other earth supported structures or elements of highway design and construction relevant to the Project. Refer to Section 2: Geotechnical Projects with Roadway Design Components, of the current TDOT *Geotechnical Guidelines*.

The Design-Builder shall perform all subsurface investigation and laboratory testing in accordance with the current TDOT *Geotechnical Guidelines*.

5.2 NOTIFICATION REQUIREMENTS

Any required lane, shoulder and/or ramp closures to perform geotechnical investigations must be approved in accordance with Section 10 of this *Contract Book 3*.

The Design-Builder shall notify the Department and all adjoining properties and Stakeholders thirty (30) days prior to commencing any activity on private property. Property owner's names and addresses shall be obtained using the latest records available from the county Tax Assessor's office. To promote good relationships, a diligent effort shall be made to contact each property owner or tenant prior to entering the property. However, personal contact is preferable to explain that entry is required, the purpose of the activity, and the activities involved, and also to determine facts pertinent to the activity.

The Department may limit when drilling activities or other geotechnical work requiring lane closures may occur within the Department's Right-of-Way.

The Department may require the Design-Builder to immediately halt drilling activities or other geotechnical work underway.

The Design-Builder shall be required to provide traffic control for all drilling activities occurring within the Department's Right-of-Way, including but not limited to lane closures and shoulder closures.

The Design-Builder shall provide field quality control for all bridge foundations, retaining wall foundations, and noise wall foundations including verifying subsurface conditions for drilled piers and bearing for shallow foundations.

5.3 GEOTECHNICAL REPORTS

The Design-Builder shall provide geotechnical reports and design and construction summaries that contain pertinent subsurface investigations, tests, and engineering evaluations.

Prior to any geotechnical design submittal, as outlined in the TDOT *Geotechnical Guidelines*, the foundation design recommendation reports shall be sealed and signed by a Professional Engineer registered in the State of Tennessee who has completed a minimum of three geotechnical design projects of the scope and complexity similar to that anticipated for this Project, using the LRFD method and in accordance with the latest edition of the AASHTO LRFD *Bridge Design Specifications*.

6.0 RIGHT-OF-WAY (ROW) SCOPE OF WORK

The Department shall be responsible for performing all acquisition activities, including appraisals, appraisal reviews, and acquisitions, and any required utilities coordination/relocation as well as the acquisition of related permits. The ROW acquisition table is shown below:

TRACT NO.	PROPERTY OWNER	AREA TO BE ACQUIRED (ACRES)
1	STATE OF TENNESSEE	0.242
2	STATE OF TENNESSEE	4.502
3	HAYWOOD COUNTY	--
4	HAYWOOD COUNTY	--
5	AMY NEWMWN ETVIR	0.242
6	MEUX HILL, LLC	2.62
7	MEUX HILL, LLC	6.326
8	RACHEL OWEN, TRUSTEE, ETAL	4.324
TOTAL		20.05

The Department has secured TEER approval. The anticipated date of Right-of-Way acquisition or Right-of-Entry shall be on or before March 31, 2024. If the actual date is after the anticipated date and there are no concurrent Design-Builder delays, the Department will review a time-impact analysis provided by the Design-Builder to justify any additional time. If warranted, additional time will extend the end completion date but will be non-compensable.

If the Design-Builder deems additional ROW, or Permanent or temporary easement, is needed outside of the limits shown on the Simplified Functional Plans, the Design-Builder shall also be responsible for preparing the additional environmental technical studies and completion of the TEER document revaluation(s). The following explains the responsibilities related to any right-of-way required:

- a. In order to minimize the unavoidable effects of right-of-way acquisition, the Department will carry out a right-of-way and relocation program in accordance with Tennessee Uniform Relocation Assistance Act of 1972 and the Uniform Relocation and Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, as amended by Public Law 100-17).
- b. The Department will perform any ROW negotiations and relocation services as well as provide appraisals. The Department will have the responsibility of certifying the availability of ROW. The Department may certify individual properties in accordance with the approved priority listing. Physical construction will not commence on any phase, segment, individual properties, or a group of properties until the Design-Builder receives a Notice to Proceed for Construction from the Department on each phase, segment, individual properties, or a group of properties. The decision to advance a right-of-way segment to the construction stage shall not impair the safety with respect to unacquired or occupied properties on the same or adjacent segments of project right-of-way.
- c. The Design-Builder will submit a list of parcels in order of right-of-way or easement acquisition priority to the TDOT Design-Build Program Manager no later than thirty (30) days after award of Contract. The Design-Builder shall allocate their list into Tract numbers and categories as noted in the table below. Unless otherwise noted herein, the Department will acquire, or otherwise gain right-of entry to, these parcels in the respective priorities approved for submittal with the RFP.

The Design-Builder shall provide information and assistance, as needed, to the Department to assist in acquiring ROW or easements, if ROW or easements are necessary.

Parcel Priority Category	Maximum number of Tracts per Category for priority listing
A	20
B	20
C	No Maximum

Parcels that involve relocations will automatically be assigned to Category C. Secondary right-of-way acquisitions needed as a result of incomplete Definitive Design Plans or revisions to the initially approved Definitive Design Plans prepared by the Design-Builder will require additional time for acquisition. The Department will provide the Design-Builder with an official acknowledgement of the approved parcel priority list and the re-assignment of parcels from Categories A and B to Category C, if necessary. Any priority listing received outside of the process established herein shall be non-binding. The Design-Builder shall submit, as part of their Technical Proposal, the priority list acknowledged by the Department for which the Department’s final response was provided.

- d. Definitive Design Plans can be phased or segmented within the final approved plans to allow right-of-way activities to be reasonably completed on individual properties or a group of properties, thereby allowing certification in a manner satisfactory to the Department for each phase or segment.
- e. The normal ROW process may take up to 20 months to complete. The Department will make every effort to acquire the ROW as early as possible according to the approved priority listing and phasing. The final Definitive Design Plans showing the approved priority and phasing shall be submitted to the Department and the ROW boundaries surveyed and staked prior to the Department proceeding with the ROW process. The Department is not liable for acquisition delays resulting from incomplete Definitive Design Plans or acquisition of any parcels not shown on the preliminary plans provided with this RFP. The normal process is as follows:

Once Final Definitive Design plans are approved, ROW boundaries surveyed and staked:	
Activity	Timeframe
Public Meeting	6 Weeks
Preliminary Group Inspection (PGI)	10 Weeks
Perform Appraisals	5 Months
Make Offer to Landowners	2 Months
Gain Right of Entry	Up to 9 Months

- f. The Department will provide advance notification of impending right-of-way (ROW) acquisition. Before acquiring any ROW, the Department will have the properties appraised on the basis of comparable sales and land use values in the area. Owners of the property to be acquired will be offered and paid fair market value for their property.
- g. The Design-Builder will **not** be responsible for the actual cost of the ROW or easements as required for the Project. The Design-Builder shall specifically show and identify any additional ROW easements (temporary, construction, drainage, etc.) planned.
- h. Any ROW or easements required other than specified in the RFP or reference documents shall be identified by the Design-Builder in an Alternate Technical Concept and shall be approved by the Department. Any costs associated with additional ROW or easements required by the Design-

Builders design not identified in the RFP or reference documents will be borne by the Design-Builder.

- i. Any ROW or ROW acquisition required for any ATC submitted shall be included as part of the ATC submitted for approval and both shall be included in the Design-Builder's Price Proposal.
- j. The Design-Builder shall provide to the Department area data sheets based upon the accepted Definitive Design Plans. The Design-Builder shall perform the initial right-of-way staking for the purpose of initial Department contact with owners, as well as final staking of right-of-way.
- k. It is understood and agreed by and between the parties hereto that all reports, surveys, studies, specifications, memoranda, estimates, etc., secured by and for the Design-Builder shall become and remain the sole property of the Department upon termination or completion of the work, and the Department shall have the right to use the same for any public purpose without compensation to the Design-Builder.
- l. The Design-Builder shall provide adequate access to all occupied properties to ensure emergency and personal vehicle access. Utility service must be available to all occupied properties at all times prior to and until relocation is completed. Open burning should not occur within 1,000 feet of an occupied dwelling.

