

**AGREEMENT
FOR THE DESIGN & CONSTRUCTION
of**

**I-26 at I-95 Interchange Improvement
Dorchester and Orangeburg Counties, South Carolina**

A DESIGN-BUILD PROJECT

**BETWEEN
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
AND
ARCHER WESTERN CONSTRUCTION, LLC**

19th day of January 2024

Project ID P038677

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WHEREAS, the South Carolina Department of Transportation, as an agency of the State of South Carolina, wishes to improve the safety and operation of the state highway system by reconstructing the interchange at Interstate 26 at Interstate 95 and replacing the bridge on S-38-1302 (Whetsell Pond Rd. over Interstate 26. (hereinafter referred to as “the Project”); and

WHEREAS, the South Carolina Department of Transportation, as a servant of the people of the State of South Carolina, wishes to see this strategic project completed; and

WHEREAS, limitations imposed by traditional methods of designing, and constructing highways would mean that the Project could be completed only after an unacceptable delay; and

WHEREAS, the South Carolina Department of Transportation, working with the Federal Highway Administration (FHWA, has devised an innovative plan to allow the commencement and completion of the Project in a timely and cost-effective manner; and

WHEREAS, pursuant to Section 57-5-1625 SC Code of Law, the South Carolina Department of Transportation desires to award a highway construction contract using a Design / Build procedure; and

WHEREAS, after a competitive process, CONTRACTOR has been selected to participate in this venture by designing and building the Project; and

WHEREAS, the South Carolina Department of Transportation wishes to avail itself of and rely on CONTRACTOR’s expertise and proven track record in designing and constructing such projects, on time and within budget; and

WHEREAS, CONTRACTOR wishes to provide that expertise and to participate in this venture for the good of the people of the State of South Carolina;

NOW THEREFORE, this Agreement is executed and made, effective as of the Effective Date as defined herein, between the SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION (“SCDOT”) and ARCHER WESTERN CONSTRUCTION, LLC (“CONTRACTOR”). In consideration of the covenants hereinafter set forth, the parties hereto mutually agree as follows:

I. CONTRACT DOCUMENTS

The Contract shall be composed of this Agreement and all exhibits, SCDOT's Request for Proposals and all attachments, Request for Qualifications and all attachments, CONTRACTOR's Proposal and all attachments, and CONTRACTOR'S Qualifications and all attachments. In case of conflict, the order of precedence of the "Contract Documents" shall be: (1) this Agreement; (2) Agreement Exhibits; (3) SCDOT Request for Proposals (RFP) document and Attachment B; (4) CONTRACTOR's Proposal and attachments, clarifications, and communications; (5) SCDOT Request for Qualifications (RFQ) and (6) CONTRACTOR's Statement of Qualifications (SOQ). In the event of a conflict between the Contract Documents and Special Provisions identified in the Agreement Exhibits, the order of precedence shall be (1) the Contract Documents and (2) Special Provisions. The Project Information Package is provided for information only and is not a Contract Document. SCDOT makes no representations or warranties regarding the accuracy of the information contained therein.

II. PROJECT SCOPE

Scope of Work

CONTRACTOR shall furnish all services, labor, materials, equipment, supplies, tools, transportation, and coordination required to perform all design, preliminary engineering, surveying, geotechnical services, scheduling, permitting, right of way services, procurement, construction, utility coordination, demolition, material disposal and any other services necessary to perform the Project as defined in the Project Scope of Work made a part hereof as Exhibit 3, Project Design Criteria made a part hereof as Exhibit 4, Exhibits 5 through 6, and Attachment B.

Design and Construction Responsibilities

1. CONTRACTOR, consistent with applicable state licensing laws, shall provide, through qualified South Carolina licensed design professionals employed by CONTRACTOR or procured from qualified, independent South Carolina licensed design consultants, the design work and quality control, including, but not limited to, surveys, right of way services, roadway design, maintenance of traffic, geotechnical exploration and design, hydraulic analyses, storm water management, erosion control, superstructure design, and foundation and substructure design including seismic analyses for the preparation of the required drawings, specifications and other design submittals to permit CONTRACTOR to complete the work in accordance with the Contract.
2. CONTRACTOR may rely on geotechnical and survey information provided in Attachment B – Supplemental Design Criteria. The CONTRACTOR shall incorporate the information into the final Project Documents. CONTRACTOR shall supplement the geotechnical and survey information provided as required for its design.

3. CONTRACTOR shall provide through itself or subcontractors the necessary supervision, labor, inspection, testing, material, equipment, machinery, temporary utilities and other temporary facilities to permit performance of all demolition, earthwork, drainage, foundation work, maintenance of traffic, roadway work, structural work, excavation, erosion and sediment control work, field layout work, construction management, engineering and inspection, utility coordination and relocation, railroad coordination, CONTRACTOR quality control, maintenance, and all other work necessary to complete construction of the Project in accordance with the Contract. CONTRACTOR shall perform all design and construction activities efficiently and with the requisite expertise, skill and competence to satisfy the requirements of the Contract. CONTRACTOR at all times shall exercise control over the means, methods, sequences and techniques of construction. CONTRACTOR's operations and construction methods shall comply with all applicable federal, state and local regulations with regard to worker safety, protection of health and protection of the environment and applicable permit requirements.
4. CONTRACTOR shall design and construct the project in accordance with the approved environmental document. Where new right of way is required to construct the Project, the CONTRACTOR shall design and construct the Project so as to minimize the additional rights of way needed while adhering to the design criteria herein. Right of way services shall be the responsibility of the CONTRACTOR and shall be done in accordance with Article VIII of this Agreement. CONTRACTOR shall furnish the SCDOT a copy of any agreements for the use of additional properties not acquired as right of way that are used in conjunction with the construction of this Project. CONTRACTOR shall abide by the provisions of all applicable environmental permits, any conditions of individual right of way agreements, and all environmental commitments. The CONTRACTOR shall sign the Contractor Certification Form and these terms will be made part of the contract.
5. It shall be the responsibility of CONTRACTOR to comply with all applicable federal, state, and local laws in connection with the services set forth in this Contract. CONTRACTOR shall remain in good standing with the State and promptly notify SCDOT in writing if it is determined to be disqualified, suspended, debarred, or otherwise excluded from bidding, proposing, or contracting with any federal or state department or agency. This obligation shall include, but not be limited to, procurement of all permits and licenses not obtained by SCDOT provided, however, that with respect to any permit or licenses that must be obtained in the name of SCDOT, CONTRACTOR shall perform all functions within its power to obtain the permit, including mitigation, and SCDOT will fully cooperate in this effort and perform any functions that must be performed by SCDOT. CONTRACTOR shall be responsible for payment of all charges, fees, and taxes, and for providing all notices necessary and incident to the performance of the Project as of the Effective Date of this Agreement. The Contract Price shall include all charges, fees and taxes related to the above obligations and if any charges, fees

or taxes are waived by the regulatory or governmental entity, then the amount waived shall be deducted from the Contract Price.

6. CONTRACTOR shall remain in good standing with the State and promptly notify SCDOT in writing if it is determined to be disqualified, suspended, debarred, or otherwise excluded from bidding, proposing, or contracting with any federal or state department of agency.

Design Criteria

It shall be the responsibility of CONTRACTOR to design all aspects of the Project in accordance with the Contract Documents. For the Project, CONTRACTOR shall provide a completed set of construction plans signed and sealed by a licensed professional engineer in South Carolina. CONTRACTOR shall be fully responsible for the accuracy of the design and compliance with specifications, standards and Project Criteria.

Design Review

7. Prior to the Preconstruction Meeting, CONTRACTOR shall provide a Design Review Submittal Schedule to SCDOT. The Design Review Submittal Schedule shall include a Gantt chart of the submittal packages and will serve as the basis for reviewing the design and construction plans. The Design Review Submittal Schedule shall be updated and included with each submittal package. CONTRACTOR, CONTRACTOR's design consultant, subcontractors, suppliers and SCDOT shall discuss the schedule and procedures for submitting design plans at the Preconstruction Meeting. CONTRACTOR, CONTRACTOR's design consultant, subcontractors and suppliers shall not provide any design deliverables until the Design Review Submittal Schedule is approved by SCDOT. The Design Review Submittal Schedule shall be included in Submittal 000.
8. A Design Quality Control (QC) Plan shall be submitted for review and approval prior to any design or plan production. The plan shall clearly detail the processes and steps utilized by the designer and contractor to consistently produce quality designs and plans. The Design QC Plan shall be the first submittal listed in the Design Review Submittal Schedule. CONTRACTOR shall not provide any design deliverables until the Design QC Plan is approved by SCDOT. The Design QC Plan shall be included in Submittal 000.
9. All submittal packages shall be uploaded electronically to ProjectWise and an email shall be sent to SCDOT that verifies the contents of the upload. A complete submittal package shall be limited to one phase (ex. Preliminary/Right Of Way (ROW)/Final/Release For Construction (RFC)) of one roadway segment or structure and include all design deliverables specified in Exhibit 4z. Prior to beginning any construction activities, permanent or temporary, the Traffic Management Plan and Conceptual Work Zone Traffic Control plans for the entire project shall be submitted by the CONTRACTOR and approved by SCDOT.

10. Prior to beginning any construction activities, permanent or temporary, the Traffic Management Plan and Conceptual Work Zone Traffic Control plans for the entire Project shall be submitted by the CONTRACTOR and approved by SCDOT.
11. If approved by SCDOT, one Maintenance of Traffic submittal package, including but not limited to, an NPDES permit application and related plans, may be allowed to provide the opportunity to begin construction of non-permanent work items, such as clearing and grubbing, shoulder strengthening, minor demolition not adversely impacting traffic or operations.
12. CONTRACTOR shall provide submittal packages as defined in Exhibit 4z. Prior to commencement of permanent construction activities on any defined segment or structure, SCDOT will have the right, but not the obligation, to review and comment upon all submittal packages pertaining to the said segment or structure. SCDOT reserves the right to provide comments on the design or plans at any time when an issue is identified that is not compliant with the Project Design Criteria, the RFP or is an error or omission.
13. All documents of a submittal package must be uploaded to ProjectWise by 11:59PM for the review period to begin the next business day. No more than one new submittal package shall be uploaded to ProjectWise within a five business day period. SCDOT reserves the right to utilize Bluebeam Studio to facilitate design reviews between SCDOT and the CONTRACTOR. The initial review period for each submittal package shall be 15 business days following the date SCDOT receives an accurate and complete submittal in conformity with the contract. SCDOT review comments will be sent to the CONTRACTOR, who shall respond within five business days and prior to subsequent phase submittals. SCDOT will then status CONTRACTOR'S responses and will provide additional comments, if any, within five business days. If any open comments remain after the initial 15 day review and subsequent 5 day review and comment periods, there will be no time constraint for the CONTRACTOR to respond. For all subsequent rounds of CONTRACTOR responses, SCDOT will status CONTRACTOR'S responses and will provide additional comments, if any, within five business days. Review comments for Preliminary, ROW, and Final phases of each segment or structure shall be closed before the associated RFC plans are authorized to be submitted and prior to commencement of construction, demolition or disposal activities.
14. CONTRACTOR shall revise design deliverables and upload to ProjectWise for verification to allow SCDOT to close review comments. Verification design deliverables are not required for preliminary phase submittal packages. Verification design deliverables are required to close SCDOT comments in order to approve ROW and authorize RFC phase submittal packages. CONTRACTOR shall clearly identify and describe any changes made to a verification design deliverable that are unrelated to SCDOT review comments. A complete verification package shall include revised contents for all design deliverables with open SCDOT review comments and be submitted along with CONTRACTOR responses. After comments are closed and before RFC submittal packages are uploaded to

ProjectWise, any changes made to design deliverables may, at the sole discretion of SCDOT, require a new submittal package be provided and require adjustment to the CONTRACTOR's Design Review Submittal Schedule.

15. SCDOT's participation in the review and comment process is fully discretionary to SCDOT; however, no review or comment nor any failure to review or comment by SCDOT shall operate to absolve CONTRACTOR of its responsibility to design and build the Project in accordance with the Contract Documents or to shift responsibility to SCDOT.
16. SCDOT reserves the right to reject any submittal package that is deficient or incomplete. SCDOT will provide a written notice, including cause for rejection, for any submittal package that does not demonstrate the work can be completed in accordance with the Contract. Rejected submittal packages must be revised to comply with the Contract. Revised submittal packages will be considered a new submittal package and reviewed as described above. Rejected submittal packages shall not in any way serve to extend the Construction Time.

Maintenance of Traffic

1. The SCDOT work zone mobility requirements found within the documents known as *Rule on Work Zone Safety and Mobility: The Policy for South Carolina Department of Transportation and Rule on Work Zone Safety and Mobility: Implementation, Maintenance, and Safety Guidelines* (Policy) shall apply to this Project. These requirements apply to the CONTRACTOR, all subcontractors, and designated representatives acting on behalf of the CONTRACTOR performing duties with responsibilities relative to a work zone, including but not limited to planning, project development, design, construction, and maintenance.
2. The CONTRACTOR shall design, develop, implement and maintain a set of coordinated strategies to manage the work zone impacts of the Project designated as the Transportation Management Plan. These strategies will include a Temporary Traffic Control plan (TMP), a Transportation Operations component, and a Community and Public Relations Plan component. The Policy and the anticipated work zone impacts of the Project shall determine the level of detail, content, and scope of the TMP. The primary component, the Temporary Traffic Control plan shall address traffic control and safety throughout and adjacent to the Project site. A secondary component, the Transportation Operations plan, will address management of traffic operations in the Project site and all adjacent areas impacted by the Project. The final component, the Community and Public Relations Plan, addresses communications with the public and entities impacted by the Project. The CONTRACTOR's Transportation Management Plan and its components shall comply with the requirements of this Agreement and subsequent Exhibits, Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD) latest edition, and SCDOT policies, standard specifications and all addendums to the standard specifications, the typical traffic control standard drawings for road construction, and procedures.

Ownership of Documents

1. The Project Documents are intended by the parties each to be a “work-made-for-hire” as used in 17 U.S.C. § 101, et seq., and SCDOT shall be the owner of the Project Documents and, except as expressly set forth otherwise in this clause F., all associated Intellectual Property.
2. Upon the Effective Date of this Agreement, CONTRACTOR grants SCDOT an irrevocable, transferable, perpetual, fully paid-up, worldwide, royalty-free, nonexclusive license, with right to grant sublicenses, to reproduce the Proprietary Intellectual Property and Project Documents for the purposes of, but not limited to, promoting, using, maintaining, upgrading, or adding to the Project. The foregoing license includes license to reproduce, modify, adapt, and disclose the Proprietary Intellectual Property in connection with the Project and any interstate or state highway, whether tolled, owned, or operated by SCDOT. The foregoing right to transfer is limited to any governmental entity that succeeds to SCDOT’s ownership of the Project.
3. Upon completion of the Project, SCDOT step-in, or upon early termination of this Agreement, CONTRACTOR shall provide all Project Documents to SCDOT in the format designated by SCDOT.
4. All Proprietary Intellectual Property shall remain exclusively the property of CONTRACTOR (or its subcontractors, suppliers, or vendors).
5. To the extent permitted by applicable law, SCDOT will not disclose any Proprietary Intellectual Property other than to authorized transferees and sublicensees that, to the extent permitted by applicable law, agree to be bound by the foregoing nondisclosure obligation relating thereto. Notwithstanding any provision of this Agreement to the contrary, in no event shall SCDOT or any of its directors, officers, employees, consultants or agents be liable to CONTRACTOR, any of its subcontractors, suppliers, or other vendors, or any affiliate of any of the foregoing, for any losses caused by, arising out of, relating to, or resulting from any breach of the duty of confidentiality set forth in this clause 5 and in clause 2 if such breach is not the result of gross negligence or intentional misconduct, and CONTRACTOR hereby irrevocably waives, and shall cause all such subcontractors, suppliers, and other vendors, to waive, any and all claims against SCDOT or the State of South Carolina to any such losses.
6. With respect to any Proprietary Intellectual Property owned by a person or entity other than CONTRACTOR, CONTRACTOR shall obtain from such owner, concurrently with the execution of any contract with such owner or in connection with the first use or adaptation of the Proprietary Intellectual Property for the Project, both for CONTRACTOR and SCDOT, a license on the same terms as described in clause 2 above. The foregoing requirement shall not apply, however, to mass-marketed software products (sometimes referred to as “shrink wrap software”) owned by such a person or entity, where such a license cannot be

extended to SCDOT using commercially reasonable efforts. The limitations imposed upon SCDOT described in clauses 2 and 5 above shall also apply to SCDOT's licenses in such Proprietary Intellectual Property.

7. Definitions. For purposes of this Article II.F., the following terms have the meanings ascribed:
 - a. Intellectual Property means all current and future legal and/or equitable rights and interests in know-how, patents (including applications), copyrights (including moral rights), trademarks (registered and unregistered), service marks, trade names, trade secrets, trade secret rights, designs (registered and unregistered), design rights, utility models, circuit layouts, plant varieties, business and domain names, inventions, solutions embodied in technology, and other intellectual activity, and applications of or for any of the foregoing, subsisting in or relating to the Project, Project design data or Project traffic data. Intellectual Property includes traffic management algorithms, and software used in connection with the Project (including software used for management of traffic on the Project), and associated source code and source code documentation. Intellectual Property is distinguished from physical construction and equipment itself and from other Project Documents (i.e., documents that disclose Intellectual Property).
 - b. Project Documents means any drawings, specifications, test data, inspection reports, QC documents, QA documents, daily diaries, other data, and any other documents (including plans, elevations, sections, details, diagrams, specifications, samples, drawings, sketches, charts, calculations, depictions, specifications, layouts, manuals, files, artwork, correspondence, and other submittals made under this Agreement), including those in electronic form, whether prepared by or on behalf of CONTRACTOR.
 - c. Proprietary Intellectual Property means Intellectual Property created, used, applied or reduced to practice in connection with the Project or with CONTRACTOR's scope of the work that derives commercial value from its protection as a trade secret under applicable law or from its protection under patent law.

Construction Criteria

CONTRACTOR shall construct the Project in accordance with all applicable Federal, State, and local statutes and regulations. All construction shall be performed in accordance with the following criteria, which are incorporated herein by reference and made a part hereof. The construction criteria are intended to be complementary and to describe and provide for a complete work. Where the following construction criteria conflict, the order of precedence shall be as listed below:

1. Approved Alternative Technical Concepts (ATCs) in CONTRACTOR's Response to RFP

2. Exhibit 4 – Project Design Criteria
3. Exhibit 5 – Special Provisions
4. Exhibits 6 – Environmental Criteria
5. Final Construction Plans provided by SCDOT
6. SCDOT Standard Drawings, effective as of the most recent Standard Highway Letting prior to the release of the Final RFP ([see Design Build Website - https://www.scdot.org/business/design-build.aspx](https://www.scdot.org/business/design-build.aspx))
7. SCDOT Supplemental Specifications and Supplemental Technical Specifications, effective as of the release of the Final RFP ([see Design Build Website - https://www.scdot.org/business/design-build.aspx](https://www.scdot.org/business/design-build.aspx))
8. SCDOT Standard Specifications for Highway Construction, effective as of the release of the Final RFP ([see Design Build Website - https://www.scdot.org/business/design-build.aspx](https://www.scdot.org/business/design-build.aspx))
9. SCDOT Construction Manual, effective as of the release of the Final RFP
10. Qualified Products Policies and Qualified Products List are available on SCDOT internet website.

Project Management

1. CONTRACTOR shall be responsible for ensuring that the Project is constructed in conformance with the Contract, all referenced documents and specifications, and applicable laws and regulations.
2. CONTRACTOR shall provide project management services sufficient to supervise the activities of his own personnel and subcontractors. CONTRACTOR shall provide a sufficient number of persons on site, to the satisfaction of SCDOT, to provide for the construction management of the Project.
3. SCDOT will provide representatives assigned to the Project to monitor the construction and provide necessary coordination between SCDOT and CONTRACTOR. All costs for salary and equipment to maintain SCDOT employees will be provided by SCDOT at no expense to CONTRACTOR. SCDOT and FHWA, if applicable, representatives will have unrestricted access to the Project, the work in progress, the “Daily Diaries”, and to other technical documents and project records associated with design, construction, demolition, material disposal, materials, quality control, materials installation, and testing. SCDOT will receive reasonable notice of and have the opportunity to participate in any meetings that may be held concerning the Project or the relationship between CONTRACTOR and its consultants and subcontractors when such meetings are associated with technical matters, progress, or quality of the Project. As used in

this paragraph, “notice” shall require actual written notice to SCDOT or SCDOT’s Agent.

4. CONTRACTOR shall participate in various Project meetings with SCDOT as outlined below.
 - a) Project Management Progress Meetings
 - i. CONTRACTOR shall participate in weekly or bi-weekly meetings to review and discuss the progress of the design and construction of the Project. During these meetings, the CONTRACTOR will discuss the planned design and construction work for the week, as well as the planned work for the following three weeks. The CONTRACTOR shall ensure that the Project Manager, Lead Design Engineer, Construction Manager, and other appropriate personnel to include active subcontractors are available to participate in the progress meetings.
 - b) Executive Management Meetings
 - i. CONTRACTOR shall participate in monthly executive level management meetings to review and discuss the status of the Project. During the meetings, the parties will address any issues identified and discuss the causes, responsible party, impacts, and potential solutions with the mutual goal of finding the most effective solutions for issue resolution. The CONTRACTOR shall make the Project Executive, Project Manager, and other relevant personnel, including company executives not directly associated with the project, available to participate in these meetings.
5. In the event a dispute arises, the parties shall first attempt to resolve it informally and directly using the Issue Resolution Ladder, recognizing the urgency of resolving disputes promptly and that time is of the essence. The Issue Resolution Ladder is the process for elevating disputes from the field level to higher levels of review, including executive management if necessary, with defined durations for each level of review. The objective of the Issue Resolution Ladder is to resolve disputes as close to the field level as possible while acknowledging the necessity to escalate issues to a higher level before they impact the Project’s cost or schedule.
 - a) The Issue Resolution Ladder shall consist of six levels of review, each with corresponding durations, as outlined below:

Level of Review	Contractor Reviewer	SCDOT Reviewer	Time Limit
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6	Executive Officer	Construction Alternative Delivery Engineer	10 Business Days
5	Project Manager	Alternative Delivery Construction Manager	5 Business Days
4	Project Manager	District Construction Engineer	72 hours
3	Project Manager	Resident Construction Engineer (RCE)	24 hours
2	Construction Manager	Assistant RCE/Field Engineer	5 hours
1	Superintendent	Inspector	1 hour

- b) During the Preconstruction / Partnering conference, the project team shall identify the individuals from both SCDOT and CONTRACTOR’s organizations who will fill the roles of reviewers in the Issue Resolution Ladder, as well as the required documentation for each level of review in the Issue Resolution Ladder.
- c) If reviewers at any level of the Issue Resolution Ladder are unable resolve a dispute within the specified time limits, they shall elevate the dispute to the next level of review.

Control of the Work

1. CONTRACTOR shall determine the appropriate means, methods and scheduling necessary to complete the work timely and in accordance with all construction requirements. SCDOT and FHWA, if applicable, will have the right to review and inspect the work at any time.
2. If, at any time, SCDOT observes or has actual notice of any fault or defect in CONTRACTOR’s performance of this Agreement, SCDOT will comply with the provisions of Article XVII, Default, Suspension and Termination. SCDOT is not required to discover or to accept defective or faulty work. SCDOT’s right to have defective or faulty work promptly corrected shall not be waived by any action of SCDOT.
3. SCDOT will have the authority to suspend the work, in accordance with Article XVIII of this Agreement.

Cooperation with Other Contractors

1. Contractor Duty of Cooperation
 - a. Contractor acknowledges that SCDOT has awarded or plans to award contracts for construction and other work at or near the Site, and that other projects at or near the Site may be in various stages of design and construction.

- b. Contractor shall in good faith cooperate and coordinate the work with SCDOT Contractors whose projects or work may affect this project or the work on this project. Contractor shall schedule and sequence the work as reasonably necessary to accommodate the projects and work of other contractors. Further, Contractor shall conduct its work, dispose of the materials, and perform its obligations under the contract documents as set forth herein.
 - c. Contractor shall satisfactorily join work and in proper sequence with the work of other contractors, including other SCDOT contractors. Contractor shall ensure all planning or modification to an existing plan facilitates efficient completion of the work by all parties.
 - d. SCDOT has included and agrees to include within its contracts with SCDOT contractors and other contractors' provisions like this, imposing a similar duty of cooperation among contractors.
2. Interference by other contractors, resolution by SCDOT
- a. If Contractor asserts that any of SCDOT's other contractors have caused damage to the work then Contractor's shall immediately notify SCDOT so that SCDOT can seek recourse against the responsible contractor. Contractor shall submit a change order for the repair and delay costs to assist SCDOT in recovering these amounts.
 - b. Wherever work being done by other contractors and Contractor is in conflict that cannot be resolved by those parties, the respective rights of the various interests involved shall be established by SCDOT, in order to secure the completion of the various portions of the work in general harmony. Contractor shall be entitled additional time and cost arising out of or caused by SCDOT's resolution of any scheduling or sequence dispute with other contractors if:
 - (i.) Contractor has used diligent efforts to obtain the cooperation of SCDOT's other contractors as necessary to avoid schedule conflict;
 - (ii.) Contractor is unable (or anticipates it will be unable), after diligent efforts, to reach agreement with SCDOT's other contractors to avoid schedule conflict within a reasonable time;
 - (iii.) Contractor reasonably believes for any other reason that SCDOT's other contractor will not undertake or permit a schedule modification in a manner consistent with the timely completion of the Project, or in accordance with law, the governmental approvals or the contract documents;
 - (iv.) Contractor becomes aware that SCDOT's other contractor is not cooperating in a timely manner to provide agreed-upon or necessary work, approvals, or other cooperation;
 - (v.) Any other dispute arises between Contractor and SCDOT's other contractor with respect to the Project, despite Contractor's diligent

efforts to obtain such cooperation or otherwise resolve such dispute before seeking SCDOT's assistance;

- (vi.) Contractor provides notice to SCDOT and SCDOT's other contractor seeking SCDOT's assistance in resolving the dispute or in otherwise obtaining SCDOT's other contractor's timely cooperation. The notice shall also include information relating to Contractor's attempts to resolve the scheduling dispute, SCDOT's other contractor's failure to cooperate or SCDOT's other contractor's responses to Contractor's position on the schedule conflict; and
- (vii.) SCDOT shall resolve the conflict and decide whether Contractor is entitled to relief as a SCDOT caused delay.

3. SCDOT Contractor Impacts

Contractor will not be entitled to a relief event if it fails to materially comply with its obligations to cooperate and resolve conflicts with SCDOT Contractors within Section II (J)(1) and Section II(J)(2)

Contract Deliverables

CONTRACTOR shall submit deliverables including, but not limited to, the following as set forth in the CONTRACT. All deliverables shall contain proper references to both the Contract ID number and the appropriate Project ID number for that specific location. Deliverables noted below with an asterisk shall be included in the Design Review Submittal Schedule and follow Design Review procedures as outlined in Article II, Section D of the Agreement.

1. Contract Deliverable Matrix
2. All deliverables as specified in Exhibit 4z*
3. CPM Schedule, as specified in Article IV
4. Design Review Submittal Schedule including Gantt Chart of Submittals*
5. Schedule of Values, as specified in Exhibit 2
6. Design QC Plan*
7. Construction QC Plan
8. Clearing and Grubbing Plan
9. CONTRACTOR'S Erosion Control Plan
10. SCDHEC Notice of Intent (NOI) for Stormwater Discharges Covered Under SC NPDES Construction General Permit SCR160000) & Storm Water Pollutant Prevention Plan and signed Contractor Certification Form (SCDHEC 0437)

11. Wetland and Stream Mitigation
12. Crane Operator Documents
13. Community and Public Relations Support Plan, as specified in Article X and Exhibit 5
14. EEO and OJT Requirements as specified in Article XIX & Exhibit 5
15. DBE Requirements as specified in Article XVIII and SCDOT DBE Supplemental Specification.
16. Right-of-Way documents, as specified in Article VIII
17. Escrow Proposal Documents
18. CONTRACTOR's Materials Certification
19. HAZMAT surveys for structures not already surveyed, SCDHEC Notice of Demolition for RCE Signature
20. Utility Coordination Reports, including Utility Agreements, and Supporting Documentation
21. Right of Way Plats and Monuments (per Preconstruction Advisory Memorandum #8)
22. Shop Plans and Working Drawings
23. As-Built Plans

Incorporation of ATCs

1. In the event that the approved ATCs incorporated into the Contract Documents require additional third-party approvals, governmental approvals, permits, analysis, assessment, or findings prior to implementation, CONTRACTOR shall (a) be solely responsible for the cost and schedule impact of any related review, analysis, assessment, approvals, permits and findings; (b) be solely responsible for the risk that any approvals, permits or findings are not granted, issued, approved or obtained or timely granted, issued, approved or obtained; and (c) not be entitled to any increase in the Contract Price or extension of the Contract Time as a result of any delay or cost associated with any such approvals, permits, analysis, assessment, or findings related to such ATC, including the inability to obtain any approvals, permits or findings.
2. If the Contract incorporates any approved ATCs and: (a) CONTRACTOR does not comply or is unable to comply with one or more of SCDOT conditions, restrictions, or other constraints on implementation imposed in connection with approval of the

ATC, (b) CONTRACTOR is unable to obtain any approval, permit, or finding required for the ATC, or (c) the ATC otherwise proves to be infeasible, then CONTRACTOR shall comply with the Contract requirements that would have been applicable but for the ATC, without any increase in the Contract Price, extension of the Contract Time or any other entitlement to a Change Order hereunder. In such case and depending upon the circumstances (including if CONTRACTOR fails to use all reasonable efforts to implement the ATC or obtain any such approvals, permits, or findings, SCDOT may also be entitled to (i) a reduction in the Contract Price in an amount equal to the estimated value of the ATC on the Cost Proposal, as reasonably determined by SCDOT, but which in no event shall be less than cost (plus mark-up and profit) of the ATC as reflected in the Cost Proposal, and (ii) a reduction in the Contract Time in an amount equal to the estimated schedule savings as a result of the ATC not being implemented, as reasonably determined by SCDOT.

3. ATCs submitted by unsuccessful Proposers who have accepted the stipend may, in SCDOT's sole discretion, be presented to CONTRACTOR as a Contract Change Request.

Subcontracts

1. CONTRACTOR shall retain or cause to be retained only subcontractors that are qualified, experienced and capable in the performance of the portion of the work assigned. CONTRACTOR shall assure that each subcontractor has at the time of execution of the corresponding subcontract, supply agreement, or other vendor contract, and maintains at all times during performance of the assigned work, all licenses required by applicable laws. For purposes of this clause, "subcontract, supply agreement, or other vendor contract" shall be referred to as a "Subcontract."
2. The retention of subcontractors by CONTRACTOR will not relieve CONTRACTOR of its responsibility hereunder or for the quality of the work or materials provided by it. CONTRACTOR shall supervise and be fully responsible to SCDOT for the acts, omissions, negligence, intentional misconduct, or breach of applicable law, contract, governmental approval or permit by any subcontractor, vendor, supplier, or other contractor to CONTRACTOR (a "subcontractor", or by any member or employee of CONTRACTOR or any such subcontractor, vendor, supplier, or other contractor (each, a "Contractor-Related Entity"), as though CONTRACTOR directly employed all such individuals. No subcontract entered into by CONTRACTOR will impose any obligation or liability upon SCDOT to any such subcontractor or any of its employees. Nothing in this Agreement will create any contractual relationship between SCDOT and any subcontractor.
3. Each Subcontract shall:
 - a. Set forth a standard of professional responsibility or a standard for commercial practice equal to the requirements of this Agreement and prudent industry

practices for work of similar scope and scale and shall set forth effective procedures for claims and Change Orders.

- b. Require the subcontractor to carry out its scope of work in accordance with this Agreement, all applicable governmental approvals and permits, and applicable law.
- c. Physically Include Form FHWA-1273.
- d. Incorporate the general wage decisions applicable to the Project.
- e. Without cost to CONTRACTOR or SCDOT, expressly permit assignment to SCDOT or its successor, assign or designee of all CONTRACTOR's rights under the Subcontract, contingent only upon delivery of request from SCDOT following termination of this Agreement, allowing SCDOT or its successor, assign or designee to assume the benefit of CONTRACTOR's rights with liability only for those remaining obligations of CONTRACTOR accruing after the date of assumption, such assignment to include the benefit of all subcontractor warranties, indemnities, guarantees and professional responsibility.
- f. Expressly state that any acceptance of assignment of the Subcontract to SCDOT or its successor, assign or designee shall not operate to make the assignee responsible or liable for any breach of the Subcontract by CONTRACTOR or for any amounts due and owing under the Subcontract for work or services rendered prior to assumption (but without restriction on the Subcontractor's rights to suspend work or demobilize due to CONTRACTOR's breach).
- g. Expressly include a covenant to recognize and attorn to SCDOT upon receipt of notice from SCDOT that it has exercised its rights under this Agreement (including specifically step-in rights in the context of Contractor Defaults), without necessity for consent or approval from CONTRACTOR or to determine whether SCDOT validly exercised its rights, and CONTRACTOR's covenant to waive and release any claim or cause of action against the subcontractor arising out of or relating to its recognition and attornment in reliance on any such notice.
- h. Not be assignable by the subcontractor to any person or entity other than SCDOT (or its assignee) without CONTRACTOR's prior consent.
- i. Not be assignable by the CONTRACTOR to any person other than SCDOT (or its assignee) without SCDOT's prior consent.
- j. Expressly include requirements that the Subcontractor will: (i) maintain usual and customary books and records for the type and scope of business operations in which it is engaged (e.g., constructor, equipment supplier, designer, service provider); (ii) permit audit thereof with respect to the Project or work by each of CONTRACTOR, FHWA and SCDOT pursuant to this Agreement, (iii)

provide progress reports to CONTRACTOR appropriate for the type of work it is performing sufficient to enable CONTRACTOR to provide the reports it is required to furnish SCDOT under this Agreement.

- k. Include the right of CONTRACTOR to terminate the Subcontract in whole or in part upon any termination by SCDOT of this Agreement for SCDOT's convenience without liability of CONTRACTOR or SCDOT for the subcontractor's lost profits, business opportunity, or any consequential, incidental, indirect, special, or punitive damage.
- l. Expressly require the Subcontractor to participate in meetings between CONTRACTOR and SCDOT, upon SCDOT's request, concerning matters pertaining to such Subcontract or its work.
- m. Include an agreement by the subcontractor to give evidence in any dispute resolution proceeding pursuant to this Agreement, if such participation is requested by either SCDOT or CONTRACTOR.
- n. Expressly include a provision prohibiting cross-contract offset between the parties thereto, meaning that if a subcontractor is performing work on multiple contracts for the other party to the Subcontract or the other party's affiliates, the other party or its affiliate shall not withhold payment from the subcontractor on its Subcontract because of disputes or claims on another contract.
- o. Expressly require the subcontractor to make payments to sub-subcontractors, and be liable for interest payments to sub-subcontractors, under applicable law.
- p. Contain no waiver of the prompt payment protections for the subcontractor provided under applicable law.
- q. Expressly provide that all claims and charges of the subcontractor and its subcontractors at any time shall not attach to any interest of SCDOT in the Project or the Project ROW.
- r. Expressly include a covenant, expressly stated to survive termination of the Subcontract, to promptly execute and deliver to SCDOT a new contract between the subcontractor and SCDOT on the same terms and conditions as the Subcontract, in the event: (i) the Subcontract is rejected by CONTRACTOR in bankruptcy or otherwise wrongfully terminated by CONTRACTOR; and (ii) SCDOT delivers request for such new contract following termination or expiration of this Agreement.
- s. Be consistent in all other respects with the terms and conditions of this Agreement to the extent such terms and conditions are applicable to the scope of work of such subcontractors, and include all provisions required by this Agreement.

- t. Expressly require the Subcontractor to notify CONTRACTOR and SCDOT, in writing, promptly following any determination by any federal or state department or agency that the subcontractor is disqualified, suspended, debarred, or otherwise excluded from bidding, proposing, or contracting with any such federal or state department or agency.
4. CONTRACTOR shall not amend any Subcontract with respect to any of the foregoing matters without the prior consent of SCDOT.
 5. CONTRACTOR shall not enter into any Subcontracts with any person or entity then debarred or suspended from submitting bids by any agency of the State.
 6. Additional Requirements Relating to Subcontracts
 - a. Prior to any subcontractor performing any work on the Project, CONTRACTOR shall submit the Subcontractor/Hauler Approval Request Form for approval. SCDOT reserves the right to request the subcontract at any time. If requested by SCDOT, then CONTRACTOR shall submit a true and complete copy of the proposed Subcontract to SCDOT for such review and approval. SCDOT may disapprove any proposed Subcontract for reasons to include but not limited to default or delinquency of subcontractor.
 7. Subcontracts with Affiliates
 - a. For purposes of this clause, "Affiliate" means (i) any equity member of CONTRACTOR, (ii) any person or entity who directly or indirectly, through one or more intermediaries, controls or is controlled by, or is under common control with CONTRACTOR or any such equity member, or (iii) any person or entity for which ten percent or more of the equity interest in such person or entity is held directly or indirectly, beneficially, or of record, by CONTRACTOR, any such equity member, or any affiliate of any person or entity described under clause (ii). "Control" means the possession, directly or indirectly, of the power to cause the direction of the management of an entity, whether through voting rights, securities, by contract, family relationship, or otherwise.
 - b. CONTRACTOR shall have the right to have work and services performed by Affiliates only under the following terms and conditions (in addition to all other general requirements for Subcontracts set forth in this Agreement):
 - (viii.) CONTRACTOR shall execute a written Subcontract with the Affiliate;
 - (ix.) The Subcontract shall comply with all applicable provisions of this clause, be consistent with prudent industry practices, and be in form and substance substantially similar to Subcontracts then being used by CONTRACTOR or Affiliates for similar work or services with unaffiliated subcontractors;

- (x.) The Subcontract shall set forth the scope of work and services and all the pricing, terms and conditions respecting the scope of work and services;
 - (xi.) The pricing, scheduling and other terms and conditions of the Subcontract shall be no less favorable to CONTRACTOR than those that CONTRACTOR could reasonably obtain in an arms' length, competitive transaction with an unaffiliated Subcontractor. CONTRACTOR shall bear the burden of proving that the same are no less favorable to CONTRACTOR; and
 - (xii.) No Affiliate shall be engaged to perform any work or services which this Agreement states are to be performed by an independent or unaffiliated party.
 - (xiii.) No Affiliate shall be engaged to perform any work or services that would be inconsistent with prudent industry practices.
- c. CONTRACTOR shall make no payments to Affiliates for work or services in advance of provision of such work or services, except for reasonable mobilization payments or other payments consistent with arm's length, competitive transactions of similar scope.

III. CONTRACT PRICE/CONTRACT PAYMENTS

Contract Price

The "Contract Price" shall be \$202,967,000.00 In consideration for the Contract Price, CONTRACTOR shall perform all of its responsibilities under the Contract. The Contract Price shall include all work identified in the Agreement and subsequent Exhibits and as identified in the Cost Proposal Bid Form – **EXHIBIT 1**.

Contract Price Adjustments

1. Allowable adjustments

When expressly permitted hereunder, only to the extent so permitted, and except as otherwise expressly stated with respect to an aspect of the work (or basis for a change to the Contract Price), the Contract Price may be added to or deducted from as a result of any of the following:

- a. A "Change" or "Force Account Directive".
- b. Differing site condition as set forth in Article XIII.
- c. Suspension for Convenience as set forth in Article XVII.
- d. Intentional or bad faith acts or omissions by SCDOT that unreasonably interfere with CONTRACTOR's performance and cause delay of work on the critical path of the Project.

- e. Changes in legal requirements or regulations that are effective subsequent to the date of submission of CONTRACTOR's response to the RFP.
- f. Discovery of hazardous materials not previously identified in Exhibit 4 Project Design Criteria and Attachment B as set forth in Article XI
- g. Discovery of archeological or paleontological sites not previously identified as set forth in Article X.
- h. Actual Premium Right Of Way Acquisition Costs as set forth in to Article VIII. No additional amount for overhead, profit, bonds and insurance will be considered for this item.
- i. Adverse Utility Adjustments impacts meeting the requirements as set forth in Article VII.

If the critical path is not affected, the Contract Price may be adjusted as follows. The additional 10% adjustment accounts for costs attributable to profit and all overheads.

$$\text{Allowable Contract Price Adjustment} = \text{Direct Costs} + (10\% \times \text{Direct Costs})$$

If the critical path is affected, the Contract Price may be adjusted as follows. The additional 10% adjustment accounts for costs attributable to profit and all overheads (except Extended Job Site).

$$\begin{aligned} \text{Allowable Contract Price Adjustment} \\ &= \text{Direct Costs} + \text{Extended Job Site Overhead} \\ &+ (10\% \times (\text{Direct Costs} + \text{Extended Job Site Overhead})) \end{aligned}$$

Extended Job Site Overhead equals the Rate (D), established in Exhibit 5, times an approved Time Extension.

Other than as provided above, the Contract Price shall not be increased for Contract Time extensions or, except as expressly stated otherwise herein, delay damages. Contract Price adjustments shall be documented by Change Order through the Contract Change Request process signed by both parties and shall be reflected immediately in a revision to the Schedule of Values. No claim by the CONTRACTOR for an adjustment hereunder shall be allowed if notice is not given prior to final payment under this Agreement.

2. Changes

- a. A "Change" shall be any deviation or variation from the Project Scope or the Project Criteria. No Change shall be implemented without the express written approval of SCDOT.

- b. SCDOT or the CONTRACTOR may initiate a “Contract Change Request” in writing via the Contract Requests process in Exhibit 5. If SCDOT approves the change, CONTRACTOR shall perform the services as changed.
3. Force Account Directive
 - a. A Force Account Directive is a written order from SCDOT directing a Change prior to agreement with CONTRACTOR on adjustment, if any, to the Contract Price or Contract Time. If a price for the work cannot be agreed upon or a time constraint requires expedited work, CONTRACTOR shall perform the work under Force Account Procedures as outlined in Section 109.5 of SCDOT’s Standard Specifications.
4. Direct Costs

For the purpose of a Contract Price Adjustment, “Direct Costs” shall be defined as:

- a. Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers’ compensation insurance;
- b. Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- c. Actual costs of machinery and equipment owned by CONTRACTOR or any affiliated or related entity exclusive of hand tools;
- d. Actual costs paid for rental of machinery and equipment exclusive of hand tools;
- e. Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes; and
- f. Costs incurred or fees paid for design work related to the change or event.

Contract Payments

1. Schedule of Values

Prior to execution of this Agreement, CONTRACTOR shall provide a Schedule of Values acceptable to SCDOT and work may not start until the Schedule of Values is approved by SCDOT. The Schedule of Values will serve as the basis for cost loading of the CPM Schedule. The CPM schedule shall include sufficient information to provide for monetary and quantitative tracking of the work by SCDOT. Updates to the cost-loaded CPM schedule will serve as the basis for progress payments requested by and made to CONTRACTOR. If the Contract Price is adjusted, CONTRACTOR shall revise its Schedule of Values and the CPM Schedule to reflect the adjustment in the Contract Price. The revised Schedule of Values must be approved by SCDOT prior to

the time for the subsequent request for a progress payment otherwise no progress payments will be made. The Schedule of Values shall be incorporated herein as **EXHIBIT 2**. The Schedule of Values should include Lump Sum items that will serve as measurement and payment for any item referred to in this Contract as a “contract unit bid price” item.

2. Mobilization

Mobilization shall not exceed 5% of the Total Contract Cost as shown in the Schedule of Values. Mobilization will be paid in two equal installments. The first will be paid in the progress payment immediately following Notice to Proceed, and the second will be paid at the start of construction.

3. Periodic Progress Payment Applications

No application for payment of the Contract Price shall be submitted until SCDOT gives a notice to proceed. Applications for payment of the Contract Price may be submitted once a month. Each application for payment of the Contract Price shall set forth, in accordance with the Schedule of Values and the cost-loaded CPM schedule, the percentage of all items comprising the work completed since CONTRACTOR’s immediately prior request for payment. The application for payment of the Contract Price may also request payment for equipment and materials not yet incorporated into the Project, provided that (i) SCDOT is satisfied that the equipment and materials are suitably stored at either the Project or another acceptable location, (ii) the equipment and materials are protected by suitable insurance and (iii) upon payment, SCDOT will receive title to the equipment and materials free and clear of all liens and encumbrances.

4. Periodic Progress Payments

SCDOT will review each application for payment and respond within seven calendar days. SCDOT will generate an “Estimate Summary to Contractor” and “Contractor Concurrence Form” for CONTRACTOR review. The “Contractor Concurrence Form”, with the attached “Estimate Summary to Contractor”, shall be the undisputed application for payment. SCDOT will make each payment within 21 calendar days of the receipt of the corresponding undisputed application for payment. In the event of a dispute over the quality of work or percentage of the Project completed, SCDOT’s decision is controlling and final. Payment by SCDOT will not preclude or estop SCDOT from correcting any measurement, estimate, or certificate regarding the percentage completion of the Project, and future payments may be adjusted accordingly.

5. Prompt Payment of Subcontractors

CONTRACTOR shall comply with the requirements of the SCDOT Prompt Payment Clause Supplemental Specification.

6. Withholding of Payment

SCDOT may withhold all or part of any payment under the Contract for any of the reasons listed below. Any funds withheld will be released upon CONTRACTOR fully remedying the defect, fault, or failure and will be included in the next regularly schedule pay estimate. Payment will be subject to retainage if applicable.

- a. Any CONTRACTOR default as set forth in Article XVII;
- b. Reasonable evidence that the Work will not be Substantially Complete within the Construction Time as adjusted and that the unpaid balance of the Contract Price will not be adequate to cover Liquidated Damages for the actual unexcused delay;
- c. Any fines or other charges to SCDOT due to CONTRACTOR's failure to comply with permit requirements or other regulations;
- d. Notice of cancellation of insurance;
- e. Violation of QC plan requirements;

Retainage

Provided the Project is proceeding satisfactorily, SCDOT will not withhold retainage. However, if at any time SCDOT determines that CONTRACTOR fails to meet contract terms or the Project is not proceeding satisfactorily, SCDOT may retain up to 10% of the Contract Price as retainage.

IV. CONTRACT TIME

Project Schedule

1. Time for Completion of Project: Time is of the essence. The Project shall be Substantially Complete within 1200 calendar days from Notice to Proceed. The Notice to Proceed shall be no later than 45 days from the effective date of the Agreement. Final Completion shall be reached as defined in paragraph 5 below.
 - a. Contract Time shall be the number of calendar days from effective date of agreement to Final Completion.
 - b. Construction Time is defined as calendar days from Notice to Proceed to Substantial Work Completion on the Project.
2. Substantial Completion: When CONTRACTOR believes that it has reached Substantial Completion, it shall notify SCDOT in writing. Substantial Completion is the point in the Project when the work has been constructed to the typical section in the plans over the entire length of the Project, including tie ins to adjacent projects or existing roads, all travel lanes are open to the public, all safety features are installed and are being properly maintained, no lanes will have to be closed to complete any remaining work, and all work is completed except for "Project Close-

out Activities”. “Project Close-out Activities” are defined as punch list items, site clean-up, demobilization, and final Project documentation, including but not limited to as-built plans.

3. Critical Path Method Schedule: CONTRACTOR shall prepare and maintain a schedule for the Project using the Critical Path Method of scheduling (hereinafter called “CPM Schedule”). Prepare a Level II CPM Schedule in accordance with this agreement and the SCDOT Supplemental Specifications with the following exceptions:
 - a. Submit to the SCDOT the initial baseline CPM schedule within 30 days from the Effective Date of this Agreement. No contract payment will be made to Contractor and no construction work may begin until a CPM baseline schedule is received and accepted by SCDOT. Update the baseline CPM schedule for monetary and quantitative tracking purposes as RFC plans are developed.
 - b. Cost-load the CPM schedule using the expenses identified in the schedule of values. Use the schedule of values to establish Expense Categories and assign to the correct activities.
 - c. Include submittal activities. Allow duration for these activities to include SCDOT review periods.
 - d. Reuse of deleted activity ID’s from schedule update to schedule update is not allowed.
 - e. Failure to include any element of work or any activity including but not limited to utility relocation, right of way acquisition, and permitting will not relieve the CONTRACTOR from completing all work within the Construction Time at no additional time or cost to the SCDOT, notwithstanding the acceptance of the schedule by SCDOT.
 - f. Develop project specific calendars reflecting all seasonal restrictions included in this Agreement and non-work days. Address durations for weather within activity duration, not within the calendar.
 - g. Use only a Work Breakdown Structure (WBS) to organize schedule activities. At a minimum, breakout the design and construction phases. These two breakouts should have the same parent within the structure.
 - h. Submit monthly updates no later than 15 days following the most recent estimate period end date, whether or not an estimate was generated. Set the data date the same as the most recent estimate period end date.
 - i. If SCDOT determines any schedule submission is deficient, it will be returned to the CONTRACTOR. A corrected schedule shall be provided within 7 calendar days from the SCDOT’s transmittal date.

- j. The CONTRACTOR may plan for early completion; however, the schedule shall never reflect a completion date earlier than the original Substantial Completion date. SCDOT will not be liable in any way for CONTRACTOR's failure to complete the Project prior to the original Substantial Completion date. Any additional costs, including extended overhead incurred between CONTRACTOR's scheduled early completion date and the original Substantial Completion date, shall be the responsibility of the CONTRACTOR.
 - k. Include in each narrative a detailed listing of crews utilized on activities and their responsibilities. In lieu of this, the Contractor may request to submit a Resource Loaded CPM schedule.
4. Progress Review Meetings:
- a. Review Meetings shall be held between CONTRACTOR and SCDOT at least every 2 weeks. Periodic construction meetings shall be held by CONTRACTOR with its consultants and subcontractors to coordinate the work, update the schedule, provide information and resolve potential conflicts.
 - b. SCDOT and CONTRACTOR will hold a regular CPM Progress Meeting at which all principal parties are expected to attend. These meetings will be held the week before the application for payment is due so that job progress will coincide with the payment application. At this meeting, CONTRACTOR shall provide the most recent schedule with notations showing actual start dates, actual finish dates, and activity progress. If the schedule provided indicates an actual or potential delay to the completion of the Contract, CONTRACTOR shall provide a narrative identifying the problems, causes, the activities affected and describing the means and methods available to complete the Project by the Contract Time.
5. Final Completion: Final Completion shall be achieved within 150 calendar days of Substantial Completion as defined in this Agreement. When CONTRACTOR believes that all elements of its work on the Project, including all of the requirements of the Contract, have been completed, it shall notify SCDOT in writing. Within 30 days thereafter, SCDOT will acknowledge project completion or will advise CONTRACTOR in writing of any aspect of the Contract or the Project Scope that is incomplete or unsatisfactory. CONTRACTOR shall complete all corrective action within thirty (30) days after written notification of incomplete or unsatisfactory items. CONTRACTOR will notify SCDOT in writing upon completion of necessary corrective action. SCDOT will verify satisfactory completion of the corrective action in writing to CONTRACTOR. The number of days referenced above to achieve Final Completion does not include SCDOT's review period and the CONTRACTOR's corrective action time. Upon verification, the Project shall be deemed to have achieved Final Completion.
6. Inspection/Acceptance; No Waiver: No inspection, acceptance, payment, partial waiver, or any other action on the part of SCDOT will operate as a waiver of any

portion of this Agreement or of any power reserved herein or any right to damages or other relief, including any warranty rights, except insofar as expressly waived by SCDOT in writing. SCDOT will not be precluded or estopped by anything contained herein from recovering from CONTRACTOR any overpayment as may be made to CONTRACTOR.

Time Extensions

Time may be extended if there is a delay to the critical path of the Project caused by an event listed below. All requests for time extensions shall be made in writing to SCDOT within 20 days of the event causing the delay. All time extensions must be approved in writing by SCDOT. Time extensions for weather shall not be allowed, except as provided under Force Majeure. Time extensions may be allowed for the following events that affect the critical path:

1. Force Majeure as that term is defined in this Agreement in Article XIV;
2. Changes or Force Account Directives;
3. Differing site conditions as defined under Article XIII;
4. Injunctions, lawsuits, or other efforts by individuals or groups that hinder, delay, or halt the progress of the Project, provided that such efforts are not premised on alleged wrongs or violations by CONTRACTOR or its subcontractors;
5. Interference with or delay of work on the critical path of the Project by SCDOT; however, CONTRACTOR shall not be entitled to a time extension if SCDOT's actions are necessitated by CONTRACTOR's actions, omissions, failure to perform quality work, or failure to comply with contract requirements;
6. Changes in the legal requirements or regulations which are effective subsequent to the date of this Agreement;
7. Discovery of hazardous materials not previously identified as set forth in Article XI;
8. Discovery of archeological or paleontological remains not previously identified as set forth in Article X; or
9. Adverse utility relocation impacts meeting the requirements set forth in Article VII.
10. Adverse Railroad coordination impacts as set forth in Article VII.
11. Adverse permit acquisition impacts as set forth in Article IX.

Owner's Right to Stop Work

SCDOT will have the authority to suspend the work, wholly or in part, for such periods, as SCDOT may deem necessary, due to CONTRACTOR's failure to meet the requirements of the Contract in the performance of the work. Such suspension of the work shall not constitute grounds for claims for damages, time extensions, or extra compensation.

Liquidated Damages

1. CONTRACTOR shall pay liquidated damages to SCDOT in the amount of \$ 15,000 for each day for which the project is not substantially complete, as defined in Article IV.
2. CONTRACTOR shall pay liquidated damages to SCDOT in the amount of \$5000 for each day that Final Completion, as defined in Article IV, is not achieved.
3. The parties acknowledge, recognize and agree that because of the unique nature of the Project, it is difficult or impossible to determine with precision the amount of damages that would or might be incurred by SCDOT as a result of the CONTRACTOR's failure to complete the Project as specified in the Contract. Therefore, any sums payable under this provision are in the nature of liquidated damages, and not a penalty, and are fair and reasonable and such payment represent a reasonable estimate of fair compensation for the losses that may reasonably be anticipated from such failure. Liquidated damages are SCDOT's sole remedy for delayed completion; however, liquidated damages do not apply to CONTRACTOR's liability for other contractual breaches, duties, or obligations.

V. CONSTRUCTION QUALITY ASSURANCE PROGRAM

CONTRACTOR's Responsibilities

CONTRACTOR shall be responsible for the QUALITY CONTROL Portion of the Program to include the items listed below. Work shall not commence until CONTRACTOR has met these requirements.

1. Quality Control Plan: CONTRACTOR shall submit a Quality Control (QC) Plan that outlines how CONTRACTOR shall assure that the materials and work are in compliance with the contract documents. The initial plan shall be submitted to SCDOT for review and approval at least five business days prior to the beginning of any construction activity. The plan shall be updated as necessary prior to the start of any specific construction operation. The plan shall include a list of SCDOT certified personnel responsible for management and quality control of the Project, and define the authority of each individual. The plan shall also include how CONTRACTOR will monitor quality and deal with failing materials. The QC Plan shall include the QC testing and sampling frequencies and shall indicate the frequency at which the QC Manager will provide QC test results to SCDOT. CONTRACTOR shall include a summary of quantities to SCDOT for the purposes

of meeting the minimum acceptance and independent assurance sampling and testing requirements for the Project.

2. Personnel: CONTRACTOR shall provide a sufficient number of SCDOT certified personnel to adequately control the work of the Project. Any personnel required to obtain samples or conduct material testing shall be SCDOT certified. CONTRACTOR shall provide SCDOT with copies of each individual's certifications for review and approval by SCDOT. Approved CONTRACTOR QC personnel shall be on the job at all times that permanent work items and materials are being incorporated into the project. CONTRACTOR's QC personnel shall not have any other project responsibilities.
3. CONTRACTOR Testing: Notwithstanding any required sampling and testing stipulated in Article II.G, the CONTRACTOR should establish additional sampling and testing to ensure that all workmanship and materials are in compliance with the contract requirements. Although not used for acceptance, QC testing and inspection shall ensure that quality has been incorporated into all elements of work prior to requesting acceptance testing and inspection. The QC Program should be sufficient in scope to remedy repeated discoveries of non-compliant work by those performing acceptance inspection and testing. Repeated observations of QC quality shortfalls shall be considered a breakdown of the QC program and shall be cause for investigation and corrective action prior to commencement of work areas affected. Corrective action may include the addition of new QC procedures, revision to existing QC procedures, re-training of QC personnel, removal and replacement of QC personnel, or other such actions which will restore the effectiveness of the QC program. All QC testing shall be performed in accordance with existing AASHTO, ASTM, or test methods used by SCDOT. The cost of these activities will be borne by CONTRACTOR.
4. Testing Laboratories: Hot Mix Asphalt testing laboratories require SCDOT certification. All other testing laboratories used on the Project must be AASHTO certified and approved by SCDOT 30 days prior to beginning the portion of work for which the laboratory will be performing the testing.
5. Mix Designs: Copies of all initial hot-mix asphalt mix designs and Portland Cement Concrete mix designs, along with supporting data, shall be submitted to SCDOT for review at least five business days prior to use. All hot-mix asphalt mix designs will be prepared by personnel certified in Mix Design Methods. Portland Cement Concrete mix designs will be prepared by a certified concrete technician or a Professional Engineer. The Portland Cement Concrete mix proportions given in the specifications are to be followed. CONTRACTOR shall design the mix to obtain the strength and water/cement ratios given in the specifications, and shall provide workability, air content, gradation and suitable set times as set forth in the Standard Specifications. The SCDOT will be notified of any revisions to CONTRACTOR's mix design. Copies of such revisions will be sent to SCDOT for review at least 10 business days prior to use.

6. Materials Certifications: CONTRACTOR's QC Manager shall submit all material certifications to SCDOT prior to the CONTRACTOR incorporating the material into the project.

SCDOT Responsibilities

SCDOT will be responsible for the QUALITY ACCEPTANCE portion of the program to include: conducting inspections, acceptance testing, independent assurance testing and final project material certification.

1. Acceptance Testing: SCDOT personnel assigned to the Project, or qualified personnel retained by SCDOT, will conduct sampling and testing, separate from CONTRACTOR's testing, at the frequencies set forth in SCDOT's Quality Acceptance Sampling and Testing Guide. This testing will be used by SCDOT to determine the acceptability of the materials. All sampling and testing will be in accordance with existing AASHTO, ASTM, or SC test methods used by SCDOT. The cost of these activities will be borne by SCDOT. CONTRACTOR's QC Manager is required to coordinate all activities closely with SCDOT to allow the necessary acceptance testing to be conducted prior to proceeding to the next operation. The disposition of failing materials must be approved by SCDOT.
2. Independent Assurance Testing: SCDOT will be responsible for conducting Independent Assurance Testing. Personnel performing these tests will be SCDOT employees or qualified persons retained by SCDOT. Persons performing these tests will not be involved in Acceptance Testing. This testing will be used to ensure that proper sampling and testing procedures are being followed, and that testing equipment is functioning properly. This testing will consist of observing sampling and testing by both SCDOT personnel performing Acceptance Testing and CONTRACTOR personnel performing Quality Control Testing, as well as taking split samples for the purposes of comparison testing. Independent Assurance Testing will be at an approximate frequency of one-tenth of the Acceptance Testing frequency. Independent Assurance test results will not be used for acceptance. The cost of these activities will be borne by SCDOT.
3. Materials Certification: SCDOT will be responsible for preparing the Materials Certification as required by the FHWA on federally funded projects.

CONTRACTOR's Obligation

SCDOT's testing in no way relieves CONTRACTOR of its obligation to comply with the Contract requirements. All materials incorporated into the Project must meet or exceed contract requirements and specifications. Further, any testing by SCDOT will not relieve CONTRACTOR of any of its warranty obligations.

VI. INSURANCE AND BONDING

Insurance

1. CONTRACTOR shall purchase and maintain insurance using a company or companies that maintain an A.M. Best rating of not less than A-VII with coverage forms acceptable to SCDOT. The insurance described below shall be maintained uninterrupted for the duration of the Project, including warranty periods, and shall protect CONTRACTOR from claims set forth below which may arise out of or result from CONTRACTOR's operations under the Contract, whether such operations be performed by CONTRACTOR or by any subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable:
 - a. Claims under workers' or workmen's compensation, disability benefit and other similar employee benefit acts;
 - b. Claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR's employees;
 - c. Claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR's employees;
 - d. Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by CONTRACTOR, or (2) by any other person;
 - e. Claims for damages, other than to the work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
 - f. Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
 - g. Claims involving contractual liability insurance applicable to the Contractor's obligations under the indemnity provisions of this contract.
 - h. Claims involving professional liability.
2. The minimum limits of liability for the following types of insurance are required, except where greater limits are required by statute:
 - a. Workers' Compensation, including: Worker's Compensation Insurance/Employer's Liability

State Statutory limits	Employer's Liability
	\$100,000 per accident
	\$500,000 per disease
	\$100,000 each employee
 - b. Commercial General Liability

	\$2,000,000 per occurrence
	\$4,000,000 annual aggregate

Send Notice of Cancellations to Director of Construction Room 330, PO Box 191, Columbia, SC 29202. Make certain that the policies are endorsed to reflect this requirement. Verification of additional insured status shall be furnished to SCDOT by including a copy of the endorsements with the Certificate of Insurance. This insurance, including insurance provided under the commercial umbrella shall apply as primary and noncontributory insurance with respect to any other insurance or self-insurance programs, including any deductibles, afforded to, or maintained by, SCDOT. CONTRACTOR'S deductibles shall not exceed \$1,000,000 without written consent of the SCDOT and that the certificates show the deductible amounts. CONTRACTOR shall provide a notarized letter from a Certified Public Accountant showing that they have the financial ability to cover the amount of the deductible at the time of the execution of the agreement and for every year thereafter until the insurance obligation ends.

4. Limits shown in this provision are minimum acceptable limits and in no way limit available coverage to the additional insured. CONTRACTOR's CGL and commercial umbrella policies shall contain no provision providing that the limits available to an additional insured are less than the limits available to the CONTRACTOR. SCDOT shall be given all the same rights and insurance coverage as CONTRACTOR.
5. There shall be no endorsements or modifications of the CGL limiting the scope of coverage for liability arising from explosion, collapse, underground property damage or work performed by contractors on behalf of SCDOT.
6. Hazardous Materials: If the CONTRACTOR is required to remove and haul any hazardous waste from the Project, or if the Project involves such similar environmental exposure, pollution liability coverage equivalent to that provided under the ISO Pollution Liability – Broadened Coverage for Covered Autos Endorsement (CA 99 48), shall be provided, and the Motor Carrier Act Endorsement (MCS 90) shall be attached. Limits of pollution liability shall be not less than \$1,000,000 per occurrence and \$2,000,000 annual aggregate. Coverage shall apply on an “occurrence form” basis, shall cover at a minimum bodily injury, property damage, defense costs and clean-up costs and be extended to include non-owned disposal sites and transportation coverage. This insurance shall remain in effect after acceptance by Owner for the time period required to satisfy the statute of limitations in South Carolina. However, if coverage is written on a “claims made form”, then the Contractor's Pollution Liability coverage shall include a retroactive date that precedes the commencement of work under this Agreement. Such coverage shall apply as primary and non-contributory insurance with respect to any other insurance or self-insurance programs, including any deductibles, afforded to, or maintained by SCDOT. Pollution Liability policy must include contractual liability coverage.
7. Waiver of Subrogation: CONTRACTOR shall waive its rights against SCDOT, other additional insured parties, and their respective agents, officers, directors and employees for recovery of damages, or any other claims, to the extent these

damages are covered by the CGL, business auto, pollution liability, workers compensation and employer's liability or commercial umbrella maintained pursuant to this section of the Agreement.

8. CONTRACTOR shall provide Builder's Risk Insurance acceptable to the SCDOT in the amount of the Contract Price protecting the respective interests of SCDOT and CONTRACTOR and covering physical loss or damage to the work during construction of the project. The certificate of insurance shall be provided to the SCDOT at the time of execution of this Agreement. The CONTRACTOR shall also obtain \$1,000,000 in Delay in Start Up Coverage under the Builder's Risk policy. The policy shall name the SCDOT as an additional insured and shall reference the Project by name. The certificate shall also state that the coverage will not be cancelled or reduced without 30 days prior written notice to the SCDOT.
9. After Final Completion of the work, CONTRACTOR shall maintain CGL, professional liability, and commercial umbrella coverage to include liability coverage for damage to insured's completed work equivalent to that provided under ISO CG 00 01 for eight years after substantial completion.
10. By execution of the contract, the CONTRACTOR accepts the responsibility to provide the liability insurance policies and endorsements as specified herein. Failure of SCDOT to identify a deficiency in the Certificate of Insurance submitted by the CONTRACTOR's insurance agent as evidence of the specified insurance or to request other evidence of full compliance with the liability insurance specified shall not be construed as a waiver of the CONTRACTOR's obligation to provide and maintain the required insurance for the duration of the contract. The CONTRACTOR shall assess its own risks and if it deems appropriate and/or prudent, maintain higher limits and/or broader coverages. The CONTRACTOR is not relieved of any liability or other obligations assumed or pursuant to the Contract by reason of its failure to obtain or maintain insurance in sufficient amounts, duration, or types.

Bonding

1. CONTRACTOR shall at the time of the execution of this Agreement, provide SCDOT the following bonds:
 - a. A Performance and Indemnity Bond from a surety or sureties satisfactory to SCDOT. The amount of bond shall be equal to the Contract Price.
 - b. A Payment Bond from a surety or sureties satisfactory to SCDOT. The amount of bond shall be equal to the Contract Price.
2. These bonds shall be in accordance with the requirements of S.C. Code Ann. §57-5-1660, (1976 as amended) and S.C. Code Ann. §29-6-250 (2000). Bonds shall be issued by a surety company licensed in the State of South Carolina with an "A" minimum rating of performance as stated in the most current publication of "A.M.

Best Key Rating Guide, Property Liability” and signed by the surety's agency or attorney-in-fact. Surety must be listed on the current U.S. Department of the Treasury Financial Management Service list of approved bonding companies as approved for an amount equal to or greater than the amount for which it obligates itself in the Bond. If surety qualifies by virtue of its Best's listing, the amount of the Bond may not exceed ten percent of policyholders' surplus as shown in the latest A.M. Best's Key Rating Guide.

3. CONTRACTOR shall also provide a warranty bond, acceptable to SCDOT, in the amount of \$5,000,000 to cover the warranty obligations of the contract.

VII. UTILITIES AND RAILROAD COORDINATION

Utilities

1. As part of the Project Scope, CONTRACTOR shall have the responsibility of coordinating the Project construction and demolition activities with all utilities that may be affected. CONTRACTOR shall be responsible for the cost of all utility coordination unless defined otherwise herein. If applicable, all temporary relocation costs as well as any other conflict avoidance measures shall be the responsibility of the CONTRACTOR. For those utilities that have prior rights SCDOT will be responsible for permanent relocation costs as defined by the Federal code. For those utilities where the CONTRACTOR determines that the SCDOT has prior rights, CONTRACTOR may exercise these rights and require the utility company to bear the costs of relocation. If there is a dispute over prior rights, SCDOT shall be responsible for resolving the dispute. SCDOT shall have final determination of the utility's prior rights.
2. For those utilities requiring relocation, CONTRACTOR shall conform with SCDOT's "A Policy for Accommodating Utilities on Highway Rights of Way", the applicable State laws, and the Code of Federal Regulations, Title 23, Chapter 1, Subchapter G, part 645, subparts A and B. The CONTRACTOR is responsible for all costs associated with relocating utilities owned by SCDOT.
3. The resolution of any conflicts between utility companies and the construction of the Project shall be the responsibility of the CONTRACTOR. If said utility companies interfere or fail to relocate conflicting utilities in a timely manner, SCDOT may, on an individual basis, consider a time extension for utility company delays when CONTRACTOR can demonstrate that appropriate coordination efforts have been made to expedite the utility relocation, and that the delay has a direct impact on the approved Critical Path. CONTRACTOR shall meet with the Department's Utilities Office within 30 days of the Notice to Proceed to gain a full understanding of what is required with each utility submittal.
4. CONTRACTOR shall design the Project to avoid conflicts with utilities where possible, and minimize impacts where conflicts cannot be avoided. If there is a dispute between the CONTRACTOR and SCDOT as to whether a utility relocation

is required, SCDOT shall have the final determination. Additional utility relocations desired by the CONTRACTOR for but not limited to construction staging, access or convenience, shall be the sole responsibility of CONTRACTOR and all associated costs shall be borne by the CONTRACTOR.

5. CONTRACTOR shall initiate early coordination with all utilities and provide the utility companies with design plans for their use in developing Relocation Sketches as soon as the plans have reached a level of completeness adequate to allow the companies to fully understand the Project impacts. If a party other than the utility company prepares Relocation Sketches, there shall be a concurrence box on the plans where the utility company signs and accepts the Relocation Sketches as shown.
6. CONTRACTOR shall be responsible for collecting and submitting to SCDOT the following from each utility company that is located within the project limits:
 - a. **Relocation Sketches** including letter of “no cost” where the company does not have a prior right;
 - b. **Utility Agreements** including documentation of prior rights, cost estimate and relocation plans where the company has a prior right; and/or
 - c. **Letters of “no conflict”** where the company’s facilities will not be impacted by the Project. Include location sketches on SCDOT plans confirming and certifying that facilities are not in conflict.
 - d. **Encroachment Permits** for all relocations regardless of prior rights.
7. CONTRACTOR shall assemble the information included in the Utility Agreements and Relocation Sketches in a final and complete form and in such a manner that the Department may approve the submittals with minimal review. CONTRACTOR shall ensure that there are no conflicts with the proposed highway improvements, or between each of the utility company’s relocation plans. CONTRACTOR may not authorize the utility companies to begin their relocation work until authorized in writing by SCDOT. Any early authorization by CONTRACTOR shall be at the CONTRACTOR’s risk.
8. At the time that CONTRACTOR notifies SCDOT that CONTRACTOR deems the Project to have reached Final Completion, CONTRACTOR shall certify to SCDOT that all utilities have been identified and that those utilities with prior rights or other claims related to relocation or coordination with the Project have been relocated or their claims otherwise satisfied or will be satisfied by CONTRACTOR.
9. CONTRACTOR shall accurately show the final location of all utilities on the as-built drawings for the Project. SCDOT reserves the right to request CADD files as needed.

Railroad

If Railroad property is impacted by this project, the following provisions shall apply:

1. Under the direction of and in coordination with SCDOT, the CONTRACTOR shall be responsible for all coordination with the involved Railroad Companies, including but not limited to, sending plans, meetings, correspondence, phone calls, writing/reviewing agreements, and etc. as may be necessary to secure the applicable executed railroad agreements, needed for the construction of the project, between the SCDOT and all involved Railroad Companies. All correspondence related to railroad agreements or conditions shall include the railroad file number and railroad milepost information. The CONTRACTOR shall be responsible for the cost of railroad coordination as defined herein.
2. SCDOT will submit for approval, all required railroad agreements necessary for the Preliminary Engineering and Construction of the project. Upon approval, the SCDOT will submit the agreement to the Railroad Company for execution. The CONTRACTOR shall be responsible for assisting SCDOT in the development of the railroad agreement by providing requested information.
3. The CONTRACTOR shall be responsible for all costs to the Railroad Company or Companies for services provided by the Railroad or the Railroad's Agent, as detailed in the executed Railroad Agreement between the SCDOT and the Railroad. This includes all expenses such as railroad flagging operations. The CONTRACTOR shall be responsible for all other costs associated with designing and constructing the project as described in the executed Railroad Agreement between the SCDOT and the Railroad Company. The CONTRACTOR shall include all costs associated with these requirements in the final bid price. Once a contract is executed, SCDOT shall administer invoicing for costs to the Railroad Company or Companies. Monies will be deducted from the CONTRACTOR's progress payments after payments are made to the Railroad Company.
4. All design and construction activities in, adjacent to, over or under the railroad shall comply with all applicable Federal and State laws and standards, all terms identified in the Special Provisions for Protection of Railway Interests, and all terms of the final agreement executed with the Railroad Company.
5. The CONTRACTOR shall be required to meet the Railroad's Insurance Requirements as specified in the Special Provisions for Protection of Railway Interests.
6. The CONTRACTOR shall attend a mandatory meeting with the SCDOT's Utilities Office and Railroad Projects Office within 30 days after the Notice to Proceed. The CONTRACTOR shall use the SCDOT approved agreement language and procedures, that will be provided in this meeting.

7. CONTRACTOR shall provide project specific information to SCDOT for inclusion into the agreements. The CONTRACTOR shall anticipate and include in the proposed schedule a minimum 90-day approval time-frame for all railroad agreements. If said Railroad Companies interfere or fail to provide information in a timely manner, SCDOT shall provide a time extension for Railroad Company delays when CONTRACTOR can demonstrate that appropriate coordination efforts have been made to expedite the railroad coordination, and that the delay has a direct impact on the approved Critical Path. CONTRACTOR shall not be entitled to additional compensation for interference or delays related to railroad coordination.
8. CONTRACTOR shall anticipate the need for a separate right-of-entry agreement between the CONTRACTOR and Railroad for surveys, borings, etc. The required PE Agreement, between SCDOT and Railroad, must be executed before Railroad will review or comment on any design questions or submittals from the CONTRACTOR. The Construction Agreement, between SCDOT and Railroad, must be executed before any construction activities can begin at the railroads.
9. CONTRACTOR is advised that all utility relocations required within railroad right-of-way will require separate agreements between the affected utility company and the Railroad.

VIII. RIGHT OF WAY ACQUISITION

Right of Way Services

1. CONTRACTOR, acting as an agent on behalf of the State of South Carolina, shall provide right of way services for the Project unless otherwise directed herein. SCDOT's Right of Way office, through its assigned project manager and/or other designee, will retain final authority for approving just compensation, relocation benefits, administrative settlements, and legal settlements.
2. Right of way services shall include written appraisal, negotiation, acquisition, and relocation assistance services. CONTRACTOR shall be responsible for all costs related to these right of way services. CONTRACTOR will provide expert testimony and SCDOT will provide legal services necessary for any cases that are to be resolved by trial. Experts are defined as engineering and appraisal witnesses. SCDOT will designate a hearing officer to hear any relocation assistance appeals. SCDOT 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.
3. All offers of just compensation will be based on a written approved appraisal unless prior approval is given to CONTRACTOR by SCDOT. If SCDOT decides to utilize cost estimate offers, SCDOT will prepare the cost estimates and provide CONTRACTOR with the approved right of way cost estimate. SCDOT may allow offers to be made based on cost estimates on tracts estimated to be \$20,000 or less

and determined by SCDOT to be non-complicated. In the event the cost estimate offer is rejected by the property owner, a written appraisal shall be required.

4. SCDOT will be responsible for reviewing and approving all appraisals and setting just compensation. Appraisals will be reviewed and released within 15 business days of receipt. If appraisal review cannot be completed within 15 business days because of deficiencies within the appraisal, the Rights of Way Consultant will be notified immediately of the appraisal status. SCDOT will provide appraisal reviews complying with the technical review guidelines of SCDOT's Right of Way Appraisal Manual. The review appraiser will be an SCDOT staff appraiser or a review appraiser from SCDOT's approved reviewer list. SCDOT will be responsible for review appraiser costs.
5. CONTRACTOR shall carry out the responsibilities as follows:
 - a. Acquire property in accordance with all Federal and State laws, guidelines, and regulations, including but not limited to the Uniform Relocation and Real Property Acquisition Act of 1970, as amended (the "Uniform Act"), the SCDOT Acquisition Manual, the SCDOT Appraisal Manual, SCDOT Relocation Manual, and the South Carolina Eminent Domain Procedure Act ("The Act"). CONTRACTOR shall not be entitled to an increase in the Contract Price for acquisition of borrow sources.
 - b. Submit procedures for handling right of way acquisitions and relocations to the SCDOT for approval prior to commencing right of way activities. These procedures are to show CONTRACTOR'S methods, including the appropriate steps and workflow required for appraisal, acquisition, and relocation. These procedures shall also include an appropriate time allowance for SCDOT's right of way project manager to approve just compensation, relocation benefits, administrative settlements, and legal court settlements.
 - c. CONTRACTOR shall be granted the authority to negotiate administrative settlements up to a set amount. This maximum administrative settlement amount for this Project shall be set by SCDOT's Right of Way office and provided in writing to the CONTRACTOR upon review and approval of the right of way procedures. SCDOT's right of way project manager will issue decisions on approval requests within three business days concerning just compensation, relocation benefits, administrative settlements, and legal settlements. This commitment is based on the procedures providing a reasonable and orderly workflow and the work being provided to SCDOT's right of way project manager as completed. Regardless of amount, CONTRACTOR shall send all administrative settlements to SCDOT's right of way project manager for final concurrence and signature.
 - d. Utilize SCDOT's right of way project tracking system and provide an electronic status update a minimum of twice per month or upon request by SCDOT's right of way project manager.

- e. As part of the right of way acquisition and relocation procedures, include a right of way quality control plan to the SCDOT for review prior to commencing right of way activities. SCDOT standard forms and documents will be used to the extent possible.
- f. Provide a toll free telephone number for landowners and displaced persons to call and an office near the Project which is located within the State of South Carolina for the duration of the right of way acquisition and relocation services for this Project.
- g. Provide a current title certificate by a licensed South Carolina attorney for each parcel within 90 days of the date of closing or the date of filing of the Condemnation Notice.
- h. Prior to preparing appraisals, CONTRACTOR shall determine the appraisal scope for each tract in conjunction with SCDOT's Chief Appraiser or designee. Appraisals shall be prepared in accordance with SCDOT's Right of Way Appraisal Manual. Appraisals shall be prepared by appraisers from SCDOT's approved list of active fee appraisers.
- i. Prepare and obtain execution of all documents conveying title. Prior to recording, CONTRACTOR shall present these documents to SCDOT's right of way project manager. The SCDOT's right of way project manager will review the documents and provide comments within five business days. SCDOT review comments will be sent to the CONTRACTOR, who shall respond within five business days. SCDOT will review the CONTRACTOR'S revised documents and will provide additional comments, if warranted, within five business days. After documents are accepted by the right of way project manager, documents will be forwarded to Director of Right of Way's Office for final approval, which will be obtained within 15 business days. Upon final approval, SCDOT will provide payment to the property owner and provide a notification to CONTRACTOR within 30 business days. CONTRACTOR shall record documents conveying title to such properties to SCDOT with the Office of the Register of Deeds, and deliver all executed and recorded general warranty deeds to SCDOT. For all properties acquired in conjunction with the Project, title will be acquired in fee simple (except that SCDOT may, in its sole discretion and by written notification from SCDOT's right of way project manager, direct the acquisition of a right of way easement or permission, in lieu of fee simple title) and shall be conveyed to "The South Carolina Department of Transportation" by general warranty deed, free and clear of all liens and encumbrances except permitted encumbrances.
- j. Because these acquisitions are being made as agent on behalf of the State of South Carolina, SCDOT 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 CONTRACTOR. When SCDOT authorizes the filing of a condemnation,

CONTRACTOR shall prepare a Notice of Condemnation in the name of SCDOT, and submit it to SCDOT. The SCDOT's right of way project manager will review the documents and provide comments within five business days. SCDOT review comments will be sent to the CONTRACTOR, who shall respond within five business days. SCDOT will review the CONTRACTOR'S revised documents and will provide additional comments, if warranted, within five business days. After documents are accepted by the right of way project manager, documents will be forwarded to the Director of Right of Way's Office for final approval, which will be obtained within 15 business days. Upon final approval, SCDOT will provide payment to the Clerk of Court and provide a notification to CONTRACTOR within 30 business days. SCDOT will serve appropriate condemnation documents and pleadings, and request priority status pursuant to S.C. Code Ann. Section 28-2-310(1976, as amended).

- k. SCDOT shall prosecute condemnation proceedings to final judgment pursuant to the requirements of the South Carolina Eminent Domain Procedures Act. The procedure shall be by way of trial as provided by Section 28-2-240 of "The Act". SCDOT shall be responsible for obtaining legal representation and CONTRACTOR will be responsible for providing expert witnesses, necessary for condemnation actions, at its own expense. All settlements of condemnation cases shall be at SCDOT's sole discretion.
- l. CONTRACTOR shall provide a right of way certification and SCDOT shall approve and sign that certification prior to CONTRACTOR entering the property. Only in exceptional circumstances will a certification be approved based on a right of entry. Certification may be on a tract-by-tract basis.
- m. If after right of entry Certifications have been submitted there remains outstanding remaining tracts that have not been resolved, CONTRACTOR shall exercise care in its operations when working in proximity to adjacent developed properties, properties not yet acquired, and residences or businesses that are to be relocated. CONTRACTOR shall submit a plan to the SCDOT's right of way project manager for approval to:
 - (i.) Establish a clear zone adjacent to properties occupied by persons to be displaced in which construction equipment shall not be operated or parked,
 - (ii.) Establish a clear zone for construction for properties occupied by persons to be displaced to prevent undue impacts or hardships,
 - (iii.) Establish a method of protecting equipment from vandalism or unauthorized use,
 - (iv.) Perform all burning in accordance with applicable laws and ordinances, with specific attention to SCDHEC's Bureau of Air Quality Control criteria which require compliance with the South Carolina Air Pollution Control laws, regulations, and standards as they concern the related work included in the Contract.

- (v.) Provide reasonable and safe access to residences or businesses that are to be displaced until such time as the property is vacant, and
 - (i.) Observe the property rights of landowners of adjacent and/or yet to be acquired properties.
- n. CONTRACTOR shall use reasonable care in determining whether there is reason to believe that property 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, CONTRACTOR shall take steps consistent with customary industry standards to investigate. SCDOT shall be notified of the presence of such materials before an offer is made to acquire the property.
- o. During the acquisition process and for a period of three years after final payment is made to CONTRACTOR for any phase of the work, all project documents and records not previously delivered to SCDOT, 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 SCDOT for inspection or audit.

Acquisition of Right-of-Way

1. The CONTRACTOR is responsible for verification of all information necessary for acquisition of the right of way.
2. Acquisition of any additional area (not right of way) desired by the CONTRACTOR for, but not limited to, construction staging, access or borrow pits, shall be the sole responsibility of CONTRACTOR, and any title or interest shall be secured in the name of the CONTRACTOR. CONTRACTOR shall provide SCDOT the location and documentation for these additional areas. CONTRACTOR shall furnish SCDOT a copy of any agreements, whether for purchase or lease, for the use of additional properties in conjunction with the construction of the Project. CONTRACTOR shall abide by the provisions of all applicable environmental permits, any conditions of individual right of way agreements, and all environmental commitments. Any necessary permit modifications are the responsibility of the CONTRACTOR. CONTRACTOR is responsible for all costs associated with these additional areas, including premium right-of-way costs. If additional right-of-way is necessary beyond what has been evaluated in the NEPA documentation, CONTRACTOR shall be responsible for any re-evaluation of the approved Environmental Documents.
3. Right of way acquisition costs shall be defined as amounts paid for: (1) direct payments for ownership or other property rights, and (2) direct payments for eligible relocation expenses as provided for under the Uniform Act less premium right of way acquisition costs.

4. Premium right of way acquisition costs shall be the amount a jury award or a settlement that exceeds “Just compensation.” “Just compensation” shall be defined as the value SCDOT approves for a parcel after the following procedure: CONTRACTOR shall submit its recommendation for just compensation based on appraisals/appraisal reviews or cost estimates which support the recommendation. If SCDOT’s right of way project manager approves CONTRACTOR’S recommendations, that value becomes just compensation. If SCDOT’s right of way project manager does not approve the recommendation, CONTRACTOR or SCDOT shall obtain another appraisal using an appraiser from the SCDOT’s approved list and submit this appraisal to SCDOT. SCDOT shall be responsible for the cost of the second appraisal. SCDOT shall assign a value to the parcel which shall be deemed just compensation supported by the appraisals for the parcel.
5. SCDOT shall be responsible for right of way acquisition costs and premium right of way costs except for those additional areas explained above.
6. Upon final completion of the project, if any right of way condemnation actions are still pending, CONTRACTOR shall be responsible for adequate security to cover its contractual obligation relating to right of way acquisition.

IX. PERMITS

- A. All permits necessary for completion of this project shall be procured by the CONTRACTOR. The CONTRACTOR shall comply with all local, state, and federal permitting requirements. Regarding any permit or license that must be obtained in the name of SCDOT, the CONTRACTOR shall perform all functions within its power to obtain the permit or license, and SCDOT shall fully cooperate in this effort and perform any functions that must be performed by SCDOT. The CONTRACTOR shall submit permit applications to SCDOT. SCDOT will submit the permit application to the appropriate permitting agency indicating that CONTRACTOR is acting as an agent for SCDOT. If said regulatory agencies fail to issue permits in a timely manner, SCDOT may, on an individual basis, consider a time extension for permit approval delays when CONTRACTOR can demonstrate that the application was submitted in a timely manner, all reasonable efforts have been made to expedite the permit approval, and that the delay has a direct impact on the Critical Path. CONTRACTOR shall not be entitled to additional compensation for delays in permit approval.

X. ENVIRONMENTAL COMPLIANCE

Compliance with Environmental Commitments

CONTRACTOR shall comply with all Environmental commitments and requirements including, but not limited to, the following:

1. Compliance with the provisions of all environmental permits applicable to the Project. A copy of the environmental document is included in Attachment B. Environmental Commitments are included in Exhibit 6.

2. Compliance with those stipulations and conditions under which SCDOT received approval of the Environmental Document(s) and any modifications resulting from a re-evaluation of the Document(s). If the CONTRACTOR elects to construct the Project in a manner that is not consistent with the assumptions in the SCDOT prepared environmental documents, the CONTRACTOR will be responsible for revising the environmental documents and provide any additional studies that may be required. All revisions will require SCDOT and FHWA, if applicable, approval prior to any right of way acquisition or construction activity;
3. Compliance with applicable laws and regulations relating to potential or actual hazardous materials that may be encountered in the course of carrying out this Agreement;
4. Carrying out all necessary social, economic, and environmental studies required by regulatory authorities in the course of construction;
5. Cost, preparation, revision, acquisition, compliance, and adherence to conditions of any permits required by federal, state, or local laws or regulations; The CONTRACTOR is responsible for any mitigation required by permits. Compensatory mitigation may be available through an approved mitigation bank or Permittee Responsible Mitigation (PRM) as define in EPA's 2008 Mitigation Rule; and
6. The resolution of any deviations from the contract documents, drawings or other information included in the environmental permits that would violate the intent or spirit of the permits. Any proposed changes within the permitted areas would need to be coordinated with SCDOT's Environmental Services Office.

Preconstruction / Partnering Conference(s)

CONTRACTOR shall conduct one (or more, if appropriate) pre-construction / partnering conference(s) prior to any construction activity to discuss environmental and permitting issues, which conference shall include all subcontractors, and, to the extent feasible, representatives from the U.S. Army Corps of Engineers, the S.C. Department of Health and Environmental Control Water Quality Division, the FHWA, CONTRACTOR, and SCDOT.

Protection of Archeological and Paleontological Remains and Materials

1. When archeological or paleontological remains are uncovered, CONTRACTOR shall immediately halt operations in the area of the discovery and notify SCDOT.
2. Archeological remains consist of any materials made or altered by man which remains from past historic or prehistoric times (i.e. older than 50 years) Examples include old pottery fragments, metal, wood, arrowheads, stone implements or tools, human burials, historic docks, structures or not recent (i.e. older than 100 years) vessel ruins. Paleontological remains consist of old animal remains, original or fossilized, such as teeth, tusks, bone, or entire skeletons.

3. SCDOT will have the authority to suspend the work for the purpose of preserving, documenting, and recovering the remains and materials of archeological and paleontological importance for the State. CONTRACTOR shall carry out all instructions of SCDOT for the protection of archeological or paleontological remains, including steps to protect the site from vandalism and unauthorized investigations, from accidental damage and from dangers such as heavy rainfall or runoff.
4. CONTRACTOR's Contract Time and or Contract Price shall be adjusted to the extent CONTRACTOR's cost and/or time of performance have been adversely impacted by the presence of archeological or paleontological remains.

Community and Public Relations Plan

The CONTRACTOR shall provide to SCDOT for review and written approval a Community Relations Plan as part of the Project in accordance with Exhibit 5. The Community Relations Plan shall describe how the CONTRACTOR will actively promote good relationships with local elected officials, the news media, and the community at large. All costs associated with community relations will be included in the Total Project Cost. SCDOT will expect the CONTRACTOR to maintain positive communications with the local community (including public meetings as necessary), the adjacent property owners, and local businesses. The Community Relations Plan shall be submitted within 45 calendar days after NTP.

XI. HAZARDOUS MATERIALS

Identified Hazardous Materials

1. The CONTRACTOR is referred, in addition to this Article, to Exhibit 6, Project Design Criteria and Attachment B for information and requirements regarding Hazardous Materials inspections and other environmental documentation regarding Hazardous Materials. The CONTRACTOR shall be responsible for handling, storage, remediation, and disposal of any materials, wastes, substances and chemicals deemed to be a solid waste or hazardous waste under applicable state or federal law, (hereinafter "Hazardous Materials") encountered at the Site which were identified in the Hazardous Materials inspections or other environmental documentation regarding Hazardous Materials provided in Exhibit 6, Project Design Criteria and Attachment B and the cost of these activities shall be included in the Contract Price.
2. If the CONTRACTOR's plan includes demolition, removal, or disposal of existing structures not previously inspected by SCDOT, the Contractor is required to perform lead-based paint and asbestos inspections on the existing structures prior to performing those activities. The cost of the lead-based paint and asbestos inspections shall be included in the Contract Price. Removal of lead-based paint and asbestos and lead-based paint and asbestos containing materials identified by inspections shall be by a qualified independent firm retained by the Department or

by negotiating a Contract Change Request with the CONTRACTOR as outlined in the procedures in Article XI.B.

3. If the CONTRACTOR's plan includes demolition, removal, or disposal of existing structures previously surveyed by SCDOT, but the asbestos inspection reports have expired, the CONTRACTOR is required to perform new asbestos inspections on the existing structures prior to performing those activities. The cost of the asbestos inspections shall be included in the Contract Price. The cost of removal, handling, storage, remediation, and disposal of asbestos containing materials identified in the expired inspection reports shall be included in the Contract Price.
4. A copy of the lead-based paint and asbestos inspection reports and the notification of demolition or renovation forms must be submitted to SCDHEC at least ten (10) working days prior to demolition of an existing structure. Prior to submitting the reports and forms to SCDHEC, the CONTRACTOR shall obtain the RCE's signature. The CONTRACTOR is responsible for obtaining all required permits to proceed with the work.
5. The CONTRACTOR is responsible for all necessary containment, removal, transportation, and disposal of the subsurface and surface Hazardous Materials identified in inspections or other environmental documentation provided in Attachment B in compliance with all applicable Federal (EPA, OSHA & DOT) and State (SCDHEC & SCDOT) and local (County and Municipality) requirements for Hazardous Materials and worker health and safety. The CONTRACTOR is responsible for obtaining all required permits to proceed with the work.

Unexpected Hazardous Materials

Unexpected Hazardous Materials are any Hazardous Materials not identified in Exhibit 6, Project Design Criteria and Attachment B that are present at the Site except any such Hazardous Materials that are present at the Site because of the action or omission of CONTRACTOR.

Upon encountering any Unexpected Hazardous Materials, the CONTRACTOR shall follow the procedures as described below:

1. CONTRACTOR shall stop Work immediately in the affected area and duly notify SCDOT and, if required by state or federal law, all government or quasi-government entities with jurisdiction over the Project or site.
2. Upon receiving notice of the presence of Hazardous Materials, SCDOT will take necessary measures required to verify that the Hazardous Materials are remediated or rendered harmless. Such necessary measures will include SCDOT either (i) retaining qualified independent firm or (ii) negotiating a Contract Change Request with CONTRACTOR.
3. CONTRACTOR shall resume Work at the affected area of the Project only after written notice from SCDOT that the (i) Hazardous Materials have been removed or

rendered harmless and (ii) all necessary approvals have been obtained from all government and quasi-government entities having jurisdiction over the Project.

4. CONTRACTOR's Contract Price and/or Contract Time shall be adjusted to the extent CONTRACTOR's cost and/or time of performance has been adversely impacted by the presence of Hazardous Materials.
5. If a Contract Change Request is negotiated, the CONTRACTOR shall comply with Article XI.A.5.

General Information

1. For purposes of this Project, the Hazardous Material Generator shall be listed as "SCDOT" of any and all Hazardous Materials and/or hazardous wastes associated with work on the Project, with the exception that CONTRACTOR shall be the generator for all Hazardous Materials it, its consultants, subconsultants, subcontractors or suppliers, brings on to the Project or that is brought to the Project by them and subsequently is caused to be released on the Project by the CONTRACTOR, CONTRACTOR's design consultants, subcontractors and suppliers. The foregoing shall not preclude or limit any rights or remedies that SCDOT may have against third parties and/or prior owners, lessees, licensees and occupants of the Project's right of way.
2. SCDOT is not responsible for Hazardous Materials actually brought to the Project by CONTRACTOR, CONTRACTOR's design consultants, subcontractors and suppliers or anyone for whose acts they may be or are liable. SCDOT is not responsible for negligent or willful acts by CONTRACTOR, CONTRACTOR's design consultants, subcontractors and suppliers or anyone for whose acts they may be or are liable relating to Hazardous Materials found at the site. CONTRACTOR shall indemnify, defend and hold harmless SCDOT and SCDOT's officers, directors, employees and agents from and against all claims, losses, damages, liabilities and expenses, including attorney's fees and expenses arising out of or resulting solely from those Hazardous Materials actually brought to the Project or negligent or willful acts relating to Hazardous Materials, or both by CONTRACTOR, CONTRACTOR's design consultants, subcontractors and suppliers or anyone for whose acts they may be or are liable.

XII. DEMOLITION, REMOVAL & DISPOSAL OF STRUCTURES

CONTRACTOR shall be responsible for the demolition, removal and disposal of all structures and their appurtenances within SCDOT Right of Way necessary for the completion of the Project, to include those portions which may extend outside the right of way, but were purchased as a part of the acquisition process. Structures shall include the bridges identified in the scope of work and all buildings acquired for the Project. All necessary permitting shall comply with Articles II.B.4 and IX of the Contract. Handling and disposal of Hazardous Materials shall be in accordance with Article XI of the Contract. Before demolition of the structures, the CONTRACTOR shall complete and submit a

Notification of Demolition and Renovation form to the South Carolina Department of Health and Environmental Control.

XIII. DIFFERING SITE CONDITIONS

Differing Site Conditions, Defined; Burden of Proof

1. “Differing Site Conditions” are concealed or latent physical conditions encountered at the Project site during the term of the Agreement that (i) materially differ from the conditions reasonably assumed to exist at the site (Type 1); or (ii) are of an unusual nature, differing materially from the conditions ordinarily encountered and generally recognized as inherent in the work provided for in the Agreement (Type 2). Type 1 conditions are those geotechnical or geological deviations from what is normally assume to exist based on information provided in the RFP and actual site location. The only Type 2 conditions eligible for relief under this Article XIII are:
 - a. The discovery at the site of any archaeological, paleontological, biological or cultural resource; provided that the existence of such resource was not disclosed in the RFP; and
 - b. The discovery at the site of any species listed as threatened or endangered under the federal or State Endangered Species Act, except for those species disclosed as threatened or endangered in the RFP; and
 - c. The discovery at the site of any manmade object or manmade condition not normally found in subsurface material; and
 - d. The discovery at, near or on the site of any unexpected artesian condition.
2. The definition of Differing Site Condition excludes unanticipated utilities and unexpected Hazardous Waste.
3. CONTRACTOR shall bear the burden of proving that a Differing Site Condition exists and that CONTRACTOR could not have reasonably (i) designed the Project or (ii) worked around the condition, including by resequencing, relocating, or redeploying its forces to other portions of the Project or other activities unrelated to its work, so as to avoid additional cost. CONTRACTOR shall have no right to claim that any condition constitutes a Differing Site Condition if (A) CONTRACTOR, or any person or entity for which CONTRACTOR is legally responsible, had actual knowledge regarding such conditions prior to submission of the Cost Proposal, or (B) such condition would have become known to CONTRACTOR based upon a Reasonable Investigation prior to the submission of the Cost Proposal, as defined below. Furthermore, CONTRACTOR hereby acknowledges and agrees that, based upon the opportunity to review all available information, seek reasonable additional information, visit the Project site prior to submission of the Cost Proposal, and make any additional subsurface explorations or soil tests that CONTRACTOR determined to have been useful, in each case,

prior to the submission of the Cost Proposal, it has assumed all risks with respect to the need to work around locations impacted by Differing Site Conditions.

Responsibility

1. Type 1: SCDOT is responsible for only Type 1 Differing Site Conditions that exist throughout a specified area around each SCDOT-provided test hole, as listed in the geotechnical data in Attachment B. For purposes of the Type 1 portion of the definition of Differing Site conditions, “reasonably assumed to exist” means that the geotechnical and geological conditions indicated with respect to each SCDOT test hole exist throughout an area represented by a five- foot radius drawn from the center of the test hole.
2. Type 2: SCDOT is responsible for only Type 2 Differing Site Conditions listed above.
3. CONTRACTOR shall assume responsibility for all other Differing Site Conditions not identified as Type 1 or Type 2.

Relief for Certain Differing Site Conditions

1. CONTRACTOR shall submit a Contract Change Request to seek any relief for Differing Site Conditions for which SCDOT has responsibility. So long as CONTRACTOR has met its burden of proof that a condition is a Differing Site Condition for which CONTRACTOR is entitled to certain relief. CONTRACTOR shall be entitled to a Change Order that provides for:
 - a. additional time, to achieve Substantial Completion for a Differing Site Condition that causes or will result in an identifiable and measurable disruption to the critical path under the then-current CPM Schedule, after consumption of all then-available float; provided, however, that SCDOT may, in its sole discretion, elects to order acceleration, in which case the Change Order shall not provide for an adjustment to the then-current CPM Schedule as a result of such Differing Site Condition;
 - b. actual, direct, and documented costs incurred solely and directly attributable to the Differing Site Condition;
 - c. acceleration costs, only if SCDOT elects to order acceleration.
2. CONTRACTOR’s entitlement to a Change Order is subject to the following additional limitations:
 - a. CONTRACTOR shall not be entitled to any disruption damages in connection with any additional costs claimed with respect to any Differing Site Condition;

- b. CONTRACTOR shall not be entitled to any punitive, indirect, special, incidental, or consequential damages in connection with any additional costs claimed with respect to any Differing Site Condition;
- c. Costs shall not exceed those allowed in, and calculated pursuant to Section 105.16.5 of the SCDOT Standard Specifications, with the exception of extended job site overhead rates which shall be as set forth in Exhibit 5 of the RFP;
- d. CONTRACTOR shall not be entitled to an extension of time or additional costs if the delay attributable to the Differing Site Condition is concurrent with any other unrelated delay to an activity on the critical path under the then-current CPM Schedule for which CONTRACTOR is responsible under this Agreement.
- e. If SCDOT directs acceleration of the Work, the as part of CONTRACTOR's CCR, CONTRACTOR shall show all acceleration costs associated with meeting the original scheduled date for Substantial Completion.

