-- STATE OF NORTH CAROLINA--
DEPARTMENT OF TRANSPORTATION
RALEIGH, N.C.

FOURTH INDUSTRY DRAFT REQUEST FOR PROPOSAL

DESIGN-BUILD PROJECT

TIP I-5701 / I-5703

October 8, 2026

VOID FOR BIDDING

DATE AND TIME OF TECHNICAL PROPOSAL SUBMISSION: **February 23, 2027** BY **3:00 PM**

DATE AND TIME OF PRICE PROPOSAL SUBMISSION: **March 4, 2027** BY **3:00 PM**

DATE AND TIME OF PRICE PROPOSAL OPENING: **March 16, 2027** AT **2:00 PM**

CONTRACT ID:	C205177
WBS ELEMENT NO.	50119.3.1; 50120.3.GV1
FEDERAL-AID NO.	NHPP-040-4(156)298; 5012001
COUNTY:	Wake
ROUTE Nos.	I-40, I-440, US 1 / US 64
MILES:	4.9
LOCATION:	The I-5701 / I-5703 Design-Build Project adds lanes on I-40 from the I-440 / US 1 / US 64 interchange to the SR 1009 (Lake Wheeler Road) interchange and reconstructs the existing interchange of I-40 with I-440 / US-1 / US-64
TYPE OF WORK:	DESIGN-BUILD AS SPECIFIED IN THE SCOPE OF WORK CONTAINED IN THE REQUEST FOR PROPOSALS

NOTICE:

ALL PROPOSERS SHALL COMPLY WITH ALL APPLICABLE LAWS REGULATING THE PRACTICE OF GENERAL CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA WHICH REQUIRES THE PROPOSER TO BE LICENSED BY THE N.C. LICENSING BOARD FOR CONTRACTORS WHEN BIDDING ON ANY NON-FEDERAL AID PROJECT WHERE THE BID IS $30,000 OR MORE, EXCEPT FOR CERTAIN SPECIALTY WORK AS DETERMINED BY THE LICENSING BOARD. PROPOSERS SHALL ALSO COMPLY WITH ALL OTHER APPLICABLE LAWS REGULATING THE PRACTICES OF ELECTRICAL, PLUMBING, HEATING AND AIR CONDITIONING AND REFRIGERATION CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA. NOT WITHSTANDING THESE LIMITATIONS ON BIDDING, THE PROPOSER WHO IS AWARDED ANY PROJECT SHALL COMPLY WITH CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA FOR LICENSING REQUIREMENTS WITHIN 60 CALENDAR DAYS OF BID OPENING, REGARDLESS OF FUNDING SOURCES.

_____

5% BID BOND OR BID DEPOSIT REQUIRED

_____

PROPOSAL FORM FOR THE CONSTRUCTION OF CONTRACT NO. C205177

IN Wake COUNTY, NORTH CAROLINA

Date_____ 20_____

DEPARTMENT OF TRANSPORTATION,

RALEIGH, NORTH CAROLINA

The Design-Build Team herein acknowledges that it has carefully examined the location of the proposed work to be known as Contract No. C205177; has carefully examined the Final Request for Proposals (RFP) and all addendums thereto, specifications, special provisions, the form of contract, and the forms of contract payment bond and contract performance bonds, which are acknowledged to be part of the Contract; and thoroughly understands the stipulations, requirements and provisions. The undersigned Design-Build Team agrees to be bound upon their execution of the Contract and including any subsequent award to them by the Secretary of Transportation in accordance with this Contract to provide the necessary contract payment bond and contract performance bond within fourteen calendar days after the written notice of award is received by them.

The undersigned Design-Build Team further agrees to provide all necessary materials, machinery, implements, appliances, tools, labor, and other means of construction, except as otherwise noted, to perform all the work and required labor to design, construct and complete all the work necessary for State Highway Contract No. C205177 in Wake County by no later than the dates(s) specified in the Final RFP or Technical Proposal, whichever is earlier, and in accordance with the requirements of the Engineer, the Final RFP and Addenda thereto, the 2024 *Standard Specifications for Roads and Structures* (*Standard Specifications*), specifications prepared by the Department, the Technical Proposal prepared by the Design-Build Team, at the lump sum price(s) bid by the Design-Build Team in their Price Proposal.

The Design-Build Team shall provide signed and sealed documents prepared by the Design-Build Team, which specifications and plans show the details covering this project and adhere to the items noted above.

The Design-Build Team acknowledges that project documents furnished by the Department are preliminary and provided solely to assist the Design-Build Team in the development of the project design. Unless noted otherwise herein, the Department does not warrant or guarantee the sufficiency or accuracy of any information furnished by the Department.

The Department does not warrant or guarantee the sufficiency or accuracy of any investigations made, nor the interpretations made or opinions of the Department as to the type of materials and conditions to be encountered at the project site. The Design-Build Team is advised to make such independent investigations, as they deem necessary to satisfy their self as to conditions to be encountered on this project. The Design-Build Team shall have no claim for additional compensation or for an extension of contract time for any reason resulting from the actual conditions encountered at the site differing from those indicated in any of the information or

documents furnished by the Department except as may be allowed under the provisions of the *Standard Specification*.

Although the Department has furnished preliminary designs for this project, unless noted otherwise herein, the Design-Build Team shall assume full responsibility, including liability, for the project design, including the use of portions of the Department design, modification of such design, or other designs as may be submitted by the Design-Build Team.

The Design-Build Team shall be fully and totally responsible for the accuracy and completeness of all work performed under this contract, and shall indemnify and hold the Department harmless for any additional costs and all claims against the Department or the State which may arise due to errors or omissions of the Department in furnishing the preliminary project designs and information, and of the Design-Build Team in performing the work.

The published volume entitled *North Carolina Department of Transportation, Raleigh, Standard Specifications for Roads and Structures,* January 2024, as well as, all design manuals, policy and procedures manuals, and AASHTO publications and guidelines referenced in the Request For Proposals, with all amendments and supplements thereto, are by reference, incorporated and made part of this contract; that, except as herein modified, all the design, construction and Construction Engineering Inspection included in this contract shall be done in accordance with the documents noted above and under the direction of the Engineer.

If the Design-Build Proposal is accepted and the award is made, the Technical Proposal submitted by the Design-Build Team is by reference, incorporated and made part of this contract. The contract is valid only when signed either by the Contract Officer or such other person as may be designated by the Secretary to sign for the Department of Transportation. The conditions and provisions herein cannot be changed except by written approval as allowed by the Request for Proposals.

Accompanying the Price Proposal shall be a bid bond secured by a corporate surety, or certified check payable to the order of the Department of Transportation, for five percent of the total bid price, which deposit is to be forfeited as liquidated damages in case this bid is accepted and the Design-Build Team fails to provide the required payment and performance bonds with the Department of Transportation, under the condition of this proposal, within 14 calendar days after the written notice of award is received by them, as provided in the *Standard Specification*; otherwise said deposit will be returned to the Design-Build Team.

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*** PROJECT SPECIAL PROVISIONS ***

BUILD AMERICA, BUY AMERICA (BABA)

(10-21-26) 106 DB1 G05C

Revise the *Standard Specifications* as follows:

Page 1-47 and 1-48, Article 106-1 GENERAL REQUIREMENTS, lines 30-47 and 1-49, delete and replace Article 106-1 with the following:

106-1 MATERIALS AND MANUFACTURING

(A) General Requirements

The Design-Build Team shall furnish materials that conform to all contract requirements, are suitable for their intended use, and are free from defects. All materials used in the work shall meet the requirements of the contract and shall be subject to inspection, test, or rejection by the Engineer. All materials permanently incorporated into the completed work shall be new, unless otherwise specified in the contract or as approved by the Engineer.

The Design-Build Team is responsible for selecting, procuring, and delivering materials of the types and quantities necessary to perform the work and meet contract requirements. Delays in material delivery or quality control do not relieve the Design-Build Team of obligations for schedule or quality.

All materials incorporated into the work shall be approved before use. Approval is based on testing, certification, or both, as required by the contract. Department review or acceptance does not relieve the Design-Build Team of responsibility for material compliance. The Department may inspect, sample, and test materials at any time before, during, or after installation.

Materials shall be handled, stored, and protected to prevent damage, contamination, or deterioration. Materials determined to be defective, damaged, contaminated, or otherwise not in compliance shall be rejected and promptly removed from the project.

To facilitate inspection and testing, the Design-Build Team shall furnish a complete statement of origin for all materials, including certifications or samples when requested. This information shall be submitted to the Materials and Tests Unit when required by the contract or as directed by the Engineer, in advance of fabrication, shipment, or use to allow for appropriate inspection.

The Design-Build Team shall furnish Safety Data Sheets (SDS) for all paints and hazardous chemicals proposed for use on the project, in accordance with the North Carolina Hazard Communication Standard, 29 CFR 1910.1200 and NCGS § 95-174.

The Design-Build Team shall provide access, equipment, means and assistance for the verification and calibration of any devices used in testing, measurement, or documentation of materials.

If the Design-Build Team proposes to use materials from local deposits not identified in the contract, the Design-Build Team shall be responsible for preliminary sampling, source approval, and production of acceptable material. Preliminary samples shall be furnished at no cost to the Department. If requested in writing, the Department may perform sampling, with costs to be charged to the Design-Build Team as determined by the Engineer.

Sampling or testing by the Department does not constitute pre-approval or acceptance of material. The Design-Build Team remains responsible for ensuring quality and uniformity of all materials produced or delivered, including those from local deposits. The Design-Build Team shall indemnify and hold harmless the Department from any claims, costs, or damages related to the development or use of such sources, including, but not limited to, failure to meet quantity or quality requirements.

Materials covered by Subarticles 106-1(B) and 106-1(C) shall comply with applicable domestic content requirements, including those for iron and steel, construction materials, and manufactured products.

(B) Domestic Material Requirements

Domestic material requirements apply to iron and steel products permanently incorporated into any project in accordance with 23 U.S.C. § 313, 23 CFR 635.410, and NCGS § 136-28.7. Construction materials and manufactured products permanently incorporated into the work are subject to domestic-content requirements only on Federal-aid projects, in accordance with 23 U.S.C. § 313, Build America Buy America Act (IIJA § 70914), 2 CFR 184, and as implemented for the Federal-aid highway program through 23 CFR Part 635.410.

All iron or steel products, construction materials, and manufactured products subject to domestic content requirements shall be of domestic origin and meet the applicable requirements of the contract based on the project's funding source.

Before any materials are delivered to the project, the Design-Build Team shall submit a notarized letter acknowledging their understanding of the domestic material requirements for the specific contract. This acknowledgment is a contract-level affirmation that the Design-Build Team is responsible for ensuring that no iron or steel product, construction material, or manufactured product subject to domestic content requirements is permanently incorporated into the work without the required certification. This acknowledgment does not substitute for product-level certifications from the manufacturer or supplier. The Department reserves the right to deny or recover payment for any material incorporated into the work without valid documentation.

For iron and steel, all manufacturing processes must occur in the United States.

For construction materials, all manufacturing processes must occur in the United States.

For manufactured products, final assembly must occur in the United States, and the cost of the components of the manufactured product that are mined, produced, or manufactured in

the United States must be greater than 55 percent of the total cost of all components of the manufactured product.

Before any iron or steel product, construction material, or manufactured product subject to domestic content requirements is eligible for payment, the Design-Build Team shall submit a certification from the manufacturer or supplier confirming compliance with the applicable regulations. A separate certification is required for each shipment or delivery and must clearly identify the items covered, linked to the associated bill of lading, invoice, or packing list.

The Design-Build Team shall ensure that all required certifications from the manufacturer or supplier are obtained and submitted to the Engineer prior to payment for any iron or steel product, construction material, or manufactured product subject to domestic content requirements. The Engineer will retain documentation in accordance with Department procedures. Compliance with domestic material requirements is the responsibility of the Design-Build Team, based on certifications and documentation provided by the manufacturer or supplier.

(C) Material Category Requirements

(1) Iron and Steel Products

Items are considered iron or steel products if they consist wholly or predominantly of iron or steel. Predominantly means the cost of iron or steel components exceeds 50% of the total cost of all product components.

All steel and iron products that are permanently incorporated into the work shall be produced in the United States. This includes any such item that is melted, cast, rolled, formed, shaped, drawn, extruded, forged, fabricated, finished or otherwise processed in the manufacture of the product. Coatings applied to iron and steel products shall also be applied in the United States.

A minimal amount of foreign iron or steel products may be permitted provided the total value of such foreign material, as delivered to the project, does not exceed 0.1% of the total contract cost or $2,500, whichever is greater. Documentation establishing the value of the foreign material shall be submitted when requested. This allowance is intended only for incidental quantities that may arise despite good-faith compliance efforts and may not be used to intentionally procure foreign iron or steel.

Domestically produced high-strength fasteners are required, and foreign-produced high-strength fasteners are not permitted under any circumstance.

Raw materials such as pig iron, processed pelletized iron ore, and reduced iron ore may be sourced internationally; however, all manufacturing processes to produce the final product, including coatings, must occur within the United States.

(2) Construction Materials

Construction materials shall consist of a single, listed material type permanently incorporated into the work as defined in 2 CFR 184.3. The following are classified as construction materials:

(a) Non-ferrous metals (such as aluminum, copper, and zinc);
(b) Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
(c) Glass (including optical glass);
(d) Fiber optic cable (including drop cable);
(e) Optical fiber;
(f) Lumber;
(g) Engineered wood;
(h) Drywall

For construction materials, all manufacturing processes must occur in the United States. If a construction material is combined with other materials, components, or features to form a product with new properties or functions, it shall be classified as a manufactured product.

Minor additions such as binding agents, dyes, or adhesives that do not materially alter the item's properties do not affect classification.

(3) Manufactured Products

Manufactured products are articles, materials, or supplies that are made by combining one or more materials to create a product with new or different properties, functions, or uses. This includes items that incorporate multiple components, materials, or assemblies and cannot be classified as a single listed construction material.

Final assembly of all manufactured products must occur in the United States, and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States must be greater than 55 percent of the total cost of all components of the manufactured product. Certification must address the product as a whole, including all incorporated components.

Items that meet the definition of construction materials or iron and steel products shall not be reclassified as manufactured products.

(4) Materials Not Subject to Domestic Content Requirements

The following materials are not subject to domestic content requirements and do not require certification, as identified below:

(a) Materials Excluded by Federal Statute or Regulation

The following materials are excluded from domestic content requirements under applicable Federal law or regulation:

(i) Cement and cementitious materials
(ii) Aggregates such as stone, sand, or gravel
(iii) Aggregate binding agents or additives

(b) Materials Not Permanently Incorporated into the Work

Materials that are not permanently incorporated into the completed project are not subject to domestic content requirements. Materials are not permanently incorporated when they are used solely to facilitate construction activities and do not perform an ongoing structural, operational, or functional role after construction is complete. Determinations regarding whether a material is permanently incorporated will be made by the Engineer.

(D) Classification and Clarification of Materials

All items subject to domestic content requirements shall be classified as either an iron or steel product, construction material, manufactured product, or a material not subject to domestic content requirements based on their final form as delivered to the project site. Each item may be classified into only one category and shall not be reclassified to avoid more stringent requirements. Classification of a manufactured product does not relieve the Design-Build Team of compliance with iron and steel domestic manufacturing requirements applicable to embedded iron or steel components when required by Federal law or regulation. When an item's classification is uncertain or does not clearly fall within the listed categories, the Design-Build Team shall submit the item for review by the Engineer. Approval must be obtained prior to procurement or incorporation into the project.

CONTRACT TIME AND LIQUIDATED DAMAGES

(4-17-12)(Rev. 7-21-26) DB1 G008C

The date of availability for this contract is April 26, 2027, except that the Design-Build Team shall begin ground disturbing activities only as allowed by this Request for Proposals (RFP). The Design-Build Team shall consider this factor in determining the proposed Substantial Completion Date and proposed Construction Completion Date for this project.

The Substantial Completion Date is defined as the date proposed in the Technical Proposal by the Design-Build Team who is awarded the contract. Substantial Completion is achieved, as defined by the *Substantial Completion* Project Special Provision found elsewhere in this RFP. Intermediate contract time and liquidated damages shall be in accordance with the *Intermediate Contract Time Number 2 and Liquidated Damages* special provision found elsewhere in this RFP.

The Construction Completion Date is defined as the date proposed in the Technical Proposal by the Design-Build Team who is awarded the contract. Construction Completion is defined as completion and acceptance of all work included in this contract except for the work required under the Project Special Provision entitled *Permanent Vegetation Establishment (PVE)* and any observation periods required by the contract. The proposed Construction Completion Date shall not be later than May 15, 2033. Intermediate contract time and liquidated damages shall be in accordance with the *Intermediate Contract Time Number 1 and Liquidated Damages* special provision found elsewhere in this RFP.

For purposes of the Final Completion Date, the work required for Final Completion consists of the work required under the Project Special Provision entitled *Permanent Vegetation Establishment*, including establishment of permanent vegetation, maintenance and removal of remaining temporary erosion control measures, removal of remaining temporary traffic control devices and work zone signs, correction and vegetation of disturbed areas, and other work necessary to satisfy the requirements of that special provision.

The Final Completion Date for this contract will be 180 calendar days after the Construction Completion Date proposed by the Design-Build Team, as may be adjusted in accordance with the contract. Liquidated damages of **Two Hundred Dollars ($200)** per calendar day will apply to the Final Completion Date until the requirements of the *Permanent Vegetation Establishment* Project Special Provision are satisfied and the work is accepted by the Department.

Liquidated damages will not be assessed concurrently for the Substantial Completion Date, Construction Completion Date, and Final Completion Date. Only one liquidated damages rate will apply to a given calendar day. When more than one of these contract times has not been met, the highest applicable liquidated damages rate will govern until the corresponding contract time is satisfied.

The Substantial Completion Date and Construction Completion Date proposed in the Technical Proposal by the Design-Build Team who is awarded the contract will become contract requirements. The Final Completion Date will be established as 180 calendar days after the Construction Completion Date proposed by the Design-Build Team awarded the contract, as may be adjusted in accordance with the contract, and will also become a contract requirement.

INTERMEDIATE CONTRACT TIME NUMBER 1 AND LIQUIDATED DAMAGES

(3-22-07)(Rev. 5-16-23) DB 1 G08

The Design-Build Team shall complete all work required for Construction Completion by the Construction Completion Date and shall place and maintain traffic on the completed work.

The date of availability for this intermediate contract time is defined as the date of availability in the *Contract Times and Liquidated Damages* special provision found elsewhere in the RFP.

The completion date for this intermediate contract time is the Construction Completion Date as defined in the *Contract Times and Liquidated Damages* special provision found elsewhere in the RFP.

The liquidated damages for this Intermediate Contract Time #1 are **Three Thousand Dollars ($3,000)** per calendar day. Liquidated damages attributable to delay in the Construction Completion Date will accrue until all work required for Construction Completion is complete and accepted in accordance with Article 105-17 of the *Standard Specifications* and the *Contract Times and Liquidated Damages* special provision found elsewhere in the RFP. These liquidated damages will not be assessed concurrently with the Substantial Completion Date and Final Completion Date liquidated damages described in the *Contract Times and Liquidated Damages* special provision found elsewhere in the RFP.

Upon apparent completion of the work required by the Construction Completion Date, an inspection will be held in accordance with Article 105-17 of the *Standard Specifications*. Upon acceptance, the Department will assume responsibility for maintenance of all accepted work, excluding Permanent Vegetation Establishment (PVE) as defined in the Project Special Provision entitled *Permanent Vegetation Establishment* found elsewhere in the RFP. The Design-Build Team shall remain responsible for correcting damage to the completed roadway caused by planting operations, whether occurring before or after traffic has been placed on the project.

Observation periods will be administered in accordance with the *Contract Times and Liquidated Damages* special provision found elsewhere in this RFP.

INTERMEDIATE CONTRACT TIME NUMBER 2 AND LIQUIDATED DAMAGES

(3-22-07)(Rev. 5-16-23) DB 1 G08

The Design-Build Team shall complete all work required for Substantial Completion by the Substantial Completion Date.

The date of availability for this intermediate contract time is defined as the date of availability in the *Contract Times and Liquidated Damages* special provision found elsewhere in the RFP.

The completion date for this intermediate contract time is the Substantial Completion Date as defined in the *Contract Times and Liquidated Damages* special provision found elsewhere in the RFP.

The liquidated damages for this Intermediate Contract Time #2 are **Eleven Thousand Dollars ($11,000)** per calendar day. Liquidated damages attributable to delay in the Substantial Completion Date will accrue until Substantial Completion is achieved, as defined by the *Substantial Completion* Project Special Provision found elsewhere in this RFP. These liquidated damages will not be assessed concurrently with the Construction Completion Date and Final Completion Date liquidated damages described in the *Contract Times and Liquidated Damages* special provision found elsewhere in the RFP.

Observation periods will be administered in accordance with the *Contract Times and Liquidated Damages* special provision found elsewhere in this RFP.

OTHER LIQUIDATED DAMAGES AND INCENTIVES

(3-22-7) (Rev. 2-14-8) DB1 G11

Reference the Transportation Management Scope of Work found elsewhere in this RFP for more information on the following time restrictions and liquidated damages:

Liquidated Damages for Intermediate Contract Time #3 for lane narrowing, lane closure, holiday and special event time restrictions for a single lane on I-40 or US 1 / I-440 / US 64, including lane closures on any multilane Collector Distributor (CD) road, ramps and loops, are $1,250.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #4 for lane narrowing, lane closure, holiday and special event time restrictions for two or more lanes on I-40 or US 1 / I-440 / US 64 are $2,500.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #5 for lane narrowing, lane closure, holiday and special event time restrictions on Walnut Street or Jones-Franklin Rd are $750.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #6 for lane narrowing, lane closure, holiday and special event time restrictions for two lanes on Walnut Street, are $1,500.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #7 for lane narrowing, lane closure, holiday and special event time restrictions on Crossroads Blvd are $500.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #8 for road closure time restrictions for construction operations on I-40 or US 1 / I-440 / US 64 are $5,000.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #9 for road closure time restrictions for construction operations on any CD road, ramp or loop are $2,500.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #10, #11 and #12 for road closure time restrictions for ramp, loop, or CD reconstruction are $10,000.00 per calendar day or any portion thereof.

Liquidated Damages for Intermediate Contract Time #13 and #14 for road closure time restrictions for ramp, loop, or CD reconstruction are $2,000.00 per calendar day or any portion thereof.

Liquidated Damages for Intermediate Contract Time #15 for the installation of Work Zone Performance Pavement Markings on I-40, US 1 / I-440 / US 64, including CD roads, ramps, and loops are $250.00 per day or any portion thereof.

Liquidated Damages for Intermediate Contract Time #16 for Lane Reduction for Pavement Replacement on US 1 / I-440 / US 64 North are $10,000.00 per day or any portion thereof.

Liquidated Damages for Intermediate Contract Time #17 for Lane Reduction for Pavement Replacement on US 1 / I-440 / US 64 South are $10,000.00 per day or any portion thereof.

Liquidated Damages for Intermediate Contract Time #18 for failure to repair a damaged or malfunctioning Dynamic Traveler Information System device and restore operation within 24 hours are $250.00 per calendar day or any portion thereof.

Reference the ITS Scope of Work found elsewhere in this RFP for more information on the following time restrictions and liquidated damages:

Liquidated Damages for Intermediate Contract Time #19 for failure to report a damaged NCDOT fiber optic communications infrastructure within one hour are $1,000.00 per hour or any portion thereof.

Liquidated Damages for Intermediate Contract Time #20 for failure to reestablish NCDOT fiber optic communications within eight hours of a planned disruption are $1,000.00 per hour or any portion thereof.

Liquidated Damages for Intermediate Contract Time #21 for failure to provide a plan 30 calendar days prior to work that defines 1) an anticipated planned disruption timeframe, 2) a plan of action for reestablishing NCDOT communications within eight hours of the planned disruption are $10,000.00 per failure.

Liquidated Damages for Intermediate Contract Time #22 for failure to restore operation/communication to ITS devices or provide a replacement device within 24 hours are $500.00 per hour or any portion thereof.

Liquidated Damages for Intermediate Contract Time #23 for failure to reestablish ITS Device operation within the timeframe specified above after a planned disruption are $500.00 per hour or any portion thereof.

Liquidated Damages for Intermediate Contract Time #24 for failure to provide a plan that defines 1) an anticipated ITS device planned disruption timeframe and 2) a plan of action for reestablishing ITS device operation a minimum of 21 calendar days prior to a planned disruption are $10,000.00 per failure.

Reference the Traffic Signals and Signal Communications Scope of Work found elsewhere in this RFP for more information on the following time restrictions and liquidated damages:

Liquidated Damages for Intermediate Contract Time #25 for failure to repair a damaged Town of Cary fiber optic communications cable and restore communications within 24 hours are $500.00 per hour or any portion thereof.

Liquidated Damages for Intermediate Contract Time #26 for failure to reestablish Town of Cary Signal System fiber optic communications within 24 hours are $500 per hour or any portion thereof.

Liquidated Damages for Intermediate Contract Time #27 for failure to provide a plan that defines 1) an anticipated Town of Cary Signal System fiber optic communications disruption timeframe, and 2) a plan of action for reestablishing the Town of Cary Signal System fiber optic communications a minimum of 21 calendar days prior to a proposed disruption in service are $10,000.00 per failure.

Reference the Erosion and Sedimentation Control Scope of Work found elsewhere in this RFP for more information on the following time restrictions and liquidated damages:

Liquidated Damages for Intermediate Contract Time #28 for failure to complete a mowing cycle within 14 calendar days prior to the Memorial Day, Independence Day, Labor Day, and Veterans Day holidays, the 2029 US Open Golf Tournament, and the beginning of the North Carolina State Fair are $500.00 per calendar day or any portion thereof.

Liquidated Damages for Intermediate Contract Time #29 for failure to complete monthly litter management cleanups just prior to planned mowing activities are $2,000.00 per failure.

Reference the Pavement Management Scope of Work found elsewhere in this RFP for more information on the following time restrictions and liquidated damages:

Liquidated Damages for Intermediate Contract Time #30 for Temporary Repair and Overlay of the southbound I-440 / US-1 / US 64 Collector Distributor by December 15, 2027 are $1,500.00 per calendar day or any portion thereof.

MOBILIZATION

(1-16-24) DB1 G15B

Revise the *Standard Specifications* as follows:

Page 8-1, Subarticle 800-2, MEASUREMENT AND PAYMENT

Delete this subarticle in its entirety and replace with the following:

800-2 MEASUREMENT AND PAYMENT

Five percent of the "Total Amount of Bid for Entire Project" shall be considered the lump sum amount for Mobilization. Partial payments for Mobilization will be made beginning with the first partial pay estimate paid on the contract. Payment will be made at the rate of 50 percent of the lump sum amount calculated for Mobilization. The remaining 50 percent will be paid with the partial pay estimate following approval of all permits required in the Environmental Permits Scope of Work for this project.

SUBSTANTIAL COMPLETION

(3-22-07)(Rev. 7-21-26) DB1 G16

Revise the *Standard Specifications* as follows:

Page 1-47, Article 105-17, line 27, insert the following after the last paragraph:

Substantial Completion establishes the point at which the work required by the Substantial Completion Date has been completed to the extent required by these specifications.

Substantial Completion of the project, or the portion of the project required by an intermediate contract time, is achieved when the following conditions are met within the applicable project limits:

(A) Traffic Operations

Through traffic has been placed in the final traffic configuration. All travel lanes and shoulders necessary for the final traffic configuration are open to traffic such that traffic can move unimpeded at the posted speed. Intersecting roads and service roads are complete to the extent necessary to provide safe and convenient public use, as determined by the Engineer.

(B) Final Pavement

The final pavement layers for all travel lanes and shoulders are placed and accepted by the Engineer. Temporary pavement, interim surfaces, or deferred surface courses do not satisfy this requirement.

(C) Signing

Permanent regulatory, warning, and guide signs required for the applicable project limits are installed and accepted by the Engineer.

(D) Safety Features, Noise Walls, Drainage, and Earthwork

Permanent safety features, noise walls, drainage devices, ditches, excavation and embankment within the applicable project limits that are shown in the plans or required by the contract are complete and functional as determined by the Engineer.

(E) Remaining Work

Remaining work within the applicable project limits is limited to permanent pavement markings, permanent pavement markers, or incidental work as determined by the Engineer that does not affect traffic operations, safety, or public use.

Substantial Completion is based on completion of the requirements of these specifications and is not achieved solely by placing traffic on the project or on the portion of the project required by an intermediate contract time.
Substantial Completion does not constitute Construction Completion, Final Completion, or final acceptance of the project. Work remaining after Substantial Completion shall be completed within the applicable contract times established elsewhere in this RFP.

Upon apparent Substantial Completion of the entire project or the work required by an intermediate contract time, the Engineer will inspect the work. If the work is substantially complete, the Engineer will notify the Design-Build Team in writing that Substantial Completion has been achieved. If the work is not substantially complete, the Engineer will notify the Design-Build Team in writing of the work remaining to achieve Substantial Completion. The work will not be considered substantially complete until the remaining work identified during the inspection has been completed as required by these specifications.

SUBMITTAL OF QUANTITIES, FUEL BASE INDEX PRICE AND OPT-OUT OPTION

(9-19-22) DB1 G43

(A) Submittal of Quantities

Submit quantities on the *Fuel Usage Factor Chart and Estimate of Quantities* sheet, located in the back of this RFP, following the Itemized Proposal Sheet.

The Design-Build Team shall prepare an Estimate of Quantities that will be incorporating into the completed project and upon which the Price Proposal was based. The quantity breakdown shall include all items of work that appear in the *Fuel Usage Factor Chart and Estimate of Quantities* sheet. Only those items of work which are specifically noted in the *Fuel Usage Factor Chart and Estimate of Quantities* sheet will be subject to fuel price adjustments. The quantity estimate submitted shall be the final total quantity limit for which fuel price adjustments will be made for each item, regardless of Supplemental Agreements.

Submittal - The submittal shall be signed and dated by an officer of the Design-Build Team. The information shall be copied and submitted in a separate sealed package with the outer wrapping clearly marked “Fuel Price Adjustment” and shall be delivered at the same time and location as the Technical Proposal. The original shall be submitted in the Price Proposal.

Trade Secret - Information submitted on the *Fuel Usage Factor Chart and Estimate of Quantities* sheet will be considered "Trade Secret" in accordance with the requirements of G.S. 66-152(3) until such time as the Price Proposal is opened.

(B) Base Index Price

The Design-Build Team's Estimate of Quantities will be used on the various partial payment estimates to determine fuel price adjustments. The Design-Build Team shall submit a payment request for quantities of work completed based on the work completed for that estimate period. The quantities requested for partial payment shall be reflective of the work actually accomplished for the specified period. The Design-Build Team shall certify that the quantities are reasonable for the specified period. The base index price for DIESEL #2 FUEL is **$** _____ per gallon.

(C) Opt Out of Fuel Price Adjustment

If the Design-Build Team elects not to pursue reimbursement for Fuel Price Adjustments, a quantity of zero shall be entered for all quantities in the *Fuel Usage Factor Chart and Estimate of Quantities* sheet and the declination box shall be checked. Failure to complete this form will mean that the Design-Build Team is declining the Fuel Price Adjustments for this project.

(D) Change Option

The proposer will not be permitted to change the option after the copy of the *Fuel Usage Factor Chart and Estimate of Quantities* sheet is submitted with the Technical Proposal.

(E) Fuel Usage Factor for Asphalt Line Items

If the Design-Build Team elects to pursue reimbursement for Fuel Price Adjustments, the Design-Build Team shall select either the 0.90 **or** 2.90 Fuel Usage Factor for each individual asphalt line item by marking the appropriate Factor on the *Fuel Usage Factor Chart*. If the Design-Build Team does not mark either Fuel Usage Factor or marks both Fuel Usage Factors for an asphalt line item, the 2.90 Fuel Usage Factor shall be used for that asphalt line item.

(F) Failure to Submit

Failure to submit the completed *Fuel Usage Factor Chart and Estimate of Quantities* sheet separately with the Technical Proposal and in the Price Proposal will result in the Technical and Price Proposal being considered irregular by the Department and the Technical and Price Proposal may be rejected.

STEEL PRICE ADJUSTMENT

(12-20-22) DB1 G47

Description and Purpose

When the price of raw steel mill products utilized on the contract have fluctuated, steel price adjustments will be made to the payments due the Design-Build Team for selected eligible items, as defined herein, that are permanently incorporated into the work. The Department will adjust monthly progress payments up or down, as appropriate, for cost changes in steel according to this provision.

Eligible Items

The list of standard items the Department has determine are eligible for steel price adjustment can be found on the Departments website at the following address:

https://connect.ncdot.gov/letting/Pages/Central-Letting-Resources.aspx

Nuts, bolts, anchor bolts, rebar chairs, connecting bands and other miscellaneous hardware associated with these items shall not be included in the price adjustment.

Price adjustments shall only be made for fluctuations in the material cost of the steel used in the above products as specified in the Product Relationship Table below. The producing mill shall be defined as the source of steel product before any fabrication has occurred (e.g., coil, plate, rebar, hot rolled shapes, etc.). No adjustment will be made for changes in the cost of fabrication, coating, shipping, storage, etc.

A steel price adjustment shall not be made for any products manufactured from steel having an adjustment date, as defined by the Product Relationship Table below, prior to the Price Proposal Opening date.

Price Proposal Submittal Requirements

The Design-Build Team shall provide Form SPA-1DB listing the steel material, (with corresponding Trns*port Item Number, Item Description, and Category) for the steel products they wish to have a price adjustment calculated. Only the work items corresponding to the list of eligible item numbers for steel price adjustment may be entered on Form SPA-1DB. The Design-Build Team may choose to have steel price adjustment applied to any, all, or none of the eligible items. However, the Design-Build Team's selection of work items for steel price adjustment or non-selection (non-participation) shall not change once the Department has received Form SPA-1DB.

Work items the Design-Build Team chooses for steel price adjustment must be designated by writing the word "Yes" in the column titled "Option" by each Trns*port Pay Item chosen for price adjustment. The Design-Build Team's designations on Form SPA-1DB shall be written in ink or typed. The completed SPA-1DB shall be signed and dated by an officer of the Design-Build Team

to be considered complete. Items not properly designated, designated with "No", or left blank on the Design-Build Team's Form SPA-1DB shall automatically be removed from consideration for a price adjustment.

The Design-Build Team shall include the completed Form SPA-1DB in the sealed package containing the Price Proposal and deliver the completed Form SPA-1DB at the same time and location as the Price Proposal requirements found elsewhere in this RFP. If the Design-Build Team fails to return the completed Form SPA-1DB with the Price Proposal, no steel items will be eligible for price adjustments on this project.

Form SPA-1DB can be found on the Department's website below:

https://connect.ncdot.gov/letting/LetCentral/Form%20SPA-1%20DB%202022-7-26.xlsm

Establishing the Base Price

The Department will use a blend of monthly average prices as reported from the Fastmarkets platform to calculate the monthly adjustment indices (BI and MI). This data is typically available on the first day of the month for the preceding month. The Department will calculate the indices for the different categories found on the Product Relationship Table below. For work item numbers that include multiple types of steel products, the category listed for that Trns*port item number shall be used for adjusting each steel component.

CATEGORY STEEL ITEMS PRICE TO BE INCLUDED IN THE FINAL RFP

The bidding index for Category 1 Steel items shall be **$ [Dollars]** per hundredweight.
The bidding index for Category 2 Steel items shall be **$ [Dollars]** per hundredweight.
The bidding index for Category 3 Steel items shall be **$ [Dollars]** per hundredweight.
The bidding index for Category 4 Steel items shall be **$ [Dollars]** per hundredweight.
The bidding index for Category 5 Steel items shall be **$ [Dollars]** per hundredweight.
The bidding index for Category 6 Steel items shall be **$ [Dollars]** per hundredweight.
The bidding index for Category 7 Steel items shall be **$ [Dollars]** per hundredweight.

The bidding indices represent a selling price of steel based on Fastmarkets data for the month of **[Month] _____ [Year] _____**.

MI = Monthly Index - in Dollars ($) per hundredweight (CWT). Use the adjustment indices from the month the steel was shipped from the producing mill, received on the project, or member cast as defined in the Product Relationship Table.

BI = Bidding Index - in Dollars ($) per hundredweight (CWT). Use the adjustment indices as listed in the Final Request for Proposals, including all Addenda.

Product Relationship Table			
Steel Product (Title)	**BI, MI***	**Adjustment Date for MI**	**Category**
Reinforcing Steel, Bridge Deck and SIP Forms	Based on one or more Fastmarkets indices	Delivery Date from Producing Mill	1
Structural Steel and Encasement Pipe	Based on one or more Fastmarkets indices	Delivery Date from Producing Mill	2
Steel H-Piles and Soldier Pile Walls	Based on one or more Fastmarkets indices	Delivery Date from Producing Mill	3
Guardrail Items and Pipe Piles	Based on one or more Fastmarkets indices	Material Received Date**	4
Fence Items	Based on one or more Fastmarkets indices	Material Received Date**	5
Overhead Sign Assembly, Signal Poles and High Mount Standards	Based on one or more Fastmarkets indices	Material Received Date**	6
Prestressed Concrete Members	Based on one or more Fastmarkets indices	Cast Date of Member	7
* BI and MI are in converted units of Dollars per Hundredweight ($ / CWT)			
** Material Received Date shall be defined as the date the materials are received on the project site. If a material prepayment is made for a Category 4 - 6 item, the Adjustment Date to be used shall be the date of the prepayment request instead of the Materials Received Date.			

Submit documentation to the Engineer for all items listed in the contract for which the Design-Build Team is requesting a steel price adjustment.

Submittal Requirements

Immediately upon arrival at the fabricator, the items in categories 1, 2 and 3, shall be specifically stored, labeled, or tagged, recognizable by color marking, and identifiable by Project for inspection and audit verification.

Furnish the following documentation for all steel products to be incorporated into the work and documented on Form SPA-2. Submit all documentation to the Engineer prior to incorporation of the steel into the completed work. The Department will withhold progress payments for the affected contract line item(s) if the documentation is not provided and, at the discretion of the Engineer, the work is allowed to proceed. Progress payments will be made upon receipt of the delinquent documentation.

Form SPA-2 can be found on the following website:

https://connect.ncdot.gov/projects/construction/Construction%20Forms/Form%20SPA-2.xlsx

Step 1 (Form SPA -2)

Utilizing Form SPA-2, submit separate documentation packages for each work item from Form SPA-1DB for which the Design-Build Team opted for a steel price adjustment. For work items with multiple steel components, each component shall be listed separately. Label each SPA-2 documentation package with a unique number as described below:

a. Documentation package number: (Insert the work item) - (Insert sequential package number beginning with "1")

   Example: 412 - 1
   412 - 2
   424 - 1
   424 - 2
   424 - 3, etc.

b. The steel product quantity in pounds

   i. The following sources shall be used, in declining order of precedence, to determine the weight of steel / iron, based on the Engineer's decision:

      1. Approved Shop Drawings
      2. Verified Shipping Documents
      3. Released for Construction (RFC) Plans
      4. Standard Drawing Sheets
      5. Industry Standards (e.g., AISC Manual of Steel Construction AWWA Standards, etc.)
      6. Manufacture's data

   ii. Any item requiring approved shop drawings shall have the weights of steel calculated and shown on the shop drawings or submitted and certified separately by the fabricator.

c. The date the steel product, subject to price adjustment, was shipped from the producing mill (Categories 1 - 3), received on the project (Categories 4 - 6), or casting date (Category 7).

Step 2 (Monthly Calculator Spreadsheet)

For each month, upon the incorporation of the steel product into the work, provide the Engineer the following:

1) Completed NCDOT Steel Price Adjustment Calculator Spreadsheet, summarizing all the steel submittal packages (Form SPA-2) actually incorporated into the completed work in the given month.

    a. Contract Number
    b. Bidding Index Reference Month
    c. Contract Completion Date or Revised Contract Completion Date
    d. County, Route and Project TIP information
    e. Work Item Number from Table of Quantities
    f. Line-Item Description (corresponding Trns*port pay item)
    g. Submittal Number from Form SPA-2
    h. Adjustment Date
    i. Pounds of Steel

2) An affidavit signed by the Design-Build Team stating the documentation provided in the NCDOT Steel Price Adjustment Calculator Spreadsheet is true and accurate.

Price Adjustment Conditions

Download the Monthly Steel Adjustment Spreadsheet with the most current reference data from the Department's website each month. The Steel Price Adjustment Calculator Spreadsheet can be found on the following website:

https://connect.ncdot.gov/projects/construction/Pages/Construction-Resources.aspx

If the monthly Fastmarkets data is not available, the data for the most recent immediately preceding month shall be used as the basis for price adjustment.

Price Adjustment Calculations

The price adjustment shall be determined by comparing the percentage of change in index value listed in the Final Request for Proposals, including all Addenda, (BI) to the monthly index value (MI) (Reference the examples below). Weights and date of shipment shall be documented as required herein. The final price adjustment dollar value will be determined by multiplying this percentage increase or decrease in the index by the represented quantity of steel incorporated into the work, and the established bidding index (BI) subject to the limitations herein.

Price increase / decrease shall be computed as follows:

$$SPA = ((MI/BI) - 1) * BI * (Q / 100)$$

Where:

SPA = Steel price adjustment in dollars

MI = Monthly Shipping Index - in Dollars ($) per hundredweight (CWT). Use the adjustment indices from the month the steel was shipped from the producing mill, received on the project, or member cast as defined in the Product Relationship Table.

BI = Bidding Index - in Dollars ($) per hundredweight (CWT). Use the adjustment indices as listed in the Final Request for Proposals, including all Addenda.

Q = Quantity of steel, product, pounds actually incorporated into the work as documented by the Design-Build Team and verified by the Engineer.

Calculations for price adjustment shall be shown separate from the monthly progress estimate and shall not be included in the total cost of work for determination of progress or for extension of contract time in accordance with Subarticle 108-10(B)(1) in Division One found elsewhere in this RFP.

Any apparent attempt to unbalance bids in favor of items subject to price adjustment, in the Department's sole discretion, may result in rejection of the Price Proposal.

Adjustments shall only be paid or charged to the Design-Build Team. Any Design-Build Team receiving a price adjustment under this provision shall distribute the proper proportional part of such adjustments to the subcontractor who performed the applicable work.

Delays to the work caused by steel shortages may be justification for a contract time extension, but will not constitute grounds for claims for standby equipment, extended office overhead, or other costs associated with such delays.

Price adjustments of eligible work items shall be adjusted up or down to a maximum of 50% from the Bid Index (BI) when compared to the Monthly Index (MI) of the steel product adjustment date.

If the decrease in the steel material exceeds 50% of the BI, the Design-Build Team may submit to the Department additional market index information specific to the work item in question to dispute the decrease. The Department will review this information and determine if the decrease is warranted.

When the steel product adjustment date, as defined in the Product Relationship Table, is after the approved contract completion date, the steel price adjustments shall be based on the lesser value of either the MI for the month of the approved contract completion date or the MI for the actual adjustment date.

If the price adjustment is based on estimated material quantities for that time, and a revision to the total material quantity is made in a subsequent or final estimate, an appropriate adjustment will shall be made to the price adjustment previously calculated. The adjustment shall be based on the same indices used to calculate the price adjustment which is being revised. If the adjustment date of the revised material quantity cannot be determined, the adjustment for the quantity in question,

shall be based on the indices utilized to calculate the steel price adjustment for the last initial documentation package submission, for the steel product subject to price adjustment, that was incorporated into the particular work item, for which quantities are being finalized.

Example: Structural steel for a particular bridge was provided for in three different shipments with each having a different mill shipping date. The quantity of structural steel actually used for the bridge was calculated and a steel price adjustment was made in a progress payment. At the conclusion of the work an error was found in the plans of the final quantity of structural steel used for the bridge. The quantity to be adjusted cannot be directly related to any one of the three mill shipping dates. The steel price adjustment for the quantity in question shall be calculated using the indices that were utilized to calculate the steel price adjustment for the quantity of structural steel represented by the last initial structural steel documentation package submission. The package used shall be the one with the greatest sequential number.

Extra Work / Force Account

When steel products, as specified herein, are added to the contract as extra work, in accordance with the provisions of Article 104-7 or 104-8, the Engineer will determine and specify in the supplemental agreement, the application of steel price adjustments on a case-by-case basis. A steel price adjustment shall not be made for any products manufactured from steel having an adjustment date prior to the supplemental agreement execution date. Price adjustments shall be made as provided herein, except the Bidding Index shall be based on the month in which the supplemental agreement pricing was executed.

For work performed on force account basis, reimbursement of actual material costs, along with the specified overhead and profit markup, shall be considered to include full compensation for the current cost of steel and steel price adjustments shall not be made.

Example: Form SPA-2

Steel Price Adjustment Submission Form

Contract Number C203394 Bid Reference Month January 2019

Submittal Date 8/31/2019

Work Item from the Table of Quantities 237

Work Item Description APPROX….LBS Structural Steel

Sequential Submittal Number 2

Supplier	Description of material	Location information	Quantity in lbs.	Adjustment Date
XYZ mill	Structural Steel	Structure 3, Spans A - C	1,200,000	May 4, 2020
ABC distributing	Various channel and angle shapes	Structure 3 Spans A - C	35,000	July 14, 2020
		Total Pounds of Steel	1,235,000	

Note: Attach the following supporting documentation to this form:

- Bill of Lading to support the shipping date(s)
- Supporting information for weight documentation (e.g., Pay item reference, shop drawings, shipping documents, Standards Sheets, industry standards, or manufacturer's data)

By providing this data under my signature, I attest to the accuracy of and validity of the data on this form and certify that no deliberate misrepresentation in any manner has occurred.

Printed Name Signature

_____ _____

Example: Form SPA-2

Steel Price Adjustment Submission Form

Contract Number C203394 Bid Reference Month January 2019

Submittal Date August 31, 2019

Work Item from the Table of Quantities 158

Work Item Description SUPPORT, OVRHD SIGN STR -DFEB- STA 36+00 -L-

Sequential Submittal Number 2

Supplier	Description of material	Location information	Quantity in lbs.	Adjustment Date
XYZ mill	Tubular Steel (Vertical legs)	-DFEB- STA 36+00 -L-	12,000	December 11, 2021
PDQ Mill	4" Tubular steel (Horizontal legs)	-DFEB- STA 36+00 -L-	5,900	December 11, 2021
ABC distributing	Various channel and angle shapes (see quote)	-DFEB- STA 36+00 -L-	1,300	December 11, 2021
	Catwalk assembly	-DFEB- STA 36+00 -L-	2,000	December 11, 2021
Nucor	Flat plate	-DFEB- STA 36+00 -L-	650	December 11, 2021
		Total Pounds of Steel	21,850	

Note: Attach the following supporting documentation to this form.

- Bill of Lading to support the shipping date(s)
- Supporting information for weight documentation (e.g., Pay item reference, shop drawings, shipping documents, Standards Sheets, industry standards, or manufacturer's data)

By providing this data under my signature, I attest to the accuracy of and validity of the data on this form and certify that no deliberate misrepresentation in any manner has occurred.

Printed Name Signature

_____ _____

Example: Price Adjustment Calculation - Increase

Price Proposal opened on September 17, 2019

Work Item 635 "Structural Steel" has a Released for Construction plan quantity of 2,717,000 pounds

Bidding Index for Structural Steel (Category 2) in the Final Request for Proposals, including all Addenda, was $36.12 / CWT = BI

450,000 pounds of Structural Steel for Structure 2 at Station 44+08.60 -L- were shipped to fabricator from the producing mill in same month, May 2021.

Monthly Index for Structural Steel (Category 2) for May 2021 was $64.89 / CWT = MI

The Steel Price Adjustment formula shall be as follows:

SPA = ((MI/ BI) - 1) * BI * (Q / 100)

Where: SPA = Steel price adjustment in dollars

BI = Bidding Index - in dollars ($) per hundredweight (CWT). Use the adjustment indices as listed in the Final Request for Proposals, including all Addenda.

MI = Mill Shipping Index - in dollars ($) per hundredweight (CWT). Use the adjustment indices from the month the steel was shipped from the producing mill, received on the project, or member cast as defined in the Product Relationship Table.

Q = Quantity of steel product, in pounds (lbs.) actually incorporated into the work as documented by the Design Build Team and verified by the Engineer.

BI = $36.12 / CWT

MI = $64.89 / CWT

% change = ((MI/ BI) - 1) = ($64.89 / $36.12 - 1) = (1.79651 - 1) = 0.79651162791

Q = 450,000 pounds

SPA = 0.79651162791 * $36.12 x (450,000 / 100)

SPA = 0.79651162791 * $36.12 * 4,500

SPA = $129,465 pay adjustment to the Design-Build Team for Structural Steel (Structure 2 at Station 44+08.60 -L-)

Example: Price Adjustment Calculation - Decrease

Price Proposal opened on December 18, 2018

Work Item 635 Structural Steel has a Released for Construction plan quantity of 2,717,000 pounds

Bidding Index for Structural Steel (Category 2) in the Final Request for Proposals, including all Addenda, was $46.72 / CWT = BI

600,000 pounds of Structural Steel for Structure 1 at Station 22+57.68 -Y- were shipped to fabricator from the producing mill in same month, August 2020.

Monthly Index for Structural Steel (Category 2) for August 2020 was $27.03 / CWT = MI

The Steel Price Adjustment formula shall be as follows:

SPA = ((MI/ BI) - 1) * BI * (Q / 100)

Where: SPA = Steel price adjustment in dollars

BI = Bidding Index - in dollars ($) per hundredweight (CWT). Use the adjustment indices as listed in the Final Request for Proposals, including all Addenda.

MI = Mill Shipping Index - in dollars ($) per hundredweight (CWT). Use the adjustment indices from the month the steel was shipped from the producing mill, received on the project, or member cast as defined in the Product Relationship Table.

Q = Quantity of steel product, in pounds (lbs.) actually incorporated into the work as documented by the Design Build Team and verified by the Engineer.

BI = $46.72 / CWT

MI = $27.03 / CWT

% change = ((MI / BI) - 1) = ($27.03 / $46.72 - 1) = (0.57855 - 1) = -0.421446917808

Q = 600,000 pounds

SPA = -0.421446917808 * $46.72 * (600,000 / 100)

SPA = -0.421446917808 * $46.72 * 6,000

SPA = $118,140.00 pay adjustment (credit) to the Department for Structural Steel (Structure 1 at Station 22+57.68 -Y-)

Example - Price Adjustment Calculation - Increase

Price Proposal opened on July 16, 2020

Work Item 614 Reinforced Concrete Deck Slab has a Released for Construction plan quantity of 24,1974 pounds.

Bidding Index Reference Month was May 2020. Bidding Index for Reinforced Concrete Deck Slab (Category 1) in the proposal was $29.21 / CWT = BI

51,621 pounds of reinforcing steel and 52,311 pounds of epoxy coated reinforcing steel for Structure 2 at Station 107+45.55 -L- was shipped to fabricator from the producing mill in same month, May 2021.

Monthly Index for Reinforced Concrete Deck Slab (Category 1) for May 2021 was $43.13 / CWT = MI

The Steel Price Adjustment formula shall be as follows:

SPA = ((MI/ BI) - 1) * BI * (Q / 100)

BI = Bidding Index - in dollars ($) per hundredweight (CWT). Use the adjustment indices as listed in the Final Request for Proposals, including all Addenda.

MI = Mill Shipping Index - in dollars ($) per hundredweight (CWT). Use the adjustment indices from the month the steel was shipped from the producing mill, received on the project, or member cast as defined in the Product Relationship Table.

Q = Quantity of steel product, in pounds (lbs.) actually incorporated into the work as documented by the Design Build Team and verified by the Engineer.

