

**DESIGN-BUILD
RFP CONTRACT BOOK 1
INSTRUCTIONS TO
DESIGN-BUILDERS (ITDB)**

**State Route 396, Saturn Parkway Extension,
Maury County- TENNESSEE**

**PROJECT IDENTIFICATION NUMBER (PIN 114169.00)
CONTRACT NUMBER: DB1601**



August 31, 2017

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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 (the Department) to all firms and teams of firms (“Design Builders”) that the Department has shortlisted for the Department’s Request for Proposals (RFP) to solicit competitive Proposals for **SR-396, Saturn Parkway Extension, Maury County- TN**

Design Build Project (the “Project”). 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 the Contract Documents. 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.

This solicitation is a request for competitive proposals. Proposals are only invited from and will only be considered from those entities (“Design Builders”) on the short-list as determined through the evaluation of Statements of Qualifications (“SOQ”) submitted in response to the Request for Qualifications (“RFQ”).

The DB 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 DB 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. In the event the Design Builder has been awarded contracts for highway work in the past, they shall have financed the work in such a manner that just and proper claims in the discretion of the Department, representing labor and materials entering therein, have not been filed with the Department.

This **Contract Book 1 (ITDB - Instructions to Design Builders)** contains 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)**, **DB 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.

This project consists of SR 396, Saturn Parkway Extension, and improvement on State Route 247 (Beechcroft Road) including grading, drainage, and paving, the construction and design of roadway and Bridges, possible retaining wall and installation of signs and signals. The approximate Project length is approximately 1.5 miles.

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; and
- Contacting the Department Alternative Contracting Office for any necessary clarification or interpretation of the Contract prior to proceeding with the affected work.
- 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.
- 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 Materials, and of the Design-Builder in performing the work.

2. PROJECT OVERVIEW

Project Description: **State Route 247 (Beechcroft Road) improvements and State Route 396, Saturn Parkway Extension –**

This project will consist of three separate projects (see attached maps)

- Project 1 (PIN 117319.01) – Project will involve the widening of SR-247 (Beechcroft Road), east of Cleburne Road, from 2 lanes to 3 lanes curb & gutter section, widening of SR-247, west of Cleburne Road to accommodate an east bound right turn lane onto Cleburne Road and the widening of Cleburne Road to accommodate a northbound left turn lane. Project will connect to Site 1 of PIN 121394.00 (Project Shotgun).
- Project 2 (PIN 121394.00, Project Shotgun)
 - Site 1 - Will involve the widening of SR-247 (Beechcroft Road) from 2 lanes to 3 lanes curb & gutter section. Site 1 is approximately 2750 feet in length. Site 1 will connect to PIN 117319.01 & PIN 123399.00).
 - Site 2 – Will involve the widening of SR-247 (Beechcroft Road) to accommodate an eastbound right turn lane onto Town Center Parkway.
 - Site 3 – Will involve the improvement of the northwest quadrant of the US 31 (Main Street) and Stephen P. Hirsch Parkway.

Project 3 (PIN 123399.00, Project Triple Crown) – Project is the extension of State Route 396 (Saturn Parkway) to State Route 247 (Beechcroft Road) on new alignment. The project will include stream crossing(s) over McCormack Branch (a FEMA Studied Stream), a new grade separated railroad crossing, intersection/interchange modifications to the GM facility and a new connection to SR-247. Project will connect to PIN 121394.00. The approximate mainline length is 1.3 miles.

This section of the corridor will be constructed with minimal disturbance to existing residential and commercial areas.

- The Design Builder shall be responsible for determining all utility conflicts / relocations, and costs. Coordination shall include any and all necessary utility agreements when applicable.
- The Design Builder shall provide right-of-way acquisition services for the Project. Right-of-way acquisition services shall include certified title reports, appraisal, appraisal review, negotiations, relocation assistance services, property management services, parcel closings and all related activities. The Design Builder shall be responsible for the right of way acquisition costs.
- The Design Builder shall be responsible for coordinating the construction/relocation of private utilities with the appropriate owners.
- The Design Builder shall be responsible for development and installation of the Traffic Control and Pavement Marking Plans.
- The Design Builder shall be responsible for all erosion prevention and sediment control designs and implementation.
- The Design Builder shall be responsible for preparing all documents necessary for to obtain the environmental permits. 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.

- The Design Builder shall follow all reference guidance as stated in **DB Standard Guidance**.
- Specific Technical requirements as stated in **Contract Book 3 (Project Specific Information)**.
- The Design Builder shall be responsible for preparing the design exception request needed for FHWA Approval in accordance with TDOT Design Guidelines.

3. **RFP COMMUNICATION**

The Department Alternative Contracting C.E. Manager 2 for the duration of the procurement process, together with address, phone number, fax number, and e-mail address, are set out in the Contract.

a. **CORRESPONDENCE**

All correspondence and submittals must be submitted in a sealed envelope or package addressed to the Department Alternative Contracting C.E. Manager 2 and labeled as set out in Section C.2 of **Contract Book 2 (Design-Build Contract)**.

Return Address – The Design Builder's must also include on the envelope or package the Design Builder's name and return address.

Any Department designated contact person specified in the **DB 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 may also communicate with the Department Alternative Contracting C.E. Manager 2 by fax, phone, or e-mail (or if the Program Manager is unavailable, as a secondary contact, the Department Director of Construction by telephone at 615-741-2414. Advance copies of submittals delivered to the Department by fax or e-mail are not considered official until the Department receives the hard copy. 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 Alternative Contracting C.E. Manager 2 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 (liaobaid@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 or protest 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 QPL product by identifying the product category included on the QPL. The 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 Alternative Contracting C.E. Manager 2 and will only be accepted in the format of Form QR in electronic format by e-mail (lia.obaid@tn.gov) or fax. 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 Alternative Contracting C.E. Manager 2 and will only be accepted in the format of Form QR in electronic format using MS Word by e-mail (lia.obaid@tn.gov) or fax.

g. PROHIBITED DESIGN-BUILDER COMMUNICATIONS

No member of 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, city(ies) and county(ies) in which the Project or any part of it are located.

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

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.

Deadline for Submittal of Initial Right-Of-Way Acquisition	<i>September 15, 2017</i>
Deadline for Submittal of Alternate Technical Concepts (Dependent on Completion the NEPA Document)	<i>On or before September 22, 2017 4:00 p.m., CT.</i>
Deadline for Response to Alternate Technical Concepts, and ROW acquisition	<i>October 6, 2017 4:00 p.m., CT.</i>
Deadline for Submittal of Question Requests, and Requests for QPL Determination	<i>October 13, 2017 4:00 p.m., CT.</i>
Anticipated Deadline for Issuance of Last Addendum	<i>October 20, 2017 4:00 p.m., CT.</i>
Technical Proposal and Price Proposal Due Date and Time	<i>October 27, 2017 4:00 p.m., CT.</i>
Public Price Proposal Opening	<i>November 3, 2017 9:00 a.m., CT.</i>
Anticipated Award of DB contract, or rejection of all proposal	<i>On or before November 17, 2017</i>
Anticipated Issuance of Initial Notice to Proceed	<i>December 1, 2017</i>

The Department will not consider any late Proposals. Proposals received after the Proposal Due Date will be returned to the 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 the Design Builder does not submit a Proposal by 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. As a result, the Design Builder will not be eligible to respond to any additional RFP requests from the Department on this project.

6. CONTRACT DOCUMENTS

- Contract Book 1 (ITDB - Instructions to Design Builders);
- Contract Book 2 (Design-Build Contract);
- Contract Book 3 (Project Specific Information);
- DB Standard Guidance and Addendum;
- The Department Standard Specifications;
- The Department Supplemental Specifications;
- The Department Design Guidelines, and Addendum;
- The Department Construction Circular Letters;
- The Department Standard Drawings;
- Design Procedures for Hydraulic Structures;
- Drainage Manual;
- 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;
- All Material Included by Reference in any of the above Documents.
- The Department Material and Test Standard Operating Procedures.

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 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 Project Manager (v 5.0). 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 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, as applicable;
- 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) 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 Contracting Office.

The Department 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 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 will 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 includes two steps:

Step One: RFQ (determination of Short list); and,

Step Two: RFP (selection of from submitting responsive Proposals).

Evaluation of Proposals will be based on information submitted in the Proposals or otherwise available to the Department, and will involve both pass/fail factors 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 **DB Standard Guidance** and any other Contract Documents released for this procurement.

2. 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 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 two (2) individually bound copies 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.

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 Alternative Contracting C.E. Manager 2. 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 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 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 & 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 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 regards 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.

3. **SELECTION PROCEDURE**

The Department will utilize a ***Meets Technical Criteria (A+B)*** selection process in this procurement to 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.

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

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

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 their Price Proposal and will become the contract completion time.

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

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, then 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 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 is complete, including punch list items, on the Project by the Department in accordance with the Contract.

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;
- 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;
- 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 RC 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 1680-5-4, Procedures for the Selection and Award of Design Build Contract, will publically open and read the Total Contract Amount (A+B). 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 IV 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

The submittals required under Response Category I as stated in this **Contract Book 1 (ITBD - Instruction to Design Builders)** will be evaluated as a matter of responsibility on a pass/fail basis.

a. 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) All other forms are to be placed within this Response Category.

b. OTHER

- 1) City and state where assigned staff will be located, particularly the location(s) of design staff.
- 2) List of DBEs Contacted (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 **Contract Book 3 (Project Specific Information)**, will be evaluated as a matter of responsibility 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 Project 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) Personnel Organization (Format as stated in **Contract Book 3 (Project Specific Information)** Section 2).

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 form in **Contract Book 3 (Project Specific Information)** will be evaluated as a matter of responsibility on a pass/fail basis (be as specific as possible):

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. Consider if the Scope of Services attached to this RFP is sufficient to attain the Department's goals and objectives.
- 2) Identify any potential right-of-way and utility conflicts.
- 3) 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 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.
 - Plans and procedures to insure timely deliveries of materials to achieve the Project schedule.
 - Categories of work that 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.
 - An explanation of Design Builder's methodology for updating it.
 - b) The Design Builder may adjust the list to more accurately reflect planned sequences and methods, 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
- ITS
- Construction Staking

105-01.55 Design Build Design Services

- 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
- Acquiring
- Public meetings if required

109-10.01 TRAINEE

Trainee at the unit price \$0.80 per hour for each hour approved training provided, as indicated in SP1240

203-01.95 Design Build Grading & Roadways

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

204-05.50 Design Build Geotechnical

- Borings
- Geotechnical Investigations
- Sinkhole

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 (≤ 10 in. Thickness)
- Any Portland Cement Concrete Pavement (> 10 in. Thickness)
- Tack, Prime coat

604-10.95 Design Build Bridges

- Components (steel, deck drains, etc.)
- Bridge
- ABC superstructure units
- Bridge Repairs
- Inspections

604-50.50 Design Build Minor Structures (Other)

- Removal of Existing Buildings and Improvements
- Box Culvert

- Retaining Walls
- Endwalls
- Wingwalls
- Temporary structure

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

714-40.75 Design Build Utilities and Railroad

- 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) Describe the administrative and operational structure that would be used to perform the proposed work, including:
 - Describe how design personnel will interface with the construction personnel.
 - Communicating and coordinating 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. Explanation of how independence of quality staff and function will be maintained.
- 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.
- 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. 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 **DB Standard Guidance**.
- The Design Builder will also be responsible for fulfilling FHWA 1273 "Contract Provisions"

d. ENVIRONMENTAL COMPLIANCE

- 1) Identify any potential environmental impacts.
- 2) Describe or outline the process for environmental compliance.
- 3) Describe or outline the approach to Erosion Prevention and Sediment Control for the Project.

- 4) 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.
- 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 **Contract Book 3 (Project Specific Information)** (be as specific as possible):

- a. See **Contract Book 3 (Project Specific Information)** for specific technical and design required information.
- b. 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.
- c. 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 costs.
 - Identify types of any retaining walls and /or noise walls if applicable.
- d. The Technical Proposal shall include half-size plan sheets depicting those elements required by the RFP.
 - e. Describe any traffic control requirements that will be used for each construction phase.
 - f. Describe how traffic will be maintained as appropriate and describe understanding of any time restrictions noted in the RFP.
 - g. Describe the safety considerations specific to the Project.
 - h. Discuss overall approach to safety.
 - i. 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.

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 Technical Proposal, the Price Proposal, and all required Contract Documents. The Technical Proposal shall be delivered in a sealed container within the mailing package clearly identified, labeled, and addressed as follows:

- **Recipient (the Department) set out in the Contract and "Proposal - Procurement Sensitive"**
- **Return address: Design-Builder's name, contact person's name, mailing address;**
- **Date of submittal;**

▪ **Contents labeled as SR-396, Saturn Parkway Extension; and Design Build Project (DB1601)” and “Design Build Technical Proposal”.**

The Technical Proposal may be sent by United States Mail or private carrier (i.e., Federal Express, United Postal Service, etc.), or be hand-delivered to the address shown in Section C.2 of **Contract Book 2 (Design-Build Contract)**. The container shall include the packaged sealed manila envelope as follows:

- Technical Proposal Package labeled as such (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 II Design Builder’s Organization and Expertise,” etc.) with each appropriate Response Category Form.

Technical Proposal pages shall be 8-½ inch x 11-inch white paper. Drawings or sketches shall be submitted on 11-inch x 17-inch and/or 8 ½-inch x 11-inch white paper. Schedule plots shall be on 8-½-inch x 11-inch or 11-inch x 17-inch paper. Double-sided pages shall be used except for pre-printed information, such as corporate brochures, and the original copy of all signed forms, which shall be single-sided.

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.

Three (3) originals and eight (8) copies of the Technical Proposal. Label the original Technical Proposals “ORIGINAL” and label each copy “COPY ____ of 8”.

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 printed 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. You 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 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 the ATC.

There will be projects that will have numerous alternates. The 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.

Additionally, 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 on CD, organized and numbered consistent with the required organization.

1) TECHNICAL PROPOSAL

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

Technical Proposal Response Category I – There is *no page limit* on the information required to be submitted under Response Category I.

Technical Proposal Response Categories II through IV – Proposal responses to Response Categories II through IV shall be limited to the combined maximum total of 75 page count (not 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 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 to perform below minimum Contract requirements or fail to perform any other Contract obligation.

2. PROPOSAL OPENING

a. TECHNICAL PROPOSALS

The Department Alternative Contracting C.E. Manager 2 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 to 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 7. 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 scoring of the Technical Proposals, the Department will conduct a public opening of the Price Proposals for each responsive bid at the following location:

505 Deaderick Street, J.K. Polk Bldg.

Suite 700, Nashville, TN 37243, 7th floor Large Conference Room.

on the date and time set out in above in Section A.5, page 7.

Totals read at the opening of the Price Proposals are not guaranteed to be correct and no final award of the Contract will be made until Proposals have been checked and re-checked.

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 which 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 stipulated fee of **\$40,000** will be awarded to each eligible Design Builder on the short-list that provides a responsive bid, but unsuccessful, Proposal. If a contract award is not made, all Design Builder's on the short-list that submits a responsive Proposal shall receive the stipulated fee. 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 responding to the additional request and/or requirement. The Department Alternative Contracting C.E. Manager 2 will be notified of the opportunity to request to invoice for the stipulated fee 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 stipulated fee, the Department reserves the right to use any ideas or information contained in the Proposals 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. Unsuccessful Design Builders may elect not to invoice and thus refuse payment of the stipulated fee to retain any rights to its Proposal and the ideas and information contained therein.

The decision to issue a new RFP, a modified/revised RFP, or a "Best and Final Offer" indicates the Departments decision to continue with the award on or not to cancel the project; therefore the stipend will only be paid once after the conclusion of the entire procurement process.

F. PRICE PROPOSAL EVALUATION

1. PRICE PROPOSAL EVALUATION METHODOLOGY

a. PRELIMINARY EVALUATION

1) 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 Departments 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.

2) UNBALANCED PRICING

The Department will prepare a Department cost estimate prior to accepting Price Proposals. This will be used as a basis for a preliminary evaluation of the Price Proposal 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 which are anticipated for the performance of the items in question in comparison with the Departments 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 score 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 responsibility 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 Project Manager. The Design Builder shall identify a single point of contact for the 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 not yet a legal Entity or is a joint venture or general partnership, authorized representatives of all Principal Participants shall sign the letter. Additionally, if the Design Builder wishes to add, delete, or substitute a Principal Participant, or wishes to substitute its Designer or any Key Personnel that it identified in its SOQ, the Design Builder

must make such request in this cover letter. In addition to including such a substitution or change request in its cover letter, the Design Builder must follow the procedures and submit the information required under this RFP.

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 QR, Form ATC, and Response Category Forms are located in **Contract Book 3 (Project Specific Information)**. All other contract forms are located within **Contract Book 2 (Design-Build Contract)**.

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 into 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 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 **Contract Book 3 (Project Specific Information)**. 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 to the **Contract Book 2 (Design Build Contract)** in which the forms are referenced.

1. DESIGN-BUILDER QUESTIONS

FORM QR, Question Request Form.

2. TECHNICAL PROPOSAL FORMS

- RESPONSE CATEGORY FORMS II THRU IV;
- ATC FORM;
- FORM COI, CONFLICT OF INTEREST DISCLOSURES;
- FORM TPSP, TECHNICAL PROPOSAL SIGNATURE PAGE FORM;

3. FORM LC, LOBBYING CERTIFICATE; 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).

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-Builder's 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 does not expect to hold a pre-proposal meeting on this project; however, the Department may 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 of that from the short-List, and any Proposal submitted by that 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 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 the Short-List. The Department will give no further consideration to that Design Builder's Proposal, and that will be ineligible for a stipend. If the Department elects to require oral presentations, the

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

The oral presentation will be an opportunity for the Design Builders to either explain or present their Technical Proposals and respond to the Department 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 Score.

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

Key Personnel identified in the SOQ shall not be modified in the Technical Proposal without written approval of the Department. Any request for modification shall be sent to the Department Alternative Contracting C.E. Manager 2. The written approval to modify the Key Personnel shall be included in Technical Proposal Response Category I. Failure to comply with this requirement may be justification for removing the Design Builder from further consideration for this Project.

The must submit with any request the same information about the proposed Principal Participant or team member that was originally required to be submitted in the SOQ, including legal and financial information (pass/fail) and Technical evaluation information. If a Major Participant is being added, deleted, or substituted, the must submit such additional information as may be required by the Department to demonstrate that the changed organization still meets the RFQ criteria upon which short-list selection was based.

L. MODIFYING A PROPOSAL PRIOR TO PROPOSAL DUE DATE

1. ERASURES, INTERLINEATIONS, STRIKEOUTS

If the initial Proposal has been modified by hand-written interlineations, strikeouts, or erasures, **EACH** such alteration must be initialed in blue ink by the signatory to the Technical Proposal and submitted to the Department Alternative Contracting C.E. Manager 2.

2. SUBSEQUENT TO THE INITIAL SUBMITTAL

Subsequent to Proposal submittal, a Design Builder may submit written modifications identified either by redlined text or on Design Builder's letterhead indicating the revisions with reference to the Proposal or form section, subsection, paragraph (if

applicable) and page number. The must submit with its Proposal modifications an affirmation signed by each of the original signatories that the modifications amend the terms of the Proposal previously submitted and submitted to the Department Alternative Contracting C.E. Manager 2.

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 Alternative Contracting C.E. Manager 2 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 that will be contacted to arrange for the Design Builder to retrieve the withdrawn Proposal.

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. If possible, the Department will return all Proposal materials at the time an in-person withdrawal is presented. However, Proposals are in the possession of one individual and are available only when that person is present.

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 Contracting C.E. Manager 2 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 withdraw written notice their request to be considered eligible to submit a Proposal in this instance. If the withdrawal is in person or the written notice does not state this request, the Design Builder will no longer be considered eligible for the Project.

N. CONFLICT-OF-INTEREST DISCLOSURE REQUIREMENTS

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 SOQ, or if additional potential conflicts of interest have developed since the Design Builder's

submittal of its SOQ, the Design Builder shall comply with the following disclosure requirements.

1. THE DESIGN-BUILDER ORGANIZATION CHANGE OR ADDITIONAL POTENTIAL CONFLICTS OF INTEREST

If the Design Builder's organization has changed and the change has been approved by the Department per Section G., or additional potential conflicts of interest have developed since the Design Builder's RFQ submittal, the Design Builder shall submit with its Proposal a new RFQ submittal for that SOQ Section and making a full disclosure of all potential 23 CFR 636 organizational conflicts of interest other than those already disclosed in the SOQ. If the Design Builder's organization has not changed and no additional potential conflicts of interest have developed since initial submittal of the Design Builder's SOQ, the Design Builder shall submit a signed statement that no potential 23 CFR 636 organizational conflicts currently exist other than those already disclosed within the Design Builder's SOQ. Also see **DB Standard Guidance**, and the COI Guidelines provided with Form COI regarding State conflict of interest standards and disclosure regarding former the Department employees.

2. SUBCONTRACTORS

The Design Builder shall include in its subcontracts a completed Conflict of Interest statement from each Subcontractor for whom 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.

O. 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:

- 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
- CD 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)
 - Form QR (This is the most current FORM QR with all Department answers);
 - 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 scoring/review as opposed to responsiveness.

5. *THE DEPARTMENT’S RIGHT TO SEEK CLARIFICATION; WAIVER*

As permitted by Law, the Department Points 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 it deems necessary or advisable that the best interest of the Department and/or the public will be promoted thereby.

As permitted by Law, the Department 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 will reject any Proposal submitted by a Design Builder that does not meet the applicable standards of responsibility.

7. *REJECTION IN THE PUBLIC INTEREST*

The Department reserves the right to reject any Proposal at its discretion. The Department may reject all Proposals for good cause upon a finding that to do so is in the public interest.

P. CONFIDENTIALITY

Documents submitted pursuant to this RFP will be subject to the Tennessee Open Records Law, TCA §§ 10-7-503 to 10-7-506, et. seq. Information submitted will be kept confidential until award by the Department, unless otherwise provided 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.

Q. 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 electronically through Bid Express.
- If the Design Builders bidder's bond is offered as guaranty, the bond must be made by a surety company, qualified and authorized to transact business in the State of Tennessee and must be acceptable to the Department.

R. 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 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 **DB 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 bind 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. **This includes the SP712B requirement.**

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).

S. MODIFICATION OF CONTRACT

The Department may make modifications to the Contract as it may determine, in the exercise of its sole discretion, to be necessary to fully incorporate the terms of the Apparent 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 Design-Builder. The Department will then continue the process of discussion with the next highest-ranked 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.

T. MODIFIED OR NEW RFP ISSUANCE

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

- Reject any or all Proposals.
- Issue new RFP.
- Cancel, modify, or withdraw the RFP in their entirety.
- Solicit subsequent "Best and final offer" (BAFO) from Design Builders.
- 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 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 shortlisted 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.

U. 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 Design Builder's failure to execute and deliver the duly-executed Contract, Contract, and required submittals to the Department within the response period, will result in (a) forfeiture of the Proposal Security as Liquidated Damages payable to the Department, and (b) the Department's commencement of discussions with the second highest-ranking Design Builder. If the Apparent Design Builder is a joint venture or partnership, each joint venture member or partner must sign the Contract on behalf of both itself and Design Builder.

2. BY THE DEPARTMENT

If the Department fails to execute the Contract and deliver to the Apparent Design Builder an original of the Contract within forty-five (45) Calendar Days following receipt of the Apparent Design Builder's duly-executed Contract, and other required submittals, the Design Builder shall have the right to withdraw the Proposal without penalty.

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.

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.

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

TENNESSEE DEPARTMENT OF TRANSPORTATION

State Route 396, Saturn Parkway Extension,

Maury County- TENNESSEE

CONTRACT NUMBER: DB1601



August 31, 2017

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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 **State Route 396, Saturn Parkway Extension and State Route 247 (Beechcroft Road) improvements and Maury Count-** 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;

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 and warranties 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 **DB 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 **DB Standard Guidance**, Chapter 1. A Quality Plan, Safety Plan, Environmental Plan or other management plans, pursuant to the **DB Standard Guidance**, Chapter 1, have to be submitted under this Contract.

8. **RIGHT- OF-WAY/UTILITY COORDINATION SERVICES**

Right-of Way (ROW) and Utility Coordination and acquiring 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 **DB Standard Guidance**, Chapter 5:

- 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 **DB Standard Guidance**, Chapter 5, 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 **DB Standard Guidance**, Chapter 5.
- The Design Builder shall submit to the Department all documentation and Design Quality Records required under **DB Standard Guidance**, Chapter 5.
- 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 **DB Standard Guidance** Chapter 2. 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. VECs adopted by the Department will be implemented through Change Orders pursuant to **DB Standard Guidance**, Chapter 2.

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 specified in **DB Standard Guidance**, 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 **DB Standard Guidance**, Chapter 2.
- 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 **DB 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 **DB Standard Guidance**, Chapter 7.
- The Design Builder shall maintain, on the work location, a copy of all approved Management Plans, environmental permits, approved design documents, project records and the entire Contract and any other document required in accordance with **DB Standard Guidance**, Chapter 7.
- 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 **DB Standard Guidance** and **Contract Book 3 (Project Specific Information)**, respectively. Consistent with **DB Standard Guidance**, Chapter 2 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 **DB Standard Guidance**, Chapter 2. This subparagraph shall in no way affect the applicability or coverage of the bonds and insurance required under Section 7.0 of this Contract.
- The Design Builder shall deliver to the Department all notices regarding completion of the work pursuant to **DB Standard Guidance**, Chapter 7.
- 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

DB Standard Guidance, Chapter 2, 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:

- 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 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, 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 **DB 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 **DB Standard Guidance**, Chapter 2.

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

Ms. Lia Obaid, P.E.
 CONSTRUCTION DIVISION REPRESENTATIVE
Address: **TENNESSEE DEPARTMENT OF TRANSPORTATION**
505 DEADERICK STREET, SUITE 700
NASHVILLE, TN 37243
E-mail: lia.obaid@tn.gov
Telephone Number: **615-532-7522** **Fax Number:** **615-741-0782**

3. DESIGN-BUILDER REPRESENTATIVE

The Design Builder's representative for this Project is

 Design Builder's Project Manager
Address: _____

E-mail: _____

Telephone Number: _____

Fax Number: _____

4. KEY PERSONNEL AND DESIGN PROFESSIONALS

The Design Builder's Key Personnel, Design Professionals, shall perform the functions established under the Contract for the duration of the Contract and are listed below.

a. KEY PERSONNEL

Design Builder's Project Management Personnel (Level "1" Personnel) shall consist of the following:

- Project Manager: _____
- Construction Manager/Superintendent: _____
- Design Manager: _____
- Traffic Engineering Manager: _____
- Traffic Control Supervisor: _____
- Environmental Compliance Manager: _____

b. DESIGN PROFESSIONALS

The Design Builder's design professionals (Level "2" Personnel) shall consist of the following:

- Utilities Design Engineering/Coordination Supervisor: _____
- Design Lead Engineer - Structures: _____
- Design Lead Engineer - Roadway: _____
- Erosion Prevention/Sediment Control Inspector: _____

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 **DB Standard Guidance**, Chapter 2. 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 **DB Standard Guidance**, Chapter 7.

2. COMMENCEMENT OF SERVICES

The Design Builder is authorized to commence the work within the Contract for post award submittals pursuant to **DB Standard Guidance**, Chapter 3. 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. COMPLETION DATES

The Design Builder shall complete all work to be done under the Contract, except for plant establishment, not later than **July 31, 2020**.

The Design Builder shall specify the number of calendar days for completion of the project within their price proposal. The number of calendar days specified by the Design Builder in their price proposal will be placed in the Contract above prior to execution of this design build contract.

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 **DB Standard Guidance**, Chapter 9.

2. PROGRESS PAYMENTS

The Department shall make progress payments to the Design Builder in accordance with **DB Standard Guidance**, Chapter 9. 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 **DB Standard Guidance**, Chapter 2.

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 of the **DB Standard Guidance**;
- 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, **DB Standard Guidance**, Chapter 1. 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 coverage's required under **DB Standard Guidance**, Chapter 2.

The Design Builder, being an independent contractor, agrees to maintain errors and omissions insurance in such an amount (**\$ 1000,000.00 minimum**) and form as are agreeable to the Department.

2. BONDING REQUIREMENTS

During the term of the Contract, the Design Builder shall maintain in full force, at its own expense and from Sureties licensed to do business in Tennessee, Performance and Payment Bond in the full Contract Amount. 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 assume full responsibility for the quality of the Design Builder's work and its conformance with all applicable law, rules, regulations and orders governing said work. 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 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. This requirement 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 **DB 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 **DB Standard Guidance**, Chapter 5. 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 **DB Standard Guidance**, Chapters 1 and 7, 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 **DB Standard Guidance**, Chapter 7 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 Standard Specifications, as amended. In such case, the Department will make payment in accordance with **DB Standard Guidance**, Chapter 9. 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 Standard Specifications, as amended, and **DB Standard Guidance**, Chapter 9. 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 **DB 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 **DB 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. *DB STANDARD GUIDANCE AND ADDENDUM;***
- 5. *THE DEPARTMENT STANDARD SPECIFICATIONS;***
- 6. *THE DEPARTMENT SUPPLEMENTAL SPECIFICATIONS;***
- 7. *THE DEPARTMENT DESIGN GUIDELINES, AND ADDENDUM;***
- 8. *THE DEPARTMENT CONSTRUCTION CIRCULAR LETTERS;***
- 9. *THE DEPARTMENT STANDARD DRAWINGS;***
- 10. *THE DEPARTMENT MATERIAL AND TEST STANDARD OPERATING PROCEDURES;***
- 11. *EXHIBIT A (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 APPLICABLE 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. EXHIBIT A (TECHNICAL PROPOSAL);**
- 3. CONTRACT BOOK 2 (DESIGN-BUILD CONTRACT);**
- 4. CONTRACT BOOK 1 (INSTRUCTIONS TO DESIGN-BUILDERS - ITDB);**
- 5. THE DEPARTMENT SUPPLEMENTAL SPECIFICATIONS;**
- 6. THE DEPARTMENT CONSTRUCTION CIRCULAR LETTERS;**
- 7. THE DEPARTMENT STANDARD SPECIFICATIONS;**
- 8. THE DEPARTMENT DESIGN GUIDELINES AND ADDENDUM;**
- 9. THE DEPARTMENT STANDARD DRAWINGS;**
- 10. DB STANDARD GUIDANCE;**
- 11. ALL OTHER PROGRAMMATIC PLANS OR ANY OTHER CONTRACT DOCUMENTS;**
- 12. 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 this **Contract Book 2 (Design-Build Contract)**. The Design Builder shall comply with the Department DBE requirements in the **DB 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. *GOALS AND TARGETS*

There is a DBE Utilization Goal of 8% for this Project. If a goal is stated, the Design-Builder shall follow the DBE provisions as provided in **Contract Book 3 (Project Specific Information)**.

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 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 the Department. 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. 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

*SR 396, Saturn Parkway Extension,
and improvement on State Route 247
Maury County*



- 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 14.13, 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.

*SR 396, Saturn Parkway Extension,
and improvement on State Route 247
Maury County*



THIS CONTRACT is executed in three (3) original copies, of which one is to be delivered to the Design Builder, and the remainder to the Department.

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
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**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION**

This Contract is accepted this _____ day of _____, _____, and

is effective on the _____ day of _____, _____.

John Schroer, Commissioner

John 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:

<http://www.tn.gov/tdot/section/tdot-construction-division>

Supplemental Specifications to the Standard Specifications Revision Date

Supplemental Specification to Section 100 -----	5/15/2017
Supplemental Specification to Section 200 -----	5/15/2017
Supplemental Specification to Section 300 -----	5/15/2017
Supplemental Specification to Section 400 -----	5/15/2017
Supplemental Specification to Section 500 -----	5/15/2017
Supplemental Specification to Section 600 -----	5/15/2017
Supplemental Specification to Section 700 -----	5/15/2017
Supplemental Specification to Section 900 -----	5/15/2017

S T A T E

(Rev. 3-30-15)

(Rev. 11-16-15)

(Rev. 6-27-16)

(Rev. 12-2-16)

(Rev. 5-15-17)

O F

T E N N E S S E E

January 1, 2015

Supplemental Specifications - Section 100

of the

Standard Specifications for Road and Bridge Construction

January 1, 2015

Subsection 101.03 (pg. 10) 5-15-17; Add the following definition for Specialty Items:

“**Specialty Item.** Work items identified in the contract which are not bid normally associated with highway construction and require highly specialized knowledge, abilities, craftsmanship, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract in general, these items are to be limited to minor components of the overall contract.”

Subsection 102.11 (pg. 18), 3-30-15; Add the following to the second paragraph:

“The Department may retain the Proposal Guaranty, not as a penalty, but as liquidated damages in the event a bidder does not have a license at the time of award.”

Subsection 104.04 (pg. 27), 3-30-15; Add the following as the first full paragraph on page 27:

“If a holiday falls on Saturday or Sunday, do not close lanes or restrict traffic from the preceding Friday at 6 am to the following Monday at 6 am.”

Subsection 105.03 (pg. 38), 12-2-16; Add the following to the end of the section:

“Products listed on the QPL which fail to comply with Departmental performance expectations shall be removed from the QPL. Products removed from the QPL shall be replaced with an equivalent product from the QPL. At the Departments discretion, an equitable adjustment may be made to the contract for invoice price deviations.”

Subsection 105.03 (pg. 38), 6-27-16; Add the following to the end of the section:

“All products must be listed on the Qualified Products List (QPL) and perform as specified at the time of use regardless of Letting date. Any products removed from the

QPL or that do not perform as specified, must be supplied or replaced at the Contractor's expense."

Subsection 105.06 (pg. 40), 3-30-15; Replace 2nd sentence of 1st paragraph with

"The contractor must attend a preconstruction conference arranged by the Engineer."

Subsection 105.10 (pg. 46), 5-15-17; Revise 2nd sentence of the first paragraph:

"Such inspection may extend to any part or to all of the Work and to the preparation, fabrication, or manufacture of materials to be used ~~including offsite waste and borrow areas.~~"

Subsection 105.11 (pg. 46), 5-15-17; Revise the 1st sentence:

"The Engineer or its representative will inspect all materials and each part or detail of the Work ~~including waste and borrow areas.~~"

Subsection 105.13 (pg. 48), 5-15-17; Remove the 2nd paragraph.

~~"After any offsite waste and borrow area(s) are no longer needed, ensure that the disturbed area is stabilized according to the TN NPDES Construction General Permit criteria or the agreed upon Reclamation Plan. After the area has reached final stabilization, request a meeting with the Engineer to perform a final inspection. Once the Engineer deems the area acceptable, terminate Contractor obtained permits."~~

Subsection 105.15 (pg. 49), 5-15-17; Remove last paragraph:

~~"If exclusive offsite waste and/or borrow area(s) were used as part of the Project, the Engineer will not start the process for final acceptance of the Project until the Contractor provides proof of permit termination for all waste and /or borrow area(s). If the Contractor wishes to continue use of the waste and/or borrow area(s), provide the Engineer with a letter indicating the intended use and updated documentation."~~

Subsection 106.06 (pg. 61), 5-15-17; Revise the first paragraph of A. and subsection A.2:

"Provide a Type A Laboratory consisting of a building, room, or dedicated area having at least 120 square feet of floor area with a minimum width of 8 feet and a minimum height of 7 feet. Provide laboratory space that is floored, roofed, sealed inside, weather-tight, and furnished with electricity. Furnish the space with adequate work benches, cabinets, and drawers. Provide suitable heat and air conditioning, and equip the laboratory with a laboratory oven capable of maintaining a temperature of 230 °F ± 9 °F. Stove tops and hot plates may be used to determine moisture conditions of aggregates. Provide lights, electrical outlets, and adequate ventilation for the tests being performed.

When the determination of aggregate gradation is required, furnish the following equipment:

1. Scales of appropriate capacity and design to weigh the required samples. Scales are to be sensitive to within 0.2% of the sample to be weighed. Provide standard weights for scale calibration.

2. Screens of appropriate size and mesh to separate the samples into the required series of sizes. Woven wire cloth shall conform to AASHTO M 92. Screens for running gradations of coarse aggregates shall meet AASHTO T27.
3. A mechanical shaker approved by the Engineer and suitable for running both coarse and fine aggregate.
4. Facilities to perform wash tests according to AASHTO T 11 that include an adequate and suitable water supply.”

Subsection 107.08 (pg. 69), 5-15-17; Add the following to the end of the third paragraph:

“All costs associated with any support activities including obtaining permission from landowners, permits, and compliance are to be included in the bid cost for the project.”

Subsection 108.01 (pg. 78) 5-15-17; Subletting of Contract, Add the following list of specialty items:

“Do not sublet, allow second tier sublet, sell, transfer, assign, or otherwise dispose of the Contract or any portion thereof or a right, title, or interest in the Contract without the Engineer’s written consent. If the Engineer consents to subletting or second tier subletting a portion of the Contract, the Contractor shall self-perform work amounting to not less than 30% of the total original Contract cost. For items designated in the Contract as “specialty items,” the Contractor may sublet or second tier sublet this work and deduct the cost of such specialty items from the total original cost before computing the amount of the Work required to be self-performed by the Contractor with its own organization.

As stated above, unless there is a Special Provision 108A in the proposal, the following items are designated as Specialty Items:

- Item 105-01 - Construction Stakes, Lines and Grades
- Item 202-01.02 – Removal of Asbestos
- Item 209 - EPSC Item 411-12. **Shoulder Scoring
- Item 501-03.12 – Concrete Shoulder Rumble Strip
- Item 602-03 - Steel Structures
- Item 602-04 - Steel Structures
- Item 602-10.13 / .14 - Navigational LightingItem 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 604-04.62 - 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 624 – Retaining Wall Items
- Item 625-01.08,10,11 – Inclinator, Drilled Shaft Inspections
- Item 640 - Weigh Station Items

Item 705 - Guardrail, Anchors, etc.
Item 706 - Guardrail Items
Item 707 - Fencing ItemsItem 712 - Traffic Control Items
Item 713 - Signing Items
Item 714 - Lighting Items
Item 716 - Pavement Marking Items
Item 720-03, 720-04, 720-05, 720-06, 720-07, 720-08, 720-09 – Railroad Highway Crossing
Item 721-01.06 – Irrigation System Repair
Item 721-10, 721-11.20, 721-11.30, 721-12 – Landscape and Irrigation Item 725 – ITS items
Item 730 - Traffic Signal Items
Item 7** - Utility Items
Item 750.01 – Mitigation Site
Item 801 - Seeding
Item 802 - Landscaping Items
Item 803-01 - Sodding
Item 805 - Erosion Control
Item 806 - Project Mowing”

Subsection 109.01 (pg. 98-100) 11-16-15; Measurement of Quantities, E. Weight; Remove the 12th paragraph and replace with the following:

“The scales shall be checked by an independent certified scale company. The check shall be performed on a semiannual basis; January through June and July through December. The results shall be maintained onsite and made available for review to Departmental personnel. If deficiencies are reported, all corrections shall be performed, documented, and verified prior to supplying material for TDOT projects.”

Subsection 109.01 (pg. 98-99) 5-15-17; Measurement of Quantities, E. Weight, Modify the 6th paragraph to the following:

“Employ a Certified Public Weigher as defined in the Certified Public Weigher Law of 1981, Tennessee Code Annotated, Section 47-26-801, et seq., as amended. The Engineer will measure all applicable materials in accordance with the Certified Public Weigher Law and Department policy on scales approved by the Engineer. Provide weight (haul) tickets in accordance with Department policy and as directed by the Engineer. These requirements apply to entities located both inside and outside the state of Tennessee”

Subsection 109.01 (pg. 98-100) 5-15-17; Measurement of Quantities, E. Weight, Modify the 12th paragraph to the following:

“The scales shall be calibrated and certified ~~echecked~~ by an independent certified scale company. The calibration and certification ~~echeck~~ shall be performed on a semiannual basis; January through June and July through December. Scales shall be validated on a quarterly basis to ensure their continued accuracy. Validation shall be made by a verified known weight, or other scales that are approved by the Department or other State agency. A verified known weight shall be checked for continued accuracy each time the scales are calibrated. The results shall be maintained onsite and made available for review to Departmental personnel. If deficiencies are reported, all corrections shall be performed, documented, and verified prior to supplying material for TDOT projects.”

Subsection 109.04 (pg. 106), 3-30-15; Replace C. Force Account, 4. Equipment, c. with:

“Idle or standby cost will not be paid for more than 8 hours in a day or 40 hours in a week”.

S T A T EO FT E N N E S S E E

(Rev. 5-18-15)
(Rev. 11-16-15)
(Rev. 5-15-17)

January 1, 2015

Supplemental Specifications - Section 200**of the****Standard Specifications for Road and Bridge Construction****January 1, 2015**

Subsection 201.03 Clearing and Grubbing, A. General (pg. 118-119), 5-15-17; remove the third paragraph:

~~“For clearing and grubbing activities associated with Contractor-supplied borrow pits and waste areas, ensure that the areas have been approved in advance by the Engineer, the Environmental Coordinator, and the Environmental Division. Operate and maintain such areas according to the manual *Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects.*”~~

Subsection 201.03 Clearing and Grubbing, C. Clearing and Grubbing Activities, 5. Borrow Pit Areas (pg. 120), 5-15-17; remove the last sentence in the last paragraph:

“In areas approved as borrow pits by the Engineer, clear and grub all trees, stumps, brush, and heavy vegetation.

In areas designated for obtaining construction material other than borrow, clear and grub trees, stumps, brush, and vegetation, and strip overburden lying above the material to be obtained.