Differing Site Condition Procedure

1. If CONTRACTOR encounters known or suspected Differing Site Conditions, CONTRACTOR shall promptly notify SCDOT by either submitting a formal notice to SCDOT (for those conditions that CONTRACTOR anticipates are CONTRACTOR's responsibility) or submitting a Contract Change Request before (for those conditions that CONTRACTOR anticipates are SCDOT's responsibility), in either case without substantially disturbing or altering the affected area. If CONTRACTOR is entitled to relief, then CONTRACTOR shall not resume work that affects or reasonably could affect the condition until a Change Order is executed or a Force Account order is issued for the affected work. If CONTRACTOR is not entitled to relief, or if CONTRACTOR elects not to pursue relief to which it may otherwise be entitled, then CONTRACTOR shall not resume work that affects or reasonably could affect the condition until SCDOT consents to work resuming, subject to applicable law and governmental approvals.
2. Each Contract Change Request relating to a Differing Site Condition shall be accompanied by:
 - a. a statement signed by a qualified professional setting forth (i) all relevant assumptions made by CONTRACTOR with respect to the condition at the relevant portion of the Site, (ii) justifying as reasonable the basis for all such assumptions which includes supporting documentation, (iii) explaining exactly how the condition encountered qualifies as a Differing Site Condition and (iv) listing the specific work-arounds the CONTRACTOR undertook, to mitigate any cost and delay effects of the encounter with the condition, and
 - b. a signed statement certifying that CONTRACTOR, and any person or entity for which CONTRACTOR is legally responsible (i) had no actual knowledge

regarding such condition as of the submission of the Cost Proposal and (ii) such condition would not have become known to CONTRACTOR based upon a Reasonable Investigation.

3. If the request is based on Type 1 Differing Site Conditions, the Contract Change Request shall also include detailed information regarding the alleged error in the boring data provided by owner or performed by CONTRACTOR forming the basis for the request, and shall explain how CONTRACTOR's assumptions would have changed had the boring data been accurate.
4. Upon submittal of a Contract Change Request or other notice as set forth above, SCDOT will investigate the conditions within three business days and if it is determined that (1) a Differing Site Condition exists, (2) the condition is SCDOT's responsibility, and (3) the condition causes an increase in the cost or time required for performance of the work, the Contract will be adjusted consistent with the relief provided above.
5. SCDOT shall have the right to require the CONTRACTOR to resume work in the area at any time, even though an investigation may still be ongoing. CONTRACTOR shall promptly resume work in the area upon receipt of notification from SCDOT to do so.

Reasonable Investigation

"Reasonable Investigation" means the following activities by appropriate, qualified professionals prior to the submission of the Cost Proposal:

1. Visit and visual, non-intrusive inspection of the site and adjacent locations, except areas to which access rights have not been made available prior to the submission of the Cost Proposal;
2. Review and analysis of all reference documents;
3. Review and analysis of SCDOT-provided governmental approvals or permits, if any, available prior to the submission of the Cost Proposal;
4. Reasonable inquiry with real property, particularly those properties indicating former gas stations/auto garages, and utility owners or occupants, including request for and review of plans provided thereby, if any;
5. Review and analysis of laws, regulations, rules, ordinances, etc. applicable to the Project prior to the submission of the Cost Proposal; and
6. Other activities sufficient to familiarize CONTRACTOR with surface and subsurface conditions, including the presence of utilities, hazardous materials, archeological, paleontological and cultural resources, and threatened or endangered species, affecting the site or surrounding locations.

XIV. FORCE MAJEURE

Delays or failures of performance, in each case, that materially and adversely affect performance of the CONTRACTOR hereunder, shall not constitute breach of the Agreement if and to the extent such delays or failures of performance result in a delay to the critical path identified in the current accepted CPM Schedule that are caused by:

Causes

1. acts of God or the public enemy;
2. expropriation or confiscation of facilities;
3. compliance with any order or request of any governmental authority other than SCDOT or a party in privity with it;
4. a change in law after the CONTRACTOR'S submission in response to the RFP that directly and substantially affects performance of the Project;
5. acts of war (including civil and revolutionary); invasion, armed conflict, violent act of foreign enemy, military or armed blockade, military or armed takeover of the Project or the Site;
6. rebellion, terrorism, riot, insurrection, civil commotion or sabotage that causes direct physical damage to, or otherwise directly causes interruption to construction or direct losses during maintenance of the Project;
7. fires, floods, earthquakes, including all foreshocks and aftershocks, where such earthquakes include ground shaking, liquefaction, settlement, or ground movements that directly impact, and cause damage to, temporary or permanent works of the Project; landslides caused by natural events, tornados, hurricanes, tropical storms, sinkholes caused by natural events, in each case directly impacting the physical improvements of the Project or CONTRACTOR'S performance of the scope of the work;
8. explosions, nuclear explosion, including radioactive contamination that triggers CONTRACTOR's obligations pertaining to hazardous materials hereunder and, in each case directly impacting the physical improvements of the Project or performance of the CONTRACTOR's scope of work,
9. national or regional unavailability or shortage of materials as determined by SCDOT after the CONTRACTOR's submittal of the Technical Proposals;
10. embargos directly affecting materials required to perform the CONTRACTOR'S scope of the work;

11. quarantine or suspension by the Governor, President, or other regional authority, or declared epidemic or pandemic, in each case, directly affecting the CONTRACTOR's performance of the scope of the work;
12. declared state of emergency by the Governor, the U.S. President or regional authority having jurisdiction over the Project or the CONTRACTOR'S performance of the scope of the work;
13. strikes (both national or regional strikes) or other concerted acts of workman not arising out of or relating to CONTRACTOR or any person or entity for which CONTRACTOR is responsible;
14. vehicle, as defined by 56-1-10 of South Carolina Code of Laws, collision that occurs prior to Final Completion, the impact of which causes damage to full pavement structure, bridge structure, noise wall, barrier wall/retaining wall or overhead sign structure of the Project;

(each of the foregoing a "Force Majeure Event"), except, in each case, to the extent that any of the foregoing events or consequences of such events (i) arose out of (A) any breach of Contract by CONTRACTOR or any person or entity for whom CONTRACTOR is legally responsible, (B) any act or omission by CONTRACTOR or any such person or entity, (C) any negligence, recklessness, willful misconduct, fraud, or violation of laws by CONTRACTOR or any such person or entity; or (ii) could reasonably have been avoided by CONTRACTOR or any such person or entity (by the exercise of caution, due diligence or reasonable efforts, or otherwise). Any expense attributable to such occurrence of a Force Majeure Event shall not entitle CONTRACTOR to an adjustment in the Contract Price, as it is the Parties' intent that these events will be compensated under the CONTRACTOR's appropriate insurance policy. The duration of delay to the critical path identified in the current accepted CPM Schedule directly caused by a Force Majeure Event shall be added to the Contract Time.

CONTRACTOR shall bear the burden of proving that a Force Majeure Event exists and that CONTRACTOR could not have reasonably worked around the condition, including by resequencing, relocating, or redeploying its forces to other portions of the Project or other activities unrelated to its work, so as to avoid additional delay or cost.

XV. WARRANTY

CONTRACTOR Warranties

1. CONTRACTOR warrants that it will perform all services in accordance with the standards of care and diligence normally practiced by recognized engineering and construction firms in performing services and obligations of a similar nature. CONTRACTOR warrants that all materials and equipment furnished shall be of good quality and new unless otherwise authorized by SCDOT and that the construction shall conform to the Contract requirements. CONTRACTOR agrees to promptly correct, at its own expense, defects or deficiencies in materials and

workmanship that appear prior to and during a period of three years after Final Completion of the Project. This shall include all plant-produced materials (i.e. asphalt, concrete, etc.). CONTRACTOR shall not be responsible for damages caused by SCDOT's failure to provide timely notification of potentially damaged or defective work of which SCDOT had actual knowledge. CONTRACTOR shall properly perform, at the written request of SCDOT made at any time within the warranty period after Final Completion of the Project as defined in Article IV.A.5, all steps necessary to satisfy the foregoing warranty and correct any element of the Project or the services that is defective or does not reflect such standards of care and diligence. The cost of such corrective services shall be CONTRACTOR's responsibility.

2. CONTRACTOR further warrants the performance of all bridge components on all structures for three years from Final Completion of the Project. If a component fails to perform properly for any reason, including but not limited to normal wear and tear, the CONTRACTOR shall replace the failed component at no cost to SCDOT.
3. The warranty periods begin at Final Completion of the Project. CONTRACTOR shall immediately abate any warranty deficiency that poses an unsafe condition to the public; otherwise deficiencies shall be corrected no later than 30 days from the determination of corrective action. In the event CONTRACTOR, after notice, fails to immediately abate the deficiency or fails to make correction within the prescribed 30 days, SCDOT may have the deficiency corrected. All costs associated with such correction by SCDOT shall be the responsibility of the CONTRACTOR and his Surety. With respect to any component that is repaired or replaced pursuant to this warranty, the warranty period of that component shall be the longer of one year from repair or replacement of the component or the remainder of the original warranty period.
4. CONTRACTOR shall take all steps necessary to transfer to SCDOT any manufacturer's or other third-party's warranties of any materials or other services used in the construction of the Project.
5. These warranties are in addition to all warranties implied by law.

XVI. INDEMNITY

Indemnifications by CONTRACTOR

1. Definitions
 - a. **Indemnified Parties** means SCDOT, the State of South Carolina, their respective successors, assigns, officeholders, officers, directors, agents, representatives, consultants and employees.
 - b. **Loss or Losses** means any loss, damage, injury, liability, obligation, cost, response cost, expense (including attorneys', accountants' and expert

witnesses' fees and expenses (including those incurred in connection with the enforcement of any indemnity or other provision of the Agreement)), fee, charge, judgment, penalty, fine or third party claims. Losses include injury to or death of persons, damage or loss of property, and harm or damage to natural resources.

c. **CONTRACTOR-Related Entity** means:

- (i.) CONTRACTOR;
- (i.) CONTRACTOR's shareholders, partners, joint venturers or members;
- (ii.) Subcontractors and suppliers;
- (iii.) Any other persons performing any of the work;
- (iv.) Any other persons for whom CONTRACTOR may be legally or contractually responsible; and
- (v.) The employees, agents, officers, directors, shareholders, representatives, consultants, successors, assigns and invitees of any of the foregoing.

2. CONTRACTOR shall release, defend, indemnify and hold harmless the Indemnified Parties from and against any and all third-party claims and other Losses (including those incurred in connection with the enforcement of this indemnity) arising out of, relating to or resulting from the following (each an "Indemnified Claim"):

- a. The breach or alleged breach of any of this Contract by CONTRACTOR-Related Entity;
- b. The failure or alleged failure by any CONTRACTOR-Related Entity to comply with any SCDOT approvals, governmental approvals, any applicable environmental laws or other governmental rules (including environmental laws);
- c. Any alleged patent or copyright infringement or other allegedly improper appropriation or use of trade secrets, patents, proprietary information, know-how, copyright rights or inventions in performance of the work, or arising out of any use in connection with the Project of methods, processes, designs, information, or other items furnished or communicated to SCDOT or another Indemnified Party pursuant to the Contract; provided, that this indemnity shall not apply to any infringement resulting from SCDOT's failure to comply with specific written instructions regarding use provided to SCDOT by CONTRACTOR;
- d. The actual or alleged CONTRACTOR fault in or associated with performance of the work;
- e. Any and all claims by any governmental entity or taxing authority claiming taxes based on gross receipts, purchases or sales, the use of any property or

income of any CONTRACTOR-Related Entity or any of their respective agents, officers or employees with respect to any payment for the work made to or earned by any CONTRACTOR-Related Entity;

- f. Any and all stop notices, liens and claims filed in connection with the work, including all expenses and attorneys', accountants' and expert witness fees and costs incurred in discharging any stop notice, lien or claim, and any other liability to subcontractors, laborers and suppliers for failure to pay sums due for their work, services, materials, goods, equipment or supplies, provided that SCDOT is not in default in payments owing (if any) to CONTRACTOR with respect to such work and such SCDOT payment default is the direct reason for the stop notice, lien or claim;
- g. Any release of Hazardous Materials or threatened release of Hazardous Materials
 - (i.) which was brought onto the Project site by any CONTRACTOR-Related Entity, or
 - (ii.) attributable to any CONTRACTOR fault, regardless of the source, origin, or method of deposit of such Hazardous Materials;
- h. To the extent of CONTRACTOR fault, the claim or assertion by any other person (excluding persons in privity of contract with SCDOT) that any CONTRACTOR- Related Entity (i) interfered with or hindered the progress or completion of work being performed by such other contractor, so as to cause inconvenience disruption, delay, or loss, except where the CONTRACTOR-Related Entity was not in any manner engaged in performance of the work, or (ii) failure of any CONTRACTOR-Related Entity to cooperate reasonably with other contractors in accordance therewith;
- i. Any dispute between CONTRACTOR and a Utility Owner, or any CONTRACTOR-Related Entity's performance of, or failure to perform, the obligations with respect to such Utility Owner;
- j. Any dispute between CONTRACTOR and the Railroad, or any CONTRACTOR-Related Entity's performance of, or failure to perform, or obtain approval with respect to the Railroad;
- k. Any CONTRACTOR-Related Entity's breach of or failure to perform an obligation that SCDOT owes to a third person, including governmental entities, railroads, and Utility Owners, under law or under any agreement between SCDOT and a third person, where (i) SCDOT has delegated performance of the obligation to CONTRACTOR under the Contract or (ii) the acts or omissions of any CONTRACTOR- Related Entity which render SCDOT unable to perform or abide by an obligation that SCDOT owes to a third Person, including governmental entities and Utility Owners, under

any agreement between SCDOT and a third person, where the agreement was expressly disclosed to CONTRACTOR;

- l. Inverse condemnation, trespass, nuisance or similar taking of or harm to real property by reason of: (i) the failure of any CONTRACTOR-Related Entity to comply with good industry practices, requirements of the Contract or governmental approvals, (ii) any CONTRACTOR default, or (iii) the actual physical entry onto or encroachment upon another's property by any CONTRACTOR-Related Entity;
 - m. The failure of CONTRACTOR to fully comply with any insurance requirements described in the Contract;
 - n. Any failure to protect and/or maintain valuable papers and records that the Contract require CONTRACTOR to maintain;
 - o. Any act, claim or amount arising or recovered under workers' compensations law;
 - p. Any errors, inconsistencies or other defects in the design or construction of the Project and/or of Utility Adjustments included in the work;
 - q. Any violation of any representation, warranty, or other covenant, obligation or agreement under the Contract or governmental laws and rules to be complied with by CONTRACTOR hereunder or thereunder;
 - r. Any failure to pay any liquidated damages under the Contract;
 - s. Errors in the design documents provided by CONTRACTOR (including those pertaining to Utility Adjustments), regardless of whether such errors were also included in the RFP, Exhibits and Attachment B. CONTRACTOR agrees that, because the concepts in the RFP, Exhibit and Attachment B are subject to review and modification by CONTRACTOR, it is appropriate for CONTRACTOR to assume liability for errors in the completed Project even though they may be related to errors in the RFP, Exhibits and Attachment B; and/or
 - t. any act or omission of any CONTRACTOR-Related Entity or any CONTRACTOR default in any way causing, contributing to, relating to or arising out of (i) any bodily injury (including death) to any person or (ii) any Losses to the tangible property of third parties.
3. Subject to the releases and disclaimers herein, CONTRACTOR's indemnity obligation shall not extend to any third-party Losses to the extent directly caused by:

- a. The gross negligence, recklessness, willful misconduct, bad faith, or fraud of the Indemnified Party;
 - b. SCDOT's breach of any of its material obligations under the Contract;
 - c. An Indemnified Party's violation of any governmental laws, regulations, ordinances, zoning, permits, certifications, or approvals; or
 - d. Any material defect inherent in a prescriptive design, construction, operations or maintenance specification included in the design criteria, exhibits and Attachment B, but only where prior to occurrence of the third-party Losses, CONTRACTOR complied with such specification and did not actually know, or would not reasonably have known, while exercising reasonable diligence, that it was deficient or, if CONTRACTOR actually knew of the deficiency, unsuccessfully sought SCDOT's waiver or approval of a deviation from such specification.
4. In claims by an employee of CONTRACTOR, a subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section A above, shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or a subcontractor under workers' compensation, disability benefit or other employee benefits laws.
 5. CONTRACTOR is advised that Utility Agreements and the Railroad Agreement may include certain agreements by SCDOT to indemnify, defend, save and hold harmless the Utility Owners and Railroad, respectively, with respect to certain matters. CONTRACTOR's obligations under this Indemnity Article shall automatically apply to require CONTRACTOR, to release, indemnify, defend, save and hold harmless the Utility Owners, Railroad and their employees and agents, in addition to the Indemnified Parties, with respect to all such matters.
 6. For purposes of this Section I, "third party" means any Person other than an Indemnified Party and CONTRACTOR, except that a "third party" includes any Indemnified Party's employee, agent or contractor who asserts a claim that is (a) against an Indemnified Party, (b) within the scope of the indemnities and (c) not covered by the Indemnified Party's worker's compensation program.
 7. SCDOT, and the State shall have no obligation to indemnify, defend and hold harmless CONTRACTOR or any other CONTRACTOR-Related Entity.
 8. The requirement to provide an indemnity as specified in this Section I is intended to provide protection to SCDOT with respect to third-party claims associated with the event giving rise to the indemnification obligation, and is not intended to provide SCDOT with an alternative cause of action against CONTRACTOR for

Losses incurred directly by SCDOT with respect to the event giving rise to the indemnification obligation.

Defense and Indemnification Procedures

1. If SCDOT receives notice of a claim or otherwise has actual knowledge of a claim that it believes is within the scope of the indemnities under Section I, and if SCDOT gives notice thereof, then SCDOT shall have the right to conduct its own defense unless either an insurer accepts defense of the claim within the time required by governmental law and rules or CONTRACTOR accepts the tender of the claim in accordance with Section B.5 below.
2. If the insurer under any applicable insurance policy accepts the tender of defense, SCDOT and CONTRACTOR shall cooperate in the defense as required by the insurance policy and, for purposes of the Contract and proceedings relating to such matter, the applicable Indemnified Party/ies shall be deemed to be (an) insured party/ies. If no insurer under potentially applicable insurance policies provides defense, then Section B.9. below shall apply.
3. If the defense is tendered to CONTRACTOR, then within 30 days after receipt of the tender, CONTRACTOR shall provide to the Indemnified Party written notice whether it has tendered the matter to an insurer, and, if not tendered to an insurer or if the insurer has rejected the tender, shall deliver a written notice stating that CONTRACTOR:
 - a. Accepts the tender of defense and confirms that the claim is subject to full indemnification hereunder without any "reservation of rights" to deny or disclaim full indemnification thereafter;
 - b. Accepts the tender of defense but with a "reservation of rights" in whole or in part; or
 - c. Rejects the tender of defense based on a determination that it is not required to indemnify against the claim under the terms of this Contract.
4. If CONTRACTOR has tendered the matter to an insurer, and the insurer has not rejected the tender, then, for purposes of the Contract and proceedings relating to such matter, the applicable Indemnified Party/ies shall be deemed to be (an) insured party/ies.
5. If CONTRACTOR accepts the tender of defense under Section B.3.a or B.3.b above, CONTRACTOR shall have the right to select legal counsel for the Indemnified Party, subject to reasonable approval by the Indemnified Party, and CONTRACTOR shall otherwise control the defense of such claim, including settlement, and bear the attorneys', consultants' and expert witness fees and costs of defending and settling such claim. During such defense:

- a. CONTRACTOR shall fully and regularly inform the Indemnified Party of the progress of the defense and of any settlement discussions; and
 - b. The Indemnified Party shall reasonably cooperate in said defense, provide to CONTRACTOR all materials and access to personnel it requests as necessary for defense, preparation and trial and which or who are under the control of or reasonably available to the Indemnified Party, and, subject to governmental laws and rules, maintain the confidentiality of all communications between it and CONTRACTOR concerning such defense.
6. If CONTRACTOR responds to the tender of defense as specified in Section B.3.c, the Indemnified Party shall be entitled to select its own legal counsel and otherwise control the defense of such claim, including settlement.
 7. Notwithstanding Sections B.1 and B.2, the Indemnified Party may elect to temporarily assume its own defense at any time by delivering to CONTRACTOR written notice of such election and the reasons therefor, if the Indemnified Party, at the time it gives written notice of the claim or at any time thereafter, reasonably determines that:
 - a. A conflict exists between it and CONTRACTOR which prevents or potentially prevents CONTRACTOR from presenting a full and effective defense;
 - b. CONTRACTOR is otherwise not providing an effective defense in connection with the claim; or
 - c. CONTRACTOR lacks the financial capacity to satisfy potential liability or to provide an effective defense.
 8. If the Indemnified Party is entitled and elects to conduct its own defense pursuant hereto of a claim for which it is entitled to indemnification, CONTRACTOR shall reimburse on a current basis all costs and expenses the Indemnified Party incurs in investigating and defending such claim. If the Indemnified Party is entitled to and elects to conduct its own defense, then:
 - a. In the case of a defense that otherwise would be conducted under Section B.3.a the Indemnified Party shall have the right to settle or compromise the claim with CONTRACTOR's relevant insurer(s)' prior written consent, which, in each case, shall not be unreasonably withheld or delayed;
 - b. In the case of a defense that otherwise would be conducted under Section B.3.b, the Indemnified Party and CONTRACTOR shall consult with each other on a regular basis to determine whether settlement is appropriate and, subject to the rights of any insurer providing coverage for the claim under a policy required under this Contract and the Indemnified Party shall have the right to settle or compromise the claim with CONTRACTOR's prior written

consent without prejudice to the Indemnified Party's rights to be indemnified by CONTRACTOR; and

- c. In the case of a defense conducted under Section B.3.c, the Indemnified Party shall, subject to the rights of any insurer providing coverage for the claim under a policy required under this Contract, have the right to settle or compromise the claim without CONTRACTOR's prior written consent and without prejudice to its rights to be indemnified by CONTRACTOR.
 - d. Where CONTRACTOR has the right under these procedures to settle a claim, in no event shall CONTRACTOR agree to a settlement that will increase the risk, liability or costs of SCDOT or any other Indemnified Party or adversely affect the Project, the work or the completion deadlines without the prior written consent of SCDOT or such Indemnified Party, in its sole discretion.
9. A refusal of, or failure to accept, a tender of defense, as well as any dispute over whether an Indemnified Party which has assumed control of defense is entitled to do so under Section B.8, shall be resolved according to the Claims Procedure. CONTRACTOR shall be entitled to contest an indemnification claim and pursue, through the Claims Procedure, recovery of defense and indemnity payments it has made to or on behalf of the Indemnified Party.

No Effect on Other Rights

The foregoing obligations shall not be construed to negate, abridge, or reduce other rights or obligations which would otherwise exist in favor of an Indemnified Party hereunder.

CERCLA Agreement

1. The indemnities set forth in Section A.7 are intended to operate as agreements pursuant to Section 107(e) of CERCLA to insure, protect, hold harmless and indemnify the Indemnified Parties..

XVII. DEFAULT; SUSPENSION; TERMINATION

CONTRACTOR Events of Default (Contractor Default).

1. CONTRACTOR shall be in default of this Agreement if:
 - a. CONTRACTOR fails to begin performance of the scope of the work promptly following issuance of the Notice to Proceed;
 - b. CONTRACTOR fails to perform the scope of the work in accordance with (i) the documents described in Article I (contract documents), (ii) the final, and as applicable, as-approved deliverables under Article II.J, (iii) applicable standards set forth therein;

- c. CONTRACTOR refuses to remove, replace, and correct rejected materials, or nonconforming or unacceptable work;
- d. CONTRACTOR (i) suspends, ceases, or stops performance of the scope of the work, or (ii) fails to perform the scope of the work continuously and diligently to completion, in either case (A) where CONTRACTOR fails to resume performance or to prosecute the work, as determined in SCDOT's reasonable discretion) as is identified in Preliminary Notice of Delinquency and thereafter in any Notice of Delinquency (as each such term is defined in Section 108 of the Standard Specification), within 15 days after dispatch of such Notice of Delinquency, and (B) excluding work stoppages directed by SCDOT, approved by SCDOT, or for other reasons expressly permitted under this Agreement;
- e. CONTRACTOR abandons all or a material part of the Project, which abandonment is deemed to occur if (i) CONTRACTOR demonstrates through statements, acts, or omissions an intent not to continue, for any reason other than for a reasons expressly permitted under this Agreement, or (ii) no satisfactory progress in the work is performed for a continuous period of more than 15 days unless due to CONTRACTOR's compliance with work stoppages directed by SCDOT or for reasons expressly permitted under this Agreement;
- f. CONTRACTOR fails to resume performance of the scope of the work that has been suspended or stopped within five calendar days after (i) cessation of the event preventing performance (and for which CONTRACTOR is expressly permitted to have suspended or stopped performance under this Agreement) or (ii) receipt of notice from SCDOT to resume performance;
- g. Insolvency, Bankruptcy Events:
 - (i.) CONTRACTOR commences a voluntary case seeking liquidation, reorganization or other relief with respect to CONTRACTOR or CONTRACTOR's debts under any U.S. or foreign bankruptcy, insolvency or other similar law; seeking the appointment of a trustee, receiver, liquidator, custodian or other similar official of its, or any substantial part of its, assets; becomes insolvent, or generally does not pay its debts as they become due; provides notice of its inability to pay its debts; makes an assignment for the benefit of creditors; or takes any action to authorize any of the foregoing;
 - (ii.) An involuntary case is commenced against CONTRACTOR seeking liquidation, reorganization, dissolution, winding up, a composition or arrangement with creditors, a readjustment of debts or other relief with respect to such CONTRACTOR or CONTRACTOR's debts under any U.S. or foreign bankruptcy, insolvency or other similar law; seeking the appointment of a trustee, receiver, liquidator, custodian or other similar official of it or any substantial part of its assets; seeking the issuance of a writ of attachment, execution, or similar process; or seeking like relief,

- and such involuntary case shall not be contested by it in good faith or shall remain undismissed and unstayed for a period of 60 days;
- (iii.) In any voluntary or involuntary case seeking liquidation, reorganization or other relief with respect to CONTRACTOR or its debts under any U.S. or foreign bankruptcy, insolvency or other similar law, this Agreement or any of the other Contract Documents, is rejected, including a rejection under 11 U.S.C. Section 365 or any successor statute; or
 - (iv.) Any voluntary or involuntary case or other act or event described in clause (g)(i) or (g)(ii) shall occur (and in the case of an involuntary case shall not be contested in good faith or shall remain undismissed and unstayed for a period of 60 days) with respect to (i) any equity member, partner or joint venture member of CONTRACTOR, or (ii) any equity member, partner or joint venture member of CONTRACTOR for whom transfer of ownership or management authority would constitute an impermissible assignment hereunder;
- h. Allows any final judgment to remain unsatisfied for a period that, in SCDOT's sole judgment, poses a material adverse effect on CONTRACTOR's ability to perform the scope of the Work and, in particular, to pay for its obligations to SCDOT, subcontractors, and suppliers in connection therewith;
 - i. CONTRACTOR makes, attempts to make, or suffers a voluntary or involuntary assignment or transfer of all or any portion of this Agreement or its interest in the Project;
 - j. CONTRACTOR materially fails to observe or to perform, or to cause to be observed or performed, timely any other material covenant, agreement, obligation, term, or condition required to be observed or performed by CONTRACTOR under the Agreement including but not limited to:
 - (i.) Fails to supply a sufficient number of properly skilled workmen, tools, materials and equipment to assure the prompt completion of the work; or
 - (ii.) Failure to comply with applicable permits, law, or use of the Project violates such permits, law, or this Agreement;
 - k. Any representation or warranty in the Agreement, the SOQs and Proposal (which representations and warranties of CONTRACTOR are incorporated into the Proposal explicitly or by reference), or the Proposal is false in any material respect, materially misleading, or inaccurate in any material respect when made (except as relates to continuing representations and warranties), or omits material information when made (except as relates to continuing representations and warranties);
 - l. Any certificate, schedule, report, instrument, or other document delivered by or on behalf of CONTRACTOR to SCDOT under the Agreement is false or

- incorrect in any material respect, materially misleading, or inaccurate in any material respect when made (except as relates to continuing representations and warranties in any such certificates, schedules, reports, instruments, or other documents), or omits material information when made (except as relates to such continuing representations and warranties);
- m. CONTRACTOR (i) fails to make any payment owing to SCDOT under the Agreement in full and when due (including specifically payment of any liquidated or stipulated damages hereunder); or (ii) fails to make, absent a bona fide and valid dispute, payment in full and when due for labor, equipment, or materials in accordance with applicable law and with its agreements with consultants, subcontractors, subconsultants, vendors, or suppliers;
 - n. CONTRACTOR fails (i) to obtain, provide, and maintain any insurance, surety bonds, guarantees, letters of credit, or other payment or performance security as is required under the Agreement for the benefit of the relevant parties, or (ii) to comply with any requirement of the Agreement pertaining to the amount, terms, or coverage of the insurance or security, or (iii) to pay the associated premiums, deductibles, self-insured retentions, co-insurance, or any such other amounts with respect to the insurance or security as and when due;
 - o. Unless continued performance of this Agreement is permitted under the terms of a debarment agreement with the State of South Carolina or otherwise as permitted under clause 2.e. below, and after any rights of appeal have been exhausted, if CONTRACTOR, any equity or joint venture member of CONTRACTOR, any consultant, subcontractor, subconsultant, vendor, or supplier, or any person or entity for which CONTRACTOR is legally responsible (i) is determined to be disqualified, suspended, or debarred, or otherwise is excluded from bidding, proposing, or contracting with a federal or state department or agency, or (ii) has not dismissed any consultant, subcontractor, subconsultant, vendor, or supplier whose work is not substantially complete and who is determined to be disqualified, suspended, debarred, or otherwise excluded from bidding, proposing, or contracting with a federal or state department or agency;
 - p. CONTRACTOR fails to comply with any order by SCDOT issued under, and pursuant to a contractual right in, this Agreement, including specifically orders to suspend CONTRACTOR's performance of the scope of work, in whole or in part, within the time allowed in such order; or
 - q. CONTRACTOR fails to achieve Substantial Completion or Final Completion by the Long Stop Date pursuant to Article IV.
2. Cure Periods. The following list identifies CONTRACTOR's rights to receive notice and opportunity to cure before SCDOT may exercise its remedies under clause 3 below, and this list also identifies other Contractor Defaults that are not subject to cure:

- a. Except as otherwise specifically set forth in this clause 2, CONTRACTOR and the surety providing the bond(s) pursuant to Article VI.B shall be entitled to 15 days prior written notice and opportunity to cure any Contractor Defaults before SCDOT may exercise any remedies hereunder, including specifically those under clause 3 below.
- b. CONTRACTOR and the surety providing the bond(s) pursuant to Article VI.B shall be entitled to seven days prior written notice and opportunity to cure the Contractor Defaults under clauses XVII.A.1.h., m., and n. before SCDOT may exercise any remedies hereunder, including specifically those under clause 3 below.
- c. Except with respect to those Contractor Defaults listed in clauses d. and e. below, if Contractor Defaults under clauses XVII.A.1.a., f., m., and n. are capable of cure (as determined by SCDOT in its sole discretion) but, by its nature, cannot be cured within such seven or 15 day period, as applicable, (also as determined by SCDOT in its sole discretion), then CONTRACTOR shall commence to cure such Contractor Default within such seven or 15 day period, as applicable, and thereafter diligently prosecute such cure to completion within 60 days or such other later time as determined by SCDOT, in its sole discretion, before SCDOT may exercise any remedies hereunder, including specifically those under clause 3 below.
- d. Except with respect to those Contractor Defaults listed in clause c. above and clause e. below, if a Contractor Default under clause XVII.A.1.e. cannot be cured within 15 days (as determined by SCDOT in its sole discretion), then CONTRACTOR shall commence to cure such Contractor Default within such 15 day period, and thereafter diligently prosecute such cure to completion within 30 days or such other later time as determined by SCDOT, in its sole discretion, before SCDOT may exercise any remedies hereunder, including specifically those under clause 3 below.
- e. CONTRACTOR hereby acknowledges and agrees that no notice and no opportunity to cure is required with respect to the Contractor Defaults under clauses XVII.A.1.g., i., k., l., o.(ii), p. and q., and SCDOT has the right to exercise its remedies hereunder immediately, including specifically those under clause 3 below.
- f. With respect to the Contractor Default under clause XVII.A.1.o., CONTRACTOR shall take appropriate steps to obtain, or to require its equity or joint venture member of CONTRACTOR, any consultant, subcontractor, subconsultant, vendor, or supplier, or any person or entity for which CONTRACTOR is legally responsible to obtain, a debarment agreement with the State of South Carolina in connection with any pending action for disqualification, suspension or debarment or any pending agreement for voluntary exclusion from bidding, proposing or contracting. If a debarment agreement is obtained that permits continued performance under this

Agreement, then the disqualification, suspension, debarment or agreement for exclusion shall not be considered a Contractor Default. If, however, such a debarment agreement is not obtained, the CONTRACTOR shall have the following cure rights:

- (i.) With respect to a Contractor Default under clause XVII.A.1.o(i) involving CONTRACTOR, CONTRACTOR shall have 60 days after the effective date of the disqualification, suspension, debarment or agreement for exclusion to (i) obtain a debarment agreement allowing continued performance or (ii) otherwise cure the Contractor Default;
- (ii.) With respect to a Contractor Default clause XVII.A.1.o(i) involving any equity or joint venture member of CONTRACTOR involving any equity or joint venture member of CONTRACTOR, CONTRACTOR shall have 60 days after the effective date of the disqualification, suspension, debarment or agreement for exclusion (i) to remove the affected equity or joint venture member and obtain SCDOT's approval of the change in the ownership structure of CONTRACTOR, (ii) to obtain a debarment agreement allowing continued performance or (iii) otherwise cure the Contractor Default; and
- (iii.) With respect to a Contractor Default under clause XVII.A.1.o(i) involving a consultant, subcontractor, subconsultant, vendor, or supplier, or any other person or entity for which CONTRACTOR is legally responsible, CONTRACTOR shall have 60 days after the effective date of the disqualification, suspension, debarment or agreement for exclusion to obtain a debarment agreement allowing continued performance or otherwise cure the Contractor Default.

3. Remedies.

a. General Provisions.

- (i.) Failure to provide notice to CONTRACTOR's surety providing the bond(s) pursuant to Article VI.B shall not preclude SCDOT from exercising its remedies under this clause 3.
- (ii.) SCDOT shall also be entitled to exercise any other rights and remedies available under this Agreement, or available at law.
- (iii.) SCDOT's rights under this Agreement shall be cumulative and shall be in addition to every other right provided under this Agreement or at law, and the exercise or beginning of the exercise by SCDOT of any one or more of any of such rights or remedies shall not preclude the simultaneous or later exercise by SCDOT of any or all other such rights or remedies.
- (iv.) Except as expressly stated otherwise in this Agreement, SCDOT's exercise of any right or remedy does not waive or release, nor shall be deemed to waive or release, CONTRACTOR from any obligations or limiting other remedies that may be available to SCDOT,

b. SCDOT Step-In

- (i.) Subject to any surety rights under surety bond(s) placed for the Project pursuant to Article VI.B., SCDOT shall have the right, but not the obligation, to pay such amounts and or perform such acts as may then be required of CONTRACTOR under the Agreement or contracts with consultants, subcontractors, subconsultants, vendors, or suppliers, whether assigned to SCDOT.
- (ii.) SCDOT may appropriate any or all materials on the Site as SCDOT determines may be suitable and acceptable and, if and when consistent with the terms of any surety bond(s) placed pursuant to Article VI.B, SCDOT may direct the Surety to complete the Project, may enter into an agreement for the completion of the Project (with the surety or another contractor), or may complete the Project itself. If SCDOT exercises any right to perform any obligations of CONTRACTOR, then SCDOT may, but is not obligated to, among other things: (A) perform or attempt to perform, or cause to be performed, such work; (B) spend such sums as SCDOT deems necessary and reasonable to employ and pay such architects, engineers, consultants, and contractors, and obtain materials and equipment as may be required to complete such work; (C) execute all applications, certificates, and other documents as may be required to complete the Project, including paying such amounts and performing such other acts as may then be required from CONTRACTOR pursuant to its subcontracts with consultants, subcontractors, vendors, and suppliers; (D) modify or terminate any contractual arrangements; (E) take any other actions that SCDOT may, in its sole discretion, consider necessary to complete the Project; and (vi) prosecute and defend any action or proceeding incident to completion of the Project.
- (iii.) SCDOT may deduct from any amounts payable by SCDOT to CONTRACTOR such amounts payable by CONTRACTOR to SCDOT, including those damages listed in clause c. below.

c. Performance Security

- (i.) SCDOT may make demand upon and enforce any surety bond, and make demand upon, draw on and enforce and collect any letter of credit, guaranty or other payment or performance security available to SCDOT under this Agreement, with respect to such Contractor Default in any order.
- (ii.) SCDOT will apply the proceeds of any such action to the satisfaction of CONTRACTOR's obligations under this Agreement, including payment of amounts due to SCDOT.
- (iii.) The provisions of clauses (i) and (ii), shall not apply where access to any such surety bond, letter of credit, guaranty or other payment or performance security is for the purpose of satisfying damages owing to SCDOT, in which case SCDOT shall be entitled to make demand, draw, enforce and collect regardless of whether Contractor Default is subsequently cured.

- (iv.) SCDOT will notify CONTRACTOR at the same time or promptly after it takes any action to make demand upon, draw on, enforce or collect any such surety bond, letter of credit, guaranty or other payment or performance security.

d. Damages

- (i.) Without limiting SCDOT's right to deduct in the event of self-performance under clause 3.b. above, and except as limited by SCDOT's agreement to liquidate certain damages as specified in the Agreement, SCDOT shall be entitled to recover any and all damages available at law on account of the occurrence of a Contractor Default. CONTRACTOR shall owe any such damages that accrue after the occurrence of Contractor Default regardless of when any notice regarding any Contractor Default is given or whether Contractor Default is subsequently cured. Such damages include, but are not limited to:
 - a) the aggregate of reimbursements owing SCDOT;
 - b) any liquidated or stipulated damages accrued;
 - c) 125% of the amounts SCDOT deems advisable to cover any existing or threatened claims of consultants, subcontractors, subconsultants, vendors, suppliers, other laborers, or other persons or entities;
 - d) amounts of any losses incurred or reasonably expected to be incurred by SCDOT in completing the Project;
 - e) the cost to complete or remediate uncompleted or other nonconforming work, plus an administrative charge equal to 10% of such costs;
 - f) throw-away costs for unused portions of the completed portions of the Project
 - g) increased financing costs of SCDOT, if any,
 - h) other damages or amounts that SCDOT has or will be incurred to rectify any breach or failure to perform by CONTRACTOR and/or to bring the condition of the Project to the standard it would have been in if CONTRACTOR had complied with its obligations to carry out and complete the Work in accordance with the Contract Documents; and
 - i) other damages or amounts that SCDOT has determined are or may be payable to SCDOT under this Agreement.

- (ii.) Where this Agreement is terminated, the damages recoverable by SCDOT shall also include the present value of
 - a) actual and projected costs to SCDOT to terminate, take over the Project, re-procure and replace CONTRACTOR;
 - b) actual and projected delay costs; and
 - c) actual and projected increases in costs to SCDOT to complete the Project.
 - (iii.) Damages owed to SCDOT under this clause c. shall bear interest at the statutory rate of interest under S.C. Code Ann. 34-31-20 from and after the date any amount becomes due to SCDOT until the date paid. The interest rate shall accrue on all amounts SCDOT has had to pay in excess of the remaining balance of the Contract Price from the date of SCDOT's payment.
 - (iv.) Additional Provisions pertaining to costs.
 - a) If, after termination, it is determined that the Contractor was not in default, or that the default was excusable, the rights and obligations of the parties shall be the same as a termination by SCDOT for its convenience.
 - b) In lieu of the provisions of this Article XVII for terminating this Agreement for cause, SCDOT may pay CONTRACTOR for the work already completed in accordance with the Agreement and may treat the work remaining undone as if they had never been included or contemplated by this Agreement. No claim under this clause (C) will be allowed for prospective profits on, or any other compensation relating to, work remaining and uncompleted by CONTRACTOR.
- e. Termination of the Agreement by SCDOT.
- (i.) CONTRACTOR acknowledges and agrees that any Contractor Default would result in material and substantial harm to SCDOT's rights and interests under this agreement, and therefor justifies termination of this Agreement unless fully and completed cured within the applicable cure period, if any, under clause XVII.A.2.
 - (ii.) Upon expiration of any applicable cure period (if any), and after complying with other obligations of SCDOT, if any, under any surety bonds provided by CONTRACTOR under Article VI.B., if CONTRACTOR's surety providing such bond(s) refuses to complete the work or fails to take over the work under the terms of the performance bond, then SCDOT may in its sole discretion terminate this Agreement for cause. If SCDOT terminates this Agreement for cause, SCDOT shall deliver a notice to the CONTRACTOR so stating, and

termination will be effective three days after dispatch, unless otherwise specified in such notice.

f. Joint and Several Liability of CONTRACTOR and Surety/ies

If a Contractor Default occurs, CONTRACTOR, and any surety providing the bond(s) pursuant to Article VI.B shall be jointly and severally liable to SCDOT for all costs, damages, and expenses of SCDOT listed under clause XVII.A.3.d., including specifically any interest that accrues thereon, whether by virtue of late payment by CONTRACTOR or late payment by surety.

g. Final Release

Except as otherwise expressly provided in this Agreement, if this Agreement is earlier terminated for any reason, then SCDOT's payment to CONTRACTOR of the amounts required under this Agreement (if any) shall constitute full and final satisfaction of, and upon payment SCDOT shall be forever released and discharged from, any and all claims, causes of action, suits, demands and losses, known or unknown, suspected or unsuspected, that CONTRACTOR may have against SCDOT caused by, arising out of, relating to, or resulting from this Agreement or termination thereof, or the Project. Upon such payment, CONTRACTOR shall execute and deliver to SCDOT all such releases and discharges as SCDOT may reasonably require to confirm the foregoing, but no such written release and discharge shall be necessary to give effect to the foregoing satisfaction and release.

B. Suspension of the work for cause

1. Notwithstanding the notice and cure period provisions of this Article XVII, if not substantially cured promptly after SCDOT notifies CONTRACTOR of any of the following, SCDOT has the authority to suspend the Work by written order, wholly or in part, for CONTRACTOR's failure to:
 - a. handle (i) Hazardous Waste, or (ii) any archaeological, paleontological, biological, or cultural resource, in any case, in accordance with prudent industry practices, applicable laws, governmental approvals, or permits; or
 - b. comply with any law, governmental approval or permit.
2. If not substantially cured within three days after SCDOT delivers notice thereof to CONTRACTOR, SCDOT has the authority to suspend the Work by written order, wholly or in part, for CONTRACTOR's failure to:
 - a. observe any conditions to commencement of certain portions of the scope of the Work and thereafter commences performance;
 - b. provide proof of required insurance coverage hereunder;

- c. maintain any surety bond(s) required hereunder;
 - d. correct any nonconforming work; or
 - e. perform the scope of the work in compliance with the Agreement.
3. CONTRACTOR shall promptly comply with any such written suspension order, even if it disputes the grounds for suspension. CONTRACTOR shall promptly recommence performance of the scope of the work upon receipt of written notice from SCDOT directing CONTRACTOR to resume performance. SCDOT will lift the suspension order promptly after CONTRACTOR fully cures and corrects the applicable breach or failure to perform or any other reason for the suspension order ceases to apply.
 4. SCDOT shall have no liability to CONTRACTOR in connection with any such suspension, and CONTRACTOR shall have no right to any adjustment in the Contract Price, additional costs, or additional time on the then-current CPM Schedule in connection with any suspension of Work founded on any of the grounds set forth in this clause XVII.B.
 5. If SCDOT orders suspension of Work on one of the foregoing grounds but it is finally determined under the Agreement's dispute resolution procedures that such grounds did not exist, it shall be treated as a suspension for SCDOT's convenience under clause XVII.C.

C. Suspensions for Convenience; Suspensions for Safety

1. SCDOT may, at any time and for any reason, by written notice, order CONTRACTOR to suspend all or any part of performance of the scope of the work for the period of time that SCDOT deems appropriate for the convenience of SCDOT. CONTRACTOR shall promptly comply with any such written suspension order. CONTRACTOR shall promptly recommence performance of the scope of the work upon receipt of written notice from SCDOT directing CONTRACTOR to do so.
2. CONTRACTOR shall be entitled for additional time, on a day-by-day basis (or for such additional time, in SCDOT's sole discretion), to achieve Substantial Completion for each day of delay to the CPM Schedule caused by or will result in an identifiable and measurable disruption of an activity on the critical path under the then-current CPM Schedule, after consumption of all then-available float, any such suspensions directed by SCDOT for its convenience; provided, however, that
 - a. SCDOT shall have the right to direct suspensions of the work for convenience not exceeding 48 hours each, up to a total of 144 hours during the term before any such CONTRACTOR entitlement to additional time shall accrue;
 - b. SCDOT may nonetheless suspend the work for its convenience for lack of appropriations, in which case, any such suspension shall not serve to diminish

SCDOT's balance of 144 hours then-existing, but CONTRACTOR shall be entitled to additional time and costs under this clause C for the duration of any such suspension. Subject to clause c. below, if the duration of suspensions for convenience reaches 270 days continuously, then SCDOT will be deemed to have terminated this Agreement for its convenience;

- c. SCDOT may suspend the work for its convenience during any period of governmental shutdowns, government-declared restrictions, or other direction of the State or federal executive (including specifically any quarantine or other governmental and non-governmental measures intended to limit the spread of disease), and the duration of any such suspension shall not serve to diminish SCDOT's balance of 144 hours then-existing, nor shall continuation of any such suspension beyond 270 days continuously shall not be deemed to be a termination for SCDOT's convenience;
 - d. SCDOT may suspend the work for its convenience upon discovery of any known or suspected Hazardous Waste or any known or suspected archaeological, paleontological, biological, or cultural resource, and without limiting clause B.1.a above, the duration of any such suspension shall not serve to diminish SCDOT's balance of 144 hours then-existing, nor shall continuation of any such suspension beyond 270 days continuously shall not be deemed to be a termination for SCDOT's convenience.
3. CONTRACTOR shall not be entitled to any additional costs incurred or additional compensation arising out of, relating to, resulting from, or caused by any such suspension directed by SCDOT for its convenience not exceeding 48 hours each, up to a total of 144 hours during the term, but CONTRACTOR shall be entitled to actual, direct, and documented costs incurred resulting from suspensions directed by SCDOT for its convenience beyond any 48 hour period or beyond the aggregate of 144 hours, so long as CONTRACTOR establishes in any CCR that any delay to the CPM Schedule could not have reasonably been mitigated or avoided, and subject to the following further limitations:
- a. CONTRACTOR shall not be entitled to any disruption damages in connection with any additional costs claimed with respect to any suspension directed by SCDOT for its convenience;
 - b. CONTRACTOR shall not be entitled to any punitive, indirect, special, incidental, or consequential damages in connection with any additional costs claimed pursuant to any suspension directed by SCDOT for its convenience;
 - c. Delay and such other actual, direct, and documented additional incremental costs shall not exceed those calculated pursuant to Section 105.16.5 of the SCDOT Standard Specifications, with the exception of extended job site overhead rates which shall be as set forth in Exhibit 5 of the RFP.

4. CONTRACTOR shall not be entitled to an extension of time or additional costs if the delay arising out of, relating to, or resulting from any suspension directed by SCDOT for its convenience is concurrent with any other unrelated delay to an activity on the critical path under the then-current CPM Schedule for which CONTRACTOR is responsible under this Agreement.
5. Notwithstanding anything to the contrary herein, CONTRACTOR acknowledges that among SCDOT's functions and purposes under SC. Code Ann. 57-1-30(B) is to provide safe transportation for the movement of people and goods throughout the state, and accordingly, SCDOT may issue an order suspending work wholly or in part and to take appropriate action when public safety is jeopardized. CONTRACTOR shall promptly comply with any such written suspension order. CONTRACTOR shall promptly recommence performance of the scope of the work upon receipt of notice from SCDOT directing CONTRACTOR to resume performance. Any such suspension shall not be, nor be deemed to be, (a) a suspension directed by SCDOT for its convenience or (b) a suspension for cause under clause XVII.A.3.e, requiring notice and opportunity to cure or otherwise. SCDOT shall have no liability to CONTRACTOR in connection with any such suspension, and CONTRACTOR shall have no basis to submit a CCR or otherwise claim entitlement to additional cost or accommodation of delay.

D. Responsibilities of CONTRACTOR During Suspension Periods

During any suspension periods directed by SCDOT hereunder, CONTRACTOR shall continue to be responsible for the Project and shall prevent damage, loss or injury to the Project. Without limiting the generality of the foregoing, CONTRACTOR shall specifically provide for drainage, protect any known or suspected Hazardous Waste or known or suspected archaeological, paleontological, biological, or cultural resources (including taking affirmative steps to protect the site from vandalism and unauthorized investigations), protect the site from accidental damage, heavy rainfall, runoff, and shall erect necessary temporary structures, signs or other facilities required to maintain the Project. CONTRACTOR shall also maintain all insurance policies and bonds required to be in place under this Agreement, comply with all applicable governmental approvals and other permits. CONTRACTOR shall, unless otherwise directed by SCDOT, continue to be responsible for traffic control, erosion control, and maintenance of the roadway in accordance with this Agreement.

E. Termination for Convenience

1. SCDOT reserves the right to terminate the Agreement at any time, in whole or in part, and upon 30 days written notice to CONTRACTOR, if SCDOT determines it to be in the public interest. Should the Agreement be so terminated by SCDOT for its convenience, CONTRACTOR shall be paid for the value of the work, based upon the Schedule of Values, performed to the effective date of termination and reasonable demobilization costs, together with any reasonable, pre-agreed cancellation charges by vendors, suppliers, and subcontractors. CONTRACTOR shall also be entitled to the cost of securing that portion of the work as directed by

SCDOT, provided such cost is reasonable and is approved by SCDOT. In no event, shall CONTRACTOR recover any amount for work not performed. The total payment to CONTRACTOR pursuant to any termination by SCDOT for its convenience shall not exceed the Contract Price.

2. Termination of all or a portion of this Agreement shall not relieve CONTRACTOR of any responsibility it would otherwise have for the work completed, or for any claims arising from that work.
3. For avoidance of doubt, any termination by SCDOT for lack of appropriations would be a termination for convenience under this clause E.

F. Responsibilities of CONTRACTOR Following Notice of Termination of the Agreement

1. CONTRACTOR shall timely comply with the following provisions independently of, and without regard to, the timing for determining, adjusting, settling, and paying any amounts due CONTRACTOR or SCDOT on account of termination, if any:
 - a. CONTRACTOR shall promptly deliver to SCDOT or its designee possession of all Project Documents, as defined in Article II.F, in CONTRACTOR's possession or control that relates to the Project and that SCDOT deems necessary for completion of the Project;
 - b. CONTRACTOR shall discontinue performance of the scope of the Work, withdraw from the Site, and shall remove materials, equipment, tools, and instruments used by, and any debris or waste materials generated by CONTRACTOR and any subcontractor, vendor, or supplier in the performance of the scope of the Work;
 - c. If and as directed by SCDOT, CONTRACTOR shall confirm the assignment to SCDOT of any contracts with consultants, subcontractors, subconsultants, vendors, or suppliers, and CONTRACTOR shall terminate, at its sole cost, any such contracts not assigned;
 - d. CONTRACTOR shall otherwise promptly and orderly transition the work, demobilize, and transfer management, care, custody, and control of the Project to SCDOT.
2. If SCDOT determines that CONTRACTOR has failed to comply with the foregoing, then upon subsequent notice from SCDOT to CONTRACTOR making reference to this clause, CONTRACTOR acknowledges and agrees that it shall be deemed to have surrendered its access rights to the Site.
3. CONTRACTOR shall, and shall cause its consultants, subcontractors, subconsultants, vendors, and suppliers to, complete all of the foregoing prior to the effective date of the termination of the Agreement as set forth in the notice to CONTRACTOR

XVIII. DISADVANTAGED BUSINESS ENTERPRISES

The DBE goal on this Project is 15.8 percent. In meeting the overall goal, 0.4 percent (a portion of the overall DBE goal) must be met with firms certified as a DBE in the Professional Services industry or demonstrate good faith efforts in meeting the goal. The remaining 15.4 percent must be met in any trade in support of Professional Services and/or constructing the project. Information regarding DBE requirements and goals will be included in the RFP. DBE commitments for the 0.4 percent must be submitted no later than 30 calendar days from contract execution.

Firms that provide Professional Services are those defined under Engineering and Design Related Services set forth in the SCDOT Manual for Procurement, Management and Administration of Engineering and Design Related Services, dated May 1, 2018 [<http://info2.scdot.org/professionalserv/HostDocs/PSCO-Manual-5-1-2018.pdf>].

Whether or not there is a DBE contract goal on the contract, the Proposer is strongly encouraged to obtain the maximum amount of DBE participation feasible on the contract. SCDOT will have the right to audit all documentation regarding DBE participation in the Project.

XIX. ON-THE-JOB TRAINING REQUIREMENTS

There is an On-The-Job (OJT) Training requirement for this Project. The CONTRACTOR shall comply with the requirements, including the number of persons to be trained, provided in the Specific Equal Employment Opportunity Responsibilities Training Special Provisions within the Federal Aid Supplemental Specifications found in Exhibit 5 and OJT Manual found on the SCDOT website. The CONTRACTOR shall submit its plan for OJT Training to SCDOT for written approval prior to commencing construction activities.

XX. RECORD RETENTION

Retention Period

1. CONTRACTOR shall maintain the following documents for a period of three years or a period equal to the warranty period, whichever is longer, after Final Completion of the Project:
 - a. All CONTRACTOR samples and test reports;
 - b. Daily Diaries and any other documents required to be retained in accordance with the Quality Control Plan.
 - c. Documents required to be retained under Article VIII.A.17.
 - d. Documents required to be retained under FHWA 1273.
 - e. Documents items listed in Subsection 109.10 and 105.16.9 of the SCDOT Standard Specification.

2. During the retention period, SCDOT will be granted access to those documents upon reasonable notice. At any time during the retention period, SCDOT will have the option of taking custody of the documents. CONTRACTOR shall obtain a written release from SCDOT prior to destroying the records after the retention period.

XXI. AS-BUILTS

Documents

1. In addition to those documents set forth elsewhere in this Agreement, CONTRACTOR shall provide to SCDOT prior to Final Completion, complete sets of as-built drawings (See Article XXI.D for details). As-built plans consist of the final version of the design plan CADD drawings that incorporate all changes, including any adjustments, relocations, additions and deletions that occurred during construction. CONTRACTOR shall certify that the as-built plans are a true and correct representation of the work as constructed. If any design changes occur during construction, the plan sheets (or any other “job site record document” with a seal) revised after award of contract shall include a complete accounting and detail of the revisions and design changes. The P.E. responsible for the revisions shall seal each altered plan sheet (or any other “job site record document” with a seal). This documented information is to be part of the As-Built Plan requirements. The CONTRACTOR shall develop as-built plans in accordance with the SCDOT Manual of Instructions for the Preparation of As-Built Plans, edition effective as of the release of the Final RFP.
2. Information regarding major revisions to the plans shall be noted in a revision box on the plans. The information listed in the revision box shall include: the initiator of the revision, a brief explanation of the nature of the revision, and acceptance and approval from CONTRACTOR, along with associated dates.
3. In addition to the revisions that incorporated changes during construction, the as-built plans shall include the following information gathered during construction:
 - a. The location and elevation of foundations remaining below grade.
 - b. The final profile of each bridge constructed. The profile shall include the elevation along the centerline (or as specified by SCDOT) and a line three feet inboard of each gutter line. Points on the profile shall be taken at no greater than 25-foot intervals and shall include the beginning and end of each span.
 - c. If any structure has pile foundations, information concerning the pile driving operation shall be listed to include pile and driving equipment data, final pile bearing, elevation of pile tip when plan bearing was obtained, final pile tip elevation, penetration into the ground, and PDA or WEAP analysis data. This information shall be entered on each footing or bent sheet, or be included as a new sheet inserted immediately following the pertinent footing or bent sheet.

- d. If any structure has drilled shaft foundations, information concerning the installation of the shaft shall be listed to include the drilled shaft report. This information shall be entered on each footing or bent sheet, or be included as a new sheet inserted immediately following the pertinent footing or bent sheet.
 - e. The final horizontal location of all existing and relocated utility lines and structures that are within the right-of-way. Include approved Utility Agreements, No Cost/No Conflict Letters, and Encroachment Permits.
 - f. The final location and elevations of all pipes, culverts, and drainage structures.
 - g. To include all right-of-way revisions, permissions, and an updated right-of-way data sheet to show the date and manner of acquisition of each tract
4. As-built plans shall be submitted as two full size (36 inch x 22 inch) copies and one (1) copy on compact disc in a format acceptable to SCDOT. The levels and symbology of the as-built CADD drawings shall conform to SCDOT standard levels and symbology used to develop the design drawings for the Project.

XXII. ESCROW PROPOSAL DOCUMENTS

The Contractor shall submit bid documentation used to prepare the technical and cost proposals for this contract to the Department in accordance with the Supplemental Specification entitled Escrow Bid Documentation dated October 1, 2014.

XXIII. DISPUTE RESOLUTION

Parties

1. Each party hereby waives a trial by jury regarding any dispute between them arising out of this Contract and any such trial will be a non-jury trial before the South Carolina Circuit Court in Richland County.
2. In the event of a dispute between the parties, it shall be a condition precedent to litigation that the parties submit the dispute to the Standing Dispute Review Board pursuant to the Claims Procedure set forth in the Project Supplemental Specifications.
3. CONTRACTOR consents that any papers, notices, or process necessary or proper for the initiation or continuation of any disputes, claims, or controversies relating to the Agreement, any court action in connection therewith, or for the entry of judgment on any award made, may be served on CONTRACTOR by certified mail (return receipt requested) addressed to CONTRACTOR at the address provided in Article XXVI. Notice by certified mail is deemed duly given upon deposit in the United States mail.

XXIV. SCDOT'S AGENT

SCDOT will appoint an individual who will be authorized to act on behalf of SCDOT, with whom CONTRACTOR may consult at all reasonable times, and whose instructions and decisions will be binding upon SCDOT as to all matters pertaining to this Agreement and the performance of the parties hereunder.

XXV. ASSIGNABILITY

By CONTRACTOR

1. Neither the Agreement nor CONTRACTOR's interest herein, in whole or in part, shall be voluntarily or involuntarily assigned, sold, conveyed, transferred, pledged, mortgaged, or otherwise encumbered (by way of grant of right of entry, grant of special use, management, or control of the Project, or otherwise) by CONTRACTOR without the prior written consent of SCDOT. Notwithstanding the foregoing, CONTRACTOR may assign this Agreement to any entity in which the organizations signing this Agreement for CONTRACTOR, or the shareholder(s), general partner(s) or member(s) that exercise management control over such organizations, hold and exercise effective management control and hold at least 50 percent of the equity interest.
2. Any purported voluntary or involuntary sale, assignment, conveyance, transfer, pledge, mortgage, or encumbrance of this Agreement, in whole or in part, or other grant of right of entry, or grant of other special use, management or control of the Project in violation of this Article shall be null and void ab initio.

By SCDOT.

SCDOT may assign the Contract without the consent of CONTRACTOR.

Restrictions on Equity Transfers and Changes of Control

1. Except as permitted in this Article, no voluntary or involuntary Change of Control of CONTRACTOR, including any Equity Transfer that would result in a Change of Control of CONTRACTOR, shall be permitted without the prior written consent of SCDOT.
2. Transfers and transactions within any of the exceptions described in clauses (a) through (e) of the definition of Change of Control are allowed at any time without necessity for SCDOT's approval but, in the case of exceptions described in clauses (a) through (c), subject to the condition that CONTRACTOR delivers to SCDOT, no later than ten days prior to the effectiveness of the transfer or transaction, a written notice describing the transfer or transaction and (if applicable) the names of the transferor and transferee, together with documentation demonstrating that the transfer or transaction is within such an exception.

3. Any purported voluntary or involuntary Equity Transfer or Change of Control in violation of this clause C. shall be null and void ab initio.

Definitions.

For purposes of this Article, the following terms have the meanings ascribed.

1. Equity Transfer means any sale, assignment, conveyance, transfer, pledge, mortgage, or other encumbrance of any equity interest in CONTRACTOR.
2. Change of Control means any Equity Transfer, transfer of an interest, direct or indirect, in an equity member, or other sale, assignment, conveyance, transfer, pledge, mortgage, or other encumbrance financing, grant of security interest, hypothecation, transfer of interest or transaction of any type or description, including by or through voting securities, asset transfer, contract, merger, acquisition, succession, dissolution, liquidation, bankruptcy or otherwise, that results, directly or indirectly, in a change in possession of the power to direct or control or cause the direction or control of the management of CONTRACTOR or a material aspect of its business. A change in possession of the power to direct or control or cause the direction or control of the management of an equity member of CONTRACTOR may constitute a Change of Control of CONTRACTOR if such equity member possesses, immediately prior to such Change of Control, the power to direct or control or cause the direction or control of the management of CONTRACTOR. Notwithstanding the foregoing, the following shall not constitute a Change of Control:
 - a. A change in possession of the power to direct or control the management of CONTRACTOR Developer or a material aspect of its business due solely to a bona fide transaction involving beneficial interests in the ultimate parent organization of an equity member, (but not if the equity member is the ultimate parent organization), provided, however, that this exception shall not apply if the transferee in such transaction is, at the time of the transaction, suspended or debarred, or subject to a proceeding that may result in being suspended or debarred from bidding, proposing or contracting with any federal or state department or agency;
 - b. An upstream reorganization or transfer of direct or indirect interests in CONTRACTOR so long as there occurs no change in the entity with ultimate power to direct or control or cause the direction or control of the management of CONTRACTOR;
 - c. An Equity Transfer, where the transferring equity member and the transferee are under the same ultimate parent organization ownership, management and control before and after the transfer;
 - d. A change in possession of the power to direct or control the management of CONTRACTOR or a material aspect of its business due solely to bona fide

open market transactions in securities effected on a recognized public stock exchange, including such transactions involving an initial public offering; or

- e. The exercise of minority veto or voting rights (whether provided by applicable law, by CONTRACTOR's organizational documents or by related member or shareholder agreements or similar agreements) over major business decisions of CONTRACTOR, provided that if such minority veto or voting rights are provided by shareholder or similar agreements, SCDOT has received copies of such agreements.

XXVI. GENERAL PROVISIONS

1. This Agreement shall be governed by and interpreted in accordance with the substantive laws of the State of South Carolina.
2. Headings and titles of the various parts of this Agreement are for convenience of reference only and shall not be considered in interpreting the text of this Agreement. Modifications or amendments to this Agreement must be in writing and executed by duly authorized representatives of each party.
3. In the event that any portion or all of this Agreement is held to be void or unenforceable, the parties agree to negotiate in good faith to reach an equitable agreement which shall affect the intent of the parties as set forth in this Agreement. For purposes of construction of this Agreement, this Agreement will be considered to have been drafted by both parties and will not be construed against SCDOT because it was drafted by SCDOT.
4. All notices pertaining to this Agreement shall be in writing and, if to SCDOT, will be sufficient when sent registered or certified mail to SCDOT addressed as follows:

Deputy Secretary for Engineering
South Carolina Department of Transportation
Post Office Box 191
Columbia, South Carolina 29202-0191

All notices to CONTRACTOR shall be sufficient when sent registered or certified mail to CONTRACTOR addressed as follows:

Archer Western Construction, LLC

11000 Regency Parkway, #100
Cary, North Carolina 27518

5. The Contract Documents set forth the full and complete understanding of the parties as of the Effective Date defined herein, and supersedes any and all prior agreements, representations, and understandings of any kind.
6. The parties make no representations, covenants, warranties or guarantees, express or implied, other than those expressly set forth herein. The parties' rights, liabilities, responsibilities and remedies within respect to the work shall be exclusively those expressly set forth in this Agreement.

7. In no event shall any failure by either party hereto to fully enforce any provision to this Agreement be construed as a waiver by such party of its right to subsequently enforce, assert or rely upon such provision.
8. Nothing in this Agreement is intended to create any contract rights for any party other than SCDOT and CONTRACTOR, nor are any third-party beneficiary rights intended to be created hereby.
9. All obligations of SCDOT hereunder are subject to all applicable law and appropriations by the South Carolina General Assembly. The obligation of SCDOT to make any payments under this Agreement does not constitute an indebtedness of the State of South Carolina within the meaning or application of any constitutional provision or limitation and does not constitute a pledge of the faith, credit or taxing power of the State of South Carolina or any political subdivision thereof within the meaning or application of any constitutional provision or limitation.
10. CONTRACTOR is an independent contractor, and nothing contained in this Contract shall be construed as constituting any relationship with SCDOT other than that of independent contractor. In no event shall the relationship between SCDOT and CONTRACTOR be construed as creating any relationship whatsoever between SCDOT and CONTRACTOR's employees, suppliers, or other contractors. Neither CONTRACTOR nor any of the employees, suppliers, or contractors of CONTRACTOR or any of CONTRACTOR's affiliates is or shall be deemed to be an employee of SCDOT. Except as otherwise expressly stated or implied in law or under any governmental approval or permit, CONTRACTOR has sole authority and responsibility to employ, discharge, and otherwise control its employees and has complete and sole responsibility as a principal for its agents, for all suppliers, subcontractors, and for all other persons or entities that CONTRACTOR or any supplier or subcontractor hires to perform or assist in performing the work under this Contract.
11. This Contract shall be binding on and inure to the benefit of SCDOT and CONTRACTOR and each of their successors, permitted assigns, and legal representatives.
12. CONTRACTOR's and SCDOT's representations and warranties, if any, the dispute resolution provisions, the indemnifications, the express obligations of the parties following termination, and all other provisions which by their inherent character should survive expiration or earlier termination of this Contract and/or Final Completion shall survive the expiration or earlier termination of this Contract and/or the Final Completion of the Project.
13. Persons employed by, or contracted to, SCDOT in connection with this Contract are acting solely as agents and representatives of SCDOT when carrying out the provisions of, or exercising the power or authority granted to them under, this Contract. They shall not be liable either personally or as employees of or

contractors to SCDOT for actions in their ordinary course of employment or performance of contracted services.

14. It is understood and agreed by the parties hereto that if any part, term, or provision of this Contract is by the courts held to be illegal or in conflict with any law of the State of South Carolina, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Agreement did not contain the particular part, term, or provisions to be invalid.
15. The language in all parts of the Contract shall in all cases be construed simply, as a whole and in accordance with its fair meaning and not strictly for or against any party. In the event of an ambiguity in or dispute regarding the interpretation of the Contract, the Contract shall not be interpreted or construed against the party preparing it, and instead other rules of interpretation and construction shall be utilized.
16. This instrument may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

I-26 at I-95 Interchange Improvement
Dorchester and Orangeburg Counties

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the Effective Date defined herein. The Effective Date is defined as the date signed by the Director of Construction on behalf of South Carolina Department of Transportation.

Witnesses:


Matthew M. Walsh, IV

Date: 1/19/2024


1/19/2024

Witnesses:



Matthew M. Walsh, IV, Secretary

SOUTH CAROLINA DEPARTMENT
OF TRANSPORTATION

By: 
Chris L. Gaskins, P.E., P.G., DBIA, CPM
Director of Alternative Delivery

Recommended:


Jennifer Taylor
Contract Administrator

CONTRACTOR


Archer Western Construction, LLC

By: Daniel P. Walsh

Its: President

CERTIFICATION OF CONTRACTOR

I hereby certify that I am the duly authorized representative of CONTRACTOR and that neither I nor the above CONTRACTOR I here represent has:

1. employed or retained for a commission, percentage, brokerage, contingent fee, or other consideration, any firm or person (other than a bona fide employee working solely for me or the above CONTRACTOR) to solicit or secure this contract;
2. agreed, as an express or implied condition for obtaining this contract, to employ or retain the services of any firm or person in connection with carrying out the contract, or
3. paid, or agreed to pay, to any firm, organization or person (other than a bona fide employee working solely for me or the above CONTRACTOR) any fee, contribution, donation, or consideration of any kind for, or in connection with, procuring or carrying out the contract except as here expressly stated (if any);
4. either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action, in restraint of free competitive bidding in connection with the submitted proposal.

By execution of this Agreement, CONTRACTOR certifies CONTRACTOR and all CONTRACTOR's consultants, sub-consultants, contractors, employees and agents will comply with South Carolina's Ethics, Government Accountability, and Campaign Reform Act of 1991, as amended. The following statutes require special attention: (a) Offering, giving, soliciting, or receiving anything of value to influence action of public employee - §8-13-790, 8-13-705, 8-13-720; (b) Recovery of kickbacks - §8-13-790, (c) Offering, soliciting or recovering money for advice or assistance of public official - §8-13-720, (d) Use or disclosure of confidential information - §8-13-725, (e) Persons hired to assist in the preparation of specifications or evaluation of bids - §8-13-1150, (f) Solicitation of state employees - §8-13-755, 8-13-760 and §8-13-725, (g) False Claims Act -§16-13-240. The state may rescind any contract and recover all amounts expended as a result of any action taken in violation of this provision.

I acknowledge that this certificate is to be furnished to the Department, the Federal Highway Administration, and the U. S. Department of Transportation, and is subject to applicable State and Federal laws, both criminal and civil.

I acknowledge that giving false, misleading, or incomplete information on this certification may subject me to prosecution under Section 16-9-10 of the South Carolina Code of Laws.

CONTRACTOR

Archer Western Construction, LLC

By:  Daniel P. Walsh

Its: President

Date: 1/8/2024

CERTIFICATION OF DEPARTMENT

I hereby certify that I am the Director of Alternative Delivery for the South Carolina Department of Transportation (SCDOT) of the State of South Carolina and that the above CONTRACTOR or its representative has not been required, directly or indirectly, as an express or implied condition in connection with obtaining or carrying out this agreement to:

1. employ or retain, or agree to employ or retain, any firm or person, or
2. pay, or agree to pay, to any firm, person, or organization, any fee, contributions, donations, or consideration of any kind, except as here expressly stated (if any).

I acknowledge that this certificate is to be furnished to the Federal Highway Administration, and U. S. Department of Transportation, and is subject to applicable State and Federal laws, both criminal and civil.

SOUTH CAROLINA DEPARTMENT OF
TRANSPORTATION

BY: 

TITLE: DIRECTOR OF ALTERNATIVE DELIVERY

Date: 1/19/23

DRUG-FREE WORKPLACE CERTIFICATION

In accordance with Section 44-107-30, South Carolina Code of Laws (1976), as amended, and as a condition precedent to the execution of this agreement, the undersigned, who is an authorized representative of the CONTRACTOR certifies on behalf of the CONTRACTOR that the PROPOSER will provide a drug-free workplace by:

- (1) publishing a statement notifying employees that the unlawful manufacture, distribution, dispensations, possession, or use of a controlled substance is prohibited in the CONTRACTOR's workplace and specifying the actions that will be taken against employees for violations of the prohibition;
- (2) establishing a drug-free awareness program to inform employees about:
 - (a) the dangers of drug abuse in a workplace;
 - (b) the person's policy of maintaining a drug-free workplace;
 - (c) any available drug counseling, rehabilitation, and employee assistance programs; and
 - (d) the penalties that may be imposed upon employees for drug violations;
- (3) making it a requirement that each employee to be engaged in the performance of the agreement be given a copy of the statement required by item (1);
- (4) notifying the employee in the statement required by item (1) that, as a condition of employment of this agreement, the employee will:
 - (a) abide by the terms of the statement; and
 - (b) notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five days after the conviction;
- (5) notifying the South Carolina Department of Transportation within ten days after receiving notice under item (4)(b) from an employee or otherwise receiving actual notice of the conviction;
- (6) imposing a sanction on, or requiring the satisfactory participation in a drug abuse assistance or rehabilitation program by, any employee convicted as required in Section 44-107-50; and
- (7) making a good faith effort to continue to maintain a drug-free workplace through implementation of items (1), (2), (3), (4), (5), and (6)

By execution of this Agreement CONTRACTOR certifies CONTRACTOR and all CONTRACTOR's consultants, sub-consultants, contractors, employees and agents will comply with all applicable provisions of the Drug-Free Workplace Act, Title 44, Chapter 107 of the South Carolina Code of Laws, as amended.

CONTRACTOR: 

Daniel P. Walsh, President

COMMISSIONER EMPLOYEE INTEREST CERTIFICATION


As a condition precedent to the execution of this Agreement, the undersigned, who is an authorized representative of the CONTRACTOR/CONSULTANT certifies on behalf of the CONTRACTOR/CONSULTANT, that during the procurement and award of this Agreement, and as an ongoing obligation under this Agreement until the end of the contract period, CONTRACTOR/CONSULTANT represents and agrees to comply with the following provisions:

1. In accordance Section 23 of Act 40 of 2017 (now codified as Section 57-1-350(G) of the Code of Laws of South Carolina 1976, as amended):
 - a) No member of the SCDOT Commission has an interest, direct or indirect, in the proposal or bid submitted to SCDOT for this Project, during the member's term of appointment and for one year after the termination of the appointment.
 - b) No member of the SCDOT Commission will have an interest, direct or indirect, in any contract, franchise, privilege, or other benefit granted or awarded by the Department relating in any way to this Project (through subcontractors, consultants, vendor, or suppliers) during the member's term of appointment and for one year after the termination of the appointment.
2. In accordance with SCDOT Departmental Directive 45(a) regarding Post-employment Restrictions on Qualification-Based Procurements dated August 13, 2015 and amended June 2, 2017:

No current or former employee, who served in a management level position or above, may work on or invoice for services performed on this Project within 365 days after their last day of employment with SCDOT. For the purposes of this bright line rule, "management level position" is defined as any SCDOT Pay Band 7 and above position, which includes, but is not limited to, Directors, Assistant Directors, District Engineering Administrators, District-level Engineers, Program Managers, Assistant Program Managers and Resident-level Engineers.

CONTRACTOR/CONSULTANT hereby certifies that it and all of its consultants, sub-consultants, contractors, vendors, suppliers, employees and agents will comply with the above provisions.

CONTRACTOR/CONSULTANT
Archer Western Construction, LLC

By: 
(Signature)

Print Name: Daniel P. Walsh

Date: 1/8/2024

Its: President

PROJECT INFORMATION PACKAGE ACKNOWLEDGMENT FORM

ACKNOWLEDGMENT

NO RIGHT TO RELY ON PROJECT INFORMATION PACKAGE

The undersigned Proposer hereby agrees that it did not rely on the contents, accuracy, thoroughness, and completeness of the Project Information Package (PIP) as part of its response to the Request for Proposals (RFP) process. The information—defined as broadly as possible—contained within the PIP was provided by or on behalf of SCDOT for informational purposes equally to prospective proposers. The undersigned Proposer acknowledges that the information gathered and provided as the PIP is preliminary only and not intended by SCDOT, its officers, employees, consultants, agents, heirs, and assigns to be comprehensive.

Proposer is hereby informed that SCDOT compiled the information contained within the PIP for the purposes of obtaining all necessary permits, to ascertain feasibility, to estimate project duration and/or cost, and other such determinations as SCDOT deemed necessary in determining whether to pursue this Project. Proposer agrees that SCDOT has specifically disclaimed the accuracy and completeness of the information in the PIP from whatever source it is derived or compiled. SCDOT has made no representations, covenants, warranties or guarantees, either express or implied, regarding the accuracy and completeness of the information contained within the PIP.

Proposer also acknowledges and agrees that the information contained in the PIP is of such a preliminary character that is unreasonable to use for technical, engineering, or scientific decisions relating to, necessary to make, or contained within a proposal including, but not limited to, designs, quantities of materials to be excavated, engineering decisions, material quantities required, etc. Proposer agrees that it is its responsibility to conduct an independent investigation of the facts and circumstances necessary to submit a proposal. Proposer admits that, if it has relied on the information contained within the PIP, it has been specifically advised against doing so and relies upon the PIP at its own risk. The Proposer accepts that there is a substantial possibility that there are potential risks not discovered by the preparers of the PIP. Proposer specifically and intentionally waives reliance upon the thoroughness and comprehensiveness of the PIP, and shall hold harmless SCDOT, its officers, employees, consultants, agents, heirs, and assigns.

Proposer agrees this acknowledgment is an essential and material part of its Proposal and Contract with SCDOT. Proposer has had the advice of learned counsel or the opportunity to consult with said counsel prior to the execution of this acknowledgment.

I acknowledge that giving false, misleading or incomplete information on this certification may subject me to prosecution under the laws of the United States of America and/or the State of South Carolina.

PROPOSER

Name of Proposer: Archer Western Construction, LLC

Authorized Representative Daniel P. Walsh 

Its: President

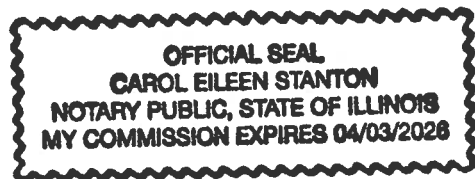
SWORN to before me this

01 day of January 20 24

(S)  _____

Notary Public for the State of Illinois

My Commission Expires: 4/3/2026



I-26 at I-95 Interchange Improvement Dorchester and Orangeburg Counties

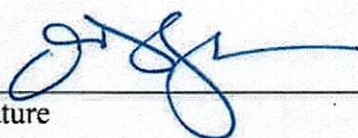
CONTRACTOR: ARCHER WESTERN CONSTRUCTION, LLC.

ADDRESS: 11000 REGENCY PKWY., STE. 100, CARY NC 27518

Provide full Project scope as described in Attachment A.

TOTAL COST TO COMPLETE (A) = \$ 202,967,000.00 (USD)

No conditional or qualified Bids will be accepted, nor Bids with reservations, assumptions, or that are premised upon changes to the terms of the Contract, and all such Bids will be rejected.



Signature

October 24, 2023
Date

Andrew Douglas, PE
Printed Name

EXHIBIT 1

COST PROPOSAL BID FORM

I-26 at I-95 Interchange Improvement Dorchester and Orangeburg Counties

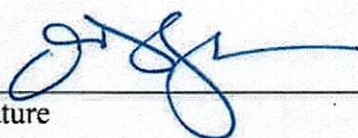
CONTRACTOR: ARCHER WESTERN CONSTRUCTION, LLC.

ADDRESS: 11000 REGENCY PKWY., STE. 100, CARY NC 27518

Provide full Project scope as described in Attachment A.

TOTAL COST TO COMPLETE (A) = \$ 202,967,000.00 (USD)

No conditional or qualified Bids will be accepted, nor Bids with reservations, assumptions, or that are premised upon changes to the terms of the Contract, and all such Bids will be rejected.



Signature

October 24, 2023
Date

Andrew Douglas, PE
Printed Name

EXHIBIT 2

SCHEDULE OF VALUES



Contract Schedule

Contract ID: 8868470

Project(s): P038677

Awarded Vendor: 1AR002

ARCHER WESTERN CONSTRUCTION, LLC

SECTION 1

ROAD PAY ITEMS - P038677

\$150,967,000.00

Alt Set ID:

Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0010	9210301 PROJECT MOBILIZATION	10,148,000.000 DOL	1.00000		10,148,000.00	
0020	9210303 BONDS / INSURANCE	4,059,000.000 DOL	1.00000		4,059,000.00	
0030	9210305 MOBILIZATION-SUBCONTRACTORS	10,148,000.000 DOL	1.00000		10,148,000.00	
0040	9210504 CONSTRUCTION SURVEY	3,000,000.000 DOL	1.00000		3,000,000.00	
0050	9210700 TRAFFIC CONTROL	5,000,000.000 DOL	1.00000		5,000,000.00	
0060	9210706 TEMPORARY SHORING	1,000,000.000 DOL	1.00000		1,000,000.00	
0070	9211101 DESIGN & ENGINEERING FOR DESIGN/BUILD PROJECT DESIGN & ENGINEERING FOR DESIGN / BUILD	25,000,000.000 DOL	1.00000		25,000,000.00	
0080	9220102 CLEARING AND GRUBBING	3,500,000.000 DOL	1.00000		3,500,000.00	
0090	9220304 GRADING	6,000,000.000 DOL	1.00000		6,000,000.00	
0100	9220306 EARTHWORK	28,000,000.000 DOL	1.00000		28,000,000.00	
0110	9240300 ASPHALT PAVING	10,000,000.000 DOL	1.00000		10,000,000.00	
0120	9240400 TEMPORARY ASPHALT PAVING	11,212,000.000 DOL	1.00000		11,212,000.00	
0130	9250100 CONCRETE PAVEMENT	17,000,000.000 DOL	1.00000		17,000,000.00	



Contract Schedule

Contract ID: 8868470

Project(s): P038677

Awarded Vendor: 1AR002

ARCHER WESTERN CONSTRUCTION, LLC

SECTION 1

ROAD PAY ITEMS - P038677

\$150,967,000.00

Alt Set ID:

Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0140	9250110 FLATWORK	1,000,000.000 DOL	1.00000		1,000,000.00	
0150	9262500 SIGNING	300,000.000 DOL	1.00000		300,000.00	
0160	9263990 MILLING EXISTING PAVEMENT (VARIABLE) FOR DESIGN BUILD	850,000.000 DOL	1.00000		850,000.00	
0170	9271305 MECH.STAB.EARTH WALLS FOR DESIGN BUILD PROJ.	3,500,000.000 DOL	1.00000		3,500,000.00	
0180	9271402 DRAINAGE	2,500,000.000 DOL	1.00000		2,500,000.00	
0190	9271450 BOX CULVERTS	1,100,000.000 DOL	1.00000		1,100,000.00	
0200	9280520 PERMANENT BARRIER	1,750,000.000 DOL	1.00000		1,750,000.00	
0210	9280530 GUARDRAIL / FENCE	900,000.000 DOL	1.00000		900,000.00	
0220	9281500 EROSION CONTROL	5,000,000.000 DOL	1.00000		5,000,000.00	



Contract Schedule

Contract ID: 8868470

Project(s): P038677

Awarded Vendor: 1AR002

ARCHER WESTERN CONSTRUCTION, LLC

SECTION 2

BRIDGE PAY TIEMS - P038677

\$52,000,000.00

Alt Set ID:

Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0230	9251000 DRILLED SHAFTS	10,000,000.000 DOL	1.00000		10,000,000.00	
0240	9270130 BRIDGE DEMOLITION	2,000,000.000 DOL	1.00000		2,000,000.00	
0250	9270201 BRIDGE SUBSTRUCTURE FOR DESIGN BUILD PROJECT 001	10,500,000.000 DOL	1.00000		10,500,000.00	
0260	9270251 BRIDGE SUPERSTRUCTURE FOR DESIGN BUILD PROJECT 002	27,000,000.000 DOL	1.00000		27,000,000.00	
0270	9271200 FOUNDATIONS - HP PILES	2,500,000.000 DOL	1.00000		2,500,000.00	
Total Bid:						\$202,967,000.00

EXHIBIT 3

SCOPE OF WORK

EXHIBIT 3 – SCOPE OF WORK

The project consists of all work necessary to complete the design and reconstruction of the system-to-system interchange at I-26 and I-95 in Orangeburg and Dorchester Counties. The project will maintain existing I-26 and I-95 thru-lanes in their current location and provide clearances for future lanes towards the inside of each interstate mainline. Work will include design and construction of new bridges on I-95 over I-26 and related roadway approaches along I-95, design and construction of interchange ramps, and demolition of the existing bridges on I-95. The work also includes replacement of the S-1302 overpass bridge over I-26 and associated roadway approaches. The purpose of the project is to address traffic deficiencies at the interchange, to bring the facility up to current standards and to accommodate future lanes in each direction along both interstate mainlines.

SCDOT values:

- Elimination of weaving movements
- Reduction of impacts to the travelling public
- Interchange design which accommodates all traffic movements and provides an appropriate level of service
- Construction of a project that will accommodate a future third and fourth through-lane in each direction along I-26 and I-95
- Quality plans production and efficient and effective submittal schedules
- Quality construction to produce a durable and easily maintainable facility

Pavement rehabilitation is being performed by others within the project limits along I-26 and along I-95 north and south of the overpasses over I-26 under 3 separate contracts. The work along I-26 and along I-95 north of the interchange, but within the project limits, have completion dates of December 2024. Priority will be given to these two rehabilitation projects up until the completion date noted herein. The work on the project to the south of the interchange along I-95 will end at MM 84.19. The work performed under the reconstruction of the interchange shall tie into work completed under other referenced projects.

SCDOT has executed a contract to clear all trees within the existing SCDOT controlled access limits for the limits of the project. The contractor shall be responsible for all grubbing within the existing controlled access area. The clearing work is anticipated to be completed prior to execution of this contract. The contractor shall also be responsible for clearing and grubbing the remaining R/W and any additional R/W necessary to construct the project.

For a full understanding of the project scope and the criteria of the construction items needed for this project, review Exhibit 4, Exhibit 5, Exhibit 6 and Attachment B.

EXHIBIT 4

PROJECT DESIGN CRITERIA

EXHIBIT 4 – PROJECT DESIGN CRITERIA

This exhibit details the criteria by which the project shall be designed and constructed. It is the responsibility of the Engineer to get clarification from the Department if a question arises from the use of the below exhibits. These criteria are divided into subsections as listed below:

Exhibit 4a – Roadway Design Criteria

Exhibit 4b – Structures Design Criteria

Exhibit 4c – Pavement Design Criteria

Exhibit 4d – Traffic Design Criteria

Part 1. Signing and Pavement Marking

Part 2. Work Zone Traffic Control

Part 3. Pavement Marking

Part 4. Signing

Part 5. Traffic Intelligent Transportation System

Exhibit 4e – Hydraulic Design Criteria

Exhibit 4f – Geotechnical Design Criteria

Exhibit 4z – Project Deliverables

DESIGN REFERENCES

This exhibit describes the general design considerations and criteria for the proposed roadway approaches, hydraulics, structures, and surveys.

Design standards shall be in accordance with the following design references as supplemented or amended by Sections 4a, 4b, 4c, 4d, 4e, 4f and 4z of this Exhibit. Any variation in design from the included information shall require written approval from SCDOT.

- AASHTO A Policy on Design Standards Interstate System, 2016
- AASHTO An Informational Guide On Fencing Controlled Access Highways, 1990
- AASHTO Drainage Manual, 2014 first edition
- AASHTO Drainage Manual, Appendix 17A
- AASHTO Guide for the Development of Bicycle Facilities, 2012
- AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2nd Edition
- AASHTO Highway Drainage Guidelines, 2007
- AASHTO LRFD Bridge Design Specifications, 2017, 8th Edition
- AASHTO LRFD Bridge Construction Specifications, 2017, Fourth Edition
- AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges, 2015 Interim
- AASHTO LRFD Bridge Design Guide Specifications for GFRP-Reinforced Concrete, 2018, 2nd Edition
- AASHTO Guide Specifications for Analysis and Identification of Fracture Critical Members and System Redundant Members, 1st Edition with 2022 Interim
- AASHTO Guide Specifications for Bridges Vulnerable to Coastal Storms, 2008 Edition
- AASHTO Guide Specification for Service Life Design of Highway Bridges, 2020, 1st Edition
- AASHTO Manual for Assessing Safety Hardware (MASH)
- AASHTO Manual for Bridge Evaluation, latest edition
- AASHTO Roadside Design Guide, 2011, 4th Edition
- AASHTO Roadway Lighting Design Guide, latest edition
- AASHTO Standard Specifications for Highway Bridges, 17th Edition
- AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, latest edition
- AASHTO Highway Safety Manual
- AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, latest edition (Only for Standard 35' Luminaire Poles and High Mast Luminaire Poles)
- AASHTO/AWS D1.5/D1.5M: 2020 Bridge Welding Code, 8th Edition
- AASHTO/AWS D1.1/D1.1M: 2020 Structural Welding Code – Steel, 24th Edition
- AASHTO/AWS D1.4/D1.4M: 2018 Structural Welding Code – Reinforcing Steel, 8th Edition
- AASHTO “Standard Specifications for Transportation Materials and Methods of Sampling and Testing” 2013 Thirty-Third Edition
- ACI 318 Building Code and Commentary
- ASCE’s “Minimum Design Loads for Buildings and Other Structures”, latest edition

EXHIBIT 4 – PROJECT DESIGN CRITERIA

- ANSI C2 National Electrical Safety Code, latest edition
- FEMA Regulations, 44CFR Chapter 1
- FHWA Manual on Uniform Traffic Control Devices, Latest edition
- FHWA Report No. FHWA-SA-14-067 Diverging Diamond Interchange Informational Guide
- NCHRP Report 672, Roundabouts: An Informational Guide – Second Edition
- NFAP-70 National Electrical Code, latest edition
- International Building Code, latest edition
- PCI Bridge Design Manual, 3rd Edition
- PCI CB-02-16: Recommended Practice for Lateral Stability of Precast, Prestressed Concrete Bridge Girders
- PCI CB-04-20: User Manual for Calculating Lateral Stability of Precast, Prestressed Concrete Bridge Girders
- SCDHEC NPDES Construction Permit # SCR160000
- SCDHEC NPDES MS4 Permit # SCS040001
- SCDOT Access and Roadside Management Standards, August 2008 with updates
- SCDOT Americans with Disabilities Act Transition Plan, December 2014 with updates
- SCDOT Bridge Design Manual, 2006
- SCDOT Bridge Design Memoranda, effective between July 1, 2006 and the Final RFP release date
- SCDOT Bridge Drawings and Details, effective as of the Final RFP release date
- SCDOT Bridge Inspection Guidance Document, 2020
- SCDOT Engineering Directives, effective as of the Final RFP release date
- SCDOT Environmental Reference Document, 2008
- SCDOT Geotechnical Design Manual, 2022 Edition
- SCDOT Geotechnical Design Bulletins, effective as of the Final RFP release date
- SCDOT Geotechnical Drawings and Details, effective as of the Final RFP release date
- SCDOT Hydraulic Design Bulletins
- SCDOT Load Rating Guidance Document, 2019, including latest Technical Notes
- SCDOT Pavement Design Guidelines, July 2008 Edition
- SCDOT Preconstruction Advisory Memorandums, effective as of the Final RFP release date
- SCDOT Preconstruction Design Memorandum, effective as of the Final RFP release date
- SCDOT Preconstruction Survey Manual, effective as of the Final RFP release date
- SCDOT Procedures and Guidelines for Work Zone Traffic Control Design, effective as of the Final RFP release date
- SCDOT Qualified Product Lists, effective as of the Final RFP release date
- SCDOT Requirements for Hydraulic Design Studies, May 2009
- SCDOT Road Design Reference Material for Consultant Prepared Plans, June 2010
- SCDOT Roadway Design Manual, 2021, with updates effective as of the Final RFP release date and supplemented with AASHTO A Policy on Geometric Design of Highways and Streets, 2018
- SCDOT Roadside Plants to Avoid/Trees with Limitations on R/W, October 2014
- SCDOT Roadway CADD Manual, effective as of the Final RFP release date
- SCDOT Seismic Design Specifications for Highway Bridges, 2008 (Version 2.0)
- SCDOT Standard Drawings, effective as of the Final RFP release date

EXHIBIT 4 – PROJECT DESIGN CRITERIA

- SCDOT Standard Specifications for Highway Construction, 2007
- SCDOT Stormwater Quality Design Manual, effective as of the Final RFP release date;
- SCDOT Supplement to the MUTCD
- SCDOT Supplemental Specifications (2007), effective as of the Final RFP release date
- SCDOT Supplemental Technical Specifications, effective as of the Final RFP release date
- SCDOT Supplemental Specifications for Roadway Lighting dated December 6, 2018
- SCDOT Traffic Signal Design Guidelines, 2021 Edition
- SCDOT Traffic Signal Material Specifications, effective as of the Final RFP release date
- SCDOT Traffic Signal Supplemental Specifications, effective as of the Final RFP release date
- SCDOT Street Trees and Sidewalk Planting Suggestions, May 2013
- SCDOT Vegetation Management Guidelines, effective as of the Final RFP release date
- South Carolina State Water Law
- The Rule on Work Zone Safety and Mobility, Policy and Guidelines
- The State Stormwater and Sediment and Erosion Control Regulations administered by DHEC, 26 S.C. Code Ann. Regs. 72-405 (Supp. 1995) et seq.
- TRB Highway Capacity Manual, 6th Edition
- TRB Highway Capacity Manual, 2010
- United States Access Board's Revised Draft Guidelines for Accessible Public Rights-of-Way (PROWAG), November 23, 2005

EXHIBIT 4a

ROADWAY DESIGN CRITERIA

1.0 GENERAL

Prepare the roadway geometric design for the project using the design standards and criteria that are most appropriate based on design speed, functional classification, design traffic volumes, right-of-way, and aesthetics. The design elements shall include, but not be limited to, the horizontal and vertical alignments, lane widths, shoulder widths, median widths, sight distance, clear zone, cross slopes, and side slopes.

2.0 CRITERIA

Classify the terrain as level on all routes within the scope of work.

2.1 Functional Classification

The functional classification for each roadway is as follows:

- Interstate 95 Rural Freeway
- Interstate 26 Rural Freeway
- Interchange Ramps Rural Freeway
- S-1302 Rural Local Group 4
- Other local and Non SCDOT Roads Rural Local Groups 2-4

2.2 Design Speed

- Interstate 95 70 mph
- Interstate 26 70 mph
- I-26 WB to I-95 NB Ramp 55 mph
- I-26 EB to I-95 SB Ramp 55 mph
- All Other Ramps 45 mph
- Loops 35 mph

2.3 Traffic Lane, Shoulder & Median Criteria

Develop traffic lane, shoulder, and median widths in compliance with SCDOT Roadway Design Manual.

Interstate 95 & Interstate 26

- Through Lanes 12 ft.
- Auxiliary Lanes 12 ft.
- Shoulder (outside) 12 ft. total (10 ft. paved, 2 ft. earth)

- Shoulder (inside) 10 ft. total (4 ft. paved, 6 ft. earth for areas with 2 lanes) (see Figure 17.3A)
- Auxiliary Lane Shoulder 12 ft. total (10 ft. paved, 2 ft. earth)
*10 ft. paved at rigid barrier locations

Basic Number of Lanes – all ramp segments shall have the minimum number of lanes as indicated in the Interchange Modification Report (IMR).

Ramp type- entrance and exit ramps shall be parallel type with acceleration/deceleration lane lengths determined by IMR.

Interchange Ramps

- Through Lanes 16 ft. single lane/12 ft. double lanes
- Shoulder (outside) 10 ft. total (6 ft. paved, 4 ft. earth)*
- Shoulder (inside) 10 ft. total (4 ft. paved, 6 ft. earth)*

Local Roads & Non-SCDOT

- Through Lane Use SCDOT RDM Tables
- Shoulder Use SCDOT RDM Tables

2.4 Horizontal Alignments

Develop horizontal curves and superelevation in compliance with SCDOT Roadway Design Manual and the SCDOT Standard Drawings.

For horizontal sight distance, use grade adjusted SSD values where the downgrades are 3 percent or greater.

If modifications to frontage and side roads result in tying into existing roads within a horizontal curve, transition superelevation to existing superelevation in accordance with the SCDOT RDM.

Do not use broken-back curves.

2.5 Vertical Curves, Grades, and Clearances

Develop vertical curves, grades, and clearances in compliance with SCDOT Roadway Design Manual.

Use grade adjusted K values where the downgrades are 3 percent or greater.

Do not use spline grades. Spline grades are only acceptable on the ramps within the

2.9 Ramps

Develop ramps in compliance with SCDOT Roadway Design Manual.

2.10 Intersections

Design all intersection turning radii in accordance with the RDM functional class requirements. Design all intersections using appropriate design vehicle and design speed for application of intersection sight distance.

Use the SCDOT Roadway Design Manual, Chapter 9, Section 9.2.5. for the selection of the design vehicle.

2.11 Roadside Barriers

Develop roadside barriers in compliance with SCDOT Roadway Design Manual. Include the following items in the work:

Guardrail: Ensure that all new guardrail and end treatments are listed on the Qualified Products Policies & Listings.

Provide paving under guardrail in accordance with the guidance found in the Exhibit 5, Special Provisions Section 403. The non-mow strip shall be asphalt or concrete. Proprietary non-mow strip material is not allowed.

Where right of way or environmental impacts dictate that standard guardrail shoulder break cannot be built, use additional length guardrail posts with compressed guardrail shoulder break and provide documented justification for its necessary use.

Do not use three-beam guardrail with critical offset posts at the bridge piers.

Cable Median Barrier: Only a single-run of median cable barrier is allowed.

Concrete Median Barrier: Provide concrete median barrier where proposed medians are less than 36 feet wide. Pave entire width to the face of barrier.

See Exhibit 4b for design and detailing requirements. Provide custom barrier design where required in accordance with Exhibit 4b.

Concrete Roadside Barrier: Concrete roadside barrier treatment is required in the following conditions: Where the clear zone of an interstate lane, auxiliary lane, or interstate ramp lane overlaps with the shoulder of an adjacent proposed or existing service road. Where physical separation is required between the interstate mainline lanes and adjacent ramp or collector-distributor lanes to control access to/from the mainline. To provide protections where retaining walls, pipe/culvert headwalls, or similar linear hazard over 10 feet in length (measured parallel to the roadway centerline) which cause an abrupt/near vertical change in roadside grading greater

than 3 feet are located within the clear zone of any roadway.

For determination of the need for barrier protection per the conditions above, the clear zone shall be the full distance as defined in section “Clear Zones” within this Exhibit regardless of presence of other protection such as guardrail. Placement of the concrete barrier walls must accommodate the future corridor widening.

When concrete barrier is constructed, pave the shoulder to the barrier. Paint all new concrete barriers in accordance with SCDOT Standard Specifications. Use single slope shaped concrete barriers and pier protection in accordance with SCDOT Standard Drawings.

See Exhibit 4b for design and detailing requirements. Provide custom barrier design where required in accordance with Exhibit 4b.

Where concrete median barrier terminates and cable median barrier starts, use PREMASH stiffness transitions in conjunction with a PREMASH impact attenuator and provide cable barrier overlap in accordance with Standard Drawing 805-935-00.

2.12 Bicycle and Pedestrian Accommodations

This project location is not part of any South Carolina bicycle tour routes or pedestrian plans and bicycle/pedestrian accommodations are not required.

2.12 Right-Of-Way and Control Of Access

Clear the entirety of the ROW. Perform grubbing operations to the construction limits. When the NPDES line is outside of the construction limits, extend grubbing operations within the limits of the BMPs.

Maintain fully controlled access along interstate, all interchanges, and ramp intersections. Follow SCDOT and FHWA guidelines for Control of Access at interstate interchanges.

2.13 Design File

All design files will be developed using Microstation and GEOPAK software.