BI = $29.21 / CWT

MI = $43.13 / CWT

% change = ((MI / BI) - 1) = ($43.13 / $29.21 - 1) = (1.47655 - 1) = 0.47654912701

Q = 103,932 pounds

SPA = 0. 47654912701 * $29.21 * (103,932 / 100)

SPA = 0. 47654912701 * $29.21 * 1,039.32

SPA = $14,467.33 pay adjustment to the Design-Build Team for Reinforced Concrete Deck Slab (Category 1) at Station 107+45.55 -L-

INDIVIDUAL MEETINGS WITH PROPOSERS

(9-1-11) DB1 G048

The Department will provide at least four Question and Answer Sessions to meet with each proposer individually to specifically address questions regarding the draft Requests for Proposals.

After issuance of the First Industry Draft RFP, the Design-Build Team's Utility Coordinator shall coordinate with the affected utility owners at their discretion.

The Department will afford each proposer three additional meetings with the Department (maximum two-hour time limit per each meeting) to discuss project specifics and address the proposer's concerns and questions. These meetings may occur at any time after the first Question and Answer Session with the proposers and before two weeks prior to the Price Proposals submittal date. The proposer shall request these meetings in writing to the State Contract Officer, providing the Department a minimum of one week advance notice of the requested date. The proposer shall also state in the request those disciplines within the Department that are requested to be in attendance. The Department makes no assurance that the request may be honored on that specific date or that all disciplines requested can be in attendance.

EXECUTION OF BID, NON-COLLUSION AFFIDAVIT, DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION

(1-24-13) DB1 G52

The Proposer's attention is directed to the various sheets in the Request for Proposals which are to be signed by the Proposer. A list of these sheets is shown below. The signature sheets are located behind the Itemized Proposal Sheet in this Request for Proposal. The NCDOT bid bond form is available on-line at:

https://connect.ncdot.gov/projects/AlternativeDelivery/Pages/default.aspx

or by contacting the Records and Documents office at 919-707-6900.

1. Applicable Signature Sheets: 1, 2, 3, 4, 5, or 6 (Bid)

2. Bid Bond dated the day of the Price Proposal submission

The Proposer shall certify to the best of his knowledge all subcontractors, material suppliers and vendors utilized herein current status concerning suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency, in accordance with the "Debarment Certification" located behind the *Execution of Bid Non-Collusion Affidavit, Debarment Certification and Gift Ban Certification* signature sheets in this RFP. Execution of the bid signature sheets in conjunction with any applicable statements concerning exceptions, when such statements have been made on the "Debarment Certification", constitutes the Proposer's certification of "status" under penalty of perjury under the laws of the United States.

SUBMISSION OF DESIGN-BUILD PROPOSAL

(9-1-11) (Rev. 1-16-24) DB1 G55A

The Proposer's attention is directed that each Proposer's Design-Build Proposal shall comply with the following requirements in order for that Design-Build Proposal to be responsive and considered for award.

1. The Proposer shall be prequalified with the Department prior to submitting a Price Proposal.

2. The Proposer shall deliver the Technical Proposal and the Price Proposal to the place indicated, and prior to the times indicated in this Request for Proposals.

3. The Price Proposal documents shall be signed by an authorized employee of the Proposer.

4. The Price Proposal shall be accompanied by Bid surety in the form of a Bid Bond or Bid Deposit, dated the day of the Price Proposal submission.

5. If Disadvantaged Business Enterprises (DBE) goals are established for this contract, the Proposer shall complete the form Listing of DBE Subcontractors contained elsewhere in this RFP in accordance with the *Disadvantaged Business Enterprises* Project Special Provision found elsewhere in this RFP.

6. The Design-Build Proposal shall address all the requirements as specified in this Request for Proposals.

In addition to the above requirements, failure to comply with any of the requirements of Article 102-8 of the Standard Special Provisions, Division One (found elsewhere in this RFP), Article 102-9 of the *Standard Specifications,* or Article 102-10 of the *Standard Specifications* and as amended in the Standard Special Provisions, Division One (found elsewhere in this RFP) may result in a Design-Build Proposal being rejected.

ALTERNATIVE TECHNICAL CONCEPTS AND CONFIDENTIAL QUESTIONS

(6-8-11) (Rev. 1-27-22) DB1 G56A

To accommodate innovation that may or may not be specifically allowed by the RFP, or other documents incorporated into the contract by reference, the Design-Build Team has the option of submitting Confidential Questions and Alternative Technical Concepts.

Definitions

A Confidential Question is a private query to the Department containing information whose disclosure could alert others to certain details of doing business in a particular manner.

An Alternative Technical Concept is a private query to the Department that requests a variance to the requirements of the RFP, or other documents incorporated into the contract by reference, that

is equal or better in quality or effect, as determined by the Department in its sole discretion, and that has been used elsewhere under comparable circumstances.

Confidential Questions

The Design-Build Team will be permitted to ask Confidential Questions of the Department, and neither the question nor the answer will be shared with other Design-Build Teams. The Department, in its sole discretion, will determine if a question is considered confidential.

Confidential Questions arising prior to issuance of the Final RFP will be allowed during the industry review of the draft RFPs with the individual Design-Build Teams. The Department will answer the Confidential Question verbally at the industry review meeting, if possible, and / or through subtle changes in the Final RFP, which will clarify the scope by either allowing or disallowing the request. To the greatest extent possible, the revision will be made in such a manner as to not disclose the Confidential Question.

After issuance of the Final RFP, Confidential Questions may be submitted to the State Contract Officer via the Design-Build e-mail address (altdelivery@ncdot.gov). After evaluation, the State Contract Officer will respond to the question in writing and / or through subtle changes in the Final RFP, as reflected in an Addendum, which will clarify the scope by either allowing or disallowing the request. To the greatest extent possible, the revision will be made in such a manner as to not disclose the Confidential Question. Minor questions will not be acknowledged or answered.

If the Design-Build Team includes concepts / work based on the Confidential Questions and answers, the concepts / work shall be discussed in the Technical Proposal.

Alternative Technical Concepts

The Design-Build Team will be allowed to submit a maximum of twelve (12) Alternative Technical Concepts. The aforementioned maximum number of ATCs shall include both Preliminary and Formal ATCs. Excluding (1) Formal ATCs that are submitted in response to the Department's favorable review of a Preliminary ATC, (2) ATCs that are deemed to take advantage of an error or omission in the RFP, and (3) ATCs that contain multiple concepts, all ATCs submitted by the Design-Build Team shall count towards the maximum number of allowable ATCs, regardless of the Department's response. The Design-Build Team is cautioned that ATCs that receive responses that nullify the ATC shall count towards the maximum number of allowable ATCs. For example, at a minimum, the responses below shall count towards the maximum number of allowable ATCs:

- The ATC does not qualify as an ATC
- The RFP does not permit the concept proposed in the ATC to be submitted as an ATC, and the Department did not evaluate or consider the ATC
- A documented question has been received outside of the ATC process on the same topic and the RFP will be revised to address that question without further regard for confidentiality

- More than one ATC has been received on the same topic and the Department has elected to exercise its right to revise the RFP without further regard for confidentiality

Additionally, should the Design-Build Team resubmit an ATC that the Department did not approve, the original ATC, as well as all ATC resubmittals, shall count towards the maximum number of allowable ATCs, resulting in a minimum of two ATCs.

Once an ATC has been submitted to the Department, the Design-Build Team will **NOT** be allowed to rescind the ATC.

Should the Design-Build Team submit a single ATC with multiple concepts, the Department (1) will not evaluate the concepts proposed in the ATC, and (2) will return the ATC to the Proposer requiring a separate submittal for each individual concept. The single ATC with multiple concepts will not be considered received within the ATC submittal deadlines noted below.

Initial ATC submittals shall be submitted in accordance with the following deadlines:

- The Design-Build Team will be allowed to submit the maximum number of allowable ATCs prior to the Final RFP distribution.

- The Design-Build Team will be allowed to submit a maximum of seven (7) ATCs after the Final RFP distribution provided (1) the ATC submittal does not exceed the aforementioned maximum number of allowable ATCs, and (2) the ATC is received by the Department no later than seven weeks prior to the Technical Proposal submittal deadline.

The Design-Build Team may include an ATC in the Technical and Price Proposal only if the ATC was received by the Department in accordance with the requirements noted above and it has been approved by the Department (including conditionally approved ATCs, if all conditions are met).

The submittal deadlines above only apply to initial ATC submittals that contain one concept. Resubmittal of an ATC that (1) has been revised in response to the Department's requests for further information concerning a prior submittal, (2) is a Formal ATC for a Preliminary ATC that received a favorable response from the Department, or (3) requests approval of additional required variances to the RFP requirements that were omitted in the original ATC submittal shall be received by the Department no later than three weeks prior to the Technical Proposal submittal deadline.

The Design-Build Team shall be solely responsible for reviewing all versions of the RFP, including all Addenda, and determining variances required by a Formal ATC. The Design-Build Team is cautioned that the Department's approval in no way implies that the Design-Build Team has requested approval of all the required variances to the RFP requirements. Additionally, should the Department revise the RFP after a Formal ATC has been approved, the Design-Build Team shall be solely responsible for reviewing the RFP and determining if the ATC deviates from the revised requirements. If necessary, the Design-Build Team must submit a request for approval of all additional required variance(s) no later than three weeks prior to the Technical Proposal submittal deadline unless the ATC deviates from revised requirements in an RFP Addendum that is

distributed within three weeks prior to the Technical Proposal submittal deadline. If the ATC deviates from revised requirements in an RFP Addendum that is distributed within three weeks prior to the Technical Proposal submittal deadline, the Design-Build Team must submit a request for approval of all additional required variance(s) within five business days of the date of the Department's ATC response letter and / or the RFP Addendum distribution, as appropriate.

An ATC shall in no way take advantage of an error or omission in the RFP, or other documents incorporated into the contract by reference. If, at the sole discretion of the Department, an ATC is deemed to take advantage of an error or omission in the RFP, or other documents incorporated into the contract by reference, the RFP will be revised without regard for confidentiality. If at any time, the Department receives a documented question on the project similar to a concept submitted in the form of a Preliminary ATC or Formal ATC, the Department reserves the right to revise the RFP without further regard for confidentiality.

By approving an ATC, the Department acknowledges that the ATC may be included in the design and RFC Plans; however, approval of any ATC in no way relieves the Design-Build Team of its obligation to satisfy (1) other contract requirements not specifically identified in the ATC submittal; (2) the Department's comments resulting from review of the design details post-Award; (3) any obligation that may arise under applicable laws and regulations; and (4) any obligation mandated by the regulatory agencies as a permit condition.

ATC Submittals

All ATCs shall be submitted in electronic .pdf format to the State Contract Officer, via the Design-Build e-mail address (altdelivery@ncdot.gov). Excluding the ATC distribution letter, the ATC shall not include any reference to the submitter's identity.

Formal ATCs

Each Formal ATC submittal shall include the following information:

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

2) **Usage -** Where and how the ATC would be used on the project

3) **Deviations -** References to all RFP requirements, or other documents incorporated into the contract by reference, that are inconsistent with the proposed ATC, an explanation of the nature of the deviations from said requirements, and a request for approval of such variance(s)

4) **Analysis -** An analysis justifying use of the ATC and why the variance to the RFP requirements, or other documents incorporated into the contract by reference, should be

allowed. **All intersection and interchange reconfigurations shall include corresponding electronic traffic analyses files and a signing concept.**

5) **Impacts -** Discussion of potential vehicular traffic impacts, environmental impacts, community impacts, safety and life-cycle project impacts, and infrastructure costs (including impacts on the cost of repair and maintenance)

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

7) **Risks -** A description of added risks to the Department and other entities associated with implementing the ATC

8) **Costs -** An estimate of the ATC implementation costs to the Department, the Design-Build Team, and other entities (right of way, utilities, mitigation, long term maintenance, etc.)

The Formal ATC, if approved, shall be included in the Price Proposal if the Design-Build Team elects to include it in their Technical Proposal.

Review of ATCs

A panel will be selected to review each ATC, which may or may not include members of the Technical Review Committee. The Design-Build Team shall make no direct contact with any member of the review panel, except as may be permitted by the State Contract Officer. Unapproved contact with any member of the review panel shall result in a disqualification of that ATC.

At any time, the Department may request additional information regarding a proposed ATC. To the greatest extent possible, the Department will return responses to, or request additional information from, the Design-Build Team within 15 business days of the original submittal of a Formal ATC. If additional information is requested, the Department will provide a response within ten business days of receipt of all requested information.

In accordance with the *Individual Meetings with Proposers* Project Special Provision found elsewhere in this RFP, a Design-Build Team's ATC may be discussed during confidential one-on-one meeting(s). Under no circumstances will the Department be responsible or liable to the Design-Build Team or any other party as a result of disclosing any ATC materials, whether the disclosure is deemed required by law, by a court order, or occurs through inadvertence, mistake or negligence on the part of the Department or their respective officers, employees, contractors, or consultants.

In the event that the Department receives 1) ATCs from more than one Design-Build Team or 2) an ATC and a documented question outside of the ATC process that are deemed by the Department, in its sole discretion, to be similar in nature, the Department reserves the right to modify the RFP without further regard for confidentiality.

The Department Response to Formal ATCs

The Department will review each Formal ATC and will respond to the Design-Build Team with one of the following determinations:

1) The Formal ATC is approved.

2) The Formal ATC is not approved.

3) The Formal ATC is not approved in its present form, but may be approved upon satisfaction, in the Department's sole discretion, of certain identified conditions that shall be met or certain clarifications or modifications that shall be made (conditionally approved or additional information is required).

4) The submittal does not qualify as an ATC but may be included in the Design-Build Proposal without an approved ATC (e.g., the concept complies with the baseline requirements of the RFP).

5) The Formal ATC is deemed to take advantage of an error or omission in the RFP, or other documents incorporated into the contract by reference, in which case the Formal ATC will not be considered, and the RFP will be revised to correct the error or omission without further regard for confidentiality.

6) A documented question has been received outside of the ATC process on the same topic and the RFP will be revised to address that question without further regard for confidentiality.

7) More than one ATC has been received on the same topic and the Department has elected to exercise its right to revise the RFP without further regard for confidentiality. This response could also follow and supersede one of the other previously provided responses above.

8) The Formal ATC contains multiple concepts and has not been considered. Should the Design-Build Team wish to pursue one or more of the concepts presented in the Formal ATC, a submittal for each individual concept shall be required.

Formal ATC Inclusion in Technical Proposal

The Design-Build Team may incorporate one or more approved Formal ATCs as part of its Technical and Price Proposals. If the Department responded to a Formal ATC by stating that it would be approved if certain conditions were met, those conditions shall be stipulated and met in the Technical Proposal or the concept will be deemed in violation of the RFP requirements.

In addition to outlining each implemented Formal ATC, and providing assurances to meet all attached conditions, the Design-Build Team shall also include a copy of the Formal ATC approval

letter from the State Contract Officer in each of the twelve Technical Proposals submitted. This letter will be included in the distribution of the Technical Proposals to the Technical Review Committee.

Approval of a Formal ATC in no way implies that the Formal ATC will receive a favorable review from the Technical Review Committee. The Technical Proposals will be evaluated in regards to the evaluation criteria found in this RFP, regardless of whether or not Formal ATCs are included.

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

Preliminary ATCs

At the Design-Build Team's option, a Preliminary ATC submittal may be made that presents a concept and a brief narrative of the concept's benefits. The purpose of allowing a Preliminary ATC is to limit the Design-Build Team's expense in the pursuit of a Formal ATC that may be quickly denied by the Department.

To the greatest extent possible, the Department will review Preliminary ATCs within ten business days of submittal and will respond to the Design-Build Team with one of the following determinations:

1) The Preliminary ATC would be considered as a Formal ATC if the Team so elects to pursue a Formal ATC submission.

2) The Preliminary ATC is denied.

3) An ATC is not required.

4) The Preliminary ATC takes advantage of an error or omission in the RFP or other documents incorporated into the contract by reference, in which case the Preliminary ATC will not be considered, and the RFP will be revised to correct the error or omission without further regard for confidentiality.

5) A documented question has been received outside of the ATC process on the same topic and the RFP will be revised to address that question without further regard for confidentiality.

6) More than one ATC has been received on the same topic and the Department has elected to exercise its right to revise the RFP without further regard for confidentiality. This response could also follow and supersede one of the other previously supplied responses above.

7) The Preliminary ATC contains multiple concepts and has not been considered. Should the Design-Build Team wish to pursue one or more of the concepts presented in the Preliminary ATC, a submittal for each individual concept shall be required.

The Department in no way warrants that a favorable response to a Preliminary ATC submittal will translate into a favorable response to a Formal ATC submittal. Likewise, a favorable response to a Preliminary ATC submittal is not sufficient to include the ATC in the Technical Proposal.

PAYOUT SCHEDULE

(02-9-23)(Revised 1-16-24) DB1 G57

No later than 12:00 o'clock noon on the 14th day after the Price Proposal opening, the responsive proposer with the lowest adjusted price shall submit a proposed Anticipated Monthly Payout Schedule to the office of the State Contract Officer. The Anticipated Monthly Payout Schedule shall be submitted as a hard copy version and as an electronic version in Excel Spreadsheet. Both versions of the Anticipated Monthly Payout Schedule shall be submitted in a sealed package with the outer wrapping clearly marked "Anticipated Monthly Payout Schedule" along with the Design-Build Team name and the contract number. The Anticipated Monthly Payout Schedule will be used by the Department to establish the monthly funding levels for this project. The Anticipated Monthly Payout Schedule shall parallel, and agree with, the project schedule the Design-Build Team submits as a part of their Technical Proposal. The Anticipated Monthly Payout Schedule shall include a monthly percentage breakdown (in terms of the total contract amount percentages) of the work anticipated to be completed. The Anticipated Monthly Payout Schedule shall begin with the Date of Availability and end with the Actual Completion Date proposed by the Design-Build Team. If the Anticipated Monthly Payout Schedule is not submitted as stated herein, the Technical and Price Proposals will be considered irregular by the Department, and the bid may be rejected.

As detailed above, the Design-Build Team shall submit electronic and hard copy updates of the Anticipated Monthly Payout Schedule on March 15th, June 15th, September 15th, and December 15th of each calendar year until project acceptance. The Design-Build Team shall submit all updates to the Resident Engineer, with copies to the State Construction Engineer at 1 South Wilmington Street, 1543 Mail Service Center, Raleigh, NC 27699-1543.

SCHEDULE OF ESTIMATED COMPLETION PROGRESS

(7-15-08) (Rev. 6-17-25) 108-2 DB1 G58

The Design-Build Team's attention is directed to the *Availability of Funds - Termination of Contracts* Standard Special Provision found elsewhere in this RFP. The Department of Transportation's schedule of estimated completion progress for this project, as required by that Standard Special Provision, shall be as follows:

Fiscal Year	Progress (% of Dollar Value)
2027 (07/01/26 - 06/30/27)	4% of Total Amount Bid
2028 (07/01/27 - 06/30/28)	6% of Total Amount Bid
2029 (07/01/28 - 06/30/29)	22% of Total Amount Bid
2030 (07/01/29 - 06/30/30)	24% of Total Amount Bid
2031 (07/01/30 - 06/30/31)	26% of Total Amount Bid
2032 (07/01/31 - 06/30/32)	13% of Total Amount Bid
2033 (07/01/32 - 06/30/33)	5% of Total Amount Bid

In accordance with Article 108-2 of the *Standard Specifications,* the Design-Build Team shall also furnish its own progress schedule. Any acceleration of the progress as shown by the Design-Build Team's progress schedule over the progress as shown above shall be subject to the approval of the Engineer.

DISADVANTAGED BUSINESS ENTERPRISE

(10-16-07) (Rev. 10-8-25) 102-15(J) SP1 G61 DB1 G061

Description

The purpose of this special provision is to carry out the U.S. Department of Transportation's policy of ensuring nondiscrimination in the award and administration of contracts financed in whole or in part with Federal funds. This provision is guided by 49 CFR Part 26.

Definitions

Additional DBE Subcontractors - Any DBE submitted at the time the Price Proposal is submitted that will not be used to meet the DBE goal. No submittal of a Letter of Intent is required.

Committed DBE Subcontractor - Any DBE submitted at the time the Price Proposal is submitted that is being used to meet the DBE goal by submission of a Letter of Intent. Or any DBE used as a replacement for a previously committed DBE firm.

Contract Goal Requirement - The approved DBE participation at time of award, but not greater than the advertised contract goal.

DBE Goal - A portion of the total contract, expressed as a percentage, that is to be performed by committed DBE subcontractor(s).

Disadvantaged Business Enterprise (DBE) - A firm certified as a Disadvantaged Business Enterprise through the North Carolina Unified Certification Program.

Goal Confirmation Letter - Written documentation from the Department to the Proposer confirming the Design-Build Team's approved, committed DBE participation along with a listing of the committed DBE firms.

Manufacturer - A firm that operates or maintains a factory or establishment that produces on the premises, the materials or supplies obtained by the Design-Build Team.

Regular Dealer - A firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials or supplies required for the performance of the contract are bought, kept in stock, and regularly sold to the public in the usual course of business. A regular dealer engages in, as its principal business and in its own name, the purchase and sale or lease of the products in question. A regular dealer in such bulk items as steel, cement, gravel, stone, and petroleum products need not keep such products in stock, if it owns and operates distribution equipment for the products. Brokers and packagers are not regarded as manufacturers or regular dealers within the meaning of this section.

Replacement / Substitution - A full or partial reduction in the amount of work subcontracted to a committed (or an approved substitute) DBE firm.

North Carolina Unified Certification Program (NCUCP) - A program that provides comprehensive services and information to applicants for DBE certification, such that an applicant is required to apply only once for a DBE certification that will be honored by all recipients of USDOT funds in the state and not limited to the Department of Transportation only. The Certification Program is in accordance with 49 CFR Part 26.

United States Department of Transportation (USDOT) - Federal agency responsible for issuing regulations (49 CFR Part 26) and official guidance for the DBE program.

Forms and Websites Referenced in this Provision

DBE Payment Tracking System - On-line system in which the Design-Build Team enters the payments made to DBE subcontractors who have performed work on the project.

https://apps.dot.state.nc.us/Vendor/PaymentTracking/

DBE-IS *Subcontractor Payment Information* - Form for reporting the payments made to all DBE firms working on the project.

https://connect.ncdot.gov/business/Turnpike/Documents/Form%20DBE-IS%20Subcontractor%20Payment%20Information.pdf

RF-1 *DBE Replacement Request Form* - Form for replacing a committed DBE.

https://connect.ncdot.gov/projects/construction/Construction%20Forms/DBE%20MBE%20WBE%20Replacement%20Form%20and%20Instructions.pdf

SAF *Subcontract Approval Form* - Form required for approval to sublet the contract.

https://connect.ncdot.gov/projects/construction/Construction%20Forms/SAF%20Form%20-%20Subcontract%20Approval%20Form%20Revised%2004-19.xlsm

JC-1 *Joint Check Notification Form* - Form and procedures for joint check notification. The form acts as a written joint check agreement among the parties providing full and prompt disclosure of the expected use of joint checks.

http://connect.ncdot.gov/projects/construction/Construction%20Forms/Joint%20Check%20Notification%20Form.pdf

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Letter of Intent - Form signed by the Contractor and the DBE subcontractor, manufacturer or regular dealer that affirms that a portion of said contract is going to be performed by the signed DBE for the estimated amount (based on quantities and unit prices) listed at the time the Price Proposal is submitted.

http://connect.ncdot.gov/letting/LetCentral/Letter%20of%20Intent%20to%20Perform%20as%20a%20Subcontractor.pdf

Listing of DBE Subcontractors Form - Form for entering DBE subcontractors on a project that will meet this DBE goal contained elsewhere in this RFP.

http://connect.ncdot.gov/municipalities/Bid%20Proposals%20for%20LGA%20Content/08%20DBE%20Subcontractors%20(Federal).docx

Subcontractor Quote Comparison Sheet - Spreadsheet for showing all subcontractor quotes in the work areas where DBEs quoted on the project. This sheet is submitted with good faith effort packages.

http://connect.ncdot.gov/business/SmallBusiness/Documents/DBE%20Subcontractor%20Quote%20Comparison%20Example.xls

DBE Goal

There is NO goal for participation by Disadvantaged Business Enterprises for this contract.

The following DBE goal for participation by Disadvantaged Business Enterprises is established for this contract:

Disadvantaged Business Enterprises

(A) *If the DBE goal is more than zero*, the Design-Build Team shall exercise all necessary and reasonable steps to ensure that DBEs participate in at least the percent of the contract as set forth above as the DBE goal.

(B) *If the DBE goal is zero*, the Design-Build Team shall make an effort to recruit and use DBEs during the performance of the contract. Any DBE participation obtained shall be reported to the Department.

Directory of Transportation Firms (Directory)

Real-time information is available about firms doing business with the Department and firms that are certified through NCUCP in the Directory of Transportation Firms. Only firms identified in the Directory as DBE certified shall be used to meet the DBE goal. The Directory can be found at the following link.

https://www.ebs.nc.gov/VendorDirectory/default.html

The listing of an individual firm in the directory shall not be construed as an endorsement of the firm's capability to perform certain work.

Listing of DBE Subcontractors

At the time the Price Proposal is submitted, Proposers shall submit all DBE participation that they anticipate to use during the life of the contract. Only those identified to meet the DBE goal will be considered committed, even though the listing shall include both committed DBE subcontractors and additional DBE subcontractors. Additional DBE subcontractor participation submitted at the time the Price Proposal is submitted will be used toward the Department's overall race-neutral goal. Only those firms with current DBE certification at the time of Price Proposal opening will be acceptable for listing in the Proposer's submittal of DBE participation. The Design-Build Team shall indicate the following required information:

(1) *If the DBE goal is more than zero,*

(a) Proposers, at the time the Price Proposal is submitted, shall submit a listing of DBE participation, including the names and addresses on *Listing of DBE Subcontractors* contained elsewhere in the contract documents in order for the Price Proposal to be considered responsive. Proposers shall indicate the total dollar value of the DBE participation for the contract.

(b) If Proposers have no DBE participation, they shall indicate this on the *Listing of DBE Subcontractors* by entering the word "None" or the number "0." This form shall be completed in its entirety. **Blank forms will not be deemed to represent zero participation**. Price Proposals submitted that do not have DBE participation indicated on the appropriate form will not be read publicly during the opening of the Price Proposals. The Department will not consider these Price Proposals for award and the proposal will be rejected.

(c) The Proposer shall be responsible for ensuring that the DBE is certified at the time the Price Proposal is submitted by checking the Directory of Transportation Firms. If the firm is not certified at the time of the opening of the Price Proposals, that DBE's participation will not count towards achieving the corresponding goal.

(2) *If the DBE goal is zero*, entries on the *Listing of DBE Subcontractors* are not required for the zero goal, however any DBE participation that is achieved during the project shall be reported in accordance with requirements contained elsewhere in this special provision.

DBE Prime Contractor

When a certified DBE firm proposes on a contract that contains a DBE goal, the DBE firm is responsible for meeting the goal or making good faith efforts to meet the goal, just like any other proposer. In most cases, a DBE proposer on a contract will meet the DBE goal by virtue of the work it performs on the contract with its own forces. However, all the work that is performed by the DBE proposer and any other DBE subcontractors will count toward the DBE goal. The DBE proposer shall list itself along with any DBE subcontractors, if any, in order to receive credit toward the DBE goal.

For example, if the DBE goal is 45.0% and the DBE proposer will only perform 40.0% of the contract work, the prime will list itself at 40.0%, and the additional 5.0% shall be obtained through additional DBE participation with DBE subcontractors or documented through a good faith effort.

DBE Prime Contractors shall also follow Sections A and B listed under *Listing of DBE Subcontractor* just as a non-DBE proposer would.

Written Documentation - Letter of Intent

The Proposer shall submit written documentation for each DBE that will be used to meet the DBE goal of the contract, indicating the Proposer's commitment to use the DBE in the contract. This documentation shall be submitted on the Department's form titled *Letter of Intent*.

The documentation shall be received in the office of the State Contractor Utilization Engineer or at DBE@ncdot.gov no later than 10:00 a.m. on the sixth calendar day following opening of Price Proposals, unless the sixth day falls on an official state holiday. In that situation, it is due in the office of the State Contractor Utilization Engineer no later than 10:00 a.m. on the next official state business day.

If the Proposer fails to submit the Letter of Intent from each committed DBE to be used toward the DBE goal, or if the form is incomplete (e.g., both signatures are not present), the DBE participation will not count toward meeting the DBE goal. If the lack of this participation drops the commitment below the DBE goal, the Design-Build Team shall submit evidence of good faith efforts, completed in its entirety, to the State Contractor Utilization Engineer or DBE@ncdot.gov no later than 10:00 a.m. on the eighth calendar day following opening of the Price Proposals, unless the eighth day falls on an official state holiday. In that situation, it is due in the office of the State Contractor Utilization Engineer no later than 10:00 a.m. on the next official state business day.

Submission of Good Faith Effort

If the Proposer fails to meet or exceed the DBE goal the Proposer with the apparent adjusted low price shall submit to the Department documentation of adequate good faith efforts made to reach the DBE goal.

A hard copy and an electronic copy of this information shall be received in the office of the State Contractor Utilization Engineer or at DBE@ncdot.gov no later than 10:00 a.m. on the sixth calendar day following opening of the Price Proposals unless the sixth day falls on an official state holiday. In that situation, it is due in the office of the State Contractor Utilization Engineer no later than 10:00 a.m. on the next official state business day. If the Design-Build Team cannot send the information electronically, then one complete set and five copies of this information shall be received under the same time constraints above.

Note: Where the information submitted includes repetitious solicitation letters, it will be acceptable to submit a representative letter along with a distribution list of the firms that were solicited. Documentation of DBE quotations shall be a part of the good faith effort submittal. This documentation may include written subcontractor quotations, telephone log notations of verbal quotations, or other types of quotation documentation.

Consideration of Good Faith Effort for Projects with DBE Goals More Than Zero

Adequate good faith efforts mean that the Proposer took all necessary and reasonable steps to achieve the goal which, by their scope, intensity, and appropriateness, could reasonably be expected to obtain sufficient DBE participation. Adequate good faith efforts also mean that the Proposer actively and aggressively sought DBE participation. Mere *pro forma* efforts are not considered good faith efforts.

The Department will consider the quality, quantity, and intensity of the different kinds of efforts a Proposer has made. Listed below are examples of the types of actions a proposer will take in making a good faith effort to meet the goal and are not intended to be exclusive or exhaustive, nor is it intended to be a mandatory checklist.

(A) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising, written notices, use of verifiable electronic means through the use of the NCDOT Directory of Transportation Firms) the interest of all certified DBEs who have the capability to perform the work of the contract. The Proposer must solicit this interest within at least ten days prior to the opening of the Price Proposals to allow the DBEs to respond to the solicitation. Solicitation shall provide the opportunity to DBEs within the Division and surrounding Divisions where the project is located. The Proposer must determine with certainty if the DBEs are interested by taking appropriate steps to follow up initial solicitations.

(B) Selecting portions of the work to be performed by DBEs in order to increase the likelihood that the DBE goals will be achieved.

(1) Where appropriate, break out contract work items into economically feasible units to facilitate DBE participation, even when the Prime Contractor might otherwise prefer to perform these work items with its own forces.

(2) Negotiate with subcontractors to assume part of the responsibility to meet the contract DBE goal when the work to be sublet includes potential for DBE participation (2^{nd} and 3^{rd} tier subcontractors).

(C) Providing interested DBEs with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

(D) (1) Negotiating in good faith with interested DBEs. It is the Proposer's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBEs to perform the work.

(2) A proposer using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBEs is not in itself sufficient reason for a proposer's failure to meet the contract DBE goal, as long as such costs are reasonable. Also, the ability or desire of a Prime Contractor to perform the work of a contract with its own organization does not relieve the Proposer of the responsibility to make good faith efforts. Proposing Design-Build Teams are not, however, required to accept higher quotes from DBEs if the price difference is excessive or unreasonable.

(E) Not rejecting DBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The Proposer's standing within its industry, membership in specific groups, organizations, or associates and political or social affiliations (for example, union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the Proposer's efforts to meet the project goal.

(F) Making efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or proposer.

(G) Making efforts to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.

(H) Effectively using the services of available minority / women community organizations; minority / women contractors' groups; Federal, State, and local minority / women business

assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBEs. Contact within seven days from the Price Proposals opening the Business Opportunity and Work Force Development Unit at BOWD@ncdot.gov to give notification of the Proposer's inability to get DBE quotes.

(I) Any other evidence that the Proposer submits which shows that the Proposer has made reasonable good faith efforts to meet the DBE goal.

In addition, the Department may take into account the following:

(1) Whether the Proposer's documentation reflects a clear and realistic plan for achieving the DBE goal.

(2) The Proposer's past performance in meeting the DBE goals.

(3) The performance of other proposers in meeting the DBE goal. For example, when the Proposer with the apparent adjusted low price fails to meet the DBE goal, but others meet it, you may reasonably raise the question of whether, with additional reasonable efforts the Proposer with the apparent adjusted low price could have met the goal. If the Proposer with the apparent adjusted low price fails to meet the DBE goal, but meets or exceeds the average DBE participation obtained by other proposers, the Department may view this, in conjunction with other factors, as evidence of the Proposer with the apparent adjusted low price having made a good faith effort.

If the Department does not award the contract to the Proposer with the apparent adjusted low price, the Department reserves the right to award the contract to the Proposer with the next apparent adjusted low price that can satisfy the Department that the DBE goal can be met or that an adequate good faith effort has been made to meet the DBE goal.

Non-Good Faith Appeal

The State Prequalification Engineer will notify the Design-Build Team verbally and in writing of non-good faith. A Design-Build Team may appeal a determination of non-good faith made by the Goal Compliance Committee. If a Design-Build Team wishes to appeal the determination made by the Committee, they shall provide written notification to the State Prequalification Engineer or at DBE@ncdot.gov. The appeal shall be made within two business days of notification of the determination of non-good faith.

Counting DBE Participation Toward Meeting DBE Goal

(A) Participation

The total dollar value of the participation by a committed DBE will be counted toward the contract goal requirement. The total dollar value of participation by a committed DBE will

be based upon the value of work actually performed by the DBE and the actual payments to DBE firms by the Design-Build Team.

(B) Joint Checks

Prior notification of joint check use shall be required when counting DBE participation for services or purchases that involves the use of a joint check. Notification shall be through submission of Form JC-1 *(Joint Check Notification Form)* and the use of joint checks shall be in accordance with the Department's Joint Check Procedures.

(C) Subcontracts (Non-Trucking)

A DBE may enter into subcontracts. Work that a DBE subcontracts to another DBE firm may be counted toward the contract goal requirement. Work that a DBE subcontracts to a non-DBE firm does not count toward the contract goal requirement. If a DBE contractor or subcontractor subcontracts a significantly greater portion of the work of the contract than would be expected on the basis of standard industry practices, it shall be presumed that the DBE is not performing a commercially useful function. The DBE may present evidence to rebut this presumption to the Department. The Department's decision on the rebuttal of this presumption is subject to review by the Federal Highway Administration but is not administratively appealable to USDOT.

(D) Joint Venture

When a DBE performs as a participant in a joint venture, the Design-Build Team may count toward its contract goal requirement a portion of the total value of participation with the DBE in the joint venture, that portion of the total dollar value being a distinct clearly defined portion of work that the DBE performs with its forces.

(E) Suppliers

A Design-Build Team may count toward its DBE requirement 60.0 percent of its expenditures for materials and supplies required to complete the contract and obtained from a DBE regular dealer and 100.0 percent of such expenditures from a DBE manufacturer.

(F) Manufacturers and Regular Dealers

A Design-Build Team may count toward its DBE requirement the following expenditures to DBE firms that are not manufacturers or regular dealers:

(1) The fees or commissions charged by a DBE firm for providing a *bona fide* service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a DOT-assisted contract, provided the fees or commissions are determined to be reasonable and not excessive as compared with fees and commissions customarily allowed for similar services.

(2) With respect to materials or supplies purchased from a DBE, which is neither a manufacturer nor a regular dealer, 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 materials or supplies required on a job site (but not the cost of the materials and supplies themselves), provided the fees are determined to be reasonable and not excessive as compared with fees customarily allowed for similar services.

Commercially Useful Function

(A) DBE Utilization

The Design-Build Team may count toward its contract goal requirement only expenditures to DBEs that perform a commercially useful function in the work of a contract. 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 shall also be responsible with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material and installing (where applicable) and paying for the material itself. To determine whether a DBE is performing a commercially useful function, the Department will evaluate the amount of work subcontracted, industry practices, whether 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 any other relevant factors.

(B) DBE Utilization in Trucking

The following factors will be used to determine if a DBE trucking firm is performing a commercially useful function:

(1) The DBE shall be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there shall not be a contrived arrangement for the purpose of meeting DBE goals.

(2) The DBE shall itself own and operate at least one fully licensed, insured, and operational truck used on the contract.

(3) The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.

(4) The DBE may subcontract the work to another DBE firm, including an owner-operator who is certified as a DBE. The DBE who subcontracts work to another DBE receives credit for the total value of the transportation services the subcontracted DBE provides on the contract.

(5) The DBE may also subcontract the work to a non-DBE firm, including from an owner-operator. The DBE who subcontracts the work to a non-DBE is entitled to credit for the total value of transportation services provided by the non-DBE subcontractor not to exceed the value of transportation services provided by DBE-owned trucks on the contract. Additional participation by non-DBE subcontractors receives credit only for the fee or commission it receives as a result of the subcontract arrangement. The value of services performed under subcontract agreements between the DBE and the Design-Build Team will not count towards the DBE contract requirement.

(6) A DBE may lease truck(s) from an established equipment leasing business open to the general public. The lease must indicate that the DBE has exclusive use of and control over the truck. This requirement 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. This type of lease may count toward the DBE's credit as long as the driver is under the DBE's payroll.

(7) Subcontracted / leased trucks shall clearly display on the dashboard the name of the DBE that they are subcontracted / leased to and their own company name if it is not identified on the truck itself. Magnetic door signs are not permitted.

DBE Replacement

When a Design-Build Team has relied on a commitment to a DBE subcontractor (or an approved substitute DBE subcontractor) to meet all or part of a contract goal requirement, the Design-Build Team shall not terminate the DBE for convenience. This includes, but is not limited to, instances in which the Design-Build Team seeks to perform the work of the terminated subcontractor with another DBE subcontractor, a non-DBE subcontractor, or with the Contractor's own forces or those of an affiliate.

The Design-Build Team must give notice in writing both by certified mail and e-mail to the DBE subcontractor, with a copy to the Engineer of its intent to request to terminate and / or substitute, and the reason for the request. The Design-Build Team must give the DBE subcontractor five (5) business days to respond to the Design-Build Team's notice of intent to request termination and / or substitution. If the DBE subcontractor objects to the intended termination / substitution, the DBE, within five (5) business days, must advise the Design-Build Team and the Department of the reasons why the action should not be approved. The five-day notice period shall begin on the next business day after written notice is provided to the DBE subcontractor.

A committed DBE subcontractor may only be terminated after receiving the Department's written approval based upon a finding of good cause for the proposed termination and / or substitution. For purposes of this section, good cause shall include the following circumstances:

(a) The listed DBE subcontractor fails or refuses to execute a written contract.

(b) The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the Prime Contractor.

(c) The listed DBE subcontractor fails or refuses to meet the Prime Contractor's reasonable, nondiscriminatory bond requirements.

(d) The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness.

(e) The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant to 2 CFR Parts 180, 215 and 1,200 or applicable state law.

(f) The listed DBE subcontractor is not a responsible contractor.

(g) The listed DBE voluntarily withdraws from the project and provides written notice of withdrawal.

(h) The listed DBE is ineligible to receive DBE credit for the type of work required.

(i) A DBE owner dies or becomes disabled with the result that the listed DBE contractor is unable to complete its work on the contract.

(j) Other documented good cause that compels the termination of the DBE subcontractor. Provided, that good cause does not exist if the Prime Contractor seeks to terminate a DBE it relied upon to obtain the contract so that the Prime Contractor can self-perform the work for which the DBE contractor was engaged or so that the Prime Contractor can substitute another DBE or non-DBE contractor after contract award.

The Design-Build Team shall comply with the following for replacement of a committed DBE:

(A) Performance Related Replacement

When a committed DBE is terminated for good cause as stated above, an additional DBE that was submitted at the time the Price Proposal was submitted may be used to fulfill the DBE commitment. A good faith effort will only be required for removing a committed DBE if there were no additional DBEs submitted at the time the Price Proposal was submitted to cover the same amount of work as the DBE that was terminated.

If a replacement DBE is not found that can perform at least the same amount of work as the terminated DBE, the Design-Build Team shall submit a good faith effort documenting the steps taken. Such documentation shall include, but not be limited to, the following:

(1) Copies of written notification to DBEs that their interest is solicited in contracting the work defaulted by the previous DBE or in subcontracting other items of work in the contract.

(2) Efforts to negotiate with DBEs for specific subbids including, at a minimum:

(a) The names, addresses, and telephone numbers of DBEs who were contacted.
(b) A description of the information provided to DBEs regarding the plans and specifications for portions of the work to be performed.

(3) A list of reasons why DBE quotes were not accepted.

(4) Efforts made to assist the DBEs contacted, if needed, in obtaining bonding or insurance required by the Design-Build Team.

(B) Decertification Replacement

(1) When a committed DBE is decertified by the Department after the SAF (*Subcontract Approval Form*) has been received by the Department, the Department will not require the Design-Build Team to solicit replacement DBE participation equal to the remaining work to be performed by the decertified firm. The participation equal to the remaining work performed by the decertified firm will count toward the contract goal requirement.

(2) When a committed DBE is decertified prior to the Department receiving the SAF (*Subcontract Approval Form*) for the named DBE firm, the Design-Build Team shall take all necessary and reasonable steps to replace the DBE subcontractor with another DBE subcontractor to perform at least the same amount of work to meet the DBE goal requirement. If a DBE firm is not found to do the same amount of work, a good faith effort must be submitted to NCDOT (See A herein for required documentation).

(3) Exception: If the DBE's ineligibility is caused solely by its having exceeded the size standard during the performance of the contract, the Department will not require the Design-Build Team to solicit replacement DBE participation equal to the remaining work to be performed by the decertified firm. The participation equal to the remaining work performed by the decertified firm will count toward the contract goal requirement and Department’s overall race-neutral goals.

All requests for replacement of a committed DBE firm shall be submitted to the Engineer for approval on Form RF-1 (DBE Replacement Request). If the Prime Contractor or any affiliated companies within the Design-Build Team fails to follow this procedure they may be disqualified from further bidding for a period of up to six months.

Changes in the Work

When the Engineer makes changes that result in the reduction or elimination of work to be performed by a committed DBE, the Design-Build Team will not be required to seek additional participation. When the Engineer makes changes that result in additional work to be performed by a DBE based upon the Design-Build Team's commitment, the DBE shall participate in additional work to the same extent as the DBE participated in the original contract work.

When the Engineer makes changes that result in extra work, which has more than a minimal impact on the contract amount, the Design-Build Team shall seek additional participation by DBEs unless otherwise approved by the Engineer.

When the Engineer makes changes that result in an alteration of plans or details of construction, and a portion or all of the work had been expected to be performed by a committed DBE, the Design-Build Team shall seek participation by DBEs unless otherwise approved by the Engineer.

When the Design-Build Team requests changes in the work that result in the reduction or elimination of work that the Design-Build Team committed to be performed by a DBE, the Design-Build Team shall seek additional participation by DBEs equal to the reduced DBE participation caused by the changes.

Reports and Documentation

A SAF (*Subcontract Approval Form*) shall be submitted for all work which is to be performed by a DBE subcontractor. The Department reserves the right to require copies of actual subcontract agreements involving DBE subcontractors.

When using transportation services to meet the contract commitment, the Design-Build Team shall submit a proposed trucking plan in addition to the SAF. The plan shall be submitted prior to beginning construction on the project. The plan shall include the names of all trucking firms proposed for use, their certification type(s), the number of trucks owned by the firm, as well as the individual truck identification numbers, and the line item(s) being performed.

Within 30 calendar days of entering into an agreement with a DBE for materials, supplies or services, not otherwise documented by the SAF as specified above, the Design-Build Team shall furnish the Engineer a copy of the agreement. The documentation shall also indicate the percentage (60.0% or 100.0%) of expenditures claimed for DBE credit.

Reporting Disadvantaged Business Enterprise Participation

The Design-Build Team shall provide the Engineer with an accounting of payments made to all DBE firms, including material suppliers and contractors at all levels (prime, subcontractor, or second tier subcontractor). This accounting shall be furnished to the Engineer for any given month by the end of the following month. Failure to submit this information accordingly may result in the following action:

(A) Withholding of money due in the next partial pay estimate; or

(B) Removal of an approved Prime Contractor or other affiliated companies within the Design-Build Team from the prequalified bidders' list or the removal of other entities from the approved subcontractors list.

While each contractor (prime, subcontractor, 2nd tier subcontractor) is responsible for accurate accounting of payments to DBEs, it shall be the Prime Contractor's responsibility to report all monthly and final payment information in the correct reporting manner.

Failure on the part of the Design-Build Team to submit the required information in the time frame specified may result in the disqualification of that Prime Contractor and any affiliate companies within the Design-Build Team from further bidding until the required information is submitted.

Failure on the part of any subcontractor to submit the required information in the time frame specified may result in the disqualification of that Prime Contractor or any affiliate companies within the Design-Build Team from being approved for work on future NCDOT projects until the required information is submitted.

Design-Build Teams reporting transportation services provided by non-DBE lessees shall evaluate the value of services provided during the month of the reporting period only.

At any time, the Engineer can request written verification of subcontractor payments.

The Design-Build Team shall report the accounting of payments through the Department's DBE Payment Tracking System.

Failure to Meet Contract Requirements

Failure to meet contract requirements in accordance with Subarticle 102-15(J) of the *Standard Specifications* may be cause to disqualify the Prime Contractor or any affiliated companies within the Design-Build Team from further bidding for a specified length of time.

CERTIFICATION FOR FEDERAL-AID CONTRACTS

(3-21-90) DB1 G85

The Proposer certifies, by signing and submitting a Design-Build Proposal, to the best of his or her knowledge and belief, that:

(1) 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.

(2) 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.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by *Section 1352, Title 31, U.S. Code*. 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.

The Proposer also agrees by submitting a Design-Build Proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such sub-recipients shall certify and disclose accordingly.

CONTRACTOR'S LICENSE REQUIREMENTS

(7-1-95) DB1 G88

If the Design-Build Team does not hold the proper license to perform any plumbing, heating, air conditioning, or electrical work in this contract, he shall sublet such work to a contractor properly licensed in accordance with Article 2 of Chapter 87 of the General Statutes (licensing of heating, plumbing, and air conditioning contractors) and Article 4 of Chapter 87 of the General Statutes (licensing of electrical contractors).

USE OF UNMANNED AIRCRAFT SYSTEM (UAS)

(1-16-24)(Rev. 3-17-26) DB1 G092

The Design-Build Team shall adhere to all Federal, State and Local regulations and guidelines for the use of Unmanned Aircraft Systems (UAS). This includes but is not limited to US 14 CFR Part 107, NC GS 15A-300, American Security Drone Act of 2023 (ASDA), Office of Management and Budget (OMB) Memorandum M-26-02, all FAA rules, regulations and policies and all NCDOT UAS Policies. The required operator certifications include possessing a current Federal Aviation Administration (FAA) Remote Pilot Certificate, as well as operating a UAS registered with the FAA.

All UAS operations shall be approved by the Engineer prior to beginning the operations.

All contractors or subcontractors operating UAS shall have UAS specific general liability insurance to cover all operations under this contract.

The use of UAS is at the Contractor’s discretion. No measurement or payment will be made for the use of UAS. In the event that the Department directs the Contractor to utilize UAS, payment will be in accordance with Article 104-7 Extra Work.

CONSTRUCTION EQUIPMENT EMISSIONS

(1-3-22) DB1 G94

Reporting Requirements

During construction, within 60 days after the end of each calendar year, the Design-Build Team shall submit to the Department a list of non-road diesel-powered construction equipment that was used for construction work for more than 40 hours during that calendar year. Such list shall be submitted each year through the final acceptance of the project. The list shall be submitted on a form supplied by the Department and shall include the following information for each applicable piece of non-road construction equipment:

- Equipment type and manufacturer
- Engine manufacturer and model
- Engine model number
- Engine family name and model year
- Engine horsepower or kilowatts
- Engine serial number
- Engine EPA Tier number

The submittal shall include the Tier (0, 1, 2, 3 or 4) Non-road Exhaust Emission Standard that the equipment's engine currently satisfies in accordance with EPA current standards. In accordance with the requirements above, the Design-Build Team shall update and submit this list annually.

Failure to provide the equipment list by the timeframe provided above may result in the Department withholding money from the Design-Build Team due for work performed by that entity in the next partial payment until the necessary assurances are made consistent with this project special provision.

Minimum Tier Requirements

A minimum of fifty percent (50.0%) of the reported construction equipment used on the project must meet Tier 4 or Tier 4i requirements.

Incentive

The Department will pay a Fifty Thousand and 0/100 Dollars ($50,000.00) incentive to the Design-Build Team if, at the conclusion of the project, each calendar year's report reflects that both items below were accomplished:

(1) More than seventy-five percent (75.0%) of the total number of pieces of applicable construction equipment used on the project met Tier 4 Final requirements, and
(2) Less than twenty-five percent (25.0%) of the total number of pieces of applicable construction equipment used on the project was categorized as Tier 0 or 1.

Exclusions

A piece of applicable construction equipment operated by DBE firms (federally funded projects) or MBE / WBE firms (state funded projects) may be excluded from the Reporting Requirements and Minimum Tier Requirements Sections of this project special provision, provided the applicable piece of equipment meets at least the Tier 1 requirements. However, to be eligible for the incentive, the Design-Build Team must include all of these firms' applicable construction equipment in the percentage calculations provided in the Incentive Section of this project special provision.

Regardless of Tier level, cranes shall be subject to the Reporting Requirements Section of this project special provision. However, any crane may be excluded from the calculations provided under the Minimum Tier Requirements and Incentive Sections of this project special provision, provided that crane meets Tier 1 or higher requirements.

U.S. DEPARTMENT OF TRANSPORTATION HOTLINE

(8-18-22) 108-5 DB1 G100

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

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

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

SUBSURFACE INFORMATION

(10-2-20) DB1 G112C

Available subsurface information will be provided on this project. The Design-Build Team shall be responsible for additional investigations and for verifying the accuracy of the subsurface information supplied by the Department.

COOPERATION BETWEEN CONTRACTORS

(7-1-95) (Rev. 1-16-24) DB1 G133

The Design-Build Team's attention is directed to Article 105-7 of the 2*Standard Specifications*.

- Project U-2719 is located east of, and adjacent to, Project I-5703 on I-440. Project U-2719 is ongoing and nearing project completion.

- Project HP-0003 is located approximately 0.5 miles north of Project I-5703 on I-40. Project HP-0003 has an anticipated July 2040 Let date.

- Project HL-0050 is located approximately 0.3 miles south of Project I-5701 on SR 1319 (Jones Franklin Road). Project HL-0050 has an anticipated July 2026 Let date.

- Project B-5130 is located approximately 0.4 miles north of Project I-5701 on SR 1321 (Avent Ferry Road). Project B-5130 has an anticipated July 2032 Let date.
-

The Design-Build Team on this project shall cooperate with the Contractor or Design-Build Team working within or adjacent to the limits of this project, to the extent that the work can be carried out to the best advantage of all concerned.