If the Design-Builder deems additional ROW is needed for their Definitive Design Plans, no additional time will be given.

The Design-Builder shall maintain a sufficient buffer or hold off zone around parcels which have not been acquired and/or occupied properties to ensure compliance with ROW procedures prior to starting construction activities in these affected areas. There should be no construction-related activities within the hold off zone until the property is acquired and/or vacated. The Department will provide written notification before the contractor can enter the hold off zone.

Condemnations

Property acquisition requiring condemnation shall be handled by the State of Tennessee Attorney General's Office. TDOT has no control over the timeframe for the condemnation proceedings. The Design-Builder shall anticipate time for condemnation proceedings. The Design-Builder is solely at-risk for any delays for right-of-entry associated with condemnation proceedings.

7.0 UTILITY SCOPE OF WORK

The Project is a Chapter 86 project. Reimbursement will be subject to TDOT 340-07, Utility Relocation from Public Highway Right-of-Way Under TCA § 54-5-804. The Project utility coordination will be performed by TDOT, inclusive of submitting plans, receiving, reviewing, and approving responses, reimbursement agreements, easement agreements, and authorization to proceed with utility relocation.

TDOT is advancing the utility coordination and relocation based on the Simplified Functional Plans. The Design-Builder may coordinate with utilities as needed prior to the proposal. The Move-In State (MIS) utilities relocation work is only to be accomplished if a MIS Contract is executed by both TDOT and the Utilities. These MIS contracts will require that each utility provide the detailed construction plans,

construction specifications and quantities -- collectively known as the “B-Date Package” -- in the Utility Agreement, no later than thirty (30) calendar days after the utility receives the fully executed contract back from the Department. The Department will revise the Design-Builder Contract to include the MIS work per *Standard Specification 109.04*. The submittal of the “B-Date Package(s)” shall be on or no later than December 31, 2023. The Design-Builder shall include the duration for completing the utility relocation work in the “B” Portion of their bid. If the actual date is after the anticipated date and there are no concurrent Design-Builder delays, the Department will review a time-impact analysis provided by the Design-Builder to justify any additional time. If warranted, additional time will extend the end completion date but will be non-compensable.

If the Design-Builder’s Definitive Design Plans vary from the Simplified Functional Plans, the additional time and cost for utility coordination and/or relocation will be the sole responsibility of the Design-Builder. If these alterations are deemed necessary and approved by the Department, the Design-Builder shall include these utility coordination tasks by the Department in their CPM Schedule for Utility Investigation:

- a) Immediately after TDOT’s approval of the Design-Builder’s final Definitive Design Plans, TDOT will re-engage the utility coordination according to the statute (T.C.A. § 54-5-854) which requires the utility to respond within one hundred and twenty (120) calendar days of receiving the Definitive Design Plans (A-date). This response will include the “A-Date Package,” which includes color coded relocation plans (rainbows), a schedule of calendar days, and an estimate of cost in order to generate the Utility Relocation Agreement. The “A-date” may be extended up to an additional forty-five (45) calendar days upon request of the Utility and approval by TDOT as provided in T.C.A. § 54-5-854.
- b) Move-In State (MIS) utility relocation work is only to be accomplished if a MIS Contract is executed by both TDOT and the utility. These MIS contracts will require that the utility provide the detailed construction plans, construction specification and quantities, collectively known as the “B-Date Package” in the Utility Agreement, no later than thirty (30) calendar days after the utility receives the fully executed contract back from the Department.
- c) The Design-Builder shall coordinate with utilities during construction. *See TDOT Standard Specification 105.07.*

The Design-Builder shall be responsible for all time and costs associated with utility relocations due to revising the Simplified Functional Plans after submittal to the utility for coordination with respect to any temporary conditions resulting from the Design-Builder’s methods of operation or sequence of work.

Some adjustment of utility facilities may be required due to the Design-Builder’s design. The Design-Builder shall be responsible for identifying any utility conflicts/relocations from the utility construction plans. Exact locations shall be determined in the field by contacting the utility companies involved. Notification by calling the Tennessee One Call System, at 1-800-351-1111 as required by T.C.A. § 65-31-106 will be required.

Prior to submitting the Proposal, the Design-Builder shall be solely responsible for contacting owners of all affected utilities in order to determine the extent to which utility relocations and/or adjustments will affect the schedule of work for the Project. While some work may be required around utility facilities that will remain in place, other utility facilities may need to be adjusted concurrently with the Design-Builder’s operations.

In the event the Design-Builder performs any utility relocation work, it is their responsibility to obtain any

and all applicable permits, including environmental permits.

The Design-Builder shall be familiar with TDOT Rule Chapter 1680-06-01, Rules and Regulations for Accommodating Utilities within Highway Rights-of-Way; Tennessee Code Annotated, Title 54, Part 8, Relocation of Utilities (T.C.A. § 54-5-801 through § 54-5-856); 23 CFR Part 645 -- Utilities; and TDOT Policy 340-07, Utility Relocation from Public Highway Right-of-Way Under TCA § 54-5-804 (Chapter 86). Adherence to the above-referenced regulations and procedures is mandatory.

The Design-Builder shall notify each individual utility owner of their plan of operation in the area of the utilities. Prior to commencing work, the Design-Builder shall contact the utility owners and request them to properly locate their respective utility on the ground. This notification shall be given at least three (3) Business Days prior to commencement of operations around the utility in accordance with T.C.A. § 65-31-106.

The Design-Builder shall provide all necessary protective measures to safeguard existing utilities from damage during construction of this Project. In the event that special equipment is required to work over and around the utilities, the Design-Builder shall be required to furnish such equipment. The cost of protecting utilities from damage and furnishing special equipment will be included in the price bid for other items of construction.

The Design-Builder shall accommodate utility adjustments, reconstruction, new installation, and routine maintenance work by others that may be underway or take place during the progress of the Contract.

No additional compensation or time shall be granted for any delays, inconveniences, or damage sustained by the Design-Builder or its Subcontractors due to interference from utilities or the operation of relocating utilities.

The Design-Builder shall make all reasonable efforts to design the Project to avoid conflicts with utilities and minimize impacts where conflicts cannot be avoided.

The following utilities have been identified by the Department as having facilities within the Project corridor for which the Department contemplates that an adjustment, protection, or relocation is possible.

Utility	Owner	Contact	Phone Number Email Address
Communications	COMCAST	Karen Price	901-623-7463/901-508-0920 Karen_price@comcast.com
Electric/Fiber	Chickasaw Electric Co.	Lloyd Muncy	901-466-2536 lmuncy@chickasaw.coop
Elec./Gas/Water/Wastewater	Brownsville Energy Authority	Russ Stoots	731-772-8845 rstoots@budutil.com
Telephone	RITTER COMMUNICATIONS	Brandon Hoy	901-872-5209 Brandon.hoy@rittercommunications.com

Water/Sewer	CITY OF STANTON	Allan Sterbinsky	731-548-2565 Allan.sterbinsky@gmail.com
Fiber	WINDSTREAM KDL	Tommy Rayfield	931-994-1249 Tommy.rayfield@windstream.com

8.0 ENVIRONMENTAL SCOPE OF WORK

The Environmental documents have been approved and are included on the Project website. The project commitment sheets, proposed ROW, permanent and temporary easements, as shown in the Simplified Functional Plans, are referenced in these documents. The Design-Builder shall refer to the Environmental documents for complete descriptions of the Environmental Commitments for the Project.