EXHIBIT 4b

STRUCTURES DESIGN CRITERIA

1. GENERAL

Prepare the structures design for the project using the design standards and criteria that are most appropriate for the construction of new grade separations for ramps, interstate routes, waterways, railroads and other roadways as required for the Project, the construction of retaining walls, concrete median barriers and bridge pier protection, and the replacement of existing bridges as denoted in the Scope of Work.

Additional design criteria is located in Attachment B.

2. CRITERIA

2.1 New Highway Bridges

2.1.1 Bridge Design

Design all new bridges in accordance with the requirements of the AASHTO LRFD Bridge Design Specifications, 8th edition. Use the HL-93 design live loading and all vehicles as required by SCDOT Load Rating Guidance Document. See the “Bridge Load Rating” requirements in this exhibit.

2.1.2 Seismic Design and Detailing

In accordance with the SCDOT Seismic Design Specifications (SDS) for Highway Bridges, the Bridge Operational Classification (OC) for new bridges that carry interstate mainline, collector-distributor, and system-to-system ramp traffic is “I”. OC for all other new bridges is “II”. Except SDC A and Single Span Bridges, submit Seismic Design Summary Reports according to the requirements shown in Exhibit 4z along with bridge structure plan submittals.

SDS Section 3.11 is revised to eliminate the specific requirement to perform detailed seismic analysis and design using the acceleration coefficient given in the FEE for each intermediate construction stage of the bridge. Design the final bridge configuration to meet the seismic design requirements for permanent structures.

For additional requirements, see Revisions to SCDOT Seismic Design Specifications for Highway Bridges in Attachment B.

2.1.3 Corrosion Protection

Provide galvanized rebar in all new bridge decks and their concrete appurtenances including barriers and sidewalks on this project. See “Galvanized Reinforcing Bars” special provision in Exhibit 5. Galvanizing is not required on steel studs, beam stirrups, or diaphragm reinforcement extended into decks. Galvanized rebar is not required in approach slabs and their associated barriers.

2.1.4 Dimensions

Construct the new bridges with bridge roadway widths that are equal to or greater than the approach roadway widths (traveled way and shoulders) that are specified in Exhibit 4a.

For bridges carrying I-26 or I-95 mainline traffic, provide sufficient bridge width to accommodate a minimum of three mainline lanes (in addition to any auxiliary, ramp, or collector-distributor lanes) in each direction, along with associated shoulders.

For bridges crossing over I-26 or I-95 traffic, provide sufficient opening beneath to accommodate a minimum of four mainline lanes (in addition to any auxiliary, ramp, or collector-distributor lanes) in each direction, along with associated shoulders. Additionally, for bridges crossing over I-26 westbound traffic, provide sufficient opening beneath to accommodate a future 16-foot outside shoulder adjacent to the existing I-26 mainline lanes, except at locations where an auxiliary or ramp lane is present.

See section titled “Horizontal Clearances/Pier and Abutment Protection” for horizontal clearance requirements where width is provided for future accommodations.

2.1.5 Vertical Clearances

Provide vertical clearance in accordance with the values listed in the SCDOT Roadway Design Manual or other requirements in this Exhibit. Consider the horizontal and vertical geometry as well as cross slope effects associated with the additional lane requirements in section entitled “Dimensions” in computation of vertical clearances for bridges.

2.1.6 Horizontal Clearances / Pier and Abutment Protection

Locate all abutments and piers, and associated protection barrier to provide horizontal clearances under the new bridges over interstates and interstate ramps that are sufficient to accommodate roadway widths that are equal to or greater than the roadway widths (traveled way and shoulders) specified in Exhibit 4a and the additional future accommodations required by section titled “Dimensions” in this Exhibit.

Horizontal clearance provided under bridges for future accommodations are to be free of any and all obstructions including but not limited to physical obstacles and unrecoverable/non-traversable slopes.

Provide barrier protection for interior bents and abutments located within the roadway clear zone. Use Rigid Barrier Pier Protection details for interior bents from SCDOT Standard Drawings and abutment protection in accordance with the detail entitled “Rigid Barrier Adjacent to Wall” in Attachment B. Provide rigid barriers and pier protection at an elevation that accommodates the future 8-lane section along I-26 and I-95.

Interior bents located outside of the clear zone but within 30 feet to the edge of travel way, that do not have rigid barrier pier protection, shall meet the requirements for collision force outlined in SCDOT Bridge Design Memorandum DM0213. Vertical abutment retaining walls located outside of the clear zone but within 30 feet to the edge of travel way are not required to have rigid barrier protection and are not required to be investigated for collision force.

2.1.7 Removal and Disposal of Existing Bridges and Abandoned Utilities and Drainage Structures

Remove and dispose of the existing bridges being replaced in accordance with the Standard Specifications for Highway Construction.

If a portion of an existing structure is to be removed while traffic is maintained on the bridge, ensure the structural capacity will be adequate to accommodate loads remaining on the bridge, based on the loads for which the bridge was originally designed.

Entirely remove and dispose of abandoned wet utilities and abandoned drainage structures at locations where they are in conflict with the outer limits of any bent cap, wing wall, abutment wall, or foundation component including piles, footings, and drilled shafts.

2.1.8 Superstructures

For this project, Section 12.3.3 of the SCDOT Bridge Design Manual does not apply. Allowable superstructure types are outlined in Sections 12.3.2.1, 12.3.2.2, 12.3.2.3, and 12.3.2.4 of the BDM.

Do not mix superstructure types or switch between concrete and steel girders within the same bridge.

For prestressed concrete girder superstructures, use prestressed concrete girders that are “I” shaped. Design prestressed concrete girders so that the algebraic sum of the beam deflections due to prestress and beam self-weight, the beam dead load deflections due to non-composite dead load, and composite dead load deflections due to applied superimposed dead loads (including future wearing surface) results in a positive (upward) camber. For this calculation, the beam camber due to prestress and self-weight shall be considered “At erection” as described in the PCI Bridge Design Manual, 3rd Edition (PCIBDM) section 8.7.1 and shall be augmented by the “At erection” multipliers commensurate with PCIBDM Table 8.7.1-1.

For prestressed concrete bulb-tee beams, Florida I-beams, and structural steel plate girders used on this project, BDM Section 12.2.5.3 is amended to increase the maximum girder spacing to 12.0 feet.

For prestressed concrete beams that exceed the following span-to-depth ratios, the bridge engineer of record is responsible for performing a stability analysis to ensure the design accounts for stresses and deformations induced during handling, transportation and erection. For AASHTO I-beams, perform stability analysis when the S/D ratio exceeds 22, where S is span length and D is beam depth. For Bulb Tees and Florida I-Beams, perform stability analysis when the S/D ratio exceeds 25. Perform the stability analysis in accordance with the Recommended Practice for Lateral Stability of Precast, Prestressed Concrete Bridge Girders (CB-02-16), including errata dated March 2020, published by the Precast Concrete Institute (PCI), as well as the User Manual for Calculating Lateral Stability of Precast, Prestressed Concrete Bridge Girders (PCI publication CB-04-20). Input assumptions used in the analysis for handling and hauling shall be shown on the beam sheets in the final bridge plans. Verify assumptions for the hauling vehicle with the proposed precast fabricator for the project.

BDM Section 15.5.3.3, item 5, is amended to permit debonding of strands in the bottom row of prestressed concrete beams in accordance with AASHTO LRFD requirements. Exterior strands in each horizontal row shall be bonded.

For steel welded plate girder superstructures, use structural steel girders that are "I" shaped. For steel welded plate girder and steel rolled beam superstructures, use unpainted (except as required by BDM Section 16.2.1.3) weathering steel that conforms to the requirements of AASHTO M 270.

At each support of prestressed concrete girders, steel welded plate girders, and steel rolled beam superstructures, connect all beams and girders to the substructure using anchor bolts.

Detail all construction stages for girder bridges to consist of a minimum of two lines of girders.

Bridge decks are to be continuous over the girders from side to side and end to end; "exposed" girders without deck on top are not permitted.

Floorless culverts are classified as "Other Structure Types" (Section 12.3.3 of the SCDOT Bridge Design Manual) and are not permitted for this project. Box culverts will not be permitted as substitutes for bridges on this project.

2.1.9 Concrete Strengths

In prestressed concrete piles and beams, concrete design strengths are not allowed to exceed 8,000 and 10,000 psi maximum, respectively. Utilize Class 4000 concrete in all cast-in-place concrete bridge components except as noted in Section 15.2.1 of the BDM. All precast bridge components with concrete shall have a minimum compressive strength of 5000 psi.

For bridge deck and flat slab pours, optimize the Class 4000 mix design to minimize shrinkage cracking. The use of high-early-strength mix designs are

prohibited. The maximum cement content for the mix design is 705 pounds per cubic yard.

2.1.10 Lightweight Concrete

Lightweight Concrete is only permitted in cast-in-place decks and barrier parapets. Use lightweight concrete that conforms to the requirements of the Sand Lightweight Concrete Special Provision in Exhibit 5. When calculating dead loads, include a minimum allowance of 7 pounds per cubic foot for reinforcing steel.

2.1.11 Final Finish of Exposed Concrete Surfaces

Apply final surface finish to the following designated bridge areas:

- Entire surface of all barrier rails, parapet walls, approach slab curbs, concrete utility supports, and wing walls; outside vertical edge of bridge deck slabs and sidewalks
- Outside face of exterior prestressed concrete beams
- Entire surface of all substructure units, except top of bent caps and piers

Apply an Anti-Graffiti Coating to exposed concrete surfaces of bridge abutment walls, including precast panels and coping of MSE Walls. Apply an Anti-Graffiti Coating to exposed concrete surfaces of all retaining walls facing interstate traffic, excluding bifurcated median barrier walls.

Apply final surface finish and anti-graffiti coatings at rates specified by the manufacturer.

2.1.12 Bridge Aesthetics

Bridges with all or part of the structure visible to traffic, either passing beneath the bridge or travelling in lanes adjacent to the bridge, shall use constant depth of exterior beams along the entire length of the bridge to maintain uniform appearance.

No exposed conduits is allowed on bents, columns, bridge beams, overhangs, or other visible surfaces.

Substructure columns and bent caps shall be of similar size (within 15 percent in each direction) within the same bridge (i.e. in a 4-span bridge, bents 2-4 shall appear similar in size).

Slope the bottom of single and multi-column interior bent cap overhangs a minimum height of one-third of the cap height as shown in Interior Bent Cap Overhang Details sketch in Attachment B.

See Retaining Wall section in this Exhibit for wall finish treatment requirements.

2.1.13 Post-Tensioning

Post-tensioning is not permitted for this project.

2.1.14 Bridge Decks

For girder and beam spans, construct bridge decks with reinforced cast-in-place concrete.

Apply a transverse Grooved Surface Finish to all concrete bridge deck riding surfaces (permanent and temporary lanes and shoulders) in accordance with Subsection 702.4.16 of the Standard Specifications for Highway Construction.

Make the connection of the reinforcing of decks between stages by lap-splice or mechanical splice.

Asphalt overlays are not permitted on bridge decks.

Longitudinal expansion joints are not permitted.

If excess deck area (area in addition to the travel-way plus median and shoulder widths specified in the Roadway Technical Provision) exists, locate a SCDOT MASH barrier at the edge of deck.

2.1.15 Stay-in-Place Bridge Deck Forms

The Contractor may use permanent stay-in-place bridge deck forms for concrete deck slabs between new beams and girders. Fabricate permanent stay-in-place bridge deck forms and supports from steel conforming to ASTM A 653, Grades 40 or 50, and having a coating class of G165 in accordance with ASTM A 924. Do not use fillers in the flutes of the stay-in-place forms. Fill form flutes with concrete as the deck slab is placed. Do not use permanent stay-in-place steel bridge deck forms in bays in which longitudinal deck construction joints are located and in bays between stages. For the clips embedded in the top flange of concrete beams, use 10 gauge thickness clips spaced at a maximum of 12 inches along the length of beam.

2.1.16 Barriers, Railing Walls, and Sidewalks

Provide bridge barrier in accordance with the SCDOT Bridge Design Memo DM0119 and the SCDOT Bridge Drawings and Details for MASH Barrier. Provide two (2) conduits in each barrier as shown in the SCDOT Bridge Drawings and Details. If roadway lighting is required to be located on the bridge, detail lighting conduit, pull boxes, and junction boxes that are independent from the conduits and associated pull boxes detailed in the SCDOT Bridge Drawings and Details.

For concrete median barrier on interstate bridges, provide TL-5 56-inch high single-slope rigid barrier in accordance with Section 805 of the SCDOT Standard Drawings. Design the connection of the median barrier to the bridge deck such that the barrier weight itself, considering length between barrier expansion joints, and adhesive anchors can resist sliding and overturning. Avoid a full-moment connection that would potentially damage beams/girders supporting the deck.

2.1.17 Highway Light Pole Supports

For light poles located on bridges, design and detail supporting structures as an extension of bridge deck, outside of the traffic barrier. Provide pull boxes for lighting conduits at each light pole and facilitate wiring from each bridge corner. Provide conduits from the pull boxes through the deck extension to daylight at the base of the light pole. Use embedded or bolt-through anchor bolts for attaching the light post base plate. Adhesively bonded anchors are not an acceptable substitute for the embedded or bolt-through anchor bolts required.

2.1.18 Overhead Sign Attachment to Bridges

For overhead signs attached to bridges, design the bridge for the sign loads and state the loading assumptions on the bridge load rating summary form. Signs cannot decrease vertical clearance. No field welding to steel girders or field drilling to precast beams is allowed. Attachment to cast-in-place concrete elements shall be made with inserts or in accordance with SCDOT Bridge Memo DM0408 for Adhesively Bonded Anchors and Dowels. Attachment hardware shall be galvanized or stainless steel.

2.1.19 Bridge Drainage

BDM Subsection 18.2.2 does not apply to this project. Allowable water spread requirements in BDM Figure 18.2-1 shall dictate the minimum number of drainage inlets on the bridge in the final condition. Refer to Exhibit 4e for temporary drainage design requirements. Restrict temporary drainage spread to the shoulder width on bridge decks. Free-falling discharge is not allowed onto travel lanes beneath a bridge, in both temporary and permanent conditions.

Low points on the bridge are not permitted. Avoid bridge geometry that results in ponding on the bridge deck due to a superelevation transition in combination with a relatively flat longitudinal gradient. Bypass flow at superelevation rollover locations is restricted to 0.20 cubic feet per second.

Provide a single, standard concrete flume at each bridge corner, except where the gutterline is located on the high side of superelevation. Limit bypass gutter flow onto an erodible surface to 0.20 cubic feet per second. Include calculations showing discharge at each bridge inlet, each flume, and bypass flow at each flume in the Preliminary and Final Hydraulic Reports.

At bridge corners with flumes, provide shoulder paving triangles with 4:1 taper as shown on Standard Drawing 805-325-75. At bridge corners without flumes, provide shoulder paving triangles with 4:1 taper to ensure the entire width of approach slab or end of bridge interfaces with pavement.

Provide deck drainage as required in conformance with SCDOT Bridge Drawing No. 700-05 and 700-05.01. Use a minimum drain diameter of six inches in diameter. Grated inlets larger than the 6” diameter standard grated inlet specified in Bridge Drawing No. 700-05.01 may be used as needed to meet spread requirements.

If a closed drainage system is required, the bridge drainage shall be designed in accordance with SCDOT requirements. Scuppers shall be connected to under deck collector pipes which outfall to protected slopes, riprap pads, or connect to adjacent roadway drainage facilities. Provide accessible cleanouts for collector pipes.

Downspouts and collector pipes shall be fiberglass and shall be colored (not painted) to match the finished bridge color. No drains or discharge pipes shall be allowed inside of structural elements other than the bridge deck. Collector pipes are not to extend below the bottom of the girders except for downspout locations.

At finger joint locations, detail drainage troughs with downspouts and collector pipes to capture runoff into the joint. Expansion joint drainage shall not discharge freely out the side of the bridge deck and downspouts shall discharge beneath the bridge at least five feet down from the bottom of bent cap.

For bridge decks with future accommodations, provide deck drains to satisfy the spread requirements based on the future conditions. For bridges crossing roadways with allowances for future conditions, locate drains so they do not discharge onto current or future travel lanes. Bridge deck drains shall not be allowed to discharge directly into railroad right-of-way. Scupper placement over Waters of the U.S. shall be coordinated with permitting requirements.

2.1.20 Pile Sizes and Types

Minimum pile sizes and acceptable pile types are listed below. No other pile types are permitted. Where the geotechnical report indicates corrosion is a concern, use the entire perimeter of the steel section in contact with soil/water when determining sacrificial thicknesses for the design life of the member.

PILE TYPE	MINIMUM SIZE
Steel H-Piles	HP12x53
Steel Pipe Piles	16” Diam. (min. wall thickness equal to ½”)
Solid Prestressed Concrete Piles	18” Square
Prestressed Concrete Pile Points	W8x58

2.1.21 Steel Pipe Pile Connection Details

The pile connection detail described in Item 2 of Section 19.2.6.3 of the SCDOT Bridge Design Manual does not apply for this project. Terminate steel pipe piles at the bottom of the end bent cap and footing. Connect the piles to the cap and footing using a reinforced concrete infill, with the reinforcing extending into the cap or footing. The minimum clearance of the reinforcement shall satisfy the requirement of SCDOT Design Memorandum DM0107.

2.1.22 Drilled Shafts

SCDOT Bridge Design Memorandum DM0111 contains a requirement to detail the portion of shaft below the construction casing with a diameter that is six inches smaller than the diameter of the casing. This six-inch reduction requirement does not apply to this project. For this project, detail the portion of the shaft below the bottom of the construction casing, whether in soil or rock, with a diameter that is at least two inches smaller than the outer diameter of the casing.

If a drilled shaft is extended above ground, above the scour line, or through liquefiable soil, structurally design the shaft as a column and detail the longitudinal reinforcing steel with a maximum spacing of 8 inches center-to-center.

When the design for the upper portion of a drilled shaft requires a column reinforcement cage to be inserted into a larger diameter drilled shaft reinforcement cage, provide a construction joint in the shaft just below the bottom of the column cage. Prior to casting the upper portion of the shaft, remove all drilling fluids and unsound concrete and roughen the surface of the construction joint. Arrange for CSL testing to be performed prior to placement of the column reinforcement cage. Install the column reinforcement cage in the upper portion of the shaft prior to drilled shaft concrete placement in the splice region.

2.1.23 Crosshole Sonic Logging (CSL) Testing

Design and detail drilled shafts to include access tubes in all drilled shafts in accordance with the SCDOT Standard Specifications.

2.1.24 Substructures

Design Interior Single and Multi-Column Bents using cast-in-place reinforced concrete bent caps and columns supported on cast-in-place reinforced concrete drilled shafts or pile footings. Deep foundations are required to extend below any compacted fill.

Set the tops of pile footings in accordance with Section 19.5.5 of the SCDOT Bridge Design Manual. In cases where there is pavement above the pile footing,

locate the top of footing a minimum of two feet below the bottom of the base course.

Interior Pile Bents are not permitted on this project.

Design end abutments as either vertical abutments or spill through abutments with a 2:1 maximum slope. Vertical abutments include the end bents supporting the bridge spans along with the associated wall structures retaining the embankment of the bridge approaches. Construct vertical abutments and vertical abutment wing walls using cast-in-place reinforced concrete or MSE walls. Vertical abutment wing walls refer to the part of the wall structure extending beyond the end of the end bent cap retaining the embankment of the bridge approaches, not the bridge wings connected to the end bent cap. For stream crossings, vertical abutments and vertical abutment wing walls are not allowed within the limits of the 500 year water level. For spill-thru abutments, set the elevation of the berm so that the top of the berm is no greater than 5 feet below the superstructure.

To minimize the use of short sections of embankment between back-to-back bridges, provide a minimum distance of 200 feet between adjacent ends of back-to-back bridges. Distance between bridge ends is to be measured along the roadway alignment.

At MSE walls, use bridge ends consisting of cast-in-place reinforced concrete caps supported with piles or cast-in-place reinforced concrete drilled shafts that are set back behind the MSE wall faces as shown in the SCDOT Geotechnical Drawings and Details.

The following applies to bent cap cantilevers for end bents:

- For a cap supported by prestressed concrete piles, provide a minimum of the equivalent of 2 pile widths of distance from the centerline of the exterior pile to the end of the cap.
- Do not detail the intersection of the centerlines of bent and exterior beam/girder on the bent cap cantilever.
- Provide a distance from the centerline of exterior pile to the edge of a slab superstructure, measured along the bent cap centerline, that is less than or equal to 30 percent of the average pile spacing of the bent.

The following applies to multi-column interior bents:

- The column spacing shall not exceed 25 feet center to center of columns, except where a maximum spacing of 20 feet is required based on DM0213.
- Provide a cantilever distance from the center of exterior column to the end of the bent cap that is less than or equal to 35 percent of the average column spacing of the bent.

2.1.25 Approach Slabs and Wing Walls

Where bridge ends are located near intersections or ramp merge/diverge locations, adjust approach slab and/or barrier geometry as necessary to accommodate attachment and appropriate clearances for guardrail or other roadway components required for roadside safety.

No reduction of minimum approach slab length outlined in the BDM or GDM is permitted.

Design the approach slab to span the uncompacted aggregate underdrain, particularly in locations where severe skews and/or deep structure depths are present. Provide approach slab lengths such that five feet of slab is bearing on compacted subgrade material allowing the approach slab loading to be effectively distributed to the soil prior to termination of the approach slab.

Provide parallel wing walls (wing walls that are parallel to the centerline of bridge) and detail the bottom of the wing wall level and at the same elevation as the bottom of the bent cap. Detail the top of parallel wing walls sloped and at the same elevation as the top of the outside edge of the approach slab.

2.1.26 Slope Protection

Provide concrete slope protection for the end fills under new bridges over interstate routes, ramps, or other roadways. If a bridge has a vertical abutment wall without barrier protection in front, provide concrete slope protection in the area under the bridge between the wall and the paved shoulder. Also provide concrete slope protection in the area on top of the abutment wall extending from the paved ditch on top of the wall up to the end of the bridge wing wall. Detail concrete slope protection with a minimum thickness of 4 inches and in accordance with SCDOT Bridge Drawing No. 804-01 and the Standard Specifications.

Where concrete median barriers, pier protection, and abutment wall protection are constructed under bridges, extend shoulder paving to the barrier.

For bridges crossing waterways, protect the end fills with rip rap in accordance with Standard Drawing 804-105-00.

2.1.27 Bearing Assemblies

Pot bearings may be used where required due to large loads and/or geometric constraints. See Exhibit 5 for Special Provision.

2.1.28 Bridge Plans

As required by the SCDOT Bridge Design Manual, include in the bridge plans Reinforcing Steel Schedules and Quantities Tables for each bridge component (end bents, interior bents, spans, etc.). When these components are required to be constructed in stages, break the Reinforcing Steel Schedules and Quantities Tables down by stage. Immediately following the title sheet, provide a quantities

sheet that includes a tabulation of estimated quantities and a summary of estimated quantities.

2.2 Retaining Walls

2.2.1 Mechanically Stabilized Earth (MSE) Walls

Design and construct MSE walls in conformance with Supplemental Technical Specification SC-M-713 and SCDOT Geotechnical Drawings and Details, Drawings No. 713-01 and 713-02. If MSE wall is adjacent to an underground drainage feature (drainage structure, pipe, culvert, etc) the leveling pads of the MSE wall must be located to facilitate future maintenance of the drainage feature. The leveling pad elevation and offset distance from the feature shall provide sufficient slope stability for open trench working condition during future maintenance operations.

For all MSE walls on this project, construct wall facing using precast concrete panels with a deep fractured fin finish in accordance with Standard Drawing 701-950-01.

Design wall heights and lengths to provide adequate cover for roadway and bridge drainage inlets and pipes in the roadway approaches. In addition, design wall heights and lengths to provide adequate slope transitions to maintain stable shoulders and slopes and design clearances and templates in accordance with the design criteria.

In cases where retained fill slopes towards the fill face at the top of wall and no other features are present to intercept runoff, provide a concrete paved drainage ditch along the top of the wall as shown on the SCDOT Geotechnical Drawings and Details. Size the drainage ditch and provide drainage inlets and piping as necessary to prevent water from overtopping the wall during the design storm.

2.2.2 Reinforced Concrete Walls

Design cast-in-place concrete cantilever walls in accordance with the SCDOT Geotechnical Design Manual.

All exposed wall face other than integral traffic barrier (or area concealed by independent traffic barrier) and a two foot strip along the top to mimic MSE wall coping shall have a deep fractured fin finish in accordance with Standard Drawing 701-950-01.

Provide a concrete paved drainage ditch along the top of the wall if the retained soil slopes towards the back of the wall. Provide drainage inlets as necessary to prevent water from overtopping the wall during the design storm.

Spread footings are permitted for cast-in-place concrete retaining walls that are not directly supporting bridges. Step the retaining wall footings when there is a change in grade.

2.2.3 Other Wall Types

Other acceptable wall types include Prefabricated Modular Walls, Tangent Pile/Secant Pile walls, Anchored walls, Sheet Pile walls having reinforced concrete coping, Soldier Pile and Lagging walls, and Soil-Nailed walls.

Prior to commencing any designs of other wall types as specified herein, submit to SCDOT the wall type selected, design methodology, design criteria, and material and construction specifications for review. In the design criteria, include wall geometry and location, resistance factors, soil properties, and material properties of the wall. Submit shop plans and design calculations for other wall types in accordance with the Supplemental Specifications and Attachment B criteria.

Provide a concrete paved drainage ditch along the top of the wall if the retained soil slopes towards the back of the wall. Provide drainage inlets as necessary to prevent water from overtopping the wall during the design storm.

Wall face shall be concrete and all exposed faces other than integral traffic barrier (or area concealed by independent traffic barrier) and a two foot strip along the top to mimic MSE wall coping shall have a deep fractured fin finish in accordance with Standard Drawing 701-950-01.

2.2.4 Requirements for Horizontal Layout of Walls

Locate walls adjacent to ramp or interstate travel lanes to accommodate appropriate barrier treatment and allow for future additional lanes and horizontal clearance as described in Sections titled “Dimensions” and “Horizontal Clearances/Pier and Abutment Protection” in this Exhibit.

For fill walls, locate wall and/or proposed new right-of-way line to provide a minimum horizontal distance of 1.2 times the wall height between the fill face of the wall and the right-of-way line.

For cut walls, locate wall and/or proposed new right-of-way line to provide the lessor of 15 feet or 1.2 times the wall height between the exposed face of wall and the right-of-way line.

In addition to the wall location criteria above, locate walls and/or proposed new right-of-way line such that all retaining wall footings, MSE wall reinforcing, and wall anchorages are within right-of-way.

Entirely remove any abandoned utilities or abandoned drainage structures at locations where they are in conflict with proposed retaining wall limits, including leveling pads and the reinforced zone of MSE walls and anchored walls.

2.2.5 Anti-Graffiti Coating

Apply an Anti-Graffiti Coating to exposed surfaces of retaining walls. Apply at rate specified by manufacturer.

2.2.6 Plans Preparation

See supplemental criteria in Attachment B titled “Non-bridge Structure Plan Preparation Requirements.”

2.3 Concrete Barriers

2.3.1 Concrete Median Barrier

Construct concrete median barrier according to SCDOT standard drawings except as modified in this Exhibit. Provide 56” minimum height Test Level 5 median barrier with exception that if there is an elevation difference between the two sides greater than 18 inches, the higher side can be 46” minimum or Test Level 4.

Condition A – Concrete Median Barrier with grade separations of 18 inches or less: Use details from the SCDOT Standard Drawings.

Condition B – Concrete Median Barrier with grade separations between 18 inches and 36 inches require a complete design. Calculate and detail the minimum expansion joint spacing required for stability analysis to resist the overturning of the Test Level 4 impact force at the increased moment arm generated by the grade separation.

Condition C – Concrete Median Barrier with grade separations 36 inches and greater: In addition to the design requirements of Condition B, design the cantilever wall barrier in accordance with SCDOT Geotechnical Design Manual requirements at the Extreme Event I limit state.

For Conditions B and C, when evaluating the stability of the barrier, use a transverse force of 10 kips. For Conditions B and C, design and detail the barrier to provide a minimum height, measured from top of higher pavement surface to top of barrier, of 46 inches. Use a 10:1 taper to transition between Condition A barriers and Conditions B and C barriers.

2.3.2 Concrete Roadside Barrier

For cast-in-place concrete gravity and semi-gravity retaining walls serving as roadside barriers, the analysis/design methodologies and conditions outlined for Conditions B and C in the section entitled “Concrete Median Barrier” shall apply.

Except for barriers incorporated into cast-in-place concrete gravity and semi-gravity retaining walls, barriers must be detailed independently of the adjacent wall or obstruction and must be supported by a moment slab. An exception to this is that at the low side of a wall only, the detail entitled “Rigid Barrier Adjacent to Wall” in Technical Provisions Attachment, may be used in lieu of the barrier supported by moment slab.

When required, provide barriers supported by moment slabs that are designed in accordance with the AASHTO LRFD Bridge Design Specifications or SCDOT standard drawings for rigid barrier with moment slab (805-840 series). Where moment slabs are required along the top of MSE walls or other earth retaining structures, detail the moment slabs independently of MSE walls as shown on Drawing No. 713-01d of the SCDOT Geotechnical Drawings and Details. Extend moment slab as necessary to avoid conflicts with buried wall termination detail and approaching guardrail posts.

Detail moment slabs adjacent to other obstacles/obstructions independently with the details of the moment slab and barrier complying with Drawing No. 713-01d of the SCDOT Geotechnical Drawings and Details.

Detail barriers and railings on moment slabs in accordance with section entitled “Barriers, Railing Walls, and Sidewalks.”

Do not detail concrete roadside barriers with moment slabs in locations where the moment slab would block maintenance access to roadside drainage structures.

In all concrete roadside barriers on top of retaining walls, provide two (2) conduits in each barrier as shown in the SCDOT Bridge Drawings and Details.

3. BRIDGE LOAD RATING

Perform load capacity ratings in accordance with the SCDOT Load Rating Guidance Document, associated Technical Notes on the SCDOT Bridge Maintenance website, and the Manual for Bridge Evaluation, latest edition.

Request a new bridge Asset ID at Preliminary Plan submittal as directed in the Load Rating Guidance Document.

In the event the load rating indicates the bridge would require load posting (any LRFR rating factors < 1.0), redesign the bridge and update the load until the required capacity is achieved. No new bridge will be accepted by SCDOT which indicates the need for load posting.

Submit Load Rating files for review with the final bridge plan submittal in accordance with Chapter 20 of the LRGD and Technical Note 09e. Update the load rating and submit final load rating documentation and software files with the as-built plans. All load ratings shall be signed and sealed by a South Carolina registered professional engineer.

4. BRIDGE INSPECTION

In the event the designer determines the need to design a bridge that contains fracture critical or complex components as defined in the SCDOT Bridge Inspection Guidance Document (BIGD), develop and submit bridge specific inspection procedures meeting the requirements of the BIGD.

EXHIBIT 4c

PAVEMENT DESIGN CRITERIA

1.0 GENERAL

The design for pavement shall conform to the criteria listed in Section 2.0.

2.0 CRITERIA

2.1 Existing Pavement

2.1.1 I-26 Mainline and Shoulders

Where new Hot Mix Asphalt (HMA) pavement ties in with existing pavement at the project termini, perform full depth patching as directed by the RCE, variable mill as necessary to provide a smooth transition between existing and new ~~HMA Surface~~ SMA (9.5mm). If profile differential between new and existing does not allow for a butt joint, tie in with ~~HMA Surface~~ SMA(9.5mm) over a minimum length of 500 feet or 75 feet per inch of grade whichever is greater.

2.1.2 I-95 Mainline and Shoulders

2.1.2.1 HMA Pavement

Where new Hot Mix Asphalt (HMA) pavement ties in with existing pavement at the project termini, perform full depth patching as directed by the RCE, variable mill as necessary to provide a smooth transition between existing and new ~~HMA Surface~~ SMA (9.5mm). If profile differential between new and existing does not allow for a butt joint, tie in with ~~HMA Surface~~ SMA (9.5 mm) over a minimum length of 500 feet or 75 feet per inch of grade whichever is greater.

Follow build-up limitations as specified in section 2.6 in the areas where I-95 Bridge over I-26 is raised.

2.1.2.2 Concrete Pavement (I-26 overpass to New Proposed Asphalt Transverse Joint at MM 84.19)

Milling of the existing PCC pavement is not allowed. Perform full depth patching as required in Exhibit 5 so that Full Depth Concrete Patching is performed in the travel lanes and Full Depth Asphalt Patching in the shoulders as directed by the RCE. Correct the cross slope with Asphalt Surface E for correction up to 1.8 inches and Asphalt Intermediate Type B for greater correction. Overlay with 200 psy of intermediate B and 200 psy of SMA (9.5mm).

Follow build-up limitations as specified in section 2.6 in the areas where I-95 Bridge over I-26 is raised.

**2.1.2.3 Inside and Outside Asphalt Shoulders (I-26 overpass to ~~Existing~~
New Proposed Asphalt Transverse Joint at MM 84.19)**

Reconstruct inside and outside shoulders and overlay with the same pavement section shown in the Interstate 95 rehabilitation typical section provided in Attachment B.

Retain the underdrain and clean the discharge points of underdrain system adjacent to the concrete pavement under the outside shoulder in both the northbound and southbound directions where the shoulders are specified to be ~~retained and repaired~~ reconstructed.

In areas where the outside shoulder will be replaced with ramp lanes, completely remove the existing underdrain and discharge lines to allow construction of the ramp pavement section. Cap the ends of the underdrain that will remain in place.

2.2 New Pavement

2.2.1 Interchange Ramps

Remove, as necessary, existing PCC pavement and construct a new PCC pavement with the following characteristics:

PCC Pavement Thickness:	11 inches
Transverse Joint Spacing:	15 Feet
Transverse Load Transfer:	1.5 inch dowels, 18 inches Long, spaced 12 inches c-c
Longitudinal Reinforcement:	#5 Tie bar, 30 inches long Spaced 12 inches c-c
Surface Texture:	Diamond Ground
Joint Sealant:	Hot pour, ¼ inch wide longitudinal and transverse (single saw cut, fill saw cut with sealant)
Base:	8 inches graded aggregate base course, and 175 psy

	Surface Type C overlay
Width:	As necessary
Shoulders:	Full Depth - (11 inches of PCC Pavement with base option above)

2.2.2 I-95 Mainline Pavement and Acceleration Lanes

Construct a composite pavement for the travel lane. Construct a plain jointed Portland cement concrete (PCC) pavement and overlay with an HMA pavement having the following characteristics:

- PCC Pavement in accordance with Section 2.2.1 (Do not reduce width below 12 feet)
- Overlay with 400 psy of HMA
 - 200 psy intermediate B
 - 200 psy SMA (9.5mm)
- Diamond gridding is not required with asphalt overlay.

For acceleration lanes, utilize the PCC Pavement Provided in Section 2.2.1 up to the gore. After the gore, transition the grade to accommodate the pavement design above.

2.3 General Notes for PCC

For all new PCC pavements construct an expansion joint when abutting bridges or other structures. At bridge ends and other rigid obstructions, provide three expansion joints one inch in width located at the obstruction and 75 feet and 150 feet away from the obstruction. Construct one inch transverse expansion joints utilizing a material off of the qualified product list (QPL) 81 and provide load transfer with either a 12 inch thick sleeper slab or dowels/expansion tube assembly. Construct one inch longitudinal expansion joints utilizing a material off of the QPL 81.

Section 5.2 of SC-M-501(0308) is removed and replaced with the following:

5.2 Aggregate:

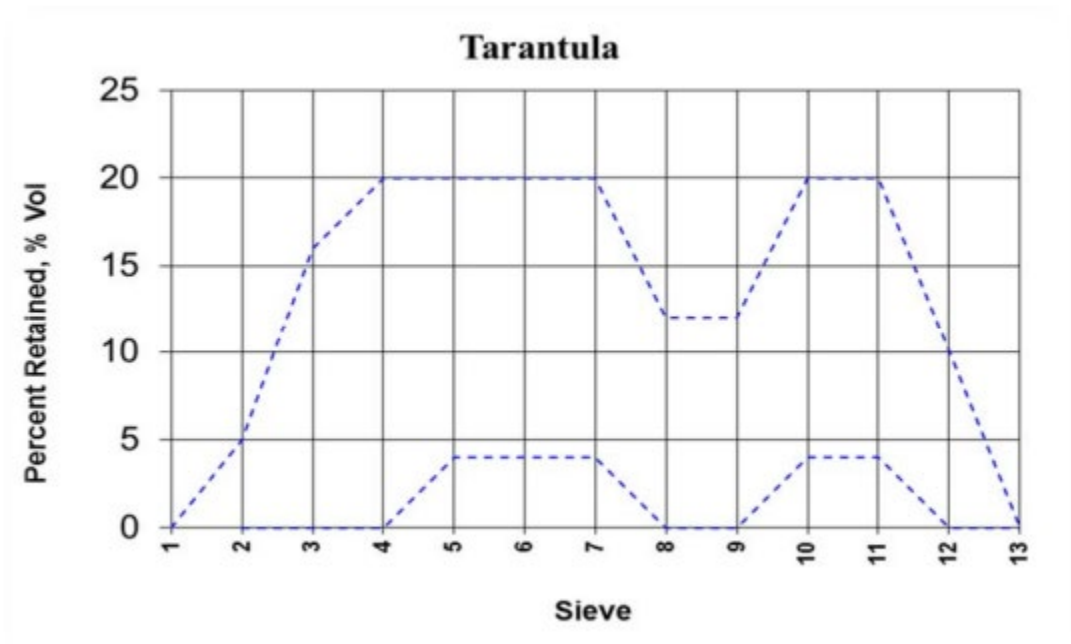
5.2.1 Use coarse aggregate meeting the gradations identified in Appendix Sheet A-4 of the 2007 SCDOT Standard Specifications with the exception of CR-14. Other gradations may be used with the approval of the State Pavement Design Engineer. However, additional trial batch information as specified by the State Pavement Design Engineer may be required to demonstrate that the proposed gradation will provide the desired characteristics. When using blended aggregates, each aggregate

EXHIBIT 4c – PAVEMENT DESIGN CRITERIA

type/gradation shall have a separate bin on the plant for batching. Other methods of blending shall be approved by the State Pavement Design Engineer.

5.2.2 The combined target gradation of the coarse and fine aggregates given in the mix design submittal shall meet the Tarantula Curve defined below.

Sieve Size	Maximum Percent Retained % Vol	Minimum Percent
2"	0	
1-1/2"	5	0
1"	16	0
3/4"	20	0
1/2"	20	4
3/8"	20	4
#4	20	4
#8	12	0
#16	12	0
#30	20	4
#50	20	4
#100	10	0
#200	0	0



Section 5.3.1 of SC-M-501(0308), the maximum w/c ratio of 0.53 is removed and replaced with 0.42.

In Section 5.6.1 of SC-M-501(0308), the compressive strength of 4000 psi is removed and replaced with 4500 psi.

Section 6 of SC-M-501(0308) is removed and replaced with the following:

6.1 General

6.1.1 Provide adequate space at the concrete production facility, or otherwise, onsite for the placement of QA testing laboratory for concrete pavement. Coordinate with SCDOT as necessary for the availability of water and electricity if required.

6.1.2 Provide temperature controlled curing boxes for the temporary storage of QA compressive strength cylinders. Provide access to boxes, relocate as necessary while work progresses, and provide any necessary power sources to operate boxes.

Section 7.4.2 and 7.4.3 of SC-M-501(0308) is removed and replaced with the following:

7.4.2 When the 28-day compressive strength for a lot falls below 4500 psi, the unit price for Concrete Pavement will be adjusted according to Table below.

Schedule for Adjusted Payment Based on 28-day Compressive Strength	
Compressive Strength	Adjusted Unit Price
Greater than 4220 psi	100%
4219 psi to 4050 psi	90%
4049 psi to 3825 psi	70%

7.4.3 If the 28 day compressive strength is less than 3825 psi, the District Construction Engineer may either require that the lot be removed and replaced or accepted at an adjusted unit price of 50%. Selection of corrective action for this condition is at the sole discretion of the Department.

Temporary markings on PCC pavement shall be eradicated by water-blasting.

PCC longitudinal joints must be placed at the lane lines. No partial width slabs shall be allowed, with the exception of ramps, where a center longitudinal joint is required due to overall width.

Provide an isolation joint detail for pavement adjacent to median barrier or other walls and drainage structures.

HMA pavement in direct contact with PCC pavement shall include 1% hydrated lime.

The base, material type, in contact with PCC pavement shall not vary transversely across the pavement.

The second sentence of Section 5.2.2.3 of SC-M-502 is revised as follows: Ensure that the land area between the grooves is between 0.060 and 0.125 inch wide and the peaks of the ridges shall be 1/8 inch +/- 1/16 inch higher than the bottom of the grooves.

The fifth sentence of Section 5.2.2.4 of SC-M-502 is revised as follows: Texture not less than 98 percent of any 100 foot section of the specified surface. No untextured area shall exceed dimensions of 3 feet by 3 feet.

2.4 Temporary Pavement

Design of temporary pavement is required and is the responsibility of the Contractor. The design method selected for temporary pavement must follow the SCDOT Pavement Design Guide or be approved through the temporary pavement design process. Submit Temporary Pavement Designs in accordance with the requirements in Attachment B.

Temporary pavement must provide a satisfactory rideability to the public prior to opening to traffic and during construction. Satisfactory rideability is defined as any 0.1 mile segment having roughness not to exceed 170 inches per mile when tested in accordance with SC-T-125. In addition to rideability, rutting shall not exceed 1/4" when the wheel paths are measured with a four (4) foot straightedge.

If potholes appear in the temporary pavement the Contractor shall take action within one calendar day to temporarily fill all potholes for safety. A pothole identified by the RCE as a safety hazard must be filled within 24 hours. \$1,000 will be assessed as a liquidated damage for every 24 hours, or any portion thereof, that potholes, identified by the RCE, are not temporarily filled. All temporarily filled pot holes shall be full depth patched, once per month at a minimum, varying in depth as necessary but shall be no less than four (4) inches. Any full depth patching required on temporary pavement is not to be paid for from full depth patching quantities included in Exhibit 5.

2.5 Side Roads

2.5.1 Existing Location

Where new Hot Mix Asphalt (HMA) pavement ties in with existing pavement at the project termini, perform full depth patching as directed by the RCE, variable mill as necessary to provide a smooth transition between existing and new HMA Surface. If profile differential between new and existing does not allow for a butt joint, tie in with HMA Surface over a minimum length of 75 feet per inch of grade.

2.5.2 New Location

Provide the following Design:

- 200 psy Surface Type C
- 200 psy Intermediate Type C
- 8 inches GAB

2.6 Additional HMA Paving Notes

Where leveling, build-up or cross slope correction is required, use HMA Surface Type E for thicknesses 0 to 1.8 inches. Use Intermediate B for any greater thicknesses. Placement and selection of mixes shall be in accordance with Asphalt Mix Design Guidelines found here:

http://www.scdot.org/business/pdf/materials-research/Guidelines_Aspphalt_Mix_Selection.pdf

EXHIBIT 4d

TRAFFIC DESIGN CRITERIA

Part 1 – Traffic Analysis

1. GENERAL

1.1 Traffic Analysis Requirements

Revisions to the Preferred Alternative that alter intersection or interchange locations or types shall be addressed in a traffic analysis. Changes including, but not limited to, number of lanes, merge, diverge, lane utilization, lane configuration, traffic control types, and storage lengths shall be analyzed in a traffic report.

All traffic analysis methods will be required to analyze 2030 Opening-year Build scenario, 2050 Horizon-year Build scenario, Failure Date (if applicable), and construction staging/temporary scenarios matching proposed MOT plans for AM and PM peak hours. All traffic analyses shall be based on the volumes found in the Approved IMR in Attachment B.

The design shall be evaluated with the same operational performance measures of effectiveness (MOEs) as the Preferred Alternative provided in the Approved IMR and TransModeler File. Traffic analyses of any CONTRACTOR originated design changes shall be performed using the requirements and parameters outlined in the RFP. Traffic analyses methodology and results shall be “equivalent or better” than the Preferred Alternative as shown in the Approved IMR. The area of influence along arterials shall include, at a minimum, the same analysis boundaries as shown in the IMR.

MOEs include:

1.1.1 Freeway Operations Performance

- AM and PM Mainline/Merge/Diverge/Weave Densities and LOS
- AM and PM Mainline and Ramp Volumes
- AM and PM Ramp Queue Lengths
- AM and PM Mainline Speeds

1.1.2 Arterial Operations Performance

- Intersection/Approach/Movement Delays and LOS
- Intersection Queue Lengths

1.1.3 Network Performance

- AM and PM Vehicle Miles Traveled
- AM and PM Vehicle Hours Traveled
- AM and PM Total Completed Trips
- AM and PM Total Denied Entry
- AM and PM Interstate End to End Travel Times

Specific design requirement: the acceleration lane adjacent to I-95 southbound, carrying the I-26 eastbound traffic to I-95 southbound, shall extend to the southern limit of the project

study area with taper ending near Station 6061+80. A minimum of 5,000' acceleration length shall be provided on I-95 southbound beyond the painted gore at the merge point. The acceleration lanes shall carry two travel lanes to 2,500' beyond the gore then drop to a single acceleration lane 2,500' in length.

Specific design requirement: the acceleration lane adjacent to I-26 westbound, carrying the I-95 northbound traffic to I-26 westbound, shall extend to the western limit of the project study area near station 3133+00. A minimum of 4,000' acceleration length shall be provided on I-26 westbound beyond the painted gore at the merge point. The acceleration lanes shall carry two travel lanes to 1,500' beyond the gore then drop to a single acceleration lane 2,500' in length.

SCDOT values a design that reduces crash frequencies and eliminates crash patterns as compared to existing conditions.

SCDOT values a design that preserves the effectiveness of I-26, and I-95 as viable through-routes for all vehicle types, including oversize/overweight vehicles.

SCDOT values optimized intersection spacing throughout the interchange area to reduce or eliminate queueing and weaving effects and improved operations. FHWA and SCDOT value a design that does not have significant adverse impact on the safety and operations of I-26 and I-95.

Designs shall not include ramp metering or traffic demand strategies.

2. CRITERIA

2.1 Traffic Study Methodology Requirements

All evaluations of proposed changes to the Preferred Alternative shall be conducted utilizing Highway Capacity Manual (HCM) methodology outputs with TransModeler software. It is recommended to start with HCM methodologies to start the screening of alternatives and transition to TransModeler for more complex analyses. SCDOT may require TransModeler simulations/analyses for design changes if deemed necessary.

Models shall use TransModeler (version 6.1 and build 8570) referenced in the Approved Interchange Modification Report (IMR) for necessary interstate mainline, collector distributor, and interchange simulations.

The CONTRACTOR shall use the provided TransModeler files generated for the IMR as the base models for the development of all proposed alternatives if necessary. The CONTRACTOR shall only change the model in regard to changing geometry, intersection control type, lane configurations, volumes, and speed (justify in traffic analysis). The CONTRACTOR shall not change any other settings or model parameters that would affect the capacity of the model including, but not limited to, driver types, capacity, headways, and gaps. These model settings/parameters shall not be changed for any MOT analyses either.

2.1.1 Intersection Analysis

Intersection analysis shall be conducted using Synchro 11 or equivalent software for unsignalized and signalized intersections. Analysis shall evaluate overall intersection LOS and LOS of individual movements with HCM Reports. SimTraffic shall be run a minimum of 10 times (with no specific seed number) for each scenario to provide the 95th percentile queuing for each intersection. SimTraffic intervals shall be a minimum of 15 minute seeding or sufficient duration to saturate the model and recordings of 60 minutes. Roadways with traffic signals shall be treated as coordinated systems for the model runs. Synchro 11 default settings are provided in Attachment B.

The CONTRACTOR shall only change the Synchro and SimTraffic settings in regard to changing geometry, intersection control type, lane configurations, volumes, and speed (justify in traffic analysis). The CONTRACTOR shall not change any other settings or parameters that would affect the capacity of the model including, but not limited to, driver types, capacity, headways, and gaps. The HCM Reports generated from the Synchro files and the SimTraffic 95th Percentile Queueing shall be reported in the Traffic Analysis and IMR (if necessary).

EXHIBIT 4d

TRAFFIC DESIGN CRITERIA

Part 2 – Work Zone Traffic Control

1. GENERAL

The CONTRACTOR shall execute the item of Traffic Control as required by the Standard Specifications, the Standard Drawings for Road Construction, the Special Provisions, all Supplemental Specifications, the SCDOT Procedures and Guidelines for Work Zone Traffic Control Design, the MUTCD, the Plans, and the Engineer. This is an amendment to the Standard Specifications to require the following:

2. CRITERIA

2.1 General Regulations

These special provisions shall have priority to the plans and comply with the requirements of the MUTCD and the standard specifications.

In accordance with the document, *Rule on Work Zone Safety and Mobility: Implementation, Maintenance, and Safety Guidelines*, this project has been classified as “SIGNIFICANT” and all components of the Transportation Management Plan prepared by the CONTRACTOR are required and shall be implemented.

Install and utilize changeable message signs in all lane closures installed on high volume high-speed multilane roadways. Use of changeable message signs in lane closures installed on low volume low speed multilane roadways is optional unless otherwise directed by the plans and the Engineer. Install and use a changeable message sign within a lane closure set-up as directed by the *Standard Drawings For Road Construction*. When a lane closure is not present for any time to exceed 24 hours, remove the changeable message sign from the roadway. Place the sign in a predetermined area on the project site, as approved by the Engineer, where the sign is not visible to passing motorists. Utilize preprogrammed messages in accordance with the *Standard Drawings For Road Construction* when using the changeable message sign as part of the traffic control set-up for lane closures. Only those messages pertinent to the requirements of the traffic control situation and the traffic conditions are permitted for display on a changeable message sign at all times. At no time will the messages displayed on a changeable message sign duplicate the legends on the permanent construction signs.

During operation of changeable message signs, place the changeable message sign on the shoulder of the roadway no closer than 6 feet between the sign and the near edge of the adjacent travel lane. When the sign location is within 30' of the near edge of a travel lane open to traffic, supplement the sign location with no less than 5 portable plastic drums placed between the sign and the adjacent travel lane for delineation of the sign location. Install and maintain the drums no closer than 3 feet from the near edge of the adjacent travel lane. This requirement for delineation of the sign location shall apply during all times the sign location is within 30' of the near edge of a travel lane open to traffic, including times of operation and non-operation. Oversized cones are prohibited as a substitute for the portable plastic drums during this application.

All signs mounted on portable sign supports shall have a minimum mounting height of 5' from the bottom of the sign to the ground. All signs mounted on ground mounted u-

channel posts or square steel tube posts shall have a minimum mounting height of 7' from the bottom of the sign to the grade elevation of the near edge of the adjacent travel lane or sidewalk when a sidewalk is present.

On multilane primary routes, avoid placement of signs on portable signs supports within paved median areas utilized for two-way left turns unless otherwise directed by the RCE.

Temporary "Exit" signs (M1025-00) shall be located within each temporary gore during lane closures on multilane roadways. Mount these signs a minimum of 7' from the pavement surface to the bottom of the sign in accordance with the requirements of the MUTCD.

When mounting signs on ground mounted u-section or square steel tube posts, utilize either a sign support / ground support post combination with an approved breakaway assembly or a single direct driven post for each individual sign support of a sign assembly installation. Do not combine a sign support / ground support post combination and a direct driven post on the same sign assembly installation that contains two or more sign supports. Regarding sign support / ground support post combination installations, ensure that post lengths, stub heights and breakaway assemblies comply with the manufacturer's requirements and specifications. Use approved breakaway assemblies found on the *Approved Products List For Traffic Control Devices in Work Zones*.

When covering signs with opaque materials, SCDOT prohibits attaching a covering material to the face of the sign with tape or a similar product or any method that will leave a residue on the retroreflective sheeting. Residue from tape or similar products, as well as many methods utilized to remove such residue, damages the effective reflectivity of the sign. Therefore, contact of tape or a similar product with the retroreflective sheeting will require replacement of the sign.

Overlays are prohibited on all rigid construction signs. The legends and borders on all rigid construction signs shall be either reversed screened or direct applied.

Signs not illustrated on the typical traffic control standard drawings designated for permanent construction signs shall be considered temporary and shall be included in the lump sum price bid item for "Traffic Control" unless otherwise specified.

Install "Grooved Pavement" signs (W8-15-48) supplemented with the "Motorcycle" plaque (W8-15P-30) in advance of milled or surface planed pavement surfaces. On primary routes, install these signs no further than 500 feet in advance of the beginning of the pavement condition. On interstate routes, install these signs no less than 500 feet in advance of the beginning of the pavement condition. Install two sign assemblies at each sign location, one on each side of the roadway, on multilane roadways when the pavement condition is present. Install these signs immediately upon creation of this pavement condition and maintain these signs until this pavement condition is eliminated.

Install "Steel Plate Ahead" signs (W8-24-48) in advance of an area of roadway where temporary steel plates are present. Install these signs no further than 300 feet in advance of locations where steel plates are present. On multilane roadways, comply with the same

guidelines as applied to all other advance warning signs and install two sign assemblies at each sign location, one on each side of the roadway, when roadway conditions warrant. Install these signs immediately upon installation of a temporary steel plate and maintain the signs until the temporary steel plates are removed. Steel plates are not allowed on interstates without approval from the Resident Construction Engineer.

Install and maintain any necessary detour signing as specified by the typical traffic control standard drawings designated for detour signing, Part VI of the MUTCD, these Special Provisions, and the Engineer.

The CONTRACTOR shall maintain the travel patterns as directed by the traffic control plans and shall execute construction schedules expeditiously. The CONTRACTOR shall provide the Resident Engineer with no less than a two-week prior notification of changes in traffic patterns.

During nighttime flagging operations, flaggers shall wear a safety vest and safety pants that comply with the requirements of ANSI / ISEA 107 standard performance for Class 3 risk exposure, latest revision, and a fluorescent hard hat. The safety vest and the safety pants shall be retroreflectorized and the color of the background material of the safety vest and safety pants shall be fluorescent orange-red or fluorescent yellow-green.

During nighttime flagging operations, the CONTRACTOR shall illuminate each flagger station with any combination of portable lights, standard electric lights, existing street lights, etc., that will provide a minimum illumination level of 108 Lx or 10 fc.

During nighttime flagging operations, supplement the array of advance warning signs with a changeable message sign for each approach. These changeable message signs are not required during daytime flagging operations. Install the changeable message signs 500' in advance of the advance warning sign arrays. Messages shall be "Flagger Ahead" and "Prepare To Stop".

During surface planing and milling operations, grade elevation differences greater than 1 inch in areas with pavements composed of hot mixed asphalt (HMA) base courses, intermediate courses or surface courses and Portland cement concrete are prohibited unless otherwise directed by SCDOT. However, during surface planing and milling operations for removal of Open-Graded Friction courses ONLY, a grade elevation difference of 1½ inches between adjacent travel lanes opened to traffic may exist unless otherwise directed by SCDOT.

During the paving operations, the length of roadway with an acceptable grade elevation difference less than or equal to 2" shall be restricted to 2 miles.

During the milling and surface planing operations, the length of roadway with an acceptable grade elevation difference less than or equal to 1" shall be restricted to 2 miles.

During construction on the ramps, the CONTRACTOR shall conduct flagging operations. The flagging operations shall either stop traffic or direct the traffic around the work area. Installation and operation of these flagging operations shall be according

to these special provisions and the MUTCD. The hourly restrictions for lane closures of the mainline immediately upstream of the ramp applies to flagging operations on the ramp. For example, I-26 EB to I-95 SB would use the lane restriction for I-26 EB.

Supplement and delineate the shoulder edges of travel lanes through work zones with traffic control devices to provide motorists with a clear and positive travel path. Utilize portable plastic drums unless otherwise directed by SCDOT. Vertical panels may be used where specified by the plans and directed by the RCE. The installation of traffic control devices are required in all areas where those areas immediately adjacent to a travel lane open to traffic have been altered in any manner by work activities, including but not limited to activities such as grading, milling, etc. Install the traffic control devices immediately upon initiating any alterations to the areas immediately adjacent to or within 15 feet of the near edge line of the adjacent travel lane. When sufficient space is available, place the traffic control devices no closer than 3 feet from the near edge of the traffic control device to the near edge line on the adjacent travel lane. When sufficient space is unavailable, place the traffic control device at the maximum distance from the near edge of the adjacent travel lane available.

2.2 Lane Closure Restrictions

The lane closure restrictions stated below are project specific, for all other restrictions, see supplemental specification, “Lane Closure Restriction”, dated July 1, 2019.

The CONTRACTOR shall install all lane closures as directed by the Standard Specifications For Highway Construction (latest edition), the Standard Drawings For Road Construction, these special provisions, the MUTCD, and the Engineer. The CONTRACTOR shall close the travel lanes of interstate routes as directed by the typical traffic control standard drawings designated for lane closures on interstate routes and primary and secondary routes as directed by the typical traffic control drawings designated for primary and secondary routes.

SCDOT reserves the right to suspend a lane closure if any resulting traffic backups are deemed, in SCDOT’s reasonable judgment, excessive by the Engineer or his or her designee. No such suspension shall entitle CONTRACTOR to any extension of time or additional compensation. SCDOT shall only suspend such closures for the duration reasonably required to mitigate the excessive traffic backup. No such suspension shall be, nor shall be deemed to be, a suspension for SCDOT’s convenience.

2.2.1 Primary and Secondary Routes -

On primary and secondary routes, SCDOT prohibits lane closures during any time of the day that traffic volumes exceed 800 vehicles per hour per direction. Maintain all lane closure restrictions as directed by the plans, these special provisions, and the Engineer.

2.2.2 Interstate Routes (Single and Dual Lane Closures) –

1. I-26 Milepost 167 to Milepost 169.6

On Interstate 26 and its ramps, SCDOT prohibits single and dual lane closures during the hours listed in the table below.

Hourly Lane Closure Prohibitions (Single)		Hourly Lane Closure Prohibitions (Dual)	
Eastbound	Westbound	Eastbound	Westbound
MON: 7A-6P	MON: 7A-7P	N/A	N/A
TUE: 8A-6P	TUE: 8A-6P	N/A	N/A
WED: 8A-7P	WED: 8A-7P	N/A	N/A
THU: 8A-8P	THU: 8A-8P	N/A	N/A
FRI: 8A-9P	FRI: 7A-9P	N/A	N/A
SAT: 8A-8P	SAT: 7A-8P	N/A	N/A
SUN: 9A-9P	SUN: 9A-9P	N/A	N/A

2. I-95 Milepost 84.4 to Milepost 86.7

On Interstate 95 and its ramps, single and dual lane closures are prohibited during the hours listed in the table below.

Hourly Lane Closure Prohibitions (Single)		Hourly Lane Closure Prohibitions (Dual)	
Northbound	Southbound	Northbound	W Southbound
MON: 10A-6P	MON: 9A-6P	N/A	N/A
TUE: 10A-6P	TUE: 9A-6P	N/A	N/A
WED: 10A-6P	WED: 9A-6P	N/A	N/A
THU: 9A-7P	THU: 9A-7P	N/A	N/A
FRI: 8A-9P	FRI: 8A-9P	N/A	N/A
SAT: 7A-8P	SAT: 8A-7P	N/A	N/A
SUN: 9A-8P	SUN: 8A-8P	N/A	N/A

All other routes with lane closure prohibitions for this project are listed on the SCDOT website under Doing Business with SCDOT in the Publications and Manuals section for Traffic Engineering.

These restrictions also apply to all road closures and pacing operations. SCDOT reserves the right to suspend a lane closure if any resulting traffic backups are deemed excessive by the Engineer. Maintain all lane closure restrictions as directed by the plans, these special provisions, and the Engineer.

Installation and maintenance of a lane closure is prohibited when the CONTRACTOR is not actively engaged in work activities specific to the location of the lane closure unless otherwise specified and approved by the Engineer. The length of the lane closure shall

not exceed the length of roadway anticipated to be subjected to the proposed work activities within the work shift time frame or the maximum lane closure length specified unless otherwise approved by the Engineer. Also, the maximum lane closure length specified does not warrant installation of the specified lane closure length when the length of the lane closure necessary for conducting the work activity is less. The length and duration of each lane closure, within the specified parameters, shall require approval by the Engineer prior to installation. The length and duration of each lane closure may be reduced by the Engineer if the work zone impacts generated by a lane closure are deemed excessive or unnecessary.

The presence of temporary signs, portable sign supports, traffic control devices, trailer mounted equipment, truck mounted equipment, vehicles and vehicles with trailers relative to the installation or removal of a closure and personnel are prohibited within the 15 to 30 foot clear zone based upon the roadway speed limit during the prohibitive hours for lane closures specified by these special provisions.

On multilane primary and secondary routes, a reduced regulatory speed limit of 35 MPH shall be in effect during lane closures. Erect temporary regulatory “Speed Limit” signs (R2-1-48-35) and “Speed Reduction 35 MPH” signs (W3-5-48-35) on temporary supports according to the typical traffic control standard drawings. Cover the existing regulatory speed limit signs when reduced speed limits are in place. Immediately remove or cover the “Speed Limit” signs (R2-1-48-35) and the “Speed Reduction 35 MPH” signs (W3-5-48-35) upon the removal of the lane closures.

On interstate routes, a reduced regulatory speed limit of 45 MPH shall be in effect during lane closures. Erect temporary regulatory “Speed Limit” signs (R2-1-48-45) and “Speed Reduction 45 MPH” signs (W3-5-48-45) on temporary supports according to the typical traffic control standard drawings. Cover the existing regulatory speed limit signs when reduced speed limits are in place. Immediately remove or cover the “Speed Limit” signs (R2-1-48-45) and the “Speed Reduction 45 MPH” signs (W3-5-48-45) upon the removal of the lane closures.

On interstate routes, the presence of temporary signs, portable sign supports, traffic control devices, trailer mounted equipment, truck mounted equipment, vehicles and vehicles with trailers relative to the installation or removal of a closure and personnel are prohibited within 30 foot clear zone during the prohibitive hours for lane closures specified by these special provisions.

Truck mounted changeable message signs shall be required during all interstate lane closures. The CONTRACTOR shall provide, install, and maintain these signs in accordance with all requirements of the Standard Specifications for Highway Construction (latest edition) and the typical traffic control standard drawings designated for interstate lane closures.

The truck mounted changeable message signs are in addition to the requirements for trailer mounted changeable message signs. Truck mounted changeable message signs and trailer mounted changeable message signs are not interchangeable.

The CONTRACTOR shall discontinue and remove a lane closure when the work activities requiring the presence of the lane closure are completed or are discontinued or disrupted for any period of time to exceed 60 minutes unless the presence of unacceptable grade elevation differences greater than 1” in milled areas or greater than 2” in all other areas are present unless otherwise directed by the Engineer.

2.3 Shoulder Closure Restrictions

2.3.1 Primary and Secondary Routes –

On primary and secondary routes, the CONTRACTOR is prohibited from conducting work within 15’ of the near edge of the adjacent travel lane on an outside shoulder or a median area under a shoulder closure during any time of the day that traffic volumes exceed 800 vehicles per hour per direction. The routes and times are listed above in Section 2.2. The hourly restrictions for lane closures shall also apply to work activities conducted under a shoulder closure within 15’ of the near edge of an adjacent travel lane or a median area. SCDOT reserves the right to suspend work conducted under a shoulder closure if any traffic backups develop and are deemed excessive by the Engineer. Maintain all shoulder closure restrictions as directed by the plans, these special provisions, and the Engineer.

On primary and secondary roadways, the CONTRACTOR is prohibited from conducting work within 1’ or less of the near edge of an adjacent travel lane under a shoulder closure. All work that may require the presence of personnel, tools, equipment, materials, vehicles, etc., within 1’ of the near edge of an adjacent travel lane shall be conducted under a lane closure.

2.3.2 Interstate Routes -

On I-26 and I-95, the CONTRACTOR is prohibited from conducting work within 15’ of the near edge of the adjacent travel lane on the outside shoulders or the median areas during the same lane closure restriction times listed above in Section 2.2. This applies when the work area is not protected by barrier.

The hourly restrictions for lane closures shall also apply to work activities conducted under a shoulder closure within 15’ of the near edge of an adjacent travel lane or a median area. SCDOT reserves the right to suspend work conducted under a shoulder closure if any traffic backups develop and are deemed excessive by the Engineer. Maintain all shoulder closure restrictions as directed by the plans, these special provisions, and the Engineer.

On interstate highways, the CONTRACTOR is prohibited from conducting work within the limits of a paved shoulder or within 10’ of the near edge of an adjacent travel lane under a shoulder closure. All work that may require the presence of personnel, tools, equipment, materials, vehicles, etc., within the limits of a paved shoulder or within 10’ of the near edge of an adjacent travel lane shall be conducted under a lane closure.

The CONTRACTOR shall install all shoulder closures as directed by the typical traffic control standard drawings designated for shoulder closures, and the Engineer. Substitution of the portable plastic drums with oversized cones during nighttime shoulder closures is prohibited.

2.4 Mobile Operations

A mobile operation moves continuously at all times at speeds of 3 mph or greater without any stops. The minimal traffic flow impacts generated by these operations involve brief traffic flow speed reductions and travel path diversions. Conduct work operations that cannot be performed at speeds of 3 mph or greater under standard stationary lane closures.

The CONTRACTOR is prohibited from conducting mobile operations during the hours when lane closures are prohibited. The hourly restrictions for lane closures shall also apply to work activities conducted under mobile operations. SCDOT reserves the right to suspend work conducted under mobile operations if any traffic backups develop and are deemed excessive by the Engineer. Maintain all mobile operation restrictions as directed by the plans, these special provisions, and the Engineer.

The distance intervals between the vehicles, as indicated in the *Standard Drawings For Road Construction*, may require adjustments to compensate for sight distance obstructions created by hills and curves and any other conditions that may obstruct the sight distance between the vehicles. However, adjustments to the distance intervals between the vehicles shall be maintained within the range of variable distance intervals indicated in the standard drawings unless otherwise directed by the Engineer.

Maintain two-way radio communication between all vehicles in the vehicle train operating in a mobile operation.

Supplement the work vehicles and the shadow vehicles with amber colored flashing dome lights. The vehicles may also be supplemented with advance warning arrow panels and truck mounted attenuators as directed in the *Standard Drawings For Road Construction* and the Standard Specifications.

The CONTRACTOR shall install, operate and maintain all advance warning arrow panels, truck mounted attenuators and truck mounted changeable message signs as required by these special provisions, the manufacturer's specifications, the *Standard Drawings For Road Construction*, the Standard Specifications, the plans and the Engineer.

2.5 Typical Traffic Control Standard Drawings

The typical traffic control standard drawings of the *Standard Drawings For Road Construction*, although compliant with the MUTCD, shall take precedence over the MUTCD. The typical traffic control standard drawings of the *Standard Drawings For Road Construction* shall apply to all projects let to contract.

Install the permanent construction signs as shown on the typical traffic control standard drawings designated for permanent construction signing.

2.6 Staging

Traffic Control Restrictions (Project Specific General)

Maintain the existing number of I-26 and I-95 mainline lanes of traffic in each direction during the times of the lane closure restrictions. Maintain the existing number of travel lanes for all on-ramps and off-ramps during the times of the lane closure restrictions unless otherwise approved by SCDOT. All ramps must remain open to traffic and maintain free-flow operation (no yield control) unless otherwise approved by SCDOT.

All routes shall remain open to traffic including no restriction/reduction in movements. No closure or restriction in movement or detour is allowed unless otherwise approved by SCDOT.

The presence of acceptable grade elevation differences less or equal to 1" in milled areas or less than or equal to 2" in paved areas adjacent to a travel lane open to traffic are prohibited during weekends from 7:00 am Friday to 9:00 pm Sunday unless otherwise directed by the Engineer. When necessary, the weekend restriction may be extended due to the proximity of a holiday as directed by the Engineer.

The existing lane widths for all loop ramps shall be maintained during construction. Other ramps should maintain their existing lane widths if possible; however can be reduced to 12 feet as a result of constructability or staging concerns. Sufficient lane width shall be provided for the appropriate design vehicle during construction.

The CONTRACTOR shall have no more than 72 hours to begin elimination of any grade elevation differences between or adjacent to the travel lanes of I-26 and I-95. The 72 hour time period shall begin upon creation of the grade elevation difference. This restriction shall apply to all acceptable grade elevation differences less than or equal to 1" in milled areas or less than or equal to 2" in paved areas.

Traffic is not allowed to run on milled surfaces on interstate pavements.

During surface planing and milling operations, the length of roadway with a milled surface open to traffic is restricted to 6 miles. This restriction does not apply to concrete diamond grinding operations.

During surface planing and milling operations, the length of roadway with an acceptable grade elevation difference less than or equal to 1" adjacent to a single travel lane or between multiple travel lanes open to traffic is restricted to a maximum distance of 6 miles.

During asphalt paving operations, the length of roadway with an acceptable grade elevation difference less than or equal to 2" adjacent to a single travel lane or between multiple travel lanes open to traffic is restricted to a maximum distance of 6 miles.

The CONTRACTOR may conduct various work activities in the same direction at various locations concurrently if approved by SCDOT. Various work activities in the same direction requiring simultaneous closures in the same travel lane or shoulder shall be separated by no less than 2 miles from the end of the first closure that a motorist will encounter to the beginning of the taper of the second closure. Also, various work activities in the same direction requiring simultaneous right and left lane closures or shoulder closures shall be separated by no less than 4 miles from the end of the first closure that a motorist will encounter to the beginning of the taper of the second closure.

Construction vehicle access will be allowed on I-26 and I-95 per the requirements of the Construction Access Design Criteria provided in Attachment B. The Resident Construction Engineer (RCE) has the right to remove the construction access from operation at any time the RCE deems necessary.

EXHIBIT 4d

TRAFFIC DESIGN CRITERIA

Part 3 – Pavement Markings

1. GENERAL

1.1 Permanent Pavement Markings

Pavement marking work on this project consists of preparing detailed pavement marking plans and applying appropriate markings for the entire length of the project. All mainline, CD route, ramp edge lines, and lane lines shall be to interstate standards as detailed in the Standard Drawings. Interstate lane lines and edge lines shall be 6 inches in width. Exit and entrance gore markings, as well as mainline lane drop markings, shall be 12 inches in width. All other crossing route/service road lane lines and edge lines shall be 4 inches in width with the exception of 8 inch channelization/crosswalk markings. The final roadway surface material will determine which type of permanent marking material is to be applied. The CONTRACTOR shall use either polyurea or preformed tape (T-1) markings on concrete surfaces for the applications noted below. Thermoplastic markings shall be used on all asphalt surfaces. The CONTRACTOR shall install surface mounted raised pavement markers in accordance with the Standard Drawings.

2. CRITERIA

2.1 Permanent Pavement Markings

2.1.1 Thermoplastic Pavement Markings (Asphalt Surfaces)

All thermoplastic markings installed on the interstate mainline or any crossing routes shall meet the requirement of Section 627 of the Standard Specifications.

2.1.2 Polyurea Pavement Markings (Concrete Surfaces)

All polyurea markings installed on the interstate mainline, crossing routes or any bridge decks on this project shall be a liquid, multi-component system that includes highly reflective elements as recommended by the manufacturer of the polyurea binder. The CONTRACTOR may use 3M Stamark Liquid Pavement Marking Series 5000, Epoplex Glomarc 90, or an SCDOT approved equivalent.

The polyurea pavement marking lines shall have a minimum dry thickness of 20 mils when placed on concrete and asphalt pavements. The pavement marking material and highly reflective elements shall be applied in a simultaneous operation.

The CONTRACTOR shall apply the polyurea resin, mixed at the proper ratio according to the manufacturer's recommendations, to the pavement surfaces within the proper application temperatures as determined by the material manufacturer. Highly reflective elements shall be injected into the molten (liquid) polyurea pavement markings in accordance with the manufacturer's recommendations using a dispenser approved by the manufacturers of both the polyurea materials and the highly reflective elements.

Upon curing, the markings shall be uniformly reflectorized and have the ability to resist deformation caused by traffic throughout the entire length of the line.

If requested by the Engineer, the manufacturer of the selected polyurea material shall provide a technical representative, or a manufacturer's certified representative, to assure proper application technique by the contractor during the initial installation of the product.

All materials will be accepted based on manufacturer's certifications.

Do not use polyurea pavement markings for Interim condition pavement markings on bridge decks. Use preformed tape in accordance with 2.1.3.

2.1.3 Preformed Patterned Tape (T-1) Pavement Markings (Options for Concrete Bridge Decks)

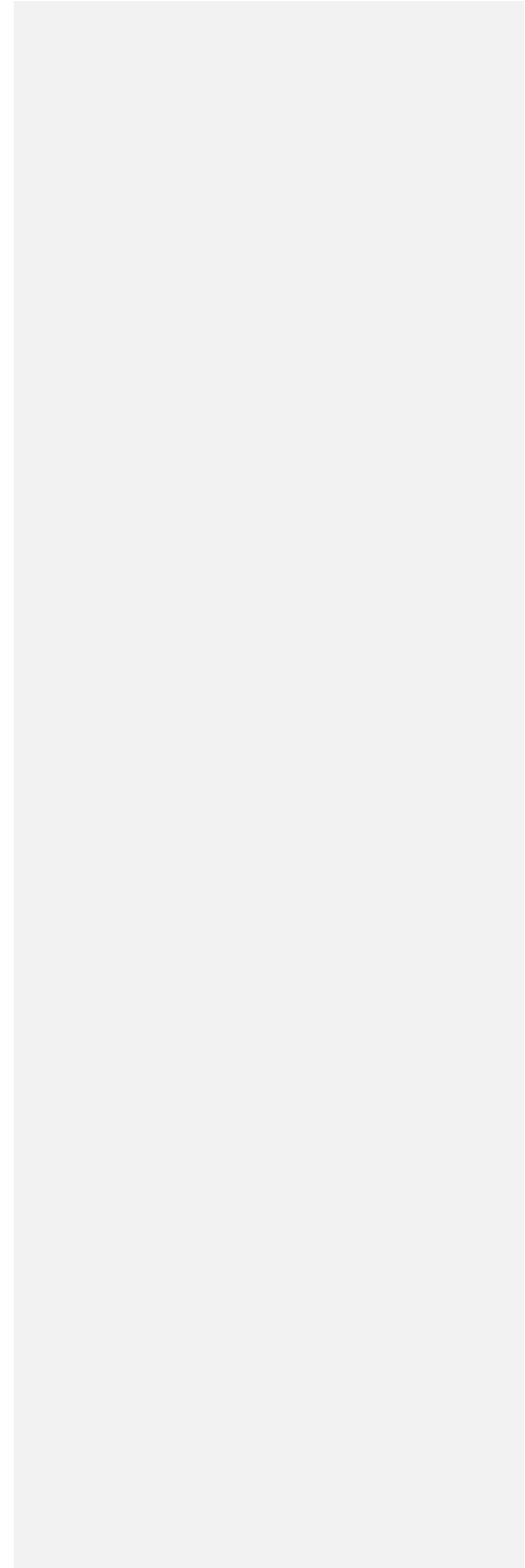
The CONTRACTOR may choose to apply preformed patterned tape markings to concrete bridge decks on this project. If this option is selected the markings shall be preformed patterned tape with a raised diamond pattern covered with ceramic elements having a refractive index of 1.9 or greater. All preformed tape markings installed on the bridge decks on this project shall be installed with a truck mounted application system or other motorized applicator approved by the manufacturer.

The CONTRACTOR shall provide to SCDOT the manufacturer's normal warranty which shall guarantee the tape materials for a period of 72 months from the date of installation from failure to retain the minimum reflectance values provided by the manufacturer and from failure due to loss of material adhesion or complete wear through. If failure occurs, the manufacturer will provide the replacement materials to restore the markings to their original effectiveness.

EXHIBIT 4d

TRAFFIC DESIGN CRITERIA

Part 4 – Signing



1. GENERAL

1.1 Permanent Signing

Signing work on this project consists of preparing a detailed, comprehensive signing plan for the entire I-26 and I-95 interstate corridor; and fabricating, furnishing, and erecting new ground mounted and overhead mounted signs, breakaway posts, overhead sign structures, and delineators. Also included is the removal and relocation of the signs, delineators, overhead structures and supports to be replaced or that are impacted. Impacts to signing include relocating, removing, or causing to be non-compliant. All existing signs, delineators, sign structures and supports shall be removed and replaced, with the exceptions of the signs called out by the notes in the Conceptual Signing Plans. Conceptual Signing Plans, which detail locations for all extruded panel signs to be mounted on I-beams or overhead structures, are provided in Attachment B. All signs and supports shall be replaced except for LOGO signs which should typically be retained and relocated. LOGO signs, unless damaged, shall be relocated to new supports upon coordination with SCDOT.

2. CRITERIA

2.1 Permanent Signing

2.1.1 Maintenance of Mainline and Ramp Directional and Information (LOGO) Signing Mounted on I-Beam Breakaway Posts

The existing mainline and ramp directional and information signs mounted on I-beam breakaway posts may have to be relocated due to the construction. Where relocation is necessary, the mainline signs should be mounted temporarily on 4"x6" wood posts using the method detailed on Standard Drawing 652-120-00. Ramp information signs (logo) should be mounted temporarily on 4"x4" wood posts. No separate payment will be made for these relocations. All signs are to be maintained throughout construction.

In addition, the CONTRACTOR will be responsible for replacing signs damaged during construction which are to be retained (i.e. logo signs) and erected as part of the permanent signing. SCDOT will conduct an inspection/evaluation prior to and at the conclusion of construction to determine if any damage occurred during execution of the contract. The CONTRACTOR shall be responsible for replacing damaged signs discovered by SCDOT.

2.1.2 Bridge Clearance and Crossing Route Information Signing

The CONTRACTOR will be required to erect bridge vertical clearance and crossing route number flat sheet signs on the new and existing bridges in both directions of travel. The signs shall be fabricated in accordance with the SCDOT sign numbers shown in the table below. The CONTRACTOR shall

EXHIBIT 4d – TRAFFIC DESIGN CRITERIA – PART 4

determine the actual minimum vertical clearance in each direction after all interstate mainline or crossing route surfacing is completed.

SCDOT Sign Number	Sign Description	Crossing Route Type
W12-2P-78	Vertical Clearance	All
OHB M1-1-48	Crossing Route Information	Interstate – 2 or 3 digit
OHB M1-4-48	Crossing Route Information	US Route – 2 digit
OHB M1-4-60	Crossing Route Information	US Route – 3 digit
OHB M1-5-48	Crossing Route Information	SC Route – 2 digit
OHB M1-5-60	Crossing Route Information	SC Route – 3 digit
OHB M1-6-78	Crossing Route Information	Secondary Route – 2 digit
OHB M1-6-84	Crossing Route Information	Secondary Route – 3 digit

Detailed layouts for the signs in the table above will be provided by SCDOT’s Director of Traffic Engineering office post award. Written requests for detailed layouts shall be addressed to the Resident Construction Engineer.

The vertical clearance sign shall be centered over the centerline of the interstate or crossing route travel way. The crossing route number sign shall be placed to the left of the vertical clearance sign with a minimum spacing of 8 feet between the right of the route number sign and the left of the clearance sign.

The flat sheet panels may be mounted on the outside beam on each side of the bridge using 3-M Very High Bond Tape in accordance with the tape manufacturer’s recommendations, or other method, such as direct bolting, as approved by the Engineer.

2.2 Sign Damage

In the event an existing overhead structure is hit and damaged, the CONTRACTOR will be required to mobilize immediately and provide a professional evaluation and assessment of the structure damage. An engineering firm that specializes or has experience in this type of structural inspection and evaluation shall conduct a detailed on-site evaluation of the structure. If the major structural components or foundations exhibit obvious and significant/critical damage, the sign structure should be removed immediately. The damaged structure shall be placed at a location either protected by guardrail or beyond the clear zone as approved by SCDOT.

If the structure appears to be structurally sound and the damage appears to be limited to the sign hangers and/or walkway and lighting systems, the CONTRACTOR shall conduct a structural evaluation and provide the results of the evaluation within 24 hours of notification which should include verification that the structure is sound and can remain in service or if it should be removed as soon as possible. The results shall be stamped by a professional engineer registered in the state of South Carolina

If the inspector determines that the structure can remain in service, the evaluation should include recommendations of components that need to be replaced. The CONTRACTOR will be responsible to pursuing all repairs within an agreed upon schedule with SCDOT. The CONTRACTOR shall also provide all traffic control necessary for the proper inspection of the structure and any necessary repairs.

2.3 Special Instructions to the CONTRACTOR

A conceptual signing plan is included in Attachment B of the RFP which shows the proposed sign locations and sign layouts for overhead signs as well as signs mounted on I-beam breakaway posts along the interstate mainline, CD roads, and crossing routes. To aid in estimating the costs of signing work, notes are provided on the conceptual plan for each sign location that details the sign size, sign identification numbers and a brief description of work to be accomplished. The conceptual plan does not show the location of flat sheet signs (intermediate reference location signs (mile markers), warning signs, regulatory signs, etc.) along the interstate mainline. These signs shall be included in the CONTRACTOR's Comprehensive Signing Plan and replaced as part of this contract. The conceptual plan does not include flat sheet signs for the interchange ramps and crossing routes. These signs shall also be included in the comprehensive signing plan.

Vertical clearances for existing sign structures shall be field verified and modifications made as necessary to provide appropriate vertical clearance.

There shall be a minimum 1 foot separation incorporated into the design of sign assemblies on all overhead signs.

The conceptual signing plans provided in Attachment B are designed to accommodate the proposed interchange with no mainline widening on I-26 nor I-95. The overhead sign structures, however shall accommodate a future widening of I-26 and I-95 to 6-

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EXHIBIT 4d – TRAFFIC DESIGN CRITERIA – PART 4

lanes. The structures may be required to carry a different sign size and a longer span after the widening of I-26 and I-95 to 6-lanes.

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Any sign structures and/or foundations which are retained shall be verified by the Contractor to be structurally adequate or replaced if proposed signs are larger than those shown in the conceptual signing plan.

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The CONTRACTOR shall contact the Director of Traffic Engineering within 30 days of the issuance of the Notice to Proceed to review the conceptual signing plan and the overall signing requirements of the contract. A complete as built set of signing plans should be submitted to the Director of Traffic Engineering at the conclusion of the project. The Director of Traffic Engineering will provide an example set of interstate signing plans to the CONTRACTOR at this meeting to use as a guide in preparation of the as built signing plans.

The signs shall be designed using SignCAD software using E Modified Fonts.

Walkways shall be included in the design of all new overhead structures as noted in the Standard Specifications.

Guard rail shall be included for all overhead uprights located within the clear zone on either side of the travel way. For guardrail installations that protect sign uprights, typically the face of the guardrail is located approximately 1 foot behind the edge of shoulder. The center of the upright should be located approximately 9 feet behind the face of guardrail.

The CONTRACTOR will be responsible for obtaining soil borings to be used for foundation designs for all new overhead sign structures.

The CONTRACTOR is advised that all signs have a unique barcode sticker attached to the back of each sign and each sign assembly has a unique barcode sticker attached to one post of the assembly. The CONTRACTOR will be required to record the barcode number for each sign and the associated assembly that is removed, replaced or relocated. These numbers and the date that the sign and assembly were removed, replaced or relocated shall be recorded on the Sign Barcode form provided in Attachment B. This form shall be turned in to the Resident Construction Engineer. SCDOT will place the new barcodes on signs.

All I-beam posts for LOGO signs will be designed to support full size LOGO panels. Full size mainline panels are 15' X 10' and full-size ramp panels are 8.5' X 6.5'. New LOGO signing shall be located along on the outside shoulder areas. If LOGO signs mounted on I-beam posts cannot be accommodated along the outside shoulder, coordinate with SCDOT regarding permanent removal of LOGO signs. Include in the Conceptual Signing Plans any existing LOGO signs which cannot be accommodated or become obsolete based on the proposed design.

Install flexible delineators on both sides of concrete barrier wall at a spacing of two hundred feet (200'). The mounting height of the delineators is thirty-four inches (34").

EXHIBIT 4d – TRAFFIC DESIGN CRITERIA – PART 4

See SCDOT Standard Drawing 656-110-00 for detail of delineator and mounting method.

Temporary signing overlays will be allowed on guide signs as long as the messages and/or arrangement of arrows provide motorists proper direction. The overlays should be of the proper font and copy size if possible and should be constructed on flat sheet aluminum panels that will be fastened to the existing extruded panel signs. The existing sign layouts and conceptual sign layouts are provided in the Project Information Package.

EXHIBIT 4d

TRAFFIC DESIGN CRITERIA

Part 5 – Intelligent Transportation System (ITS)

1. GENERAL

The CONTRACTOR is not responsible for either the Work Zone Intelligent Transportation System (WZITS) or the maintenance or construction of permanent ITS elements on this project.

2. INTELLIGENT TRANSPORTATION SYSTEM (ITS)

SCDOT will sever the fiber connection at the locations indicated in the map labeled “ITS Fiber Sever Location” in Attachment B. The CONTRACTOR shall not impact the fiber line or ITS equipment outside of those locations. The CONTRACTOR is not responsible for the maintenance or construction of permanent SCDOT ITS elements; however permanent ITS elements should be considered in the design for future installation by SCDOT. Removal and disposal of existing ITS components shall be the responsibility of the CONTRACTOR as provided in Exhibit 5 – ITS Elements ~~Installation~~ Removal Salvage and Disposal of Equipment and Materials.

The CONTRACTOR shall notify SCDOT a minimum of 30 days in advance of any activities that may disturb the existing ITS system.

EXHIBIT 4e

HYDRAULIC DESIGN CRITERIA

1.0 GENERAL

Perform all hydrologic and hydraulic drainage designs in accordance with the “SCDOT’s Requirements for Hydraulic Design Studies”, May 2009, Stormwater Quality Design Manual, and Project Design Criteria as listed in EXHIBIT 4. Designs, at a minimum, to address include:

- Best Management Practices
- Bridge-Sized Culverts, Bridges and Scour
- Cross-line Pipes and Non-Bridge Sized Culverts
- Ditch Capacity and Stability
- Sediment and Erosion Control
- Stormwater Quality Design
- Storm Sewer Systems

2.0 CRITERIA

2.1 Roadway Drainage

- 2.1.1 Evaluate the pre- and post- developed hydrologic and hydraulic conditions for roadway drainage. Perform all aspects of roadway drainage, to include approach runoff, cross line pipe, storm sewer systems, ditches, and outfalls. Adequately size and replace or supplement with additional drainage conveyance all drainage components that are analyzed within project limits and found to be undersized. Ensure offsite areas that affect the hydraulic systems and outfalls of this project are accounted for.
- 2.1.2 Perform hydraulic analyses, to include headwater and tail-water effects, on all cross-line and median drainage structures for the design storm event. Additionally, include the 50-year surcharging event for median inlets. Pipes or culverts crossing multiple alignments shall be designed to the criteria of the highest roadway classification crossed by the pipe or culvert.
- 2.1.3 Design new and analyze existing closed-drainage systems with GEOPAK drainage software. Use Type-25 catch basins along new median barriers and along barriers separating travel lanes. Place inlets at staggered stations when a grade separation exceeds (18) inches or cantilever walls are used. Consider interstate ramps as primary roads. Provide drainage conveyance structures to intercept offsite runoff prior to reaching the toe behind constructed walls. Design the structures to contain the 10-year storm event..
- 2.1.4 Perform open channel designs. Include ditch capacity and stability analyses on the median, sideline and outfall ditches impacted within the limits of the project. When existing ditches are filled in due to new slopes, design and construct means to convey the runoff to an outfall. Provide additional

information and analyses for those locations where structures are upsized. Minimize velocities to non-erosive rates. Summarize the pre- and post-developed outfall conditions.

- 2.1.5 Design temporary drainage systems in accordance with AASHTO Drainage Manual Appendix 17A. Use permanent design criteria if design frequency given by Appendix 17A exceeds that of the permanent condition. Follow selection factor 2 on pages 17-25 through 17-27 when evaluating Loss of Life Impact Rating Value.
- 2.1.6 If pipes need to be abandoned, remove the abandoned pipe or fill with flowable fill. Note pipe locations that are to be filled with flowable fill on drainage plan sheets.
- 2.1.7 Repair or replace damaged drainage structures. Include notes on the drainage sheets when retaining or replacing these structures. All drainage structures shall be immediately accessible to the final surface grade by either a manhole or grate access. New storm sewer systems shall not include blind junctions.
- 2.1.8 Perform rehabilitations to washout areas. Repair existing concrete and asphalt ditches in accordance with Special Provision 815 Erosion Control.
- 2.1.9 Underground detention systems are not allowed to minimize post-construction discharges. Detention systems are not allowed within the interchange. Outside of the interstate mainline and the clear zone, detention is allowed. (Interchange limits are inside loops or triangles formed by ramps and mainline)
- 2.1.10 Investigate post-construction impacts at all right-of-way outfall locations to ensure post-construction discharges will not create adverse downstream impacts nor contribute to existing adverse downstream impacts.
- 2.1.11 Replace 15-inch pipe with minimum 18-inch pipe at all locations where design warrants retaining pipes except for driveways and yard drain connections that meet design standards.
- 2.1.12 At locations where fill height is greater than or equal to ten feet, provide a minimum five foot buffer between the toe of fill and the nearest top of bank of any sideline ditch or swale. See detail included in Attachment B.
- 2.1.13 Ensure proposed drainage systems are not constructed under future lanes.

- 2.1.14 All new pipes under rigid or flexible pavement shall not encroach into the bottom of the pavement structure and shall follow the minimum cover requirements of SCDOT's Standard Drawings for Road Construction.
- 2.1.15 Pipes determined to be extended at the existing slope and same orientation, material, and size shall be extended with pipe collars constructed in accordance with SCDOT standard drawings. The Contractor may also remove the existing pipe to the nearest joint and extend the pipe based on the requirements of the SCDOT standard drawings and pipe specifications as long as the joint between the existing and new pipe satisfies all SCDOT requirements. If the extension includes a change in pipe size, orientation, material, slope, etc. the Contractor shall use a manhole or catch basin for the pipe connection.
- 2.1.16 In locations in which drainage structures are required to alter the alignment of the crossline, avoid abrupt changes to the flow direction, i.e., 90-degree bends. When drainage structures are used to alter the alignment, the crossline system shall be analyzed to show the hydraulic grade lines meet the hydraulic design requirements of the highest roadway classification for the crossline.
- 2.1.17 When retaining Type-5 and Type-6 catch basins, convert to Type-17 (719-017-RX). When retaining Type-7 catch basins, convert to Type-18 (719-018-RX). When conversions are not practical, replace with new structures. Replace all damaged Type-9 catch basins with Drop Inlet Type-112 (719-112-XX) within controlled access locations only. Replace all damaged Type-9 catch basins with Type-9 Ditch Installation (719-009-03) where practical. Replace all other damaged Type-9 catch basins using Type-9 Top Slabs with Integral Throat walls only (719-009-01). Replace damaged inlets such as DI 24x24, Type-12 and Type-112. Include notes on the drainage sheets indicating retention, removal, replacement, conversion, or adjustment of existing structures within project limits. All drainage structures shall be immediately accessible to the final surface grade by either a manhole or grate access (i.e., no blind junctions).
- 2.1.18 Maximum allowable deflection without a radius for proposed box culverts or box culvert extensions is 15 degrees measured along the centerline of the box culvert. Use a minimum radius of 30 feet for deflection angles greater than 15 degrees.
- 2.1.19 Field and video inspections have been performed on the majority of existing cross-line structures within the project limits. Implement the alternatives as

directed in the “Existing Pipe Evaluation Results and Recommendations” located in Attachment B. Pipes within the project limits may be replaced in lieu of repaired. Verify the hydraulic capacity of the pipes. When analyses do not demonstrate compliance with the Hydraulic Design Requirements and other Criteria, replace the pipes or make other improvements to the system to achieve compliance. Analyses shall reflect the “n” value for the liner material and any reduction in diameter. Add notes to the plan sheets for the chosen alternatives when existing pipes are retained. Cross-line pipes within the project limits which have not been inspected shall be replaced.

All references to culverts identifiers (ex. EP-xx or BC-xx) are taken from the I-26 at I-95 Interchange Hydrology Report.

Retain existing 6’ by 6’ Box Culverts BC-2 (I-26 Station 3214+28) and BC-3 (I-95 Station 6022+50) with their respected existing HW/D values. There shall be no increases to these headwaters and conveyance shall be designed and implemented to mitigate any increases caused by the interchange improvement project. Existing BC-1 (I-26 Station 3145+50) will be controlled by the future I-26 widening that will tie into the interchange project. Retain BC-1 for current Interchange project with existing HW/D ratio. Existing BC-4 (Bluff Road Sta. 119+25) shall be designed or supplemented to meet criteria of HW/D of 1.2 or retained if criteria is met with proposed design. Existing pipe culverts that have HW/D ratios that exceed 1.2, may be retained for HW/D ratios not to exceed 1.5 with the exception of EP-34. Existing HW/D for EP-34 shall not be increased. Place trenchless culverts where necessary by design to convey any additional runoff from Interchange project when compared to existing conditions and provide improvements where necessary by design to conform to the RFP. No overtopping for design or 1% AEP will be permitted. Additional conveyance is required to meet RPF criteria where needed.

2.1.20 Perform field and video inspections on retained cross-line structures that have not been inspected, in accordance with the SCDOT’s Pipe and Culvert Inventory and Inspection Guidelines (2011) with exceptions noted herein.

- Inspect retained pipes 18-inches and greater in diameter using a pipe camera system (no laser).
- Inspect retained box culverts via direct measure techniques utilizing a video camera to document condition, jointing, and obstructions.
- Perform a condition assessment to evaluate inlets, outlets, joints, cracks, spalling, slope, sediment, debris, efflorescence, and rust staining.

Additionally note all drop inlet structural deficiencies and outfalls in need of regrading for positive drainage or armoring.

- For retained pipes and box culverts, prepare an inspection report and summary table for recommended alternatives. Acceptable alternatives are retain, replace, seal, clean, clean and line pipes, or a combination of these. Label one table column *Solution* as depicted in Attachment B and list the chosen alternatives. A SC Registered Professional Engineer shall sign the report. The Contractor shall correct the deficiencies noted in the inspection report and summary table for pipes smaller than 36-inches that are discovered and inspected post contract award.
- SCDOT will take necessary measures to ensure the deficiencies are remediated, or rendered harmless, for retained box culverts and retained pipes 36-inches and greater which have not been inspected at the time of award of the contract. Such measures will include self-performing, retaining a qualified firm, or negotiating a construction change order with the Contractor.

2.2 Bridge Drainage

Spread criteria for replacement bridges shall follow Exhibit 4b. Temporary drainage spread will be restricted to the shoulder width.

2.3 Floodplains and Floodways

2.3.1 This project falls within FEMA Flood Insurance Rate Maps (FIRMs) 45075C0635C for Orangeburg County SC. Based on these FIRMs, there are no stream crossings within Special Flood Hazard Areas (SFHAs).

2.3.2 The Contractor shall continuously verify the FIRMs associated with this project are the most current ones available and is responsible to comply with any modifications made to these FIRMs that affects the project.

2.4 Sediment and Erosion Control and Water Quality

2.4.1 Determine the classification of the receiving waterbodies and note downstream impairments.

2.4.2 Develop a plan to meet the requirements of SCDOT's Construction Permit SCR160000 for erosion and sedimentation control during construction for the entire project length. In areas where sediment dams, basins, or ponds are required, include plots of these structures on the roadway cross sections.

2.4.3 Provide additional water quality treatment when outfalls discharge to 303(d) listed, TMDL, and other sensitive waters. Utilize vegetative practices where possible and structural controls when vegetative practices are not applicable at these outfalls. Exhaust all options prior to implementing structural controls.

2.5 NPDES Permitting

2.5.1 Prepare the NPDES permit package(s), to include the Stormwater Prevention Plan (SWPPP) checklist found in Attachment B, and perform the coordination with SCDHEC to obtain the permit. The SCDOT reviews, signs and submits the package to SCDHEC.

EXHIBIT 4f

GEOTECHNICAL DESIGN CRITERIA

1.0 GENERAL

All subsurface exploration, geotechnical design, and construction for the Project shall be carried out in accordance with the SCDOT Geotechnical Design Manual (GDM), Geotechnical Design Bulletins, the Special Provisions listed in Exhibit 5, and the design criteria herein.

2.0 CRITERIA

The Geotechnical Subsurface Data Report (GSDR) and subsurface investigation field testing data files have been provided in Attachment B.

Geotechnical information provided in Attachment B as part of this RFP may be used in the design of the Project at the CONTRACTOR's discretion. If the CONTRACTOR elects to use the geotechnical information in Attachment B, the CONTRACTOR shall verify that the information provided is applicable to the CONTRACTOR's specific design.

All temporary and permanent shoring submittals shall be reviewed and approved by the Lead Design Engineer and Geotechnical Engineer of Record (GEOR) for the Project prior to submitting to SCDOT's Resident Construction Engineer (RCE).

2.1 Bridge

The CONTRACTOR shall be responsible for the load testing of all foundations used on this project if required by design. All testing reports for driven piles shall bear the legible seal, signature, and date of the testing firm's engineer registered as a Professional Engineer in the State of South Carolina. The CONTRACTOR's EOR and GEOR shall review and approve, in writing, all load test reports prior to submitting the reports to SCDOT's RCE or Construction Engineering and Inspection (CE&I) team as designated for review and acceptance or comment. Comments made by SCDOT shall be reviewed and rectified by the Contractor's EOR and GEOR prior to the results of the load testing being used in design.

2.1.1 Driven Piles

The CONTRACTOR shall provide a Pile Installation Plan (PIP) that shall include the pile index testing program, if index piles are utilized, in addition to the requirements of the Standard Specifications. The pile index testing program shall at a minimum include the Bent and Pile number of each pile to be tested as well as the number of index piles to be tested. The number of index piles shall conform to the SCDOT GDM. The GEOR and EOR shall provide a QC review of the CONTRACTOR's PIP prior to submitting to SCDOT's RCE or CE&I team as designated for QA review. After performing QA review, SCDOT's RCE will submit the PIP to the SCDOT Bridge Construction Engineer (BCE) for final acceptance.

If Pile Driving Analyzer (PDA) testing is required for driven piles by the GEOR's design, the Contractor's PDA testing shall be performed by a PDA

certified operator with a Certificate of Proficiency from Pile Dynamics, Inc. of Advanced or higher. The PDA certification shall have been renewed within 4 years of the date of pile installation. In addition to the PDA testing, CAPWAP (Case Pile Wave Analysis Program) analysis shall also be performed.

The GEOR shall review the PDA testing data and reports and develop driving criteria for the production piles. Following installation of the production piles, the GEOR shall perform a QC review of all production pile driving logs, PDA testing reports, and RFC plans to verify that all criteria have been met. If all criteria have not been met, the Design-Build Team shall perform additional work as necessary to ensure all criteria have been met. The EOR shall submit an As-Installed Driven Pile Foundation Package for each structural element supported on driven pile foundations that includes all PDA testing reports and production pile driving logs with a certification statement that all criteria have been met.