BID DOCUMENTATION

(7-31-12) (Rev. 8-20-24) DB1 G142

General

The successful Design-Build Team shall submit the original, unaltered bid documentation or a certified copy of the original, unaltered bid documentation used to prepare the Price Proposal for this contract to the Department within ten days after receipt of notice of award of contract. Such documentation shall be placed in escrow with a banking institution or other bonded document storage facility selected by the Department.

The Department will not execute the contract until the original, unaltered bid documentation or a certified copy of the original, unaltered bid documentation has been received by the Department.

Terms

Bid Documentation - Bid Documentation shall mean all written information, working papers, computer printouts, electronic media, charts, and all other data compilations which contain or reflect information, data, and calculations used by the Proposer in the preparation of the Price Proposal. The term *bid documentation* includes, but is not limited to, Design-Build Team equipment rates, Design-Build Team overhead rates, labor rates, efficiency or productivity factors, arithmetical calculations, and quotations from subcontractors and material suppliers to the extent that such rates and quotations were used by the Proposer in formulating and determining the Price Proposal. The term *bid documentation* also includes any manuals, which are standard to the industry used by the Proposer in determining the Price Proposal. Such manuals may be included in the bid documentation by reference. Such reference shall include the name and date of the publication and the publisher. *Bid Documentation* does not include bid documents provided by the Department for use by the Proposer in bidding on this project. The Bid Documentation can be in the form of electronic submittal (i.e. thumb drive) or paper. If the Bidder elects to submit the Bid Documentation in electronic format, the Department requires a backup submittal (i.e. a second thumb drive) in case one is corrupted.

Design-Build Team's Representative - Officer of the Prime Contractor's company; if not an officer, the Contractor shall supply a letter signed and notarized by an officer of the Prime Contractor's company, granting permission for the representative to sign the escrow agreement on behalf of the Prime Contractor.

Escrow Agent - Officer of the select banking institution or other bonded document storage facility authorized to receive and release bid documentation.

Escrow Agreement Information

A draft copy of the Escrow Agreement will be mailed to the Proposer after the notice of award for informational purposes. The Proposer and Department will sign the actual Escrow Agreement at the time the bid documentation is delivered to the Escrow Agent.

Failure to Provide Bid Documentation

The Proposer's failure to provide the original, unaltered bid documentation or a certified copy of the original, unaltered bid documentation within 14 days after the notice of award is received by him may be just cause for rescinding the award of the contract and may result in the removal of the Proposer from the Department's list of qualified bidders for a period of up to 180 days. Award may then be made to the Proposer with the next lowest adjusted price or the work may be readvertised and constructed under the contract or otherwise, as the Department may decide.

Submittal of Bid Documentation

(A) Appointment - Email **specs@ncdot.gov** or call 919.707.6900 to schedule an appointment.

(B) Delivery - A representative of the Bidder shall deliver the original, unaltered bid documentation or a certified copy of the original, unaltered bid documentation to the Department, in a container suitable for sealing, within ten days after the notice of award is received.

(C) Packaging - The container shall be no larger than 15.5 inches in length by 12 inches wide by 11 inches high and shall be water resistant. The container shall be clearly marked on the face and the back of the container with the following information: Bid Documentation, Bidder's Name, Bidder's Address, Date of Escrow Submittal, Contract Number, TIP Number if applicable, and County.

Affidavit

Bid documentation will be considered a certified copy if the proposer includes an affidavit stating that the enclosed documentation is an EXACT copy of the original documentation used by the Proposer to determine the bid for this project. The affidavit shall also list each bid document with sufficient specificity so a comparison may be made between the list and the bid documentation to ensure that all of the bid documentation listed in the affidavit has been enclosed for escrow. The affidavit shall attest that the affiant has personally examined the bid documentation, that the affidavit lists all of the documents used by the proposer to determine the bid for this project, and that all bid documentation has been included. The affidavit shall be signed by a chief officer of the company, have the person's name and title typed below the signature, and the signature shall be notarized at the bottom of the affidavit.

Verification

Upon delivery of the bid documentation, the State Contract Officer acting directly or through a duly authorized representative and the Design-Build Team's representative will verify the accuracy and completeness of the bid documentation compared to the affidavit. Should a discrepancy exist, the Design-Build Team's representative shall immediately furnish the State Contract Officer acting directly or through a duly authorized representative with any other needed bid documentation. The State Contract Officer acting directly or through a duly authorized representative upon determining that the bid documentation is complete will, in the presence of the Design-Build Team's representative, immediately place the complete bid documentation and affidavit in the container and seal it. Both parties will deliver the sealed container to the Escrow Agent for placement in a safety deposit box, vault, or other secure accommodation.

Confidentiality of Bid Documentation

The bid documentation and affidavit in escrow are, and will remain, the property of the Proposer. The Department has no interest in, or right to, the bid documentation and affidavit other than to verify the contents and legibility of the bid documentation unless the Design-Build Team gives written notice of intent to file a claim, files a written claim, files a written and verified claim, or initiates litigation against the Department. In the event of such written notice of intent to file a claim, filing of a written claim, filing a written and verified claim, or initiation of litigation against the Department, or receipt of a letter from the Design-Build Team authorizing release, the bid documentation and affidavit may become the property of the Department for use in considering any claim or in litigation as the Department may deem appropriate.

Any portion or portions of the bid documentation designated by the Proposer as a *trade secret* at the time the bid documentation is delivered to the State Contract Officer acting directly or through a duly authorized representative shall be protected from disclosure as provided by *G.S. 132-1.2*.

Duration and Use

The bid documentation and affidavit shall remain in escrow until 60 calendar days from the time the Prime Contractor receives the final estimate; or until such time as the Design-Build Team:

(A) Gives written notice of intent to file a claim,
(B) Files a written claim,
(C) Files a written and verified claim,
(D) Initiates litigation against the Department related to the contract; or
(E) Authorizes in writing its release.

Upon the giving of written notice of intent to file a claim, filing a written claim, filing a written and verified claim, or the initiation of litigation by the Design-Build Team against the Department, or receipt of a letter from the Design-Build Team authorizing release, the Department may obtain the release and custody of the bid documentation.

The Proposer certifies and agrees that the sealed container placed in escrow contains all of the bid documentation used to determine the Price Proposal and that no other bid documentation shall be relevant or material in litigation over claims brought by the Design-Build Team arising out of this contract.

Release of Bid Documentation to the Contractor

If the bid documentation remains in escrow 60 calendar days after the time the Design-Build Team receives the final estimate and the Design-Build Team has not filed a written claim, filed a written and verified claim, or has not initiated litigation against the Department related to the contract, the Department will instruct the Escrow Agent to release the sealed container to the Prime Contractor.

The Prime Contractor will be notified by certified letter from the Escrow Agent that the bid documentation will be released to the Prime Contractor. The Prime Contractor or his representative shall retrieve the bid documentation from the Escrow Agent within 30 days of the receipt of the certified letter. If the Prime Contractor does not receive the documents within 30 days of the receipt of the certified letter, the Department will contact the Prime Contractor to determine final dispersion of the bid documentation.

Payment

The cost of the escrow will be borne by the Department. There will be no separate payment for all costs of compilation of the data, container, or verification of the bid documentation. Payment at the various contract unit or lump sum prices in the contract will be full compensation for all such costs.

TWELVE-MONTH GUARANTEE

(7-15-03) DB1 G145

(A) The Design-Build Team shall guarantee materials and workmanship against latent and patent defects arising from faulty materials, faulty workmanship or negligence for a period of twelve months following the date of final acceptance of the work and shall replace such defective materials and workmanship without cost to the Department. The Design-Build Team will not be responsible for damage due to normal wear and tear, for negligence on the part of the Department, and / or for use in excess of the design.

(B) Where items of equipment or material carry a manufacturer's guarantee for any period in excess of twelve months, then the manufacturer's guarantee shall apply for that particular piece of equipment or material. The Department's first remedy shall be through the manufacturer, although the Design-Build Team shall be responsible for invoking the warranted repair work with the manufacturer. The Design-Build Team's responsibility shall be limited to the terms of the manufacturer's guarantee. NCDOT shall be afforded the same warranty as provided by the manufacturer.

This guarantee provision shall be invoked only for major components of work in which the Design-Build Team would be wholly responsible for under the terms of the contract. Examples include pavement structures, bridge components and sign structures. This provision will not be used as a

mechanism to force the Design-Build Team to return to the project to make repairs or perform additional work that the Department would normally compensate the Design-Build Team for. In addition, routine maintenance activities (e.g., mowing grass, debris removal, ruts in earth shoulders, etc.) are not parts of this guarantee.

Appropriate provisions of the payment and / or performance bonds shall cover this guarantee for the project. In addition, failure on the part of the responsible entity(ies) of the Design-Build Team to perform guarantee work within the terms of this provision shall be just cause to remove the responsible entity(ies) from the Department's corresponding prequalified list. The Design-Build Team shall be removed for a minimum of six months and will be reinstated only after all work has been corrected and the Design-Build Team requests reinstatement in writing.

To ensure uniform application statewide, the Division Engineer will forward details regarding the circumstances surrounding any proposed guarantee repairs to the Chief Engineer for review and approval prior to the work being performed.

PERMANENT VEGETATION ESTABLISHMENT

(6-11-15) (Rev. 8-18-26) 104 DB01 G0160

Establish permanent vegetation stands of the Long Term Stabilization mixtures identified in the Erosion and Sedimentation Control Scope of Work found elsewhere in this RFP. Beginning with initial vegetation planting and continuing until the Final Completion Date, perform all work necessary to establish permanent vegetation on all erodible areas within the project limits and in borrow and waste pits. Work includes, but is not limited to, erosion control device maintenance and installation, repair seeding and mulching, supplemental seeding and mulching, mowing, and fertilizer topdressing, maintenance and removal of remaining temporary erosion control measures, correction of disturbed areas, and other work necessary to establish permanent vegetation. Perform all work in accordance with the Erosion and Sedimentation Control Scope of Work found elsewhere in this RFP and the applicable sections of the *Standard Specifications*.

Perform all work required for initial vegetation planting as part of the work necessary to satisfy the Construction Completion Date. The period between the Construction Completion Date and the Final Completion Date is the vegetation establishment period as further described in the Contract Times and Liquidated Damages and Intermediate Contract Time Number 1 and Liquidated Damages special provisions found elsewhere in the RFP. During the vegetation establishment period, the Design-Build Team remains responsible for establishing permanent vegetation, maintaining remaining temporary erosion control measures, removing temporary erosion control measures that are no longer needed, and correcting areas disturbed by operations performed in connection with permanent vegetation establishment. During the vegetation establishment period, the Department will be responsible for preparing the required National Pollutant Discharge Elimination System (NPDES) inspection records.

Permanent Vegetation Establishment is achieved when the Engineer determines that exposed soil areas requiring permanent vegetation have reached at least 80 percent vegetation density and no erodible areas remain within the project limits or in borrow and waste pits. Vegetation density means the amount of established vegetation per given area necessary to stabilize the soil.

Once the Engineer has determined that the Permanent Vegetation Establishment requirement has been achieved, remove remaining temporary erosion control measures that are no longer needed. Correct and vegetate areas disturbed by permanent vegetation establishment operations or removal of temporary erosion control measures, whether the disturbance occurs before or after traffic has been placed on the project.

Final Completion is achieved when the requirements of this provision have been satisfied, remaining temporary erosion control measures that are no longer needed have been removed, disturbed areas have been corrected and vegetated, and the work has been accepted by the Department.

No separate payment will be made for Permanent Vegetation Establishment. Include all costs for Permanent Vegetation Establishment in the lump sum price bid for the contract. No additional compensation will be paid for maintaining or removing temporary erosion control measures during the vegetation establishment period.

EROSION & SEDIMENT CONTROL / STORMWATER CERTIFICATION

(1-16-07) (Rev. 10-26-20) 105-16, 225-2, 16 DB1 G180

General

Schedule and conduct construction activities in a manner that will minimize soil erosion and the resulting sedimentation and turbidity of surface waters. Comply with the requirements herein regardless of whether or not a National Pollutant Discharge Elimination System (NPDES) permit for the work is required.

Establish a chain of responsibility for operations and subcontractors' operations to ensure that the *Erosion and Sediment Control / Stormwater Pollution Prevention Plan* is implemented and maintained over the life of the contract.

(A) *Certified Supervisor* - Provide a certified Erosion and Sediment Control / Stormwater (E & SC / SW) Supervisor to manage the Design-Build Team and subcontractor(s) operations, ensure compliance with Federal, State and Local ordinances and regulations, and manage the Quality Control Program.

(B) *Certified Foreman* - Provide a certified, trained foreman for each construction operation that increases the potential for soil erosion or the possible sedimentation and turbidity of surface waters.

(C) *Certified Installer* - Provide a certified installer to install or direct the installation for erosion or sediment / stormwater control practices.

(D) *Certified Designer* - Provide a certified designer for the design of the erosion and sediment control / stormwater component of reclamation plans and, if applicable, for the design of the project erosion and sediment control / stormwater plan.

Roles and Responsibilities

(A) *Certified Erosion and Sediment Control / Stormwater Supervisor* - The Certified Supervisor shall be Level II and shall be responsible for ensuring the erosion and sediment control / stormwater plan is adequately implemented and maintained on the project and for conducting the quality control program. The Certified Supervisor shall be on the project within 24 hours notice from initial exposure of an erodible surface to the project's final acceptance. The Certified Supervisor shall perform the following duties:

(1) Manage Operations - Coordinate and schedule the work of subcontractors so that erosion and sediment control / stormwater measures are fully executed for each operation and in a timely manner over the duration of the contract.

(a) Oversee the work of subcontractors so that appropriate erosion and sediment control / stormwater preventive measures are conformed to at each stage of the work.
(b) Prepare the required National Pollutant Discharge Elimination System (NPDES) Inspection Record and submit to the Engineer.
(c) Attend all weekly or monthly construction meetings to discuss the findings of the NPDES inspection and other related issues.
(d) Implement the erosion and sediment control / stormwater site plans requested.
(e) Provide any needed erosion and sediment control / stormwater practices for the Design-Build Team's temporary work not shown on the plans developed by the Design-Build Team, such as, but not limited to, work platforms, temporary construction, pumping operations, plant and storage yards, and cofferdams.
(f) Acquire applicable permits and comply with requirements for borrow pits, dewatering and any temporary work conducted by the Design-Build Team in jurisdictional areas.
(g) Conduct all erosion and sediment control / stormwater work in a timely and workmanlike manner.
(h) Fully perform and install erosion and sediment control / stormwater work prior to any suspension of the work.
(i) Coordinate with Department, Federal, State and Local Regulatory agencies on resolution of erosion and sediment control / stormwater issues due to the Design-Build Team's operations.
(j) Ensure that proper cleanup occurs from vehicle tracking on paved surfaces and / or any location where sediment leaves the right of way.
(k) Have available a set of erosion and sediment control / stormwater plans that are initialed and include the installation date of Best Management Practices. These practices shall include temporary and permanent groundcover and be properly updated to reflect necessary plan and field changes for use and review by Department personnel, as well as regulatory agencies.

(2) Requirements set forth under the NPDES Permit - The Department's NPDES Stormwater Permit (NCS000250) outlines certain objectives and management measures pertaining to construction activities. The permit references *NCG010000, General Permit to Discharge Stormwater* under the NPDES, and states that the Department shall incorporate the applicable requirements into its delegated Erosion and Sediment Control Program for construction activities disturbing one or more acres of land. The Department further incorporates these requirements on all contracted bridge and culvert work at jurisdictional waters, regardless of size. Some of the requirements shall be, but are not limited to:

(a) Control project site waste to prevent contamination of surface or ground waters of the state, e.g. from equipment operations / maintenance construction materials, concrete washout, chemicals, litter, fuels, lubricants, coolants, hydraulic fluids, any other petroleum products, and sanitary waste.
(b) Inspect erosion and sediment control / stormwater devices and stormwater discharge outfalls at least once every seven calendar days, and within 24 hours after a rainfall event equal to or greater than 1.0 inch that occurs within a 24-hour period. At the discretion of Division of Water Resources personnel, additional monitoring may be required if the receiving stream is 303(d) listed for turbidity and the project has had documented problems managing turbidity.
(c) Maintain an onsite rain gauge or use the Department’s Multi-Sensor Precipitation Estimate website to maintain a daily record of rainfall amounts and dates.
(d) Maintain erosion and sediment control / stormwater inspection records for review by Department and Regulatory personnel upon request.
(e) Implement approved reclamation plans on all borrow pits, waste sites and staging areas.
(f) Maintain a log of turbidity test results as outlined in the Department's Procedure for Monitoring Borrow Pit Discharge.
(g) Provide secondary containment for bulk storage of liquid materials.
(h) Provide training for employees concerning general erosion and sediment control / stormwater awareness, the Department's NPDES Stormwater Permit NCS000250 requirements, and the applicable requirements of the General Permit, NCG010000.
(i) Report violations of the NPDES Permit to the Engineer immediately who will notify the NC Department of Environmental Quality Regional Office within 24 hours of becoming aware of the violation.

(3) Quality Control Program - Maintain a quality control program to control erosion, prevent sedimentation and follow provisions / conditions of permits. The quality control program shall:

(a) Follow permit requirements related to the Design-Build Team and subcontractors’ construction activities.

(b) Ensure that all operators and / or subcontractor(s) on site have the proper erosion and sediment control / stormwater certification.
(c) Notify the Engineer when the required certified erosion and sediment control / stormwater personnel are not available on the job site when needed.
(d) Conduct the inspections required by the NPDES Permit.
(e) Take corrective actions in the proper timeframe as required by the NPDES Permit for problem areas identified during the NPDES inspections.
(f) Incorporate erosion control into the work in a timely manner and stabilize disturbed areas with mulch / seed or vegetative cover on a section-by-section basis.
(g) Use flocculants approved by state regulatory authorities where appropriate and where required for turbidity and sedimentation reduction.
(h) Ensure proper installation and maintenance of temporary erosion and sediment control devices.
(i) Remove temporary erosion or sediment control devices when they are no longer necessary as agreed upon by the Engineer.
(j) The Design-Build Team's quality control and inspection procedures shall be subject to review by the Engineer. Maintain NPDES inspection records and make records available at all times for verification by the Engineer.

(B) *Certified Foreman* - At least one Certified Foreman shall be onsite for each type of work listed herein during the respective construction activities to control erosion, prevent sedimentation and follow permit provisions:

(1) Foreman in charge of grading activities
(2) Foreman in charge of bridge or culvert construction over jurisdictional areas
(3) Foreman in charge of utility activities

The Design-Build Team may request to use the same person as the Level II Supervisor and Level II Foreman. This person shall be onsite whenever construction activities, as described above, are taking place. This request shall be approved by the Engineer prior to work beginning.

The Design-Build Team may request to name a single Level II Foreman to oversee multiple construction activities on small bridge or culvert replacement projects. This request shall be approved by the Engineer prior to work beginning.

(C) *Certified Installers* - Provide at least one onsite, Level I Certified Installer for each of the following erosion and sediment control / stormwater crew:

(1) Seeding and Mulching
(2) Temporary Seeding
(3) Temporary Mulching
(4) Sodding
(5) Silt fence or other perimeter erosion / sediment control device installations
(6) Erosion control blanket installation
(7) Hydraulic tackifier installation

(8) Turbidity curtain installation
(9) Rock ditch check / sediment dam installation
(10) Ditch liner / matting installation
(11) Inlet protection
(12) Riprap placement
(13) Stormwater BMP installations (such as, but not limited to, level spreaders, retention / detention devices)
(14) Pipe installations within jurisdictional areas

If a Level I *Certified Installer* is not onsite, the Design-Build Team may substitute a Level II Foreman for a Level I Installer, provided the Level II Foreman is not tasked to another crew requiring Level II Foreman oversight.

(D) *Certified Designer* - Include the certification number of the Level III Certified Designer on the erosion and sediment control / stormwater component of all reclamation plans and if applicable, the certification number of the Level III Certified Designer on the design of the project erosion and sediment control / stormwater plan.

Preconstruction Meeting

Furnish the names of the Certified Erosion and Sediment Control / Stormwater Supervisor, Certified Foremen, Certified Installers and Certified Designers and notify the Engineer, in writing, of changes in certified personnel over the life of the contract within two days of change.

Ethical Responsibility

Any company performing work for the North Carolina Department of Transportation has the ethical responsibility to fully disclose any reprimand or dismissal of an employee resulting from improper testing or falsification of records.

Revocation or Suspension of Certification

Upon recommendation of the Chief Engineer to the certification entity, certification for Supervisor, Certified Foremen, Certified Installer and Certified Designer may be revoked or suspended with the issuance of an Immediate Corrective Action (ICA), Notice of Violation (NOV), or Cease and Desist Order for erosion and sediment control / stormwater related issues.

The Chief Engineer may recommend suspension or permanent revocation of certification due to the following:

(A) Failure to adequately perform the duties as defined within this certification provision
(B) Issuance of an ICA, NOV, or Cease and Desist Order
(C) Failure to fully perform environmental commitments as detailed within the permit conditions and specifications

(D) Demonstration of erroneous documentation or reporting techniques
(E) Cheating or copying another candidate's work on an examination
(F) Intentional falsification of records
(G) Directing a subordinate under direct or indirect supervision to perform any of the above actions
(H) Dismissal from a company for any of the above reasons
(I) Suspension or revocation of one's certification by another entity

Suspension or revocation of a certification will be sent by certified mail to the certificant and the Corporate Head of the company that employs the certificant.

A certificant has the right to appeal any adverse action which results in suspension or permanent revocation of certification by responding, in writing, to the Chief Engineer within ten calendar days after receiving notice of the proposed adverse action.

Chief Engineer
1536 Mail Service Center
Raleigh, NC 27699-1536

Failure to appeal within ten calendar days shall result in the proposed adverse action becoming effective on the date specified on the certified notice. Failure to appeal within the time specified shall result in a waiver of all future appeal rights regarding the adverse action taken. The certificant will not be allowed to perform duties associated with the certification during the appeal process. The Chief Engineer will hear the appeal and make a decision within seven days of hearing the appeal. The decision of the Chief Engineer shall be final and will be made in writing to the certificant.

If a certification is temporarily suspended, the certificant shall pass any applicable written examination and any proficiency examination, at the conclusion of the specified suspension period, prior to having the certification reinstated.

Measurement and Payment

Certified Erosion and Sediment Control / Stormwater Supervisor, Certified Foremen, Certified Installers and Certified Designers will be incidental to the project for which no direct compensation will be made.

TACK FOR MULCH FOR EROSION CONTOL

(1-16-24) SP

Description

This work consists of supplying and installing an approved material for binding mulch for erosion control in accordance with Section 1060-5, Section 1615 and Section 1660 of the *Standard Specifications*. This special provision defines acceptable materials and rates for tacking material for holding mulch in place.

Materials

(a) Emulsified Asphalt

Asphalt emulsion tack shall conform to the requirements of AASHTO M 140, Specification for Emulsified Asphalt. The emulsified asphalt may be rapid setting, medium setting, or slow setting. Apply emulsified asphalt tackifier at a rate of 0.10 gallons per square yard (approximately 484 gallons per acre).

(b) Cellulose Hydromulch

Cellulose hydromulch products shall be non-toxic, weed-free, prepackaged cellulose fiber (pulp) material containing no more than 3% ash or other inert materials. Cellulose hydromulches may contain dyes or binders specifically formulated to enhance the adhesive qualities of the hydromulch. Apply cellulose hydromulches at a rate of 1000 pounds (dry weight) per acre.

Wood fiber or wood fiber blend hydromulches may be substituted for cellulose hydromulch at the same application rate.

(c) Other tackifiers

Other approved materials, specifically designed and manufactured for application as a straw mulch tacking agent, may be used at the manufacturer's recommended rate.

Construction Methods

Apply the Tack for Mulch for Erosion Control uniformly across straw mulch per Section 1615 and Section 1660 of the *Standard Specifications.*

PROCEDURE FOR MONITORING BORROW PIT DISCHARGE

(1-22-13) (Rev. 1-16-24) DB1 G181

Water discharge from borrow pit sites shall not cause surface waters to exceed 50 NTUs (nephelometric turbidity unit) in streams not designated as trout waters and 10 NTUs in streams, lakes or reservoirs designated as trout waters. For lakes and reservoirs not designated as trout waters, the turbidity shall not exceed 25 NTUs. If the turbidity exceeds these levels due to natural background conditions, the existing turbidity level shall not be increased.

If during any operating day, the downstream water quality exceeds the standard, the Design-Build Team shall do all of the following:

(A) Either cease discharge or modify the discharge volume or turbidity levels to bring the downstream turbidity levels into compliance, or

(B) Evaluate the upstream conditions to determine if the exceedance of the standard is due to natural background conditions. If the background turbidity measurements exceed the

standard, operation of the pit and discharge can continue as long as the stream turbidity levels are not increased due to the discharge.

(C) Measure and record the turbidity test results (time, date and sampler) at all defined sampling locations 30 minutes after startup and at a minimum, one additional sampling of all sampling locations during that 24-hour period in which the borrow pit is discharging.

(D) Notify DWR within 24 hours of any stream turbidity standard exceedances that are not brought into compliance.

During the Environmental Assessment required by Article 230-4 of the *Standard Specifications*, the Design-Build Team shall define the point at which the discharge enters into the State's surface waters and the appropriate sampling locations. Sampling locations shall include points upstream and downstream from the point at which the discharge enters these waters. Upstream sampling location shall be located so that it is not influenced by backwater conditions and represents natural background conditions. Downstream sampling location shall be located at the point where complete mixing of the discharge and receiving water has occurred.

The discharge shall be closely monitored when water from the dewatering activities is introduced into jurisdictional wetlands. Any time visible sedimentation (deposition of sediment) on the wetland surface is observed, the dewatering activity will be suspended until turbidity levels in the stilling basin can be reduced to a level where sediment deposition does not occur. Staining of wetland surfaces from suspended clay particles, occurring after evaporation or infiltration, does not constitute sedimentation. No activities shall occur in wetlands that adversely affect the functioning of a wetland. Visible sedimentation shall be considered an indication of possible adverse impacts on wetland use.

The Engineer will perform independent turbidity tests on a random basis. These results will be maintained in a log within the project records. Records will include, at a minimum, turbidity test results, time, date and name of sampler. Should the Department's test results exceed those of the Design-Build Team's test results, an immediate test shall be performed jointly with the results superseding the previous test results of both the Department and the Design-Build Team.

To plan, design, construct, and maintain BMPs to address water quality standards, the Design-Build Team shall use the NCDOT *Turbidity Reduction Options for Borrow Pits Matrix,* available at the website noted below:

https://connect.ncdot.gov/resources/roadside/FieldOperationsDocuments/TurbidityReductionOptionSheet.pdf

Tier I Methods include stilling basins which are standard compensatory BMPs. Other Tier I methods are noncompensatory and shall be used when needed to meet the stream turbidity standards. Tier II Methods are also noncompensatory and are options that may be needed for protection of rare or unique resources or where special environmental conditions exist at the site which have led to additional requirements being placed in the DWR's 401 Certifications and approval letters, Isolated Wetland Permits, Riparian Buffer Authorization or a DOT Reclamation

Plan's Environmental Assessment for the specific site. Should the Design-Build Team exhaust all Tier I Methods on a site exclusive of rare or unique resources or special environmental conditions, Tier II Methods may be required by regulators on a case by case basis per supplemental agreement.

The Design-Build Team may use cation exchange capacity (CEC) values from proposed site borings to plan and develop the Price Proposal for the project. CEC values exceeding 15 milliequivalents per 100 grams of soil may indicate a high potential for turbidity and should be avoided when dewatering into surface water is proposed.

No additional compensation for monitoring borrow pit discharge will be paid.

CLEARING AND GRUBBING

(9-1-11)(Rev. 8-18-15) DB2 R01

With the exception of areas with Permanent Utility Easements, perform clearing on this project to the limits established by Method "III" shown on Roadway Standard Drawing No. 200.03. In areas with Permanent Utility Easements, clearing shall extend to the right of way limits.

BURNING RESTRICTIONS

(7-1-95) DB2 R05

Open burning shall not be permitted on any portion of the right of way limits established for this project. The Design-Build Team shall not burn the clearing, grubbing or demolition debris designated for disposal and generated from the project at locations within the project limits, off the project limits or at any waste or borrow sites in Wake County. The Design-Build Team shall dispose of the clearing, grubbing and demolition debris by means other than burning and in accordance with state and local rules and regulations.

BUILDING AND APPURTENANCE REMOVAL / DEMOLITION

(9-1-11) (Rev. 1-16-24) DB2 R12A

Unless otherwise as agreed upon by the Department, seal all wells and remove or demolish all buildings and appurtenances, in their entirety, that are located either partially or completely within the project's right of way limits or are located outside the project's right of way limits but within property purchased as an uneconomical remnant in accordance with Sections 205, 210 and 215 of the *Standard Specifications.*

The Department will perform all assessment, removal and disposal of asbestos. Once the Design-Build Team has acquired a parcel and all buildings and appurtenances have been vacated, the Design-Build Team shall immediately notify the Division Right of Way Agent in writing. Upon receipt of the written notification, the Department then requires 60 days to assess and remove any asbestos prior to the Design-Build Team demolishing any building or appurtenance.

MANUFACTURED QUARRY FINES IN EMBANKMENTS

(11-30-16) (Rev. 1-16-24) 235 DB02 R72

Description

This specification addresses the use of manufactured quarry fines that are not classified as select materials. The specification allows the Design-Build Team an option, with the approval of the Engineer, to use manufactured quarry fines (MQFs) in embankments as a substitute for conventional borrow material. Furnish and place geotextile for subgrade stabilization in accordance with the *Geotextile for Subgrade Stabilization* Project Special Provision found elsewhere in this RFP and the detail developed by the Design-Build Team. Geotextile for subgrade stabilization shall be required to prevent pavement cracking and provide separation between the subgrade and pavement section at embankment locations where manufactured quarry fines are utilized and as directed by the Engineer.

Manufactured Quarry Fines (MQF)

Site specific approval of MQFs material shall be required prior to beginning construction as detailed in the preconstruction requirements of this provision.

The following MQFs are unacceptable:

(A) Frozen material
(B) Material with a maximum dry unit weight of less than 90 pounds per cubic foot when tested in accordance with AASHTO T-99 Method A or C
(C) Material with greater than 80% by weight Passing the #200 sieve

Collect and transport MQFs in a manner that will prevent nuisances and hazards to public health and safety. Moisture condition the MQFs as needed and transport in covered trucks to prevent dusting. If MQFs are blended with natural earth material, follow Borrow Criteria in Section 1018 of the *Standard Specifications.*

Geotextiles

In embankment areas where MQFs are incorporated, Geotextile for Subgrade Stabilization shall be used. The Geotextile for Subgrade Stabilization shall adhere to all requirements of the *Geotextile for Subgrade Stabilization* Project Special Provision found elsewhere in this RFP except the notification of subgrade elevation, sampling and waiting period required in the Construction Methods section.

Preconstruction Requirements

When MQFs are to be used as a substitute for earth borrow material, request written approval from the Engineer at least ninety (90) days in advance of the intent to use MQFs and include the following details:

(A) Description, purpose and location of project
(B) Estimated start and completion dates of project
(C) Estimated volume of MQFs to be used on project with specific locations and construction details of the placement
(D) The names, addresses and contact information for the generator of the MQFs
(E) Physical location of the site at which the MQFs were generated

The Engineer will forward this information to the State Materials Engineer for review and material approval prior to incorporation.

Construction Methods

Place MQFs in the core of the embankment section with at least four feet of earth cover to the outside limits of the embankments or subgrade.

Construct embankments by placing MQFs in level uniform lifts with no more than a lift of ten inches and compacted to at least a density of 95 percent as determined by test methods in AASHTO T-99, Determination of Maximum Dry Density and Optimum Moisture Content, Method A or C depending upon particle size of the product. Provide a moisture content at the time of compaction of within 4.0 percent of optimum but not greater than one percent above optimum as determined by AASHTO T-99, Method A or C.

CONCRETE PIPE DESIGN

(9-1-11) (Rev. 9-8-17) DB3 R006

Description

This work consists of the design and manufacture of reinforced concrete pipes which require fills greater than 40 feet and less than or equal to 80 feet.

Materials

(A) Design

When the design of a reinforced concrete pipe is required on the plans developed by the Design-Build Team, design the reinforced concrete pipe in accordance with the current edition of the AASHTO LRFD Bridge Design Specifications. Provide the diameter of pipe as indicated on the plans developed by the Design-Build Team and manufacture the pipe in accordance with ASTM C 1417. Provide a reinforced concrete pipe that meets the requirements of Section 1032-6, Section 1077 and any other applicable parts of the *Standard Specifications*.

The design of the reinforced concrete pipe shall be the Design-Build Team's responsibility and shall be subject to review, comments and approval. Submit two sets of detailed plans for review and acceptance. Include all details in the plans, including the size and spacing of the required reinforcement necessary to fabricate the reinforced concrete pipe. Include checked design calculations for the reinforced concrete pipe. Have a North Carolina

Registered Professional Engineer seal the plans and design calculations. After the plans are reviewed and, if necessary, all corrections made, submit one set of reproducible tracings on 22" x 34" sheets to become part of the plans developed by the Design-Build Team.

(B) Reinforced Concrete Pipe Sections

(1) Class

Reinforced concrete pipe sections manufactured in accordance with this Project Special Provision shall be designated by inside pipe diameter and design earth cover.

(2) Design Criteria

The design of the reinforced concrete pipe shall be in accordance with Article 12.10.4.2 "Direct Design Method" of the current edition of the AASHTO LRFD Bridge Design Specifications. The following assumptions shall be used in the design calculations:

NCDOT Criteria for Direct Design Method
Process and Material Factors Radial Tension, F_{rp}=1.0 Shear Strength, F_{vp}=1.0
Design Concrete Strength - f'$_c$ 5,000 psi < f'c < 7,000 psi
Heger Pressure Distribution - Type 2 Installation Vertical Arching Factor = 1.40 Horizontal Arching Factor = 0.40
Soil Unit Weight = 120 lb / ft^3
Depth of Fluid = Inside Pipe Diameter
Minimum Concrete Cover = 1.00"
Crack Control = 0.90 (maximum)

(C) Joints

Produce the reinforced concrete pipe sections with spigot and bell ends. Design and form the ends of the pipe section so, when the sections are laid together, they make a continuous line of pipe with a smooth interior free of appreciable irregularities in the flow line, and compatible with the permissible variations given in the *Standard Specifications* and ASTM C 1417.

(D) Manufacture

In addition to the requirements of the *Standard Specifications* and ASTM C 1417, devices or holes are permitted in each pipe section for the purpose of handling and placement. Submit details of handling devices or holes for approval and do not cast any concrete until

approval is granted. Remove all handling devices flush with concrete surfaces as directed. Fill holes in a neat and workmanlike manner with an approved non-metallic non-shrink grout, concrete, or plug.

DRAINAGE PIPE

(1-16-24) DB3 R36

Description

Where shown in the plans developed by the Design-Build Team, the Design-Build Team shall use Reinforced Concrete Pipe, Corrugated Aluminum Alloy Pipe, Aluminized Corrugated Steel Pipe, Welded Steel Pipe, Corrugated Polyethylene Pipe (HDPE Pipe) or Polyvinyl-Chloride Pipe (PVC Pipe) in accordance with the following requirements:

- The appropriate Reinforced Concrete Pipe class and the appropriate gage thickness for Corrugated Aluminum Alloy Pipe Aluminized Corrugated Steel Pipe and Welded Steel Pipe shall be selected based on fill height. All pipe types shall be subject to the maximum and minimum fill height requirements as found on-line at the below:

https://connect.ncdot.gov/resources/hydro/Pages/NCDOT-Pipe-Material-Selection-Guide.aspx

- Site specific conditions may limit a particular material beyond what is identified in this Project Special Provision. These conditions include, but are not limited to, abrasion, environmental, soil resistivity and pH, high ground water and special loading conditions. The Design-Build Team shall determine if additional restrictions are necessary.

BRIDGE APPROACH FILLS

(1-16-18)(Rev. 1-16-24) 423 DB4 R02

Description

Bridge approach fills consist of backfilling behind bridge end bents with select material or aggregate to support all or part of bridge approach slabs. Install outlets and grade bridge approach fills to drain water through and away from approach fills. Install geotextiles to allow for possible future slab jacking and separate approach fills from embankment fills, natural ground and pavement sections as required. For bridge approach fills behind end bents with mechanically stabilized earth (MSE) abutment walls, reinforce bridge approach fills with MSE wall reinforcement connected to end bent caps as required. Construct bridge approach fills in accordance with the contract, accepted submittals and bridge approach fill *Roadway Standard Drawings*.

Define bridge approach fill types as follows:

Type 1 Approach Fill – Approach fill for bridge abutment in accordance with *Roadway Standard Drawing* No. 423.01;

Type 1A Approach Fill – Alternate approach fill for integral bridge abutment in accordance with *Roadway Standard Drawing* No. 423.02;

Type 2 Approach Fill – Approach fill for bridge abutment with MSE wall in accordance with *Roadway Standard Drawing* No. 423.03 and

Type 2A Approach Fill – Alternate approach fill for integral bridge abutment with MSE wall in accordance with *Roadway Standard Drawing* No. 423.04.

At the Design-Build Team's option, use Type 1A or 2A approach fills instead of Type 1 or 2 approach fills, respectively, for integral bridge abutments. Type 1A and 2A approach fills consists of constructing an approach fill with a temporary geotextile wall before placing all or a portion of the concrete for the backwall and wing walls of the integral end bent cap. The temporary geotextile wall is designed for a construction surcharge, remains in place and is aligned so the wall face functions as a form for the integral end bent cap backwall and wing walls.

Materials

Refer to Division 10 of the *Standard Specifications*.

Item	**Section**
Geotextiles	1056
Portland Cement Concrete	1000
Select Materials	1016
Subsurface Drainage Materials	1044
Welded Wire Reinforcement	1070-3

Provide Type 1 geotextile for separation geotextiles, Type 4a geotextile for under bridge approach slabs and Class B concrete for outlet pads. Use Class V or Class VI select material for Type 1 and 1A approach fills and the same aggregate type approved for the reinforced zone in the accepted MSE wall submittal for Type 2 and 2A approach fills. For MSE wall aggregate, reinforcement and connector materials, see the *Mechanically Stabilized Earth Retaining Walls* provision. Provide outlet pipes and fittings for subsurface drainage materials. Provide 1/4" hardware cloth with 1/4 inch openings constructed from 24 gauge wire.

For temporary geotextile walls, use welded wire reinforcement for welded wire facing and Type 5a geotextile for reinforcement geotextiles. Use Type 5a geotextile with lengths as shown in *Roadway Standard Drawing* No. 423.02 or 423.04.

Construction Methods

Excavate as necessary for approach fills and, if applicable, temporary geotextile walls in accordance with the contract. Ensure limits of approach fills are graded to drain as shown in the bridge approach fill *Roadway Standard Drawings*. For Type 1 and 1A approach fills in embankment fills, place and compact a temporary 1.5:1 (H:V) fill slope in accordance with *Roadway Standard Drawing* No. 423.01 or 423.02 and in accordance with Subarticle 235-3(B) and 235-3(C) of the *Standard Specifications*. Density testing is required within the temporary fill slope and additional more frequent density testing is also required for bridge approach embankments. Wait 3 days before cutting the slope back to complete the approach fill excavation. Use excavated material elsewhere on the project to form embankments, subgrades, or shoulders. If a slope for an approach fill is excavated to flatter than what is required for access or any other reason, that same slope is required for the entire approach fill excavation. Do not backfill overexcavations that extend outside the approach fill limits shown on the *Roadway Standard Drawings* with embankment soils. Instead, expand approach fill limits to include overexcavations.

Notify the Engineer when embankment fill placement and approach fill excavation is complete. Do not place separation geotextiles or aggregate until approach fill dimensions and embankment materials below and outside approach fills are approved.

For Type 2 approach fills, cast MSE wall reinforcement or connectors into end bent cap backwalls within 3 inches of locations shown in the accepted MSE wall submittals. Install MSE wall reinforcement with the orientation, dimensions and number of layers shown in the accepted MSE wall submittals. If a Type 2 approach fill is designed with geogrid reinforcement embedded in an end bent cap, cut geogrids to the required lengths and after securing ends of geogrids in place, reroll and rewrap portions of geogrids not embedded in the cap to protect geogrids from damage. Before placing aggregate over any MSE wall geosynthetic reinforcement, pull reinforcement taut so that it is in tension and free of kinks, folds, wrinkles or creases.

For Type 1 and 1A approach fills, place pipe sleeves in wing walls so water drains towards outlets. Use sleeves that can withstand wing wall loads. Insert outlet pipes into pipe sleeves to direct water towards outlets. Attach hardware cloth in front of the outlet pipe at the wing. Connect outlet pipes and fittings with solvent cement in accordance with Article 815-3 of the *Standard Specifications* and place outlet pads in accordance with Roadway Standard Drawing No. 815.03.

Attach separation geotextiles to end bent cap backwalls and wing walls with adhesives, tapes or other approved methods. Overlap adjacent geotextiles of the same type at least 18 inches. Cover select material or aggregate with Type 4a geotextile at an elevation 6 inches below the bridge approach slab. Hold geotextiles in place with wire staples or anchor pins as needed. Contact the Engineer when existing or future obstructions such as foundations, pavements, pipes, inlets or utilities will interfere with geotextiles or MSE wall reinforcement.

For Type 1A and 2A approach fills, install temporary geotextile walls as shown in *Roadway Standard Drawing* No. 423.02 or 423.04. At the Design-Build Team's option, construct the bottom portion of integral end bents before temporary geotextile walls as shown in the plans. Erect and set welded wire facing for temporary geotextile walls so facing functions as a form for the

integral end bent cap backwall. Place welded wire facing adjacent to each other in the horizontal and vertical directions to completely cover the temporary geotextile wall face. Stagger welded wire facing to create a running bond by centering facing over joints in the row below. Wrap reinforcement geotextiles at the wall face in accordance with *Roadway Standard Drawing* No. 423.02 or 423.04 and cover geotextiles with at least 3 inches of select material or aggregate. Place layers of reinforcement geotextiles within 3 inches of locations shown in *Roadway Standard Drawing* No. 423.02 or 423.04. Install reinforcement geotextiles with the direction shown in *Roadway Standard Drawing* No. 423.02 or 423.04. Orient overlapping seams in reinforcement geotextiles perpendicular to the integral end bent cap backwall. Do not overlap reinforcement geotextiles so seams are parallel to the wall face. Before placing select material or aggregate over reinforcement geotextiles, pull geotextiles taut so they are in tension and free of kinks, folds, wrinkles or creases. Temporary geotextile walls are designed for a surcharge pressure in accordance with *Roadway Standard Drawing* No. 423.02 or 423.04. If loads from construction equipment will be more than what the wall is designed for, contact the Engineer before positioning equipment on top of temporary geotextile walls.

Place select material or aggregate in 6 inch to 8 inch thick lifts. Compact fine aggregate for Type 2 and 2A approach fills in accordance with Subarticle 235-3(C) of the *Standard Specifications* except compact fine aggregate to a density of at least 98%. Compact select material for Type 1 and 1A approach fills and coarse aggregate for Type 2 and 2A approach fills with at least 4 passes of a trench roller in a direction parallel to the end bent cap backwall. Do not displace or damage geosynthetics or MSE wall reinforcement when placing and compacting select material or aggregate. End dumping directly on geosynthetics is not permitted. Do not operate heavy equipment on geosynthetics until they are covered with at least 8 inches of select material or aggregate. Replace any damaged geosynthetics to the satisfaction of the Engineer. When approach fills extend beyond bridge approach slabs, wrap Type 4a geotextiles over select material or aggregate and back under approach slabs as shown in *Roadway Standard Drawing* No. 423.03 or 423.04.

GEOTEXTILE FOR SUBGRADE STABILIZATION

(5-7-14) (Rev. 4-16-24) DB5 R9

Description

Provide geotextile for subgrade stabilization in accordance with the Geotechnical Engineering Scope of Work found elsewhere in this RFP. Geotextile for subgrade stabilization is required for subgrades to prevent pavement cracking at locations shown in the plans developed by the Design-Build Team and as directed by the Engineer.

Materials

Refer to Article 505-2 of the *Standard Specifications*.

Construction Methods

Refer to Article 505-3 of the *Standard Specifications*.

PRICE ADJUSTMENTS FOR ASPHALT BINDER

(9-1-11) (Rev. 1-16-24) DB6 R25

Price adjustments for asphalt binder for plant mix will be made in accordance with Section 620 of the *Standard Specifications*.

The base price index for asphalt binder for plant mix is $ **PRICE TO BE INCLUDED IN THE FINAL RFP** per ton.

This base price index represents an average of F.O.B. selling prices of asphalt binder at supplier's terminals on .

PRICE ADJUSTMENTS - ASPHALT CONCRETE PLANT MIX

(9-1-11) (Rev. 1-16-24) DB6 R26

Revise the *Standard Specifications* as follows:

Page 6-15, Article 609-11 and Page 6-30, Article 610-14

Add the following paragraph before the first paragraph:

The "Asphalt Price" used to calculate any price adjustments set forth in this section shall be $40.00 per theoretical ton. This price shall apply for all mix types.

DYNAMIC MESSAGE SIGN (DMS)

(1-16-24) DB 08-04

DESCRIPTION

To ensure compatibility with the existing DMS Control Software deployed in the State, furnish NTCIP compliant DMS that are fully compatible with the current control software in use by the Department. (also referred to hereinafter as the "Control Software"). Contact the engineer to inquire about the current version being used.

Furnish and install DMS compliant with UL standards 48, 50 and 879.

Furnish, install, test, integrate and make fully operational the new DMS at locations shown in the plans developed by the Design-Build Team.

Furnish operating Dynamic Message Signs, not limited to, the following types. Dimensions represent DMS sizes commonly used by the Department, other size DMS may be specified in the plans developed by the Design-Build Team.

DMS Naming Convention	
Type	Color
Type 1 – Front Access Type 2 – Walk-in	A – Amber – 66mm C – Full Color – 20mm

Type 3 – Embedded Type 4 – Lane Control	

- **DMS Type 1A** – Front Access Amber 66mm – 27 pixels high by 60 pixels wide
  - 3 lines, 10 characters per line, using 18" high characters.
- **DMS Type 1C** – Front Access Full Color 20mm – 96 pixels high by 208 pixels wide
  - 3 lines, 11 characters per line, using 18" high characters.
- **DMS Type 2A** – Walk-in Amber 66mm – 27 pixels high by 90 pixels wide
  - 3 lines, 15 characters per line, using 18" high characters.
- **DMS Type 2C** – Walk-in Full Color 20mm – 96 pixels high by 288 pixels wide
  - 3 lines, 15 characters per line, using 18" high characters.
- **DMS Type 3A** – Embedded Front Access Tri-color 66mm – 7 pixels high by 35 pixels wide
  - 1 line, 7 characters per line, using 18" high characters.
- **DMS Type 3C** – Embedded Front Access Full Color 20mm – 24 pixels high by 160 pixels wide
  - 1 line, 8 characters per line, using 18" high characters.
- **DMS Type 4C** – Lane Control Sign Full Color 20mm – 48- or 64-pixels square
  - 48 pixels high by 48 pixels wide
    - 1 line, 2 characters per line using 18" high characters
  - 64 pixels high x 64 pixel wide
    - 2 lines, 3 characters per line using 18" high characters

Use only UL listed and approved electronic and electrical components in the DMS system.

Use only approved DMS models listed on the NCDOT Qualified Products List (QPL) at the time of construction. NCDOT Qualified Products List can be accessed via official website at https://apps.ncdot.gov/products/qpl/

MATERIALS
Environmental and Operating Requirements

Construct the DMS and DMS controller cabinet so the equipment within is protected against moisture, dust, corrosion, and vandalism. Design and construct the DMS unit for continuous usage of at least 20 years. Design the DMS system to comply with the requirements of Section 2.1 (Environmental and Operating Standards) of NEMA TS 4-2016.

Viewing Requirements for all DMS

Each line of text should be clearly visible and legible to a person with 20/20 corrected vision from a distance of 900 feet in advance of the DMS at an eye height of 3.5 feet along the axis.

Any line must display equally spaced and equally sized alphanumeric individual characters. Each character must be at least 18 inches in height (unless otherwise noted in the plans) and composed from a luminous dot matrix.

Housing Requirements for all DMS

Construct the external skin of the sign housing out of aluminum alloy 5052 H32 that is a minimum of 1/8 inches thick for all walk-in DMS and 0.090-inch-thick for all front access or embedded DMS. Ensure the interior structure is constructed of aluminum. Ensure that exterior seams and joints, except the finish coated face pieces, are continuously welded using an inert gas welding method. Ensure that no internal frame connections or external skin attachments rely upon adhesive bonding. Ensure the sign housing meets the requirements of Section 3 of NEMA TS 4-2016.

Ensure that all drain holes and other openings in the sign housing are screened to prevent the entrance of insects. Ensure that the top of the housing includes multiple steel lifting eyebolts or equivalent hoisting points. Ensure hoist points are positioned such that the sign remains level when lifted. Ensure that the hoist points and sign frame allow the sign to be shipped, handled, and installed without damage. Ensure all external assembly and mounting hardware, including but not limited to; nuts, bolts, screws, and locking washers are corrosion resistant galvanized steel and are sealed against water intrusion. Ensure all exterior housing surfaces, excluding the sign face, and all interior housing surfaces are a natural aluminum mill finish. Ensure signs are fabricated, welded, and inspected in accordance with the requirements of the current ANSI/AWS Structural Welding Code-Aluminum. Do not place a manufacturer name, logo, or other information on the front face of the DMS or shield. Do not paint the stainless-steel bolts on the Z-bar assemblies used for mounting the enclosure.

Housing Requirements for Walk-in type DMS

Ensure the sign housing meets the requirements of Section 3.2.8 of NEMA TS 4-2016. Stitch weld the exterior housing panel material to the internal structural members to form a unitized structure. Ensure that exterior mounting assemblies are fabricated from aluminum alloy 6061-T6 extrusions a minimum of 3/16 inches thick. Ensure housing access is provided through an access door at each end of the sign enclosure that meets the requirements of NEMA TS 4-2016, Section 3.2.8.1. Ensure the access doors include a keyed tumbler lock and a door handle with a hasp for a padlock. Ensure the doors include a closed-cell neoprene gasket and stainless-steel hinges. Install one appropriately sized fire extinguisher within 12 inches of each maintenance door. Ensure the sign housing meets the requirements of NEMA TS 4-2016, Section 3.2.8.3 for service lighting. All service lighting should be LED, incandescent and fluorescent lamps are not permitted. Ensure that the sign housing includes LED emergency lighting that automatically illuminates the interior when the door is open in the event of a power outage. Emergency lighting must be capable of operation without power

for at least 90 minutes. Ensure the sign housing meets the requirements of NEMA TS 4-2016, Section 3.2.9 for convenience outlets.

Housing Requirements for Front Access DMS

Comply with the requirements of Section 3.2.5 and 3.2.6 of NEMA TS 4-2016 as it applies to front access enclosures. The following requirements complement TS 4-2016. Ensure access door does not require specialized tools or excessive force to open. Provide multiple access doors that allow maintenance personnel access to 2 or 3 sign modules at a time. Vertically hinge the doors and design to swing out from the face to provide access to the enclosure interior. Extend each door the full height of the display matrix. Provide a retaining latch mechanism for each door to hold the door open at a 90-degree angle. Each door will form the face panel for a section of the sign. Mount the LED modules to the door such that they can be removed from the door when in the open position. Other sign components can be located inside the sign enclosure and be accessible through the door opening. Provide for each door a minimum of two (2) screw-type captive latches to lock them in the closed position and pull the door tight and compress a gasket located around the perimeter of each door. Install the gasket around the doors to prevent water from entering the cabinet.