The Design-Builder shall adhere to all project commitments and requirements included in the Environmental documents. If the Design-Builder's design footprint or construction limits extend beyond the proposed ROW, including permanent and/or temporary easements, as shown in the Simplified Functional Plans, and/or results in changes to impacts to identified resources, the Design-Builder shall be responsible for the additional environmental technical studies and re-evaluation of the TEER document(s). If the proposed project does not go to construction within three (3) years of the approval date of the TEER document(s), the Design-Builder shall be responsible for the TEER document re-evaluations.

No additional time will be allotted to the Project schedule for the Design-Builder's preparation of the TEER document re-evaluation(s), TDOT Environmental Division staff's Review and Approval of the TEER document re-evaluation(s), agency coordination, and subsequent FHWA approval, as required, of the TEER document re-evaluation(s).

8.1 TENNESSEE ENVIRONMENTAL EVALUATION REPORT (TEER) DOCUMENT

The Design-Builder shall review and adhere to all approved TEER documents and technical reports; specifically, any Environmental Commitments listed on the "Green Sheet" of the approved TEER documents. These commitments are to be taken into account throughout the design and construction process. All commitments listed with respect to their technical area are to be fulfilled during construction activities and/or prior to completion of the Project.

The TEER document, including the "Green Sheet" Environmental Commitments, are provided on the Project website.

Should any environmental features within the proposed ROW, or within the permanent or temporary Easements, as shown in the Simplified Functional Plans, not addressed in the TEER document be uncovered during construction activities, all construction activities shall stop immediately in that area and the Design-Builder shall contact the TDOT Environmental Division Office for consultation. All technical study activities must be completed in accordance with Department practices. The Design-Builder shall be responsible for obtaining any necessary documentation standards from the TDOT Environmental Analysis Office.

In accordance with the TEER, the Design-Builder is responsible for any and all required re-evaluation(s) of the approved document to address project changes, such as any additional ROW and/or easements not studied under the original project footprint or changes to the project design or scope that were not covered under the approved TEER document. The Design-Builder is also responsible for all technical studies needed for re-evaluations. The re-evaluation(s) may take place at any time during the development of the Project. Depending on the magnitude of the design changes required, the re-evaluation may require review and approval by FHWA; however, any minor changes may be documented, reviewed and concurred with by the Department's Environmental Division.

Should any changes to the design of the Project occur, the Design-Builder shall provide the Environmental Division Office with a notification and copy of the revised plans. The Design-Builder shall be responsible for any technical studies and the TEER document re-evaluation required.

No additional time will be allotted to the Project schedule for the Design-Builder's preparation of a TEER document re-evaluation, TDOT Environmental Division staff's review and concurrence of the TEER document re-evaluation, agency coordination, and, if needed, subsequent FHWA approval of the TEER document re-evaluation.

8.2 ENVIRONMENTAL BOUNDARIES

The Design-Builder is responsible to make certain all features from the Environmental Boundaries Report (EBR), provided by the Department's HQ Environmental Tech Office (HQ ETO), are field verified and an updated EBR is prepared as necessary.

If the Design-Builder proposes to make changes to the Simplified Functional Design that result in impact changes to the environmental features, the Design-Builder shall be responsible for all additional compensatory mitigation of impacts to environmental features documented in the updated EBR, or additional features identified prior to and during construction.

The Design-Builder shall be required to use the TN Stream Quantification Tool (TN SQT) to collect data on any streams that will require compensatory mitigation and/or relocation in accordance with Tennessee Department of Environment and Conservation (TDEC) guidance. The data will be used to determine the amount of credits and/or debits used for compensatory mitigation required to obtain environmental permits. Please note that TDOT has not collected any TN SQT data to date on any of the streams in the EBR. More information can be found at TDEC's website: <https://www.tn.gov/environment/permit-permits/water-permits/aquatic-resource-alteration-permit--arap-.html> (>Documents Associated with the TN SQT).

If needed, the updated EBR must be completed in accordance with Department practices. The Design-Builder shall be responsible for obtaining any necessary documentation standards from the TDOT Environmental Division.

For impacts to any streams, springs, wetlands, sinkholes, or other water resource features identified during construction, and not previously documented in the original EBR, it shall be the responsibility of the Design-Builder to provide the data sheets and forms listed below to the Department's HQ ETO for review prior to submittal to the regulatory agencies:

Streams

- Hydrologic Determination Field Data Sheet (Version 1.4).
- Ecology Water Resources Field Data Sheet.

- TDEC - Division of Water Resources: Habitat Assessment Field Data Sheet – Moderate to High Gradient Stream.
- A location map, plan sheets with resources clearly marked and labeled, and a U.S. Geological Survey (USGS) Quad map showing the proposed stream(s) using Department-provided map templates.
- Photo summary of each feature including photo views of the location of the proposed alteration, upstream, downstream, and along the centerline of the Project.

Wetlands

- U.S. Army Corps of Engineers (USACE): Wetland Determination Data Form – Eastern Mountain and Piedmont Region: Version 2.0.
- Tennessee Division of Water Resources (TDEC): Tennessee Rapid Assessment Methodology (TRAM) documentation for wetlands, including TRAM Decision Key, TRAM Outstanding Natural Resource Water or Exceptional Tennessee Water Decision Table, appropriate HGM field data forms (if applicable) or Non-HGM field data forms (if applicable) for the wetland type being assessed, and TRAM Quantitative Summary Table.
- A location map, plan sheets with resources clearly marked and labeled, and a USGS Quad map showing the proposed wetland(s) using Department-provided map templates.
- Photo summary of each feature including photo views of the location of the proposed alteration and wetland boundaries.

Water resource determinations shall be completed by a Tennessee Qualified Hydrologic Professional (TN-QHP). The certification for the TN-QHP must be submitted along with the Hydrologic Determination Field Data Sheet for the individual preparing the data sheets and forms. All additional environmental field studies are to be performed by the Design-Builder's personnel with the required qualifications.

8.3 STATE OR FEDERAL ENDANGERED / THREATENED SPECIES

The Project is not expected to impact any state-listed and/or federal-listed species that are Deemed-in-Need-of-Management, Threatened, or Endangered as included in the EBR. If the Design-Builder requires any additional ROW and/or easements not studied under the footprint of the proposed project, this will immediately require additional review(s) and coordination of the proposed changes by USFWS, TWRA, and TDEC Division of Natural Areas. The Design-Builder shall contact the Department's HQ ETO prior to any coordination with resource agencies.

The Design-Builder's coordination with resource agencies must, at a minimum, include the following information: a clear description of the project changes to be reviewed, timing and schedule for implementation of the changes, maps showing location of changes (if applicable), plans documenting the changes, description of how the changes maintain compliance with existing project commitments, and previous coordination responses from the resource agencies.

If a TEER re-evaluation is required, the Design-Builder shall be responsible for any additional project commitments required by the resource agencies as a result of the additional agency review and coordination. These commitments may include, but are not limited to, preparation of species reports or biological assessments, any species surveys, species sweeps and relocations, additional prohibitions on work during designated time periods, and any required species monitoring.

The Design-Builder shall (in consultation with the Department) allow time in the CPM for the Department's

HQ ETO to coordinate with TWRA, USFWS, and the TDEC Division of Natural Areas, if required.

8.4 MIGRATORY BIRDS / BARN OWL

The Design-Builder shall perform all construction work in observance of the Migratory Bird Treaty Act (MBTA) of 1918 (last amended in 1998) and the USFWS/TDOT Memorandum of Agreement outlining procedures for addressing cliff and barn swallow nesting sites found on Department projects. MBTA of 1918 (amended 1998) provides protections to all migratory birds, with the exception of pigeons and starlings.