The As-Installed Driven Pile Foundation Package shall be submitted to SCDOT's RCE or CE&I team as designated for QA review. After performing QA review, SCDOT's RCE will submit the As-Installed Driven Pile Foundation Package to the SCDOT BCE for final acceptance. As-Installed Driven Pile Foundation Packages submitted with any deficiencies in criteria that have not been specifically addressed will be rejected. This process shall also be followed when PDA testing is not required by the GEOR's design.

2.1.2 Drilled Shafts

The CONTRACTOR shall provide a Drilled Foundation Installation Plan (DFIP) in accordance with the requirements of the Standard Specifications. The GEOR and EOR shall provide a QC review of the CONTRACTOR's DFIP prior to submitting to SCDOT's RCE or CE&I team as designated for QA review. After performing QA review, SCDOT's RCE will submit the DFIP to the SCDOT Bridge Construction Engineer (BCE) for final acceptance.

Following installation of the drilled shafts, the GEOR shall perform a QC review of all production drilled shaft logs, CSL and TIP test reports, and RFC plans to verify that all criteria have been met. If all criteria have not been met, the Design-Build Team shall perform additional work as necessary to ensure all criteria have been met. The EOR shall submit an As-Installed Drilled Shaft Foundation Package for each structural element supported on drilled shaft foundations that includes all testing reports and production drilled shaft logs with a certification statement that all criteria have been met.

The As-Installed Drilled Shaft Foundation Package shall be submitted to SCDOT’s RCE or CE&I team as designated for QA review. After performing QA review, SCDOT’s RCE will submit the As-Installed Drilled Shaft Foundation Package to the SCDOT BCE for final acceptance. As-Installed Drilled Shaft Foundation Packages submitted with any deficiencies in criteria that have not been specifically addressed will be rejected.

2.2 Roadway

Fill slopes or ditch slopes steeper than 2H:1V are not allowed.

Miscellaneous overhead structure foundations such as lighting and signage shall be designed in accordance with AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, effective as of the Final RFP release date.

2.3 Seismic

Seismic design of the bridge structures, roadway structures, and bridge embankments shall be required in accordance with the SCDOT Geotechnical Design Manual and SCDOT Seismic Design Specifications for Highway Bridges.

The Simplified Newmark method described in Section 13.15.2 and Equation 13-72 of the GDM shall be used to analyze seismic ground displacements along a shear plane.

Use of discrete elements or rigid inclusions for soil shear strength loss (SSL) mitigation using area replacement ratio, shear modulus ratio, and shear stress reduction methodology are not permitted. Additionally, methods proposed to mitigate soil SSL that do not include densification or excess pore pressure reduction are not permitted.

Three-Point Acceleration Design Response Spectrum (ADRS) curves have been generated for the Project and are provided below.

Design EQ	PGA	S _{DS}	S _{D1}
FEE	0.23	0.41	0.14
SEE	0.55	1.04	0.50

EXHIBIT 4f – GEOTECHNICAL DESIGN CRITERIA

The range of natural period of the soil column on the project has been calculated for the project site and is provided in the ADRS curve. The Structural Engineer of Record (SEOR) shall calculate the fundamental period range of interest of each seismically designed structure and compare the earthquake period, soil column period, and structure period. If these three fundamental periods coincide, the SEOR shall demonstrate that structural design has accounted for this greatest potential of damage as referenced in LRFD Seismic Analysis and Design of Transportation Geotechnical Features and Structural Foundations, FHWA-NHI-11-032, GEC No. 3.

EXHIBIT 4f – GEOTECHNICAL DESIGN CRITERIA

3-Point Acceleration Design Response Spectrum

SCDOT v3.1.1 - 11/29/2022

Project ID: P038677	Latitude: 33.3186
Route: I-26	County: 38 - Orangeburg
Project: I-26 and I-95 Interchange	Longitude: 80.5479

Designer: N. Harman - Support
Date: 3/13/2023

Design EQ	PGA	S _{DS}	S _{D1}	M _W	R	PGV	D ₉₅₋₉₅	T'₀
	g	g	g	-	km	inches/sec	sec	sec
FEE	0.23	0.41	0.14	7.30	47.83	5.22	26.38	0.09
SEE	0.55	1.04	0.50	7.30	47.67	19.12	26.35	0.26

Damping: 5%	Geologic Condition: Geologically Realistic (Q = 100)*
	SCCP
ADRS Location within Soil Column: At Ground Surface	

South Carolina Coastal Plain

*Same Geologic Condition as used in SCENARIO_PC (2006)

Fundamental Period of Structure, T ₀ [*]	Range of Interest		V _{s,H} [*]	H	T _{NH}	
	sec				sec	
sec	0.5*T ₀	2.0*T ₀	ft/sec	ft	(4*H)/V _{s,H} [*]	(6*H)/V _{s,H} [*]
0.00	0.00	0.00	1690.36	506.90	0.31	1.78
0.00	0.00	0.00				

FEE Data		SEE Data	
T	S _a	T	S _a
0.00	0.234	0.00	0.547
0.01	0.263	0.02	0.630
0.02	0.292	0.03	0.713
0.03	0.322	0.05	0.796
0.04	0.351	0.06	0.879
0.06	0.380	0.08	0.961
0.07	0.410	0.10	1.044
0.09	0.410	0.13	1.044
0.11	0.410	0.16	1.044
0.13	0.410	0.19	1.044
0.16	0.410	0.22	1.044
0.18	0.410	0.26	1.044
0.20	0.410	0.29	1.044
0.22	0.410	0.32	1.044
0.25	0.410	0.35	1.044
0.27	0.410	0.39	1.044
0.29	0.410	0.42	1.044
0.31	0.410	0.45	1.044
0.34	0.410	0.48	1.044
0.49	0.279	0.63	0.799
0.65	0.212	0.78	0.647
0.81	0.171	0.93	0.543
0.96	0.143	1.07	0.468
1.12	0.123	1.22	0.412
1.28	0.108	1.37	0.367
1.43	0.096	1.52	0.331
1.59	0.086	1.67	0.302
1.75	0.079	1.81	0.277
1.90	0.072	1.96	0.256
2.06	0.067	2.11	0.238
2.22	0.062	2.26	0.223
2.37	0.058	2.41	0.209
2.53	0.054	2.56	0.197
2.69	0.051	2.70	0.186
2.84	0.048	2.85	0.176
3.00	0.046	3.00	0.168

SC Seismic ADRS Curve

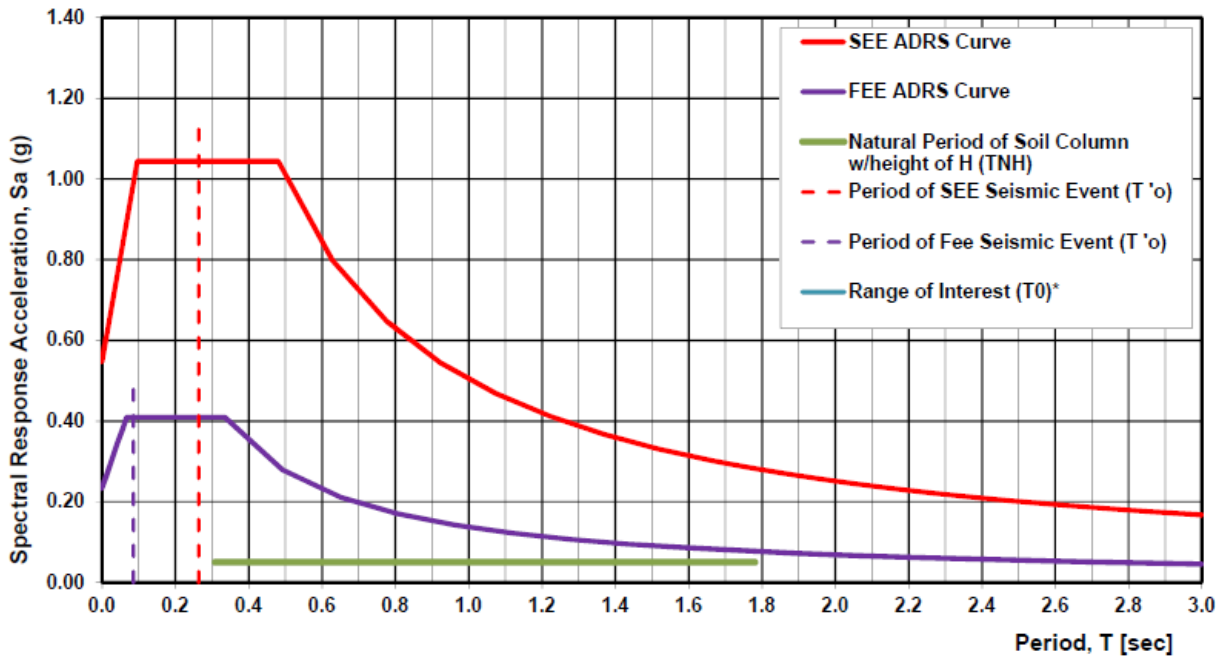


EXHIBIT 4z

PROJECT DESIGN DELIVERABLES

1.0 GENERAL

This exhibit describes the makeup of submittal packages used for Design Review and permanent record retention by SCDOT. All submittals shall be in accordance with Departmental guides, including but not limited to, the Road Design Reference Material for Consultant Prepared Plans, as amended herein, and shall include all checklists, indexes and electronic files in the specified format and folder structure.

1.1 Document Naming Conventions

Documents submitted on SCDOT Design-Build projects shall follow the Design-Build file naming conventions that can be found under Design-Build Resources at the following link: <https://www.scdot.org/business/pdf/design-build/Design-Build-File-Naming-Conventions.pdf>

2.0 SUBMITTAL PACKAGES

SUBMITTAL PACKAGE CONTENTS****
Preliminary Submittal Packages
Preliminary Road Submittal Packages shall include:
<ul style="list-style-type: none"> • Preliminary Road Plans
<ul style="list-style-type: none"> • Survey Control Data Sheet
<ul style="list-style-type: none"> • Conceptual Work Zone Traffic Control Plans*
<ul style="list-style-type: none"> • Conceptual ITS Design Plans*
<ul style="list-style-type: none"> • Preliminary Roadway Drainage Design Report
<ul style="list-style-type: none"> • Preliminary Road Geotech Report
Preliminary Bridge Submittal Packages shall include:
<ul style="list-style-type: none"> • Preliminary Bridge Plans
<ul style="list-style-type: none"> • Preliminary Bridge Hydraulic Design Report
<ul style="list-style-type: none"> • Preliminary Bridge Geotech Report
<ul style="list-style-type: none"> • Preliminary Seismic Design Summary Report

Right-of-Way Submittal Packages
Right of Way Submittal Packages shall include:
<ul style="list-style-type: none"> • Right-of-Way Plans
<ul style="list-style-type: none"> • Survey Control Data Sheet
<ul style="list-style-type: none"> • Conceptual Work Zone Traffic Control Plans*
<ul style="list-style-type: none"> • Conceptual ITS Design Plans*
<ul style="list-style-type: none"> • Right-of-Way Hydraulic Reports
Final Submittal Packages
Final Road Submittal Packages shall include:
<ul style="list-style-type: none"> • Final Roadway Plans
<ul style="list-style-type: none"> • Survey Control Data Sheet
<ul style="list-style-type: none"> • Work Zone Traffic Control Plans
<ul style="list-style-type: none"> • Final ITS Design Plans
<ul style="list-style-type: none"> • Final Roadway Drainage Design Report
<ul style="list-style-type: none"> • Final Road Geotech Reports
Final Bridge Submittal Packages shall include:
<ul style="list-style-type: none"> • Final Bridge Plans
<ul style="list-style-type: none"> • Final Bridge Hydraulic Design Report
<ul style="list-style-type: none"> • Final Bridge Geotech Report
<ul style="list-style-type: none"> • Final Seismic Design Summary Report
<ul style="list-style-type: none"> • Bridge Load Rating Documentation
<ul style="list-style-type: none"> • Final Independent Peer Review Letter and Report
RFC Submittal Packages
RFC Road Submittal Packages shall include:

EXHIBIT 4z – PROJECT DESIGN DELIVERABLES

<ul style="list-style-type: none"> • RFC Roadway Plans
<ul style="list-style-type: none"> • Survey Control Data Sheet***
<ul style="list-style-type: none"> • RFC Work Zone Traffic Control Plans
<ul style="list-style-type: none"> • RFC ITS Design Plans
<ul style="list-style-type: none"> • RFC Road Geotech Reports
<ul style="list-style-type: none"> • RFC Design Calculations
<p>RFC Bridge Submittal Packages shall include:</p>
<ul style="list-style-type: none"> • RFC Bridge Plans
<ul style="list-style-type: none"> • RFC Bridge Hydraulic Design Report
<ul style="list-style-type: none"> • RFC Bridge Geotech Report
<ul style="list-style-type: none"> • RFC Seismic Design Summary Report
<ul style="list-style-type: none"> • RFC Design Calculations
<ul style="list-style-type: none"> • Bridge Load Rating Documentation
<ul style="list-style-type: none"> • RFC Independent Peer Review Letter and Report
<p>Construction Submittals (including, but not limited to)**</p>
<ul style="list-style-type: none"> • Traffic Management Plan
<ul style="list-style-type: none"> • Paving Plan
<ul style="list-style-type: none"> • Foundation Installation Plan Submittals
<ul style="list-style-type: none"> • Foundation Testing Submittals
<ul style="list-style-type: none"> • Hazardous Materials Testing Submittals
<ul style="list-style-type: none"> • Shop Plans
<ul style="list-style-type: none"> • Working Drawings
<ul style="list-style-type: none"> • NPDES Submittals
<ul style="list-style-type: none"> • Permit Drawings/Revised Permit Drawings

- | |
|---|
| <ul style="list-style-type: none"> • As-Built Plans |
| <ul style="list-style-type: none"> • As-Built ITS Design Plans |

* If ROW plans are not anticipated, these plans shall be included with the preliminary road plans.

** Reviews for these submittals are not held to the standard periods as outlined in Article II, Section D of the Agreement.

*** CONTRACTOR may rely on survey information provided in Attachment B – Supplemental Design Criteria. CONTRACTOR shall incorporate the information into the final project documents. CONTRACTOR shall be responsible for supplementing the survey information provided as required for their specific design.

**** CONTRACTOR shall supply hard copies if requested by SCDOT.

3.0 SUBMITTAL PACKAGE CONTENTS

3.1 All Submittals Packages

- Partial submittal of the required contents of the preliminary, right of way, or final submittal packages will not be allowed.
- Perform a thorough QC review of the submittal packages prior to submitting them to SCDOT.
- Digital or inked signatures are allowable for RFC documents. However, only one method of signature, digital or inked, is allowed per Project ID.
- All pdf documents of a submittal package shall be flattened before being uploaded to Projectwise.
- Plans shall be submitted electronically as a landscape 22"x36" pdf file.
- Reports shall be submitted electronically as a portrait 8.5"x11" pdf file. Larger sheets may be included for charts, diagrams, etc.
- At the request of SCDOT or its representative, Contractor shall submit calculations and/or design files, including computer aided drafting files for review with a submittal package.

3.2 Preliminary Submittal Packages

3.2.1 Preliminary Road Plans

- The plans shall include, but not be limited to, the following:
 - title sheet
 - roadway typical section
 - survey control data
 - strip map, including property closures
 - roadway plan and profile
 - cross sections (begin and end station cross sections required, showing proposed design tying into existing conditions)
 - clearing limits on plan view and cross sections

- drainage features
- existing right-of-way
- proposed right-of-way
- roadway structure layout limits
- noise barrier wall alignments

3.2.2 Conceptual Work Zone Traffic Control Plans

- The plans shall include, but not be limited to, the following:
 - Staging Narrative
 - Concept Staging Plans
 - Widening/Rehabilitation Typical Sections for each Stage of Construction and any critical points
 - Where additional Right-of-Way is warranted for the purposes of Staging
 - Separation of Adjacent Travel Lanes / Traffic Splits as described in the SCDOT Procedures and Guidelines for Work Zone Traffic Control Design
 - Where the travel lane leaves the existing roadway bed or direction on new alignment (transition area) and returns (termination area)

3.2.3 Conceptual ITS Design Plans

- The Contractor shall develop and furnish conceptual design plans as indicated in Exhibit 5*

3.2.4 Preliminary Bridge Plans

- The plans shall include, but not be limited to, all items described in Chapter 3 of the SCDOT Bridge Design Manual.

3.2.5 Preliminary Hydraulic Reports

- Preliminary Roadway Drainage Design Reports shall include, but not be limited to, the following:
 - Pre/post outfall summaries
 - HW/D summaries for crosslines
 - Open channel designs
 - Address permitting requirements
 - Field Investigation and Pipe Inspection Report
- Preliminary Bridge Hydraulic Design Reports shall include, but not be limited to, the following:
 - Preliminary Hydraulic Model Design and Supporting Documentation including Hydrology Data Sheets, the Hydraulic Design and Risk Assessment Form, and the NEPA Bridge

Replacement Scoping Trip Risk Assessment Forms (for each applicable location)

- Modeling files
- Address permitting requirements (for each applicable location)
- NPDES permitting-if permitting is going to be phased, address how submittals will be phased and anticipated submission schedules.

3.2.6 Preliminary Road & Bridge Geotechnical Reports

- The geotechnical reports shall include, but not be limited to, the following:
 - all items described in Chapter 21 of the SCDOT Geotechnical Design Manual and the latest design memorandums

3.2.7 Preliminary Seismic Design Summary Report

- Provide the information outlined in SCDOT Bridge Design Memorandum DM0122.

3.2.8 Right-of-Way Plans

- The plans shall include, but not be limited to, the following:
 - title sheet
 - roadway typical section
 - survey control data
 - strip map, including property closures
 - right-of-way data sheet
 - roadway plan and profile
 - cross sections (include sediments basins, dams and crosslines)
 - clearing limits on plan view and cross sections
 - drainage features
 - existing right-of-way
 - proposed right-of-way
 - roadway structure layout limits
 - noise barrier wall alignments

3.2.9 Conceptual Work Zone Traffic Control Plans

- The plans shall include, but not be limited to, the following:
 - Staging Narrative
 - Concept Staging Plans
 - Widening/Rehabilitation Typical Sections for each Stage of Construction and any critical points
 - Where additional Right-of-Way is warranted for the purposes of Staging

- Separation of Adjacent Travel Lanes / Traffic Splits as described in the SCDOT Procedures and Guidelines for Work Zone Traffic Control Design
- Where the travel lane leaves the existing roadway bed or direction on new alignment (transition area) and returns (termination area)

3.2.10 Conceptual ITS Design Plans

- The Contractor shall develop and furnish conceptual design plans as indicated in Exhibit 5*

3.2.11 Right-of-Way Hydraulic Reports

- Roadway Drainage Design Reports shall include, but not be limited to, the following:
 - Updates to the preliminary roadway drainage designs
 - Inlet spacing calculations and bridge deck drainage calculations
 - Geopak drainage summaries
 - Storm sewer system profiles for the design storm and the 50-yr event at sag locations
 - Sediment and erosion control designs
 - Water quality and post construction designs
 - Detention designs and supporting documentation
- NPDES package shall be provided for review in preparation for submittal to SCDHEC/OCRM.

3.3 Final Submittal Packages

3.3.1 Final Road Plans

- The plans shall include, but not be limited to, the following:
 - title sheet
 - roadway typical section
 - survey control data
 - strip map, including property closures
 - right-of-way data sheet
 - roadway plan and profile
 - cross sections (begin and end station cross sections required, showing proposed design tying into existing conditions)
 - clearing limits on plan view and cross sections
 - drainage design (include drainage tables per Plan Preparation Guide behind each drainage sheet)
 - existing right-of-way
 - proposed right-of-way
 - summary of estimated quantities

- strip map including property closures
- sediment and erosion control design
- proposed barrier locations
- permanent signing plans
- permanent pavement markings plans
- traffic signal plans
- roadway structure plans
- Electronic files submittals: Information herein is an abbreviated list of electronic deliverables taken from the Road Design Reference Material for Consultant Prepared Plans. Submit Checklists, Indexes and files in accordance with the format and attachments specified in the document.
 - CADD electronic files index with the detailed descriptions of the contents of each file must be provided in a “readme” file. The index should also include detailed descriptions and names of horizontal and vertical alignments and profiles utilized by the GEOPAK software on the project. A copy of the file folder structure is shown in Road Design Reference Material for Consultant Prepared Plans.
 - All surveyed mapping, control points, benchmarks, GPS setup, 2D or 3D contours, spot points, survey notes, DTM, breaklines, TIN files, aerial photos and all other CADD files and data used in developing surveys for the project. Also, the survey points should be provided in ASCII file format (Point number, N, E, Z, and Descriptions). Contact information for the survey company should be provided. All electronic survey files are to be placed in a separate folder.
 - All MicroStation files including all files that would supplement the ability to view files correctly such as reference files and cell libraries.
 - All .gpk files and any other Geopak files, such as input and criteria files that are needed to facilitate the review of plans should be submitted.
 - If other Civil Engineering software packages were utilized for project development then all binary or ASCII files that are software dependent for that package shall be submitted
 - All electronic files that pertain to the construction stake out. Files will be in SMI format and will include all horizontal controls, vertical controls and templates. SMI data will be provided in a separate folder.
 - Copies of all hand written or electronic calculations or notes (non-CADD) that will facilitate verification and review of the plans.
 - All roadway design calculations will be provided in a separate folder. (Ex: guardrail length of need graphics, intersection sight distance graphics, superelevation development calculations, etc.)

- On each printed sheet in the plans, the electronic folder name, filename, and date must be shown.
- Provide plot setting to include levels used, symbology, line weights and pen tables in order to reproduce all plans sheets
- All roadway structures' design criteria with calculations will be provided in a separate folder.
- Pavement Design will be provided in a separate folder with soil support data, traffic volumes, and ESAL's
- Electronic files for specifications and special provisions in Adobe PDF or Microsoft Word format
- Approved Design Exceptions to AASHTO and/or SCDOT design standards developed during design

3.3.2 Final Bridge Plans

- The plans shall include, but not be limited to all items described in Chapters 3 and 6 of the SCDOT Bridge Design Manual.
- Submit electronic plans with digital signatures in accordance with SCDOT Preconstruction Design Memorandum PCDM-04. In addition to digitally-signed individual plan sheets, provide a flattened, multipage PDF copy of the entire plan set for easier viewing.
- Additional electronic file submittals:
 - All MicroStation files including all files that would supplement the ability to view files correctly such as reference files and cell libraries.
 - Copies of all hand written or electronic calculations or notes (non-CADD) that will facilitate verification and review of the plans.
 - Electronic files for specifications and special provisions in Adobe PDF or Microsoft Word format

3.3.3 Work Zone Traffic Control Plans

- The plans shall be in accordance with the SCDOT Procedures and Guidelines for Work Zone Traffic Control Design and all other applicable design references listed in Exhibit 4

3.3.4 Final ITS Design Plans

- The Contractor shall develop and furnish ITS design plans as indicated in Exhibit 5*

3.3.5 Final Hydraulic Report

- Final Roadway Drainage Design Reports shall include, but not be limited to, the following:

- Updates to the Right-of-Way hydraulic drainage designs
- Final Bridge Hydraulic Design Reports shall include, but not be limited to, the following:
 - Final Hydraulic Model Design and Supporting Documentation including all updated forms
 - Final Modeling files
 - Scour Study- additionally plot the 100- and 500-year lines on the bridge triple profile sheet (for each applicable location)
 - Address CLOMR and/or “No Impact” Certifications (for each applicable location)
 - Include the hydrology data for bridges, culverts and pipes greater than 48 inches on the bridge triple profile sheets
- Complete NPDES package

3.3.6 Final Road & Bridge Geotechnical Reports

- The geotechnical reports shall include, but not be limited to, the following:
 - all items described in Chapter 21 of the SCDOT Geotechnical Design Manual and the latest design memorandums
 - design details and plan notes along with data that are consistent with that shown in the final bridge and road plans
 - Contractor’s designer shall prepare the required geotechnical bridge and roadway plan sheets that clearly detail any geotechnical requirements outlined in the reports

3.3.7 Final Seismic Design Summary Report

- Provide the information outlined in SCDOT Bridge Design Memorandum DM0122.

3.3.8 Bridge Load Rating Documentation

- See Requirements for Bridge Load Rating in Exhibit 4b, Section 3.

3.3.9 Final Independent Peer Review Report

- If a bridge contains complex components in accordance with the “Complex Bridge Peer Review Requirements” contained in Attachment B, provide the Independent Peer Review Letter and accompanying documentation as required.

3.4 RFC Submittal Packages

- RFC submittal packages shall be submitted once all comments have been closed on all submittals for each phase (ex. Preliminary/ROW/Final/RFC) of a segment or structure and a request for RFC plans has been issued by the Construction Office.
- After all comments are closed, no changes shall be made to the design deliverables before providing a RFC submittal package.
- Insert RFC Plans into plan folders as detailed in the SCDOT Plan Preparation Guide and the SCDOT Bridge Design Manual if not submitted with digital signatures.
- The Engineer of Record, a licensed and registered Professional Engineer in the State of South Carolina, shall sign and seal all RFC plans and reports. RFC documents shall be original documents if not submitted with digital signatures.
- RFC documents submitted with digital signatures shall comply with the SCDOT Digital Signatures Manual.
- A complete set of design calculations shall be included with the RFC submittal package and at any point prior when requested by SCDOT.

3.5 Revisions to RFC Plans and Reports

- After providing a RFC submittal package, any subsequent changes to the RFC plans and reports will be considered revisions. Revisions shall be denoted as detailed in the design manuals or as directed by the Department.

3.6 Traffic Management Plan

- The Contractor shall submit a Traffic Management Plan in accordance with the document, Rule on Work Zone Safety and Mobility: Implementation, Maintenance, and Safety Guidelines.
- All components of the Transportation Management Plan shall be submitted for review by SCDOT and must be approved before any construction activities can begin.

3.7 Foundation Installation Plan Submittals

- Prepare Drilled Foundation Installation Plans (DFIP) and/or Pile Installation Plans (PIP) in accordance with the SCDOT Standard Specifications for Highway Construction, 2007 Edition. Submit all foundation installation plan submittals electronically. The Contractor's designer shall review and approve all DFIP and PIP (including pile driving criteria) prior to submitting the foundation installation plans to SCDOT for review and acceptance. SCDOT will review the foundation installation plans and provide either acceptance or comments. The Contractor's designer shall resolve all comments prior to re-submittal to SCDOT. SCDOT will review the DFIP

and/or the PIP only to verify that the specifications have been addressed. The Contractor shall provide a supplement to the report containing the actual field conditions encountered and as-built foundation data and information after construction of the foundations is complete.

3.8 Foundation Testing Submittals

- Submit to SCDOT an electronic copy of all applicable foundation testing reports for all bridge and roadway structures to include but not limited to Shaft Load Test and Pile Driving Analyzer test reports.

3.9 Hazardous Materials Testing Submittals

- The Contractor shall submit to SCDOT:
 - Results of any hazardous materials analytical testing of sampled or excavated subsurface materials as outlined in the Agreement.
 - Manifests of all hazardous materials requiring disposal.

3.10 Shop Plans

- For this project, see the “Design-Build Shop Plan Review Process” criteria provided in Attachment B - Bridge.

3.11 Working Drawings

- Submit working drawings and design calculations, as defined by the Standard Specifications for Highway Construction, to the Contractor’s designer for review and approval. Route all approved working drawings and design calculations to the SCDOT for review and distribution. Provide working drawings and design calculation submittals that meet the criteria of Subsection 725.1.2 of the Standard Specifications for Highway Construction. SCDOT will review the drawings and calculations and either provide acceptance of the drawings as prepared or provide comments. If comments are provided, the Contractor’s designer shall review the comments prior to resubmittal to SCDOT for further review. The Contractor’s designer shall stamp the working drawings and design calculations “approved” prior to submittal to SCDOT. SCDOT will stamp and distribute the drawings and calculations. Do not commence construction/erection until after SCDOT distributes the drawings and calculations. The responsible engineer, registered as a Professional Engineer in the State of South Carolina, shall seal, sign, and date all design calculations and working drawings. SCDOT will review the working drawings and design calculations only to verify that the specifications have been addressed.

3.12 NPDES Submittals

- The appropriate level of design and review shall be completed prior to any NPDES package submittal.

3.13 Permit Drawings/Revised Permit Drawings

- Contractor shall provide to SCDOT permit drawings (including digital files) used for the approved USACE permit.
- Contractor shall provide to SCDOT revised permit drawings (including digital files) that show changes from those in the approved USACE Permit.

3.14 As-Built Plans

- Provide a copy of the as-built plans in accordance with the Manual of Instruction for the Preparation of As-built Plans.
- Provide a final copy of all electronic data as noted in section 3.4.1 and 3.4.2 which captures all changes to electronic data since the final plans submittal.
- A complete as-built set of signing plans, including SignCAD copies of all layouts, shall be submitted to the SCDOT as directed by the Director of Traffic Engineering at the conclusion of the project.
- The CONTRACTOR shall provide as-built plans to include: directional bore logs, conduit offsets every 500', GPS data of device locations, all service and pull boxes, power metering points, mid span and reel end splices (three complete sets). An electronic copy of all GPS data will be turned in at the same time as the as-built plans. Allocation drawing and Fiber Trak data entry will be furnished by the Department as part of the integration.
- Provide As-Built "red-lined" signal plans to the District Signal Shop after the signal work is completed.
- Provide as-built load rating(s), updated as needed, with as-built plans if there have been any changes to the bridge(s) that affect the load rating. If no changes are made that affect the load rating(s), provide a certification signed by the engineer of record stating the original load rating(s) remain accurate for the bridge(s).
- Provide an updated Complex Bridge Independent Peer Review Report, if any construction changes resulted in additional peer review, in accordance with the Complex Bridge Independent Peer Review Requirements in Attachment B.

3.15 As-Built ITS Plans

- The CONTRACTOR shall provide as-built plans to include: directional bore logs, conduit offsets every 500', GPS data of device locations, all service and pull boxes, power metering points, mid span and reel end splices (three

EXHIBIT 4z – PROJECT DESIGN DELIVERABLES

complete sets). An electronic copy of all GPS data will be turned in at the same time as the as-built plans. Allocation drawing and Fiber Trak data entry will be furnished by the Department as part of the integration.

EXHIBIT 5

SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

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EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

GENERAL DECISION NUMBER SC42 172

SPECIAL PROVISIONS

(1) SECTION 101: STANDARD DRAWINGS:

The Bidders are hereby advised that this project shall be constructed using the Current Standard Drawings with all updates effective at the time of this letting. For this design-build project, the time of the letting is the most recent Standard Highway Letting that occurred on or before the Final RFP release date. The Standard Drawings are available for download at <https://www.scdot.org/business/standard-drawings.aspx>. All drawings that are updated are labeled with their effective letting date in red.

All references in the plans, standard specifications, supplemental specifications, supplemental technical specifications or special provisions to drawings under the previous numbering system (prior to 2007) are hereby updated to the new drawing numbers. Refer to sheets 000-205-01 through 000-205-07 to find new drawing numbers when looking for references to older drawing numbers. "Old sheet numbers" are also visible on the website when using the full set of drawings "current" search and are sortable by clicking the header over the appropriate column on the results page. Be aware that some older drawings now span over multiple pages due to detailing changes.

(2) SECTION 102: UNIQUE ENTITY ID (SAM) REQUIREMENT FOR ALL PROJECTS

The Bidders are advised that the Prime Contractor must register and maintain a current registration in the System for Award Management (<http://sam.gov>) at all times during this project. Upon registration, the Contractor will be assigned a SAM Unique Entity ID.

The Bidders are also advised that prior to the award of this contract, they **MUST** be registered, active, and have no active exclusions in the System for Award Management.

(3) SECTION 102: IMMINENT STANDARD DRAWINGS

On the Standard Drawings search page, enter status of Imminent with other fields blank to see a list of upcoming Standard Drawings and their corresponding effective let date. Imminent drawings may be used at any time they are available if approved by the Resident. Follow procedure shown in imminent drawings when noted in this section.

Imminent Drawings will be made available as soon as they are signed.

(4) SECTION 102: STANDARD DRAWING ERRATA:

The Bidders are hereby advised that the following note changes apply to the published Standard Drawings.

On sheet **000-205-05**, add the following information under the columns below:

OLD DRAWING NAME	NEW DRAWING NAME
720-905-01 to 720-905-05	720-901-01 to 720-993-32

On sheet **605-005-05 (ver 1-1-2013)**, replace entire text of General Note #4 with the following text:

4. The square footage of sign panels attached to 2½" x 2½" 12 gauge sign support secured to a 3" x 3" 7 gauge breakaway anchor shall not exceed 20 square feet.

On sheet **610-005-00 (ver 5-1-18)** added the following definition to Note 1 of Flagging Operations section:

SIDE ROAD FLAGGER – This flagger is stationed on an intersecting side road and controls the side road traffic entering into the roadway where the work activity area is located.

On sheet 610-005-20 (ver 5-1-18) added Note 5 :

5. When the work proceeds through a “STOP sign controlled” “SIDE ROAD” intersection continue the work operations through the intersection to a specific location point within the “DEPARTURE LANE” no less than 300 FT to 500 FT beyond the limits of the intersection to allow the work train and all portions of the lane closure to clear the intersection.

On sheet 610-005-20 (ver 5-1-18)

Added dimension “300’-500” for the work activity area after the intersection.

On sheet 610-005-30 (ver 5-1-18) added Note 5 :

5. When the work proceeds through a “STOP SIGN CONTROLLED” intersection continue the work operations through the intersection to a specific location point within the “DEPARTURE LANE” no less than 300 FT to 500 FT beyond the limits of the intersection to allow the work train and all portions of the lane closure to clear the intersection.

On sheet 610-005-40 (ver 5-1-18) added Note 5 :

5. When the work proceeds through a “TRAFFIC SIGNAL CONTROLLED” intersection continue the work operations through the intersection to a specific location point within the “DEPARTURE LANE” no less than 300 FT to 500 FT beyond the limits of the intersection to allow the work train and all portions of the lane closure to clear the intersection.

On sheet 610-005-50 (ver 5-1-18) added Note 5 :

5. When the work proceeds through a “TRAFFIC SIGNAL CONTROLLED” intersection continue the work operations through the intersection to a specific location point within the “DEPARTURE LANE” no less than 300 FT to 500 FT beyond the limits of the intersection to allow the work train and all portions of the lane closure to clear the intersection.

On sheet 610-005-60 (ver 5-1-18) Title block changed :

Title block now reads “Flagging Operations – Work Zones Beginning @ Intersections with Two-Lane Two-Way Roadways – Departure Lane.”

On sheet 610-005-70 (ver 5-1-18) Title block changed :

Title block now reads “Flagging Operations – Work Zones Terminating @ Intersections with Two-Lane Two-Way Roadways – Approach Lane.”

On sheet 610-005-80 (ver 5-1-18) Note 6 revised:

6. Dependent upon the location of the work zone in the “Departure Lane” or the “Approach Lane” of the two-lane two-way road, when the work zone progresses to a location that requires conversion from this flagging operation traffic control setup to a standard flagging operation traffic control setup or vice versa, comply with the requirements of Standard Drawing No. 610-005-60 or Standard Drawing No. 610-005-70 as necessary regarding these conversions.

On sheet 610-005-90 (ver 5-1-18) Note 6 revised:

6. Dependent upon the location of the work zone in the “Departure Lane” or the “Approach Lane” of the two-lane two-way road, when the work zone progresses to a location that requires conversion from this flagging operation traffic control setup to a standard flagging operation traffic control setup or vice

versa, comply with the requirements of Standard Drawing No. 610-005-60 or Standard Drawing No. 610-005-70 as necessary regarding these conversions.

In Section 714-000 – Pipe Culverts (Permanent) (ver January 2011)

Delete and replace all references to P1 Biaxial Geogrid with B4 Geogrid on all Drawings within this Section of the Standard Drawings.

On sheet 720-305-00 (ver May 2008), delete the entire note directly above main detail:

On sheet 720-405-00 (ver May 2009) Detail 2 replace dimension 2'-6" maximum with:

2'-6" minimum

On sheet 720-901-01 (ver Feb 2015) replace note 5.04 with:

5.04 When a mid-block crossing is required, consider mid-block staggered crossing (720-955-41) to encourage eye contact between the pedestrian and the oncoming traffic. Always angle the stagger so that the pedestrian travels through the refuge facing the oncoming traffic.

On sheet 722-305-00 (ver May 2010) Detail 4 replace note "French Drain see note 21" with:

French Drain see note 4.5.

On sheet 722-305-00 (ver May 2010) table 722-305A, 4th column, change the following:

Delete

Replace text "up to 36" with "up to 3'X3' "

Replace text "larger than 36" with "larger than 3'X3' "

On sheet 722-305-00 (ver May 2010) change general note 3.3 2nd sentence & Detail 4:

Place Class 2 Type C Geotextile for Erosion Control under riprap as specified in SCDOT Standard Specification.

On sheet 804-105-00 (ver May 2008) Title Block replace text "Rirap (Bridge End)" with:

Riprap (Bridge End)

On sheet 804-105-00 (ver May 2008) Change Note 2: Geotextile Pay Item to:

8048210 Geotextile for Erosion Control under riprap (Class 2) Type C.... SY

On sheet 804-205-00 (ver May 2009) Change Note 2: Geotextile Pay Item to:

8048210 Geotextile for Erosion Control under riprap (Class 2) Type C.... SY

On sheet 804-305-01 (ver Jul 2017) Change Note 4: Geotextile Pay Item to:

8048210 Geotextile for Erosion Control under riprap (Class 2) Type C.... SY

On sheet 804-305-02 (ver Jul 2017) Change Section A: Geotextile Note to:

Geotextile for Erosion Control under riprap (Class 2) Type C

On sheet 804-310-00 (ver Jul 2017) Change Note 3: Geotextile Pay Item to:

8048210 Geotextile for Erosion Control under riprap (Class 2) Type C.... SY

On sheet **805-001-01 Jan 2019** version, replace note 25.06 with:

25.06 FOR PROJECTS THAT SPECIFY PREMASH DEVICES (W-BEAM, TYPE T, TBBC, TYPE B, ETC.) INSTALL W-BEAM RAIL HEIGHT AT 29" +/- 1" (PREVIOUSLY NOTED AS 27.75" +3"/-0").

On sheet **805-220-00 (ver Jul 2018)** replace note 5:

FOR SITES WITH BRIDGES, BOLT GUARDRAIL TO BRIDGE PARAPET AS REQUIRED IN STIFFNESS TRANSITION, AND HOLD FACE OF GUARDRAIL POSITION (TYPICALLY 5'-3" FROM FACE OF CURB) THROUGH STIFFNESS TRANSITION. Make any necessary adjustments to face of guardrail within the LONGITUDINAL BARRIER. INSTALL END TREATMENT so that impact head is beyond the back of sidewalk.

On website, drawings between 805-500-00 and 805-779-99 are reserved as PREMASH standards. Do not value engineer or otherwise substitute PREMASH devices in any location where it has been determined that MASH devices fit and are specified. If MASH devices do not fit site condition, install PREMASH only upon approval by the Resident Engineer. Note that during MASH implementation, some PREMASH details may be published with old drawing numbering and a cover sheet that addresses drawing and pay item changes.

On sheets **805-860-xx (05, 10, 15, 20, 24, 30) (ver Jan 2016):**

All references to toe drain details are revised to refer to drawing 805-875-10 (correct all notes pointing to drawings 805-895-00 or other incorrect drawing numbers).

(5) SECTION 103: BONDS AND INSURANCE:

Bonds and Insurance consists of all Bonds and Insurance required of the contractor. A maximum allowable amount of 2.0% of the total contract amount will be paid on the first pay estimate after work begins. If there is a remaining amount of the lump sum price for Bonds and Insurance after payments are made according to the limit above, then the remaining amount will be paid on the final estimate.

If special insurance is required by the contract provisions, such as railroad or coastal insurance, no maximum limit will apply to this bid item.

Item No.	Pay Item	Unit
1032010	BONDS AND INSURANCE	LS

(6) SECTION 103: MOBILIZATION – SUBCONTRACTOR:

Mobilization – Subcontractor consists of the preparatory operations for subcontractors including: moving personnel and equipment to the project site; paying bond and insurance premiums; establishing offices, buildings, and other facilities necessary for work on the project; and all other preparatory work or costs incurred before beginning work on the project.

Mobilization - Subcontractor is paid at the lump sum price bid, which price and payment is full compensation for organizing and moving all subcontractor forces, supplies, equipment and incidentals to the project site, regardless of the number of times such moves are made. The price and payment also includes costs for demobilization.

When the item Mobilization – Subcontractor is included in the Schedule of Values, payment will be made on the first four estimates once construction begins. Each payment is for 25% of the lump sum price for Mobilization - Subcontractor, subject to the maximum total limit of 5.0% of the total contract amount.

If there is a remaining amount of the lump sum price for Mobilization after payments are made according to the limit above, then the remaining amount is paid after all work on the project has been completed and accepted.

Partial payment for this item in no way acts to preclude or limit any of the provisions of partial payments otherwise provided for by the Contract or these specifications.

Payment for this item includes all direct and indirect costs and expenses required to complete the work.

Pay items under this section include the following:

Item No.	Pay Item	Unit
1031100	MOBILIZATION – SUBCONTRACTOR	LS

(7) SECTION 104: CONTRACT CHANGES:

A. PURPOSE

The purpose of this document is to establish the responsibilities and procedures for processing Requests for Information (RFI), Design Change Notifications (DCN), Field Change Notifications (FCN), and Contract Change Requests (CCR) after the execution of the contract for SCDOT design-build projects. These actions require review and either acceptance or approval prior to implementation. The timely review and response to Contractor/SCDOT submittals by the appropriate project officials is imperative to maximize the benefits of design-build contracting and reduce project delays.

B. DEFINITIONS

The following are the four different types of Contract Requests (CR).

Request for Information (RFI): A written request, typically by the Contractor to SCDOT, requesting clarifications or interpretations of the contract, plans, and specifications, including input required to resolve discrepancies. An RFI can also be used to obtain concurrence for construction means and methods that differ from traditional practice. In addition, SCDOT may initiate an RFI to the Contractor requesting clarification of means and methods.

Design Change Notification (DCN): A written notification by the Contractor that states changes within the contract requirements are needed to the design after the plans have been released for construction. These changes to the design will be subject to the same level of quality assurance and quality control reviews as the original design, including SCDOT and Contractor review, respectively.

Field Change Notification (FCN): A written notification by the Contractor to SCDOT to construct the project differently than shown in the Released for Construction (RFC) plans, but still within the contract requirements and SCDOT accepted practices. FCNs typically capture minor changes that do not require review and approval from the Engineer of Record (EOR), but will be noted on the as-built plans.

Contract Change Request (CCR): A written request to change contract requirements or deviate from SCDOT accepted practices. CCRs shall document all changes to contract time and price. CCRs, if approved, will be processed individually or in groups via a Change Order in SiteManager.

C. PROCEDURES

1. General

- a. Utilize SCDOT CR Form for all RFIs, DCNs, FCNs, and CCRs.
- b. Contractor will submit a form to the SCDOT RCE via ProjectWise, or vice versa, for all RFIs, DCNs, FCNs, and CCRs. FHWA shall be copied on Projects of Division Interest (PoDI).
- c. A sequential project-specific numbering system should be used for each CR submittal (e.g. CR-001).

- d. The RCE shall track the review progress for all documents in real time in a single spreadsheet in ProjectWise. This spreadsheet shall include:
 - 1) The CR number
 - 2) The duration agreed to for review completion
 - 3) The status of each submittal in each update
 - 4) The party that is currently responsible for reviewing and responding
- e. Initial review times for each of these documents will be 10 business days, unless otherwise agreed upon by the RCE and the Contractor. Review times may be extended if SCDOT's initial comments are not addressed. The Contractor and RCE are responsible for ensuring all parties fully understand the magnitude of potential schedule impacts of each submittal.
- f. If an approved CCR impacts contract time or price, it should be documented expeditiously as a Change Order in SiteManager.
- g. If a CR requires revision, it shall supersede all previous submittals and therefore must include all necessary attachments. A new CR form shall be submitted with the original identification number and applicable revision number (e.g. CR-001-R1).

2. Requests for Information

An RFI may be initiated by the Contractor or SCDOT. RFIs that are internal to the Design-Build Team, i.e. Contractor, should not be tracked by SCDOT.

a. RFIs submitted by the Contractor to SCDOT:

- 1) All RFIs are to be submitted by the Contractor's Project Manager to the RCE using the CR Form. The form and supporting documentation shall be placed in a designated ProjectWise folder that the Contractor, RCE, DOC's Office, and Preconstruction may access. A Bluebeam session may be initiated by SCDOT if multiple reviewers are involved.
- 2) Upon receipt, discipline experts for the Contractor, EOR, or SCDOT may discuss details independently, but any conclusions and supporting information must be documented in a formal response by the RCE utilizing the original CR Form.

b. RFIs sent by SCDOT to the Contractor:

- 1) The RCE will develop the RFI in coordination with SCDOT staff as needed using Form XXX. The RCE will provide all RFIs via a designated ProjectWise folder that the Contractor, RCE, DOC's office, and Preconstruction may access.
- 2) The Contractor will submit the response and supporting information to the RCE in this same ProjectWise folder.
- 3) The RCE will review the Contractor's response and determine whether a separate notification or request is needed.

3. Design Change Notification

- a. The Contractor shall notify the RCE of any design changes being considered on any documents or plans that have been released for construction by utilizing CR Form. Supporting the form should be all revised documents that clearly identify all proposed changes. The form and supporting documentation shall be placed in a designated ProjectWise folder that the Contractor, RCE, DOC's Office, and Preconstruction may access. A Bluebeam session may be initiated by SCDOT if multiple reviewers are involved.
- b. Once the DCN is reviewed and if all comments are resolved, the RCE will accept the DCN using CR Form and submit to the Contractor along with all necessary attachments. If any SCDOT comments cannot be resolved in accordance with the contract requirements, the DCN will be rejected, and SCDOT will provide an explanation for the rejection and comment on the favorability as a CCR.

- c. Digital and hard copies of revised plans that will become revised RFC plans shall be submitted by the Contractor following the procedures outlined in the contract and as agreed to for the original RFC plans. The Contractor shall provide revised Released for Construction (RFC) plans after SCDOT accepts the DCN.
 - d. The Contractor is to ensure that all parties affected by any design changes and/or plan revisions receive revised RFC plans, i.e. utility companies, subcontractors, sub-consultants, railroad company representatives, etc.
4. Field Change Notification
- a. The Contractor shall notify the RCE of any FCN under consideration utilizing CR Form.
 - b. The Contractor shall clearly identify all proposed changes on CR Form and attach all supporting documents and details needed for SCDOT to fully understand the proposed changes. A Bluebeam session may be initiated by SCDOT if multiple reviewers are involved.
 - c. If the FCN does not require any design changes to the RFC plans, does not violate the contract requirements, and in the opinion of the RCE, complies with SCDOT accepted practices, the RCE will accept the FCN.
 - d. If the FCN requires design changes to the RFC plans, the FCN will be rejected and SCDOT will provide an explanation for the rejection and the need to resubmit as a DCN.
 - e. If the FCN violates the contract requirements, the FCN will be rejected and SCDOT will provide an explanation for the rejection and comment on the favorability as a CCR.
 - f. If the FCN does not comply with SCDOT accepted practices, the FCN may be accepted or rejected. If rejected, SCDOT will provide an explanation for the rejection and comment on the favorability as a CCR.
 - g. The Contractor shall document all SCDOT accepted FCNs as redlines in the as-built plans.
5. Contract Change Request
- a. CCRs sent by Contractor to the SCDOT:
 - 1) The Contractor shall submit a CCR to the RCE using Form XXX with sufficient description, information, calculations, justification, and any impacts to cost and time for SCDOT to make an informed decision. The Contractor shall provide the RCE with additional supporting documents or justification upon request.
 - 2) The RCE is to review the submittal and seek input from SCDOT discipline experts as needed. A Bluebeam session may be initiated by SCDOT if multiple reviewers are involved.
 - 3) Upon concurrence with SCDOT and FHWA staff, the RCE will approve or reject any CCR using CR Form.
 - 4) If the CCR is approved, including any changes to cost and time, a SiteManager Change Order will be issued to the Contractor for review and concurrence.
 - 5) If the CCR is determined to be necessary to the project but cost and time cannot be agreed upon, SCDOT reserves the right to direct the Contractor to perform the work under Force Account Procedures in lieu of rejection. Upon completion of the changed work, a SiteManager Change Order will follow for contractor review and concurrence.
 - b. CCRs sent by SCDOT to the Contractor:
 - 1) The RCE shall submit a CCR to the Contractor using Form XXX with sufficient description and information for the Contractor to respond.
 - 2) The Contractor must respond with sufficient information, calculations, and justification for all cost and time changes.
 - 3) The RCE is to review the response and seek input from SCDOT discipline experts as needed. A Bluebeam session may be initiated by SCDOT if multiple reviewers are involved.

- 4) Upon concurrence with SCDOT and FHWA staff, the RCE will approve or reject any cost or time changes associated with the CCR using CR Form.
- 5) If the CCR is approved, including any changes to cost and time, a SiteManager Change Order will be issued to the Contractor for review and concurrence.
- 6) If the CCR is determined to be necessary to the project but cost and time cannot be agreed upon, SCDOT reserves the right to direct the Contractor to perform the work under Force Account Procedures in lieu of rejection. Upon completion of the changed work, a SiteManager Change Order will follow for contractor review and concurrence.

(8) SECTION 105: SCDOT COMPUTER USAGE POLICY

The consultant and its designated employees, as well as any subcontractors and subconsultants of any tier, having access to SCDOT electronic data, is required to follow SCDOT's Acceptable Computer Usage Policy (http://iwww.dot.state.sc.us/pdf/departamental_directives/updated/DD37.pdf) which establishes guidelines for acceptable use and confidentiality of SCDOT's information for data entry into SCDOT'S computer system; provided that the section of the Policy pertaining to SCDOT's right to inspect any users email at any time is qualified to reserves unto SCDOT the right to inspect consultant, subcontractor or subsconsultant emails that are SCDOT business related, including emails that are related to the services with which consultant is under contract.

The consultant and its designated employees, as well as any subcontractors and subconsultants of any tier, having access to SCDOT electronic data, is required to also follow SCDOT's IT Security Policy (http://iwww.dot.state.sc.us/pdf/IT_Security_Policies_09042012.pdf), which sets forth SCDOT IT Security Policy including Network Security Policy, Network Access and Authentication Policy, Physical Security Policy, Backup Policy, Incident Response Policy, Corporate Security Policies, VPN Site-to-Site Policy, Wireless Access Policy, Remote Access Policy, Confidential Data Policy, Guest Access Policy, Third Party Connection Policy, Outsourcing Policy, and Mobile Device Policy; the South Carolina Act 190 of 2008; the Financial and Identity Theft Protection Act; and the Personal Financial Security Act. Prior to access to the SCDOT network, each person designated by the consultant is required to sign an acknowledgment of the DD37 policy requirements.

The consultant's obligations with respect to the provisions of computer use and data confidentiality shall survive termination or expiration of the contract. Without limiting any rights SCDOT may have, and notwithstanding any other term of this contract, the consultant agrees that SCDOT may have no adequate remedy at law for a breach of the consultant's obligations under this clause and therefore SCDOT shall be entitled to pursue equitable remedies in the event of a breach.

Consultant is responsible for ensuring that it, as well as any subcontractors and subconsultants of any tier, having access to SCDOT electronic data, is required to manage and reduce risk by employing and using good cyber threat preventative measures. Consultant, subcontractors and subconsultants shall use the National Institute of Standards and Technology's Risk Management Framework (NIST RMF) as its cybersecurity framework or use other comparable frameworks and standards for cyber security protection. consultant shall insert a NIST RMF or equivalent framework requirement provision in all subcontract for this Project which require or allow a subconsultant or subcontractor to have access to SCDOT data. consultant shall provide SCDOT, upon request, third party certifications to verify implementation of an industry recognized cyber security framework during the Project. Other comparable cyber security frameworks include: NIST RMF; NIST CSF; ISO IES 27001/ISO 27002; SOC 2; IASME Governance; CIS Controls version 7; COBIT 5; FedRAMP; HIPAA; GDPR; FISMA; NERC CIP; HITRUST CSF.

(9) SECTION 105: CROSS SLOPE VERIFICATION:

A. DESCRIPTION

The cross slopes of the roadway are to be constructed as described in the RFP and within the tolerances listed in this specification. It is the responsibility of the Contractor to ensure that the roadway cross slopes meet the requirements of the RFP and this specification.

B. CALCULATING CROSS SLOPE

The cross slope of a travel lane in the cross section view is the ratio or percent based on the change in horizontal compared to the change in vertical. Cross slope is calculated by subtracting the difference in elevation between the two edges of the travel lane and dividing this difference by the lane width. For example, a typical 48:1 Normal Crown (NC) pavement cross slope is calculated as - 0.0208 ft/ft or -2.08% for a 12 foot lane.

C. ACCEPTABLE TOLERANCES OF CROSS SLOPES:

Tolerance Level 1 for cross slopes shall be ± 0.00174 ft/ft of the design cross slopes.

Tolerance Level 2 for cross slopes shall be ± 0.00348 ft/ft of the design cross slopes.

D. FINAL PAVEMENT CROSS SLOPE VERIFICATION:

Verify cross slopes along all interstate mainline lanes.

Calculate the pavement cross slopes after placing the final surface (prior to OGFC if specified). Verify that the correct cross slopes have been obtained. Elevation data is to be collected at the edge of each travel lane perpendicular to the roadway centerline at the following locations:

1. Even 100-foot stations in tangent sections and even 50-foot stations in curves
2. Begin and end of superelevation, flat cross slopes within superelevation transition, remove crown, begin and end of maximum superelevation, PC's, and PT's
3. Cross slopes on begin and end of bridges

Submit to the RCE a summary of the final pavement measurements. The data submitted for review shall include the following information for each travel lane:

Station	LETL Elevation	RETL Elevation	Lane Width	Calculated X-slope	Plan X- slope	Deviation	Tolerance Level
---------	-------------------	-------------------	---------------	-----------------------	------------------	-----------	--------------------

1. Station
2. Left Edge of Travel Lane Elevation (LETL) in ft
3. Right Edge of Travel Lane Elevation (RETL) in ft
4. Lane width in ft
5. Calculated cross slope in ft/ft
6. Plan cross slope in ft/ft
7. Deviation between calculated cross slope and plan cross slope
8. Tolerance Level (1, 2, or Out of tolerance)

Areas outside of **Tolerance Level 1** and **within Tolerance Level 2** will be subject to review by the RCE and the DCE. The DCE will either require corrective measures at the Contractor's expense, or will provide a memo of acceptance with a pay reduction.

Areas outside of **Tolerance Level 2** will be subject to review by the DCE and the Director of Construction. The Director of Construction will either require corrective measures at the Contractor's expense, or will provide a memo of acceptance with a pay reduction.

E. PERFORMANCE ADJUSTMENTS:

For Final Pavement Measurements within **Tolerance Level 1**, no pay adjustment will be made.

For Final Pavement Measurements outside of **Tolerance Level 1**, the DCE will either require corrective measures at the Contractor's expense, or will provide a memo of acceptance with a pay reduction of \$200/100' for each travel lane over the length of the section. The section length(s) will be determined as follows:

The beginning of each section will be halfway between the first point outside Tolerance Level 1 and the previous (adjacent) point within full compliance. The end of each section will be halfway between the last point outside Tolerance Level 1 and the adjacent point which is within full compliance. The minimum section length will be 100 feet. This amount will be deducted from monies due for pavement mixes.

For Final Pavement Measurements outside of **Tolerance Level 2**, the DOC will either require corrective measures at the Contractor's expense, or will provide a memo of acceptance with a pay reduction of \$300/100' for each travel lane over the length of the section. (This pay reduction will be in addition to the \$200 pay reduction for being outside of Tolerance Level 1.) The section length(s) will be determined as follows:

The beginning of each section will be halfway between the first point outside Tolerance Level 2 and the previous (adjacent) point within Tolerance Level 2. The end of each section will be halfway between the last point outside Tolerance Level 2 and the adjacent point which is within Tolerance Level 2. The minimum section length will be 100 feet. This amount will be deducted from monies due for HMA mixes.

F. AS-BUILT PLAN SHEETS AND ELECTRONIC DELIVERABLES

After any Performance Adjustments have been settled, provide final pavement cross sections on full size (22" x 36") plans sheets and submit to the RCE for inclusion in the as-built plans. Include the final disposition of cross slopes outside of the specified tolerances (i.e. corrected survey data, memo of acceptance from DOC, etc).

The as-built construction plans should include the following:

1. Control points, horizontal alignment, and stationing used to construct the project
2. Superelevation with horizontal curve data
3. Cross sections as defined in the Final Pavement Cross Slope Verification section
4. Corresponding electronic files on CD-ROM or DVD to include all files used to develop the survey for the project, all files used to verify the cross slopes for the project, superelevation calculations, and any MicroStation CADD files that pertain to the cross sections

(10) SECTION 105: EXTENDED JOB SITE OVERHEAD:

Delete Paragraph 1, item D of Subsection 105.16.5 of the Standard Specifications and replace it with the following:

D. Extended Job site Overhead as determined by the formula set forth below:

$$D = A \times C / B$$

Where: A = Original Contract Amount

B = Original Contract Time

C = 7%

D = Extended Jobsite Overhead rate per calendar day for compensable delays

(11) SECTION 106: SOURCE OF TELECOMMUNICATION AND VIDEO SURVEILLANCE EQUIPMENT

In accordance with 2 CFR 200.216, Contractors, in the performance of this Contract, are prohibited from procuring or obtaining telecommunication or video surveillance equipment, services, or systems produced by:

- Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

- Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).

(12) SECTION 106: SOURCE OF SUPPLY AND QUALITY OF MATERIALS:

Delete Paragraph 3 of Subsection 106.1 of the Standard Specifications and replace it with the following:

“When materials, components, or elements that are not specifically covered in the Standard Specifications, Supplemental Specifications, Supplemental Technical Specifications, or Project Special Provisions are proposed to be incorporated into the work, submit to the RCE a specification covering the proposed material, component, or element for review and acceptance prior to incorporating it into the work. Ensure that such materials, components, or elements meet the requirements of the AASHTO specifications that were effective as of the date of the Final RFP. If the materials, components, or elements are not covered in the AASHTO specifications, ensure that they meet the requirements of the ASTM specifications that were effective as of the date of the Final RFP. Submission of a specification for a material, component, or element not covered in the Standard Specifications, Supplemental Specifications, Supplemental Technical Specifications, or Project Special Provisions does not guarantee approval for use on the Project.”

(13) SECTION 106: PLANT/FABRICATOR INSPECTION:

Subsection 106.4, **Plant Inspection**, of the Standard Specifications shall be amended with the following:

Change the subsection title to **Plant/Fabricator Inspection** and add the following sentence after the first sentence:

“Provide 14 calendar days written notice to the Materials and Research Engineer prior to beginning fabrication work for Department projects.”

(14) SECTION 106: QUALIFIED PRODUCT LISTINGS:

All references to “Approval Sheet” or “Approval Policy” are to be replaced with “Qualified Products Listings (QPL)” and “Qualified Products Policies (QPP)” respectively. This change includes all references in the SCDOT Standard Drawings, SCDOT Standard Specifications, SCDOT Supplemental Specifications, SCDOT Special Provisions, SCDOT Supplemental Technical Specifications, SCDOT Internet and Intranet websites, and all other documents produced by SCDOT.

(15) SECTION 106: SOUTH CAROLINA MINING ACT:

The South Carolina Mining Act Supplemental Specification dated March 20, 2003 is hereby modified as follows:

Paragraph 9 is hereby deleted and replaced with the following:

The deputy secretary for engineering, or his duly appointed representative, will make a final inspection of the reclaimed area and keep a permanent record of his approval thereof. A map or sketch providing the location and approximate acreage of each pit used on the project will be provided to the resident construction engineer for inclusion in the final plans.

The last paragraph is hereby deleted and replaced with the following:

The contractor shall comply with the provisions of the plan that are applicable to the project as determined by the engineer. Seeding or other work necessary to comply with the plan on pits furnished by the contractor shall be at the expense of the contractor. Seeding shall be in accordance with SC-M-810 (latest version) which can be found at http://www.scdot.org/doing/road_SupTechSpec.aspx.

(16) SECTION 106: SOURCE OF PRODUCTION OF IRON AND STEEL PRODUCTS AND CONSTRUCTION MATERIALS:

Paragraph 3 of the Supplemental Specification is hereby deleted and replaced with the following:

All construction materials permanently incorporated into federal-aid projects must be produced in the United States. All manufacturing processes must occur in the United States and include at least the final manufacturing process and the immediately preceding manufacturing stage for the construction material. "Construction materials" includes an article, material, or supply that is or consists primarily of:

- non-ferrous metals;
- plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
- glass (including optic glass);
- fiber optic cable (including drop cable);
- optical fiber;
- lumber;
- drywall; or
- engineered wood.

Cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives are excluded from this requirement. There is no minimum use allowance of foreign construction materials.

(17) SECTION 107: PROJECT BULLETIN BOARDS:

In accordance with the Required Contract Provisions Federal-Aid Construction Contracts Section II, Item 3, Part d, add the following:

Single Location Projects – On projects in which work is performed at a single location (such as bridge replacement projects, two-lane to five-lane widening projects, etc.), mount the project bulletin board in a permanent location within the project limits so that it is visible and accessible at all times.

Multiple Location Projects – On projects in which work is being performed or has the capability of being performed at multiple locations (such as resurfacing projects, pavement marking projects, etc.), display a portable bulletin board with at least one of the prime contractor's work crews. If the prime contractor is not performing work, display the portable bulletin board with at least one of the subcontractor's work crews. Display the portable bulletin board in a location and a manner that is acceptable to the RCE. Notify the RCE and all subcontractors as to the location of the portable bulletin board. On resurfacing projects, mount an additional project bulletin board in a permanent location at the asphalt plant supplying asphalt mix to the project so that it is visible and accessible at all times.

(18) SECTION 107: FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED:

Attention is directed to this Federal Legislation, which has been enacted into law. The contractor will be responsible for carrying out all of the provisions of this legislation, which may affect this contract.

(19) SECTION 107: CARGO PREFERENCE ACT REQUIREMENTS:**A. Use of United States-flag vessels – General Provisions:**

"(1) Pursuant to Pub. L. 664 (43 U.S.C. 1241(b)) at least 50 percent of any equipment, materials or commodities procured, contracted for or otherwise obtained with funds granted, guaranteed, loaned, or advanced by the U.S. Government under this agreement, and which may be transported by ocean vessel, shall be transported on privately owned United States-flag commercial vessels, if available.

"(2) Within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (A)(1) of this section shall be furnished to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to

the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590."

- B. Use of United States-flag vessels - The contractor agrees:
- "(1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.
- "(2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (B)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.
- "(3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract."

(20) SECTION 107: CONTRACT PROVISION TO REQUIRE CERTIFICATION AND COMPLIANCE CONCERNING ILLEGAL ALIENS:

By submission of this bid, the bidder as the prime contractor does hereby agree:

- A. to certify its compliance with the requirements of Chapter 14 of Title 8 of the S.C. Code of Laws regarding Unauthorized Aliens and Public Employment;
- B. to provide SCDOT with any documents required to establish such compliance upon request; and
- C. to register and participate and require agreement from subcontractors and sub-subcontractors to register and participate in the federal work authorization program to verify the employment authorization of all new employees, or to employ only workers who supply the documents required pursuant to S.C. Code 8-14-20(B)(2).

(21) SECTION 107: IRAN DIVESTMENT ACT:

By submission of this bid/proposal, the bidder/proposer as the prime contractor/consultant/vendor does hereby certify his compliance to the following:

- A. CERTIFICATION: (a) The Iran Divestment Act List is a list published pursuant to Section 11-57-310 that identifies persons engaged in investment activities in Iran.. Section 11-57-310 requires the government to provide a person ninety days (90) written notice before he is included on the list. The following representation, which is required by Section 11-57-330(A), is a material inducement for the SCDOT to award a contract to you. (b) By signing your Offer, you certify that, as of the date you sign, you are not on the then-current version of the Iran Divestment Act List. (c) You must notify the SCDOT immediately if, at any time before posting of a final statement of award. You are added to the Iran Divestment Act List.
- B. ONGOING OBLIGATIONS: (a) You must notify SCDOT immediately if, at any time during the contract term, you are added to the Iran Divestment Act List. (b) Consistent with Section 11-57-330(B), you shall not contract with any person to perform a part of the Work, if, at the time you enter into the subcontract, that person is on the then-current version of the Iran Divestment Act List.
- C. OPTION TO RENEW RESTRICTION: Contractor acknowledges that, unless excused by Section 11-57-320, if the contractor is on the then-current Iran Divestment Act List as of the date of any contract renewal, the renewal will be void ab initio.

(22) SECTION 107: APPLICATION OF DAVIS-BACON AND RELATED ACTS TO INDEPENDENT TRUCK DRIVERS AND MISCELLANEOUS CONSTRUCTION ACTIVITIES:

June 13, 1990

- A. The Davis-Bacon and Related Acts apply when:

1. A Contractor or Subcontractor hires a trucking firm or fleet of trucks to haul materials from a plant, pit, or quarry, which has been established specifically to serve (or nearly so) a particular project or projects covered by Davis-Bacon and Related Acts.
2. A Contractor or Subcontractor hires a trucking firm or fleet of trucks to haul material from a non-commercial stockpile or non-commercial storage site outside the limits of the project to the project site.
3. A Contractor or Subcontractor hires a trucking firm or fleet of trucks to haul excavated materials away from a Davis-Bacon covered project.
4. A contractor or Subcontractor rents or leases equipment with an operator to perform work as called for under a Davis-Bacon construction contract.
5. A common carrier is used for the transportation of materials from an exclusive material supply facility to fulfill the specific need of a construction contract.

The fleet owner is not considered a Subcontractor with regard to the 70% subcontracting limitations and would not have to be approved as a Subcontractor. However, payrolls must be submitted by truck fleet owner covering the truck drivers, and all requirements such as predetermined wages, overtime, etc., are applicable. Legitimate owner-operators (truck owner driving his own truck) must appear on the payroll by name and notation "truck Owner Operator" with no hours, etc. shown.

B. The Davis-Bacon and Related Acts do not apply when:

1. A Contractor or Subcontractor hires a trucking firm or fleet of trucks to haul materials from a commercial plant, pit, or quarry which had previously been established for commercial use and regularly sell materials to the general public.
2. A Contractor or Subcontractor hires a trucking firm or fleet of trucks to haul materials from an established commercial plant, pit, or quarry to a stockpile outside the limits of the project.
3. Bona fide owner-operators of trucks, who are independent contractors, use their own equipment to haul materials to or from or on a Davis-Bacon covered project. (One man-One truck)

The fleet owner is not considered a Subcontractor with regard to the 70% subcontracting limitation and would not have to be approved as a Subcontractor.

(23) SECTION 107: REQUIREMENTS FOR FEDERAL AID CONTRACTS WHICH AFFECT SUBCONTRACTORS, DBE HAULERS, MATERIAL SUPPLIERS AND VENDORS:

March 1, 2010

- A. The contractor's attention is directed to the requirements of Section I.2 in Form FHWA 1273 that is included in your contract documents as the Supplemental Specification "Required Contract Provisions Federal-Aid Construction Contracts". Section I.2 requires that "the contractor shall insert in each subcontract all of the stipulations contained in the Required Contract Provisions". This requirement also applies to lower tier subcontractors or purchase orders. These provisions must be physically included in your subcontracts. A reference to the applicable specification will not suffice.
- B. The contractor's attention is directed to the requirements of the Supplemental Specification "Standard Federal Equal Employment Opportunity Construction Contract Specifications". Section 2 requires that the provisions of this specification must be physically included in each subcontract with a value of \$10,000 or greater.
- C. The contractor's attention is directed to the requirements of the Equal Employment Opportunity Performance certifications in the Proposal Form Certifications and Signatures section of the contract. Section 1 concerning Equal Employment Opportunity must be physically included in each subcontract.
- D. Prior to the issuance of formal approval, all DBE subcontracts must include a signed copy of the subcontract agreement between the Prime Contractor and the DBE Subcontractor.
- E. Prior to the issuance of formal approval, of any DBE haulers, the contractor must submit a signed copy of the hauling agreement.
- F. The contractor's attention is further directed that sections 1, 2, 3, 8, 9, and 11 of Form FHWA 1273, or Sections 1, 3, 8 and 10 of Form 1316 (for Appalachian contracts only) must be physically included in each purchase agreement with a value of \$10,000 or greater with a vendor or supplier, and in

open-end contracts where individual purchases are less than \$10,000 but where the total purchases accumulate to \$100,000 or more per year.

(24) SECTION 107: LATE DISCOVERY OF ARCHAEOLOGICAL/HISTORICAL REMAINS ON FEDERAL AID PROJECTS AND APPROVAL OF DESIGNATED BORROW PITS:

August 7, 1991

A. LATE DISCOVERY OF ARCHAEOLOGICAL/HISTORICAL REMAINS ON FEDERAL AID PROJECTS

1. Responsibilities:

The Contractor and subcontractors must notify their workers to watch for the presence of any prehistoric or historic remains, including but not limited to arrowheads, pottery, ceramics, flakes, bones, graves, gravestones, or brick concentrations. If any such cultural remains are encountered, the Resident Construction Engineer shall be immediately notified and all work in the vicinity of the discovered materials or site shall cease until the Department's Staff Archaeologist or the State Highway Engineer directs otherwise.

2. Applicability:

This provision covers all areas of ground disturbance resulting from this federal - aid contract, including but not limited to road construction, Department designated borrow pits, Contractor furnished borrow pits, and/or staging areas.

3. Cost Reimbursement and Time Delays:

Any extra work required by A(1) above within the project right of way or on Department designated borrow pits (see below) will be paid for in accordance with Subsection 104.05 of the Standard Specifications. Extra contract time may be provided under Subsection 108.06 of the Standard Specifications for archaeological work within the project right of way or on designated borrow pits.

NOTE: On Contractor furnished borrow pits the contractor is not entitled to any additional time or money for delay on impact resulting from A(1) above or for extra work required by A(1) above. Therefore, contractors may wish to retain professional archaeological services to better ensure that borrow pit areas are cleared of archaeological/historical remains prior to use on Federal aid projects.

B. APPROVAL OF DESIGNATED BORROW PITS ON FEDERAL AID PROJECTS (PLANT SITES WHICH QUALIFY AS COMMERCIAL ARE NOT INCLUDED)

In instances where the Department specifically designates the location of borrow pits on project plans or in contract specifications for use on a Federal aid project, an archaeological survey will be performed by Department archaeologists prior to award of contract.

This provision also applies to designated disposal sites, staging areas, haul roads, and job site field offices.

(25) SECTION 107: SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES TRAINING SPECIAL PROVISIONS:

August 20, 1975

Revised April 1, 2004

This Training Special Provision supersedes Subparagraph 7b of the Special Provision entitled "Specific Equal Employment Opportunity Responsibilities", (Attachment 1), 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 TRAINEES TO BE TRAINED UNDER THE SPECIAL PROVISION WILL BE.

Road – 15 (at 520 hours each).

Bridge – 0 (at 0 hours each).

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, provided however, that 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 commencing construction, the Contractor shall submit to the State Highway Agency 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.

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 State Highway Agency and the Federal Highway Administration. The State Highway Agency 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, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training 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 crafts rather than clerk-typists or secretarial-type positions. Training is permissible 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 division office. Some off-site 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 cost for the training will be included in the contract price. There will be no reimbursement given by SCDOT for the hours of training that are provided on this project. However, a “Statement of Completed Training” will be required at the end of the project. The fact that the cost of the training must be included in the contract does not prohibit the contractor from receiving training program funds from other sources, if he so desires. Training hours may be counted if training is done off-site where the contractor 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 off-site training period.

The training requirement will not be considered completed by 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 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. 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 Departments 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.

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, as required under the SCDOT approved training program.

Meeting the On-the-job Training Requirements or Making Good Faith Efforts to Meet the On-the-job Training Requirements. It is the Contractor’s responsibility to meet the On-the-job Training Requirements stated in this section. Failure to meet the requirement or demonstrate good faith efforts, as determined by SCDOT, to meet the requirement may result in any one or more of the following sanctions:

- A. Withholding monthly progress payments;
- B. Declaring the Contractor in default pursuant to Section 108.10 of the Standard Specifications and terminating the contract;
- C. Disqualifying the Contractor from bidding pursuant to Regulation 63-306, Volume 25A, of the S. C. Code of Laws; and/or
- D. Requiring the Contractor to obtain On-the-job Training participation on future contracts to the extent the Contractor failed to meet or use good faith efforts to meet the On-the-job training contract requirement.

(26) SECTION 107: DISADVANTAGED BUSINESS ENTERPRISE (DBE)

It is the policy of the South Carolina Department of Transportation (SCDOT) to ensure non-discrimination in the award and administration of federally assisted contracts and to use Disadvantaged Business Enterprises (DBEs) (all references to “DBE” herein shall mean “South Carolina certified DBE”) in all types of contracting and procurement activities according to State and Federal laws. To that end the SCDOT has established a DBE program in accordance with regulations of the United States Department of Transportation (USDOT) found in 49 CFR Part 26.

This document, known as the “DBE Supplemental Specifications” includes three main parts:

- Part A. Instructions to Bidders – Pre-award Requirements
- Part B. Instructions to Contractors – Post Award
 - 1) Bid-Build/LPA Process
 - 2) Alternate Delivery Process

PART A. INSTRUCTIONS TO BIDDERS – PRE- AWARD REQUIREMENTS

When incorporated into Alternative Delivery and/or Local Public Agency procurements, the terms “bid,” “bidder” and “bid letting” shall mean “proposal,” “proposer” and “proposal opening.” The title Director of Construction shall mean Director of Alternative Delivery.

1. DBE CONTRACT GOAL

- a. The DBE participation goal for this contract is set forth in the DBE Special Provisions.
- b. The successful bidder shall exercise all necessary and reasonable steps to ensure that DBE firms perform services or provide materials on this contract in an amount that meets or exceeds the DBE contract goal and commitment. Submitting the bid, including electronically, shall constitute an agreement by the bidder that it will meet or exceed the DBE contract goal and commitment or make good faith efforts to show that it could not meet the goal or commitment, if awarded the contract. Failure to meet the contract goal or make good faith efforts to meet the contract goal, will result in the bid being considered irregular and rejected, subject to section 3.E., resulting in the contract being awarded to the next lowest responsible and responsive bidder.
- c. When a surety company assumes control over a project (including hiring another prime Contractor), in whole or in part, the provisions within this DBE Supplemental Specification applies.

2. DBE COMMITTAL

- a. Each bidder shall enter all required information regarding how it intends to meet the DBE goal in the electronic bid folder found on the electronic bidding service website, Bid Express, entitled “DBE List.” See paragraph D (below) for non-electronic bid submissions. The listing of DBE(s) shall constitute a commitment by the bidder to utilize the listed DBE(s), subject to the replacement requirement set forth below in Section 2 of Part B. A DBE listed on the DBE List or DBE Committal Sheet hereinafter shall be referred to as a “committed DBE.”
- b. In meeting the DBE contract goal, the bidder shall use only certified DBEs listed in the most recent “South Carolina Unified Certification Program DBE Directory” (hereinafter referred to as the “Unified DBE Directory”) accessible online at <http://dbw.scdot.org/dbesearch/DirectoryQuery.aspx> and available on the day of bid submission. Only DBE firms listed in the DBE directory at the time of bid submission, may be used to meet the project DBE goal. The DBE.BIN file used for the electronic bidding contains the names of the certified DBEs listed in the “Unified DBE Directory.” For more information on the use of the DBE.BIN file in electronic bidding, see Section 6 below.
- c. The failure by a bidder to provide all information required in the electronic bid or DBE Committal Sheet will make the bid irregular and it will be rejected. SCDOT will then award the contract to the next lowest responsible and responsive bidder. SCDOT may, within its sole discretion, allow a bidder to correct minor deficiencies and errors (mis-spellings, transposed numbers, etc.) as set forth in section 3A below.
- d. The DBE.BIN file listed must be downloaded for each particular letting because the “Unified DBE Directory” is frequently updated to add and remove companies. ALL DBE data such as Name, Company ID, and Address must be selected from drop-down lists provided by the DBE. BIN file. If the DBE.BIN file is not downloaded, no data for the drop-down lists will be

available. For non-electronic bidding in Alternative Delivery or Local Public Agency procurements, use the attached DBE Committal Sheet, in lieu of the DBE.BIN file.

The following information must be selected or entered in the electronic bid:

- (1) The names and addresses of certified DBEs whose services or materials will be used in the contract.
- (2) Work Type and Work Code selected from a drop-down list. When one of these is selected, the other will automatically be filled in. [Note: Only select the Work Type and Work Code for which the selected DBE firm has been certified to perform].
- (3) An Item of work, approximate Quantity of work to be performed or materials to be supplied, Unit (of measurement), Unit Price, and the extended dollar amount of participation by each DBE listed.
 - (a) Item: The Item is the bid item with which the DBE will be associated and must be selected from the Schedule of Bid Items found in the drop-down list. If the proposed work is for only a portion of an Item of work (i.e., hauling of materials, tying of reinforced steel, etc.) an adequate description of this work shall be included in the note block.
 - (b) Quantity, Unit, & Unit Price: Initially when an Item is selected, the contract quantity, unit, and the bidder's unit price and extension will appear. If the proposed work is for only a portion of an item as described in (1) above, then the Quantity, Unit Price and /or Extension shall be changed to reflect the actual amount of work committed to the DBE. The Unit (of measurement) cannot be changed.
- (4) The bidder must also submit a copy of a signed statement or quote from each of the DBEs listed in the DBE List folder of the electronic bid or DBE committal sheet. The signed statements or quotes should verify the items, quantities, units, unit prices, and dollar values listed in the DBE List folder of the electronic bid or DBE committal sheet. COPIES OF THE SIGNED STATEMENTS MUST BE SUBMITTED TO SCDOT CONTRACT ADMINISTRATION OFFICE WITHIN FOUR (4) BUSINESS DAYS OF THE BID LETTING, from the apparent low bidder. Should the apparent low bid be rejected for failing to meet the goal, the next apparent low bidder will have three (3) business days from notification, to submit the signed quotes. SCDOT will accept facsimiles of the verified statements with the caveat that the bidder must furnish the original document to SCDOT upon request. Signed quotes must be on the DBEs' letterhead and contain the following information: date, printed name, address, and phone number of the authorized individual providing the quote, project name and identification number; quote needs to be addressed to Contractor from DBE, and identify specific services being performed and/or material being supplied.
- (5) Watering and repair of silt fence will not be allowed as part of a commitment, but must be reported if performed by a DBE.

3. GOOD FAITH EFFORTS REQUIREMENTS

- a. Requirements for Submission for Approval of a Good Faith Effort. A bidder that cannot meet the DBE contract goal through DBE committals submitted with the bid, must request in writing (faxes and emails are acceptable) a good faith effort review by SCDOT, no later than 5:00 pm of the next business day following the letting. Bidder must submit evidence to support its claim of conducting a good faith effort to meet the contract DBE goal. THIS SUPPORTING DOCUMENTATION MUST BE FURNISHED TO SCDOT CONTRACT ADMINISTRATION OFFICE (LOCAL CONTRACT ADMINISTRATOR FOR LPAs) IN WRITING WITHIN THREE (3) BUSINESS DAYS OF THE BID LETTING. One complete set of this information must be received by Contract Administration no later than 12:00 noon of the third business day following the bid letting. It will be acceptable to submit a single sample representative letter

along with the list of the firms being solicited instead of submitting repetitious solicitation letters. The documented efforts listed in item (C.) below are some of the items SCDOT will consider in evaluating the bidder's good faith efforts. The documentation may include written subcontractor quotations, telephone log notations of verbal quotations, or other types of quotation documents.

- b. Failure to Submit Required Material. If the bidder fails to provide this information by the deadline, the bid is considered irregular and can be rejected,
- c. Evaluation of a Good Faith Effort. SCDOT may consider the following factors in judging whether or not the bidder made adequate and acceptable good faith efforts, to meet the DBE contract goal:
 - 1) Did the bidder contact SCDOT for assistance in meeting the goal?
 - 2) Did the bidder attend any pre-bid meetings that were scheduled by SCDOT or Local Public Agency to inform DBEs of subcontracting opportunities?
 - 3) Did the bidder provide solicitations through all reasonable and available means (e.g., post a request for quotes from DBE subcontractors on SCDOT Construction Extranet webpage; attend at pre-bid meetings, advertise and/or written notices at least 10 days prior to the letting; or show the bidder provided written notice to all DBEs listed in the "Unified DBE Directory" that specialize in the areas of work in which the bidder will be subcontracting)? Solely emailing DBEs without a response is not considered a Good Faith Effort.
 - 4) Did the bidder follow-up initial solicitations of interest by contacting DBEs, to determine with certainty whether they were interested or not? If a reasonable amount of DBEs in the area of work do not provide an intent to quote, did the bidder contact the Division of Minority & Small Business Affairs for assistance?
 - 5) Did the bidder select portions of the work to be performed by DBEs, in order to increase the likelihood of meeting the contract goal? This includes, where appropriate, breaking out contract items of work into economically feasible units to facilitate DBE participation, even when the bidder might otherwise perform these items of work with its own personnel.
 - 6) Did the bidder provide interested DBEs with adequate and timely information about the plans, specifications, and requirements of the contract?
 - 7) Did the bidder negotiate in good faith with interested DBEs, or reject them as unqualified without sound reasons based on a thorough investigation of their capabilities? Any rejection should be noted in writing with a description as to why an agreement could not be reached. The fact that the bidder has the ability or desire to perform the work with its own personnel will not be considered as sound reason for rejecting a DBEs quote.
 - 8) Was a quote received from an interested DBE, but rejected as unacceptable because it was not the lowest quote received? The fact that the DBE firm's quotation is not the lowest quotation received will not in and of itself be considered a sound reason for rejecting the quotation as unacceptable, as long as the quote is not unreasonable.
 - 9) Did the bidder specifically negotiate with non-DBE subcontractors/partners to assist with meeting the overall DBE project goal?
 - 10) Did other bidders meet the overall project DBE goal?
 - 11) Any other evidence that the bidder submits which demonstrates that the bidder has made reasonable good faith efforts, to include DBE participation.
- d. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy DBE contract goals. Commitments to suppliers/dealers count at 60% of the quote. If the bidder miscalculates using 100% of the supplier's quote, the bidder may make the appropriate adjustment to reflect 60%. However, the bid will be rejected if the adjustment drops the commitments below the DBE goal.
- e. If the required documents submitted are complete but contains minor errors, SCDOT may, within its sole discretion, give the bidder an opportunity to cure any minor deficiencies resulting from an informality or irregularity in the DBE commitment or waive any such

deficiency when it is in the best interest of the State. A minor informality or irregularity is one which is merely a matter of form, scrivener's error or is some immaterial variation from the exact requirements of the invitation for bids having no effect or merely a trivial or negligible effect on DBE contract goal, quality, quantity, or delivery of the supplies or performance of the contract, and the correct or waiver of which would not be prejudicial to bidders.

4. GFE DETERMINATION AND RECONSIDERATION PROCEDURES

- a. After the letting, SCDOT will determine whether the low bidder has met the DBE participation contract goal or made good faith efforts to attempt to meet the goal. SCDOT will notify the apparent low bidder of its determination by email and also by either US Mail or hand-delivery, if SCDOT determines the apparent low bidder failed to meet the goal, did not demonstrate a good faith effort to meet the goal, or meet the requirements of a commercially useful function. The apparent low bidder may request a reconsideration of this determination.
- b. The bidder must make a request for reconsideration in writing within three (3) business days of receipt of the determination via email. The bidder must provide written documentation to SCDOT's Director of Construction, supporting its position within six (6) business days of receipt of SCDOT's adverse determination. Only documentation dated before three (3) business days of the bid letting may be used in support of its position that it could not meet the goal. No DBE good faith efforts performed after the bid opening will be allowed as evidence. The determination shall be final, if the bidder fails to request a reconsideration within three (3) business days.
- c. To reconsider the bidder's DBE commitment or good faith efforts, the Deputy Secretary for Engineering will designate a panel of three (3) SCDOT employees, who did not take part in the original determination, comprised of: (1) one employee from the District Construction Engineer's (DCE) Office, (2) one employee from the MSBA, and (3) one employee at large (hereinafter referred to as the "Reconsideration Panel"). The DCE Office representative will be appointed chairman of the Reconsideration Panel. A representative from FHWA may be a non-voting member of the Reconsideration Panel. The Reconsideration Panel will contact the bidder and schedule a meeting. The Reconsideration Panel will make reasonable efforts to accommodate the bidder's schedule; however, if the bidder is unavailable or not prepared for a hearing within ten (10) business days of receipt of SCDOT's original written determination, the bidder's reconsideration rights will be considered to have been waived.
- d. The meeting will be held at SCDOT Headquarters Building, 955 Park Street, Columbia, South Carolina or via video-conferencing software such as Webex, Zoom or Microsoft Teams, as may be determined by SCDOT. The bidder will be allowed up to two (2) hours to present written or oral evidence supporting its position. The bidder's presentation shall be made by an employee of bidder. Legal counsel may be present for the reconsideration, but may not actively participate. Bidder shall provide the panel with at least one business day's notice of its intent to bring legal counsel.
- e. The Reconsideration Panel will issue a written report and recommendation to the Deputy Secretary for Engineering or his designee. The Deputy Secretary for Engineering or his designee will review all information supporting the recommendation. SCDOT shall not award the contract until the Deputy Secretary for Engineering issues a decision or the bidder waives its reconsideration right, either through failure to request reconsideration or failure to be available for the meeting. The Deputy Secretary for Engineering will notify the bidder of the final decision in writing and send the final decision to the DOC to either notify the bidder of award barring any other issues, or notifying the next lowest responsible and responsive bidder.

5. CONSEQUENCES OF FAILURE TO COMPLY WITH DBE PROVISIONS

- a. Failure on the part of the bidder to meet the DBE contract goal or to demonstrate good faith efforts to meet the DBE contract goal, will result in the bid being declared irregular and may be rejected. Upon rejection, the award may be made to the next lowest responsible and responsive bidder.
 - b. After bid letting, but prior to award, SCDOT reserves the right to cancel the project, or any or all bids or proposals may be rejected in whole or part, when it is in the best interest of the State.
6. DIRECTORY OF SOUTH CAROLINA CERTIFIED DISADVANTAGED BUSINESS ENTERPRISES

- a. The electronic DBE.BIN file found on the electronic bidding service website, Bid Express, contains data from the "Unified DBE Directory" approved for use in each particular letting. The file must be downloaded for each letting because the directory is routinely updated. The bidder is advised that this directory pertains only to DBE certification and not to qualifications. It is the bidder's responsibility to determine the actual capabilities and/or limitations of the certified DBE firms. For non-electronic bid submissions, the directory can be found at: <https://www.scdot.org/business/bus-development-dbe-sbe-cert.aspx>.
- b. In meeting the DBE participation contract goal, the bidder shall use only DBEs that are included in the "Unified DBE Directory" contained in the DBE.BIN file, or on-line, current for the month the bid is submitted. The bidder may only count toward the DBE goal work in the areas for which the DBE has been certified, unless prior written approval from SCDOT is obtained. The bidder and the DBE must jointly apply to SCDOT's Director of Construction for approval of work, in an area of work other than that, in which the DBE has been certified. The requested work must be in an area related to the area of work in which the DBE has been certified. Such requests must be submitted in writing to the Director of Construction no later than ten (10) business days prior to the date of the letting. The Director of Construction has the right to approve or disapprove the request. The Director of Construction will give the bidder and the DBE written notice of his/her decision, no later than five (5) business days prior to the date on which bids are received. If approved, a copy of the written approval must accompany the submission of the subcontractor's quote.
- c. Certification of a DBE for work in a certain area of work or approval to perform work in a related area shall not constitute a guarantee that the DBE will successfully perform the work or that the work will be performed completely. Such certification or approval shall only imply that the successful completion of the work by the DBE, can count toward satisfying the DBE contract goal in accordance with the counting rules set forth in 49 CFR Part 26 (see Section 3 of Part B below.)
- d. The bidder may print a copy of the "Unified DBE Directory" from SCDOT web page (6 A. above.)

7. ADDITIONAL DBE PARTICIPATION

The bidder is strongly encouraged to exceed the DBE Goal and obtain the maximum amount of DBE participation feasible on the contract. Any DBE participation in excess of the DBE contract goal shall also be included in the DBE Quarterly Reports.

8. CONTRACTOR'S RESPONSIBILITY TO REPORT BIDDER INFORMATION

The bidder should keep a list of all subcontractors (DBE or non-DBE) who bid or quoted for subcontracts on this project. As a condition to prequalification or renewal of prequalification, Contractors must submit the names and addresses of all firms (DBE and non-DBE), who quoted the Contractor for subcontracts on SCDOT projects throughout the course of the previous year.

9. BOND SURETY

When a bond surety assumes responsibility of a project in whole, or in part, the provisions of this DBE Supplemental Specifications applies to the bond surety and any Contractor used to complete this project.

PART B (1) INSTRUCTIONS TO CONTRACTORS –POST-AWARD REQUIREMENTS**– Bid-Build/LPA**

1. CONTRACTOR'S OBLIGATIONS

- a. 49 CFR 26. The Contractor shall carry out the applicable requirements of 49 CFR Part 26 and these DBE Supplemental Specifications in the award and administration of this contract. The requirements of 49 CFR Part 26 and these DBE Supplemental Specifications are an essential part of this contract. The failure by the Contractor to carry out these requirements or any provision of the DBE regulations and specifications is a material breach of the contract, and may result in the termination of the contract or such other remedy, as SCDOT in its sole discretion, deems appropriate.
- b. Meeting both the Goal and Commitment or Making Good Faith Efforts to Meet the Goal and Commitment. It is the Contractor's responsibility to meet or make good faith efforts to meet the DBE contract goal and commitments. Compliance with the DBE contract goals and commitments shall be assessed by SCDOT on a monthly basis. Failure to meet the goal or commitments to the specific DBEs listed on the committal sheet or to demonstrate good faith efforts to meet the goal or commitments, may result in any one or more of the following sanctions:
 - 1) Withholding monthly progress payments until Contractor complies with the DBE contract goals and commitments;
 - 2) Imposition of liquidated damages;
 - 3) Declaring the Contractor in default pursuant to Section 108.10 of the Standard Specifications and terminating the contract;
 - 4) Assessing sanctions in the amount of the difference in the DBE contract committal and the actual payments made to each certified DBE;
 - 5) Disqualifying the Contractor from bidding pursuant to Regulation 63-306, Volume 25A, of the S. C. Code of Laws.

Sanctions may be imposed at any time. When a Contractor replaces a committed DBE or self performs worked committed to a DBE firm without DOC approval, sanctions are to be imposed at the time of the violation and cannot be made up unless the affected DBE is provided additional work equal to the commitment. When approved by the DOC, the Contractor may make-up of the loss of the DBE commitment, at any time during the life of the project. The District Construction Engineer will decide when to impose sanctions.

- c. Using the DBEs shown on the Committal Sheet to Perform the Work. The Contractor must utilize the specific DBE firm(s) listed on the "DBE Committal Sheet" to perform the work and supply the materials for which each is listed. However, the Contractor may seek approval from the Director of Construction to perform the work with other personnel or obtain the materials from other sources, as set forth in Section 3 below. The Contractor shall not be entitled to any payment for such work or material, unless it is performed or supplied by the listed DBE or, with prior written approval of the Director of Construction, by other personnel (including those of the Contractor). Failure to meet a commitment to a specific DBE may result in sanctions listed in Section 1(B) above, unless prior written approval is obtained for replacement of the committed DBE from the Director of Construction or his/her designee.

When SCDOT makes changes that result in the reduction or elimination of work to be performed by a committed DBE, the Contractor will not be required to seek additional participation. When SCDOT makes changes that result in additional work to be performed by a DBE based upon the Contractor's commitment, the DBE shall participate in additional work, to the same extent as the DBE participated in the original work.

Once a DBE firm is committed, the Contractor shall ensure committed DBE firms are utilized to the fullest extent possible. If it appears the committed DBE(s) will fall short of the commitment, the Contractor must provide every opportunity for the committed DBE(s), to perform in meeting the original commitment made to the DBE firm. Additional work added to the project, e.g., hauling additional materials, building additional structures, etc., that is outside the original committal and within the DBE

firms' approved area of work will be considered. Failure to do so may affect a determination of good faith efforts.

- d. Incorporating DBE Supplemental Provisions in Subcontracts. The Contractor shall make available, at the request of SCDOT, a copy of all DBE subcontracts. The Contractor shall ensure that all subcontracts or agreements with DBEs to supply labor or materials, require that the subcontract and all lower tier subcontracts be performed in accordance with these DBE Supplemental Specifications.

The Contractor is required to insert the following provision in each subcontract or agreement with a DBE goal:

- 1) This contract or agreement shall be performed in accordance with the requirements of the most recently adopted SCDOT DBE Supplemental Specifications, in effect on the date of contract solicitation.
- 2) This contract and all subcontracts shall be performed in accordance with the requirements of the most recently adopted SCDOT Prompt Payment Clause Supplemental Specifications, in effect on the date of contract solicitation.
- 3) No Contractor (prime, sub, or sub-subcontractor) may withhold or delay payment to any party unless there is good cause and only with prior written approval by SCDOT. The request to withhold or delay payment must be submitted to SCDOT in writing.
- 4) Defines "satisfactorily completed" as when all the tasks called for in the subcontract have been accomplished and documented as required by the recipient. When a recipient has made an incremental acceptance of a portion of a prime contract, the work of a subcontractor covered by that acceptance is deemed to be satisfactorily completed.
- 5) A Party may not intimidate, threaten, coerce, or discriminate against any individual or firm for the purpose of interfering with any right or privilege secured by 49 CFR Part 26 and these DBE Supplemental Specifications or because the individual or firm has made a complaint, testified, assisted, or participated in any manner in an investigation, proceeding, or hearing under this part. Failure to adhere to this prohibition will result in the Contractor being considered noncompliant with this part.

- e. Contractor shall invite all subcontractors (both DBE and Non-DBE) to attend progress meetings at least two weeks prior to the anticipated start of the subcontractors' work.

2. Preconstruction/Partnering Conferences

Contractor is required to invite representatives of all subcontractors to the initial preconstruction/partnering meetings used to "kick-off" construction activities in accordance with SCDOT's 2007 Standard Specifications for Highway Construction, Section 108.2 - Preconstruction Conference.

3. REPLACEMENT / AUGMENT / SUPPLEMENT OF COMMITTED DBEs

- a. Requirement for Replacing/Augmenting/Supplementing (Referred as Replace). The following shall apply to replacement of a DBE firm listed on the "DBE Committal Sheet" regardless of circumstance or reason:

- 1) When a DBE listed on the DBE committal sheet (hereafter referred to as a "committed DBE") fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards, the Contractor shall follow the replacement procedures in Section B below. Failure on the part of the Contractor to comply with this requirement shall constitute a breach of contract and may be cause for the imposition of the sanctions set forth in Section 1(B) above.

- 2) When a committed or non-committed DBE is decertified or removed from the SC Unified DBE Directory after signing a valid subcontract agreement with the Contractor:
 - a) The Contractor may continue to utilize the decertified DBE on the contract and receive credit toward the DBE contract goal for the DBE's work unless the Contractor is implicated in the DBE decertification. However, the Contractor is encouraged to replace the decertified DBE with a certified DBE pursuant (following replacement procedures in Section B below) where feasible, to assist SCDOT in meeting the overall statewide DBE goal.
 - b) If a committed or non-committed DBE is removed from the SC Unified DBE Directory due to graduation from the DBE program, the Contractor may continue to utilize the graduated DBE on the contract and receive credit toward the DBE contract goal for the DBE's work. If Contractor elects to replace a DBE graduate, then the Contractor shall follow replacement procedure in Section B below.
- 3) When a committed DBE is decertified or removed from the SC Unified DBE Directory prior to execution of a valid subcontract agreement with the Contractor, the Contractor shall follow the replacement procedures in Section B below. Failure on the part of the Contractor to comply with this requirement shall constitute a breach of contract and may be cause for the imposition of sanctions set forth in Section B1 (B) above.
 - b. Replacement Procedures. In order to replace/augment/supplement a committed DBE regardless of circumstance or cause, the Contractor must coordinate with MSBA as part of the GFE process and obtain prior written approval from the Director of Construction only. Prior to requesting SCDOT's approval to terminate and/or substitute a committed DBE, the Contractor is to give five (5) business days' notice to the DBE subcontractor in writing (certified mail) with a copy provided to both the Director of Construction and MSBA.

The purpose of this notice is to both inform the DBE subcontractor of the Contractor's intent to request SCDOT's approval to terminate and/or substitute/supplement the committed DBE, as well as to outline the reasons for the request. The DBE subcontractor shall be given five business days from receipt of notice to provide a written response stating either its consent or its reasons why it objects to the proposed termination. On a case by case basis and at SCDOT's sole discretion, a shorter response period than five (5) business days may be allowed as a matter of public necessity. If SCDOT determines a shorter response period is justified, the Contractor and committed DBE will be advised in writing via email.

In no case shall the Contractor's ability to negotiate a more advantageous contract with another subcontractor be considered a valid basis for replacement. If the Contractor obtains the Director of Construction's written approval for the replacement, the Contractor shall replace/supplement the committed DBE with another certified DBE firm or make good faith efforts to do so as set forth in Section 3(A) above. Any DBE who is certified at the time of replacement, may be used as a replacement.

If the Director of Construction does not approve the replacement/supplement, the Contractor shall continue to use the currently committed DBE in accordance with the contract unless continued performance is rendered impossible or illegal. The determination of whether the currently committed DBE is available shall be made by the Director of Construction or his/her designee in consultation with MSBA. Failure to do so may constitute cause for imposition of any of the sanctions set forth in Section 1(B) above.

The Contractor may use DBE firms already subcontracted on the project with increased work, that exceeds the amount of work already subcontracted to that DBE.

A committal sheet(s) with the DBE firm's signed quote with a change order must be submitted for the DBE firm identified to replace/augment/supplement a committed DBE.

Approval of a Subcontractor's Request does not constitute or imply DOC's approval to replace/augment/supplement a committed DBE firm. The Subcontractor's Request for committed DBE firms must meet or exceed the amount committed.