Complete this work prior to removing borrow or construction materials. ~~Operate and maintain all offsite borrow areas according to the manual *Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects.*”~~

Subsection 202.03 General (pg. 125), 5-15-17; remove the last sentence of the 2nd paragraph:

“Remove material designated for salvage in readily transportable pieces, and store the removed pieces at specified locations within the Project limits. Replace with new material, at no additional cost to the Department, those materials designated for salvage that are damaged during removal, transport, or storage operations. Take ownership of material not designated for the Department’s use, and dispose of such material beyond view from the Project limits. ~~If disposing of material on private property, obtain written~~

~~permission from the property owner and adhere to the manual *Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects*.~~

Subsection 203.02 (pg. 134), 5-15-17; remove the last sentence of the 1st paragraph:

“Borrow Excavation consists of material required for the construction of embankments or other portions of the work. ~~Obtain borrow from approved sources outside the right-of-way according to the manual *Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects*, unless otherwise shown on the Plans.~~”

Subsection 203.04 (pg. 139), 5-15-17; add 5. to the list of provisions:

- “1. The cost of this material is more economical than borrow excavation.
2. The material is available within the adjusted balance where the shortage exists or the material may be hauled outside the limits of adjusted balance if the cost of the material is more economical than borrow after considering the additional cost of overhaul.
3. The material can be excavated without blasting.
4. There is a minimum of 20 feet between the top of the existing slope and the top of the new slope and a minimum of 5 feet between the top of the new slope and right-of-way line or Control Access fence. The 20-foot minimum will not apply when the existing slope is 4:1 or flatter or to overlapping or near overlapping slopes in medians or between parallel roads or ramps. The Engineer may reduce the 20-foot minimum at the Contractor’s written request.
5. The material has not been designated as potentially acid producing material.”

Subsection 203.04 (pg. 139-140), 5-15-17; add the 2nd paragraph as follows, revise the 5th paragraph to remove the reference to the *Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects*:

“E. Borrow Areas

Notify the Engineer before opening any borrow area to allow adequate time for the Engineer to take cross-section elevations and measurements of the ground surface after being stripped, and to test the borrow material before use. Obtain approval for the borrow area according to the ~~manual~~ *Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects*. Allow at least 14 days for testing borrow materials or other material from roadside pits proposed for construction purposes.

Borrow materials shall not contain acid producing materials. Representative samples of the proposed borrow material shall be tested for pH (EPA600/2-78-054 or ASTM D4239). Material with a pH less than 5 is considered acid producing and will not be accepted.

Unless otherwise allowed, do not place borrow material until after the roadway excavation material has been placed in the embankments. If the Contractor places more borrow than is required and thereby causes a waste of excavation, the Department will deduct the amount of such waste from the measured borrow volume. Do not excavate beyond the dimensions and elevations established.

The Contractor may remove highway fencing to obtain borrow materials. Replace the fencing removed with new fence at no cost to the Department, and assume responsibility for confining livestock, as necessary.

Excavate borrow pits to be self-draining where possible and practicable, and of a shape that can be easily cross-sectioned.

After completing excavation operations, provide the area with a neat appearance. Cover all self- draining borrow areas with topsoil and stabilize ~~according to the manual Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects.~~ Provide and place topsoil and seeding (with mulch) as specified in **203.06** and **801**, respectively.

For borrow pits 1 acre or larger in size that are not self-draining, refer to Sections 53-801 through 53-809 of the TCA. Full information regarding the requirements to be complied with and the necessary permits that the property owner must secure for the construction of a pond, lake, borrow pits, etc., 1 acre or larger that is not constructed to drain, will be supplied upon application to the TDEC.”

Subsection 203.07 (pg. 141-142), 5-15-17; replace the last paragraph:

~~“When placing waste material off the right-of-way in areas which, in the judgement of the Engineer, are so removed from the right-of-way as to not constitute a potential threat to the stability of the Project, follow the manual Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects to~~ Ensure the offsite disposal grading plan waste area is properly —designed (including but not limited to slope stability and fill placement recommendations); regulated, and implemented.”

Subsection 204.06 – 2 (pg.152-154), 5-18-15; replace Tables 204.06 with the following:

1. General Use Flowable Fill

Table 204.06-2: Specification Limits for General Use Flowable Fill

Property	Specification Limit
Load Application (ASTM D6024)	24 hours maximum in any condition
Consistency	15 inches minimum tested as specified in this 204.06.B.1

Page 153

2. Excavatable Flowable Fill (EFF)

Table 204.06-3: Specification Limits for EFF

Property	Specification Limit
Air content (ASTM D6023)	Maximum 30% ⁽¹⁾
Load Application (ASTM D6024)	24 hours maximum in any condition
Consistency	15 inches minimum as tested per 204.06.B.1
Compressive strength (ASTM D4832) ⁽²⁾	30 psi minimum at 28 days
⁽¹⁾ When using air entrained mixture design	
⁽²⁾ ASTM D4832 4 x 8 inch cylinder molds may be used. The preferred capping method to be used is wetsuit neoprene restrained in rigid retainers.	

Page 154

3. Early Strength Flowable Fill (ESFF)

Table 204.06-4: Specification Limits for ESFF

Property	Specification Limit
Air content (ASTM D6023)	Maximum 30% ⁽¹⁾
Load Application (ASTM D6024)	6 hours maximum in any condition
Consistency	15 inches minimum as tested per 204.06.B.1
Compressive strength (ASTM D4832) ⁽²⁾	30 psi minimum at 24 hours
⁽¹⁾ When using air entrained mixture design	
⁽²⁾ ASTM D4832 4 x 8 inch cylinder molds may be used. The preferred capping method to be used is wetsuit neoprene restrained in rigid retainers.	

Subsection 204.06 (pages. 153-154) 11-16-15; Excavatable Flowable Fill - delete the first sentence of the first full paragraph after Table 204.06-3 on page 153, Early Strength Flowable Fill – delete the first sentence of the second paragraph below Table 204.06-4 on page 154:

Subsection 206.03 (pg. 180-181), 5-15-17; remove the reference to the *Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects* in the next to last sentence of the first paragraph:

“Perform final dressing by hand work and machines to produce a uniform satisfactory finish to all parts of the roadway and other components of the Project. Shape the roadbed, shoulders, ditches, and slopes to within reasonably close conformity to the specified lines, grades, and cross-sections. Dress spoil banks, borrow areas, waste areas, and similar areas ~~according to the manual~~

~~Procedures for Providing Offsite Waste and Borrow on TDOT Construction Projects.~~ Clear rock cuts of all loose fragments, and leave in a neat, safe, and workmanlike condition.”

Subsection 209.01 (pg.190), 5-15-17; revise the 1st sentence of the 2nd paragraph:

“Implement erosion prevention and sediment control (EPSC) measures during all phases of construction, ~~including at all approved waste and borrow areas.~~ Ensure that all EPSC measures shown on the Stormwater Pollution Prevention Plan (SWPPP) are in place before beginning soil disturbing activities.”

S T A T E

(Rev. 11-16-15)

(Rev. 6-27-16)

(Rev. 12-2-16)

(Rev. 5-15-17)**O F****T E N N E S S E E**

January 1, 2015

Supplemental Specifications - Section 300**of the****Standard Specifications for Road and Bridge Construction****January 1, 2015**

Subsection 303.01 (pg. 220) 5-15-17; add the following sentence as the last sentence of the 2nd paragraph:

“Mineral aggregates base shall be Type A or Type B, whichever is shown on the Plans and called for in the bid schedule. Reclaimed Concrete Aggregate (RCA) may be used as an alternate for Type A or Type B base material.”

Subsection 303.02 (pg. 220-221) 5-15-17; add the following sentence to the last sentence of the 1st paragraph:

“Depending upon whether the Plans require Type A or Type B base, provide mineral aggregate meeting 903.05. For Type A base, use aggregate of Grading D. For Type B base, the Contractor may use aggregate of Grading C or D. For RCA, use grading specified in 903.05-C.”

Subsection 303.07 (pg. 222-223) 5-15-17; modify the 1st sentence of the 1st paragraph to the following:

“Construct Mineral Aggregate Base, Type A, ~~or~~ Type B, or RCA in one or more layers, to the compacted thickness shown on the Plans.”

Subsection 303.08 (pg. 223-224) 5-15-17; add the last sentence to the last paragraph of subsection A:

“For Mineral Aggregate Base, Type A, use the stationary plant method. For Mineral Aggregate Base, Type B, requiring the blending of two or more materials, use either the stationary plant method or the road mix method (mechanical mixer), except as provided for in **903.05**. For Mineral Aggregate Base, Type B, requiring additive, use either stationary plant mixing or road mixing. When using RCA as a replacement for Mineral Aggregate Base, Type A or Type B, use the intended method of mixing for the material listed above.”

Subsection 303.10 (pg. 225-227) 5-15-17; add subsection c.:

“2. Density Requirements

a. **Type A Base.** The average density of each lot of Type A base, unless otherwise specified, shall be within 100% of maximum density as determined according to AASHTO T 99, Method D, with no individual test less than 97% of maximum density.

b. **Type B Base.** The average density of each lot of Type B base, unless otherwise specified, shall be not less than 97% of maximum density as determined according to AASHTO T 99, Method D, with no individual test being less than 95% of maximum density.

c. **RCA Base.** The average density of each lot of RCA base, unless otherwise specified, shall be not less than 100% of maximum density as determined according to AASHTO T 99, Method D, with no individual test less than 97% of maximum density. The moisture content shall be within $\pm 3\%$ of the optimum moisture content as determined by an independent laboratory analysis. Mixing of the material with water shall be completed per Section 303.08.”

Subsection 303.14 (pg. 228) 5-15-17; revise the first sentence of A.:

“A. Mineral Aggregate for Mineral Aggregate Base, Type A or Type B, or RCA

The Department will measure Mineral Aggregate for Mineral Aggregate Base, Type A, ~~or~~ Type B, or RCA, by the ton, in accordance with **109**.”

Subsection 307.03 (pg. 246) 11-16-15; Modify Table 307.03-3:

B. Recycled Asphalt Pavement for Bituminous Plant Mix Base, Table 307.03-3

Table 307.03-3: Mixtures Using RAP

Mix Type	% RAP (Non-processed) ⁽¹⁾	Maximum % RAP (Processed) ⁽²⁾	Maximum % RAP Processed & Fractionated ⁽³⁾	Maximum Particle Size (inches)
307-ACRL	0	00	-	-
307-AS	0	00	15	-
307-A	15	20	35	1-1/2
307-B	15	30	35	1-1/2
307-BM	15	30	35	3/4
307-BM2	15	30	35	3/4
307-C	15	30	35	3/8
307-CW	15	30	35	1/2
307-CS	0	15	25	5/16

⁽¹⁾ “Non-processed” refers to RAP that has not been crushed and screened or otherwise sized prior to its use.

⁽²⁾ “Processed” refers to RAP that has been crushed and screened

or otherwise sized such that the maximum recycled material particle size is less than that listed in Table 307.03-3 prior to entering the dryer drum.

⁽³⁾ "Fractionated" refers to RAP that has been processed over more than one screen, producing sources of various maximum particle sizes (e.g., 3/4 to 1/2 inch, 1/2 inch to #4, etc.). The Contractor may use the larger percentages of fractionated RAP specified only if individual fractions of two different maximum particle size are introduced into the plant as separate material sources for increased control.

⁽⁴⁾ RAP for 307-AS must be processed in a manner such that the minimum particle size is no smaller than 3/4" prior to solvent extraction. For RAP containing gravel as coarse aggregate, the maximum allowable RAP content shall be 10%.

2. Recycled Asphalt Shingles (RAS) RAS may be included to a maximum of 3% of the total weight of the mixture.

Subsection 307.03 (pg. 246) 5-15-17; Modify Table 307.03-3:

B. Recycled Asphalt Pavement for Bituminous Plant Mix Base, Table 307.03-3

Table 307.03-3: Mixtures Using RAP

Mix Type	% RAP (Non-processed) ⁽¹⁾	Maximum % RAP (Processed) ⁽²⁾	Maximum % RAP Processed & Fractionated ⁽³⁾	Maximum Particle Size (inches)
307-ACRL	0	00	-	-
307-AS	<u>10</u>	<u>1000</u>	<u>1015</u>	-
307-A	15	20	35	1-1/2
307-B	15	30	35	1-1/2
307-BM	15	30	35	3/4
307-BM2	15	30	35	3/4
307-C	15	30	35	3/8
307-CW	15	30	35	1/2
307-CS	0	15	25	5/16

⁽¹⁾ "Non-processed" refers to RAP that has not been crushed and screened or otherwise sized prior to its use.

⁽²⁾ "Processed" refers to RAP that has been crushed and screened or otherwise sized such that the maximum recycled material particle size is less than that listed in Table 307.03-3 prior to entering the dryer drum.

⁽³⁾ "Fractionated" refers to RAP that has been processed over more than one screen, producing sources of various maximum particle sizes

(e.g., 3/4 to 1/2 inch, 1/2 inch to #4, etc.). The Contractor may use the larger percentages of fractionated RAP specified only if individual fractions of two different maximum particle size are introduced into the plant as separate material sources for increased control.

~~⁽⁴⁾ RAP for 307 AS must be processed in a manner such that the minimum particle size is no smaller than 3/4" prior to solvent extraction. For RAP containing gravel as coarse aggregate, the maximum allowable RAP content shall be 10%.~~

Subsection 307.03 (pg. 250) 6-27-16; C. revise the last paragraph to the following:

“Mix an approved antistrip agent with the asphalt cement at the dosage as specified in **921.06.B.**”

Subsection 307.06 (pg. 250) 12-2-16; add the following as the second paragraph:

“Do not place AS/ACRL which cannot be covered by the next course of pavement within the same construction season.”

Subsection 313.03 (pg. 273) 11-16-15; B. Bituminous Treated Permeable Base, add the following sentence to the end of the paragraph:

“Recycled Asphalt Pavement (RAP) meeting the requirements of 307.03.B may be incorporated into asphalt treated permeable base up to 15% by weight of aggregate. RAP must be processed in a manner such that the minimum particle size is no smaller than 3/4” prior to solvent extraction. Treated permeable base mixtures containing RAP shall contain at least 65% virgin asphalt binder. For RAP containing gravel as a coarse aggregate, the maximum allowable RAP content shall be 10%”

Subsection 313.03 (pg. 273) 5-15-17; B. Bituminous Treated Permeable Base, revise the sentence added on 11-16-15 to the following sentence:

“Recycled Asphalt Pavement (RAP) meeting the requirements of 307.03.B may be incorporated into asphalt treated permeable base up to 105% by weight of aggregate. ~~RAP must be processed in a manner such that the minimum particle size is no smaller than 3/4” prior to solvent extraction.~~ Treated permeable base mixtures containing RAP shall contain at least 65% virgin asphalt binder. For RAP containing gravel as a coarse aggregate, the maximum allowable RAP content shall be 10%.

Mix an approved antistrip agent with the asphalt cement at the dosage as specified in **921.06.B.**”

Subsection 313.10 (pg. 276) 5-15-17; Basis of Payment, add the sentence as the third paragraph:

“The cost of antistrip additive used in Bituminous Plant Mix (Hot Mix) will be included in the price of Treated Permeable Base.”

STATE

(Rev. 5-18-15)

(Rev. 7-13-15)

(Rev. 11-16-15)

(Rev. 6-27-16)

(Rev. 12-2-16)

(Rev. 1-6-17)

(Rev. 5-15-17)**OF****TENNESSEE**

January 1, 2015

Supplemental Specifications - Section 400**of the****Standard Specifications for Road and Bridge Construction****January 1, 2015****Subsection 402.03** (pg. 282) 5-27-16; revise 0.2 to 0.05 in the range as shown in the 2nd paragraph:

“The distributor shall be designed, equipped, maintained, and operated so that bituminous material at even heat may be applied uniformly on variable surface widths at readily determined and controlled rates from 0.05 to 0.5 gallons per square yard, with uniform pressure, and with an allowable variation from any specified rate of plus or minus 0.02 gallons per square yard.”

Subsection 403.02 (pg. 285-286) 12-2-16; Bituminous Materials, remove trackless tack information from specifications and reference the QPL for approved Emulsified Trackless Tacks, remove trackless tacks from Table 403.02-1:

“Emulsified Asphalt, SS-1, SS-1h, CSS-1, CSS-1h, TST-1P, CQS-1h, CQS-1hp.....904.03 or Approved Emulsified Trackless Tack from the QPL.

Table 403.02-1: Tack Coat Application Temperatures

Material	Temperature Range
SS-1, SS-1h, CSS-1, TST-1P, CQS-1h, CQS-1hp and CSS-1h	60 to 140 °F

Subsection 403.02 (pg. 285-286) 11-16-15; Bituminous Materials, update the reference to 904.03, add TTT-3 to Table 403.02-1:

“Emulsified Asphalt, SS-1, SS-1h, CSS-1, CSS-1h, TST-1P, CQS-1h, CQS-1hp, TTT-1, TTT-2, TTT-3904.03”

Table 403.02-1: Tack Coat Application Temperatures

Material	Temperature Range
SS-1, SS-1h, CSS-1, TST-1P, CQS-1h, CQS-1hp and CSS-1h	60 to 140 °F
TTT-1	160 to 180 °F
TTT-2	120 to 160 °F
TTT-3	100 to 180 °F

Subsection 403.05 (pg. 286) 11-16-15; A. Emulsified Asphalt, Add the following paragraph at the end of the subsection:

“Take a minimum of 3 cores throughout the length of the project for informational tack coat shear testing. Include the underlying layer. Not required for mats less than one inch thick.”

Subsection 403.05 (pg. 287) 11-16-15;) B. Test Strip, modify the 2nd paragraph to update the rate as 0.08 and 0.12:

“If placing the bituminous material upon a milled surface, apply the tack material at a rate of between 0.08 and 0.12 gallons of applied emulsion per square yard.”

Subsection 403.05 (pg. 287) 6-27-16; revise the last sentence of the 2nd paragraph:

“If placing the bituminous material upon a milled surface, apply the tack material at a rate of between 0.08 and 0.12 gallons applied emulsion per square yard.”

Subsection 404 (pg. 289-293) 1-6-17; Remove the entire subsection. All specifications regarding Double Bituminous Surface Treatment has been incorporated into subsection 405. All references shall be updated to subsection 405.

Subsection 405 (pg. 294-298) 1-6-17; replace subsection 405 with the following:

“405.01 Description

This work consists of constructing a bituminous seal coat consisting of one or more applications each of bituminous material and cover aggregate.

MATERIALS

405.02 Materials

Provide materials as specified in:

Mineral Aggregate, Size Nos. 7, 8, 78, 89.....	903.13
Mineral Aggregate.....	903.14
Emulsified Asphalt, CRS-2p	904.03

Apply seal coat at a temperature range of 60 to 140 °F.

EQUIPMENT

405.03 Equipment

Provide a power broom or other mechanical sweeping equipment, equipment for heating bituminous material, a pressure distributor meeting the requirements of 402.03, pneumatic-tire and steel-wheel rollers, self-propelled mechanical aggregate spreading equipment that can be adjusted so as to spread accurately at the specified rate, and such other equipment and small tools as may be required to perform the work in a satisfactory manner.

CONSTRUCTION REQUIREMENTS

405.04 Limitations

Only apply bituminous material:

1. When the designated surface is dry, firm, and properly cured;
2. Between April 15 and October 1; and, unless otherwise directed,
3. When the ambient temperature in the shade and away from artificial heat is 70°F or more.

405.05 Preparing the Designated Surface

Before placing seal coat, clean all surfaces to be sealed by sweeping with a motorized broom to remove any loose material. Clean depressions and cracks not reached by the power broom using hand brooms or pressurized air.

Cover any utility installations to prevent adherence of the bituminous mixture. Suitable covering includes plywood disks, sand, craft paper, roofing felt or other approved methods. Remove the protective coverings before opening the road to traffic. The cost for these adjustments shall be included in the bid price for other items.

The Plans will indicate whether the surface is to be constructed on a treated or untreated subbase, a granular base, an asphalt base, or on an existing surface. The surface of the base or sub-base upon which the construction is to be placed shall meet the requirements of the applicable Section of Part 3, Bases and Subgrade Treatments, of these Specifications.

Condition existing surface, if called for on the Plans, as specified in 407.10. Condition existing mineral aggregate base as specified in 310.

Construct and maintain Prime Coat or Tack Coat, if shown on the Plans, as specified in 402 or 403, respectively.

405.06 Application

A. Applying Bituminous Material:

Have all equipment calibrated prior to starting work. The TDOT inspector shall be present during calibration to determine aggregate spread rate and distributor rates. Distributor trucks shall have proper calibration of spray equipment. Spray nozzles should be clean, properly angled, and appropriately sized for the desired application rate. Stop work if the distributor is not applying material properly, such as gaps in application or streaking.

Place a 500 ft. test strip for the bituminous seal coat at the beginning of the project to assure proper coverage and proper equipment calibration. The test section is to verify break time of emulsion and chip retention. The test strip shall be able to carry normal traffic within 3 hours. If normal traffic cannot be carried, the emulsion shall be adjusted and another test strip is required.

At least 14 working days before the scheduled start of construction of any bituminous seal coat, submit a sample of aggregate intended for use for the determination of the appropriate application rates of bituminous material and aggregate. Apply emulsified asphalt by pressure distributor at a uniform rate in accordance with Table 405.06-1 below. The exact rate will be established by the Engineer.

Table 405.06-1: Application Rates for Bituminous Material

Aggregate Size (per 903.22)	Aggregate Spread Rate (lb/yd ²)	Emulsion Shot Rate (gal/yd ²)
7	25 – 30	0.30 – 0.45
78	22 – 28	0.28 – 0.38
8	20 – 25	0.20 – 0.35
89	17 – 23	0.17 – 0.28

Before beginning each spread, place building paper across the roadway surface with the forward edge exactly coinciding with the end of the preceding covered spread. Start distributors on the paper, the width of which shall allow the full force of all nozzles to be in effect before the forward edge of the paper is reached. If required by the Engineer, also stop the spread on building paper. Remove the paper immediately after its use, and dispose of properly. Immediately correct all defects in application.

The length of spread of bituminous material shall not exceed that which trucks loaded with cover material can immediately cover.

The spread of bituminous material shall not extend more than 6 inches wider than the width covered by the cover material. Do not allow the bituminous material to chill or otherwise impair retention of the cover material.

Do not allow traffic on the bituminous material until it has been covered with mineral aggregate.

Treat areas that are inaccessible to the distributor with either hand sprays or pouring pots as directed by the Engineer.

B. Application of Double Bituminous Surface Treatment:**First Application**

Apply the first application of emulsified asphalt using pressure distributors at a uniform rate established by the Engineer within the range of 0.30 to 0.38 gallons per square yard. Apply each spread of bituminous material so as not to be more than 6 inches wider than the width covered by the immediate spread of cover aggregate. Each width of spread shall not be less than half the surface to be treated.

Before beginning each spread, place building paper across the roadway surface with the forward edge exactly coinciding with the end of the preceding covered spread. Start distributors on the paper, the width of which shall allow the full force of all nozzles to be in effect before the forward edge of the paper is reached. If required by the Engineer, also stop the spread on building paper. Remove the paper immediately after its use, and dispose of properly. Immediately correct all defects in application.

Treat areas that are inaccessible to the distributor with hand sprays or pouring pots as directed by the Engineer.

If treating less than the full width of the roadway, do not spread the aggregate on the inside 6 inches of either the first or second application until the adjacent lane has been treated. Immediately following each application, uniformly cover the applied bituminous material with Size No. 7 mineral aggregate that is reasonably free of surface moisture.

Spread the aggregate at a rate between 24 and 30 pounds per square yard, as established by the Engineer, using a self-propelled mechanical spreader; except on short projects of 1/2 mile in length or less, self-propelled mechanical spreading equipment will not be required. Back the truck on the aggregate being spread, without driving on or over uncovered bituminous material.

The length of bituminous material spread shall not exceed that which trucks loaded with cover material can immediately cover.

Second Application

Apply the second application of emulsified asphalt in the same manner as the first application, at a uniform rate established by the Engineer within the range of 0.20 and 0.35 gallons per square yard.

Spread mineral aggregate, Size No. 8, in the same manner as the first spread at a rate established by the Engineer within the range of 16 to 28 pounds per square yard.

Immediately after each spread of cover aggregate, broom to achieve uniform coverage. Use a power source, which is independent of the drive train that propels the equipment, to power the revolving brooms of mechanical sweeping equipment. Place additional aggregate by hand on thin or bare areas.

405.07 Spreading and Rolling Aggregate**A. Spreading**

Immediately after bituminous material has been applied, no more than two minutes, spread and embed the mineral aggregate cover in the bituminous material. Spread the aggregate as close to the

application of bituminous material as is practicable, and cover each distributor load applied immediately. Aggregates shall be moistened and visually damp at the time of placement.

Spread the aggregate in accordance with the rates specified in Table 405.06-1. The exact rate will be established by the Engineer. Back the truck on the aggregate being spread, without driving on or over uncovered bituminous material. If treating less than the full width of roadway, do not spread the aggregate on the inside 6 inches of the bituminous spread until the adjacent lane is treated. Immediately after spreading the aggregate, perform hand-brooming to achieve uniform coverage. Place additional aggregate by hand on thin or bare areas.

The speed of the spreader shall be such that the aggregates are not rolling over, and starting and stopping of the spreader is minimized. Use of previously used (swept) aggregates is not permitted.

B. Rolling – Bituminous Seal Coat

Immediately after distributing the aggregate, roll the entire surface by moving in a longitudinal direction, beginning at the outer edges and progressing toward the center of the roadway, with each trip of the roller overlapping the previous trip by half the width of the rear wheel. Perform initial rolling with a self-propelled pneumatic tire roller, and follow with steel-wheel rolling. The amount and sequence of rolling shall be as directed by the Engineer. Complete the initial rolling of the aggregate within 1 hour after applying the bituminous material.

Use power brooms to correct irregularities by sweeping the aggregates from areas of thick or heavy distribution to areas of thin or light distribution. Then continue rolling using both steel-wheel and pneumatic rollers until the aggregate is thoroughly embedded in the bituminous material. The Engineer may require additional rolling at a later date. Redistribute excess or loose aggregate that was thrown out of place.

Slow moving traffic may use the section or roadway upon which the aggregate has been spread.

Rolling and Curing – Double Bituminous Seal Coat

Immediately after spreading and brooming the cover aggregate, roll the entire surface, beginning at the edges and progressing to the center. Begin rolling within 30 minutes after spreading the aggregate. Perform initial rolling with a self-propelled pneumatic tire roller, and follow with steel-wheel rolling. The amount and sequence of rolling shall be as directed by the Engineer.

Allow the first application of bituminous material and aggregate to cure for as long as deemed necessary by the Engineer before beginning the second application. Immediately before the second application of bituminous material, roll the surface with a steel-wheel roller.

For the second application of bituminous material and cover aggregate, repeat the same rolling and curing procedures as required for the first application.

The Contractor may allow slow-moving traffic to use sections of the roadway where the bituminous material has been covered with mineral aggregate.

405.08 Shoulders

Restore shoulders that have been disturbed by the Contractor's construction operations at no cost to the Department. Remove all objectionable material placed on the shoulders by the Contractor as directed by the Engineer.

Construct shoulders, when specified, as provided for under **208**.

405.09 Maintenance and Protection

Maintain in a satisfactory condition each completed section of seal coat until the entire Project is complete. Maintenance shall include making repairs where failures occur, and maintaining the seal coat in a smooth uniform condition; and brooming, dragging, and rolling when required.

After the final application, maintain the work in a satisfactory condition for at least 10 calendar days. If all other requirements of the Contract have been fulfilled, the Department will not charge working time during the 10-day maintenance period against the Contract time.

For final cleanup, sweep up all excessive quantities of loose, dislodged cover aggregate that may have collected along the edge of the completed seal coat, and dispose of this material as directed by the Engineer.

405.10 Method of Measurement

The Department will measure Mineral Aggregate and Bituminous Material by the ton in accordance with **109**. The Department may use net certified weights as a basis of measurement for mineral aggregate, subject to correction for aggregate that is lost, wasted, or otherwise not incorporated into the Work.

405.11 Basis of Payment

The Department will pay for accepted quantities of Bituminous Seal Coat, complete in place, at the contract prices as follows:

<i>Item</i>	<i>Pay Unit</i>
Bituminous Material	Ton
Mineral Aggregate	Ton

The Department will measure and pay for the work required to prepare the designated surface, as provided for under **405.05**, in accordance with the applicable Section or Subsection under which the work is performed."

Subsection 407.02 (pg. 300-301) 12-2-16; Replace the 4th paragraph:

"If anti-stripping additive, other than hydrated lime, meeting 921.06.B.1 is required, use approved in-line blending equipment, as specified in 407.04.A.6, to add it at the mixing plant or inject it at the asphalt terminal. Manufacture's documentation that asphalt binders will continue to meet requirements listed in subsection **904** after the anti-stripping additive is added shall be provided

by the contractor with the mix design submittal. For mix designs submitted more than six months in advance, the documentation shall be resubmitted prior to use of the mix design with updated test results.”

Subsection 407.02 (pg. 300) 11-16-15; Materials, add the following at the end of the fourth paragraph:

“If anti-stripping additive, other than hydrated lime, meeting **921.06.B.1** is required, use approved in-line blending equipment, as specified in **407.04.A.6**, to add it at the mixing plant or inject it at the asphalt terminal. Provide manufacture’s documentation ensuring asphalt binders will continue to meet requirements listed in Subsection **904** after anti-stripping additives are added.”

Subsection 407.06 (pg. 327), 5-18-15; - A. Pavers. Replace the entire first paragraph with the following:

“Bituminous pavers shall be self-contained, power-propelled units provided with an activated screed, equipped to be heated, and capable of spreading and finishing courses of bituminous plant mix material in lane widths applicable to the specified typical section and thickness shown on the Plans. All screed extensions shall be full assembly extensions, including activated and heated screeds. Pavers shall include throw-back blades, reverse augers, or equivalent to place mix beneath the auger gearbox. Auger extensions shall be incorporated in a manner such that the maximum distance from the augers to the end plate shall be 18 inches. Screed extensions may extend beyond the 18-inch maximum from auger extensions only when extending for short-term temporary deviations in pavement width such as driveways. Do not use strike-off boxes, with the exception of sections with continuously varying width.”

Subsection 407.11 (pg. 332) 12-2-16; Add the following to the paragraph below Table 407.11-1:

“Minimum temperature for OGFC mixes shall be 280°.”

Subsection 407.15, C. Test Strips. (pg. 340-341) 11-16-15; Add the following paragraph after the 7th paragraph of the subsection:

“Take an additional 3 cores after placement of the surface layer on the tack coat test strip described in subsection **403.05.B**. Include the underlying pavement layer for shear testing. These cores will be for informational testing only. Not required for mats less than one inch thick”

Subsection 407.15 (pg. 341) 6-27-16; remove the 2nd sentence of the 8th paragraph:

“Take cores on the test strip at ten randomly selected locations as designated by the Engineer. Provide these cores to the Department for use in calibrating the nuclear gauge and to verify that the average density of the test strip meets the density requirements of the specifications. The Department will report all densities using the corrected nuclear gauge readings. Correction factors are specific to the nuclear gauges used during the test strip construction. If a different nuclear gauge needs to be used for acceptance, it will be necessary to cut new cores from the ongoing pavement construction to calibrate the new gauge.”

Subsection 407.15 (pg. 341) 12-2-16; remove “randomly selected” from 1st sentence of the 8th paragraph as follows:

“Take cores on the test strip at ten locations as designated by the Engineer.”

Subsection 407.15 A. 3. c. (pg. 337-338) 5-15-17; update 10,000 square yards to 1,000 tons:

“c. Projects containing less than 1,000 tons ~~10,000-square-yards~~ or bituminous pavement.”

Subsection 407.20 (pg. 346) 5-18-15; Basis of Payment; B. Acceptance of Mixture; Modify the last paragraph to revise 500 tons to 1000 tons:

“When the total plan quantity of any mix is less than 1000 tons, the Department will accept the mix on the basis of visual inspection and Contractor Quality Control certification. The Department may run extraction, gradation analysis, or other tests deemed necessary for acceptance purposes.”

Subsection 407.20 (pg. 348) 11-16-15; Table 407.20 – 2, make the following changes:

**Table 407.20-2: Acceptance Schedule of Payment
(Asphalt Plant Mix Characteristics)**

Characteristics	Pay Factor	Average Arithmetic Deviation of the Lot Acceptance Test from the JMF	
		1 Test	2 Tests or more
Asphalt Cement Content ⁽¹⁾ (Extraction or ignition oven)	1.00	0.00-0.30	0.00-0.25
	0.95	0.31-0.35	0.26-0.30
	0.90	0.36-0.40	0.31-0.35
	0.80 ⁽²⁾	over 0.40	over 0.35
Gradation 3/8 inch sieve and larger	1.00	0.00-6.50	0.00-5.70
	0.95	6.51-7.08	5.71-6.20
	0.90	7.09-7.66	6.21-6.69
	0.80 ⁽²⁾	over 7.66	over 6.69
Gradation No. 4 sieve ⁽³⁾	1.00	0.00-4.62	0.00-4.00
	0.95	4.63-5.20	4.01-4.50
	0.90	5.21-5.77	4.51-5.00
	0.80 ⁽²⁾	over 5.77	over 5.00

Subsection 407.20 (pg. 350) 11-16-15; B. 5. Acceptance for Mix Density on the Roadway, Replace the entire 2nd paragraph with the following:

“For density testing purposes, the Department will divide the pavement into lots of 1,000 tons. Five density tests will be performed in each lot and the average results compared with the requirements specified in Tables 407.15-1 to 407.15-4. At the beginning of a project or at any time it is deemed advisable, the Department may consider smaller lots to evaluate compaction methods or for other reasons as approved or directed by the Engineer.”

Subsection 411.03 (pg. 363) 11-16-15; 2. Recycled Asphalt Shingles (RAS), change 5% to 3% in the 1st sentence of the 1st paragraph.

“Recycled Asphalt Shingles (RAS) may be included to a maximum of 3% of the total weight of mixture.”

Subsection 411.03 B. Anti-strip Additive (pg. 365) 6-27-16; revise the 2nd paragraph:

“Mix an approved anti-strip agent with the asphalt cement at the dosage as specified in **921.06.B.**”

Subsection 414.02 (pg. 369) 11-16-15; Materials, add the following paragraph to the end of the subsection:

“Ensure that no deleterious material is introduced into aggregate stockpiled at project site.”

S T A T E

(Rev. 5-18-15)

(Rev. 11-16-15)

(Rev. 5-15-17)**O F****T E N N E S S E E**

January 1, 2015

Supplemental Specifications - Section 500**of the****Standard Specifications for Road and Bridge Construction****January 1, 2015**

Subsection 501.03 (pg. 395), 5-18-15; 3. Mix Design Submittal, Replace the first paragraph with the following:

“Instead of the above mix design submittal, a request to use an existing design may be submitted for approval provided the design has been used on a state funded project within the last six (6) months. The approval of this concrete design submittal will not relieve the Contractor of the responsibility of providing concrete meeting the requirements of these Specifications. A temporary mix design may be issued if the 7-day or 14-day compressive strengths exceed the required 28-day strengths.”

Subsection 501.03 A. Proportioning (pg. 395) 5-15-17; Add water as 22. on the list of Design Submittal requirements, update the paragraph below the list to add water requirements:

“A. Proportioning

3. Design Submittal. Include the following information as a minimum in the proposed concrete design submittal:

1. Source of all aggregate
2. Brand and type of cement
3. Source and class of fly ash (if used)
4. Source and grade of ground granulated blast furnace slag (if used)
5. Specific gravity of cement
6. Specific gravity of fly ash (if used)
7. Specific gravity of ground granulated blast furnace slag (if used)
8. Admixtures (if used)
9. Gradation of aggregates
10. Specific gravities of aggregates (saturated surface dry)
11. Air content (if air entrainment is used)
12. Percentage of fine aggregate of the total aggregate (by volume)
13. Slump
14. Weight per cubic yard

15. Yield
16. Temperature of plastic concrete
17. Water/cement ratio (pound/pound)
18. 7-day compressive strength [minimum of two 4-inch x 8-inch cylinders]
19. 14-day compressive strength [minimum of two 4-inch x 8-inch cylinders]
20. 28-day compressive strength [minimum of two 4-inch x 8-inch cylinders]
21. Weight of each material required to produce a cubic yard of concrete
22. Water – submit testing results per Tables 921.01-1 & 921.01-2

Instead of the above mix design submittal, a request to use an existing design may be submitted for approval provided the design has been used on a state funded project within the last six (6) months. When submitting for the use of an existing mix design, the most current water testing results per 921.01 shall accompany the submittal. The approval of this concrete design submittal will not relieve the Contractor of the responsibility of providing concrete meeting the requirements of these Specifications. A temporary mix design may be issued if the 7-day or 14-day compressive strengths exceed the required 28-day strengths.”

Subsection 501.03 (pg. 399-402) 11-16-15; B. Quality Control and Acceptance of Concrete, adjust the following:

“1. Test to determine aggregate gradations (AASHTO T 27 with AASHTO T 11 when required). Conduct a combined belt gradation before work starts and at least daily to verify consistency if using a dynamic, multi-aggregate feed system.

3. Calibrate the weighing systems, aggregate feed flow rate and weigh bridges, water meters, and admixture dispensing systems before starting production.

4. Ensure accurate weighing or flow rate of the aggregates and cement, the proper metering of water and admixtures, and the quality of water.

6. Adjust mix proportions due to actual moisture content of both coarse and fine aggregates, with moisture content determined according to AASHTO T 255. If using a dynamic aggregate weighing system, multi-aggregate proportioning adjustments are to be made by using an in-bin moisture sensor.”

7. Conduct slump (AASHTO T119) or slump flow (ASTM C1611) and air tests (AASHTO T152).

Page 401- “Make, cure, and transport all early break cylinders (7-14 day, etc.) according to AASHTO T 23, and deliver to the Regional laboratory or other established satellite laboratories for testing. Make all early break cylinders (7-14 day, etc.) for self-consolidating concrete according to ASTM C1758, and deliver to the Regional laboratory or other established satellite laboratories for testing.”

Page 402 - “Correct batch weights or aggregate feed flow rates to compensate for surface moisture on the aggregate at the time of use. The Contractor...”

Subsection 501.04 (pg. 402) 11-16-15; replace the following:

“A. Batching Plant, Multi-Aggregate Feed System, and Equipment,

1. General. The batching plant shall include bins, weighing hoppers or belt feeds with weigh bridges and load cells, and scales. If using cement in bulk,...

2. Bins and Hoppers- Add the following new paragraph under the existing paragraph

For multi-aggregate feed systems, provide bins as noted with variable size openings and variable speed belts. Each bin must have a calibrated moisture sensor to adjust aggregate feed flow rates. Assure consistent, uninterrupted aggregate flow and consistent belt speeds once aggregate feed system is calibrated.

3. Scales- Add the following new paragraph under the last paragraph in the section.

For multi-aggregate feed systems, provide a dual idler weight bridge with load cells to accurately weigh the actual aggregate flow rate.”

Subsection 501.04 (pg. 404) 11-16-15; B. Mixers, removed the complete 4th paragraph.

Subsection 501.12 – Placing Concrete (pg. 413-415) 5-15-17; replace the subsection:

“501.12 Placing Concrete

Either unload the concrete into an approved spreading device, or deposit it directly on the base, and mechanically spread the concrete in a manner that prevents segregation of the materials. When using central or transit mixed concrete, deposit it in an approved spreader. Place the mixture so as to minimize rehandling and relocation from point of placement. The mechanical spreader will not be required on areas too small to accommodate the paving equipment, projects that contain 10,000 square yards or less of concrete paving, and on variable width sections and ramps. Placing shall be continuous between transverse joints without the use of intermediate bulkheads. Do not place concrete on frozen grade.

Perform any necessary hand spreading with shovels or other approved tools. Do not allow workmen to walk in the freshly mixed concrete with boots or shoes coated with earth or other foreign substances.

If placing concrete adjacent to a previously constructed lane of pavement and mechanical equipment is to be operated on this existing lane of pavement, that lane shall meet the requirements for opening to traffic specified in **501.22**. If the existing lane is to only carry finishing equipment, the Contractor may begin paving the adjoining lanes after 7 days.

Deposit concrete as near to expansion and contraction joints as possible without disturbing them; do not dump concrete from the discharge bucket or hopper onto a joint assembly unless the hopper is well centered on the joint assembly.

Immediately remove all concrete materials that may fall on or be worked into the surface of a completed slab using approved methods.

When using the slip-form method of concrete paving, place the concrete with an approved slip-form paver meeting the requirements of **501.04.D.11**.

Ensure that the sliding forms are rigidly held together laterally to prevent spreading of the forms. The forms shall trail behind the paver for such a distance that no appreciable slumping of the concrete will occur and so that necessary finishing can be accomplished while the concrete is still within the forms. Before the concrete has hardened, correct any edge slump of the pavement, exclusive of edge rounding, in excess of 1/4 inch.

Operate the slip-form paver with as nearly a continuous forward movement as possible, and coordinate all operations of mixing, delivering, and spreading of concrete so as to provide uniform progress while minimizing the stopping and starting of the paver. If, for any reason, it is necessary to stop the forward movement of the paver, also immediately stop the vibratory and tamping elements. Apply no tractive force to the machine, other than that which is controlled from the machine. Replace slabs with random cracks before completion of paving operations.

Contractor may choose to utilize a single lift or two lift paving process according to the following requirements.

A. Single Lift Pavement

Use vibrators to thoroughly consolidate the concrete against and along the faces of all forms and along the full length and on both sides of all joint assemblies. Do not allow vibrators to come in contact with a joint assembly, the grade, or a side form. Do not operate the vibrator for longer than 5 seconds in any one location.

The Contractor may only use hand-operated vibrators on projects containing 10,000 square yards or less of concrete paving and on variable width sections. Only operate vibrators mounted on a machine while the machine is in motion.

Equip the slip-form paver with vibrators meeting the applicable requirements of **501.04.D.1** to vibrate the concrete for the full width and depth of the strip of pavement being placed.

B. Two Lift Composite Pavement

When placing two lift composite pavements, the upper lift shall be of a lesser thickness as designated by contract design. It shall be placed such that the result is a wet-on-wet application. The lower lift will be one foot less in width than the upper lift.

Paving operations shall be adjusted and approved by the Engineer as necessary to assure a wet-on-wet monolithic pavement section. If the bonding between lifts or the consolidation of concrete is determined to be unsuitable by the Engineer, the lower lift shall be removed and replaced prior to the upper lift placement.