Housing Face Requirements for all DMS

Ensure the sign face meets the requirements of NEMA TS 4-2016, Section 3.1.3. Protect the DMS face with contiguous, weather-tight, removable panels. The DMS front face shall be constructed with multiple rigid panels, each of which supports and protects a full-height section of the LED display matrix. The panels shall be fabricated using aluminum sheeting on the exterior and polycarbonate sheeting on the interior of the panel. These panels must be a polycarbonate material that is ultraviolet protected and have an antireflection coating. Prime and coat the front side of the aluminum mask, which faces the viewing motorists, with automotive-grade semi-gloss black acrylic enamel paint or an approved equivalent. Guarantee all painted surfaces provide a minimum outdoor service life of 20 years. Design the panels so they will not warp nor reduce the legibility of the characters. Differential expansion of the DMS housing and the front panel must not cause damage to any DMS component or allow openings for moisture or dust. Glare from sunlight, roadway lighting, commercial lighting, or vehicle headlights must not reduce the legibility or visibility of the DMS. Install the panels so that a maintenance person can easily remove or open them for cleaning.

Housing Face Requirements for Walk-in type DMS

No exposed fasteners are allowed on the housing face. Ensure that display modules can be easily and rapidly removed from within the sign without disturbing adjacent display modules.

Housing Face Requirements for Front Access type DMS

The DMS front face shall be constructed with multiple vertically hinged rigid door panels, each of which contains a full-height section of the LED display matrix.

Any exposed fasteners on the housing face must be the same color and finish as the housing face. Only captive fasteners may be used on the housing face.

Housing Face Requirements for Embedded Front Access type DMS

The DMS front face shall be constructed with a single, horizontally hinged rigid face panel which contains a full-height section of the LED display matrix.

Any exposed fasteners on the housing face must be the same color and finish as the housing face. Only captive fasteners may be used on the housing face.

Sign Housing Ventilation System for all DMS

Install a minimum of one (1) temperature sensor that is mounted near the top of the DMS interior. The sensor(s) will measure the temperature of the air in the enclosure over a minimum range of -40ºF to +176ºF. Ensure the DMS controller will continuously monitor the internal temperature sensor output and report to the DMS control software upon request.

Design the DMS with systems for enclosure ventilation, face panel fog and frost prevention, and safe over-temperature shutdown.

Design the DMS ventilation system to be thermostatically controlled and to keep the internal DMS air temperature lower than +140ºF, when the outdoor ambient temperature is +115ºF or less.

The ventilation system will consist of two or more air intake ports located near the bottom of the DMS rear wall. Cover each intake port with a filter that removes airborne particles measuring 500 microns in diameter and larger. Mount one or more ventilation fans at each intake port. These fans will positively pressure the DMS enclosure.

Design the ventilation fans and air filters to be removable and replaceable from inside the DMS housing. To ease serviceability, mount the ventilation fans no more than four (4) feet from the floor of the DMS enclosure. Position ventilation fans so they do not prevent removal of an LED pixel board or driver board.

Provide each ventilation fan with a sensor to monitor its rotational speed, measured in revolutions per minute and report this speed to the sign controller upon request.

The ventilation system will move air across the rear of the LED modules in a manner such that heat is dissipated from the LED's. Design the airflow system to move air from the bottom of the enclosure towards the top to work with natural convection to move heat away from the modules.

Install each exhaust port near the top of the rear DMS wall. Provide one exhaust port for each air intake port. Screen all exhaust port openings to prevent the entrance of insects and small animals.

Cover each air intake and exhaust port with an aluminum hood attached to the rear wall of the DMS. Thoroughly seal all intakes and exhaust hoods to prevent water from entering the DMS.

Provide a thermostat near the top of the DMS interior to control the activation of the ventilation system.

The DMS shall automatically shut down the LED modules to prevent damaging the LEDs if the measured internal enclosure air temperature exceeds a maximum threshold temperature. The threshold temperature shall be configurable and shall have a default factory setting of 140ºF. The DMS provide an output to the controller to notify the Control Software when the DMS shuts down due to high temperature.

Sign Housing Ventilation System for Walk-in DMS

Ensure the sign includes a fail-safe ventilation subsystem that includes a snap disk thermostat that is independent of the sign controller. Preset the thermostat at 140°F. If the sign housing's interior reaches 140°F, the thermostat must override the normal ventilation system, bypassing the sign controller and turning on all fans. The fans must remain on until the internal sign housing temperature falls below 115°F.

Sign Housing Photoelectric sensors

Install three photoelectric sensors with ½ inch minimum diameter photosensitive lens inside the DMS enclosure. Use sensors that will operate normally despite continual exposure to direct sunlight. Place the sensors so they are accessible and field adjustable. Point one sensor north or bottom of the sign. Place the other two, one on the back wall and one on the front wall of the sign enclosure. Alternate designs maybe accepted, provided the sensor assemblies that are accessible and serviceable from inside the sign enclosure.

Provide controls so that the Engineer can field adjust the following:

- The light level emitted by the pixels in each Light Level Mode,
- The ambient light level at which each Light Level Mode is activated.

Display Modules

Manufacture each display module with a standard number of pixels which can be easily removed. Assemble the modules onto the DMS assemblies contiguously to form a continuous matrix to display the required number of lines, characters, and character height.

Design display modules that are interchangeable, self-addressable, and replaceable without using special tools. Provide plug-in type power and communication cables to connect to a display module. Ensure that the sign has a full matrix display area as defined in NEMA TS 4-2016, Section 1.6.

Design each module to display:

- All upper- and lower-case letters,
- All punctuation marks,

- All numerals 0 to 9,
- Special user-created characters or images.

Display upper-case letters and numerals over the complete height of the module. Optimize the LED grouping and mounting angle within a pixel for maximum readability.

Furnish two (2) spare display modules per each DMS installed for emergency restoration.

Discrete LEDs

Provide discrete LEDs with a nominal viewing cone of 30 degrees with a half-power angle of 15 degrees measured from the longitudinal axis of the LED. Make certain, the viewing cone tolerances are as specified in the LED manufacturer's product specifications and do not exceed +/- 3 degrees half-power viewing angle of 30 degrees.

Provide LEDs that are untinted, non-diffused, high output solid state lamps utilizing AlInGaP technology for Red and InGaN technology for Green and Blue. No substitutions will be allowed. Provide LEDs that emit a full color.

Provide LEDs with a MTBF (Mean Time Before Failure) of at least 100,000 hours of permanent use at an operating point of 140° F or below at a specific forward current of 20mA. Discrete LED failure is defined as the point at which the LED's luminous intensity has degraded to 50% or less of its original level.

Obtain the LEDs used in the display from a single LED manufacturer. Obtain them from batches sorted for luminous output, where the highest luminosity LED is not more than fifty percent more luminous than the lowest luminosity LED when the LEDs are driven at the same forward current. Do not use more than two successive and overlapping batches in the LED display.

Individually mount the LEDs on circuit boards that are at least 1/16" thick FR-4 fiberglass, flat black printed circuit board in a manner that promotes cooling. Protect all exposed metal on both sides of the LED pixel board (except the power connector) from water and humidity exposure by a thorough application of acrylic conformal coating. Design the boards so bench level repairs to individual pixels, including discrete LED replacement and conformal coating repair is possible.

Operate the LED display at a low internal DC voltage not to exceed 24 Volts.

Design the LED display operating range to be –20° F to +140° F at 95% relative humidity, non-condensing.
Supply the LED manufacturer's technical specification sheet with the material submittals.

LED Power Supplies

Power the LED Display by means of multiple regulated switching DC power supplies that operate from 120 volts AC input power and have an output of 24 volts DC or less. Wire the power supplies in a redundant parallel configuration that uses multiple power supplies per display. Provide the power supplies with current sharing capability that allows equal amounts of current to their portion

of the LED display. Provide power supplies rated such that if one supply fails the remaining supplies will be able to operate their portion of the display under full load conditions (i.e. all pixels on at maximum brightness) and at a temperature of 140° F.

Provide power supplies to operate within a minimum input voltage range of +90 to +135 volts AC and within a temperature range of –22° F to 140° F. Power supply output at 140° F must not deteriorate to less than 65% of its specified output at 70° F. Provide power supplies that are overload protected by means of circuit breakers, that have an efficiency rating of at least 75%, a power factor rating of at least .95, and are UL listed. Provide all power supplies from the same manufacturer and with the same model number for each Type of DMS. Design the power driver circuitry to minimize power consumption.

Design the field controller to monitor the operational status (normal or failed) of each individual power supply and be able to display this information on the Client Computer screen graphically. Color code power supply status, red for failed and green for normal. Provide power supply monitoring circuitry to detect power failure in the DMS and to automatically report this fault to the Control Software. This requirement is in addition to reporting power failure at the controller cabinet.

LED Pixels

A pixel is defined as the smallest programmable portion of a display module that consists of a cluster of closely spaced discrete LEDs. Design each pixel with either 66mm or 20mm spacing depending on the type of DMS called for in the plans.

Construct the pixels with strings of LEDs. It is the manufacturer's responsibility to determine the number of LEDs in each string to produce the candela requirement as stated herein.

Use continuous current to drive the LEDs at the maximum brightness level. Design the light levels to be adjustable for each DMS / controller so the Engineer may set levels to match the luminance requirements at each installation site.

Ensure each pixel produces a luminous intensity of 40 Cd when driven with an LED drive current of 20 mA per string.

Power the LEDs in each pixel in strings. Use a redundant design so that the failure of an LED in one string does not affect the operation of any other string within the pixel and does not lower the luminous intensity of the pixel more than 25% of the 40Cd requirement. Provide the sign controller with the ability to detect the failure of any LED string and identify which LED string has failed.

DMS Mini Controller

For Walk-In and Front Access DMS Types only, furnish and install a mini controller inside the DMS that is interconnected with the main controller using a fiber-optic cable. The mini controller will enable a technician to perform all functions available from the main controller. Provide the

mini controller with a Display and keypad interface. Size the display screen to allow preview of an entire one-page message on one screen. Provide a 4 X 4 keypad.

DMS Enclosure Structure Mounting

Mount the DMS enclosure and interconnect system securely to the supporting structures. Design the DMS enclosure supports and structure to allow full access to the DMS enclosure inspection door. Mount the DMS enclosure according to the manufacturer's recommendations.

Furnish and install U-bolt connections of hanger beams to truss chords with a double nut at each end of the U-bolt. Bring the double nuts tight against each other by the use of two wrenches.

Submit plans for the DMS enclosure, structure, mounting description and calculations to the Engineer for approval. Have such calculations and drawings approved by a Professional Engineer registered in the state of North Carolina, and bear his signature, seal, and date of acceptance.

Provide removable lifting eyes or the equivalent on the DMS enclosure rated for its total weight to facilitate handling and mounting the DMS enclosure.

Design the DMS structure to conform to the applicable requirements of Section 906 of the *Standard Specifications* and the section titled "DMS Pedestal Structure" of these Project Special Provisions.

DMS / DMS Controller Interconnect

Furnish and install all necessary cabling, conduit, and terminal blocks to connect the DMS and the DMS controller located in the equipment cabinet. Use approved manufacturer's specifications and the plans developed by the Design-Build Team for cable and conduit types and sizes. Use fiber-optic cable to interconnect sign and controller. Install fiber-optic interconnect centers in the sign enclosure and cabinet to securely install and terminate the fiber-optic cable. Submit material submittal cut sheets for the interconnect center.

DMS Controller and DMS Cabinet

Furnish and install one DMS controller with accessories per DMS in a protective cabinet. Controlling multiple DMS with one controller is allowed when multiple DMS are mounted on the same structure. Mount the controller cabinet on the Sign support structure. Install cabinet so that the height from the ground to the middle of the cabinet is 4 feet. Ensure a minimum of 24" x 36" level concrete working surface under each cabinet that provides maintenance technicians with a safe working environment.

Provide the DMS controller as a software-oriented microprocessor and with resident software stored in non-volatile memory. The Control Software, controller and communications must comply with the NTCIP Standards identified in these Project Special Provisions. Provide sufficient non-volatile memory to allow storage of at least 500 multi-page messages and a test pattern program.

For DMS Type 4C installations provide a single controller that can control up to eight (8) signs simultaneously.

Furnish the controller cabinet with, but not limited to, the following:

- Power supply and distribution assemblies,
- Power line filtering hybrid surge protectors,
- Radio Interference Suppressor,
- Communications surge protection devices,
- Industrial-Grade UPS system and local disconnect,
- Microprocessor based controller,
- Display driver and control system (unless integral to the DMS),
- RJ45 Ethernet interface port,
- Local user interface,
- Interior lighting and duplex receptacle,
- Adjustable shelves as required for components,
- Temperature control system,
- All interconnect harnesses, connectors, and terminal blocks,
- All necessary installation and mounting hardware.

Furnish the DMS controller and associated equipment completely housed in a Caltrans 336S cabinet made from 5052 H32 sheet aluminum at least 1/8" thick. Use natural aluminum cabinets. Perform all welding of aluminum and aluminum alloys in accordance with the latest edition of AWS D1.2, Structural Welding Code – Aluminum. Continuously weld the seams using Gas Metal Arc Welding (GMAW).

Slant the cabinet roof away from the front of the cabinet to prevent water from collecting on it.

Do not place a manufacturer name, logo, or other information on the faces of the controller cabinet

Provide cabinets capable of housing the components and sized to fit space requirement. Design the cabinet layout for ease of maintenance and operation, with all components easily accessible. Submit a cabinet layout plan for approval by the Engineer.

Locate louvered vents with filters in the cabinet to direct airflow over the controller and auxiliary equipment, and in a manner that prevents rain from entering the cabinet. Fit the inside of the cabinet, directly behind the vents, with a replaceable, standard size, commercially available air filter of sufficient size to cover the entire vented area.

Provide a torsionally rigid door with a continuous stainless-steel hinge on the side that permits complete access to the cabinet interior. Provide a gasket as a permanent and weather resistant seal at the cabinet door and at the edges of the fan / exhaust openings. Use a non-absorbent gasket material that will maintain its resiliency after long term exposure to the outdoor environment. Construct the doors so that they fit firmly and evenly against the gasket material when closed.

Provide the cabinet door with louvered vents and air filters near the bottom as described in the paragraph above.

The cabinet shall contain a full-height standard EIA 19-inch rack. The rack shall be secured within the cabinet by mounts at the top and bottom.

The rack shall contain a minimum of one (1) pullout drawer. The drawer shall be suitable for storing manuals and small tools. The drawer shall be able to latch in the out position to function as a laptop/utility shelf.

Provide a convenient location on the inside of the door to store the cabinet wiring diagrams and other related cabinet drawings. Provide a Corbin #2 main door lock made of non-ferrous or stainless-steel material. Key all locks on the project alike and provide 1 key per lock to the Engineer. In addition, design the handle to permit padlocking.

Provide the interior of the cabinet with ample space for housing the controller and all associated equipment and wiring. Provide ample space in the bottom of the cabinet for the entrance and exit of all power, communications, and grounding conductors and conduit.

Arrange the equipment to permit easy installation of the cabling through the conduit so that they will not interfere with the operation, inspection, or maintenance of the unit. Provide adjustable metal shelves, brackets, or other support for the controller unit and auxiliary equipment. Leave a 3-inch minimum clearance from the bottom of the cabinet to all equipment, terminals, and bus bars.

Provide power supply monitoring circuitry to detect power failure and to automatically report the occurrence to the Control Software.

Install two LED light strips with shields, one in the top of the cabinet and the other under the bottom shelf. Design both lights to automatically turn on when the cabinet door is opened and turn off when the door closes.

Mount and wire a 120V (+10%) GFCI duplex receptacle of the 3-wire grounding type in the cabinet in a location that presents no electrical hazard when used by service personnel for the operation of power tools and work lights.

No cabinet resident equipment may utilize the GFCI receptacle. Furnish one spare non-GFCI duplex receptacle for future equipment.

Mount a bug-proof and weatherproof thermostatically controlled fan and safety shield in the top of the cabinet. Size the fan to provide at least for two air exchanges per minute. Fuse the fan at 125% of the capacity of the motor. The magnetic field of the fan motor must not affect the performance of the control equipment. Use a fan thermostat that is manually adjustable to turn on between 80° F and 160° F with a differential of not more than 10° F between automatic turn on and turn off. Mount it in an easily accessible location, but not within 6 Inches of the fan.

Install additional fans and/or heaters as needed to maintain the temperature inside the cabinet within the operating temperature range of the equipment within the cabinet as recommended by equipment manufacturer(s).

Wiring

The requirements stated herein apply wherever electrical wiring is needed for any DMS system assemblies and subassemblies such as controller cabinet, DMS enclosure, electrical panel boards etc.

Neatly arrange and secure the wiring inside the cabinet. Where cable wires are clamped to the walls of the control cabinet, provide clamps made of nylon, metal, plastic with rubber or neoprene protectors, or similar. Lace and jacket all harnesses or tie them with nylon tie wraps spaced at 6 inches maximum to prevent separation of the individual conductors.

Individually and uniquely label all conductors. Ensure all conductor labels are clearly visible without moving the conductor. Connect all terminal conductors to the terminal strip in right angles. Remove excess conductor before termination of the conductor. Mold the conductor in such a fashion as to retain its relative position to the terminal strip if removed from the strip. Do not run a conductor across a work surface with the exception of connecting to that work surface. No conductor bundles can be support by fasteners that support work surfaces. Install all connectors, devices and conductors in accordance to manufactures guidelines. Comply with the latest NEC guideline in effect during installation. No conductor or conductor bundle may hang loose or create a snag hazard. Protect all conductors from damage. Ensure all solder joints are completed using industry accepted practices and will not fail due to vibration or movement. Protect lamps and control boards from damage.

No splicing will be allowed for feeder conductors and communication cables from the equipment cabinet to the DMS enclosure.

Insulate all conductors and live terminals so they are not hazardous to maintenance personnel.

Route and bundle all wiring containing line voltage AC and / or shield it from all low voltage control circuits. Install safety covers to prevent accidental contact with all live AC terminals located inside the cabinet.

Use industry standard, keyed type connectors with a retaining feature for connections to the controller.

Label all equipment and equipment controls clearly.

Supply each cabinet with one complete set of wiring diagrams that identify the color-coding or wire tagging used in all connections. Furnish a water-resistant packet adequate for storing wiring diagrams, operating instructions, and maintenance manuals with each cabinet.

Power Supply and Circuit Protection

Design the DMS and controller for use on a system with a line voltage of 120V + 10% at a frequency of 60 Hz ± 3 Hz. Under normal operation, do not allow the voltage drop between no load and full load of the DMS and its controller to exceed 3% of the nominal voltage.

Blackout, brownout, line noise, chronic over-voltage, sag, spike, surge, and transient effects are considered typical AC voltage defects. Protect the DMS system equipment so that these defects do not damage the DMS equipment or interrupt their operation. Equip all cabinets with devices to protect the equipment in the cabinet from damage due to lightning and external circuit power and current surges.

Circuit Breakers

Protect the DMS controller, accessories, and cabinet utilities with thermal magnetic circuit breakers. Provide the controller cabinet with a main circuit breaker sized according to the NEC. Use appropriately sized branch circuit breakers to protect the controller, sign display and accessories and for servicing DMS equipment and cabinet utilities.

Provide a subpanel in the sign enclosure with a main and branch circuit breakers sized appropriately per NEC.

Provide a detailed plan for power distribution within the cabinet and the sign. Label all breaker and conductor with size and loads. Have the plans signed and sealed by a NC registered PE and submit the plans for review and approval.

Surge Suppressor

Install and clearly label filtering hybrid power line surge protectors on the load side of the branch circuit breakers in a manner that permits easy servicing. Ground and electrically bond the surge protector to the cabinet within 2 inches.

Provide power line surge protector that meets the following requirements:

Peak surge current occurrences	20 minimum
Peak surge current for an 8 x 20 microsecond waveshape	50,000 Amperes
Energy Absorption	> 500 Joules
Clamp voltage	240 Volts
Response time	<1 nanosecond
Minimum current for filtered output	15 Amperes for 120VAC*
Temperature range	-40ºF to +158ºF

*Capable of handling the continuous current to the equipment

Transients and Emissions

DMS and DMS controller will be designed in such a way to meet the latest NEMA TS-4 for Transients and Emissions.

Transient Protection

The RS232 and Ethernet communication ports in the DMS sign controller shall be protected with surge protection between each signal line and ground. This surge protection shall be integrated internally within the controller.

Lightning Arrester

Protect the system with an UL approved lightning arrester installed at the main service disconnect that meets the following requirements:

Type of design	Silicon Oxide Varistor
Voltage	120/240 Single phase, 3 wires
Maximum current	100,000 Amps
Maximum energy	3000 Joules per pole
Maximum number of surges	Unlimited
Response time one milliamp test	5 nanoseconds
Response time to clamp 10,000 amps	10 nanoseconds
Response time to clamp 50,000 amps	25 nanoseconds
Leak current at double the rated voltage	None
Ground Wire	Separate

Uninterruptible Power Supply (UPS)

Furnish UPS with external temperature monitoring that will shut off when running on battery power and the maximum operating temperature for the ethernet switch is reached.

Install UPS with RJ-45 ethernet network monitoring ports that can be disabled via the UPS software/firmware.

The Design-Build Team is responsible for supplying a UPS and batteries that can adequately power the cabinet load plus an additional 20% for a **minimum** of 4 hours. The Design-Build Team shall request the power requirements for any department supplied equipment prior to submitting UPS for approval. Allow eight (8) weeks for the department to supply equipment power requirements. Provide to the Engineer for Approval, a submittal package with Engineering Calculations consisting of, as a minimum, schematic drawing, technical data sheets, and supporting documentation. Ensure the documentation demonstrates, in theory, that the battery(ies) will provide for continuous operation for a minimum of four (4) consecutive hours with no additional charging.

Furnish and install one rack mounted UPS in each new cabinet that meet the following **minimum** specifications:

Output

Nominal Output Voltage	120V
Output Voltage Distortion	Less than 5% at full load
Output Frequency (sync to mains)	57 - 63 Hz for 60 Hz nominal
Crest Factor	up to 5:1
Waveform Type	Sine wave

Output Connections	(4) NEMA 5-15R
Input	
Nominal Input Voltage	120V
Input Frequency	50/60 Hz +/- 3 Hz (auto sensing)
Input Connections	NEMA 5-15P
Input voltage range for main operations	82 - 144V
Input voltage adjustable range for mains operation	75 -154 V
Battery Type	
Maintenance-free sealed Lead-Acid battery with suspended electrolyte, leak-proof.	
Typical recharge time	2 hours
Communications & Management	
Interface Port(s)	DB-9 RS-232, USB,RJ-45 Ethernet
Control panel battery	LED status display with load and bar-graphs
Surge Protection and Filtering	
Surge energy rating	480 Joules
Environmental	
Operating Environment	-32 - 165 °F
Operating Relative Humidity	0 - 95%
Conformance	
Regulatory Approvals	FCC Part 15 Class A, UL 1778

Controller Communications Interface

Provide the controller with the following interface ports:

- An EIA/TIA-232E port for remote communication using NTCIP,
- An 10/100 Ethernet port for remote communication using NTCIP,
- An EIA/TIA-232E port for onsite access using a laptop,
- An EIA/TIA-232E auxiliary port for communication with a field device such as a UPS,
- Fiber-optic ports for communication with the sign,

Controller Local User Interface

Provide the controller with a Local User Interface (LUI) for at least the following functions:

- On / Off Switch: controls power to the controller,

- Control Mode Switch: for setting the controller operation mode to either remote or local mode,
- Display and Keypad: Allow user to navigate through the controller menu for configuration (display, communications parameter, etc.) running diagnostics, viewing peripherals status, message creation, message preview, message activation, etc. Furnish a display with a minimum size of 240x64 dots with LED back light.

Protected access to the LUI with an alphanumeric and PIN passwords. Allow the user to select a preferred method of password protection. Default and hardcoded passwords are not allowed.

Controller Address

Assign each DMS controller a unique address. Preface all commands from the Control Software with a particular DMS controller address. The DMS controller compares its address with the address transmitted; if the addresses match, then the controller processes the accompanying data.

Controller Functions

Design the DMS controller to continuously control and monitor the DMS independent of the Control Software. Design the controller to display a message on the sign sent by the Control Software, a message stored in the sign controller memory, or a message created on site by an operator using the controller keypad.

Provide the DMS controller with a watchdog timer to detect controller failures and to reset the microprocessor, and with a battery backed up clock to maintain an accurate time and date reference. Set the clock through an external command from the Control Software or the Local User Interface.

DMS Controller Memory

Furnish each DMS controller with non-volatile memory. Use the non-volatile memory to store and reprogram at least one test pattern sequence and 500 messages containing a minimum of two pages of 45 characters per page. The Control Software can upload messages into and download messages from each controller's non-volatile memory remotely.

Messages uploaded and stored in the controller's non-volatile memory may be erased and edited using the Control Software and the controller. New messages may be uploaded to and stored in the controller's non-volatile memory using the Control Software and the controller.

Equipment List

Provide a general description of all equipment and all information necessary to describe the basic use or function of the major system components. Include a general "block diagram" presentation. Include tabular charts listing auxiliary equipment, if any is required. Include the nomenclature, physical and electrical characteristics, and functions of the auxiliary equipment unless such

information is contained in an associated manual; in this case include a reference to the location of the information.

Include a table itemizing the estimated average and maximum power consumption for each major piece of equipment.

Physical Description

Provide a detailed physical description of size, weight, center of gravity, special mounting requirements, electrical connections, and all other pertinent information necessary for proper installation and operation of the equipment.

Parts List

Submit a parts list that contains all information needed to describe the characteristics of the individual parts, as required for identification to the Engineer. Include a list of all equipment within a group and a list of all assemblies, sub-assemblies, and replacement parts of all units. Arrange this data in a table, in alpha numerical order of the schematic reference symbols, which gives the associated description, manufacture's name, and part number, as well as alternate manufacturers and part numbers. Provide a table of contents or other appropriate grouping to identify major components, assemblies, etc.

Character Set Submittal

Submit an engineering drawing of the DMS character set including at a minimum, 26 upper case and lower case letters, 10 numerals, 9 punctuation marks (. , ! ? – ‘ “ ; :) 12 special characters (# & * + / ( ) [ ] < > @) and arrows at 0, 45, 90, 135, 180, 225, 270, and 315 degrees.

Wiring Diagrams

Submit a wiring diagram for each DMS and each controller cabinet, as well as interconnection wiring diagrams for the system as a whole to the Engineer.

Routine of Operation

Describe the operational routine, from necessary preparations for placing the equipment into operation to securing the equipment after operation. Show appropriate illustrations with the sequence of operations presented in tabular form wherever applicable. Include in this section a total list of the test instruments, aids and tools required to perform necessary measurements and measurement techniques for each component, as well as set up, test, and calibration procedures.

Maintenance Procedures

Specify and submit the recommended preventative maintenance procedures and checks at pre-operation, monthly, quarterly, semiannual, annual, and "as required" periods to assure equipment operates reliably to the Engineer. List specifications (including tolerances) for all electrical, mechanical, and other applicable measurements and / or adjustments.

Repair Procedures

Include in this section all data and step by step procedures necessary to isolate and repair failures or malfunctions, assuming the maintenance technicians are capable of analytical reasoning using the information provided in the sections titled “Wiring Diagrams”, “Routine of Operation” and “Maintenance Procedures”

Describe accuracy, limits, and tolerances for all electrical, physical, or other applicable measurements. Include instructions for disassembly, overhaul, and reassembly, with shop specifications and performance requirements.

Give detailed instructions only where failure to follow special procedures would result in damage to equipment, improper operation, danger to operating or maintenance personnel, etc. Include such instructions and specifications only for maintenance that specialized technicians and engineers in a modern electromechanical shop would perform. Describe special test set up, component fabrication, and the use of special tools, jigs, and test equipment.

Warranty

Ensure that the DMS system and equipment has a manufacturer’s warranty covering all defects and failures for a minimum of five (5) years from the date of final acceptance by the Engineer. This warranty will cover all parts, labor, shipping, and any other costs associated with the repair of the DMS.

CONSTRUCTION METHODS

Description

This article establishes practices and procedures and gives minimum standards and requirements for the installation of DMS systems, auxiliary equipment and the construction of related structures.

Provide electrical equipment described in this specification that conforms to the standards of NEMA, UL, or Electronic Industries Association (EIA), wherever applicable. Provide connections between DMS equipment and DMS sign housing and electric utilities that conform to NEC standards.

Provide stainless steel screws, nuts, and locking washers in all external locations. Do not use self-tapping screws unless specifically approved by the Engineer. Use parts made of corrosion resistant materials, such as plastic, stainless steel, brass, or aluminum. Use construction materials that resist

fungus growth and moisture deterioration. Separate dissimilar metals by an inert dielectric material.

Layout

The Regional ITS engineer or Division Traffic Engineer will establish the actual location of each DMS assembly. It is the Design-Build Team's responsibility to ensure proper elevation, offset, and orientation of all DMS assemblies. The location of service poles as well as conduit lengths shown in the plans developed by the Design-Build Team, are approximate based on available project data. Make actual field measurements to place conduit and equipment at the required location.

Construction Submittal

When the work is complete, submit "as built" plans, inventory sheets, and any other data required by the Engineer to show the details of actual construction and installation and any modifications made during installation.

The "as built" plans will show: the DMS, controller, and service pole locations; DMS enclosure and controller cabinet wiring layouts; Wiring Diagrams, Parts list; coordinates of the DMS and devices; and wire and conduit routing. Show horizontal and vertical locations of all underground conduits and cables dimensioned from fixed objects.

Include detailed drawings that identify the routing of all conductors in the system by cable type, color code, and function. Clearly label all equipment in the DMS system, controller cabinet, and DMS enclosure.

Conduit

Install the conduit system in accordance with Section 1715 of the *Standard Specifications* and NEC requirements for an approved watertight raceway.

Make bends in the conduit so as not to damage it or change its internal diameter. Install watertight and continuous conduit with as few couplings as standard lengths permit.

Clean conduit before, during, and after installation. Install conduit in such a manner that temperature changes will not cause elongation or contraction that might damage the system.

Attach the conduit system to and install along the structural components of the Sign structure assemblies with beam clamps or stainless-steel strapping or inside the structure if there is available space. Install strapping according to the strapping manufacturer's recommendations and according to NEC requirements. Do not use welding or drilling to fasten conduit to structural components. Space the fasteners at no more than 4 feet for conduit 1.5 inches and larger or 6 feet for conduit smaller than 1.25 inches. Place fasteners no more than 3 feet from the center of bends, fittings, boxes, switches, and devices.

Flexible conduit will only be allowed when the conduits transition from the horizontal structure segment to the horizontal truss segment and from the horizontal truss segment to the rear entrance of the DMS when installing the DMS communications and feeder cables. The maximum length of flexible conduit allowed at each transition will be 5 feet.

Do not exceed the appropriate fill ratio on all cable installed in conduit as specified in the NEC.

Wiring Methods (Power)

Do not pull permanent wire through a conduit system until the system is complete and has been cleaned.

Color-code all conductors per the NEC. Use approved marking tape, paint, sleeves or continuous colored conductors for No.8 AWG and larger. Do not mark a white conductor in a cable assembly any other color.

Do not splice underground circuits unless specifically noted in the plans developed by the Design-Build Team.

Equipment and Cabinet Mounting

Mount equipment securely at the locations shown in the plans developed by the Design-Build Team, in conformance with the dimensions shown. Install fasteners as recommended by the manufacturer and space them evenly. Use all mounting holes and attachment points for attaching DMS enclosures and controller cabinets to the structures.

Drill holes for expansion anchors of the size recommended by the manufacturer of the anchors and thoroughly clean them of all debris.

Provide cabinets with all strapping hardware and any other necessary mounting hardware in accordance with these Project Special Provisions and the plans developed by the Design-Build Team.

Seal all unused conduit installed in cabinets at both ends to prevent water and dirt from entering the conduit and cabinet with approved sealing material.

Install a ground bushing attached inside the cabinet on all metal conduits entering the cabinet. Connect these ground bushings to the cabinet ground bus.

Install a level concrete technician pad measuring a minimum 4 inches thick, 36 inches wide and 36 inches long at the front door of the DMS equipment cabinet as shown on the Typical Details sheet within the plans developed by the Design-Build Team.

Work Site Clean-Up

Clean the site of all debris, excess excavation, waste packing material, wire, etc. Clean and clear the work site at the end of each workday. Do not throw waste material in storm drains or sewers.

General Test Procedure

Test the DMS and its components in a series of functional tests and ensure the results of each test meet the specified requirements in the presence of the Engineer. These tests should not damage the equipment. The Engineer will reject equipment that fails to fulfill the requirements of any test. Resubmit rejected equipment after correcting non-conformities and re-testing; completely document all diagnoses and corrective actions. Modify all equipment furnished under this contract, without additional cost to the Department, to incorporate all design changes necessary to pass the required tests.

Provide electronic copies of all test procedures and requirements to the Engineer for review and approval at least 30 days prior to the testing start date.

Only use approved procedures for the tests. Include the following in the test procedures:

- A step-by-step outline of the test sequence that demonstrates the testing of every function of the equipment or system tested
- A description of the expected nominal operation, output, and test results, and the pass / fail criteria
- An estimate of the test duration and a proposed test schedule
- A data form to record all data and quantitative results obtained during the test
- A description of any special equipment, setup, manpower, or conditions required by the test

Provide all necessary test equipment and technical support. Use test equipment calibrated to National Institute of Standards and Technology (NIST) standards. Provide calibration documentation upon request.

Conform to these testing requirements and the requirements of these specifications. It is the Design-Build Team's responsibility to ensure the system functions properly even after the Engineer accepts the CCTV test results.

Provide electronic copies of the quantitative test results and data forms containing all data taken, highlighting any non-conforming results and remedies taken, to the Engineer for approval. An authorized representative of the manufacturer must sign the test results and data forms.

Compatibility Tests

DMS System

Compatibility Tests are applicable to DMS that the Design-Build Team wishes to furnish but are of a different manufacturer or model series than the existing units installed in the Region. If required, the Compatibility Test shall be completed and accepted by the Engineer prior to approval of the material submittal.

The Compatibility Test shall be performed in a laboratory environment at a facility chosen by the Engineer based on the type of unit being tested. Provide notice to the Engineer with the material submitted that a Compatibility Test is requested. The notice shall include a detailed test plan that

will show compatibility with existing equipment. The notice shall be given a minimum of 15 calendar days prior to the beginning of the Compatibility Test.

The Design-Build Team shall provide, install, and integrate a full-functioning unit to be tested. The Department will provide access to existing equipment to facilitate these testing procedures. The Engineer will determine if the Compatibility Test was acceptable for each proposed device. To prove compatibility the Design-Build Team is responsible for configuring the proposed equipment at the applicable Traffic Operations Center (TOC) with the accompaniment of an approved TOC employee.

Operational Field Test (On-Site Commissioning)

DMS System

Final DMS locations must be field verified and approved by the Engineer. Perform the following local operational field tests at the DMS assembly field site in accordance with the test plans in the presence of the ITS Design Unit and a representative of the DMS manufacturer. The Design-Build Team is responsible for providing a laptop for camera control and positioning during the test. After completing the installation of the camera assemblies, including the camera hardware, power supply, and connecting cables, the Design-Build Team shall:

Local Field Testing

Furnish all equipment and labor necessary to test the installed camera and perform the following tests before any connections are made.

- Verify that physical construction has been completed.
- Inspect the quality and tightness of ground and surge protector connections.
- Check the power supply voltages and outputs, check connection of devices to power source.
- Verify installation of specified cables and connection between the DMS and control cabinet,
- Make sure cabinet wiring is neat and labeled properly; check wiring for any wear and tear; check for exposed or loose wires.
- Perform the DMS assembly manufacturer's initial power-on test in accordance with the manufacturer's recommendation.
- Set the DMS control address.

Central Operations Testing

- Interconnect the DMS's communication interface device with one of the following methods as depicted on the plans:
    - communication network's assigned Ethernet switch and assigned fiber-optic trunk cable and verify a transmit/receive LED is functioning and that the DMS is fully operational at the TOC.

AND/OR

- to the DOT furnished cellular modem and verify a transmit/receive LED is functioning and that the DMS is fully operational at the TOC.

- Review DMS date and time and DMS controller information.
- Run DMS diagnostics and review results.
- Run DMS pixel test and review results.
- Run test message.
- Run test schedule.
- Program burn-in scenario.

Approval of Operational Field Test results does not relieve the Design-Build Team to conform to the requirements in these Project Special Provisions. If the DMS system does not pass these tests, document a correction or substitute a new unit as approved by the Engineer. Re-test the system until it passes all requirements.

Conduit for Jetting Fiber

DESCRIPTION

For jetted fiber installations furnish and install conduit that has internal longitudinal ribbing and factory lubricated. Ensure the conduit is manufactured from High Density Polyethylene (HDPE) materials.

Furnish individual HDPE conduits (Traditional) and Grouped Microcell Conduits that are comprised of individual microducts manufactured into a multi-cell conduit configuration as required by the plans. Furnish individual HDPE conduits (Traditional) with an embedded tracer wire. If there are more than one HDPE conduit in the same trench, provide tracer wire with only one of the conduits. See Section 1. 2.(C) "Traditional - HDPE Conduit" below. Furnish grouped microcell conduits with an internal tracer wire.

Furnish all HDPE conduit that is suitable for direct buried applications through standard trenching, plowing and/or directional drilling operations.

Ensure the conduit is coilable and can be furnished on reels.

For traditional conduits designated as spare, furnish polyester pull tape with an embedded tracer wire.

MATERIALS

Furnish material, equipment, and hardware under this section that is pre-approved on the ITS and Signals QPL at the time of project letting.

A. Solid Wall HDPE Conduit with Internal Ribbing (Traditional & Grouped Microcell)

Use HDPE conduit that conforms to the material and dimensional requirements of UL Standard 651A. Provide conduit meeting Conduit trade Size and Standard Dimension Ratio (SDR) based on the fiber count as listed below or as required in the Plans. Ensure the supplied conduits meet or exceed the minimum wall thickness ratios (SDR) corresponding to EPEC-40 (Schedule 40) or EPEC-B (SDR 13.5) as listed in UL Standard 651A,

HDPE CONDUIT SIZE and FIBER COUNT		
Traditional Conduit Trade Size	**Fiber Count (None Micro-Fiber)**	**Furnish**
1”	12 - 96	EPEC-40
1 ¼”	12 - 144	EPEC-40
1 ½”	72 - 288	EPEC-B (SDR 13.5)
2”	288 - larger	EPEC-B (SDR 13.5)
Microduct Conduit Trade Sizes	**Fiber Count (Micro-Fiber)**	**Furnish**
22 mm OD & 16 mm ID	12 - 864	EPEC-7.3 (SDR 7.3)

Ensure the PE resin compounds used in manufacturing the conduit meet or exceed the cell classification PE 334480C (black with 2% minimum carbon black) or PE 334480E (colored conduit with UV inhibitors) in ASTM D3350 and the table below.

RESIN PROPERTIES		
Property	**Requirement**	**Test Method**
Density	0.940 g/cm^3 min.	ASTM D1505 ASTM D792 ASTM D4883
Melt Index (condition 190/2.16 is acceptable)	< 0.4 grams/10 minutes	ASTM D1238
Flexural Modulus	80,000 psi, min.	ASTM D790
Tensile Strength	Tensile Strength 3,000 psi, min.	ASTM D638
Elongation	Elongation 400%, min.	ASTM D638
Slow Crack Growth Resistance	An ESCR as per condition B, 10% IGEPAL requirement of F_{10}>96 hrs is allowable	ASTM D1693
Hydrostatic Design Basis	“0” for Non-Pressure Rated Pipe	ASTM D2837
UV Resistance (Outdoor Conduit Only)	Stabilize with at least 2% by weight carbon black or colored with UV Inhibitor	ASTM D4218

Ensure the HDPE conduit is resistant to benzene, calcium chloride, ethyl alcohol, fuel oil, gasoline, lubricating oil, potassium chloride, sodium chloride, sodium nitrate and transformer oil and is protected against degradation due to oxidation and general corrosion.

Furnish all HDPE conduits with internal longitudinal ribbing and that is factory lubricated with a permanent coextruded internal layer to provide a low coefficient of friction of 0.20 or less in accordance with Telcordia GR-356.

Furnish coilable conduit that is supplied on reels in continuous lengths for transportation and storage outside. Ensure that the process of installing the coilable conduit on the reel does not alter the properties or performance of the conduit for its intended purpose.

B. Conduit Color Schemes

Ensure for traditional conduits and grouped microcell conduits that multiple conduit colors can be provided in accordance with the plan requirements. For conduits manufactured with stripes, ensure that a minimum of three stripes are uniformly spaced around the conduit with 120 degrees of separation. Do not use "Solid Yellow" or "Black with Yellow Stripes" conduit, furnish conduits in the following minimum colors (Blue, Orange, Green, Brown, Slate or Grey, Black, Red, White).

Furnish grouped microcell conduit assemblies with an "Orange" outer sheath unless otherwise noted in the plans or these project special provisions. An alternate grouped microcell conduit outer sheath color may be submitted for approval by the Engineer.

C. Traditional - HDPE Conduit

On traditional conduits, where multiple conduits are to be placed at the same time, furnish one HDPE locatable conduit manufactured with a minimum of a #14 AWG solid copper (soft drawn or annealed per ASTM B3) tracer wire attached to the outer shell of the conduit. Ensure the locatable conduit is manufactured to the material and dimensional specifications of NEMA TC-7 for the wall type to be certified by the manufacturer.

Ensure the non-locatable standard wall supplied HDPE conduit is printed in accordance with the requirements of UL Standard 651A and is listed by a Nationally Recognized Testing Laboratory (NTRL). Ensure all non-locatable standard wall HDPE conduits are marked at least with the following information at 2 feet or less intervals per the examples below in a-f. For locatable standard wall HDPE conduit ensure the conduit is marked at least with the following information on 2 feet or less intervals with items a-e below:

(a) Material: HDPE

(b) Trade Size: i.e., 2 inches

(c) Conduit Type: SDR 13.5 or EPEC-B

(d) Manufacturer's name or trademark

(e) Manufacturer's production code to identify manufacturing date, facility, etc.

(f) National Recognized Testing Laboratory (NRTL) symbol or listing number for the non-locatable wall types and manufacturer certified for the locatable wall types

D. Traditional – Mechanical Duct plugs, Mechanical Fiber/Conduit Duct Plugs

Provide reusable mechanical duct plugs to seal traditional HDPE conduits that are designated as spare or unused at the time of installation. Ensure the mechanical duct plug is sized to slip inside the conduit and can be tightened using compression to expand a seal creating a snug fit to ensure debris cannot enter the conduit system. Conduit plugs and/or caps that require special adhesive glues that permanently adhere the device to the conduit will not be accepted.

Provide mechanical fiber/conduit sealing split duct plugs designed to slip over the fiber cable and inside the HDPE conduit. Ensure mechanical fiber/conduit sealing split duct plugs through the use of compression have an expandable seal to ensure a snug fit around the fiber's outside diameter and the inside diameter of the conduit to ensure debris cannot enter the conduit system.
The use of a duct and conduit sealer or mastic which is of a putty-like compound shall not be used.

Ensure any duct plug used to seal a conduit with or without a fiber cable is removable and re-usable. Conduit plugs are not required to be listed electrical devices.

E. Grouped Microcell Conduits

Furnish individual microduct conduits that are bound together within and outer extruded 0.070" sheath of high-density polyethylene to form a grouped microcell conduit assembly. Ensure the individual 22/16 mm microducts that form the grouped microcell conduit assembly have a SDR number less than or equal to 7.3.

Furnish grouped microduct conduit assemblies with a minimum allowable flexural modulus of 5,625 Kg/cm^2 (80,000 psi) and a minimum Pipe Stiffness of 49.2 Kg/cm^2 (699 psi).

Ensure the completed grouped microcell conduit assembly is furnished with a minimum of two (2) ripcords located along the outer sheath. The outer sheath of the grouped microcell conduit assembly shall not be adhered (glued) to the internal microcell conduits to allow for easy removal of outer sheath.

Furnish grouped microcell conduits assemblies with a preinstalled 14 AWG THWN solid copper soft drawn per ASTM B3 tracer wire located within the interior of the outer sheath. Grouped Microcell conduit assemblies with and internal tracer wire located inside an individual microduct conduit will not be accepted.

For overriding applications, where a new single microduct will be installed in an existing conduit system, furnish a microduct conduit with an SDR number less than or equal to 11 to serve as the new carrier pipe. For override applications provide a microduct conduit sized as specified in the Plans.

Ensure the individual microducts supplied by the manufacturer meet quality and verification testing in accordance with ASTM F2160 for materials and associated properties for cell

classification PE 334480 C for black or E for color. Ensure the outer sheath of the group microcell conduit system is marked every 2 feet in accordance with ASTM F2160 standards to include the following a-f below:

(a) Material: HDPE

(b) Trade Sizes and # of micoducts: i.e., 4-way 22/16 mm

(c) Conduit Type: SDR 7.3 or EPEC-7.3

(d) Manufacturer's name or trademark

(e) Manufacturer's production code to identify manufacturing date, facility, etc.

(f) Manufacturer certified meeting the material and dimensional microduct requirements.

F. Microduct Couplers and End Caps

Furnish gasketed couplers and gasketed end caps recommended by the manufacturer of the furnished microduct conduits for joining and sealing off of the microduct conduit ends. Couplers and end caps shall be sized specifically for the microduct conduits and designed to be easily removed by hand and re-useable.

Couplers shall meet, at minimum, the required safety margins testing as outlined under Bell Core GR-356-CORE. Additionally, the couplers shall be tested to illustrate that the couplers are 100% airtight (no air loss) due to failure of couplers when pressure is raised from the 125 psi (maximum Bell Core GR-356-CORE pressure tested) to 175 psi 23^0 C $\pm 5^0$ C (73^0 F $\pm 9^0$ F) for 5 minutes.

G. Pull Tape

Furnish pull tape manufactured out of ½-inch wide polyester material with a minimum of a #22 AWG solid PVC insulated tracer wire woven into the polyester material. Ensure the pule tape is pre-lubricated and has a minimum tensile strength of 1,250 lbs.

CONSTRUCTION METHODS

A. General

Install traditional HDPE conduits and grouped microcell conduit assemblies utilizing the method identified in the plans (trench, micro-trench, plow, directional drill, etc.) Comply with the following Sections in Article 1715-3 "Construction Methods" of the North Carolina Standard Specifications for Roads and Structures -Dated January 2024, where applicable:

Section 1715-3 (B) – Trenching
Section 1715-3 (C) – Plowing
Section 1715-3 (D) – Directional Drilling

MINIMUM CLEARANCE REQUIREMENTS	
Man-made Structure or General Installations	**Minimum Clearance Requirement (all distances are "averages")**
Minimum/Maximum Conduit Depth Parallel to Interstate	42"/48"
Minimum/Maximum Conduit Depth crossing the Interstate (Perpendicular)	15 feet below
Bridge Foundation	5 ft horizontal and 4 ft vertical (clearances greater than minimum horizontal should continue to use the 4V:5H ratio, i.e., 10 ft horizontal should be no deeper than 8 ft)
Drainage Pipes 60" or Less	14 to 15 feet below
Drainage Pipes Greater than 60"	14 to 15 feet below
Box Culverts	14 to 15 feet below
Slope Protection (rip rap)	32" below
Slope Protection Foundation Footing	5 ft below
Crossing Beneath Ditches	32" below bottom of ditch

Follow industry accepted practices for installing the conduit(s) when trenching, plowing and/or directional drilling operations are required. Use pulling eyes or external conduit grips sized in accordance with the manufacture's recommendations for directional drilling operations. Where external grips are to be used the ends of the conduits should be sealed to prevent debris from entering as the conduit is being installed.

For any installation practices that require pulling of the conduits use a breakaway swivel rated to not exceed the manufactures recommended working tensile load. When a field bend or elevation change in the conduit is required to work around obstructions or obstacles do not violate the manufacturer's recommend safe working tensile load and minimum allowable bend radius.

Backfill and tamp trenches in 6-inch lifts while removing any rocks or debris that could possibly damage the conduit system. Place non-detectable marker tape 12 inches below the final grade.

During installation of any conduit(s) temporarily install a mechanical duct plug (traditional) or end cap (microduct) on the exposed conduit ends to prevent any debris from entering the conduit.

Install conduit(s) to enter and exit the junction boxes through the mouse holes, precast knockouts or field drilled conduit entrance holes. Sufficient slack conduit should be pulled into the junction box so the opposing ends overlap for joining. Adequate time should be given prior to joining to allow the conduit to relax and recover due to any elongation that may have occurred as it was being pulled into place. **Conduits installed for the purpose of jetting in fiber shall not enter or exit junction boxes through the bottom.**

Install quick setting, non-shrinking grout around the conduit openings to seal and hold the conduit in place as it enters and exits the junction boxes. Ensure the lowest conduit entering the junction box maintains a minimum of 4-inch separation from the bottom layer of crushed stone located inside the junction box.

Ensure the orientation for conduits of the same color enter and exit the junction box positioned opposite each other so that when mating the conduit of the same color the ends will be in direct line with one another. During initial installations of the conduits ensure the opposing conduits are pulled into the junction box so the opposing ends overlap for joining and are properly sealed.

Install conduits in one continuous length between junction boxes. Joining conduits shall only be performed within junction boxes, unless otherwise approved by the Engineer (see "Conduit Integrity Testing" below).

When temporarily joining conduits inside junction boxes to increase fiber jetting distances use removable split couplers designed to be airtight to temporarily join the opposing ends. Prior to joining two conduits with a removable split coupler use approved conduit shears to provide smooth, clean, square cuts on ends of the conduits. At the appropriate time during cable installation, the split couplers will need to be removed to allow for the specified slack loop length to be installed.

Final dressing of the conduits shall be done after the cable slack loops have been installed in each junction box. For the conduit sections where the cable has been installed, the conduit is to be slit and removed to 4" from the junction box wall. Consult the conduit manufacturer for the determining the appropriate tools to be used that will protect the installed cables. A split expandable seal is to be placed around the cable into the end of each conduit end, see Section 1.4 (B) - "Jetting Operations" below.

For the spare conduits the duct ends are to be left overlapped for future use. All ends should be sealed using an expandable duct plug which is to be removed when the "Conduit Integrity Testing", see B below, is being done. Once the CIT testing has been completed the ends are to be sealed as outlined in Section 1.4 (C) "Duct Sealing" below.

B. Conduit Integrity Testing

Immediately upon completing the conduit installation or prior to installation of the fiber cable it will be the responsibility of the Desing-Build Team to ensure usability of the conduit system. This will be done by conducting a mandatory "Conduit Integrity Tests" (CIT) on each individual conduit in the presence of the Engineer. The purpose of performing the CIT to identify there are no obstructions, leaks or other defects resulting from the conduits installation between access

points (junction box locations). The CIT includes a series of three (3) individual steps to be completed, prior to acceptance of the conduit system.

CIT Steps

1) Air Pressure Test
2) Shuttle/Mandrel Test
3) Sponge Test/Cleaning

Air Pressure Test:

Seal the downstream end of the conduit with a pressure rated temporary end cap or plug and attach an airtight fitting with a quick connect air coupling and pressure gauge to compressor end of the conduit. Connect the compressor hose to the fitting with an inline pressure gauge and fill the conduit with compressed air raising the pressure to 6 bars (87 psi). Once the pressure has reached the designated level wait to see if the pressure drops slightly and add additional air to reach the desired pressure level. Once the pressure level appears to have stabilized at the prescribed level wait 5 minutes to see if the pressure remains stable. If the pressure reading remains stable or does not drop significantly (Minimal reductions of 1 to 2 pounds is acceptable) after a 5 minutes lapse of time, then there is no leakage in the duct and the section being tested has passed.