- c. Good Faith Efforts Post Award, The Contractor shall provide the Director of Construction with documentation of its good faith efforts to find a replacement. This documentation shall include, but is not limited to the following:
- 1) Copies of written notification to certified DBEs, that their interest is solicited in subcontracting the work defaulted by the previous certified DBE, or in subcontracting other items of work in the contract. A single representative copy of the written notification with a list of DBEs contacted is sufficient to satisfy this requirement.
 - 2) Statement of efforts to negotiate with certified DBEs for specific sub-bids including, at a minimum:
 - a) Names, addresses and telephone numbers of certified DBEs who were contacted;
 - b) Description of the information provided to certified DBEs regarding the plans and specifications for portions of the work to be performed;
 - c) Statement of why additional agreements with certified DBEs were not reached.
 - 3) For each certified DBE contacted, but rejected, the Contractor must state in writing why it rejected each of them.
 - 4) Written confirmation the Contractor contacted SCDOT's Division of Minority & Small Business Affairs for assistance in locating certified DBEs, willing to take over that portion of work or perform other work on the contract.
 - 5) Failure to find a replacement DBE at the original cost, is not in itself evidence of good faith efforts.

The remaining portion of the DBE's work shown on the "DBE Committal Sheet" can be completed by the Contractor's personnel or by a non-DBE subcontractor approved by SCDOT, after SCDOT determines the Contractor demonstrated a good faith effort to replace the committed DBE, with another DBE.

The Contractor will not be required to make up that part of the DBE goal attributable to the portion of work not completed by the committed DBE, and this shortfall in meeting the DBE goal will be waived by SCDOT.

SCDOT may impose sanctions as set forth in Section 1.B (1) above, if the Contractor has not made good faith efforts to replace the committed DBE.

d. Payment from SCDOT.

The Contractor shall not be entitled to payment for work or material committed to a committed DBE unless:

- 1) The work is performed by the committed DBE; or
- 2) The work is performed by another certified DBE after the Director of Construction has given approval to replace the committed DBE as provided above; or
- 3) The work is performed by a non-DBE after SCDOT determines that the Contractor has demonstrated good faith efforts to replace the committed DBE as provided above.

4. COUNTING CERTIFIED DBE PARTICIPATION TOWARD MEETING THE DBE GOAL

DBE participation shall be measured by the actual, verified payments made to DBEs subject to the following rules. The Contractor is bound by these rules in regard to receiving and reporting credit toward the DBE contract goal. The Contractor shall report on DBE Quarterly Reports only the amounts properly attributable toward the goal under these rules.

a. General Counting Rules.

- 1) The entire amount of that portion of a construction contract (or other contract not covered by paragraph A (2) of this section) that is performed by the DBEs own personnel, may be counted toward the goal. The cost of supplies and materials obtained by the DBE for the work of the contract, including supplies purchased or equipment leased by the DBE (except supplies and equipment the DBE subcontractor purchases or leases from the prime Contractor or its affiliate), can be counted toward the goal.
 - 2) The work of a DBE subcontracted to another certified DBE firm may be counted toward the DBE goal. Any work that a DBE subcontracts to a non-DBE firm does not count toward the DBE goal/commitment.
 - 3) The Contractor is allowed to count expenditures to a DBE only, if the DBE is certified as a DBE by SCDOT, except as provided in section 3(A) (2) above, in the event a DBE loses eligibility status, after a subcontract is signed.
 - 4) The Contractor can count expenditures to a DBE, only after the DBE has actually been paid.
- b. Joint Ventures. When a DBE performs as a participant in a joint venture, the portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work of the contract that the DBE performs with its own personnel, can be counted toward DBE goals. A joint venture must be coordinated with the MSBA and approved by the Director of Construction prior to start of the contract.
- c. Commercially Useful Function (CUF). A DBE Contractor must perform a commercially useful function to be counted toward the DBE goal/commitment on that contract:
- 1) A DBE performs a commercially useful function when it is responsible for 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 for negotiating materials/supplies price, determining materials/supplies quality and quantity, ordering the material, and installing materials/supplies (where applicable) and paying for the material/supplies itself. SCDOT will evaluate the amount of work subcontracted, industry practices, whether or not the amount the firm is to be paid under the contract is commensurate with the work it is actually performing and the DBE credit claimed for its performance of the work, and other relevant factors to determine whether a DBE is performing a commercially useful function.
 - 2) A DBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation.
 - 3) SCDOT will presume that the DBE is not performing a commercially useful function if a DBE does not perform or exercise responsibility for at least 30 percent of the total cost of its contract with its own work force, or the DBE subcontracts a greater portion of the work of a contract than would be expected on the basis of normal industry practice for the type of work involved.
 - 4) A DBE may present evidence to rebut the presumption it is not performing a commercially useful function as provided in paragraph (3) of this section. SCDOT may determine that the firm is performing a commercially useful function, given the type of work involved and normal industry practices.
 - 5) SCDOT's decisions on commercially useful function matters are subject to review by the Federal Highway Administration, but are not administratively appealable to the USDOT.
- d. Special Rules for Trucking Companies. SCDOT will use the following rules to determine whether a DBE trucking company is performing a commercially useful function and what portion of the DBE work can be counted toward DBE goals:

- 1) DBE must control all work. The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, to be considered as performing a commercially useful function. There cannot be a contrived arrangement for the purpose of meeting DBE goals.
- 2) DBE must “own” at least one truck. The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the project. A DBE will be considered to “own” a truck for purposes of this section if:
 - a) The truck is titled in the DBEs name; or,
 - b) The DBE leases the truck under a valid lease-to-own agreement and the driver of the truck is an employee of the DBE.

The DBE must submit documentation to SCDOT to establish the number of trucks the DBE owns, operates and insures. The DBE must submit the documentation to SCDOT’s MSBA at the time of certification, annual reporting on certification requirements, or at any time during the year that the DBE obtains additional trucks.

- 3) Counting DBE trucking toward DBE goal. The Contractor can count toward DBE goals, the total value of the transportation services the DBE provides using trucks the DBE owns, insures, and operates using drivers the DBE employs.
- 4) Counting leased DBE trucking toward DBE goal. The DBE may lease with another DBE firm, including an owner-operator who is certified as a DBE, to provide trucks on a project. In this case, the Contractor may count toward the DBE goal the total value of the transportation services provided by the DBE subcontractor.
- 5) Counting leased non-DBE trucking toward the goal. The DBE may lease trucks from a non-DBE firm, including an owner-operator, to provide trucks on a project. Prior to beginning work, the DBE must provide SCDOT’s Resident Construction Engineer with a list identifying all DBE and non-DBE trucks and truck numbers that will be used on the project. In this case, the Contractor may count toward the DBE goal the total value of the transportation services provided in each quarter by the non-DBE trucks, not to exceed the value of the transportation services provided by DBE-owned trucks in that quarter. For example, in a given quarter, if DBE-owned trucks provide transportation services of \$50,000, while non-DBE trucks provide transportation services of \$75,000, a maximum of \$100,000 can be counted toward the DBE goal in that quarter.

For purposes of this paragraph (5), a lease (example attached) must indicate that the DBE has exclusive use of and control over the truck. 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 a placard with the name and USDOT identification number of the DBE leasing the truck. The placard must be legible and visible when standing at least 15 feet from the driver’s side of the truck. It may be affixed to the side of the truck or inside the cab window as long as it does not interfere with the safe operation of the truck. See example below. Failure to display the name and identification number of the DBE firm may subject the Contractor to sanctions (part B 1 above).

Sample placard:

Operated by:

Bell's Trucking, LLC

USDOT 123456

NOTE: DBE firms may not receive credit for DBE participation when leasing non-DBE owned trucks from the Prime Contractor or its affiliates with whom the DBE firm is subcontracted as 49 CFR 26.55(a) (1) applies.

- e. DBE Manufacturers and Dealers. The Contractor can count expenditures with DBEs for materials or supplies toward DBE goals in accordance with the following rules:
- 1) DBE Manufacturers. The Contractor can count 100 percent of the cost of the materials or supplies toward DBE goals if the materials or supplies are obtained from a DBE manufacturer. For purposes of this paragraph, a manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications. The DBE must be listed as a "manufacturer" in the "South Carolina Unified DBE Directory" to be considered a manufacturer for purposes of these counting rules.
 - 2) DBE Dealers/Suppliers. The Contractor can count 60 percent of the cost of the materials or supplies toward DBE goals if the materials or supplies are purchased from a DBE regular dealer. For purposes of this section, a regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. The DBE must be listed as a "dealer" in the South Carolina Unified DBE Directory to be considered a dealer for purposes of these counting rules.
 - 3) DBE Brokers. A Contractor can count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of material or supplies required on a job site, toward DBE goals with respect to materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer/supplier.

5. JOINT CHECKS.

The Director of Construction must approve all requests for a Contractor to issue and use joint checks (attached) with a DBE. All of the following conditions apply:

- a. The DBE must submit a request to the Director of Construction which includes a formalized agreement between all parties that specify the conditions under which the arrangement will be permitted;
- b. The DBE remains responsible for all other elements of 49 CFR 26.55(c)(1). SCDOT must clearly determine that independence is not threatened because the DBE retains final decision making responsibility; and
- c. There can be no requirement by the prime Contractor that a DBE use a specific supplier nor the prime Contractor's negotiated unit price.

6. REPORTS

The Contractor shall provide SCDOT the following reports and information. THIS REQUIREMENT APPLIES REGARDLESS OF WHETHER THERE IS A DBE CONTRACT GOAL ASSIGNED TO THE CONTRACT.

- a. **DBE Quarterly Reports.** The Contractor shall provide DBE Quarterly Reports showing the dollar amount of payments to each certified DBE. The Contractor and each DBE that received payment must sign the report. The Contractor's and DBE's signature on the Quarterly Report shall constitute certification that the DBE has performed the work, and that the Contractor is entitled to credit toward the DBE goal, for the amount shown in accordance with the counting rules set forth in Section 3 above. The report shall include the amount paid to each DBE for the quarter and the total amount paid to each DBE on the contract. The report must include DBE subcontractors, hauling firms, and suppliers. The report shall be submitted in duplicate to the Resident Construction Engineer by the 15th of the month after each calendar quarter (January, April, July, and October). The failure to submit the quarterly report may result in the withholding of monthly progress and/or final payment. The Quarterly Report must be submitted for each quarter, even if no payments have been made to a DBE in that quarter. DBEs are not required to sign the report when no payments have been made to a DBE in a quarter.
 - b. **Trucker's Reports.** All DBE haulers must complete and submit a DBE Trucker's Report, along with the DBE quarterly report, when the DBE leases trucks from another firm. The DBE hauler must list all trucks leased, payments made to the lessee during the quarter, and identify whether each leased truck is owned by a certified DBE or non-DBE. DBE Haulers must also submit one copy of each lease agreement to the Resident Construction Engineer, prior to the start of work for each truck leased. A lease must indicate that the DBE has exclusive use of and control over the truck. 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.
 - c. **Other Documents.** Upon request of SCDOT, the Contractor and all subcontractors shall furnish all documents necessary to verify the amount and costs of the materials or services provided by certified DBE suppliers or subcontractors including subcontracts. The Contractor shall keep the documents that verify this information for at least three years from the date of final close-out of the contract. Failure to provide these documents upon request may result in the withholding of monthly progress and/or final payment or disqualifying the Contractor from bidding pursuant to R. 63-306, South Carolina State Regulations.
7. **CONTRACT COMPLETION – DETERMINATION OF WHETHER CONTRACTOR HAS MET THE GOAL OR MADE GOOD FAITH EFFORTS**
- a. **DBE Closeout.** Final DBE Quarterly reports, documentation concerning missed commitments and/or Good Faith Efforts are due to the RCE no later than thirty (30) calendar days from the significant work completion date.
 - b. **Review by SCDOT.** After receipt of the final DBE Quarterly Reports, SCDOT will review the necessary contract documentation to determine whether the Contractor has met the DBE commitments and contract goal.
 - c. **Notification of Failure to Meet Goal.** If the documentation indicates that the Contractor has not met the DBE commitments and contract goal, the Director of Construction will notify the Contractor in writing and request documentation of the Contractor's good faith efforts to meet the goal.
 - d. **Determination of Good Faith Efforts.** The Contractor shall submit documentation demonstrating good faith efforts to meet the contract commitments and goal to the Director of Construction within thirty (30) days of the date of the "Notification of Failure to Meet Goal." The Director of Construction will provide the Contractor with written notice of SCDOT's determination, whether good faith efforts have been demonstrated.
 - e. **Request for Reconsideration.**

- 1) The Contractor may request a reconsideration by filing a written request with the Director of Construction within ten (10) business days after receipt of the determination if the Contractor disagrees with SCDOT's determination of post construction compliance.
- 2) The Contractor shall submit any additional documentation that it wishes to be considered in support of its position, within ten (10) business days of its request for reconsideration.
- 3) The determination shall be final if the Contractor fails to request a reconsideration within ten (10) days.
- 4) If the Contractor requests reconsideration, the Director of Construction Office will appoint a Reconsideration Official, who did not take part in the original determination to review the decision and supporting documentation (hereinafter referred to as the "Reconsideration Official"). FHWA may participate in the review process.
- 5) The Reconsideration Official will contact the Contractor and schedule a meeting with the Contractor. The meeting will be held at the SCDOT Headquarters Building in Columbia or virtually. At the meeting, the Contractor will have an opportunity to present oral and written evidence to demonstrate that good faith efforts were made to meet the DBE commitments and contract goal. The Reconsideration Official may also consider evidence presented by SCDOT at the same meeting.
- 6) After the meeting, the Reconsideration Official will issue a written report and recommendation to the Director of Construction. The Director of Construction shall make the final decision on the issue. The Director of Construction will notify the Contractor of the final decision in writing.

PART B (2) INSTRUCTIONS TO CONTRACTORS

REQUIREMENTS – ALTERNATIVE DELIVERY

NOTE: References to the Director of Construction is interchangeable with Director of Alternative Delivery

a. GOAL

The DBE goal on this project is located in the Contract Agreement.

b. GENERAL

Contractor shall comply with Parts A and B (1) above, except as specifically modified pursuant to this section. This section modifies the timing and steps for which the Contractor is to submit DBE committals for an Alternative Delivery project.

c. DBE PROGRAM RELATED CERTIFICATIONS

The Contractor agrees to each of the following DBE Program-related conditions and assurances:

- 1) 1. Contractor shall adhere to the requirements of 49 CFR 26 and this supplemental specification.
- 2) Contractor's failure to comply may result in one or more sanctions, as outlined in Part B (1) above.
- 3) Contractor shall ensure DBE firms are given full and fair opportunities to participate with the Contractor on this project.
- 4) Contractor shall not discriminate on the basis of race, color, age, national origin, or sex in the performance of the contract.

- 5) Contractor will not prevent a DBE firm from providing quotations to other contractors.
- 6) Contractor shall adhere to the rules and requirements of good faith efforts in seeking qualified DBE firms.
- 7) Contractor shall adhere to the rules and requirements of Commercially Useful Function (CUF) as described in 49 CFR 26 and Part B (1) above.

d. ALTERNATIVE DELIVERY DBE PROGRAM COMPLIANCE PROCEDURES

1) DBE Utilization Commitments Plan

- a) Within thirty (30) calendar days from the effective date of the Agreement, the Contractor shall submit to SCDOT a notarized DBE Utilization Commitments Plan (attached) for review and approval. This plan shall include the following information:
 - 1) The various work elements the Contractor anticipates subcontracting to DBE firms in order to meet the established contract goal;
 - 2) The expected dollar amount and contract percentages of each work element to be applied towards meeting the contract goal; and
 - 3) Anticipated timeframes for which Contractor expects DBE subcontracts to be executed for each of the work elements identified.
- b) Failure to submit the DBE Utilization Commitments Plan as required may result in the suspension of reviewing design submittals, withhold progress payments and/or stop all construction work. This will not delay the issuance of the Notice to Proceed, thereby commencing construction time.
- c) As the Project proceeds through the design phase, the Contractor may submit revisions to the approved DBE Utilization Commitments Plan, if necessary, for the SCDOT's consideration and approval. Reasons for the revisions shall be documented by the Contractor and included in the revision request.
- d) The DBE Utilization Commitments Plan must identify an active DBE liaison officer responsible for administrating the DBE program and promoting an inclusive DBE program.
- e) After approval of the DBE Utilization Commitments Plan, Contractor may begin submitting DBE Committal Sheet.

2) Establishing DBE Committals

- a) The Contractor shall aggressively implement the approved DBE Utilization Commitments Plan by submitting DBE Committal Sheets listing specific DBE firms to carry out the identified work elements. The use of DBE firms and the information to be provided on the DBE Committal Sheet shall be as instructed in Part a. above. The Contractor's Final DBE Committal Sheet(s) with signed quotes on DBE company letterhead must be submitted and approved thirty (30) days prior to the start of construction activity. Failure to meet this deadline may result in withholding progress payments and construction activity will not begin until all DBE committals sheets are approved by SCDOT. The DCE may, at his or her discretion, approve construction activity in preparation for the start of construction activities. If the work is being performed by a DBE firm, a DBE committal sheet will be required seven (7) business days before the firm starts working. A copy of the fully executed DBE subcontractor agreement is required at the time the subcontractor's request is submitted.
- b) If the Final DBE Committal Sheet(s) does not meet the DBE contract goal, the Contractor shall comply with the good faith efforts procedures in accordance with

Part a. above, with the exception that the good faith information is due within three (3) business days, following the submission of final DBE committal sheet.

- c) The start of construction will be established by the Construction Alternative Delivery Engineer (CADE). For the purposes of the DBE program, construction begins when within seven (7) days of the Contractor's issuance of the Notice of Intent (NOI).

Failure to submit all committals will delay the NOI submission and may result in withholding progress payments.

The CADE has the ability to allow early limited construction of work not requiring an NOI or for utility work under limited NOI's if the DBE committal is submitted and approved 7 days prior to start of work.

3) Progress Review Meetings / Monthly Updates

- a) Implementation of the DBE Utilization Commitments Plan shall be a discussion point during each progress review meeting until such time as the SCDOT deems it a closed issue.
- b) The DBE liaison officer shall attend all progress review meetings (in person or via teleconference).
- c) Contractor's failure to submit monthly updates or if SCDOT believes the efforts of the Contractor in implementing the DBE Utilization Commitments Plan are insufficient, the Contractor may incur sanctions. SCDOT's approval date of the DBE Utilization Commitments Plan will establish the date for which monthly updates are required. Failure to submit monthly updates may result in withholding of payments.

4) Contractor's Obligation Post DBE Committal

- a) Once a firm is listed on the DBE Committal sheet, the Contractor shall administer the subcontract with the firm in accordance with the instructions provided in Part 1B(1).
- b) Contractor must invite all subcontractors to the pre-construction/partnering session(s) for the "Kick-off" of construction activities.
- c) Contractor, for itself, and for its subcontractors and suppliers, whether certified DBE firm or not, commits to complying fully with all federal and state DBE provisions and agrees to assume these Contractual obligations and to bind the alternative delivery team contractually to the same at the Contractor's expense.
- d) Special Rules for Alternative Delivery

(1) When the Contractor changes work that results in the reduction or elimination of work that the Alternative Delivery team committed to be performed by a DBE, the Alternative Delivery team shall seek additional participation by DBEs equal to the reduced DBE participation caused by the change.

(2) DBE goals established on Alternative Delivery projects may require a portion of the overall goal to be met using DBE firms performing in the professional services areas. This will require the Contractor to submit DBE committal sheets within 30 days from contract execution to meet the percentage identified for professional services. The remaining committals will be required as stated in D (2) above.

Firms that provide Professional Services are those defined under Engineering and Design Related Services set forth in the SCDOT Manual for Procurement, Management and Administration of Engineering and Design related services, dated May 1, 2018 and can be found at:

<http://info2.scdot.org/professionalserv/HostDocs/PSCO-Manual-5-1-2018.pdf>.

(3) Contractor is required to establish two, one-week sessions for firms certified as DBEs to meet one-on-one in-person with the contractor beginning 30 days from project award. These sessions will afford DBE firms the ability to meet and offer their

services for subcontracting opportunities. This will be in lieu of the Department's DBE outreach sessions usually held within 30 days of when the short-listed firms are identified. It is recommended the proposer hold additional in-person sessions within 90 (ninety) business days of the beginning of construction.

(4) Contractor is required to identify an experienced point-of-contact responsible for administrative matters, related to the DBE program. The Project Manager will be the point of contact to address issues related to DBE program compliance.

(5) Contractor will make key managers and field supervisors available for a one-time SCDOT provided training sessions concerning DBE program compliance. Newly hired managers and field supervisors shall attend a training session within 90 (ninety) business days of hire for this project.

The SCDOT Minority & Small Business Affairs' DBE Alternative Delivery Support, Technical Assistance and Compliance team is available to assist with the successful implementation and understanding DBE program requirements and meeting the project's DBE goal.

DISADVANTAGED BUSINESS ENTERPRISES (DBE) COMMITTAL SHEET

Information must be shown on this sheet as required by the supplemental specifications entitled “Disadvantaged Business Enterprises (DBE) Supplemental Specification” included in this proposal.

FAILURE TO PROVIDE ALL INFORMATION REQUIRED ON THIS FORM MAY RESULT IN THE AWARD BEING MADE TO THE NEXT LOWEST RESPONSIBLE AND RESPONSIVE BIDDER. FOR ALTERNATIVE DELIVERY PROJECTS, FAILURE TO PROVIDE ALL INFORMATION REQUIRED ON THIS FORM MAY RESULT IN SANCTIONS IN ACCORDANCE WITH PART B OF THE DBE SUPPLEMENTAL SPECIFICATIONS.

¹ Name & Address of DBE's (Sub-Contractor/Sub-consultant or Supplier)	² Percent	³ Description of Work and Approximate Quantity ⁶ (show percent when appropriate)				⁵ Dollar Value
		Item	Qty.	Unit	⁴ Unit Price	

NOTE: IF THE DBE GOAL IS NOT MET, THE CONTRACTOR MUST REQUEST A GOOD FAITH EFFORT REVIEW BY 5PM THE NEXT CALENDAR DAY.

Prime Contractor _____ **SCDOT Project Number** _____

Total amount committed \$ _____ **Percentage committed:** _____ **% DBE Goal:** _____ **%**

1. The designation of Firm A and/or B is not considered acceptable. I hereby certify that this company has communicated with and received quotes from the DBE's listed above and that they are willing to perform the work as listed above and that this company is committed to utilizing the above firm(s) on this contract.
2. Percent – show percent of total contract amount committed to each DBE listed.
3. All information requested must be included unless item is listed in proposal on a lump sum basis.
4. Unit Price – show unit price quoted by DBE.
5. Dollar Value – extended amount based on Quantity and Unit Price.
6. Applies to lump sum items only. When using lump sum, the DBE quote must detail work to be performed with costs, quantities, material, etc.

This form may be reproduced or additional sheets added in order to provide all requested information.

SWORN to before me this _____

Representative
Day of _____, 20____

Notary Signature (SEAL)

Notary Public for _____

My commission expires: _____

Printed Name of Prime Contractor

By: _____
Prime Contract Representative Signature

Title: _____
Title of Representative

Date Signed: _____

Date: _____

DBE Subcontractor Firm: _____

Prime Contractor Firm: _____

Supplier Firm: _____

SCDOT will closely monitor the use of joint checks. To receive DBE credit for performing a commercially useful function with respect to obtaining materials and supplies, a DBE must “be responsible for negotiating price, determining quality and quantity, ordering the material and installing (where applicable) and paying for the material itself.” Only when a DBE meets all of these requirements should credit be counted for the procurement of the items by the DBE. Please refer to the attached Procedures for Using Joint Checks under the Disadvantaged Business Program for qualifying conditions. If proper procedures are not followed or SCDOT determines that the arrangement results in lack of independence for the DBE involved, no credit for the DBE’s participation as it relates to material cost will be counted toward the contract goal requirement.

I have read and understand the above information and have attached a copy of the Joint Check Agreement relating to this request. I hereby acknowledge that the information provided on this form is true and accurate.

Authorized DBE Representative	
Signature	Title
Date	
Authorized Prime Contractor Representative	
Signature	Title
Date	
Authorized Material Supplier Representative	
Signature	Title
Date	
SCDOT USE ONLY	
Date Received:	Director of Construction or Authorized Representative:
<input type="checkbox"/> Approved <input type="checkbox"/> Denied	<i>Note: Do not process this request without a signed copy (all parties) of the Joint Check Agreement, statement of history, and any related policies.</i>
Comments:	

(27) SECTION 107: DISADVANTAGE BUSINESS ENTERPRISE (DBE) SPECIAL REQUIREMENTS:

In addition to the DBE requirements shown in the contract documents, the PROPOSER shall implement the items listed below.

- A. The proposer is required to establish two one-week sessions for firms certified as DBEs to meet one-on-one in-person with the proposer beginning 30 days after project award. These sessions will afford DBE firms the ability to meet and offer their services for sub-contracting opportunities. This will be in lieu of the Department's DBE outreach sessions usually held within 30 days of when the short-listed firms are identified. It is recommended the proposer hold additional in-person sessions within 90 days prior to the beginning of construction.
- B. Proposer is required to identify an experienced point-of-contact responsible for administrative matters related to the DBE program. The Project Manager will be the point of contact to address issues related to DBE program compliance.
- C. Proposer will make key managers and field supervisors available for a one-time SCDOT provided training sessions concerning DBE program compliance. Newly hired managers and field supervisors shall attend a training session within 90 days of hire for this project.

(28) SECTION 107: MONITORING OF CONSTR.-RELATED EARTHBORNE VIBRATIONS:

July 8, 2015

A. DESCRIPTION

The project construction will generate vibrations that will travel through the earth, which will subsequently be received or "sensed" by nearby structures and inhabitants. Specific procedures that will generate earthborne vibrations during bridge and roadway construction include (but are not limited to) the installation of piles, earthquake drains, shoring walls, general foundation construction, and vibratory compaction of unclassified or borrow excavation. To mitigate the risk of vibration-related damage to nearby structures, this specification outlines the Contractor's responsibility for performing a program of pre-construction condition assessment and vibration monitoring during construction.

This specification is based, in part, on AASHTO R 8-96 (2004) *Standard Recommended Practice for Evaluation of Transportation-Related Earthborne Vibrations*. As discussed in AASHTO R 8-96 (2004), humans respond to a much broader range of vibration frequencies and intensities than structures. Intrusive vibration levels can annoy humans at much lower intensities than levels considered critical for structures. Thus, occupants of adjacent properties may perceive that the construction-induced vibrations may present risk to their structures. The recommended safe vibration limits are intended to mitigate the risk of structure damage, and more specifically, reduce the development of "threshold cracks" or cosmetic cracking. Such cracks may appear at lower vibration levels than the level at which architectural or minor structural damage would be expected to occur.

B. PRE-CONSTRUCTION CONDITION ASSESSMENT

The Contractor shall retain a geotechnical engineering firm to perform a pre-construction condition assessment to document the conditions of nearby buildings and other sensitive nearby structures prior to the beginning of construction. The assessment shall be performed on all properties adjacent to the project site and any other properties as directed by the Engineer. The assessment shall include any structures within 300 feet of any vibration inducing construction activity. The assessment should include video and photographic documentation of all exteriors and interiors, and installation of crack monitors on cracks that might propagate due to construction vibrations. All documentation of existing building conditions and information concerning the type and location of crack monitors shall be presented to the Engineer in a report prior to construction.

C. CRACK MONITORING DURING CONSTRUCTION

During all construction, the Contractor shall perform periodic readings of the crack monitors that were installed during the pre-construction condition assessment. All readings shall be provided to the Engineer within 48 hours of taking the reading. Provided that the crack readings confirm that vibrations are not contributing to increasing the crack width, the crack monitors may be read once per week. More frequent readings may be directed by the Engineer during activities that are expected to have greater earthborne vibrations (e.g., pile driving). If the crack readings suggest that vibrations

from the project site are contributing to crack width, then the Contractor shall immediately notify the Engineer and review those activities that are generating the earthborne vibrations. The Contractor and his or her geotechnical firm shall then submit a detailed plan for repair, perform the repair at no cost to the Department and develop and submit for review a revised construction plan to address the vibration problems and minimize further damage and complaints.

D. VIBRATION MONITORING DURING CONSTRUCTION

1. Procedure - The Contractor shall monitor vibrations at no less than four locations at each specific site of construction activity along the perimeter of the project during all foundation and embankment construction activities. The locations shall be selected by the Contractor based on the location of the construction activities and their relative position to nearby offsite structures. Prior to construction, a plan of the monitoring locations shall be submitted to the Engineer for acceptance. The locations of the vibration monitors shall be adjusted during construction with acceptance by the Engineer. The vibration monitors shall be established at the site so that background vibrations may be determined prior to beginning foundation or embankment construction. The sensitivity range of the seismograph shall be selected so that the recording is initiated below the maximum allowable particle velocity shown in Figure 1 and extends above the highest expected intensity. Specific activities of the vibration source shall be indexed in time to allow correlation with the arrivals on the vibration
2. Project Vibration Criteria - The maximum allowable particle velocity is shown in Figure 1. If the data from the monitors indicate that vibrations are exceeding the established criteria, then the Contractor shall immediately notify the Engineer and suspend those activities which are generating the earthborne vibrations, until the Contractor and his or her geotechnical firm have developed a revised construction plan to resolve the problem. The problem shall be resolved at no additional cost to the Department.
3. Instrumentation – The vibration monitors shall consist of digital seismographs that display the particle velocities and associated frequencies plotted against the criteria for this project (i.e., Figure 1). Each seismograph shall contain geophones with response capability in three mutually perpendicular axes or components: one vertical and two horizontal (radial and transverse). The frequency response of the geophones shall be linear from at least 4 Hz to more than 200 Hz. The sensitivity shall range from less than 0.02 in/sec to more than 5.0 in/sec. The BlastMate III by InstanTel is one type of seismograph that is suitable for this project.
4. Calibration and Instrument Use - The Contractor shall field calibrate the vibration monitors before the start of each recording period. The transducer shall be positioned with the longitudinal axis toward the vibration source. Transducers must be adequately coupled with the ground. Operation of all vibration monitors shall be in accordance with the instrument manufacturer's instructions and recommendations. Vibration records shall be collected in waveform plot or strip chart plot. The peak vector sum of the particle velocity in longitudinal, transverse, and vertical planes shall be shown along with the respective dominant or principle frequencies. The highest recorded particle velocity (i.e., the vector sum of the three orthogonal directions), when indexed to a particle vibration event, shall be reported as the peak particle velocity. The recorded peak particle velocity shall be compared to criteria appropriate for the subject of concern.
5. Complaints - In the event of a complaint, the Contractor shall immediately contact the Engineer and review those construction activities that are inducing vibrations into the earth. The Contractor shall prepare a report documenting all relevant data such as the time and date presented in the complaint, a description of the construction activities during the subject time/date, data from the monitoring instruments for the subject time/date, complaint information and a description (including photographs, if possible) of the alleged damage. The Contractor and his or her geotechnical firm shall then submit a detailed plan for repair, perform the repair at no cost to the Department and develop and submit for review a revised construction plan to address the vibration problems and minimize further damage and complaints.

E. METHOD OF MEASUREMENT

In addition to the pre-construction condition assessment report, the Contractor shall also provide monthly reports containing the results of the crack monitors and vibration monitors during those activities that generate earthborne vibrations, including (but not limited to) ground improvement and

foundation construction. The reports shall document that the Contractor is providing the work described by this specification.

F. BASIS OF PAYMENT

Payment shall be made in proportion with the percent of the project that is complete. Final payment of the remaining lump sum balance shall be made when vibration monitoring is complete as approved by the Engineer. Payments shall be made under:

Item No.	Pay Item	Pay Unit
1075001	MONITORING OF CONSTRUCTION-RELATED EARTHBORNE VIBRATIONS	LS

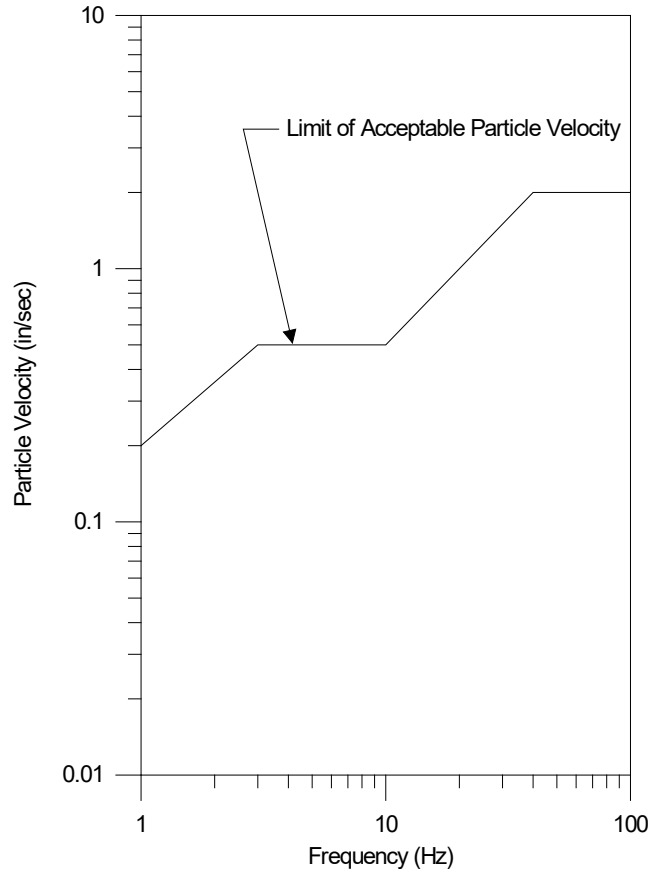


Figure 1 - Vibration Criteria (adapted from AASHTO R8-96)

(29) SECTION 107: COMMUNITY AND PUBLIC RELATIONS PLAN:

SCDOT will take the lead role on this project and be responsible for a portion of the public information efforts. Unless noted otherwise elsewhere in this RFP, the SCDOT responsibilities include:

- A. Developing and maintaining the project website
- B. Soliciting and administering advertisements and media announcements, as deemed necessary

The Contractor shall coordinate with the Department to promote public awareness for this project. The amount of public involvement required for this project is directly based on the Contractor's Transportation Management Plan and construction details. The Design- Build Team's responsibilities shall include:

- A. Providing details surrounding the impacts to the public
- B. Providing advance notice to the Department of upcoming project impacts
- C. Assisting the Department in the development of the target audience list

- D. Attending and/or speaking at public meetings
- E. Hand delivery of time sensitive informational materials
- F. Preparing advertisements and media announcements
- G. Preparing and forwarding direct mailers, flyers, and other promotional materials as necessary
- H. If required, organizing public meetings, including venue selection, reservation and fee

The Contractor shall hold an initial project coordination meeting with SCDOT at least one month prior to start of construction to discuss project impacts to the public. This information will be used by the Contractor to create a Public Information Plan.

The Contractor shall inform the Department at least twenty-one (21) calendar days in advance of any construction activity that will have significant impact on the public, including, but not limited to, the start of construction, major traffic shifts, road closures, ramp closures, detours, night work and project completion.

The Contractor will develop, with the assistance of SCDOT, the specific list of target audiences for this project. The following groups are identified as typical target audiences to receive informational materials:

- A. State Senator(s) and Representative(s)
- B. Chairman of the County Council
- C. County Administrator/Manager
- D. County Planner
- E. City Mayor (as appropriate)
- F. City Manager (as appropriate)
- G. Transportation services
- H. Emergency services
- I. Neighborhood groups and private homes
- J. Industry and businesses
- K. Chamber(s) of Commerce
- L. Individual schools effected by the project
- M. Public School District(s) and Transportation Office(s)
- N. Post Office
- O. Any other organization as deemed necessary by the Department

The minimum public information requirements solely associated with the Transportation Management Plans shall include, but not be limited to the following:

Public Meetings - If Beginning of Construction meeting for area businesses and residents is held, Contractor shall attend and be prepared to speak at this event.

Distribution of Informational Materials - For beginning of construction and for all road closures with detour routes, the Contractor shall be responsible for delivering time sensitive informational material provided by the SCDOT directly to portions of the target audience. If the Contractor informs the Department of the aforementioned activities less than twenty-one (21) calendar days in advance, the Contractor shall hand deliver the informational materials to the impacted target audiences.

The Department will be responsible for establishing, creating, maintaining and updating the project website for this project. However, throughout the project duration, the Contractor shall coordinate with the RCE to ensure the accuracy of the aforementioned project website. At a minimum, the Contractor shall designate a contact for public information inquiries and coordination. Throughout construction, at a minimum, this contact shall provide bi-weekly updates to the RCE, including, but not limited to, traffic control phasing, graphic illustrations, project pictures, etc.

The Contractor shall include in their Total Cost to Complete, all costs associated with their involvement in the Community and Public Relations Plan.

(30) SECTION 107: SCDOT TRADEMARK RIGHTS

A. DESCRIPTION

By execution of this Contract, CONTRACTOR agrees to comply with the following terms with respect to the CONTRACTOR's rights and obligations relating to the use of the SCDOT service/trademark mark(s) (U.S. Registration No(s). 5963731; 5963732; and 6017777).

SCDOT is the owner of the following marks (hereinafter called MARKS)



SCDOT

SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION

Additionally, when any of the above-referenced trademarks are used on SCDOT or contractor websites, advertising, or the like, the following Attribution Statement should be placed at the bottom of the page (with the proper year):

"© 2020 – All Rights Reserved – South Carolina Department of Transportation. The South Carolina Department of Transportation is the owner of US Trademark Registration Nos. 5,963,731; 5,963,732 and 6,017,777."

This language need not be used on internal documents, on the sides of trucks, or other places where it would be illegible or difficult for the public to read.

A. GRANT OF TRADEMARK LICENSE

SCDOT grants to CONTRACTOR a nonexclusive, nontransferable license to use the MARKS in connection with the goods and services covered by the above-referenced service mark registrations for the MARKS, and CONTRACTOR accepts the license subject to the following terms and conditions.

B. OWNERSHIP OF MARKS

CONTRACTOR acknowledges the ownership of the SCDOT MARKS, agrees that it will do nothing inconsistent with such ownership and that all use of the MARKS by CONTRACTOR shall inure to the

benefit of and be on behalf of SCDOT, and agrees to assist SCDOT in recording this Trademark License with appropriate government authorities, if necessary. CONTRACTOR agrees that nothing in this Trademark License shall give CONTRACTOR any right, title or interest in the MARKS other than the right to use the MARKS in accordance with this Trademark License and CONTRACTOR agrees that it will not attack the title of SCDOT to the MARKS or attack the validity of this Trademark License.

C. QUALITY STANDARDS

CONTRACTOR agrees that the nature and quality of all services rendered by CONTRACTOR in connection with the MARKS, all goods sold or services provided by CONTRACTOR under the MARKS; and all related advertising, promotional and other related uses of the MARKS by CONTRACTOR shall conform to standards set by and be under the control of SCDOT.

D. QUALITY MAINTENANCE

CONTRACTOR agrees to cooperate with SCDOT in facilitating SCDOT's control of such nature and quality, to permit reasonable inspection of CONTRACTOR's operation, and to supply SCDOT with specimens of all uses of the MARKS upon request. CONTRACTOR shall comply with all applicable laws and regulations and obtain all appropriate government approvals pertaining to the sale, distribution and advertising of goods and services covered by this Trademark License.

E. FORM OF USE

CONTRACTOR agrees to use the MARKS only in the form and manner and with appropriate legends as prescribed from time to time by SCDOT, and not to use any other trademark or service mark in combination with the MARKS without prior written approval of SCDOT.

F. INFRINGEMENT PROCEEDINGS

CONTRACTOR agrees to notify SCDOT of any unauthorized use of the MARKS by others promptly as it comes to CONTRACTOR's attention. SCDOT shall have the sole right and discretion to bring infringement or unfair competition proceedings involving the MARKS.

G. TERM

This Trademark License shall continue in force and effect for the effective term of this Agreement.

H. TERMINATION FOR CAUSE

SCDOT shall have the right to terminate this Trademark License upon thirty (30) days written notice to CONTRACTOR in the event of any affirmative act of insolvency by CONTRACTOR, or upon the appointment of any receiver or trustee to take possession of the properties of CONTRACTOR or upon the winding-up, sale, consolidation, merger or any sequestration by governmental authority of CONTRACTOR, or upon breach of any of the provisions hereof by CONTRACTOR.

I. EFFECT OF TERMINATION

Upon termination of this Agreement, CONTRACTOR agrees to immediately discontinue all use of the MARK and any term confusingly similar thereto, and that all rights in the MARK and the good will connected therewith shall remain the property of SCDOT.

(31) SECTION 108: PARTNERING:

A. COVENANT OF GOOD FAITH AND FAIR DEALING

This Contract imposes an obligation of good faith and fair dealing in its performance and enforcement.

The CONTRACTOR and Department, with a positive commitment to honesty and integrity, agree to the following mutual duties:

1. Each will function within the laws and statutes applicable to their duties and responsibilities.

2. Each will avoid hindering the other's performance.
3. Each will proceed to fulfill its obligations diligently.
4. Each will cooperate in the common endeavor of the Contract.

B. PARTNERING

The Department encourages the foundation of cohesive partnering with the CONTRACTOR and its principle subcontractors and suppliers. This partnering is not a legal partnership as defined by South Carolina law. Partnering will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objectives are effective and efficient contract performance and completion within budget, on schedule, and in accordance with the Contract.

The establishment of a partnering charter will not change the legal relationship of the parties to the contract nor relieve either party from any of the terms of the Contract. Any cost associated with effectuating partnering will be agreed to by the Department and the CONTRACTOR and will be shared equally between them.

(32) SECTION 108: EVALUATION OF DELAYS

The Contractor shall evaluate delays and calculate the appropriate time extension due based on the following:

1. The Contractor shall base all evaluations of delay and all calculations of the appropriate time extensions due on the schedules submitted to and accepted by the Department. The Contractor shall not use schedules that did not exist on the project or create schedules after the delay has occurred to demonstrate entitlement to a time extension.
2. The Contractor shall base evaluations and calculations related to the determination of extensions of time on the Critical Path as established by the schedules submitted to and accepted by the Department. The Contractor is not entitled to a time extension for delays that do not delay the Critical Path. The Critical Path is defined as the longest path through a project schedule.
3. The evaluations and calculations required to establish entitlement to a time extension will vary depending on the nature and timing of the delay and whether the Contract Time is measured in working days, calendar days, or based on a fixed completion date.
4. The schedules relevant to the evaluation and calculation of time extensions are the most current schedules submitted to and accepted by the Department. For example, if the Department determines that Extra Work is required and the Supplemental Agreement adding this work will be dated June 2, then the determination of the time extension due the Contractor will be based on the last schedule submitted and accepted by the Department prior to June 2 of the same year.
5. The Contractor's evaluations and calculations to document an appropriate time extension shall be performed as follows:
6. The Contractor shall use the method known in the construction industry as the Time Impact Analysis (TIA) to identify and measure critical delays that have not yet occurred (prospective). The Contractor shall not use this method to evaluate delays that have already occurred (retrospective). In general terms, the Contractor shall perform a TIA as follows:
 - a. Develop a "mini" schedule depicting the changed work (hereby referred to as a fragnet).
 - b. Identify the current Progress Schedule as described in paragraph (4), above. Record the scheduled completion date in this schedule.
 - c. Insert the fragnet into the current Progress Schedule by properly linking the fragnet with the existing activities in the current Progress Schedule.
 - d. Recalculate the current Progress Schedule with the fragnet inserted and record its scheduled completion date.
 - e. The difference in the scheduled completion dates (or other Milestone dates) between the current Progress Schedule and the Progress Schedule calculated with a properly inserted

and properly composed fragment is the delay attributable to the changed work. The time extension due, if any, will be based on this delay.

7. The Contractor shall use a Contemporaneous Analysis when evaluating delays that have already occurred. In general terms, the Contractor shall perform a Contemporaneous Analysis as follows:
 - a. Identify the accepted Progress Schedule that is immediately before the start of the delay being evaluated.
 - b. Identify each Progress Schedule in effect during the delay and the Progress Schedule with a data date immediately following the conclusion of the delay.
 - c. Identify the critical path each day from immediately before the start of the delay to the Accepted Progress Schedule immediately following the delay.
 - d. Determine whether the delay falls on the critical path.
 - e. If the delay does not fall on the critical path, then no project delay occurred, and no time extension is due.
 - f. If the delay falls on the critical path, then determine the number of days the critical path is delayed. The time extension due, if any, will be based on this delay to the scheduled completion date

Concurrent Delays are two separate and independent delays that both delay the critical path at the same time. Concurrent Delays can occur when a CONTRACTOR caused delay is concurrent with an SCDOT-caused delay, when a delay that is the responsibility of neither the CONTRACTOR nor SCDOT is concurrent with an SCDOT-caused delay, or when a CONTRACTOR caused delay is concurrent with a delay that is the responsibility of neither the CONTRACTOR nor SCDOT. In each of these scenarios, the Contractor is entitled to an extension of Contract Time but is not entitled to recover additional time-related costs for the period of concurrency.

(33) SECTION 109: FUEL ADJUSTMENT INDEXES:

The Fuel Adjustment Indexes Supplemental Specification dated December 1, 2009 applies to this project. For this project the diesel fuel and unleaded gasoline indexes will be determined on the first calendar day of the month cost proposals are due. The indexes and price adjustment tables will be available on the internet at <https://www.scdot.org/business/constructionletting-monthlyindex.aspx>, or from the office of the Contracts' Administrator.

All items of work included in this project that are listed in the table entitled "Items of Work Eligible for Fuel Adjustments" below paragraph 4 of the supplemental specification will be subject to price adjustment.

The following items are hereby included in the table entitled "Items of Work Eligible for Fuel Adjustments" in the Supplemental Specification:

Smooth Wall Pipe (24" or less)	Gallons/LF	0.50	0.15
Smooth Wall Pipe (greater than 24")	Gallons/LF	0.75	0.15
Corrugated Wall Pipe (24" or less)	Gallons/LF	0.50	0.15
Corrugated Wall Pipe (greater than 24")	Gallons/LF	0.75	0.15

The following Section of the Supplemental Specification is hereby modified:

Additional Provisions:

The Department will calculate and apply fuel adjustments to estimates based on index values set at the beginning of the estimate period.

Estimate period begins on the 1st of the month and ends on the last day of the month. The 1st of the month Index will be compared to the contract Base Index to determine index adjustments for the estimate period.

(34) SECTION 109: REFERENCES TO UNIT PRICING:

Except listed below, any references in the contract documents to unit price, measurement, and payment, are typical references for design-bid-build contracts and are not applicable to the extent they effect payment on Design-Build contracts. The Design-Build contractor's schedule of values shall provide sufficient detail to compare work progress to the contractor's schedule and determine appropriate periodic payments.

The following Special Provisions contain unit rate and payment information specifically applicable to this Design-Build contract:

SECTION 105: CROSS SLOPE VERIFICATION

SECTION 401: HOT MIX ASPHALT (HMA) QUALITY ACCEPTANCE

SECTION 401: HOT-MIX ASPHALT RIDEABILITY

SECTION 401: FULL DEPTH ASPHALT PAVEMENT PATCHING

SECTION 413: COLD CENTRAL PLANT RECYCLING MATERIALS

SECTION 501 ROLLER COMPACTED CONCRETE

SECTION 503: PORTLAND CEMENT CONCRETE PAVEMENT UNIT COST

SECTION 701: NON-CONFORMING CONCRETE

SECTION 806: REPAIR EXISTING CONTROL OF ACCESS FENCE

(35) SECTION 202: REMOVAL OF EXISTING GUARDRAIL:

Section 202.4.4.3 applies on this project.

(36) SECTION 202: RECLAIMING EXISTING ROADWAY:**A. DESCRIPTION**

This work consists of the restoration of paved areas. These areas are typically shown as hatched areas on the plans when outside the construction limits.

B. MATERIALS

None

C. CONSTRUCTION REQUIREMENTS

1. Asphalt Pavement with Earth Base: Remove and dispose of areas of pavement shown as hatched areas on the plans. Grade the area to properly drain. Seed the area in accordance with Section 810.
2. Asphalt Pavement with Stone Base: Remove and dispose of areas of pavement and base shown as hatched areas on the plans. Grade the area to properly drain. Seed the area in accordance with Section 810.
3. Earth roadway or Bituminous Surfacing with Earth Base: Scarify existing areas of roadway. Grade the area to properly drain. Seed the area in accordance with Section 810.
4. Bituminous Surfacing with Stone Base: Remove and dispose of areas of pavement and base shown as hatched areas on the plans. Grade the area to properly drain. Seed the area in accordance with Section 810.

Suitable materials may be used for embankment construction on the project. In the event that removed materials are used for embankment construction a corresponding deduction in Unclassified Excavation will be made by the Resident Construction Engineer.

D. MEASUREMENT

Removed asphalt pavement greater than 2 inches in depth will be measured by the square yard. Removed bituminous surfacing with stone base will be measured by the cubic yard. Removed stone base will be measured by the cubic yard. Scarified areas will not be measured for payment.

E. PAYMENT

Removed asphalt pavement which is greater than 2 inches in depth will be paid at the unit price bid for Removal and Disposal of Existing Asphalt Pavement. Removed bituminous surfacing with stone base will be paid for at the unit price bid for Unclassified Excavation. Removed stone base will be paid for at the unit price bid for Unclassified Excavation. No payment will be made for scarifying earth roadway or bituminous surfacing with earth base. No separate or additional payment will be made for grading necessary to obtain proper drainage.

(37) SECTION 202: STAGED REMOVAL OF EXISTING BRIDGES:

For existing bridges that will be removed in stages, maintain stability of the existing structure at all times while traffic is on or passing under the bridge. At a minimum, replace all tie rods after removal of any slab sections and maintain bracing on the existing piles at all times while traffic is on or passing under the bridge.

(38) SECTION 203: BORROW EXCAVATION:

Delete paragraph 1 of Subsection 203.2.1.8 of the Standard Specifications and replace it with the following:

1. Borrow consists of material required for the construction of embankments or for other portions of the work where the elevation of the existing subgrade is less than the subgrade elevation required on the Plans or directed by the RCE. When sufficient material is available entirely within the right-of-way, the work is covered by the item Unclassified Excavation and the material shall meet the material requirements of Borrow Excavation in this subsection. When it is necessary to bring material from outside of the right-of-way, the work is covered by the item Borrow Excavation, and the material shall also meet the requirements for Borrow Excavation in this subsection. The material requirements of this subsection apply to all material used in the work regardless of its origin. The requirements of this subsection are not applicable to in situ subgrade material.

(39) SECTION 203: BORROW EXCAVATION (FOR SHOULDERS):

This work shall consist of satisfactory placement of all materials necessary to bring the shoulder grade to within 2 inches of the final pavement edge grade. The Contractor shall furnish all earth material necessary to eliminate any edge of final pavement to shoulder gradient differential that exceeds 2 inches. The quantities shown on the plans are the Engineering estimate of the number of units that will be necessary for this project, actual field measurements may cause these quantities to vary.

Selected materials shall be used for this operation. The selected material shall consist of a friable material such as topsoil, etc., containing grass roots and having the properties of being comparatively porous, capable of growing grass and of a stable nature in that when compacted it will resist erosion and be capable of supporting vehicles when relatively wet. When the area where material is to be placed, is greater than 4 feet in width, it shall be scarified and/or disked to a minimum depth of 3 inches prior to placing any material. Scarifying or disked is not required for areas less than 4 feet in width. Borrow shall be mixed with the existing scarified and/or disked shoulder material in such a manner as to provide a seed bed in accord with Section 810.15 of the Standard Specifications. The Contractor has the option of placing the borrow material (a) Prior to placing final surface course or (b) Following the placing of the finished surface course.

The method of measurement will be the volume in cubic yards, determined in accordance with Section 203 of the Standard Specifications. The Contractor, at his option, may elect to base the quantity measured on the loose volume at the point of delivery by scaling and counting the loads, with a deduction of 35 percent made for shrinkage. All cost for borrow material including obtaining, hauling, and placing shall be included in the unit price.

(40) SECTION 203: BORROW PITS:**A. PERMITTING OF BORROW PITS**

Prior to using borrow material from commercial or other borrow pits located wholly or in part in wetland areas, the contractor shall submit written evidence that operations to obtain fill material from the borrow pit(s) have received all appropriate and necessary authorizations from federal, state, and/or local authorities.

Permitted Borrow Pits

If the appropriate federal, state, and local authorities have issued permits, the contractor shall provide to SCDOT copies of all permits issued for such borrow pit sites.

B. BORROW PITS WITHOUT SECTION 404 PERMIT

For borrow pit sites for which a Section 404 permit under the Clean Water Act has not been issued, the contractor shall provide SCDOT with copies of documentation provided by the contractor or its subcontractor(s) to the U.S. Army Corps of Engineers, which shall, at a minimum, clearly define the location of the borrow pits and any wetlands on the borrow pit site; describe the proposed activities and processes that will be used to prepare the site, obtain fill material from the site, and store material at the site; and request the U.S. Army Corps of Engineers to confirm in writing that no Section 404 permit is required for those operations. No operations shall take place at the borrow sites for at least thirty days from the date of the submission of confirmation request to the U.S. Army Corps of Engineers. After thirty-one days the contractor may begin work. The contractor shall also provide copies to SCDOT of any response(s) provided by the U.S. Army Corps of Engineers to its documentation.

C. RESPONSIBILITY

SCDOT has no obligation or duty to review, assess, evaluate, or act upon such documentation and maintains no authority or responsibility to alter, amend, reject, accept, or otherwise exercise any control over the contractor or subcontractor regarding compliance with Clean Water Act Section 404 and the implementing regulations for Section 404. Documentation submitted to SCDOT is for public information and coordination purposes only. The contractor is responsible for all costs related to the selection, operation, and/or activities at any borrow pit site in wetlands including fines, additional mitigation, and impact delays related to failure to obtain any and all necessary federal, state, and local permits and approvals for borrow pits and operations. Nothing herein shall affect in any way SCDOT's right to accept or reject any fill material not meeting the required technical specifications.

(41) SECTION 205: HIGH-STRENGTH GEOTEXTILE FOR EMBANKMENT REINFORCEMENT:

April 21, 2015

A. DESCRIPTION

This work shall consist of furnishing and installing construction geotextiles in accordance with the details shown in the plans, specifications, or as directed by the RCE.

B. MATERIALS

A geotextile is defined as any permeable polymeric textile used with foundation, soil, rock, earth, or any other geotechnical engineering related material, as an integral part of a civil engineering project, structure, or system. Use geotextiles and thread used in joining geotextiles manufactured from fibers consisting of long-chain polymers, composed of at least 95 percent by weight of polyolefins or polyesters. Use geotextiles with fibers formed into a stable network such that the fibers or yarns retain their dimensional stability relative to each other, including selvages (edges) during shipping, handling, placement, and in service. Use geotextile free from defects or tears.

- 1. Minimum Average Roll Values:** All property values, with the exception of Apparent Opening Size (AOS), represent Minimum Average Roll Values (MARV) in the weakest principal direction. Provide geotextiles whose average test results from any roll sampled in a lot for conformance or quality assurance testing meets or exceeds minimum values provided in this Section.

2. **Apparent Opening Size:** Values for Apparent Opening Size (AOS) represent maximum average roll values. Acceptance will be based on ASTM D 4759.
3. **Reinforcement Geotextile:** Use reinforcement geotextile within existing and/or proposed fills for slope reinforcement.

Furnish geotextiles meeting the property requirements outlined in Table 1.

Table 1: High Strength Geotextile Properties (Design Requirements)^{1,2}

Property	Test Method	Geotextile Property Requirements
Long-Term Design Strength, T_{al} , MD		22,800 lb/ft
Long-Term Design Strength, T_{al} , XD		2,280 lb/ft
Sewn Seam Breaking Strength ³	ASTM D4884	900 lbs/ft
AOS	ASTM D4751	$\leq (1.0 \text{ to } 2.0)D_{85(\text{soil})}$
Permeability	ASTM D4491	$\geq 10k_{\text{soil}}$
Default Pullout Friction Factor, F^*	ASTM D6706	$0.6 \tan \Phi$
Default Alpha, α	ASTM D6706	0.6
Ultraviolet Stability	ASTM D4355	$\geq 50\%$ after 500 hrs of exposure

- Notes:
1. The test procedures shall conform to the most recently approved ATSM geotextile test procedures.
 2. All numeric values represent Minimum Average Roll Value (MARV).
 3. Applies to factory or field sewn seams.

4. Source Approval and Certification

Prior to construction, the Contractor shall submit to the Resident Construction Engineer (RCE) a Certification Package prepared by the geotextile reinforcement manufacturer. The Contractor shall allow 21 calendar days from the day the submittals are received by the RCE for review and acceptance. Submit the following information regarding each geotextile proposed for use:

- a. Manufacturer's name and current address;
- b. Full product name/number, including roll number;
- c. Geosynthetic material (i.e. polymer type) and structure (including fiber/yarn type);
- d. Proposed geotextile use(s); and
- e. Certified test results for the properties outlined in Table 1 and below in Section 4.

The Certification shall state that the furnished geotextile soil reinforcement is in full compliance with the design requirements as stated in this specification and the design drawings and is fit for use in long-term critical soil reinforcement applications. In addition to the minimum required properties in Table 1, the submittal shall also certify the following values for each geotextile soil reinforcement used on the project:

- a. The ultimate tensile strength, T_{ULT} , (MARV) for geogrid soil reinforcements, MD/XD
- b. The tensile strength at 5% strain, MD
- c. The creep reduced tensile strength, MD
- d. The geotextile's pullout coefficients (F^* , α)

The Contractor's submittal package shall include, but not be limited to, actual test results for tension, creep, durability, construction damage, joint/seam strength, pullout and quality control. A person having the legal authority to bond the manufacturer shall attest to the certificate. Any tests required shall be performed at no additional cost to the Department. If in the opinion of the RCE, the required documentation is not provided for individual reduction factors (RF) or pullout coefficients (F^* , α), default values for these design parameters shall be used in accordance with this specification.

a. Ultimate Tensile Strength (T_{ult}):

The ultimate tensile strength, T_{ult} , shall be determined from wide width tensile tests (ASTM D 4595). Geotextile samples tested in accordance with ASTM D 4595 shall be with an 8-inch width specimen, or a 4-inch specimen width with correlation to an 8-inch width. Correlation methodology shall be submitted to, and is subject to acceptance by the RCE. All geotextile strength tests (ASTM D 4595 and ASTM D 6637) shall be conducted at a strain rate of 10% per minute based on actual gage length necessary to meet the testing sample dimension requirements. Laboratory test results documenting the ultimate tensile strength, T_{ult} , in the reinforcement direction shall be based on the minimum average roll values (MARV) for the product.

b. Long-Term (Allowable) Design Tensile Strength (T_{al}):

The allowable tensile load per unit width of geotextile soil reinforcement, T_{al} , in accordance to the backfill type used shall be computed as follows:

$$T_{al} = \frac{T_{ult}}{RF}$$

c. Reduction Factor (RF):

The total reduction factor, RF, is the combined reduction factor for long-term degradation due to installation damage, creep, and durability. The total reduction factor, RF, shall be defined as follows:

$$RF = RF_{ID} \times RF_{CR} \times RF_D \geq 3.0$$

The individual reduction factors shall be documented in accordance with the site conditions, design calculations, and specifications. When sufficient documentation is not provided for individual reduction factors, RF_{ID} , RF_{CR} , and RF_D , a reduction factor RF of 7.0 shall be used. The reinforcement manufacturer shall certify and document the individual reduction factors as follows:

d. Installation Damage Reduction Factor (RF_{ID}):

The reduction factor for installation damage, RF_{ID} , shall be documented by field and laboratory test results and literature review, as described in ASTM D 5818 for the reinforced backfill specified or for more severe soils. Samples subjected to installation damage shall be tested for tensile strength and deformation characteristics in accordance with ASTM D 4595. Recommended values for reduction factors for installation damage (RF_{ID}) for various soils shall also be documented. The minimum installation damage reduction factor, RF_{ID} , shall be 1.1, regardless of product specific test results.

e. Creep Reduction Factor (RF_{CR}):

Laboratory test results documenting creep performance over a range of load levels, for a minimum duration of 10,000 hours based on tension creep test (ASTM D 5262) shall be required. Creep test samples shall be of sufficient width to be representative of overall product creep response (fiber creep testing will not be accepted).

The creep-limiting strength, T_I , shall be based on extrapolating the 10,000 hours (or longer duration) tension creep tests to a 75-year design life, unless a 100-year design life is specified in the plans. The creep extrapolation method shall be based on methods described in FHWA NHI-10-025, "Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes" - Appendix "D". Laboratory test results and extrapolation methodology shall be documented.

The reduction factor for creep, RF_{CR} , is defined as the ratio of the average lot specific ultimate tensile strength, T_{ULTLOT} , to the creep-limiting strength, T_I . The average lot specific ultimate tensile strength, T_{ULTLOT} , for the lot of material used for creep testing, T_{ULTLOT} , shall be determined from wide width tensile test, ASTM D 4595.

f. Durability Reduction Factor (RF_D):

The total reduction factor for durability, RF_D, shall be defined as the combined effects of chemical and biological degradation. Laboratory test results, extrapolation techniques, and a comprehensive literature review shall document the reduction factor for durability for all material components in accordance with FHWA NHI-09-087, "*Corrosion / Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes*". The minimum durability reduction factor, RF_D, shall be 1.1, regardless of product specific test results.

g. Soil Reinforcement Pullout Coefficients (F*, α):

The Certification Package shall document the pullout coefficients (F*, α) meet or exceed the required coefficients necessary to obtain the T_{al} provided above where,

F* = Minimum pullout friction factor = C_i Tan Φ,

C_i = Soil interaction coefficient ≥ 0.6

Φ = Soil Angle of Internal Friction

The pullout friction factor, F*, and the scale effect correction factor, α, shall be documented by laboratory testing from pullout tests. Pullout testing shall be conducted for site-specific materials or for materials representative of the reinforced backfill at confining pressures specified by the Engineer. When laboratory tests are used from representative soils, the representative soils shall be documented by providing the soil's angle of internal friction, gradation, and coefficient of uniformity (C_u = D₆₀/D₁₀). Recommended pullout coefficients for various soil types shall also be documented. The pullout coefficients shall be determined by using the quick effective stress pullout tests ("Measuring Geosynthetic Pullout Resistance in Soil" per ASTM D 6706). The soil interaction coefficient, C_i, shall be documented when computing the pullout friction factor, F*. When sufficient documentation is not provided for pullout coefficients, F* and α, and the coefficient of uniformity, C_u, is greater or equal to 4, the default values indicated in this specification can be used. If the coefficient of uniformity of the reinforced backfill is less than 4, laboratory pullout test shall be required to determine pullout friction factor, F*, and the default scale effect factor, α.

5. Sample Approval.

To confirm that the on-site geotextile meets the property values specified, random samples shall be submitted to the RCE for evaluation. The machine direction shall be marked clearly on each sample submitted for evaluation. The machine direction is defined as the direction perpendicular to the axis of the roll.

Cut a sample from the geotextile roll with the minimum dimensions of 4 feet by the full width of the roll beyond the first wrap. The geotextile samples shall be cut from the roll with scissors, sharp knife, or other suitable method that produces a smooth edge and does not cause geotextile ripping or tearing. Submit a manufacturer's certificate of compliance signed by an authorized manufacturer's official. The certificate must attest that the geotextile meets all the Minimum Average Roll Value (MARV) requirements specified in Table 1 as evaluated under the manufacturer's quality control program. Geotextiles supplied for construction of the project shall be certified in accordance with the following criteria. The tests described in the specification shall be conducted by the manufacturer or by an approved independent testing laboratory on samples taken from the same lot number as the material actually shipped to the project and at the specified frequency. The manufacturer or independent testing laboratory shall maintain the appropriate accreditations and must be preapproved by the Department. All rolls shall be marked with individual and distinct roll numbers. All roll numbers shall have traceable certified mill test reports from the given lot that they were manufactured. These test reports must be supplied to the Department prior to installation of any geotextile materials. After the sample and the required information have been submitted to the RCE, allow 30 calendar days for evaluation.

Product acceptance is determined by comparing the average test results of all specimens within a given sample to the Minimum Average Roll Values (MARV) listed in Table 1. Install geotextiles

only after the material has been tested and/or evaluated and accepted. Replace all geotextiles installed prior to acceptance that do not meet specifications at Contractor's expense.

a. Sewn Seam Approval

If the geotextile seams are to be sewn in the field, the Contractor shall provide a section of sewn seam that can be sampled by the RCE before the geotextile is installed. The sewn seam shall be in accordance with ASTM 6193.

The seam sewn for sampling shall be sewn using the same equipment and procedures as will be used to sew the production seams. The seam sewn for sampling must be at least 6 feet in length. If the seams are sewn in the factory, the Contractor shall provide samples of the factory seam at random from any of the rolls to be used. Regardless of whether the seam is to be sewn in the factory or the field, the manufacturer and/or Contractor shall certify that the strength meets the requirement set forth in Table 1. If seams are to be sewn in both the machine and cross-machine direction, provide samples of seams from both directions. The seam assembly description shall be submitted by the Contractor to the Engineer and will be included with the seam sample obtained for testing. This description shall include the seam type, stitch type, sewing thread type(s), and stitch density.

If sewn seams are used for seaming the geotextile, use thread that consists of high strength polypropylene or polyester. Do not use nylon thread. Use thread that is of contrasting color to that of the geotextile itself.

If the manufacturer can provide a T_{al} MD that is greater than the sum of the required T_{al} MD and sewn seam breaking strength (for each specified in the project plans), the sewn seams may be eliminated and a minimum overlap of 1 foot may be used.

6. Identification, Shipment and Storage

Conform to ASTM D 4873, *Standard Guide for Identification, Storage, and Handling of Geotextiles*. Clearly label each roll of geotextile shipped to the project with the name and address of the manufacturer, full product name/number, quantity, and roll number.

The RCE will reject materials that are mislabeled or misrepresented. Wrap each roll with a material that protects the geotextile, including ends of the roll, from damage due to shipment, water, sunlight, and contaminants. Maintain the protective wrapping during periods of shipment and storage. Do not damage the geotextile or wrapping when unloading or transferring from one location to another. Do not drag the rolls.

During storage, elevate geotextile rolls off the ground and adequately cover to protect them from the following:

- a. Site construction damage;
- b. Precipitation;
- c. Ultraviolet radiation including sunlight;
- d. Chemicals that are strong acids or strong bases;
- e. Flames including welding sparks, temperatures in excess of 140 °F (60 °C); and
- f. Mud, dirt, dust, debris and any other environmental condition that may damage the physical property values of the geotextile

C. CONSTRUCTION REQUIREMENTS

1. General

Prepare the surface on which the geotextile is to be placed so that no damage occurs to the geotextile. Do not drive or operate any construction equipment directly on the geotextile. Dispose of material with defects, rips, holes, flaws, deterioration, or other damage. Do not use defective material in the work. The manufacturer shall be present on site for a minimum of two days of geotextile installation such that the manufacturer observes any field-sewn seams.

2. Installation Plan

Within thirty (30) calendar days after award of the contract or no later than thirty (30) calendar days before beginning high-strength geotextile installation, the Contractor shall submit to the Department for review a high-strength geotextile installation plan that includes as a minimum the following information:

- a. The Contractor shall certify and provide proof to the Department of experience in the work described. The Contractor shall have successfully installed at least 500,000 square yards of any geotextile that has sewn seams during the last five years. In addition, the Contractor shall have successfully completed at least five projects within the last five years of similar size and complexity to that of the Project.

The Contractor's experience shall be documented by providing a project summary that includes for each referenced project, the project start and completion dates, total quantity of geotextile installed (specifically indicate if high-strength geotextile installed), and a detailed description of the project, site conditions, and subsurface conditions. The project description shall include details of the geotextile materials, the equipment and technique used to install the geotextiles, the average and maximum area of geotextile installed, the client name and address, the name and telephone number of the representative of the consultant and owner for whom the work was performed and who can attest to the successful completion of the work, and any other information relevant to demonstrating the Contractor's qualifications.

- b. Resume of supervisor documenting experience and qualifications in the installation of both normal and high-strength geotextile. The Contractor shall have a full-time supervisor who has been in responsible charge of supervising geotextile installation operations for at least five projects in the last five years. The supervisor shall be present at the work site at all times during installation operations. The acceptability of the supervisor, as well as any replacement for the supervisor, will be subject to the approval of the Department.
- c. Shop drawings showing the planned locations and elevations of all high-strength geotextiles. The installation sequence shall also be provided including any required staging. The shop drawings shall also show the location of the bridge abutment, and the limits of the final embankment and construction staging.
- d. Detailed description of proposed installation procedures
- e. Proposed methods and equipment for sewn seams

3. Site Preparation

Prepare the installation site by clearing, grubbing, and excavating or filling the area to the design grade. This includes removal of topsoil or vegetation. The RCE will identify soft spots and unsuitable areas during site preparation. This may include but not be limited to proof-rolling specific areas defined by the RCE. Excavate these areas and backfill with approved borrow or bridge lift material and compact as specified. The area to be covered by the geotextile shall be graded to a smooth, uniform condition free from ruts, potholes, and protruding objects such as rocks or sticks.

The Contractor may construct a working platform, up to 2 feet in thickness, in lieu of grading the existing ground surface. A working platform is required where stumps or other protruding objects which cannot be removed without excessively disturbing the subgrade are present. These areas shall be prepared in accordance with the 2007 Standard Specifications for Highway Construction. The stumps shall be covered with at least 6 inches of fill before placement of the first geotextile layer.

4. Geotextile Placement

The geotextile shall be spread immediately ahead of the covering operation. The geotextile shall be laid with the machine direction perpendicular or parallel to centerline as shown in Plans. All seams shall be sewn. Seams to connect the geotextile strips end to end will not be allowed. The geotextile shall not be left exposed to sunlight during installation for a total of more than 14 calendar days. The geotextile shall be laid smooth without excessive wrinkles. Under no

circumstances shall the geotextile be dragged through mud or over sharp objects, which could damage the geotextile.

Small soil piles or the manufacturer's recommended method shall be used as needed to hold the geotextile in place until the specified cover material is placed. Remove wrinkles and folds by pulling the geotextile taut as required.

Should the geotextile be torn or punctured or the sewn joints disturbed, as evidenced by visible geotextile damage, subgrade pumping, intrusion, or roadbed distortion, the backfill around the damaged or displaced area shall be removed and the damaged area repaired or replaced by the Contractor at no expense to the Department. The repair shall consist of a patch of the same type of geotextile placed over the damaged area. The patch shall be sewn at all edges.

If geotextile seams are to be sewn in the field or at the factory, the seams shall consist of two parallel rows of stitching, or shall consist of a J-seam, Type SSn-2. The two rows of stitching shall be 1 inch apart with a tolerance of plus or minus 0.5 inches and shall not cross, except for re-stitching. The stitching shall be a lock-type stitch. The minimum seam allowance, i.e., the minimum distance from the geotextile edge to the stitch line nearest to that edge, shall be 1.5 inches if a flat or prayer seam, Type SSa-2, is used. The minimum seam allowance for all other seam types shall be 1 inches. The seam, stitch type, and the equipment used to perform the stitching shall be as recommended by the manufacturer of the geotextile and as approved by the RCE.

The seams shall be sewn in such a manner that the seam can be inspected readily by the RCE or his representative. The seam strength will be tested and shall meet the requirements stated herein.

5. Fill Placement.

Embankment construction shall be kept symmetrical at all times to prevent localized bearing capacity failures beneath the embankment or lateral tipping or sliding of the embankment. Place fill over the geotextile by dumping onto previously placed material and pushing the material into place. Stockpiling of fill on the geotextile will not be allowed. Do not operate any construction equipment directly on the geosynthetic material under any circumstances.

Place the fill material in uniform layers so that there is a minimum lift thickness (loose) of 8 inches between the geosynthetic material and equipment tires or tracks at all times. The minimum thickness of the first lift is 8 inches. Do not allow construction equipment to turn on the first lift of material above the geosynthetic material. Do not blade the first lift placed over the geosynthetic material. If the subgrade is very soft with an undrained shear strength less than 500 psf, minimize pile heights to less than 3 feet and spread piles as soon as possible after dumping to minimize the potential for localized subgrade failure due to overloading of the subgrade.

Do not use sheepsfoot or studded compaction equipment on the first lift placed over the geosynthetic material. Stop vibrator on compaction equipment if pumping occurs. Do not operate any construction equipment that results in rutting in excess of 3 inches on the first lift. If rutting exceeds 3 inches, decrease the construction equipment size and/or weight or increase the lift thickness. Use only rubber-tired rollers for compaction if any foundation failures occur when placing subsequent lifts. Compact all lifts to the moisture and density requirements for each embankment specified in the Standard Construction Specifications. Do not blade material down to remove ruts. Fill any ruts or depressions with additional material and compact to the specified density.

A sandy material that meets the requirements of an A-2 AASHTO soil classification shall be the only borrow excavation soil allowed for placement between the lowest elevation geotextile and the bottom of the pavement section. The embankment fill soils shall be compacted in accordance with the 2007 Standard Specifications for Highway Construction. Fill shall be placed in 12-inch

maximum lift thicknesses where heavy compaction equipment is to be used and 6-inch maximum uncompacted lift thicknesses where hand-operated equipment is used.

The geotextile shall be pretensioned during installation using either Method 1 or Method 2 as described herein. The method selected will depend on whether or not a mudwave forms during placement of the first one or two lifts. If a mudwave forms as fill is pushed onto the first layer of geotextile, Method 1 shall be used. Method 1 shall continue to be used until the mudwave ceases to form as fill is placed and spread. Once mudwave formation ceased, Method 2 shall be used until the uppermost geotextile layer is covered with a minimum of 1 foot of compacted fill. These special construction methods are not needed for fill construction above this level. If a mudwave does not form as fill is pushed onto the first layer of geotextile, then Method 2 shall be used initially and until the uppermost geotextile layer is covered with at least 1 foot of compacted fill.

Method 1

After the working platform, if needed, has been constructed, the first layer of geotextile shall be laid as outlined in the project plans and the joints sewn together. The geotextile shall be stretched manually to ensure that no wrinkles are present in the geotextile. The fill shall be end-dumped and spread from the edge of the geotextile. The fill shall first be place along the outside edges of the geotextile to form access roads. These access roads will serve three purposes: to lock the edges of the geotextile to form access roads, to contain the mudwave, and to provide access as needed to place fill in the center of the embankment. These access roads shall be approximately 16 feet wide. The access roads at the edges of the geotextile shall have a minimum height of 2 feet completed. Once the access roads are approximately 50 feet in length, fill shall be kept ahead of the filling operation, and the access roads shall be kept approximately 50 feet ahead of this filling operation. Keeping the mudwave ahead of this filling operation and keeping the edges of the geotextile from moving by use of the access roads will effectively pre-tension the geotextile. The geotextile shall be laid out no more than 20 feet ahead of the end of the access roads at any time to prevent overstressing of the geotextile seams.

Method 2

After the working platform, if needed, has been constructed, the first layer of geotextile shall be laid and sewn as in Method 1. The first lift of material shall be spread from the edge of the geotextile, keeping the center of the advancing fill lift ahead of the outside edges of the lift. The geotextile shall be manually pulled taut prior to fill placement. Embankment construction shall continue in this manner for subsequent lifts until the uppermost geotextile layer is completely covered with 1 foot of compacted fill.

D. METHOD OF MEASUREMENT

Measurement of geotextile is on a square yard basis and will be computed based on the total area of geotextile shown in the plans, exclusive of the area of geotextiles used in any overlaps, seams, and/or joints. This shall include all costs associated with installation of the geotextile. Overlaps and any geotextile waste are an incidental item.

E. BASIS OF PAYMENT

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the contract. Payment for the completed and accepted quantities is made under the following:

Item No.	Pay Item	Unit
2037110	GEOTEX REINF.	SY

(42) SECTION 205: VIBRATING WIRE DATA COLLECTION CENTERS:

May 24, 2013

A. DESCRIPTION

This work includes furnishing all supervision, materials, equipment, and labor, and related services necessary for providing and maintaining a Vibrating Wire Data Collection Center (VW-DCC) at the locations indicated in the plans and in accordance with these specifications. This work consists of automating the data collection for vibrating wire rod extensometers (RE), total pressure cells (TPC), and piezometers (PZ) with a real-time system that is accessible via the internet in accordance with the Department's Geotechnical Instrumentation Monitoring Plan for the entire duration of the project as determined necessary for evaluating the settlement and pressure instrumentation of the embankments being constructed.

B. VIBRATING WIRE DATA COLLECTION CENTER

The Vibrating Wire Data Collection Center (VW-DCC) is an automated centralized vibrating wire data collection center. The VW-DCC will be used to collect VWRE, TPC and PZ readings. Temperature readings shall also be collected when instrumentation contains thermistors. The automated collection of VW data shall be accomplished by using a data logging system that is sufficiently capable to monitor the VW sensors indicated in the plans and with the capability of adding four additional rod extensometers and six piezometers to the system. Sufficient ports shall be provided to also monitor temperature. The reserve instrumentation monitoring capacity can be either achieved by using a data logging system with sufficient ports or by having the capability to expand the system if needed. The Contractor shall maintain compatibility between the data logging system and the rod extensometers, total pressure cells, and piezometer instrumentation. In order to maintain compatibility of the systems and be able to get technical assistance from the manufacturer during installation and throughout the project, the VW-DCC system should be supplied / manufactured by the same company that is supplying the VWRE, TPC, and PZ instrumentation. In addition, the VW-DCC shall have the following features:

1. Data logging system with sufficient capacity to read and save instrumentation readings
2. The data logging system shall have the reserve capacity to add additional instrumentation if needed
3. Powered by on-site AC current
4. Battery power back-up with surge suppression
5. Telephone/cellular access for transmitting data through the internet
6. Dedicated server for storing and running viewing software
7. On-line instrumentation software for reviewing/downloading instrumentation data
8. Enclosure that protects the equipment from damage during construction, vandalism, and weather

Data collected via the VW-DCC shall be provided to the Department in the format outlined in the Geotechnical Instrumentation and Monitoring Plan.

C. SUBMITTALS

Within 30 calendar days before installing the VW-DCC, the Contractor shall submit to the Department for review the personnel qualification, installation plan, and monitoring plan. The submittals shall contain as a minimum the following information.

1. Qualifications:

The Contractor shall identify the geotechnical engineer that will be responsible for installing and maintaining the VW Data Collection Center. The same geotechnical engineer that is responsible for the vibrating wire REs, TPCs, and PZs will also be responsible for the VW-DCC. The geotechnical engineer's experience in providing automated data logging capabilities such as the VW-DCC in accordance with the plans and contract documents shall be documented by providing a project summary, of at least three projects, that includes for each project the project name, role in providing instrumentation services, type of data logging system, equipment used, duration of the project (i.e. dates), client name and address, name and phone number of representative of the consultant and owner for whom the work was performed and can attest to the successful completion of the work, and any other information relevant to demonstrating the

geotechnical engineer's qualifications. In addition, the manufacturer/supplier shall also be on-site during the initial installation of the VW-DCC to ascertain that all instruments have been connected correctly. The manufacturer/supplier shall also be available for questions from either the geotechnical engineer responsible for maintaining the VW-DCC or from the Department concerning the data being collected.

2. Installation Plan:

- a. The installation plan shall include as a minimum the following information:
- b. The Contractor shall submit the Specification sheet for the proposed VW-DCC system for review and approval by the Engineer
- c. Submit locations where VW-DCC will be installed
- d. Proposed installation method
- e. Proposed method to protect VW-DCC during construction from construction equipment, vandalism, weather

3. Submittal Reviews:

Approval of the personnel qualification and installation plan by the Department shall not relieve the Contractor of its responsibility to successfully install the VW REs, TPCs, and PZs and monitor this instrumentation with VW-DCC in accordance with the plans and specifications. Approval by the Department of the VW-DCC installation plan shall be contingent upon satisfactory demonstration that the VW-DCC is meeting the objectives of the Department's Geotechnical Instrumentation Monitoring Plan. If, at any time, the Department or the Engineer considers that the VW-DCC does not produce satisfactory results, the Contractor shall alter the method and/or equipment as necessary to comply with the Special Provisions and Department's Instrumentation Plan. The Department will be the sole judge in determining the adequacy of the Contractor's VW-DCC.

D. DELIVERY, STORAGE, AND HANDLING

The Contractor shall check all materials and equipment upon delivery to ensure that the proper items are received and are not damaged. All materials shall be stored and maintained in a clean, uncontaminated condition throughout the course of the project. Upon receipt of the VW-DCC, the Contractor shall submit copies of the manufacture's installation and instruction manual for review and approval by the Engineer, and shall make available the data logging system for inspection by the Engineer.

E. ABANDONMENT OF VW-DCC

Once the Engineer has determined that VW-DCC systems have served their purpose and are no longer needed, the VW-DCC shall be abandoned by removing all equipment and signal wires a minimum of 2 feet of ground surface.

F. METHOD OF MEASUREMENT

The number of VW-DCC provided in the plans, will be paid for at the contract unit price bid for "Vibrating Wire Data Collection Center" which shall include, but not limited to, all labor, materials, and equipment necessary to install a vibrating wire data collection center along with data as outlined in the Geotechnical Instrumentation and Monitoring Plan. Payment will not be made for VW-DCC that malfunction or are rejected for their inability to perform, or do not meet the requirements in the plans and these specifications.

G. BASIS OF PAYMENT

The price and payment for this work shall be full compensation for furnishing the necessary data logging system, enclosure, protection from vandalism and construction equipment, data as outlined in the Geotechnical Instrumentation and Monitoring Plan, and incidental items based on the successful implementation of the VW-DCC system.

Payments shall be made under:

Item No.	Pay Item	Pay Unit
8990440	VW DATA COLLECTION CENTER	EA

(43) SECTION 205: VIBRO COMPACTION:

June 27, 2013

A. DESCRIPTION

This section presents administrative and procedural requirements for ground modification by Vibro-Compaction (VC). Vibro-compaction shall be implemented in and below the existing embankment fill material of both the beginning of bridge approach embankment and the end of bridge approach embankment. VC shall be provided as documented in the plans. The purpose of the vibro-compaction program is to densify the granular soils at the specified locations and depths to mitigate liquefaction potential.

The Contractor shall perform layouts and measurements for VC work. VC points may be surveyed in or located by measuring offsets from surveyed points (e.g., project stations) using a tape measure.

The Contractor shall notify the Engineer a minimum of 48 hours prior to commencement of the VC operations at each approach embankment location.

Any change in the predetermined VC program necessitated by a change in the field conditions shall be immediately reported and submitted to the Geotechnical Engineer. Upon completion of the work, the Contractor shall submit a drawing of as-built locations of vibro-compacted columns.

B. REFERENCES

The Geotechnical Engineer will coordinate all testing to determine compliance with the project design.

1. Applicable Standards: The most recent version of the following testing methods or standards shall be employed:
 - a. ASTM D1586 "Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils"
 - b. ASTM D5778 "Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils" (CPT)
 - c. ASTM D6635 "Standard Test Method for Performing the Flat Plate Dilatometer" (DMT)
2. Reference Documents: Reference documents to be used by the Contractor shall include:
 - a. This specification
 - b. Attached plans
 - c. Project geotechnical report prepared by the Geotechnical Engineer.

Prior to commencing work, the contractor shall examine the site, drawings, records of existing utilities and other existing subsurface structures, and soil test boring logs made available in the original bid documents and those performed by the Geotechnical Engineer to help determine VC installation conditions.

C. SUBMITTALS

This section details all submittals required prior to field work, at completion of the test section, during production work, and after the work is completed.

1. Pre-Field Work Submittals: The following shall be submitted to the SCDOT by the Geotechnical Engineer prior to the start of the work. VC operations may not commence until approval by the SCDOT is granted.

- a. A Work Plan prepared by the Contractor for the production work outlining the anticipated spacing, location and depth to achieve the project design criteria.
 - b. Drawing(s) for review, indicating the spacing, location, and depth of the VC probes to achieve the project design criteria.
2. Post Test Section and Pre Production Work:
 - a. Results of the test section evaluation.
 - b. A revised work plan and VC layout should the test section results require a modification to the original work and production plans.
 3. During Production Submittals: The following shall be submitted to the SCDOT by the Geotechnical Engineer during the work:
 - a. Any change in the predetermined VC program necessitated by a change in the field conditions.
 4. Closeout Submittal: The following shall be submitted to the SCDOT by the Geotechnical Engineer within 14 days of the completion of the VC work.
 - a. As built drawings: Drawings documenting any significant changes to the shop drawing. If no changes are noted, then no as-built drawings are necessary following completion of the VC program.

D. EQUIPMENT AND MATERIALS

The Contractor shall supply equipment in good operating condition capable of performing the work specified herein. The Contractor shall use equipment capable of efficiently accomplishing the required soil densification. The probe shall have durable markings on one foot intervals allowing a visual determination of the depth of penetration when in use. The probe shall be of sufficient length to extend a minimum depth of thirty (30) feet below existing grade.

The VC procedure is not intended to be a ‘wet’ operation. Water shall be used sparingly to mitigate clogging of the VC equipment.

Settlement resulting from the VC operations is anticipated. Any required fill placement in the resulting deformations required to meet the design grade(s) shall meet the requirements outlined in the *Special Provision 40 – Section 203: Borrow Excavation* provided in the bid documents.

Groundwater is anticipated to emerge to the ground surface during VC operations. The Contractor shall implement Best Management Practices (BMP’s) to efficiently control surface groundwater runoff in accordance with the contract documents.

E. CONSTRUCTION

Production VC criteria shall be as follows:

1. Depth of treatment: The probe tip shall penetrate to the minimum elevation specified in the above referenced documents and submittals.
2. Locations/Spacing: The center to center probe spacing shall adhere to the requirements in the above referenced documents and submittals. Probes shall be performed within 12 inches of the planned location
3. Limits of work: The limits of the VC work are shown on the drawings described in the above referenced documents and submittals.

F. QUALITY CONTROL

The details of the quality control program are as follows:

1. Technical Oversight: All VC operations shall be performed under the inspection of the Geotechnical Engineer’s representative.

2. Monitoring and Logging: Monitoring and logging of all VC operations for the test area and production work shall be done by the Contractor.
3. Test Section: The Geotechnical Engineer's representative shall monitor the performance of the test section and perform the testing indicated below:
 - a. A test section shall be performed before production work, as follows:
 - 1) The test section location shall be agreed upon by the Geotechnical Engineer and the Contractor within the treatment area. The test section will consist of a minimum of twelve (12) VC points in three (3) rows of four (4) points each. For preliminary design considerations, the vibro-densification program will utilize a five (5) foot triangular grid for the indicated treatment area(s).
 - 2) The method of installation, materials, equipment, and procedures shall be the same as those to be used for production work.
 - 3) Based on the results from the test section, modifications to the Work Plan may be implemented, as needed, to meet the project design. Any changes to the Work Plan will be submitted to the SCDOT following completion of the test program.
 - b. The Geotechnical Engineer shall coordinate the following tests of the test section after a minimum wait period of four (4) days from completion of the VC activities of the test program: One (1) CPT (or SPT) test performed at the center of a VC probe location, and one (1) CPT (or SPT) test performed at the midpoint of adjacent VC probe locations.
 - c. The primary method for determining the post-treatment soil strength parameters for production VC work will be from the phi angle correlations in Chapter 7 of the SCDOT Geotechnical Design Manual. These equations are based on either the blow counts as determined from the SPT test, the cone tip resistance as determined from the CPT test, or the horizontal stress index as determined from the DMT test.
 - d. The production VC criteria will be based on a minimum applied relative energy for a given time rate. Following completion of the test program, the Geotechnical Engineer will establish criteria for the production VC work.
4. Daily Records: Monitoring and logging of VC operations for the test area and production work shall be performed by the Contractor. At a minimum, the following information shall be collected for each VC probe location:
 - a. Equipment details and specifications
 - b. Embankment location
 - c. Probe ID (i.e. A-27)
 - d. Start and finish time
 - e. Maximum recorded energy reading
 - f. Depth of treatment
 - g. Comments or unusual observations

A sample monitoring log for the VC work is provided with this specification.
5. Monitoring of Existing Structures: There are no structures within 500 feet of the planned VC work, and, therefore, a vibration monitoring program is not required for the VC work
6. The Contractor shall ensure that procedures and documentation conform to these specifications.

G. METHOD OF MEASUREMENT

The acceptance of the VC work shall be solely based on the results from the pre-treatment test program outlined in this specification. The Geotechnical Engineer shall provide to the SCDOT a signed and sealed statement that the soil improvement conforms to requirements of the project design.

H. RESTRICTIONS

The Contractor shall be responsible for obtaining the necessary State and municipal permits for the intended construction. The Contractor shall be responsible for the precise delineation of all above and below ground utilities and obstructions and shall accurately mark their layout at the site. The following shall also be listed within this section when applicable:

1. Environmental restrictions
2. Work boundaries
3. Hours and days available for construction

(44) SECTION 205: DEEP SOIL MIXING (DSM):

September 22, 2011

A. DESCRIPTION

This work shall consist of using deep soil mixing (DSM) construction techniques (also known as deep mixing methods, DMM) to improve weak subsurface soils by mixing a binder material with in-situ soil to produce a DSM column composed of a soil-binder mixture that has increased compressive strength and stiffness properties compared to the original in-situ soil properties. A column is defined as the extent that the existing ground is improved by insertion and removal of the mixing tool to the full improvement depth required in the plans. DSM column mixing methods allowed are described in subsection A.1 and DSM column spacing requirements are described in subsection A.2. The purpose for constructing DSM columns is to improve weak subsurface soils in order to stabilize and/or improve performance of existing ground prior to constructing bridge foundations, embankments, mechanically stabilized earth (MSE) walls, retaining walls, and other transportation structures or facilities as specified herein and shown on the plans and contract documents. References listed in subsection A.3 may be used in these special provisions and will be used to evaluate this work.

The work covered by this specification includes furnishing all necessary plant, labor, equipment, geotechnical subsurface investigation, pre-production laboratory testing, test section(s), surcharges/berms constructed at the DSM improved locations (if shown in the plans or required to meet DSM column performance requirements), in-situ testing, sampling/coring, QA/QC testing, reporting, and other work described below. The Contractor shall be familiar with project geotechnical conditions and recognize that geotechnical data is available with geotechnical boring logs, laboratory testing results, and other pertinent information.

1. DSM Mixing Methods:

This special provision contains specifications for construction of DSM columns by either the wet or dry mechanical mixing method. The Contractor shall use the DSM mechanical mixing method specified in the plans unless other methods are approved in writing by the Engineer. DSM column mixing method for the wet and dry mixing methods are defined as follows:

- a. **Wet Method:** The wet method consist of mixing a binder in slurry form (i.e. cement grout) with existing soils using auger-type equipment (paddles, augers, and other rigid mixing tools), without use of externally directed high pressure jets, to form a DSM column consisting of a homogeneous mixture of cement grout and in-situ soils. The wet mixing method typically produces spoils in the range of 10 to 60 percent of the treated volume. A soil-cement column formed by the wet mixing method is abbreviated herein as DSM-SCC).
- b. **Dry Method:** The dry method consists of mixing dry binders (i.e. lime-cement or cement) into the in-situ soils. The dry binder is injected into the soil by using air pressure. The mixing tool blends the binder material with the in-situ soil and water to form a DSM column of a homogeneous mixture of binder materials and in-situ soils. The dry mixing method typically produces spoils less than 10 percent of the treated volume. A DSM column (lime-cement or cement) formed by the dry mixing method is abbreviated herein as DSM-LCC.

2. DSM Column Spacing:

The DSM columns shall be spaced and arranged as indicated on the plans or as otherwise directed by the Engineer. DSM columns can be constructed by using group column spacing or by using block column spacing as described below:

- a. **Group Column Spacing (GCS):** DSM group column spacing (GCS) consists of constructing a single column (no overlap with adjacent DSM columns) with a diameter of 20 to 36 inches or as required in the plans. The DSM columns group spacing is defined in the plans by specifying a pattern (i.e. triangular, grid, etc.) and center-to-center spacing between DSM columns.
- b. **Block Column Spacing (BCS):** DSM block columns spacing (BCS) consists of constructing an improved soil zone with DSM columns overlapping adjacent DSM columns. Since the improved soil zone is continuous, the size of the DSM column is not specified in the plans to accommodate variations in the Contractor's equipment dimensions. As a result of Contractor equipment variations in size, any variations in the dimensions of the zone of ground improvement shown in the plans will require written approval by the Engineer. The center-to-center spacing shall be determined by the Contractor based on the DSM construction equipment in order to provide continuous overlapped DSM columns in accordance with the plans and specifications. Continuous column spacing may be achieved by the use of DSM equipment capable of constructing multiple columns simultaneously. The DSM column overlap distance between adjacent DSM columns shall be a minimum of 20 percent of the DSM column diameter or as approved by the Engineer. The DSM column center-to-center spacing between adjacent columns shall be defined as the DSM column diameter minus the column overlap distance.

3. References:

The evaluation of this work, including the DSM Installation Plan, test section(s), QC testing, and QA testing will be based on, but not limited to, the following references:

- a. Bruce, D.A. (2000). "An Introduction to the Deep Soil Mixing Methods as Used in Geotechnical Applications, Volume I," FHWA-RD-99-138.
- b. Bruce, D.A. (2000). "An Introduction to the Deep Soil Mixing Methods as Used in Geotechnical Applications, Volume II: Appendices," FHWA-RD-99-149.
- c. Bruce, D.A. (2001). "An Introduction to the Deep Mixing Methods as Used in Geotechnical Applications, Volume III: The Verification and Properties of treated Ground," FHWA-RD-99-167.
- d. Elias, V., Welsh, J., Warren, J., Lukas, R., Collin, J.G., and Berg, R.R., (2006). "Ground Improvement Methods," Volumes I and II, FHWA NHI-06-019 and FHWA NHI-06-020, US Dept. of Transportation, Federal Highway Administration.
- e. Filz, G. M., Hodges, D. E., Weatherby, D. E., and Marr, W. A. (2005). "Standardized Definitions and Laboratory Procedures for Soil-Cement Specimens Applicable to the Wet Method of Deep Mixing." *Innovations in Grouting and Soil Improvement*, Reston, Virginia, 13.
- f. Filz, G. M. and Stewart, M. E. (2005). "Design of Bridging Layers in Geosynthetic-Reinforced, Column-Supported Embankments." Virginia Transportation Research Council, Charlottesville, VA
- g. Jacobson, J. R., Filz, G. M., and Mitchell, J. K. (2003). "Factors Affecting Strength Gain in Lime-Cement Columns and Development of a Laboratory Testing Procedure," Report prepared for the Virginia Transportation Research Council, Virginia Polytechnic Institute and State University, Report No. 57565, FHWA/VTRC 03-CR16.
- h. Jacobson, J. R., Filz, G. M., and Mitchell, J. K. (2005). "Factors Affecting Strength of Lime-Cement Columns Based on a Laboratory Study of Three Organic Soils." Deep Mixing'05: International conference on deep mixing best practice and recent advances.
- i. Larsson, S. (2005a). "State of Practice Report – Execution, monitoring and quality control," Volume 2, Deep Mixing '05: International Conference on Deep Mixing Best Practice and Recent Advances.

- j. Larsson, S. (2005b). "On the use of CPT for quality assessment of lime-cement columns." Deep Mixing '05: International Conference on Deep Mixing Best Practice and Recent Advances.
- k. McGinn, A. J. and O'Rourke, T. D. (2003). "Performance of deep mixing methods at Fort Point Channel." Cornell University.

B. MATERIALS

1. Wet Method (DSM-SCC):

Cement: Portland cement shall be low alkali Type II conforming to Section 701.2.1 and ASTM C150. Slag cement shall conform to Section 701.2.3 and ASTM C 989. All cement shall be homogeneous in composition and properties, and shall be manufactured using the same methods at one plant by one supplier. Tricalcium aluminate content shall not exceed 7 percent.

Water: Water shall conform to the requirements of Section 701.2.11.

Admixtures: Cement admixtures will not be allowed without written approval by the Engineer. Cement admixtures are ingredients that are used to permit efficient use of materials and proper workability of the binder material being mixed into the in-situ soils. The Contractor is required to submit any proposed admixtures and their intended effect when the binder mix design is submitted for approval by the Engineer.

Cement Grout: The cement grout shall be a stable homogeneous mixture of cement, admixtures (if approved), and water in proportions determined by the results of the test section and approved by the Engineer. The cement grout is mixed with the in-situ soils to form DSM-SCC columns.

Soil-Cement Mixture: The DSM column shall be composed of a stable and uniform soil-cement mixture of cement grout and in-situ soil that meets the project compressive strength and other requirements in the plans and these special provisions. The proposed ratios of concrete grout to in-situ soils and quantities of various components shall be determined by the results of the test section and approved by the Engineer.

2. Dry Method (DSM-LCC):

Cement: Portland cement shall be low alkali Type II conforming to Section 701.2.1 and ASTM C150. Slag cement shall conform to Section 701.2.3 and ASTM C 989. All cement shall be homogeneous in composition and properties, and shall be manufactured using the same methods at one plant by one supplier. Tricalcium aluminate content shall not exceed 7 percent.

Quick Lime: Quick lime shall have at least 99 percent passing the #8 sieve (3.18 mm) and at least 90 percent passing a No. 12 Sieve (2.12 mm), an active CaO content greater than 80% and a floatability of 70.

Premixed Lime-Cement: If a premixed quick lime and cement is to be used, the manufacturer of the mixture must certify that the proportions of lime and cement provided are in accordance with the design requirements developed from the test section and approved by the Engineer.

Admixtures: Cement admixtures will not be allowed without written approval by the Engineer. Cement admixtures are ingredients that are used to permit efficient use of materials and proper workability of the binder material being mixed into the in-situ soils. The Contractor is required to submit any proposed admixtures and their intended effect when the binder mix design is submitted for approval by the Engineer.

Binder: The binder will be a stable homogeneous mixture of cement, lime (if applicable), and admixtures (if approved), in proportions determined by the results of the test section and approved by the Engineer. The binder material is delivered using air pressure and is mixed with the in-situ soils to form DSM-LCC columns.

Soil-Binder Mixture: The DSM column will be composed of a stable and uniform soil-binder mixture that meets the project design requirements and these special provisions. The proposed ratios of binder material to in-situ soils and quantities of various components shall be determined by the results of the test section and approved by the Engineer.

C. SUBMITTALS

A minimum of 45 calendar days prior to beginning the DSM work, the Contractor shall submit a DSM Construction Plan and Shop Plans/Working Drawings for review and approval by the Engineer. The DSM Construction Plan and Shop Plans/Working Drawings shall be prepared, signed, and sealed by an agent/representative of the DSM Contractor that is a professional engineer licensed in the State of South Carolina. The Contractor shall not commence DSM installation without the approval of all submittals by the Engineer. Approval by the Engineer will not relieve the Contractor of its responsibilities to provide materials and equipment necessary to install DSM columns in accordance with the plans and specifications. If, at any time, the Engineer considers that the Contractor's installation operation does not produce a satisfactory DSM column, the Contractor shall alter its method and/or equipment as necessary to comply with the plans and specifications at no additional cost to the Department.

The Contractor shall submit 8 sets of the DSM Construction Plan and 8 sets of Shop Plans/Working Drawings to the Preconstruction Support Engineer (PSE) for review in accordance with the requirements provided herein. Send DSM Construction Plan and Shop Plans/Working Drawings for projects designed for the Department by a design consultant directly to the consultant. For DSM Construction Plan and Shop Plans/Working Drawings sent to the PSE, send a copy of the transmittal letter to the BCE, the OMR, and the RCE. For Shop Plans sent directly to a design consultant, send a copy of the transmittal letter to the PSE, the BCE, the OMR, and the RCE. Obtain the necessary mailing information at the Preconstruction Conference.