1. Lower Lift. Uniformly spread concrete with a spreader or slipform machine. Internal vibration will be required for the lower lift. Tie bars and dowel bars (with the use of dowel baskets) shall be placed in the lower lift at mid-depth of the finished concrete pavement thickness. The lower lift shall not require curing, texturing, or sawing before the upper lift is placed. The lower lift shall be struck off to provide a nominal lower lift thickness that complies with the pavement design. The upper lift shall be struck off to allow for the finished total pavement to conform to the cross section shown in the contract plans.

2. Upper Lift. Place the upper lift within 45 minutes following the placement of the lower lift. Placement of the upper lift shall be such that intermingling of the two concrete mixtures is minimal. External vibration for the upper lift will be allowed if proper consolidation and finishing can be demonstrated in accordance with **501.16**. Dowel bars can be inserted during the placement of the upper

lift. Cure the upper lift only in accordance with 501.18. At no time shall the total thickness be less than shown on the pavement design and the cross section shown in the contract plans.

Frequency of the vibrators shall be established based on the workability of the concrete mixture and past experiences. Electronic, internal, T-shaped, poker vibrators shall be used. Other types of vibrating equipment may be approved by the Engineer. Vibrator impulses shall be delivered directly to the concrete and the intensity of vibration shall be sufficient to consolidate the concrete thoroughly and uniformly throughout the depth and width of the lift. Increase in the speed of the vibrators will be allowed with the permission of the Engineer.

A paving plan shall be supplied to the Engineer for review and approval prior to pouring. The plan shall document procedures to ensure consistency of material properties during concrete placement and finishing, identify and eliminate potential for load misidentification, and maintain speed of production and paving. Concrete for each lift shall be produced from the same ready-mix facility.”

Subsection 501.17 (pg. 424) 11-16-15; A. Surface Testing, modify the following:

- “3. Ramps where the design speed is greater than 40 miles per hour
 (a) Test sections shall terminate 100 feet from a stop or slow speed yield condition
 (b) Superelevated sections greater than 40 miles per hour design speed must be ground in accordance with **Table 501.17-1**
 4. Ramps where the design speed is 40 miles per hour or less
 (a) Test sections shall terminate 100 feet from a stop or slow speed yield condition
 (a) Superelevated sections with a design speed of 40 miles per hour or less must be ground in accordance with **Table 501.17-2**

Subsection 501.17 (pg. 425) 11-16-15; B. Pay Factors and Required Corrective Action, modify the following:

“Payment factors and required corrective actions relative to profile indexes for ramps with design speeds of 40 MPH or less shall conform to Table 501.17-2.

Table 501.17-2: Pay Factors & Corrective Action for Ramps with Design Speeds of 40 mph or less

Profile Indexes	Pay Factor	Corrective Action
<10 inches per mile	105%	None
10 to < 20 inches per mile	100%	None
20 to < 23 inches per mile	98%	Grind to 20 inches per mile
23 plus inches per mile	95%	Grind to 20 inches per mile

Subsection 501.26 – Basis of Payment (pg. 434) 5-15-17; add the following sentence to the 7th paragraph of the subsection:

“The Department will pay for additional concrete, measured in accordance with **501.25**, at the purchase price, F.O.B. the unloading point, as verified by invoices, with no compensation allowed for further handling. The State will be reimbursed from monies due the Contractor for a decrease in concrete measured in accordance with **501.25** in an amount equal to the purchase price of the cement, F.O.B. the

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unloading point. No payment will be allowed for any changes in the proportions of the aggregates. No additional payment will be made if two-lift composite pavement alternate is selected.

S T A T E**O F****T E N N E S S E E**

(Rev. 5-18-15)

(Rev. 11-16-15)

(Rev. 6-27-16)

(Rev. 12-2-16)

(Rev. 5-15-17)

January 1, 2015

Supplemental Specifications - Section 600**of the****Standard Specifications for Road and Bridge Construction****January 1, 2015**

Subsection 602.17 (pg.459-477), 12-2-16; Entire Subsection: Replace all references to AASHTO M164 and AASHTO M253 with ASTM F3125, Grade A325 and A490

Subsection 602.17 (pg. 459) 12-2-16; modify the first paragraph of A.:

“All high strength bolts, or equivalent fasteners, tightened to a high tension shall be coated with permitted coatings in accordance with ASTM F3125 for their respective grade. Use the bolts in holes conforming to 602.06, 602.07, and 602.08. All Grade A325 and A490 bolts, except Type 3 bolts used in weathering steel, shall be coated. Permitted coatings for Grade A325 and Grade A490 bolts are listed in ASTM F3125, Annex A1.”

Subsection 602.17 (pg. 465–469), 12-2-16; Update Tables:

Table 602.17-1: Minimum Bolt Tension ⁽¹⁾

Bolt Diameter (inches)	Bolt Tension (pounds)	
	(GradeA325)	GradeA490 Bolts
½	12,000	15,000
5/8	19,000	24,000
¾	28,000	35,000
7/8	39,000	49,000
1	51,000	64,000
1-1/8	64,000	80,000
1-1/4	81,000	102,000
1-3/8	97,000	121,000
1-1/2	118,000	148,000

⁽¹⁾ Equal to 70% of the specified minimum tensile strength of bolts.

Bolt Diameter (inches)	Grade A325 Snug Tension (kips)	Grade A490 Snug Tension (kips)
1/2	1	1
5/8	2	2
3/4	3	4
7/8	4	5
1	5	6
1-1/8	6	8
1-1/4	8	10
1-3/8	10	12
1-1/2	12	15

Table 602.17-3: Minimum Installation Tension

Bolt Diameter (inches)	Grade A325 Tension (kips)	Grade A490 Tension (kips)
1/2	12	15
5/8	19	24
3/4	28	35
7/8	39	49
1	51	64
1-1/8	64	80
1-1/4	81	102
1-3/8	97	121
1-1/2	118	148

Table 602.17-4: Rotation from Snug Condition

Bolt Length (measured in Step 1)	Grade A325 Required Rotation	Grade A490 Required Rotation
Up to and including 4 diameters	2/3	2/3
Over 4 diameters, but not exceeding 8 diameters	1	5/6
Over 8 diameters to 12 diameters	1-1/6	1

Table 602.17-5: Turn Test Tension

Bolt Diameter (inches)	Grade A325 Tension (kips)	Grade A490 Tension (kips)
1/2	14	17
5/8	22	28
3/4	32	40
7/8	45	56
1	59	74
1-1/8	74	92
1-1/4	94	117
1-3/8	112	139
1-1/2	136	170

Table 602.17-6

Bolt Length (measured in Step 1)	Required Rotation (All Grades)
Up to and including 4 diameters	1/3
Over 4 diameters, but not exceeding 8 diameters	1/2

Table 602.17-7

Bolt Diameter (inches)	Grade A325 Torque (ft-lbs)	Grade A490 Torque (ft-lbs)
1/2	150	180
5/8	290	370
3/4	500	630
7/8	820	1020
1	1,230	1540
1-1/8	1,730	2160
1-1/4	2,450	3050
1-3/8	3,210	3980
1-1/2	4,250	5310

Table 602.17-8

Bolt Length (measured in Step 1)	Additional Required Rotation Grade A325	Additional Required Rotation Grade A490
Up to and including 4 diameters	1/3	1/4
Over 4 diameters, but not exceeding 8 diameters	1/2	1/3

Table 602.17-9: DTI Requirements for A325 Bolts

Bolt Diameter (inches)	Verification Tension (kips)	Maximum Verification Refusals	DTI Spaces	Minimum Installation Refusals
1/2	13	1	4	2
5/8	20	1	4	2
3/4	29	2	5	3
7/8	41	2	5	3
1	54	2	6	3
1-1/8	67	2	6	3
1-1/4	85	3	7	4
1-3/8	102	3	7	4
1-1/2	124	3	8	4

Table 602.17-11

Bolt Diameter (inches)	Bolt Tension (kips)	
	AASHTO M 164 Bolts (ASTM A325)	ASTM A490 Bolts
1/2	13	16
5/8	20	25
3/4	29	37
7/8	41	51
1	54	67
1-1/8	67	84
1-1/4	85	107
1-3/8	102	127
1-1/2	124	155

Table 602.17-12

Bolt Diameter (inches)	Number of Spaces	
	Bolts (Grade A325)	Grade A490 Bolts
1/2	4	N/A
5/8	4	N/A
3/4	5	6
7/8	5	6
1	6	7
1-1/8	6	7
1-1/4	7	8
1-3/8	7	8
1-1/2	8	N/A

Subsection 602.19 (pg. 478), 6-27-16; add the following as the 2nd paragraph:

“All welders shall be qualified in accordance with the AASHTO/AWS D1.5, Bridge Welding Code, current edition. Welders shall be certified for each weld process and position which they will be using.”

Subsection 602.39 (pg.488), 6-27-16; revise the title as follows:

“CONSTRUCTION REQUIREMENTS – ERECTION – REMOVAL”

Subsection 602.42 (pg.489), 6-27-16; revise as follows:

“All contractors and subcontractors directly engaged in the erection or removal of structural steel, precast prestressed or mild steel reinforced concrete bridge beams or girders over active highway traffic lanes, on any route, railroad or any stream deemed navigable to commercial or pleasure water craft, shall submit an erection or removal plan prepared and stamped by a Professional Engineer licensed in the State of Tennessee. Include the following in these plans: the sequences of erection or removal, the generalized location of all pick points, and the plan to adequately stabilize the structure throughout the erection or removal process. Submit this plan to the Engineer at least 30 days before starting erection. At each stopping point in the erection or removal sequence, have a competent contractor’s representative inspect the beams to ensure adequate stability.

Do not begin any erection or removal work without the Engineer’s approval. The Engineer’s approval does not relieve the Contractor of the responsibility for the safety of its method or equipment or from carrying out the work in accordance with the Plans and Specifications.”

Subsection 604.02 (pg. 519), 11-16-15; C. 2nd paragraph, 1st sentence:

“Prior to construction, submit for approval shop drawings of the proposed precast structure and design calculations for any details which deviate from the standard box culvert drawings.”

Subsection 604.02 (pg. 517-518), 5-15-17; A. General, add Class DS Concrete to the index:

604.02 Materials

A. General

Provide materials as specified in:

Hydraulic cement ¹	901.01
Fine Aggregate, (all Classes of concrete).....	903.01
Coarse Aggregate	
For Class A Concrete: Size No. 57	903.03
For Class D Concrete: Size No. 57	903.03
For Class DS Concrete: Size No. 57	903.03
For Class L Concrete.....	903.19
Joint Filler, Preformed Type	905.01
Steel Bar Reinforcement	907.01
Welded Steel Wire Fabric	907.03
Structural Steel.....	908.01
Permanent Steel Bridge Deck Forms	908.03
Steel Castings.....	908.05
Gray Iron Castings	908.07
Bronze Bearing Plates, Plain.....	908.09
Bronze Bearing Plates, Self-Lubricating.....	908.10

¹Use Type I, Type IL, or Type IS unless otherwise specified or permitted, or Type I or Type IL cement with either fly ash and/or ground granulated blast furnace slag as a partial cement replacement unless otherwise specified or permitted. When using Type I or Type IL cement with either fly ash and/or ground granulated blast furnace slag as a partial cement replacement, comply with the requirements of **604.03**.

Subsection 604.03 (pg. 520-521), 5-15-17; Table 604.03-1: Composition of Various Classes of Concrete and Table 604.03-2: Use of Chemical Admixtures, Add class DS to the Tables, revise footnotes 2 and 3 of Table 604.03-1 and the note below Table 604.03-3; Update Table 604.03-4: Composition of Self-Consolidating Concrete and Table 604.03-5: Use of Chemical Admixtures to add SH-SCC, update :

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 \pm production tolerance)	Slump (inches)
A	3,000	564	0.45	6 \pm 2	3 \pm 1 ⁽¹⁾
D, DS ^(2, 3)	4,000	620	0.40	7 ⁽³⁾	8 max ⁽⁴⁾
L ^(3, 5)	4,000	620	0.40	7 ⁽³⁾	8 max ⁽⁴⁾
S (Seal) ⁽⁶⁾	3,000	682	0.47	6 \pm 2	6 \pm 2
X ⁽⁷⁾					

⁽¹⁾ For slip forming, the slump shall range from 0 to 3 inches.

⁽²⁾ Use Class DS concrete in riding surfaces as described in 903.03 and in accordance to Specification 903.24 requirements. Use Class D concrete in all other bridge decks except box and slab type structures unless otherwise shown on the Plans.

⁽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.

⁽⁵⁾ 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.

⁽⁶⁾ The use of fly ash as a cement replacement will be allowed in Class S (Seal) concrete.

⁽⁷⁾ Plan specific requirements.

Include chemical admixtures in the concrete mixture as specified in Table 604.03-2 based on the ambient air temperature and expected weather conditions.

Table 604.03-2: Use of Chemical Admixtures

Class of Concrete	Temperature less than 85 °F and falling	Temperature 85 °F or greater and rising
A	Type A or F	Type D or G or A and B
D, DS	Type A or F	Type A or F and B or G
L	Type F	Type F and B or G
S	Type D or G or A and B	Type D or G or A and B

Table 604.03-3: Type I or Type II Cement Modified by Fly Ash or Ground Granulated Blast Furnace Slag (GGBFS)

Modifier	Maximum Cement Replacement Rate % (by weight)	Minimum Modifier Cement Substitution Rates (by weight)
GGBFS (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, ground granulated blast furnace slag, and fly ash) for Class A, Class D, and Class DS 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 as a partial replacement for the hydraulic cement.

Table 604.03-4: Composition of Self-Consolidating 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 \pm production tolerance)	Slump Flow (inches)
SCC (2,3,4,5)	3,000 ⁽¹⁾	564	0.45	6 \pm 1	25 \pm 4
SH-SCC (2,3,4,5,6)	4,500	620	0.45	6 \pm 1	25 \pm 4

(1) Or as shown on the Plans or approved shop drawings.

(2) Acceptance range for the T50 test in accordance with ASTM C1611 shall be between 2-7 seconds.

(3) Passing ability in accordance with ASTM C1621 shall be less than 2 inches for acceptance.

(4) Visual Stability Index (VSI) shall not exceed 1.0 as per ASTM C1611 for acceptance.

(5) Static segregation as measured by ASTM C 1610 shall not exceed 20%.

(6) Air Content may be reduced if placed under water or underground if approved by the Engineer

Table 604.03-5: Use of Chemical Admixtures

Class of Concrete	Temperature less than 85 °F and falling	Temperature 85 °F or greater and rising
SCC, SH-SCC	Type A or F Type S (Viscosity Modifying)	Type D or G or A and B Type S (Viscosity Modifying)

Subsection 604.03 (pg. 522-523) 5-15-17; A. Classification and Proportioning and Quality Assurance: Add 22.-28, add sentence to 5th paragraph:

2. **“Mix Design Submittal.** Submit the proposed concrete design to the Engineer for approval. Develop the design using saturated surface dry aggregate weights and trial batches meeting the requirements of these Specifications. The concrete design shall be prepared by a TDOT certified Class 3 concrete technician or approved independent testing laboratory under the direction of a registered civil engineer licensed by the State of Tennessee. The concrete plant technician or the civil engineer shall certify that the information contained on the design is correct and is the result of information gained from the trial batches. The concrete design 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. Provide concrete of the design strength specified in all applicable Special Provisions, Plans, and Standard Specifications. Build trial batches for design no more than 90 days before submitting the concrete design. The approved mix design will expire after 6 months if it is not used on a Department funded project and meet the minimum 28-day strength requirements. Assume responsibility for all costs of concrete design, preparation, and submittal.

As a minimum, include the following information in the proposed concrete design submittal:

1. Source of all aggregates
2. Brand and type of cement
3. Source and class of fly ash (if used)
4. Source and grade of ground granulated blast furnace slag (if used)
5. Specific gravity of cement
6. Specific gravity of the fly ash (if used)
7. Specific gravity of the ground granulated blast furnace slag (if used)
8. Admixtures (if used)
9. Gradations of aggregates
10. Specific gravity of aggregates (saturated surface dry)
11. Air content (if air entrainment is used)
12. Percentage of fine aggregate of the total aggregate (by volume)
13. Slump
14. Weight per cubic yard
15. Yield
16. Temperature of plastic concrete
17. Water/cement ratio (pound/pound)
18. 7-day compressive strength (minimum of two 4-inch x 8-inch cylinders)
19. 14-day compressive strength (minimum of two 4-inch x 8-inch cylinders)
20. 28-day compressive strength (minimum of two 4-inch x 8-inch cylinders)
21. Weight of each material required to produce a cubic yard of concrete
22. Water – submit testing results per Tables 921.01-1 & 921.01-2

In addition to the above mentioned items, for self-consolidating concrete include as a minimum the following information in the proposed SCC design submittal:

- 23. Slump flow, VSI, and T50, in accordance with ASTM C1611, shall be required in place of the slump test.
- 24. Passing ability in accordance with ASTM C1621.
- 25. Static segregation in accordance with ASTM C1610.
- 26. 7-day compressive strength (minimum of **two** 4-inch x 8-inch cylinders), in accordance with ASTM C1758.
- 27. 14-day compressive strength (minimum of **two** 4-inch x 8-inch cylinders), in accordance with ASTM C1758.
- 28. 28-day compressive strength (minimum of **two** 4-inch x 8-inch cylinders), in accordance with ASTM C1758.

Self-consolidating concrete (Classes SCC, SH-SCC and P-SCC) shall be verified prior to placement either at the ready mix facility or prestressed plant. The submitted mix design shall be reviewed by Headquarters Materials and Tests for specification compliance. The concrete producer shall then perform a trial batch verification of the submitted mix design in the presence of Regional Materials and Tests. The trial batch will ensure that all batch quantities and target admixture dosage rates are acceptable and meet TDOT specification prior to full mix design approval. If using a previously approved SCC design additional verification of the trial batch is not required. All quantities and identified admixture target dosage rates shall meet the tolerances specified in **501.09**

Instead of the above mix design submittal, an existing design may be submitted for approval provided the design has been used on a state funded project within the last six (6) months. **When submitting for the use of an existing mix design, the most current water testing results per 921.01 shall accompany the submittal.** The approval of this concrete design submittal will not relieve the Contractor of the responsibility of providing concrete meeting the requirements of these Specifications. A temporary mix design may be issued if the 7-day or 14-day compressive strengths exceed the required 28-day strengths."

Subsection 604.03 (pg. 522 and 523), 5-18-15; 2. Mix Design Submittal; Replace the first sentence of the last paragraph on page 522 with the following:

"Instead of the above mix design submittal, an existing design may be submitted for approval provided the design has been used on a state funded project within the last six (6) months."

Subsection 604.03 (pg. 519-522), 11-16-15; A. Classification and Proportioning and Quality Assurance, modify the following:

"1a. Design and Production Parameters. Proportion the concrete based on a pre-determined minimum cement content, and a water-cement ratio that does not exceed the maximum shown in **Table 604.03-1**. Below this limit, adjust the quantity of water to meet the slump requirements. The fine aggregate shall not exceed 44% by volume calculation of the total aggregate, with the exception of slip formed Class A concrete incorporated into parapets and median barriers. For slip formed parapet and median barriers exclusively, the percentages of fine and coarse aggregate in an approved concrete mix design may be adjusted plus or minus 2%, such that the....

1b. Self-Consolidating Concrete (SCC) Design and Production Parameters. Proportion the concrete based on a pre-determined minimum cement content, and a water-cement ratio that does not exceed the maximum shown in **Table 604.03-4**. The fine aggregate shall not exceed 50% by volume calculation of the total aggregate volume. Maximum size of coarse aggregate shall not exceed a No. 67 stone. The Contractor may elect to use SCC as an alternate/option in replacement of Class A concrete.

Document mixture adjustments in the field book and daily concrete report. Ensure that the adjusted mix complies with all of the performance criteria specified in **Table 604.03-4**.

Table 604.03-4: Composition of Self-Consolidating 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 \pm production tolerance)	Slump Flow (inches)
SCC (2,3,4,5)	3,000 ⁽¹⁾	564	0.45	6 \pm 1	25 \pm 4

(1) Or as shown on the Plans or approved shop drawings.

(2) Acceptance range for the T50 test in accordance with ASTM C1611 shall be between 2-7 seconds.

(3) Passing ability in accordance with ASTM C1621 shall be less than 2 inches for acceptance.

(4) Visual Stability Index (VSI) shall not exceed 1.0 as per ASTM C1611 for acceptance.

(5) Static segregation as measured by ASTM C 1610 shall not exceed 20%.

Include chemical admixtures in the self-consolidating concrete mixture as specified in Table **604.03-5** based on the ambient air temperature and expected weather conditions. Approved viscosity modifying admixtures (VMA) may be used as part of the chemical admixtures if they are shown in the approved mixture design.

Table 604.03-5: Use of Chemical Admixtures

Class of Concrete	Temperature less than 85 °F and falling	Temperature 85 °F or greater and rising
SCC	Type A or F Type S (Viscosity Modifying)	Type D or G or A and B Type S (Viscosity Modifying)

Dosage rates for any admixtures incorporated into the concrete shall be stated during the mix design submittal process. All admixtures shall be compatible and from the same manufacturer.

2.Mix Design Submittal. Submit the proposed concrete design to the Engineer for approval. Develop the design using saturated surface dry aggregate weights and trial batches meeting the requirements of these Specifications....

As a minimum, include the following information in the proposed concrete design submittal:

1. Source of all aggregates
2. Brand and type of cement

3. Source and class of fly ash (if used)
4. Source and grade of ground granulated blast furnace slag (if used)
5. Specific gravity of cement
6. Specific gravity of the fly ash (if used)
7. Specific gravity of the ground granulated blast furnace slag (if used)
8. Admixtures (if used)
9. Gradations of aggregates
10. Specific gravity of aggregates (saturated surface dry)
11. Air content (if air entrainment is used)
12. Percentage of fine aggregate of the total aggregate (by volume)
13. Slump
14. Weight per cubic yard
15. Yield
16. Temperature of plastic concrete
17. Water/cement ratio (pound/pound)
18. 7-day compressive strength (minimum of three 4-inch x 8-inch cylinders)
19. 14-day compressive strength (minimum of three 4-inch x 8-inch cylinders)
20. 28-day compressive strength (minimum of three 4-inch x 8-inch cylinders)
21. Weight of each material required to produce a cubic yard of concrete

In addition to the above mentioned items, for self-consolidating concrete include as a minimum the following information in the proposed SCC design submittal:

22. Slump flow, VSI, and T50, in accordance with ASTM C1611, shall be required in place of the slump test.
23. Passing ability in accordance with ASTM C1621.
24. Static segregation in accordance with ASTM C1610.
25. 7-day compressive strength (minimum of three 4-inch x 8-inch cylinders), in accordance with ASTM C1758.
26. 14-day compressive strength (minimum of three 4-inch x 8-inch cylinders), in accordance with ASTM C1758.
27. 28-day compressive strength (minimum of three 4-inch x 8-inch cylinders), in accordance with ASTM C1758.

Self-consolidating concrete (Classes SCC and P-SCC) shall be verified prior to placement either at the ready mix facility or prestressed plant. The submitted mix design shall be reviewed by Headquarters Materials and Tests for specification compliance. The concrete producer shall then perform a trial batch verification of the submitted mix design in the presence of Regional Materials and Tests. The trial batch will ensure that all batch quantities and target admixture dosage rates are acceptable and meet TDOT specification prior to full mix design approval. If using a previously approved SCC design additional verification of the trial batch is not required. All quantities and identified admixture target dosage rates shall meet the tolerances specified in **501.09**.

Subsection 604.03 (pg. 522), 12-2-16; Mix Design Submittal, modify the following:

- “18. 7-day compressive strength (minimum of two 4-inch x 8-inch cylinders)
19. 14-day compressive strength (minimum of two 4-inch x 8-inch cylinders)
20. 28-day compressive strength (minimum of two 4-inch x 8-inch cylinders)”

Subsection 604.13 (pg. 541), 5-15-17; Mixing Concrete, add Class DS concrete to the 2nd paragraph, 3rd sentence:

“Do not retemper concrete by adding water or by other means. However, the Contractor may withhold a portion of the mixing water or chemical admixtures from transit mixers and add at the work site if all requirements of the approved mix design are met. Water added at the placement site for Class A, Class D, Class DS and Class L concrete shall not exceed 1 gallon per cubic yard. The total amount of water in the mix shall not exceed the maximum in the approved mix design. To achieve additional slump, use a water reducing admixture. If water, air entrainers, or chemical admixtures are added at the placement site, mix the concrete a minimum of 30 revolutions at mixing speed after making the additions. Do not use concrete that is not within the specified slump limits, air content limits, temperature limits, or time limits at the time of placement.”

Subsection 604.14 (pg. 542), 11-16-15; Consistency of Concrete, modify the following:

“The slump of the concrete when measured according to AASHTO T 119 shall meet 604.03 - **1A**. The slump flow of self-consolidating concrete when measured according to ASTM C1611 shall meet **604.03 1B**.”

Subsection 604.15 (pg. 542-543), 11-16-15; B. Concrete Acceptance Cylinders, modify the following:

“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 at no additional cost to the Department.

Concrete cylinders submitted for testing beyond 28 days shall comply with the strength requirements specified in Table 604.15-1.

Table 604.15-1: Strength Requirements

Class of Concrete	Compressive Strength (psi) at:			
	Less than 31 days	31 to 42 days	43 to 56 days	
A, S, CP, SCC	3,000	3,300	3,500	
D, L	4,000	4,400	4,600	
X	Plans Requirement (Req)	Req. + Req. * (10%)	Req. + Req. * (15%)	

If the acceptance cylinders fail to meet the specified strengths, the Contractor may drill core samples from the hardened concrete as verification of concrete strength instead of using the concrete cylinders. 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. If the above mentioned requirements are met, the Contractor may then elect to drill a maximum of three core samples per set of cylinders from the hardened concrete. The Contractor shall obtain the cores in accordance with the Department’s Standard Operating Procedure 4-2, and bear all costs of obtaining the cores and repairing the core holes.”

Subsection 604.15 (pg. 543), 5-15-17; Table 604.15-1: Strength Requirements, Add Class DS to Table, update 2nd paragraph 3rd sentence to remove “cylinders and”:

Table 604.15-1: Strength Requirements

Class of Concrete	Compressive Strength (psi) at:		
	Less than 31 days	31 to 42 days	43 days to 56 days
A, S, CP, SCC	3,000	3,300	3,500
D, <u>DS</u> , L	4,000	4,400	4,600
<u>SH-SCC</u>	<u>4,500</u>	<u>4,950</u>	<u>5,175</u>
X	Plans Requirement (Req)	Req. + Req. * (10%)	Req. + Req. * (15%)

If the acceptance cylinders fail to meet the specified strengths, the Contractor may drill core samples from the hardened concrete as verification of concrete strength instead of using the concrete cylinders. 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. If the above mentioned requirements are met, the Contractor may then elect to drill a maximum of three core samples per set of cylinders from the hardened concrete. The Contractor shall obtain the cores in accordance with the Department's Standard Operating Procedure 4-2, and bear all costs of obtaining the cores and repairing the core holes.

Acceptance for payment may be based on cores provided by the Contractor at its expense. These cores shall meet the strength requirements specified in Table 604.15-1. The Engineer will not accept concrete ~~cylinders and~~ cores submitted for testing beyond 56 days.

Subsection 604.16 (pg. 545) 5-15-17; Placing Concrete, A. General – revise the 1st paragraph to add Class DS in the first sentence:

“Unless otherwise specified, before placing a bridge deck overlay of Class D , Class DS, or Class L concrete, machine scarify the surface to be covered to a minimum depth of 1 inch. In areas inaccessible to machine scarifying, and in areas of spalling where steel reinforcement is exposed, remove deteriorated concrete using hand tools or other methods approved by the Engineer. After scarifying, clean the deck of all deleterious material. Do not allow traffic on the scarified deck.”

Subsection 604.27 (pg. 560), 11-16-15; Rideability of New or Resurfaced Bridge Decks and Roadway Approaches, A. General, revise the 1st paragraph to the following:

“On all highway sections with a posted speed greater than 40 miles per hour, the following rideability provisions shall apply to new or resurfaced bridge decks and roadway approaches.”

Subsection 604.31 (pg. 567-568) 5-15-17; Basis of Payment, add Class DS to item and pay unit list:

604.31 Basis of Payment

The Department will pay for accepted quantities at the contract prices as follows:

<i>Item</i>	<i>Pay Unit</i>
Class A Concrete (Description)	Cubic Yard
Class D Concrete (Description)	Cubic Yard
Class DS Concrete (Description)	Cubic Yard
Class L Concrete (Description)	Cubic Yard
Class S Concrete (Description)	Cubic Yard
Steel Bar Reinforcement	Pound
Epoxy Coated Reinforcing	Pound
Scarifying	Square Yard
Applied Texture Finish	Square Yard
Hydro-demolition	Square Yard

Subsection 606.04.B.1(b) (pg. 578), 6-27-16; replace 1.b. with the following:

“(b) Except as provided in paragraph 2(b) below, develop an energy per blow in foot-pounds not less than 250 multiplied by R, where R is the required minimum bearing resistance of the pile in tons.”

Subsection 606.07.A. (pg. 581), 6-27-16; revise the 1st paragraph:

“Construct cast-in-place concrete piles of the design shown on the Plans and that consist of concrete cast in drilled holes or in steel shells or pipes driven to the required bearing. Use Class A concrete meeting **604**, or use Class X concrete, as required by design, meeting **604**. Provide and place suitable casing when required to prevent caving of the hole before concrete is placed.

Subsection 613.02 (pg. 633), 6-27-16; add the following section:

“Brick Paving Units912.05”

Subsection 615.09 (pg. 644), 11-16-15; Proportioning and Mixing of Concrete, update Table 615.09-1 and add the 3rd paragraph below the table, modify the last paragraph:

Table 615.09-1: Composition of Prestress Concrete Classes

Class of Concrete	Minimum 28-Day Compressive Strength (psi)	Minimum Pounds Cement per Cubic Yard	Maximum Water/Cement Ratio (pound/pound)	Air Content %	Slump or Slump Flow (inches)
P	5,000 ⁽¹⁾	658	0.45	0-8 ⁽²⁾	2 ± 1 ⁽³⁾
P-SCC ⁽⁴⁾	5,000 ⁽¹⁾	658	0.45	0-6 ⁽²⁾	25 ± 4

⁽¹⁾ Or as shown on the Plans or approved shop drawings.

⁽²⁾ Air entraining is optional with the Contractor, unless otherwise shown on the Plans or shop drawings.

⁽³⁾ Not to exceed 3 inches before the addition of high range admixtures, and not to exceed 10 inches after the addition of high range admixtures. If water-cement ratio is equal to or less than 0.35 then the maximum slump is 10 inches. If the water-cement ratio is 0.36 – 0.45, the maximum slump is 8 inches.

⁽⁴⁾ Maximum coarse aggregate size of a No. 67 stone.

Comply with all applicable provisions of **604.03** except as modified herein.

Submit a concrete design to the Department for review and approval. In addition to the proportions, identify in the design submittal the source or brand of all materials and the type of cement to be used. The Contractor may use Type I or Type III cement, unless otherwise specified. Do not use calcium chloride. Use a retardant admixture when the ambient temperature is 75 °F or higher. The slump of the concrete shall be 2 inches with a tolerance of ±1 inch at the time of placement. When an approved superplasticizer is to be used, the slump of the concrete shall be the same as above before the superplasticizer is added to the mix. After the addition of the superplasticizer, the slump may be increased to a maximum of 8 inches at the time of placement.

The slump flow of self-consolidating concrete shall be determined and within the design and production tolerances stated in **Table 615.09-1**. Include chemical admixtures in the self-consolidating concrete mixture as specified in **Table 604.03-5** based on the ambient air temperature and expected weather conditions. Approved viscosity modifying admixtures (VMA) may be used as part of the chemical admixtures if they are shown in the approved mixture design.

Handle, measure, and batch materials; mix concrete; and comply with the limitations of mixing as specified in **501.09**, **501.10**, and **501.11**, respectively.

Make concrete test specimens for Class P and Class P-SCC, in accordance with AASHTO T 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 as specified above with additional curing water, as provided in AASHTO...

Subsection 615.17 (pg. 652), 5-18-15; Table 615.17-1: Manufacturing Tolerances in Standard Sections, Update Table 615.17-1:

Table 615.17-1: Manufacturing Tolerances in Standard Sections

Description	Tolerance	
	I-Sections	Box Sections
Nominal Depth	$\pm 1/2$ inch	$\pm 1/2$ inch
Nominal Width	$\pm 1/2$ inch	$\pm 1/2$ inch
Nominal Length	Computed Elastic Shortening $\pm 1/2$ inch	Computed Elastic Shortening $\pm 1/2$ inch
Variation in Straightness, inches	$1/4$ inch x (Total Length in feet)/10	$1/4$ inch x (Total Length in feet)/10
Variation in Camber, inches	Beams in any 1 span not more than: $1/8$ inch x (Total Length in feet)/10	Beams in any 1 span not more than: $1/8$ inch x (Total Length in feet)/10
Location of Voids	-----	Length $\pm 1/2$ in Wall Thickness $\pm 1/2$ in
Bearing	Full Bearing - Full Width of Beam	Full Bearing on at Least $2/3$ of Width of Beam
Tendon Placement	$\pm 1/2$ inch	$\pm 1/2$ inch
Reinforcing Steel Placement	$\pm 1/2$ inch	$\pm 1/2$ inch
Reinforcing Steel Concrete Cover	$\pm 1/2$ inch	$\pm 1/2$ inch
Reinforcing Steel Splice Lengths	Minus 1-1/2 inches	Minus 1-1/2 inches

Subsection 622.03 (pg. 686) 12-2-16; Add the following paragraph at the beginning of the section:

“Same-as designs shall not be submitted for Shotcrete.”

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T E N N E S S E E

(Rev. 6-27-16)

(Rev. 12-2-16)

(Rev. 5-15-17)

January 1, 2015

Supplemental Specifications - Section 700

of the

Standard Specifications for Road and Bridge Construction

January 1, 2015

Subsection 712.04 (pg. 759), 12-2-16; A. Flaggers, add ABET Accredited University Programs to the list of flagger training:

- “1. American Traffic Safety Services Association (ATSSA)
2. National Safety Council (NSC)
3. Tennessee Transportation Assistance Program (TTAP)
4. ABET Accredited University Programs”

Subsection 712.04.B (pg.759-760) 12-2-16; revise the first paragraph of B. THP Troopers and Uniformed Law Enforcement Officers:

“B. THP Troopers and Uniformed Law Enforcement Officers

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 marked 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 712.09 (pg. 769), 12-2-16; change Uniformed Police Officer to Uniformed Law Enforcement in the last paragraph:

“The Department will pay for Uniformed Law Enforcement Officers provided by the Contractor at the invoice price of the work plus 5%, not to exceed \$50 per hour for the hours present on the Project. No compensation will be made for drive time.”

Subsection 713.04 (pg. 772) 5-15-17; Construction Methods and Requirements; add steel requirement as the last paragraph:

“Ensure steel meets all specifications in 602.04.”

Subsection 713.04.C.6 (pg. 774), 6-27-16; replace C.6. with the following:

“6. Concrete. Use either (1) Class A concrete meeting 604.03 or (2) Class X concrete with a f’c as identified in the plans or required by the design. If Class X concrete is required, use a mix meeting the minimum requirements of **604.03** for Class A concrete, but with a cementitious material quantity necessary to produce the specified strength.”

Subsection 713.04.C.8 (pg. 774), 6-27-16; add sentence to the end of 8.:

“8. Setting Anchor Bolts and Stubs. Set anchor bolts and stubs for sign supports to proper locations and elevations with templates, and carefully check them after constructing the sign foundation and before the concrete has set. Anchor rods shall conform to the requirements of section **730.11**”

Subsection 730.11 (pg. 835), 6-27-16; Revise the title:

“AnchorRods”

Subsection 730.11 (pg. 835), 6-27-16; revise the first paragraph:

“Furnish, with anchor-base type poles, anchor rods meeting the requirements of ASTM F1554, Grade as required by design. Fit each anchor bolt with two heavy hex nuts. Hot-dip galvanize all nuts and not less than 10 inches of the threaded ends of anchor bolts according to ASTM A153. The anchor bolts shall be capable of resisting at yield strength stress the bending moment of the shaft at its yield strength stress.”

Subsection 730.32.A. (pg. 868), 6-27-16; revise the last paragraph of subsection 730.32 A.:

“Provide a welded frame handhole, 5 x 8 inches minimum and located with a clear distance above the base of no less than the pole diameter, “D”.”

STATE

(Rev. 5-18-15)
 (Rev. 11-16-15)
 (Rev. 6-27-16)
 (Rev. 12-2-16)
 (Rev. 5-15-17)

OF**TENNESSEE**

January 1, 2015

Supplemental Specifications - Section 900**of the****Standard Specifications for Road and Bridge Construction****January 1, 2015**

Subsection 903.01 - Table 903.01-1 (pg. 920), 5-18-15; Replace Note (1) with the following:

“(1) If the fine aggregate is manufactured from crushed stone and if material finer than the No. 200 sieve consists of the dust of fracture, essentially free from clay or shale, this limit may be increased to 5%.

Subsection 903.01 - Table 903.01-1, Table 903.01-2 (pg. 921), 5-15-17; replace Tables 903.01-1 and 903.01-2 with the following Tables:

Table 903.01-1: Limits of Deleterious Substances in Fine Aggregate for Concrete

Substance	Maximum Permissible Limits Percent by Weight
Clay Lumps	0.5
Coal and Lignite	0.5
Material Passing the No. 200 Sieve ⁽¹⁾⁽³⁾	3.0
Other deleterious substances (such as shale, alkali, mica, coated/grains, soft and flaky particles) ⁽¹⁾⁽²⁾	3.0
⁽¹⁾ If the fine aggregate is manufactured from crushed stone and if material finer than the No. 200 sieve consists of the dust of fracture, essentially free from clay or shale, this limit may be increased to 10 5%.	
⁽²⁾ Determine other organic impurities according to AASHTO T 267.	
⁽³⁾ <u>If the fine aggregate is manufactured from crushed gravel and if material finer than the No. 200 sieve consists of the dust of fracture, essentially free from clay or shale, this limit may be increased to 3.5%.</u>	

Table 903.01-2: Gradation Requirements for Fine Aggregate

Sieve Size	Total Percent Passing by Weight
3/8 inch	100
No. 4	95-100
No. 16	50-90
No. 50	5- 35 30
No. 100	0- 20 10
No. 200 ⁽¹⁾	0-3

⁽¹⁾ If the fine aggregate is manufactured from ~~crushed stone limestone or dolomite~~ and if material finer than the No. 200 sieve consists of the dust of fracture, essentially free from clay or shale, this limit may be increased to 105%.

Subsection 903.03 (pg. 922) 5-15-17; Coarse Aggregate for Concrete, add the following as the 4th paragraph:

“Coarse aggregate in two-lift composite pavements shall consist of Size No. 467 in the lower lift, graded as specified in 903.22. 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.”

Subsection 903.03 (pg. 922-923) 11-16-15; Coarse Aggregate for Concrete, modify the 4th and 5th paragraphs, update Table 903.03-1: Coarse Aggregate Sizes to the following:

“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 absorption of plus 4 material not to exceed 5%. 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.”

Table 903.03-1

Application	Coarse Aggregate Size ⁽¹⁾
Structural concrete	No. 57
Self-Consolidating concrete	Maximum-No.67
Prestressed concrete	No. 57 or 67
Precast concrete	Any size fraction
Concrete curbing placed by machine-extrusion methods	No. 7, 57, 67, or 78

Cement treated permeable base No. 57
(2)

-
- (1) Gradation shall conform to **903.22**.
(2) Aggregate shall meet the quality requirements specified below.
-

Subsection 903.03-2 (pg. 924) 5-15-17; Revise Table 903.03-2: Limits of Deleterious Substances in Coarse Aggregate for Concrete, update Material passing No. 200 Sieve and Footnote 2:

Table 903.03-2: Limits of Deleterious Substances in Coarse Aggregate for Concrete

Substance	Maximum Percent by Weight
Soft or non-durable fragments (fragments that are structurally weak such as shale, soft sandstone, limonite concretions, gypsum, weathered schist, or cemented gravel), and organic impurities as determined by AASHTO T 267 ⁽¹⁾	3
Coal and lignite ⁽¹⁾	1
Clay lumps ⁽¹⁾	0.25
Material passing the No. 200 sieve ⁽¹⁾⁽²⁾	<u>1.5</u>
Thin or elongated pieces (length greater than 5 times average thickness)	10
Other local deleterious substances ⁽¹⁾	1
⁽¹⁾ The sum of the percentages of these materials (i.e., soft or non-durable fragments, coal and lignite, clay lumps, material passing the No. 200 sieve, and other local deleterious substances) shall not exceed 5.0. ⁽²⁾ For crushed aggregate, if all the material finer than the No. 200 sieve, as determined in accordance with AASHTO T 11, consists of the dust of fracture, essentially free of clay or shale, this limit may be increased to <u>1.52.0</u> .	

Subsection 903.05 – B. Type B Aggregate (pg. 927), 5-18-15; Replace the 1st paragraph of subsection 3. With the following:

- “3.** Do not use material having clay content greater than 12%, as determined by hydrometer analysis performed in accordance with AASHTO T 88. Material may be used having a clay content exceeding 12% if a plasticity index-fines product does not exceed 3 when calculated by the following formula”

Subsection 903.05 – Aggregate for Mineral Aggregate Base and Surface Courses (pg. 928) 5-15-17; add section C to the bottom:

C. Reclaimed Concrete Aggregate. Provide material comprised of concrete reclaimed from the demolition of a concrete structure or pavement. Reclaimed Concrete Aggregate may only be used

as a mineral aggregate base course, subbase or shoulder course. The material shall be free of any materials classified as Solid or Hazardous Waste, especially asbestos, lead and mercury, with test results submitted by the contractor to the Project Supervisor. These test results shall be certified and notarized. The percentage of wear as determined in accordance with AASHTO T 96 shall not exceed 50. Deleterious substances shall be kept to a minimum, and may not be higher than the amounts listed on Table 903.05-3.