If the pressure reading shows a significant drop-in pressure, then determine where the leakage is occurring, and corrective actions shall be taken. Note the loss of pressure may be occurring at the coupler, if it has not been properly installed. If it is at the coupling in a handhole for example correct it and retest. If the problem is found to be in the conduit between access points notify the Engineer and make arrangements to replace or repair that section of conduit at no additional expense to the Department (see repair of conduit segments later)

Shuttle/Mandrel Test:

An obstruction or kink or some other defect in the installed conduit can be determined by a shuttle test. The test is conducted by using a shuttle that is 70-80% of conduits inner diameter that is either a sphere or a segment of fiber optic cable with a length of 3 times the diameter of the conduit being tested. The shuttle is to be inserted into the conduit and passed through the conduit by applying compressed air. The pulling option is to pull a segmented mandrel through the conduit, designed for proving duct runs.

Provided the shuttle or mandrel passes through from end to end of the conduit then the duct is considered to be acceptable for cable installation. If the shuttle mandrel fails to pass from end to end, then the conduit is either kinked or blocked. It will be the installers obligation to find the blockage or kinked location. For conduits that do not pass this test notify the Engineer and make arrangements to replace or repair that section of conduit at no additional expense to the Department (see repair of conduit segments later).

Sponge Test/Cleaning:

Installation of a test sponge as recommended by the jetting equipment or conduit manufacturer is to be used for cleaning and/or lubricating the conduits inner diameter from end to end, prior to cable installation. Two sponges are to be used for this purpose using the steps listed below:

1. From the jetting end blow one or two sponges through the conduit to the destination handhole. Inspect the sponges and repeat this step until the sponges are clean of dirt and debris after passing through the conduit system, then move to step 2.
2. At the jetting end of the conduit insert one sponge pushing it into the end of the conduit several inches.
3. Leave enough room to then pour in the lubricant manufacturer's suggested amount of lube for the diameter and distance the cable is to be jetted.
4. Lubricate and insert the second sponge into the end of the conduit.
5. Secure the conduit lead end to the jetting machine's sealed air block and apply compressed air to blow the sponge and lubricant through the conduit.
6. The last step is to jet the fiber cable into the conduit.

Repair of Conduit Segments

For HDPE Conduit segments (traditional and/or multicell), where the conduit has been discovered to have been damaged (failing to pass the Conduit Integrity Testing) notify the Engineer. The Engineer has the authority to require any of the following options regarding the damaged section of conduit:

1) Replace the damaged section of conduit
2) Allow the use of conduit couplers to replace the damaged section of the conduit
3) Allow the damaged section to be repaired using the "HDPE pipe welding heat fusion" process.

C. Conduit Sealing

Immediately upon completing the Conduit Integrity Testing install an approved mechanical duct plug or gasketed end coupler over the ends of all conduits to guard against debris or water entering the conduit.

D. HDPE Conduit Couplers

For HDPE Conduit couplers:

a) No more than two (2) couplers per conduit segment between junction boxes unless otherwise approved by the engineer.
b) Install a locatable marker ball at each coupler location.
c) Document and provide GPS coordinates for each coupler location.
d) Ensure couplers are installed per manufacturer specifications and installers are trained and certified by the manufacturer.
e) Provide details on coupler installation requirements and training to the Department and/or its representatives upon request.

E. Spare Conduits and Pull Tape

For conduits designated to be used as spares, install a continuous section of Pull Tape through the conduit. Place the embedded tracer wire of the pull tape under the gel filled wire nut along with

the other conduit's internal tracer wire. (See "Tracer Wire Bonding/Isolation Test Switch" in the Junction Box details found elsewhere in these Specifications).

JETTING FIBER

A. General

Furnish personnel trained in the operation of the fiber jetting machine and all safe operating procedures. Provide a fiber jetting machine complete with a head and feeder system with all necessary seals and nozzle attachments including a compressed air machine to facilitate installation of the fiber.

Provide couplers and split half couplers as necessary to make temporary joints of conduits to facilitate jetting of the fiber cable through midspan junction boxes. Ensure the couplers and split half couplers are designed to provide an airtight seal around the HDPE conduits and that they are reusable. Ensure split half couplers can be easily assembled and disassembled using standard wrenches and/or nut drivers and that couplers can easily be removed and reused.

Furnish a UL approved blowing lubricant recommended by the conduit manufacturer and approved by the fiber manufacturer that will not adversely affect the HDPE conduit nor the fiber optic cable both during and after the cable jetting installation process. Ensure the lubricant is designed to meet or exceed all cable blowing requirements with respect to viscosity, cling, drag, wetting and designed for use in the temperature range indicative of the environmental temperature when the cable is installed. Ensure the lubricant is safe to use and is non-toxic, non-corrosive, non-flammable and does not stain, alter or cause a smearing effect to the required markings found on the outer sheath of the fiber optic cable.

B. Jetting Operations

Upon successful completion of the CIT procedures begin jetting operations to install the fiber. Ensure the fiber reel and jetting machine are synchronized to minimize unnecessary pulling and jerking on the fiber cable as it is being removed from the reel during the installation process. Apply cable pulling lubricant as recommend by manufacturers to minimize the Coefficient of Friction allowing the cable to slide effortlessly through the conduit system.

During the jetting process provide spare fiber at junction boxes and/or cabinets as required by the plans. After the jetted fiber is installed ensure that all spare conduits are sealed off with a mechanical sealing plug or gasketed end cap. For conduits that contain a fiber cable install a mechanical fiber/conduit sealing split duct plug to seal the fiber and conduit from debris. Moldable Duct Seal will not be acceptable for spare conduits or conduits containing fiber when those conduits are installed for the future installation of fiber using the "Fiber Jetting Process" and when the installation of the conduit system is along a "Limited Access" or "Controlled Access Facility".

Ensure any conduits designated as spare have a mechanical duct plug (Traditional) or gasketed end cap (Microcell) installed in the open ends to seal against debris entering the conduit system.

Fiber-Optic Cable and Splice Testing

Revise the *Standard Specifications* as follows:

Page 17-26 & 17-27, Article 1731-3 (F) Testing, the following replaces pages 17-26 lines 20-47 & 17-27 lines 1-5:

(A) Testing
Provide notification a minimum of 10 business days before beginning Fiber-Optic tests to the Engineer and ITS Design Unit. After splicing is completed, perform bi-directional OTDR tests and bi-directional Optical Power Meter (OPM) tests on each fiber, including unused fibers.

Install a 1,000 meter pre-tested launch cable between the OTDR and fiber-optic cable to be tested and a 1,000 meter pre-tested destination cable on the end of the fiber-optic cable to be tested. Ensure each launch cable has been tested and is compatible with the fiber being installed. Provide Engineer and ITS Design Unit with verified length and test results of the launch cable before use. Re-test or replace launch cable at Engineer's request.

Ensure the OTDR tester pulse length, pulse width, averaging time/count, and any other settings are appropriately set to provide a detailed, high-resolution trace for the length of cable being tested.

Test the fiber-optic cable at both 1310 and 1550 nm.

Ensure bi-directionally averaged fusion splice losses do not exceed 0.05 dB per splice and connectors have a loss of 0.5 dB or less per connector. If any splice or connector exceeds maximum allowable loss or if a fiber exceeds its calculated loss budget, take appropriate corrective actions up to and including replacement of the fiber cable.

Clearly record and label each bi-directional OTDR trace result, identifying a starting and ending point, and all splices and connectors with their distance/location measurements, for all fibers being tested in a spreadsheet file format.

Perform OPM tests in both directions for each fiber to measure the overall loss. Submit OPM test results for both directions in a spreadsheet file format for review and approval. Do not submit bi-directionally averaged OPM test results. Ensure the fiber number and direction of each OPM test result is clearly labeled. Ensure the OPM tester is configured properly for the length of cable being tested and perform OPM test in accordance with the testing equipment manufacturer recommendations, including properly sized launch and landing cables. Provide OPM tester settings and launch/landing cable details with the OPM test results.

Provide engineering calculations for each fiber or group of fibers that demonstrate the loss budget. The calculations shall summarize the optical losses versus the allowable losses for each fiber. Provide a spreadsheet with a labeled tabular summary showing each test segment with begin and end points and actual versus allowable losses.

Furnish an electronic copy of all OTDR trace results, OPM test results and digital photographs showing workmanship for each splice. Furnish the manufacturer's make, model number and software version of the OTDR and OPM used for testing

JUNCTION BOXES (Limited access facilities)

DESCRIPTION

Furnish and install junction boxes with covers, graded stone, and all necessary hardware in accordance with the plans and specifications.
Provide Electronic Marking Balls to aid in locating the junction

MATERIALS

General

Refer to Division 8 and 10 of the 2024 *Standard Specifications for Roads and Structures*.

Item	Section
#57 or #67 Washed Stone	1005

Furnish material, equipment, and hardware under this section that is pre-approved on the ITS and Signals QPL.

Junction Box

Provide junction boxes with at least two size 3/8-inch diameter stainless steel hex head cover bolts to match inserts in the box. Ensure junction boxes are provided with open bottoms. Provide vertical extensions of 6 inches to 12 inches as required by project provisions.

Provide the required logo on the cover. Provide pull slot(s) with stainless steel pin(s).

Provide third party certification that the junction boxes and covers meet ANSI/SCTE 77 2013 and Tier 22 loading. Provide certification that testing methods are compliant with ANSI/SCTE 77 2013.

Provide standard size junction boxes and covers with minimum inside dimensions of 16" (l) x 10" (w) x 10" (d). Provide a cover embossed with the following wording "NCDOT Electrical".

Provide oversized junction boxes and covers with minimum inside dimensions of 28" (l) x 15" (w) x 22" (d) for installing only fiber-optic communications cable.

Provide special oversized junction boxes and covers with minimum inside dimensions of 33" (l) x 22" (w) x 22" (d) where underground fiber-optic splice enclosures are to be installed or as directed by the plans.

Provide additional oversized junction boxes and covers as identified in the plans where underground fiber-optic splice enclosures and conduit requirements may require a junction box that is larger than what is listed above. Boxes of this nature can be supplied with a cover that is of a single or split cover design, but boxes with a split cover may be supplied with a center brace to support the cover/lid.

For oversized and special oversized junction boxes, provide a cover embossed with the following wording "NCDOT Fiber Optic". Additionally, for junction boxes designated for fiber optic cable, furnish an access point/hatch on the lid to allow access to the tracer wire boding/isolation test switch that is located inside the junction box (See "Tracer Wire Bonding/Isolation Test Switch" requirements below).

For oversized and any special oversized junction boxes, provide junction boxes with mouse holes or knock-outs fabricated in the sides to accommodate conduit entrances. Boxes fabricated without mouse holes or knock-outs shall be approved by the manufacturer for field drilling conduit entrance holes. Consult the manufacturer to identify the amount of surface area that can be removed for field drilling conduit entrance holes without violating the boxes structural integrity. Upon request, provide written approval from the manufacturer stating their recommendations. **All conduits shall enter the junction boxes through the mouse holes/knock-outs.**

Electronic Marker Ball

Furnish an electronic marking ball, with a minimum life expectance of 15 years and that are locatable when buried up to 5 feet deep to aid in locating buried Junction Boxes. Ensure the marking ball is designed to be self-leveling to provide precise horizontal positioning of the marker ball electronics (internal passive antenna) once installed in a junction box. Ensure the marker balls are compatible with a Metro Mark - Passive Marker Locator Model #760DX or approved equivalent and are tuned to the following frequencies:

Orange Ball – 101.4 KHz - Fiber Installations
Red Ball – 169.8 KHz – Power Cable Installations

CONSTRUCTION METHODS

(A) Junction Boxes

Install standard size junction boxes as shown in the plans. When lateral runs for electrical cables are greater than 150 feet, install additional junction boxes to ensure distances between junction boxes does not exceed 150 feet.

Install oversized junction boxes and any special oversized junction boxes at maximum intervals of 3000 feet unless otherwise stated in the plans.
Backfill beneath and around the boxes using #57 or #67 washed stone in conformance with Section 1005 of the 2024 *Standard Specifications for Roads and Structures.* Backfill beneath the box a minimum of 12-inches and around the exterior of the box a minimum of 3 inches.

Avoid placing junction boxes on slopes of 3:1 or greater.

(B) Electronic Marker Ball

Install the appropriate colored Marker Ball in each junction box upon completion of the junction box installation. Test to ensure that the Marker Ball is functioning properly with the approved electronic locater device. Record precise latitudinal and longitudinal coordinates for the location of each locate ball/junction box. See "GPS Coordinates" requirements below.

(C) GPS Coordinates

Provide real world coordinates for all junction boxes and equipment cabinets installed or used under this project. Provide the coordinates in feet units using the North Carolina State Plane coordinate system (1983 North American Datum also known as NAD '83). Furnish coordinates that do not deviate more than 1.7 feet in the horizontal plane and 3.3 feet in the vertical plane. Global positioning system (GPS) equipment able to obtain the coordinate data within these tolerances may be used. Submit cut sheets on the GPS unit proposed to collect the data for approval by the Engineer.

Provide a digital copy of all information regarding the location (including, but not limited to, manufacturer, model number, and NCDOT inventory number) in the Microsoft® spreadsheet shown by example below. Provide this information to the Engineer and the NCDOT ITS (TSMO) Unit.

NCDOT Inv #	Name	Location	Latitude	Longitude	Manufacturer	Model #
05-0134	Equipment Cabinet	US 70 at Raynor Rd./ Auburn-Knightdale	-78.5500	35.6873	McCain	Type-332
05-0134	Junction Box # 1 (Phase 2 Side)	US 70 at Raynor Rd./ Auburn-Knightdale	-78.5516	35.6879	Quazite	PG1118BA12(Box) PG118HA00(Cover)
05-0134	Junction Box # 2 (Phase 2 Side)	US 70 at Raynor Rd./ Auburn-Knightdale	-78.5506	35.6876	Quazite	PG1118BA12(Box) PG118HA00(Cover)
05-0134	Junction Box # 3 (Near Cabinet)	US 70 at Raynor Rd./ Auburn-Knightdale	-78.5501	35.6873	Quazite	PG1118BA12(Box) PG118HA00(Cover)
05-0134	Junction Box # 4 (Phase 6 Side)	US 70 at Raynor Rd./ Auburn-Knightdale	-78.5486	35.6873	Quazite	PG1118BA12(Box) PG118HA00(Cover)
05-0134	Junction Box # 5 (Phase 6 Side)	US 70 at Raynor Rd./ Auburn-Knightdale	-78.5493	35.6876	Quazite	PG1118BA12(Box) PG118HA00(Cover)
05-0134	Junction Box # 6 (Phase 4 Side)	US 70 at Raynor Rd./ Auburn-Knightdale	-78.5503	35.6879	Quazite	PG1118BA12(Box) PG118HA00(Cover)

ITS HUB CABINET

DESCRIPTION

Furnish and install air-conditioned hub cabinets, hub cabinet base extenders, hub cabinet foundations and all necessary hardware as described herein. Size the cabinet appropriately to fit

all the equipment and to allow for 25% free space available after all equipment is installed. Size the cabinet to ensure ease of access to equipment and provide proper ventilation in order to maintain an internal operating environment that does not exceed the environmental operating ranges for devices placed within the cabinet.

1.2 MATERIALS

A. Hub Cabinet

1. Standards

Ensure that the hub cabinets comply with the following standards:

- ANSI;
- ASTM;
- IMSA ;
- ISO 9001;
- NEC;
- NEMA TS-2; and
- UL listed.

2. Functional

Furnish Caltrans Type 332D or equivalent base-mounted hub cabinets meeting the following minimum requirements:

- Side-by-side, double doors on both front and rear of cabinet;
- Fiber-optic interconnect centers (paid separately);
- Grounding bus bar;
- 19-inch rack system for mounting of all devices in the cabinet;
- Pull-out shelf for laptop and maintenance use;
- Maintenance access connections;
- LED lighting;
- Ventilation fans;
- 120/240VAC power supply;
- 120VAC ground fault circuit interrupter (GFCI)-protected duplex outlets for tools;
- 120VAC surge-protected duplex outlets for equipment;
- Sunshields constructed of light gauge aluminum that sit approximately one inch

- above the surface of the cabinet on all sides, including doors
- Lightning and surge protection on incoming and outgoing electrical lines (power and data);
- Managed Ethernet switch (provided by NCDIT);
- Door status sensors compatible with provided Managed Ethernet switches
- Power strip along vertical rail;
- HVAC system to maintain optimal temperature and humidity for the Ethernet hub switches and other powered electronics in the cabinet.
- UPS with sufficient capacity to hold hub's electrical load (minus the HVAC) for 4 hours. Cabinet HVAC system will not be connected to the UPS.

3. Physical Features

Provide cabinets that are completely weatherproof to prevent the entry of water. Provide cabinet and door exterior seams that are continuously welded, and all exterior welds are smooth. Provide cabinets with four full-size doors with full-length stainless steel piano hinges, with stainless steel pins spot-welded at the top. Provide hinges that utilize stainless steel hinge pins. Provide hinges that are mounted so that they cannot be removed from the door or cabinet without first opening the door. Provide door and hinges braced to withstand a 100-pound per vertical foot of door height load applied vertically to the outer edge of the door when standing open. Ensure that there is no permanent deformation or impairment of any part of the door or cabinet body when the load is removed. Provide cabinet door fitted with a #2 Corbin lock. Provide two keys for each cabinet. Provide cabinet doors that are also pad lockable. Provide door openings that are double flanged on all four sides.

Provide cabinets constructed of unpainted sheet aluminum alloy H5052-H32 with a minimum thickness of 0.125 inch.

Provide the hub cabinet with sunshields outside to deflect solar heat away from the cabinet. The sunshields must be offset a minimum of one inch from the exterior cabinet walls. Ensure that the sunshields are fabricated from 5052-H32 aluminum sheet that is 0.125 inch thick, and that sunshield corners are rounded and smoothed for safety. Mount the sunshields on standoffs on the top and on each side of the cabinet including the doors.

Provide doorstops at 90 and 180-degree positions. Ensure that both the door and the doorstop mechanism are of sufficient strength to withstand a simulated wind load of five pounds per square foot of door area applied to the both inside and outside surfaces without failure, permanent deformation, or compromising of door position and normal operation. Do not provide auxiliary police doors.

Ensure that cabinet doors include a gasket to provide a dust and weather-resistant seal when closed. Ensure that the gasket material is closed-cell neoprene and maintains its resiliency after exposure to the outdoor environment. Ensure that the gasket shows no sign of rolling or sagging and provide a uniform dust and weather-resistant seal around the entire door facing.

Provide cabinets that include predrilled holes of standard diameter and bolt pattern with four (4) anchor bolts with each cabinet unit as part of the unit price bid. Provide a panel with each cabinet that matches the rest of the cabinet; and is held in place by four bolts provided with the panel. Drill or punch the panel to accommodate the bolts; the drill holes shall match the bolt pattern of the base cabinet of the cabinet. Provide a panel designed to be fitted in the interior of the cabinet and fabricated of the same material and thickness as the cabinet bottom.

Provide rails to create a cage to mount hardware, wiring panels and miscellaneous mounting brackets. Provide rails constructed of .1345-inch steel or .105-inch stainless steel. Provide rails with a keyhole design with slots 2 inches on center with a top opening of 5/8 inch in diameter to allow the insertion of a .625-inch by 1-inch carriage bolt. Ensure that the rails are 1.5 to 2 inches wide by .5 inches deep. Drill and tap the rails for 10-32 screws or rack screws with EIA universal spacing.

Provide rack assemblies that have a removable, standard 19-inch EIA compliant rack. The rack shall have a clearance between the rails of 17.5 inches.

Equip each cabinet with an aluminum storage compartment mounted in the rack assembly with the following dimensions (±0.5 inch): 16 inches wide, 14 inches long, and 1.75 inches deep. Provide compartment with ball-bearing telescoping drawer guides to allow full extension from the rack assembly. Ensure that when extended, the storage compartment opens to provide storage space for cabinet documentation and other miscellaneous items. Ensure that the storage compartment is of adequate construction to support a weight of 20 pounds when extended without sagging. Provide a top to the storage compartment that is hinged aluminum. Provide two (2) removable metal shelves with each cabinet.

Furnish a cabinet base extender with each hub cabinet that complies with the requirements of the "Cabinet Base Adapter and Base Extender" section of these Project Special Provisions.

Install an external generator connection port on the side of the cabinet opposite the air conditioning unit. Port shall be designed and sized for the appropriate electrical requirements of the cabinet.

4. Lighting

Provide the field cabinet with four LED lamps (one above each door) and clear shatterproof shield assemblies which are mounted on the inside front and rear top of the cabinet. Ensure that these lamps are unobstructed and able to cast light on the equipment. Equip the field cabinet with door-actuated switches so that the lamps automatically turn on when any cabinet door is opened and go off when all the doors are closed.

5. Electrical

Provide a service panel assembly to function as the entry point for AC power to the cabinet and the location for power filtering, transient suppression, and equipment grounding. Provide AC isolation within the cabinet. Configure cabinet to accept 120 VAC from the utility company.

Provide circuit breakers that meet the NEC requirements, are UL listed and have an interrupt capacity of 5,000 amperes and insulation resistance of 100 M at 500 VDC. Provide the hub cabinet with a main circuit breaker sized according to the NEC. Use appropriately sized branch circuit breakers to protect the electronics in the hub cabinet. Provide a dedicated branch circuit for each of the following items:

- HVAC
- Lighting
- Receptacles
- Ventilation Fan
- One circuit per rack
- Others as needed.

Provide UL listed surge protection devices according to the UL 1449, 2nd edition standard that comply with the NEMA requirements as detailed in the NEMA LS 1 (1992) standard.

Provide branch circuits, surge protection devices, and grounding for the connected load served by the cabinet, including ventilation fans, internal lights, electrical receptacles, etc., as shown on the Plans. Terminate field wiring on terminal blocks with the voltage and current rating of the terminal block is greater than the voltage and current rating of the wire fastened to it.

Furnish a power distribution assembly that fits in the EIA 19-inch rack and provides for protection and distribution of 120VAC power.

Ensure that ground bus bars are fabricated from a copper alloy material compatible with copper wire. Use ground bus bars that have at least two positions where a #6 AWG stranded copper wire can be attached.

Mount the ground bus bar on the side of the cabinet wall adjacent to the service panel assembly for the connection of AC neutral wires and chassis ground wires. If more than one ground bus bar is used in a cabinet, use a minimum of a #10 AWG copper wire to interconnect them.

Terminate conductors on terminal blocks using insulated terminal lugs large enough to accommodate the conductor to be terminated. When two or more conductors are terminated on field wiring terminal block screws, use a terminal ring lug for termination of those conductors. Number all terminal block circuits and cover the blocks with a clear insulating material to prevent inadvertent contact.

6. Ventilation

Ensure the cabinet assembly can maintain the temperature and humidity within the environmental requirements of the hub switches and other powered electronics in the cabinet.

Include two cooling fans with 100 CFM, minimum capacity. Provide thermostats to be incorporated into the ventilation system. Mount fans in the top of the cabinet.

Provide the cabinets with vent openings in the lower portion of the door to allow convection cooling of electronic components. Cover them fully on the inside with a commercially available disposable three layer graded type filter. All air entering the cabinet must pass through the air filter.

7. Air Conditioner

Furnish each hub cabinet with an externally mounted air conditioner that operates on 120VAC.

The air conditioners shall have a built-in condensate evaporator and condensate drain fitting and hose that is plumbed to the outside of the cabinet. The air conditioner shall be rated for a minimum of 3500 BTU. There shall be low temperature control to prevent overcooling.

Provide EMI/RFI transient spike protection. Equip the cabinet and air conditioner with remote monitoring of high temperature and low airflow conditions. Air conditioners shall be CFC free or low ODP (R-22) refrigerant and shall use closed loop cooling. Insulate all cold components (coolant lines, compressor, evaporator, etc.) with high-performance insulation.

Blower motors shall be UL listed. Ensure the blower motors are equipped with automatic reset thermal overload protection. Provide double sealed and double shielded ball bearings.

The air conditioners shall have permanent corrugated aluminum or stainless steel air filters. The filters shall be removable and washable.

All grilles shall be stainless steel.

B. Hub Cabinet Base Extender

Fabricate hub cabinet base extenders from the same materials and with the same finish as the hub cabinet housing. Fabricate base extender in the same manner as hub cabinets, meeting all of the same applicable specifications called for in these project special provisions. Provide cabinet base extenders with a height of at least 12 inches.

C. Hub Cabinet Foundation

Furnish either poured concrete hub cabinet foundations or preformed hub cabinet foundations. Obtain approval of foundation type from the engineer.

Comply with Section 1000-4 of the *2024 Standard Specifications.*

Provide hub cabinet foundations with a minimum pad area that extend 24 inches from the front and back of the hub cabinet and 6 inches from the sides of the cabinet.

Furnish hub cabinet foundations with chamfered top edges. Provide minimum class B concrete.

On the same side as the cabinet generator hookup, cast a three inch inside-width galvanized steel U-bolt into the cabinet foundation. A minimum of four inches of the U-bolt shall be cast into the concrete and a minimum of three inches of the U-bolt shall be exposed for securing a generator to the foundation.

Provide preformed hub cabinet foundations with 7” (L) x 18” (W) minimum opening for the entrance of conduits. For precast hub cabinet foundations, include steel reinforcement to ensure structural integrity during shipment and placing of item. Include four ¾ inch coil thread inserts for lifting. Comply with Article 1077-16 of the *2024 Standard Specifications.*

D. Hub Cabinet UPS

Furnish and install one rack mounted UPS in each new cabinet.

Furnish UPS with external temperature monitoring that will shut off when running on battery power and the maximum operating temperature for the hub switch is reached.

Install UPS with RJ-45 ethernet network monitoring ports that can be disabled via the UPS software/firmware.

The Design-Build Team is responsible for supplying a UPS and batteries that can adequately power the cabinet load plus an additional 20% for a minimum of 4 hours. The Design-Build Team shall request the power requirements for any department supplied equipment prior to submitting

UPS for approval. Allow eight (8) weeks for the department to supply equipment power requirements. Provide to the Engineer for Approval, a submittal package with Engineering Calculations consisting of, as a minimum, schematic drawing, technical data sheets, and supporting documentation. Ensure the documentation demonstrates, in theory, that the battery(ies) will provide for continuous operation for a minimum of four (4) consecutive hours with no additional charging.

UPS shall meet the following **minimum** specifications:

Output

Nominal Output Voltage	120V
Output Voltage Distortion	Less than 5% at full load
Output Frequency (sync to mains)	57 - 63 Hz for 60 Hz nominal
Crest Factor	up to 5:1
Waveform Type	Sine wave
Output Connections	(8) NEMA 5-15R

Input

Nominal Input Voltage	120V
Input Frequency	50/60 Hz +/- 3 Hz (auto sensing)
Input Connections	NEMA 5-15P
Input voltage range for main operations	82 - 144V
Input voltage adjustable range for mains operation	75 -154 V

Battery Type

Maintenance-free sealed Lead-Acid Gel Electrolyte battery with suspended electrolyte, leak-proof. AGM batteries are not acceptable.

Typical recharge time	2 hours

Communications & Management

Interface Port(s)	DB-9 RS-232, USB, RJ-45 Ethernet
Control panel	LED status display with load and battery bar-graphs

Surge Protection and Filtering

Surge energy rating	480 Joules

Environmental

Operating Environment	-32 - 165 °F
Operating Relative Humidity	0 - 95%

Conformance

Regulatory Approvals	FCC Part 15 Class A, UL 1778

CONSTRUCTION METHODS

A. Hub Cabinet

Ensure all cabinet wiring is tagged and identified using insulated pre-printed sleeves and follows the project's cable identification scheme. Ensure that the wire markers identify usage in plain words with sufficient details without abbreviations or codes.

Use stranded copper for all conductors, including those in jacketed cables and solid copper for all grounding. Neatly arrange all wiring, firmly lace or bundle it, and mechanically secure the wiring without the use of adhesive fasteners. Route and secure all wiring and cabling to avoid sharp edges and to avoid conflicts with other equipment or cabling. Terminate all wiring on a terminal block, strip, bus bar, device clamp, lug, or connector. Do not splice any wiring. Label all wiring, cables, terminal strips, and distribution blocks with permanent and waterproof tags. Provide strain relief for all cabling with connectors, all cabling entering knockouts or ports at the equipment, and where appropriate.

Fasten all components of the cabinet assembly to be mounted on cabinet side panels with hex-head or Phillips-head machine screws. Install the screws into tapped and threaded holes in the panels. The components include, but are not limited to, terminal blocks; bus bars, panel and socket mounted TVSS, circuit breakers, accessory and equipment outlets, and DC power supply chassis.

Fasten all other cabinet components with hex-head or Phillips-head machine screws installed with nuts (with locking washer or insert) or into tapped and threaded holes. Fasten stud-mounted components to a mounting bracket providing complete access to the studs and mounting nuts. Ensure that all fastener heads and nuts (when used) are fully accessible within a complete cabinet assembly, and any component is removable without requiring removal of other components, panels or mounting rails. Do not use self-tapping or self-threading fasteners.

Mount the air conditioner in the bottom of the cabinet and do not obstruct any cable entry into the cabinet. Install condensate drains to drain condensation water out of the cabinet. Ensure the cabinet has provisions to route conduit to the existing cabinet as shown in the drawings.

Furnish and install a 48" 120 VAC power strip vertically along one of the rear rails of the communications rack. Provide a power strip that has at least eight outlets along its length.

Provide a cabinet that is ISO 9001 certified at the time of bid letting.

Locate cabinets as close to the edge of the controlled access as possible and protect hub cabinets with guardrail unless instructed otherwise by the engineer.

Install base mounted cabinets as shown on the Plans and as approved by the Engineer. Refer to the "Hub Cabinet Foundation" section of these Project Special Provisions for installation requirements for the hub cabinet foundations. Install only the required number of conduits as shown on the Plans plus one additional spare stub out conduit. Position the ends of conduits approximately 2 inches above the finished surface of the concrete base.

Mount the hub cabinets on cabinet base extenders in accordance with the "Hub Cabinet Base Extender" section of these Project Special Provisions.

Mount surge protection devices in the cabinet for the field devices that will be connected to that cabinet.

Terminate power service wire, video, and data cabling on the appropriate terminal strips, surge protection devices or jacks in the cabinet with insulated terminal lugs or connectors. Use a calibrated ratchet-type crimping tool to install the insulated terminal lugs onto the field wires.

Label spare circuits of the data cables and connect them to the cabinet ground bus bar.

Neatly bundle and identify all field wiring cables in the cabinet with permanent waterproof tags.

Ground all hub cabinets in accordance with NEC requirements and the Hub Cabinet Grounding Detail included in these Project Special Provisions. Keep the ground wire from the cabinet ground bus bar to the ground rod assembly or array as short as possible. Ensure the ground wire is not in contact with any other part of the cabinet.

B. Hub Cabinet Base Extender

Install hub cabinet base extender at all hub cabinet locations.

Use permanent, flexible, waterproof sealing material to:

(a) Seal between the hub cabinet base and hub cabinet base extender.

(b) Seal 2-piece hub cabinet base extender seams.

(c) Seal space between hub cabinet base extender and the hub cabinet foundation.

C. Hub Cabinet Foundation

Comply with Section 825 of the *2024 Standard Specifications.*

When using poured concrete foundations and preformed concrete foundations, use procedures, equipment and hardware as follows:

(d) Locate new hub cabinets in locations as shown on the plans and approved by the Engineer.

(e) Do not install foundations over uncompacted fill or muck.

(f) Do not install foundations in low areas or locations prone to standing water.

(g) Hand tamp soil before placing concrete to ensure ground is level.

(h) Use a minimum of four ½ inch diameter expanding type anchor bolts to secure cabinet to foundation.

(i) Install minimum 4 inches above and 4 inches below finished grade.

(j) Locate external stubbed out conduit at cabinet foundation so conduit is located on the side of the hub cabinet with the UPS, do not locate conduit under the air conditioning system. Install a minimum of 6 conduit stub-outs.

(k) Give hub cabinet foundation a broom finish and chamfered edges.

(l) Seal space between cabinet base and foundation with a permanent, flexible, waterproof sealing material.

D. Hub Cabinet UPS

Install rack mounted UPS in each hub cabinet in accordance with the plans and detail drawings.

HORIZONTAL DRAINS

(11-7-19) (Rev. 1-16-24) DB8 R17

Description

Construct horizontal drains for slopes, rock cuts and retaining walls in accordance with the contract and Geotechnical Standard Detail No. 817.01. A horizontal drain typically consists of a slotted PVC pipe placed in a drilled hole inclined at an angle above horizontal but in some holes, the pipe may be omitted. Horizontal drains are required to drain water from slopes and rock cuts and from behind retaining walls at locations and elevations shown in the plans developed by the Design-Build Team and as directed by the Engineer.

Materials

Refer to Division 10 of the *Standard Specifications*.

Item	Section
PVC Pipe	1044-6

Use solid and slotted PVC Schedule 40 or 80 pipes as shown in the plans for drain pipe. Provide slotted PVC pipes with 0.01" wide horizontal slots in the direction perpendicular to the pipe length and evenly spaced around and along pipe so that open area is at least 1 sq in per linear ft of pipe.

Construction Methods

The Engineer will determine the number, locations, elevations, inclination and lengths of horizontal drains required. The approximate known drain locations, elevations, inclination and lengths are shown in the plans. Drain pipe requirements including those drains without pipes will also be determined by the Engineer and known pipe information is shown in the plans.

Use drill rigs of the sizes necessary to install horizontal drains and with sufficient capacity to drill through whatever materials are encountered. Drilling through boulders, cobbles and rock lenses may be required but drilling in continuous intact weathered or hard rock as determined by the Engineer is not required unless drain pipe is omitted. Drill straight and clean holes with the dimensions and orientation shown in the plans or as directed. Drill holes within 6" of planned

locations and elevations and 2° of required inclination.

For horizontal drains with drain pipes, do not insert PVC pipes into drill holes until hole locations, elevations, dimensions, inclination and cleanliness are approved. Insert drain pipes through hollow stem augers or into open clean drill holes. Do not vibrate, drive or otherwise force pipes into holes. If a drain pipe cannot be completely and easily inserted into a drill hole, remove the pipe and clean or redrill the hole.

Extend solid PVC sections of drain pipes out past slope face far enough to connect pipe to a drainage system or discharge water as directed. Seal all around drain pipe at collar of drill hole with a method acceptable to the Engineer. Record horizontal drain number, location, elevation and installation date, description of drilling conditions and completed drain pipe, if applicable, and drill hole diameter, length and inclination for each horizontal drain and provide this information to the Engineer.

STEEL FENCE POSTS FOR WOVEN WIRE FENCE

(11-19-24) 866 DB8 R84

Description

Use steel fence posts to install woven wire fence in accordance with Section 866 of the *Standard Specifications*, Roadway Standard Drawings No. 866.03, the details in the plans developed by the Design-Build Team and this Special Provision.

Materials

Refer to Division 10 of the *Standard Specifications*.

Item	Section
Metal Posts and Rails	1050-3(B)

Construction Methods

Woven wire fence shall be constructed using 7.5-foot or 8-foot steel fence posts in accordance with the plans developed by the Design-Build Team, Article 866-3 of the *Standard Specifications* and as directed by the Engineer.

FOUNDATIONS AND ANCHOR ROD ASSEMBLIES FOR METAL POLES

(1-17-12)(Rev. 07-10-23) 9, 14, 17 DB9 R05

Description

Foundations for metal poles include foundations for signals, cameras, overhead and dynamic message signs (DMS) and high mount and light standards supported by metal poles or upright trusses. Foundations consist of footings with pedestals and drilled piers with or without grade beams or wings. Anchor rod assemblies consist of anchor rods (also called anchor bolts) with nuts

and washers on the exposed ends of rods and nuts and a plate or washers on the other ends of rods embedded in the foundation.

Construct concrete foundations with the required resistances and dimensions and install anchor rod assemblies in accordance with the contract and accepted submittals. Construct drilled piers consisting of cast-in-place reinforced concrete cylindrical sections in excavated holes. Provide temporary casings or polymer slurry as needed to stabilize drilled pier excavations. Use a prequalified Drilled Pier Contractor to construct drilled piers for metal poles. Define "excavation" and "hole" as a drilled pier excavation and "pier" as a drilled pier.

This provision does not apply to foundations for signal pedestals; see Section 1743 of the *Standard Specifications* and Roadway Standard Drawing No. 1743.01.

Materials

Refer to the Standard Specifications.

Item	Section / Article
Conduit	1091-3
Grout, Type 2	1003
Polymer Slurry	411-2(B)(2)
Portland Cement Concrete	1000
Reinforcing Steel	1070
Rollers and Chairs	411-2(C)
Temporary Casings	411-2(A)

Provide Type 3 material certifications in accordance with Article 106-3 of the Standard Specifications for conduit, rollers, chairs and anchor rod assemblies. Store steel materials on blocking at least 12" above the ground and protect it at all times from damage; and when placing in the work make sure it is free from dirt, dust, loose mill scale, loose rust, paint, oil or other foreign materials. Load, transport, unload and store foundation and anchor rod assembly materials so materials are kept clean and free of damage. Bent, damaged and / or defective materials shall be rejected.

Use conduit type in accordance with the contract. Use Class A concrete for footings and pedestals, Class Drilled Pier concrete for drilled piers and Class AA concrete for grade beams and wings including portions of drilled piers above bottom of wings elevations. Corrugated temporary casings may be accepted at the discretion of the Engineer. A list of approved polymer slurry products is available from:

connect.ncdot.gov/resources/Geological/Pages/Products.aspx

Provide anchor rod assemblies in accordance with the contract consisting of the following:

(A) Straight anchor rods,

(B) Heavy hex top and leveling nuts and flat washers on exposed ends of rods, and

(C) Nuts and either flat plates or washers on the other ends of anchor rods embedded in foundations.

Do not use lock washers. Use steel anchor rods, nuts and washers that meet ASTM F1554 for Grade 55 rods and Grade A nuts. Use steel plates and washers embedded in concrete with a thickness of at least 1/4". Galvanize anchor rods and exposed nuts and washers in accordance with Article 1076-4 of the *Standard Specifications* It is not necessary to galvanize nuts, plates and washers embedded in concrete.

Construction Methods

Install the required size and number of conduits in foundations in accordance with the plans developed by the Design-Build Team and accepted submittals. Construct top of piers, footings, pedestals, grade beams and wings flat, level and within 1" of elevations shown in the plans developed by the Design-Build Team or approved by the Engineer. Provide an Ordinary Surface finish in accordance with Subarticle 825-6(B) of the *Standard Specifications* for portions of foundations exposed above finished grade. Do not remove anchor bolt templates or pedestal or grade beam forms or erect metal poles or upright trusses onto foundations until concrete attains a compressive strength of at least 3,000 psi.

(A) Drilled Piers

Before starting drilled pier construction, hold a predrill meeting to discuss the installation, monitoring and inspection of the drilled piers. Schedule this meeting after the Drilled Pier Contractor has mobilized to the site. The Resident or Division Traffic Engineer, Design-Build Team and Drilled Pier Contractor Superintendent will attend this predrill meeting.

Do not excavate holes, install piles or allow equipment wheel loads or vibrations within 20 ft of completed piers until 16 hours after Drilled Pier concrete reaches initial set.

Check for correct drilled pier alignment and location before beginning drilling. Check plumbness of holes frequently during drilling.

Construct drilled piers with the minimum required diameters shown in the plans developed by the Design-Build Team. Install piers with tip elevations no higher than shown in the plans developed by the Design-Build Team or approved by the Engineer.

Excavate holes with equipment of the sizes required to construct drilled piers. Depending on the subsurface conditions encountered, drilling through rock and boulders may be required. Do not use blasting for drilled pier excavations.

Contain and dispose of drilling spoils and waste concrete as directed and in accordance with Section 802 of the Standard Specifications. Drilling spoils consist of all materials and fluids removed from excavations.

If unstable, caving or sloughing materials are anticipated or encountered, stabilize holes with temporary casings and/or polymer slurry. Do not use telescoping temporary casings. If it becomes necessary to replace a temporary casing during drilling, backfill the excavation, insert a larger casing around the casing to be replaced or stabilize the excavation with polymer slurry before removing the temporary casing.

If temporary casings become stuck or the Design-Build Team proposes leaving casings in place, temporary casings should be installed against undisturbed material. Unless otherwise approved, do not leave temporary casings in place for mast arm poles and cantilever signs. The Engineer will determine if casings may remain in place. If the Design-Build Team proposes leaving temporary casings in place, do not begin drilling until a casing installation method is approved.

Use polymer slurry and additives to stabilize holes in accordance with the slurry manufacturer's recommendations. Provide mixing water and equipment suitable for polymer slurry. Maintain the required slurry properties at all times except for sand content.

Define a "sample set" as slurry samples collected from mid-height and within 2 ft of the bottom of holes. Take sample sets from excavations to test polymer slurry immediately after filling holes with slurry, at least every 4 hours thereafter and immediately before placing concrete. Do not place Drilled Pier concrete until both slurry samples from an excavation meet the required polymer slurry properties. If any slurry test results do not meet the requirements, the Engineer may suspend drilling until both samples from a sample set meet the required polymer slurry properties.

Remove soft and loose material from bottom of holes using augers to the satisfaction of the Engineer. Assemble rebar cages and place cages and Drilled Pier concrete in accordance with Subarticle 411-4(E) of the *Standard Specifications*, except for the following:

(1) Inspections for tip resistance and bottom cleanliness are not required,
(2) Temporary casings may remain in place if approved, and
(3) Concrete placement may be paused near the top of pier elevations for anchor rod assembly installation and conduit placement or

(4) If applicable, concrete placement may be stopped at bottom of grade beam or wings elevations for grade beam or wing construction.

If wet placement of concrete is anticipated or encountered, do not place drilled pier concrete until a concrete placement procedure is approved. If applicable, temporary casings and fluids may be removed when concrete placement is paused or stopped in accordance with the exceptions above provided holes are stable. Remove contaminated concrete from exposed Drilled Pier concrete after removing casings and fluids. If holes are unstable, do not remove temporary casings until a procedure for placing anchor rod assemblies and conduit or constructing grade beams or wings is approved.

Use collars to extend drilled piers above finished grade. Remove collars after Drilled Pier concrete sets and round top edges of piers.

If drilled piers are questionable, pile integrity testing (PIT) and further investigation may be required in accordance with Article 411-5 of the *Standard Specifications*. A drilled pier will be considered defective in accordance with Subarticle 411-5(D) of the *Standard Specifications* and drilled pier acceptance is based in part on the criteria in Article 411-6 of the *Standard Specifications* except for the top of pier tolerances in Subarticle 411-6(C) of the *Standard Specifications*.

If a drilled pier is under further investigation, do not grout core holes, backfill around the pier or perform any work on the drilled pier until the Engineer accepts the pier. If the drilled pier is accepted, dewater and grout core holes and backfill around the pier with approved material to finished grade. If the Engineer determines a pier is unacceptable, remediation is required in accordance with Article 411-6 of the *Standard Specifications*. No extension of completion date or time will be allowed for remediation of unacceptable drilled piers or post repair testing.

Permanently embed a plate in or mark top of piers with the pier diameter and depth, size and number of vertical reinforcing bars and the minimum compressive strength of the concrete mix at 28 days.

(B) Footings, Pedestals, Grade Beams and Wings

Excavate as necessary for footings, grade beams and wings in accordance with the plans developed by the Design-Build Team, accepted submittals and Section 410 of the *Standard Specifications*. If unstable, caving or sloughing materials are anticipated or encountered, shore foundation excavations as needed with an approved method. Notify the Engineer when foundation excavation is complete. Do not place concrete or reinforcing steel until excavation dimensions and foundation material are approved by the Engineer.

Construct cast-in-place reinforced concrete footings, pedestals, grade beams and wings with the dimensions shown in the plans developed by the Design-Build Team and in accordance with Section 825 of the *Standard Specifications*. Use forms to construct portions of pedestals and grade beams protruding above finished grade. Provide a chamfer with a 3/4" horizontal width for pedestal and grade beam edges exposed above finished grade. Place concrete against undisturbed soil or backfill and fill in accordance with Article 410-8 of the Standard Specifications. Proper compaction around footings and wings is critical for foundations to resist uplift and torsion forces.

(C) Anchor Rod Assemblies

Size anchor rods for design and the required projection above top of foundations. Determine required anchor rod projections from nut, washer and base plate thicknesses,

the protrusion of 3 to 5 anchor rod threads above top nuts after tightening and the distance of one nut thickness between top of foundations and bottom of leveling nuts.

Protect anchor rod threads from damage during storage and installation of anchor rod assemblies. Before placing anchor rods in foundations, turn nuts onto and off rods past leveling nut locations. Turn nuts with the effort of one workman using an ordinary wrench without a cheater bar. Report any thread damage to the Engineer that requires extra effort to turn nuts.

Arrange anchor rods symmetrically about center of base plate locations as shown in the plans developed by the Design-Build Team. Set anchor rod elevations based on required projections above top of foundations. Securely brace and hold rods in the correct position, orientation and alignment with a steel template. Do not weld to reinforcing steel, temporary casings or anchor rods.

Install top and leveling (bottom) nuts, washers and the base plate for each anchor rod assembly in accordance with the following procedure:

(1) Turn leveling nuts onto anchor rods to a distance of one nut thickness between the top of foundation and bottom of leveling nuts. Place washers over anchor rods on top of leveling nuts.

(2) Determine if nuts are level using a flat rigid template on top of washers. If necessary, lower leveling nuts to level the template in all directions or if applicable, lower nuts to tilt the template so the metal pole or upright truss will lean as shown in the plans developed by the Design-Build Team. If leveling nuts and washers are not in full contact with the template, replace washers with galvanized beveled washers.

(3) Verify the distance between the foundation and leveling nuts is no more than one nut thickness.

(4) Place base plate with metal pole or upright truss over anchor rods on top of washers. High mount luminaires may be attached before erecting metal poles but do not attach cables, mast arms or trusses to metal poles or upright trusses at this time.

(5) Place washers over anchor rods on top of base plate. Lubricate top nut bearing surfaces and exposed anchor rod threads above washers with beeswax, paraffin or other approved lubricant.

(6) Turn top nuts onto anchor rods. If nuts are not in full contact with washers or washers are not in full contact with the base plate, replace washers with galvanized beveled washers.

(7) Tighten top nuts to snug-tight with the full effort of one workman using a 12" wrench. Do not tighten any nut all at once. Turn top nuts in increments. Follow a star pattern cycling through each nut at least twice.

(8) Repeat (7) for leveling nuts.

(9) Replace washers above and below the base plate with galvanized beveled washers if the slope of any base plate face exceeds 1:20 (5%), any washer is not in firm contact with the base plate or any nut is not in firm contact with a washer. If any washers are replaced, repeat (7) and (8).

(10) With top and leveling nuts snug-tight, mark each top nut on a corner at the intersection of 2 flats and a corresponding reference mark on the base plate. Mark top nuts and base plate with ink or paint that is not water-soluble. Use the turn-of-nut method for pretensioning. Do not pretension any nut all at once. Turn top nuts in increments for a total turn that meets the following nut rotation requirements:

NUT ROTATION REQUIREMENTS (Turn-of-Nut Pretensioning Method)	
Anchor Rod Diameter, inch	**Requirement**
≤ 1 1/2	1/3 turn (2 flats)
> 1 1/2	1/6 turn (1 flat)

Follow a star pattern cycling through each top nut at least twice.

(11) Ensure nuts, washers and base plate are in firm contact with each other for each anchor rod. Cables, mast arms and trusses may now be attached to metal poles and upright trusses.

(12) Between 4 and 14 days after pretensioning top nuts, use a torque wrench calibrated within the last 12 months to check nuts in the presence of the Engineer. Completely erect mast arm poles and cantilever signs and attach any hardware before checking top nuts for these structures. Check that top nuts meet the following torque requirements:

TORQUE REQUIREMENTS	
Anchor Rod Diameter, inch	**Requirement, ft-lb**
7/8	180
1	270
1 1/8	380
1 1/4	420
≥ 1 1/2	600

If necessary, retighten top nuts in the presence of the Engineer with a calibrated torque wrench to within ± 10 ft-lb of the required torque. Do not overtighten top nuts.

(13) Do not grout under base plate.

OVERHEAD AND DYNAMIC MESSAGE SIGN FOUNDATIONS

(1-16-24) DB9 R07

Description

Sign foundations include foundations for overhead and dynamic message signs (DMS) supported by metal poles or upright trusses. Sign foundations consist of footings with pedestals or drilled piers with or without grade beams or wings, conduit and anchor rod assemblies. Construct sign foundations in accordance with the contract and accepted submittals. Define "cantilever sign" as an overhead cantilever sign support in accordance with Figure 1-1 of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals,* 6th Edition, including the latest interim specifications and the latest interim revisions.

Materials

Use sign foundation materials that meet the *Foundations and Anchor Rod Assemblies for Metal Poles* Project Special Provision found elsewhere in this RFP.

Subsurface Conditions

Assume the following soil parameters and groundwater elevation for sign foundations unless these subsurface conditions are not applicable to sign locations:

A. Unit weight (γ) = 120 pcf,

B. Friction angle (ϕ) = 30°,

C. Cohesion (c) = 0 psf and

D. Groundwater seven feet below finished grade.

A subsurface investigation shall be required if the Engineer determines these assumed subsurface conditions do not apply to a sign location and the sign cannot be moved. Subsurface conditions requiring a subsurface investigation shall include, but are not limited to, weathered or hard rock, boulders, very soft or loose soil, muck or shallow groundwater. No additional compensation or extension of completion date or time will be allowed for subsurface investigations.

Subsurface Investigations

Use a prequalified geotechnical consultant to perform one standard penetration test (SPT) boring in accordance with ASTM D1586 at each sign location requiring a subsurface investigation. Rough

grade sign locations to within two feet of finished grade before beginning drilling. Drill borings to two drilled pier diameters below anticipated pier tip elevations or refusal, whichever is higher.

Use the computer software gINT version V8i or later manufactured by Bentley Systems, Inc. with the current NCDOT gINT library and data template to produce SPT boring logs. Provide boring logs sealed by a geologist or engineer licensed in the state of North Carolina.

Sign Foundation Designs

Design sign foundations for the wind zone and clearances shown in the plans developed by the Design-Build Team and the slope of finished grade at each sign location. Use the assumed soil parameters and groundwater elevation above for sign foundation designs unless a subsurface investigation is performed or required by the Engineer. For sign locations requiring a subsurface investigation, design sign foundations for the subsurface conditions at each sign location. Design footings, pedestals, drilled piers, grade beams and wings in accordance with the 2013 AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals,* 6th Edition, including the latest interim specifications and the latest interim revisions. In some instances, conflicts with drainage structures may dictate sign foundation types.

Design footings in accordance with Section 4.4 of the AASHTO *Standard Specifications for Highway Bridges*. Do not use an allowable bearing pressure of more than 3,000 psf for footings.

Design drilled piers for side resistance only in accordance with Section 4.6 of the AASHTO *Standard Specifications for Highway Bridges* except reduce ultimate side resistance by 25% for uplift. Use the computer software LPILE Version 2016 or later manufactured by Ensoft, Inc. to analyze drilled piers. Provide drilled pier designs with a horizontal deflection of less than one inch at top of piers. For cantilever signs with single drilled pier foundations supporting metal poles, use wings to resist torsion forces. Provide drilled pier designs with a factor of safety of at least 2.0 for torsion.