1. DSM Construction Plan:

The DSM Construction Plan shall document and provide, as a minimum, the following information:

- a. *Qualifications:* Evidence of six years of accumulated experience over a period of 10 years and competence to construct the required DSM columns by the mixing method (i.e. wet or dry) required for the project shall be submitted. As a minimum, the Contractor shall submit a detailed description of three DSM projects completed using the required mixing method within the previous six years that demonstrate the Contractor's experience and competence. Jet grouting or penetration grouting projects will not be acceptable as representative of DSM construction techniques. Each DSM project submitted as proof of experience and competence shall have a minimum total treatment volume of not less than 20 percent of the DSM treatment volume for this project or 30,000 cubic yards of DSM treatment volume, whichever is greater, in high plasticity clay, sand, and silt. At least two of the submitted DSM projects using the required mixing method shall have average treatment depths greater than 60 feet. Each DSM project submitted shall have the following information:
 - 1) Project name, location, and completion date
 - 2) Current contact information (address, phone number, and email) of project owner, designer, geotechnical consultant, and contract manager
 - 3) Surface and subsurface conditions, and strength (average, ranges, and means used to determine strength) of DSM columns installed
 - 4) Minimum, maximum, and average rates of DSM installation
 - 5) Project cost and duration of DSM installation
 - 6) Average depths and ranges of depths of DSM columns installed. Provide total linear footage and volume (cubic yards) of DSM columns installed
 - 7) Percent of project total based on QA/QC testing that met the project Acceptance Criteria and percent of project total based on QA/QC testing that required remediation techniques after initial DSM installation

The Contractor shall also submit a list of completed ground improvement projects where they performed DSM column construction techniques over the past six years that includes items “a” and “e” listed above, type of DSM mixing, and DSM quantity constructed (similar to item “f” above).

The Contractor's proposed DSM superintendent shall have a minimum of three years of accumulated experience with DSM construction equipment and construction management within the past six years. The DSM superintendent shall have been employed by the Contractor for the most recent three years. The proposed DSM superintendent shall have been superintendent for the Contractor on at least one of the three DSM projects submitted by the Contractor as evidence of their experience. Experience and training records shall be submitted for proposed DSM superintendent and operators of construction equipment. Any changes in DSM construction personnel shall require submittal of qualifications for approval.

The Independent Testing Laboratory shall have at least 5-years' experience as a materials testing laboratory, including the performance of testing comparable to that required herein. The person in charge of the testing work for the Independent Testing Firm shall be a Professional Civil Engineer, registered in the State of South Carolina. The Independent Testing Laboratory's supervisor and each field representative who will take samples in the field shall have at least 5-years' experience in taking concrete samples in the field and performing compressive strength tests in accordance with AASHTO requirements, and be accredited as required by SCDOT to obtain and form concrete test cylinders. The persons who will perform laboratory testing shall have at least 2-years' experience in performing the soil tests required herein.

- b. *Protection of Utilities:* Location of all subsurface utilities in the area and the plan to protect them in place if the utilities are not being relocated out of the affected area.
- c. *Construction Schedule:* A construction schedule for the DSM work identifying start dates and durations for all portions of the work, including equipment mobilization, equipment setup, test section(s) construction, production DSM construction at each location, and QC testing.
- d. *DSM Mixing Method:* Provide the type of mixing method (Wet or Dry) that will be used in accordance with the plan documents to construct the DSM columns in accordance with the plans and these specifications.
- e. *Equipment and Procedures:* A detailed description of the equipment (include catalog cut sheets of equipment dimensions) and procedures to be used during all facets of the project including, but not limited to the conduct of the following:
 - 1) Test section(s)
 - 2) Site preparation
 - 3) Stage construction of DSM test section(s) and production DSM (if required)
 - 4) Locating the DSM columns in the field
 - 5) DSM spoil containment, handling, and disposal
 - 6) Confirming method to check that the DSM are installed plumb
 - 7) Quality control program
 - 8) Monitoring quality control parameters
 - 9) Sample collecting for laboratory confirmation testing
- f. *DSM Test Section Subsurface Information and Location:* Submit the probe testing results used to pre-approve the location of the test section(s). Provide a minimum of two probe test at each test section in accordance with Section H.2 for review and approval by the Engineer of the proposed location of the test section(s). Pre-approval of the test section location(s) shall be required before commencing Pre-production field and laboratory testing (Section D). Probe testing shall be conducted to the production DSM depths plus 10 feet that the test section represents. Indicate on a plan drawing the location of the test section(s), dimensions and layout of the test section(s), number of DSM columns (include designation of each DSM column), and location of probe testing performed (Section H.2). This information should be

included in this submittal even if submitted previously during pre-approval of DSM test section location(s).

- g. *Pre-Production DSM Binder Mix Design Report*: Final report of pre-production laboratory and field testing used to develop proposed wet or dry binder mix design for the construction of the test section(s). The pre-production laboratory and field testing shall conform to Section D of this special provision.
- h. *Cement and Cement Grout Mix Design (Wet Mixing Method, DSM-SCC)*: Proposed cement and cement grout mix design when DSM columns are constructed using the wet mixing method (DSM-SCC). The design shall include the following:
 - 1) Cement type and Cement manufacturer's certificate of compliance.
 - 2) Cement grout water-cement ratio, by weight. Include details to fully describe and illustrate the methods for grout proportioning to achieve the design mix.
 - 3) Cement Factor (also known as Residual Cement Factor) which is the amount of cement, dry weight in pounds, that remains in the ground after mixing, per cubic yard of in-situ soil-cement.

These mix design parameters will be reviewed based on the pre-production field and laboratory testing results developed in accordance with Section D. The acceptance of the proposed grout mix/soil/cement mix design shall be contingent on the test section(s) results meeting the acceptance criteria of Section K. The Contractor may propose to expand the size of the test section to demonstrate that somewhat different grout water/cement ratio and/or cement factor is workable in achieving the required soil-cement strength under actual in-situ conditions. Provide documentation of calibration of the mixing plant.

- i. *Binder Mix Design (Dry Mixing Method, DSM-LCC)*: Proposed binder mix design(s) when DSM columns are constructed using the dry mixing method (DSM-LCC). Binder mix design shall include all materials, quantities, and dosages required to achieve the Acceptance Criteria (Section K). The design shall include the following:
 - 1) Cement type and Cement manufacturer's certificate of compliance
 - 2) Quick lime (if used) manufacturer's certificate of compliance
 - 3) Pre-mixed lime-cement (if used) manufacturer's certificate of compliance
 - 4) Binder mix dosage of each material in the binder mix per volume
 - 5) Proportion of binder material to soil in the soil-binder mixture

These mix design parameters will be reviewed based on the pre-production field and laboratory testing results developed in accordance with section D. The acceptance of the proposed binder and soil/binder mix design shall be contingent on the test section(s) results meeting the acceptance criteria of section K. The Contractor may propose to expand the size of the test section to demonstrate that somewhat different binder mix design is workable in achieving the required soil-binder strength under actual in-situ conditions. Provide documentation of calibration of the mixing plant.

- j. *Independent Laboratory Testing*: Identification of all independent AASHTO certified materials laboratory testing facilities that will be used on the project and the type laboratory testing that will be conducted at each laboratory. All laboratory testing shall be performed at a materials laboratory with current AASHTO certification for the type of test being conducted. A single independent AASHTO certified materials testing laboratory shall be used to conduct all of the compressive strength testing that will be performed on the project.
- k. *Calibrations*: Calibration tests for all metering equipment, including mixing systems, delivery systems, alignment systems, mixing tool rotational and vertical speed, injection pressure, rotation penetration/extraction rates, etc. that are applicable to the mixing method being used on the project.
- l. *Surcharges/Berms*: Details of any surcharges/berms being constructed as indicated in the plans or required to obtain DSM column performance in accordance with plans and specifications. Provide a description of materials used (soil type, Atterberg limits, moisture

content, etc.), location, and removal schedule (if required). Surcharges that are required to obtain DSM column performance and are not shown in the plans shall be constructed after being approved by the Engineer and at no additional cost to the Department.

- m. *Runoff and Spoil Containment (Wet Mixing Method Only)*: Details of all run-off and spoil containment structures will be required when DSM columns are constructed using the wet mixing method (DSM-SCC). These structures will be used to prevent the migration of either cement grout or soil-cement return spoils, disturbed in-situ soils, or other soil material beyond the immediate limits of the soil-cement mixing operation. Also provide description of processes and procedures to be used to collect and retain the soil-cement return and other spoil materials in such manner to allow the spoils to solidify for the necessary time to become a hardened material resembling a hard, dry cohesive material. The resulting hardened spoils shall be disposed of off-site, at no additional cost to the Department.
- n. *Daily Production Control Report and Installation Log*: Provide a sample report and installation log in paper and electronic format that will be used to record the construction of all production DSM columns for the required mixing method. The Daily Production Control Report/Log shall contain at least the following information:
- 1) Project Name
 - 2) DSM column number and reference drawing number
 - 3) Date
 - 4) Name of DSM Superintendent and equipment operator
 - 5) Start/Finish time of DSM column installation
 - 6) Machine/Rig Number
 - 7) Type of mixing tool and indicate if single or multiple columns formed per stroke
 - 8) DSM column(s) diameter/size
 - 9) DSM column(s) total length (include top and bottom elevations)
 - 10) DSM column center-to-center spacing from adjacent DSM column
 - 11) Verticality of mixing tool in two orthogonal planes for each DSM column
 - 12) Binder mix design designation used
 - 13) A description of obstructions, interruptions, DSM column construction out of tolerance or other difficulties encountered during installation of DSM column and how they were resolved
 - 14) *Material Certifications*: Supplier's certifications of binder materials quality and other additives, if used

Wet Mixing Method (DSM-SCC) reports shall include the following:

- 1) Final current draw for the drilling equipment at the bottom 2 feet of penetration or final hydraulic pressure, if hydraulic motors are used to turn the mixing tools
- 2) Grout injection pressure and volume
- 3) Estimate of spoil volume
- 4) Target and actual cement factors and grout specific gravity measurements per DSM-SCC column
- 5) Date, time, plan location, and elevation and other details of all soil-cement wet grab samples and any other samples taken during work shift
- 6) The following information shall be logged using automated computer technology for each DSM-SCC installed at intervals no greater than 4 feet and presented in table and graphical forms:
 - e) Elevation in feet
 - f) Mixing tool rotation penetration and withdrawal speed in revolutions per minute vs. depth in feet
 - g) Mixing tool rotation penetration and withdrawal rates in feet per minute vs. depth in feet
 - h) Mixing tool withdrawal rate in mm/revolution vs. depth in feet
 - i) Grout injection rate in gallons per minute vs. depth in feet

- j) Average quantity of grout injected in gallons per foot injected per vertical foot of DSM-SCC vs. depth in feet

Dry Mixing Method (DSM-LCC) reports shall include the following:

- 1) Installation air pressure at tip and top of the lime-cement column
- 2) Target and actual binder dosage mixed per DSM-LCC column
- 3) The following information shall be logged using automated computer technology for each DSM-LCC installed at intervals no greater than 4 feet and presented in table and graphical forms:
 - a) Elevation in feet
 - b) Mixing tool rotation penetration and withdrawal speed in revolutions per minute vs. depth in feet
 - c) Mixing tool rotation penetration and withdrawal rates in feet per minute vs. depth in feet
 - d) Mixing tool withdrawal rate in mm/revolution vs. depth in feet
 - e) Quantity of binder reagent (i.e. quick lime, cement, and admixtures) injected in kg/ft
 - f) Average binder reagent injected in kg per foot injected per vertical foot of DSM-LCC vs. depth in feet.

2. Shop Plan/Working Drawing:

The Shop Plan/Working Drawing shall contain the location and extent of all production DSM columns that will be constructed as indicated in the plans. Indicate DSM column spacing and overlap dimensions, including overall dimensions of ground improvement area. Provide the production DSM column numbering system/identification for each location where DSM columns will be constructed. Provide the sequence of DSM column construction that will be used to minimize the effects of ground movements on adjacent existing structures (i.e. MSE walls). The Shop Plan/Working Drawing shall be prepared, signed, and sealed by a professional engineer licensed in the State of South Carolina.

D. PRE-PRODUCTION FIELD AND LABORATORY TESTING

A pre-production field and laboratory testing program will be required to develop the proposed DSM wet or dry binder mix design prior to the construction of the test section(s). The field testing program consists of conducting a geotechnical subsurface investigation in accordance with subsection D.1 of this special provision. Soil samples obtained from the geotechnical subsurface investigation shall be used to develop and conduct the pre-production laboratory testing. The pre-production laboratory testing will be required to establish a "base line" of the degree of ground improvement that is possible under optimal construction circumstances for various DSM binder mixes for each distinct soil type that will be encountered during the conduct of the DSM ground improvement. It is recognized that the pre-production laboratory testing will be used as a general indicator of ground improvement that may be obtained in-situ because of substantial differences inherent between laboratory and in-situ mixing conditions. The Contractor shall take appropriate account of these differences, based on published documents and the Contractor's experience, to develop a DSM binder mix design that can be used for constructing the test section(s) based on the results of the pre-production laboratory testing. A pre-production laboratory testing program shall be required for each test section. A DSM binder mix design shall be developed for each major soil type encountered throughout the depth of ground improvement. As a minimum, two binder mix designs for two types of soil shall be required per test section. The minimum pre-production laboratory testing requirements for wet and dry mixing methods are provided in subsections D.2 and D.3 of this special provision, respectively.

The Contractor shall submit the geotechnical subsurface investigation plan of the proposed field sampling and laboratory testing to the Engineer for review and approval a minimum of 14 calendar days prior to commencing the geotechnical subsurface investigation. The Contractor shall submit the results of the geotechnical subsurface investigation and the pre-production laboratory testing plan to the Engineer for review and approval a minimum of 14 calendar days prior to commencing the pre-production laboratory testing. The results of the pre-production field and laboratory testing along with the proposed DSM binder mix designs shall be included in the DSM Installation Plan submittal in accordance with section C.

1. **Geotechnical Subsurface Investigation:**

In-situ soils used for the pre-production laboratory testing shall be obtained from additional subsurface investigation conducted at or near the location of the approved test section(s) locations. The Contractor shall retain the services of a geotechnical consultant to drill several 3-inch continuously sampled soil borings to obtain sufficient material to perform the pre-production laboratory testing. The sampling shall be performed in such a manner that provides continuous, representative samples of the soil column. This can be effectively accomplished via Geo-probe sampling techniques, undisturbed sampling in fine-grained soils, split-spoon sampling, or any other sampling technique proposed by the Contractor and approved by the Engineer.

Contractor shall check for utility conflicts at boring locations with appropriate utility agencies, survey boring locations and survey locations tied to the project baseline alignment. The borings shall extend from the ground surface to the bottom elevation of the DSM columns shown in the plans to establish general soil and groundwater conditions in the vicinity of the work prior to construction of the test section(s). The geotechnical investigation shall be done in conformance with the latest version of the SCDOT Geotechnical Design Manual (GDM). SCDOT practices including but not limited to boring logs and laboratory data reporting shall be used. The geotechnical consultant shall classify and record soil types within 7 days of obtaining the samples in the field. The Geotechnical consultant shall perform laboratory testing on representative samples of the entire soil profile that will be subject to ground improvement. As a minimum, test six representative samples of cohesive soils taken from different locations and four representative samples of cohesionless soils taken from different locations. The laboratory testing, as a minimum, will consist of the following:

- a. Cohesive and organic soils (i.e. peat) will be subject to laboratory tests that include, but not be limited to, moisture content, Atterberg limits, organic content, and unconfined compression tests.
- b. Cohesionless soils will be subject to laboratory tests that include, but not be limited to, grain size analysis, fraction passing #200 sieve, Atterberg Limits, and moisture content.

All soil samples to be used for the pre-production laboratory testing shall be stored in a manner that prevents any loss of moisture and in accordance with ASTM. Do not allow field samples of the clay to lose moisture between the time of removal from ground and pre-production laboratory mixing/testing.

2. **Pre-Production Laboratory Testing.**

Pre-Production laboratory testing will require the development of a DSM binder mix testing program for each type of soil where ground improvement will be performed to demonstrate that the required 28-day compressive strength indicated in the plans will be achieved. The soils obtained from the geotechnical subsurface investigation performed (Subsection D.1) will be used to perform the laboratory testing. All soil and mixed samples shall be kept out of sunlight at 70 degrees F and under fully humid conditions throughout storage and curing that prevents loss of sample moisture via evaporation.

DSM constructed using the wet mixing method (DSM-SCC) will require that the testing laboratory prepare the soil, mix the binder reagent (i.e. cement, etc.) and water to make grout, and then mix grout and soil together. The specimens shall be mixed using a minimum of four different DSM binder mixes to provide insight into the relationship of cement factor and grout water/cement ratio on the 28-day compressive strength of the soil-binder specimens. Binder materials and individual proportions of cement or admixtures (if used) used shall be documented for each specimen. The procedures outlined by Filz and Stewart (2005) may be used to provide guidance in developing a laboratory testing program.

DSM constructed using the dry mixing method (DSM-LCC) will require that the testing laboratory prepare the soil, binder reagent, and then mix the soil (at the same in-situ moisture) and binder reagent together. The specimens shall be mixed using a minimum of four different DSM binder mixes to provide insight into the relationship of binder proportions on the 28-day compressive

strength of the soil-binder specimens. Binder materials and individual proportions of lime, cement, and admixtures (if used) used shall be documented for each specimen. The procedures outlined by Jacobson et.al (2003, 2005) may be used to provide guidance in developing a laboratory testing program.

All test specimens shall be prepared using the lab mixing energy level similar to energy levels used by the Contractor's field equipment. Test specimen cylinders shall be prepared according to procedures submitted to the Department and approved. Strength test three cylinders of soil-binder mixture at 3, 7, 14, 28, and 56 days following mixing. Strength testing shall be performed in accordance with subsection H.4.

E. DELIVERY, STORAGE, AND HANDLING OF MATERIALS

1. DSM Wet Mixing Method (DSM-SCC):

Portland cement shall be measured, handled, transported, and stored in bulk in accordance with the manufacturer's recommendations. Portland cement packaged in cloth or paper bags shall be sealed with plastic or rubber vapor barriers. The Portland cement shall be stored to prevent damage by moisture. Materials that become caked due to moisture absorption shall not be used. Bags of cement shall be stacked no more than ten bags high to avoid compaction. Cement containing lumps or foreign matter of a nature that may be deleterious to the grout mixing or delivery or injection operations shall not be used.

2. DSM Dry Mixing Method (DSM-LCC):

The quicklime and cement shall be stored in closed pressure tanks suitable to be used as pressure vessels, for all pressures required, including those used to load and unload the materials. Delivery trucks shall be loaded at the manufacturer's plant unless approval is given for an intermediate storage facility. Each truck shall have a certified record of the weight of each load of material. The material shall be transported to the project site and blown into the on-site storage tanks using a pneumatic system. The air evacuated from the storage tanks during the loading process shall be filtered before being discharged to the atmosphere. A sealed refilling machine shall be used to transport material from the storage tanks to the DSM column mixing machine. This machine shall be refilled using a pneumatic system and an air filter, as specified above.

F. INSTALLATION EQUIPMENT

The DSM column construction equipment and support equipment shall be equipped with mixing tools that are capable of thoroughly blending the in situ soils and binder material into a homogeneous column of soil-binder to the depths and size required in the plans. The equipment shall be capable of advancing through previously installed and cured DSM columns as necessary for installing overlapping and end junction DSM columns. The DSM columns shall be constructed using computerized self-contained construction equipment.

1. DSM- SCC Construction Equipment:

The DSM-SCC construction equipment shall meet the following requirements:

- a. DSM-SCC shall be constructed using real-time computerized self-contained DSM-SCC construction equipment capable of monitoring, controlling, and recording installation data. The DSM-SCC construction equipment shall be equipped with electronic sensors, built into the soil mixing equipment, to perform the following:
 - 1) Determine vertical alignment of the leads in two directions: fore-aft and left-right. The verticality shall be measured using instrumentation that is capable of measure deviations from verticality to an equivalent of 1-inch in 100-feet.
 - 2) Monitor cement and water proportioning, grout mixing, and water-cement ratios.
 - 3) Monitor the mixing tool depth and penetration/withdrawal speed, and mixing tool rotation speed.

- 4) Monitor mixing tool withdrawal speed, and mixing tool rotation speed.
 - 5) Monitor injection quantities and pressure with flow meter and other measuring equipment having precision accuracy not less than 99.5 percent.
 - 6) All output from the sensors shall be routed to a console that is visible to the operator and the Engineer during penetration and withdrawal.
 - 7) The sensors shall be calibrated at the beginning of the project and calibration data provided to the Engineer. The calibration shall be repeated at intervals not to exceed one month.
 - 8) All of these monitored functions shall be fully adjustable during operation of the equipment.
- b. The DSM-SCC construction equipment power source for driving the mixing tool shall be sufficient to maintain the required revolutions per minute (RPM) or injection pressure and penetration rate from a stopped position at the maximum depth required as determined from the test section(s) for group and/or block DSM column spacing. The Contractor shall also consider the wide range of expected subsurface conditions, indicated by the available geotechnical information.
- c. The DSM-SCC construction equipment shall utilize sufficient mixing and injecting equipment to adequately produce a homogeneous distribution of cement grout throughout the mixed in-situ soils that meet the acceptable criteria. The mixing tools shall uniformly inject cement grout through hollow stem or other piping at locations that distribute the grout across the full diameter of the mixing tools and such that the full auger/mixing paddle assembly passes through the column of soil after the grout is introduced, on both the insertion and withdrawal strokes. Grout shall only be injected in direction within the diameter of the augers or mixing paddles. If grout injection jets are used, they shall not spray beyond the auger diameter.
- d. Continuous auger flights longer than 3 feet or with more than one full, uninterrupted revolution of auger are not allowed as part of the mixing tools. Auger flights and mixing paddles on a shaft shall all reach to the full column diameter, and shall have discontinuous lengths and be so oriented as to thoroughly break up the in-situ soils, and disperse and blend soils with injected cement grout to form a homogeneous soil-cement mixture.
- e. The auger mixing equipment shall form the required diameter and size of the DSM-SCC as submitted by the Contractor's approved submittals.
- f. Injection volume estimates shall be only made by precision inline flow meters. Counting or measuring grout pump strokes shall not be acceptable. Injection quantities must be measured in real time by direct measurements of volume and/or mass for each DSM column having injection capabilities, with flow meters and other measuring equipment having precision accuracy not less than 99.5%. Gages and flow meters and other measuring equipment shall be calibrated and certified as precise and accurate before the start of the equipment's work on the project, and then again every 4 months.
- g. The DSM-SCC construction equipment shall be adequately marked to allow the Engineer to confirm the penetration depth to within 6 inches during construction.
- h. The cement grout batching plant shall include all storage silos and sheds, pumps, scales, mixers, valves, gauges, and regulating devices required to continuously measure and mix cement grout in real time. Grout shall be mixed in a mixing plant, using a batch process, which combines dry materials and water in predetermined proportions. The plant mixer shall consist of grout mixer, grout agitator, grout pump, automatic batching scales, and a computer control unit. The mixing plant shall meet the following requirements:
- 1) To accurately control grout mix proportions, the addition of water and cement shall be determined by weight using automatic batch scales in the mixing plant.
 - 2) Admixtures, if used, may be delivered to the mixing plant by calibrated auger provided the Contractor can demonstrate that the auger can deliver the material at the same accuracy as by weight.

- 3) The mixing components shall be calibrated prior to beginning the work and monthly thereafter. The calibration data shall be provided to the Engineer.
 - 4) The mixing plant shall have tanks or silos with adequate storage for continuous production. The tanks shall be equipped with air filters.
- i. Positive displacement pumps shall be used to transfer the grout from the mixing plant to the mixing tool. If the DSM-SCC construction equipment has multiple shafts, and multiple mixing tools, the grout shall be delivered to each shaft by an individual positive displacement pump.
 - j. All gauges, flow meters, metering equipment, and other measuring equipment shall be calibrated and certified as precise and accurate before starting DSM column construction (i.e. test section(s) or production DSM columns), and then again every 4 months or at least every 325,000 feet of DSM column installed, whichever is sooner. The calibrations and certifications shall be supplied to the Engineer.

2. **DSM- LCC Construction Equipment:**

The DSM-LCC construction equipment shall meet the following requirements:

- a. DSM-LCC shall be constructed using real-time computerized self-contained DSM-LCC construction equipment capable of monitoring, controlling, and recording installation data. The DSM-LCC construction equipment shall be equipped with electronic sensors, built into the soil mixing equipment, to perform the following:
 - 1) Determine vertical alignment of the leads in two directions: fore-aft and left-right. The verticality to an equivalent of 1-inch in 100-feet
 - 2) Monitor the mixing tool depth, penetration/withdrawal speed, mixing tool rotation speed, and injection pressure
 - 3) All output from the sensors shall be routed to a console that is visible to the operator and the Engineer during penetration and withdrawal
 - 4) The sensors shall be calibrated at the beginning of the project and calibration data provided to the Engineer. The calibration shall be repeated at intervals not to exceed one month
 - 5) An alternative display/monitoring system may be used subject to review and approval by the Engineer prior to use
 - 6) All of these monitored functions shall be fully adjustable during operation of the equipment
- b. The DSM-LCC construction equipment power source for driving the mixing tool shall be sufficient to maintain the required revolutions per minute (RPM) or injection pressure and penetration rate from a stopped position at the maximum depth required as determined from the test section. The Contractor shall also consider the wide range of expected subsurface conditions, indicated by the available geotechnical information.
- c. The DSM-LCC construction equipment shall be adequately marked to allow the Engineer to confirm the penetration depth to within 6 inches during construction.
- d. All gauges, flow meters, metering equipment, and other measuring equipment shall be calibrated and certified as precise and accurate before the starting DSM column construction (i.e. test section(s) or production DSM columns), and then again every 4 months or at least every 325,000 feet of DSM column installed, whichever is sooner. The calibrations and certifications shall be supplied to the Engineer.

G. CONSTRUCTION REQUIREMENTS

The Contractor shall furnish all materials, labor and equipment necessary to construct the DSM columns in accordance with the plans and specification. The DSM columns shall be constructed to the lines, grades, and cross sections indicated in the Plans. The completed DSM improved zone shall be a homogeneous mixture of binder material constructed in accordance with the method of mixing and column spacing indicated in the plans.

Production DSM shall be constructed using the same equipment and construction criteria (i.e. mix design, mixing parameters, etc.) established in the accepted test section construction (subsection I).

DSM construction that is out of tolerance (subsection G.4) or is subject to unforeseen conditions (subsection G.5) shall be evaluated and corrected as approved by the Engineer with no additional cost or schedule impact to the Department.

1. Site Preparation:

The presence and location of buried pipes, sewers, and other utilities shall be identified and precautions taken to protect the utilities from damage during the construction of the DSM columns. The Contractor shall be responsible for any damage resulting from the construction of the DSM columns. The site shall be cleared and grubbed in accordance with the Contract documents. Limit grubbing to that needed to remove previous construction materials, trees, stumps, and large roots. Fill in holes left by construction materials, stumps and root extraction and grade to provide level working surface. Place bridge lift materials as required in the plans and contract documents.

Establish DSM column limits and locations by a licensed surveyor. Individual column locations shall be marked. Sufficient horizontal and vertical control shall be provided to establish that DSM columns are located accurately and reach the required plan depths.

2. DSM-SCC Soil-Grout Mixing:

Soil shall be broken up and blended with grout in place by the pugmill type action of the soil mixing equipment. The completed DSM-SCC shall be a uniform mixture of cement and the in situ soils. The soil-grout mixture shall achieve an average unconfined compressive strength in 28 days as indicated in the plans. Soil mixing shall be performed with the following minimum requirements:

- a. *Grout Preparation:* The dry materials shall be fed to the mixers for agitation and shearing. The mixing ratio of the grout shall be controlled by measuring the weight of grout components using automatic batch scales in the mixing plant. Grout mixture shall be mixed for a minimum of three minutes, with a maximum holding time of two hours, calculated from the beginning of initial mixing. The specific gravity of the grout (determined in the test section) shall be tested at least once per shift per rig, using the methods outlined in ASTM D 4380, and shall not deviate more than three percent from the calculated specific gravity for the design cement ratio. Additional tests may be required by the Engineer. If the specific gravity or density is lower than the design mix, the Contractor shall add additional cement, remix, and/or recalibrate batch scales and retest the grout until the design density is achieved, at no additional cost to the Department.
- b. *Grout Injection:* The grout shall be pumped through and injected from the mixing tool. The grout injection rate per vertical foot of DSM-SCC shall be in accordance with the requirements of the design mix established during the test section. Injection rates falling below this requirement, shall require the DSM-SCC to be remixed and additional grout injected (at the design grout-soil ratio) to a depth at least three feet below the deficient zone, at no additional cost to the Department. The Contractor may sample using wet grab methods for his own purposes. The Department will not accept results from wet sampling for quality control purposes.
- c. *Rotation Speeds:* The mixing tool rotational speeds (measured in RPM) and penetration/withdrawal rates shall be in accordance with the parameters established during the test section(s). If these parameters are varied more than 15 percent from those determined during the test section(s), the DSM-SCC section shall be remixed while injecting grout at the design grout ratio to a depth at least three feet below the deficient zone, at no additional cost to the Department.
- d. *On-Board Computer:* The preset data in the on-board computer shall be verified for each column as correct and adjusted if necessary. The operator shall monitor and adjust as necessary during column installation the feeding of material, the grout injection rate, the mixing tool rates of rotation, and penetration/withdrawal rates of the mixing tool.
- e. *Changes in Grout Mix Design:* The Contractor may request that the established grout mix be modified during the production DSM-SCC installation. To verify acceptable results for the

modified mix design, the Engineer may require additional testing or a new test section, at no additional cost to the Department.

- f. *Spoils*: During the course of soil-cement stabilization, return/spoil material shall not be dumped into or otherwise be allowed to enter the soil-cement column. The Contractor shall develop a spoil containment system that allows the channeling of the spoils to the temporary holding pit in such a direction and manner as to keep the spoils away from the site perimeter, and out of the traveled paths. Soil-cement return and spoil material shall be piped or channeled to holding ponds or other retention structures within the work area. The Contractor shall remove all excess grout and grout mixed soil generated from ground improvement activities from the construction site in accordance with the approved DSM Installation Plan.

The Contractor shall take all necessary precautions and implement measures to prevent any soil-cement return, other spoil material or stockpiled materials from entering storm drain structures, drainage courses, other utility lines, or from leaving the site via surface runoff. The Contractor shall prevent soil-cement return, fluid, ponded spoil material, or stockpiled solidified materials from migrating into any water body. In the event soil-cement return, spoil material or stockpiled materials enter storm drain structures, drainage courses, or other utilities, including, but not limited to, surface water bodies beyond site limits of soil-cement mixing operations, the Contractor shall collect and remove all of these materials, and perform all other required/necessary remediation that may be directed by the Engineer or responsible environmental agency, at no additional cost or schedule impact to the Department. The Contractor shall conduct all soil-cement operations to conform to sedimentation and turbidity control requirements of federal, state, and local agencies having jurisdiction over the work.

- g. *Delays*: The installation of each DSM-SCC column shall be continuous without interruption. If an interruption of more than two hour occurs, the DSM-SCC shall be remixed for the entire column height using fresh cement grout as though there had not been any cement grout installed, or the column may be abandoned, at no cost or schedule impact to the Department. The Contractor shall install additional columns if the interrupted columns cannot be acceptably remixed.
- h. *Instability*: Soil-cement column which exhibits partial or total instability at any time, or collapses as a result of mechanical failure of any equipment; inadequacy of cement, water supplies, cement grout; improper drilling, injection or mixing procedures; or other cause, the Contractor shall halt DSM-SCC construction and backfill to ground surface with cement grout. After the backfill has attained sufficient strength to stabilize the ground, complete the required installation by re-drilling from ground surface, at no additional expense to the Department. The Engineer will evaluate the potential impacts of the instability and may require one or more additional re-drilled columns at overlapping or adjacent locations as determined by the Engineer, and at no additional expense to the Department.
- i. *Daily Quality Control Report*: The Contractor shall submit a Daily Quality Control Report for each day that DSM-SCC work is performed. The log shall contain as a minimum the information listed in Section C. The report shall be delivered to the Engineer by the end of the next working day following the report date.
- j. *Protective Covers*: Immediately after completing a soil-cement column, the Contractor shall install protective covers to prevent persons from falling or stepping into the unhardened soil-cement column.

3. **DSM-LCC Soil-Binder Mixing:**

Soil shall be broken up with the mixing tool. As the mixing tool is raised the binder material (i.e. lime-cement or cement) is injected using air pressure. The binder-soil mixture shall achieve an average unconfined compressive strength in 28 days as indicated in the plans. Soil mixing shall be performed with the following minimum requirements:

- a. *Binder Injection*: The binder (i.e. lime-cement or cement) volume flow rate per vertical foot of DSM-LCC shall be in accordance with the requirements of the design mix established during the test section. Injection rates falling 10 percent below this requirement, shall require the

DSM-LCC to be remixed and additional binder injected (at the design rate) to a depth at least three feet below the deficient zone, at no additional cost to the Department.

- b. *Rotation Speeds:* The mixing tool rotational speeds (RPM) and the penetration/withdrawal rates shall be in accordance with the parameters established during the test section(s). If these parameters are varied by more than 15 percent from those determined during the test section(s), the DSM-LCC section shall be remixed using the design binder volume flow rate to a depth of at least three feet below the deficient zone, at no additional cost to the Department.
- c. *On-Board Computer:* The preset data in the on-board computer shall be verified for each column as correct and adjusted if necessary. The operator shall monitor and adjust as necessary during DSM column installation the feeding of material, the injection air pressure, and the rates of rotation and rise.
- d. *Changes in Binder Mix Design:* The Contractor may request that the established mixing parameters be modified during the production DSM-LCC installation. To verify acceptable results for the modified parameters, the Engineer may require additional testing or a new test section, at no additional cost to the Department.
- e. *Delays:* The installation of each DSM-LCC column shall be continuous without interruption. If an interruption of more than two hours occurs, the DSM-LCC shall be remixed for the entire column height using design binder rates as though there had not been any binder installed, or the column may be abandoned, at no cost or schedule impact to the Department. The Contractor shall install additional columns if the interrupted columns cannot be acceptably remixed.
- f. *Daily Quality Control Report:* The Contractor shall submit a Daily Quality Control Report for each day that DSM-LCC work is performed. The log shall contain as a minimum the information listed in Section C. The report shall be delivered to the Engineer by the end of the next working day following the report date.

4. **DSM Column Construction Tolerances:**

- a. *Horizontal Alignment:* The location of the DSM column shown in the Plans shall be accurately staked by a licensed surveyor before beginning installation. The horizontal alignment of DSM columns with group column spacing (GCS) shall be within 4 inches of the planned DSM top location. The horizontal alignment of DSM columns with block column spacing (BCS) shall be within 20 percent of the DSM column diameter, not to less than four inches, of the planned DSM top location in order to obtain sufficient DSM column overlap.
- b. *Vertical Alignment:* The equipment operator shall control vertical alignment of the equipment and constructed DSM column. Two measures of verticality shall be monitored, longitudinal and transverse to the DSM column alignment. The DSM column shall be installed at an inclination that deviates no more than 1:100 (horizontal to vertical).
- c. *DSM Column Lengths:* The tops of the DSM columns shall begin at the ground surface. The top of DSM column elevations shown in the plans are approximate. Natural soils above the water table, at the completion of DSM installation, shall have been treated to produce the full column design strengths up to within 3 feet of the ground surface. If the top of the DSM columns is being constructed within a surcharge or berm, the top of DSM column elevations shown in the plans shall be used.

The bottom of DSM columns shall extend to the line and grades shown in the plans. The DSM column bottom elevations indicated in the Plans provide the minimum required penetration of the DSM columns. The Engineer may require the Contractor to shorten or deepen the bottom of DSM columns indicated in the plans.

- d. *DSM-LCC Width:* When DSM columns are constructed using group column spacing (GCS) the DSM column diameter shown in the plans shall be the minimum required diameter. The diameter of DSM columns constructed using block column spacing (BCS) may vary to accommodate variations in the Contractor's equipment dimensions, provided that the plan area of ground improvement does not exceed the dimensions shown in the Plans more than six inches and is approved by the Engineer.

5. Unforeseen Conditions and Corrective Remediation:

Unforeseen conditions that result in deficient DSM column construction shall be remediated by the DSM Contractor at no additional cost to the Department. DSM column construction deficiencies and how they were addressed shall be noted in the DSM Daily Production Control Report and Installation Log. DSM column deficiencies that result from changes in rotation speeds of mixing tools, rate of penetration/withdrawal of mixing tools, changes in the rate of grout/binder injection, delays, or changes in binder mix shall be corrected as indicated in subsections G.2 and G.3 for DSM-SCC mixing and DSM-LCC mixing, respectively.

If unforeseen conditions result in DSM column interruptions that do not meet the DSM construction requirements (subsection G.2 or G.3), the DSM column installation shall be re-drilled a minimum of 1 foot below the elevation of the interruption and the DSM column construction restarted.

When interruption of the installation process occurs because of unknown obstructions or a very dense layer above the planned tip elevation, the Contractor shall document the interruption on the DSM Daily Production Control Report and Installation Log and notify the Engineer in writing by the end of that day of such encounter and shall provide all pertinent information relating to DSM column identification, plan location coordinates, depth, and expected extent of the obstruction. The Contractor shall be prepared to penetrate very dense layers by first removing mixing tools from the excavation and then using auger drilling equipment or other approved methods to allow the installation of the DSM column. When unknown obstructions are encountered, the Contractor shall submit a proposal to the Engineer for review that delineates the Contractor's proposed means and methods to overcome the unknown obstruction, including equipment and labor time estimated for this operation. Such construction to remove an unanticipated obstruction shall only be performed with the written authorization of the Engineer. When the obstruction cannot be penetrated or removed, the DSM column shall be completed to the maximum depth penetrated. The need for an alternate design or remedial construction shall then be determined by the Engineer.

Deficient DSM columns due to out of tolerances (subsection G.4) or not in compliance with DSM construction acceptance (subsection G.6) will require that the DSM Contractor to submit proposed remedial measures to the Engineer for review and approval. Remedial plans shall show the location, depth, construction exceptions requested, and proposed method of remediating the deficient DSM ground improved areas. Remedial plans, if accepted, shall be at no cost or schedule impact to the Department.

6. DSM Construction Acceptance:

The QC reporting (logs), testing, and acceptance procedures for the DSM test section(s) and production DSM columns shall be the same. QC testing methods are described in Section H and Acceptance Criteria are provided in Section K.

H. DSM TESTING METHODS

QC testing of DSM columns consists of using field and laboratory testing techniques to evaluate the integrity, consistency, and strength of the DSM column for the entire full depth of soil improvement. QC testing methods that will be used include probe testing (subsection H.1), soil borings and undisturbed sampling with Shelby tubes (subsection H.2), and coring and sampling (subsection H.3). Samples obtained by undisturbed sampling with Shelby Tubes or coring shall have samples tested for compressive strength testing (subsection H.4). DSM testing shall be conducted in accordance with the SCDOT Geotechnical Design Manual, version 1.1 (2010), or later.

The results of the compressive testing shall be used to develop correlations for use with probe testing and therefore improve the reliability of the probe testing results. This will be accomplished by performing continuous undisturbed Shelby tube sampling and/or coring in one quadrant of the DSM column and probe testing in another quadrant of the same DSM column.

Any of the DSM testing methods presented may be used on production DSM columns to evaluate deficiencies based on construction records or field observations.

1. Probe testing:

- a. Probe testing shall be conducted using the seismic cone penetrometer test with pore pressure measurements (SCPTu). The SCPTu testing results (i.e. tip resistance, friction sleeve resistance, pore pressure, and shear wave velocity vs. depth of penetration) shall be provided graphically and in electronic file format to the Engineer.
- b. Probe testing shall be performed in the presence of the Engineer, unless otherwise directed. The Contractor shall notify the Engineer at least seven calendar days in advance and confirmed 2-days (48 hours) prior to beginning SCPTu operations.
- c. The SCPTu testing shall be conducted in accordance with the SCDOT Geotechnical Design Manual.
- d. Probe testing shall be performed after the soil-binder mixture has hardened sufficiently, but before it has cured to the extent to cause refusal to the SCPTu equipment.
- e. Unless directed otherwise by the Engineer, probe tests shall be performed along an essentially vertical alignment located within one of the quadrants of the DSM column and shall include inclinometer measurements that confirm the verticality of the SCPTu test data such that the entire probe test is determined to have been advanced within the DSM column. The SCPTu shall be taken at a distance of $2/5$ the DSM column radius from the center of the DSM column.
- f. If seismic cone shear wave testing results are inconclusive, the SCPTu may be discontinued and cone penetrometer test with pore pressure measurements (CPTu) may be used with written approval from the Engineer.
- g. The CPT testing equipment shall be sized to allow full penetration and testing to the depth of the planned test DSM column plus 10 feet.
- h. If standard full-size CPT truck equipment (i.e. 20-30 ton reaction truck) is not capable of testing to the desired depths, the Contractor shall conduct SPT testing in accordance with the SCDOT Geotechnical Design Manual, at no additional cost to the Department. SPT shall be conducted on a maximum five foot center interval to the depth of the planned test DSM column plus 10 feet.
- i. All probe test holes shall be filled with cement grout that will obtain 28-day strength equal to or greater than the DSM column compressive design strength required in the plans.

2. Soil Borings and Undisturbed Sampling:

- a. Soil borings and undisturbed Shelby tube sampling shall be performed in the presence of the Engineer, unless otherwise directed. The Contractor shall notify the Engineer at least seven calendar days in advance and confirmed 2-days (48 hours) prior to beginning soil boring operations.
- b. Soil borings and sampling shall be conducted in accordance with the SCDOT Geotechnical Design Manual.
- c. High quality undisturbed sampling shall be obtained after the soil-binder mixture has hardened sufficiently to a minimum compressive strength of 3 psi (430 psf) but not greater than 55 psi (7,900 psf).
- d. Unless directed otherwise by the Engineer, soil borings shall be obtained along an essentially vertical alignment located within one of the quadrants of the DSM column. The soil boring shall be taken at a distance of $2/5$ the DSM column radius from the center of the DSM column.
- e. Sampling shall be conducted using a thin wall Shelby tube sampler and/or pitcher barrel sampler in accordance with the SCDOT Geotechnical Design Manual.
- f. Upon Shelby tube retrieval, the samples shall be logged visually without extraction of the samples from the Shelby tube and sealed to prevent loss of moisture during transport.
- g. Undisturbed samples shall be transported by the Contractor to the independent AASHTO certified materials testing laboratory where the samples will be extracted, stored, and tested.

- h. Upon extraction of the samples at the independent materials testing laboratory, the samples shall be logged and documented by taking pictures. The percent recovery per Shelby tube sampler based on the sampler penetration shall be documented. Samples shall be selected for testing and submitted to the Engineer for approval. Samples shall be stored and cured in accordance with ASTM D 1632 until the test date.
- i. All soil boring holes shall be filled with cement grout that will obtain 28-day strength equal to or greater than the DSM column compressive design strength required in the plans.

3. Coring and Sampling:

- a. Coring/sampling shall be performed in the presence of the Engineer, unless otherwise directed. The Contractor shall notify the Engineer at least seven calendar days in advance and confirmed 2-days (48 hours) prior to beginning coring/sampling operations.
- b. High quality continuous core sampling shall be obtained after the soil-binder mixture has hardened sufficiently to approximately a compressive strength of 42 psi (6,050 psf).
- c. Unless directed otherwise by the Engineer, core runs shall be obtained along an essentially vertical alignment located within one of the quadrants of the DSM column. The core run shall be taken at a distance of $\frac{2}{5}$ the DSM column radius from the center of the DSM column.
- d. Coring shall be conducted using double or triple tube samplers to obtain samples of 2.5 inches in diameter or greater. Triple tube core barrel may be required by the Engineer, at no additional cost to the Department, if the sample quality of the double tube core barrel is not providing high quality samples suitable for compression strength testing.
- e. Each core run shall be at least four feet in length and contain at least four acceptable test specimens. Three samples per core run are required to perform compressive strength testing with one reserve sample.
- f. A minimum core run recovery of 85 percent for each 4-foot-long core run shall be achieved. During coring, the elevation of the bottom of the holes shall be measured after each core run in order that the core recovery for each run can be calculated. The core recovery and RQD for every core run shall be reported in the logs. Additional cores may be required, at no additional cost to the Department, if core run recovery is less than 85 percent.
- g. Upon retrieval, the samples shall be field logged and documented by taking pictures. Samples shall be selected for testing and submitted to the Engineer for approval.
- h. Following logging and test specimen selection, the entire full-depth sample, including the designated test specimens, shall be immediately sealed in plastic wrap to prevent drying, placed in suitable core boxes, and transported to the materials testing laboratory by the Contractor within 24 hours.
- i. All core holes shall be filled with cement grout that will obtain 28-day strength equal to or greater than the DSM column compressive design strength required in the plans.
- j. Cores shall be transported by the Contractor to the independent AASHTO certified materials testing laboratory where the samples will be stored and tested. Samples shall be stored and cured in accordance with ASTM D 1632 until the test date.

4. Strength Testing of Samples:

- a. All samples shall be kept out of sunlight at 70 degrees F and under fully humid conditions throughout storage and curing that prevents loss of sample moisture via evaporation.
- b. Samples suitable for strength testing shall have a height to diameter ratio of 2.0.
- c. Strength testing shall be performed by unconfined compression testing method per AASHTO specification T-208-96, but with strain rate not faster than 0.5% per minute, but not slower than 0.25%/minute, and with test equipment set up to record in both tabular and graphical form the axial stress and strain constant increments of axial strain no larger than every 0.05% axial strain. The Contractor will be permitted to perform UU Triaxial Compressive Tests, with approval of the Engineer, in lieu of performing unconfined compressive strength test, at no additional cost to the Department.

- d. Compressive strength testing results shall be transmitted to the Engineer for review within 24 hours of the compression test completion. The remaining portions of the full-depth samples that are not tested shall be retained by the Contractor, until completion and acceptance of the work, for possible inspection and confirmation testing by the Engineer.

I. DSM TEST SECTION AND QC TESTING PROGRAM

The QC testing program for each test section will be submitted to the Engineer within 5 days after test section DSM column installation and shall be based on the results of DSM pre-production laboratory testing, early probe testing (3 and 5 days after column installation), and review of samples obtained for strength testing. The approved compressive strength testing program (i.e. Plan location, sample depth, and elapsed time after construction to perform compressive testing) shall then be submitted to the Contractor's independent AASHTO certified laboratory testing firm.

Unless otherwise directed by the Engineer, a minimum of four Plan locations shall have QC testing, per test section. QC testing at each Plan location shall consist of full-depth continuous soil borings or corings per subsections H.2 and H.3, respectively. Soil boring or coring sampling shall be performed in one DSM column quadrant, while probe testing, per subsection H.1, shall be performed in another DSM column quadrant. A minimum of six samples at each QC testing Plan location shall be selected by the Contractor and approved by the Engineer for compressive strength testing. Compressive strength testing of cores (subsection H.4) and probe testing (Section H.1) at QC testing Plan locations shall be conducted at 7, 14, 28, and 56 days after test DSM column installation. The results of the compressive testing shall be used to develop correlations for use with probe testing and therefore improve the reliability of the probe testing results. A test DSM column compressive strength testing report shall be compiled by the independent testing company and submitted to the Contractor and the Engineer. The compressive strength testing report shall document the soil boring/core sampling and compressive strength testing conducted on the cores.

In addition to probe testing conducted at QC testing Plan locations, full depth probe testing shall be conducted at two separate plan locations within the test section in separate DSM column quadrants at 3, 7, 14 and 28 days after test DSM column installation. A probe testing report shall be compiled of all testing results in accordance with Section G.2.

The Contractor shall use the results of the test sections to establish the DSM production construction criteria. The DSM production construction criteria shall be developed to produce DSM columns that meet the Acceptance Criteria in Section K. DSM production construction criteria for DSM columns shall include as a minimum, the following criteria.

DSM-SCC Production Construction Criteria:

1. Grout mix design including ratios of all materials mixed to form the grout
2. Grout specific gravity
3. Grout injection rates
4. Type of equipment
5. Mixing tool penetration and withdrawal rates
6. Mixing tool rotation speed
7. Construction procedures and techniques

DSM-LCC Production Criteria:

1. Binder mix design including ratios of all materials (i.e. lime-cement or cement) mixed to form the soil-binder material
2. Lime-cement injection rates
3. Type of equipment
4. Mixing tool penetration and withdrawal rates
5. Mixing tool rotation speed

6. Construction procedures and techniques

The Contractor shall use the results of the test sections to establish the Production Quality Control (QC) testing program per Section J.

Construction of production DSM columns may begin only after written acceptance by the Engineer of the “DSM Production Construction Criteria” and the “Production Quality Control (QC) Testing Program.” If construction criteria, construction procedures, equipment, new mobilizations, or changes in personnel are made, following acceptance of the test sections, the Department reserves the right to require the Contractor to construct a new test section at no additional cost to the Department.

J. PRODUCTION QC TESTING PROGRAM

The Production QC Testing program shall be developed by the Contractor and approved by the Engineer. The Production QC Testing program will be required to include probe testing per subsection H.1 and strength testing of samples per subsection H.4. The following minimum requirements shall be used to developing the Production QC Testing Program:

DSM QC Testing Program Minimum Requirements:

1. The Production QC Testing Program goal is to establish continuity/integrity of the columns and to obtain a measure of their strength. This is accomplished by using the QC Testing to evaluate if the DSM ground improvement is meeting the Acceptance Criteria in Section K.
2. Provided that acceptable correlations can be developed between probe testing and compression strength testing, QC probe testing per subsection H.1 shall be performed at a minimum frequency of 5 percent of production columns (1:20) but not less than 1 QC probe test for every 200 cubic yards of DSM stabilized volume.
3. One Soil boring/Coring full depth of DSM columns plus 10 feet with a minimum of one strength test per 5 feet of penetration of stabilized soil (Section H) shall be obtained adjacent to probe testing (adjacent DSM quadrant) at a minimum frequency of 0.5 percent of production columns (1:200) but not less than 1 QC probe test for every 2,000 cubic yards of DSM stabilized volume.
4. If acceptable correlations cannot be developed between probe testing and compression strength testing, one Soil boring/Coring full depth of DSM columns plus 10 feet with a minimum of one strength test per 5 feet of penetration of stabilized soil (Section H) shall be obtained adjacent to probe testing (adjacent DSM quadrant) at a minimum frequency of 1.0 percent of production columns (1:100) but not less than 1 QC probe test for every 1,000 cubic yards of DSM stabilized volume.
5. The QC Testing program shall define the limits of the production DSM testing based on the number of rigs operating, anticipated production schedule, and the minimum QC testing criteria defined above.
6. The QC Testing program shall include provisions for revising QC testing frequency as a result of failing DSM Acceptance Criteria, changes in construction criteria, construction procedures, equipment changes, new mobilizations, or changes in personnel that are made following acceptance of the test sections.
7. The Department reserves the right to require the Contractor to perform additional QC testing after review of the daily Quality Control Report/Log of the production DSM columns and/or review of QC Testing results. Although coring and conducting compressive strength testing of cores (Section G.1) is not intended to be a routine QC testing method, the Engineer reserves the right to use this QC testing method based on the results of the probe testing at any time.
8. The Contractor shall determine the time interval between DSM installation and QC testing. QC testing shall be performed on columns cured for a minimum of 3 days but no longer than 28 days, or as directed by the Engineer.
9. Only probe testing equipment and methods that have been calibrated during the test section shall be used for QC testing. If production DSM columns are being installed differently from the

test section DSM column installation, a calibration of the probe testing with coring and compression testing shall be required unless approved otherwise by the Engineer.

K. ACCEPTANCE CRITERIA

Determination that the DSM columns meet the Acceptance Criteria (for DSM construction, DSM column continuity, and DSM compressive strength requirements) shall be evaluated solely by the Engineer based on a review of daily Quality Control Report/Log of the production DSM columns and QC testing results conducted by an independent testing company.

1. DSM Construction Acceptance Criteria:

DSM columns shall be considered acceptable when daily Quality Control Report/Log of the production DSM columns and any remediation reports indicate that the:

- a. Location of the top of the columns has been verified to be within design tolerances
- b. Penetration of the column has been verified as correct by the Engineer.
- c. Continuously recorded injection quantity of cement grout for DSM-SCC and binder (lime-cement or cement) for DSM-LCC columns has been verified to be within 10% of the design (preset) value established for the production DSM construction criteria based on the results of approved production DSM construction design criteria.

2. Evaluation of DSM Column Continuity:

Lumps of unimproved soils shall not amount to more than 15 percent of the total volume of any 4-foot section of continuous full-depth evaluation by either conducting continuous probe testing, soil borings, or coring. Any individual or aggregation of lumps of unimproved soil shall not be larger than 6 inches in greatest dimension. For evaluating the volume of unimproved lumps of soil, all of the unrecovered samples shall be assumed to be unimproved soil. In addition, within a sample, the sum length of unmixed or poorly mixed soil regions or lumps that extend entirely across or a portion thereof the diameter of the sample will be considered unimproved.

3. Design Compressive Strength Acceptance:

Unless directed otherwise by the Engineer, all DSM QC compressive strength test results shall indicate a minimum of 60 percent of the design compressive strength at 5 days or less. Failure to meet this criterion shall deem the DSM column to be in non-conformance of the DSM compressive strength acceptance criterion. The DSM column shall be retested (same DSM column, different quadrant) at 28 days where the average QC strength testing shall indicate 100 percent or more of the compressive design strength with no sample testing less than 85 percent of the compressive design strength. Failure to meet the 28 day QC strength testing criterion shall deem the DSM column to be in non-conformance of the DSM compressive strength acceptance criteria. The Contractor may elect to conduct additional QC strength testing in excess of 28 days, with approval of the Engineer, at no additional cost to the Department. Unless otherwise determined by the Engineer, the extent of the non-conformance QC test area shall be considered to include all DSM constructed during all rig shifts that occurred after construction when passing tests were achieved. Non-conforming DSM QC test areas shall be remedied by the Contractor by conducting the following procedures.

The Contractor may conduct two or more additional QC probe tests (locations designated by the Contractor and approved by the Engineer) to better define the limits of the non-conformance and submit the results of those tests for review by the Engineer at no additional cost to the Department. If a minimum of 60 percent of the design strength has been achieved at 5 days or less, the Engineer shall evaluate the DSM construction documentation to determine which DSM columns are in conformance. If compressive strength criteria are achieved, with approval of the Engineer, all or a portion of the production DSM QC testing area may be approved provided that any deficient production DSM columns are remedied by one of the following two options. Failure to meet the required design strength of the additional DSM QC testing shall require that the DSM QC test area be remedied by one of the following options as approved by the Engineer.

- a. Provide 2 or more additional QC tests (locations designated by the Engineer) within the DSM QC test area which demonstrate that at 28 days, the average QC strength testing is 100 percent or more of the compressive design strength with no sample testing less than 85 percent of the compressive design strength.
- b. Re-drilling all or a portion of the nonconforming DSM QC test area and mixing additional cement grout for DSM-SCC columns or binder material (lime-cement or cement) for DSM-LCC, while raising the mixing tool. The Contractor shall submit a proposed plan for remixing or repair of failed sections for review and approval by the Engineer. Repair work of failed DSM columns shall be performed at no additional cost to the Department. Changing grout or binder quantities may require additional QC testing to calibrate QC probe testing. After reconstruction of the production DSM-LCC testing section, the affected DSM-LCC testing section will be subject to the compressive strength acceptance criteria as defined in this section.

L. AS-BUILT PLANS

Following completion of the production DSM column construction, the Contractor shall furnish to the Engineer a set of as-built plans detailing the locations of the DSM columns in terms of project coordinates, top and bottom elevations, QC compressive strength testing results, and any other dimensions of the DSM columns that are pertinent to the project.

M. MEASUREMENT AND PAYMENT

DSM constructed using group columns spacing (GCS) will be measured per linear foot of DSM column constructed and then accepted by the Engineer. DSM constructed using block column spacing (BCS) will be measured by the total neat-line ground improved volume (in cubic yards) accepted by the Engineer, where the neat-line is the rectangular plan area of the required ground improvement zone times the specified improvement depth. Material located outside of the tolerances specified will not be measured. Material used to remix an area found to be unacceptable to the Engineer will not be measured. The test section(s) will not be measured, and is considered incidental to the production DSM ground improvement.

Payment will be made at the unit contract price per linear feet for DSM constructed using group columns spacing (GCS) and per cubic yard for DSM constructed using block column spacing (BCS). Payment for DSM columns will be full pay to perform the work as specified including construction and testing of test sections, QC testing, construction and removal of surcharges and berms, handling and hauling of excavated spoils, and site cleanup.

Payment will be made under:

Item No.	Pay Item	Pay Unit
2051201	GROUND IMPROVEMENT (DEEP SOIL MIXING SOIL-CEMENT COLUMNS – BCS)	CY
2051202	GROUND IMPROVEMENT (DEEP SOIL MIXING SOIL-CEMENT COLUMNS - GCS)	LF
2051203	GROUND IMPROVEMENT (DEEP SOIL MIXING LIME-CEMENT COLUMNS- BCS)	CY
2051204	GROUND IMPROVEMENT (DEEP SOIL MIXING LIME-CEMENT COLUMNS- GCS)	LF

(45) SECTION 205: GROUND MODIFICATION – COMPACTION GROUTING COLUMNS:

June 28, 2013

A. GENERAL

- 1. **Scope:**

The work under this Section consists of furnishing all supervision, labor, material, equipment, and related services necessary to perform ground improvement by the compaction grout technique as indicated on the Contract Drawings and specified herein.

For this project, the purpose of the compaction grouting is to reinforce the loose sand layers below embankments. The compaction grouting will serve to reinforce loose sand in the event of liquefaction during an earthquake.

The work includes the delivery and placement of all concrete/grout material necessary for compaction grouting construction.

2. Compaction Grout Column Construction

The work is to be accomplished using specifically-designed equipment for compaction grouting. The drill is to be advanced to the specified compaction grouting depth. Concrete/grout shall then be injected through the drill pipe as the pipe is being withdrawn, in such a way as to exert a positive lateral pressure on the soil surrounding the concrete/grout filled grout hole.

3. Methods and Contractor Qualifications:

The Specialty Contractor performing the compaction grouting installation shall be one who can provide a minimum 3-year experience record documenting 5 recent, successful projects completed with these general site conditions and improvement criteria. References asserting this documentation shall be submitted with the bid.

A detailed description of the proposed construction method (including equipment and personnel) and the qualifications of the proposed Specialty Subcontractor shall be submitted with the bid.

4. References:

American Society for Testing and Materials (ASTM) Standards

American Concrete Institute (ACI) Standards

Prior to commencing work, the Contractor shall examine the site, drawings, records or existing utilities and other existing subsurface structures, and soil boring logs made available by the Engineer to help determine compaction grouting installation conditions.

Any subsurface data provided by the Department is provided solely as general information for convenience of Contractor. It is expressly understood that the Department, Engineer, or the Engineer's consultants will not be responsible for interpretations or conclusions drawn there from by the Contractor. The Department and Engineer expressly encourage the Contractor to perform soil test borings or other subsurface explorations to determine whether the Contractor's proposed ground modification method is capable of installing the specified compaction grout columns. Additional test borings and other exploratory operations may be made by the Contractor at no additional cost to the Department.

5. Submittals:

The following data shall be submitted for the approval of the Engineer prior to beginning of work.

- a. A detailed written procedure to be followed in installing the compaction grout columns and confirming that the specified work requirements have been achieved. The written procedure shall include a detailed description of the specialized equipment to be used.
- b. Proposed compaction grout design mix and descriptions of materials to be used. These shall be in sufficient detail to indicate their compliance with the specifications and either 1.) Laboratory tests of trial mixes made with the proposed mix or 2.) Laboratory tests of the proposed mix used on previous projects.

- c. The Contractor shall be responsible for providing all lines and grades for compaction grouting, including locations of all utilities and surveying markers.
- d. The Contractor shall be responsible for all health and safety requirements including those associated with the handling and disposal of contaminated materials. The Contractor shall be responsible for providing written procedures including a Health and Safety Plan.

6. Site Preparation:

The Contractor shall ensure a firm base on which heavy equipment can be operated safely under its own power.

The Contractor shall accurately locate all compaction grout columns in accordance with approved drawings. Compaction grouting shall be adjusted, as approved by the Engineer, to avoid utilities, foundations, and all other underground construction.

The Contractor shall provide access and maintenance thereof, for the compaction grouting equipment, work force and delivery of materials to the work site.

B. PRODUCTS

1. Materials:

- a. Portland Cement: Portland Cement shall conform to current ASTM standards, designation C 150. The use of cement replacement materials will be permitted subject to the approval of the Engineer and provided that they can be shown to have beneficial effects on concrete impermeability, heat generation during setting and general durability. The mix proportions of use shall be approved. For onsite batching, all cement and cement replacement materials shall be stored in separate containers according to type in waterproof stores or silos.
- b. Mineral Admixture: Mineral admixture, if used, shall be flyash or natural pozzolan which possesses the property of combining with the lime liberated during the process of hydration of Portland Cement to form compounds containing cementitious properties. The material shall conform to ASTM C 618, Class C or Class F.
- c. Fluidifier: Fluidifier shall be a compound possessing characteristics which will increase the fluidity of the mixture, act as water reducing agent and retardant.
- d. Water: Water shall be potable, fresh, clean and free of sewage, oil, acid, alkali, salts or organic matter.
- e. Fine Aggregate: Sand shall meet the requirements of current ASTM standards, designation C 33.

2. Grout Mixes:

The concrete/grout mix shall consist of Portland cement, sand, and water, and may also contain a mineral admixture and approved fluidifier. The components shall be proportioned and mixed to produce a concrete capable of maintaining the solids in suspension, which may be pumped without difficulty. These materials shall be proportioned to produce a hardened concrete/grout which will achieve the design strength within 28 days. The design 28-day concrete strength for this project shall be 2500 psi.

All materials shall be accurately measured by volume or weight as they are fed to the mixer. Time of mixing shall be not less than one minute at the site. If agitated continuously, the concrete/grout may be held in the mixer or agitator for a period not exceeding two and one half hours at concrete temperatures below 70 degrees F and for a period not exceeding two hours at higher temperatures, not exceeding 100 degrees F. Concrete/grout shall not be placed when its temperature exceeds 100 degrees F.

Protect concrete/grout from physical damage or reduced strength which could be caused by frost, freezing actions or low temperatures or from damage during high temperatures in accordance with ACI 305/306.

The concrete/grout mix shall be tested by making a minimum of six 2-inch cubes for each day during which compaction grouting is performed. A set of six cubes shall consist of two cubes to be tested at seven days, and two cubes to be tested at 28 days and two cubes held in reserve. Test cubes shall be cured and tested in accordance with ASTM C 109. Test the flow of each batch of concrete mix.

3. **Concrete/Grout Testing:**

- a. Sampling: Concrete/grout for the columns shall be sampled in accordance with ACI standards.
- b. Workability: The workability of concrete/grout shall be determined by the slump test as described in ACI standards or by an alternative approved method.
- c. Cube Tests: For each mix design of concrete, six cubes shall be made from a single batch when required for 65 cy of concrete/grout or part thereof in each day's work. Testing shall be carried out by an independent and approved laboratory. Two cubes shall be tested at an age of 7 days, two at 28 days, and two cubes shall be held in reserve for further testing, if required. Alternatively, cubes may be tested in accordance with an approved accelerated testing regime. The Contractor shall submit certified copies of the results of all tests to the Engineer.
- d. Standard of Acceptance: The standard of acceptance of the concrete mix cubes shall be in accordance with ACI standards or as otherwise approved.
- e. Record of Tests: The contractor shall keep a detailed record of the results of all tests on concrete/grout and concrete materials. Each test shall be clearly identified with the columns to which it relates.

4. **Batching Concrete/Grout:**

- a. General: Facilities shall be provided for the Engineer to inspect the concrete/grout mixing plant or plants when requested. Unless otherwise specified the requirements in Clauses 2.5.2, 2.5.3, 2.5.4 shall be met.
- b. Accuracy of Weighing and Measuring Equipment: The weighing and water-dispensing mechanisms shall be maintained at all times to within the limits of accuracy described in ACI standards.
- c. Tolerance in Weights: The weights of the quantities of each size of aggregate and of cement shall be within 2% of the respective weights per batch after due allowance has been made for the presence of free water in the aggregates, which shall be determined by the Contractor by an approved method.
- d. Moisture Content of Aggregates: The moisture content of aggregates shall be measured immediately before mixing and as frequently thereafter as is necessary to maintain consistency of mix.

5. **Mixing Concrete/Grout**

- a. Type of Mixer: The mixer shall be of the batch type, specifically designed for concrete/grout mixing.
- b. Tolerance of Mixer Blades: The mixing blades of pan mixers shall be maintained within the tolerances specified by the manufacturers of the mixers, and the blades shall be replaced when it is no longer possible to maintain the tolerances by adjustment.
- c. Cleaning of Mixers: Mixers which have been out of use for more than 30 minutes shall be thoroughly cleaned between the mixing of different types of cement
- d. Minimum Temperature: The temperature of fresh concrete/grout shall not be allowed to fall below 37° F. No frozen material or materials containing ice shall be used. Newly cast columns are to be covered to protect them against freezing unless the final cut off level is at least 0.8 ft. below the final head level as cast. Where a column is cast in frozen ground, appropriate precautions shall be taken to protect any section of the column in contact with the frozen soil where this occurs below the cut off level.

6. **Transporting Concrete/Grout**

- a. Method of Transporting: The method of transporting concrete/grout shall be submitted for approval. Concrete/grout shall be transported in uncontaminated watertight containers in such a manner that loss of material and segregation are prevented.
- b. Pumping Concrete/Grout: Pumped concrete/grout complying with this Specification may be used. The methods employed in its use shall be subject to approval.

7. **Ready-mixed Concrete/Grout**

- a. Conditions of Use: Subject to approval, the Contractor may use ready-mixed concrete/grout in accordance with ACI standards. Approval shall be obtained for each proposed use of ready-mixed concrete/grout in different sections of the Works and for each different mix, which shall comply with this Specification.
- b. Mixing Plant: Unless otherwise agreed by the Engineer, truck mixer units and their mixing and discharge performance shall comply with the requirements of ACI standards.

C. **EXECUTION**

1. **General**

The Compaction grout column technology employs a drill stem for both penetration and maintaining borehole stability. The concrete/grout is pumped into the column from the base of the drill stem. All materials and work shall be in accordance with Sections A, B and C of this Specification.

2. **Layout**

The procedure for layout of columns and checking their positions shall be approved by the Engineer. The actual compaction grout columns shall be installed within 3 inches of the design location shown on the Drawings, approved shop drawings or as otherwise directed by the Engineer.

3. **Diameter of Columns**

The diameter of a column shall be not less than 24-in.

4. **Equipment**

The contractor shall use a drill rig capable of penetrating all necessary soil layers or obstructions.

5. **Penetration**

- a. Penetration Near Recently Cast Columns: Columns shall not be advanced so close to other columns which have recently been cast and which contain workable or unset concrete/grout that a flow of concrete could be induced from or damage caused to any of the columns. A minimum distance of 8 ft (center-to-center) shall be kept between columns less than 24-hours old and on-going column installations.
- b. Removal of Drill Pipe from the Ground: Drill Pipe shall not be extracted from the ground during the penetration or construction of a column in such a way that an open unsupported void or inflow of water into the column section would result.
- c. Depth of Columns: Any failure of a column to reach the required depth, as given in the Specification or shown on the Drawings, shall be reported to the Engineer without delay and a full statement of the reasons given.

6. **Placing of Concrete/Grout**

- a. Mix Design and Workability: Where not otherwise stated in this Section, the concrete shall comply with Section B of this Specification. The design and workability of concrete to be used in the formation of a column shall produce a mix which is suitable for pumping. It shall have a target slump of 4 to 6 inches unless otherwise approved and a minimum cement content of 580 lbs/yd³. The fine aggregate shall be in accordance with ACI standards. This mix shall be designed so that segregation does not occur during the placing process, and bleeding of the mix shall be minimized.

- b. Equipment for Supply of Concrete/Grout to Columns: Concrete/Grout shall be supplied to the column through suitable tubing and hoses.
- c. Commencement of Concrete/Grout Supply to Each Column: The technique and equipment used to initiate and maintain the concrete flow shall be such that a column of the full specified cross-section is obtained from the maximum depth to the final cut off level.
- d. Rate of Supply of Concrete/Grout: The concrete/grout shall be supplied to the column at a sufficient rate during drill pipe withdrawal to ensure that a continuous monolithic shaft of the full specified cross-section is formed, free from debris or any segregated concrete/grout. The rate of withdrawal of the drill pipe and pressures of concrete/grout shall be measured and recorded throughout the phase of vibrator withdrawal for each column. The Contractor shall submit proposals for his method of monitoring construction for approval prior to the commencement of the Works.
- e. Completion of Columns: If the concrete/grout placing in any column cannot be completed in the normal manner, then the column shall be re-penetrated before concrete/grout has hardened and shall be completely replaced.
- f. Casting Level of Column Head: Concrete shall be cast to the commencing surface level or slightly above unless otherwise specified
- g. Disposal of Contaminated Material: The Contractor is responsible for disposal of all excavated soil, excess water, and spoil generated during installation of the compaction grouting installation at no extra cost. Manifests necessary for waste disposal shall be executed by the Engineer.

7. **Cutting of Column Heads**

When cutting off and trimming columns to the specified cut off level, the Contractor shall take care to avoid shattering or otherwise damaging the rest of the column. Any laitance, or contaminated, cracked or defective concrete/grout shall be cut away and the column made good in an approved manner to provide a full and sound section up to the cut off level.

8. **Documentation:**

Any proposed change in the approved construction program, necessitated by a change in the subsurface conditions, shall be submitted in writing to the Engineer for approval.

A daily log shall be submitted to the Engineer by the Contractor to include hole number, start/finish time of treatment, depth of treatment, diameter of drill hole, description of soil penetrated, and volume of grout/concrete placed at depth in no more than 2-ft increments.

D. CONSTRUCTION

The compaction grout columns shall be constructed prior to bridge foundations. Positive site drainage shall be established prior to construction of compaction grouting. Contractor shall control all spoils generated during compaction grouting and prevent spoils from flowing offsite. Spoils generated by compaction grouting shall be disposed of properly and removed from the site by the Contractor. No additional compensation shall be made for handling spoil.

Compaction grouting columns shall be constructed to the lines and elevation shown on the plans, and in accordance with the Special Provisions.

Compaction grout columns shall extend from the existing ground surface to the elevations outlined in the plans. No payment will be made for compaction grout columns installed within areas that are later excavated. The contractor shall be responsible to construct compaction grout columns to the depths required, and shall use the methods necessary to penetrate to the required depth, including but not limited to drilling through stiff and dense layers that may be present, as well as obstructions from existing construction.

The compaction grout columns shall be installed to the minimum required Area Replacement Ratio. The required minimum area replacement ratio (A_r) achieved at any depth by the compaction grouting shall be that which is equivalent to the diameter of the grout columns at the center-to-center (c-c)

spacing shown in the plans and on a triangular pattern. The area replacement ratio shall be defined by the following relationships:

$$A_r = \frac{\text{Column Area}}{\text{Tributary Area}} \times 100\%$$

Tributary Area

Where: Column Area = Area of circle based on column diameter as defined below.

$$\text{Tributary Area} = 0.866 (\text{Column Spacing})^2 \text{ for triangular spacing.}$$

Acceptance of the constructed column will be based on the theoretical column diameter determined from the volume of concrete/grout installed.

The Contractor shall, at all times, protect structures, underground utilities and other construction from damage caused by grouting operations. Damaged material shall be replaced or repaired to the satisfaction of the Engineer at no additional cost to the Department.

E. METHOD OF MEASUREMENT

The bid item for compaction grouting shall include the delivery and placement of all concrete material necessary for compaction grout column construction. It shall also include disposal of all spoil (surface water, soil, etc.) in a manner acceptable to the Department of Health and Environmental Control and to the Engineer.

F. BASIS OF PAYMENT

The quantity of ground modification measured for payments shall be the actual length of the installed compaction grout columns acceptable to the Engineer. No payment will be made for ground modification beyond the limits required by the Contract Documents, unless such increases in the specified area are directed in writing by the Engineer.

The accepted quantity, measured as above, will be paid for at the contract unit price per linear foot for compaction grout columns constructed at the diameter specified in the plans, which price and payment shall be full compensation for furnishing, hauling, treating, compacting of materials, removal of spoils and for all labor, equipment, tools, maintenance, and incidentals necessary to complete this item of work.

Payment will be made under:

Item No.	Pay Item	Pay Unit
8990353	GROUND MODIFICATION–COMPACTION GROUTING COLUMNS	Linear ft

(46) SECTION 305: MAINTENANCE STONE:

Maintenance Stone used on this project shall conform to the gradation requirements of Section 305, or to the gradation specified for Aggregate No. CR-14 in the Standard Specifications.

(47) SECTION 401: ASPHALT BINDER ADJUSTMENT INDEX:

The Liquid Asphalt Binder Adjustment Index Supplemental Specification dated March 3, 2009 applies to this project. For this project the Basic Bituminous Material Index will be determined on the first calendar day of the month in which cost proposals are due. The index and adjustment table will be available on the internet at http://www.scdot.org/doing/constructionLetting_MonthlyIndex.aspx, or may be obtained from the office of the Contracts' Administrator.

The following is hereby included in the table entitled "Items of Work Eligible for A.C. Binder Adjustments" in the supplemental specification.

PREVENTATIVE MAINTENANCE SURFACE TREATMENT	SY	0.0026
ASPH. SURF. TREAT. (TRIPLE T-1)	SY	0.0024

All items of work included in this project, that are listed in the table entitled "Items of Work Eligible for A.C. Binder Adjustments" below paragraph 4 of the supplemental specification will be subject to price adjustment.

The following Section of the Supplemental Specification is hereby modified:

Additional Provisions:

The Department will calculate and apply asphalt binder index adjustments to estimates based on index values set at the beginning of the estimate period.

Estimate period begins on the 1st of the month and ends on the last day of the month. The 1st of the month Index will be compared to the contract Base Index to determine index adjustments for the estimate period.

(48) SECTION 401: DRESSING OF SHOULDERS:

Prior to the placement of asphalt mixtures on existing roadways, the contractor will be required to remove all vegetation adjacent to the edge of pavement which impedes the placement of the asphalt mixture to the specified width. The contractor shall also remove and dispose of all excess asphalt which is disturbed during minor grading for widening, or during removal of debris or grass from existing surface during preparation of surface for new lift. After the asphalt mixture has been placed, the contractor shall blade the disturbed material to the extent that the shoulder is left in a neat and presentable condition. All excess material shall be removed from the project. No direct payment shall be made for this work; all costs are to be included in the price of other items of work.

(49) SECTION 401: SURFACE PLANING OF ASPHALT PAVEMENT:

A. GENERAL

1. Description:

This Special Provision replaces all references to Surface Planing of Asphalt Pavement in Subsection 401 of the Standard Specifications in their entirety. It does not replace or amend Subsection 611 of the Standard Specifications. It describes the material and construction requirements for the surfacing planing of existing asphaltic concrete pavement by micro-milling to remove wheel ruts and other surface irregularities, restore proper grade and/or transverse slope of pavement as indicated in the Plans or as instructed by the RCE. Ensure that the planed surface provides a texture suitable for use as a temporary riding surface or an overlay with OGFC with no further treatment or overlays. Do not use the planed surface as a temporary riding surface for more than ten days if no corrective action is required and no more than 21 days if corrective action is required unless otherwise instructed by the RCE.

B. REFERENCED DOCUMENTS

1. SCDOT Standard Specifications, Edition of 2007
2. SC-M-502, Rideability of PCC Pavement

C. EQUIPMENT

1. Provide power-driven, self-propelled micro-milling equipment that is the size and shape that allows traffic to pass safely through areas adjacent to the work. Also, use equipment with the following characteristics.
 - a. Ensure that the equipment is equipped with a cutting mandrel with carbide-tipped cutting teeth designed for micro-milling HMA and bituminous treated pavement to close tolerances.
 - b. Ensure that the equipment is equipped with grade and slope controls operating from a string line or ski and based on mechanical or sonic operation.

- c. Ensure that the equipment is capable of removing pavement to an accuracy of 0.0625 inches.
- d. Ensure that the equipment is furnished with a lighting system for night work, as necessary.
- e. Ensure that the equipment is provided with conveyors capable of transferring the milled material from the roadway to a truck located to the side, rear, or front while minimizing airborne dust and debris.

D. CONSTRUCTION REQUIREMENTS

1. Follow the Plans to micro-mill the designated areas and depths, including bridge decks, shoulder, and ramps, as required. Ensure that the following requirements are met.
 - a. Prior to commencement of the Work, construct a test section that is 1156 feet in length with a uniformly textured surface and cross section on the road to be treated as approved by the RCE. Ensure that the final pavement surface has a transverse pattern of 0.2 inches center to center of each strike area and the difference between the ridge and valley of the mat surface in the test section does not exceed 0.0625 inches.
 - b. Milling depth may range up to 2 inches as necessary to fully remove existing OGFC surface, which has a typical nominal depth of one inch, as well as lesser depths on shoulders to provide a planar surface that allows appropriate drainage prior to placement of new OGFC. While milling depths over one inch are anticipated to ensure OGFC removal in low spots as well as to meet rideability requirements, milling depth should be minimized when possible to avoid excessive removal of the pavement structure while still removing all existing OGFC.
 - c. The Department will test the test section for rideability following Subsection 6 of SC-M-502 for diamond ground and textured existing concrete pavement, except that the maximum acceptable rideability is 90 inches per mile for each 0.1 mile segment. The first and last 50 feet of the test section will not be included in the two 0.1 mile segments. Provide the RCE with at least three business days of notice prior to need of rideability testing.
2. If any of the requirements of Section D.1 are not met, do no further work and provide a written plan of action to the RCE detailing what steps will be taken to improve operations. The RCE may require corrective action to the test section prior to acceptance or accept the test section as is. Once the plan has been approved by the RCE, construct a second test section at a different location from the first. If the second test section meets the requirements of Section D.1 and is approved by the RCE, continuous milling may commence. If the second test section fails to meet the requirements of Section D.1, continue to construct test 1156 foot sections until satisfactory results are achieved.
3. Once continuous operations commence, continue to produce a uniform finished surface and maintain a constant cross slope between extremities in each lane.
4. Provide positive drainage to prevent water accumulation on the micro-milled pavement as shown on the Plans or as directed by the RCE.
5. Bevel back the longitudinal vertical edges greater than one inch that are produced by the removal process and left exposed to traffic. Bevel back at least 1.5 inches for each one inch of material removed. Use an attached mold board or other approved method.
6. When removing material at ramp areas and ends of milled sections, the transverse edges may be temporarily tapered 10 feet to avoid creating a traffic hazard and to produce a smooth surface. However, ensure that a neat transverse joint is created prior to the placement of the OGFC; do not terminate OGFC by “pinching” the OGFC over a tapered area.
7. Remove dust, residue, and loose milled material from the micro-milled surface. Do not allow traffic on the milled surface and do not place overlying layers on the milled surface until removal is complete.

E. ACCEPTANCE

1. Ensure that the micro-milling operation produces a uniform pavement texture that is true to line, grade, and cross section.
2. The Department will test and accept the milled surface for rideability as given in Subsections 6.2 through 6.4 of SC-M-502. The Adjusted Schedule of Payment given in Table 2 of Subsection 6

of SC-M-502 will apply to the contract unit price for the micro-milling as given in Subsection F of this special provision.

3. Micro-milled pavement surfaces are also subject to visual and straightedge inspections. Keep a 10-foot straightedge near the micro-milling operation to measure surface irregularities of the milled surface. Repair any areas exceeding 0.125 inches between the ridge and valley of the mat surface to the satisfaction of the RCE at no additional cost to the Department. Provide a written plan of action to the RCE for approval prior to performing any corrective action on the basis of rideability, grade, or surface texture.

F. MEASUREMENT AND PAYMENT

1. Measurement: The quantity measured for payment under this special provision is the number of square yards of micro-milled surface in place and accepted.
2. Basis of Payment: The quantity, as measured above, will be paid for at the contract unit price subject to the adjustments given herein, for which price and payment is full compensation for furnishing all materials, equipment, tools, labor, hauling, stockpiling, temporary asphalt, and any other incidentals necessary to satisfactorily complete the work. All reclaimed asphaltic pavement (RAP) becomes the property of the Contractor unless otherwise specified. No adjustment in the unit price for this item or other items will be considered for variations in the amount of RAP actually recovered.

Payment includes all direct and indirect costs and expenses required to complete the work. Payment will be made under:

Item No.	Pay Item	Unit
4013099	SURFACE PLANE ASPHALT PAVEMENT, VARIABLE	Square Yard

(50) SECTION 401: HOT MIX ASPHALT (HMA) QUALITY ACCEPTANCE:

Reference is made to the Supplemental Technical Specification “Hot Mix Asphalt (HMA) Quality Acceptance.” For the purposes of applying this Supplemental Technical Specification, pay factor adjustments will be based on a unit price of \$75 per ton.

(51) SECTION 401: HOT-MIX ASPHALT RIDEABILITY:

Reference is made to the Supplemental Technical Specification “Hot-Mix Asphalt Rideability.” For the purposes of applying this Supplemental Technical Specification, pay factor adjustments will be based on a unit price of \$100 per ton.

(52) SECTION 401: FULL DEPTH ASPHALT PAVEMENT PATCHING:

A. DESCRIPTION:

The Contractor shall patch existing asphalt pavement at locations directed by the Engineer. This work shall consist of the removal of deteriorated pavement and replacing with full depth asphalt plant mix patch.

B. CONSTRUCTION PROCESS:

The deteriorated pavement shall be removed to the width and length indicated by the RCE, with the face of the cut being straight and vertical. The pavement shall be removed to a depth of 4 and 8 inches as directed by the RCE. In the event unstable material is encountered at this point, then such additional material shall be removed as directed by the RCE.

The volume of material removed below the patch shall be backfilled with crushed stone and thoroughly compacted in 4-inch layers with vibratory compactors. Prior to placing the asphalt patch material in the hole, the sides of the existing asphalt pavement shall be thoroughly tacked. The patch material shall then be placed in layers not exceeding 3 inches with each layer being thoroughly compacted with a vibratory compactor and pneumatic roller. The patch material shall be an approved SCDOT Asphalt Concrete Binder Course Mix. Patches shall be opened and filled in the same day. Asphalt mixture shall not be applied when the existing surface is wet or frozen. The finished patch shall be smooth riding. The patches are to be no less than six feet by six feet in size and should be spaced at not less than 25 feet between patches.

The quantity of full depth asphalt pavement patching to be paid for will be the actual number of square yards of existing asphalt pavement which has been patched and accepted. The work includes cleaning, removing, and disposing of debris from the patching work, furnishing and placement of crushed stone and asphalt patching material, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of this item of work.

The Contractor's bid shall include 2000 square yards each of 4 inch and 8 inch full depth asphalt pavement patching. If more than the estimated square yards of patching are required by SCDOT, the Contractor will be paid a unit price of \$50.00 per square yard for 4" and \$72.00 per square yard for 8 inch. If less than the estimated square yards of patching are required by SCDOT, the Contractor shall reimburse SCDOT at the same unit price for the quantity of full depth patching that was not needed.

(53) SECTION 403: WARM MIX ASPHALT – ASPHALT INTERMEDIATE COURSE TYPE B (SPECIAL):

WMA Intermediate B Special will utilize the same specifications for Intermediate B with several exceptions:

- A. The mix must use WMA Technology using a chemical process on QPL # 77 to utilize maximum reduction in temperature to improve constructability in the field placement operations.
- B. The mix will require the exact same requirements as stated in SC-M-402 with exception of target air voids. The air voids will be targeted at 2.5-3.0% on the mix design to increase binder content and improve field compaction and fatigue resistance.
- C. The placement rate will also be different than conventional mix in order to make necessary repairs to the milled pavement sections during one lane closure sequence.
- D. In place density will be measured and accepted by using the gauge in lieu of taking roadway cores. A test strip will be required on the shoulder of the roadway to set up a roller pattern and establish target density. Ensure in place density is acceptable by taking 6 inch roadway cores at the end of the test strip to verify maximum compaction effort is obtained. All other mix acceptance testing will follow SC-M-400 using the same mixture acceptance criteria as the Intermediate Course Type B.

Item No.	Pay Item	Unit
4112320 X	WMA INTERMEDIATE COURSE TYPE B "SPECIAL"	TON

(54) SECTION 410: STONE MATRIX ASPHALT MIXTURES

A. DESCRIPTION

Work specified in this section consists of mixing, placing and compacting a Stone Matrix Asphalt (SMA) mixture. SMA mixtures are required to be composed of crushed mineral aggregate, RAP (optional), mineral filler, fiber stabilizing additive, and polymer modified asphalt binder. The SMA courses are produced through an asphalt plant and constructed in accordance with applicable Special Provisions and Standard Specifications, except as noted herein.

B. MATERIALS

1. **Aggregates:** Crushed aggregate is required for all fine and coarse aggregates with the exception of RAP. The crushed coarse aggregate must have 2 or more freshly mechanically induced fractured faces on at least 90% (based on count) of the material retained on the 4.75 mm (No. 4) sieve in accordance to AASHTO T335. The crushed coarse aggregate and the parent aggregate of the crushed fine aggregate in the SMA courses must have a maximum abrasion loss of 45.0% and a maximum absorption of 1.5% when tested in accordance with AASHTO T 96 and T 85, respectively.
 - a. Ensure the coarse aggregate is sufficiently washed to produce a clean aggregate, free from lumps, disintegrated particles, vegetation or deleterious substances and adherent coatings which may be considered detrimental to the performance of the SMA. Crushed coarse aggregate must not have more than 1.5% passing the 75µm (No. 200) sieve. Limestone, slag, and crusher-run aggregates will not be permitted in the SMA courses.
 - b. Ensure all fine aggregate consist of a blend of 100% crushed manufactured sand and has a minimum fine aggregate angularity of 45.0% when tested in accordance with AASHTO T 304.

- c. Fractionated RAP is permitted at a maximum aged binder percentage of 15.0% as compared to the optimum binder content of the mix design.

- 2. **Hydrated Lime:** Use hydrated lime that meets the requirements of AASHTO M 303, Type 1, and the product is listed on Qualified Product List 39. Hydrated lime is required to be blended with the damp aggregate at a rate of 1.0% by weight of dry aggregate. Blending of the hydrated lime is required according to subsection 401.4.11, Blending of Hydrated Lime, of the Standard Specifications.

- 3. **Polymer Modified Asphalt Binder:** Use an asphalt binder that meets the Supplemental Specification “Asphalt Binder and Additives” for Performance Grade 76-22 (PG 76-22).

- 4. **Stabilizing Fiber Additive:** Use a fiber that meets the properties described below.
 - a. **Cellulose Fibers:** Use cellulose fibers at a dosage rate between 0.2% and 0.4%, by weight of the total mix as approved by the Asphalt Materials Engineer. The actual amount may be adjusted outside of this range if deemed necessary by the AME to prevent excessive drain-down. Fiber properties will be as follows:

Fiber length (maximum):	6.35mm (0.25 inch)
Moisture Content	5.0% maximum (AASHTO T 255)
Sieve Analysis:	
Test Method: (AASHTO T 27)	
Passing 850µm (No. 20) sieve	80.0 – 95.0%
Passing 425µm (No. 40) sieve	45.0 – 85.0%
Passing 150µm (No. 100) sieve	5.0 – 40.0%

- 5. **Mineral Filler:** Use mineral filler that consist of crushed aggregate fines or fly ash. Ensure the filler is sufficiently dry to flow freely and be free from lumps.

Table 1 - Mineral Filler Properties - Mineral Filler will be graded within the following limits

Sieve Size	Percent Passing (AASHTO T 27)
600µm (No. 30)	100.0
300µm (No. 50)	95.0 – 100.0
75µm (No. 200)	55.0 – 100.0
20µm (No. 635)	30.0 (Maximum)

Ensure the Mineral Filler is free from organic impurities using AASHTO T 21 and have a plasticity index not greater than 4 using AASHTO T 90.

C. COMPOSITION OF MIXTURE

Combine the aggregates and hydrated lime in proportions so the composite gradation and the volumetric properties meet the following criteria during the mix design procedure in accordance with AASHTO T 312, “Preparation and Determining the Density of Hot-Mix Asphalt (HMA) Specimens by Means of the Gyratory Compactor.”

Table 2. Job Mix Formula and Design Limits

Mixture Control Tolerances		Asphalt Mixture	9.5 mm SMA	12.5 mm SMA
		Grading Requirements	Percent Passing	
Gradation	See 401.2.3.3 for tolerance for Surface Courses	19.0mm (3/4") Sieve	100.0	100
		12.5mm (1/2") Sieve	95.0 – 100.0	85.0 – 90.0
		9.5mm (3/8") Sieve	75.0 – 90.0	60.0 – 80.0
		4.75mm (No. 4) Sieve	32.0 – 54.0	25.0 – 32.0
		2.36mm (No. 8) Sieve	17.0 – 30.0	18.0 – 24.0
		0.60 mm (No. 30) Sieve	12.0 – 20.0	12.0 – 20.0
		300µm (No. 100) Sieve	9.0 – 15.0	9.0 – 15.0
		75µm (No. 200) Sieve	8.00 – 13.00	8.00 – 12.00
Design Requirements				
Volumetrics	See SC-M-400 Surface Courses	Range for % AC	5.80 – 7.00	5.60 – 7.00
		Air Voids (%)	3.50 ± 0.50	3.50 ± 0.50
		VMA, %	16.5 min	16.5 min
		VFA, %	65.0 – 85.0	65.0 – 85.0
		Drain-down, % (SC-T-90)	< 0.3	< 0.3
		Tensile Strength Ratio (SC-T-70)	85% min	85% min
	AASHTO T 19 / R46	Voids in Coarse Aggregate Tests	VCA _{drc} > VCA _{mix} Volume of CA (Dry-Rodded Condition) vs. Volume of CA (Mixture)	
Gyraton Level			35	

D. PLANT PRODUCTION

1. **SMA Mixing Plant:** Provide an asphalt plant that can prepare the SMA mixture that conforms to SC-M-401 with the following additions:

2. **Handling and Addition of Mineral Filler:** Provide adequate dry storage for the mineral filler and ensure equipment can add the filler into the mixture so it is done uniformly in the desired percentage according to the job mix formula. Introduce mineral filler into a batch plant by adding it directly into the weigh hopper. Add mineral filler in a drum mix plant directly into the drum mixer. Providing appropriate equipment for accurately proportioning the relatively large amounts of mineral filler required for an SMA mixture.

3. **Fiber Addition:** Provide adequate dry storage for the cellulose fibers and ensure equipment is in place to proportion fiber into the mixture uniformly and in the desired percentage according to the job mix formula. Fibers may not be required if Warm Mix Asphalt Technology is utilized in the SMA mixture per SC-M-408 (WMA Additives only) to prevent drain-down.
 - a. Batch Plant - Add fiber through a separate inlet directly into the weigh hopper above the pugmill. The addition of fiber must be timed to occur during the hot aggregate charging of the hopper. Adequate dry mixing time will be required to ensure proper blending of the aggregate and the fiber stabilizer. Dry mixing time is typically increased by 5 to 15 seconds. Wet mixing time is typically is typically increased by at least 5 seconds for the cellulose fibers to ensure adequate blending with the asphalt binder.

 - b. Drum Mix Plant - Add fiber into the drum mixer to ensure complete blending of the fiber into the mix. For this purpose, when adding loose fiber, a separate fiber feed system is required

to uniformly introduce fiber into the drum at such a rate as not to limit the normal production of mix through the drum. Ensure that no fiber is returned into the baghouse or returned/wasted baghouse fines.

4. **Mix Storage:** If the SMA mixture is not to be hauled immediately to the project and placed, provide storage bins. All storage must be either surge bins to balance production capacity with hauling and placing capacity or silos that are heated and insulated to prevent temperature excessive loss. Extended storage of any SMA mixture will be permitted up to 4 hours maximum.

E. CONSTRUCTION REQUIREMENTS

Perform all work to Section 401 of the Standard Specifications and other applicable Special Provisions except as noted in this specification. Place the SMA course in a manner to prevent segregation, provide the required in-place compaction, and produce a smooth riding surface. Ensure when the HMA mixture is delivered to the paver, mix temperature is not less 300°F and no greater than 350°F. If the mixture is produced using Warm Mix Technology, ensure the WMA mixture is delivered to the paver with a mix temperature not less than 240°F and no greater than 300°F. Temperatures may be allowed to extend beyond these ranges if directed by the AME. RCE will monitor mix temperature on each load prior to dumping the SMA mixture into the spreader.

F. ACCEPTANCE CRITERIA

Acceptance of the SMA mixtures will be based on SC-M-400 – “Asphalt Mixture Quality Assurance” using the same criteria as the Surface Type A.

G. METHOD OF MEASUREMENT AND BASIS OF PAYMENT

This work will be measured and paid for as specified in Subsections 401.5 and 401.6 of the Standard Specification for Highway Construction.

(55) SECTION 413: COLD CENTRAL PLANT RECYCLED MATERIAL:

413.1 DESCRIPTION

These special provisions cover the requirements for Cold Central Plant Recycling Material (CCPRM). Cold Central Plant Recycling (CCPR) is a process in which recycled asphalt concrete pavement is processed and stabilized using foamed asphalt or emulsified asphalt at a plant and then placed using conventional asphalt paving equipment. **CCPRM will not be used as a final riding surface.**

413.2 MATERIALS

413.2.1 STABILIZING AGENT (EMULSIFIED OR FOAMED PG BINDER)

Use stabilizing agents that are either asphalt emulsion or PG 64-22 binder (must be listed on SCDOT Qualified Product List 37 or 38). Use emulsified asphalts that conform to the requirements of AASHTO M 208, M 140, or M 316 that is formulated for CCPRM use. Use PG 64-22 that meets the requirements of section 401.2.1.1 of the Standard Specifications. Emulsified Asphalt, used as a stabilizing agent, is not permitted when placement occurs during night time hours and will be opened to traffic the next morning.

413.2.2 WATER

Use water for mixing that meets the requirements of Section 701.2.11 of the Standard Specifications.

413.2.3 OTHER ADDITIVES (HYDRATED LIME OR PORTLAND CEMENT)

Use, if necessary, additional additives that meet the requirements in **TABLE 4**. In the case where an additional additive is used, show type and dosage as described in the Job Mix Formula submitted to the Department.

413.2.3.1 HYDRATED LIME

Use hydrated lime that conforms to the requirements of AASHTO M 303, Type 1 from suppliers listed on the most recent edition of SCDOT Qualified Product List 39.

413.2.3.2 PORTLAND CEMENT

Use Portland cement that conforms to the requirements of Subsection 701.2.1 with the allowable maximum alkali content ($Na_2O+0.658K_2O$) increased to 1.0%.

413.2.4 ASPHALT TACK COAT

Use an asphalt tack coat material that meets the requirements of Subsection 401.4.18 of the Standard Specifications.

413.2.5 ASPHALT FOG SEAL

Use an asphalt emulsion fog seal material or PG 64-22 binder from Qualified Product Listing No. 37 / 38.

413.2.6 FINE AGGREGATE

Use a fine aggregate for the Grit application that conforms to FA 10 or FA 13 and from suppliers listed on the most recent edition of SCDOT Qualified Products List 1.

413.2.9 CRUSHED RECLAIMED ASPHALT PAVEMENT (RAP) MATERIAL

Additional RAP material (other than that reclaimed from the project) may be used and, if added, must meet the requirements of Section 401.2.2.6 of the Specifications and **TABLE 1**.

TABLE 1 – ADDITIONAL CRUSHED RAP

Tests	Method	Limit
Deleterious Materials: Clay Lumps and Friable Particles in Aggregate	AASHTO T 112	0.2% maximum
Maximum Sieve Size, 1.5 inches (37mm)	AASHTO T 27	100% Passing

413.2.10 ADDITIONAL AGGREGATE

Add additional aggregate if deemed necessary so the results of the job mixture meet the gradation requirements in **TABLE 3**. If additional aggregate is needed ensure that it comes from materials listed on Qualified Product List 1 and/or 2 and also meet the requirements of **TABLE 2**.

TABLE 2 – ADDITIONAL AGGREGATE

Tests	Method	Limit
Los Angeles Abrasion Value	AASHTO T 96	55% maximum loss
Sand Equivalent	AASHTO T 176	45% minimum
Maximum Sieve Size, 1.5 inches (37mm)	AASHTO T 27	100% Passing

Water absorption	AASHTO T 85	3% maximum
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413.3 JOB MIX FORMULA

Submit a job-mix formula (JMF) to the State Pavement Design Engineer for approval no less than 30 calendar days prior to the start of CCPRM operations. More than one JMF may be required to avoid any construction delays in case of materials changes. Ensure that the gradation of each JMF is within the bands shown in **TABLE 3**. Ensure that the contingency plan addresses actions to be taken if the gradation fails to meet these requirements. The RCE reserves the right to require appropriate measures be taken that may include stopping the work.

TABLE 3 – JMF GRADATION RANGE

Sieve Size	Gradation Band* (Percent Passing)	
	Lower	Upper
1.5"	-	100
¾", 3/8", No. 4 , No. 8	Production targets set off of blended gradation	
No. 200	2	9

*Values based on AASHTO T 27 using washed, pulverized materials, prior to stabilization. For CCPRM using Foamed Asphalt, cement can be used as a portion of the material passing the No. 200 sieve.

Ensure that the following items are included on the JMF:

1. Target field density (nearest 0.1 lbs / #/ft³)
2. Target percent (nearest 0.1%) of the stabilizing agents to be added to the recycled mix
3. Target percent (nearest 0.1%) by weight of water (at room temperature) required
4. Expansion ratio, half-life characteristics, and temperature of asphalt binder at the time of dosage into foaming chamber (for mixtures using foamed asphalt). Minimum curing time/set time for the emulsified asphalt and temperature of emulsified asphalt at the time of dosage into the mixture (for mixtures using emulsified asphalt)
5. Target gradation for sieve sizes 1.5", ¾", 3/8", No.4 and No. 200 (including any aggregate to be added).

Note: If a change in source materials is made during construction, create and submit new JMFs to the RCE and ensure that they are approved prior to use on the project.