Cliff swallows (*Petrochelidon pyrrhonota*) and barn swallows (*Hirundo rustica*) nests, eggs, or birds (young and adults) shall not be disturbed between April 15 and July 31. From August 1 to April 14, nests may be removed or destroyed, and measures may be implemented to prevent future nest building at the site (e.g., closing off area using netting).

8.5 OTHER NATURAL RESOURCES

The Design-Builder shall ensure identification, survey, and monitoring of other natural resources such as sinkholes, caves, or specialized habitats. The Design-Builder shall coordinate with the Department's HQ ETO for coordination with regulatory agencies (e.g., TDEC) when necessary and obtain any necessary permits for modifications to the natural resources (e.g., TDEC Underground Injection Control (UIC) Permit, etc.).

8.6 GPS / GIS DATA COLLECTION

The Design-Builder's data collection for streams, wetlands, springs, sinkholes, or other jurisdictional features shall be with mapping grade accuracy (defined as sub meter).

8.7 MITIGATION OF STREAMS AND WETLANDS

The Department is procuring stream and wetland mitigation based on the Simplified Functional Design Plans. If the Design-Builder proposes to make changes to the Simplified Functional Design that result in impact changes to the environmental features, the Design-Builder shall be responsible for acquiring any additional mitigation credits needed for those changes.

If additional mitigation credits are needed, the Design-Builder shall be responsible for all stream and wetland mitigation required for the Project including all costs associated with obtaining mitigation, maintenance, and monitoring of the mitigation site. This may include (but is not limited to):

- Planning;
- Design;
- Permitting;
- Construction and maintenance of on-site/off-site mitigation for stream and/or wetlands impacts;
- Purchasing of wetland mitigation credits from an approved bank or site; and/or
- Purchasing of stream mitigation from an approved site/organization.

If the Design-Builder proposes to make changes to the Simplified Functional Design that result in impact changes to the environmental features, the Design-Builder will monitor any additional constructed mitigation sites for the required monitoring period post construction as defined in the permits and shall be

responsible for the correction of any deficient or failing mitigation measures during this time. The cost for any repairs during the required monitoring period shall be included in the Design-Builder's bid.

All stream and wetland mitigation shall follow the requirements outlined in the Stream Mitigation Guidelines for the State of Tennessee, prepared by TDEC, Division of Water Resources Permits Section, and federal mitigation requirements of the Department of the Army, Corps of Engineers, 33 CFR Parts 325 and 332. Any off-site stream or wetland mitigation areas shall be entirely located within the State of Tennessee. All proposed stream and wetland mitigation shall be submitted to and coordinated with the Department's HQ ETO and the Headquarters Environmental Mitigation Office for coordination with regulatory agencies prior to the submittal of the permit application. It shall be the responsibility of the Design-Builder to make any and all adjustments deemed necessary by the regulatory agencies to the proposed mitigation plan.

The Design-Builder shall be responsible for any additional on-site mitigation requirements listed in the permits and all costs associated with mitigation requirements.

8.8 PERMITTING

The Department will obtain environmental water quality permits for the Simplified Functional Design Plans and provide the mitigation credits needed for the permits. The anticipated date for acquiring the environmental water quality permits shall be April 15, 2024. If the actual date is after the anticipated date and there are no concurrent Design-Builder delays, the Department will review a time-impact analysis provided by the Design-Builder to justify any additional time. If warranted, additional time will extend the end completion date but will be non-compensable.

If the Design-Builder proposes to make changes to the Simplified Functional Design that result in impact changes to the environmental features, the Design-Builder shall be responsible for procuring modified permit(s) and acquiring any additional mitigation credits needed for those changes.

In addition to the modified environmental water quality permits for the project, the Design-Builder shall be solely responsible for complying with and obtaining any necessary building, demolition, grading, and environmental permits or approvals, including but not limited to archaeology, ecology, historical, hazardous materials, air and noise, TVA 26a, TDEC ARAP/401, USACE Section 404, and TDEC National Pollution Discharge Elimination System (NPDES) permits, from federal, state and/or local agencies regarding any material and staging areas and the operation of any project-dedicated asphalt and/or concrete plants, and any waste or borrow areas that will be used. Any such permits shall be supplied to the Department's HQ ETO prior to the commencement of activities in the permitted area(s).

The Design-Builder is responsible, under the laws and regulations listed above, to avoid and minimize, to the maximum extent practicable, impacts to Waters of the State and/or Waters of the U.S. when considering design changes to the Simplified Functional Plans and constructing the project. Avoidance and minimization of impacts are beneficial to the Design-Builder because such actions avoid or reduce the amount of compensatory mitigation that may be required to obtain water quality permits prior to construction.

If environmental water quality permit modifications are necessary prior to completion of the Definitive Design Plans, the Design-Builder shall contact the Department's Alternative Contracting Office immediately for guidance.

The Department's HQ ETO and Headquarters Environmental Division Permitting Section shall be included in all correspondence and/or negotiations with agencies.

The Design-Builder shall obtain and pay for all additional regulatory permits as required by applicable laws, the plans, or contract specifications. This includes stormwater discharges associated with construction support activities including, but not limited to, equipment staging yards, material storage areas, excess excavated materials disposal, demolition disposal (waste) areas, and borrow areas. These areas are to be addressed in accordance with the TDOT *Waste and Borrow Manual* (May 15, 2017 Version). The Design-Builder shall be cognizant of and adhere to the requirements of the various permits that will be necessary for construction and operation of the Project.

Applying for and Obtaining Modified Water Quality Permits

The Design-Builder shall be responsible for preparing all documents (water quality permit modification application package) and attending all public meetings necessary to obtain the environmental permits required for the construction of this Project. TDOT application templates will be provided to the Design-Builder and shall be used in the permit application package.

The Design-Builder shall obtain information and prepare permit drawings/sketches that reflect the impacts and minimization efforts resulting from the Design-Builder's design of this Project. If water quality permit modifications are required, there shall be scheduled reviews of permittable plans, application, and permit conditions by the Department's HQ ETO and, upon request, the Headquarters Environmental Division Permitting Section to ensure regulatory practices are consistent. TDOT will review the Design-Builder's permits within 10 business days.

The Design-Builder shall be responsible for developing the water quality permit modification application for any change to jurisdictional water resource impacts. The Design-Builder shall be responsible for all public notice requirements such as documentation to be placed in the local newspaper and in the field and answering of public notice comments. The Design-Builder shall employ all personnel that it deems necessary in order to provide permit compliance.

The Design-Builder shall submit the water quality permit modification application in its own name and ensure the permit is issued in its name. If, under the applicable laws and regulations, the water quality permit modification application cannot be submitted in the Design-Builder's name, the Design-Builder shall submit the permit modification application as an Authorized Agent of the Department and ensure the permits are issued with the Department as the Permittee. The Design-Builder shall attend a final review meeting with the Department to review all water quality permit modification applications prior to submitting the application to the permitting agencies.

Environmental permits may also be required when activities such as core sampling, seismic exploratory operations, geotechnical investigations, ROW fence replacement, utility relocations, and historic resources surveys are within Waters of the State or Waters of the U.S. These permits may also be required for placement and operations of scientific measurement devices.

The Department's HQ ETO and Headquarters Environmental Division Permitting Section shall be invited to any meeting between the Design-Builder and the respective regulatory agency to discuss issues related to the modification application for (or refusal of) a permit. The Design-Builder shall inform the Department a minimum of ten (10) business days in advance of the time and location such a meeting is to take place and provide a meeting agenda five (5) business days in advance of the meeting.