For drilled pier sign foundations supporting upright trusses, use dual drilled piers connected with a grade beam having a moment of inertia approximately equal to that of either pier. The Broms' method is acceptable to analyze drilled piers with grade beams instead of LPILE. Use a safety factor of at least 3.5 for the Broms' design method in accordance with C13.6.1.1 of the 2013 AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals,* 6th Edition, including the latest interim specifications and the latest interim revisions.

Submit boring logs, if any, working drawings and design calculations for acceptance in accordance with Article 105-2 of the *Standard Specifications*. Submit working drawings showing plan views, required foundation dimensions and elevations and typical sections with reinforcement, conduit and anchor rod assembly details. Include all boring logs, design calculations and LPILE output for sign foundation design submittals. Have sign foundations designed, detailed and sealed by an engineer licensed in the state of North Carolina.

Construction Methods

Construct footings, pedestals, drilled piers, grade beams and wings and install anchor rod assemblies for sign foundations in accordance with the *Foundations and Anchor Rod Assemblies for Metal Poles* Project Special Provision found elsewhere in this RFP. Submit boring logs, if any, working drawings and design calculations for acceptance in accordance with Article 105-2 of the *Standard Specifications*. Submit working drawings showing plan views, required foundation dimensions and elevations and typical sections with reinforcement, conduit and anchor rod assembly details. Include all boring logs, design calculations and LPILE output for sign foundation design submittals. Have sign foundations designed, detailed and sealed by an engineer licensed in the state of North Carolina.

ROADWAY LIGHTING FOUNDATIONS

(1-16-24) DB9 R09

Description

Roadway lighting foundations include foundations for high mount and light standards. High mount foundations for high mount standards and standard foundations for light standards consist of drilled piers or footings with pedestals, conduit and anchor rod assemblies. Construct roadway lighting foundations in accordance with the contract, Roadway Standard Drawings and accepted submittals. Define "high mount foundation" as a drilled pier including the conduit and anchor rod assembly that meets Roadway Standard Drawing No. 1402.01. Define "standard foundation" as a drilled pier or footing with pedestal including the conduit and anchor rod assembly that meets Roadway Standard Drawing No. 1405.01.

Materials

Use roadway lighting foundation materials that meet the *Foundations and Anchor Rod Assemblies for Metal Poles* Project Special Provision found elsewhere in this RFP. Provide metal shrouds for median mounted light standards in accordance with Subarticle 1400-4(I) of the *Standard Specifications*.

Roadway Lighting Foundations

(A) High Mount Foundations

Construct high mount foundations for the wind zone and high mount heights shown in the Final Lighting Plans provided by the Department, unless the following assumed site conditions are not applicable to high mount locations:

1) Soil with unit weight (γ) $\geq$ 120 pcf and friction angle (ϕ) $\geq$ 30°,

2) Groundwater at least seven feet below finished grade and

3) Slope of finished grade 6:1 (H:V) or flatter.

A subsurface investigation and high mount foundation design shall be required if the Engineer determines these assumed site conditions do not apply to a high mount location and the high mount cannot be moved. Subsurface conditions requiring a high mount foundation design, include but are not limited to, weathered or hard rock, boulders, very soft or loose soil, muck or shallow groundwater. No extension of completion date or time will be allowed for subsurface investigations or high mount foundation designs.

(B) Standard Foundations

Construct standard foundation types for the light standard types shown in the Final Lighting Plans provided by the Department and the site conditions at each light standard location. When weathered or hard rock, boulders or obstructions conflict with standard foundations, submit an alternate standard foundation design for acceptance in accordance with Article 105-2 of the *Standard Specifications*. No extension of completion date or time will be allowed for alternate standard foundations.

Subsurface Investigations

Use a prequalified geotechnical consultant to perform one standard penetration test (SPT) boring in accordance with ASTM D1586 at each high mount location requiring a subsurface investigation. Rough grade high mount locations to within two feet of finished grade before beginning drilling. Drill borings to two drilled pier diameters below anticipated pier tip elevations or refusal, whichever is higher.

Use the computer software gINT Version V8i or later manufactured by Bentley Systems, Inc. with the current NCDOT gINT library and data template to produce SPT boring logs. Provide boring logs sealed by a geologist or engineer licensed in the state of North Carolina.

High Mount Foundation Designs

Design high mount foundations for the wind zone and high mount heights shown in the Final Lighting Plans provided by the Department and the slope of finished grade and subsurface conditions at each high mount location. Design drilled piers, footings and pedestals in accordance with the 2013 AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals*, 6th Edition, including the latest interim specifications and the latest interim revisions.

Design drilled piers for side resistance only in accordance with Section 4.6 of the AASHTO *Standard Specifications for Highway Bridges*. Use the computer software LPILE Version 2016 or later manufactured by Ensoft, Inc. to analyze drilled piers. Provide drilled pier designs with a horizontal deflection of less than 0.5-inch at top of piers.

Design footings in accordance with Section 4.4 of the AASHTO *Standard Specifications for Highway Bridges.* Do not use an allowable bearing pressure of more than 3,000 psf for footings.

Submit boring logs, working drawings and design calculations for acceptance in accordance with Article 105-2 of the *Standard Specifications*. Submit working drawings showing plan views, required foundation dimensions and elevations and typical sections with reinforcement, conduit and anchor rod assembly details. Include all boring logs, design calculations and LPILE output for high mount foundation design submittals. Have high mount foundations designed, detailed and sealed by an engineer licensed in the state of North Carolina.

Construction Methods

Grade around roadway lighting locations with cut and fill slopes as shown on Roadway Standard Drawing No. 1402.01 or No. 1405.01. Construct drilled piers, footings and pedestals and install anchor rod assemblies for roadway lighting foundations in accordance with the *Foundations and Anchor Rod Assemblies for Metal Poles* Project Special Provision found elsewhere in this RFP.

For median mounted light standards, place concrete for median barriers and underlying pedestals in the same pour. Construct concrete barriers in accordance with the contract and make concrete median barriers continuous through standard foundations. Coordinate construction of median mounted light standards with sign structures, concrete barriers, drainage structures, etc. to avoid conflicts.

LIGHTING

1.00 DESCRIPTION

The work covered by this Section consists of furnishing, installing, connecting, and placing into satisfactory operating condition roadway lighting at locations shown on the plans. Perform all work in accordance with these Special Provisions, the Plans, the National Electrical Code, and the North Carolina Department of Transportation "Standard Specifications for Roads and Structures" (*2024 Standard Specifications*).

Perform all work in conformance with Division 14 of the *2024 Standard Specifications* except as modified or added to by these Special Provisions. Install all bore pits outside the clear zone, as defined in the AASHTO Roadside Design Guide or as directed by the Engineer.

In addition to the requirements of Division 1400, other specific Sections of the *2024 Standard Specifications* applicable to the work on this project are listed below.

Section 1401	High Mount Standard and Portable Drive Unit
Section 1404	Light Standards
Section 1407	Electric Service Pole and Lateral
Section 1408	Light Control System
Section 1409	Electrical Duct
Section 1410	Feeder Circuits
Section 1411	Electrical Junction Boxes
Section 1412	Underpass Lighting

1.10 ELECTRICAL INSPECTIONS AND TESTING

Replace the final paragraph of Article 1400-5 of the 2024 Standard Specifications with the following:

Contact the Department to schedule a final inspection of lighting systems at least 2 weeks before the requested inspection date. The Lighting and Electrical personnel will perform an insulation resistance test as described above, inspect the system for adherence to contract requirements and prepare a lighting inspection memo based on the Lighting System Inspection Checklist. The inspection checklist is available on the Department's website. As-built plans are required to be submitted to the Engineer and Engineer of Record prior to the final inspection. If there is a change to the as-built plans after the final inspection, as-built plans are required to be resubmitted to the Engineer and Engineer of Record within 30 days. Provide the personnel and equipment necessary for disconnecting and reconnecting fuse holders and/or operating circuit breakers to facilitate the insulation resistance test performed by the Lighting and Electrical personnel.

2.00 LIGHT STANDARD LIGHT EMITTING DIODE (LED) LUMINAIRES

2.10 DESCRIPTION

Furnish, install and place into satisfactory operation a light standard luminaire, either on a bracket arm or directly mounted to the standard, complete with all light sources, drivers, wiring inside standard from circuit conductors to each respective luminaire, in-line breakaway fuse holders and fuses for each respective luminaire and ground wiring at the pole on light standards less than 55 ft. in height.

Any light standard luminaire submitted for approval must meet the minimum requirements in the table and sections below.

Type	HPS Replacement Equivalent	Color Temp	Min. % of initial output at 70k hours	Min. Maintained Delivered Lumens
185W LED	250W	3,000K	83%	15,500
285W LED	400W	3,000K	83%	19,150

Third party certified photometric files in IES format are required to be submitted with the catalog cuts for the proposed LED roadway luminaire. Photometric files must show that proposed luminaire will meet or exceed the design shown in the plans.

The manufacturer shall state the Light Loss Factor (LLF) used in the photometric calculations for the proposed luminaire. LLF shall be calculated as follows:

LLF = Lamp Lumen Depreciation (LLD) x Luminaire Dirt Depreciation (LDD)

- Lamp Lumen Depreciation (LLD) shall be the value calculated and reported by the manufacturer based on the LM-80 and TM-21 reports for the proposed fixture for 70,000 hours at 25° C.
- Luminaire Dirt Depreciation (LDD) = 0.90

2.20 MATERIALS

2.21 LUMINAIRE REQUIREMENTS

A. General Requirements

- LM-79 photometric test reports shall be provided for all LED luminaires. LM-79 luminaire photometric reports shall be produced by an independent test laboratory and include the following:
    - Name of test laboratory. The test laboratory must hold National Voluntary Laboratory Accreditation Program (NVLAP) accreditation for the IES LM-79 test procedure or must be qualified, verified, and recognized through the U.S. Department of Energy's CALiPER program.
    - Report number
    - Date
    - Complete luminaire catalog number. Catalog number tested must match the catalog number of the luminaire submitted, except for variations which do not affect performance.
    - Description of luminaire, LED light source(s), and LED driver(s)
    - Goniophotometry
    - Colorimetry

- LM-80 lumen maintenance test report shall be provided for each respective LED light source.
- Luminaire shall be constructed of a single piece die cast aluminum housing. Each luminaire shall be finished gray in color unless otherwise noted.
- The luminaire shall have a 7 pin ANSI C136.41 compliant photocontrol receptacle for future expansion capabilities.
- Provide a summary of reliability testing performed for LED driver.
- Luminaires maximum total power consumption shall not exceed the values shown in the table above. Nominal luminaire input wattage shall account for nominal applied voltage and any reduction in driver efficiency due to sub-optimal driver loading.
- Luminaire shall have a maximum Backlight, Uplight & Glare (BUG) rating of 3-0-3 and an IESNA distribution of Type II or Type III as required to meet the spacing, the average maintained footcandle level and the average to minimum uniformity ratio requirements shown on the plans. The same BUG rating and distribution type shall be used throughout the project.
- Minimum Ingress Protection (IP) dust and moisture ratings for the luminaire electrical components (driver and surge protection) and luminaire optical components shall be IP65 and IP66, respectively, as specified in ANSI C136.25.
- Luminaire shall have external and internal labels per ANSI C136.15 and ANSI C136.22, respectively. Internal label shall identify the manufacturer, year and month of manufacture and the manufacturer's part number.
- Luminaire shall have an internal bubble level.

- Luminaires shall start and operate in -20°C to +40°C ambient.
- Luminaires shall be rated for continuous service at an ambient temperature of 40°C (104°F)
- Electrically test fully assembled luminaires before shipment from factory.
- Effective Projected Area (EPA) and weight of the luminaires shall not exceed 1.4 square feet and 46 lbs.
- Luminaires shall be designed for ease of electrical component replacement.
- Luminaires shall be rated for minimum 2G vibration, minimum, per ANSI C136.31.
- LED light sources and drivers shall be RoHS compliant.
- The luminaire manufacturer shall have no less than five (5) years of experience in manufacturing LED-based lighting products and the manufacturing facility must be ISO 9001 certified.
- Luminaire shall have a 1.25" to 2.0" adjustable tenon mount for connection to luminaire bracket arm assembly.
- Pole hardware, nuts, bolts, and washers, etc. shall be made from 18-8 stainless steel, or steel conforming to ASTM A307 galvanized in accordance with ASTM A153.
- Grommets shall be installed in cable entry holes. Cable entry holes shall be free from sharp edges which might cut conductors or an ungloved hand.
- All conductors inside the luminaire shall be neatly secured with tie-wraps as needed to prevent pinch points and assist in trouble shooting.

B. Driver
- Shall be 0V-10V dimmable.
- Rated case temperature shall be suitable for operation in the luminaire operating in the ambient temperature range of -20°C to +40°C.
- Shall be rated for 480VAC at 50/60 Hz, and shall operate normally for input voltage fluctuations of ± 10%.
- Shall have a minimum Power Factor (PF) of 0.90 at full input power and across specified voltage range.
- Shall provide UL Class II output.

C. Surge Suppression
- Integral surge protection shall meet ANSI/IEEE C62.45 procedures based on ANSI/IEEE C62.41.2 definitions for standard and optional waveforms for location category C-High 10kV/10kA test, IEC 61000-4-2 (Electrostatic Discharge) 8kV Air/4kV Contact test and IEC 61000-4-4 (Fast Transients).

D. Electromagnetic interference
- Luminaires shall have a maximum Total Harmonic Distortion (THD) of 20% at full input power and across specified voltage range.
- Luminaires shall comply with FCC 47 CFR part 15 non-consumer RFI/EMI standards.

E. Electrical safety testing
- Luminaires shall be listed for wet locations.
- Luminaires shall be UL listed and labeled.

F. Finish
- Luminaires shall be painted with a corrosion resistant polyester powdered paint with a minimum 2.0 mil thickness.
- Luminaires shall exceed a rating of six per ASTM D1654 after 1000 hours of salt spray fog testing per ASTM B117.
- The coating shall exhibit no greater than 30% reduction of gloss per ASTM D523, after 500 hours of QUV testing at ASTM G154 Cycle 6.
- Exterior surfaces shall be smooth and free of burrs.

G. Thermal management
- Mechanical design of protruding external surfaces (heat sink fins) on roadway luminaries shall facilitate hose-down cleaning and discourage debris accumulation.
- Liquids or moving parts will not be allowed for thermal management.

H. Color Quality
- Minimum Color Rendering Index (CRI) of 70 with a Correlated Color Temperature (CCT) of 3000K.

I. Optics
- Transmissive optical components shall be applied in accordance with OEM design guidelines to ensure suitability for the thermal/mechanical/chemical environment.

J. The following shall be in accordance with corresponding sections of ANSI C136.37
- All internal components shall be assembled and pre-wired using modular electrical connections.
- Terminal blocks shall be used for incoming AC lines. Terminal blocks shall be easily accessible to installers or repair personnel. Wire nuts are prohibited inside the luminaire housing.

K. Latching and hinging
- Refractor and housing door holders and hinges shall be designed to maintain positive control of door to the luminaire body so as not to allow the accidental disengagement of either door.
- Drivers shall be mounted to a housing door designed to be opened from the bottom of the luminaire. Housing door shall allow easy removal for troubleshooting/repair on the ground.

L. Manufacturer or local sales representative shall provide installation and troubleshooting support via telephone and/or email.

Include a shorting cap for each luminaire provided.

Provide wiring inside the light standard, breakaway fuse holders and fuses meeting Article 1400-2 of the *2024 Standard Specifications*.

2.30 WARRANTY

Provide a minimum ten-year warranty covering maintained integrity and functionality of the luminaire housing, wiring, and connections, LED light source(s) and LED driver. Negligible light output from more than 10 percent of the LED packages, color shifting, or flickering/strobing not related to incoming power issues all constitute luminaire failure.

Warranty period shall begin after project acceptance by the Department. Supplier shall furnish documentation of warranty procedures to the Design-Build Team stating that warranty is for NCDOT.

2.40 CONSTRUCTION METHODS

Level and secure each luminaire in all directions. Adjust any luminaires, as directed by the Engineer, to provide optimal illumination distribution.

When installing twin arm poles, the Design-Build Team shall install a separate SOOW cable along with a separate breakaway fuse holder and fuses for each luminaire.

All LED packages on all luminaires must be operating normally at contract completion. Any luminaire displaying improper operating characteristics prior to contract completion will be replaced by the Design-Build Team at no additional cost to the Department.

3.00 HIGH MAST LIGHT EMITTING DIODE (LED) LUMINAIRES

3.10 DESCRIPTION

Furnish, install and place into satisfactory operation, LED luminaires on high mount standards as detailed in these Special Provisions.

Any high mast luminaire submitted for approval must meet the minimum requirements in the table and sections below.

Mounting Height	Max. LED Fixture Wattage	Number & HPS Replacement Equivalent	Color Temp	Min. % of initial output at 70k hours	Min. Maintained Delivered Lumens (per fixture)
120’	560W	8 x 750W	3,000K	87%	54,000
100’	560W	6 x 750W	3,000K	87%	54,000
80’	335W	8 x 400W	3,000K	87%	27,000
60’	335W	4 x 400W	3,000K	87%	27,000

The Design-Build Team shall supply the Department with current catalog cuts and 3rd party certified photometric data files in Illuminating Engineering Society (IES) format for any high mount luminaire submitted for approval. The Department will thoroughly evaluate all high mount luminaires to determine if the submitted high mount luminaire meets or exceeds design criteria and pole spacing shown on the plans. High mount luminaires which do not meet or exceed the design criteria, or which do not produce enough light to meet the pole spacings shown on the plans, will not be approved for use.

The manufacturer shall state the Light Loss Factor (LLF) used in the photometric calculations for the proposed luminaire. LLF shall be calculated as follows:

LLF = Lamp Lumen Depreciation (LLD) x Luminaire Dirt Depreciation (LDD)

- Lamp Lumen Depreciation (LLD) shall be the value calculated and reported by the manufacturer based on the LM-80 and TM-21 reports for the proposed fixture for 70,000 hours at 25° C.
- Luminaire Dirt Depreciation (LDD) = 0.90

High mount luminaire retrofit LED kits are not an acceptable alternative.

3.20 MATERIALS

3.21 LUMINAIRE REQUIREMENTS

A. General Requirements

- LM-79 photometric test reports shall be provided for all LED luminaires. LM-79 luminaire photometric reports shall be produced by an independent test laboratory and include the following:
  - Name of test laboratory. The test laboratory must hold National Voluntary Laboratory Accreditation Program (NVLAP) accreditation for the IES LM-79 test procedure or must be qualified, verified, and recognized through the U.S. Department of Energy's CALiPER program.
  - Report number
  - Date
  - Complete luminaire catalog number. Catalog number tested must match the catalog number of the luminaire submitted, except for variations which do not affect performance.
  - Description of luminaire, LED light source(s), and LED driver(s)
  - Goniophotometry
  - Colorimetry

- LM-80 lumen maintenance test report shall be provided for each respective LED light source.
- Luminaire shall be constructed of aluminum. Each luminaire shall be finished gray in color unless otherwise noted.
- The luminaire shall have a 7 pin ANSI C136.41 compliant photocontrol receptacle for future expansion capabilities.
- Provide a summary of reliability testing performed for LED driver.

- Luminaires maximum total power consumption shall not exceed the values shown in the table above. Nominal luminaire input wattage shall account for nominal applied voltage and any reduction in driver efficiency due to sub-optimal driver loading.
- Luminaire shall have a maximum Backlight, Uplight & Glare (BUG) rating of 5-0-5 and an IESNA distribution of Type V as required to meet the spacing, the average maintained footcandle level and the average to minimum uniformity ratio requirements shown on the plans. The same BUG rating and distribution type shall be used throughout the project.
- Luminaire LED modules shall meet dust and moisture rating of IP-66, minimum.
- Luminaire shall have an external label per ANSI C136.15.
- Luminaires shall have an internal label per ANSI C136.22.
- Luminaires shall start and operate in -20°C to +40°C ambient.
- Electrically test fully assembled luminaires before shipment from factory.
- Effective Projected Area (EPA) and weight of the luminaires shall not exceed 1.3 square feet and 65 lbs.
- Luminaires shall be designed for ease of electrical component replacement.
- Luminaires shall be rated for minimum 2G vibration, minimum, per ANSI C136.31-2010
- LED light sources and drivers shall be RoHS compliant.
- The luminaire manufacturer shall have no less than five (5) years of experience in manufacturing LED-based lighting products and the manufacturing facility must be ISO 9001 certified.
- Pole hardware, nuts, bolts, and washers, etc. shall be made from 18-8 stainless steel, or steel conforming to ASTM A307 galvanized in accordance with ASTM A153.

B. Driver
- Shall be 0V-10V dimmable.
- Rated case temperature shall be suitable for operation in the luminaire operating in the ambient temperature range of -20°C to +40°C.
- Shall be rated for 480VAC at 50/60 Hz, and shall operate normally for input voltage fluctuations of ± 10%.
- Shall have a minimum Power Factor (PF) of 0.90 at full input power and across specified voltage range.

C. Surge Suppression
- Integral surge protection shall meet ANSI/IEEE C62.45 procedures based on ANSI/IEEE C62.41.2 definitions for standard and optional waveforms for location category C-High 10kV/10kA test, IEC 61000-4-2 (Electrostatic Discharge) 8kV Air/4kV Contact test and IEC 61000-4-4 (Fast Transients).

D. Electromagnetic interference
- Luminaires shall have a maximum Total Harmonic Distortion (THD) of 20% at full input power and across specified voltage range.

- Luminaires shall comply with FCC 47 CFR part 15 non-consumer RFI/EMI standards.

E. Electrical safety testing
   - Luminaires shall be listed for wet locations.
   - Luminaires shall be UL listed and labeled.

F. Finish
   - Luminaires shall be painted with a corrosion resistant polyester powdered paint with a minimum 2.0 mil thickness.
   - Luminaires shall exceed a rating of six per ASTM D1654 after 1000 hours of salt spray fog testing per ASTM B117.
   - The coating shall exhibit no greater than 30% reduction of gloss per ASTM D523, after 500 hours of QUV testing at ASTM G154 Cycle 6.

G. Thermal management
   - Mechanical design of protruding external surfaces (heat sink fins) shall facilitate hose-down cleaning and discourage debris accumulation.

H. Color Quality
   - Minimum Color Rendering Index (CRI) of 70 with a Correlated Color Temperature (CCT) of 3000K.

I. Optics
   - Transmissive optical components shall be applied in accordance with OEM design guidelines to ensure suitability for the thermal/mechanical/chemical environment.

J. The following shall be in accordance with corresponding sections of ANSI C136.37
   - All internal components shall be assembled and pre-wired using modular electrical connections.
   - Terminal blocks shall be used for incoming AC lines
   - Latching and hinging

K. Manufacturer or local sales representative shall provide installation and troubleshooting support via telephone and/or email.

Include a shorting cap for each luminaire provided.

3.30 WARRANTY

Provide a minimum ten-year warranty covering maintained integrity and functionality of the luminaire housing, wiring, and connections, LED light source(s) and LED driver. Negligible light output from more than 10 percent of the LED packages, color shifting, or flickering/strobing not related to incoming power issues all constitute luminaire failure.

Warranty period shall begin after project acceptance by the Department.

3.40 CONSTRUCTION METHODS

Level and secure each luminaire in all directions. Securely terminate the wiring for each high mount luminaire and include an equipment grounding conductor to bond the housing to the supply cord grounding conductor.

Adjust any luminaires, as directed by the Engineer, to provide optimal illumination distribution.

All LED packages on all luminaires must be operating normally at contract completion. Any luminaire displaying improper operating characteristics prior to contract completion will be replaced by the Design-Build Team at no additional cost to the Department.

4.00 COORDINATION WITH STATEWIDE LIGHTING MAINTENANCE FIRM

4.10 DESCRIPTION

The existing lighting system installed at the I-40/US 1 interchange and US 1/Walnut Street interchange is being monitored by Brady/Trane Services (Brady) under a Statewide service agreement. As part of the service agreement with Brady, a smart lighting control system (GE LightGrid) has been installed at these interchanges to monitor the power usage and status of the lighting system. The smart lighting control system consists of a wireless gateway installed at the control panel location and smart nodes installed on each luminaire.

The Design-Build Team shall coordinate with Brady at 919-232-5764 or warranty.request@bradyservices.com to have Brady turn the smart lighting control system on and off for the roadway lighting system reconfiguration, installation and testing and to troubleshoot communication issues after system reconfiguration. Brady shall bill the Design-Build Team directly for these services.

4.20 MATERIALS

No materials are required for this section.

4.30 CONSTRUCTION METHODS

As a function of the LightGrid system, the Design-Build Team is unable to turn the lights on for testing during the day using the Hand-Off-Auto switch in the existing control panel. The existing luminaires are powered 24/7 and the smart node installed on each luminaire has an integral photocontrol, preventing the luminaire from operating during daylight hours.

The Design-Build Team shall notify Brady at least two weeks prior to beginning the construction work for the reconfiguration of the existing lighting system. Brady will remotely turn all of the lights on for 24/7 operation for the duration of the lighting construction. This will allow the Design-Build Team to turn the lighting circuits on and off during the day via the existing breakers

in the existing control panel. When not in conflict and where construction allows, the lighting circuits shall be energized at night.

The Design-Build Team shall notify Brady again when work is complete. At that point Brady will remotely confirm that there is communication between the smart nodes and the gateway, and return the system to normal dusk to dawn operation.

In the event that this reconfiguration project causes a communication failure of some or all smart nodes or the gateway, the Design-Build Team shall coordinate with Brady to troubleshoot and resolve the failure.

If control nodes and fixtures are to be dismounted and stored during the reconfiguration, the Design-Build Team shall store nodes and fixtures in accordance with section 5.00 of these Special Provisions.

5.00 LUMINAIRE STORAGE

5.10 DESCRIPTION

The work covered in this section consists of providing all equipment, labor, materials and transportation necessary to transport and store LED luminaires and LightGrid smart nodes at a bonded and climate-controlled warehouse facility.

5.20 MATERIALS

The Design-Build Team shall provide pallets and straps for storing and transporting the luminaire and smart nodes.

5.30 CONSTRUCTION METHODS

Should storage of the LED luminaires and corresponding smart nodes be necessary during the project, the Design-Build Team is required to store the luminaires and smart nodes in a bonded, climate-controlled warehouse facility.

The Design-Build Team shall securely strap the luminaires with smart nodes to a pallet, and transport the pallet(s) to the warehouse facility. If the smart nodes are removed from the luminaires during storage, the Design-Build Team must institute a tagging system so that the same smart node can be reinstalled on the same luminaire. The Design-Build Team shall provide proof to the Engineer that a bonded and climate-controlled warehouse is being used. Bonding and climate control are required in order for the Department to maintain the warranty provided by Brady for any of the existing luminaires and smart nodes which are reused and reinstalled as part of this project.

When luminaires are to be reinstalled, the Design-Build Team shall retrieve the luminaires and smart nodes from the warehouse facility and reinstall.

The Design-Build Team shall replace any luminaire, smart node or shorting cap lost or damaged during storage at no cost to the Department.

6.00 RELOCATE HIGH MOUNT LIGHT STANDARDS

6.10 DESCRIPTION

The work covered by this section consists of providing all equipment, labor and materials necessary to move an existing high mount light standard to a new foundation at the location shown on the plans. This section also includes storage of materials to be reused, and removal of the existing foundation. Construction of a new foundation is not included in this section. Refer to Standard Provision titled Roadway Lighting Foundations (SP14 R004) for foundation requirements.

6.20 MATERIALS

Reuse existing materials, including the high mount standard shaft, lowering device head frame, luminaire carrier ring, luminaires and smart nodes, winch assembly, hoist cables, enclosed circuit breaker, connectors and branch circuitry. Replace materials that are to be reused if they are damaged during relocation. Materials damaged during relocation will be replaced with new materials at no additional cost to the Department.

The Design-Build Team is responsible for the storage and protection of the reused materials against loss or damage. Refer to Section 5.00 of these Special Provisions for luminaire and control node storage requirements.

The Design-Build Team shall provide new anchor bolts, nuts and washers. The Design-Build Team shall verify that the anchor bolts furnished on the project are equal to the existing anchor bolts. The Department will provide the specifications of the existing anchor bolts upon request.

6.30 CONSTRUCTION METHODS

Dismount the high mount light standard from the existing foundation and reinstall on a new foundation. Use rope or web slings when hoisting or lifting the high mount light standard to prevent damage or marking. If the light standards are to be stored between dismounting and reinstalling, provide proper transportation and supports to prevent warping. Provide protection against the elements. Refer to Section 5.00 of these Project Special Provisions if the high mast luminaires and control nodes are to be stored between removal and reinstallation.

The existing high mount light standard shall be kept in operation until such time that it is in conflict with construction. The Design-Build Team shall schedule high mount standard relocation work as directed by the Engineer to cause minimal disruption of traffic.

All other lighting operating from the same lighting control panel as the relocated high mount light standard shall remain operational while the high mount standard is relocated or stored.

Remove or abandon existing concrete high mount light standard foundations. Dispose of the removed concrete, reinforcing steel, and anchor bolts in manner acceptable to the Engineer. Backfill the holes with suitable material and compact the material as required.

Abandon or remove the conductors and conduit as required by construction. Install new feeder circuitry as shown on the plans.

Refer to Section 1400-10 of the *2024 Standard Specifications* for abandonment requirements.

After relocation of the high mount light standard, the operation of the lowering device shall be demonstrated by the Design-Build Team by raising and lowering the carrier ring with luminaires a minimum of two (2) times. The raising and lowering demonstration shall include latching and latching at the top and connection of test cables at the bottom. Twisting of the cables, failure of the carrier ring to latch or unlatch, unlevelness of the carrier ring or hang up of the guide arms shall be sufficient reason for the Engineer not to accept the relocated high mount.

7.00 RELOCATE SINGLE ARM LIGHT STANDARDS

7.10 DESCRIPTION

The work covered by this section consists of providing all equipment, labor and materials necessary to move an existing single arm light standard to a new foundation at locations shown on the plans. This section also includes storage of materials to be reused, and removal of the existing foundation. Construction of a new foundation is not included in this section.

7.20 MATERIALS

Reuse existing materials, including the single arm light standard, breakaway base, breakaway fuse holders and arm. Shims and washers may be reused, but new connecting bolts are required. Replace materials that are to be reused if they are damaged during relocation. Materials damaged during relocation will be replaced with new materials at no additional cost to the Department.

The Design-Build Team is responsible for the storage and protection of the reused materials against loss or damage. Refer to Section 5.00 of these Special Provisions for luminaire and control node storage requirements.

7.30 CONSTRUCTION METHODS

Dismount the single arm light standard from the existing standard foundation. Reassemble and reinstall single arm light standards on a new foundation and reuse the existing breakaway base. Replace the connecting bolts joining the standard to the breakaway base and attachment hardware for the standard-to-arm connection. Use rope or web slings when hoisting or lifting the light standard, to prevent damage or marking. If the single arm light standards are to be stored between dismounting and reinstalling, provide proper transportation and supports to prevent warping. Provide protection against the elements.

Remove or abandon existing concrete single arm light standard foundations. Dispose of the removed concrete, reinforcing steel, and anchor bolts in manner acceptable to the Engineer. Backfill the holes with approved material and compact backfill to 95% density in accordance with Section 235-3(C) of the *2024 Standard Specifications*.

Remove the conductors and remove or abandon the conduit as required by construction. Refer to Section 1400-10 of the *2024 Standard Specifications*. Install new circuitry inside the standard, and install new feeder circuitry as shown on the plans.

8.00 REMOVE HIGH MOUNT STANDARDS

8.10 DESCRIPTION

The work covered by this section consists of the removal of existing high mount standards on concrete foundations at locations shown on the plans. The standards are attached to the foundations with anchor bolts.

Remove or abandon concrete foundations.

8.20 MATERIALS

No materials are required for this work except such miscellaneous items as tape and terminal devices to dead-end circuits serving the standards.

8.30 CONSTRUCTION METHODS

Maintain operation of the existing lighting system until such time that it becomes in conflict with the actual construction work, or it becomes a hazard to traffic as determined by the Engineer.

Coordinate work with the NCDOT Division Traffic Engineer to assure that circuits can be de-energized where and when necessary. Work shall be conducted so that portions of the lighting system which are not in conflict with construction will be maintained in continuous nighttime operation.

Carefully remove the luminaire with the GE LightGrid smart node from the head frame carrier ring. Deliver luminaires and nodes to the Division 5 storage yard.

Dismount high mast pole and remove lowering device head frame and carrier ring. High mast pole and all components shall be disposed of by the Design-Build Team.

Remove or abandon existing concrete high mast foundations as defined Section 1400-10 of the *2024 Standard Specifications*. Dispose of the removed concrete, reinforcing steel and anchor bolts in a manner acceptable to the Engineer. Backfill the holes with approved material and compact backfill to 95% density in accordance with Section 235-3(C) of the *2024 Standard Specifications*.

Abandon or remove the conductors and the conduit for the removed high mast light standards as shown on the plans. Refer to Section 1400-10 of the *2024 Standard Specifications*.

9.00 REMOVE TWIN ARM LIGHT STANDARD

9.10 DESCRIPTION

The work covered by this section consists of the removal of existing metal twin-arm light standards mounted to standard foundations in a grassy median. The standards are 50' or less in mounting height and are attached to the foundations with anchor bolts.

Remove or abandon concrete foundations.

9.20 MATERIALS

No materials are required for this work except such miscellaneous items as tape and terminal devices to dead-end circuits serving the light standards.

9.30 CONSTRUCTION METHODS

The existing lighting system shall be left in operation until such time that it becomes in conflict with the actual construction work or it becomes a hazard to traffic as determined by the Engineer.

Coordinate work with the NCDOT Division Traffic Engineer to assure that circuits can be de-energized where and when necessary. Work shall be conducted so that portions of the lighting system which are not in conflict with construction will be maintained in continuous nighttime operation.

Breakaway fuse holders shall be disconnected from the circuitry and turned over to the Department. If circuitry connections to the fuse holders are by compression connectors, the connector shall be left intact, and the conductors shall be cut leaving a 12" lead to the connector.

Prior to deenergizing the lighting system, the Design-Build Team and Engineer, or their assigned representative, shall meet on site to assess and document the working condition of all existing twin arm luminaires. After the working condition is documented, remove luminaires from pole arms. The luminaires south of Walnut Street have GE LightGrid smart nodes installed to the photocontrol receptacle. The luminaires north of I-40 have shorting caps installed on the photocontrol receptacle. All luminaires, smart nodes and shorting caps will be reinstalled on new twin arm light standards as shown in the plans. Refer to Section 5.00 of these Special Provisions for luminaire and smart node storage requirements. Refer to Section 10.00 of these Special Provisions for luminaire reinstallation. Replace luminaires and smart nodes at no cost to the Department if they are damaged during removal.

Dismount the twin arm light standard from the existing standard foundation. All hoisting and lifting shall be with rope or web slings fastened in such a manner as to prevent damaging or marking any of the salvaged materials.

Remove or abandon existing concrete twin arm light standard foundations. Dispose of the removed concrete, reinforcing steel, and anchor bolts in manner acceptable to the Engineer. Backfill the holes with approved material and compact backfill to 95% density in accordance with Section 235-3(C) of the *2024 Standard Specifications*.

Remove all existing underground conductor and remove or abandon conduit. Dispose of removed conductor in a manner acceptable to the Engineer.

The Design-Build Team shall deliver all removed fuse holders, twin arm light standards and breakaway transformer bases to the NCDOT Division 5 storage yard. The Design-Build Team shall provide proper transportation and supports so that standards will not be warped, and shall provide protection so that rain, etc. will not damage any removed and salvaged components. The Design-Build Team shall furnish cranes, labor, and blocking materials to unload and properly store all salvaged materials at the NCDOT Division 5 storage yard.

10.00 REINSTALL LUMINAIRES

10.10 DESCRIPTION

Reuse the cobrahead light emitting diode (LED) luminaires and GE LightGrid smart nodes or shorting caps removed from the removed twin arm poles as part of this project. See Section 9.00 of these Project Special Provisions.

10.20 MATERIALS

Provide new SOOW cord, new breakaway fuse holders and new fuses within the new twin arm light standards.

Replace materials that are to be reused if they are damaged during reinstallation. Materials damaged during reinstallation shall be replaced with new materials at no additional cost to the Department.

10.30 CONSTRUCTION METHODS

Install and place into satisfactory operation the used luminaire with smart node or shorting cap on a bracket arm for new twin arm light standards. Include new wiring inside the standard from circuit conductors to luminaires, new in-line breakaway fuse holders and fuses and new ground wiring at the standard.

Reused luminaires with smart nodes shall be installed south of Walnut Street. Reused luminaires with shorting caps shall be installed north of I-40.

Level and secure each luminaire in all directions. Adjust any luminaires, as directed by the Engineer, to provide optimal illumination distribution.

Once reinstalled, all luminaires must be in the same operating condition as documented in Section 9.30 of the Project Special Provisions. The Design-Build Team shall repair or replace at no cost to the Department any luminaires which are not operating as documented prior.

In the event of node failure, provide a replacement photocell in lieu of a new smart node. Photocells shall meet the same requirements as described in Section 1408-3 of the *2024 Standard Specifications*

BLACK EPOXY PAVEMENT MARKING MATERIAL

(1/26/2017) (Rev. 10/13/2023)

Description

This work shall consist of applying black epoxy pavement marking material on concrete.

Epoxy Pavement Marking Material

(A) Formulation

Use epoxy pavement marking material consisting of 100% solid two-part system formulated and designed to provide a simple volumetric mixing ratio of the two components.

(B) Epoxide Value: ASTM D1652

WPE of the epoxy resin shall be 250 ± 50 for component A on a pigment free basis.

(C) Amine Value ASTM D2074

The total amine value of the curing agent (component B) shall be 450 ± 50

(D) Requirements

(1)	Color	
	Black:	Shall meet ASTM standard
(2)	Hardness:	ASTM D2240
	Minimum Shore D hardness:	80
(3)	Abrasion Resistance:	ASTM C-501
	Minimum wear index of catalyzed sample:	80
(4)	Adhesion to Concrete**:**	ASTM D4541

	At 100% concrete failure:	greater than 325 psi
(5)	Tensile Strength:	ASTM D638
	Minimum average tensile strength:	6000 psi
(6)	Compressive Strength:	ASTM D695
	Minimum compressive strength:	12000 psi
(7)	Drying Time:	ASTM D711
	Maximum drying time at 75±2°F:	10 minutes
(8)	Gel Time:	ASTM D2471
	Maximum gel time:	3 minutes

(E) Material Certification**:** Type 3 Material Certification and Type 4 Material Certification

Construction Methods

Epoxy Pavement Marking Material shall conform to the requirements of Section 1205 of the *Standard Specifications for Roads and Structures*.

(A) Application Equipment

Use epoxy application equipment, which is equipped with or capable of the following:

Precisely metering the two components in the ratio of proportion recommended by the manufacturer.

Producing the required amount of heat at the mixing head and gun tip.

Maintaining temperatures within the tolerances recommended.

Gauges for each proportioning pump so that any pressure difference can be easily monitored.

A minimum 24" long static mixer unit for proper mixing of the two components of the epoxy marking material.

Each component of the epoxy pavement marking shall be in a homogeneous state prior to mixing,

Have the capability to totally mix component A with component B immediately prior to the marking application.

Have the capability to spray pavement marking material and have the equipment mounted on a truck of sufficient size and stability with an adequate power source to produce uniform lines of the specified dimension.

A metering device to register the accumulated installed footage for each gun

(B) Weather Limitations

Apply epoxy pavement marking only when the ambient air temperature and the pavement surface temperature is a minimum of 35° F and rising.

(C) Application

Produce epoxy pavement marking lines that have a minimum dry thickness of 15 mils when placed on concrete pavements and 20 mils when placed on asphalt pavements.

Use **Type I** epoxy material (fast dry) for epoxy pavement markings except when otherwise specified in the contract documents.

Type II epoxy material may be used with lane closures as approved by the Engineer to allow for curing time.

Do not place epoxy markings on fresh asphalt pavements until 15 days have elapsed after the last asphalt layer is placed.

Using the epoxy application equipment, apply the pavement marking materials simultaneously. Hot-spray the epoxy resin, mixed in accordance with the manufacturer's recommendations, onto the pavement surface within an application temperature range recommended by the manufacturer.

Individual Components: Before mixing, heat the individual components to within the temperature range of 100° F to 170° F. Do not exceed the upper limit of the manufacturer's recommended heating temperature at any time under any circumstances.

Mixed Material: After mixing, ensure that the application temperatures for the combined materials at the gun tip are within the temperature range recommended by the manufacturer for the particular product used.

Produce marking, which upon cooling, has the ability to resist deformation caused by traffic throughout its entire length.

(D) Observation Period

Epoxy pavement markings shall be subject to a 30-day observation period.

Maintain responsibility for the pavement markings for a 30-day observation period beginning upon the satisfactory completion of all work required in the plans developed by the Design-Build Team. Guarantee the markings under the payment and performance bond in accordance with Article 105-17 of the *Standard Specifications for Roads and Structures*.

Have traffic operating on the facility during the entire 30-day observation period unless otherwise directed.

Provide pavement marking material, which during the 30-day observation period, shows no signs of failure due to blistering, excessive cracking, chipping, bleeding, staining, discoloration, oil content of the pavement materials, smearing or spreading under heat, deterioration due to contact with grease deposits, oil, diesel fuel, or gasoline drippings, spilling, poor adhesion to the pavement materials, vehicular damage, debonding and normal wear.

Replace, at no additional expense to the Department, any pavement markings that do not perform satisfactorily under traffic during the 30-day observation period.

WORK ZONE BLANK CANVAS

(1/21/2025)

Description

The Design-Build Team shall provide a uniform surface appearance in color and texture on asphalt and concrete pavements. The Design-Build Team shall perform the work covered in this provision including, but not limited to, removing pavement markings and/or pavement marking residue, removing pavement material, and disposing of any excess material resulting from the removal process during work zone operations.

Equipment

The Design-Build Team shall use a self-propelled unit with sufficient power to accurately provide a uniform pavement surface suitable for handling traffic without damage to the underlying pavement structure. Equipment shall be capable of removing pavements to a depth of 1/8 inch or less in a single pass.

Construction Methods

The Design-Build Team shall submit a construction sequence to the Engineer at least 14 days prior to blank canvas operations. The Design-Build Team shall maintain traffic in accordance with the traffic control plans.

At the discretion of the Design-Build Team, the Design-Build Team may either:

- Complete blank canvas operations as part of pavement marking removal. This is suitable for lower profile existing pavement markings that do not require traditional pavement marking removal methods first.

OR

- Complete blank canvas operations within 14 days after completing a traffic shift. This is better suited for higher profile markings that require traditional pavement marking removal methods first.

The Design-Build Team shall complete blank canvas operations in a continuous manner with consecutive passes of 6 feet minimum width, parallel to the centerline and direction of travel. Do not remove pavement to a depth of more than 1/8 inch.

The Design-Build Team shall complete operations such that the resulting surface is devoid of machine produced streaks, ruts, or overlap grooves that may interfere with the free flow of water. Ensure water does not puddle in areas where the existing pavement markings are removed. No visible overlaps between passes are allowed.

The Design-Build Team shall remove all debris and/or wastewater immediately following each blank canvas operations and prior to opening closed lanes to traffic. Disposing or wasting of removed materials will not be permitted within the right of way. Sweep or vacuum any residue before it can (a) be blown by traffic or wind, (b) migrate across open travel lanes or shoulders, or (c) enter a drainage facility.

CONNECTED LANE CLOSURE SYSTEM

(10/29/2018) (Rev. 2/17/2026)

Description

The Design-Build Team shall furnish, install, operate, maintain, relocate, and remove Connected Lane Closure Systems (CLCS) for lane closures on multi-lane roadways with posted speed limits of 55 mph and greater. The purpose of CLCS is to transmit real-time information of active lane closures for use by the State Transportation Operations Center (STOC), Regional Transportation Management Centers (TMCs), and traveler information systems; and for third party vendors (Mapping, Navigation, Connected Vehicles, etc.) to identify and provide advanced notification of active lane closures to approaching motorists.

Materials

The CLCS shall be designed and built to transmit the real-time location and direction of the lane closure. The information transmitted shall conform to the current version of the USDOT's Work Zone Data Exchange (WZDx) specification and be made available to NCDOT approved consumers of this data. More information about the WZDx specification can be found at:

https://www.transportation.gov/av/data/wzdx

The connected lane closure devices shall be capable of wireless communication.

The initial connected device representing the START location shall be designed and attached to the flashing arrow board in such a manner that it is only activated when either the left or right arrows are displayed, not when the flashing arrow board is operated in caution mode. The connected device shall no longer transmit location information when the flashing arrow board is turned off or changed to caution mode. The device shall have a visual indicator (e.g. an illuminated light, either steady burn or flash) to allow clear, visual proof the device is powered on, has established communication and is transmitting. The visual indicator shall not be located such that it potentially creates confusion for the motorists.

A second connected device representing the END location shall be installed on a crashworthy traffic control device. It shall have an easily accessible power switch and a small status indicator light mounted such that it is visible when passing by in a vehicle at operating speed. When switched to the ON position, the light shall indicate the device has established communication and is transmitting. The light may be either steady burn or flashing and shall not exceed one (1) inch in diameter. This second connected device representing the END location may be created virtually by a connected flashing arrow board.

The devices shall have sufficient battery life to maintain operation for the duration of the lane closure or can be recharged without deactivating the device or impacting the lane closure information transmitted to the external parties. All costs associated with charging are incidental and shall be included in the cost of the system.

Construction Methods

CLCS shall be used on all lane closures on multi-lane roadways with posted speed limits of 55 mph and greater throughout the duration of the project.

A START and END location shall be established by the installed system per grouping of lane closures (single, double, or triple); one attached and wired into the flashing arrow board at the beginning of the first taper. The other at the last traffic control device at the end of the lane closure(s) if the END location cannot be created virtually. Supplemental flashing arrow boards in advance of the first lane closure taper or flashing arrow boards in subsequent lane closures (for double and triple lane closures) shall not transmit location information if equipped with connected devices. Subsequent lane closures occurring downstream of where all lanes have been reopened or lane closures in the opposite direction of travel will require additional connected devices.

The second connected lane closure device shall be manually turned ON and OFF by crews installing and removing the lane closure unless the device can be controlled or virtually created by the initial connected device. The unit shall be turned ON immediately upon installation of the lane closure and turned OFF immediately upon removal of the lane closure.

When the lane closure is removed, the flashing arrow board shall be turned off or changed to caution mode, and the connected device shall automatically turn off simultaneously and shall no longer transmit location information. Turning the device away from traffic or moving the device to a staging area with the arrow board in arrow mode is not acceptable.

The CLCS shall run continuously during any active lane closure for the duration of the contract. Once installed, the Design-Build Team shall verify that the connected lane closure devices are transmitting information prior to leaving the device unattended and re-verify transmission every 72 hours for long-term installations.

Technical Requirements

The GPS within the connected devices shall have a horizontal accuracy of 10 feet, 95% of the time.

The system shall send real-time alerts to designated NCDOT personnel when the flashing arrow mode or direction is changed. The alert shall be within 5 minutes of the actual change.

The connected device shall transmit a Connected Work Zone (CWZ) Device Feed in compliance with the Work Zone Data Exchange (WZDx) specification (WZDx Specification (Field Device) / Connected Work Zone Specification (CWZ)). The feed shall be transmitted within five (5) minutes of initiation and updated every fifteen (15) minutes to the central server.

All required properties shall be transmitted. In addition, the following properties are also require:

- Road Direction
- Road Name
- Status Messages
- Is in Transport Position

More information about the WZDx specification can be found at:

https://www.transportation.gov/av/data/wzdx

The Design-Build Team shall provide multiple logins to a secured server (e.g. vendor dashboard) that provides real-time and historic status. The status must be exportable, within 24 hours, in .csv or .xls/.xlsx format and include data for date, device name, flashing arrow mode, communication status, road name, road direction, battery voltage, time on, time off, and GPS coordinates. The historic logged information shall be available to CLCS users 24/7/365 during the length of the entire construction phase. All logged information from the project shall be retained by the Design-Build Team and be available to the NCDOT for at least three (3) years after the contract ends.

The battery voltage shall be collected at least once an hour. The information shall be stored and available for troubleshooting. To prevent communication loss, the system shall transmit an alert via E-mail or SMS to designated personnel if the battery voltage of a device is under a specified threshold.

The CLCS shall provide an immediate electronic alert (e.g. via E-mail or SMS) to the Traffic Control Supervisor or other designated individual if a device is not transmitting its position for a period of 30 minutes or more.

The outputs from the connected device on the arrow board and the downstream connected (or virtual) device at the end of the lane closure shall be easily identifiable as a single system, either by sequential device IDs, identical project names, or other method as approved by the Engineer. Additional pairs on the project shall have unique identifiable information such that it is not confused with another project system.

HIGH VISIBILITY DEVICES

(10/25/2019) (Rev. 5/19/2026)

Description

Furnish and install high visibility devices on all roadways within the project limits with speed limits of 55 mph or higher.

Materials

(A) General

Use the following high visibility devices for work zone performance applications that are listed on the NCDOT APL.

(a) Drums
(b) Skinny Drums
(c) Work Zone Stationary Signs
(d) Work Zone Rigid Portable Signs (nighttime use)

All drums and skinny drums shall meet the requirements of Article 1089-5 of the *Standard Specifications* and shall have Grade B flexible, fluorescent orange sheeting that meets the retroreflective requirements of Article 1092-2 of the *Standard Specifications*.

All stationary work zone signs shall meet the requirements of Articles 1089-1 and 1089-2 of the *Standard Specifications*. Legend overlays are prohibited. Vertical sign post reflector strips shall be added to all stationary sign supports. Use Grade B fluorescent orange for work zone sign supports and Grade B fluorescent yellow for exit sign supports. Install sign post reflector strips a minimum of 2” wide, a minimum of 6’ long on sign supports with one sign mounted and a minimum of 4.5’ long for sign supports with two or more signs mounted vertically.

All portable work zone signs shall meet the requirements of Article 1089-1 and 1089-2 of the *Standard Specifications*. However, roll-up signs are prohibited for night work.

(B) Material Qualifications/Certifications

Provide a Type 3 Material Certification for all materials in accordance with Articles 106-3 and 1087-4 of the *Standard Specifications*.

Construction Methods

Install high visibility devices in accordance with this special provision and the applicable requirements of Section 1110, 1130 and 1180 of the *Standard Specifications*.

Maintenance

Replace any sign or drum that prematurely fails due to any damage or defect that causes it to perform unsatisfactorily with a device of similar quality and age according to the guidelines set forth in the American Traffic Safety Service Association's (ATSSA) Quality Guidelines for Work Zone Traffic Control Devices.

TYPICAL MEDIAN ACCESS AREAS

(12/18/18) (Rev. 5/13/2026)

Description

Perform the work covered by this section including, but not limited to, constructing, maintaining, and removing Typical Median Access Areas for construction vehicle ingress to and egress from the median to/from active travel lanes on controlled access facilities.

Typical Median Access Areas are not required when construction vehicle ingress and egress is conducted using lane closures as shown on detail 1101.05, Sheet 2, of the *Roadway Standard Drawings*.

Materials

Refer to Divisions 6, 10, 11, 12, and 17 in the *Standard Specifications for Roads and Structures.*

Provide temporary traffic control devices listed on the NCDOT Approved Products List (APL).

Provide Work Zone Performance Pavement Markings for Design-Build Projects (See Project Special Provision)

Provide High Visibility Devices (See Project Special Provision)

Flashing Beacon and Detection System:

(A) General

Provide flashing beacon and detection system components listed on the NCDOT ITS and Signals Qualified Products List (QPL).

Provide a trailer mounted flashing beacon and warning sign assembly that meets or exceeds the physical and operational requirements of the MUTCD, or other mounting method approved by the Department. The following specifications supplement those basic requirements.