TABLE 4 – CCPRMJMF REQUIREMENTS

Item	Test Method	Criteria	Fabrication / Conditioning Procedure
<i>Emulsified Asphalt Stabilized Materials</i>			

TABLE 4 – CCPRMJMF REQUIREMENTS

Item	Test Method	Criteria	Fabrication / Conditioning Procedure
1	Moisture Density Relations AASHTO T 180, Method D	Determined by Design; Used to Establish Target Field Density	—
2	Mixture Stability Test ASTM D 5581 (6 in. specimens) or 150mm specimens) AASHTO T 245 (4 in. specimens)	2500 lbs. minimum (6 in. diameter specimen) Or (150mm diameter) 1250 lbs. minimum (4 in. diameter specimen)	Produce three specimens at 75 blows per side (or 30 gyrations per AASHTO T 312) and cured at 140°F ± 5°F to constant mass, hold specimens at 104°F ±5°F for 2 hours ±5 min. in a forced draft oven immediately prior to testing.
3	Retained Stability ASTM D5581 (6 in. specimens) or 150 mm specimens) AASHTO T 245 (4 in. specimens)	Minimum 70% of results of item #2	Produce an additional three specimens and cure at 140°F ±5°F to constant mass. Vacuum saturate specimens to 55-65% moisture content, 77°F ±1.8°F water bath for 23 hours ±30 min and 104°F ±1.8°F water bath for an additional hour immediately prior to testing
4	Raveling Stability (ASTM D 7196)	Maximum 2%	Produce specimens using a gyratory compactor following AASHTO T 312 at 20 gyrations and cured at 50°F ±5°F for 4 hours ±5 min at 50% humidity.
5	Thermal Cracking (Indirect Tensile Test) AASHTO T 322	The critical cracking temperature must be less than or equal to the pavement temperature given for the project climate area and pavement depth by LTPPBind ¹ .	See Notes 1 through 7 below.

TABLE 4 – CCPRMJMF REQUIREMENTS

Item	Test Method	Criteria	Fabrication / Conditioning Procedure
<i>Foamed Asphalt Stabilized Materials</i>			
1	Moisture Density Relations AASHTO T 180, Method D	Determined by Design; Used to Establish Target Field Density	----
2	Dry Indirect Tensile Strength AASHTO T 283 Section 11	45 psi minimum	Produce three specimens using 75 blows per side (or 30 gyrations per AASHTO T 312) compacted at or below OMC and cured as follows: 4 inch diameter specimens, oven dry at 104°F ±5 °F for 72 hrs ± 30 min. and cool to ambient temperature for 24 hrs ± 30 min.; 6 inch or 150 mm diameter specimens, air dried for 24 hours ± 30min., then an additional 48 hours at 104°F ±5 °F in sealed plastic bag, cool to ambient temperature for 24 hrs ± 30 min.
3	Retained Indirect Tensile Strength AASHTO T 283 Section 11	Minimum, 70% of the Dry ITS from Item 2	Produce an additional three specimens and cure according to Item 2, and then submerge in 77°F ± 1.8 °F water bath for 24 hours ± 30 min. prior to testing.
4	Expansion Ratio. Wirtgen 2012 Cold Recycling Manual	10 times when Aggregate Temperature is 50°F to 77°F 8 times when Aggregate Temperature is greater than 77°F	-----

TABLE 4 – CCPRMJMF REQUIREMENTS

Item	Test Method	Criteria	Fabrication / Conditioning Procedure
5	Half-Life Wirtgen 2012 Cold Recycling Manual	6 second minimum	----

JMF Notes:

1. Choose the specification temperature using current FHWA LTPPBind software, using the weather station closest to the project. Ensure that the required temperature is the coldest temperature at the top of the recycled layer, using 98% reliability.
2. Compact samples to 6 in(150mm) diameter and at least 4.52 inches (115mm) in height, compacted to within 1% of design air voids at the design stabilizing agent content. Cure compacted samples at 140 ± 5 °F no less than 48 hours \pm 30 mins. Before testing, check sample mass every two hours \pm 5 mins until change in mass between successive checks does not exceed 0.05%. After curing, saw-cut two specimens from each compacted sample to 2 in. in height. Perform bulk density testing after saw-cutting.
3. Prepare three specimens at each of the three testing temperatures.
4. Select two testing temperatures that bracket the specification temperature. For example, if the specification temperature is -13°F, then two of the selected testing temperatures will be -4°F and -22°F. A temperature of 14°F or -40°F would be used as the third testing temperature.
5. Perform the tensile strength test on each specimen directly after the tensile creep test (at the same temperature as the creep test).
6. The critical cracking temperature is defined as the temperature at the intersection of the thermal stress curve (derived from the creep data) and the tensile strength line (the line connecting the average tensile strengths at the three testing temperatures).
7. Ensure that the critical cracking temperature predicted by the Indirect Tensile Test is less than or equal to the pavement temperature given for the project climate area and pavement depth by LTPPBind.

413.4 QUALITY CONTROL PLAN

Prepare a Quality Control Plan to ensure that operational techniques and activities provide a homogeneous and finished material of acceptable quality meeting the requirements of this special provision. Conform the plan to show sampling and testing that will be performed to control the processes and ensure material compliance within the requirements of this special provision. Provide the Quality Control Plan and the JMF that is intended to be used to accomplish the work to the State Pavement Design Engineer for review and approval no less than 30 calendar days prior to the start of CCPRM operations.

For each CCPRM project, a project specific Quality Control Plan is required, and must include the following (minimum) information:

1. A description of the Quality Control organization, including the number of full-time equivalent employees or Sub-Contractors with specific Quality Control responsibilities and an organizational chart showing lines of authority and reporting responsibilities.
2. A listing by discipline with the name, qualifications, duties, responsibilities and authorities for all persons proposed to be responsible for construction Quality Control.

3. A Quality Control Sampling, Testing and Analysis Plan with methods that include a description of how random locations for testing and sampling are determined.
4. Identification and description (and accreditation status) of the laboratories to be used for each type of testing.
5. Specific list of documentation for Quality Control activities.
6. Procedures to meet contract requirements and corrective action when QC criteria are not met.
7. Procedures to protect stabilized material from receiving excessive moisture from weather events (i.e. rain, fog, etc.) and corrective actions when criteria are not met.
8. Contingency Plan including: inclement weather, equipment breakdowns, materials shortages, deficient density of installed CCPRM, material doesn't break or cure in timely manner, as established by the JMF, gradation is outside of tolerances, and production modifications based on changes in ambient and/or material temperature

413. 5 PLANT EQUIPMENT

413.5.1 CCPRM PLANT

Use a plant that is capable of homogeneously incorporating all stabilizing agent(s) and materials up to the sizes shown in **TABLE 3**. Ensure that the plant is capable of delivering the amount of additives to within +/- 0.2% of the required amount by weight of the pulverized asphalt material, except that a capability of adding up to 5% water by weight of the pulverized bituminous material is mandatory. Use automated systems to regulate the application of stabilizing agent(s) and water that adjust automatically to the mass of the material being processed. When using foamed asphalt, outfit the plant with a test or inspection nozzle at one end of the spray bar that can produce a representative sample. Use a plant that is capable of maintaining the temperature of the liquid asphalt at a minimum of 300°F. Ensure that the plant is equipped with the means for the operator to verify that the stabilizing agent(s) and water are being evenly distributed and that the correct dosage rates of each are being applied. Ensure that the plant has the ability to print out stabilizing agent(s) and water quantities used during production. Ensure that the equipment is operated in accordance with the manufacturer's recommendations.

413.5.2 PLANT SCALES

Use scales that are approved in accordance with the requirements of SC-M-401.

413.5.3 TRUCKS, TRUCK SCALES AND AUTOMATIC PRINTER SYSTEM

Use truck scales and an automatic printer system that meets the requirements of SC-M-401.

413.6 PLACEMENT OPERATIONS EQUIPMENT

413.6.1 ASPHALT PAVERS

Use an asphalt paver that meets the requirements of Section 401.3.10 of the Standard Specifications. Place CCPRM at the specified depth set forth in the plans and ensure that the mix is spread uniformly without segregation.

413.6.2 ROLLERS

Use rollers that are self-propelled. Ensure that at least one pneumatic tire roller has a minimum gross operating weight of not less than 50,000 lbs. Ensure that at least one double steel-wheeled vibratory roller has a gross operating weight of not less than 24,000 lbs. and a width of 78 inches. Ensure that all rollers have properly working scrapers and water spraying systems.

413.7 CONSTRUCTION

413.7.1 WEATHER RESTRICTIONS

Ensure that recycling operations are performed when both the ambient temperature and material to be processed (measured in the shade and away from artificial heat) is a minimum 50°F. Do not perform any work when the weather forecast calls for freezing temperatures within 48 hours after placement of CCPRM on any portion of the project.

413.7.2 PLACING AND FINISHING

413.7.2.1 TRIAL TEST SECTION

At least one week, but not more than 30 days prior to the start of production, construct a 1,000 foot long trial section, one-lane wide, at the designated thickness and designed optimal stabilizing agent(s) content provided in the approved JMF. Construct the trial section at a location approved by the RCE on the project using the same construction procedures and equipment intended for the entire project. Cease production after construction of the trial section until the trial section is evaluated and accepted by the RCE. The Trial Section will be considered a LOT and payment will follow the payment tables established in this special provision.

In the event the initial trial section fails to meet JMF on gradation, binder content, designated depth, and field density requirements, make necessary corrections and construct a second trial section on the project site. The RCE may require a Technical Representative present during mixing and placing operations for the second trial section. When a Technical Representative is required, they must remain present during mixing and placement of any additional trial sections until acceptance has been made by the RCE. Additionally, ensure that the Technical Representative is present for the next day of production to oversee the mixing and placing operation. If during the next production day, the materials meet the mixture and placement acceptance criteria, the Technical Representative will no longer be required on the project site. If additional trial sections beyond the first two are needed, construct the trial section at sites approved by the RCE.

Ensure that the Technical Representative meets the following criteria:

1. Have 2 years minimum experience with the CCPRM process
2. Have personally supervised a minimum of 5 successful CCPRM projects
3. Have personal experience in developing CCPRM mix designs
4. Have the experience to perform and supervise field process control testing
5. Submit a list of references, with current telephone numbers, of persons who are able to verify the experience required herein.

Consultants or manufacturer’s representatives may be used to satisfy the technical representative requirements listed herein.

The initial trial section will be paid for at the contract unit price for CCPRM, to include price adjustments. If needed, the Department will pay for up to one additional trial section of CCPRM at the contract unit price, to include price adjustments. The Department will pay for a maximum of two trial sections at the contract unit price. If more than two trial sections are needed, the Contractor will bear all costs associated with producing and placing the material at a site approved by the RCE.

413.7.2.2 MATERIAL TESTING – QUALITY CONTROL

413.7.2.2.1 GRADATION AND BINDER CONTENT

CCPRM acceptance for gradation and binder content will be based on a mean of the results of each day’s run - production. A lot will be considered to be acceptable for gradation if the mean of the test results obtained is within the tolerance allowed for the job-mix formula as specified in **TABLE 5**. If a lot does not conform to the acceptance requirements for gradation stop paving/production and take corrective measures to bring the gradation within tolerance of the approved JMF.

TABLE 5						
Process Tolerance on Each Laboratory Sieve and Asphalt Content: Percent Plus and Minus						
No. Tests	1 ½"	¾"	⅜"	No. 4	No. 200	
1	0.0	8.0	8.0	8.0	2.0	
2	0.0	5.7	5.7	5.7	1.4	

3	0.0	4.4	4.4	4.4	1.1
4	0.0	4.0	4.0	4.0	1.0
5	0.0	3.6	3.6	3.6	0.9
6	0.0	3.3	3.3	3.3	0.8
7	0.0	3.0	3.0	3.0	0.8
8	0.0	2.8	2.8	2.8	0.7
9 or more	0.0	2.3	2.3	2.3	0.6

Establish, as part of the JMF, a target percent passing for the 1.5", 3/4", 3/8", No. 4 and No, 200 sieves. Create the JMF(s) using either existing materials obtained directly from the project site (prior to the start of construction) or from an existing stockpile of RAP. Quality Acceptance testing will be conducted by obtaining a sample of the mixture from the truck prior to it leaving the plant. The sample frequency will use SC-T-101 at a rate of 1 sample per 1000 tons.

Determine the asphalt binder content using an asphalt ignition oven in accordance with SC-T-75. Ensure a mix correction factor is determined in accordance with SC-T-75 prior to production. Perform gradation on the extracted ignition sample using SC-T-102. Cure all extraction samples to constant weight in a 300-350°F oven until the weight loss in a 15 minute period does not exceed +/- 1.0 grams within consecutive 15 minute intervals. There will be no price adjustment for asphalt content.

413.7.2.2.2 STABILIZING AGENT CONTENT

Provide with each gradation sample a computer printout of the stabilizing agent content percentage/rate of the plant at the time of sampling. If the dosage rate is outside of 0.20 percentage points, stop paving/production and take corrective measures to bring the dosage rate within tolerance of the approved JMF. In addition, provide a daily summary of the stabilizing agent content percentage/rate to the RCE.

413.7.2.2.3 MOISTURE CONTENT

Report the percent moisture content for prior to performing the mix extraction using the following equation:

$$\% \text{ Moisture} = \frac{\text{Original Mass} - \text{Final Mass}}{\text{Final Mass}} \times 100$$

413.7.2.2.4 MIXTURE STABILITY

When emulsified asphalt is used as the stabilizing agent, acceptance for Mixture Stability will be based on results of samples taken at a frequency a minimum of once per day. If the results are less than the established job-mix target, a pay adjustment will be applied for the tonnage represented by the results in section 414.8.4 under Acceptance.

413.7.2.2.5 DRY INDIRECT TENSILE STRENGTH

When foamed asphalt is used as the stabilizing agent, acceptance for Dry Indirect Tensile Strength will be based on results of samples taken at a minimum of once per day. If the results are less than the established job-mix target, a pay adjustment will be applied for the tonnage represented by the results in section 414.8.4 under Acceptance.

413.7.2.2.6 HALF-LIFE AND EXPANSION RATIO

Verify and provide reports to the RCE confirming that each load of asphalt binder used for foaming meets the requirements of TABLE 4.

413.7.2.2.7 FIELD COMPACTION

Ensure compaction of the recycled mix is completed using rollers meeting the requirements of this specification. In addition, set the vibratory roller near the highest frequency and near the lowest amplitude setting without damaging the CCPRM. Ensure that final rolling eliminates pneumatic tire

marks and to achieve density, and done using a double drum steel roller(s), either operating in a static, oscillating or vibratory mode. Use oscillating and vibratory mode only if it is shown to not damage the pavement. Complete finish rolling no more than one hour after paving is completed, unless otherwise approved by the RCE. Do not stop rollers and allow them to sit on the uncompacted material. Establish rolling patterns so that they begin or end on previously compacted material or the existing pavement. Perform rolling until the material reaches a density of 98 percent of the maximum target density from the JMF as measured via a nuclear density gauge following SC-T-30, SC-T-31, or SC-T-32.

Use a nuclear density gauge conforming to the requirements of SC-T-65 to determine mat density by the Direct Transmission method. Ensure that the nuclear density gauge has been calibrated within the previous 12 months. In addition, maintain documentation of such calibration service for the 12-month period from the date of the calibration service and furnish the same to the RCE if requested. Construct a control strip and establish a roller pattern in accordance with the requirements of SC-T-65. The control strip will be acceptable if the field proctor (AASHTO T 180, Method D) is at least 98 percent of the maximum target density from the approved JMF and the density of the compacted CCPRM course is not less than 98.0 percent of the maximum target density from the approved JMF. Construct an additional control strip when a change in the source of material is made, when a change in compaction equipment is made, when a significant change in the composition of the material occurs, a change in roadway conditions occurs, or when there is a failing test section.

413.7.2.2.8 DEPTH CHECKS

Perform depth checks at a minimum rate of twice per 5,000 linear feet after compaction by coring the newly CCPRM after compaction has been completed. Measure the depth by the height of the core in 3 separate evenly spaced measured transversely across the mat and average 3 readings. Use SC-T-101 to determine the random locations. The RCE will take verification measurements of the same core. Acceptance of CCPRM course for depth will be based on the mean result of measurements of samples taken from each LOT of material placed. A LOT will be considered acceptable for depth if the mean result of the tests is within the tolerance of the plan depth for the number of tests taken as shown in **TABLE 7**.

TABLE 7 – PROCESS TOLERANCE FOR DEPTH CHECKS

Plan Depth, inches	Tolerance, inches (Plus or Minus)		
	2 tests	3 tests	4 tests
≤ 4	0.45	0.35	0.30
>4 ≤ 8	0.65	0.50	0.40
>8 ≤ 12	0.90	0.70	0.50
>12	1.00	0.80	0.60

If the mean depth of a LOT of material is in excess of the tolerance, the payment will not be made for that material in excess of the tolerance for the plan depth specified throughout the length and width of the LOT of material represented by the tests. For excessive depth CCPRM courses, the rate of deduction from the tonnage allowed for payment as CCPRM course will be calculated based on the JMF weight per square yard per inch of depth in excess of the tolerance for plan depth and the number of tests taken as specified in **TABLE 7** or the RCE can require excessive material to be removed at no additional expense to the Department.

If the mean depth of a lot of material is deficient by more than the allowable tolerance for the plan depth specified, correction will be required and payment will be made for the quantity of material that

has been placed in the lot. For sections of CCPRM course that are deficient in depth beyond the tolerance, furnish and place material specified for the subsequent course or as approved by the RCE to bring the deficient CCPRM course depth within the tolerance of the specified plan depth. This additional material will be placed at no additional expense to the Department.

413.7.2.2.9 FOGSEAL

Ensure that after compaction of the recycled material has being completed, a fog seal is applied to the recycled surface at a uniform application rate of 0.04 gal/sy residual using a emulsified asphalt or PG 64-22 binder. A light application of fine aggregated used as grit may be applied to the fog seal to aide in the reduction of CCPRM pickup and raveling (if necessary). Ensure that after fog sealing no traffic, including construction equipment, drives on the completed recycled material for at least two hours. After two hours rolling traffic may be permitted on the recycled material. This time may be adjusted by the RCE to allow establishment of sufficient cure so traffic will not initiate raveling. After opening to traffic, maintain the surface of the recycled pavement in a condition suitable for the safe movement of traffic. Remove all loose particles that may develop on the pavement surface without damaging the surface. Within the limits of the Contract, maintain the CCPRM material in good condition until all work has been completed and accepted. This maintenance includes immediate repairs or defects that may occur including raveling or other surface imperfections. Perform this work without additional compensation and repeat as often as may be necessary to keep the area continuously intact. Replace faulty work for the full depth of the layer.

413.7.2.2.10 VERIFICATION OF MOISTURE CONTENT

Prior to placing the asphalt concrete surface courses, or other applicable surface treatment, allow the CCPRM material to cure until the moisture of the material is a maximum of 50 percent of the optimum water content or until approval of the RCE is received. Measure the moisture content using AASHTO T 329 on samples taken from two random locations and immediately placed in a sealed plastic bag, as determined by the RCE for each production day. Other methods and sampling rates may be used if supplied in the Quality Control Plan and approved by the RCE. Split samples may be taken at the direction of the RCE. Split samples may be part of the random locations or at additional locations determined by the RCE. Apply a tack coat, in accordance with Subsection 401.4.18, prior to any additional asphalt layers. Do not use **CCPRM as a final riding surface**.

413.7.2.2.11 TESTING RECORDS

Ensure that all testing information is readably available during the performance of the work and all records are collected by the RCE prior to the next LOT. Provide accurate reports meeting the requirements of AASHTO R 18.

414.8 ACCEPTANCE

414.8.1 DAILY PRODUCTION - LOT

For the purposes of acceptance, each day’s production will be considered a LOT. When paving is less than 2,000 feet, it will be combined with the next day’s production or added to the previous day’s production if it is the last day to create a lot.

414.8.2 MIX QUALITY ACCEPTANCE

If key test results are less than the established JMF target, a pay adjustment will be applied for the tonnage represented by the results using the **TABLE 8** for mix stability and **TABLE 9** for Indirect Tensile Strength.

TABLE 8 - Mix Quality – Stability (Foamed Asphalt)	
% of Job-Mix Target Stability	% of Payment
Greater than 99.0	100
95.0 to 99.0	95
90.0 to 94.9	90

Less than 90.0*	90% pay and Cease Production
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* Immediately cease production and notify the RCE when results fall below 90.0% of the approved JMF target. Make any necessary corrective actions to the mix and provide verification to the RCE that it conforms to the approved JMF. Should the results fall below the minimum specified in **TABLE 4**, remove the material represented by the failing results and replace it at no cost to the Department. With approval of the RCE, subsequent paving operations can resume.

TABLE 9 - Mix Quality – Indirect Tensile Strength (Emulsified Asphalt)	
% of Job-Mix Target Dry Indirect Tensile Strength	% of Payment
Greater than 99.0	100
95.0 to 98.9	95
90.0 to 94.9	90
Less than 90.0*	90% and Cease Production

* Immediately cease production and notify the RCE when results fall below 90.0% of the approved JMF target. Make any necessary corrective actions to the mix and provide verification to the RCE that it conforms to the approved JMF. Should the results fall below the minimum specified in **TABLE 4**, remove the material represented by the failing results and replace it at no cost to the Department. With approval of the RCE, subsequent paving operations can resume.

414.8.3 Field Compaction

Measure density by taking a nuclear density reading from two random test sites selected by the RCE within every 1000 feet. Ensure that readings are not located within 12 inches of the edge of any application width for CCPRM. Nuclear density test locations will be marked and labeled by the RCE in accordance with the requirements of SC-T-101.

The average of the density measurements taken for the LOT will be compared to the target nuclear density established by the approved JMF to determine the acceptability of the lot. Once the average density of the lot has been determined, do not provide additional compaction to raise the average. If two consecutive 1000 foot sections produce density results less than 98 percent of the target density, immediately notify the RCE and institute corrective action. By the end of the day's operations, furnish the test data developed during the day's recycling to the RCE. Verify results for every lot by performing a field proctor (AASHTO T 180, Method D). Ensure that the field proctor is at least 98 percent of the target density from the approved JMF. A pay adjustment for the tonnage represented by the LOT will be applied using TABLE 10.

TABLE 10 - PAYMENT SCHEDULE FOR LOT DENSITIES

% of Target Control Strip Density	% of Payment
98.0 or greater	100
97.0 to less than 98.0	95
96.0 to less than 97.0	90

Less than 96.0	75
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414.8.4 LOT PAY FACTOR

The RCE will compute the Lot Pay Factor (LPF) once payments are determined using the tables for mix quality and field density using the following formula. The LPF will be rounded to the nearest 0.1%.

$$\text{LPF} = 0.50 (\text{PF mix quality}) + 0.50 (\text{PF Density})$$

414.9 MEASUREMENT

Measurement and payment for the Cold Plant Recycling Material (CCPRM) will be paid by the ton of the completed sections and will be paid for at the Contract unit price per ton. This price will be full compensation for removal, hauling and processing of the existing pavement (if RAP from the same project is used) and/or existing RAP stockpile(s); for additional aggregate if needed; for preparing, hauling, placing and compacting of all materials; furnishing stabilizing agents (PG Binder or Emulsion), fog seal, aggregate used in grit application and additives (lime and cement); for all freight involved; for all manipulations, rolling and brooming; for testing and documentation; asphalt supplier services; and for all labor, tools, equipment and incidentals necessary to complete the work. Net weight information will be furnished with each load of material delivered in accordance with the requirements of Section 401 of the Specifications. Batch weights will not be permitted as a method of measurement unless the Contractor's plant is equipped in accordance with the requirements of Section 401 of the Specifications, in which case the cumulative weight of the batches will be used for payment. The unit price for calculating pay factor will be \$40.00 per ton.

(56) SECTION 501: ROLLER COMPACTED CONCRETE:**A. GENERAL**

1. Description: Roller Compacted Concrete (RCC) consists of aggregate, Portland cement and possibly other supplementary cementitious materials (fly ash, slag), and water. RCC is proportioned, mixed, placed, compacted, and cured in accordance with these specifications. Ensure that the RCC conforms to the lines, grades, thickness, and typical cross section shown in the plans or otherwise established by the RCE. When used as base course, it will be covered with one or more lifts of asphalt as shown on the Plans. Otherwise, the RCC will provide the final riding surface.

B. SUBMITTALS

1. Proposed RCC mix design: At least 45 days prior to the beginning of placing of RCC in the roadway, submit a proposed mix design to the State Materials Engineer at the SCDOT Office of Materials and Research for review. If the mix design appears satisfactory to the SCDOT, prepare and test a trial batch mixture at the Contractor's facilities to verify that the design criteria for strength are met. Perform batch mixture preparation and testing in the presence of representatives of the SCDOT Office of Materials and Research. Make no production until an approved mix design has been obtained.

C. MATERIALS

1. General: The RCE will approve all materials to be used for RCC construction based on laboratory tests or certifications of representative materials that will be used in the actual construction. All materials must conform to Section 700 of the *SCDOT Standard Specifications for Highway Construction*, unless otherwise modified herein.
2. Portland Cement, Fly Ash, and Water-Granulated Blast Furnace Slag: All cementitious material must conform to Section 501.2.1. Pozzolanic substitution for Portland cement shall be allowed as specified in Section 701.4.9. If the use of silica fume is desired, have the type and usage pre-approved by the SCDOT State Materials Engineer.
3. Aggregates: Obtain all aggregates to be used from qualified sources appearing on the SCDOT Qualified Products Listing for aggregates. Use no aggregate where the plasticity index of the aggregate exceeds 5. Aggregates may be obtained from a single source or borrow pit, or may

be a blend of fine and coarse aggregates. Use well-graded aggregate without gradation gaps and conforming to the following gradation:

Sieve Size	Percent Passing by Weight
1 inch	100
¾ inch	90-100
½ inch	70-100
3/8 inch	60-85
#4	40-60
#16	20-40
#100	6-18
#200	2-8

4. Water: Use only water conforming to Section 701.2.11 of the Standard Specifications.
5. Curing Compound: Where curing compounds are used, only those white-pigmented products shown in the current edition of SCDOT Qualified Products List 33 shall be used.

D. DESIGN STRENGTH

Use a mix design that demonstrates a compressive strength of 4000 psi within 28 days when specimens prepared according to ASTM C 1435 are tested according to AASHTO T 22. At least two sets of three cylinders will be produced, with one set being tested at 4 days and the other at 28 days. To determine the compressive strength for a set, two of the specimens will be tested. If the weaker of the two specimens is at least 90 percent of the strength of the stronger specimen, then the two values will be averaged to determine the overall compressive strength. If the weaker specimen has less than 90 percent of the strength of the stronger specimen, then the third specimen will be broken and all three specimens will be averaged. If one individual result is much lower or much higher than the other two due to defects in the specimen, that value may be discarded at the State Materials Engineer's discretion.

E. EQUIPMENT

1. General: Construct roller compacted concrete with any combination of equipment that will produce a completed pavement meeting the requirements for mixing, transporting, placing, compacting, finishing, and curing as provided in this specification.
2. Mixing Plant: Locate the mixing plant within a thirty-minute haul time from the point of RCC placement. Use only plants capable of producing an RCC pavement mixture in the proportions defined by the final approved mix design and within the specified tolerances. The capacity of the plant must be sufficient to produce a uniform mixture at a rate compatible with the placement equipment. If the plant is unable to produce material at a rate adequate to prevent unnecessary cold joints and frequent paver stoppages, the RCE may halt production until such time that a plant of appropriate capacity is used. Have the plant inspected and approved by the SCDOT Office of Materials and Research prior to production of material under these specifications.
 - a. Pugmill Plant: Use only pugmill plants of the central plant type with a twin-shaft pugmill mixer, capable of batch or continuous mixing, equipped with synchronized metering devices and feeders to maintain the correct proportions of aggregate, cement, pozzolan, and water. Other pugmill plant requirements are as follows:
 - 1) *Aggregate Storage*: If previously blended aggregate is furnished, storage may be in a stockpile from which it is fed directly to a conveyor feeding the mixer. If aggregate is furnished in two size groups, follow proper stockpiling techniques to ensure aggregate separation.
 - 2) *Aggregate Feed Rate*: Use aggregate bins with a feed rate controlled by a variable speed belt, or an operable gate calibrated to accurately deliver any specified quantity of material. If two aggregate size stockpile sources are used, the feed rate from each bin must be readily adjustable to change aggregate proportions, when required. Feed rate controls must maintain the established proportions of aggregate from

each stockpile bin when the combined aggregate delivery is increased or decreased.

- 3) *Plant Scales*: Plant scales, if utilized, for any weigh box or hopper must comply with Section 701.3.2.
 - 4) *Cement and Pozzolan Material Storage*: Supply separate and independent storage silos for Portland cement and pozzolan. At plants with two or more silos in which different types of cement or cementitious materials are stored, ensure that each silo has a sign at each fill inlet to reduce the potential for loading errors. Make the sign from a durable material, with minimum two-inch high by ¼-inch wide letters that are raised, indented, or cut. Ensure that the sign clearly identifies the material that is in the silo and may be easily read even when completely coated with dust. Flat signs with painted or applied letters are not acceptable.
 - 5) *Pre-blended Portland Cement and Pozzolan*: If using pre-blended Portland cement and pozzolan (such as fly ash or slag), employ blending equipment acceptable to the RCE and demonstrate, with a testing plan, the ability to successfully produce a uniform blended material meeting the mix design requirements. Perform testing on at least a daily basis to ensure both uniformity and proper quantities.
 - 6) *Cement and Pozzolan Feed Unit*: Provide a satisfactory means of dispensing Portland cement and pozzolan, volumetrically or by weight, to ensure a uniform and accurate quantity of cementitious material enters the mixer.
 - 7) *Water Control Unit*: Use a water control unit capable of measuring the required amount of water for the approved mix by weight or volume. Ensure that the unit is equipped with an accurate metering device. Vary the amount of water to be used only with the approval of the RCE.
 - 8) *Gob Hopper*: For continuous operating pugmills, provide a gob hopper attached to the end of the final discharge belt to temporarily hold the RCC discharge in order to allow the plant to operate continuously.
- b. *Rotary Drum Mixer*: Provide a rotary drum batch mixer capable of producing a homogeneous mixture, uniform in color, and having all coarse aggregate coated with mortar. Equip the mixer with batching equipment to meet the following requirements:
- 1) *Weighing Equipment*: Measure the amounts of cement, pozzolan, and aggregate entering into each batch of RCC by direct weighing equipment. Use only weighing equipment that is readily adjustable in order to compensate for the moisture content of the aggregate or to change the proportionate batch weights. Include a visible dial or equally suitable device that will accurately register the scale load from zero to full capacity. The cement and pozzolan may be weighed separately or cumulatively in the same hopper on the same scale, provided the cement is weighed first.
 - 2) *Weigh Hoppers*: Use only bulk cement and pozzolan weigh hoppers that are equipped with vibrators to operate automatically and continuously while weighing hoppers are being dumped. Ensure that the weigh hopper has sufficient capacity to hold not less than 10 percent in excess of the cementitious material required for one batch.
 - 3) *Water Metering*: Measure the amount of water entering each batch of RCC by weight or volume. Use only equipment capable of measuring the water to within a tolerance of plus or minus one percent and equipped with an accurate gauge or dial measuring device. Vary the amount of water to be used only with the approval of the RCE. During batching, admit water to the mixer only through the water measuring device and then only at the time of charging.
 - 4) *Mixing Time*: Use only drum mixers equipped with an accurate clock or timing device, capable of being locked, for visibly indicating the time of mixing after all the materials, including the water, are in the mixer.

- 5) *Recharging*: Discharge all material in the drum before recharging. Ensure that the volume of mixed material per batch does not exceed the manufacturer's rated capacity of the mixer.
3. Paver: Place RCC with a high-density asphalt-type paver subject to approval by the RCE. Use only pavers equipped with compacting devices capable of producing an RCC pavement with a minimum of 90 percent of the maximum density in accordance with AASHTO T 180, Method D prior to any additional compaction. Ensure that the paver is of suitable weight and stability to spread and finish the RCC material, without segregation, to the required thickness, smoothness, surface texture, cross-section, and grade.
4. Compactors: Use self-propelled steel drum vibratory rollers having a minimum static weight of 10 tons for primary compaction. For final compaction, use either a steel drum roller, operated in a static mode, or a rubber-tired roller of equal or greater weight. Only use walk-behind vibratory rollers or plate tampers for compacting areas inaccessible to large rollers.
5. Haul Trucks: Use trucks for hauling the RCC material from the plant to the paver with covers available to protect the material from inclement weather. To ensure adequate and continuous supply of RCC material to the paver, have a sufficient number of trucks. If the number of trucks is inadequate to prevent frequent starts and stops of the paver, cease production until additional trucks are obtained.
6. Water Trucks: Keep at least one water truck, or other similar equipment, on-site and available for use throughout the paving and curing process. Equip such equipment with a spreader pipe containing fog spray nozzles capable of evenly applying a fine spray of water to the surface of the RCC without damaging the final surface.
7. Inspection of Equipment: Before start-up, the Contractor's equipment will be carefully inspected. Should any of the equipment fail to operate properly, cease work until the deficiencies are corrected.
8. Access for Inspection and Calibration: Provide the RCE or RCE's representative access at all times for any plant, equipment, or machinery to be used in order to check calibration, scales, controls, or operating adjustments.

F. CONSTRUCTION REQUIREMENTS

1. Preparation of Subgrade: Before the RCC processing begins, prepare the subgrade in accordance with Section 208 of the SCDOT Standard Specifications.
2. Quality Control Test Specimens: For each day's production, up to 1500 cubic yards of mix produced, prepare at least three sets of test specimens in accordance with ASTM C 1435 under the direct observation of the RCE or RCE's representative. A set of specimens consists of three cylinders. Make an additional three sets for each additional 1500 cubic yards or fraction thereof. Cure and transport the specimens to the Contractor's (or mix producer's) Office of Materials and Research-approved laboratory in accordance with ASTM C 31. Test two cylinders for compressive strength in accordance with ASTM C 39 at 3 days, 7 days, and 28 days under the direct observation of the RCE or RCE's representative. If the measured compressive strength between two cylinders varies by more than 10 percent of the stronger cylinder, test the third cylinder and average the results of the three cylinders. Otherwise, average the measured compressive strengths of the two cylinders tested at 28 days to determine the compressive strength of the lot. Retain the compressive strength test results for inspection by the RCE.

If the compressive strength measured at 3 days indicates that the 28-day compressive strength will be less than 3500 psi, investigate the potential causes of the low strengths and report to the RCE within 24 hours. If the compressive strength measured at 3 days indicates 28-day compressive strengths less than 3200 psi, immediately stop production and notify the RCE. Do not resume production until the cause of the discrepancy has been determined to the satisfaction of the RCE. The RCE may adjust compressive strength targets at 3 days as production continues based on field experience.

3. Mixing Process: Use the same mixture for the entire project unless otherwise stated in the project documents. If, during production, the source of Portland cement, pozzolan, or aggregates is changed, then suspend production and submit a new mix design to the RCE for approval. Do

not exceed the manufacturer's rated capacity for dry concrete mixtures in the mixing chamber. Keep the sides of the mixer and mixer blades free of hardened RCC or other buildups. Routinely check mixer blades for wear and replace if wear is sufficient to cause inadequate mixing.

- a. *Mixing Time*: Use a mixing time adequate to ensure a thorough and complete mixing of all materials. Do not allow the mixing time, after all materials including water are in the mixer, to be less than 1½ minutes for one cubic yard and 20 seconds for each additional cubic yard.
- b. *Mixture Ingredient Tolerances*: Ensure that the mixing plant receives the quantities of individual ingredients to within the following tolerances:

Material	Variation by Weight
Cementitious Material	±2.0%
Water	±3.0%
Aggregates	±4.0%

- c. *Plant Calibration*: Prior to commencement of RCC production, carry out a complete and comprehensive calibration of the plant in accordance with the manufacturer's recommended practice. Provide all scales, containers, and other items necessary to complete the calibration. After completion of the initial calibration, calibrate the plant periodically as directed by the RCE. Plants listed on SCDOT Qualified Product List 28 at the time of RCC production are exempt from this requirement, although the SCDOT reserves the right to require additional calibration if variation in mixture quantities are suspected.
 - d. *Daily Reports*: Supply daily plant records of production and quantities of materials used that day to the RCE. These records may be used as a check on plant calibration.
4. *Transportation*: Transport the RCC pavement material from the plant to the areas to be paved in dump trucks equipped with retractable protective covers for protection from rain or excessive evaporation. Ensure that the trucks are dumped clean with no buildup or hanging of RCC material in the corners. Have the dump trucks deposit the RCC material directly into the hopper of the paver or into a secondary material distribution system that deposits the material into the paver hopper. Dump truck delivery must be timed and scheduled so that RCC material is spread and compacted within the specified time limits.
 5. *Placing*:
 - a. *Subbase Condition*: Prior to RCC placement, ensure that the surface of the subbase is clean and free of foreign material, ponded water, and frost. Ensure that the subbase is uniformly moist at the time of RCC placement. If sprinkling of water is required to remoisten certain areas, ensure that the method of sprinkling will not form mud or pools of freestanding water. Correct soft or yielding subbase areas prior to placement of RCC as specified in Section F.1 above.
 - b. *Weather Conditions*:
 - 1) *Cold Weather Precautions*: Employ cold weather precautions as detailed in Section 501.4.6 of the Standard Specifications.
 - 2) *Hot Weather Precautions*: During periods of hot weather or windy conditions, take special precautions to minimize moisture loss due to evaporation. Cooling of aggregate stockpiles by shading or the use of a fine mist may be required. Protective covers may be required on dump trucks. Keep the surface of the newly placed RCC pavement continuously moist.
 - 3) *Rain Limitations*: Conduct no placement of RCC pavement during rain conditions sufficient to be detrimental to the finished product. Placement may continue during light rain or mists provided the surface of the RCC pavement is not eroded or damaged in any way. Use dump truck covers during these periods. The RCE may terminate paving at any time when, in the RCE's judgement, the rain is detrimental to the finished product.
 - c. *Paver Requirements*: Place all RCC with an approved paver as specified in Section E.3 and also meet the following requirements:

- 1) *Filling the Paver:* Do not allow the quantity of RCC material in the paver to approach empty between loads. Maintain the material above the auger at all times during paving.

Stopping the Paver: Ensure that the paver proceeds in a steady, continuous operation with minimal starts and stops, except to begin a new lane. Maximum paver speed during laydown is 10 feet per minute. Higher paver speeds may be allowed at the discretion of the RCE if the higher speeds may be obtained without distress to the final product or cause additional starts and stops.

- 2) *Surface Condition:* Ensure that the surface of the RCC pavement is smooth, uniform, and continuous without excessive tears, ridges, or aggregate segregation once it leaves the paver.

- d. *Inaccessible Areas:* Pave all areas inaccessible to either roller or paver with cast-in-place concrete meeting the compressive strength requirements of these specifications.
 - e. *Adjacent Lane Pavement:* Place adjacent paving lanes within 60 minutes. If more than 60 minutes elapses between placement of adjacent lanes, the vertical joint must be considered a cold joint and prepared in accordance with Section F.7 below. At the discretion of the RCE, this time may be increased or decreased depending on ambient conditions of temperature, wind, and humidity. Multiple pavers may be used in tandem to reduce the occurrence of cold joints.
 - f. *Hand Spreading:* Broadcasting or fanning the RCC material across areas being compacted is not permissible. Such additions of materials may only be done immediately behind the paver and before any compaction has taken place. Any segregated coarse aggregate shall be removed from the surface before rolling.
 - g. *Segregation:* If segregation occurs in the RCC during paving operations, placement shall cease until the cause is determined and corrected to the satisfaction of the RCE. If the segregation is judged by the RCE to be severe, remove and replace the segregated area at no additional cost to the Department.
6. **Compaction:**
- a. *Time to Compaction Start:* Ensure that compaction begins with the placement process and is completed within 60 minutes of the start of the mixing at the plant. The time may be increased or decreased at the discretion of the RCE depending on ambient conditions of temperature and humidity. Do not permit delays in rolling unless approved by the RCE. Plan operations and supply sufficient equipment to ensure that these criteria are met.
 - b. *Rolling:* Determine the sequence and number of passes by vibratory and non-vibratory rollers to obtain the specified density and surface finish. Only operate rollers in the vibratory mode while in motion. Rubber-tire rollers may be used for final compaction. Use additional rollers if specific density requirements are not obtained or if placing operations get ahead of the rolling operations.
 - c. *Rolling Longitudinal and Transverse Joints:* Do not operate the roller within 2 feet of the edge of a freshly placed lane until the adjacent lane is placed. Then, roll both edges of the two lanes together within the allowable time. If a cold joint is planned, then roll the complete lane and follow cold joint procedures as specified in Section F.7 below.
 - d. *Inaccessible Areas:* Compact areas inaccessible to large rollers using walk-behind rollers or hand tampers.
 - e. *Density Requirements:* Field density tests will be performed in accordance with SC-T-33 as soon as possible, but no later than 30 minutes after the completion of the rolling. Only wet density is used for evaluation. The required minimum density is 98 percent of the maximum laboratory density obtained according to AASHTO T 180 (Method D). The in-place density and moisture content may be determined with a nuclear moisture-density gauge. The gauge will be calibrated for moisture content at the beginning of the work and at any time during the work. RCC properly placed and compacted, but not meeting the density requirements, shall be cored and tested at the Contractor's expense. If the tested area achieves 28-day design

strength, it will be paid at the full unit price. If the tested area indicates strength less than 3500 psi but greater than 3150 psi, payment will be made as follows:

Compressive Strength (psi)	Price Reduction (Percent of Unit Bid Price)
3300-3499	5
3150-3299	15

If the cores indicate strengths less than 3150 psi at 28 days or longer, the Department will evaluate the results and may reject the affected area and require removal and replacement or elect to pay at a reduced rate.

7. Joints:

- a. *Fresh Vertical Joints*: A joint is considered a fresh joint when an adjacent RCC lane is placed within 60 minutes of placing the previous lane or as specified by the RCE based on ambient conditions. Fresh joints do not require special treatment.
- b. *Cold Vertical Joints*: Any planned or unplanned construction joints that do not qualify as fresh joints are considered cold joints. Prior to placing fresh RCC mixture against a compacted cold vertical joint, thoroughly clean the cold joint of loose or foreign material. Wet the vertical joint face and maintain it in a moist condition immediately prior to placement of the adjacent lane.
 - 1) *Sawing Cold Vertical Joints*: For uncompacted surfaces or slopes more than 15 degrees from the vertical, cut the joint vertically for the full depth. Within 2 hours of final compaction, the edge of a cold joint may be cut with approved mechanical equipment. For edges cut after 2 hours, sawcut to the full depth of the pavement. Demonstrate any modification or substitution of the sawcutting procedure to the RCE for approval prior to use. In no case allow cutting of the edge to cause raveling or tearing of the surface. Moisten the cut edge immediately prior to placement of the adjacent lane.
- c. *RCC Pavement Joints at Structures*: Line structures such as manholes, valves, or concrete curb and gutter with joint filler as defined in Section 501.2.6.1 of the Standard Specifications.
- d. *Control Joints*: Construct transverse contraction joints at regular intervals up to 20-feet in the RCC pavement to induce cracking at pre-selected locations unless otherwise indicated on the Plans or as directed by the RCE. At the option of the Contractor, soft-cut or green-cut saws may be utilized as soon as possible behind the rolling operation and set to manufacturer's recommendations. Conventional cut saws must be used as soon as the sawing operation will not result in raveling or other damage to the RCC pavement, but not more than 18 hours after RCC placement. Cut all joints to 1/4 the depth of the RCC pavement to a single saw blade width.

8. Finishing:

Ensure that the finished surface of the RCC pavement, when tested with a 10-foot straightedge or crown surface template, does not vary from the straightedge or template by more than 1/4 inch at any one point and shall be within 5/8 inch of the specified finished grade. When surface irregularities are outside these tolerances, diamond-grind the surface to meet the tolerance at no additional cost to the SCDOT.

9. Curing:

Immediately after final rolling and compaction testing, keep the surface of the RCC pavement continuously moist until an approved curing compound, a suitable prime coat, or a layer of asphalt concrete is applied.

- a. *Water Cure*: Apply water cure by water trucks equipped with fog spray nozzles, soaking hoses, sprinkling system, or other means such that a uniform moist condition on the surface of the RCC is ensured. Apply this moisture in a manner that will not erode or damage the surface of the finished RCC pavement.

- b. *Curing Compound*: Do not use curing compounds when the RCC material is to be promptly covered with asphalt. Apply curing compound as indicated in Section 501.4.11 of the Standard Specifications, except that the minimum rate of curing compound application is 0.09 gallons per square yard (11 square yards per gallon) unless a higher rate is specified by the curing compound manufacturer.
10. *Traffic*: Protect the RCC from vehicular traffic during the curing period. Completed portions of the RCC pavement may be opened to automotive and light truck traffic as soon as the strength is sufficient to prevent damage to the RCC. The pavement may be opened to unrestricted traffic after 4 days. If the temperature drops below 40° F, then the period of time the temperature is below 40° F will be added to the minimum time to opening.
 11. *Maintenance*: Maintain the RCC pavement in good condition until all work is completed and accepted. Perform such maintenance at no additional cost to the SCDOT.
 12. *Thickness*: Provide and operate equipment capable of extracting a small (approximately 1 inch diameter or greater) core to determine the pavement thickness. Extract samples in the presence of the RCE or RCE's representative unless otherwise directed.
 13. *Thickness Tolerance* - The thickness of the completed RCC is measured at staggered intervals not to exceed 250 feet in length for two-lane roads. Measure the core to the nearest 1/8 inch at three different, evenly spaced locations and record the average. Where the RCC is deficient by more than 1/2 inch, correct such areas by removal and replacement. Where the measured thickness is more than 1/2 inch thicker than shown on the Plans, it is considered as the specified thickness, plus 1/2 inch. The average job thickness is the average of the depth measurements determined as specified above. Should this average thickness be more than 1/4 inch below the specified thickness, an adjusted unit price is used in calculating payment. This adjusted contract unit price bears the same ratio to the contract unit price as the square of the average thickness bears to the square of the specified thickness. When the contract includes more than one road, each road is considered separately.

G. UNIT PRICE

1. A unit price of \$51.00/SY will be applied for the purpose of pay adjustment.

(57) SECTION 501: NONWOVEN GEOTEXTILE INTERLAYER FABRIC:

This Special Provision describes the construction and material requirements for installation of an interlayer fabric to be used between concrete pavement and cement stabilized aggregate base.

A. REFERENCED DOCUMENTS

ASTM D 4355 Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus

ASTM D 4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity

ASTM D 4595 Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method

ASTM D 4716 Standard Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head

ASTM D 5199 Standard Test Method for Measuring the Nominal Thickness of Geosynthetics

ASTM D 5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles

B. GENERAL

1. Provide and install a non-woven geotextile interlayer to be placed between concrete pavements and cement stabilized aggregate bases. The fabric is intended to provide limited drainage, separation between the base and pavement to retard the transmission of cracking, and relief of bedding stress due to movement of the concrete pavement on a stiff base. Attach the fabric firmly to the base to prevent movement during paving operations. Conduct paving operations to

minimize fabric damage due to vehicle movements. Repair any damage prior to paving to ensure complete coverage of the base.

C. MATERIAL REQUIREMENTS

1. Geotextile requirements:

- a. Fabric type: Provide a nonwoven needle-punched geotextile. Thermal treatment (calendaring or IR) is not acceptable.
- b. Color: Ensure that the color is uniform and uses nominally the same color fibers throughout.
- c. The following requirements must be met by 95% of samples. Minimum Average Roll Values (MARV) are also acceptable:

- 1) Mass per unit area: Ensure that mass per unit area is greater than 450 grams per square meter (13.3 ounces per square yard) and less than or equal to 550 grams per square meter (16.2 ounces per square yard) when tested in accordance with ASTM D 5261.
- 2) Thickness under load (pressure): Ensure that the thickness under load is greater than or equal to 3.0 mm at 2 kPa (0.12 inch at 0.29 psi), greater than 2.5 mm at 20 kPa (0.10 inch at 2.9 psi), and greater than 1.0 mm at 200 kPa (0.04 inch at 29 psi) when tested in accordance with ASTM D 5199.
- 3) Wide-width tensile strength: Ensure the tensile strength is greater than 10 kN per meter (685 pounds per foot) when tested in accordance with ASTM D 4595.
- 4) Maximum elongation: Ensure that the maximum elongation is less than or equal to 130 percent when tested in accordance with ASTM D 4595.
- 5) Water permeability in normal direction under load (pressure): Ensure that the water permeability in the normal direction under load (pressure) is greater than or equal to 1×10^{-4} meters per second (3.3×10^{-4} feet per second) when tested in accordance with modified ASTM D 4491 at 20 kPa (2.9 psi) or ASTM D 5493.
- 6) In-plane water permeability: Ensure that the in-plane water permeability (transmissivity) under load (pressure) is greater than or equal to 5×10^{-4} meters per second (1.6×10^{-3} feet per second) when tested in accordance with modified ASTM D 4716 at 20 kPa (2.9 psi) and is greater than or equal to 2×10^{-4} meters per second (6.6×10^{-4} feet per second) when tested in accordance with modified ASTM D 4716 at 200 kPa (29 psi) or ASTM D 6574.
- 7) Weather resistance: Ensure that the retained strength after 500 hours of weathering is greater than or equal to 60 percent of the initial strength when tested in accordance with ASTM D 4355.
- 8) Alkali resistance: Provide a manufacturer certification that the supplied material is composed of 96% or more polypropylene/polyethylene.

- d. Certification: Prior to incorporation in the work, provide the RCE with a manufacturer's certification stating that the material being used meets all requirements of this Special Provision for each batch or lot of material. Ensure that the provided certification references the batch number(s) supplied and is attested to by the notarized signature of an officer of the manufacturing company. Also provide the RCE with a copy of the manufacturer's independent test data showing results for all the properties given in this section obtained by the test methods provided. Test data does not have to be batch or lot-specific.

2. Anchor system requirements:

- a. Fasteners: Use hardened steel pin fasteners with a galvanized finish intended for insertion in concrete by a powered fastening tool. Select a diameter and length adequate to anchor the geotextile such that normal paving operations do not dislodge the pins and the base is not damaged by the insertion.
- b. Discs: Provide thin, galvanized steel discs ranging from 2.0 to 2.8 inches in diameter with small stamped claws for holding the fabric and distributing the anchoring load.

D. CONSTRUCTION

1. Preparation of base: Repair any damaged or defective areas in the base to the satisfaction of the RCE. Thoroughly sweep the base immediately prior to fabric placement and ensure that the surface is free of loose debris.
2. Timing of placement: Place fabric no more than 3 days ahead of paving operations. If concrete is being placed by trucks directly in front of the paver, do not place fabric more than 650 feet ahead of the paver.
3. Placement: Roll the material onto the base, keeping the fabric tight with no wrinkles or folds. Roll out the sections of the fabric in a sequence that will facilitate good overlapping, prevent folding or tearing by construction traffic and minimize the potential that the material will be disturbed by the paver. Overlap sections of the fabric a minimum of 6 inches and a maximum of 10 inches. Ensure that no more than three layers overlap at any point. Extend the fabric a minimum of 12 inches beyond the edge of the concrete pavement.
4. Anchoring: Secure the fabric with fasteners punched through the steel discs into the base. Space the anchors as necessary to securely hold the fabric in position during paving operations. However, maintain a maximum anchor spacing of 6 feet under all circumstances.
5. Construction traffic: Keep all nonessential traffic off of the fabric. Ensure that operations are staged such that no vehicles make sharp turning motions on the fabric. Remove and replace damaged fabric using required placement overlaps and sufficient anchors.
6. Moisture: Lightly but completely dampen the fabric ahead of the paving operations to ensure that the fabric does not draw water from the concrete. If the fabric is wetted due to precipitation or other reasons to the point of standing water or that free water appears when the fabric is walked on, allow the fabric to dry to a moist condition before continuing paving operations.

(58) SECTION 502: FULL DEPTH CONCRETE PAVEMENT PATCHING:**A. A. DESCRIPTION**

The Contractor shall patch existing concrete pavement or roller compacted concrete as directed by the RCE. This work shall consist of the removal of deteriorated pavement and replacing with full depth Portland cement concrete pavement.

B. B. CONSTRUCTION PROCESS

The deteriorated pavement shall be removed to the width and length indicated by the RCE, with the face of the cut being straight and vertical. The pavement shall be removed to a depth of 10 inches as directed by the RCE. In the event unstable material is encountered at this point, then such additional material shall be removed as directed by the RCE.

The volume of material removed below the patch shall be backfilled with crushed stone and thoroughly compacted in 4-inch layers with vibratory compactors. Patching shall be performed in accordance with Section 502 of the Standard Specifications and the Concrete Pavement Patching Drawings in Attachment B. The finished patch shall be smooth riding.

The quantity of full depth concrete pavement patching to be paid for will be the actual number of square yards of existing concrete pavement which has been patched and accepted. The work includes cleaning, removing, and disposing of debris from the patching work, furnishing and placement of crushed stone and concrete patching material, and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of this item of work.

The Contractor's bid shall include 400 square yards of full depth concrete pavement patching. If more than the estimated square yards of patching are required by SCDOT, the Contractor will be paid a unit price of \$202.00 per square yard. If less than the estimated square yards of patching are required by SCDOT, the Contractor shall reimburse SCDOT at the same unit price for the quantity of full depth patching that was not needed.

(57) SECTION 503: PORTLAND CEMENT CONCRETE PAVEMENT UNIT COST:

The Contractor is obligated to comply with the 2007 Standard Specifications regarding compressive strength and thickness. This Special Provision establishes the Portland Cement Concrete unit cost for any payment adjustments associated with Supplemental Technical Specification SC-M-501, SC-M-502, SC-M-503, regarding compressive strength, rideability, and thickness. For purposes of applying any payment adjustments associated with these Supplemental Technical Specification, a unit price of \$90.00/SY will be used. SC-M-502DB no longer applies. SC-M-502 (04/16) will be applied to this contract unless noted otherwise in Exhibit 4c.

(58) DIVISION 600: FURNISH AND INSTALL DETECTOR LOOPS:

The Contractor is hereby notified that All Catalog descriptions and documentation are to be submitted within (5) days after the bid openings to the Contracts Administrator.

The loops shall be installed in the surface course on all projects in Engineering Districts 3, 4, 5, 6, & 7.

The loops shall be installed in the binder course for all projects in Engineering District 1.

The loops shall be on installed in the binder course on new construction projects, and in the surface for resurfacing projects in Engineering District 2.

(59) DIVISION 600: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES:

The Contractor is advised that all work involving design or installation of traffic control devices, including but not limited to signs, pavement markings, elements of work zone traffic control, signals, etc., shall be in compliance with the FHWA's Manual on Uniform Traffic Control Devices (MUTCD), latest edition. The latest edition is defined as the edition that the Traffic Engineering Division of SCDOT recognizes as having been officially adopted (Engineering Directive, Memorandum 19) at the time the project is let, unless stated otherwise in the Special Provisions.

(60) DIVISION 600: REMOVAL SALVAGE AND DISPOSAL OF EQUIPMENT AND MATERIALS

DESCRIPTION – This item consists of the Removal and Salvage, or the Removal and Disposal of equipment and materials, during the construction of this project. Construction includes new installations, and the modification, or removal of existing ITS devices. It shall be disposed of, as stated below:

1. GENERAL

a. Removal and Salvage

These items are to be carefully removed from the job site, salvaged, and returned to the Department. The items of major equipment to be salvaged are listed on the Plans. The Contractor shall deliver, (and obtain a RECEIPT for), the salvaged equipment, to: **SCDOT Intelligent Transportation Systems Maintenance Facility ** in Columbia, SC Contact the ITS Field Operations Manager at (803)-737-0394 for deliveries.

b. Disposal

Material NOT to be salvaged, shall be removed from the job site, become the property of the Contractor; and should be properly disposed of by the Contractor, at an APPROVED LAND FILL (or material reclamation yard). Any materials designated as HAZARDOUS WASTE shall be disposed in accordance with regulations enforced by the SC Department of Health and Environmental Control (DHEC), Bureau of Solid and HAZARDOUS Waste; (803)-734-5000 for information.

c. Inspection

Removal and disposal quantities will not be measured as pay items, but shall be included in the price bid for Removal, Salvage, and Disposal. FINAL ACCEPTANCE and Final Payment will be withheld, if the Contractor has not removed unneeded equipment from the

job site, and if the Contractor cannot present RECEIPTS from the Shop showing that the salvaged equipment has been delivered to the Department as specified.

d. Holes

Every hole caused by removing old equipment shall be filled THE SAME DAY. It shall be back-filled, compacted, and reseeded/sodded, to the satisfaction of the Engineer. Holes in PAVEMENT shall be cleanly side-trimmed, then brought to grade and finished with the same paving material as the adjacent pavement. Sidewalk "squares" shall be completely replaced (complete square), using forms and expansion material.

2. SPECIFIC ITEMS

a. Controllers and Cabinets

Controllers and Cabinets to be removed by the Department. Contractor to be responsible for the foundations of ground-mounted cabinets and shall be removed completely or cleared to 0.3 meters (1 ft.) below ground.

b. Cameras

Cameras units to be removed by the Department.

c. Wood Poles

Wood Poles that are not utilized in the new ITS system, and are not required by other utilities, shall be removed and disposed of. Back guys, grounding systems, and miscellaneous hardware shall be disposed of.

d. Concrete Poles

Concrete poles shall be removed and disposed of by contractor.

e. Miscellaneous Equipment

Minor equipment shall be removed from the site and discarded. This includes steel cable, electrical cable, fiber optic cable, concrete pads, and spliceboxes/pullboxes/handboxes. Underground conduit and detector loops not utilized, shall be abandoned in place.

(61) DIVISION 600: EVALUATION OF RETROREFLECTIVITY:

Within 20 days of initial application, the Contractor shall arrange for an independent party to evaluate the retroreflectivity of the pavement markings using a mobile retroreflectometer utilizing 30 meter CEN geometry. All long lines on the interstate mainline, CD routes and ramps shall be measured in both directions. The independent party conducting the measurements shall furnish directly to the Department a report detailing the average of the readings over two-tenth of a mile segments for each type of long line (white edgeline, white lane lines, yellow edgelines) along the length of the project. Interstate mile markers may be used for beginning and ending points on the mainline and CD routes, with the first and last segments in each direction being less than two tenths of a mile in length. Each ramp shall be referenced individually with the white edge line reading to the point where the ramp taper joins the mainline edge line. The initial minimum retroreflectivity values shall be as follows:

Retroreflectivity (mcd/lux/m²)

<u>White</u>	<u>Yellow</u>
450	350

A second evaluation shall take place within 20 days prior to the end of the 180 day observation period. The evaluation method shall be the same as described above. The 180 day minimum retroreflectivity values shall be as follows:

Retroreflectivity (mcd/lux/m²)

White	Yellow
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400

300

If the permanent markings are snowplowed during the 180-day observation period, the lines shall meet the following minimum retroreflectivity values at the time of the second evaluation:

Retroreflectivity (mcd/lux/m²)

White Yellow

250 200

All markings failing to meet the initial minimum retroreflectivity requirements by more than 50 mcd / lux / m² shall be replaced immediately at the Contractor's expense. All markings failing to meet initial requirements by less than 50 mcd / lux / m² may be reevaluated at the time of the 180 day evaluation unless the defect causing the lower readings is obvious to the Engineer.

(62) DIVISION 600: MAINTENANCE AND CONTROL OF TRAFFIC

A. CONSTRUCTION (SUB-SECTION 601.4)

1. Sub-section 601.4.2 Construction Vehicles (paragraph 2) -

When working within the rights-of-way of access-controlled roadways such as Interstate highways, the Contractor's vehicles may only change direction of travel at interchanges. These vehicles are prohibited from crossing the roadway from right side to the median or vice versa. Use a flagger to control the Contractor's vehicles when these vehicles attempt to enter the roadway from a closed lane or the median area. Ensure the flagger does not stop roadway traffic, cause roadway traffic to change lanes, or affect roadway traffic in any manner. The Contractor's vehicles may not disrupt the normal flow of roadway traffic or enter the travel lane of the roadway until a sufficient gap is present.

The Contractor shall have flaggers available to control all construction vehicles entering or crossing the travel lanes of secondary and primary routes. The RCE shall determine the necessity of these flaggers for control of these construction vehicles. The RCE shall consider sight distance, vertical and horizontal curves of the roadway, prevailing speeds of roadway traffic, frequency of construction vehicles entering or crossing the roadway and other site conditions that may impact the safety of the workers and motorists when determining the necessity of these flaggers. Ensure these flaggers do not stop roadway traffic, cause roadway traffic to change lanes or affect roadway traffic in any manner. The Contractor's vehicles may not disrupt the normal flow of roadway traffic or enter the travel lane of the roadway until a sufficient gap is present.

When working within the rights-of-way of access-controlled roadways with posted regulatory speed limits of 55 MPH or greater and average daily traffic volumes {ADT} of 10,000 vehicles per day or greater, i.e. Interstate highways, all construction and work vehicles possessing any one or more of the vehicular characteristics listed below are only permitted to enter and exit a right or left shoulder work area during the presence of active lane closures unless otherwise directed by the RCE. These vehicles are not permitted to enter or exit these work areas without the presence of active lane closures unless otherwise directed by the RCE. Shoulder closures are unacceptable and insufficient methods for control of traffic at ingress / egress areas for these vehicles. The restrictive vehicular characteristics include the following:

- Over six (6) tires
- Tandem rear axles
- A base curb weight greater than 8000 lbs.
- A gross vehicular weight greater than 12000 lbs. unless performing duties as a shadow vehicle while supporting a truck mounted attenuator
- A trailer in tow except under the following conditions:

- Trailers transporting traffic control devices (including but not limited to standard and 42" oversized traffic cones, portable plastic drums, signs, portable sign supports, u-channel and square steel tube sign posts) relative to the installation of lane closures, shoulder closures or other traffic control operations approved by the RCE
 - Trailer mounted traffic control devices (including but not limited to advance warning arrow panels, changeable message signs, temporary traffic signals, highway advisory radios, work zone intelligent transportation systems and trailer towed truck mounted attenuators)
2. Sub-section 601.4.2 Construction Vehicles - Auxiliary Warning Lights for Vehicles and Equipment

Supplement all construction and/or construction-related vehicles and equipment that operate in a stationary or mobile work zone within or adjacent to a roadway within the highway rights-of-way with AMBER or YELLOW colored high intensity rotating or strobe type flashing auxiliary warning light devices. Utilize, install, operate and maintain a single or multiple lighting devices as necessary to provide visibility to approaching motorists.

All auxiliary warning light models shall meet *Society of Automotive Engineers* (SAE) Class I standards and SAE Standard J575 relative to *Tests for Motor Vehicle Lighting Devices and Components* and these specifications.

The amber/yellow color of the dome/lens of an auxiliary warning light device shall meet SAE Standard J578 for amber/yellow color specifications.

Auxiliary warning lights with parabolic reflectors that rotate shall rotate around a halogen lamp at a rate to produce approximately 175 flashes per minute. The parabolic reflector shall produce a minimum 80,000 candle power and a minimum 54,000 candela through an SAE Standard J846 approved amber dome.

Equip strobe type flashing auxiliary warning light devices with photosensitive circuit controls to adjust the lighting intensity in response to changes in ambient light conditions such as from day to night. These lights shall have a double-flash capability rated at approximately 80 double flashes per minute and produce a minimum 24 joules of flash energy at the highest power level setting.

Acceptable auxiliary warning light models shall provide sufficient light output to be clearly recognizable at a minimum distance of 1750 feet.

Mount all auxiliary warning light devices intended to function as the auxiliary warning light system or as an element thereof on vehicles and equipment at locations no less than 3 feet above the ground and in conspicuous locations to provide visibility to approaching motorists.

Auxiliary warning light devices and/or models that mount in the locations of the standard vehicle lighting system are unacceptable as the specified auxiliary warning light system due to restrictive simultaneous visibility capabilities from multiple sight angles. However, auxiliary warning light devices that mount in the standard vehicle lighting system locations are acceptable as supplements to the specified lighting devices mounted in locations that do meet the minimum height requirements and provide simultaneous visibility capabilities from multiple sight angles.

Standard vehicle hazard warning lights are only permitted as supplements to the specified auxiliary warning light devices.

3. General Requirements for Providing and Maintaining Traffic Control Devices in the Work Zone (Section 602) – Sub-section 602.4 Construction (paragraph 8) -

Mount flat sheet signs straight and level and with the face of the signs perpendicular to the surface of the roadway. This requirement applies to flat sheet signs whether they are portable or have the embedded supports. Mount advance construction signs 2 feet from the edge of a paved shoulder or the face of a curb, or if no paved shoulder exists, 6 feet to 12 feet from the

edge of an adjacent travel lane to the nearest edge of the signs. The mounting height of single signs mounted on ground embedded sign supports is no less than 7 feet or no greater than 8 feet from the bottom edge of the sign to the grade elevation of the near edge of the adjacent travel lane or sidewalk when a sidewalk is present. Any secondary sign on the same assembly has a minimum mounting height of 6 feet from the ground to the bottom edge of the secondary sign. Ensure that signs mounted on portable sign supports, including advance construction signs, regulatory signs, warning signs, etc., have a minimum mounting height of 5 feet from the ground to the bottom edge of the sign. Provide special sign mounting assemblies, when necessary, in areas of double-layered guardrail, concrete median barrier, or bridge parapet walls.

B. CATEGORY I TRAFFIC CONTROL DEVICES (SECTION 603) –

1. Sub-section 603.2.2 Oversized Traffic Cones (paragraph 6) -

Reflectorize each oversized traffic cone with 4 retroreflective bands: 2 orange and 2 white retroreflective bands. Alternate the orange and white retroreflective bands, with the top band always being orange. Make each retroreflective band not less than 6 inches wide. Utilize Type III – Microprismatic retroreflective sheeting for retroreflectorization on all projects let to contract after May 1, 2010 unless otherwise specified. Separate each retroreflective band with not more than a 2-inch non-reflectorized area. Do not splice the retroreflective sheeting to create the 6-inch retroreflective bands. Apply the retroreflective sheeting directly to the cone surface. Do not apply the retroreflective sheeting over a pre-existing layer of retroreflective sheeting.

2. Sub-section 603.2.3 Portable Plastic Drums (paragraph 3) -

Reflectorize each drum with Type III – Microprismatic retroreflective sheeting: 2 orange and 2 white retroreflective bands, 6 inches wide on all projects let to contract after May 1, 2010 unless otherwise specified. Alternate the orange and white retroreflective bands with the top band always being orange. Ensure that any non-reflectorized area between the orange and white retroreflective bands does not exceed 2 inches. Do not splice the retroreflective sheeting to create the 6-inch retroreflective bands. Apply the retroreflective sheeting directly to the drum surface. Do not apply the retroreflective sheeting over a pre-existing layer of retroreflective sheeting.

C. CATEGORY II TRAFFIC CONTROL DEVICES (SECTION 604) –

1. Sub-section 604.2.1 Type I and Type II Barricades (paragraph 3) -

Reflectorize these barricades with Type VIII or IX Prismatic retroreflective sheeting on all projects let to contract after May 1, 2012 unless otherwise specified. Ensure that the retroreflective sheeting has alternate orange and white stripes sloping downward at a 45-degree angle in the direction of passing traffic. The stripes shall be 6 inches wide.

2. Sub-section 604.2.2 Type III Barricades (paragraph 3) -

Reflectorize these barricades with Type VIII or IX Prismatic retroreflective sheeting on all projects let to contract after May 1, 2012 unless otherwise specified. Ensure that the retroreflective sheeting has alternate orange and white stripes sloping downward at a 45-degree angle. Apply the sloping orange and white stripes in accordance with the requirements of the Plans, SCDOT Standard Drawings and the MUTCD. The stripes shall be 6 inches wide.

D. TEMPORARY CONCRETE BARRIER (SUB-SECTION 605.2.3.2) –

1. Sub-section 605.2.3.2 Temporary Concrete Barrier (paragraph 6) -

Previously used temporary concrete barrier walls are subject to inspection and approval by the RCE before use. Ensure that previously used temporary concrete barrier walls are in good condition. Defects to a temporary concrete barrier wall that may disqualify a section of wall for use include gouges, cracks, chipped, or spalled areas. A defect that exposes reinforcing steel warrants immediate disqualification. A disqualification grade type defect shall consist of

measurements in excess of 1 inch, entirely or partially within the boundaries of the end connection areas and the drainage slot areas as illustrated in the “Standard Drawings for Road Construction”, and/or in excess of 4 inches for all areas beyond the end connection areas. To warrant disqualification, these measurements shall exceed the specified dimensions in all three directions, width, height, and depth. A defect that exceeds the specified dimensions in only one or two of the three directions does not warrant disqualification.

Temporary concrete barrier walls with defects less than 6 inches in all three directions, width, height, and depth that do not expose reinforcing steel may be repaired in accordance with the following requirements. Repair is prohibited on temporary concrete barrier walls with defects 6 inches or greater in all three directions, width, height, and depth.

For repair of temporary concrete barrier walls with defects less than 6 inches in all three directions, width, height, and depth that do not expose reinforcing steel, repair the defect with a premanufactured patching material specifically fabricated for patching structural concrete. The strength of the patch must meet or exceed the design strength of the class 3000 concrete of the temporary concrete barrier wall. Perform the repair procedures in accordance with all requirements and instructions from the manufacturer of the patch material. Use a bonding compound between the patch material and the concrete unless specifically stated by the manufacturer that a bonding compound is not required. If the manufacturer states that application of a bonding compound is optional, SCDOT requires application of a bonding compound compatible with the patch material. If cracking occurs within the patched area, remove the patch material completely and repeat the repair process. The contractor shall submit documentation stating all repairs have been conducted in accordance with these requirements prior to installing any temporary concrete barrier walls with repairs. Utilization of temporary concrete barrier walls with repairs shall require approval by the RCE prior to installation.

The Contractor shall submit certification documents for the patch material utilized for repairs to the Engineer prior to placing temporary concrete barrier walls that have been repaired on the project site.

***** (Effective on all projects let to contract after January 1, 2017) *****

2. Sub-section 605.2.3.2 Temporary Concrete Barrier (paragraph 5) -

In regard to projects let to contract after January 1, 2017, ALL *NCHRP Report 350* compliant temporary concrete barrier walls placed on a project site SHALL comply with the requirements for the recessed approval stamp as directed by the *SCDOT Standard Drawings*. Those *NCHRP Report 350* compliant temporary concrete barrier walls with the original recessed approval stamp that reads "SCDOT 350" will continue to be acceptable on projects let to contract after January 1, 2017. However, those temporary concrete barriers with the "SCDOT 350" identification plate attached to the side of the barrier walls with mechanical anchors previously grandfathered will no longer be acceptable on projects let to contract after January 1, 2017.

E. CONSTRUCTION SIGNS (SUB-SECTION 605.4.1.1) –

***** (Effective on all projects let to contract after January 1, 2016) *****

On all projects relative to interstate highways let to contract after January 1, 2016, all signs attached to portable sign supports on and/or adjacent to interstate highways shall be rigid. Fabricate each of these rigid signs from an approved aluminum laminate composite rigid sign substrate approved by the Department. Utilization of signs fabricated from roll-up fabric substrates attached to portable sign supports installed on and/or adjacent to interstate highways will no longer be acceptable on projects let to contract after January 1, 2016.

ONLY those portable sign supports specified and approved for support of rigid signs fabricated from approved aluminum laminated composite rigid sign substrates and included on the Approved Products List for Traffic Control Devices in Work Zones, latest edition, are acceptable. To facilitate location of acceptable portable sign supports, the listing of portable sign supports is

now separated into two (2) sections; “Portable Sign Supports for Use with Roll-Up Signs ONLY” and “Portable Sign Supports for Use with Roll-Up Sign Substrates and Rigid Sign Substrates”.

The trade names of the approved aluminum laminate composite rigid sign substrates are “Acopan”, “Alpolic”, “Dibond” and “Reynolite”. These rigid sign substrates are restricted to thicknesses no greater than 2 millimeters.

Rigid signs fabricated from standard aluminum sign blanks or any other rigid material other than Acopan, Alpolic, Dibond or Reynolite are PROHIBITED for attachment to portable sign supports. However, rigid signs fabricated from standard 0.080 and 0.100 inches thick aluminum sign blanks will continue to be acceptable for mounting on ground mounted sign supports.

Signs fabricated from roll-up fabric substrates approved by the Department will continue to be acceptable for use on and/or adjacent to secondary and primary roadways unless otherwise directed by the Department.

The minimum mounting height of signs mounted on these portable sign supports shall continue to be 5 feet from the ground to the bottom edge of the sign except where a minimum 7 foot mounting height is required in accordance with the standard specifications, the standard drawings, these special provisions and the MUTCD, latest edition.

F. TRUCK-MOUNTED ATTENUATOR (SUB-SECTION 605.4.2.2) –

1. Sub-section 605.2.2.2.3.3 Color (paragraph 1) -

Use industrial grade enamel paint for cover of the metal aspects of the unit. Provide and attach supplemental striping to the rear face of the unit with a minimum Type III high intensity retroreflective sheeting unless otherwise directed by the Department. Utilize an alternating 4 to 8 inch black and 4 to 8 inch yellow 45-degree striping pattern that forms an inverted “V” at the center of the unit that slopes down and to the sides of the unit in both directions from the center.

2. Sub-section 605.4.2.2 Truck-Mounted Attenuators (paragraph 6) -

A direct truck mounted truck mounted attenuator is mounted and attached to brackets or similar devices connected to the frame of a truck with a minimum gross vehicular weight (GVW) of 15,000 pounds (actual weight) unless otherwise directed. A trailer towed truck mounted attenuator is towed from behind and attached via a standard pintle hook / hitch to the frame of a truck with a minimum gross vehicular weight (GVW) of 10,000 pounds (actual weight) unless otherwise directed.

Each truck utilized with a truck mounted attenuator shall comply with the manufacturer’s requirements to ensure proper operation of the attenuator. The minimum gross vehicular weight (GVW) (actual weight) for each truck shall comply with these specifications unless otherwise directed within the “Remarks” column of the *Approved Products List For Traffic Control Devices in Work Zones* in regard to specific requirements for the device in question.

If the addition of supplemental weight to the vehicle as ballast is necessary, contain the material within a structure constructed of steel. Construct this steel structure to have a minimum of four sides and a bottom to contain the ballast material in its entirety. A top is optional. Bolt this structure to the frame of the truck. Utilize a sufficient number of fasteners for attachment of the steel structure to the frame of the truck to ensure the structure will not part from the frame of the truck during an impact upon the attached truck mounted attenuator. Utilize either dry loose sand or steel reinforced concrete for ballast material within the steel structure to achieve the necessary weight. The ballast material shall remain contained within the confines of the steel structure in its entirety and shall not protrude from the steel structure in any manner.

G. TRAILER-MOUNTED CHANGEABLE MESSAGE SIGNS (SUB-SECTION 606.3.2) -

1. Sub-section 606.3.2.7 Controller (paragraphs 1-4) -

The controller shall be an electronic unit housed in a weatherproof, rust resistant box with a keyed lock and a light for night operation. Provide the unit with a jack that allows direct communications between the on-board controller and a compatible personal computer. The unit shall have a LCD display screen that allows the operator to review messages prior to displaying the message on the sign.

The controller shall have the capability to store 199 factory preprogrammed messages and up to 199 additional messages created by the user in a manner that does not require a battery to recall the messages. Also, the controller shall allow the operator the capability to program the system to display multiple messages in sequence.

Provide the controller with a selector switch to allow the operator to control the brightness or intensity level of the light source of the sign panel. The selector switch shall include "bright," "dim" and "automatic" modes; inclusion of additional modes is permissible. When the selector switch is in the "automatic" mode, a photosensitive circuit shall control the brightness or intensity level of the light source in response to changes in ambient light such as from day to night and other various sources of ambient light.

Equip each sign with remote communications capabilities, such as utilization of cellular telephone or internet browser technology, to allow the operator to revise or modify the message selection from the office or other remote location. Also, provide protection to prohibit unauthorized access to the controller, (i.e. password protection).

2. Sub-section 606.5 Measurement (paragraph 2) -

Trailer-mounted changeable message signs are included in the lump sum item for Traffic Control in accordance with **Subsections 107.12** and **601.5** of the "2007 Standard Specifications for Highway Construction". No separate measurement will be made for trailer-mounted changeable message signs unless the contract includes a specific pay item for trailer-mounted changeable message signs.

The Contractor shall provide, install, operate, and maintain the trailer-mounted changeable message sign per traffic control set-up as directed by the Plans, the "Standard Drawings for Road Construction", these Special Provisions, the Specifications, and the Engineer.

3. Sub-section 606.6 Payment (paragraph 2) -

In addition to **Subsections 107.12** and **601.6**, the payment for Traffic Control is full compensation for providing, installing, removing, relocating, operating, and maintaining trailer-mounted advance warning arrow panels and trailer-mounted changeable message signs as specified or directed and includes providing the units' primary power source; repairing or replacing damaged or malfunctioning units within the specified time; providing traffic control necessary for installing, operating, and maintaining the units; and all other materials, labor, hardware, equipment, tools, supplies, transportation, incidentals, and any miscellaneous items necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other items of the Contract.

4. Sub-section 606.6 Payment (paragraph 3) -

Disregard this paragraph unless the Contract includes a specific pay item for trailer-mounted changeable message signs.

H. TEMPORARY PAVEMENT MARKINGS (SUB-SECTION 609.4.1) –

1. Sub-section 609.4.1.1.1 Application Requirements General (in addition to paragraph 3) -

On two-lane two-way roadways, apply and place temporary or permanent pavement markings, as specified hereupon, prior to the end of each day's work or shift or reopening a closed travel lane to traffic. These pavement markings shall include 4-inch wide solid lines on edge lines and solid center lines and 4-inch wide by 10 feet long broken lines with a 30-foot gap for broken center lines and lane lines unless otherwise specified. The center line pavement markings shall

be either double yellow solid lines, yellow broken lines or an appropriate combination of a yellow solid line and yellow broken lines for passing / no passing zones. Placement of a singular yellow solid line for a center line pavement marking is unacceptable. The edge line pavement markings shall be a white solid line.

On multilane primary and secondary roadways, apply and place temporary or permanent pavement markings, as specified hereupon, to the travel lanes prior to reopening a closed travel lane to traffic. These pavement markings shall include 4-inch wide solid lines, utilized for edge lines and solid center lines, and 4-inch wide by 10 feet long broken lines with a 30-foot gap, utilized for lane lines and turn lanes, unless otherwise specified. The center line pavement markings shall be either double yellow solid lines or an appropriate combination of a yellow solid line and 4-inch wide by 10 feet long yellow broken lines for two-way left turn median areas. The right edge line pavement markings shall be a white solid line and the left edge line shall be a yellow solid line except in areas where the travel lanes separate to create a gore type situation and then the color schemes shall comply with SCDOT application practices for gore areas. The lane lines between travel lanes and turn lanes shall be 4-inch wide by 10 feet long white broken lines with a 30-foot gap.

However, on two-lane two-way and multilane primary and secondary roadways, application of a 4-inch wide solid line utilized for an edge line adjacent to an earth shoulder, white or yellow, may be delayed up to 72 hours after eradication of the original line when the length of eradicated line at a single location is no longer than 250 feet. In the event of multiple locations along the same line, each location must be separated from the adjacent location by no less than 250 feet with a cumulative total distance of eradicated line of no more than 1300 feet within any continuous 1 (one) mile length of roadway measured from a selected location. If the length of eradicated line exceeds 250 feet at any single location, the distance interval between multiple adjacent locations is less than 250 feet or a cumulative total distance of multiple locations of eradicated line exceeds 1300 feet within any continuous 1 (one) mile length of roadway measured from a selected location, replace the eradicated line(s) prior to reopening the adjacent travel lane to traffic.

On interstate roadways, apply and place temporary or permanent pavement markings, as specified hereupon, to the travel lanes prior to reopening a closed travel lane to traffic. These pavement markings shall include 6-inch wide solid lines, utilized for edge lines, and 6-inch wide by 10 feet long white broken lines with a 30-foot gap, utilized for lane lines between travel lanes and auxiliary lanes, unless otherwise specified. The right edge line pavement markings shall be a white solid line and the left edge line shall be a yellow solid line except in areas where the travel lanes separate to create a gore type situation and then the color schemes shall comply with SCDOT application practices for gore areas.

Due to excessive wear resulting from high volume traffic and construction activities, replace and reapply all pavement markings on mainline lanes, on and off ramps, and on interchange crossing routes at time intervals not greater than 90 days and as directed by the RCE.

On all roadways, apply and place white stop bars and white triangle yield bars in all locations where previous stop bars and triangle yield bars have been eradicated by the work. Apply and place white stop bars and white triangle yield bars at intersections controlled by stop and yield signs within 72 hours of the eradication of the original pavement marking. Apply and place white stop bars at signalized intersections controlled by traffic control signals and at railroad crossings prior to reopening a closed travel lane to traffic.

Within the limits of existing turn lanes on all roadways, apply and place white arrows in all locations where previous arrows have been eradicated by the work unless otherwise directed by the RCE. Apply and place white arrows within 72 hours of the eradication of the original pavement markings. However, in regard to newly constructed turn lanes, apply and place white arrows the within turn lanes as directed by the RCE.

Within the limits of existing lane-drop sites on all roadways, apply and place white arrows in all locations where previous arrows have been eradicated by the work prior to the end of each day's work or shift or reopening the closed travel lane to traffic. In regard to newly constructed lane-

drop sites, apply and place white arrows within the travel lane to be terminated prior to opening the travel lane to traffic and as directed by the RCE.

2. Sub-section 609.4.1.1.1 Application Requirements General (Revision to paragraph 8) -

On two-lane, two-way roadways, passing zones may be eliminated within the work zone through application of 4-inch double yellow centerline pavement markings if determined feasible and directed to do so by the Plans and/or the RCE. Apply no passing zone markings as specified by the Plans, the Specifications, the *MUTCD* and the RCE.

I. FLAGGING OPERATIONS (SUB-SECTION 610.4.1) –

1. Sub-section 610.4.1.1 Flagging Operations (paragraph 1) -

Use a flagging operation to control the flow of traffic when two opposing directions of traffic must share a common travel lane. A flagging operation may be necessary during a lane closure on a two-lane two-way roadway, an intermittent ramp closure or an intermittent encroachment of equipment onto a portion of the roadway. Utilize flagging operations to direct traffic around work activities and maintain continuous traffic flow at reduced speeds when determined to be appropriate by the RCE. As stated above, flagging operations shall direct traffic around the work activities and maintain continuous traffic flow; therefore, stopped traffic shall not be required to stop for time durations greater than those listed below unless otherwise directed by the RCE. Begin measurement of the time interval immediately upon the moment the Flagger rotates the Stop/Slow paddle to display the “Stop” condition to the approaching motorists.

LENGTH OF CLOSURE	MAXIMUM TIME DURATION FOR STOPPED TRAFFIC
1 MILE or LESS	5 Minutes
1 to 2 MILES	7 ½ Minutes

If the work activities require traffic to be stopped for periods greater than 5 to 7 ½ minutes as stated above, consider alternate work methods, conducting work activities during times of lowest traffic volumes such as during the hours of darkness or complete road closure with detour installation.

J. PAVING AND RESURFACING (SUB-SECTION 611.4.1) –

1. Sub-section 611.4.1.2 Requirements (paragraph 8) -

Whenever travel lanes with acceptable grade elevation differences are open to traffic, provide “Uneven Lanes” signs (W8-11-48) or “Uneven Pavement” signs (W8-11A-48). Reflectorize these signs with a fluorescent orange colored prismatic retroreflective sheeting unless otherwise specified. Install these signs adjacent to roadways with uneven pavement surfaces between travel lanes or between travel lanes and the adjacent paved shoulders. Install these signs at intervals no greater than 2600 feet.

(63) SECTION 601: PENALTY FOR VIOLATING LANE CLOSURE RESTRICTIONS:

The Contractor is advised that the Lane Closure Restrictions outlined in the Traffic Design Criteria will be strictly enforced. Should lane closures remain in place or not be completely removed by the time specified in the Traffic Design Criteria, a penalty will be assessed at the rate of **\$1,500.00 (Fifteen Hundred Dollars)** for each 1/4 hour interval (or any portion thereof) for each lane closed. Should lane closures remain in place or not be completely removed for a period of longer than one hour beyond the time specified by the Traffic Design Criteria the penalty will increase to **\$\$3,000.00 (Three**

Thousand Dollars) for each 1/4 hour interval (or any portion thereof) for each lane closed. The penalty also applies to any ramp closures specified in the Traffic Design Criteria.

(64) SECTION 605: PERMANENT CONSTRUCTION SIGNS:

Utility locations must be performed prior to the placement of Permanent Construction Signs. State Law requires that the location of each sign be marked with a white line in the roadway or a stake in the shoulder. The locator company will mark 25 feet on either side of the location. The responsibility for marking the sign locations prior to the contractor calling PUPS for utility locate lies with the party responsible for lines and grades on the project. If Construction Lines and Grades is a pay item, then the Prime Contractor is responsible for marking the sign location. If this is not included, it is the Department's responsibility to mark the locations.

Prior to marking the sign location, care must be taken when marking the signs to ensure that there are no obstructions or other mitigating factors that will cause the sign to be moved outside of the 50 foot utility window. Any costs associated with staking out the sign locations are considered incidental to the cost of Permanent Construction Signs.

Requests for utility locates must be specific and isolated to the sign locations if no ground disturbing activities are occurring outside of the sign placement.

(65) SECTION 610: WORK ZONE TRAFFIC CONTROL PROCEDURES:

The first sentence of Section 610.3 of the 2007 Standard Specifications is hereby revised to:

“Ensure that background color of personal protective apparel is either fluorescent Yellow-Green or fluorescent Orange-Red, and meets ANSI Standard 107-2004 National Standard for High Visibility Apparel Class 2 (or Class 3 as necessary) Performance Criteria, or latest edition.”

Note #12 of Standard Drawing 610-005-00 is hereby revised to:

“During nighttime flagging operations, flaggers shall wear a Safety Vest and Safety Pants meeting ANSI Standard 107-2004 National Standard for High Visibility Apparel Class 3 Performance Criteria, or Latest Edition, and a Hardhat. The color of the apparel background material shall be either fluorescent Yellow-Green or fluorescent Orange-Red.”

(66) SECTION 653: RETROREFLECTIVE SIGN POST PANELS:

Section 653 is hereby modified as follows:

A. 653.2 MATERIALS

Add the following paragraph:

Use retroreflective sign post panels constructed of a nonmetallic composite or 3mm aluminum composite material approved by the SCDOT covered with a 3-inch wide type III sheeting. Use sheeting that meets the requirements of Section 651.2.3. Use approved panels included on the Approved Products List For Traffic Control Devices in Work Zones.

B. 653.4.2 ERECTION

Add the following paragraph:

Mount the panel for the full length of the post from the sign to within 6 inches above the edge of the roadway. Mount panel only on post specified in the plans or special provisions. Secure the panel to the post with a minimum of 3 5/16-inch bolts and a lock washer and flat washer between post and nut, or tamper-resistant and rust-resistant screws. Use bolts, washers and nuts meeting the requirements of section 651.2.2. Provide the sheeting in the color that matches the background color of the sign except that the color for the “Yield” and “Do Not Enter” signs shall be red. Install panels to both posts, if there are two posts supporting the sign.

C. 653.5 MEASUREMENT

Replace with the following:

653.5 Measurement

The quantity for the pay item U-Section Post for Sign Support – (2 or 3)P, U-Section Post for Sign Bracing –2P or retroreflective sign post panel is the length of U-section post used for sign support or bracing or panel and is measured to the nearest 1/100 of a linear foot (LF) of the required post or panel, complete and accepted.

D. 653.6 PAYMENT

Replace with the following:

653.6 Payment

Payment for the accepted quantity for U-Section Post for Sign Support – (2or 3)P, U-Section Post for Sign Bracing –2P or Retroreflective Sign Post Panel, measured in accordance with Subsection 653.5, is determined using the contract unit bid price for the applicable pay item, and the payment includes all direct and indirect cost and expenses necessary to complete the work.

Payment is full compensation for fabricating and erecting U-section posts or braces or panels as specified or directed and includes providing mounting hardware; removing and disposing of existing signs supports, braces, and mounting hardware removed or replaced; replacing or relocating supports or braces shown on the Plans or directed by the RCE; and all other materials, labor, equipment, tools, supplies, transportation, and incidentals necessary to fulfill the requirements of the pay item in accordance with the Plans, the Specifications, and other terms of the Contract.

Pay items under this section include the following:

Item No.	Pay Item	Unit
6531205	U-SECTION POST FOR SIGN SUPPORTS – 2P	LF
6531210	U-SECTION POST FOR SIGN SUPPORTS – 3P	LF
6531215	U-SECTION POST FOR SIGN BRACING – 2P	LF
6531500	REFLECTIVE SIGN POST PANELS	LF

(67) DIVISION 700: ANTI-GRAFFITI COATING:

October 4, 2019

A. GENERAL

The anti-graffiti coating system shall be applied to locations as described in Exhibit 4 and in accordance with this Specification. Anti-graffiti coatings intended for use under this Specification shall be of a composition capable of preventing the adhesion of and facilitating the removal of acrylic, polyurethane, and alkyd spray paint. Use a clear, non-sacrificial anti-graffiti coating for all applications.

B. MATERIALS

All anti-graffiti coatings must possess the physical and handling characteristics that are compatible with the requirements of this Specification. Anti-graffiti coating shall be manufactured by one of the approved manufacturers listed on the most recent Qualified Product List 7, titled “Qualified Spray-On/Brush-On Surface Coatings for Concrete Finish”. Contractor shall ensure that the anti-graffiti coating is compatible with the selected applied Finish Coating, if applicable.

Anti-graffiti coatings shall contain less than 5.0 lb/gal volatile organic compounds (VOC) as defined by 40 CFR Part 59, Subpart D. The manufacturer shall supply the following additional information:

1. Technical data sheet that includes installation instructions and graffiti removal instructions by pressure washing with water.

2. Certification that non-sacrificial anti-graffiti coating shall not blister, crack, check, chalk, delaminate, or exhibit a color change of more than 8 dE94 (or dE76) CIELAB units for a period of one year after installation.

Additionally, submit a certification that the coating meets the following laboratory performance requirements:

Additional Laboratory Performance and Tests		
Test	Method	Limits
Graffiti Resistance	ASTM D 6578; Use identified marking materials; initial and re-cleanability; and after exposure initial and re-cleanability	Cleanability Level 8, 9, or 10.
Fluid Resistance	ASTM D 1308; Paint thinner, gasoline	No blistering, discoloration, softening, or adhesion loss

C. APPLICATION

Apply an anti-graffiti coating or coating system in accordance with manufacturer's product data sheet and as specified herein, when the ambient temperature is between 40° and 90°F, and the surface temperature is between 50° and 85°F and rising.

Ensure all concrete has cured a minimum of 30 days before applying anti-graffiti coating. Do not apply coating when precipitation is expected within 12 hours of the completion of application or the relative humidity exceeds that specified by the manufacturer.

D. PROTECTION OF ADJACENT SURFACES

Consider wind direction, velocity and geographic location as having a major impact on all cleaning and anti-graffiti coating operations. Use all necessary precautions to prevent cleaning and anti-graffiti coating materials from being dispersed outside the work site. If conditions are such that material is dispersed to areas where vehicles or other property may be damaged, suspend operations until conditions improve and work can continue without affecting adjacent property.

Protect all surfaces not intended to be coated, which are adjacent to, or in close proximity to the surfaces to be coated, during the application of anti-graffiti coating. Clean surfaces that are to be coated, as per the manufacturer's product data sheet.

E. SURFACE PREPARATION

Prior to applying any anti-graffiti coatings, prepare all surfaces to be coated in accordance with ASTM D 4261 or ASTM D 4258 and the manufacturer's product data sheet. When the anti-graffiti coating or coating system is to be applied over an existing coating, apply a test patch (minimum area of 4 square feet) in accordance with this Specification. Allow the test patch to cure a minimum of 7 days without any defects. No time extension will be granted as a result of this test requirement.

F. BASE COAT

Apply the base coat, if part of the system, as specified by the manufacturer. Unless otherwise specified by the manufacturer, ensure the cured base coat has a minimum dry film thickness of 4.0-8.0 mils.

G. FINISH COAT

When applicable, ensure the base coat surface is clean and cured to a dry hard state according to the manufacturer's instructions before applying the finish coat. Mix finish coat and apply in accordance with the manufacturer's instructions. Ensure the cured finish coat of the two coat system has a minimum dry film thickness of 2.5-5.0 mils. Apply as many coats as necessary to provide a finish coat which is a uniform continuous film over the entire surface, free of pinholes, runs, sags, or any other deficiencies. Finish coat shall be considered "non-sacrificial".

H. CORRECTION OF DEFICIENCIES

Remove all applied anti-graffiti coatings identified by the Engineer as damaged, defective, or otherwise not meeting these Specifications, in accordance with the manufacturer's

recommendations. Prepare the surface and reapply the coating in accordance with the manufacturer's recommendations and as specified herein, at no additional cost to the Department.

I. REMOVAL OF GRAFFITI BEFORE ACCEPTANCE

Remove all graffiti from areas receiving anti-graffiti coating, at no additional cost to the Department. Ensure all federal, state, and local environmental regulations are met when removing graffiti. Removal shall be in accordance with manufacturer's recommendations.

(68) SECTION 700: NOISE BARRIER WALLS:

July 26, 2018

Design, furnish, and construct noise barrier walls in accordance with the requirements of Exhibit 4 and this Specification.

A. GENERAL

Secure joints and connections in such a manner as to be structurally sufficient with no visible openings for sound transmission and as to not be a secondary source of sound transmission due to vibration.

Conform top of walls to the elevation shown and construct walls to conform to the horizontal alignments, corners and offsets shown in the plans. Provide all drainage related items in order to control the buildup of moisture from storm water runoff. Follow the design requirements for the type, gradation, and method of placement of backfill required. Exercise due caution in placing backfill at noise barrier wall foundation so as to maintain proper wall alignment.

B. PRECAST CONCRETE PANELS

Precast concrete panels shall conform to the following requirements:

1. Cast all precast panels in a precasting facility approved by the Materials and Research Engineer.
2. Prior to construction of complete noise barrier, provide a full scale sample representative of the panels to be used, and showing the architectural finish pattern on at least the median height of the noise barrier for approval by the RCE. Coordinate with the RCE if the sample panels will be reviewed on site or at the precast facility. After approval, Sample panels may be used in the permanent structure as long as they are fabricated with the same structural details as the permanent noise barrier.
3. Fabricate wall panels using a fractured fin finish (Standard Drawing 701-950-01) on the interstate side and a raked finish on the back side. On the interstate side of the top panel, provide a broom finish on the top two feet of the panel to provide the appearance of a concrete coping. Fabricate posts using smooth or brushed finish.
4. Acceptability of the panels will be determined from the compressive strength of cylinders made and cured in the same manner as the panels, and by inspection during the manufacturing process. The manufacturer of the panels shall furnish such facilities and assistance as may be required to carry out the sampling and daily testing in an expeditious and satisfactory manner.
5. Cast panels on a steel surface with steel side forms prepared so that there is no damage to panel finish. Do not strip forms until a minimum concrete strength of 2400 psi is attained. Vertical forms are required to provide the surface relief specified on each side of the panel.
6. Place concrete in each panel without interruption, and consolidate by the use of vibrators supplemented by hand tamping and rodding so as to force the concrete into the corners of the forms and eliminate stone pockets, cleavage planes, and air bubbles.
7. Repair minor honeycombing and voids within 24 hours of the removal of forms.
8. Cure the panels as specified in SCDOT Standard Specification Subsection 702.4.4 for a sufficient length of time so that the concrete will develop the specified compressive strength. Do not use a curing period less than 72 hours under normal summer temperature conditions. In

colder weather extend the curing period, as directed by the RCE, to provide equivalent curing. Protect the curing panels from freezing and evaporation from the time the concrete is placed until curing is complete. As an alternate to the wet cure method, steam cure the panels as specified in Section 704.

9. On each panel, include the date cast and the Inspector's approval stamp. Acceptance by the Inspector at the precast yard will not preclude rejection at the erection point if any damage or defects are discovered.
10. Erect the panels in accordance with plan details and dimensions.
11. After erection is complete and before final acceptance of the project, clean the Sound Barrier Wall to remove any dirt or stain in an environmentally safe procedure.
12. Panels will be subject to rejection due to failure to meet any of the requirements specified above. In addition, any of the following defects will be cause for rejection:
 - c. Defects that indicate imperfect mixing and casting.
 - d. Honeycomb or open texture.
 - e. Exposure of the reinforcement.
 - f. Failure to meet the specified concrete compressive strength at 28 days.
13. For items damaged during shipment or installation, repair/replace procedure shall be approved by the RCE.
14. Handle and ship panels in as close to vertical position as possible as directed by the manufacturer to prevent damage to the finish.

C. TEST WALL

Erect a portion of the wall as directed by the RCE (not less than 50 feet in length) which will be used for testing and acceptance. The RCE will use this portion of the wall to determine if the Contractor's methods and equipment are sufficient to produce a Sound Barrier Wall that meets the requirements of the contract documents including sound reduction performance, appearance, and texture. The Contractor may revise his methods and equipment as necessary in order to satisfactorily meet all contract requirements. If this portion of wall does not meet the requirements of the contract documents, remove and dispose of any rejected portions at no expense to the Department.

D. TOLERANCES

Limit vertical deviation from plumb for walls and posts to: ½ inch for wall heights less than 10 feet; 1 inch for wall heights 10 feet to 20 feet; and 1 ½ inches for wall heights greater than 20 feet.

Limit horizontal tolerance for walls to prevent panels from slipping out of the post joints.

Set posts within ½ inch of their intended location. For Sound Barrier Walls that are built on top of earth berms, construct the berms of earthwork fill material and compacted to ninety-five percent (95%) of the maximum density as determined by AASHTO T 99.

(69) SECTION 701: SAND LIGHTWEIGHT CONCRETE:

Use sand lightweight concrete, where specified in the plans, complying with the requirements of this Special Provision.

Sand lightweight concrete is composed of portland cement, fine aggregate, lightweight coarse aggregate, water, and admixtures. Provide sand lightweight concrete that complies with the applicable requirements of Section 701 of the Standard Specifications and the additional requirements herein.

At least 35 days prior to the proposed use, submit for approval a mix design from a testing laboratory accredited by the AASHTO Accreditation Program. Provide a mix that obtains a 28-day design compressive strength equal to or greater than 4000 psi and satisfies the following design criteria:

TEST	TEST METHOD	REQUIREMENT
Max. Unit Weight, plastic, lbs/ft ³	AASHTO T 121	120
Max. Unit Weight, dry, lbs/ft ³	ASTM C567 using equilibrium (air dried) unit weight	115
Min. Relative Dynamic Modulus, (percent)	AASHTO T 161 Procedure A	80

When submitting the mix design, include the source of the aggregates, cement, and admixtures and the gradation, specific gravity, and fineness modulus (fine aggregate only) of the aggregates. Submit test results showing the mix design conforms to the criteria, including the 28 day compressive strength of a minimum of six cylinders. Provide a mix design that produces an average compressive strength sufficient to ensure that a minimum strength of 4000 psi is achieved in the field.