Table 903.05-3: Deleterious Materials

<u>Material</u>	<u>Maximum Permissible Limits Percent by Weight</u>
<u>Brick</u>	<u>5</u>
<u>Bituminous Concrete Materials</u>	<u>5</u>
<u>Weathered Rock</u>	<u>2</u>
<u>Wood</u>	<u>0.1</u>
<u>Metals</u>	<u>0.1</u>

The gradations of the coarse and fine fractions of aggregate shall be such that, when combined in proper proportions, the resultant mixture will fall within the grading specified in Table 903.05-4.

Table 903.05-4: RCA Grading Tolerances

<u>Sieve Size</u>	<u>Total Percent Passing per Weight</u>
<u>1 ½ inch</u>	<u>100</u>
<u>1 inch</u>	<u>85-100</u>
<u>¾ inch</u>	<u>60-95</u>
<u>3/8 inch</u>	<u>50-80</u>
<u>No. 4</u>	<u>40-65</u>
<u>No. 16</u>	<u>20-40</u>
<u>No. 100</u>	<u>5-18</u>

Subsection 903.05 – Aggregate for Mineral Aggregate Base and Surface Courses (pg. 925) 5-15-17; add reference to subsection **903.05 C.** in the second paragraph of subsection A.:

“903.05 Aggregate for Mineral Aggregate Base and Surface Courses

Provide crushed stone, crushed slag, crushed or uncrushed gravel, or crushed or uncrushed chert that may be blended with crushed recycled concrete or screened reclaimed asphalt pavement (RAP), together with material such as manufactured sand or other fine materials that are either naturally contained or added as needed to conform to these Specifications.

Provide aggregate of Types A and B, as specified below.

A. Type A Aggregate

Provide hard, durable particles or fragments of stone, slag, gravel, or chert, and other finely divided mineral matter.

The Contractor may use recycled concrete aggregate per 903.05 C. or reclaimed asphalt pavement, ~~at a maximum rate of 25% by weight;~~ for Type A aggregate, provided the combined aggregate blend meets all the requirements specified below. Crush and screen the recycled concrete and asphalt to produce a uniform

stockpile before blending it with the virgin material. Keep the recycled stockpiles free of bricks, steel, wood, and all other deleterious materials. “

Subsection 903.05 – Aggregate for Mineral Aggregate Base and Surface Courses (pg. 925-926) 5-15-17; add reference to subsection **903.05 C.** in the second paragraph of subsection B.:

“For Provide crushed or uncrushed gravel, crushed or uncrushed chert, crushed stone or crushed slag, and other finely divided particles.

The Contractor may use recycled concrete aggregate per 903.05 C. or reclaimed asphalt pavement, at a maximum rate of 30% by weight, for Type B aggregate, provided the combined aggregate blend meets all the requirements specified below. Crush and screen recycled concrete and asphalt to produce a uniform stockpile before blending it with the virgin material. Keep the recycled stockpiles free of bricks, steel, wood, and all other deleterious materials.”

Subsection 903.06 - C. Combined Aggregate Grading (pg. 930) 11-16-15; add the following sentence at the end of the first paragraph:

“For mixtures including recycled asphalt pavement, RAP, and/or recycled asphalt shingles, RAS, stockpiles will not be considered as contributing to the required minimum of three stockpile sizes.”

Subsection 903.11 - Aggregate for Asphaltic Concrete Surface Coarses (Hot Mix) (pg. 934) 11-16-15; add the following sentence at the end of the first paragraph:

“For mixtures including recycled asphalt pavement, RAP, and/or recycled asphalt shingles, RAS, stockpiles will not be considered as contributing to the required minimum of three stockpile sizes.”

Subsection 903.11 (pg. 934) 11-16-15; A. Coarse Aggregate (retained on a No. 4 sieve), revise the 1st paragraph and subsection 3:

“Provide aggregate, consisting of crushed stone, crushed slag, crushed gravel, crushed granite, crushed quartzite, crushed gneiss, or natural combinations of these materials.”,

“3. Combined aggregate shall consist of siliceous particles processed from washed material, of which at least 70% by count of the material retained on the No. 4 sieve shall have a minimum of two fractured faces, one of which must be fractured for the approximate average diameter or thickness of the particle. Do not add pea gravel or uncrushed particles. The absorption of the crushed aggregate retained on the No. 4 sieve shall not exceed 5% when tested in accordance with AASHTO T 85.”

Subsection 903.11 - A. Coarse Aggregate (retained on a No. 4 sieve) (pg. 934), 5-18-15; revise subsection 2. as follows:

“2. Material retained on the No. 4 sieve shall contain a maximum of 10% elongated pieces (length greater than five times the average thickness)”

Subsection 903.11 C.3. (pg. 938), 6-27-16; revise the 1st paragraph of subsection C.3 to the following:

“3. Grading OGFC. A minimum of 75% of the aggregate shall meet the requirements specified in 903.24 for Surface Mixtures (Non-Skid Aggregates). The coarse aggregate shall have at least 90% crushed aggregate with two fractured faces and 100% with one fractured face as determined in accordance with ASTM D5821. The coarse aggregate shall have a LA Abrasion value of less than 40% and a maximum absorption of 3.0%.”

Subsection 903.11 (pg. 938), 12-2-16; Add the following to C. as subsection 5.:

“5. Grading C, CS, CW. The mixture shall meet all requirements of **903.06**. When using Grading C, CS, or CW as a final riding surface for traffic lanes and the design ADT is greater than 1000, a minimum of 75% of the aggregate shall meet the requirements specified in **903.24** for Surface Mixtures (Polish-Resistant Aggregate) for the appropriate levels.”

Subsection 903.12 (pg. 938) 11-16-15; A. Aggregate for Slurry Seal, revise the 1st paragraph a A. as shown; delete the 2nd paragraph:

“The aggregate shall be crushed slag, crushed granite, or crushed stone (crushed stone as specified in 903.24), meeting the requirements of ASTM D692, except the gradation shall be as specified in Table 903.12-1. The aggregate shall have a minimum sand equivalent, as determined in accordance with AASHTO T 176, of 45.

Subsection 903.12 (pg. 939) 11-16-15; B. Aggregate for Micro-Surface: modify the first paragraph, delete the second paragraph:

“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 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.

Subsection 903.12 (pg. 939) 5-15-17; B. Aggregate for Micro-Surface: Add the following as the 2nd paragraph:

“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 stockpile meeting the job mix formula gradation. Proportion and blending equipment shall be calibrated at the beginning of production. All aggregate sources shall meet the requirements of **Table 903.24-1**. Do not blend aggregates with a front end loader. Proportion the aggregate to produce a uniform gradation meeting the requirements specified in Table 903.12-2. The contractor shall provide a Type A laboratory as defined by **106.06** capable of verifying gradation at the location where blending occurs.”

Subsection 903.13 (pg. 940), 12-2-16; modify the last sentence of the 1st paragraph:

“Provide aggregate consisting of crushed stone, crushed slag, or crushed gravel, meeting the quality requirements of ASTM D692, except that at least 50% by count of crushed gravel aggregates shall have at least one fractured face. Crushed slag aggregate retained on the No. 4

sieve shall contain no more than 20% by weight of glassy particles. Provide aggregates meeting the requirements of **903.24 except, if ADT is less than 1000.**”

Subsection 903.15 (pg. 941), 5-15-17; revise the 3rd paragraph:

“The Contractor may use recycled concrete aggregate per 903.05 C. or reclaimed asphalt pavement (RAP), at a maximum rate of 25% by weight; provided the combined aggregate blend meets all the requirements specified above. If blending, cCrush and screen the recycled concrete and/or asphalt to produce a uniform stockpile before blending it with the virgin material. Keep the reclaimed asphalt pavement ~~reeyeled~~ stockpiles free of bricks, steel, wood, and all other deleterious materials. The virgin and reclaimed asphalt pavement ~~reeyeled material~~ blend shall meet the quality requirements specified in Table **903.05-1.**”

Subsection 903.24 (pg. 946), 5-18-15; Modify the 1st paragraph to the following:

“Provide coarse aggregate consisting of crushed gravel, crushed granite, crushed slag, crushed quartzite, crushed gneiss, or crushed sandstone. Other crushed aggregate may be used provided it has the chemical, physical, and performance characteristics specified in Table 903.24-1.”

Subsection 904.01 (pg. 948) 11-16-15; Asphalt Cements, add the following between the 4th and 5th paragraphs:

“Polyphosphoric acid may be used as a modified not exceeding 0.5% by weight of asphalt binder and may only be used when the primary modifier is one of the styrene-based products listed above.”

Subsection 904.01 (pg. 949), 12-2-16; Modify Table 904.01-1:

“Table 904.01-1: Requirements for Asphalt Cement

Property*	PG 64- 22, PG 67-22	PG 70- 22	PG 76- 22	PG 82- 22
Non-recoverable creep compliance at 3.2kPa, Jnr(3.2), kPa ⁻¹ at 64°C, Max	4.5	1.0	0.5	0.5
% Difference in Non-Recoverable Creep Compliance, Jnr(diff) at 64°C, %, Max	75	75**	n/a	n/a

* Tested in accordance with AASHTO T350.

** Shall be waived if Jnr(3.2) is equal to or less than 0.5

PG76-22 and PG82-22 grade asphalts shall meet the requirements for Indication of Elastic response as defined in Appendix X1 of AASHTO M332. PG70-22 grade asphalts shall have a minimum percent recovery at 3.2 kPa of 29%.”

Subsection 904.01 (pg. 948-950) 5-18-15; revise the 1st paragraph to add the word cement, add sentence to the end of the 2nd paragraph, add “cement high-temperature grade properties to the 4th paragraph, remove the grades of asphalts and add asphalt cements to the 5th paragraph, update Table 904-01-1 to remove “Ring and Ball” and” Elastic Recovery”, add “Non-recoverable creep compliance” requirements to Table 904-01-1, add footnote to Table, add a 6th paragraph, remove A. Test Procedures and Table 904.01-2, remove Materials Certification header, remove 8th paragraph, and revise the 9th paragraph:

“Only obtain asphalt cement for use on Department projects from Certified Asphalt Cement Suppliers that have an approved Quality Control Plan in accordance with the Department’s Standard Operating Procedures.

Asphalt cement shall conform to AASHTO M 320 and Department procedures. Direct Tension testing is not required.

Instead of PG 64-22, the Contractor may use asphalt cement graded to PG 67-22. PG 67-22 shall conform to the requirements of AASHTO M 320 when the applicable tests are conducted at 67 °C and -12 °C, and the dynamic shear of the rolling thin film, pressure aged vessel sample is tested at 26.5 °C.

To modify the asphalt cement high-temperature grade properties, properly blend styrene butadiene (SB), styrene butadiene styrene (SBS), or styrene butadiene rubber (SBR) to a PG 64-22 or PG 67-22 base asphalt.

In addition to the above requirements, asphalt cements shall meet the requirements specified in Table 904.01-1.

Table 904.01-1: Requirements for Asphalt Cement

Property*	PG 64- 22, PG 67-22	PG 70- 22	PG 76- 22	PG 82- 22
Non-recoverable creep compliance at 3.2kPa, Jnr(3.2), kPa ⁻¹ at 64°C, Max	4.5	1.0	0.5	0.5
% Difference in Non-Recoverable Creep Compliance, Jnr(diff) at 64°C, %, Max	75	75	75	75

* Tested in accordance with AASHTO T350.

All modified grades shall meet the requirements for Indication of Elastic response as defined in Appendix X1 of AASHTO M332.

Furnish a certification to the Engineer on each project stating that the asphalt cement provided meets the Department's specification. Ensure that quality control and compliance testing are completed in accordance with the asphalt supplier's approved quality control plan and Department procedures.

In addition, the asphalt cement supplier shall provide a temperature-viscosity curve for PG 64-22 and PG 67-22 asphalt cements with a recommended mixing temperature range. In order to develop a temperature-viscosity curve, it may be necessary to run the viscosity test at a higher temperature, based on the softening point of the modified asphalt cement."

Subsection 904.01(pg. 949), 6-27-16; Modify Table 904.01-1:

Table 904.01-1: Requirements for Asphalt Cement

22

Property	PG64-22 PG67-22	PG 70-22	PG 76-22	PG 82-
Non-recoverable creep compliance at 3.2kPa, Jnr(3.2), kPa ⁻¹ at 64°C, Max	4.5	1.0	0.5	0.5
% Difference in Non-Recoverable Creep Compliance, Jnr(diff) at 64°C, %, Max	75	75	75	n/a

Max				
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Subsection 904.03 (pg. 951) 11-16-15; Emulsified Asphalts, Add “TTT-3” to 904.03-1 with the following requirements:

Saybolt-Furol Viscosity @ 77 °F, seconds	10-100
Particle Charge	Positive
Sieve Test, %	0.1 Max
Residue by	Distillation ⁽¹⁾
Residue, %	50 Min
Demulsibility, %	65 Min
Penetration	40-90

¹-Distill at 350°F

Subsection 904.03 (pg. 954), 12-2-16; Revise Table 904.03-1(c) to remove TTT-1, TTT-2, and TTT-3:

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

Practices	AASHTO Test Method	CRS-2P	RS-2	RS-1
Saybolt-Furol Viscosity @ 77 °F, seconds	T59	n/a	n/a	20-100
Saybolt-Furol Viscosity @ 122 °F, seconds	T59	100-400	75-400	n/a
Storage Stability Test, 24- h, %	T59	1 Max	1 Max	1 Max
5-day Settlement, %	T59	n/a	n/a	n/a
Particle Charge	T59	Positive	n/a	n/a
Sieve Test, %	T59	0.1 Max	0.1 Max	0.1 Max
Residue by	T59	Evaporation	Distillation	Distillation

Practices	AASHTO Test Method	CRS-2P	RS-2	RS-1
Residue, %	T59	65 Min	63 Min	55 Min
Demulsibility, %	T59	40 Min	60 Min	60 Min
Distillate, %	T59	n/a	n/a	n/a
Oil Test, %	T59	n/a	n/a	n/a
Stone Coating	T59	n/a	n/a	n/a
Float Test, seconds	T50	n/a	n/a	n/a
Penetration	T49	75-175	100-200	100-200
Elastic Recovery, % (2)	T301	50 Min	n/a	n/a
Ductility @ 77 °F, cm	T51	40 Min	40 Min	40 Min
Ductility @ 40 °F, cm	T51	n/a	n/a	n/a
R&B Softening Point, °F	T53	125 Min	n/a	n/a
Original G*/sind @ 82 °C	T315	n/a	n/a	n/a

Subsection 904.03 (pg.954), 5-18-15; Replace with the following:

Subsection 904.03, Table 904.03-1(c). Modify as follows for TTT-1, TTT-2:

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

Practices	AASHTO Test Method	CRS-2P	RS-2	RS-1	TTT-1	TTT-2
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Practices	AASHTO Test Method	CRS-2P	RS-2	RS-1	TTT-1	TTT-2
Saybolt-Furol Viscosity @ 77 °F, seconds	T59	n/a	n/a	20-100	20-100	10-100
Saybolt-Furol Viscosity @ 122 °F, seconds	T59	100-400	75-400	n/a	n/a	n/a
Storage Stability Test, 24- h, %	T59	1 Max	1 Max	1 Max	1 Max	1 Max
5-day Settlement, %	T59	n/a	n/a	n/a	n/a	n/a
Particle Charge	T59	Positive	n/a	n/a	n/a	Positive
Sieve Test, %	T59	0.1 Max	0.1 Max	0.1 Max	0.1 Max	0.1 Max
Residue by	T59	<i>Evaporation</i>	Distillation	Distillation	Distillation	Distillation (1)
Residue, %	T59	65 Min	63 Min	55 Min	50 Min	50 Min
Demulsibility, %	T59	40 Min	60 Min	60 Min	n/a	n/a
Distillate, %	T59	n/a	n/a	n/a	n/a	n/a
Oil Test, %	T59	n/a	n/a	n/a	n/a	n/a
Stone Coating	T59	n/a	n/a	n/a	n/a	n/a
Float Test, seconds	T50	n/a	n/a	n/a	n/a	n/a
Penetration	T49	75-175	100-200	100-200	0-20	40-90
Elastic Recovery, % (2)	T301	50 Min	n/a	n/a	n/a	n/a
Ductility @ 77 °F, cm	T51	40 Min	40 Min	40 Min	n/a	n/a
Ductility @ 40 °F, cm	T51	n/a	n/a	n/a	n/a	n/a
R&B Softening	T53	125 Min	n/a	n/a	60-75	n/a

Practices	AASHTO Test Method	CRS-2P	RS-2	RS-1	TTT-1	TTT-2
Point, °F						
Original G*/sind @ 82 °C	T315	n/a	n/a	n/a	1.0 Min	n/a
⁽¹⁾ Distill at 350 °F						
⁽²⁾ Straight-sided mold, 20-cm elongation, 5min hold, 25 °C						

Subsection 908.04 (pg. 968), 5-18-15, High Strength Bolts, A. Specifications; Add the following to the first paragraph:

“Unless otherwise shown on the Plans, mechanically galvanize all bolts, nuts and washers in accordance with ASTM B695 Class 50.”

Subsection 908.04 (pg. 968), 12-2-16, High Strength Bolts, A. Specifications; revise the first paragraph:

“Unless otherwise shown on the Plans, all bolts, nuts and washers shall be coated with acceptable coating in accordance with ASTM F3125 for the respective grade.”

Subsection 908.04 (pg. 968) 12-2-16; revise A. Specifications, 1.:

“A. Specifications: 1. Bolts. ASTM F3125, Grade 325 and Grade 490 - High Strength Bolts for Structural Joints”

Subsection 908.04 (pg. 970) 12-2-16; Revise C. Testing, 3. Assemblies, subsection f., update Table 908-04-2:

C. Testing, 3. Assemblies, f. Table 908.04-2 The minimum rotation, from a snug tight condition (10% of the specified proof load), shall be as specified in Table 908.04-2.

Table 908.04-2: Rotation from Snug Tight Condition

Bolt Length	Minimum Rotation from Snug
Up to and including 4 diameters	240 degrees (2/3 turn)
Over 4 diameters, but not exceeding 8 diameters	360 degrees (1 turn)
Over 8 diameters	480 degrees (1-1/3 turn)

(Note: These values differ from those shown in ASTM F3125.)

Subsection 909.02(pg. 977), 12-2-16; Remove the 4th paragraph referencing a tolerance of 5% from B. Steel Posts and Braces.

Subsection 909.02 (pg. 980-981), 12-2-16; Remove the word minimum from Table 909.02-1:

Table 909.02-1: Post and Braces

Application	Material	ASTM Specification	Nominal Diameter (inches)	Outside Diameter (inches)
Line Posts	Galvanized steel pipe	F1083	1.5	1.900
	Aluminum alloy standard (ANSI Schedule 40) pipe	B429, Alloy 6063, Temper T6	1.5	1.900
	Triple coated steel pipe with a 0.120-inch wall thickness	F1043, Group I-C	1.5	1.900

Application	Material	ASTM Specification	Nominal Diameter (inches)	Outside Diameter (inches)
End, Corner, and Pull Posts	Galvanized standard steel pipe	F1083	2.0	2.375
	Aluminum alloy standard (ANSI Schedule 40) pipe	B429, Alloy 6063, Temper T6	2.0	2.375
	Triple coated steel pipe with a 0.130-inch wall thickness	F1043, Group I-C	2.0	2.375
End and Corner Braces	Galvanized standard steel pipe	F1083	1.25	1.660
	Aluminum alloy standard (ANSI Schedule 40) pipe	B429, Alloy 6063, Temper T6 (for corner posts: B241)	1.25	1.660
	Triple coated steel pipe with a 0.111-inch wall thickness	F1043, Group I-C	1.25	1.660

Subsection 909.03 (pg. 983), 12-2-16; Remove the last paragraph of the subsection.

Subsection 912.05 (pg. 1001), 6-27-16; Add subsection 912.05 – Brick Paving Units:

“912.05 Brick Paving Units

Provide brick of the kind and grade specified.

A. Masonry Brick

1. Sidewalk: ASTM C902, Class SX, Type 1
2. Crosswalks and Roadway: ASTM C1272, Type R

B. Concrete Brick and Truncated Dome Concrete Brick

Provide brick conforming to ASTM C936

C. Truncated Dome Brick

Provide brick conforming to ASTM C902, Class SX, Type 1”

Subsection 915.02 (pg. 1007), 6-27-16; modify the description of 915.03, remove zinc coated, iron from 915.02 A. update the first paragraph of 915.02 A., Remove subsection B. Aluminum Coated Steel Pipe, Revise C. to become B., revise D to become C, Remove 1st and 2nd paragraphs of D now C, revise E to become D, update 915.03 to match index title: :

“SECTION 915 – METALLIC PIPE

915.01 Ductile Iron or Cast Iron Pipe	1007
915.02 Corrugated Metal Pipe Culverts, Pipe Arches, and Underdrains.....	1007
915.03 Polymer Pre-coated, Corrugated Steel Pipe, Culverts, and Underdrains....	1008

915.01 Ductile Iron or Cast Iron Pipe

Provide ductile iron pipe conforming to ASTM A716 for the specified diameters and strength classes. Unless otherwise specified, either smooth, corrugated, or ribbed pipe may be furnished. For pipe diameters in excess of 48 inches, conform to ANSI Standard for Cast Iron Pit Cast Pipe, or as otherwise specified in the Contract, for the specified diameter and strength class.

Provide cast iron drain pipe conforming to ASTM A74. Unless otherwise specified, provide ductile iron pressure pipe for water lines or sewer construction conforming to the requirements of ASTM A377 for the diameters and working pressures specified.

915.02 Corrugated Metal Pipe Culverts, Pipe Arches, and Underdrains

A. Corrugated Steel Pipe, Pipe Arches, and Underdrains

Provide corrugated steel pipe, pipe arches, or underdrains, including special sections, such as elbows and flared ends, that conform to AASHTO M 36, aluminum-coated Type 2 meeting AASHTO M274. Special Sections shall be the same thickness as the pipe, arch, or underdrain to which they are joined. Furnish shop-formed elliptical pipe and shop-strutted pipe only where shown on the Plans.

B. Corrugated Aluminum Pipe, Pipe Arches, and Underdrains

When using corrugated aluminum pipe, pipe arches, or underdrains, conform to the applicable requirements of AASHTO M 196. Use special sections, such as elbows and flared end sections that conform to the applicable requirements of AASHTO M 196 and that are of the same gauge as the conduit to which they are joined.

C. Structural Plate Corrugated Steel and Aluminum Structures

Corrugated aluminum alloy structural plate for pipe, pipe arches, and arches shall conform to the requirements of AASHTO M 219.

D. Bituminous Coating

When material supplied for any of the items specified above are to be bituminous-coated, ensure that the metal to be coated is free of grease, dirt, and other contaminants. Bituminous coating and paving shall conform to the requirements of AASHTO M 190. Apply the coating in accordance with the manufacturer's recommended procedures and as directed by the Department."

915.03 Polymer Pre-coated, Corrugated Steel Pipe, Culverts and Underdrains

Provide polymer pre-coated corrugated steel pipe conforming to AASHTO M 245, Grade 250/250, unless otherwise specified."

Subsection 916.05 E. (pg. 1012); 12-2-16, Add sentence to first paragraph:

"Fabricators must be AISC certified as specified in **602.04 A.4.**"

Subsection 917.02.A.6. (pg. 1023), 6-27-16; Revise the following:

"6. Anchor Bolts. Use anchor rods of high strength steel meeting the requirements of ASTM F 1554, Grade to be determined by design. Fit each anchor bolt with a hex nut and lock-washer."

Subsection 918.04 (pg. 1036), 12-2-16; add as a 2nd paragraph:

"For small quantities less than 100 units of seeding or sod, bagged pelletized or agricultural limestone meeting the Department of Agriculture Tennessee Liming Materials Act may be utilized."

Subsection 921.01 (pg. 1049), 5-18-15, Water; Replace subsection with the following:

"For mixing concrete, use water that is reasonably clean and free of oil, salt, acid, alkali, sugar, vegetable matter, and other substances injurious to the finished product. Water provided by a municipal utility may be used without testing.

All other water shall have quality results submitted in accordance with the frequency listed in Table 921.01-01. All water quality results shall adhere to Table 921.01-2.

Table 921.01-1 Testing Frequency for Mixing Water

Water Source	Testing Frequency⁽¹⁾
Municipal	NA
Non-Municipal	Every 3 months; tested annually after 4 consecutive passing tests

(1) The frequency may vary at the discretion of the Department.

Table 921.01-2 Quality Requirements for Mixing Water

Maximum Concentration in Mixing Water	Limits	ASTM Test Method ⁽¹⁾
Chloride Ion Content, ppm	500	C114
Alkalies as (NaO ₂ + 0.658 K ₂ O), ppm	600	C114

Sulfates as SO ₄ , ppm	3000	C114
Total Solids by mass, ppm	50000	C1603
pH	4.5-8.5	(2)
Resistivity, Minimum, kohm-cm	0.500	D1125
Soluble Carbon Dioxide, ppm	600	D513
Calcium and Magnesium, ppm	400	D511
Iron, ppm	20	(2)
Phosphate, ppm	100	D4327

(1) Other methods (EPA or those used by water testing companies) are generally acceptable.

(2) No ASTM method available.

Subsection 921.06 (pg.1051) 11-16-15; B. Bituminous Additives - 1. Anti-Stripping Additive, replace the ASTM C977 reference with AASHTO M 303.

“Use hydrated lime conforming to AASHTO M 303 or other heat-stable asphalt anti-stripping additive containing no ingredient harmful to the bituminous material or the workmen and that does not appreciably alter the specified characteristics of the bituminous material when added in the recommended proportions.”

Subsection 921.06 B. Bituminous Additives (pg.1052) 10-10-16; revise the 3rd paragraph to the following:

“When using an anti-stripping additive other than hydrated lime, use a dosage rate of 0.3%, unless either gravel is used as a coarse aggregate or test results indicate moisture susceptibility, in which case mix at a dosage rate of 0.5%.

APPENDIX B

SPECIAL PROVISIONS

TITLE	SP#
EMPLOYING AND CONTRACTING WITH ILLEGAL IMMIGRANTS	102I
Specifications for Road and Bridge Construction	102 LC
SPECIAL PROVISIONS RELATIVE TO PROTECTION OF RAILROAD PROPERTY RAILROAD FLAGGING AND INSURANCE REQUIREMENTS	105 C
BUY AMERICAN REQUIREMENTS	106A
PROJEET COMPLETION AND LIQUIDATED DAMAGES	108B
PAYMENT ADJUSTMENT FOR FUEL	109A
PRICE ADJUSTMENT FOR BITUMINOUS MATERIAL	109B
Section 411-Asphalt Concrete Surface (Hot Mix)	411 B
RETAINING WALLS	624
Traffic Queue Protection	712 PTQ
EQUAL EMPLOYMENT OPPORTUNITY	1230
STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)	1231
NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)	1232
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TENNESSEE DEPARTMENT OF TRANSPORTATION MINIMUM WAGE SCALES FOR FEDERAL-AID	1320

B

Design-Build Project

SR 396, Saturn Parkway Extension,
and improvement on State Route 247
Maury County

TITLE	SP#
CONSTRUCTION AND STATE FUNDED CONSTRUCTION	
FEDERAL WAGE RATES	AA-FED RATES
STATE WAGE RATES	AA-ST RATES

*SR 396, Saturn Parkway Extension,
and improvement on State Route 247
Maury County*

C

Design-Build Project

STATE**OF****TENNESSEE**

Rev: October 10, 2016

January 1, 2015

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.

S T A T E

O F

T E N N E S S E E

January 1, 2015

(Rev. 03-30-15)

SPECIAL PROVISION

REGARDING

TENNESSEE DEPARTMENT OF TRANSPORTATION STANDARD

SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION

DESCRIPTION

Any and all references concerning the March 1, 2006 Standard Specifications for Road and Bridge Construction shall be interpreted as the January 1, 2015 Standard Specifications for Road and Bridge Construction.

The following Special Provisions have been incorporated into the January 1, 2015 Standard Specifications for Road and Bridge Construction:

- 107SHP
- 407G
- 411TL
- 411TLD
- 411OGFC
- 716ST

Any reference to these Special Provisions shall refer to the January 1, 2015 Standard Specifications for Road and Bridge Construction.

EXHIBIT A

STATE

OF

TENNESSEE

SPECIAL PROVISIONS RELATIVE TO PROTECTION OF RAILROAD PROPERTY RAILROAD FLAGGING AND INSURANCE REQUIREMENTS

Project Information: PIN#: 123399.00; Legislative – Reconstruction; State Route 396; Saturn Parkway Extension – Construction of Temporary At-Grade Crossing and Construction of New Overhead Bridge Grade Separated Crossing; CSXT Railroad Crossing (DOT#: 350600S); Proj. No.(s): STP-396(4); 60100-3209-14; in Maury County; CSXT OP#: TN0476.

Tennessee Project Number(s): PE: 60100-1209-04
Construction: 60100-3209-14

County: Maury

Railroad Company: CSX Transportation, Inc.
P.O. Box 45052
Jacksonville, FL 32232-5052

AUTHORITY OF CSXT ENGINEER

The authorized representative of the railroad, hereinafter referred to as CSXT Engineer, shall have final authority in all questions affecting his railroad operations, and the contractor must be governed accordingly.

All engineering correspondence, scheduling of work, and request for pre-construction representation shall be addressed to the CSX Transportation, Inc. Project Manager contact (See sheet number 8 for name and address).

INTERFERENCE WITH RAILROAD OPERATIONS:

The Department or its contractor shall so arrange and conduct their work that there will be no interference with railroad operations, including train, signal, telephone and telegraphic services, or damage to the property of the railroad, or to wires or other facilities of the tenants on the rights-of-way of the railroad.

The use of any scaffolding or other temporary framework that effects horizontal or vertical clearance must first be approved by the railroad CSXT Engineer and in no case exceed the approved clearances.

If conditions arising from or in connection with the Project require that immediate and unusual provisions be made to protect train operation or CSXT's property, the Department or its Contractor shall make such provision. If the CSXT Representative determines that such provision is insufficient, CSXT may, at the expense of the Department or its Contractor, require or provide such provision as may be deemed necessary, or cause the Work to cease immediately.

DAMAGE TO RAILROAD PROPERTY:

Should any damage occur to railroad property, as a result of the contractor's unauthorized or negligent operations, and the railroad superintendent deems it necessary to repair such damage or perform any work for the protection of its property, the required materials, labor and equipment shall be furnished by the railroad and the contractor shall reimburse it for the costs incurred.

TEMPORARY GRADE CROSSINGS:



If the contractor desires access across railroad's right-of-way and tracks at other than an existing and open public road crossing in or incident to construction of the project, the railroad may permit such contractor access across said right-of-way and tracks at such location as shall be mutually agreed upon by CSXT and contractor, provided contractor first executes a license agreement satisfactory to the railroad and agrees to bear all costs and liabilities related to such access, including reimburse the railroad for the flagmen expenses, cost of providing and removing any temporary grade crossing, and other costs which CSXT deems necessary for protection of its property and operations. Contractor shall at no time cross the railroad's right-of-way or tracks with vehicles or equipment of any kind or character, except at such crossing or crossings as may be established pursuant to this subsection.

WATCHMEN:

The railroad shall have the right to assign a watchman to the site of the project to perform inspection services for protection of its railroad operations, whenever, in the opinion of CSXT, such inspection may be necessary to prevent interference with railroad operations, such as but not necessarily limited to obstruction of track clearances and roadbed drainage, foreign substances on or adjacent to the rails and disturbance of surface and alignment of track, but such inspection shall not relieve the contractor from liability. The cost incurred by the railroad for furnishing a watchman to perform such inspection services will be reimbursed by TDOT.

FLAGGING SERVICES:

Any flagging service required, when in the opinion of CSXT that such service is necessary for the safety of its operations because of work being performed by the contractor or in connection therewith, will be provided by the railroad. The requirements of the railroad are as follows:

The services of two flagmen whenever the contractor's men or equipment are, or are liable to be, working within the specified track clearances, or over the tracks, or when work has disturbed the surface and alignment of any operated track to such extent that movement of trains should be controlled by flagging.

The Department or contractor shall give a minimum of thirty (30) days advance notice to CSXT for anticipated need for flagging service. No work shall be undertaken until the flag person(s) is/are at the job site. If it is necessary for CSXT to advertise a flagging job for bid, it may take up to 90 days to obtain this flagging service, and CSXT shall not be liable for the cost of delays attributable to obtaining this flagging service.

The Department will reimburse the Railroad directly for all costs incurred for flagging services by railroad personnel. The Railroad has officially allotted **Four Hundred (400)** flagging days to the Contractor for the resurfacing of the above described project. In the event that flagging services are required in excess of the officially allotted days, the Department will reimburse the Railroad for the additional cost of flagging services and such costs deducted from monies due the Contractor. No adjustments will be made to costs of flagging services that are required in excess of the allotted days. These additional flagging costs assessed against the Contractor will be made under the following item:

105-03

Railroad Flagging

Dollar

The payment of flagging services will be based on invoices received from the Railroad. The Engineer shall sign the invoice in order to verify the flagging service performed by the Railroad.

Estimated flagging rate for this contract is \$392.00 per day per flagman based on an eight hour work day.

Overtime rate over eight hours = 1.5 x regular hourly rate and over 16 hours = 2.0 x regular hourly rate.

Holiday rate = 1.5 x regular hourly rate up to 16 hours and = 2.0 x regular hourly rate over 16 hours.

In addition to the above rate there will be an additive of 163.09% of direct labor for vacation, holiday, sickness, pension, administration, etc. and \$120.00 per day, per flagman, for travel, meals, lodging, equipment and others.

Minimum + hours per call out is eight (8) hours and notification to start or to terminate flagman must be given at least five (5) days in advance or else contractor might be billed for flagman whether he is working or not working.

The Contractor and Department will review and sign the Railroad flagman's time sheet attesting that the flagman was present during the time recorded. Flagmen may be removed by Railroad if form is not signed. If flagman is removed, the Contractor will not be allowed to re-enter the Railroad right-of-way until the issue is resolved. Any complaints concerning flagman or flagmen must be resolved in a timely manner. If need for flagman or flagmen is questioned, please contact CSX Transportation, Inc. **Flag Request Contact.** (See sheet number 8 for name and address). All verbal complaints must be confirmed in writing by the Contractor within 5 working days with copy to the Highway Engineer. All written correspondence should be addressed to CSX Transportation, Inc. **Project Manager contact** (See sheet number 8 for name and address).

The Railroad flagman assigned to the project will be responsible for notifying the State Project Supervisor upon arrival at the job site on the first day (or as soon thereafter as possible) that flagging services begin and on the last day that he performs such services for each separate period that services are provided. The State Project Supervisor will document such notification in the project records. When requested, the State Project Supervisor will also sign the flagman's diary showing daily time spent and activity at the project site.

Upon completion of all work within the Railroad right-of-way, the State Project Supervisor shall notify the Railroad for final inspection of this work. The Department shall give the Railroad 120 calendar days from the date of the on-site final inspection, in which the work is accepted by the Department and the Railroad, to submit all invoices for which flagging services are to be reimbursed. Department will not be liable for any payment of flagging charges received after 120 calendar days.

USE OF EXPLOSIVES:

Explosives shall not be used on or adjacent to any track or other railroad property without the prior written approval of CSXT, but such approval will not relieve the contractor from any liability. If the use of the explosives are permitted, the blasting shall be done with light charges under supervision of a responsible employee of the Department or contractor. No blasting shall be done without the presence of an authorized representative of CSXT. At least ten (10) days advance notice to CSXT Representative is required to arrange for the presence of an authorized CSXT representative. Every precaution shall be taken to avoid damage to property, injury to persons and interruption of railroad operations. Electronic detonating fuses shall not be used because of the possibility of premature

explosions resulting from operation of two-way train radios. Blasting shall be discontinued immediately on notice from CSXT that it is too hazardous.

The Department or contractor must have at the Project Site adequate equipment, labor and materials, and allow sufficient time to (i) clean up (at the Department's expense) debris resulting from the blasting without any delay to trains; and (ii) correct (at the Department's expense) any track misalignment or other damage to CSXT's property resulting from blasting, as directed by CSXT Representative, without delay to trains. If Department's or Contractor's actions result in delay of any trains, including Amtrak passenger trains, Department shall bear the entire cost thereof. In the event that the Contractor does not restore the Railroad's track and/or related train traffic facilities to their pre-blasting condition, and/or the Contractor's actions result in any delay of train traffic CSXT's costs to mitigate such damages and/or train traffic delays that are charged to the Department by CSXT shall be reimbursed to the Department from monies due the Contractor.

The Department or Contractor shall not store explosives on CSXT property.

STORAGE OF MATERIALS:

The contractor shall not store or pile materials or equipment on the right-of-way of the railroad without having first obtained permission from CSXT, and in no case shall they be stored closer than 13' 0" from the centerline on any railroad track measured at right angles thereto. Such permission will be with the understanding that the railroad will not be liable for any damage to such materials or equipment from any cause and that CSXT may move, or require the contractor to move, at the contractor's expense, such materials and equipment. **The contractor shall store materials so as to prevent trespassers from causing damage to trains or CSXT property.**

CLEANING UP:

The contractor will be required upon completion of the work, to remove from within the limits of the railroad's right-of-way, all machinery equipment, surplus materials, falsework, rubbish, debris, or temporary buildings of said contractor, and to leave the right-of-way in a neat condition, satisfactory to CSXT. The contractor will be required to provide the project engineer with a letter of release from CSXT before final acceptance of the project by the State.

NOTICE OF STARTING WORK:

The contractor shall notify the CSXT Engineer of the railroad in writing at least 10 business days in advance, when he expects to start work on railroad's right-of-way and **thirty (30) days** in advance of flagging services.

COOPERATION AND DELAYS:

The contractor shall cooperate with others participating in the construction project, to the end that all work may be carried on to the best advantage. No charge or claim of the contractor against either the State or the railroad will be allowed for hindrance or delay on account of railroad traffic or any work done by the railroad or others, incident to or necessary for safe operation or

maintenance of railroad traffic, facilities, and property, or completion of the project, but due consideration of any such delay will be taken into account in counting the working days to be charged against the project.

During construction of the footings of piers or other supports or structures adjacent to any track of the railroad, the contractor shall make adequate provisions against sliding, shifting, sinking, or in any way disturbing the railroad embankment and track operations, by driving temporary sheeting, and/or providing temporary shoring in a manner satisfactory to the State Project Supervisor, the railroad Project Manager (**See sheet number 8 for name and address**) and the railroad Staff Engineer.

Before commencing work on any pier or structure adjacent to any track, the contractor shall submit prints of the proposed shoring and bracing details for the protection of the railroad company's track to the State Project Supervisor for his approval. This submittal shall include the proposed method of installation and be accompanied by supporting data, including design computations, soil descriptions, and other pertinent information.

After approval by the State Project Supervisor, four prints of the proposed shoring and bracing details bearing the seal of a registered structural or professional engineer, together with supporting documents, shall be forwarded to the railroad Project Manager (**See sheet number 8 for name and address**) or his engineering designate for review and approval.

The contractor shall notify the railroad Engineering Consultant Designee and Project Manager (in writing) not less than one (1) week in advance of the proposed time of the beginning of the construction of the piers, supports or structures adjacent to the track.

INSURANCE:

In addition to any other forms of insurance or bonds required under the terms of the contract and specifications, the contractor will be required to carry insurance of the following kinds and minimum amounts:

- (1.) Commercial General Liability insurance coverage with limits of not less than **\$5,000,000.00** in combined single limits for bodily injury and or property damage per occurrence. Said policy shall include "explosion, collapse, and underground hazard" ("XCU") coverage, shall be indorsed to name Railroad specified in item 2.C. below as an additional insured, and shall include a severability of interest provision, and shall be addressed directly to **CSXT Risk Management contact (See sheet number 8 for name and address)**.
- (2.) Statutory Worker's Compensation and Employers Liability Insurance with limits of not less than **\$1,000,000.00**, which insurance must contain a waiver of subrogation against CSX Transportation, Inc. and its affiliates.
- (3.) Commercial automobile liability insurance with limits of not less than **\$1,000,000** combined single limit for bodily injury and/or property damage per occurrence, and such policies shall name CSX Transportation, Inc. as an additional named insured.

Railroad's Protective Public Liability and Property Damage Liability Insurance:

- (4.) The contractor will be required to furnish Railroad Protective Insurance to protect CSX Transportation, Inc. in connection with operations to be performed on or adjacent to CSX Transportation's right-of-way. Questions concerning CSX Transportation Insurance requirements shall be addressed directly to **CSXT Risk Management**

contact (See sheet number 8 for name and address). These are CSXT specifications for proper evidence of insurance:

- A. The insurer must be financially stable and rated B+ or better in Best's Insurance Reports.
- B. The policy must be written using the ISO/RIMA Form of Railroad Protective Insurance - Insurance Services Office (ISO) Form CG 00 35.
- C. Named Insured Railroad and Address:

CSX Transportation, Inc.
Risk Management (C-907)
500 Water Street
Jacksonville, FL 32202

Electronic mail should be sent to:

insurancedocuments@csx.com

- D. Limits of Liability:
 - \$5,000,000.00 per occurrence combined single limit for bodily injury and property damage, subject to a \$10,000,000 annual aggregate limit is required because a significant number of hazardous materials trains (a total of **less than one (1)** Train Movements at **Twenty (20)** MPH along this track per day) are in the area of construction).
- E. CSX Transportation must be named as the named insured on the Railroad Protective Policy.
- F. Name and address of the contractor and TDOT must be shown on the Declarations page.
- G. Name and address of the Project Sponsor, being the State of Tennessee, Department of Transportation must be shown on the Declarations page.
- H. Description of operations must appear on the Declarations page and must match the project description, including project or contract identification numbers.
- I. Authorized Endorsements:
 - 1. Must Include:
 - a) Pollution Exclusion Amendment – CG 28 31
(Not necessary with Form CG 00 35 version 96 and later)
 - b) Delete Common Policy Conditions – CL/CG 99 01
If policy jacket does not include Common Policy Conditions this endorsement is not necessary.
 - 2. Acceptable:
 - a) Broad Form Nuclear Exclusion – IL 00 21
 - b) 30-Day Advance Notice of Non-renewal or cancellation
 - c) Required State Cancellation Endorsement

- d) Quick Reference or Index – CL/IL 240
- 3. Unacceptable:
 - a) Any Pollution Exclusion Endorsement except CG 28 31
 - b) An Endorsement that excludes TRIA coverage
 - c) An Endorsement that limits or excludes Professional Liability coverage
 - d) A Non-Cumulation of Liability or Pyramiding of Limits Endorsement
 - e) A Known Injury Endorsement
 - f) A Sole Agent Endorsement
 - g) Any Punitive or Exemplary Damages Exclusion
 - h) Any “Common Policy Conditions” Endorsement
 - i) Any endorsement that is not named in I (1) or I (2) above.
 - j) Policies that contain any type of deductible.
- J. Additional Terms:
 - 1. The Contractor must submit its original insurance policies and two copies and all notices and correspondence regarding insurance policies directly to the **CSX Risk Management Contact (See sheet Number 8 for electronic/e-mail address)**.
 - 2. Neither TDOT nor the Contractor may begin work on the Project until it has received CSXT’s written approval of the required insurance policies.