Provide a totally mobile complete unit capable of being located as traffic conditions demand.

The warning sign height shall comply with detail 1110.01, Sheet 1, of the *Roadway Standard Drawings* when raised in the upright position.

The flashing beacon housing assembly shall be of weather resistant construction.

(B) Power System

Provide a unit that is solar powered and supplemented with a battery backup system that includes a 110/120 VAC powered on-board charging system.

The unit shall also be capable of being powered by standard 110/120 VAC power source.

The batteries, when fully charged, shall be capable of powering the display for 20 continuous days with no solar power.

Store the battery bank and charging system in a lockable, weather, and vandal resistant box.

(C) Controller

Provide automatic brightness/dimming of the display and a manual override dimming switch.

The controller shall provide a battery-charge status indicator.

Mobile radio or any other radio transmissions shall not affect the controller.

Store the controller in a lockable, weather and vandal resistant box.

(D) Trailer

Finish all exterior metal surfaces with Federal orange enamel per Federal Standard 595a, color chip ID# 13538 or 12473 respectively. The trailer shall be able to support a 100 mph wind load with the display fully extended.

The trailer shall be equipped with leveling jacks capable of stabilizing the unit in a horizontal position when located on slopes 6:1 or flatter.

The trailer shall be properly equipped in compliance with North Carolina Law governing motor vehicles.

Provide a minimum 4 inch wide strip of fluorescent orange retroreflective sheeting to the frame of the trailer. Apply the sheeting to all sides of the trailer. The retroreflective sheeting shall be Grade B that conforms to Article 1092-2 in the *Standard Specifications for Roads and Structures.* Drums may be supplemented around the unit in place of the sheeting.

(E) Reliability

Provide a sign unit, flashing beacons, and detection system with all components rated to operate at temperatures ranging from -30°F to 165°F.

Construction Methods

See Typical Median Access Detail (attached).

Temporary Acceleration Lane

Construct a temporary acceleration lane with a minimum length of 1720’ and a minimum clear width of 12’ for the full length of the Temporary Acceleration Lane. At least 920’ of parallel merge/diverge area is required adjacent to the active travel lanes. The detection zone will be located from the beginning of the paved area to within 100’ of the end of the PCB. It shall have protection separating it from the active travel lanes for the first 500’.

The Temporary Acceleration Lane shall use either existing or proposed pavement, where available. If existing or proposed pavement is not available, construct temporary pavement as follows: 1.25” S9.5B, 2.5” I19.0C, and 8” ABC. Install and maintain pavement in accordance with Division 6.

Using Work Zone Performance Pavement Markings, install 12” yellow diagonals lines (2:1 slope) at 100’ intervals throughout the upstream half of the parallel merge/diverge area, and at 55’ intervals throughout the downstream half of the parallel merge/diverge area. Remove any conflicting markings in accordance with Section 1205.

Flashing Beacons and Detection System

Provide High Visibility advance warning signage as shown in the attached detail. Provide a flashing beacon system with two (2) flashing lights per sign to alert motorists in the active travel lanes of work vehicles entering from the median.

Provide a non-intrusive detection system capable of detecting vehicles in the work area in advance of the parallel merge/diverge area. The detection system shall be programmed such that passing public traffic in active travel lanes and vehicles in the work area not intending to use the parallel merge/diverge area are not detected.

Once detection occurs, the beacons on the advance warning sign(s) shall begin flashing immediately at a rate of not less than 50 or more than 60 times per minute. The beacons on the advance warning sign(s) shall flash continuously in an alternating pattern at all times that work vehicles are detected. The beacons shall continue flashing for thirty (30) seconds after detection

ceases before turning off, and personnel on site shall have the ability to adjust this time based on field conditions. The flashing beacon system shall remain dark when idle.

Expedite repairs due to failure, malfunction or damage to the flashing beacons and/or detection system. Furnish another flashing beacon system or detection system approved by the Department during the repair time. Repair or replace flashing beacon system and/or detection systems immediately; otherwise, suspend all construction activities requiring the use of the Median Access Area until the flashing beacon system and/or detection system is restored to operation.

Perform all maintenance operations recommended by the manufacturer of the flashing beacon system and detection system.

Location, Placement, and Use

Typical Median Access Areas shall meet the following conditions:

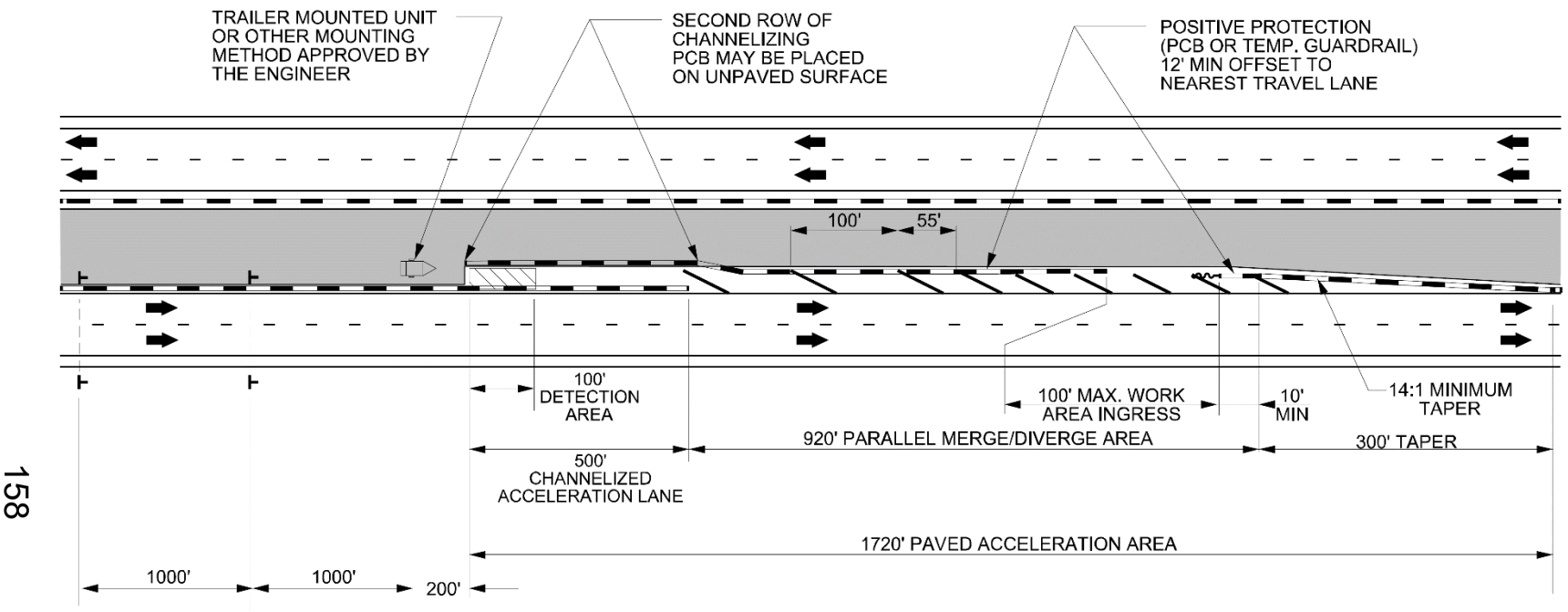
- The beginning of the parallel merge / diverge area shall not be located within one-half (1/2) mile of any upstream interchange acceleration lane or on ramp, unless approved by the Department.
- The end of the parallel merge/diverge area shall not be located within one-half (1/2) mile of any downstream interchange deceleration lane or exit ramp, unless approved by the Department.
- All proposed locations for Typical Median Access Areas shall be reviewed and approved by the Department prior to installation.

Work vehicles using a particular Median Access Area shall not utilize any interchange ramp (on-ramp or off-ramp) within one (1) mile of the Median Access area.

Typical Median Access Areas installed in accordance with this section will not require the use of temporary lane closures for ingress/egress of work vehicles.

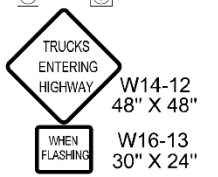
The Design-Build Team shall comply with multiple and single vehicle hauling restrictions as shown in the TMP when performing hauling of equipment or materials to or from the project while using Typical Median Access Areas.

TYPICAL MEDIAN ACCESS DETAIL

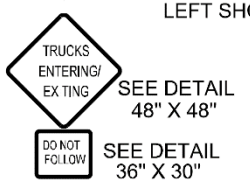




INSTALL ON BOTH SHOULDERS



INSTALL ON LEFT SHOULDER ONLY



INSTALL ON BOTH SHOULDERS

NOTES:

1. RELOCATE MEDIAN ACCESS POINTS, AS NEEDED, TO COMPLETE MEDIAN CONSTRUCTION AS APPROVED BY THE ENGINEER.
2. PLACE YELLOW DIAGONAL PAVEMENT MARKINGS THROUGHOUT ACCESS LANE. SPACING FOR UPSTREAM HALF OF LANE SHALL BE 100', AND 55' FOR DOWNSTREAM HALF OF LANE.
3. WHEN NOT IN USE FOR MORE THAN 72 HOURS, DRUMS SHALL BE USED ALONG THE SHOULDER TO CLOSE THE PARALLEL ACCELERATION/DECELERATION AREA.
4. ALL WORK VEHICLES ATTEMPTING TO RE-ENTER AN OPEN TRAVEL LANE SHALL PASS THROUGH THE DETECTION AREA. WORK VEHICLES SHALL NOT LEAVE THE WORK AREA USING THE INGRESS POINT AT ANY TIME.

SIGN NUMBER: WZTC
TYPE: STATIONARY
QUANTITY: SEE PLANS

SIGN WIDTH: 5'-6"
HEIGHT: 5'-6"
TOTAL AREA: 30.3 Sq.Ft.

BORDER TYPE: INSET
RECESS: 0"
WIDTH: 0"
RADII: 0"

NO. Z BARS: 2
LENGTH: 58.0

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT'L: 0.080" (2.0 mm) ALUMINUM

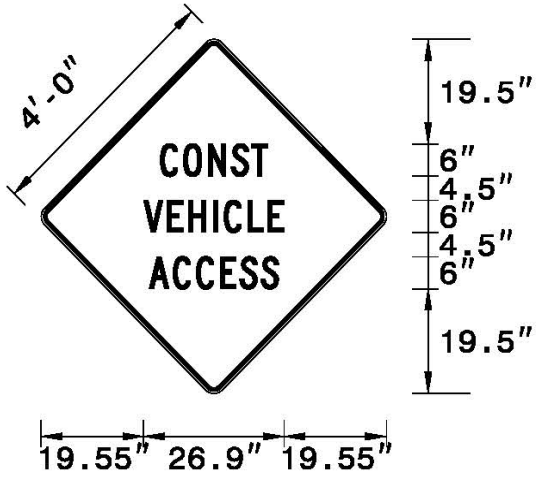
USE NOTES: 1,2

1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be NC GRADE B fluorescent orange retroreflective sheeting.

DESIGN BY: J.Navarrete
PROJECT ID: I5922

CHECKED BY:
LOCATION:

Mar 14, 2018
DIV:WZTC



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																											Series/Size Text Length
		C	O	N	S	T																					C 2000
	22.7	4.4	4.7	4.4	3.9	3.1	22.7																				20.5
		V	E	H	I	C	L	E																			C 2000
	19.6	4.6	4.1	4.7	2	4.6	3.9	3.1	19.6																		26.9
		A	C	C	E	S	S																				C 2000
	20.6	4.6	4.4	4.6	3.8	4.1	3.4	20.6																			24.8

FILENAME: I5922 Sign Designs

NORTH CAROLINA D.O.T. SIGN DETAIL

SIGN NUMBER: WZTC
TYPE: STATIONARY
QUANTITY: SEE PLANS

SIGN WIDTH: 3'-0"
HEIGHT: 2'-6"
TOTAL AREA: 7.5 Sq.Ft.

BORDER TYPE: INSET
RECESS: 0.47"
WIDTH: 0.63"
RADII: 1.5"

NO. Z BARS:
LENGTH:

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT'L: 0.080" (2.0 mm) ALUMINUM

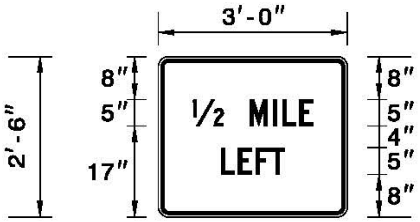
USE NOTES: 1,2

1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be NC GRADE B fluorescent orange retroreflective sheeting.

DESIGN BY: J.Navarrete
PROJECT ID: I5922

CHECKED BY:
LOCATION:

Mar 14, 2018
DIV:WZTC



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																											Series/Size Text Length
		1/2		M	I	L	E																					C 2000
	6.6	5.9	5	4.4	1.8	3.3	2.6	6.6																			22.9
		L	E	F	T																							C 2000
	12	3.3	3.4	2.8	2.6	12																					12.1

FILENAME: I5922 Sign Designs

NORTH CAROLINA D.O.T. SIGN DETAIL

SIGN NUMBER: WZTC
TYPE: STATIONARY
QUANTITY: SEE PLANS

SIGN WIDTH: 5'-6"
HEIGHT: 5'-6"
TOTAL AREA: 30.3 Sq.Ft.

BORDER TYPE: INSET
RECESS: 0"
WIDTH: 0"
RADII: 0"

NO. Z BARS: 2
LENGTH: 58.0

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT'L: 0.080" (2.0 mm) ALUMINUM

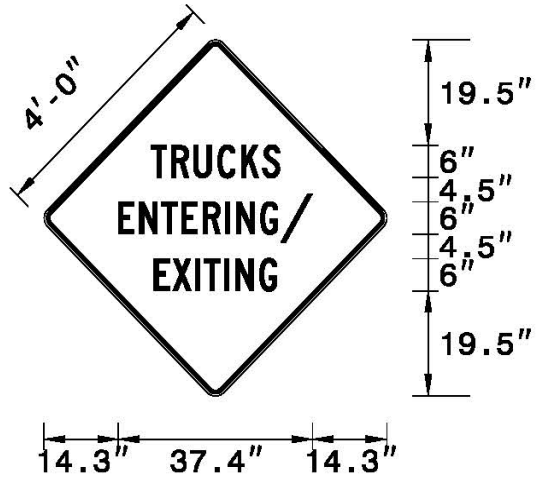
USE NOTES: 1,2

1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be NC GRADE B fluorescent orange retroreflective sheeting.

DESIGN BY: J.Navarrete
PROJECT ID: I5922

CHECKED BY:
LOCATION:

Mar 14, 2018
DIV: DIV



Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																										Series/Size Text Length
		T	R	U	C	K	S																				C 2000
	20.6	3.9	4.4	4.6	4.6	4.1	3.4	20.6																			24.8
		E	N	T	E	R	I	N	G	/																	C 2000
	14.3	4.1	4.2	3.9	4.1	4.4	2.2	4.6	3.9	6.1	14.3																37.4
		E	X	I	T	I	N	G																			C 2000
	21.2	3.6	4.4	1.7	3.9	2.2	4.6	3.4	21.2																		23.6

FILENAME: I5922 Sign Designs

NORTH CAROLINA D.O.T. SIGN DETAIL

SIGN NUMBER: WZTC
TYPE: STATIONARY
QUANTITY: SEE PLANS

SIGN WIDTH: 3′-0″
HEIGHT: 2′-6″
TOTAL AREA: 7.5 Sq.Ft.

BORDER TYPE: INSET
RECESS: 0.47″
WIDTH: 0.63″
RADII: 1.5″

NO. Z BARS:
LENGTH:

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

SYMBOL	X	Y	WID	HT

MAT'L: 0.080″ (2.0 mm) ALUMINUM

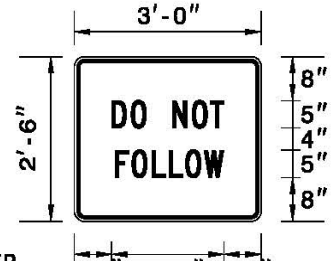
USE NOTES: 1,2

1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be NC GRADE B fluorescent orange retroreflective sheeting.

DESIGN BY: J.Navarrete
PROJECT ID: I5922

CHECKED BY:
LOCATION:

Mar 14, 2018
DIV:WZTC



BORDER
R=1.5″
TH=0.63″
IN=0.47″

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																											Series/Size Text Length
		D	O		N	O	T																				C 2000
	7.2	3.7	3	5	3.8	3.6	2.6	7.2																			21.6
		F	O	L	L	O	W																				C 2000
	7.9	3.1	3.9	3.3	3.2	3.6	3.8	7.2																			20.9

FILENAME: I5922 Sign Designs

NORTH CAROLINA D.O.T. SIGN DETAIL

WORK ZONE DIGITAL SPEED LIMIT SIGNS

(5/10/2021)

Description

In accordance with this RFP, The Design-Build Team shall furnish and install Work Zone Digital Speed Limit Signs on interstates and freeways with speed limits of 55 mph or greater. These signs are regulatory speed limit signs with LED displays for the speed limit numbers.

Materials

Digital Speed Limit Signs shall be a minimum 36” wide x 48” high. The speed limit sign (R2-1) shall be black on white with high intensity white prismatic sheeting.

The Digital Speed Limit Sign shall be mounted such that the bottom of the sign is 7’ above roadway.

The LED panel shall be a minimum of 28” wide x 18” high. The display on the LED panel shall be amber or white.

The LED numbers shall have a minimum 5 wide by 7 high pixel array with a minimum height of 18”.

The LED panel shall have auto brightness / dimming capability.

The black on orange “WORK ZONE” sign shall be mounted above the speed limit sign. It shall be 36” wide x 24” high with high intensity prismatic orange sheeting.

The black on white “$250 FINE” sign shall be mounted below the speed limit sign. It shall be 36” wide x 24” high with high intensity prismatic white sheeting.

All digital speed limit systems shall have operational software and wireless communications that allows for remote operation and data monitoring. It shall be configured to allow access by the Engineer or their designee to change each sign independently or change the speed limit on all signs at once from a PC, tablet or cellular phone application.

Radar equipment to detect approaching speeds on the digital speed limit systems is optional. However, if the systems have radar, they will be equipped to store the detected speed data, this information should be available in a spreadsheet format and accessed remotely from a secure cloud location.

The Work Zone Digital Speed Limit systems shall have flashing beacons. The beacons are to be a minimum of 8” diameter LED circular yellow. They shall be mounted above and below the sign assemblies and are to be centered. The beacons shall alternately flash at rates not less than 50 or more than 60 times per minute.

In addition, the flashing beacons shall be mounted in such a manner that the $250 FINE sign is not obscured when in operation.

Digital Speed Limit Signs may be trailer mounted or stationary mounted. The unit shall be solar powered and have the ability to operate continuously. It shall be supplemented with a battery backup system which includes a 110/120 VAC powered on-board charging system.

The batteries, when fully charged, shall be capable of powering the display for 20 continuous days with no solar power. The unit shall be capable of being powered by standard 110/120 VAC power source.

Store the battery bank and charging system in a lockable, weather and vandal resistant box.

All Work Zone Digital Speed Limit equipment shall be on the NCDOT Approved Products List.

Digital Speed Limit Displays

The speed limit shall be continuously displayed on the signs. All other stationary speed limit signs shall be covered when Digital Speed Limit systems are in operation.

Reduced Speed Limit Displays

The Digital Speed Limit systems shall have beacons activated when the work zone speed limit is reduced. Otherwise, the beacons are to remain off.

IF THE DIGITAL SPEED LIMIT SYSTEM IS EQUIPPED WITH RADAR: The Digital Speed Limit Signs shall display the reduced work zone speed limit without flashing the LED speed limit number unless approaching speeds are detected to be 6 MPH or higher than the displayed speed limit. If speeds are detected 6 MPH or above the displayed speed limit, then the LED shall flash the speed limit until the speeds are within the 6 MPH tolerance.

Existing Speed Limit Displays

When the existing speed limit is displayed on the Digital Speed Limit Signs, the beacons are to remain off.

IF THE DIGITAL SPEED LIMIT SYSTEM IS EQUIPPED WITH RADAR: The speed limit number is not to flash unless the approaching speeds are detected to be 6 MPH or higher than the displayed speed limit.

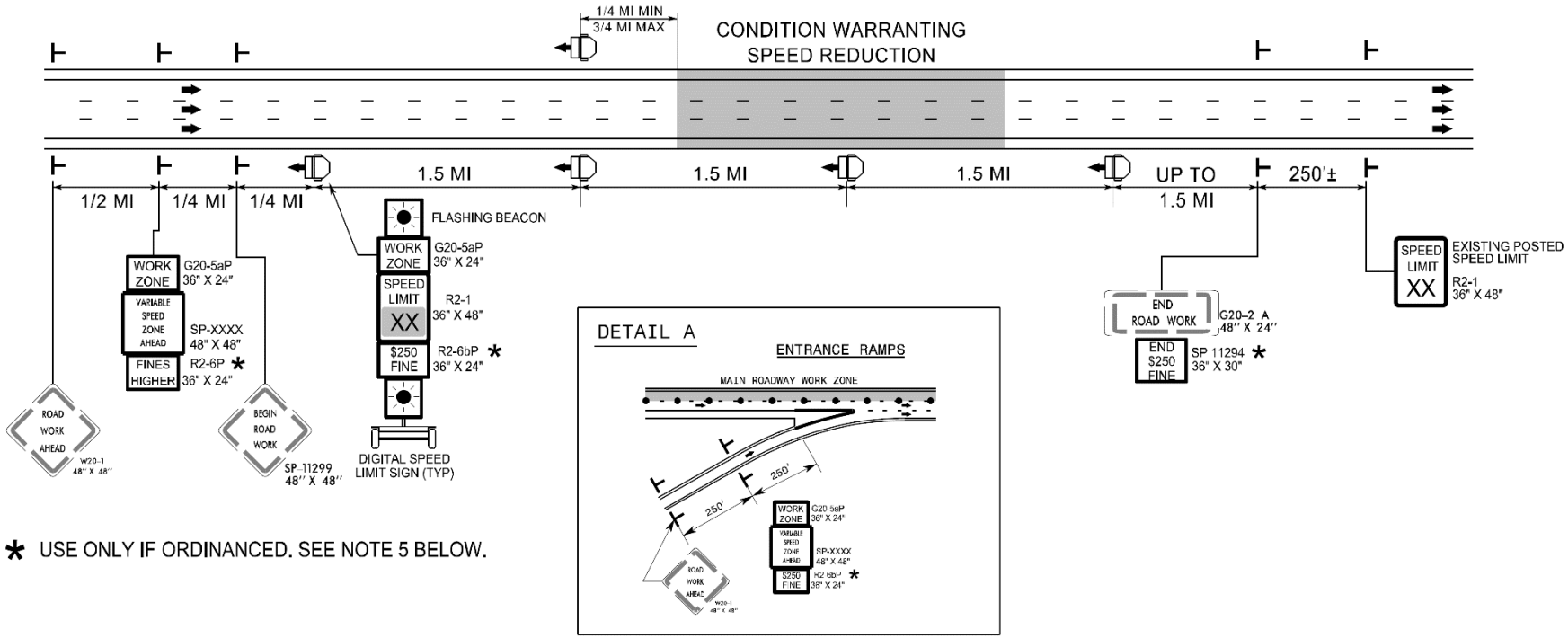
Other Construction Methods

The speed limits are the sole authority of the NCDOT. An ordinance by the State Traffic Engineer is required for all speed limits in order to have a lawfully enforceable speed limit.

The Regional Traffic Engineering Office and the Division Construction Engineer in coordination with the Work Zone Traffic Control Section will provide all work zone speed limit recommendations based on activities and conditions.

The Design-Build Team be responsible for coordinating with the Engineer when the work zone speed limits are to be changed and will have to seek approval by the Engineer or their designee before the speed limit is changed.

Whenever possible, each trailer mounted unit shall be placed on the paved shoulder and shall have the capability of being leveled.



DETAIL A

ENTRANCE RAMPS

* USE ONLY IF ORDINANCED. SEE NOTE 5 BELOW.

NOTES

1. THE DIGITAL SPEED LIMITS SIGNS WILL BE INSTALLED (TRAILER MOUNTED OR STATIONARY MOUNTED) IN ADVANCE OF AND SPACED APPROXIMATELY 1.5 MILES THROUGHOUT THE THE PROJECT LIMITS, UNLESS DIRECTED OTHERWISE.
2. WITHIN ¼ TO ¾ MILE UPSTREAM OF CONDITION WARRANTING A SPEED REDUCTION, PLACE A DIGITAL SPEED LIMIT SIGN ON BOTH THE INSIDE AND OUTSIDE SHOULDERS, UNLESS DIRECTED OTHERWISE BY THE ENGINEER. AT ALL OTHER LOCATIONS DOWNSTREAM, PLACE A SINGLE DIGITAL SPEED LIMIT SIGN ON THE OUTSIDE SHOULDER.

   IF SIGNS ARE NOT HIGHLY VISIBLE TO ALL MOTORISTS, SUPPLEMENTAL DIGITAL SPEED LIMIT SIGNS ARE PERMITTED ON THE MEDIAN SHOULDER.
3. THE DIGITAL SPEED LIMIT SIGNS TAKE PRECEDENCE OVER EXISTING SPEED LIMIT SIGNS AND SHOULD REMAIN UPRIGHT AND VISIBLE AT ALL TIMES. ALL EXISTING SPEED LIMIT SIGNS SHALL BE COVERED OR REMOVED FOR DURATION OF THE PROJECT.
4. NCDOT HAS SOLE AUTHORITY OF THE SPEED LIMITS DISPLAYED ON THE DIGITAL SPEED LIMIT SIGNS.
5. THE WORK ZONE VARIABLE SPEED LIMIT AND THE $250 SPEEDING PENALTY ARE SEPARATE ORDINANCES THAT MUST BE SIGNED BY THE STATE TRAFFIC ENGINEER TO BE VALID AND ENFORCEABLE. WITHOUT SIGNED ORDINANCES, THE SPEED LIMIT ON A FACILITY SHALL REMAIN UNCHANGED AND/OR HIGHER FINES SIGNS SHALL NOT BE USED.
6. THE REDUCED SPEED SHALL BE DISPLAYED A MINIMUM OF ¼ MILE AND A MAXIMUM OF ¾ MILE IN ADVANCE OF AND THROUGHOUT THE AREA MEETING CONDITIONS LISTED IN THE CHART. THE EXISTING SPEED LIMIT SHALL BE DISPLAYED ON ALL OTHER DIGITAL SPEED LIMIT SIGNS.
7. THE SPEED DISPLAYED SHALL BE THE LOWER OF THE EXISTING SPEED LIMIT OR THE SPEED IN THE WORK ZONE CONDITION CHART.
8. THE BEACONS ON THE DIGITAL SPEED LIMIT SIGNS SHALL ONLY FLASH DURING TIMES THE SPEED IS REDUCED, AND REMAIN OFF AT ALL OTHER TIMES.

	WORK ZONE CONDITIONS	SPEED TO DISPLAY (SEE NOTE 6 & 7)
LANE CLOSURES	2 LANES REDUCED TO 1 LANE	55
	3 LANES REDUCED TO 1 LANE	55
	3 LANES REDUCED TO 2 LANES	60
	4 LANES REDUCED TO 1 LANE	55
	4 LANES REDUCED TO 2 LANES	60
	4 LANES REDUCED TO 3 LANES	65
CONTINUOUS BARRIER (LENGTH OF BARRIER GREATER THAN 1 MILE)	1 OPEN LANE WITH CONTINUOUS BARRIER ON BOTH SHOULDERS	55
	1 OPEN LANE WITH CONTINUOUS BARRIER ON 1 SHOULDER	60
	3 OR 2 OPEN LANES WITH CONTINUOUS BARRIER ON BOTH SHOULDERS	60
	3 OR 2 OPEN LANES WITH CONTINUOUS BARRIER ON 1 SHOULDER	65
	4 OPEN LANES WITH BARRIER CONTINUOUS ON BOTH SHOULDERS	65
	4 OPEN LANES WITH BARRIER CONTINUOUS ON 1 SHOULDER	EXISTING
	UNEVEN LANES	60

C202177 / I-5701 / I-5702
Project Special Provisions
Wake County

SIGN NUMBER: WZTC
TYPE: STATIONARY
QUANTITY: SEE PLANS

SIGN WIDTH: 4′-0″
HEIGHT: 4′-0″
TOTAL AREA: 16.0 Sq.Ft.

BORDER TYPE: INSET
RECESS: 0.47″
WIDTH: 0.63″
RADII: 1.5″

NO. Z BARS: 2
LENGTH: 40.0

BACKG COLOR: Fluorescent Orange
COPY COLOR: Black

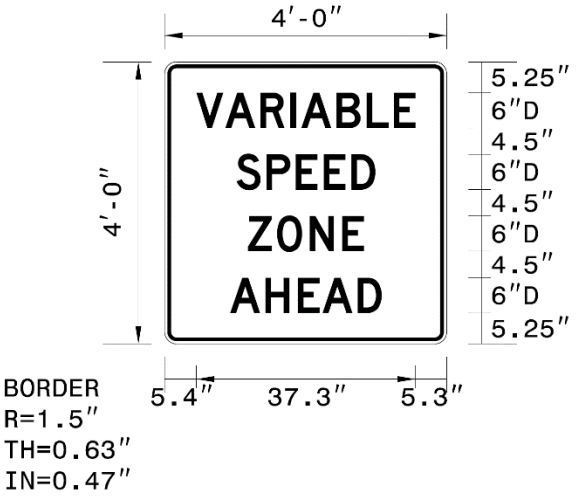
SYMBOL	X	Y	WID	HT

MAT′L: 0.080″ (2.0 mm) ALUMINUM

DESIGN BY: J.Navarrete
PROJECT ID:

CHECKED BY:
LOCATION:

May 13, 2019
DIV: DIV



USE NOTES: 1,2

1. Legend and border shall be direct applied black non-reflective sheeting.
2. Background shall be NC GRADE B fluorescent orange retroreflective sheeting.

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

																										Series/Size Text Length
	V	A	R	I	A	B	L	E																		D 2000
5.4	4.9	6	5.1	1.9	6	5.1	4.6	3.7	5.3																	37.3
	S	P	E	E	D																					D 2000
12.2	5.1	5	4.7	4.7	4.1	12.1																				23.6
	Z	O	N	E																						D 2000
14.2	5	5.6	5.5	3.7	14																					19.8
	A	H	E	A	D																					D 2000
11.2	6	5.5	4.2	6	4.1	11																				25.8

FILENAME: Special Signs 7

NORTH CAROLINA D.O.T. SIGN DETAIL

WORK ZONE PRESENCE LIGHTING

(10/14/19) (Rev. 5/10/2021)

Description

Furnish and install Work Zone Presence Lighting during nightly lane closures on multilane roadways with speed limits of 55 mph or greater.

Materials

Anti-glare lighting systems are required. Work Zone Presence Lighting shall be installed in accordance with the attached detail and the Manufacturer's recommendations.

Supply a power source for each light to provide the light output as described in the chart below.

Each light unit shall be capable of providing a minimum of 14,000 lumens illuminating a minimum area of approximately 3,000 square feet. The light shall be capable of being elevated to a height of 14 feet above the pavement.

Each light unit support base or mounting stand shall have the capability of being leveled such that the light mast is plumb.

Provide Work Zone Presence Lighting listed on the NCDOT Approved Products List.

Construction Methods

Work Zone Presence Lighting is permitted to be prestaged (up to 1 hour prior for single lane closures and up to 2 hours prior for double or triple lane closures) along with other traffic control devices or installed within 1 hour after the necessary traffic control has been installed for the lane closure(s). At the end of the work night, the Work Zone Presence Lights shall be removed within 1 hour before or after the lane closure(s) is removed.

Whenever possible, each light unit shall be placed on the outside paved shoulder, a minimum of 4 feet from the travel lane and spaced according to the chart below based on the amount of light output for each unit.

Work Zone Presence Lighting is permitted to supplement the Portable Construction Lighting inside the lane closure. At no time shall Work Zone Presence Lighting be used in lieu of Portable Construction Lighting when required.

If there is sufficient existing overhead lighting, Work Zone Presence Lighting may be eliminated as directed by the Engineer.

Lighting Unit Installation Requirements

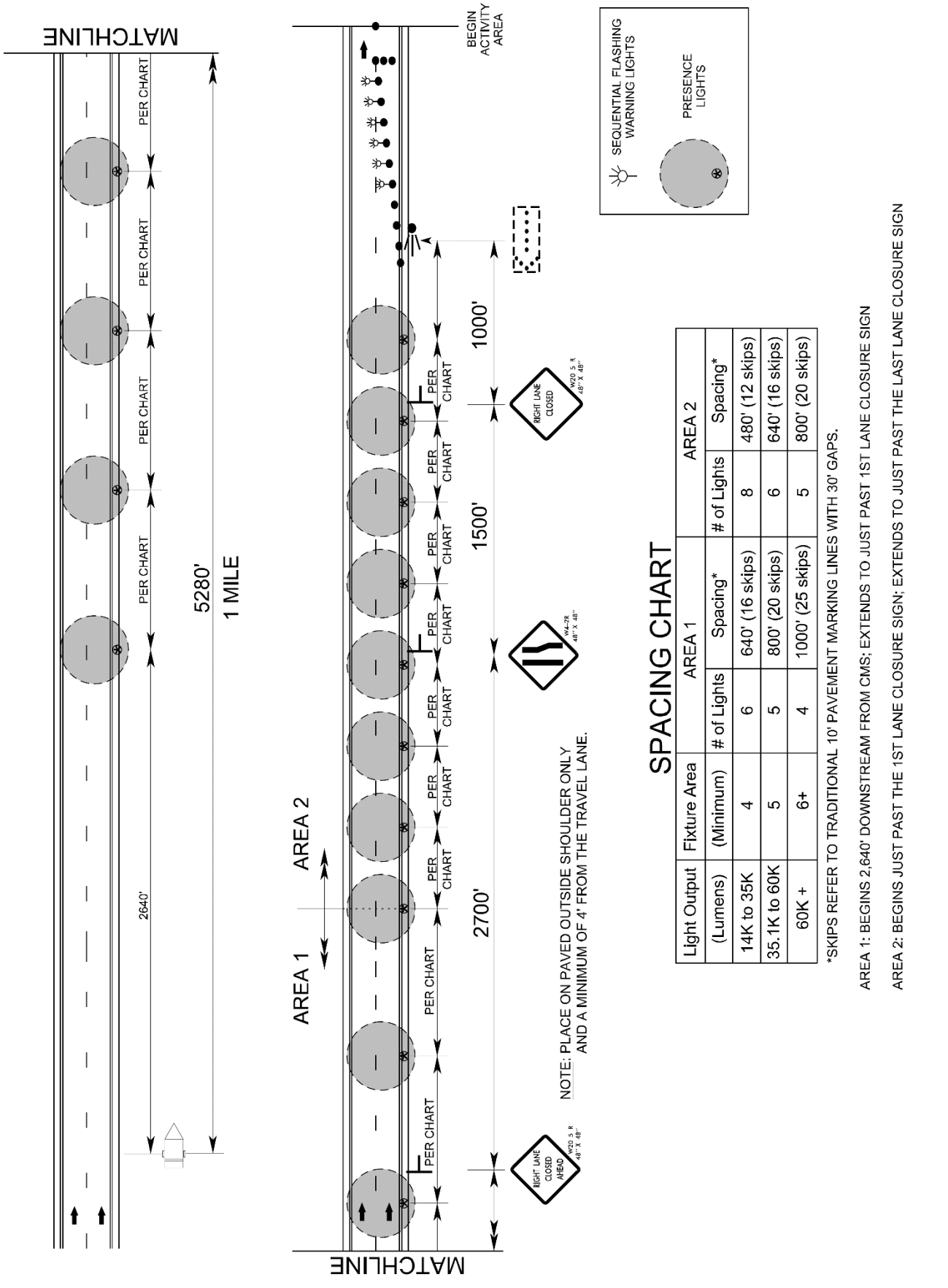
The lighting units shall be installed in advance of the lane closure as shown on the attached detail and spaced according to the chart below:

		AREA 1		AREA 2	
Light Output (Lumens)	**Illuminated Fixture Area (Sq. Ft.)**	**# of Lights**	**Spacing***	**# of Lights**	**Spacing***
14,000 - 35,000	4	6	640’ (16 skips)	8	480’ (12 skips)
35,001 - 59,999	5	5	800’ (20 skips)	6	640’ (16 skips)
60,000+	6+	4	1,000’ (25 skips)	5	800’ (20 skips)

*Skips refer to traditional 10’ pavement marking lines with 30’ gaps.

Area 1: Begins 2,640’ downstream from CMS; Extends to just past 1st Lane Closure Sign

Area 2: Begins just past the 1st Lane Closure Sign; Extends to just past the last Lane Closure Sign



NOTE: PLACE ON PAVED OUTSIDE SHOULDER ONLY AND A MINIMUM OF 4' FROM THE TRAVEL LANE.

SPACING CHART

Light Output	Fixture Area	AREA 1		AREA 2	
(Lumens)	(Minimum)	# of Lights	Spacing*	# of Lights	Spacing*
14K to 35K	4	6	640' (16 skips)	8	480' (12 skips)
35.1K to 60K	5	5	800' (20 skips)	6	640' (16 skips)
60K +	6+	4	1000' (25 skips)	5	800' (20 skips)

*SKIPS REFER TO TRADITIONAL 10' PAVEMENT MARKING LINES WITH 30' GAPS.

AREA 1: BEGINS 2,640' DOWNSTREAM FROM CMS; EXTENDS TO JUST PAST 1ST LANE CLOSURE SIGN

AREA 2: BEGINS JUST PAST THE 1ST LANE CLOSURE SIGN; EXTENDS TO JUST PAST THE LAST LANE CLOSURE SIGN

WORK ZONE PERFORMANCE PAVEMENT MARKINGS

(10/8/16) (10/9/18) (10/13/23) (Rev. 5/11/26)

Description

Furnish, install, and maintain Work Zone Performance pavement markings for traffic patterns in work zones during construction as specified in this special provision.

Materials

A) General

Use materials that comply with the manufacturer's recommendations, ensuring durability and minimum retroreflectivity as specified in this special provision for at least 12 months, unless noted otherwise.

Use the following approved materials for Work Zone Performance pavement markings:

(1) Polyurea
(2) Sprayed Thermoplastic
(3) Extruded Thermoplastic
(4) Epoxy
(5) Cold Applied Plastic (Type IV)
(6) Polymer (Single System) – Reapply Polymer (Single System) material every 90 days unless documentation from an independent Mobile Retroreflective Contractor confirming compliance with retroreflectivity requirements is submitted to the Engineer. All costs for retroreflectivity readings to avoid reapplication are the Contractor's responsibility.

Some Work Zone Performance pavement marking materials are not recommended on specific pavement surface types. The Design-Build team shall use Work Zone Performance pavement marking materials recommended by the manufacturer for use on the pavement type that the marking will be applied to.

B) Material Qualifications/Certifications

Use Work Zone Performance pavement marking materials, as listed above, which are on the NCDOT APL at the time of installation or otherwise approved by the Engineer.

All Work Zone Performance pavement markings shall incorporate a high performance glass bead, or equivalent, listed on the NCDOT APL.

Submit material certifications in accordance with Articles 106-3 and 1087-8 of the *Standard Specifications*.

Construction Methods

A) Surface Preparation

Before installation, sweep and prepare all pavement surfaces receiving Work Zone Performance pavement markings as recommended by the manufacturer.

B) Weather Limitations and Seasonal Limitations

Apply Work Zone Performance pavement markings following the weather limitations and seasonal limitations in accordance with Subarticle 1205-3(C) of the *Standard Specifications*.

In the event a traffic pattern shift must occur when the air and pavement temperatures are below the required minimums, or if a rain event occurs prior to or during a planned traffic shift, and upon approval by the Engineer, the Design-Build Team may install a minimum of one application of standard waterborne traffic paint to produce a four inch line at 15 mils (wet) thickness as a temporary pavement marking. Reflective media shall be applied to provide proper retroreflectivity in accordance with Article 1205-8 of the *Standard Specifications* until the Work Zone Performance pavement markings can be installed.

Apply Work Zone Performance pavement markings within 30 days of temporary pavement marking installation.

Interim pavement markings may be applied over the temporary pavement markings within 30 days of the initial installation. In such cases, apply Work Zone Performance pavement markings within 60 days of the initial temporary pavement marking installation.

Payment for temporary pavement markings installed due to weather or seasonal limitations will be made at the unit price for fourinch paint pavement marking lines. There will be no payment for interim pavement markings applied to extend the life of the temporary pavement markings.

C) Traffic Pattern Shifts for Design-Build Team Schedule/Coordination Convenience

The Design-Build Team may elect to shift traffic at any time with approval from the Engineer using a minimum of 1 application of standard waterborne traffic paint to produce a four inch line at 15 mils (wet) thickness as an interim pavement marking. Reflective media shall be applied to provide proper retroreflectivity in accordance with Article 1205-8 of the *Standard Specifications* until the Work Zone Performance pavement markings can be installed.

Apply Work Zone Performance pavement markings within 30 days of interim pavement marking installation.

Interim pavement markings may be reapplied within 30 days of the initial installation. In such cases, apply Work Zone Performance pavement markings within 60 days of the initial interim pavement marking installation.

There will be no payment for interim pavement markings installed for contractor schedule/coordination convenience.

D) Application Equipment

Use application equipment in accordance with Article 1205 of the *Standard Specifications.*

For applications exceeding 1,000 feet, use truck-mounted application equipment; hand-applied or non-truck-mounted methods are prohibited.

The Design-Build Team shall not use multiple passes to achieve required material thickness, unless specified otherwise by the manufacturer.

E) Material Application

The Work Zone Performance pavement marking material shall be applied at the minimum thickness recommended by the manufacturer or the following, whichever is greater:

Polyurea	30 mils (wet)
Epoxy	30 mils (wet)
Sprayed Thermoplastic	60 mils
Extruded Thermoplastic	90 mils
Polymer	30 mils (wet)
Cold Applied Plastic (IV)	Per the manufacturer’s recommendations

Unless otherwise directed by the Engineer, when Work Zone Performance pavement markings are applied to open graded friction course (OGFC) pavements, the Work Zone Performance pavement marking shall be extruded thermoplastic with a minimum thickness of 90 mils to achieve an above pavement thickness great enough to meet the retroreflectivity requirements below.

Work Zone Performance pavement markings are not required on milled surfaces or interim lifts of pavement when additional lifts are scheduled to be installed within the next 30 days or for traffic patterns that will change within 30 days. Under these circumstances, the Contractor shall install a minimum of one application of standard waterborne traffic paint to produce a four inch line at 15 mils (wet) thickness as a temporary pavement marking. Reflective media shall be applied to provide proper retroreflectivity in accordance with Article 1205-8 of the *Standard Specifications*.

Work Zone Performance pavement marking lines, symbols and characters shall be installed to conform to the sizes, shapes, and thicknesses shown in the transportation management plans.

No track dry times shall be 10 minutes or less. Traffic shall not be placed on any material until it is sufficiently dry/cured to eliminate wheel tracking.

F) Retroreflectivity Requirements

Ensure the selected Work Zone Performance pavement marking system maintains the minimum retroreflectivity levels outlined below for at least 12 months after installation.

Retroreflectivity Requirements for Work Zone Performance Pavement Markings			
Color	**Initial installation to 1 month after installation**	**Greater than 1 month to 6 months after installation**	**Greater than 6 months to 12 months after installation**
White	325 mcd/lux/m2	225 mcd/lux/m2	150 mcd/lux/m2
Yellow	220 mcd/lux/m2	120 mcd/lux/m2	100 mcd/lux/m2

G) Testing Procedures

All Work Zone Performance pavement marking installations may be scanned by the Department through an independent Mobile Retroreflective Contractor. The Work Zone Performance pavement markings may be scanned within 30 days of the last pavement marking installation to ensure the retroreflectivity requirements above in Section F are met. If the Work Zone Performance pavement marking material is not scanned within 30 days of the last pavement marking installation, the six month retroreflectivity requirements shall govern.

The Design-Build Team shall notify the Engineer a minimum of seven days prior to the installation of Work Zone Performance pavement markings for the Engineer to schedule testing.

If the markings appear to be non-performing, the Engineer may request additional retroreflectivity readings. Should the reading indicate noncompliance with Section F in this special provision, the Design-Build Team shall replace the Work Zone Performance pavement markings at no cost to the Department. Retroreflectivity is considered non-compliant when the average falls more than 15% below the requirements in the table. Pay deductions may be applied for deficiencies up to the 15% level.

H) Snowplow Damage

All Work Zone Performance pavement markings shall be durable enough to withstand a single snow event requiring snowplowing without showing excessive fatigue in either bonding or retroreflectivity.

The Design-Build Team shall replace the Work Zone Performance pavement markings if a single snowplow occurrence results in more than 25% of the pavement marking edgelines or skips being physically removed and/or the Work Zone Performance pavement markings do not meet the following minimum retroreflectivity values:

Retroreflective Requirements for Work Zone Performance Pavement Markings After a Single Snowplow Occurrence	
Color	**Minimum**
White	150 mcd/lux/m2
Yellow	100 mcd/lux/m2

Unless the traffic pattern is to be modified within 30 days, the Design-Build Team shall replace all non-compliant Work Zone Performance pavement markings within 30 days of determining they are non-compliant.

If the work zone experiences more than one snow event requiring snowplowing, the retroreflectivity values in the chart above will no longer apply. The Engineer will determine if the pavement markings are performing adequately or if replacement is necessary due to excessive damage caused solely by snowplow activities.

Replace deficient Work Zone Performance pavement markings; however, compensation will only be made if the deficiency is caused solely by snowplow damage due to multiple snowplow events. Unless the temporary traffic pattern will be modified within 30 days, the Design-Build Team shall replace all Work Zone Performance pavement markings damaged due to multiple snowplow events within 30 days.

Maintenance

Replace any Work Zone Performance pavement material that fails prematurely due to debonding or excessive wear, resulting in retroreflectivity levels below the required 12 month standard. Replacement costs for traffic control and Work Zone Performance pavement markings shall be the responsibility of the Design-Build Team, except when excessive damage is caused by snowplowing.

If Work Zone Performance pavement markings are required to remain in place beyond 12 months, they must be scanned at or near the 12-month mark by a Mobile Retroreflective Design-Build Team to verify compliance with minimum retroreflectivity levels. Markings that meet these levels may remain in place. Markings that fail to meet the required level must be replaced by the Design-Build Team within 30 days of the end of the 12-month duration, with replacement compensated at the unit price.

If replacement becomes necessary, the same notification procedure described above shall be followed to have the Work Zone Performance pavement markings scanned for the retroreflectivity compliance.

Reapplications are paid only when applied after 12 months from the initial installation, every 12 months thereafter, or when snowplow damage occurs as specified in Section H in this special provision. Reapplications of Polymer (Single System) materials required to meet the 90-day

replacement requirement will not be measured or paid. There will be no direct payment for interim paint pavement marking applications.

No direct payment will be made for: the work involved in applying the lines, including surface preparation, reapplication of molten pavement marking crossed by a vehicle, removal of all pavement marking materials spilled on the roadway surface, and repair of markings tracked by a vehicle.

Replacement of Work Zone Performance pavement markings that prematurely deteriorated, failed to adhere to the pavement, lacked reflectorization or were otherwise unsatisfactory during the life of the 12-month observation period as determined by the Engineer will be at no cost to the Department.

SOUND BARRIER WALL

(3-6-15) (Rev.1-16-24)

1.0 DESCRIPTION

This work consists of furnishing precast panels, structural steel, concrete columns, and all other materials; handling, transporting, fabricating, galvanizing, and storing materials; furnishing erection drawings, pile excavation, backfilling, erecting and installing the sound barrier wall members and all other materials as required by the plans developed by the Design-Build Team, the *Standard Specifications* and this Project Special Provision.

Unless otherwise approved by the Engineer, the Design-Build Team has a choice of ten or 15-foot pile spacing. Pile spacing greater than 15 feet will not be permitted. Provide consistent pile spacing the entire length of the wall. Use odd pile spacing, if necessary, only at the ends of the wall and at turning points, as approved by the Engineer.

A maximum one-foot drop or rise in top of wall elevation between wall sections will be permitted. Elevation changes greater than one foot, if necessary, will be allowed only at the end of the wall. Top of wall elevation changes that result in a jagged appearance shall not be allowed. Unless otherwise approved by NCDOT, the wall shall adhere to the Design Noise Report developed by the Design-Build Team.

(B) ALTERNATE PILE SPACING

As an alternate, the Design-Build Team may submit plans for pile spacing greater than ten feet and less than 15 feet for review and approval. A submittal reducing the post spacing shall include the material and design specifications. The submittal shall also include an elevation view depicting the revised post spacing and proposed top of wall elevations. The proposed top of wall elevations shall be equal to or greater than the dimensions shown in the Design Noise Report developed by the Design-Build Team. The excavated hole diameter, excavation depth and reinforcing steel shall be equal to the amount required for 15-foot pile spacing. A variance in the reinforcing steel will be allowed for the length of horizontal and number of vertical reinforcement bars in the precast panel for the alternate pile spacing.

Submit two sets of detailed plans for review. Include all details in the plans developed by the Design-Build Team, including the size and spacing of required reinforcement necessary to fabricate the precast panels. Have a North Carolina Registered Professional Engineer check, seal and date the aforementioned plans.

(C) **ALTERNATE WALL TYPE**

Walls that have been assigned "Approved" or "Approved for Provisional Use" status by the Product Evaluation Program will be considered for substitution to the detailed Standard Sound Barrier Wall only when approved by the Department, in writing. Alternate walls shall meet all design and construction requirements of this RFP. Alternate wall structural stability and connection details shall conform to the current edition of the AASHTO LRFD Bridge Design Specifications.

Prior to submittal of Working Drawings, as described herein, submit a copy of the signed NCDOT Product Status Notification Letter and two sets of preliminary plans for review and acceptance. Include material specifications for all components. Once preliminary plans are accepted, submit Working Drawings in accordance with all applicable portions of the requirements herein, including details necessary to fabricate and construct the proposed alternate.

Have a North Carolina Registered Professional Engineer check, seal and date the plans developed by the Design-Build Team and, when requested, calculations.

MATERIALS AND FABRICATION

Provide materials and fabricate members in accordance with the *Architectural Concrete Surface Treatment* Project Special Provision found elsewhere in this RFP, and the requirements of Division 10 of the *Standard Specifications*.

Provide precast panels that are nominally four inches ± ¼ inch thick with an ashlar stone, standard brick or exposed aggregate textured surface on both faces. All texture shall extend outward from the nominal panel thickness. Furnish three 24" x 24" samples for approval which establish the acceptable variations in color, texture and uniformity. After the color, texture and uniformity of the furnished samples are approved, produce a full-scale panel unit meeting design requirements. This mock-up and the furnished samples establish the standard quality for determining approval of the panels. When producing the final installed panels, use fine and coarse aggregate, retarder, and cement from the same source as those used in the approved sample panels.

CONSTRUCTION METHODS

Complete the final survey of existing ground profile after clearing the sound barrier wall area, but prior to submitting any Working Drawings. Submit the final groundline survey with the Working Drawings.

Excavate holes with the diameters shown on the plans developed by the Design-Build Team. Perform pile excavation to the depths shown on the aforementioned plans and install piles as

shown on the plans developed by the Design-Build Team with a tolerance of ½-inch per foot from vertical. Backfill excavations with concrete after placing piles.

1. Pile Excavation

   Use equipment of adequate capacity and capable of drilling through soil and non-soil including rock, boulders, debris, man-made objects and any other materials encountered. Blasting shall not be permitted to advance the excavation. Blasting for core removal shall only be permitted when approved by the Engineer. Dispose of drilling spoils in accordance with Section 802 of the *Standard Specifications* and as directed by the Engineer. Drilling spoils shall consist of all excavated material, including but not limited to water removed from the excavation either by pumping or drilling tools.