The Design-Builder shall assist the Department as needed in any proceedings relating to reservations, objections, appeals and/or applications for preliminary injunctions initiated by others against the water

quality permit modification application or by itself against the permit decision. In such proceedings, the Design-Builder shall do make every reasonable effort to defend the submitted modification application.

If any regulatory agency rejects or denies the permit modification application, it is the Design-Builder's responsibility to make the necessary revisions to ensure the permit modification is approved. If revisions are required to obtain modified permits, there should be scheduled reviews of the revisions by the Department's Headquarters Environmental Tech Office and, upon request, the Headquarters Environmental Division Permitting Section to ensure regulatory practices are consistent. The Design-Builder shall be responsible for preparing designs and proposing construction methods that are permissible. All permit modifications required for changes to a particular construction activity shall be acquired prior to commencing the particular construction activity. All costs and delays associated with incomplete permit modification packages, agency rejection, agency denials, agency processing time, or any permit violations shall be the responsibility of the Design-Builder and will not be considered sufficient reason for time extension.

The Design-Builder shall provide the Department with a copy of the draft permit decision and a copy of the final permit immediately upon receipt.

The Design-Builder shall plan, implement, monitor and maintain all applicable Erosion Prevention and Sediment Control (EPSC) measures and Best Management Practices (BMPs) in accordance with all TDOT standards during construction. The Design-Builder shall bear all costs and risks associated with applying for, obtaining, and complying with permits.

Water Quality Permit Modification Application Package Contents

The water quality permit modification application package (applicable for USACE § 404, TVA Section 26a, and TDEC ARAP permits) shall include, but not be limited to, the following information:

- TDOT Application Templates or an approved equal which meets all the required sections of the agencies' applications forms (e.g., TDEC CN-1091, USACE ENG 4345, NPDES NOC, etc.); and
- Signed application letter to the TDEC Division of Water Resources, Permits Section, TVA, and USACE listing all water quality impacts.
- The signed application cover letter shall indicate the following:
 - Alternatives for each change to or additional impact to environmental features;
 - Proposed methods utilized by the Design-Builder to minimize impacts from the change or new impacts to each environmental feature;
 - Proposed mitigation for the change to or new impacts to environmental features (if required); and
 - Reference the original TDEC ARAP and USACE permit numbers on the cover letter.
- Labeled USGS color quadrangle map. The map shall have the following information shown:
 - Impact areas labeled by permit type;
 - Longitude and latitude (precision to four decimal places) listed for each impact;
 - Quadrangle name and number;
 - Project information (including PIN, State Project Number, project description, County name, nearest city);
 - Scale bar (quad map scale shall be set to 1:24,000); and

- North arrow.
- Copy of signed CN1091 form (the originally signed CN1091 form shall be submitted to TDEC).
- Signed DA/TVA form or DA form (if applicable). DA/TVA form must be filled out if an Individual Section 404 Permit is required.
- Signed TVA Applicant Disclosure Form.
- Individual Section 404 Permit applications require the names and addresses of property owners adjacent to all permit impacts listed in an excel spreadsheet.
- Pre-filing and certification request (if applicable).
- Update or add environmental feature impact tables from original application based on Design-Builder's proposed changes (if applicable).
- Additional TN SQT data and revised debit tools (if applicable).
- Individual permit sketches of revised or new impacts to environmental features (if applicable).
- Mitigation plan or mitigation credit ledger to account for changes to or new impacts to environmental features (if applicable).
- Hydrologic Determination Field Data Sheet (if applicable).
- Ecology Field Data Sheet (if applicable).
- Habitat Assessment Field Data Sheet (if applicable).
- Wetland Determination Data Form (if applicable).
- TRAM Decision Form (if applicable).
- Quad map showing any new impact area and/or new environmental features.
- Photographs of any new environmental features (if applicable).
- Marked-up plan sheets showing new features from the Environmental Boundaries Report (if applicable).
- A copy of all coordination correspondence between the Department and the USFWS (if applicable).
- TDEC Division of Natural Areas endangered species database search (if applicable).
- A copy of all coordination correspondence between the Department and the TWRA (if applicable).
- Federal Emergency Management Agency (FEMA) flood map for the subject project with construction limits labeled.
- FEMA No-Rise Certification letter or Conditional Letter of Map Revision (CLOMR) (if applicable).
- A copy of approved reevaluation TEER document (Environment Assessment, Finding of No Significant Impact, Categorical Exclusion, etc.).
- A copy of any new State Historic Preservation Office (SHPO) letter due to proposed changes by the Design-Builder (architectural and archaeological).
- Mitigation plan/plans for all streams and wetlands changes proposed by the Design-Builder (if applicable).
- Half-size copy of the revised bridge layout(s) proposed by the Design-Builder (if applicable).

- Half-size copy of any revised utility layout(s) plans that impact(s) environmental features (if applicable).
- Modify the original and include an excel table listing the revised utility layout(s) impacts to environmental features (if applicable).
- Half-size set of plans showing all environmental features. The plans shall be highlighted according to the following guidelines:
 - New culvert construction (extensions included) shall be highlighted in orange on the proposed layout.
 - Existing culverts shall be highlighted in blue on the present layout (blue on the proposed layout if sections are remaining).
 - Stream inlet and outlet protection measures and channel detailed dimensions shall also be labeled on the plans and recorded in the impact table.
 - Streams/springs shall be highlighted in blue on the present and proposed layout.
 - Wetlands shall be highlighted on present layout (green for permanent impacts and yellow for temporary impacts).
 - Bank stabilization, outfall structures, and sinkholes shall be highlighted in pink on proposed layout.

Any temporary construction measures, including de-watering, construction access, haul roads, EPSC measures, temporary crossings, stream diversions, etc. required for the Design-Builder's revised design shall be addressed in the water quality permit modification application. The Design-Builder shall clearly indicate the location of and impacts from haul roads on jurisdictional areas. The Design-Builder shall identify all proposed borrow and waste sites and provide all clearance documentation per the Waste and Borrow Manual (May 15, 2017 edition): https://www.tn.gov/content/dam/tn/tdot/construction/old_web_page/WasteBorrowManual.pdf.

These details shall be included in the permit application data. Further, the Design-Builder shall describe the methods of construction of all structures.

NPDES Permit Specific Requirements

A TDEC National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) for construction stormwater runoff is required for this Project. It shall be the responsibility of the Design-Builder to develop final EPSC sheets and the Storm Water Pollution Prevention Plan (SWPPP), and to obtain the NPDES CGP for the Project.

The Design-Builder shall prepare a SWPPP, Documentation and Permits Binder, and a Notice of Intent (NOI) using the Department's most current format template to be approved by the Department prior to submittal of the NPDES CGP to TDEC. A copy of the SWPPP template used by the Department to develop SWPPPs and the Documentation and Permits Binder can be obtained from the Department's Environmental Division, Ecology and Permits Office: [NPDES Stormwater Permitting Program \(tn.gov\)](https://www.tn.gov/content/dam/tn/tdot/construction/old_web_page/WasteBorrowManual.pdf)

The SWPPP template shall be used as a guide in preparation of the SWPPP, and the Design-Builder is responsible for complying with all requirements of the CGP.

The SWPPP shall include the EPSC plans for application of coverage under the CGP. The SWPPP and Notice of Intent (NOI) shall be submitted at least forty-five (45) business days prior to beginning construction activities. Once a Notice of Coverage (NOC) is received by the Design-Builder, the EPSC

plans and SWPPP shall be kept current for all stages of construction. Any changes in scope subsequent to submitting the SWPPP for coverage under the CGP shall be submitted to both TDEC and the Department for their records.