GENERAL

All insurance herein-before specified shall be carried until all work required to be performed under the terms of the contract has been satisfactorily completed within the limits of the right-of-way of the railroad, as evidenced by the formal acceptance by the State.

Insuring companies may not cancel insurance except by permission of the State and railroad insured, or on thirty (30) days written notice to the State and the railroad.

RAILROAD CONTACTS NAME AND ADDRESS

<p>Scott Willis Project Manager II- Public Projects</p> <p>CSX Transportation, Inc.</p> <p>500 Water Street HQ Building, 13th Floor Jacksonville, FL 32202 O. 904.359.1405 E. Scott_Willis@csx.com</p>	<p>Tony Bellamy Director, Project Management Public Projects</p> <p>CSX Transportation, Inc.</p> <p>SC/J-301 500 Water Street Jacksonville, FL 32202 O. 904.359.7601 F. 904.245.2824 E. tony_bellamy@csx.com</p>	<p>Insurance Risk Management</p> <p>E. Victoria.Matts@stvinc.com</p>	<p>FLAGGING REQUEST</p> <p>Patrick Proud Construction Manager STV, Inc. 5200 Belford Rd., Suite 400 Jacksonville, FL 32256 O.904.730.9777 M. 678.350.6750 E. Patrick.Proud@stvinc.com Charge Flagging to: CSXT OP#: TN0476</p>
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*Railroad Contacts For Pre-Con Meeting Notification And For Coordination of Construction Work:

Railroad's Construction Division Contact:

*Mr. Bill Stewart, Director Construction Engineering
CSX Transportation, Inc.
351 Thornton Road, Suite 125
Lithia Springs, GA 30122
Phone: (770) 819-2841
Fax: (770) 819-2850
E-mail: bill_r_stewart@csx.com

Railroad's Engineering Consultant Designate:

Mr. Randy Frederick - Project Manager
STV, Incorporated
5200 Belfort Rd., Suite 400
Jacksonville, FL 32256-6054
PHONE: (904) 383-3913
CELL: (904) 254-2692
FAX: (904) 730-7766
EMAIL: RANDY.FREDERICK@STVINC.COM

*Ms. Vicki Matts – Project Coordinator
STV, Incorporated
5200 Belfort Rd., Suite 400
Jacksonville, FL 32256-6054
PHONE: (904) 383-3919
CELL: (904) 651-0902
FAX: (904) 730-7766
EMAIL: VICTORIA.MATTS@STVINC.COM

DOT Crossing Number(s): 350600S Information:

Date:	05/18/2017
Average Trains/Day:	Less than one (1)
Maximum Train Speed:	20 MPH

SPECIAL NOTES

The contractor shall provide the Railroad Protective Insurance Policy and Certificates of Insurance by e-mail within (20) calendar days of Notification of Award.

Failure to provide the above within the specified time may subject the award to annulment and forfeiture of the bid guarantee, not as a penalty, but as liquidated damages.

STATE**OF****TENNESSEE**

(Rev. 6-19-95)

(Rev. 6-1-04)

(Rev. 06-20-2011)

January 1, 2015

SPECIAL PROVISION**REGARDING****BUY AMERICA REQUIREMENTS**

All manufacturing processes for iron and steel products, and coatings applied thereon, used in this project shall occur in the United States except that if the proposal has bid items for furnishing domestic and foreign iron and steel, the bidder will have the option of (1) submitting a bid for furnishing domestic iron and steel, or (2) submitting a bid for furnishing domestic iron and steel and a bid for furnishing foreign iron and steel. If option (2) is chosen the bid will be tabulated on the basis of (a) the total bid price using the bid price for furnishing domestic iron and steel and, (b) the total bid price using the bid price for furnishing foreign iron and steel.

For the total bid based on furnishing foreign iron and steel to be considered for award, the lowest total bid based on furnishing domestic iron and steel must exceed the lowest total bid based on furnishing foreign iron and steel by more than 25 percent. The 25 percent differential applies to the total bid for the entire project, not just the bid prices for the steel or iron products.

Iron and steel products are defined as products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated or otherwise similarly processed from iron and steel made in the United States. Iron products are included, however, pig iron and processed, pelletized, and reduced iron ore may be purchased outside the United States.

Manufacturing begins with initial melting and continues through the coating stage. Any process which modifies chemical content, physical size or shape, or the final finish is considered a manufacturing process. Coatings include epoxy, galvanizing, painting or any other surface protection that enhances the value and/or durability of a material.

The contractor shall provide a certification to the Engineer with each shipment of iron and steel products to the project site that the manufacturing processes for the iron and steel products occurred in the United States. No steel shall be placed until the contractor ensures the requirements of this Special Provision are met.

The above requirements do not prevent a minimal use of foreign materials, if the cost of such materials used does not exceed 0.1 percent of the total contract cost or \$2,500.00, whichever is greater. If steel

not meeting the requirements of this Special Provision is used, the contractor shall provide a written statement to the Department prior to its use indicating where the steel will be incorporated in the work, the value of the steel, the percentage of the contract amount, and the appropriate invoices shall be submitted as documentation.

The contractor shall be responsible for all cost associated with any steel that is permanently incorporated into the project that does not meet the requirements of this Special Provision without prior written approval from the Department, up to and including removal and replacement.

SP108B

SP108B

S T A T E

O F

T E N N E S S E E

May 1, 2017

County: Maury

Contract No.: DB1601

SPECIAL PROVISION

REGARDING

PROJECT COMPLETION AND LIQUIDATED DAMAGES

The project shall be completed in its entirety on or before the completion date shown on the cover of this proposal contract.

All lane closures must be approved in advance by the Engineer. Temporary lane closures shall not interfere with school or work traffic in the mornings or afternoons as stated in RFP Book 3. No lane closures will be allowed during Special Events, Holidays or Holiday weekends in accordance with the plans and specifications, or as directed by the Engineer.

All lane closures and operations must be coordinated with GM and existing construction contracts in the area.

No partial payments, including payment for stockpile materials, shall be made before work begins.

STATE**OF****TENNESSEE**

(Rev. 10-01-06)

(Rev. 11-03-08)

(Rev. 01-03-13)

January 1, 2015 |

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 **\$ 1.81** |

The July 2017 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 per unit	Unit of measure
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	_____ =	_____

Total Fuel for Month (Fe) _____

$$PA = [(Ic \div Ib) - 1] \times Fe \times Fp$$

$$PA = [(Icd \div Ib) - 1] \times Fe \times Fp$$

S T A T E**O F****T E N N E S S E E**

January 1, 2015

(Rev. 08-01-00)

(Rev. 08-02-00)

(Rev. 01-07-13)

(Rev. 05-16-16)

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 **\$367.73** 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 only when the "Monthly Bituminous Material Index" is **less** than the "Basic Bituminous Material Index" and varies 5% or more.

Payment adjustment, for bituminous material used after the expiration of the allocated working time and where the "Monthly Bituminous Material Index" **exceeds** the "Basic Bituminous Material Index", 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, payment adjustments for bituminous material shall be calculated for each month where the allocated working time has expired, the "Monthly Bituminous Material Index" **exceeds** the "Basic Bituminous Material Index", and the indices vary 5% or more. 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 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
-microsurfacing (e.g. CQS-1HP)	65% residue
-chip seals (e.g. CRS-2, CRS-2P)	69% 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 only when the "Monthly Bituminous Material Index" is **less** than the "Basic Bituminous Material Index" and varies 5% or more.

Payment adjustment, for bituminous material containing RAP provided after the expiration of the allocated working time and where the "Monthly Bituminous Material Index" **exceeds** the "Basic Bituminous Material Index", shall **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, payment adjustments for bituminous material containing RAP shall be calculated for each month where the allocated working time has expired, the "Monthly Bituminous Material Index" **exceeds** the "Basic Bituminous Material Index", and the indices vary 5% or more. 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”.

$$PA = [Icd - Ib] \times \frac{[BA - RA]}{100} \times Tm$$

The “Monthly Bituminous Material Index” is **greater** than the “Bituminous Material Index for Contract Completion Date”.

$$PA = [Ic - Ib] \times \frac{[BA - RA]}{100} \times Tm$$

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

STATE**OF****TENNESSEE**

(Rev. 12-01-02)

January 1, 2015

(Rev. 02-01-07)

(Rev. 10-20-07)

(Rev. 05-11-2010)

SPECIAL PROVISION**REGARDING****SECTION 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 HCIRI of 60 in./mi. Any lot, or fraction thereof, of the binder layer that is greater than 60 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 Half Car International Roughness Index value exceeds 70 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 Half Car 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 Half Car International Roughness Index values

SPECIFICATION			
411B			
Road Profiler Value Half Car IRI (IN/MI)	Percentage paid on bid price of surface items	Road Profiler Value Half Car IRI (IN/MI)	Percentage paid on bid price of surface items
Less than 25	110%	48	97%
25	110%	49	96%
26	109%	50	95%
27	108%	51	94%
28	107%	52	93%
29	106%	53	92%
30	105%	54	91%
31	104%	55	90%
32	103%	56	88%
33	102%	57	86%
34	101%	58	84%
35	100%	59	82%
36	100%	60	80%
37	100%	61	77%
38	100%	62	74%
39	100%	63	71%
40	100%	64	68%
41	100%	65	65%
42	100%	66	61%
43	100%	67	57%
44	100%	68	53%
45	100%	69	49%
46	99%	70	45%
47	98%	Greater than 70	Mill and Inlay*

* The mill and inlay shall be the thickness as specified on the plans for the surface layer.

STATE**OF****TENNESSEE**

Rev. 03-17-15

January 1, 2015

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Rev. 12-7-15

Rev. 5-16-16

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

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.

- c. Any general or special notes, standard or special drawings, or other unique provisions required for construction of the wall.
- d. All horizontal and vertical curve data affecting wall construction.
- e. Cross sections showing limits of construction and in fill sections, limits and extent of select granular backfill material placed above original ground.
- f. Limits and extent of reinforced soil volume
- g. Limits and extent of any ground improvements as required by the contract plans.
- h. 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 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 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 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 exposed 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**1. 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.

C. 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 Precast 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.
- 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.

D. 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 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

- 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.

E. 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.

F. 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 ~~set forth in Section F.1.e.~~ 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 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.

**G. 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 set forth in Section G. 1.e. 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.

H. 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 restressable 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.

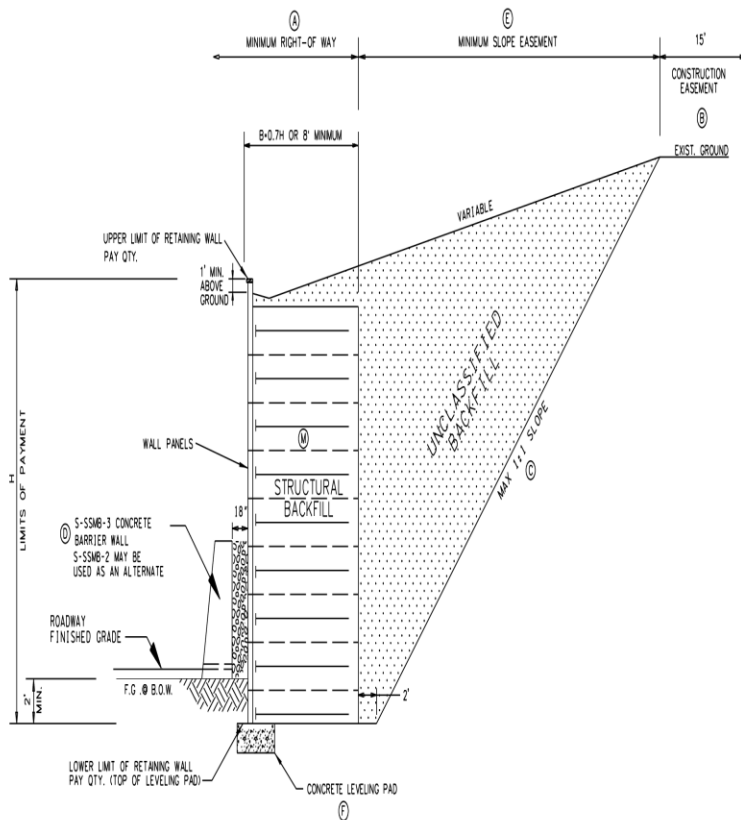
- a) A performance-tested or proof-tested ground anchor with a 60 minute load hold shall be acceptable if the: (1) ground anchor resists the maximum test load with a creep rate that does not exceed 0.08 inch in the last log cycle of time; and (2) total elastic movement at the maximum test load exceeds 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 enhance 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} .

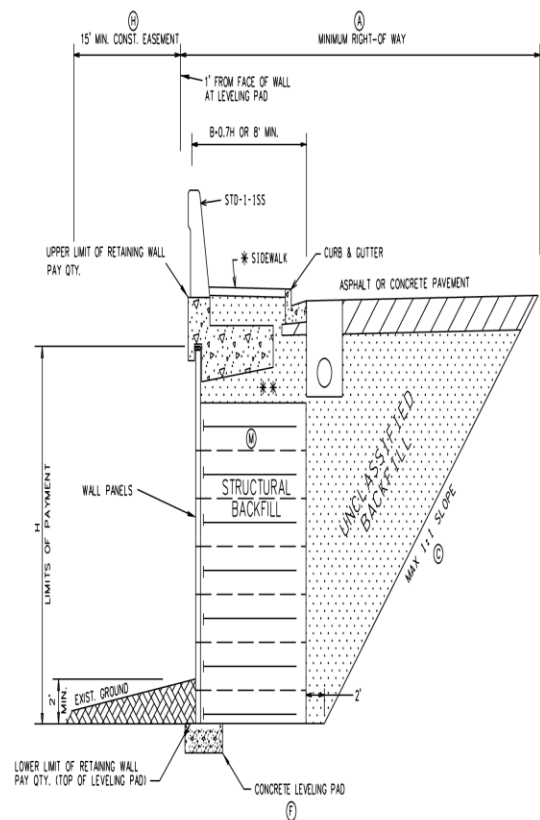
- Anchor Lift-Off Test

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.



MECHANICALLY STABILIZED EARTH (MSE)
SEGMENTAL PRECAST WALL TYPICAL SECTION IN CUT
(NOT RECOMMENDED IN CUT SECTIONS)

NOTE: THIS IS NOT A STRUCTURAL
DESIGN DRAWING. IT IS A
GUIDE FOR THE ROADWAY
DESIGNER.



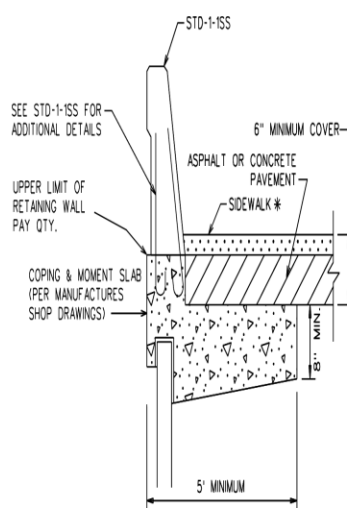
MECHANICALLY STABILIZED EARTH (MSE)
SEGMENTAL PRECAST WALL TYPICAL SECTION IN FILL

* WALL TYPE MAY ALSO BE USED WHEN ROAD SECTION HAS A
SHOULDER, INSTEAD OF CURB, GUTTER, AND SIDEWALK.
** WHEN LIGHT POLES ARE PROPOSED, WALL DESIGNER TO BE
AWARE THAT THE FOUNDATION FOR THE POLES WILL LIKELY
BE A MINIMUM OF 15' DEEP.

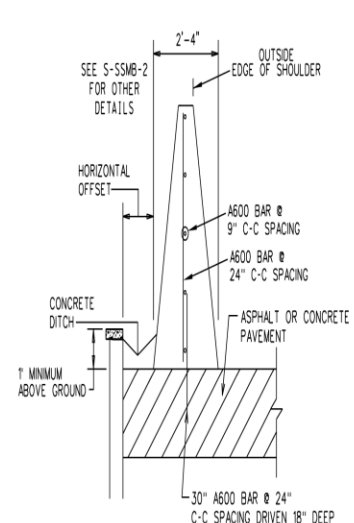
GENERAL NOTES

THE PURPOSE OF THIS DRAWING IS TO ILLUSTRATE TO THE ROADWAY DESIGNER THE RIGHT-OF-WAY, SAFETY AND DRAINAGE REQUIREMENTS ASSOCIATED WITH RETAINING WALLS.

- THE ENTIRE WALL MUST BE BUILT WITHIN THE RIGHT-OF-WAY, PLUS 1' IN FRONT OF WALL PANELS (AT LEVELING PAD) WHEN IN A FILL.
- A MINIMUM OF 15' CONSTRUCTION EASEMENT REQUIRED BEHIND SLOPE TIE IN.
- ACTUAL UNDERCUT DEPTH AND BACKFILL SLOPE TO BE DETERMINED BY THE GEOTECHNICAL ENGINEER.
- IF WALL IS WITHIN CLEAR ZONE OF ROADWAY, OR MEETS ANY OF THE CRITERIA SPECIFIED IN SP 624, PLACE CONCRETE BARRIER WALL IN FRONT OF WALL. COST TO BE INCLUDED IN S.F. COST OF THE WALL.
- BACKFILL AREA TO BE PURCHASED AS SLOPE EASEMENT UNTIL TIED IN WITH EXISTING GROUND LINE, UNLESS GEOTECHNICAL ENGINEER DEEMS SELECT BACKFILL A NECESSITY. IN WHICH CASE THE BACKFILL AREA SHALL BE PURCHASED AS RIGHT-OF-WAY.
- COST OF LEVELING PAD, WILL BE PAID FOR IN THE COST OF THE RETAINING WALL.
- IF DRAINAGE STRUCTURES ARE PRESENT WITHIN STRUCTURAL BACKFILL AREA, THE WALL MANUFACTURER SHALL DETERMINE THE EXTENT OF THIS INSTALLATION AND DESIGN THE WALL ACCORDINGLY.
- AREA OUTSIDE OF WALL TO BE GRADED TO DRAIN AWAY FROM WALL. ALL GRADING TO BE INCLUDED IN CONSTRUCTION EASEMENT.
- ALL COSTS ASSOCIATED WITH MOMENT SLAB TO BE INCLUDED IN THE COST OF THE RETAINING WALL.
- BEGINNING AND END OF WALLS SHOULD BE PLACED OUTSIDE THE CLEAR ZONE. IF THIS OPTION IS NOT FEASIBLE, USE A TL-3 END TERMINAL OR CRASH CUSHION ATTACHED TO CONCRETE BARRIER WALL DO NOT ATTACH IT TO THE WALL ITSELF.
- DEFER TO OPL. ONLY APPROVED WALL TYPES MAY BE USED.
- COST OF CONCRETE BARRIER SHALL BE PAID SEPARATELY.
- WALL DESIGNER TO BE AWARE OF ANY FEATURES THAT MAY INTERFERE WITH STRUCTURAL BACKFILL. ITEMS COULD INCLUDE, BUT ARE NOT LIMITED TO: DRAINAGE STRUCTURES, LIGHT POLES (FOUNDATIONS ARE TYPICALLY AT LEAST 15' DEEP), UTILITIES, ETC.



CONCRETE BARRIER ATTACHMENT DETAIL
TO BE PROVIDED BY MANUFACTURER

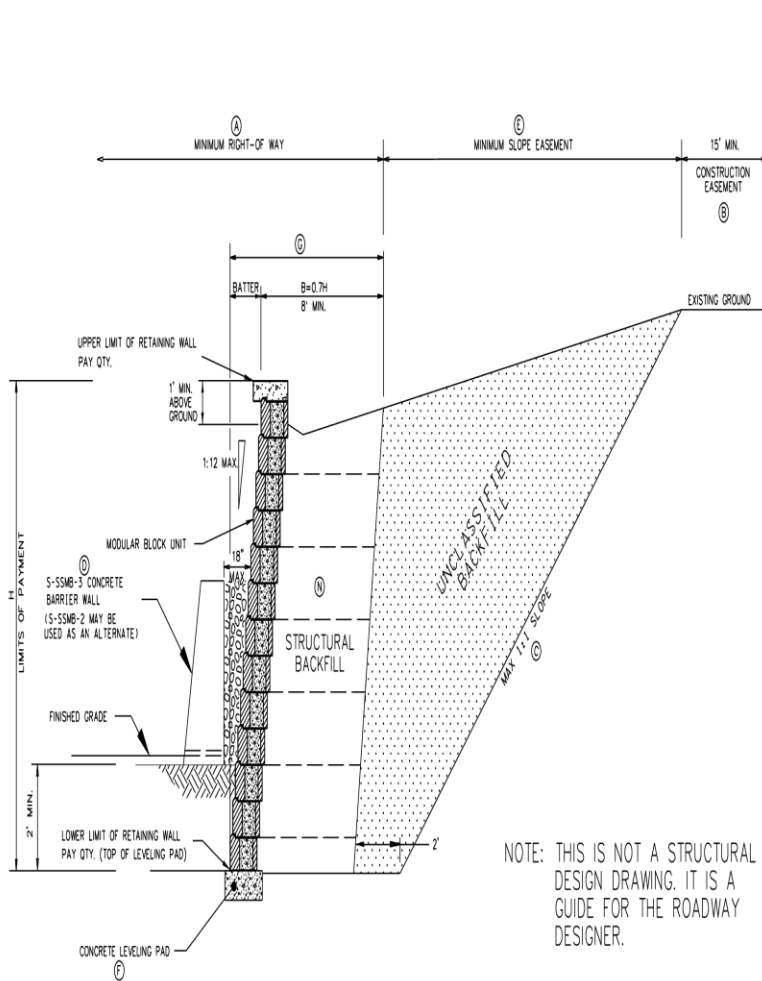


ALTERNATE ATTACHMENT DETAIL FOR
51" SINGLE SLOPE CONCRETE BARRIER

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

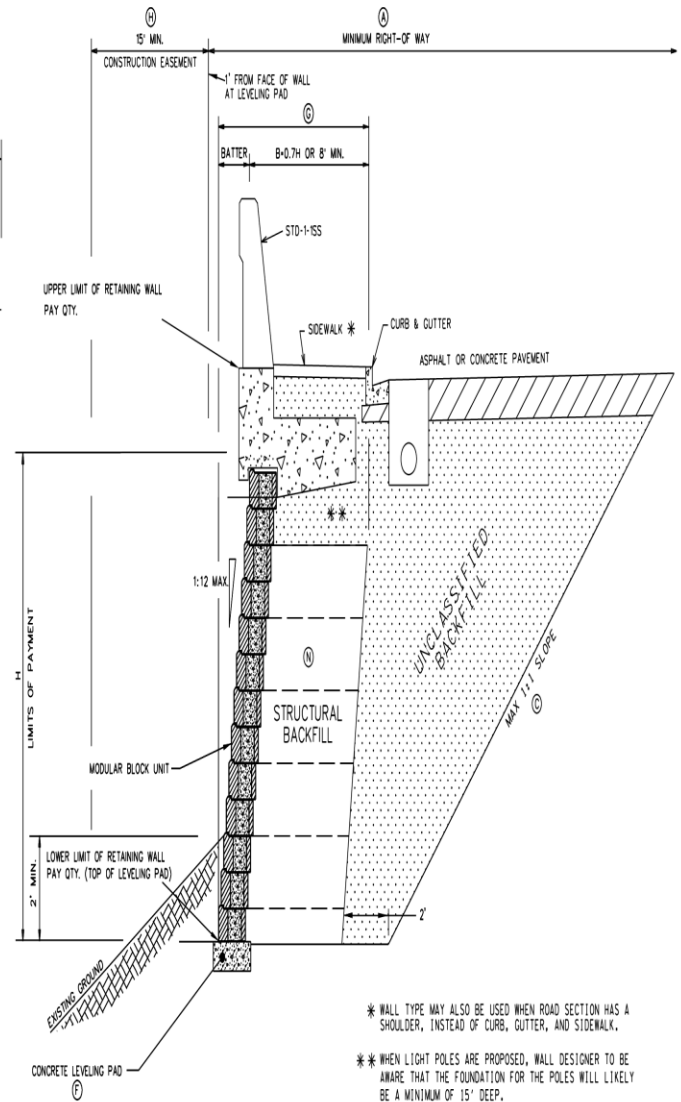
ROADWAY
FEATURES
FOR MSE SEGMENTAL
PRECAST FACING
RETAINING WALL

8-15-15 W-MSE-1



MECHANICALLY STABILIZED EARTH (MSE) WALL
MODULAR BLOCK TYPICAL SECTION IN CUT
(NOT RECOMMENDED IN CUT SECTIONS)

NOTE: THIS IS NOT A STRUCTURAL
DESIGN DRAWING. IT IS A
GUIDE FOR THE ROADWAY
DESIGNER.



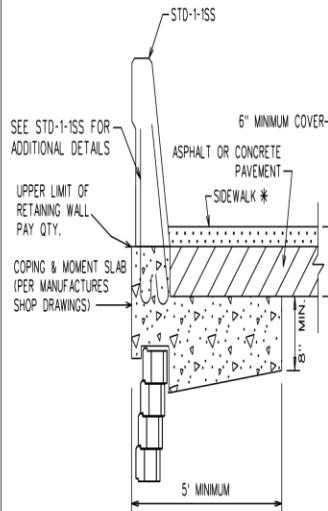
* WALL TYPE MAY ALSO BE USED WHEN ROAD SECTION HAS A
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GENERAL NOTES

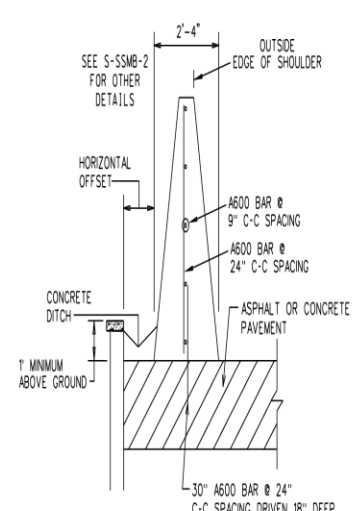
THE PURPOSE OF THIS DRAWING IS TO ILLUSTRATE TO THE ROADWAY DESIGNER THE RIGHT-OF-WAY, SAFETY AND DRAINAGE REQUIREMENTS ASSOCIATED WITH RETAINING WALLS.

- A THE ENTIRE WALL MUST BE BUILT WITHIN THE RIGHT-OF-WAY, PLUS 1' IN FRONT OF WALL PANELS (AT LEVELING PAD) WHEN IN A FILL.
- B A MINIMUM OF 15' CONSTRUCTION EASEMENT REQUIRED BEHIND SLOPE TIE IN.
- C ACTUAL UNDERCUT DEPTH AND BACKFILL SLOPE TO BE DETERMINED BY THE GEOTECHNICAL ENGINEER.
- D IF WALL IS WITHIN CLEAR ZONE OF ROADWAY, OR MEETS ANY OF THE CRITERIA SPECIFIED IN SP 624, PLACE CONCRETE BARRIER WALL IN FRONT OF WALL. COST TO BE INCLUDED IN S.F. COST OF THE WALL.
- E BACKFILL AREA TO BE PURCHASED AS SLOPE EASEMENT UNTIL TIED IN WITH EXISTING GROUND LINE, UNLESS GEOTECHNICAL ENGINEER DEEMS SELECT BACKFILL A NECESSITY. IN WHICH CASE THE BACKFILL AREA SHALL BE PURCHASED AS RIGHT-OF-WAY.
- F COST OF LEVELING PAD, WILL BE PAID FOR IN THE COST OF THE RETAINING WALL.
- G MEASURED AT TOP OF WALL, INCLUDES "B" (0.7 x WALL HEIGHT) AND BATTER (1:12 MAX.). MINIMUM 8' PLUS BATTER.
- H AREA OUTSIDE OF WALL TO BE GRADED TO DRAIN AWAY FROM WALL. ALL GRADING TO BE INCLUDED IN CONSTRUCTION EASEMENT.
- I ALL COSTS ASSOCIATED WITH MOMENT SLAB TO BE INCLUDED IN THE COST OF THE RETAINING WALL.
- J BEGINNING AND END OF WALLS SHOULD BE PLACED OUTSIDE THE CLEAR ZONE. IF THIS OPTION IS NOT FEASIBLE, USE A TL-3 END TERMINAL OR CRASH CUSHION.
- K IF DRAINAGE STRUCTURES ARE PRESENT WITHIN STRUCTURAL BACKFILL AREA, THE WALL MANUFACTURER SHALL DETERMINE THE EXTENT OF THIS INSTALLATION AND DESIGN THE WALL ACCORDINGLY.
- L DEFER TO QPL. ONLY APPROVED WALL TYPES MAY BE USED.
- M COST OF CONCRETE BARRIER SHALL BE PAID SEPARATELY.
- N WALL DESIGNER TO BE AWARE OF ANY FEATURES THAT MAY INTERFERE WITH STRUCTURAL BACKFILL. ITEMS COULD INCLUDE, BUT ARE NOT LIMITED TO: DRAINAGE STRUCTURES, LIGHT POLES (FOUNDATIONS ARE TYPICALLY AT LEAST 15' DEEP), UTILITIES, ETC.

MECHANICALLY STABILIZED EARTH (MSE) WALL MODULAR BLOCK TYPICAL SECTION IN FILL



CONCRETE BARRIER ATTACHMENT DETAIL
TO BE PROVIDED BY MANUFACTURE



ALTERNATE ATTACHMENT DETAIL FOR
51" SINGLE SLOPE CONCRETE BARRIER

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

ROADWAY
FEATURES
FOR MSE
MODULAR BLOCK FACING
RETAINING WALL

8-15-15 W-MSE-2

STATEOFTENNESSEE

January 1, 2015

SPECIAL PROVISION**REGARDING****TRAFFIC QUEUE PROTECTION**

Description: When construction activities are performed on control-access or limited access facilities, the Contractor shall pursue efforts for the protection of traffic queues caused by project operations and clearly demonstrate adequate good faith efforts as described herein. The queue protection truck is expected to alert motorists (inside or outside of project limits) of all stopped traffic caused by construction activities or incidents within the project limits.

Equipment: The contractor shall provide a minimum of one (1) queue protection truck for each traveling direction where traffic flow is reduced. One (1) additional queue protection truck shall be onsite in reserve. The system deployed must fulfill the following minimum requirements:

1. A truck mounted attenuator that meets or exceeds NCHRP TL-3 requirements.
2. Four (4) round yellow strobe lights (with auto-dimmers) positioned rear facing
 - Two (2) mounted under rear bumper
 - Two (2) mounted at cab level
3. One (1) standard cab mounted light bar.
4. A truck mounted message board with a minimum of 3 Lines and 8 Characters per line.
5. Four Hour National Traffic Incident Management (TIM) Responder Training for Queue Truck Operators.

Maintenance of Traffic: The following procedures will be followed until free flow traffic conditions are present:

- The queue protection truck shall be positioned no further than ½ mile upstream from the back of the slow moving traffic.
- The queue protection truck shall be positioned on the shoulder and clear of the traveled way so as not to impede traffic.
- The queue protection truck shall relocate as needed to maintain the minimum ½ mile distance from the back of the slow moving traffic.

- The 2nd queue protection truck shall be held in reserve, on site, and support the primary truck if conditions prevent repositioning by reverse. This truck shall not be paid for idle time.
- Trucks shall be kept in project limits during planned lane closures and other project activities expected to cause a queue.
- Queue length estimates and traffic conditions shall be reported to the TDOT District Operations Supervisor or designee at the following periods:
 1. At 30 minute intervals
 2. At significant changes
 3. When free flow traffic is achieved

The queue protection truck shall be mobilized as directed by the District Operations Supervisor or designee and shall be de-mobilized when free flow conditions are reached.

Basis of Payment: The queue protection truck, all related equipment, and labor shall be paid for as Item No. 712-08.10, per hour. All costs are to be included in the price bid. Idle time shall not be paid.

S T A T E**O F****T E N N E S S E E**

January 1, 2015 |

SPECIAL PROVISION**REGARDING****EQUAL EMPLOYMENT OPPORTUNITY**

Reference:

Federal-Aid Highway Program Manual

Transmittal 147, June 26, 1975

Replaces FHWA Order Interim 7-2(1)

Specific Equal Employment Opportunity Responsibilities**GENERAL**

- a) Equal employment opportunity requirements not to discriminate and to take affirmative action to assure equal employment opportunity as required by Executive Order 11246 and Executive Order 11375 are set forth in Required Contract Provisions (Form FHWA-1273 or PR-1316, as appropriate) and these Special Provisions which are imposed pursuant to Section 140 of Title 23, U.S.C., as established by Section 22 of the Federal-Aid Highway Act of 1968. The requirements set forth in these Special Provisions shall constitute the specific affirmative action requirements for project activities under this contract and supplement the equal employment opportunity requirements set forth in the Required Contract Provisions.
- b) The contractor will work with the Tennessee Department of Transportation and the Federal Government in carrying out equal employment opportunity obligations and in their review of his/her activities under the contract.
- c) The contractor and all his/her subcontractors holding subcontracts not including material suppliers, exceeding \$10,000, will comply with the following minimum specific requirement activities of equal employment opportunity: (The equal employment opportunity requirements of Executive Order 11246, as set forth in Volume 6, Chapter 4, Section 1, Subsection 1 of the Federal-Aid Highway Program Manual, are applicable to material suppliers as well as contractors and subcontractors). The contractor will include these requirements in every subcontract exceeding \$10,000 with such modification of language as is necessary to make them binding on the subcontractor.

Equal Employment Opportunity Policy

The contractor will accept as his operating policy the following statement which is designed to further the provision of equal employment opportunity to all persons without regard to their age, race, color, religion, sex, national origin or disability and to promote the full realization of equal employment opportunity through a positive continuing program:

It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment opportunity officer (hereinafter referred to as the EEO Officer) who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of equal employment opportunity and who must be assigned adequate authority and responsibility to do so.

Equal Employment Opportunity Officer

The contractor will designate and make known to the Tennessee Department of Transportation contracting officers an equal employment opportunity officer (hereinafter referred to as the EEO Officer) who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of equal employment opportunity and who must be assigned adequate authority and responsibility to do so.

Dissemination of Policy

- (a) All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's equal employment opportunity policy and contractual responsibilities to provide equal employment opportunity in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:
 - (1) Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's equal employment opportunity policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.
 - (2) All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer or other knowledgeable company official covering all major aspects of the contractor's equal employment opportunity obligations within thirty days following their reporting for duty with the contractor.

- (3) All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer or appropriate company official in the contractor's procedures for locating and hiring minority group employees.
- (b) In order to make the contractor's equal employment opportunity policy known to all employees, prospective employees and potential sources of employees, i.e., schools, employment agencies, labor unions (where appropriate), college placement officers, etc., the contractor will take the following actions:
 - (1) Notices and posters setting forth the contractor's equal employment opportunity policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
 - (2) The contractor's equal employment opportunity policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

Recruitment

- (a) When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be published in newspapers or other publications having a large circulation among minority groups in the area from which the project work force would normally be derived.
- (b) The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants, including, but not limited to, State employment agencies, schools, colleges and minority group organizations. To meet this requirement, the contractor will, through his EEO Officer, identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.
- (c) In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with equal employment opportunity contract provisions. (The U.S. Department of Labor has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended).
- (d) The contractor will encourage his present employees to refer minority group applicants for employment by posting appropriate notices or bulletins in areas accessible to all such employees. In addition, information and procedures with regard to referring minority group applicants will be discussed with employees.

Personnel Actions

Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to age, race, color, religion, sex, national origin or disability. The following procedures shall be followed:

- (a) The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
- (b) The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
- (c) The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
- (d) The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

Training and Promotion

- (a) The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
- (b) Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event the Special Provision Regarding Training Program Requirements is provided under this contract, this subparagraph will be superseded as indicated therein.
- (c) The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

- (d) The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

Unions

If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

- (a) The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
- (b) The contractor will use best efforts to incorporate an equal employment opportunity clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their age, race, color, religion, sex, national origin or disability .
- (c) The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the Tennessee Department of Transportation and shall set forth what efforts have been made to obtain such information.
- (d) In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to age, race, color, religion, sex, national origin or disability, making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The U.S. Department of Labor has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees). In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the Tennessee Department of Transportation.

Subcontracting

- (a) The contractor will use his best efforts to solicit bids from and to utilize minority group subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of minority-owned construction firms from the Tennessee Department of Transportation.

- (b) The contractor will use his best efforts to ensure subcontractor compliance with their equal employment opportunity obligations.

Records and Reports

- (a) The contractor will keep such records as are necessary to determine compliance with the contractor's equal employment opportunity obligations. The records kept by the contractor will be designed to indicate:
 - (1) The number of minority and non-minority group members and women employed in each work classification on the project.
 - (2) The progress and efforts being made in cooperation with unions to increase employment opportunities for minorities and women. (Applicable only to contractors who rely in whole or in part on unions as a source for their work force).
 - (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees.
 - (4) The progress and efforts being made in securing the services of minority group subcontractors or subcontractors with meaningful minority and female representation among their employees.
- (b) All such records must be retained for a period of 3 years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the of the Tennessee Department of Transportation and the Federal Highway Administration.
- (c) Each contractor and subcontractor shall submit to the Tennessee Department of Transportation an annual report for every July during which work is performed indicating the number of minority, women and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form PR 1391 and is to be received by the Department not later than the 20th of the month following the reporting period.
- (d) The contractor and/or sub-contractor will be required to complete other reports as instructed by the Engineer.
- (e) Current estimates may be withheld by the Project Engineer when reports are not received within the above specified time limits.

S T A T E**O F****T E N N E S S E E**

January 1, 2015 |

SPECIAL PROVISION**REGARDING****STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY****CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)**

- 1) As used in these specifications:
 - a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
 - b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
 - c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941
 - d. "Minority" includes:
 - I. Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - II. Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish or Portuguese Culture or origin, regardless of race);
 - III. Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
 - IV. American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining indentifiable tribal affiliations through membership and participation or community identification).
- 2) Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

- 3) If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals (including goals and time tables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
- 4) The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through p of these specifications. The goal set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.
- 5) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specification, Executive Order 11246, or the regulations promulgated pursuant thereto.
- 6) In order for the nonworking training hours of apprentices and the trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.
- 7) The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
 - (a) Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the

Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

- (b) Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available and maintain a record of the organization's responses.
- (c) Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.
- (d) Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
- (e) Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The contractor shall provide notice of these programs to the sources compiled under 7b above.
- (f) Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- (g) Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

- (h) Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
- (i) Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screenings procedures, and tests to be used in the selection process.
- (j) Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.
- (k) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
- (l) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriation training, etc., such opportunities.
- (m) Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
- (n) Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
- (o) Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
- (p) Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

- 8) Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.
- 9) A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women, generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).
- 10) The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of age, race, color, religion, sex, national origin or disability.
- 11) The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.
- 12) The Contractor shall carry out such sanctions and penalties for violations of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
- 13) The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

- 14) The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.
- 15) Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

STATE**OF****TENNESSEE**

Revised 10-19-2012

January 1, 2015

SPECIAL PROVISION**REGARDING****NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION****TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)**

1. The Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
2. The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work are as follows:

<u>County</u>	Goals for Female Participation <u>in each Trade</u>
All Counties	6.9
<u>County</u>	Goals for Minority Participation <u>for each Trade</u>
Lincoln	11.2
Hamilton, Marion, Sequatchie	12.5
Bledsoe, Bradley, Grundy, McMinn, Meigs, Monroe, Polk, Rhea	8.6
Carter, Hawkins, Sullivan, Unicoi, Washington	2.6
Greene, Hancock, Johnson	3.2
Anderson, Blount, Knox, Union	6.6
Campbell, Claiborne, Cocke, Cumberland, Fentress, Grainger, Hamblen, Jefferson, Loudon, Morgan, Roane, Scott, Sevier	4.5

<u>County</u>	<u>Goals for Minority Participation for each Trade</u>
Montgomery	18.2
Davidson, Cheatham, Dickson, Robertson, Sumner, Williamson, Wilson, Rutherford	15.8
Bedford, Cannon, Clay, Coffee, DeKalb, Franklin, Giles, Hickman, Houston, Humphreys, Jackson, Lawrence, Lewis, Macon, Marshall, Maury, Moore, Overton, Perry, Pickett, Putnam, Smith, Stewart, Trousdale, Van Buren, Warren, Wayne, White	12.0
Shelby, Tipton	32.3
Benton, Carroll, Chester, Crockett, Decatur, Dyer, Fayette, Gibson, Hardeman, Hardin, Haywood, Henderson, Henry, Lake, Lauderdale, McNairy, Madison, Obion, Weakley	26.5

These goals are applicable to all the Contractor's construction work whether or not it is Federal or federally assisted.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in CFR Part 60-4.3(a), and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from Project to Project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Office of Federal Contract Compliance Programs at the following address within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation:

U.S. Department of Labor – Regional Office
Office of Federal Contract Compliance Program
61 Forsyth Street, Room 7B75
Atlanta, GA 30303

The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

STATE**OF****TENNESSEE**

(Rev. 03-23-09)

March 1, 2006

(Rev. 05-11-09)

SPECIAL PROVISION**REGARDING****TRAINING PROGRAM REQUIREMENTS**

Reference:

Federal-Aid Highway Program
Transmittal 147, June 26, 1975
Replaces FHWA Order Interim 7-2(2)

This Training Special Provision supersedes subparagraph 7b of the Special Provision Regarding Equal Employment Opportunity, and is in implementation of 23 U.S.C. 140(a).