Produce an additional mix in accordance with AASHTO M 195 to determine the drying shrinkage. The maximum drying shrinkage for this mix is 0.07%.

For lightweight coarse aggregate, use expanded shale or slate that meets the requirements of AASHTO M 195. Provide lightweight coarse aggregate that meets the gradation table below.

GRADATION OF LIGHTWEIGHT CONCRETE AGGREGATE	
Sieve Size	Passing Square Opening Sieves (Percent by Weight)
1"	100
3/4"	90-100
3/8"	10-50
No. 4	0-15

Determine the soundness in accordance with AASHTO T 104. Loss of more than 10% of the lightweight aggregate in five cycles of the accelerated soundness test using sodium sulfate is not permitted.

Ensure the lightweight aggregate will have a wear of not more than 40% when tested in accordance with AASHTO T 96.

Ensure that lightweight aggregate has an absorbed moisture content equal to the 24 hours absorption as determined by AASHTO T 84 or T 85 when it is proportioned and incorporated into the mix. Consult with the lightweight aggregate supplier regarding minimum absorption required for proper performance of aggregate in concrete mixtures.

Have a representative from the manufacturer of the lightweight aggregate attend and participate in the Pre-pour Conference and also provide technical assistance in the production of the lightweight concrete at the batch plant and/or site for the first day of lightweight concrete mixing and placement operations.

Do not use AASHTO T 152 to determine the air content. Determine air content in accordance with AASHTO T 196.

Determine the plastic density (unit weight) of lightweight concrete in accordance with AASHTO T 121. Perform density tests for acceptance of lightweight concrete after final corrections for entrained air and slump have been made. When a density test is made and the results of the test exceed the specified maximum, perform a check test immediately from the same load of concrete. If the average of the 2 test results exceeds the specified maximum density, the load is rejected.

The quantity for Sand Lightweight Concrete is the volume of specified concrete within the neat lines of the structure as shown on the Plans or as revised by the RCE and is measured by the cubic yard (CY) of concrete, complete, and accepted. Deductions are made for the volume of embedded items, except for reinforcing steel; however, no deduction is made for edge chamfers of 3/4 inch or smaller.

(70) SECTION 701: NON-CONFORMING CONCRETE:

For purposes of applying the reduced payment and below strength provisions of Subsection 701.2.12.4 of the Standard Specifications, a unit price of \$885 dollars per cubic yard will be used for normal weight concrete and a unit price of \$900 dollars per cubic yard will be used for sand lightweight concrete.

(71) SECTION 703: GALVANIZED REINFORCED BARS:

Refer to the latest Reinforcing Steel Supplemental Specification dated July 1, 2020. This special provision covers coating reinforcing bars and mechanical couplers with a hot dipped galvanized coating for use in structures.

There are two coating methods allowed by this specification:

- Hot dipped galvanization in accordance with ASTM A 767, Class I coating
- Continuous galvanization in accordance with ASTM A 1094

Delete Subsection 703.2.3.1 of the Standard Specifications and replace it with the following:

703.2.3.1 USE, TESTING, PRODUCTION, AND BASIS OF ACCEPTANCE

Use zinc-coated galvanized deformed steel reinforcing bars in structural concrete where required by Exhibit 4 and to the limits shown in the Plans.

Hot dipped galvanized coating requirements:

Provide zinc-coated reinforcing steel in structures that is hot-dip galvanized in accordance with ASTM A 767, Class I Coating. Galvanize the steel bars after fabrication and after shop-bending of bent bars.

The coating applicator shall take the necessary precautions to prevent embrittlement by conforming to the requirements of ASTM A143 "Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedures for Detecting Embrittlement". The test for embrittlement shall be conducted by the coating applicator or his representative according to the bend test described in AASHTO M 31 "Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement". The coating applicator shall include one reinforcing bar test specimen at least 3 feet long for each lot for this testing. The test specimen shall have the same diameter as the lot members and shall be quenched and galvanized in the same manner and at the same time as the bars whose characteristics it is intended to represent. If the test specimen cracks or otherwise fails the bend test, the entire lot it represents shall be rejected. For test purposes, a lot is any one of the following:

- Reinforcing bars of the same diameter comprising a single order
- A number of reinforcing bars of the same diameter identified as a lot by the coating applicator, proving the bars are all being coated within a single production shift
- One thousand reinforcing bars of the same diameter. Notwithstanding the above two, no lot shall exceed one thousand bars.

The contractor shall coordinate the tagging and identification requirements for the project and for lot identification and shall provide a non-destructive metal tag system for bent reinforcing bars.

The coating applicator shall furnish a Certificate of Compliance with each shipment of coated bars delivered to the project. The Certificate of Compliance and embrittlement test results shall accompany the mill test report required by the Reinforcing Steel Supplemental Specifications. The Certificate of Compliance shall state the representative samples of the coated bars have been tested and that the test results conform to the requirements described herein.

Continuous galvanizing coating requirements:

Provide zinc-coated reinforcing steel in structures that is continuously hot-dipped in accordance with ASTM A 1094. The zinc coating shall be chromate treated. Furnish certification and test results at time of shipment.

Delete Subsection 703.2.3.2 of the Standard Specifications and replace it with the following:

703.2.3.2 REPAIR OF GALVANIZED REINFORCING STEEL

703.2.3.2.1 SHOP REPAIR

Reject zinc-coated reinforcing steel bars if the extent of damage exceeds 2% of the surface area of the bar in any 1-foot length. Do not repair such reinforcing bars.

703.2.3.2.2 FIELD REPAIR

Field repair damaged areas of the rebar coating and replace bars exhibiting severely damaged coatings. Severe damage is defined as 2% of the surface area of the bar in any 1-foot length.

Follow ASTM A 780 standard practice for repair of damaged areas. Repair ends of bars cut in the field and damage resulting from installing mechanical splices, field-bending or straightening. Inspect bars for damage after placement and prior to placing concrete.

Zinc rich paint used for field repairs of galvanized coatings shall meet the following requirements:

- One application of the material shall provide a dry film thickness of 2 mils
- The dried film shall have a minimum zinc dust content of 94% by mass
- The paint shall be compatible with the galvanizing and inert in concrete
- The brand of material used shall be approved by the galvanizer.

Zinc rich paint shall be applied in accordance with manufacturer's instruction for use, using brush or by spray methods. Zinc paint shall be applied in such a quantity as to produce a minimum dry film thickness of 3 mils.

Refer to Subsection 703.2.3.3 of the Standard Specifications for handling, placing, and fastening. This Subsection remains unchanged.

Supplement Subsection 703.2.4.1 of the Supplemental Specifications, Mechanical Couplers for Reinforcing Steel, with the following:

When mechanical couplers are specified for use with galvanized reinforcing bars, provide couplers that are galvanized in accordance with AASHTO M232.

(72) SECTION 710: PILE AND DRIVING EQUIPMENT DATA FORM:

Pile and Driving Equipment Data Form is located in the Standard Forms on the SCDOT Design-Build website at <http://www.scdot.org/business/design-build.aspx>.

(73) SECTION 711: GALVANIZED STEEL H PILING AND SWAY BRACES:

March 16, 1999

A. GENERAL

This Supplemental Specification covers the cleaning, hot dip shop galvanizing, field cleaning and field repair of galvanizing for new Steel H Bearing Piling and Steel Sway Bracing where required and detailed in the plans.

B. SURFACE PREPARATION

The coating applicator shall pre-clean the material to be galvanized in accordance with accepted methods to produce an acceptable surface for hot dip galvanizing.

C. SHOP GALVANIZING

Hot dip galvanizing of iron and structural steel shapes shall be produced utilizing lead free technology. Steel H Bearing Piling and Steel Sway Braces shall be hot dip galvanized in accordance with the latest ASTM A 123 Specification to provide a uniform minimum coating thickness of 3.5 mils (89 μm). Shop repair of coatings not meeting the above minimum thickness requirements will not be allowed.

Galvanizing practices and procedures shall protect against possible embrittlement of the steel as described in ASTM A143.

Inspection and testing of hot dip galvanized coatings shall be done under the requirements of ASTM A 123.

The coating applicator shall have available for inspection a quality assurance manual and shall submit an original and two copies of the coating applicator's notarized Certificate of Compliance that the hot dip galvanized coating meets or exceeds the specified requirements of ASTM A 123 as modified by this Specification.

Galvanized members shall be stored, protected, handled and loaded in accordance with industry standards to protect the coating.

D. SHOP INSPECTION

Inspection of galvanizing practices and procedures will be performed by the Department's Research and Materials Laboratory. As soon as the project has been awarded, the Contractor shall notify the Research and Materials Laboratory at (803) 737-6698, P. O. Box 191, Columbia, South Carolina 29202. The Contractor shall provide the name and address of the coating applicator so that the inspection arrangements can be made.

E. FIELD REPAIR OF GALVANIZING

Field repair of galvanized coatings may be used to repair damaged areas, weld areas at pile splices, weld areas at sway braces to piles or other areas of coating damage. All field repairs shall be made in accordance with ASTM A 780. The Engineer shall be the sole judge of damaged areas that require field repair of the galvanized coating.

When galvanized members are to be field welded the Contractor shall clean the area at the weld location for a distance sufficient to provide an area free of coating for the weld metal to be deposited. The Contractor's cleaning method shall be pre-approved by the Engineer and cleaned areas shall be inspected and approved prior to field welding.

F. METHOD OF MEASUREMENT

The galvanizing of Steel H Bearing Piling and Sway Braces will not be measured for payment. All cost for galvanizing shall be included in the price bid for the item galvanized.

G. BASIS OF PAYMENT

All costs for labor, materials, equipment, tools and other incidentals required to galvanize the Steel H Bearing Piling and Sway Braces shall be included in the price bid for those items. No separate payment will be made for galvanizing.

(74) SECTION 712: POLYMER SLURRY

Delete Paragraph 1 of Subsection 712.4.9 – Slurry of the Standard Specification and replace with the following:

If the wet construction method is utilized, use either mineral or polymer (synthetic) slurry as a drilling fluid. Test the selected slurry at the time intervals and maintain within the tolerances indicated in this subsection and this Special Provision. Do not use salt water, high yield mineral slurry and/or natural polymer slurry. Use water as the drilling fluid only when specified on the Plans or in the Special Provisions. Use only potable water when the use of plain water is allowed to be used as the drilling

fluid, install temporary casing or construction casing to the estimated tip elevation shown on the Plans or as otherwise specified by the BDGE prior to any drilled shaft excavation.

Subsection 712.4.9 of the Standard Specifications is amended by adding the following:

1. Ensure that Polymer Slurries conform to the requirements of the AASHTO LRFD Bridge Construction Specifications, 4th Edition, Section 5: Drilled Shafts: Subsections 5.2.3 – Slurry Technical Assistance; 5.3.5 – Polymer Slurry; and 5.4.3.4 – Slurry.
2. Select and use a polymer slurry from one of the Polymer Slurry Supplier/Manufacturers provided in Attachment B of the RFP.
3. Have a representative of the Polymer Slurry Supplier/Manufacturer on-site during the construction of the first drilled shaft.
4. Test both the in-situ water and water to be used in mixing the polymer slurry to insure that the water has a total hardness less than 50 parts per million (ppm). If the total hardness of the water is greater than 50 ppm, contact the Polymer Slurry Supplier/Manufacturer for requirements and instructions on additives that can be added to the polymer slurry. Conduct water testing in accordance with ASTM D1126 – Standard Test Method for Hardness in Water prior to commencing construction.
5. During construction, maintain the level of polymer slurry in the shaft excavation at a level of not less than 10 feet above the highest expected piezometric pressure head along the depth of the shaft. Provide documentation from the Polymer Slurry Supplier/Manufacturer if a lower head pressure is permitted for the site conditions and construction methods being used. If at any time, in the opinion of the RCE, the slurry construction fails to produce the desired results, discontinue the use of polymer slurry and propose an alternate method for acceptance by the BCE.
6. Properly dispose of all polymer slurries and any drilling spoils that have been mixed with the slurry in accordance with applicable Federal, State and local regulations. Contact the Polymer Slurry Supplier/Manufacturer to determine the appropriate method of neutralizing and/or disposing of the specific polymer slurry used. Contain polymer slurry and drilling spoils and keep out of any surface water at all times. Disposal of polymer slurries and materials mixed with slurry is considered incidental to the installation and construction of the drilled shaft.

(75) SECTION 712: DRILLED SHAFT FORMS:

Drilled Shaft Forms are included on the Construction Extranet.

(76) SECTION 714: SMOOTH WALL PIPE:

Note: Reinforced Concrete Pipe shall be utilized on I-26 and I-95 Mainline and Ramps where installations are required under the roadway.

A. REFERENCE

SCDOT Supplemental Technical Specification SC-M-714

B. DESCRIPTION

When bid items for smooth wall pipe are listed in the EBS file and/or proposal, the SCDOT will allow the use of reinforced concrete pipe, spiral ribbed aluminum pipe or high density polyethylene pipe in accordance with the specifications found in SC-M-714 (latest edition), the Standard Drawings, and this Special Provision. The plans may indicate reinforced concrete pipe only and are hereby superseded by this Special Provision.

C. MATERIALS

Smooth wall pipe is either Reinforced Concrete Pipe (RCP: 714-205-XX), Spiral Ribbed Aluminum Pipe (SRAP: 714-605-XX), or High Density Polyethylene pipe (HDPE: 714-705-XX) as described in SCDOT Supplemental Technical Specification SC-M-714 and in the SCDOT Standard Drawings. Use smooth wall pipe culvert from manufacturers listed on Qualified Product Lists 30, 68, or 69. No value engineering application is required in order to use alternate pipe.

For the following counties: Berkeley, Beaufort, Charleston, Colleton, Dorchester, Georgetown, Horry, and Jasper, provide pipe joints meeting AASHTO M 315 for RCP or passing the 13 psi pressure test as indicated on the QPL for SRAP or HDPE. Take care to properly lubricate and equalize pipe gaskets as indicated in the **SCDOT Standard Drawings** and **SC-M-714** to prevent gaskets from “rolling” during installation. For all other counties, provide pipe joints meeting AASHTO M 198, M 315, or passing the minimum 10 psi pressure test unless specific pipe joints are indicated in the plans or special provisions.

No other pipe type will be accepted as an alternate.

D. CONSTRUCTION REQUIREMENTS

Use only pipe that conforms to the minimum and maximum fill height limitations indicated on the appropriate standard drawing. Unless indicated otherwise in the plans, determine pipe fill height based on the following formula:

Fill Height = Elevation (top of curb or max grade above pipe) – Elevation (pipe crown)

For all locations where new pipe is being attached to an existing system, use one of the following options:

1. Any existing pipe may be extended using any acceptable alternate pipe type by using a drainage structure at the interface between the different pipe types. The drainage structure* may consist of standard junction boxes, manholes, catch basins, drop inlets, or circular drainage structures detailed on **SCDOT Standard Drawings**. For larger diameter pipe, custom drainage structures may be required. Field cut existing pipe to remove damaged joint (if applicable) and install new drainage structure at the field cut interface. Always fully clean existing pipe and pipe joints before installing joint sealant or gaskets and attaching new pipe.
2. For locations where existing pipe properties cannot be directly matched, use a custom designed interface* (concrete collar, proprietary mastic wrap, custom coupling band, etc.) appropriate to interface the existing pipe to the new pipe of the same type. Submit interface drawings and design for review by the Engineer of Record and the Design Standards Engineer. Always fully clean existing pipe and pipe joints before installing joint sealant or gaskets and attaching new pipe. Replace existing pipe that has joint damage before connecting new pipe to the system.
3. Any existing pipe may be extended using new pipe with the same joint profile and wall properties of the existing pipe. Always fully clean existing pipe and pipe joints before installing joint sealant or gaskets and attaching new pipe. Verify* the following parameters before ordering new pipe:
 - a. For RCP to RCP, confirm wall thickness, joint profile shape, and compatibility with existing manufacturer’s pipe. Replace existing pipe that has joint damage before connecting new pipe to the system.
 - b. For SRAP to SRAP, replace existing pipe that has joint damage before connecting new pipe to the system.
 - c. For HDPE to HDPE, confirm the manufacturer of the existing pipe and the joint compatibility with the new pipe. Provide a new gasket when connecting to existing spigot end of HDPE pipe. Replace existing pipe that has joint damage before connecting new pipe to the system.
 - d. For CAAP to CAAP, confirm the type and size of end corrugations of the pipe. When existing pipe has full helical corrugations, provide new connecting pipe with one end fully helical and fully helical coupling band. When end corrugation size does not match the corrugation size shown on SCDOT Standard Drawings, provide a drainage structure (described above) at the interface. Replace existing pipe that has joint damage before connecting new pipe to the system. Do not install CAAP as smooth wall pipe; however, use these requirements when plans specify installing new CAAP.

The **RCE** will verify that connections between existing pipe and new installed pipe have been handled with one of the options listed above. Repair or replace all existing to new joint interfaces that do not meet the requirements above at no additional cost to **SCDOT**.

In all installations, provide the RCE with a complete pipe table indicating the following: Plan Pay Item, Plan Pipe Description, Plan Quantity, Installed Pipe (diameter, type, class/gage), Installed Quantity, and description of interface used to join new pipe to existing pipe for each occurrence.

In cases where 2 or more different pipe types are installed, provide a copy of the proposed installation layout on the drainage/plan sheets to the RCE indicating which pipe is installed at each location.

E. MEASUREMENT

Measure smooth wall pipe in accordance with methods specified in SC-M-714 for the pipe material installed.

*No measurement will be made for drainage structure, designed interface, or field verification performed at each interface between existing pipe and new pipe unless drainage structure/interface is specified in the plans.

F. PAYMENT

Payment will be made for smooth wall pipe regardless of the type of material installed. Payment for smooth wall pipe is as specified in SC-M-714 for the pipe material installed.

*Include all costs for work related to connecting new pipe to existing pipe in the unit bid price of the new pipe. This connection work includes: drainage structure at the interface, custom designed interface, field verification of existing pipe and compatibility with new pipe, new gaskets, new joint sealant, new coupling bands, removal, and disposal of damaged sections of existing pipe.

ITEM NO.	DESCRIPTION	UNIT
7143XXX	X" SMOOTH WALL PIPE	LF
7143XXX	X"x X" SMOOTH WALL PIPE CUL.TEE	EA
714XXXX	X" x X" SMOOTH WALL PIPE CUL.WYE	EA
7144XXX	X" SMOOTH WALL PIPE X DEG BEND	EA
7144XXX	SMOOTH WALL PIPE INCR.- X" TO X"	EA

(77) SECTION 714: PIPE END TREATMENTS (2/5/2010):

A. REFERENCE

SCDOT Supplemental Technical Specification SC-M-714

B. DESCRIPTION

For exposed pipe culvert ends, provide an end treatment in accordance with this special provision.

C. MATERIALS

Rigid pipe culvert is Reinforced Concrete Pipe (RCP: 714-205-00). Flexible pipe culvert is either Spiral Ribbed Aluminum Pipe (SRAP: 714-610-00), High Density Polyethylene pipe (HDPE: 714-705-00), or Corrugated Aluminum Alloy Pipe (CAAP: 714-605-00).

Use minimum Class B riprap for pipe up to 84" diameter. Use minimum Class C riprap for pipe 84" diameter or larger.

Use minimum Class 4000 concrete (4000P for precast).

Use ASTM A-706 grade 60, low-alloy steel deformed rebar.

Use minimum AASHTO M-196 Alclad 3004-H32 alloy aluminum.

Use Type M Mortar Grout unless specified otherwise.

D. CONSTRUCTION REQUIREMENTS

Use one of the following end treatments as specified in the plans or special provisions:



For all exposed crossline pipe ends, when an end treatment is not specified in the plans, use **Pipe Riprap Protection** (804-3xx-xx). For flexible pipe larger than 24" diameter, install pipe straight headwall, pipe end structure, flared end section, or wingwall section in addition to riprap. For all exposed driveway pipe ends where no end treatment is specified in the plans, use **Pipe Riprap Protection** (804-3xx-xx) unless directed otherwise by the engineer.



Use **Beveling of Pipe End** (719-610-00) when specified in the plans or special provisions. Beveled ends may only be used on flexible pipe up to 24" diameter and on rigid pipe up to 60" diameter. When beveling of pipe ends is specified on flexible pipe larger than 24" diameter, install pipe straight headwall, pipe end structure, flared end section, or wingwall section. Use factory fabricated beveled ends for all pipe types unless approved by the Engineer.



Use **Pipe Straight Headwall** (719-605-00) when specified in the plans or special provisions. Use straight headwall only in locations where pipe exposed end does not face the direction of traffic.



Use **Pipe End Structure** (719-615-00) when specified in the plans or special provisions. Use pipe end structure in locations where pipe exposed end faces the direction of traffic. Pipe end structures may be used in other locations if approved by the RCE.



Use **Pipe Flared End Section** when specified in the plans or special provisions.



Use **Pipe Wingwall Section** when specified in the plans or special provisions.

Completely seal interface between pipe and end treatment with grout. If bricks or shims are used to place pipe, take care to remove all air pockets and voids when grouting.

For systems not designed in the SCDOT Standard Drawings, provide shop drawings, installation procedure and design calculations for review by RCE. Design must include provision to control erosion around the structure and prevent the separation of the end treatment from the pipe system. Design must provide for a proper seal at all construction joints including the interface between the pipe and the structure. Design must be self-supporting and not induce any additional loads on the pipe. Submit designs for consideration as new standard drawings to the Design Standards Engineer at the address listed in the SCDOT Standard Drawings book.

E. MEASUREMENT

Measure pipe in accordance with SC-M-714

Measure end treatments in accordance with Standard Specifications, Standard Drawings, or Special Provisions

F. PAYMENT

Beveling of pipe ends will be in addition to the standard pipe pay item. Payment for the item Beveling of Pipe Ends includes all labor required to factory (or field, if approved) fabricate a bevel on one end of pipe.

Pipe culvert and end treatments, measured as provided in **SC-M-714 Subsection x.4**, are paid for at the contract unit price for the respective items, which price and payment is compensation for furnishing all material, labor, equipment, tools including hauling and placing all pipe sections and materials, excavation of the entire standard trench, bedding, and pipe backfill as described in the measurement section (both structural and embankment backfill in this region), removal of existing pipe to be replaced, constructing pipe joints, removal of old end treatments, cleaning out pipe, disposal of surplus materials, all visual inspection, and all incidentals necessary to complete the work.

Add the following paragraph to SC-M-714 subsections x.5:

Payment for riprap and geotextile for erosion control under riprap as measured in subsection x.4 includes all direct and indirect costs and expenses necessary to complete the work.

For completing the work specified under this section, and as shown on the Drawings, the Engineer will pay the Contractor the Unit Price Bid for the Pay Item stipulated below:

(78) SECTION 714: EXISTING PIPES AND DRAINAGE STRUCTURES:

Follow the recommendations contained in the Table of Recommendations of the Video Pipe Inspection Report included in Attachment B for disposition of existing pipes and drainage structures. All pipes specified to be replaced shall be replaced in kind via trenchless pipe installation. All pipes specified to be retained and recommended to be repaired shall be cleaned, repaired, pipe end sections replaced, where specified, and lined unless the pipe is not needed based on the Contractor's design. In the event the pipes are no longer needed by design, the pipe shall be abandoned and either removed or filled with flowable fill. Repair box culverts as specified in the table. The contractor shall include in their cost proposal all work specified in the recommendations table included in Attachment B.

Any pipes specified for repair may be replaced by the Contractor at no additional cost to the Department.

Pipes which were not inspected due to access or other reason are to be replaced. Existing pipes under loops/ramps are assumed to be abandoned in place and filled with CLSM in accordance with Section 210 and 715.4.2. If existing pipes are to be reused based on the Contractor's design, the pipes shall be repaired to eliminate all deficiencies prior to retaining and at no additional cost to the Department.

Include costs for 350 TONS of Class B Riprap and 450 SY of Class 2 Non-woven Geotextile Fabric for outlet repairs on existing pipes in the cost proposal.

(79) SECTION 719: CAST IN PLACE CONCRETE PIPE COLLAR:**A. DESCRIPTION**

A cast in place concrete pipe collar is used to provide a permanent connection between two pipe culverts of the same diameter but different joint profiles. Pipe collars can be used between two pipe of the same material or different material. Use only pipe that conforms to SC-M-714, Permanent Pipe Culverts.

B. MATERIAL

Use minimum class 4000 concrete.

Use reinforcement steel conforming to ASTM A706 Grade 60.

See SCDOT Standard Drawings or Project Plans for other material requirements and design details.

C. CONSTRUCTION REQUIREMENTS - GENERAL

Follow SCDOT Standard Drawings 719-705-xx for minimum dimensions and details. Use geotextile wrap on joint to minimize concrete intrusion into the joint during the forming and curing process.

D. MEASUREMENT

Measure concrete pipe collars by each location where pipe diameter of different joint profiles are to be connected. Include in measurement all materials and work to complete the pipe collar as shown in the Standard Drawings or plans.

E. PAYMENT

Payment will be made for each location.

ITEM NO.	DESCRIPTION	UNIT
7197051	CONCRETE COLLAR FOR UP TO 12" PIPE	EA
7197052	CONCRETE COLLAR FOR UP TO 24" PIPE	EA
7197053	CONCRETE COLLAR FOR UP TO 36" PIPE	EA
7197054	CONCRETE COLLAR FOR UP TO 48" PIPE	EA
7197055	CONCRETE COLLAR FOR UP TO 60" PIPE	EA
7197056	CONCRETE COLLAR FOR UP TO 72" PIPE	EA

(80) SECTION 724: ELASTOMERIC BEARINGS:

724.4.4 Installation. Paragraph 4 was revised as follows:

Exercise caution where field weld or shop weld is made while elastomeric bearing pad is in contact with the metal. Do not expose the elastomer or elastomer bond to instantaneous temperatures greater than 400°F or any temperature limit set by the fabricator whichever is lower. Any damage to the elastomeric bearing due to welding is cause for rejection. Monitor temperature by use of heat crayons.

(81) SECTION 725: SHOP PLANS AND WORKING DRAWINGS FOR STRUCTURES

Section 725 of the 2007 Standard Specifications is hereby deleted and replaced with:

725.1 Description

1. This section contains specifications for submitting Shop Plans and Working Drawings for construction projects as required in other Sections of the Standard Construction Specifications, Supplemental Specifications, Supplemental Technical Specifications, and Special Provisions. Failure to follow the procedures herein may cause delay in processing of submittals. Any subsequent loss of construction time due to failure to follow these procedures will not be accepted by the Department as a valid reason to change the project's completion date.
2. Shop Plans are defined as plans prepared by the Contractor that contain manufacturing details or supplementary design plans of an item that will become a permanent part of the project, such as structural steel fabrication drawings, prestressed concrete beam drawings, or any other supplementary plans or similar data that the Contractor is required to submit to the RCE for review before fabrication. Shop Plans, including any red-lined revisions, become part of the as-built drawings for the completed structure.
3. Working Drawings are defined as sketches, calculations, etc., prepared by the Contractor for temporary structural features that may include erection plans, falsework plans, cofferdam plans, temporary structure plans, or any other supplementary plans or similar data that the Contractor is required to submit to the RCE for review before assembly of the subject of the drawings on the project site.

725.1.1 Shop Plans

1. Submit Shop Plans and supporting Engineering Calculations to the RCE no later than 30 days before fabrication. Submit Shop Plans through an approved electronic system in Adobe PDF Format. No extension of contract time is granted for delays due to failure to observe this time

- requirement. Have the fabricator of the material component of the structure notify the OMR a minimum of 14 calendar days prior to the start of fabrication.
2. Clearly identify the SC File Number, Project ID, County Name(s), Route Number(s), and Project Description in the Shop Plan submittal.
 3. Ensure that Shop Plans are accurate, complete, neat and legible. Shop Plans should be scaled such that they are legible on an 11in x 17in paper size, when printed.
 4. Electronically submit Shop Plans for the following items:
 - Armor Plates,
 - Bridge Bearings,
 - Bearing or Sole Plates, Shims, Booster Plates and Other Structural Steel Bearing Assembly Components,
 - Anchor Bolt Assemblies,
 - Tie Rod Assemblies,
 - Intermediate Steel Diaphragms,
 - Structural Steel Members,
 - Expansion Joint Components,
 - Miscellaneous Steel Members except Piling and Sway Bracing,
 - Metal Bridge Railings or Metal Bridge Railing Extensions,
 - SIP Bridge Deck Forms,
 - Prestressed and/or Post-tensioned Concrete Beam or Girder,
 - Prestressed Concrete Piling,
 - Miscellaneous Prestressed and Post-tensioned Concrete Members,
 - Precast Box Culverts,
 - Precast Floorless Culverts,
 - Mechanically-Stabilized Earth (MSE) Walls,
 - Prefabricated Retaining Wall Components,
 - Sound Barrier Walls,
 - Signage, and
 - Other items specified in the Plans and Contract Documents.
 5. Ensure that Shop Plans and supporting Engineering Calculations bear the seal and signature of a South Carolina registered Professional Engineer with the exception of the following items fabricated in accordance with details shown in Plans:
 - Armor Plates,
 - Bearing or Sole Plates, Shims, and Booster Plates,
 - Anchor Bolt Assemblies,
 - Tie Rod Assemblies,
 - Intermediate Steel Diaphragms,
 - Structural Steel Girders,
 - Prestressed Concrete Piling,

- Elastomeric Bearing Pads, and
- Metal Bridge Railings or Metal Bridge Railing Extensions.

If the items listed above are in any way modified from the details shown in the plans, ensure that the Shop Plans and supporting Engineering Calculations bear the seal and signature of a South Carolina registered Professional Engineer.

725.1.2 Working Drawings and Engineering Calculations

1. Ensure that the Working Drawings are accurate, complete, neat, legible, and supporting Engineering Calculations are included. Ensure that Working Drawings and Engineering Calculations are prepared in conformance with the latest edition of the AASHTO Guide Specifications for Bridge Temporary Works. Identify the title and edition of design specifications used to prepare Working Drawings and Engineering Calculations. Identify the design methodologies, material properties, design loads, load capacities, and any other parameters necessary to demonstrate that the design meets the necessary requirements.
2. Submit Working Drawings and Engineering Calculations to the RCE through an approved electronic system in Adobe PDF Format.
3. Submit Working Drawings and supporting Engineering Calculations to the RCE for SCDOT review and acceptance a minimum of 30 calendar days prior to erection or installation of the element.
4. Working Drawings and Engineering Calculations for falsework/form systems over or adjacent to railroad tracks shall be reviewed and accepted by the designated railroad representative prior to SCDOT acceptance.
5. No extension of contract time is granted for delays due to failure to observe these time requirements.

725.2 Materials

1. None specified.

725.3 Equipment

1. None specified.

725.4 Construction

1. Do not begin fabrication of items that require Shop Plans until the reviewed Shop Plans have been accepted, stamped, and distributed by the Department. When Working Drawings are required, do not begin installation of such items until the accepted drawings have been received from the Department or from the Designer of Record (with Departmental concurrence).

725.5 Measurement

1. This work is not measured for payment.

725.6 Payment

1. No separate payment is made for compliance with this specification. All costs of the above work are considered incidental to the project and included in other items of work.

(82) SECTION 727: CROSSHOLE SONIC LOGGING OF DRILLED SHAFT FOUNDATIONS:

Crosshole Sonic Logging (CSL) Testing is required for all drilled shafts. SCDOT shall be responsible for all CSL Testing.

(83) SECTION 805: TL3 TYPE T TANGENT END TERMINALS:

Qualified Product List 49 provides minimum length of continuous w-beam from the impact head for each proprietary Test Level 3 product. All radius, kinks, and transition sections must occur outside of the pay limits of the Leading End Treatments shown on SCDOT Standard Drawings for MASH MT3

and PREMASH Type T TL3 devices. Use only PREMASH devices in locations where existing guardrail installations are retained or adjusted. Where the design requires immediate transition from w-beam to thrie-beam at the end of the tangent end treatment pay limits, provide adequate space and guardrail shoulder break in advance of the impact head to conform or exceed the geometry shown on the corresponding standard drawings. Alternate PREMASH guardrail shoulder break (Standard Drawing 805-605-11 detail 2) may only be considered in locations where upgrading to standard guardrail shoulder break geometry does not fit within SCDOT Right-of-way.

(84) SECTION 805: RESETTING GUARDRAIL:

Existing steel beam guardrail that is determined to be in acceptable condition by the RCE, using the below criteria, may be reset in conformance with Section 805.4.3 of the 2007 SCDOT Standard Specifications, and adjusted to the current PREMASH Standard Drawings. The Contractor shall inspect all guardrail on the project and notify the RCE in writing of any guardrail that will be permanently reset. Provide this notice to the RCE a minimum of two weeks prior to permanently resetting any guardrail on the project. If existing wood posts are planned to be reset, all existing wood posts shall be replaced with steel posts.

Resetting Guardrail Acceptance Criteria:

- A. Any guardrail components that are bent, flattened, torn, deformed, exhibit signs of rust, or damaged in any way shall not be reset.
- B. Guardrail with obsolete components and guardrail systems that are not on the SCDOT Qualified Products List (QPL) shall not be reset.
- C. Section 805.4.3 disallows resetting guardrail posts. This shall only apply to existing wood posts.

(85) SECTION 805: NON-MOW STRIP UNDER GUARDRAIL:

May 7, 2018

Section 805 is expanded as follows:

A. GENERAL

Provide non-mow strip under guardrail as shown in the plans, in accordance with plan details, standard drawings 805-525-01 & 805-525-02, and these special provisions. Non-mow strips under guardrail shall only be placed where shown in the plans, specified in the RFP or as directed by the Engineer.

B. CONSTRUCTION

Place non-mow strips under guardrail where indicated on the plans, specified in the RFP or as directed by the Engineer. Refer to details provided in this special provision and standard drawings for typical limits of non-mow strip and requirements for leave out areas around guardrail posts.

Provide non-mow strip between the edge of pavement and the face of the guardrail when that distance is less than 20 feet.

Extend non-mow strip under guardrail to bridge end at locations where concrete approach slabs are used.

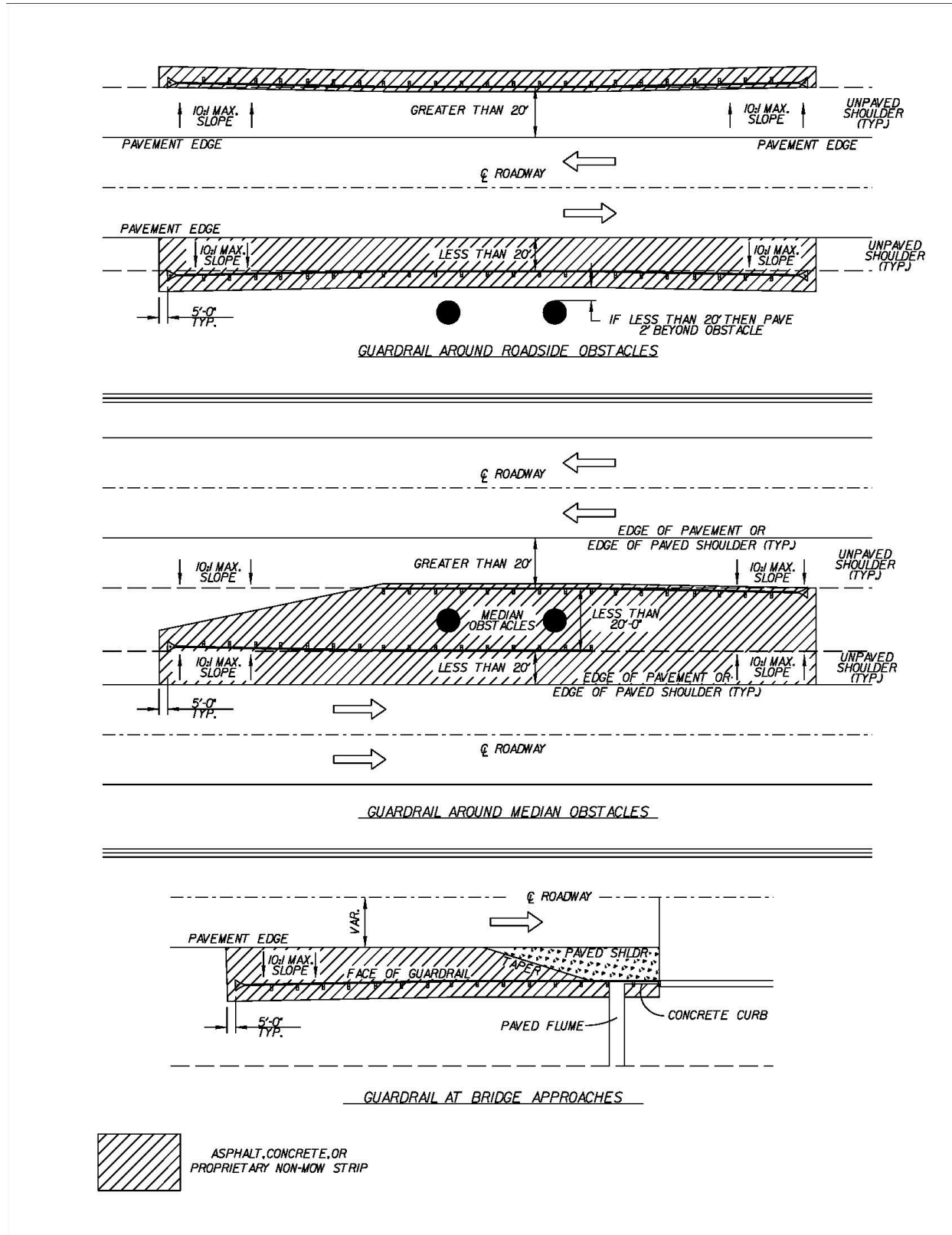
When at least one opening between parallel lines of guardrail is less than 20 feet wide, provide non-mow strip the entire area between the lines of guardrail.

When openings between parallel lines of guardrail are more than 20 feet wide, but obstructions such as bridge columns reduce the access between the guardrail and the obstruction to less than 20 feet and/or the distance between any two obstructions is less than 20 feet then provide non-mow strip for the area with any single point of access less than 20 feet wide.

When areas around obstructions have non-mow strips, no area should remain uncovered that will sustain plant life.

The top of non-mow strips shall be constructed to be flush with surrounding earth shoulders, slopes and finished pavement grade.

Damage to non-mow strips during subsequent construction, especially during driving of guardrail posts, should be minimized. Any damaged non-mow strip must be restored to its original line and grade to the satisfaction of the Engineer.



(86) SECTION 806: REPAIR EXISTING CONTROL OF ACCESS FENCE:

Repair, replace or reset any damaged control of access fencing or fence components within the project limits, as directed by the RCE. Remove and dispose of existing fences, trees, brush, stumps, logs, weeds, or other debris that interfere with the construction of the fence. CONTRACTOR's bid shall include 1000 linear feet of Repair of Existing Control of Access Fence. Should the actual length

of fence rehabilitation vary from this estimated value by more than 25%, a change order will be generated by the RCE to adjust the contract value based on the actual rehabilitated length of fence as measured by SCDOT inspectors, utilizing a unit price of **\$15.00/LF**, regardless of fence type. Ensure all waste materials and debris generated during this work is disposed of promptly and at appropriate waste facilities.

(87) SECTION 806: TEMPORARY BARRIER FENCE FOR ENVIRONMENTAL BOUNDARY:

See attached Supplemental Specification dated **May 1, 2013**.

The Contractor is hereby advised that all Jurisdictional Waters (i.e. streams & wetlands) that are adjacent to or within the construction limits shall be protected with a double row of Silt Fence or other means of double perimeter control as approved by RCE.

(88) SECTION 809: RIGHT OF WAY PLAT:

A. DESCRIPTION

The contractor by the “Substantial Work Complete” date shall prepare a right of way plat signed and sealed by a Professional Land Surveyor (PLS) licensed to practice in the state of South Carolina. The right of way plat shall be in accordance with the requirements of Section 49-460-A “General Property Survey” as outlined in the South Carolina “Standards of Practice Manual” for land surveyors. A copy of the plat will be recorded, by the contractor, in the Register Mesne Conveyance (RMC) office of the county or counties in which the project resides. The contractor will provide one copy of the plat on a full sized plan sheet(s) (22” X 36”) and submit to the resident construction engineer to be included in the as-built plans.

B. MATERIALS: REBAR CAP R/W MARKER

Materials used shall comply with those listed on SCDOT Standard Drawing No. 809-105-00.

C. CONSTRUCTION REQUIREMENT

The PLS shall set right of way markers along all new right of way lines as well as along any present right of way being retained by the Department at intervals listed on the SCDOT Standard Drawings. Right of way markers shall not be placed at points common to side property lines and/or corners. In the event that the plan reflects a break in the right of way along a side property line the right of way marker will not be set without the side property line being retraced and established by way of survey. The PLS shall prepare a plat documenting the location of all Right of Way Markers set and reflecting the as-built station and offset from the plan alignment. The plat shall show the entire project corridor as an enclosed strip or parcel of land to include the mainline and all side roads as defined on the project plan.

D. MEASUREMENT AND BASIS OF PAYMENT

The item Right of Way Plat is paid on a lump sum (LS) basis; and therefore, there is no specific measurement for this item. The unit price bid for Property Right of Way Plat shall include all costs for labor, materials, equipment, services of a PLS and any related fees or costs associated with producing a plat, recording the plat at the RMC office, and all required copies. Each marker placed in accordance with the Standard Drawings complete and accepted will be measured and paid at the unit price bid.

Bid Item Number	Description	Unit
8091010	RIGHT OF WAY MARKER (REBAR AND CAP)	EA
8091000	RIGHT OF WAY MARKER (REINFORCED CONCRETE)	EA
8091050	RIGHT OF WAY PLAT	LS

(89) SECTION 815: ANIONIC POLYACRYLAMIDE FOR EROSION CONTROL:

A. DESCRIPTION

This work consists of applying a product containing anionic polyacrylamide to disturbed land areas as a means of controlling erosion. The work also consists of the use of solid form anionic polyacrylamide as a means of sediment control.

B. MATERIALS

The product to be used is to be specific to the area to be treated. Product selection and application rate is to be determined by a testing laboratory acceptable to SCDOT. Preliminary site-specific assessment (soil and water testing) by a qualified manufacturer must be conducted to select media, additives, application rate, application method and maintenance procedure tailored to site-specific soil characteristics, topography, hydrology, and the type of erosion targeted. A copy of the test results is to be provided to the Engineer.

Anionic polyacrylamide, in pure form, shall have less than or equal to 0.05% acrylamide monomer by weight, as established by the Food and Drug Administration and the Environmental Protection Agency. The maximum application rate of polyacrylamide, in pure form, shall not exceed 200 pounds/acre/year, or 10 pounds/acre per single application event.

The polyacrylamide shall have a charge density of 10% to 55%, by weight. The polyacrylamide shall have a molecular weight of 6 to 24 Mg/mole.

The polyacrylamide and polyacrylamide mixtures shall be noncombustible.

Cationic forms of polyacrylamide are not allowed for use due to their high level of toxicity.

Polyacrylamide shall be non-toxic. A toxicity report is required to be submitted to the Engineer.

C. CONSTRUCTION REQUIREMENTS

Liquid and powder forms of polyacrylamide are to be either applied directly to the exposed soil surface or applied as a tackifier with temporary seeding to prevent detachment of soil particles during the establishment of vegetation.

In the solid form, the polymer is to be placed directly into the storm water runoff to enhance eroded particle settlement in a trapping device.

Polyacrylamide shall be mixed and/or applied in accordance with all Occupational Safety and Health Administration (OSHA) Material Safety Data Sheet (MSDS) requirements and the manufacturer's recommendations for the specified use conforming to all federal, state and local laws, rules and regulations. The Contractor is responsible for obtaining all required permits.

Emulsion batches shall be mixed following recommendations of a testing laboratory that determines the proper product and rate to meet site requirements.

Additives such as fertilizers, solubility promoters, or inhibitors, etc. to polyacrylamide shall be nontoxic.

Care is to be taken when using polyacrylamide adjacent to natural water bodies.

D. METHOD OF MEASUREMENT

The application of polyacrylamide for erosion control will be measured by the surface area treated at the recommended rate of application. Quantities are to be computed to the nearest MSY (Thousand Square Yards). Solid form anionic polyacrylamide is to be measured by weight in pounds, in place and accepted. The Contractor is required to provide, to the Engineer, invoices for all polyacrylamide products used on the project.

E. BASIS OF PAYMENT

The accepted quantity of "Anionic Polyacrylamide For Erosion Control" will be paid at the contract unit price, which price and payment shall be full compensation for all materials, labor, tools equipment, and incidentals necessary to complete the work herein described in a workmanlike and acceptable manner. Solid form anionic polyacrylamide is to be paid for by the pound. Bid Item Numbers and Descriptions are as follows:

Bid Item Number	Description	Unit
8152020	ANIONIC POLYACRYLAMIDE FOR EROSION CONTROL	MSY
8152025	SOLID FORM ANIONIC POLYACRYLAMIDE	LBS

(90) SECTION 815: EROSION CONTROL MEASURES:

In addition to the erosion control measures specified in the Plans, Standard Specifications, Supplemental Technical Specifications and the Special Provisions, the CONTRACTOR is advised that all land disturbing activities (clearing and grubbing, excavation, borrow and fill) are subject to the requirements set forth in the following permits and regulations:

- A. South Carolina Code of Regulations 63-380, Standard Plan for Erosion, Sediment, and Stormwater Runoff Control.
- B. Erosion and Sediment Reduction Act of 1983 (Title 48, Chapter 18 of the South Carolina Code of Laws of 1983, as amended). Section 70 of this code authorized the South Carolina Department of Health and Environmental Control (SCDHEC) to administer this regulation with respect to lands under the jurisdiction of the South Carolina Department of Transportation.
- C. National Pollutant Discharge Elimination System (NPDES) General Permit Number SCR160000, effective January 1, 2013: The Environmental Protection Agency, in accordance with the Federal Clean Water Act, has granted to the South Carolina Department of Health and Environmental Control (SCDHEC) the authority to administer the Federal NPDES permit program in the State of South Carolina.

In accordance with the NPDES General Permit, the Contractor must sign a Contractor Certification. The Contractor shall refer to the Construction Extranet for the certification form. By signing this form, the Contractor acknowledges that upon award and execution of the Contract, he/she accepts/understands the terms and conditions of the *Storm Water Pollution Prevention Plan (SWPPP)* as required by the NPDES General Permit and may be legally accountable to SCDHEC for compliance with the terms and conditions of the *SWPPP*. In addition, the Contractor certifies that the NPDES certification statement status is made part of all its subcontracts.

The Contractor will complete and forward an updated SCDOT approved *Notice of Intent (NOI)* to the SCDOT Construction office to submit to SCDHEC. If the Coastal Zone Consistency (CZC) permit has not been approved it shall be forwarded by the Contractor to SCDOT to submit to SCDHEC as part of *NOI* package. If SCDHEC does not send a letter within 10 business days of receipt of the *NOI*, authorizing coverage, denying coverage, or advising that a review of the *CECP* will take place, coverage will be automatically granted.

Prepare and submit a *Contractor's Erosion Control Plan (CECP)* to the RCE before the pre-construction conference. Ensure that the plan meets the requirements of the NPDES General Permit. The plan will be reviewed and approved by the Department before commencing any land disturbing activities.

At the pre-construction conference, with contactors performing land-disturbing activities present, the *CECP* will be explained and discussed so that the Contractor is made aware of their responsibilities in the *CECP*.

Once approved, fully implement the *CECP*. Coordinate the prompt installation of erosion control devices with construction activities to maintain compliance with the above regulations and NPDES General Permit.

Conduct an Erosion and Sediment Control Inspection by an appointed Certified Erosion Prevention and Sediment Control Inspector (CEPSCI) from the Contractor and the Department at least every 7-calendar days. Both parties will acknowledge participation in the inspection by signing the inspection report and include their inspector's CEPSCI number on the report. Correct deficiencies noted during these inspections within the assigned priority period. If deficiencies are not corrected within this timeframe, the RCE will stop all work (except erosion and sediment control measures) until the deficiencies are corrected.

Give special attention to critical areas within the project limits (i.e., running streams, water bodies, wetlands, etc.). In these areas, the RCE may direct the Contractor to undertake immediate corrective action, but in no case allow these deficiencies to remain unresolved more than 7 days or 48 hours in accordance with their assigned priority after being identified during the Erosion and Sediment Control Inspection.

Closely follow the grading operations with the seeding operations. Shape and prepare the slopes for seeding as the grading progresses. Unless the RCE grants prior written approval, limit the amount of surface area exposed by land disturbing activities to 750,000 square feet. Commence seeding operations within 7 days following completion of construction activities within an area.

Initiate stabilization measures within 7 days for an area where construction activities will be temporarily or permanently ceased for 14 days or longer.

Coordinate the installation of all other permanent erosion control items with the grading and seeding operations. These items include, but are not limited to, asphalt gutter and riprap. Construct gutter work before or promptly after the seeding is performed. Place riprap at the ends of pipe immediately after the pipe is laid and promptly install riprap ditch checks after ditch work has been performed.

Within existing right of way, clean and repair existing concrete paved ditches that will be retained. Within existing right of way, clean and repair existing asphalt paved ditches that are to be retained and overlay with 200 lbs/sy HMA Surface Course Type C or D. Stabilize new ditches in accordance with the *SCDOT Requirements for Hydraulic Design Studies* (May 26, 2009), the *SCDOT Water Quality Design Manual* (December 2014) and as needed for erosion control utilizing SCDHEC Best Management Practices (BMP's).

Failure to adequately comply with the provisions as detailed above or any other required erosion control measures will result in stoppage of all contract operations (except erosion and sediment control measures) until corrective action has been taken. Additional sanctions may be invoked by the SCDHEC in accordance with their authority.

Keep the following documents at the RCE's office from the start of construction until the site is finally stabilized:

- A. Copy of the *CECP*,
- B. Copies of Contractor Certification statements,
- C. Copy of the permit,
- D. Letter from DHEC authorizing permit coverage if provided by SCDHEC, and
- E. A marked-up set of site plans.

When uniform perennial vegetation achieves a cover density of 70%, submit a *Notice of Termination (NOT)* to SCDHEC to terminate coverage. Include a signed statement with the *NOT* certifying that all work on the site has been completed in accordance with the *SWPPP* and the NPDES General Permit for all sites one acre or greater.

Fines assessed on the Department by SCDHEC as the result of the CONTRACTOR's non-compliance or violation of said permit provisions will be paid by the Department and will subsequently be deducted from any monies due or that may become due to the CONTRACTOR. In case no monies are due or available, the fines incurred will be charged against the CONTRACTOR's Surety.

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

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| I. | General |
| II. | Nondiscrimination |
| III. | Non-segregated 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. | Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion |
| XI. | Certification Regarding Use of Contract Funds for Lobbying |
| XII. | Use of United States-Flag |

Vessels: 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, United States Code, as required in 23 CFR 633.102(b) (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). 23 CFR 633.102(e).

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. 23 CFR 633.102(e).

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) in accordance with 23 CFR 633.102. 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 solicitation-for-bids or request-for-proposals 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). 23 CFR 633.102(b).

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. 23 CFR 633.102(d).

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. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A 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 Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), 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 Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), 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 Part 230, Subpart A, 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 (see 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 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 Part 35 and 29 CFR Part 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. 23 CFR 230.409 (g)(4) & (5).

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, sexual orientation, gender identity, 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 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 or other knowledgeable company official.

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. 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.

d. 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, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure 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. 23 CFR 230.409. 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, sexual orientation, gender identity, 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, sexual orientation, gender identity, 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 thereunder. 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, sexual orientation, gender identity, 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, 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. Assurances Required:

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. 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 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 recipient deems appropriate, which may include, but is not limited to:

- (1) Withholding monthly progress payments;
- (2) Assessing sanctions;
- (3) Liquidated damages; and/or
- (4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

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 more than \$10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, 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, sexual orientation, gender identity, 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), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

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 (29 CFR 5.5)

a. *Wage rates and fringe benefits.* All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), 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 basic hourly 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. As provided in paragraphs (d) and (e) of 29 CFR 5.5, the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act (40 U.S.C. 3141(2)(B)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph

1.e. 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 must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in paragraph 4. of this section. 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 classifications and wage rates conformed under paragraph 1.c. of this section) and the Davis-Bacon poster (WH-1321) must 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. *Frequently recurring classifications.* (1) In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in 29 CFR part 1, a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to paragraph 1.c. of this section, provided that:

- (i) The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;
- (ii) The classification is used in the area by the construction industry; and
- (iii) The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.

(2) The Administrator will establish wage rates for such classifications in accordance with paragraph 1.c.(1)(iii) of this section. Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

c. *Conformance.* (1) The contracting officer must 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 be classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate 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 used 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) The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

(3) 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 will be sent by the contracting officer by email to DBAconformance@dol.gov. 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.

(4) 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 will, by email to DBAconformance@dol.gov, refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The 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.

(5) The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division under paragraphs 1.c.(3) and (4) of this section. The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 1.c.(3) or (4) of this section must 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.

d. Fringe benefits not expressed as an hourly rate. 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 may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

e. Unfunded plans. 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, in accordance with the criteria set forth in § 5.28, 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.

f. Interest. In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

2. Withholding (29 CFR 5.5)

a. Withholding requirements. The contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor,

withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in this section for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in paragraph 3.d. of this section, the contracting agency may on its own initiative and 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.

b. Priority to withheld funds. The Department has priority to funds withheld or to be withheld in accordance with paragraph 2.a. of this section or Section V, paragraph 3.a., or both, over claims to those funds by:

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its procurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, [31 U.S.C. 3901](https://www.law.cornell.edu/ucc/31)–3907.

3. Records and certified payrolls (29 CFR 5.5)

a. Basic record requirements (1) Length of record retention. All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

(2) Information required. Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; 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 [40 U.S.C. 3141\(2\)\(B\)](https://www.law.cornell.edu/ucc/40) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made;

and actual wages paid.

(3) *Additional records relating to fringe benefits.* Whenever the Secretary of Labor has found under paragraph 1.e. of this section 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 [40 U.S.C. 3141\(2\)\(B\)](#) of the Davis-Bacon Act, the contractor must 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.

(4) *Additional records relating to apprenticeship.* Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

b. *Certified payroll requirements (1) Frequency and method of submission.* The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts- covered work is performed, certified payrolls to the contracting agency. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system.

(2) *Information required.* The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under paragraph 3.a.(2) of this section, except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker (e.g., the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH-347 or in any other format desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division website at <https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/wh347.pdf> or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to the contracting agency.

(3) *Statement of Compliance.* Each certified payroll submitted must be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

(i) That the certified payroll for the payroll period contains the information required to be provided under

paragraph 3.b. of this section, the appropriate information and basic records are being maintained under paragraph 3.a. of this section, and such information and records are correct and complete;

(ii) That each laborer or mechanic (including each helper and apprentice) working 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 [29 CFR part 3](#); and

(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(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.

(4) *Use of Optional Form WH-347.* The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 will satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(3) of this section.

(5) *Signature.* The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

(6) *Falsification.* The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under [18 U.S.C. 1001](#) and [31 U.S.C. 3729](#).

(7) *Length of certified payroll retention.* The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

c. *Contracts, subcontracts, and related documents.* The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

d. *Required disclosures and access (1) Required record disclosures and access to workers.* The contractor or subcontractor must make the records required under paragraphs 3.a. through 3.c. of this section, and any other documents that the contracting agency, the State DOT, the FHWA, or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by § 5.1, available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

(2) *Sanctions for non-compliance with records and worker access requirements.* If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such

workers, 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, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to § 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under [29 CFR part 6](#) any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

(3) *Required information disclosures.* Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address of each covered worker, and must provide them upon request to the contracting agency, the State DOT, the FHWA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

4. Apprentices and equal employment opportunity (29 CFR 5.5)

a. *Apprentices (1) Rate of pay.* Apprentices will be permitted to work at less than the predetermined rate for the work they perform 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 (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) *Fringe benefits.* Apprentices must 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, fringe benefits must be paid in accordance with that determination.

(3) *Apprenticeship ratio.* The allowable ratio of apprentices to journeymen on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to paragraph 4.a.(4) of this section. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph 4.a.(1) of this section, must 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 this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(4) *Reciprocity of ratios and wage rates.* Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

b. *Equal employment opportunity.* The use of apprentices and journeymen under this part must be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and [29 CFR part 30](#).

c. 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. 23 CFR 230.111(e)(2). 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 as provided in 29 CFR 5.5.

6. **Subcontracts.** The contractor or subcontractor must insert FHWA-1273 in any subcontracts, along with the applicable wage determination(s) and such other clauses or contract modifications as the contracting agency may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate. 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 as provided in 29 CFR 5.5.

9. **Disputes concerning labor standards.** As provided in 29 CFR 5.5, 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 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 [40 U.S.C. 3144\(b\)](#) or § 5.12(a).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of [40 U.S.C. 3144\(b\)](#) or § 5.12(a).

c. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, [18 U.S.C. 1001](#).

11. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#);

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#);

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#); or

d. Informing any other person about their rights under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#).

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), 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 watchpersons 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. 29 CFR 5.5.

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 and interest from the date of the underpayment. 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 watchpersons and guards, employed in violation of the clause set forth in paragraph 1. of this section, in the sum currently provided in 29 CFR 5.5(b)(2)* 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.

* \$31 as of January 15, 2023 (See 88 FR 88 FR 2210) as may be adjusted annually by the Department of Labor, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990.

3. Withholding for unpaid wages and liquidated damages

a. *Withholding process.* The FHWA or the contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this section on this contract, 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 that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with Section IV paragraph 2.a. or paragraph 3.a. of this section, or both, over claims to those funds by:

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its procurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, [31 U.S.C. 3901](#)–3907.

4. Subcontracts. The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs 1. through 5. of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1. through 5. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower- tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

5. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or

d. Informing any other person about their rights under CWHSSA or this part.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

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" in paragraph 1 of Section VI 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: (based on longstanding interpretation)

(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. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), 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. Pursuant to 23 CFR 635.116(c), 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. (based on long- standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

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 Part 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. 23 CFR 635.108.

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 Part 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). 29 CFR 1926.10.

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 Part 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 11, 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 (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of \$150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.327.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.327.

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. 2 CFR 180.220 and 1200.220.

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. 2 CFR 180.320.

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. 2 CFR 180.325.

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. 2 CFR 180.345 and 180.350.

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, Subpart I, 180.900-180.1020, and 1200. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient 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 recipient or subrecipient 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. 2 CFR 180.330.

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. 2 CFR 180.220 and 180.300.

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. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. 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 System for Award Management website (<https://www.sam.gov/>). 2 CFR 180.300, 180.320, and 180.325.

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 CFR 180.325.

* * * * *

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 CFR 180.335;.
- (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, 2 CFR 180.800;

- (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, 2 CFR 180.700 and 180.800; 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. 2 CFR 180.335(d).

- (5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

- (6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

* * * * *

3. 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). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant 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. 2 CFR 180.365.

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, Subpart I, 180.900 – 180.1020, 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 recipient or subrecipient 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 recipient or subrecipient 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. 2 CFR 1200.220 and 1200.332.

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. 2 CFR 180.220 and 1200.220.

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 System for Award Management website (<https://www.sam.gov>), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

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. 2 CFR 180.325.

* * * * *

4. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

a. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(1) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(2) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(3) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing appropriations act requirements)

b. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

* * * * *

EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

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 Part 20, App. A.

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.

XII. USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.

2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS (23 CFR 633, Subpart B, Appendix B) 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.

EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

- 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.

**STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION
CONTRACT SPECIFICATIONS**

**NOTICE OF REQUIREMENT FOR AFFIRMATIVE
ACTION TO ENSURE EQUAL EMPLOYMENT
OPPORTUNITY (EXECUTIVE ORDER 11246)**

1. The Offeror's or Bidders attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal

Employment Opportunity Construction Contract Specifications" set forth herein.

2. The goals and timetables for minority and female participation expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area are as follows:

EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

Goals for Women Apply Nationwide

GOALS AND TIMETABLES <i>Timetable</i>	<i>Goals (percent)</i>
From Apr. 1, 1976 until March 31, 1979-----	3.1
-	
From Apr. 1, 1979 until March 31, 1980-----	5.1
-	
From Apr. 1, 1980 until March 31, 1981-----	6.9
-	

Goals for Minority Participation

South Carolina	
SMSA Counties:.....	16.0
Greenville, Pickens, Spartanburg	
Non-SMSA Counties:.....	17.8
Abbeville, Anderson, Cherokee, Greenwood, Laurens, Oconee, Union	
SMSA Counties:.....	23.4
Lexington, Richland	
Non-SMSA Counties.....	32.0
Calhoun, Clarendon, Fairfield, Kershaw, Lee, Newberry, Orangeburg, Saluda, Sumter	
Non-SMSA Counties.....	33.0
Chesterfield, Darlington, Dillon, Florence, Georgetown, Horry, Marion, Marlboro, Williamsburg	
SMSA Counties:.....	30.0
Berkeley, Charleston, Dorchester	
Non-SMSA Counties.....	30.7
Colleton	
Non-SMSA Counties.....	29.8
Beaufort, Hampton, Jasper	
Non-SMSA Counties.....	15.7
Chester Lancaster York	
Non-SMSA Counties.....	32.8
Barnwell, Edgefield, McCormick, Allendale, Bamberg	
SMSA Counties:.....	27.2
Aiken	

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical areas where the work is actually performed. With regard to this second area, the Contractor is also subject to the goals for both its federally involved and nonfederally involved construction.

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 41 CFR 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 of 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.

- The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs 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. 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.

- As used in this Notice and in the contract resulting from this solicitation, the "covered area" is (insert description of the geographical areas where the contract is to be performed giving the state, county, and city, if any). The "covered area is the SMSA County or Counties or Non-SMSA County or Counties in which the contract work is performed.

**STANDARD FEDERAL EQUAL EMPLOYMENT
OPPORTUNITY CONSTRUCTION CONTRACT
SPECIFICATIONS
(EXECUTIVE ORDER 11246)**

- As used in these specifications:
 - "Covered area" means the geographical area described in the solicitation from which this contract resulted;
 - "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
 - "Employer identification number" means the Federal Social Security number used on the Employers Quarterly Federal Tax Return, U. S. Treasury Department Form 941.
 - "Minority" includes:
 - Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin regardless of race);
 - Asian or 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
 - American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
- 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.
- 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 and timetables) 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.
- The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total

EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in which it has employees in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notices form and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. 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 specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
6. In order for the non-working training hours of apprentices and 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 of 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 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 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 taken.
 - d. Provide immediate written notification to the Director when 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 his 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 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 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 initialization 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, screening 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 work force.
- 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 appropriate training, etc., such opportunities.
- m. Ensure that all 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 non-segregated 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.

EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

- p. Conduct a review, at least annually of all supervisors' 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 work force 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 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 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 race, color, religion, sex, or national origin.
 11. The Contractor shall not enter into any Subcontract with any person or firm debarred from the Government contracts pursuant to the executive Order 11246.
 12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and the Equal Opportunity Clause, including suspensions, termination and cancellation of the existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended. and its implementing regulations, by the Office of the Federal Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of the 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 location at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that the 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).

EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

GENERAL DECISION NUMBER SC42

"General Decision Number: SC20230040 01/06/2023

Superseded General Decision Number: SC20220040

State: South Carolina

Construction Type: Highway

Counties: Allendale, Bamberg, Barnwell, Beaufort, Colleton, Georgetown, Hampton, Jasper, Newberry, Orangeburg and Williamsburg Counties in South Carolina.

DOES NOT INCLUDE SAVANNAH RIVER SITE IN ALLENDALE AND BARNWELL COUNTIES

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract.
	. The contractor must pay all covered workers at least \$16.20 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 2023.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract.
	. The contractor must pay all covered workers at least \$12.15 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all

EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

	hours spent performing on	
	that contract in 2023.	

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number	Publication Date
0	01/06/2023

SUSC2011-038 09/15/2011

	Rates	Fringes
CARPENTER (Form Work Only).....	\$ 14.47	**
CEMENT MASON/CONCRETE FINISHER....	\$ 14.11	**
IRONWORKER, REINFORCING.....	\$ 15.64	**
LABORER		
Asphalt, Includes Asphalt Distributor, Raker, Shoverler, and Spreader.....		
	\$ 10.96	**
Colleton.....	\$ 10.16	**
Common or General		
Beaufort.....	\$ 10.15	**
Colleton.....	\$ 10.16	**
Georgetown, Hampton, Jasper.....	\$ 10.07	**
Newberry, Allendale, Bamberg, Barnwell.....	\$ 11.82	**
Orangeburg.....	\$ 12.63	**
Williamsburg.....	\$ 10.01	**
Luteman.....	\$ 11.71	**
Pipelayer.....	\$ 13.87	**
Traffic Control-Cone Setter		
Allendale, Bamber, Barnwell, Newberry, Orangeburg.....	\$ 12.98	**
Beaufort, Colleton, Georgetown, Hampton, Jasper, Williamsburg.....	\$ 12.84	**
Traffic Control-Flagger.....	\$ 11.68	**
POWER EQUIPMENT OPERATOR:		
Backhoe/Excavator/Trackhoe		
Allendale, Bamberg,		

EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

Barnwell, Newberry, Orangeburg.....	\$ 17.56	
Beaufort.....	\$ 15.20	**
Colleton.....	\$ 17.78	
Georgetown, Hampton, Jasper, Williamsburg.....	\$ 17.23	
Bulldozer.....	\$ 20.12	
Crane.....	\$ 16.62	
Grader/Blade.....	\$ 16.62	
Loader (Front End).....	\$ 15.51	**
Mechanic.....	\$ 18.22	
Milling Machine.....	\$ 18.83	
Paver		
Allendale, Bamberg, Barnwell, Newberry, Orangeburg, Williamsburg...	\$ 15.01	**
Beaufort.....	\$ 14.96	**
Colleton, Georgetown, Hampton, Jasper.....	\$ 13.67	**
Roller.....	\$ 12.76	**
Screed.....	\$ 13.01	**
Tractor.....	\$ 13.26	**

TRUCK DRIVER

Dump Truck.....	\$ 12.00	**
Lowboy Truck.....	\$ 14.43	**
Single Axle, Includes		
Pilot Car.....	\$ 12.04	**
Tractor Haul Truck.....	\$ 16.25	

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$16.20) or 13658 (\$12.15). Please see the Note at the top of the wage determination for more information.

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

EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

is available at
<https://www.dol.gov/agencies/whd/government-contracts>.

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.

EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

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 National Office because National Office has 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:

EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

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"

"General Decision Number: SC20230034 01/06/2023

Superseded General Decision Number: SC20220034

State: South Carolina

Construction Type: Highway

Counties: Berkeley, Charleston, Dorchester and Horry Counties in South Carolina.

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

|If the contract is entered |. Executive Order 14026 |
|into on or after January 30, | generally applies to the |

EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

Distributor, Raker, Shoveler, and Spreader Berkeley, Charleston, Dorchester.....	\$ 11.62	**
Asphalt, Includes Asphalt Distributor, Shoveler and Spreader Horry.....	\$ 11.54	**
Common or General Berkeley.....	\$ 10.06	**
Charleston.....	\$ 10.16	**
Dorchester.....	\$ 11.69	**
Horry.....	\$ 9.72	**
Luteman.....	\$ 11.61	**
Mason Tender- Cement/Concrete.....	\$ 10.40	**
Pipelayer.....	\$ 13.98	**
Traffic Control-Cone Setter Berkeley, Charleston, Dorechester.....	\$ 13.19	**
Horry.....	\$ 12.63	**
Traffic Control-Flagger.....	\$ 11.07	**

POWER EQUIPMENT OPERATOR:

Backhoe/Excavator/Trackhoe Berkeley.....	\$ 15.68	**	
Charleston.....	\$ 16.09	**	
Dorchester.....	\$ 16.06	**	
Horry.....	\$ 15.04	**	
Bulldozer.....	\$ 14.81	**	
Crane Berkeley, Dorchester.....	\$ 20.00		4.73
Charleston.....	\$ 20.08		
Horry.....	\$ 20.58		
Grader/Blade.....	\$ 14.61	**	
Hydroseeder.....	\$ 11.00	**	
Loader (Front End/Track)....	\$ 16.80		
Mechanic Berkeley, Dorchester.....	\$ 19.07		
Charleston.....	\$ 19.21		
Horry.....	\$ 19.48		
Milling Machine.....	\$ 11.84	**	
Paver Berkeley, Charleston, Dorchester.....	\$ 18.85		
Horry.....	\$ 13.29	**	
Roller.....	\$ 15.17	**	
Scraper.....	\$ 12.71	**	
Screed.....	\$ 13.56	**	
Tractor.....	\$ 13.28	**	

TRUCK DRIVER

Dump Truck.....	\$ 10.67	**
Lowboy Truck.....	\$ 15.55	**

WELDERS - Receive rate prescribed for craft performing

EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

operation to which welding is incidental.

=====
** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$16.20) or 13658 (\$12.15). Please see the Note at the top of the wage determination for more information.

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 <https://www.dol.gov/agencies/whd/government-contracts>.

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EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

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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
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EXHIBIT 5 – SPECIAL PROVISIONS AND CONTRACT REQUIREMENTS

- * 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 National Office because National Office has 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.

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Branch of Construction Wage Determinations
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U.S. Department of Labor
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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"

EXHIBIT 6

ENVIRONMENTAL DESIGN CRITERIA

1. GENERAL

The CONTRACTOR shall avoid impacts to the environment to the most practicable extent. In cases where impacts cannot be avoided, the CONTRACTOR shall minimize impacts to the environment to the most practicable extent.

As a minimum, the CONTRACTOR shall include the following in the Project:

- The CONTRACTOR is responsible for the preparation, revision, acquisition, and adherence to conditions of any permits or modifications as required by federal, state, local laws or regulations.
- The CONTRACTOR is responsible for any modifications or revisions to the approved environmental document(s).
- The CONTRACTOR shall provide an Environmental Compliance Plan for the Project. The plan shall be submitted to SCDOT for approval prior to any construction activity. The plan shall identify specific measures that the CONTRACTOR will implement to assure compliance with all environmental documents, permits, and other environmental commitments. The plan shall also designate specific personnel charged with carrying out monitoring and compliance activities included in the Environmental Compliance Plan. A template is provided in Attachment B under Environmental.
- The CONTRACTOR shall stake out and delineate potential jurisdictional areas using temporary barrier fence as set forth in Supplemental Specification.
- The CONTRACTOR shall install a double row of silt fence along construction limits adjacent to actual or potential jurisdictional features not authorized for impacts.
- Fines assessed by any agencies to SCDOT as the result of the CONTRACTOR's non-compliance or violation of any permit provisions shall be paid by SCDOT and subsequently deducted from the CONTRACTOR's monthly pay estimate.
- The CONTRACTOR shall coordinate all permitting related tasks through SCDOT's Environmental Services Office (ESO).
- CONTRACTOR shall provide a summary report documenting how all commitments that fall within its responsibility have been satisfied.

2. ENVIRONMENTAL DOCUMENT COMMITMENTS

The CONTRACTOR shall comply with all Environmental Commitments set forth in the relevant project Non-Programmatic Categorical Exclusions (NPCE). The following list of Environmental Commitments and instructions outline requirements and responsibilities for SCDOT and the CONTRACTOR regarding fulfilling the Environmental Commitments for the Project.

2.1 Environmental Commitments

- a. The CONTRACTOR and subcontractors must notify their workers to watch for the presence of any prehistoric or historic remains, including but not limited to arrowheads, pottery, ceramics, flakes, bones, graves, gravestones, or brick concentrations. If any such remains are encountered, the Resident Construction Engineer (RCE) would be immediately notified and all work in the vicinity of the

discovered materials and site work shall cease until the SCDOT Chief Archaeologist directs otherwise.

The CONTRACTOR shall comply with this commitment.

- b. The CONTRACTOR(s) will be required to minimize possible water quality impacts through implementation of BMPs, reflecting policies contained in 23 CFR 650B and the Department’s Supplemental Specification on Erosion Control Measures (latest edition) and Supplemental Technical Specifications on Seeding (latest edition). Other measures including seeding, silt fences, sediment basins, etc. as appropriate will be implemented during construction to minimize impacts to water quality.

The CONTRACTOR shall comply with this commitment

- c. The federal Migratory Bird Treaty Act, 16 USC § 703-711, states that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. The South Carolina Department of Transportation (SCDOT) will comply with the Migratory Bird Treaty Act of 1918 in regard to the avoidance of taking of individual migratory birds and the destruction of their active nests.

The contractor shall notify the Resident Construction Engineer (RCE) at least four (4) weeks prior to construction/demolition/maintenance of bridges and box culverts. The RCE will coordinate with SCDOT Environmental Services Office (ESO), Compliance Division, to determine if there are any active birds using the structure. After this coordination, it will be determined when construction/demolition/maintenance can begin. If a nest is observed that was not discovered after construction/demolition/maintenance has begun, the contractor will cease work and immediately notify the RCE, who will notify the ESO Compliance Division. The ESO Compliance Division will determine the next course of action.

The use of any deterrents by the contractor designed to prevent birds from nesting, shall be approved by the RCE with coordination from the ESO Compliance Division. The cost for any contractor provided deterrents will be provided at no additional cost to SCDOT.

The CONTRACTOR, in coordination with SCDOT, shall comply with this commitment. The CONTRACTOR is advised that this commitment applies to existing, temporary, and new structures including but not limited to bridges, box culverts, and large diameter pipes.

- d. The existing structures shall be removed and disposed of by the Contractor in accordance with Subsection 202.4.2 of the Standard Specifications. The Contractor's attention is called to the fact that this project may require removal and disposal of structural components containing lead-based paints. Removal and disposal of structural components containing lead-based paints shall comply with all applicable

Federal, State, and Local requirements for lead as waste, lead in air, lead in water, lead in soil, and worker health and safety.

The CONTRACTOR shall comply with this commitment

- e. If avoidance of hazardous materials is not a viable alternative and soils that appear to be contaminated are encountered during construction, the South Carolina Department of Health and Environmental Control (SCDHEC) will be informed. Hazardous materials will be tested and removed and/or treated in accordance with the United States Environmental Protection Agency and the SCDHEC requirements, if necessary.

The CONTRACTOR shall comply with this commitment.

- f. Impacts to jurisdictional waters will be permitted under a Department of the Army Section 404 permit from the U.S. Army Corps of Engineers. Based on preliminary design, it is anticipated that the proposed project would be permitted under an Individual Army Corps of Engineers Permit (IP). The required mitigation for this project will be determined through consultation with the USACE and other resource agencies.

The CONTRACTOR shall comply with this commitment. USACE approved commercial mitigation banks do cover the project area..

The SCDOT will provide mitigation credits to cover impacts up to the amounts identified in the NPCE for each alternative. If impacts resulting from the CONTRACTOR's final design exceed those in the NPCE, the CONTRACTOR shall be responsible for securing the additional mitigation to offset the impacts per current 404 guidance. While the NPCE impact estimates exceed SCDOT General Permit (GP) thresholds, coordination efforts between the USACE and SCDOT resulted in the USACE agreeing that the GP would be an appropriate permit if impacts were reduced to meet the GP thresholds as identified in the SCDOT Regional GP 3.

- g. Based on the April 5, 2023 IPaC submission, the project may affect, but is not likely to adversely affect NLEB. If impacts may occur after 4-1-24 additional coordination with USFWS will be required. Consultation is complete and no further action is necessary unless either of the following occurs: 1.) new information reveals effects of the action that may affect NLEB in a manner or to an extent not previously considered; or, 2.) the identified action is subsequently modified in a manner that causes an effect to NLEB that was not considered when completing the determination key.

The CONTRACTOR shall comply with this commitment. SCDOT will conduct surveys as needed and provide information to the CONTRACTOR as necessary to complete the project.

- h. To minimize potential impacts to the Northern Long Eared Bat (NLEB) and Tricolored bat (TCB) (proposed endangered species), tree clearing will be prohibited

from December 1 through February 28 for the hibernation season and from May 1 through July 31 for the pup season. All tree clearing/removal must be completed outside this time frame.

The CONTRACTOR shall comply with this commitment.

- i. Prior to culvert construction activities, exclusionary devices (such as netting, hardware cloth, or one-way doors) will be installed at the inlet and outlet of all culverts where protected bats have been documented to be present. Exclusionary devices would be installed outside of the pup season (May 1 - July 31). The CONTRACTOR will consult with SCDOT environmental staff prior to selection and installation of the devices.

The CONTRACTOR shall comply with this commitment. The CONTRACTOR will coordinate with SCDOT and SCDOT will consult as necessary with the relevant agencies to properly install the appropriate devices.



South Carolina
Department of Transportation

November 30, 2023

Mr. Jeremy Haines
Archer Western Construction, LLC
11000 Regency Parkway, #100
Cary, North Carolina 27518

NOTIFICATION OF AWARD

Contract No.: 8868470
Project No.: P038677
Work Type: I-26 at I-95 Interchange Improvement Design-Build Project
Dorchester and Orangeburg Counties

Dear Contractor:

This letter serves as the official notification of award for the above referenced project based upon the cost proposal submitted on October 31, 2023 in the amount of **\$202,967,000.00** in response to the South Carolina Department of Transportation's (SCDOT) proposal request.

Subcontractor Request forms can be found on the SCDOT Extranet website under the Miscellaneous Construction tab. If required, please submit Sub1, Sub2 and Subreq3 to the Construction Alternative Delivery Engineer.

Also, SCDOT will need the following items in order to fully execute the Design-Build Contract:

- Schedule of Values – Agreement III.C.1
- Insurance Requirements – Agreement VI. A
- Bonding Requirements – Agreement VI. B

Ensure all of the required items are returned to my office within **Twenty (20) days** from the date of this letter.

Please contact Sarah Gaffney with the District Six Special Projects Office at Phone # (843) 740-1665 in order to schedule the preconstruction conference as set forth in Section 108.2 of the 2007 Standard Specifications for Highway Construction.

Sincerely,

John M. Burns Jr., P.E., DBIA
Alternative Delivery Construction Manager



ec:

Bradley Reynolds, Alternative Delivery Program Manager
Carmen Wright, CPO for Project Delivery
Wei Johnson, Construction Metrics Engineer
Maria Devito, Contract Coordinator
Jennifer Taylor, Contract Administrator
Gary Linn, Director DBE Mega Projects Support, Compliance & Technical Assistance
Timothy Henderson, District 6 Engineering Administrator
Sarah Gaffney, District 6 Special Projects Engineer

JMB:jmb
File: AD/8868470

Post Office Box 191
955 Park Street
Columbia, SC 29202-0191



www.scdot.org
An Equal Opportunity
Affirmative Action Employer
855-GO-SCDOT (855-467-2368)





South Carolina Department of Transportation Form No. 672A	Rev. 03-01-2016 PERFORMANCE AND INDEMNITY BOND	Date Bond Executed: November 30, 2023
Principal: Archer Western Construction, LLC		Bond Number: 107920686
Surety: Travelers Casualty and Surety Company of America		
Penal Sum of Bond Two Hundred Two Million, Nine Hundred Sixty-Seven Thousand Dollars and 00/100 (\$202,967,000.00)		Date of Contract: JAN 19 2024
Project S. C. File No(s): P038677 (I-26 at I-95 Interchange Improvement Design-Buid Project)		Contract Number: 8868470



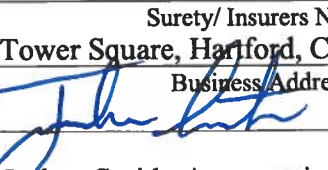
KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL AND SURETY above named are held and firmly bound unto the South Carolina Department of Transportation, hereinafter called the Department, in the penal sum of the amount stated above which shall be equal to the full amount (100%) of the contract, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the Department, numbered and dated as shown above and hereto attached:

NOW, THEREFORE, if the principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the Department, with or without notice to the surety, and during the life of any guaranty required under the contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Attest  Matthew M. Walsh, IV Corporate Secretary	FOR CORPORATE PRINCIPAL Archer Western Construction, LLC Corporation Name	
In Presence of:	11000 Regency Parkway, #100, Cary, NC 27518 Business Address	
1.  Ron Phillips, Witness	By: 	Corporate Seal
2.  Mia Espinosa, Witness	Title: Daniel P. Walsh, President	

In Presence of:	SURETY/INSURER Travelers Casualty and Surety Company of America	
Witness (2 required)	Surety/ Insurers Name	
1.  Ron Phillips, Witness	One Tower Square, Hartford, CT 06183 Business Address	
2.  Mia Espinosa, Witness	By: 	Corporate Seal
	Title: Joshua Smith, Attorney-in-Fact	



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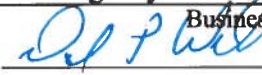
South Carolina Department of Transportation Form No. 673	Rev. 03-01-2016 PAYMENT BOND	Date Bond Executed: November 30, 2023
Principal: Archer Western Construction, LLC		Bond Number: 107920686
Surety: Travelers Casualty and Surety Company of America		
Penal Sum of Bond: Two Hundred Two Million, Nine Hundred Sixty-Seven Thousand Dollars and 00/100 (\$202,967,000.00)		Date of Contract: JAN 19 2024
Project S. C. File No(s): P038677 (I-26 at I-95 Interchange Improvement Design-Buid Project)		Contract Number: 8868470




KNOW ALL MEN BY THESE PRESENTS, That we, the PRINCIPAL AND SURETY above named are held and firmly bound unto the South Carolina Department of Transportation, hereinafter called the Department, in the penal sum of the amount stated above which shall be equal to the full amount (100%) of the contract, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the Department, numbered and dated as shown above and hereto attached:

NOW, THEREFORE, if the principal shall promptly make payment to all persons supplying labor and material, such being construed to include, but not limit to, that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment directly applicable to the contract, in the prosecution of the work provided for in said contract, and any and all duly authorized modifications of said contract that may hereafter be made, notice by which modifications to the surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Attest  Matthew M. Walsh, IV Corporate Secretary	FOR CORPORATE PRINCIPAL Archer Western Construction, LLC Corporation Name 11000 Regency Parkway, #100, Cary, NC 27518 Business Address
In Presence of: Witness (2 required) 1.  Ron Phillips, Witness 2.  Mia Espinosa, Witness	By:  Title: Daniel P. Walsh, President
	Corporate Seal

In Presence of: Witness (2 required) 1.  Ron Phillips, Witness 2.  Mia Espinosa, Witness	SURETY/INSURER Travelers Casualty and Surety Company of America Surety/ Insurers Name One Tower Square, Hartford, CT 06183 Business Address
	By:  Title: Joshua Smith, Attorney-in-Fact
	Corporate Seal



**Travelers Casualty and Surety Company of America
Travelers Casualty and Surety Company
St. Paul Fire and Marine Insurance Company**

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **Joshua Smith** of **CHICAGO**, **Illinois**, their true and lawful Attorney(s)-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this **21st** day of **April**, **2021**.



State of Connecticut

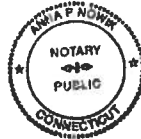
City of Hartford ss.

By: 
Robert L. Raney, Senior Vice President

On this the **21st** day of **April**, **2021**, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of each of the Companies, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of said Companies by himself as a duly authorized officer.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My Commission expires the **30th** day of **June**, **2026**




Anna P. Nowik, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of each of the Companies, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of each of the Companies, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this **30th** day of **November**, **2023**




Kevin E. Hughes, Assistant Secretary

**To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.
Please refer to the above-named Attorney(s)-in-Fact and the details of the bond to which this Power of Attorney is attached.**



CERTIFICATE OF LIABILITY INSURANCE

DATE(MM/DD/YYYY)
12/19/2023

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Aon Risk Services Central, Inc. Chicago IL Office 200 East Randolph Chicago IL 60601 USA	CONTACT NAME: PHONE (A/C. No. Ext): (866) 283-7122 FAX (A/C. No.): (800) 363-0105		
	E-MAIL ADDRESS:		
INSURED Archer Western Construction, LLC 929 West Adams Chicago IL 60607 USA	INSURER(S) AFFORDING COVERAGE		NAIC #
	INSURER A: Arch Insurance Company		11150
	INSURER B: Arch Indemnity Insurance Company		30830
	INSURER C: North American Capacity Ins Co		25038
	INSURER D: National Fire & Marine Ins Co		20079
	INSURER E:		
INSURER F:			

COVERAGES **CERTIFICATE NUMBER: 570103106332** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS. **Limits shown are as requested**

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input checked="" type="checkbox"/> LOC <input type="checkbox"/> OTHER:			41PKG8901917 SIR applies per policy terms & conditions	06/01/2023	06/01/2024	EACH OCCURRENCE	\$2,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	\$1,000,000
							MED EXP (Any one person)	\$25,000
							PERSONAL & ADV INJURY	\$2,000,000
							GENERAL AGGREGATE	\$4,000,000
							PRODUCTS - COMP/OP AGG	\$4,000,000
A	AUTOMOBILE LIABILITY			41PKG8901917 AOS	06/01/2023	06/01/2024	COMBINED SINGLE LIMIT (Ea accident)	\$5,000,000
A	<input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> NON-OWNED AUTOS ONLY			41CAB8902017 MA	06/01/2023	06/01/2024	BODILY INJURY (Per person)	
							BODILY INJURY (Per accident)	
							PROPERTY DAMAGE (Per accident)	
A	<input type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input type="checkbox"/> RETENTION			41UFP1992100	06/01/2023	06/01/2024	EACH OCCURRENCE	\$5,000,000
							AGGREGATE	\$5,000,000
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below			44WCI8937510	06/01/2023	06/01/2024	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTHER E.L. EACH ACCIDENT	\$1,000,000
							E.L. DISEASE-EA EMPLOYEE	\$1,000,000
							E.L. DISEASE-POLICY LIMIT	\$1,000,000
C	Environmental Contractors and Prof			CNP100002805 Claims Made Coverage SIR applies per policy terms & conditions	06/01/2023	06/01/2024	Per Claim/Aggr	\$10,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
 This void and replaces previously issued certificate 570103094082 dated 12/18/2023.
 Re: SC File #8868470. SCDOT I-26 at I-95 Interchange Improvement, Dorchester and Orangeburg Counties, Design-Build. Archer Western Construction, LLC Project #223183. See attached.

CERTIFICATE HOLDER SCDOT Director of Construction Room 330 P.O. Box 191 Columbia SC 29202 USA	CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE

Holder Identifier : ABGNO@

Certificate No : 570103106332



ADDITIONAL REMARKS SCHEDULE

AGENCY Aon Risk Services Central, Inc.		NAMED INSURED Archer Western Construction, LLC	
POLICY NUMBER See Certificate Number: 570103106332			
CARRIER See Certificate Number: 570103106332	NAIC CODE	EFFECTIVE DATE	

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,

FORM NUMBER: ACORD 25 **FORM TITLE:** Certificate of Liability Insurance

Excess Liability Carriers

2nd LAYER EXCESS POLICY
 Policy No. 47XSF30256808
 Carrier: Berkshire Hathaway Specialty Ins Company
 Policy Term: 06/01/2023 to 06/01/2024
 Limit: \$5,000,000 Each Occurrence / \$5,000,000 Aggregate excess of primary \$5,000,000

3rd LAYER EXCESS POLICY
 Policy No. EXS200084705
 Carrier: Swiss Re Corp Solutions America Ins Corp
 Policy Term: 06/01/2023 to 06/01/2024
 Limit: \$10,000,000 Each Occurrence / \$10,000,000 Aggregate excess of \$10,000,000

4th LAYER EXCESS POLICIES
 Policy No. 1000588415231
 Carrier: Starr Indemnity & Liability Company (50% participation)
 Policy No. 03113457
 Carrier: Allied World National Assurance Company (50% Participation)
 Policy Term: 06/01/2023 to 06/01/2024
 Limit: \$5,000,000 Each Occurrence / \$5,000,000 Aggregate excess of \$20,000,000



ADDITIONAL REMARKS SCHEDULE

AGENCY Aon Risk Services Central, Inc.		NAMED INSURED Archer Western Construction, LLC	
POLICY NUMBER See Certificate Number: 570103106332			
CARRIER See Certificate Number: 570103106332	NAIC CODE	EFFECTIVE DATE:	

ADDITIONAL REMARKS

**THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,
FORM NUMBER: ACORD 25 FORM TITLE: Certificate of Liability Insurance**

Continuation

SCDOT and their respective agents, officers, directors and employees are an Additional Insureds pertaining to General Liability and Automobile Liability with respects to liability arising out of the Named Insured's operations on the referenced project. Professional services for Architects, Engineers, Consultants, etc. are excluded.

This insurance will be Primary and Non-Contributory to the General Liability policy with respect to any other available insurance to the Additional Insureds for the negligence of the insured on the referenced project.

A waiver of Subrogation in favor of SCDOT is included on the General Liability, Automobile Liability, Excess Liability, Pollution Liability and Workers Compensation policies.

The General Liability policy includes the perils of (XCU) Explosion, Collapse and Underground.

General Liability: \$1,000,000 SIR
 Automobile Liability: \$1,000,000 Deductible (\$7,500 comp/coll)
 Umbrella Liability: \$0
 Workers Compensation: \$1,000,000 Deductible
 Pollution Liability: \$1,000,000 SIR
 Professional Liability: \$3,000,000 SIR

North American Capacity Insurance Company

Endorsement No. 9

NOTICE OF CANCELLATION TO OTHERS

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

In consideration of the premium charged, the **Insured** and the Insurer agree, subject to all terms, exclusions and conditions of the policy that:

- A. If the Insurer cancels this policy by written notice to the first **Named Insured**, for any reason other than non-payment of premium, we will mail or deliver a copy of such written notice of cancellation:
 1. To the name and address corresponding to each person or organization shown in the schedule provided to us by the first **Named Insured**. Such schedule:
 - a. Must be initially provided to us within 15 days:
 1. After the beginning of the policy period shown in the Declarations; or
 2. After this endorsement has been added to the policy;
 - b. Must contain the names and addresses of only the persons or organizations requiring notification that this Policy has been cancelled;
 - c. Must be in electronic format that is acceptable to us;
 - d. Must be accurate.Such schedule must be updated and provided to the Insurer, by the first **Named Insured**, during the policy period. Such update schedule must comply with paragraphs b., c. and d. above.
 2. At least thirty (30) days prior to the effective date of the cancellation, as advised in our notice to the first **Named Insured**, or the longer number of days notice if indicated in the schedule provided to us.
- B. If we cancel this Policy by written notice to the first **Named Insured** for non-payment of premium, we will mail or deliver a copy of such notice of cancellation to the name and address corresponding to each person or organization shown in the schedule provided to us by the first **Named Insured** at least 10 days prior to the effective date of such cancellation. Such schedule shall meet the requirements outlined in item A.1.
- C. Our notification, as described in Paragraph A. or B. of this endorsement, will be passed on the most recent schedule provided to us by the first **Named Insured** as of the date of the notice of cancellation is mailed.
- D. Proof of mailing will be sufficient proof that we have complied with Paragraph A. or B. of this endorsement.
- E. We are not responsible for the accuracy, integrity, timeliness and validity of information contained in the schedule provided to us described in Paragraph A. of this endorsement.

All other terms and conditions of this policy shall remain unchanged.

This endorsement forms a part of the policy to which attached, effective on the inception date of the policy unless otherwise stated herein.

(The information below is required only when this endorsement is issued subsequent to the preparation of the policy.)

Policy Number:

Endorsement Effective Date:

Named Insured:

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**ADDITIONAL INSURED – OWNERS, LESSEES OR
CONTRACTORS – SCHEDULED PERSON OR
ORGANIZATION**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s):	Location(s) Of Covered Operations
<p>Any person or organization, you have agreed by means of a written contract or agreement, to add as an additional insured; such person or organization is an additional insured on this policy.</p> <p>When required by a written contract or agreement, coverage afforded to these additional insured parties will be primary to and non-contributory with any other insurance available to that person or organization.</p>	
<p>Information required to complete this Schedule, if not shown above, will be shown in the Declarations.</p>	

A. Section II – Who Is An Insured is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by:

1. Your acts or omissions; or
2. The acts or omissions of those acting on your behalf;

in the performance of your ongoing operations for the additional insured(s) at the location(s) designated above.

B. With respect to the insurance afforded to these additional insureds, the following additional exclusions apply:

This insurance does not apply to "bodily injury" or "property damage" occurring after:

1. All work, including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on behalf of the additional insured(s) at the location of the covered operations has been completed; or
2. That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS – COMPLETED OPERATIONS

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s):	Location And Description Of Completed Operations
<p>ANY PERSON OR ORGANIZATION, YOU HAVE AGREED BY MEANS OF A WRITTEN CONTRACT OR AGREEMENT, TO ADD AS AN ADDITIONAL INSURED; SUCH PERSON OR ORGANIZATION IS AN ADDITIONAL INSURED ON THIS POLICY.</p> <p>WHEN REQUIRED BY A WRITTEN CONTRACT OR AGREEMENT, COVERAGE AFFORDED TO THESE ADDITIONAL INSURED PARTIES WILL BE PRIMARY TO AND NON-CONTRIBUTORY WITH ANY OTHER INSURANCE AVAILABLE TO THAT PERSON OR ORGANIZATION.</p>	
<p>Information required to complete this Schedule, if not shown above, will be shown in the Declarations.</p>	

Section II – Who Is An Insured is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury" or "property damage" caused, in whole or in part, by "your work" at the location designated and described in the schedule of this endorsement performed for that additional insured and included in the "products-completed operations hazard".

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

DESIGNATED CONSTRUCTION PROJECT(S) GENERAL AGGREGATE LIMIT

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Designated Construction Project(s):

APPLIES TO ALL CONSTRUCTION PROJECTS OF THE INSURED

Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

- A.** For all sums which the insured becomes legally obligated to pay as damages caused by "occurrences" under Section I – Coverage A, and for all medical expenses caused by accidents under Section I – Coverage C, which can be attributed only to ongoing operations at a single designated construction project shown in the Schedule above:
 - 1. A separate Designated Construction Project General Aggregate Limit applies to each designated construction project, and that limit is equal to the amount of the General Aggregate Limit shown in the Declarations.
 - 2. The Designated Construction Project General Aggregate Limit is the most we will pay for the sum of all damages under Coverage A, except damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard", and for medical expenses under Coverage C regardless of the number of:
 - a. Insureds;
 - b. Claims made or "suits" brought; or
 - c. Persons or organizations making claims or bringing "suits".
 - 3. Any payments made under Coverage A for damages or under Coverage C for medical expenses shall reduce the Designated Construction Project General Aggregate Limit for that designated construction project. Such payments shall not reduce the General Aggregate Limit shown in the Declarations nor shall they reduce any other Designated Construction Project General Aggregate Limit for any other designated construction project shown in the Schedule above.
 - 4. The limits shown in the Declarations for Each Occurrence, Damage To Premises Rented To You and Medical Expense continue to apply. However, instead of being subject to the General Aggregate Limit shown in the Declarations, such limits will be subject to the applicable Designated Construction Project General Aggregate Limit.

- B.** For all sums which the insured becomes legally obligated to pay as damages caused by "occurrences" under Section I – Coverage **A**, and for all medical expenses caused by accidents under Section I – Coverage **C**, which cannot be attributed only to ongoing operations at a single designated construction project shown in the Schedule above:
1. Any payments made under Coverage **A** for damages or under Coverage **C** for medical expenses shall reduce the amount available under the General Aggregate Limit or the Products-completed Operations Aggregate Limit, whichever is applicable; and
 2. Such payments shall not reduce any Designated Construction Project General Aggregate Limit.
- C.** When coverage for liability arising out of the "products-completed operations hazard" is provided, any payments for damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard" will reduce the Products-completed Operations Aggregate Limit, and not reduce the General Aggregate Limit nor the Designated Construction Project General Aggregate Limit.
- D.** If the applicable designated construction project has been abandoned, delayed, or abandoned and then restarted, or if the authorized contracting parties deviate from plans, blueprints, designs, specifications or timetables, the project will still be deemed to be the same construction project.
- E.** The provisions of Section III – Limits Of Insurance not otherwise modified by this endorsement shall continue to apply as stipulated.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**NOTICE OF CANCELLATION – CERTIFICATE HOLDERS
(SPECIFIED DAYS)**

The person(s) or organization(s) listed or described in the Schedule below have requested that they receive written notice of cancellation when this policy is cancelled by us. We will mail or deliver to the Person(s) or Organization(s) listed or described in the Schedule a copy of the written notice of cancellation that we sent to you. If possible, such copies of the notice will be mailed at least **60** days, except for cancellation for non-payment of premium which will be mailed 10 days, prior to the effective date of the cancellation, to the address or addresses of certificate holders as provided by your broker or agent.

Schedule

Person(s) or Organization(s) including mailing address:

All certificate holders where written notice of the cancellation of this policy is required by written contract, permit or agreement with the Named Insured and whose names and addresses will be provided by the broker or agent listed in the Declarations Page of this policy for the purposes of complying with such request.

This notification of cancellation of the policy is intended as a courtesy only. Our failure to provide such notification to the person(s) or organization(s) shown in the Schedule will not extend any policy cancellation date nor impact or negate any cancellation of the policy. This endorsement does not entitle the person(s) or organization(s) listed or described in the Schedule above to any benefit, rights or protection under this policy.

Any provision of this endorsement that is in conflict with a statute or rule is hereby amended to conform to that statute or rule.

All other terms and conditions of this policy remain unchanged.
Endorsement Number:

Policy Number: 41PKG8901917

Named Insured: THE WALSH GROUP, LTD

This endorsement is effective on the inception date of this Policy unless otherwise stated herein:

Endorsement Effective Date: 06-01-23

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**NOTICE OF CANCELLATION – CERTIFICATE HOLDERS
(SPECIFIED DAYS)**

The person(s) or organization(s) listed or described in the Schedule below have requested that they receive written notice of cancellation when this policy is cancelled by us. We will mail or deliver to the Person(s) or Organization(s) listed or described in the Schedule a copy of the written notice of cancellation that we sent to you. If possible, such copies of the notice will be mailed at least **60** days, except for cancellation for non-payment of premium which will be mailed 10 days, prior to the effective date of the cancellation, to the address or addresses of certificate holders as provided by your broker or agent.

Schedule

Person(s) or Organization(s) including mailing address:

All certificate holders where written notice of the cancellation of this policy is required by written contract, permit or agreement with the Named Insured and whose names and addresses will be provided by the broker or agent listed in the Declarations Page of this policy for the purposes of complying with such request.

This notification of cancellation of the policy is intended as a courtesy only. Our failure to provide such notification to the person(s) or organization(s) shown in the Schedule will not extend any policy cancellation date nor impact or negate any cancellation of the policy. This endorsement does not entitle the person(s) or organization(s) listed or described in the Schedule above to any benefit, rights or protection under this policy.

Any provision of this endorsement that is in conflict with a statute or rule is hereby amended to conform to that statute or rule.

All other terms and conditions of this policy remain unchanged.

Endorsement Number:

Policy Number: 44WCI8937510

Named Insured: WALSH CONSTRUCTION GROUP, LLC

This endorsement is effective on the inception date of this Policy unless otherwise stated herein:

Endorsement Effective Date: 06-01-23