If at any time, the Design-Builder is not in compliance with any applicable permit regulations, all non-compliance items must be addressed by the Design-Builder within 24 hours of such identification. The Department has the authority to suspend work until such time as the deficiencies have been corrected. The Design-Builder shall not be granted any cost compensation or time extension for any work suspension associated with non-compliance. Any monetary fees and/or fines associated with any violations shall be the sole responsibility of the Design-Builder. In the event that a Notice of Violation (NOV) is issued by a regulatory agency, the response to the NOV shall be written by the Design-Builder and approved by the Department's Region 4 ETO prior to submittal to the agency.

The Design-Builder shall prepare EPSC plans detailing BMPs to prevent erosion, control sedimentation, and prevent the discharge of any pollutants from leaving the Department's ROW or easements, or from entering jurisdictional features or stormwater conveyances, and be transported to receiving waters during the construction of the Project. The Design-Builder shall identify all outfall locations on the EPSC plans with an appropriate numbering or lettering system. The Design-Builder shall revise the SWPPP and the EPSC plans as necessary based on actual construction activities throughout the duration of the Project. All SWPPP and EPSC revisions shall be documented. The Design-Builder shall certify that the individual who prepared and reviewed the EPSC plans and SWPPP is currently certified according to the CGP. The Design-Builder shall also certify that the BMPs are designed so that if properly implemented, installed, and maintained, they will manage erosion and prevent sedimentation to waters of the state or on adjacent property owners, as well as comply with the terms of the TDEC NPDES Construction General Permit.

The Design-Builder shall follow all of the Department's applicable design standards and guidelines when developing the EPSC plans and SWPPP for the subject project.

Inspections

The Design-Builder shall complete project site inspections of the erosion control measures, disturbed areas, areas used for storage of material, construction entrance/exit, and all outfalls. Following the inspection, a report shall be prepared and maintained with the SWPPP. The CGP requires the inspections to be performed at least twice a week, 72 hours or more apart. The inspector must document the findings of the inspection fully in the report and provide a copy to the site operator and the Design-Builder, document that the rain gauge has been read and rainfall recorded on a daily basis or that a reference site has been used to document rainfall. The inspector shall also document that all records are being completed and maintained per the TN CGP.

The inspector shall use photo documentation to clearly convey recommendations to the site operator and contractor. All photos shall be saved to document site conditions over time to support the inspection report findings when the site is audited by TDEC or other regulators.

The Design-Builder shall maintain a rain gauge on-site that measures up to 6-inches of rainfall. The rain gauge shall be located along the project site in an open area such that measurements will not be influenced by outside factors. Rainfall monitoring shall be initiated prior to clearing, grubbing, excavation, grading, cutting or filling. The rain gauge shall be read and emptied after every rainfall event occurring on the project site (at approximately the same time of day). The rainfall records shall be recorded and maintained with the SWPPP. Record data should include date of rain event, amount of rainfall and the approximate duration.

Inspectors performing the required twice weekly inspections must have one of the following: a valid certification from the “Fundamentals of Erosion Prevention and Sediment Control Level I” course, licensure as a professional engineer or landscape architect, Certified Professional in Erosion and Sediment Control (CPESC) certification, or successful completion of the “Level II Principles for Erosion Prevention and Sediment Control for Construction Sites” course. A copy of each inspector’s certificate, license, or training record should be kept on site.

As outlined in the NPDES CGP, the Department will perform the monthly Environmental Quality Assurance Project Compliance Assessments (QA Inspections) on this Project, which will include any waste and borrow areas.

Water Quality Permits Specific Requirements

The Design-Builder assumes all responsibility as the Authorized Agent of the Department (Permittee) as indicated in the permit that relates to protection of the “Waters of the United States” and/or “Waters of the State of Tennessee” pursuant to the following:

- Sections 401 and 404 of the Federal Clean Water Act (33 U.S.C. §1344) and all implementing regulations, including without limitation, regulations of the U.S. Army Corps of Engineers governing permits for discharges of dredged or fill material into waters of the United States in 33 CFR Part 323;
- The Tennessee Water Quality Control Act (T.C.A. §69-3-101, et. seq.) and all implementing regulations, including without limitation the Rules of TDEC governing National Pollutant Discharge Elimination System (NPDES) permits in Chapter 1200-04-10, and Aquatic Resource Alteration Permits in Chapter 1200-04-07; Class V Injection Well Permits, for work in or near sinkholes;
- Section 26a of the Tennessee Valley Authority (TVA) Act of 1933 as amended (49 Stat 1079, 16 U. S. C. sec. 831y1.) and all implementing regulations, including without limitation the regulations of the Tennessee Valley Authority governing construction in the Tennessee River System in 18 CFR, Part 1304.

Permit Register

The Design-Builder shall administer a permit register and provide an updated permit register in every progress report. The permit register shall include an overview of all permits required of the Project. The permit register requires each permit to be indicated as follows:

- Name and address of the granting authority;
- Purpose of the permit;
- Reference to the document in which the permit conditions are defined;
- Status of permit;
- Date by which the authorization of the specific permit is anticipated;
- Permit conditions relevant for the Work;
- Date by which the permit is required (milestone);
- How the Design-Builder ensures that he shall comply with the permit requirements and conditions; and
- Validity and the expiry date (if any) of the permit.

8.9 DISPOSAL OF MATERIALS

All disposal activities shall be in accordance with the TDOT *Waste and Borrow Manual* (May 15, 2017 edition) located at:

https://www.tn.gov/content/dam/tn/tdot/construction/old_web_page/WasteBorrowManual.pdf.

Borrow and waste disposal areas shall be located in non-wetland areas and above the 100-year Federal Emergency Management Agency floodplain. Borrow and waste disposal areas shall not affect any Waters of the State/U.S. unless these areas are specifically covered by an ARAP, § 404, and/or NPDES permit, obtained solely by the Design-Builder.

8.10 EROSION PREVENTION AND SEDIMENT CONTROL (EPSC)

All EPSC designs and implementation shall be the responsibility of the Design-Builder.

Permanent stabilization shall be placed at locations to prevent damage to adjacent facilities and property due to erosion on all newly graded cut and fill slopes that have permanently ceased.

- Pre-construction vegetative ground cover shall not be destroyed, removed, or disturbed (i.e., clearing and grubbing initiated) more than 14 calendar days prior to grading or earth moving activities, unless the area is mulched, seeded with mulch, or other temporary cover is applied.
- Clearing, grubbing, and other disturbances to riparian vegetation shall be limited to the minimum necessary for slope construction and equipment operations. Existing vegetation, including stream and wetland buffers (unless permitted), should be preserved to the maximum extent possible. Unnecessary vegetation removal is prohibited.

Temporary stabilization shall be initiated within 14 calendar days when construction activities on a portion of the site are temporarily ceased, and earth disturbing activities shall not resume until after 14 calendar days. Permanent stabilization measures in disturbed areas shall be initiated within 14 calendar days after final grading of any phase of construction.

Steep slopes shall be temporarily stabilized not later than 7 calendar days after construction activity on the slope has temporarily or permanently ceased. For this project, steep slopes shall be defined as natural or created slopes of greater than 3H:1V, regardless of height.

Permanent stabilization shall replace temporary measures as soon as practicable. Priority shall be given to finishing operations and permanent EPSC measures over temporary EPSC measures.

Inspection, repair, and maintenance of EPSC structures shall be performed on a regular basis and sediment shall be removed from sediment control structures when the design capacity has been reduced by fifty percent (50%). During sediment removal, the Design-Builder shall take care to ensure that structural components of EPSC structures are not damaged and thus made ineffective. If damage does occur, the Design-Builder shall repair the structures at their own expense.