As part of the contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The contractor shall provide on-the-job training aimed at developing full journeymen in the type of trade or job classification involved.

The number of training hours under this Special Provision will be indicated in the Proposal.

In the event that a contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, however, the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this training special provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to pre-construction conference, the contractor shall submit to the Tennessee Department of Transportation OJT Program Coordinator for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the contractor shall specify the starting time for training in each of the classifications. The contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. Accordingly, the contractor shall make every effort

to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with this Training Special Provision.

This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the contractor and approved by the Tennessee Department of Transportation and the Federal Highway Administration. The Tennessee Department of Transportation and the Federal Highway Administration shall approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Employment and Training Administration, or with a State apprenticeship agency recognized by the Department of Labor and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Office of Apprenticeship, Employment and Training Administration, shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-Aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the Federal Highway Administration division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by Change Order and the AAPO, reimbursement will be made for training persons in excess of the number specified herein.

This reimbursement will be made even though the contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee, or pays the trainee's wages during the offsite training period.

No payment shall be made to the contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the contractor and evidences a lack of good faith on the part of the contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees be on board for the entire length of the contract. Failure of the contractor to employ a trainee in the classification he has requested by the time 15 percent of that type work has been performed will be just cause for withholding progress estimates unless the contractor has furnished the AAPO a satisfactory explanation in writing of his failure to do so. A contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Department of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision. However, in no case will the trainee be paid less than the minimum wage shown in the contract for the classification of laborer.

The contractor shall furnish the trainee a copy of the program he will follow in providing the training. The contractor shall provide each trainee with a certification showing the type and length of training satisfactorily completed.

The contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

Payment is to be made under item 109-10.01, Trainee, at the unit price of \$0.80 per hour, for each hour of approved training provided. In any case the number of training hours for which payment is made will not exceed number of hours specified for the approved classification by the approved Training program.

The contractor shall not be permitted to commence construction without an approved training program. Failure of the contractor to provide an approved training program shall not be considered "As a condition not under the control of the contractor" in regards to Contract Time.

STATE**OF**Sheet 1 of 1
TENNESSEE

(Rev. 06-01-03)

(Rev. 06-23-08)

(Rev. 11-10-08)

January 1, 2015 |

SPECIAL PROVISION**REGARDING****DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION**

Disadvantaged Business Enterprises (DBE) as defined in 49 CFR Part 23/26 shall have the maximum opportunity to participate in the performance of contracts let by the Department. Consequently, the disadvantaged business enterprise requirements of 49 CFR Part 23/26 apply to this contract.

Disadvantaged Business Enterprises (DBE) as defined in 49 CFR Part 23/26 shall have the maximum opportunity to participate in the performance of this contract or in the performance of subcontracts to this contract. In this latter regard, the Contractor shall take all necessary and reasonable steps in accordance with 49 CFR Part 23/26 to ensure that disadvantaged enterprises, including enterprises owned and controlled by women, have the maximum opportunity to compete for and perform subcontracts. The Contractor shall not discriminate on the basis of age, race, color, religion, national origin, sex or disability in the award of subcontracts.

The Contractor shall submit to the Civil Rights Office Small Business Development Program copies of any agreements with DBE/WBEs upon execution.

The Contractor is advised that failure to carry out the requirements as set forth above shall constitute a breach of contract, and after notification by the Department, may result in termination of the contract or other remedy deemed appropriate by the Department.

STATEOFTENNESSEE

January 1, 2015

(Rev. 04-17-15)

(Rev. 10-19-15)

SPECIAL PROVISIONREGARDINGDBE CONTRACT GOAL

All contractors shall pursue affirmative action requirements to encourage and increase participation of disadvantaged individuals in business enterprises as set forth in this specification which is imposed pursuant to 49 CFR Part 26. The bidder shall arrange for the percentage of the work specified on the cover of the Proposal Contract to be performed by Tennessee Uniform Certification Program (TNUCP) Disadvantaged Business Enterprises (DBEs) or clearly demonstrate adequate good faith efforts as described herein. All payments must follow the conditions set by the most current TCA 12-4-707.

A. Disadvantaged Business Enterprise Policy

The Contractor shall accept as operating policy and include in all subcontract agreements the following statement, which is designed to promote full participation of DBEs as suppliers and subcontractors through a continuous, positive result-oriented program on contracts let by the Department:

The Contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of U.S. Department of Transportation-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Department deems appropriate.

B. Counting DBE Participation toward Meeting Goals

The Contractor shall count DBE participation toward goals in accordance with 49 CFR Part 26. The Contractor may count toward the goals only expenditures to DBEs that perform a commercially useful function of a contract, including those functions as a subcontractor. A DBE performs a commercially useful function when it is responsible for the execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE must also be responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material,

installing (where applicable) and paying for the material itself. Work performed by a DBE firm in a particular transaction may be counted toward the goal only if the Department determines that it involves a commercially useful function. The work performed by the DBE firm shall be necessary and useful to the completion of the contract, and consistent with normal highway construction industry practices in Tennessee. The bidder may count the following DBE expenditures towards the DBE commitment:

1. **Projects where the DBE is the Prime Contractor** - The portions of the contract to be completed by certified DBE firms will be counted toward meeting the goal. Items of the contract subcontracted to non-DBE firms will not be counted in the commitment.
2. **Portions of a bid from a Joint Venture** - A bid from a joint venture, between a DBE and non-DBE Contractor, shall include an explanation of DBE commitments on DBE Form 1247A, which must be approved by the Department's Civil Rights Office - Small Business Development Program (CRO - SBDP) prior to the Letting. Only the DBE's portion will be counted toward the goal. Joint venture agreements have to be approved separately from the bid documents, prior to the awarding of the contract.
3. **DBE Subcontractors** - The DBE subcontractor shall assume actual and contractual responsibility for provision of materials and supplies, subcontracted work, or other commercially useful functions of the items of work subcontracted to them. Cost of materials purchased from or the cost of equipment leased from the Contractor will not count toward the project DBE commitment. Prior written approval must be obtained from the CRO - SBDP for any DBE use of the Prime Contractor's personnel or equipment.
4. **Manufacturers** - The Contractor may count toward the DBE commitment 100% of its expenditures for materials and supplies required under a contract and obtained from a DBE manufacturer only if the DBE firm produces and supplies goods manufactured from raw materials or substantially alters them before resale.
5. **Regular Dealers (e.g. Material Suppliers)** - The Contractor may count toward the DBE goal 60% of its expenditures for materials and supplies required under a contract and obtained from a DBE regular dealer only if the DBE firm performs a commercially useful function in the supply process. For purposes of this section, a regular dealer is a firm that owns; operates; or maintains a store, warehouse, or other establishment in which materials or supplies required for the performance of the contract are bought, kept in stock, and regularly sold to the public in the usual course of business. To be a regular dealer, the firm shall engage in, as its principal business and in its own name, the purchase and sale of the products in question. A regular dealer in such bulk items as steel, cement, gravel, stone, and petroleum products need not keep such products in stock if it owns or operates the distribution equipment. If the DBE supplier does not own the distribution equipment, a lease containing the terms of the agreement shall be available and must be approved in writing by the CRO - SBDP.

6. **Brokers and Packagers** - Brokers and packagers will not be regarded as regular dealers within the meaning of this section. Only the amounts charged for fees and commissions may be used towards meeting the DBE commitment.
7. **Transportation or Hauling of Materials** –The Department will continue to utilize the trucking regulations under 49 CFR Part 26.55. This regulation allows for DBE goal hauling-credit in either DBE trucks or in trucks leased to or by DBE firms. The verification of truck drivers employed by DBE firms will continue to be by submission of payrolls independent from any Davis-Bacon regulations.
 - a) The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting DBE goals.
 - b) The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
 - c) The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.
 - d) The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
 - e) The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks from a non-DBE is entitled to the total value of transportation services provided by non-DBE lessees not to exceed the value of transportation services provided by DBE-owned trucks on the contract. Additional participation by non-DBE lessees receives credit only for the fee or commission it receives as a result of the lease arrangement.
 - f) For purposes of this paragraph a lease must indicate that the DBE has exclusive use of and control over the truck. Leases cannot be Department contract-specific, must be long term, and must be approved by the CRO - SBDP Staff. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.
 - g) Prior to hauling, the Contractor and DBE shall provide the Department's Project Supervisor a complete list of trucks that will be used on the project for DBE goal participation. The Department will provide a form that shall be used by the Contractor and the DBE to identify the trucks. A revised list will be required any time the trucks used changes. The Contractor and DBE must be able to adequately document the actual amount of hauling eligible for DBE goal participation.
8. **Contracted Labor / Temporary Employment Agencies** – utilization of these services via subcontract will be allowed to count toward DBE goal commitment, in accordance with 49 CFR Part 26.55. The Department will count the entire amount of

fees or commissions charged by a DBE for providing a bona fide service. Provided, the Department must find the fee to be reasonable and not excessive as compared to the fees customarily allowed for similar services.

- 9. Other Commercially Useful Functions** - The fees paid to certified DBE firms, which are necessary for the completion of the contract and commonplace outside of the DBE program, may be counted towards the commitment.

C. Contract Award Procedures

The established DBE goal will be shown on the proposal as a percent of the total amount bid. If the total proposed DBE work submitted with the bid is less than the percentage of participation goals set by the Department, the bidder shall, within three (3) business days from the bid openings, propose sufficient additional DBE participation to meet the goal or shall clearly demonstrate by documentation that good faith efforts were made to meet the goal.

1. Bidder's Responsibility

It is the bidder's responsibility to determine the level of professional competence and financial responsibility of any proposed DBE subcontractor. The bidder shall ascertain that the proposed DBE subcontractor has suitable experience and equipment to perform a commercially useful function for work that is common industry practice in the Tennessee highway construction industry.

The Contractor shall develop and maintain records of negotiations with DBEs to reach agreeable prices, quotations and work schedules, including but not limited to a record of dates when the Contractor first contacted each DBE.

2. DBE's Responsibility

In order to receive goal credit on a TDOT project, a DBE must perform a commercially useful function through execution of the work of the contract and carry out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE must also be responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material, installing (where applicable) and paying for the material itself.

Before bidding and subsequently entering into a contract (as a contractor or subcontractor), the DBE should consider the scope and size of the project, as well as whether it is certified to receive credit for the type of work performed. As with any contract, this is a legally binding document and should be performed to the best of one's ability. However, should a DBE ever have to withdraw from a contract, it should provide the CRO-SBDP and Prime Contractor with written documentation. A DBE should only withdraw when there is no other option, as non-completion of its duties may result in temporary disqualification of a prequalified bidder or subcontractor by suspending the privilege of bidding on Department contracts or

becoming an approved subcontractor, as outlined in Chapter 1680-5-3 of the Rules of the Tennessee Department of Transportation.

3. Proposals with Established Project DBE Goals

For proposals with established project goals, the bidder will be required to complete the computer generated DBE Form 1247A. The bidder shall list the following information on each DBE Form 1247A that is submitted:

- a. All DBE firms being used or being considered for use as part of the bidder's DBE commitment.
- b. The work classification(s) for each DBE on the contract; and
- c. The "Amount to DBE" which has been committed to each DBE firm for use on the contract.

The completed DBE Form 1247A form shall be submitted within three (3) business days of the Letting. Failure to provide a completed form or documentation clearly evidencing a good faith effort, as detailed in Section 4 below, within three (3) business days of the Letting may cause the bid to be rejected as irregular. Only certified DBE firms may be used. Contractor may access this information on the DBE list by viewing the Department's website or the certified DBE listing.

When DBE goal projects are involved and the Prime Contractor subcontracts to a non-DBE, and the non-DBE subcontractor in turn subcontracts to a DBE as a second tier subcontractor, the Prime Contractor must affirm in writing his/her knowledge and approval of such an arrangement. Recognition of a second tier arrangement with a DBE subcontractor for goal work must be forwarded to the Director of the CRO - SBDP for verification, in writing, prior to any work performed by the DBE which will be counted toward the **goal**.

4. Bidder Selection and Good Faith Efforts

- a. Bidders shall submit proposals that meet the DBE goal or shall submit documentation clearly evidencing that they made a good faith effort to meet the DBE goal. Contractors who meet or exceed the contract goal will be assumed to have made good faith efforts to utilize DBE firms. DBE firms who bid as Prime Contractors will be considered to have met the goal.
- b. The following are illustrative of factors which will be considered in determining whether the bidder has made adequate good faith efforts:
 - 1) Whether the bidder selected portions of the work likely to attract DBE participation. The total dollar value of the portions selected should meet or exceed the contract DBE goal. If it is necessary, the bidder should break down subcontracts into economically feasible units in order to facilitate participation.
 - 2) Whether the bidder provided notice to a reasonable number of specific DBEs, including those not regularly used by the bidder, that their

participation in the contract is being solicited in sufficient time to allow them to participate effectively.

- 3) Whether the bidder provided interested DBEs with adequate information about the plans, specifications and requirements of the contract.
 - 4) Whether the bidder advertised in general circulation, trade association, or minority-focus media concerning participation opportunities or effectively used the services of available minority, community organizations, minority contractors groups, local, state or federal minority business assistance offices, or other organizations that provide assistance in the recruitment and placement of DBEs.
 - 5) Whether the bidder negotiated in good faith with interested DBEs, not rejecting DBEs as unqualified without sound reasons based on a thorough investigation of their capabilities.
 - 6) Whether the bidder made efforts to assist interested DBEs in obtaining bonding or insurance required by the bidder.
 - 7) Whether the bidder submitted all quotations received from DBEs, and for those quotations not accepted, an explanation of why the DBE was not accepted including price comparisons. Receipt of a lower quotation from a non-DBE will not in itself excuse a bidder's failure to meet contract goal.
 - 8) Whether the bidder has adequate records of its contacts and negotiations with DBEs
- c) If the Contractor has not met the DBE goal or submitted documentation clearly evidencing good faith efforts within three (3) business days after the bid opening, the Contractor's bid will be considered non-responsive and the Department may consider the next lowest responsive bid for award.
 - d) Failure of the bidder to meet the DBE goal in its bid or failure to provide documentation clearly evidencing good faith efforts to meet the goal, may be cause for the forfeiture of the Proposal Guaranty which shall become the property of the Department, not as penalty, but in liquidation of damages sustained.

As soon as practical after award of the contract, the Contractor shall submit copies of all binding subcontracts and purchase orders with DBEs to the respective Project Supervisor and the CRO- SBDP Director. No progress estimate shall be processed until this information is received.

5. Joint Checking Allowance for DBE

A DBE must receive pre-approval by the Department before using a joint check. Joint check requests shall be submitted, by the DBE, to the CRO - SBDP prior to the contract agreement.

The following are some general conditions that must be met regarding joint check use:

- a. The second party (typically the prime contractor) acts solely as a guarantor.
- b. The DBE must release the check to the supplier.
- c. The use of joint checks must be a commonly recognized business practice in the industry.
- d. The DBE remains responsible for all other elements of 49 CFR 26.55(c)(1)
- e. The DBE is not required to use a specific supplier nor the prime contractor's negotiated unit price.
- f. The DBE shall submit receipt/copy of cancelled checks to the CRO - SBDP.

D. Construction Period Requirements**1. Process for Removal of a DBE -**

At no time shall a DBE be terminated or substituted without prior written consent from the CRO-SBDP. Before terminating and/or substituting a DBE subcontractor on a project with SP1247 included in the Contract Proposal, the Prime Contractor must give notice in writing to the DBE subcontractor, with a copy to TDOT's CRO-SBDP, of its intent to request to terminate and/or substitute, and the reason for the request.

The Prime Contractor must then give the DBE five (5) days to respond to the Prime Contractor's notice. The DBE shall then advise TDOT's CRO - SBDP and the Contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why the CRO - SBDP should not approve the Prime Contractor's action. If approval is granted for removal, the TDOT CRO - SBDP will submit a letter to the Contractor and the DBE. Good faith efforts shall then be directed at finding another DBE to perform at least the same amount of work under the contract as the DBE that was terminated, to the extent needed to meet the contract goal established.

The Prime Contractor has the responsibility to comply with 49 CFR Part 26.53(f) and all applicable policies and regulations

Reasons for termination and/or substitution must meet the reasons for good cause as outlined in the current 49 CFR Part 26.53(f), which include, but are not limited to, the following circumstances:

- (i) The listed DBE subcontractor fails or refuses to execute a written contract;

- (ii) The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the prime contractor;
 - (iii) The listed DBE subcontractor fails or refuses to meet the prime contractor's reasonable, nondiscriminatory bond requirements;
 - (iv) The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
 - (v) The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1,200 or applicable state law;
 - (vi) The Department determined that the listed DBE subcontractor is not a responsible contractor;
 - (vii) The listed DBE subcontractor voluntarily withdraws from the project and provides to you written notice of its withdrawal;
 - (viii) The listed DBE is ineligible to receive DBE credit for the type of work required;
 - (ix) A DBE owner dies or becomes disabled with the result that the listed DBE contractor is unable to complete its work on the contract;
 - (x) Other documented good cause that the Department determines to compel the termination of the DBE subcontractor. Provided, that good cause does not exist if the prime contractor seeks to terminate a DBE it relied upon to obtain the contract so that the prime contractor can self-perform the work for which the DBE contractor was engaged or so that the prime contractor can substitute another DBE or non-DBE contractor after contract award.
2. Brokering of work by DBEs is not allowed and is a material breach of contract. A DBE firm involved in brokering of work may have their certification removed or suspended. Any firm involved in brokering of work that engages in willful falsification distortion, or misrepresentation with respect to any facts related to the project shall be referred to the U. S. Department of Transportation's Office of the Inspector General for prosecution under Title 18, U. S. Code, Section 100.20. Contractor shall place this provision in all subcontracts with DBEs.
3. A Department Project Supervisor/Inspector shall complete a Commercially Useful Function (CUF) Checklist to document the first date of work, work items, equipment, and forces of each DBE.

4. The Contractor shall provide a monthly payment certification to the Department entitled "Prompt Payment Certification Form." The Department shall provide the Contractor with a computer generated Prompt Payment Certification Form. An officer of the Contractor shall provide an electronic signature to the Prompt Payment Certification Form and return via email to DBE.Runningtally@tn.gov. The Department will hold estimate payments if information is not submitted. Reasons for non-payment to a DBE could include the following:

- a) Whether the DBE is performing satisfactorily;
- b) Whether Contractor has reason to believe the DBE is not performing a commercially useful function, and if so, why and what steps Contractor is taking to rectify the situation.

In the event the Contractor promptly reports questions on the Prompt Payment Certification Form regarding whether a DBE is independent and performing a commercially useful function and takes appropriate steps promptly to address the issue, then the Department will take this effort into account when considering Contractor compliance measures as described below. Payments must abide by the conditions set in TCA 12-4-707.

E. Post Construction Requirements

Prior to receiving final payment, the Contractor shall provide to the Project Engineer and CRO-SBDP certification of the dollars paid to each DBE firm, using Form CC3, "Certification of DBE Accomplishment." The certification shall be dated and signed by a responsible officer of the contractor and by the DBE. Falsification of this certification will result in the suspension of bidder qualifications. The final estimate will not be paid to the Contractor until proper certifications have been made.

F. Required Records

The Prime Contractor and all subcontractors shall retain, for a period of not less than three (3) years after final acceptance of a project, copies of canceled checks or other documentation that substantiates payments to DBE firms. These records shall be available at reasonable times and places for inspection by authorized representatives of the Department and various Federal Agencies.

G. Contractor Compliance

1. It is the intent of this Special Provision to require the Contractor to take full responsibility for the performance of a commercially useful function by all DBE subcontractors, manufacturers and materials suppliers who work on the project and are counted by the Contractor toward the project DBE goal. A DBE is considered to perform a commercially useful function when it is responsible for the execution of a distinct element of the work of a contract and carrying out its responsibilities by actually performing, managing and supervising the work involved (49 CFR Part 26).

2. If the Contractor fails to comply with Special Provision 1247, the Department may take one or a combination of the following steps:
 - 1) Require the Contractor to have its entire management staff attend DBE training arranged by the Department and paid by the Contractor.
 - 2) The next bid when the Contractor is the low bidder on a DBE goal project, require that Contractor to achieve a DBE participation that is twice the stated goals.
 - 3) For the Contractor's failure to find another DBE subcontractor to substitute a DBE that is terminated or fails to complete its work on the contract for any reason or to provide the CRO - SBDP documentation clearly evidencing good faith efforts, as detailed in D.1. above, then the Department may withhold from the Contractor an amount not to exceed the amount of money originally committed to the non-complying DBE subcontractor, not as a penalty but as liquidated damages.
 - 4) Suspend the Contractor from participation in Department bid lettings pursuant to rules promulgated by the Department.
 - 5) For repeated failures to comply, debar the Contractor pursuant to rules promulgated by the Department.
 - 6) Invoke other remedies available by law and/or in the contract.
 - 7) Invoke remedy agreed upon by the Commissioner and the Contractor in writing.

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under

this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are

applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar

with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor

will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions

of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or

will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-

Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly

rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is

evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.

2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this

covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) 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;

(3) 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 paragraph (a)(2) of this certification; and

(4) 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.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the

department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. 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 Federal 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.

b. 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 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.

2. 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 31 U.S.C. 1352. 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.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS
ROAD CONTRACTS**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

STATE**OF****TENNESSEE**

January 1, 2015

(Rev. 01-03-14)
(Rev. 09-08-14)
(Rev. 01-06-15)
(Rev. 01-11-16)
(Rev. 01-06-17)

 |**SPECIAL PROVISION****REGARDING****TENNESSEE DEPARTMENT OF TRANSPORTATION****2017 MINIMUM WAGE SCALES FOR FEDERAL-AID CONSTRUCTION** |**& 2017 MINIMUM WAGE SCALES FOR STATE FUNDED CONSTRUCTION** |

This Contract contains "Tennessee Department of Transportation 2017 Minimum Wage Scales for State Funded Construction", Tennessee Department of Labor Decision No. T-40227, dated January 1, 2017, and Tennessee Department of Transportation 2017 Minimum Wage Scales for Federal-Aid Highway Construction, U. S. Department of Labor Decision No. TN170148 (dated January 6, 2017).

 |

The Contractor is required to pay the greater of the two (2) rates for each classification

Note: Minimum Wage Scales for Federal-Aid Heavy Construction are on file with the Department, and will be included in all applicable Contract Proposals

TENNESSEE DEPARTMENT OF TRANSPORTATION
MINIMUM WAGE SCALES FOR FEDERAL AID HIGHWAY CONSTRUCTION

General Decision Number: TN170148 01/06/2017 TN148

Superseded General Decision Number: TN20160148

State: Tennessee

Construction Type: Highway

Counties: Tennessee Statewide.

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.20 for calendar year 2017 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2017. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/06/2017

SUTN2016-001 07/13/2016

	Rates	Fringes
BRICKLAYER.....	\$ 14.26	
CARPENTER.....	\$ 17.52	
CEMENT MASON/CONCRETE FINISHER...	\$ 15.55	
ELECTRICIAN.....	\$ 24.08	
IRONWORKER		

Reinforcing.....\$ 16.29
Structural.....\$ 16.89

LABORER

Common/Unskilled.....\$ 13.11
Skilled
Air Tool Operator,
Asphalt Raker, Chain Saw
Operator, Concrete Mixer
(less than 1 yd),
Concrete Rubber, Edger,
Fence Erector, Form
Setter (steel), Guard
Rail Erector, Mechanic's
Tender (tire changer or
oiler), Mortar Mixer,
Nozzleman or Gun Operator
(gunitite), Pipelayer,
Sign Erector.....\$ 15.27

PAINTER (INCLUDES SANDBLASTER)...\$ 26.36

POWER EQUIPMENT OPERATOR:

GROUP 1

Backhoe/Hydraulic
Excavator (3/4 yd &
over), Crane (less than
20 Tons), End Loader (3
yd & over), Motor Patrol
(finish), Piledriver,
Dragline.....\$ 19.14

GROUP 1A

Drill Operator (Caisson)...\$ 25.26
Farm Tractor Operator
(Power Broom).....\$ 13.50

GROUP 2

Backhoe/Hydraulic
Excavator (less than 3/4
yd), Bulldozer or Push
Dozer, End Loader (less
than 3 yd), Motor Patrol
(rough), Tractor
(crawler/ utility), Truck
Driver (Heavy Duty, Off
Road) Scraper, Shovel, or
Trenching Machine.....\$ 17.08

GROUP 3

Asphalt Paver, Concrete
Finishing Machine,
Concrete Paver, Scale,
Spreader (self-

propelled), Concrete
Grinder, Asphalt Milling
Machine, Boring Machine
(horizontal).....\$ 17.75

GROUP 4

Bobcat, Central Mining
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 and hoist),
Bituminous Distributor
Machine, pump, Track
Drill, Striping Machine....\$ 16.48
Heavy Duty Mechanic.....\$ 20.33
Light Duty Mechanic.....\$ 19.53
Sweeping Machine (Vacuum)
Operator.....\$ 15.56

GROUP 5

Crane (over 20 Tons).....\$ 20.44

TRUCK DRIVER

2 axles.....\$ 15.36
3-4 axles.....\$ 14.86
5 or more axles.....\$ 16.27

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave
for Federal Contractors applies to all contracts subject to the
Davis-Bacon Act for which the contract is awarded (and any
solicitation was issued) on or after January 1, 2017. If this
contract is covered by the EO, the contractor must provide
employees with 1 hour of paid sick leave for every 30 hours
they work, up to 56 hours of paid sick leave each year.
Employees must be permitted to use paid sick leave for their
own illness, injury or other health-related needs, including
preventive care; to assist a family member (or person who is
like family to the employee) who is ill, injured, or has other

health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that

classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial

contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

STATEOFTENNESSEETENNESSEE DEPARTMENT OF TRANSPORTATION2017 MINIMUM WAGE SCALES FOR STATE FUNDED CONSTRUCTION

January 1, 2017

Tenn. DOL Decision No. T-40227

CLASSIFICATION (ENGLISH)	CLASSIFICATION (SPANISH)	Basic Hourly Rates	Craft No.
Bricklayer	Ladrillero	14.84	01
Carpenter / Leadsperson	Carpintero o Lider	18.23	02
Class "A" Operators	Operador Clase A	19.92	03
Class "B" Operators	Operador Clase B	17.77	04
Class "C" Operators	Operador Clase C	18.47	05
Class "D" Operators	Operador Clase D	17.15	06
Concrete Finisher	Terminador de Cemento	16.18	07
Drill Operator (Caisson)	Operador de Perfordora	26.28	08
Electrician	Electricista	25.06	09
Farm Tractor Operator (Power Broom)	Operador de Tractor de Rancho	14.05	10
Ironworkers (Reinforcing)	Herrero	16.95	11
Ironworkers (Structural)	Herrero de Estructura	17.58	12
Mechanic (Class I) Heavy Duty	Mecanico Clase 1	22.34	13
Mechanic (Class II) Light Duty	Mecanico Clase 2	20.32	14
Painter / Sandblaster	Pintor o Lajador	27.43	15
Powder Person / Blaster	Proveedor de Explosivos	20.58	16
Skilled Laborer	Obrero Diestro	15.89	17
Survey Instrument Operator	Operador de Agrimensor	20.45	18
Sweeping Machine (Vacuum) Operator	Operador de Barredora	16.20	19
Truck Driver (2 axles)	Camionero (2 ejes)	15.98	20
Truck Driver (3/4 axles)	Camionero (3 o 4 ejes)	15.46	21
Truck Driver (5 or more axles)	Camionero (5 o más ejes)	16.93	22
Laborer /Unskilled , Flagger, Traffic Control, Pickup Driver	Obrero no Diestro	13.64	23
Worksite Traffic Coordinator	Coordinar de Trafico en el Lugar de Trabajo	19.82	24
Crane Operator	Operador de la Grúa	21.27	25

CLASSIFICATION

CRAFT NO.

SKILLED LABORER:

17

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, Nozzelman or Gun Operator (Gunit), *Pipelayer, Sign Erector

CLASS "A" OPERATORS:

03

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:

04

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:

05

Asphalt Paver, Concrete Finishing Machine, Concrete Paver, Scale, Spreader (Self-Propelled), Concrete Grinder, Asphalt Milling Machine, Boring Machine Operator (Horizontal)

CLASS "D" OPERATORS:

06

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:

25

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 : <http://www.tennessee.gov/labor-wfd/prevail.html>

Poster Page : <http://www.state.tn.us/labor-wfd/poster.htm>

Note: Adobe Acrobat Reader is required in order 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 Apprentiship 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:	DB1601
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.

CONFLICT OF INTEREST DISCLOSURE STATEMENT

FORM COI

DB1601

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 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. _____
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

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
CONTRACT PAYMENT AND PERFORMANCE BOND
FORM CP&PB

DB1601

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 12, chapter 4 and 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 _____

_____ (\$_____),

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* _____

By: _____

By: _____

Attorney-in-Fact

Attorney-in-Fact

Printed Name and Title

Printed Name and Title

Agency Name

Agency Name

Street Address

Street Address

City/State/Zip

City/State/Zip

(Seal)

(Seal)

Subsequent correspondence/communication from TDOT with respect to monthly progress reports and/or the contract bonds should be directed to:

Surety 1 _____

Surety 2* _____

By: _____
Attorney-in-Fact

By: _____
Attorney-in-Fact

Printed Name and Title

Printed Name and Title

Agency Name

Agency Name

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.

LOBBYING CERTIFICATE

FORM LC

**PROJECT
DESCRIPTION:** _____

DB1601

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.]

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.

TECHNICAL PROPOSAL SIGNATURE PAGE

FORM TPSP

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

ADDRESS: _____

CONTRACTOR'S LICENSE No. _____

LICENSE CLASSIFICATION _____

PROJECT: _____
(the "Project")

DB CONTRACT No.: **DB1601**

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 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 8%.

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, the **DB Standard Guidance**, ;has carefully examined any Plans provided by the Department, the Standard Specifications for Road and Bridge Construction (March 1, 2006) 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, 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 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.
- (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.
- (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 Security and be disqualified from further consideration for Contract award and eligibility for receipt of a Proposal stipend.
- (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, which is submitting a Proposal on this Contract.

I, the undersigned, am a duly-authorized representative of the Design-Build and have been authorized by the Design-Build (a) to make in the name of and on behalf of the Design-Build 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-Build to the terms of its Proposal.

Sworn to and subscribed before me

Design-Builder (1) this day of ,

Printed Name and Title	Notary Public
My commission expires	

Sworn to and subscribed before me

Design-Builder (2)* this day of ,

Printed Name and Title	Notary Public
My commission expires	

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

TDOT DESIGN-BUILD PROGRAM

**DESIGN-BUILD
RFP CONTRACT BOOK 3
PROJECT SPECIFIC INFORMATION**

TENNESSEE DEPARTMENT OF TRANSPORTATION

**State Route 396, Saturn Parkway Extension,
Maury County- TENNESSEE**

CONTRACT NUMBER: DB1601



August 31, 2017

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PROJECT REQUIREMENTS

1. GENERAL

- *Plans and/or the Department supplied material are:*
- *Survey Data File in Microstation;*
 - *The NEPA documentation was processed as a List D Categorical Exclusion (CE) under 23 CFR 771.117(d) approved on 8/28/2017*

See the Procurement Schedule/Submittal Deadlines in the RFP book 1 on page 7.

- *Conceptual Plans (the conceptual layouts are supplied for information only, the scope of the project listing in the RFP takes precedence.);*
- *Existing structure Plans;*
- *Traffic Data developed by the Department's Project Planning Division;*
- *D-B Geotechnical Reports dated January 13, 2017*
- *Except as provided by the Department above, the Design Builder shall provide all update surveys, mapping, plans, verification of existing utilities, investigation, and analysis required for completion of the work.*
- *Unless noted otherwise elsewhere in this RFP, 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 shall hold the Department harmless and shall be fully liable for any additional costs and all claims against the Department which may arise due to errors, omissions and negligence of the Design Builder in performing the work required by this contract.*
- *The Department has not or will not procure permits for the Design Builder.*
- *The Design Builder shall be solely responsible for and obtain any necessary environmental permits or approvals for any environmental permits or approvals, not supplied above, resulting from their design and construction. If environmental permits are necessary, prior to completion of the Definitive Design Plans, the Design Builder shall contact the Department Alternative Contracting Office immediately for guidance.*
- *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.

- a. The assigned DBE goal for this Project is:
 - The assigned DBE goal for this Project is **8%**.
 The Design Builder shall exercise all necessary and reasonable steps to ensure that DBEs participate in at least the percent of the total project cost as set forth above as the goal. The design Builder shall make good faith efforts in achieving this goal and shall comply with all requirements of 49 CFR part 26.
- b. Assigned On-the-Job/Apprenticeship Training:
 - Required on this project 2,740 hours for OJT.
- c. The liquidated damage for non-compliance is **\$2,000 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 will be deducted from the monies due the Design Builder as:

$$(\text{Actual Time Charged} - B) \times \$2,000/\text{Calendar Day}^*$$
 - * 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.
- d. All work shall be completed in accordance with the most current version of the Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction, unless specifically stated herein.
- e. The Department will be responsible for Construction Engineering Inspection (CEI) work.
- f. Bituminous Material, Portland Cement and Fuel Price Adjustments shall **be** available on this Project. Once the Contract is executed items for Bituminous Material and Fuel Price Adjustments will be added. The adjustments will be made on the Progress Payments approved by the Department.
- g. The Design Builder is to use ten (10) Business Days in their CPM for activities requiring the Department Review and Acceptance or Review and Comment.
- h. 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. PERSONNEL

Any licenses or certifications that are required to meet the requirements of the Contract shall be in place by the time the initial Notice to Proceed is issued. The Response Category II must list the following information.

a. ON SITE PERSONNEL

At all times that work is actually being performed the Design Builder shall have present on the project one competent individual who has been authorized to act in a supervisory capacity over all work on the project including work subcontracted. The individual who has been so authorized shall be experienced in the type of work being performed and is to be fully capable of managing, directing, and coordinating the work; of reading and thoroughly understanding the contract; and of receiving and carrying out directions from the Engineer or his authorized representatives. This person shall be an employee of the Design Builder, unless otherwise approved by the Department.

b. ON CALL PERSONNEL

At all times during the life of the project the Design Builder shall provide one permanent employee who shall have the authority and capability for the overall responsibility of the project and who shall be personally available at the site of work within 24 hours notice. Such employee shall be fully authorized to conduct all business with the Subcontractors and to execute the orders or directions of the Engineer.

c. EXCEPTIONS

If the Design Builder elects to have the employee described under (b.) above constantly available in person on the project, then the presence of this employee will be considered as also meeting the requirements of (a.) above. However, if such employee is absent from the project then an authorized individual meeting the requirements of (a.) above shall be present on the project.

d. KEY PERSONNEL

Key Personnel identified in the SOQ shall not be modified in the Technical Proposal without express written approval of the Department. Any request for modification shall be sent to the Department Design-Build Program Manager prior to the RFP submittal and the written approval from the Department shall be included in Response Category II for the Technical Proposal. Failure to comply with this requirement may be justification for removing the Design Builder from further consideration for this Project. The information provided in the SOQ will be used in the scoring criteria for Response Category II.

Design Builder's Project Management Personnel shall consist of the following individuals to be consistent with the personnel submitted in the SOQ:

- Design Builder's Project Manager
- Design Manager
- Construction Manager/ Superintendent

- Traffic Engineer Manager
- Traffic Control Supervisor
- Environmental Compliance Manager

Please provide the following information, at a minimum, in a table format for each of the Key Personnel listed above:

- Key Personnel Role;
- Name of Individual to fill the roles and responsibilities;
- Approval letter of substitution, if applicable.

e. DESIGN PROFESSIONALS

The Design Builder's design professionals shall consist of the following individuals:

- Lead Design Engineer
- Lead Structural Engineer
- Utilities Design Engineering/ Coordination Supervisor
- Erosion Prevention and Sediment Control Inspector

Please provide the following information, at a minimum, in a table format for each of the Design Professionals listed above:

The table shall include the:

- Design Professional Role;
- Name of Individual to fill the roles and responsibilities;
- Anticipated percent of each Individuals time that would be committed to the Project.
- Number of total years experience;
- Number of years experience on projects of similar size and scope;
- Number of years experience on Design Build Projects;
- Education;
- Licenses or Certifications;
- Include the length of employment with current employer and the title, roles, and responsibilities on any related projects.
- Additional qualifications as necessary.

In addition to the information above, the following information is required from the Utility Coordination Firm.

- Form DT-0330 Part II located at: <http://www.tn.gov/tdot/article/consultantinfo-forms> (This form will not count as part of the total page count)
- Included within the response for Section F. of this form documentation of experience/projects related to utility/SUE coordination and references for the firm's experience associated with these projects.

Resumes of Key Personnel shall be limited to one page each and will not be counted towards the overall page limit. If an individual fills more than one position, only one resume is required.

3. ROADWAY SCOPE OF WORK

- The Design Builder shall perform all necessary survey updates, design and construction services necessary to construct (roadway and structures) the following three projects (reference Technical Study Conceptual Layouts with Typical, Triple Crown D-B Connected Projects and SR-247 ROW Plans on this link:

<http://www.tn.gov/tdot/article/Design-Build>

- **Project 1** (PIN 117319.01) – Widening of SR-247 (Beechcroft Road), east of Cleburne Road, from 2 lanes to 3 lanes curb & gutter section, widening of SR-247, west of Cleburne Road to accommodate an east bound right turn lane onto Cleburne Road and the widening of Cleburne Road to accommodate a northbound left turn lane. Project length is approximately 1250 feet along SR-247 and 400 feet along Cleburne. Project 1 will connect to Site 1 of Project 2 (Project Shotgun).
- **Project 2** (PIN 121394.00, Project Shotgun)
 - Site 1 - Widening of SR-247 (Beechcroft Road) from 2 lanes to 3 lanes curb & gutter section. Site 1 is approximately 2750 feet in length. Site 1 will connect to Project 1 and Project 3.
 - Site 2 –Widening of SR-247 (Beechcroft Road) to accommodate an eastbound right turn lane onto Town Center Parkway. Site 2 is approximately 700 feet in length.
 - Site 3 –Improvement of the northwest quadrant of the US 31 (Main Street) and Stephen P. Hirsch Parkway.
- **Project 3** (PIN 123399.00, Project Triple Crown) – Project is the extension of State Route 396 (Saturn Parkway) to State Route 247 (Beechcroft Road) on new alignment. The project will include stream crossing(s) over McCormack Branch (a FEMA Studied Stream), a new grade separated railroad crossing, intersection/interchange modifications to the GM facility and a new connection to SR-247. Project will connect to Project 2. The approximate mainline length is 1.3 miles. The design Builder must provide for a future 5 lane section on the bridge over CSX Railroad. The Beechcroft Road over CSX Railroad bridge shall maintain a standard horizontal clearance from centerline of track to the face of the pier or abutment of 25'-0" or greater.

For Project Nos. 1 and 2:

- Final ROW plans will be furnished by TDOT. The department has secured NEPA approval, the necessary ROW and water quality permits to construct the proposed improvements as outlined in

the ROW plans. The Design Builder shall be responsible for preparation of final signed and sealed construction plans in accordance with TDOT's Design Guidelines and to construct the proposed improvements. If the Design Builder wishes to change the horizontal or vertical alignment or deems that additional ROW is needed outside of the secured ROW, they will be responsible for the additional environmental technical studies needed for re-evaluation of the NEPA document, ROW appraisals and acquisitions, utilities coordination/relocation and any permits.

- Utilities. TDOT has also contracted with affected utilities to move prior to construction.
- The roadway construction shall be phased as to maintain two lanes of traffic (one lane in each direction) during construction at all times. Access to all side roads, businesses and residences shall be maintained during construction.

For Project No. 3:

- The ground survey for this project will be provided by TDOT. The Design Builder shall verify the ground survey. In addition, the Design Builder will be responsible for field surveys support activities, such as, but not limited to geotechnical investigations, right-of-way stakeout, construction stakeout, etc. If the Design Builder's design footprint extends beyond the limits of the survey provided by TDOT, it will be the responsibility of the Design Builder to secure the necessary additional survey. All field surveys shall be performed in accordance with the latest version of the TDOT Survey Manual, as posted on the TDOT website.
- The proposed roadway shall be designed and constructed to meet a 40 mph design speed for a rolling principal arterial highway from existing SR-396 (Saturn Parkway) to the proposed intersection with SR-247 (Beechcroft Road) and shall adhere to the latest editions of all appropriate TDOT Roadway Design Standard Drawings, TDOT Design Guidelines and Instructional Bulletins, TDOT Drainage Manual, TDOT Traffic Design Manual, TDOT Design CADD Standards, and *Manual on Uniform Traffic Control Devices*. The proposed roadway shall also be designed and constructed to adhere to *AASHTO A Policy on Geometric Design of Highways and Streets, 2011*. Microstation and Geopak shall be used in the preparation of CADD files. Where practical, the Design Builder should exceed minimum design standards.
- The proposed roadway shall be designed and constructed to meet a 40 mph design speed for a rolling minor arterial highway from the above mentioned intersection in the previous bullet to where the project connects to Project No. 2, Site 1 and shall adhere to the latest editions of all appropriate TDOT Roadway Design Standard Drawings, TDOT Design Guidelines and Instructional Bulletins, TDOT Drainage Manual, TDOT Traffic Design Manual, TDOT Design CADD Standards, and *Manual on Uniform Traffic Control Devices*. The proposed roadway shall also be designed and constructed to adhere

to *AASHTO A Policy on Geometric Design of Highways and Streets, 2011*. Microstation and Geopak shall be used in the preparation of CADD files. Where practical, the Design Builder should exceed minimum design standards.

- All proposed ramps, GM entrances and side roads shall be designed and constructed to meet a 40 mph design speed and shall adhere to the latest editions of all appropriate TDOT Roadway Design Standard Drawings, TDOT Design Guidelines and Instructional Bulletins, TDOT Drainage Manual, TDOT Traffic Design Manual, TDOT Design CADD Standards, and *Manual on Uniform Traffic Control Devices*. The proposed roadway shall also be designed and constructed to adhere to *AASHTO A Policy on Geometric Design of Highways and Streets, 2011*. Microstation and Geopak shall be used in the preparation of CADD files. Where practical, the Design Builder should meet desirable design standards.
- The Design Builder shall geometrically configure the SR-396 (Saturn Parkway) / GM Plant Entrance-Exit interchange modification so as to maintain free flow movements to and from existing Saturn Parkway for GM employee parking; provide a signalized intersection on Saturn Parkway for access to the GM Truck entrance; maintain a free flow movement exiting the GM truck entrance southbound to Saturn Parkway. Reference Technical Study Conceptual Plan.
- Maximum super-elevation rates:
 - 0.08 ft/ft
 - From existing SR-396 (Saturn Parkway) to just north of the proposed GM Truck Entrance/ Exit Intersection.
 - Ramps and GM entrances
 - 0.04 ft/ft
 - From just north of the proposed GM Truck Entrance / Exit Intersection to Site 1, Pin 121394.00
 - Side Roads
- The Design Builder will be responsible for the design and construction of all structures within the project limits. The Design Builder shall ensure minimum vertical clearance as defined in the TDOT Design Guidelines is provided. The Design Builder shall submit plans as outlined in the TDOT Design Guidelines to the TDOT Structures Division for Grade Approval.
- The Design Builder will be responsible for the hydraulic design for this project. The hydraulic design will have to meet FEMA National Flood Insurance Program (NFIP) requirements and either span the floodway or include no-rise or CLOMR for both the new crossing and any work done on SR-247 (Beechcroft Road). The Design Builder shall include evaluating the existing culvert for structural adequacy per the current LRFD standards and hydraulic adequacy and possibly a replacement design if the existing

culvert isn't adequate. Bridge deck drainage design is included for any hydraulic and grade separation structures. Any floodplain map revisions necessitated by the project will be the responsibility of the Design Builder.

- A signal is required at the proposed SR-396 (Saturn Parkway) / GM Truck Entrance/ Exit Intersection. Design and installation of the traffic signal shall be in accordance with the current editions of the Traffic Design Manual, TDOT Roadway Standard Drawings, and the MUTCD. Reference Technical Study Conceptual Plan for signal location.
- At the proposed SR-396 (Saturn Parkway) / SR-247 (Beechcroft Road) intersection, the Design Builder shall perform an analysis of the intersection to determine the number of lanes on SR-247 and a signal warrant analysis in accordance with the current edition of the MUTCD. If a signal is warranted, the Design Builder shall design and install a traffic signal in accordance with the current editions of the Traffic Design Manual, TDOT Roadway Standard Drawings, and the MUTCD.
- For the new grade separated CSX R/R crossing, the vertical clearance from low chord of the structure to top of rails shall be at a minimum 23 FT. This crossing shall meet all requirements of both TDOT and the governing Railroad. The Design Builder shall maintain two lanes (one lane in each direction) at all times on SR-247 (Beechcroft Road) during construction of the grade separation over CSX Railroad.
- In order to facilitate and expedite securing a R/R agreement for the highway-railroad grade separation, the Design Builder shall provide all necessary and pertinent information as outlined in the TDOT Design Guidelines to the State Railroad Coordinator in the preliminary design phase.
- Standard TDOT stock fence per Std. Dwg. S-F-10 shall be installed on each side of the road through GM property along the proposed right-of-way. A maximum of 4 gates will be installed at locations to be determined by GM.
- The Design Builder will be responsible for providing all Geotechnical services for this project.
- The Pavement Design Report for this Project has been developed by the Department and is located as an Appendix A in this **Contract Book 3 (Project Specific Information)**.
- Typical Sections for this project have been specified by the Department and are included as Appendix A in this **Contract Book 3 (Project Specific Information)**.
- The NEPA document and the study area for this project has been developed and it is under review by the FHWA and will be included in Appendix C in this **Contract Book 3**

(Project Specific Information). The commitment sheets and the study area is referenced in appendix C. If the Design Builder's design footprint extends beyond the study area, they will be responsible for the additional environmental technical studies and to provide plans for re-evaluation of the NEPA document. No additional time will be allotted to the project schedule for TDOT preparation of the NEPA document re-evaluation and FHWA approval.

- Lighting is included in this project

For Project Nos. 1, 2, and 3:

- The Design Builder shall ensure that minimum clearing and grubbing is performed beyond the toe of slopes, preserving as much vegetation as possible.
- The Design Builder shall identify the need for any special roadway design details (i.e. any special drainage structures, rock embankment, rock plating, special guardrail, retaining walls, concrete barrier designs, etc.) and shall provide special design drawings.
- 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 contract requirements.
- 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.
- The Design Builder shall be responsible for all open channels and storm drainage design and construction. All drainage analysis and design shall be in accordance with TDOT's Drainage Manual. The design of drainage facilities shall be compatible with existing or proposed drainage systems on adjacent properties, and shall preserve existing drainage patterns wherever possible. If existing drainage patterns must be changed due to design of the Project, the Design Builder shall design and construct a solution that does not adversely impact property owners outside the ROW.
- Roadway component geometric configurations shall be designed to provide adequate drainage and minimize hydroplaning. Cross slopes shall be in accordance with the

requirements of the roadway section. Hydraulic design data shall be listed on the Readiness-for-Construction Design plans for each culvert.

- The Design Builder shall be responsible for the design of all temporary pavements and the evaluation of existing shoulders and roadways regarding their suitability for carrying traffic during construction, if necessary. If required, the Design Builder shall be responsible for strengthening existing facilities prior to routing traffic onto them.

- The design and installation of all appropriate temporary and permanent roadway signing and marking shall be the responsibility of the Design Builder.
 - All detour, construction signing, and markings shall be in strict accordance with the current edition of the MUTCD, TDOT Design Guidelines, and TDOT Standard Drawings for temporary work zones.
 - All permanent pavement markings shall be in strict accordance with the current edition of the MUTCD, TDOT Design Guidelines, and TDOT Standard Drawings for temporary work zones.
 - New guide signs on existing SR-396, SR-6 (US-31), and adjoining ramps and GM visitor and plant entrances shall be designed and installed in accordance with the Design Builder's design plans.
 - Design Builder shall submit a conceptual signing and pavement markings design plan as part of their RFP submittal.
 - The top of sign footing shall be placed level with the ground line
 - After the sign locations have been staked, but prior to ordering any material for the supports, there shall be a field Review and Approval by the Department.
 - The existing footings are to be removed 6 inches below the ground line.
 - The letters, digits, arrows, borders, and alphabet accessories on all flat sheet signs shall be applied by silk screening process, except that cut-out direct applied copy shall be used on all flat sheet signs with a green background, or brown background.
 - The Design Builder shall verify all support lengths at the site prior to erection.
 - All permanent signing shall be in accordance with the current edition of the MUTCD, the current edition of the Standard Highway Signs, the TDOT Supplement to the Standard Highway Signs, the TDOT Design Divisions Roadway Design Guidelines, TDOT Standard Roadway and Bridge Drawings and the current edition of the Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals.
 - 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 fluorescence yellow.

- All advance guide signs and exit directional guide signing shall be mounted on new overhead truss or bridge mounted sign structures (not cantilevered sign structures).
- Existing Logo, Hospital and Guide signing shall remain up through all phases of construction. All existing signing shall be replaced with new breakaway supports and new sign faces.
- Emergency Reference Markers shall be installed on project.
- All permanent signing plans; Signing Layouts, Sign Schedules, Overhead Truss and Bridge Mount conceptual drawings (on sign structure drawing sheets) & Miscellaneous Detail Sheets, shall be reviewed by TDOT Design Division (and TDOT Structures Division to assign I.D. and drawing numbers to the sign structure sheets) prior to construction.
- All overhead truss and bridge mount conceptual drawings (on sign structure drawing sheets) & miscellaneous detail sheets, shall be reviewed by TDOT Structures Division prior to construction.
- Existing sign structures shall be analyzed to ensure that the structure can support any proposed signing modifications.
- All cantilever sign structures shall be replaced with new overhead truss or bridge mounted sign structures.

Upon completion of the project, the Design Builder shall provide the Alternative Contracting Office a transmittal letter, an electronic copy of the As-Built drawings, and final foundation type, including footing elevations and lengths of individual piles, prior to final payment of funds to the Design-Builder.

The Professional Engineer in charge of the development of the Project plans shall place his 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.

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, as well as all utility locations within ROW. As indicated in the Design Build Guidance: <http://www.tn.gov/tdot/article/Design-Build>

4. STRUCTURES SCOPE OF WORK

The Design-Builder shall be responsible for the design and construction of four (4) bridges; Beechcroft Road over CSX Railroad, Beechcroft Road over McCormick Creek to replace existing culvert, new alignment over McCormick Creek, and new alignment over entrance to GM employee parking.

- a) The bridges shall be designed using the AASHTO LRFD Bridge Design Specifications, Seventh Edition (2014) with interims, and the AASHTO Guide Specifications for LRFD Seismic Bridge Design, Second Edition (2011) with interims.
- b) The Design-Builder shall reference the TDOT Standard Specifications for Road and Bridge Construction (2015 Edition) for construction materials and methods.
- c) The bridge design shall use integral abutments, and girders shall be continuous for live loads for prestressed girders, and continuous for all loads for structural steel girders.
- d) The bridges shall be designed for HL-93 live loading. The bridge design shall include 35 psf for future wearing surface. The bridge parapet rail and median barrier must be specified according to current TDOT standards. They shall have a single-sloped face.
- e) If structural steel is utilized, it shall be A709 Grade 50 weathering steel.
- f) The Design-Builder shall perform a hydraulic analysis to determine the need for deck drains and/or end of bridge drains to handle the surface water on the bridge deck.
- g) The Design-Builder shall provide a mechanically grooved finish to the bridge deck.
- h) An applied texture finish is required on the parapet rail, cantilever slab and exterior beam. The top and side of the parapet facing traffic shall receive a white finish (Fed. Spec. No. 37886). All other locations are to be mountain grey (Fed. Spec. No. 36440). The exposed portions of the substructure including the wingwalls, endwalls, abutment beams, pier columns and pier caps are to be finished in mountain grey. The "Tri-Star" emblem shall be incorporated on each bridge at locations approved by the Engineer.
- i) The bridge over the railroad shall be in accordance with all requirements of the CSX Railroad. Two 12' lanes of traffic on SR-247 shall be maintained at all times.

The Design-Builder shall be responsible for all hydraulic analysis of bridges, culverts and culvert extensions.

- a) The Design Builder shall adhere to all permit, FEMA, and hydraulic design criteria when designing bridges, culverts and culvert extensions. Design Builder shall use Drainage Manual found on TDOT Design Division website, and Design procedures for Hydraulic Structures 2012 found on TDOT Structure Division website. Design Builder shall use FHWA scour publication HEC-18, and shall use bridge deck drain design procedures contained in FHWA publication HEC-21 or HEC-22. Hydraulic designs for structures with a 50 year flow rate higher than 500 cfs shall include a HEC-RAS model of the 'no-bridge', existing structure and proposed structure conditions for flood events up to the 500 year flood.
- b) The Design-Builder shall analyze existing culverts, boxes and cross pipes, impacted or affected by the project's design.

- c) The Design-Builder shall replace or supplement any pipes or culverts that are deemed hydraulically deficient as a result of this project and replace any structurally deficient pipes or culverts within the project limits.

The Design-Builder shall be responsible for the design and construction of any required retaining walls.

- a) Retaining walls shall be designed in accordance with the AASHTO LRFD Bridge Design Specifications, Seventh Edition (2014) with interims, and Special Provision 624. Walls shall be designed for the appropriate seismic forces.
- b) Cast-in-place retaining walls shall incorporate a _____ form liner finish and an applied texture finish, mountain grey (Fed. Spec. No. 36440). The formliner pattern shall be approved by TDOT before construction. The wall shall have a 12 inch wide smooth band at the top.
- c) Retaining walls at the CSX Railroad crossing shall be a type meeting the approval of the CSX RR and TDOT Materials & Tests and Structures Divisions.

The Design-Builder shall be responsible for the design and construction of all remaining structures necessary to complete the project.

The Design-Builder shall be responsible for the removal and disposal of all deficient structures, or portions thereof.

Upon completion of the project, the Design-Builder shall provide TDOT Structures Division a final revised set of plans for all structures (bridges, walls, culverts, etc.). The plans shall be delivered on CD (each sheet an individual PDF file) as well as full size Mylars (24" x 36").

5. GEOTECHNICAL ENGINEERING SCOPE OF WORK

- a) The Design Builder shall be required to perform a design level geotechnical investigation to validate and augment the geotechnical information included in this RFP. A Preliminary Geotechnical Report for this project was completed by the Tennessee Department of Transportation Geotechnical Engineering Section. For guidance in determining the requirements of the geotechnical exploration please refer to the current TDOT Geotechnical dated October 15, 2016 (<http://t n.gov/assets/ enti ties/t dot/ att achments/ 2016 -10-15- TDOTGeote chManu al.pdf>).
- b) The Design Builder shall mail contact letters to all property owners where entry is needed at least one month 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 in order to explain that entry is required, the purpose of the activity, the activities involved and to determine facts pertinent to the activity.

c) The Design Builder shall collect appropriate field data and samples for geotechnical evaluation of embankments, subgrade, soil and rock cuts, 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 Manual.

d) Prior to any geotechnical design submittal, 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 scope and complexity similar to that anticipated for this project using the load and resistance factor design (LRFD) method and in accordance with the latest edition of the AASHTO LRFD Bridge Design Specifications.

e) The Design Builder shall be responsible for obtaining the borings for all abutments, bents, piers, retaining wall foundation locations, and noise wall 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 Manual.

f) The prequalified geotechnical firm shall also determine if additional subsurface information, other than that required and noted elsewhere in the Contract Documents, is required based upon the final roadway and structure designs. If a determination is made that additional subsurface information is required; the Design Builder shall perform all additional subsurface investigation and laboratory testing in accordance with the current TDOT Geotechnical Manual.

g) The Design Builder shall provide geotechnical design and construction summaries that contain pertinent subsurface investigations, test, and engineering evaluations.

h) The Design Builder shall provide field quality control for all bridge foundations, retaining foundations and noise wall foundations including verifying subsurface conditions for drilled piers and bearing for shallow foundations.

6. RIGHT OF WAY SCOPE OF WORK

The Design-Builder, acting as an agent on behalf of the State of Tennessee Department of Transportation, shall provide right-of-way acquisition services for the Project. Right-of-way acquisition services shall include certified title reports, appraisal, appraisal review, negotiations, relocation assistance services, property management services, parcel closings and all related activities. All appraiser/s, appraisal reviewer/s and acquisition/relocation firms shall be selected from the Tennessee Department of Transportation Right of Way Office's pre-qualified list. TDOT will retain authority for approving just compensation, relocation benefits and claims,

administrative settlements, court settlements and court awards. TDOT must issue a Notice to Proceed with Right-of-Way Acquisition to the Design-Builder prior to any offers being made to acquire the property. This represents a hold point in the Design-Builder's Baseline Schedule. TDOT must also issue a Notice to Proceed with Construction to the Design-Builder once the property has been acquired prior to commencing construction on the property. This also represents a hold point in the Design-Builder's Baseline Schedule. TDOT WILL be responsible for the actual purchase price paid to a landowner for right-of-way, including fee simple, or any and all easements, and for any relocation assistant payments. TDOT WILL be responsible for actual payments to property owners and certain expenses related to the acquisitions and associated legal costs as well as any additional monies paid the landowners to reach an administrative settlement or pay for court settlements and awards. The Design-Builder WILL be responsible for all costs associated with the services provided by the appraiser(s), review appraiser(s), acquisition/relocation firm, title company, engineering and legal services related to the acquisition of right of way, the costs of any public hearings that may be required, and any other cost associated with the services related to the purchase of right of way.

The following responsibilities shall be carried out by either the Design-Builder or TDOT as specified below:

Title Reports and Closings:

The Design-Builder shall provide a current title report (no older than one hundred and eighty (180) days) for each parcel at the time of the initial offer to landowner. Each title examination report shall be prepared by a TDOT approved title company (each TDOT Regional Right of Way Office has a list of approved title firms). The Design-Builder will furnish an original and three (3) legible copies of a title report, including summary of 5 years sale history, on a form to be provided by TDOT, designated as ROW Form-49, with copies of all recorded deeds, liens, sellos, easements, subdivision plats, divorce decrees, wills, judgments, and other pertinent documents attached, for each numbered tract on the right-of-way plan. The Design-Builder will furnish one updating of the title report; the process of updating the title report will be performed as part of the closing.

The following terms and conditions will also apply:

Preliminary reports of title are required on all tracts for which a taking or an acquisition is shown on the acquisition table.

Title insurance is not required.

An original and three (3) legible copies of the "Preliminary Report of Title" (Form 49) are to be submitted. All attachments must accompany the original and all three (3) copies.

Reports must include information on all contiguous parcels of land which form a single tract under the same ownership.

In addition to the information to be provided on the R.O.W. Form 49, each preliminary report of title shall contain the tax map, and parcel number for the particular tract as well as the civil district in which the tract is located.

In addition, include documentation of all Environmental Liens if they apply.

The Design-Builder will furnish the correct mailing address of the property owner for each tract number.

If the right-of-way plan is revised so to add additional tracts from which there will be an acquisition as shown by the acquisition table, all services covered by this agreement are to be provided for those additional tracts.

Facsimile of title report will not be accepted.

Completion and filing of Form 1099 published by the Internal Revenue Service, is required in connection with closing of right-of-way acquisition.

Copies of Tax Maps showing all tracts are to be included. These maps are to be complete, full size sheets whenever possible.

Copies of subdivision plots are to be included when the only deed description of an individual parcel consists of a lot number in the mentioned subdivision.

Please number the pages of each "Preliminary Report of Title".

If any instrument is not legible on the provided copy, (attachments) then a typed legible instrument must accompany illegible copies.

The Design-Builder will close all negotiated tracts on the project. This service will include: updating the title report to the time of closing; the preparation of the warranty deed and any releases; the preparation of a closing statement (ROW Form -24 provided by TDOT); the preparation of the deed transmittal statement (ROW Form 29 provided by TDOT). The Design Builder is responsible for the arrangement of and making of such disbursements as may be necessary to cause the removal of property taxes, judgments and instruments constituting liens for money owed, and the recording of the warranty deed. TDOT will be responsible for the reimbursement to the Design-Builder for the recording of releases and/or partial releases and the recording of any other required releases for liens or encumbrances and all cost associated with obtaining any releases and any other such documents

The Design-Builder agrees to discuss time and location for each proposed closing with the prospective grantor(s) and within reason to accomplish same in accordance with the grantor(s')

advice. Normal closings are expected to take place within 45 days after the agreement of sale is executed. Extenuating circumstances requiring more than 45 days will be reported by letter (or by FAX) no later than the 45th day from the date of the executed agreement of sale with a request for an extension. Requests for extensions beyond the normal accepted time will be considered on a case by case basis. Within 24 hours after closing the Design-Builder will notify the Regional Transportation Manager 2 of this fact. All closings are to be done by personal contact, at a time and place that is convenient to the landowner. Where a closing by mail is requested, the written consent of the Department is required, except of Out of State property owners.

Appraisal and Appraisal Reviews:

The Design-Builder shall prepare appraisals in accordance with TDOT's Guidelines for Appraisers, Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (the "Uniform Act"), the Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally-Assisted Programs (Part 24 of title 49 CFR), and the Uniform Standards for Professional Appraisal Practice (USPAP). Appraisal and Related Service shall include all or parts of the following: real estate appraisal, real estate appraisal review, real estate consultation, pre-trial conference, deposition, and court testimony, as further defined.

For the project to be covered hereunder, the Design-Builder shall provide each of the following services as required by TDOT for the subject project.

The Design-Builder shall complete all appraisal services and work product to the standards set forth herein. Failure on the part of the Design-Builder to complete each assignment according to said standards by the agreed upon due date shall be considered a material breach of this Contract.

The Design-Builder shall complete all appraisal services in accordance with the Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally-Assisted Programs (Part 24 of title 49 CFR), the Uniform Standards of Professional Appraisal Practice [USPAP (Appraisal Foundation)], [Guidelines For Appraisers (www.tdot.state.tn.us; click TDOT Services Index; Right-of-Way; Appraisal Office; Guidelines For Appraisers)], and federal, state and local laws, rules, and regulations.

The Design-Builder shall furnish an original and two (2) copies of each Market Data Brochure and each Appraisal Report. Furnish one additional copy of each appraisal report together with all exhibits and comparable data write-ups. This copy shall be clearly identified as the landowner's copy. Unless specifically directed otherwise in writing, all appraisal services products are to be delivered to the regional office.

In addition to the standard photos of the subject property and exterior photos of the acquired improvements, the Design-Builder shall provide a typical interior photo of acquired/affected

structures having substantial contributory value (i.e. residences, commercial structures, large barns, etc.) Legible digital images are acceptable.

The Design-Builder shall update to “date of possession” appraisal report(s) on any tract(s) involved in condemnation covered under Work Orders issued hereunder when requested to do so by TDOT. Appraisal updates shall be completed within sixty (60) days after the request is made in writing by TDOT. All such updates shall be in compliance with standards set forth above except that the standards in force as of the date of employment to conduct the updated appraisal service shall apply. The “update” appraisal request may require the Design-Builder to consider and include minor plan revisions and changes in market conditions.

Upon request by TDOT, the Design-Builder shall testify in any judicial or arbitration proceeding involving the determination of the value of the property, in support of the opinion of value of any and all of the property included in his/her appraisal report. Further, the Design-Builder agrees to attend, as requested by TDOT, any pre-trial conferences, meetings, depositions, etc. related to such proceedings. The Design-Builder shall be compensated for these litigation-related services in accordance with the Expert Valuation Witness Rates in effect at the time the service is rendered. The Expert Valuation Witness Rate Schedule may be adjusted periodically.

The Design-Builder shall execute disclaimers of any past, present or contemplated future personal interest in any of the properties included in the proposed agreement, as required by TDOT, or if applicable, Federal Highway Administration (FHWA).

The Design-Builder shall maintain throughout the term of this Contract Errors and Omissions insurance in the amount of not less than one million dollars (\$1,000,000.00), and proof of which shall be made available to the State upon demand.

The Design-Builder shall provide appraisal reviews complying with technical review guidelines found in TDOT’s Guidelines for Appraisers, the Uniform Act, and (USPAP), and TDOT’s Right of Way Procedures Manual and make a recommendation of just compensation. Design-Builder’s right-of-way staff that performs acquisition and relocation/property management services shall be from the TDOT pre-qualified consultant list for acquisition and relocation assistance and related services and the Design-Builder shall include a TDOT pre-qualified Fee Appraiser from TDOT’s prequalified appraiser list. The review appraiser shall be approved by TDOT and shall also be on TDOT’s prequalified fee appraiser list. TDOT shall have final approval of all the Design-Builder right of way staff.

Acquisition / Relocation Assistance / Property Management:

The Design-Builder shall acquire property in accordance with all Federal and State laws and regulations, including but not limited to the Uniform Relocation Assistance and Real Property

Acquisition Policies Act of 1970, as amended (the “Uniform Act”) the Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally-Assisted Programs and (Part 24 of title 49 CFR). The acquisition of property shall follow the guidelines as established by the Tennessee Department of Transportation Right of Way Procedures Manual. The Design-Builder shall execute a certification in its proposal that it has received the Tennessee Department of Transportation’s Right of Way Procedures Manual and will comply with the procedures.

TDOT has an Appeals Advisory Board to hear any Relocation Assistance appeals.

TDOT agrees to assist with any out of state relocation by persons displaced within the rights of way by arranging with such other state(s) for verification of the relocation assistance claim.

The Design-Builder shall establish an acquisition/relocation office at a location that is accessible to the property owners and displacees on or near the project. The purpose of maintaining this office is to ensure effective and responsive service to meet the property owners’ and displacees’ needs. The office must be operational by the time acquisitions begin. The Design-Builder shall supply relocation and negotiation personnel with substantial experience in highway right-of-way acquisition, or similar work, in numbers sufficient to accomplish the required work in a timely manner. Design-Builder’s right-of-way staff that performs acquisition and relocation/property management services shall be from the TDOT pre-qualified consultant list for acquisition and relocation assistance and related services. All relocation and negotiation personnel are to be approved by TDOT for each project hereunder. After TDOT has approved the personnel for a project, changes may only be made with the written approval of TDOT. This office shall be staffed by persons knowledgeable of the Uniform Act and the Tennessee Department of Transportation Right of Way Procedures Manual. This office shall be open during normal business hours and after hours by appointment.

The Design-Builder shall submit procedures for handling right-of-way acquisitions and relocations to TDOT for approval prior to commencing right-of-way activities. This represents a hold point in the Design-Builder’s Baseline Schedule. These procedures are to show the Design-Builder’s methods, including the appropriate steps and workflow required for certified title reports, appraisals, appraisal review, negotiations, acquisition, relocations and parcel closings and all related activities. These procedures shall include TDOT’s review and approval of just compensation, administrative settlements, relocation benefits and claims.

A TDOT Representative will be available to make timely decisions concerning establishing review and approval of just compensation, approval of administrative settlements, approval of relocation benefits and claims, on behalf of TDOT. The TDOT Representative is committed to issuing decisions on approval requests within sixty (60) days. The commitment is based on the plan providing a reasonable and orderly workflow and the work being provided to the TDOT Representative as completed.

The Design-Builder shall maintain accurate parcel files and, at the termination of the work on the project, turn over to TDOT all relocation and negotiation files, appraisal and appraisal review files, and any other pertinent acquisition files, records or reports. All files shall be documented in accordance with the applicable State and Federal requirements. During the work on the

project, the Design- Builder shall make all such files available, upon demand, for inspection by TDOT and/or by the Federal Highway Administration, when applicable.

The Design-Builder shall submit a project specific Acquisition and Relocation Plan for TDOT approval. The plan shall identify a prioritized schedule of right-of-way activities including but not limited to appraisal, appraisal review, the specific parcels to be acquired and all relocations. The plan shall allow for the orderly relocation of displaced persons based on time frames not less than those provided by the Uniform Act and/or the Department's Right of Way Procedures Manual. This plan shall be updated as necessary during the life of the Project.

The Design-Builder shall make the necessary relocation survey and promptly prepare and submit all required relocation documents in accordance with State and Federal regulations. The Design-Builder shall preform all relocations in accordance with the Uniform Act and the Tennessee Department of Transportation Right of Way Procedures Manual as applicable.

The Design-Builder shall submit bi-monthly status reports to TDOT's Right-of-way Division to manage and track the acquisition process. TDOT standard appraisal, appraisal review, acquisition and relocation assistance and property management forms and documents will be used as applicable. The status report must include but not be limited to the appraisal, appraisal review, and acquisition and relocation assistance status of all parcels.

The Design-Builder shall provide necessary property management services during the period of the Design-Builders work. Those property management services include, but are not limited to: private property owner utility adjustment cost estimates, salvage appraisals on improvements being acquired, moving cost determination, including the moving of on-premise signs and outdoor advertising devices, and determination and collection of rent after the "90 day" notice to vacate has expired.

The Design-Builder shall coordinate all work through the State's Regional Right-of-Way Transportation Manager 2 or his designated representative.

The Design-Builder shall recommend tracts for condemnation. When the Design-Builder recommends that a tract should be condemned, the request for condemnation must have the necessary back-up information attached to properly completed forms DT 1606 and DT 1602 when submitted to the Regional Right-of-Way Office. The Regional Right-of-Way Office will check these forms and process this information to obtain a voucher. In general all voucher requests for any payment will be handled in this manner.

The Design-Builder shall conduct any public meetings as requested by TDOT and as required by TDOT's right-of-way procedures and practices.

The Design Builder shall meet and coordinate with public officials of governmental agencies and civic groups as required or as requested by the State.

TDOT will be responsible for the costs associated with the payment to property owners for negotiated settlements, administrative settlements, and relocation benefits. TDOT is also responsible for the costs associated with the payment to be deposited with the court in condemnation cases. In addition, any payments agreed to by the property owner and the Attorney General's Office during the condemnation process either by settlement or through the courts including court costs and any mediation expenses is the responsibility of TDOT. The Design-Builder will be responsible for disbursement of these payments and providing indefeasible title to TDOT. All payments will be made in accordance with the policies and procedures established in the Tennessee Department of Transportation's Right of Way Procedures Manual.

The Design-Builder shall prepare, obtain execution of, and record documents conveying title to such properties to the State of Tennessee Department of Transportation and deliver all executed and recorded general warranty deeds to TDOT. For all property purchased in conjunction with the Project, title will be acquired in fee simple (except for the acquisition of slope, construction or permanent drainage easements, in lieu of fee simple title, with respect to any portion of the rights of way, which must be approved by TDOT's Design Division) and shall be conveyed to the State of Tennessee Department of Transportation, Grantee, by a TDOT-approved general warranty deed, free and clear of all liens and encumbrances except encumbrances expressly permitted by TDOT in writing in advance. All easements shall be acquired in the name of the State of Tennessee Department of Transportation.

Because these acquisitions are being made on behalf of the Department of Transportation, TDOT shall make the ultimate determination in each case as to whether settlement is appropriate or whether the filing of a condemnation action is necessary, taking into consideration the recommendations of the Design-Builder. When TDOT authorizes the filing of condemnation, the Design-Builder shall prepare all required documents necessary to file and forwarded to the appropriate TDOT Regional Right of Way Office.

The Design-Builder will provide the necessary staff and resources as directed by TDOT to work with the Department and the Attorney General's Office throughout the entire condemnation process until the property is acquired by settlement, by deed, or by Final Consent Judgment executed by TDOT and the appropriate court. The Design-Builder will provide updated appraisals (i.e., appraisal reports effective as of the date of possession) and expert testimony supporting condemnation proceedings upon request by TDOT and/or the Attorney General's Office.

The Design-Builder will be responsible for all contacts with landowners for rights of way and construction items and shall be responsible for properly setting all right of way monuments associated with the Project.

The Design-Builder shall maintain 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 complete.

The Design-Builder shall use reasonable care in determining whether there is reason to believe that property and improvements to be acquired for rights-of-way may contain concealed or hidden wastes or other materials or hazards requiring remedial action or treatment. When there is reason to believe that such materials may be present, the Design-Builder shall notify TDOT within three (3) calendar days. The Design-Builder shall not proceed with acquiring such property until they receive written notification from TDOT.

During the acquisition process and for a period of three (3) years after final payment is made to the Design-Builder for any phase of the work, and until the Department of Transportation has indefeasible title to the property, all Project documents and records not previously delivered to TDOT, including but not limited to design and engineering costs, construction costs, costs of acquisition of rights of way, and all documents and records necessary to determine compliance with the laws relating to the acquisition of rights of way and the costs of relocation of utilities, shall be maintained and made available to TDOT for inspection or audit. Throughout the design, acquisition and construction phases of the Project, copies of all documents/correspondence shall be submitted to both the TDOT Headquarters Office and the respective TDOT Regional Office.

The Design-Builder will ensure no open burning will occur within 1,000 feet of an occupied dwelling.

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 right of way 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. TDOT will provide written notification before the contractor can enter the hold off zone.

Fidelity Bond: The Design Builder shall furnish a fidelity bond in the amount of \$250,000.00 with the State being made the insured for the period of time from the first offer to the owners until all tracts have a recorded deed or vouchers submitted for condemnation, in such form as approved by the State. The bond shall indicate the State's right of way project number (both Federal and State numbers, if applicable).

7. UTILITY COORDINATION SCOPE OF WORK

- a. The Design Builder shall be familiar with 1680-6-1 Rules and Regulations for Accommodating Utilities within Highway Rights-of-Way, Tennessee Code Annotated (TCA) Part 8 Relocation of Utilities 54-5-801 through 54-5-856, 23 CFR Part 645 "Utilities", and 23 CFR 646 "Railroads" and TDOT Policy 340-07. Adherence to the above referenced regulations, procedures, and policies are mandatory.
- b. Immediately after submittal of the accepted final Definitive Design Plans, the Design Builder needs to accommodate the statute (TCA 54-5-854) required 120 - 165 Calendar Days in their CPM for Utility Investigation. In addition to accommodating the requirements of TDOT 340-07 policy administration of utility relocation performed by the Design Builder.

- c. Some adjustment of utility lines will be required due to the Design Builder design. The Design Builder shall be responsible for identifying any utility conflicts/relocations and 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, Inc., at 1-800-351-1111 as per TCA 65-31-106 will be required.
- d. 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 will 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.
- e. Prior to submitting the bid, the Design Builder will be solely responsible for contacting owners of all affected utilities in order to determine the extent to which utility relocations and/or adjustments will have upon 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. Advance clear cutting may be required by the Department at any location where clearing is called for in the specifications and clear cutting is necessary for a utility relocation.
- f. The Design Builder shall be responsible for confirming the utility locations, confirming the type of facilities, identifying the utility owners and determining the cost responsibilities in order to coordinate the relocation of any utilities in conflict with the project.
- g. 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 TCA 65-31-106.
- h. The Design Builder shall coordinate the relocation or adjustment of the utilities in accordance with the RFP. The Department will process and certify all noncompensable, compensable or Policy 340-07 reimbursed utilities.
- i. The Department will be the approving authority for all utility agreements and approval of plans. If all utility relocations are included in the construction performed by the Design Builder, MOVE IN, the Department will process the contracts necessary for the reimbursement of existing utility relocations on public right of way in accordance with Policy 340-07.
- j. The Department shall make the necessary arrangements with the utility owners on reimbursement contracts with utilities and the Design Builder shall make the necessary arrangements with the utility owners for all utility conflict relocations including non-compensable utilities, compensable utilities, and policy 340-07 MOVE IN reimbursement utilities including new installations required for the project, adjustments, relocations or removals where the Design Builder and utility company determine that such work is essential for highway safety and performance of the required construction.
- k. 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.

- l. In the event of a utility conflict, the Design Builder shall request that the utility company submit relocation plans (Plans to be provided by the Design Builder to Utility Owners) that shows existing utilities and proposed utility relocations.
- m. The Design Builder shall be responsible for determining the cost responsibility (*compensable, Policy 340-07 MOVE IN reimbursement or non-compensable utilities*) for the utility relocations. The Department will be responsible for non-betterment (*compensable and reimbursed utilities*) utility relocation cost when the utility company has prior rights-of-way, Policy 340-07 MOVE IN or compensable interest. The utility company shall be responsible for the relocation costs if they cannot furnish evidence of prior rights-of-way or compensable interest (*noncompensable utilities*) in their facilities, or they do not comply with Policy 340-07 MOVE IN requirements. The Design Builder shall be responsible for all costs associated with utility relocations due to haul roads and/or any other temporary conditions resulting from the Design Builder's methods of operation or sequence of work.
- n. If the Design Builder elects to make arrangements with a utility company to incorporate a new utility installation or relocation as part of the highway construction, the utility work done by the Design Builder and the associated costs for the work shall be negotiated and agreed upon between the Design Builder and the utility company.
- o. If the Design Builder is requested, in writing, by an entity to relocate, upgrade or incorporate new water and sewer facilities as part of the highway construction, designs shall be coordinated with the utility owner, and the Department. The associated design and construction costs shall be negotiated and agreed upon between the Design Builder and the utility company. The Design Builder shall develop designs; prepare all plans for needed agreements and permits; submit permits directly to the agencies and obtain approval from the agencies.
- p. The Department Utility Office must execute approved agreements on Design-Build highway projects. The Utility Relocation Agreements (Cost Agreement) and encroachment agreements are available from the Department.
- q. 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.
- r. 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.

8. ENVIRONMENTAL SCOPE OF WORK

The Environmental Boundaries Report (EBR) has been provided by the Tennessee Department of Transportation's (TDOT) Ecology Section. It is the responsibility of the Design-Builder to make sure all features are field verified. If a feature is discovered that is not included in the EBR, the Design-Builder will be responsible for hiring a biologist to complete the Hydrologic Determination Sheets and submit them to Tennessee Department of Environment and Conservation (TDEC) for review and approval. The Design-Builder shall be responsible for any mitigation for impacts to environmental features included in this report and for any additional features that may be detected during construction. The cost for these items shall be included in the contract amount.

I. ENVIRONMENTAL BOUNDARIES

Project 1 (PIN 117319.01), SR 247

The Environmental Boundaries Report has been provided by the Tennessee Department of Transportation's (TDOT) Ecology Section. The report indicated no streams, springs, wetlands or any other environmental features within the project area. The Design-Builder shall be responsible for any mitigation for impacts to environmental features identified within the Environmental Boundaries Report or additional features identified during construction. The cost for these items shall be included in the contract amount.

Project 2 (PIN 121394.00, Project Shotgun)

The Environmental Boundaries Report has been provided by the Tennessee Department of Transportation's (TDOT) Ecology Section. The report indicated one stream, an unnamed tributary to Carters Creek (STR-1), one Wet Weather Conveyance/Ephemeral Stream and one wetland within the project area. The Design-Builder shall be responsible for any mitigation for impacts to environmental features identified within the Environmental Boundaries Report or additional features identified during construction. The cost for these items shall be included in the contract amount.

Project 3 (PIN 123399.00, Project Triple Crown)

The Environmental Boundaries Report has been provided by the Tennessee Department of Transportation's (TDOT) Ecology Section. The report indicated two streams and two wetlands within the project area. The Design-Builder shall be responsible for any mitigation needed for impacts to the environmental features identified in the Environmental Boundaries Report or additional features identified during construction. The cost for these items shall be included in the contract amount.

Based on a letter from the U.S. Fish and Wildlife Service dated June 13, 2016, they indicated they were unaware of any federally listed or proposed species that would be impacted by the project. A letter dated June 23, 2016, from the Tennessee Wildlife Resources Agency indicated that this project is not expected to impact any state- listed species that are Deemed-in-Need-of-Management, Threatened, or Endangered. See approved NEPA document concerning additional / updated species information and requirements.

If any streams, springs, wetlands or any other environmental features are identified during construction that was not included in Environmental Boundaries Reports that was provided for the sections listed above it will be the responsibility of the Design-Builder to provide the data sheets and forms listed below to TDOT for review prior to submittal to the regulatory agencies.

Streams

- 1) Hydrologic Determination Field Data Sheet
- 2) Ecology Field Data Sheet
- 3) Habitat Assessment Field Data Sheet
- 4) A location map, marked up plan sheets, and a USGS Quad map showing the proposed stream(s)

Wetlands

- 1) Wetland Determination Data Form
- 2) TRAM Decision Form
- 3) A location map, marked up plan sheets, and a USGS Quad map showing the proposed wetland(s)

Qualifications for any additional field studies

1. Unless otherwise specified by TDOT, all personnel conducting field studies or writing ecology reports must be degreed biologists. Non-biologists may assist with field studies only under the direct, on-site supervision of a degreed biologist, and may not themselves write reports. Unsupervised use of non-biologists will be allowed only with prior TDOT approval, and will usually be acceptable only for tasks such as water bottle collection, and other similar tasks not requiring habitat notes.
2. Personnel conducting stream identifications must have completed the Tennessee Hydrologic Determination Training Course and obtained a Tennessee Qualified Hydrologic Professional Certification. This certification must be submitted with the Hydrologic Determination Field Data Sheet.
3. Personnel conducting wetland identifications and/or delineations must be degreed biologists and shall submit evidence to the TDOT Environmental Division, Ecology Section, of wetland delineation training acceptable to TDOT. TDOT may, at its discretion, disallow the conduct of studies by personnel for whom it feels the training is inadequate, or where follow-up studies indicate misidentification.
4. TDOT may require participation or supervision by subject-matter experts such as chemists, geologists, expert botanists, or malacologists, etc.
5. The contractor shall prepare Ecological Studies as directed by the TDOT/TDEC as follows:
 - a. For the subject transportation project, allowable contractor activities may include, but not be limited to: conducting various types of surveys such as ecological, environmental, water quality, and endangered/threatened species, as well as surveys of species habitats.

State or Federal Endangered/Threatened Species

Project 1 (PIN 117319.01), SR 247

Based on a letter from the U.S. Fish and Wildlife Service dated May 7, 2015, no federally listed or proposed species, or designated critical habitat are known to exist within the project impact area. An email dated April 28, 2015, from the Tennessee Wildlife Resources Agency indicated the Red Band Darter was nearby the project and requested the strict use of all applicable Best Management Practices. No seasonal restrictions or sweeps are required for this project. See approved NEPA document concerning additional / updated species information and requirements.

Project 2 (PIN 121394.00, Project Shotgun)

Based on a letter from the U.S. Fish and Wildlife Service date February 10, 2015, endangered species collection records available to the Service do not indicate that federally listed or proposed endangered or threatened species occur within the impact area of the project. A letter dated February 23, 2015, from the Tennessee Wildlife Resources Agency indicated The state Deemed-In-Need-Of-Management Redband Darter (*Etheostoma luteovinctum*) has been documented (1993 approximately 1.6 miles downstream from the proposed roadway crossing. Therefore the Tennessee Wildlife Resources Agency (TWRA) requested that any in-stream construction activities be prohibited during the period of March 1st through April 30th (the Redband Darter spawning period) or to conduct in-stream construction activities only when the stream is dry to minimize potential adverse impacts to the state listed Redband Darter. See approved NEPA document concerning additional / updated species information and requirements.