EPSC controls shall be inspected according to permit requirements to verify measures have been installed and maintained in accordance with TDOT standard drawings, specifications, and good engineering practices. EPSC inspections shall be documented on the TDOT EPSC inspection report, and a copy of each inspection report shall be provided to the Department.

Sediment removed from sediment control structures shall be placed and be treated in a manner so that the sediment is contained within the Project limits and does not migrate onto adjacent properties or into Waters of the State/United States.

The Design-Builder shall establish and maintain a comprehensive and proactive method to inspect and prevent the off-site migration or deposit of sediment off the Project limits (i.e., ROW, easements, etc.), into Waters of the State/United States, or onto roadways used by the general public. If sediment escapes the construction site, off-site accumulations of sediment that have not reached a stream must be removed at a frequency sufficient to minimize off-site impacts (e.g., fugitive sediment that has escaped the construction site and has collected in a street must be removed so that it is not subsequently washed into storm sewers and streams by the next rain and/or so that it does not pose a safety hazard to users of public streets). Arrangements concerning removal of sediment on adjoining property must be settled with the adjoining property owner before removal of sediment.

Upon conclusion of the inspections, EPSC measures found to be ineffective shall be repaired, replaced, or modified before the next rain event, if possible, but in no case more than 24 hours after the inspection or when the condition is identified. If the repair, replacement, or modification is not practical within the 24-hour timeframe, written documentation must be provided in the field diary and EPSC inspection report. An estimated repair, replacement, or modification schedule shall be documented within 24-hours of identification. All costs associated with modifications made to these measures shall be the responsibility of the Design-Builder and all modifications shall be concurred with by the Department.

Temporary EPSC measures may be removed at the beginning of the workday but must be replaced at the end of the workday or before/during a precipitation event.

Delaying planting of cover vegetation until winter months or dry months shall be avoided.

Offsite vehicle tracking of sediments and the generation of dust shall be minimized. A stabilized construction access (a point of entrance/exit to the construction project) shall be provided to reduce the tracking of mud and dirt onto public roads by construction vehicles.

The Design-Builder shall have a plan in place for dust control. The dust control plan shall be developed prior to the start of any construction activities and shall be submitted to the Department for approval.

The EPSC plan shall be updated by the Design-Builder whenever EPSC inspections indicate, or where State or Federal officials determine EPSC measures are proving ineffective in eliminating or significantly minimizing pollutant sources or are otherwise not achieving the general objectives of controlling pollutants in storm water discharges associated with the construction activity.

The accepted EPSC plan shall require that EPSC measures be in place before clearing, grubbing, excavation, grading, culvert or bridge construction, cutting, filling, or any other earthwork occurs, except as such work may be necessary to install EPSC measures.

EPSC measures shall be installed and functional prior to any earth moving operations and shall be maintained throughout the construction period except as such work may be necessary to install EPSC measures.

The Design-Builder shall establish and maintain a proactive method to prevent litter and construction wastes from entering Waters of the State/United States. These materials shall be removed from stormwater exposure prior to anticipated storm events, before being carried offsite by wind, or as otherwise needed to

prevent these materials from becoming a pollutant source for stormwater discharges. After use, materials used for EPSC shall be removed from the site by the Design-Builder.

8.11 STREAM RELOCATION

The Design-Builder shall be responsible for performing any stream relocations required for construction of the roadway project. If the proposed project ROW is not sufficient to allow for this stream relocation, and the requisite vegetative buffer, then the Design-Builder shall coordinate with the TDOT Alternative Delivery Office. Final design and construction of the relocated stream channel will be performed by the Design-Builder. In the event that any portion of the relocated stream does not meet performance standards, as set forth in the associated regulatory permits, then the Design-Builder shall be responsible for any required corrective action.

8.12 DEPARTMENT INSPECTIONS

The Department will review and monitor the Project (Quality Assurance Inspections), including all waste and borrow areas, to ensure compliance with all applicable environmental regulations and stormwater management activities throughout the duration of the Project.

If at any time, the Design-Builder is not in compliance with any applicable permit regulations, all non-compliance items must be addressed by the Design-Builder within 24 hours of such identification. The Department has the authority to suspend work until such time as the deficiencies have been corrected.

The Design-Builder shall not be granted any cost compensation or time extensions for any work suspensions associated with non-compliance. Any monetary fees and/or fines associated with any violations, as assessed by regulatory agencies, shall be the responsibility of the Design-Builder.

9.0 CONSTRUCTION SCOPE OF WORK

The Design-Builder shall meet the requirements of the Department's *Standard Specifications for Road and Bridge Construction* (January 1, 2021 Edition), supplemental specifications, contractual Special Provisions, the *Manual on Uniform Traffic Control Devices* (MUTCD), and regulations of the Tennessee Occupational Safety and Health Administration (TOSHA).

The Design-Builder shall ensure that all applicable "General and Special Notes" found in Section VI of the current edition of the State of Tennessee Department of Transportation Design Division *Roadway Design Guidelines* are adhered to during construction.

Reference Special Provision 108B, Project Completion Time and Liquidated Damages, as included in *Contract Book 2 (Design- Build Contract)*.

9.1 CONSTRUCTION SERVICES

The Design-Builder shall supervise and administer all construction activities in accordance with Contract requirements.

The Design-Builder shall perform all other construction work required to complete the Project in conformance with all Contract requirements, including Legal Requirements.

The Design-Builder shall comply with all applicable laws.

The Design-Builder shall keep the work location and its vicinity free from accumulation of waste materials and rubbish caused by the Design-Builder's operations.

Any area that is disturbed outside limits of construction during the life of this Project shall be repaired by the Design-Builder at its expense. All repaired areas shall be inspected and be deemed satisfactory by the Department.

The Design-Builder shall coordinate its work with that of other contractors working on or near the Project. The Design-Builder shall consider the schedule of other contractors when developing his schedule to maintain continuity of work and compliance with the Project schedule.

Acceptance of Material

All materials utilized in this project shall meet the requirements set forth in the contract, plans, and specifications. Materials incorporated into the project must have certifications, test reports, and/or acceptance testing as specified in the Department's Quality Assurance Program for the Sampling and Testing of Materials and Products (SOP 1-1) (<https://www.tn.gov/tdot/materials-and-tests/standard-operating-procedures.html>). The Design-Builder shall communicate what materials will be utilized in the project, along with estimated quantities, in sufficient time that adequate samples and/or acceptance testing can be performed by TDOT representatives. The Design-Builder shall provide the Department an estimated quantities list using the Department's pay item list for each lump sum item so that the Department may determine the number(s) and type(s) of testing required.

The Design-Builder is responsible for determining all means and methods of construction for the Project. However, this does not relieve the Design-Builder of the responsibility to protect the public, environment, and private property.

9.2 MAINTENANCE DURING CONSTRUCTION

The Design-Builder shall prepare a maintenance plan for Department Review and Approval that meets the requirements herein.

The Design-Builder is responsible for the maintenance of the Project in accordance with the approved maintenance plan until Project completion and acceptance by the Department.

General Requirements

The Design-Builder shall maintain the Project from the date of the Design-Builder's Notice to Proceed from the Department until Project completion and acceptance by the Department, in a manner that provides a safe and reliable transportation system.

The Design-Builder shall be fully responsible for maintenance as required by the Department's *Standard Specifications for Road and Bridge Construction*, January 2021 edition, Section 104.05 -- Maintenance During Construction. The Design-Builder shall be responsible for all components of the transportation system within construction limits to include, but not limited to, asphalt roadway, signing, and guardrail until final acceptance of the Project by the Department.

ROW Mowing and Litter Removal

The Design-Builder shall perform ROW mowing and litter Removal service to provide a consistent vegetation height and a clean non-littered appearance from the date of the Design-Builder's Notice to Proceed from the Department until Project completion and acceptance by the Department.