Project 3 (PIN 123399.00, Project Triple Crown)

Based on a letter from the U.S. Fish and Wildlife Service date June 13, 2016, they indicated they were unaware of any federally listed or proposed species that would be impacted by the project. A letter dated June 23, 2016, from the Tennessee Wildlife Resources Agency indicated that this project is not expected to impact any state- listed species that are Deemed-in-Need-of-Management, Threatened, or Endangered. See approved NEPA document concerning additional / updated species information and requirements.

Updated coordination for the areas / projects listed above may be needed with the U.S. Fish and Wildlife Service and Tennessee Wildlife Resources Agency if new information reveals impacts that may affect listed species or critical habitat, the proposed action is subsequently modified to include activities which were not previously considered during consultation (work outside of NEPA study area) or new species are listed or critical habitat designated that might be affected by the proposed projects. Questions regarding the species review or if an activity was considered during consultations please contact the TDOT Environmental Division, Ecology Section.

If additional coordination is required with the U.S. Fish and Wildlife Service (USFWS) and Tennessee Wildlife Resources Agency (TWRA) the Design–Builder shall contact TDOT Environmental Division, Ecology Section to start coordination. If TWRA or USFWS requires any species surveys, sweeps, or transplants TDOT may request the Design–Builder to perform the work and must provide the following to TDOT Environmental Division, Ecology Section before starting for coordination with the agencies listed above. The Design–Builder shall also allow time in the schedule for the TDOT Environmental Division, Ecology Section to coordinate with TWRA and USFWS if required.

1. Surveys will be conducted as appropriate, depending on the species. The Design–Build biologist shall put together a sampling plan as recommended by The U.S. Fish and Wildlife Service (USFWS) and The Tennessee Wildlife Resource Agency (TWRA). The plan should include (at a minimum) the techniques, equipment, analytical techniques or metrics (e.g., IBI, TMI), time frame, and staff qualifications, and the appropriate collection permits (if necessary).
2. A sweep is generally associated with fish, mussels, or crayfish, and has typically been conducted one or two days prior to commencement of construction work in the water. However, the new convention is to perform the sweep the same day as installation of the coffer dams, or when the work is being done in the water. A plan describing the methods for conducting the sweep will be required. All sweep methods and procedures must be discussed and coordinated with USFWS and TWRA prior to the sweep.
3. A brief transplant plan, if necessary, should be submitted to the USFWS (Federal-listed plants) and The Tennessee Department of Environment and Conservation (TDEC; State-listed plants) for approval. This would include, at a minimum, the techniques for moving the plants, the proposed relocation site, the time frame for the move, and the qualifications of the staff involved. TDOT usually has to monitor the success of relocated plants for a time period (generally three years, but it depends on the project- specific requirements of the regulatory agencies).

Migratory Birds

All migratory birds are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (last amended in 1998). Migratory birds include all birds except pigeons and starlings. A significant population of migratory birds nesting within the proposed project limits must be documented and accompanied by photos of the nests or roosts. Some examples of nesting populations include heron rookeries, turkey vulture roosts, and cliff swallow nests on bridges. The definition of significant concentration will vary depending on the species. For example, a single robin or bluebird nest would not be significant, but a single bald eagle nest or twenty cliff swallow nests may be. Biologists should use best professional judgment with regard to the nesting behaviors and social tendencies of the species in question (i.e., solitary vs. colonial, etc.) to determine what constitutes a significant concentration of nesting birds. If the Design–Build Biologist, as defined above, makes a determination of significant migratory bird population he/she shall contact the TDOT Environmental Division, Ecology Section to coordinate with the USFWS prior to or during construction.

Misc. Requirements

- 1) Ensure identification, survey, and monitoring of other natural resources such as sinkholes, caves or specialized habitats. Coordinate with regulatory agencies when necessary.
- 2) GPS/GIS data collection shall be with mapping grade accuracy (defined as sub-meter).
- 3) It is mandatory that each member of the consultant's team has completed a minimum 10-hour OSHA Construction Safety Training course annually, prior to any on-site work assigned under this contract. If a 30-hour or 40-hour OSHA certification is current, no additional training is required.

II. WATER QUALITY PERMITS**Project 1 (PIN 117319.01), SR 247**

The Tennessee Department of Transportation reviewed the above listed project and determined that water quality permits are not required. The project may need to be reevaluated if any of the following occur: (a) the alignment changes, including impacts to termini begin and end points; or (b) a possible stream, wet weather conveyance, spring, seep, or wetland is found. If additional environmental features are found, it will be the Design-Builder's responsibility to obtain all necessary water quality permits. See information below for additional details.

Project 2 (PIN 121394.00, Project Shotgun)

The Tennessee Department of Transportation reviewed the above listed project and applied for water quality permits on October 5, 2016. The Tennessee Department of Transportation received three General Aquatic Resource Alteration Permits from the Tennessee Department of Environment and Conservation, Minor Alterations to Wetlands (Permit # NRS-16.227), Construction and Removal of Minor Road Crossings (Permit # NRS-16.227B) and for Utility Line Crossings (Permit # NRS16.227C). The Tennessee Department of Transportation also received verification from the Nashville District, Corps of Engineers (File # LRN-2015-00890) that the subject project meets the criteria for Department of the Army Nationwide Permit NWP #14 for Linear Transportation Crossing and the NWP # 12 for Utility Line Crossing Activities. If the Design-Builder wishes to modify or change the plans that are referenced in the above listed permits, it shall be his/her responsibility to re-coordinate with the Tennessee Department of Environment and Conservation and Nashville District, Corps of Engineers to obtain a modification or any additional permits needed. See information below for additional details.

Project 3 (PIN 123399.00, Project Triple Crown)

The Tennessee Department of Transportation has not reviewed the above listed project and it shall be the responsibility of the Design-Builder to obtain all necessary water quality permits and provide mitigation, if needed, for any impacts to environmental features (streams, wetlands, etc.) that will be impacted by the proposed project. See information below for additional details.

The Design-Builder will obtain and pay for all regulatory permits as required by applicable laws, the plans, or contract specifications. The cost shall be included in the contract amount. 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 this project. Also, the listing herein is not all-inclusive and it shall be the responsibility of the Design-Builder to determine all of the permits required in order to perform the work.

The Design-builder assumes all responsibility 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” 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;
- 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 (TDEC) governing National Pollutant Discharge Elimination System (NPDES) permits in Chapter 1200-4-10, and Aquatic Resource Alteration Permits in Chapter 1200-4-7; Class V Injection Well Permits for work in or near sinkholes; and
 - a. 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 C.F.R., Part 1304.

List of Regulatory Agencies and Permit Types

1. **Department of Army (DA) United States Army Corps of Engineers (USACE)**
 - a. Nationwide Section 404 Permit (404)
 - b. Individual Nationwide Section 404 Permit (I404)
2. **Tennessee Department of Environment and Conservation (TDEC), Natural Resource Section**

- a. General Aquatic Resources Alteration Permit (GARAP)
 - b. Individual Aquatic Resources Alteration Permit (IARAP)
 - c. 401 Water Quality Certification (401)
3. **Tennessee Department of Environment and Conservation (TDEC), Division of Water Supply**
- a. Class V Injection Wells (sinkholes)
4. **Tennessee Department of Environment and Conservation (TDEC), Division of Water Pollution Control**
- a. General NPDES Permit for Discharge of Storm Water Associated with Construction Activities
5. **Tennessee Valley Authority (TVA)**
- a. Section 26a Permit

Permits may be modified by regulatory agencies during the course of performing the work under the contract. Therefore, wherever the term "order," "permit," "opinion," "programmatic agreement," or "authorization" is used in the contract, it is intended to refer to the current version in effect at the time the event governed by it takes place.

A TDEC permit may also be required when activities such as core sampling, seismic exploratory operations, soil surveys, soil sampling, and historic resources surveys occur within waters of the state. A TDEC permit may also be required for placement and operations of scientific measurement devices. See Tennessee General Aquatic Resource Alteration for Surveying and Geotechnical Exploration for additional details <http://www.tennessee.gov/environment/article/permit-water-aquatic-resource-alteration-list-of-general-permits>

The Design-Builder shall be responsible for preparing all documents (permit package) and attending all public meetings necessary to obtain the environmental permits for the construction requirements of this project. It shall be the Design-Builder's responsibility to acquire information and prepare permit drawings/sketches that reflect the impacts and minimization efforts resulting from the Design-Builder's design of this project. Permit drawings/sketches for individual permits (IARAP or I404) shall be prepared utilizing the TDOT's template for permit sketches.

The Design-Builder shall be responsible for developing the permit application for all jurisdictional impacts. The Design-Builder shall be responsible for all public notice requirements, such as documentation to be placed in the local paper and in the field. The cost of the public notice shall be included in the contract amount. The Design-Builder shall employ the personnel that it deems necessary in order to provide permit compliance. The design shall be complete prior to permit application.

Information to be included in the permit application package:

1. Signed application letter to the TDEC Natural Resource Section, USACE and TVA (if applicable) listing all water quality impacts.
2. The signed application letter should indicate the following:
 - a. Alternatives for each impact to environmental features.
 - b. Proposed methods utilized by the Design-Build to minimize impacts to each environmental feature.
 - c. Proposed mitigation for impacts to environmental features (if required).
3. Labeled U.S. Geologic Survey (USGS) color quadrangle map. The map should have the following information shown:
 - a. Impact area labeled by permit type.
 - b. Longitude and latitude (precision to four decimal places) listed for each impact.
 - c. Quadrangle name and number.
 - d. Project information (including PIN, State Project Number, project description, County name, nearest city).
 - e. Scale bar (quad map scale should be set to 1:240000).
 - f. North arrow.
4. Copy of signed CN1091 form (the originally-signed CN1091 form should be submitted to TDEC).
5. Signed DA/TVA form or DA form (if applicable). DA/TVA form must be filled out if an Individual Section 404 Permit is required, or if the project is located within one of the TVA watersheds. Refer to the website listed below for TVA watershed information.

http://www.tva.gov/river/landandshore/landuse_contacts.htm#

6. Signed Section 26a Permit and Land Use Application Applicant Disclosure Form (if applicable).
7. Individual Section 404 Permit applications require the names and addresses of property owners adjacent to all permit impacts listed on a separate permit sketch.
8. Individual permit sketches
9. Hydrologic Determination Field Data Sheet (if applicable)
10. Ecology Field Data Sheet (if applicable)
11. Habitat Assessment Field Data Sheet (if applicable)
12. Wetland Determination Data Form (if applicable)
13. TRAM Decision Form (if applicable)
14. Quad map showing impact area and listing all environmental features.
15. Photographs of all environmental features.
16. Marked-up plan sheets from the Environmental Boundaries

17. A copy of all coordination letters between TDOT and the United States Fish and Wildlife Service (USFWS)
18. TDEC Division of Natural Areas, endangered species database search
19. A copy of all coordination letters between TDOT and the Tennessee Wildlife Resource Agency (TWRA).
20. Federal Emergency Management Agency (FEMA) flood map for the subject project with construction limits labeled.
21. FEMA No-Rise Certification letter or Conditional Letter of Map Revision (CLOMR).
22. A copy of approved National Environmental Policy Act (NEPA) document (Environment Assessment, Finding of No Significant Impact, Categorical Exclusion, etc.)
23. A copy of the State Historic Preservation Office (SHPO) letter (Architectural & Archaeological)
24. Mitigation plan/plans for all streams and wetlands (if applicable)
25. Half-size copy of the bridge layout(s) (if applicable)
26. Half-size set of plans showing all environmental features. The plans shall be highlighted according to the following guidelines:
 - a. Have the new culvert construction (extensions included) highlighted in orange on the proposed layout.
 - b. Existing culverts highlighted in blue on the present layout (blue on the proposed layout if sections are remaining).
 - c. Streams/springs highlighted in blue on the present and proposed layout.
 - d. Wetlands highlighted on present layout (green for permanent impacts and yellow for temporary impacts). Be sure to label plans accordingly.
 - e. Bank stabilization, outfall structures, and sinkholes highlighted in pink on proposed layout.

If any regulatory agency rejects or denies the permit application, it is the Design-Builder's responsibility to make the necessary revisions to ensure the permit is approved. The Design-Builder will be responsible for preparing designs and proposing construction methods that are permissible. All permits required for a particular construction activity will be acquired prior to commencing the particular construction activity. All costs and delays associated with incomplete permit packages, agency rejection, agency denials, agency processing time, or any permit violations will be the responsibility of the Design-Builder, and will not be considered sufficient reason for time extension.

Any temporary construction measures, including de-watering, construction access, erosion control measures, temporary crossings, etc. shall be addressed in the permit 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. <http://www.tn.gov/tdot/topic/transportation-construction-division-internal-resources> these details shall be included in the permit application data. Further, the Design-Builder shall describe the methods of construction of all structures.

Typical agency review time for Nationwide Section 404 Permit applications and General Aquatic Resources Alteration Permit applications is usually 60 to 120 days; Individual Aquatic Resources Alteration Permit and Individual Nationwide Section 404 Permit applications, is usually 90 to 180 days. For TVA Section 26a Permit applications agency the review time is usually 90 to 120 days; and TDEC Class V Injection Wells (sinkholes) Permit applications typical review time is usually 30 days from the receipt of a “complete” package, including any fees. The Design-Builder needs to be aware that the timeframes, mentioned above, to review any permit application begin only after a fully-complete and 100% accurate submittal is received. Processing time can vary depending upon such things as the complexity of the activity or impact, the level of public interest (including public hearings), the quality or value of the waters to be affected, etc. Please keep in mind that not all activities are entitled to a permit. All work by the Design-Builder shall be accomplished in strict compliance with the plans submitted with the permit applications and in compliance with all terms and conditions of all permits and certifications issued by the agencies.

Mitigation of Stream and Wetlands

The Design-Builder shall be responsible for all streams and wetland mitigation required for the subject project and all costs associated with obtaining mitigation. The cost shall be included in the contract amount. This may include (but is not limited to):

- a. planning
- b. design
- c. construction of on-site/off-site mitigation for stream and/or wetlands impacts
- d. purchasing of wetland mitigation credits from an approved bank or site
- e. and/or purchasing of stream mitigation from an approved site/organization

All stream mitigation shall follow the requirements outlined in the Stream Mitigation Guidelines for the State of Tennessee, prepared by the TDEC, Division of Water Pollution Control, Natural Resources Section. All proposed stream and wetland mitigation shall be submitted to and coordinated with the regulatory agencies before 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 all on-site/off-site mitigation requirements listed in the permits and all costs associated with mitigation requirements, such as 5+/- years site monitoring after construction, reporting of mitigation monitoring to regulatory agencies, and maintenance and/or repairs needed to mitigation sites, etc.

NPDES PERMIT

The Tennessee Department of Transportation reviewed the above listed projects and determined that the proposed work will disturb greater than 1.0 acre for each project / area; therefore, a stormwater permit (National Pollutant Discharge Elimination System, NPDES) is required. It

will be the Design-Builder's responsibility to develop final Erosion Control sheets, a Storm Water Pollution Prevention Plan and obtain the NPDES Construction General Permit (CGP) for the project listed above See information below for additional details.

- A. Typical agency review time for stormwater permits (National Pollutant Discharge Elimination System, NPDES) is usually approximately 30 days.
- B. The Design-Builder shall prepare a Storm Water Pollution Prevention Plan (SWPPP) and a Notice of Intent (NOI) using the most current TDOT format approved by TDOT and TDEC for submittal of the NPDES permits to TDEC. A copy of the Storm Water Pollution Prevention Plan Manual (SWPPP) used by TDOT to develop SWPPPs can be obtained from the TDOT Environmental, Ecology and Permits Office. (Mr. John Hewitt, John.hewitt@tn.gov).
- C. The SWPPP template and Storm Water Pollution Prevention Plan Manual shall be used as a guide in preparation of SWPPPs and the Design-Builder is responsible for complying with all requirements of the CGP. Refer to the following website for a copy of the current CGP and for additional information/requirements:
<http://www.tn.gov/environment/article/permit-water-npdes-stormwater-construction-permit>
- D. The SWPPP shall include the Erosion Prevention and Sediment Control (EPSC) plans for application of coverage under the CGP. The SWPPP and NOI shall be submitted at least 30 business days prior to beginning construction activities. Once a Notice of Coverage (NOC) is received by the Design-Builder, the EPSC plans shall be kept current for all phases of construction. Any changes in scope subsequent to submitting the SWPPP for coverage under the CGP shall be submitted to TDEC for their records.
- E. As outlined in the NPDES Construction General Permit (CGP) the Department will perform the Environmental Quality Assurance Project Compliance Assessments on this project, which will include the waste and borrow areas.
- F. The Design-Builder shall prepare EPSC plans detailing best management practices (BMPs) to prevent erosion, control sedimentation, and prevent the discharge of any pollutants that may enter stormwater 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. 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 sediment accumulation in the waters of the state, as well as comply with the terms of the TDEC NPDES Construction Permit.

- G. The Design-Builder shall follow all of TDOT's Design Standards/Guidelines when developing the EPSC plan for the subject project. TDOT's Design Standards/Guidelines can be found at the following address:

<http://www.tn.gov/tdot/section/chief-engineer-design-standard-drawings-library>

- H. TDOT will review and monitor the project, 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. If non-compliance items are not addressed within this timeframe, 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. The liquidated damages amount will be addressed in a notice of warning to the Design-Builder of failure to comply. TDOT has the authority to suspend work until such time as the deficiencies have been corrected. The Design-Builder shall not be granted any cost or time compensation for any work suspensions associated with non-compliance. Any monetary fees and/or fines associated with any violations shall be the responsibility of the Design-Builder.

I. NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) DOCUMENT

In accordance with the National Environmental Policy Act, a reevaluation(s) of the approved document may be required to address any additional right-of-way (ROW) and/or easements not studied under the original footprint of the proposed project. The reevaluation(s) may take place at any time during the development of the project. Depending on the magnitude of the design changes required, the reevaluation may require review and approval by FHWA (process would consist of approximately 14 weeks for TDOT documentation, FHWA review and approval); however, any minor changes may be documented, reviewed and approved by the TDOT Environmental Division. As you move through the various phases of the Design-Build project, please remain aware of the federally mandated requirements for these re-evaluations. Please, also allow time for the environmental process for this Design Build project.

If the Design-Builder proposes to perform work outside of the approved NEPA study areas he/she will be required to submit a set of plans showing all changes clearly marked. The Design-Builder shall also provide a detailed explanation/ reason for the additional work to be included in the NEPA re-evaluation.

The Design-Builder shall be responsible for all costs associated with any additional NEPA re-evaluation(s) resulting from work proposed outside of the original study area identified in the

approved NEPA document. This may include (but is not limited to): Environmental Studies performed by TDOT or the Design Builder and cost required to develop the NEPA re-evaluation document by the TDOT.

The Design Builder shall review and adhere to all approved NEPA documents and technical reports; specifically any environmental commitments listed on the “Green Sheet” of the approved NEPA documents. These commitments are to be taken into account throughout the design 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. Should any features not addressed in the NEPA documents be uncovered during construction activities, all construction activities will stop immediately in that area and the Design Builder will contact the TDOT Environmental Analysis Office for consultation.

The Design-Builder shall provide the TDOT Environmental Analysis Office final right-of-way plans or construction plans for the entire project on State Route 396, Saturn Parkway Extension 14 weeks prior to the start of construction. This will allow the TDOT Environmental Documentation Office to complete the right-of-way and/or construction re-evaluation before construction activities commence.

9. CONSTRUCTION SCOPE OF WORK

- a. Construction Engineering Inspection (CEI) Scope of Work:
 - TDOT will be responsible for CEI work.
- b. A rideability Special Provision SP411C will be included in this Project.
- c. All EPSC designs and implementation shall be the responsibility of the Design-Builder.
 - Sod shall be placed at locations to prevent damage to adjacent facilities and property due to erosion on all newly graded cut and fill slopes as work progresses.
 - Pre-construction vegetative ground cover shall not be destroyed, removed or disturbed (i.e. clearing and grubbing initiated) more than 10 calendar days prior to grading or earth moving activities unless the area is seeded and/or mulched or other temporary cover is installed.
 - Clearing, grubbing, and other disturbance to riparian vegetation shall be limited to the minimum necessary for slope construction and equipment operations. Unnecessary vegetation removal is prohibited.
 - All disturbed areas shall be properly stabilized as soon as practicable. Priority shall be given to finishing operations and permanent EPSC measures over temporary EPSC measures on all projects.

- EPSC measures shall be installed concurrently with clearing operations, and shall be functional prior to any earth moving operations.
- EPSC inspection, repair, and maintenance of structures are to 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 contractor shall repair the structures at their own expense.
- Inspection of EPSC components shall be done on regular basis and a copy of each inspection report shall be provided to the TDOT project engineer.
- 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 into Waters of the State/U.S.
- The Design-Builder shall establish and maintain a proactive method to prevent the off-site migration or deposit of sediment on 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 timeframe, written documentation must be provided and an estimated repair, replacement or modification schedule shall be documented within 24 hours after identification. All costs associated with modifications made to these measures shall be the responsibility of the Design-Builder and all modifications shall be approved by the TDOT project engineer.
- EPSC measures must be in place and functional before earth moving operations begin, and must be constructed and maintained throughout the construction period. Temporary EPSC measures may be removed at the beginning of the workday, but must be replaced at the end of the workday. All EPSC measures as well as buffer zones and other protective measures shall be kept in good and effective operation condition.
- If permanent or temporary vegetation is to be used as an EPSC measure, then the timing of planting of vegetation. Delaying planting of cover vegetation until winter months or dry months should be avoided, if possible.
- 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, as needed, to reduce the tracking of mud and dirt onto public roads by construction vehicles.
- The EPSC measures and/or plan shall be modified as necessary so that they are effective at all times throughout the course of the Project. The cost of all modifications and upgrades to the EPSC plan as directed by the engineer shall be the responsibility of the Design-Builder.
 - The accepted EPSC plan shall require that EPSC measures be in place before clearing, grubbing, excavation, grading, cutting or filling occurs, except as such work may be necessary to install EPSC measures, including without limitation as follows:
 - Initial clearing and grubbing shall be limited to that necessary for the installation of applicable EPSC devices in accordance with the accepted EPSC plan.
 - No other clearing and grubbing operations shall be started before applicable EPSC measures are in place in accordance with the accepted EPSC plan.
 - In the event that wetlands are delineated within the project limits, no access shall be granted to these areas for any reason. These areas shall be protected from sediment prior to any clearing and grubbing operations.
 - No grading, excavation, cutting, filling, or other earthwork shall be started before EPSC measures are in place in accordance with the accepted EPSC plan.
- d. Any area that is disturbed outside limits of construction during the life of this Project shall be repaired by the Design-Builder at their expense. All repaired areas shall be inspected and be deemed satisfactory by department personnel.
- e. The Design-Builder shall not dispose of any material either on or off state-owned R.O.W. in a regulatory flood way as defined by the Federal Emergency Management Agency without approval by same. All material shall be disposed of in upland (non-wetland) areas and above ordinary high water of any adjacent watercourse. This does not eliminate the need to obtain any other licenses or permits that may be required by any other federal, state or local agency.
- f. 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.
- g. Bituminous Material and Fuel Price Adjustments **shall be** available on this Project. Once the Contract is executed items for Bituminous Material and Fuel Price Adjustments will be added. The adjustments will be made on the Progress Payments approved by TDOT.
- h.

10. TRAFFIC CONTROL/PAVEMENT MARKING SCOPE OF WORK

GENERAL/MISCELLANEOUS:

Construct the included RSAR Project at the intersection of SR-247 and Cleburne Road and SIA Project Shotgun, according to the plans developed by the Department, as soon as practicable upon receipt of Work Order.

State the method of construction in your technical proposal.

Nothing in this scope shall relieve the contractor from his responsibilities toward the safety and convenience of the general public and the residents along the proposed construction area.

The Design-Builder shall use Traffic Control materials from TDOT's Qualified Products List (QPL).

The contractor shall be required to remove and reset mailboxes where and as directed by the engineer.

TEMPORARY LANE/ROAD CLOSURE:

All lane closures must be approved in advance by the Engineer. A minimum of seven days notice must be provided in advance of any closure. No lane closures will be allowed during Special Events, Holidays or Holiday weekends in accordance with subsection 104.04 of the Standard Specifications, as amended, or as directed by the Engineer.

Temporary lane closures on SR-247 (Beechcroft Rd) or Cleburne Rd shall not be allowed between the hours of 7:00 AM to 9:00 AM and between the hours of 2:00 PM to 4:00 PM, while school is in session.

Temporary lane closures on SR-396 (Saturn Pkwy) shall be coordinated with the appropriate GM personnel in order to minimize disruptions to plant operations. At least one lane in each direction shall be maintained on SR-396 (Saturn Pkwy) at all times.

For each hour or portion thereof, which any traffic lane remains closed beyond the allowable time periods, the sum of five hundred dollars (\$500) per HOUR per lane shall be deducted from monies due the Design-Builder, not as a penalty, but as liquidated damages.

No less than seven (7) days prior to the closure of the road, the contractor shall notify the following individuals or agencies completely describing the affected roads and the approximate duration of the construction: these parties include, but are not limited to: (1) local law enforcement office, (2) local fire department, (3) ambulance service, (4) local school superintendent, (5) united states postal service, and (6) local road superintendent.

The Design Builder shall notify the Department and the local governmental agency responsible for traffic control maintenance at least one day in advance of

the cold planning activity at signalized intersections where detector loops are on the pavement. The maintaining agency will then be responsible for disconnecting the loop detectors and making any necessary timing adjustments in the signal controller prior to the construction.

TEMPORARY AND PERMANENT PAVEMENT MARKING:

Temporary and Permanent Pavement Markings shall adhere to guidance outlined in Section IV of current edition of The State of Tennessee Department of Transportation Design Division Roadway Design Guidelines for pavement markings.

Temporary pavement line markings on intermediate layers of pavement shall be reflective tape or reflectorized paint installed to permanent standards at the end of each days work. Short, unmarked sections shall not be allowed.

DETOURS, LANE SHIFTS AND MEDIAN CROSS-OVERS:

All detour, access, service and frontage roads shall be constructed with a minimum of one (1) course of base material before traffic is interrupted on existing roads.

The pavement marking on detours, lane shifts and/or median cross-overs shall be installed and maintained to the same standards as for permanent markings on the main roadway. These markings shall be in place prior to allowing traffic onto the pavement.

Before opening detours, lane shifts and/or median cross-overs to traffic, the transitional markings on the existing roadway must be in place. All existing markings in the area of these transitional markings shall be obliterated and all existing raised pavement markers shall be removed to eliminate conflicting markings. Removal of the existing conflicting markings and raised pavement markers will not be measured and paid for directly, but the cost will be included in the lump-sum price.

All detours shall be paved, striped, signed and the vertical panels are to be in place before it is opened to traffic.

PAVING/RESURFACING:

The contractor shall be required to cold plane and pave in the direction of traffic.

For non-Curb sections of roadway, the contractor shall attach a device to the screed of the paver such that material is confined at the end gate and extrudes the asphalt material in such a way that results in a consolidated wedge-shape pavement edge of approximately 25 to 30 degrees as it leaves the paver (measured from a line parallel to the pavement surface.) The device shall meet the requirements that are currently set forth in special provision 407SE.

Traffic will be allowed to temporarily drive on the milled surface of the roadway under the following conditions only:

- A. The milled surface is fine textured. The fine texture shall be obtained by a milling machine utilizing a milling head with teeth spacing of 3/8" or less operating at less than 80 feet per minute.
- B. The surface shall be swept and cleaned of all loose materials.
- C. The difference in elevation between the milled surface and the adjacent lane shall not exceed 1 1/2 inches.
- D. The milled surface shall be paved within 96 hours.
- E. Rain or inclement weather is not expected or forecasted within 48 hours after milling.
- F. All applicable signing is installed in accordance with the MUTCD. Signing shall include motorcycle warning signs (TN-64) placed in advance of any milled areas.
- G. If raveling or deterioration of the milled surface is occurring while traffic is driving on the milled surface, then this practice will not be allowed and paving shall be completed immediately after milling.
- H. Only one lane in each direction shall have a milled surface at one time.

SIGNS:

A minimum of three (3) Changeable Message Signs shall be used in addition to advance warnings signs to notify the motoring public. The locations of these Changeable Message signs shall be approved by the Department.

On all access controlled and interstate reconstruction and new construction projects, the contractor shall utilize all existing directional signing for as long as possible. These existing signs can be moved using temporary supports as needed. As soon as these existing directional signs come down permanently, the contractor shall have up at least one new temporary "Advance Guide Sign" and one new temporary "Exit Directional Sign" at all exit ramps. These signs are to be maintained within clear view of the public on the right side of the highway and shall be replaced if damaged, during all phases of construction, as directed by the engineer.

The size of these new temporary signs will be determined by the message. The message shall be the same as the existing sign that these new temporary signs will be replacing. The letter size shall be a minimum of 8 inch, "D" upper case letter. The directional arrow will be a "B" arrow at a 45 degree angle (same angle as the existing arrow). The material shall be 0.100 inch sheet aluminum; the color shall be a reflective green background with reflective white copy.

All work and material to make these new temporary directional signs along with adequate supports and to move them as needed during each phase of construction, will be paid for under the lump-sum price, as directed by the engineer.

Some of these directional signs will need an interstate, U.S., or a state highway shield, a cardinal direction, and a direction arrow to accompany the directional sign. These signs shall be mounted below the directional sign.

All existing “emergency reference markers” and “hospital signs” shall be maintained within full view of the motoring public throughout all phases of construction. All work in moving and temporary supports shall be paid for under the lump-sum price.

When existing “Tourist Oriented Directional Signs” (TODS) are on non-access controlled construction projects, the contractor shall be responsible for keeping these signs in full view to the motoring public during all phases of construction. All work in moving these “TODS” and temporary supports are to be paid for under the lump-sum price, as directed by the engineer. New supports and sign face for final location will be paid for under other items of construction.

Advanced warning signs shall not be displayed more than forty-eight (48) hours before physical construction begins. Signs may be erected up to one week before needed, if the sign face is fully covered.

If the contractor moves off the project, he shall cover or remove all unneeded signs as directed by the engineer. Costs of removal, covering, and reinstalling signs shall not be measured and paid for separately, but all costs shall be included in the original lump-sum price.

Long term but sporadic use warning signs, such as a flagger sign, may remain in place when not required provided the sign face is fully covered.

The use of advisory speed plates shall be limited to locations where the traffic control design warrants a 10 mile per hour or more reduction in speed. The Design-Builder shall make every effort to achieve a traffic control design that would avoid the use of these plates.

All detour and construction signing shall be in strict accordance with the Manual on Uniform Traffic Control Devices.

CONSTRUCTION WORK ZONE:

Traffic control devices shall not be displayed or erected unless related conditions are present necessitating warning.

Use of barricades, portable barrier rails, vertical panels, and drums shall be limited to the immediate areas of construction where a hazard is present. These devices shall not be stored along the roadway within thirty (30) feet of the edge of the traveled way before or after use unless protected by guardrail, bridge rail, and/or barriers installed for other purposes for roadways with current ADT's less than 1500 and design speed of less than 60 mph. This distance shall increase to forty-five (45) feet for roadways with current ADT's of 1500 or greater and design speed of 60 mph or greater or on the outside of a horizontal curve. These devices shall be removed from the construction work zone when the engineer

determines they are no longer needed. Where there is insufficient right-of-way to provide for this required setback, the contractor shall determine the alternate locations and request the engineer's approval to use them.

The contractor shall not be permitted to park any vehicles or construction equipment during periods of inactivity, within thirty (30) feet of the edge of pavement when the lane is open to traffic unless protected by guardrail, bridge rail, and/or barriers installed for other purposes for roadways with current ADT's less than 1500 and design speed of less than 60 mph. This distance shall be increased to forty-five (45) feet for roadways with current ADT's of 1500 or greater and design speed of 60 mph or greater or on the outside of a horizontal curve. Privately owned vehicles shall not be allowed to park within thirty (30) feet of a open traffic lane at any time unless protected as described above for roadways with current ADT's less than 1500 and design speed of less than 60 mph. This distance shall be increased to forty-five (45) feet for roadways with current ADT's of 1500 or greater and design speed of 60 mph or greater or on the outside of a horizontal curve. Where there is insufficient right-of-way to provide for this required setback, the contractor shall determine the alternate locations and request the engineer's approval to use them.

Pavement Edge Drop-off Traffic Control:

- A. Differences in elevation between adjacent traffic lanes or traffic lane and shoulder where the traffic lane is being used by traffic, caused by base, paving or resurfacing, shall be handled as follows:
 - 1. Differences in elevation between adjacent roadway elements greater than 0.75 inch and not exceeding 2 inches:
 - a. Warning signs, uneven lanes (W8-11) and/or shoulder drop-off with plaque (W8-17 and W8-17P), shall be placed in advance of and throughout the exposed area. Maximum spacing between signs shall be 2,000 feet with a minimum of 2 signs per exposed area. Where uneven pavement is encountered, signs shall be placed on each side of the roadway.
 - b. Differences in elevation between adjacent traffic lanes being utilized by traffic caused by added pavement shall be eliminated within three workdays.
 - c. Differences in elevation between adjacent traffic lanes being utilized by traffic caused by cold planing shall be eliminated within three workdays.
 - d. When the difference in elevation is between the traffic lane being utilized by traffic and shoulder the difference in elevation shall be eliminated within seven workdays after the condition is created.

2. Differences in elevation between adjacent roadway elements greater than 2 inches and not exceeding 6 inches. (Traffic is not to be allowed to traverse this difference in elevation):
 - a. Separation shall be accomplished by drums, barricades or other approved devices in accordance with the following:
 - (1) Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.
 - (2) Where posted speeds are less than 50 mph, the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.
 - b. If the difference in elevation is eliminated or decreased to 2 inches or less by the end of each workday, cones may be used during daylight hours in lieu of drums, barricades or other approved protective devices mentioned in paragraph a., provided warning signs are erected. Warning signs (uneven lanes and/or shoulder drop-off) shall be placed in advance of and throughout the exposed area. Maximum spacing between signs shall be 2,000 feet with a minimum of 2 signs per exposed area. Where uneven pavement is encountered, signs shall be placed on each side of the roadway.
 - c. When the difference in elevation is between the through traffic lane and the shoulder and the elevation difference is less than 3.5 inches, the contractor may use warning signs and/or protective devices as applicable and approved by the engineer. See paragraph a. regarding use of drums, barricades or other approved protective devices. Warning signs (uneven lanes and/or shoulder drop-off) will be placed in advance of and throughout the exposed area. Maximum spacing between signs shall be 2,000 feet with a minimum of 2 signs per exposed area. Where uneven pavement is encountered, signs shall be placed on each side of the roadway.

In these situations, the contractor shall limit his operations to one work zone not exceeding 2 miles in length unless otherwise noted on the plans or approved by the engineer. Once the contractor begins work in a work zone, a continuous operation shall be maintained until the difference in elevation is eliminated. Simultaneous work on separate roadways of divided highways will be considered independently in regard to restriction of work zone activity.

3. Differences in elevation between adjacent roadway elements greater than 6 inches but not exceeding 18 inches, the contractor, with the engineer's approval, may utilize one of the following:
 - a. The contractor shall accomplish separation by drums, barricades or other approved devices in accordance with the following:

- (1) Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.
- (2) Where posted speeds are less than 50 mph, the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.

In order to use this method, the contractor must reduce the difference in elevation to 6 inches or less by the end of the workday that the condition is created.

- b. The contractor shall provide drums, barricades or other approved separation devices as specified in paragraph a, and construct a stone wedge with a 4:1 slope, or flatter, to eliminate the vertical offset if the lower elevation is at or below subgrade at the end of each day.
- c. The contractor shall provide drums, barricades or other approved separation devices as specified in paragraph a and if the lower elevation is base stone or asphalt pavement, placement of subsequent layers of pavement must begin the next work day and progress continuously until the difference in elevation is eliminated or reduced to six inches or less.
- d. The contractor shall provide separation by portable barrier rail.

For preceding conditions a, b, and c, the contractor shall use the shoulder drop-off warning sign with plaque (w8-17 and w8-17p). It shall be placed in advance of and throughout the exposed area. Maximum spacing between the signs shall be 2,000 feet with a minimum of 2 signs per exposed area. In these situations, the contractor shall limit his operations to one work zone not exceeding 1 mile in length unless otherwise noted on the plans or approved by the engineer. Once the contractor begins work in a work zone, a continuous operation shall be maintained until the difference is eliminated. Simultaneous work on separate roadways of divided highways will be considered independently in regard to restriction of work zone activity.

4. For differences in elevation between adjacent roadway elements greater than 18 inches.

Separation will be provided by use of portable barrier rail.

In this situation the contractor shall limit his operations to one work zone not exceeding 1 mile in length unless otherwise noted on the plans or approved by the engineer. Once the contractor begins work in a work zone, a continuous operation shall be maintained until the difference in elevation is eliminated.

Simultaneous work on separate roadways of divided highways will be considered independently in regard to restriction of work zone activity.

- B. If the difference in elevation is within 30 feet of the nearest traffic lane being used by traffic caused by grading, excavation for utilities, drainage structures, undercutting, etc., differing situations shall be handled as follows:

1. If the difference in elevation is within 8 feet of the nearest traffic lane with difference in elevation greater than 3/4 inch and not exceeding 2 inches.

Warning signs (uneven lanes and/or shoulder drop-off) shall be placed in advance of and throughout the exposed area. Maximum spacing between signs shall be 2,000 feet with a minimum of 2 signs per exposed area. Where uneven pavement is encountered, signs shall be placed on each side of the roadway.

2. If the difference in elevation is within 8 feet of the nearest traffic lane with difference in elevation greater than 2 inches and not exceeding 6 inches:

- a. Separation shall be accomplished by drums, barricades or other approved devices in accordance with the following:

- (1) Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.

- (2) Where posted speeds are less than 50 mph the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.

3. If the difference in elevation is within 8 feet of the nearest traffic lane with difference in elevation greater than 6 inches:

- a. Separation shall be accomplished by drums, barricades or other approved devices in accordance with the following:

- (1) Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.

- (2) Where posted speeds are less than 50 mph the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.

- b. Eliminate vertical offset by constructing a stone wedge or grading to a 4:1 slope, or flatter, or use portable barrier rail.

The contractor shall schedule the work so as to minimize the time traffic is exposed to an elevation difference. Once the contractor begins an activity that creates an elevation difference within 8 feet of a traffic lane, the activity shall be pursued as a continuous operation until the elevation difference is eliminated.

- C. If the difference in elevation is farther than 8 feet from the nearest traffic lane but not more than 30 feet from the nearest traffic lane: Separation shall be accomplished by drums, barricades or other approved devices in accordance with the following:
1. Where posted speeds are 50 mph or greater, spacing of the protective devices shall not exceed 100 feet.
 2. Where posted speeds are less than 50 mph, the maximum spacing of the protective devices in feet shall not exceed twice the posted speed in miles per hour or 50 feet, whichever spacing is greater.

The contractor shall schedule the work so as to minimize the time traffic is exposed to an elevation difference. Once the contractor begins an activity that creates an elevation difference, the activity shall be pursued as a continuous operation until the elevation difference is eliminated.

APPENDIX A

APPENDIX B**CONTRACT BOOK 3 (PROJECT INFORMATION) FORMS**

(Located in the Design Builder's Technical Proposal "Exhibit A")

FORM NAME	FORM DESIGNATION
ALTERNATE TECHNICAL CONCEPTS (ATC) SUBMITTAL	FORM ATC
RFP QUESTION REQUEST	FORM QR
RESPONSE CATEGORY II	FORM RC II
RESPONSE CATEGORY III	FORM RC III
RESPONSE CATEGORY IV	FORM RC IV
Receipt of Addenda/Clarifications	FORM C

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 Not approved	<input type="checkbox"/>	Does not qualify as an ATC and may not be included in the Proposal.
<input type="checkbox"/>		<input type="checkbox"/>	Is Conditionally approved with identified conditions attached.
<input type="checkbox"/>		<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: ____

2. Name of Project: ____ (DB__)

3. 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).

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

5. 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).

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

7. 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).

8. 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.

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

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10. 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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RFP QUESTION REQUEST FORM QR

PROJECT: STP-396(4), 60100-1209-04

DB CONTRACT No.: **DB**1601

DATE: _____

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

RFP QUESTION REQUEST FORM QR

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

RESPONSE CATEGORY II: ORGANIZATION

1. Design-Builder Name: ____
2. Name of Project: ____ (DB____)
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

RESPONSE CATEGORY II: PROJECT EXPERTISE

1. Design-Builder Name: ____
2. Name of Project: ____ (DB__)
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.

RESPONSE CATEGORY III: PROJECT UNDERSTANDING

1. Design-Builder Name: ____
2. Name of Project: ____ (DB____)
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.

RESPONSE CATEGORY III: SCHEDULE MANAGEMENT

1. Design-Builder Name: ____
2. Name of Project: ____ (DB__)
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

RESPONSE CATEGORY III: PROJECT MANAGEMENT

1. Design-Builder Name: ____
2. Name of Project: ____ (DB__)
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.

 - 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).

RESPONSE CATEGORY III: PROJECT MANAGEMENT

- 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.

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- 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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RESPONSE CATEGORY III: ENVIRONMENTAL COMPLIANCE

1. Design-Builder Name: ____
2. Name of Project: ____ (DB__)
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.

RESPONSE CATEGORY III: INNOVATION

1. Design-Builder Name: ____
2. Name of Project: ____ (DB__)
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?

RESPONSE CATEGORY IV: TECHNICAL SOLUTION

1. Design-Builder Name: ____
2. Name of Project: ____ (DB__)
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.

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

RESPONSE CATEGORY IV: TECHNICAL SOLUTION

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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Form C
Receipt of Addenda/Clarifications

Design-Build Project: **STP-396(4), 60100-1209-04** (DB1601)

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: _____ Print Name: _____

Title: _____ Date: _____

APPENDIX C

REFERENCE INFORMATION

- [Conceptual layouts with typical](#)
- [Survey data file in Micor station](#)
- [Existing Structure details](#)
- [Green sheets in the Environmental Document](#)
- [DB Geotechnical documents](#)
- [Environmental Boundaries](#)
- [CSX public projects manual](#)

http://www.tn.gov/t_dot/article/transportation-construction-divisions-design-build-db1601