See Special Provision 806 regarding contract mowing and Special Provision 719A regarding removal and disposal of litter.

It shall be the Design-Builder's responsibility to mow and pick up litter on the full ROW.

Annually, there will be a minimum of four (4) mowing and five (5) litter cycles. The Department shall direct the Design-Builder with the exact dates for the annual mowing and litter cycles.

Acceptance of the Project

Upon Acceptance of the Project, the Department will assume responsibility for the operation and maintenance of the entire Project. Nothing contained herein shall otherwise limit any warranty obligations of the Design-Builder with respect to any defect or non-conforming Work.

10.0 TRAFFIC CONTROL / PAVEMENT MARKING SCOPE OF WORK

All primary and side road construction shall be phased in accordance with Special Provision 108B. Access to all side roads, business entrances, and driveways shall be maintained during construction unless specified elsewhere in this Contract.

Definitions

- Road Closure: Complete removal of traffic from a section of roadway using a signed detour route.
- Lane Closure: Reduction in the current number of lanes provided to traffic
- Rolling Road Block: Temporarily delaying traffic for a limited amount of time without stopping traffic or providing a detour.

10.1 GENERAL REQUIREMENTS

The Design-Builder shall:

- Develop a Transportation Management Plan, including a Traffic Control System, that addresses major aspects of the work for individual construction areas, phases and stages, including temporary traffic control, transportation and information strategies. The Transportation Management Plan shall be in accordance with TDOT *Standard Specifications for Road and Bridge Construction*, January 2021 edition, TDOT *Standard Drawings*, TDOT *Standard Traffic Operations Drawings*, TDOT *Traffic Design Manual*, TDOT *Design Guidelines*, TDOT *Work Zone Safety and Mobility Manual*, ATSSA *Quality Guidelines for Temporary Traffic Control Devices and Features* (Current Edition), and the latest edition of the *Manual of Uniform Traffic Control Devices*.
- Use traffic control materials from the Department's Qualified Products List (QPL): <https://www.tn.gov/tdot/materials-and-tests/research---product-evaluation-and-qualified-products-list.html>.
- The Design-Builder shall ensure drainage spread across all traffic lanes does not exceed allowable spread. Design-Builder shall provide drainage/spread calculations for all phases of traffic control phasing.
- The Transportation Management Plan shall describe in detail all accommodations for traffic access and flow during all stages of construction for the life of the Project. The plan shall include the following:
 - Detailed proposed sequencing plan that includes each step of the Project, including all major traffic shifts or changes, minor shifts or changes, closures, and alternate traffic patterns.
 - Overall goals of the sequencing plan and how the plan aligns with the Project Critical Path.
 - Plans for providing queue protection during operations requiring temporary lane closures, temporary road closures, rolling roadblocks, traffic pacing, and setting up or removing long-term lane shifts.
 - Conceptual construction staging diagrams (scale: 1 inch = 200 feet), including lane configuration and traffic management of the Interstate, State Routes, and local streets during the different stages of construction. Staging areas within the project limits shall be approved by the Department.

- Narrative description of how Design-Builder shall schedule and sequence the construction to minimize impacts on the environment, communities and traveling public while still providing acceptable construction performance.
- Brief description of the laydown, recycling, staging, disposal areas, waste and borrow pits, and maintenance locations to be used during construction.
- Description of how the ROW and adjacent roads and properties will be maintained and protected, including the intended measures to be used to mitigate and minimize noise, vibration, light, dust, erosion/run-off, and local road damage.

10.2 TEMPORARY LANE / ROAD CLOSURES

Access to the Blue Oval site and Keeling Road along SR 222 shall be maintained at all times. There shall be no lane closures along SR 222, unless approved by the Department. Two (2) travel lanes, each a minimum of 11-feet wide with 2-foot shoulders, shall be maintained along SR 222 during construction. Once the construction of the turning lanes at STA 3067+03.39 and STA 3093+22.31 are complete, these turning lanes shall remain open. Side roads and driveways shall be accessible at all times. See Special Provision 108B for Liquidated Damages.

10.3 TEMPORARY MARKINGS

Temporary markings shall adhere to guidance outlined in Section IV of current edition of the Department's *Design Division Roadway Design Guidelines* for pavement markings.

10.4 TEMPORARY SIGNAGE

All temporary signage shall be in accordance with TDOT *Standard Specifications for Road and Bridge Construction* (January 2021 edition), supplemental specifications, TDOT *Standard Drawings*, TDOT *Standard Traffic Operations Drawings*, TDOT *Traffic Design Manual*, TDOT *Design Guidelines*, TDOT *Work Zone Safety and Mobility Manual*, and the latest edition of the *Manual of Uniform Traffic Control Devices*.

10.5 CHANGEABLE MESSAGE SIGNS

Changeable message signs shall be used in advance of changed roadway conditions such as lane closures, road closures, or lane shifts. The locations of these changeable message signs shall be reviewed by the Department prior to implementation. Portable changeable message signs should be used as a supplement to and not as a substitute for conventional signs and pavement markings. Portable changeable message sign trailers should be delineated on a permanent basis by affixing retroreflective material, known as conspicuity material, in a continuous line on the face of the trailer as seen by oncoming road users.

10.6 DETOUR AND CONSTRUCTION SIGNAGE

All construction signing shall be in strict accordance with the current edition of the MUTCD. No detours will be allowed during construction.

10.7 CONSTRUCTION WORK ZONE

Traffic control devices shall not be displayed or erected unless related conditions are present necessitating warning.

10.8 PAVEMENT EDGE DROP-OFF TRAFFIC CONTROL

See Chapter 9, Section 5, of the TDOT *Roadway Design Guidelines*.

ROADWAY DESIGN CRITERIA

12/5/2022

GENERAL INFORMATION		VERTICAL ALIGNMENT	
Roadway Identification	Stanton - Somerville	Max Grade	See RD11-TS-2
Roadway Limits	From near SR-222 to approx. 865 feet West (Project Blue Oval)	Ascending	6% (Level)
Functional Classification	Collector	Descending	6% (Level)
Design Speed	55 mph	Min Curvature (K)	
Design Year	2045	Sag Vertical Curve	115
Traffic Volume	3,350	Crest Vertical Curve	114
Level of Service			
Access Control	Full Access	DRAINAGE	
Design Units	English	Calculation of Q	Rational Method for D.A. < 100 Acres TR-55 Method for D.A. > 100 Acres
		Cross Drains	
TYPICAL SECTION	See RD11-TS-2	Flood Frequency	50 Year (100 Year Review)
Travel Lanes		Pipe Material	RCP
Number of Lanes	4	Minimum Freeboard	50 Year
Lane Width	12'	Side Drains	
Cross Slope	2%	Flood Frequency	NA
Max Superelevation	8%	Pipe Material	NA
Shoulders		Storm Drains	
Shoulder Width	8'	Flood Frequency	NA
Cross Slope	4%	Pipe Material	NA
Max Rollover	7%	Pavement Spread	NA
Median	N/A	Minimum Pipe Size	18"
Width	N/A	Minimum Cover	Not less than 12" measured from the bottom of the subgrade to the top of the outside face of the pipe.
Slope	N/A		
Side Slopes		INTERSECTIONS	
Clear Zone Width	20-22' Minimum	Stopping Sight Distance	495' for 55 mph
Slope Inside Clear Zone	6:1 Maximum	Design Vehicle	WB-67
Slope Outside Clear Zone	3:1 Maximum		
		NOTES:	
HORIZONTAL ALIGNMENT			
Min Radius of Curve	960' for 8%		

APPENDIX C: TURNING LANE(S) DETAILED CONCEPT