   If unstable, caving or sloughing soils are anticipated or encountered, stabilize excavations with either slurry or steel casing. When using slurry, submit slurry details including product information, manufacturer's recommendations for use, slurry equipment information and written approval from the slurry supplier that the mixing water is acceptable before beginning drilling. When using steel casing, use either the sectional type or one continuous corrugated or non-corrugated piece. Steel casings shall consist of clean watertight steel of ample strength to withstand handling and driving stresses and the pressures imposed by concrete, earth or backfill. Use steel casings with an outside diameter equal to the hole size and a minimum wall thickness of ¼-inch.

2. Concrete Placement

   Before placing concrete, center and support the pile in the excavation and check the water inflow rate in the excavation after any pumps have been removed. If the inflow rate is less than six inches per half hour, remove any water and free fall the concrete into the excavation. Ensure that concrete flows completely around the pile. If the water inflow rate is greater than six inches per half hour, propose a concrete placement procedure to the Engineer. The Engineer shall approve the concrete placement procedure before placing any concrete.

   Fill the excavation with Class A concrete in accordance with Section 1000 of the *Standard Specifications*, except as modified herein. Provide concrete with a slump of six to eight inches. Use an approved high-range water reducer to achieve this slump. Place concrete in a continuous manner and remove all casings.

WORKING DRAWINGS

In accordance with Article 1077-2 of the *Standard Specifications*, submit casting drawings for the precast face panels for approval prior to casting. Show the inserts, method of handling, and support details used for transportation on casting drawings. Submit metalwork fabrication drawings for approval prior to fabrication of steel wall components. Submit an erection plan and concrete face panel placing plan, including location of various heights of panels, for review and acceptance prior to fabrication of metalwork. Submit five sets of detail drawings for review and acceptance.

Along US 1 / US 64 the Design-Build Team shall match the material, surface treatment and color of the existing steel pile exposed aggregate noisewalls along US 1 / US 64.

ARCHITECTURAL CONCRETE SURFACE TREATMENT

(1-28-15) (Rev. 1-16-24)

1.0 GENERAL

The work covered by this Project Special Provision shall consist of constructing stained, simulated stone masonry and standard brick textured surfaces on both faces of pre-cast concrete panels used in sound barrier walls and exposed faces of retaining walls as indicated on the plans developed by the Design-Build Team and herein. The Design-Build Team shall furnish all materials, labor, equipment and incidentals necessary for the construction of architectural concrete surface treatment using simulated stone masonry form liners (molds) and a compatible concrete coloring system.

Along I-40 the Design-Build Team shall use the same source of form liner and have no color stains for all sound barrier wall panels and retaining walls. The architectural concrete surface treatment shall match the appearance (stone size, stone shape, stone texture, pattern and relief) of natural stone to resemble an ashlar stone pattern **on both sides** of pre-cast concrete panels used for sound barrier walls and exposed faces of retaining walls to match.

Along I-440 the Design-Build Team shall use the same source of form liner and color stains for all sound barrier wall panels and retaining walls. The architectural concrete surface treatment shall match the appearance (brick size, brick shape, brick texture, pattern and relief) to resemble a standard brick pattern with panel staining **on both sides** of pre-cast concrete panels used for sound barrier walls and exposed faces of retaining walls to match the Red Palette Color # 30166 found in the *Federal Standard 595B – Colors Used in Government Procurement*

All texture shall be in addition to the nominal thickness of the pre-cast sound barrier wall panel thickness and retaining wall face thickness, ± ¼ inch. Maximum relief of the textured surface shall be 1¼ inch or less. The top 1’-0” of the top panel within each sound barrier wall segment shall have a smooth, non-textured and non-stained finish to resemble faux coping. Concrete columns shall remain unstained in their natural concrete color. There shall be an appreciable contrast between the colors of the unstained concrete columns and the stained panels. For information purposes only, sources of form liners in the ashlar stone and standard brick pattern include, but are not limited to:

Scott System, Inc.
10777 E. 45th Avenue
Denver, Colorado 80239

Architectural Polymers, Inc.
1220 Little Gap Road
Palmerton, Pennsylvania 18071

Fitzgerald Form Liners
1500 East Chestnut Avenue
Santa Ana, California 92701

The Design-Build Team has the option of supplying an alternative pattern of simulated stone form liner, as long as the pattern selected is approved, in writing, as an equal or approved alternative by the Engineer.

2.0 SUBMITTALS

Shop Drawings - The Design-Build Team shall submit for review and acceptance, plan and elevation views and details showing overall simulated stone pattern, joint locations, form tie locations, and end, edge or other special conditions. The drawings shall include typical cross sections of applicable surfaces, joints, corners, stone relief, stone size, pitch / working line, mortar joint and bed depths. If necessary, the Design-Build Team shall revise the shop drawings until the proposed form liner patterns and arrangement have been accepted by the Engineer. Shop drawings shall be of sufficient scale to show the detail of all stone and joint patterns. The size of the sheets used for the shop drawings shall be 22" x 34".

The form liner shall be patterned such that long continuous horizontal or vertical lines do not occur on the finished exposed surface. The line pattern shall be random in nature and shall conceal construction joint lines. Special attention shall be given to details for wrapping form liners around corners.

Shop drawings shall be reviewed and accepted prior to fabrication of any form liners.

Sample Wall Panels - After shop drawings have been reviewed and accepted by the Engineer, the Design-Build Team shall construct three 24" x 24" transportable sample panel(s) at the project site. The materials used in construction of the sample panel(s) shall comply with Section 420 of the *Standard Specifications*. The sample panel(s) shall be constructed using form liners approved by the Engineer. Any sample panel that is not approved by the Engineer shall be removed from the project site and a new sample panel produced at no additional expense to the Department.

After the color, texture and uniformity of the furnished samples are approved by the Engineer, produce a full-scale unit meeting the design requirements. This mock-up and the furnished samples shall establish the standard quality for determining the panel approval.

Architectural surface treatments and patterns of the finished work shall achieve the same final effect as demonstrated on the approved sample panel(s). Upon approval by the Engineer, the sample panel(s) shall be used as the quality standard for the project. After

the approval of the completed structure, the Design-Build Team shall dispose of the sample panels, as directed by the Engineer.

3.0 MATERIAL REQUIREMENTS

Form Liner - The form liner shall be a high quality, reusable product manufactured of high strength urethane rubber or other approved material which attaches easily to the form work system and shall not compress more than ¼-inch when concrete is poured at a rate of ten vertical feet per hour. The form liners shall be removable without causing deterioration of the surface or underlying concrete.

Form Release Agent - Form release agent shall be a non-staining petroleum distillate free from water, asphaltic, and other insoluble residue, or an equivalent product. Form release agents shall be compatible with the color system applied and any special surface finish.

Form Ties - Form ties shall be set back a minimum of two inches from the finished concrete surface. The ties shall be designed so that all material in the device to a depth of at least two inches back of the concrete face (bottom of simulated mortar groove) can be disengaged and removed without spalling or damaging the concrete. The Design-Build Team shall submit the type of form ties to the Engineer for approval.

Concrete Color System / Stain - Special surface color system shall be performed using approved coloring systems / stains suitable for the purpose intended and applied in a manner consistent with the design intent of the project. The approved sample panel shall be the basis for determining the appropriate color / stain application.

Color stains shall be a special penetrating stain mix as provided by the manufacturer and shall be light to medium red to achieve a full, natural color in the finished surface. The stain shall create a surface finish that is breathable (allowing water vapor transmission), and that resists deterioration from water, acid, alkali, fungi, sunlight, and / or weathering. Stain mix shall meet the requirements for mildew resistance of Federal Test Method Standard 144, Method 6271, and requirements for weathering resistance of 1,000 hours accelerated exposure measures by Weatherometer, in accordance with ASTM G 26. Color samples shall be submitted for approval by the Engineer. Final coloring system and the Red Palette Color # 30166 shall be subject to approval by the Engineer.

Anti-Graffiti Coating - The Design-Build Team shall apply anti-graffiti coating that is compatible with the concrete color system / stain. After application, the anti-graffiti coating shall be dry to the touch within one hour and shall achieve a final cure within three hours. The color of the anti-graffiti shall be clear after full cure. The Design-Build Team shall provide one gallon of graffiti remover, thinners, dryers and all necessary components recommended by the manufacturer to the North Carolina Department of Transportation Materials and Tests Unit, Chemical Testing Engineer.

Quality Standards - Manufacturer of simulated stone masonry form liners and custom coloring system shall have at least five years' experience making stone masonry molds and

color stains to create formed concrete surfaces to match the natural stone shapes, surface textures and colors.

The Design-Build Team shall schedule a pre-installation conference with a manufacturer representative and the Engineer to assure understanding of simulated stone masonry form liner use, color application, requirements for construction of sample panel(s), and to coordinate the work. The Design-Build Team shall disclose their source of simulated stone masonry manufacturer and final coloration contractor at the Preconstruction Conference.

4.0 CONSTRUCTION

Form Liner Preparation - Prior to each concrete pour, the form liners shall be clean and free of build-up. Each liner shall be visually inspected for blemishes and tears. Repairs shall be made in accordance with the manufacturer's recommendations. Repairs shall be approved by the Engineer before being used. Form liner panels that do not perform as intended or are no longer repairable shall be replaced.

Form Liner Attachment - Form liners shall be securely attached to forms in accordance with the manufacturer's recommendations, with less than a ¼-inch seam. Blend form liner butt joints into the stone pattern and finish off the final concrete surface. Create no visible vertical or horizontal seams or conspicuous form liner butt joint marks. At locations where the form liners are joined, carefully blend to match the balance of the stone pattern. Form liners shall be installed to withstand anticipated concrete placement pressures without leakage and without causing physical or visual defects. Wall ties shall be coordinated with the form liner system. The Design-Build Team shall have a technical representative from the form liner manufacturer on site for technical supervision during the installation and removal of form liners. Unless allowed by the Engineer, installation and removal of form liners shall not be permitted if the aforementioned technical representative is not present.

Form Release Agent - Form release agent shall be applied in accordance with the manufacturer's recommendations. The material shall be compatible with the form liner material and the concrete coloring system and in accordance with this Project Special Provision. Form release agent shall be worked into all areas, especially pattern recesses.

Patching - Using patching materials and procedures in accordance with the manufacturer's recommendations, all form tie holes and other defects in finished uncolored surface shall be filled or repaired within 48 hours of form removal.

Surface Finish - All surfaces that are to receive coloring agent application shall be free of all laitance, dirt, dust, grease, efflorescence, paint or any other foreign material prior to the application of coloring agent. Cleaning of surfaces shall be accomplished by pressure washing with water set at 3000 psi to remove laitance. The fan nozzle shall be held perpendicular to the surface at a distance of one to two feet. Sandblasting shall not be permitted.

Final surface shall be free of blemishes, discolorations, surface voids, and other irregularities. All patterns shall be continuous without visual disruption.

Reinforced concrete shall be finished in accordance with the *Standard Specifications*, except that curing of concrete shall be done to accommodate the application of coloring and surface finish treatment.

Grout Pattern Joints - Grout pattern joints shall be constructed to simulate the appearance of mortared joints produced in laid up masonry work. Grout pattern joints shall be produced in accordance with the form liner / concrete color system manufacturer.

Color / Stain Application - Finished concrete and patches shall stand in place 30 days after form liners are removed prior to application of coloring / staining agent. Maintain the concrete temperature between 40° F and 85° F during color / stain application and for 48 hours after color / stain application. Consult the manufacturer's recommendations for preparation, application, curing and storage of coloring agents / stains. The Design-Build Team shall provide a Color Application Artist who is trained in the special techniques to achieve realistic surface appearances, if requested by the Engineer. Treated surfaces located adjacent to exposed soil or pavement shall be temporarily covered to prevent dirt or soil splatter from rain.

Anti-Graffiti Coating Application - The Design-build Team shall apply anti-graffiti coating after full cure of the color coating. The anti-graffiti coating shall be applied by brush, roller or airless spray when the ambient temperature is between 45° F and 90° F, and the surface temperature is between 50° F and 100° F. Ensure the surface is clean and dry before applying the anti-graffiti coating. The minimum dry film thickness of the anti-graffiti coating shall be 2.0 mils.

Following the completion of all work, repairs of any damage made by other construction operations shall be made to the form lined and colored surfaces, as directed by the Engineer.

Experience and Qualifications - The Design-Build Team shall have a minimum of three consecutive years' experience in architectural concrete surface treatment construction on similar types of projects. The Design-Build Team shall furnish to the Engineer five references who were responsible for supervision of similar projects and will testify to the successful completion of these projects. Include name, address, telephone number, and specific type of application.

PROPOSAL SCHEDULE

(8-14-22) (Revised 10-26-22) SP

The Technical Proposal submittal shall include a Proposal Schedule, in electronic and hard copy format, that depicts the proposed overall sequence of design and construction activities, and the times during which each major work task and deliverable required to complete the project will be accomplished. The Proposal Schedule shall be organized using a hierarchical Work Breakdown Structure (WBS) that shall be broken down by major project phases (e.g., project milestones,

project management, design, public involvement, permits, right of way acquisition, utility coordination / relocation, railroad coordination, construction, etc.). The Proposal Schedule shall depict the anticipated project Critical Path (based on the longest path); summary level reviews of submittals, etc. by the Department, FHWA, and other regulatory agencies; and high-level work by suppliers, subcontractors, and other involved parties, as applicable. The final completion date and, if proposed, the substantial completion date, shall be clearly indicated on the Proposal Schedule and **labeled "Final Completion Date" and "Substantial Completion Date"**.

Unless approved otherwise by the Department, the Design-Build Team shall prepare the Proposal Schedule using software compatible with the most recent version of Primavera scheduling software system. Other software capable of providing the required information will be considered, but must be reviewed and approved by the Department prior to the Technical Proposal submittal date, via a confidential question. The Design-Build Team shall include a hard copy of the Proposal Schedule in the Technical Proposal. At the same time and location as the Technical Proposal submittal, the Design-Build Team shall submit an electronic version of the Proposal Schedule in Primavera compatible scheduling software or other software approved by the Department, and the Proposal Schedule's source document in "XER" file format in a separate sealed package with the outer wrapping clearly marked "Proposal Schedule". Failure to submit the Proposal Schedule separately in the aforementioned electronic formats and in the Technical Proposal will result in the Technical Proposal being considered irregular by the Department and the Design-Build Proposal may be rejected.

DIAMOND GRINDING CONCRETE PAVEMENT

(4-15-08)(Rev. 7-15-25) SPI 7-9A

Description

Perform the work covered by this provision including but not limited to diamond grinding and regrinding concrete pavement to meet final surface acceptable smoothness requirements detailed in Article 710-7 of the *Standard Specifications*, selecting diamond tipped saw blades and configuration of cutting head; continual removal of residual slurry from pavement and disposal; furnishing all labor, materials, supplies, tools, equipment and incidentals as necessary. Perform this work on all new concrete pavement or as directed by the Engineer.

Prior to beginning any diamond grinding operations, schedule a pre-grind meeting with the Engineer. The Design-Build Team and grinding subcontractor shall attend the pre-grind meeting.

Equipment

Use equipment with diamond tipped saw blades gang mounted on a power driven self-propelled machine with a minimum wheel base length of 15 feet that is specifically designed to smooth and texture Portland Cement Concrete pavement. Utilize equipment that does not cause ravels; aggregate fracture; spalls or disturbance to the longitudinal or transverse joints; or damage and/or strain to the underlying surface of the pavement. Should any of the above problems occur immediately suspend operations.

Provide a minimum three feet wide grinding head with 50 to 60 evenly spaced grooves per foot. Prior to designing the grinding head, evaluate the aggregate hardness of the concrete pavement and select the appropriate diamond size, diamond concentration and bond hardness for the individual saw blades.

Provide vacuuming equipment to continuously remove slurry residue and excess water from the pavement as part of the grinding operation. Transport slurry material off-site and dispose of this material appropriately. Do not allow the slurry material to flow into a travel lane occupied by traffic or into any drainage facility.

Method of Construction

Grind the pavement surface to a uniform appearance with a high skid resistant longitudinal corduroy type texture. Provide grooves between 0.09 and 0.15 inches wide with the land area between the grooves between 0.06 and 0.13 inches wide. Ensure a ridge peak of approximately 0.0625 inches higher than the bottom of the grooves.

Begin and end diamond grinding at lines normal to the pavement centerline. Grind only in the longitudinal direction. All grooves and adjacent passes shall be parallel to each other with no variation. Completely lap adjacent passes with no unground surface remaining between passes and no overlap of more than 1 1/2 inches. Adjacent passes shall be within 1/8 inch of the same height as measured with a three-foot straightedge. Maintain positive cross-slope drainage for the duration of the grinding operation.

Grind all travel lanes to include auxiliary lanes, ramps and loops with not less than 98 percent of the specified surface being textured by grinding. Unless required otherwise by this RFP, grinding of the bridge decks and concrete shoulders will not be required. Remove a minimum 0.0625 inches at all locations except dips. Extra grinding to eliminate minor depressions is not required. It is anticipated that extra grinding will be required on the high side of existing faults in the pavement. There shall be no ridge between lanes. In a separate operation, transition the grinding of any remaining ridges greater than 1/8 inch in height on the outside edge next to the shoulder or at a tie to an existing facility to the satisfaction of the Engineer.

Final surface testing is required on this project in accordance with Article 710-7 of the *Standard Specifications.* All corrective actions must be approved by the Engineer.

Disposal of Residual Slurry

Diamond grinding slurry (DGS) disposal shall be in accordance with the latest Permit No. WQ0035749. Submit a slurry disposal plan to the Engineer detailing method of handling and disposing of slurry from the diamond grinding operation a minimum of 60 days prior to beginning the diamond grinding operation. Engineer shall review the slurry disposal plan. Plan must be accepted prior to beginning the diamond grinding operation. DGS shall be transported beyond the project limits to an approved permitted site. No additional payment will be made for transporting this slurry material for disposal.

Disposal options are:

(A) Concrete grinding residues (CGR) that are not liquid and otherwise not hazardous may be disposed of in a municipal solid waste landfill or utilized as an alternate daily cover (ADC). The sanitary landfill operator that requests the use of this material as ADC shall contact the N.C. Department of Environmental Quality (DEQ) inspector for approval. The definition of a solid, for solid waste disposal purposes, is a material that passes a Paint Filter test. CGR's may be eligible for disposal or use as ADC in an unlined sanitary landfill or a construction and demolition debris landfill. If CGR is disposed in an unlined-landfill, the Design-Build Team shall submit samples of the material to a certified laboratory to verify that the CGR does not exceed Resource Conservation and Recovery Act (RCRA) regulatory limits for the following metals: Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium and Silver.

(B) Upon the Engineer's approval, dewatered CGR's may be beneficially reused within the DOT project boundary or areas within the highway right of way at agronomic rates suitable for the establishment of vegetation. Dewatered CGR's that meet the solid waste definition for inert debris, North Carolina General Statute 130A-290(a)(14), may also be used within the roadbed at rates approved by the Engineer for soil modification purposes. If CGR is disposed as beneficial reuse within DOT project boundaries, the Design-Build Team shall submit samples of the material to a certified laboratory to verify that the CGR does not exceed RCRA regulatory limits for the following metals: Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium and Silver.

To prevent the migration of any direct discharge from the diamond grinding machine DGS from entering a drainage inlet or structure, the Design-Build Team shall install wattles and silt fence at the direction of the Engineer. Silt Fence shall be installed in accordance with Section 1605 of the *Standard Specifications*.

NONWOVEN GEOTEXTILE INTERLAYER

(1-16-24) DBI 10-07

Description

Furnish and install a nonwoven geotextile interlayer at locations shown in the plans prepared by the Design-Build Team.

General

The Design-Build Team shall schedule a Pre-Pave Meeting at least three weeks prior to paving to discuss installation and construction procedures for the nonwoven geotextile interlayer with representatives from the Design-Build Team including Paving Superintendent, Subcontractor, Geotextile Manufacturer, Engineer, Roadway Inspector, Area Roadway Construction Engineer, Division Construction Engineer, and the State Pavement Construction Engineer.

Materials

The geotextile interlayer shall be constructed of a non-woven needle-punched geotextile, with no thermal treatment (calendaring or IR). The material shall be resistant to chemicals, mildew, and rot and shall not have any tears or holes that will adversely affect the in-situ performance and physical properties of the installed material.

Furnish with each shipment a Type 3 Certification in accordance with Article 106-3 of the NCDOT *Standard Specifications* certifying that the paving mat is a non-woven needle-punched geotextile with no thermal treatment (calendaring or IR) meeting the requirements shown:

Physical Properties of Non-Woven Geotextile Interlayer			
Property	**Test Method**	**Units**	**Value**
Minimum Mass per unit area	ASTM D 5261	oz/yd^2	15.0
Minimum thickness under load (a) at 2 kPa (0.29 psi) (b) at 20 kPa (2.9 psi) (c) at 200 kPa (29 psi)	ASTM D 5199	in	(a) 0.12 (b) 0.10 (c) 0.04
Minimum wide-width tensile strength	ASTM D 4595	lb/ft	685
Maximum wide-width elongation	ASTM D 4595	%	130
Minimum water permeability in normal direction under load (pressure) at 20 kPa (2.9 psi)	Mod. ASTM D 5493 or ASTM D 4491	ft/s	$3.3x10^{-4}$
Minimum in-plane water permeability (transmissivity) under load (pressure) (a) at 20kPa (2.9 psi) (b) at 200kPa (29 psi)	Mod. ASTM D 6574 or ASTM D 4716	ft/s	(a) $1.6x10^{-3}$ (b) $6.6x10^{-4}$
Minimum weather resistance retained strength	ASTM D 4355 at 500 hrs. exposure	%	60
Alkali resistance, minimum polypropylene / polyethylene	Manufacturer certification of polymer	%	96

Note: Requirements must be met for 95 percent of samples.

General Requirements

A trained and experienced installer, certified by the Geotextile Manufacturer, shall be present on-site during the installation of the geotextile and until the crew has a comfort level working with this material.

Ensure that any potential for keying of the two cementitious layers is minimized through proper repair techniques. Clean the underlying surface to remove loose debris before applying the interlayer. Roll the geotextile out on the underlying layer. The geotextile shall be tight and without excess wrinkles and folds. No more than 650 feet of geotextile shall be installed in advance of the

paving operation at a given time. The interlayer shall be placed no more than three days before concrete placement.

Keep driving on the interlayer to a minimum. Tight radius turns and excessive acceleration and braking shall be avoided.

The geotextile shall be secured to the underlying layer with pins or nails punched through two-inch to 2.75-inch galvanized washers or disks every six feet or less. Additional fasteners shall be used as needed to ensure that the geotextile does not shift or fold before or during concrete placement. Edges of the geotextile shall overlap by eight inches +/- two inches. No more than three layers of geotextile shall overlap at any location. Transverse seams of adjacent rolls shall be staggered to prevent four layers from coinciding at any location. The free edge of the geotextile shall extend beyond the edge of the new concrete into a location that facilitates drainage.

APPLICATION OF BASE AND ANTI-GRAFFITI COATING

(1-16-24) SP

GENERAL

This work consists of preparing and cleaning concrete and galvanized surfaces as well as furnishing and applying a colored base coating with a compatible anti-graffiti finish coating to the surfaces described herein. The base coating and anti-graffiti coating shall be applied to all surfaces indicated on the plans developed by the Design-Build Team and / or as directed by the Engineer and shall be applied only after the surface preparation specified herein has been completed, inspected and approved by the Engineer.

Alternate coating methods may be submitted for review and approval.

MATERIALS

The base coating shall be compatible with the anti-graffiti finish coating and must be designed specifically for coating galvanized surfaces or damp, uncured concrete. The coating material shall be delivered to the job site in sealed containers bearing the manufacturer's original labels. The brand, color, and type shall be clearly marked on each container. A copy of the manufacturer's Materials Safety Data Sheet and a copy of the manufacturer’s printed instructions shall be presented to the Engineer at the time of delivery.

The coating material shall be stored in airtight, upright containers. The containers shall be stored in a dry location where the temperature remains above 40° F and below 100° F.

The coating material shall have a shelf life of not less than 12 months. After application, the base coating shall be dry to the touch within 48 hours and shall achieve a final cure within two to three weeks. After application, the anti-graffiti coating shall be dry to the touch within one hour and shall achieve a final cure within three hours.

The color of the base coating and area of application shall be in accordance with the Federal Standard 595.

The color of the anti-graffiti coating shall be clear after full cure.

Prior to application, provide one gallon of graffiti remover, thinners, dryers and all necessary components recommended by the manufacturer to the NCDOT Materials and Tests Unit, Chemical Testing Engineer for review and acceptance.

MATERIAL TESTING AND CERTIFICATION

Prior to applying coating material, a Type 2 certification shall be provided to the Engineer attesting that the product furnished is in accordance with the same formula as that previously subjected to the tests specified below and approved. Copies of the current tests reports shall be attached to the certification. Reports for tests made more than four years prior to shipment to the project site will not be accepted.

All testing shall be performed by a qualified commercial testing laboratory that has been approved by the NCDOT Materials and Tests Unit.

Prior to application, the coating shall be subjected to, and shall satisfy, the requirements of the tests listed below:

Freeze-Thaw

1. Three concrete specimens, not less than four inches by six inches by six inches, of the mix design for the structure shall be cast and cured. Fourteen days moist curing with a drying period at room temperature, 60° F to 80° F, for 24 hours shall be required before applying the coating material to the specimens. Caution shall be taken that there be no excessive oil on specimen forms. The coating shall be applied to the sides of specimens at a spreading rate of 50 ± 10 square feet per gallon. Brush application will be permitted. Cementitious coatings shall be cured at room temperature and 30 percent relative humidity for 24 hours; at room temperature and 90 percent relative humidity for 48 hours; and at room temperature and 50 percent relative humidity for four days; for a total curing time of seven days.

2. The specimens shall be immersed in water at room temperature for three hours, then removed.

3. The specimens shall be placed in cold storage at -15° F for one hour and then removed.

4. The specimens shall be thawed at room temperature for one hour.

5. Steps 3 and 4 shall be repeated for a total of 250 cycles. At the end of 250 cycles, the specimens shall show no visible defects.

Accelerated Weathering

Coating shall be subjected to a 7,500-hour exposure test in a Twin-Carbon-Arc-Weatherometer, ASTM G 23, Type D, at an opening temperature of 145° F. The test shall be made at 20-minute cycles consisting of 17 minutes of light; and three minutes of water

spray plus light. At the end of the exposure test, the exposed samples shall show no chipping, flaking, or peeling. The panels for this test shall be prepared by applying the coating at a spreading rate of 50 ± 10 square feet per gallon to both sides and edges of panels cut from asbestos cement shingles in accordance with Federal Specification S-S-346, Type I. Curing time shall be in accordance with Freeze-Thaw Test curing time.

Fungus Growth Resistance

In accordance with Federal Specification TT-P-29g, coating shall pass a fungus resistance test. Fungus growth shall not be indicated after a minimum incubation period of 21 days.

Abrasion Resistance

In accordance with Method 6191 Abrasion Resistance-Falling Sand, Federal Test Method Standard 141a, ASTM D968-81, coating shall pass the 2,000 litre sand abrasion test. The specimens for this test shall be prepared by applying the coating to a cleaned steel panel at a spreading rate of 50 ± 10 square feet per gallon. The specimens shall be cured at room temperature for 21 days.

Impact Resistance

Coating shall be applied to a concrete panel prepared in accordance with the Federal Test Method Standard 141a, Method 2051, at a spreading rate of 50 ± 10 square feet per gallon, and allowed to cure for 21 days at room temperature. The test shall then be run using the Gardner Mandrel Impact Tester in accordance with ASTM D 2794, using a one-half inch indenter with an impact load of six inch-pounds. The coating shall show no chipping under this impact load.

Salt-Spray Resistance

A concrete specimen shall be coated at the rate of 50 ± 10 square feet per gallon and cured for 21 days at room temperature. In accordance with ASTM B 117, the coated specimen shall be exposed to a five percent salt solution for 2,500 hours where the atmospheric temperature is maintained at 90° ± 2 °F. At the end of the 2,500 hours of exposure, the coating shall show no ill effects, loss of adhesion, or deterioration.

Flexibility

A sheet metal specimen shall be coated at a rate of 50 ± 10 square feet per gallon and allowed to cure for 48 hours at room temperature. The coated specimen shall be bent at 180 degrees over a one-inch round mandrel. After bending, the coating shall show no breaking.

In addition to the certification and test reports required above, a service record shall be supplied showing that the coating material has a satisfactory service record on concrete and, when applicable, galvanized surfaces for a period of not less than five years prior to the date of submission of the service record. The coating shall also have shown satisfactory service

characteristics without peeling, chipping, flaking, and non-uniform change in texture or color. The structure for the specific product shall be named in the service record.

In addition to the above requirements, each batch delivered to the project shall be sampled and tested for color and the following product analysis data submitted:

(a) Weight per gallon
(b) Viscosity in Kreb units
(c) Weight percent pigment
(d) Weight percent vehicle solids
(e) Infrared spectra of vehicle solution
(f) Drying time

SURFACE PREPARATION

Prepare concrete surfaces and galvanized surfaces in accordance with Section 420-17(B) and Section 442-13 of the *Standard Specifications*, respectively, or the manufacturer's recommendations, whichever is more restrictive. All surfaces to be coated shall be free of efflorescence, flaking coatings, dirt, oil, curing compounds, release agents and other deleterious substances prior to the application of the coating.

Concrete curing compounds and release agents shall be removed. Water blasting will be allowed; however, the blasting operation shall not remove or damage the concrete.

Prior to application of the coating, all concrete surfaces to be coated shall be sprayed with water. If the water soaks into the concrete surfaces, the coating may be applied once all surfaces dry. If the water beads up and is repelled, the surfaces require further cleaning before application of the coating.

APPLICATION

The coating application, including equipment used, shall be in accordance with the manufacturer's recommendations. The coating shall be applied by qualified personnel with previous experience similar to the work outlined in the plans developed by the Design-Build Team.

The material shall be thoroughly mixed in its original container and shall not be thinned. Containers with coatings that have formed skins shall not be permitted for use.

The base coating may be applied over damp, but not wet concrete surfaces and shall be applied at a rate of 50 ± 10 square feet per gallon. The application rate shall produce a uniform color texture. The base coating shall be applied only when the ambient temperature is between 40° F and rising, and 100° F. It shall not be applied over frozen surfaces or if rain is imminent. If a freshly applied surface is damaged by rain, re-coating may be necessary based solely on the Engineer's assessment of the damage.

Schedule the application of the base coating as one of the final finishing operations or when construction-generated dust will be minimal. To prevent lap marks, a wet edge shall be maintained at all times. Stopping and starting in mid-sections will not be allowed. Start or end at natural breaks

in the surface (e.g. at panel edges, corners or joints). When applying the base coating with a roller, the material shall be applied in vertical strokes initially, cross rolled for even film and appearance, and then finished with vertical strikes.

Apply the anti-graffiti coating by brush, roller or airless spray when the ambient temperature is between 45° F and 90° F, and the surface temperature is between 50° F and 100° F. Ensure the surface is clean and dry before applying the anti-graffiti coating.

FINISHED PRODUCT

All coating material in the finished state shall be capable of accommodating the thermal and elastic expansion ranges of the concrete or, when applicable, galvanized surfaces without cracking.

The texture of the completed finish coat shall be similar to that of rubbed concrete. The completed finished coating shall be tightly bonded to the structure and present a uniform appearance and texture. Additional coats may be required by the Engineer in order to produce the desired surface texture and uniformity.

Coatings shall be entirely removed from the structure and reapplied if there is failure to positively adhere as evident by chipping, flaking, peeling, or the desired surface appearance is not achieved.

The average thickness of the completed finish coating shall not exceed 1/8 of an inch. The minimum dry film thickness of the anti-graffiti coating shall be 2.0 mils.

AIR TERMINAL & LIGHTNING PROTECTION SYSTEM

Description

Furnish an air terminal and lightning protection system that is comprised of items meeting UL 96 and UL 467 product standards for lightning protection and installed to be compliant with the National Fire Protection Association 780 Standards for Lightning Protection Systems. The lightning protection system shall consist of, as a minimum, an Air Terminal, vertical Air Terminal Base (wood pole) or Air Terminal Rod Clamps (metal pole), 28-Strand bare-copper lightning conductor, 4-point grounding systems (grounding electrodes), #4 AWG copper bonding conductors, marker tape and other miscellaneous hardware.

Materials

A. General

Reference the following Typical Details where applicable:

- CCTV Camera Installation for Metal Pole with Aerial Electrical Service
- CCTV Camera Installation for Metal Pole with Underground Electrical Service
- CCTV Camera Installation for Wood Pole with Aerial Electrical Service
- CCTV Camera Installation for Wood Pole with Underground Electrical Service

B. Wood Pole

Furnish a UL Listed Class II, copper clad minimum 48" long by ½" diameter air terminal. Ensure the air terminal has a tapered tip with a rounded point on one end and is threaded on the connection end with standard Unified Coarse (UNC) 13 threads per inch.

Furnish a copper vertical air terminal base that has internal threading to accept a ½" diameter air terminal with UNC 13 threads per inch. Provide a base that allows for a minimum ¼" mounting hole to secure the base to the vertical side of a wood pole. Ensure the air terminal base includes (2) 5/16" cap screws to secure the bare copper lightning conductor. Additionally, provide (2) ½" copper tube straps (conduit clamps) to secure the air terminal and bare copper lightning conductor to the pole.

C. Metal Pole

Furnish a UL Listed Class II, stainless steel minimum 48" long by ½" diameter air terminal with a tapered tip with a rounded point on one end. No threading is required on the opposing end.

Furnish an air terminal rod clamp manufactured out of 304 stainless steel. Ensure the air terminal rod clamp has two horizontal support arms that are two-inch wide by 3/16" thick and design to offset the air terminal approximately eight inches away from the metal pole. Ensure the support arms at the point where the air terminal is to be installed has an internal crease to secure the air terminal along with four (4) bolts to provide the clamping action between the two support arms. Provide two (2) stainless steel banding clamps to secure the air terminal rod clamp's base plate to the metal pole.

D. Copper Lightning Conductor and Ground Rods

Furnish a Class II rated copper lightning conductor which consists of 28 strands (minimum) of 15 AWG copper wires to form a rope-lay bare copper lightning conductor. Furnish 5/8" diameter, 10-foot-long copper-clad steel ground rods with a 10-mil thick copper cladding to serve as an integral part of the four-point grounding system. Furnish irreversible mechanical clamps to secure the 28-strand lightning conductor, #4 AWG bare copper ground wires and grounding electrodes together to complete the grounding system.

Construction Methods

A. Wood Pole

Install the vertical air terminal base approximately 12" below the top of the wood pole and install the air terminal to the threaded connection on the base. Install a ½" copper tube strap (conduit clamp) over the air terminal, six-inches from the top of the pole. Additionally, secure the copper lightning conductor under both 5/16" diameter cap screws located on the base. Install an additional ½" copper tube strap (conduit clamp) over the bare copper lightning conductor, six inches below the air terminal base. Locate the ¼" mounting hole on the vertical air terminal base and install a

¼" by three-inch (minimum) long lag bolt through the base and into the wood pole to support the air terminal assembly.

Route the bare copper lightning conductor to maintain maximum horizontal separation from any risers that traverse up the pole. Secure the bare copper lightning conductor to the pole on 24" centers using copper cable clips. From the bottom of the pole (ground level) install a two-inch by 10' long PVC U-Guard over the bare copper lightning conductor to protect the cable from vandalism.

B. Metal Pole

Install two (2) stainless steel air terminal rod clamps to the side of the metal pole structure starting at six inches below the top of the pole with the second air terminal clamp 12" from the top of the pole (approximately six inches of separation between the two clamps). Secure each air terminal rod clamp to the pole structure with two (2) stainless steel banding clamps. Install the air terminal between the horizontal support arms on each air terminal rod clamp and tighten the bolts to provide a secure connection.

C. Copper Lightning Conductor and Ground Rods

Install the four-point grounding system by installing a central grounding electrode that is surrounded by a minimum of three (3) additional grounding electrodes spaced approximately 20 feet away from the central grounding electrode and approximately 120 degrees apart. Interconnect each grounding electrode using a #4 AWG bare copper conductor back to the central grounding electrode using irreversible mechanical crimps. Additionally, using an irreversible mechanical crimp, connect the bare copper lightning conductor to the central grounding electrode. Install each grounding electrode and its corresponding #4 AWG bare copper grounding wire and 28 strand copper lightning conductor such that the wires are 24" below grade. Install marker tape 12" below grade and above all grounding conductors.

In instances where right-of-way does not allow for ground rod spacing as required above, reference the 2024 Roadway Standard Drawings - Section 1700.02 "Electrical Service Grounding" for "Limited Shoulder" or "Restricted Space" installation alternatives.

Prior to connecting the lightning protection system to an electrical service, perform a grounding electrode test on the lightning protection system to obtain a maximum of 20 ohms or less. Install additional grounding electrodes as need to obtain the 20 ohms or less requirement. The grounding electrode resistance test shall be verified or witnessed by the Engineer or the Engineer's designated representative.

Follow test equipment's procedures for measuring grounding electrode resistance. When using clamp-type ground resistance meters, readings of less than one ohm typically indicate a ground loop. Rework bonding and grounding circuits as necessary to remove ground loop circuits and retest. If a ground loop cannot be identified and removed to allow the proper use of a clamp-type ground resistance meter, use the three-point test method. Submit a completed inductive Loop & Grounding Test Form available on the Department's website.

DIGITAL DELIVERY PILOT
(07-20-26) DB1 G[___]

I. GENERAL

The I-5701 / I-5703 Design-Build Project has been identified by the Department as a Digital Delivery Pilot project. This pilot will be used to evaluate how digital design information developed by the Design-Build Team can be packaged, delivered, reviewed, and used during design, construction, inspection, and future asset management workflows.

This Digital Delivery Pilot is intended to be a limited, low-risk effort. It does not change the Design-Build Team's standard design or construction responsibilities, alter the governing contract documents, or require the Design-Build Team to adopt any specific construction means, methods, construction software platform, field technology, automated machine guidance workflow, asset management platform, or construction modeling workflow not otherwise required by this RFP.

The Department's objective is to work with the Design-Build Team to evaluate the following pilot items:

(A) Construction-Ready Electronic Files (CREF) Deliverables;
(B) Stormwater (Drainage Network) Model and Data; and
(C) Design Model Review Integration.

The Design-Build Team shall provide the digital deliverables described in this Project Special Provision. Unless expressly stated otherwise in this Project Special Provision or incorporated by written contract modification, the effort required to prepare, coordinate, submit, update, resubmit, and discuss these deliverables shall be included in the lump sum price bid for the project. No separate pay item will be established for the Digital Delivery Pilot. Submit updated digital deliverables only when required by Sections VI(B) or VII(B), and limit updates to the affected files and affected limits of work.

Deliverables, meetings, and feedback required under this Project Special Provision are limited to those expressly identified herein. Additional digital deliverables, additional meetings, or expanded pilot evaluations beyond those described in this Project Special Provision shall not be required unless agreed to by the Design-Build Team or incorporated by written contract modification.

II. PURPOSE AND INTENT

The Department is advancing Digital Delivery practices to improve continuity between project design, construction, inspection, and long-term asset management. The Department is using this pilot to better understand how digital design information can be delivered in a more useful and consistent manner while maintaining current Design-Build contract requirements and risk allocation.

For this project, the Design-Build Team shall develop the project design and shall be responsible for producing the digital pilot deliverables from its own design model. This differs from standard Design-Bid-Build pilot projects where the Department may provide electronic files to prospective bidders at advertisement. On this Design-Build project, the Digital Delivery Pilot is focused on the

Design-Build Team's development, packaging, and delivery of digital information as the design reaches Released for Construction (RFC) status and as construction workflows begin to use that information.

The pilot is intended to support the following purposes:

(A) Evaluate whether CREF deliverables can reduce duplicated model-building or reverse-engineering effort in construction-related workflows;
(B) Evaluate whether digital files can better support construction layout, survey, staking, automated machine guidance, inspection, and construction documentation;
(C) Evaluate how drainage model attributes can be carried forward for digital as-built and asset management uses;
(D) Identify where current digital design data is useful, partially useful, or not useful for construction workflows; and
(E) Inform future Department guidance, standards, and contract requirements for Digital Delivery on Design-Build and Design-Bid-Build projects.

III. CONTRACTUAL STATUS AND LIMITATIONS

The digital deliverables required by this Project Special Provision are intended to support pilot evaluation, Department review, construction coordination, Design-Build Team feedback, and Digital Delivery program development.

Unless expressly incorporated into signed and sealed plans or other governing contract documents, the digital deliverables required by this Project Special Provision:

(A) Are not signed or sealed contract documents;
(B) Do not replace the signed and sealed plans developed by the Design-Build Team, specifications, special provisions, or other governing contract documents;
(C) Do not alter the Design-Build Team's responsibility for the signed and sealed design documents;
(D) Do not alter the Design-Build Team's responsibility for construction means, methods, layout, safety, quality, or accuracy;
(E) Do not establish design criteria, construction tolerances, survey control requirements, or acceptance requirements beyond those required elsewhere in the Contract;
(F) Do not establish a separate basis for additional compensation, contract time, or claims;
(G) Do not constitute Department approval of a construction model, automated machine guidance model, survey model, or other contractor-developed model; and
(H) Do not require the Design-Build Team to guarantee compatibility with every construction software platform, field equipment platform, inspection workflow, or downstream asset management system.

In the event of a conflict between the digital deliverables and the signed and sealed plans or other governing contract documents, the signed and sealed plans and other governing contract documents shall control.

For purposes of this Project Special Provision, digital deliverables are in general consistency with the corresponding accepted design submittal or RFC Plans when the deliverables represent the same design intent, project limits, coordinate system, datum, units, and applicable modeled geometry or drainage attribute data for the corresponding limits of work. General consistency does not require the digital deliverables to duplicate plan annotations, notes, details, sheet references, or other non-modeled plan information unless that information is required by this Project Special Provision.

Initial CREF and drainage model deliverables shall be submitted as described in Sections VI(B) and VII(B). After the initial submittal of a digital deliverable for a work package, phase, area, discipline or limits of work, an updated digital deliverable is required only when an accepted design revision or construction revision materially changes the previously submitted digital deliverable. A revision materially changes a previously submitted digital deliverable when it changes modeled information or required attribute data so that the previously submitted digital deliverable no longer represents the corresponding RFC Plans or accepted construction revision for the affected limits of work. Material changes include changes to applicable alignment, profile, surface, breakline, planimetric feature location, drainage feature location, drainage configuration, size, material, invert elevation, rim elevation, connectivity, or other required modeled feature or attribute. Sheet numbering changes, drafting edits, annotation changes, note changes, or other changes that do not affect required modeled information or required attribute data do not require an updated digital deliverable. Minor field adjustments, field modifications, or construction revisions that do not affect required modeled information or required attribute data do not require an updated digital deliverable.

The Design-Build Team shall ensure that digital deliverables submitted under this Project Special Provision are in general consistency with the corresponding accepted design submittal or RFC Plans for the same limits of work. The Department's review or use of the digital deliverables does not relieve the Design-Build Team of responsibility for the design or construction requirements of the Contract.

Failure of a digital deliverable to support a particular construction software platform, automated machine guidance platform, inspection workflow, or asset management use shall not be considered a contract deficiency provided the Design-Build Team has submitted the required file types, required transmittal information, and required drainage model data in conformance with this Project Special Provision and in general consistency with the corresponding accepted design submittal or RFC Plans.

IV. DIGITAL DELIVERY COORDINATION

Within 60 calendar days after contract execution, or as otherwise directed by the Engineer, the Design-Build Team shall participate in a Digital Delivery kickoff meeting with the Department. This meeting is the Digital Delivery kickoff meeting identified in Section VIII(D)(1) and counts toward the meetings described in Section VIII(D)of this Project Special Provision. The purpose of the kickoff meeting is to confirm administrative details for the pilot, including:

(A) Department and Design-Build Team points of contact;
(B) File exchange location;
(C) File naming expectations;
(D) Submittal packaging expectations;
(E) Anticipated design submittal and RFC package schedule;
(F) Anticipated CREF package schedule;
(G) Model review coordination process;
(H) Drainage model and attribute coordination process; and
(I) Feedback and lessons-learned process.

The kickoff meeting is intended to coordinate the process for implementing the requirements of this Project Special Provision. The kickoff meeting will not add new deliverables, change the basis of payment, or modify the Contract unless the Contract is modified in writing in accordance with the applicable provisions of the RFP and Standard Specifications.

The Department will identify a Digital Delivery point of contact for coordination during the pilot. The Design-Build Team shall identify a Digital Delivery point of contact for the Design-Build Team. The Design-Build Team's point of contact may be a member of the design firm, contractor, or other member of the Design-Build Team with appropriate knowledge of the project model and digital deliverables.

V. APPLICABLE DIGITAL DELIVERY WORKFLOW GUIDANCE

Prepare the CREF deliverables required by this Project Special Provision in accordance with the Department's *Construction Ready Electronic Files Deliverables Workflows* version made available by the Department for this project before the Price Proposal submittal deadline. The workflow document is available from the Department's Digital Delivery website at:

https://connect.ncdot.gov/projects/DigitalDelivery/Pages/

The workflow document provides guidance for CREF export, packaging, naming, and review coordination. Use the workflow document to prepare consistent digital exports from the project design model. The workflow document does not add required deliverables beyond those expressly required by this Project Special Provision, change the basis of payment, alter risk allocation, or modify the Contract. In the event of a conflict between this Project Special Provision and the workflow document, this Project Special Provision governs. If the Department updates the workflow document during the project, the updated workflow document may be used for advisory guidance and pilot coordination, but it does not change the deliverables, basis of payment, risk allocation or other requirements of this Project Special Provision unless incorporated by written contract modification.

At the Digital Delivery kickoff meeting, the Department will identify the workflow document made available for this project and will confirm the file exchange, file naming, and submittal packaging expectations for the pilot. The Department may provide advisory support, coordination, or coaching regarding the workflow document during the pilot. The Department support does not

relieve the Design-Build Team of responsibility for preparing the deliverables required by this Project Special Provision.

VI. PILOT ITEM 1 — CONSTRUCTION-READY ELECTRONIC FILES (CREF) DELIVERABLES

(A) General

The Design-Build Team shall prepare and submit Construction-Ready Electronic Files derived from the Design-Build Team's project design model. For purposes of this Project Special Provision, CREF deliverables are exported digital design files intended to communicate design intent and support construction-related digital workflows. CREF deliverables are not required to be the Design-Build Team's construction model, and the pilot process does not require submission of a contractor-ready construction model, automated machine guidance model, survey model, equipment-specific model, or complete native working design environment unless expressly required elsewhere in this Project Special Provision or elsewhere in this RFP. Nothing in this Project Special Provision modifies requirements elsewhere in this RFP for automated machine guidance files, construction models, survey files, or other construction-related digital files.

Pilot Item 1 is focused on roadway finished-grade / top-surface CREF exports and the related roadway files needed to interpret those exports. The required CREF file types are limited to the files identified in Section VI(C). This pilot item does not require CREF deliverables for structures, ITS, signals, lighting, signing, pavement markings, transportation management, utilities, or other discipline-specific elements unless required elsewhere in this RFP or incorporated by written contract modification.

(B) Timing of CREF Deliverables

Submit CREF deliverables with, or no later than 30 calendar days after, the corresponding RFC Plans are accepted for construction for the same limits of work. When the Design-Build Team submits RFC Plans by work package, phase, area, or discipline, submit the corresponding CREF deliverables for the same work package, phase, area, or discipline.

CREF deliverables are not required before the design information has reached the corresponding RFC stage. CREF deliverables are not a condition of submitting RFC Plans, accepting RFC Plans for construction, submitting permit information, beginning right-of-way acquisition, or beginning construction unless required elsewhere in this RFP. Before RFC, the Design-Build Team shall provide model access, model views, reference files, or native design model files only as required by Section VIII of this Project Special Provision.

When an accepted design revision or construction revision materially changes information previously submitted as part of a CREF package, submit an updated CREF package or revised affected file with, or no later than 30 calendar days after, the corresponding revised RFC Plans or accepted construction revision.

(C) Required CREF File Types

Each applicable CREF package shall include the following file types for the corresponding RFC limits:

(1) Controlling horizontal alignment and vertical profile files in LandXML format;
(2) Proposed finished grade / top surface files in LandXML format;
Note Deleted proposed subgrade surface files
(3) Proposed three-dimensional breaklines in DXF or DWG format; and
(4) Proposed two-dimensional planimetric files in DXF or DWG format.

Native DGN/CADD reference files used to prepare the CREF exports are not part of the required CREF file types listed above. When the Department determines that native DGN/CADD reference files are necessary to open, review or verify the exported alignments, profiles, surfaces, breaklines or planimetric information for the corresponding RFC limits, submit the applicable native DGN/CADD reference files used to prepare those CREF exports. This requirement is limited to the files necessary for review of the CREF exports and does not require submission of the Design-Build Team's complete native working design environment.

Existing ground / existing top surface files are not required as part of the required CREF deliverable unless required elsewhere in this RFP or included in the Design-Build Team's corresponding design submittal. Additional existing ground / existing top surface files may be provided for pilot evaluation if mutually agreed by the Department and Design-Build Team.

(D) CREF Content Expectations

Export CREF deliverables from the Design-Build Team's current design model for the corresponding RFC package. The deliverables shall be in general consistency with the design intent shown in the corresponding RFC Plans.

CREF deliverables shall include model information necessary to support interpretation of the corresponding RFC roadway geometry, including applicable controlling alignments, active profiles, proposed surfaces, breaklines, and planimetric information developed for the corresponding work package. The CREF deliverables are intended to be derived from the model used to develop the RFC plans and not an extensive effort for a fully accurate construction model. It is within expectation that gaps may exist within the surface and breakline deliverables for this pilot.

CREF deliverables are intended to support construction-related digital workflows, but the Design-Build Team is not required under this pilot item to prepare a contractor-ready construction model, automated machine guidance model, survey model, or equipment-specific model.
No Level of Development (LOD) requirement applies to the CREF deliverables. The CREF deliverables are defined by the file types, timing, and workflow expectations described in this Project Special Provision.

Use template drop interval spacing no greater than the following maximum values when preparing applicable modeled corridor surfaces and related CREF exports, unless otherwise approved by the

Department. Where more than one category applies, use the smaller spacing. Identify the template drop interval spacing or export interval settings used for each applicable surface or related CREF export in the CREF package transmittal. The Department will request feedback on these values as part of the pilot process. These spacing values are requirements for preparing CREF exports under this pilot and are not acceptance criteria, construction tolerances, or design criteria. A deviation from these values that is identified in the CREF package transmittal will be evaluated for pilot usability and will not by itself be considered a contract deficiency unless the deviation prevents use of the CREF deliverable for the pilot or creates a material inconsistency with the corresponding RFC Plans.

Facility or Work Area	Maximum Template Drop Interval Spacing
Freeways	20 ft
Arterials and ramps	10 ft
Urban sections, intersections, and driveways	5 ft

(E) CREF Package Transmittal

Submit each CREF package through the file exchange location identified at the Digital Delivery kickoff meeting. Each CREF package shall include a brief transmittal or file index identifying:

(1) Project TIP number and contract number;
(2) RFC package, plan set, phase, area, or limits represented by the CREF package;
(3) Date of export;
(4) Software and workspace version used to prepare the files;
(5) Coordinate system, datum, and units;
(6) List of files included in the package;
(7) Brief description of the design information represented by each file;
(8) Known limitations, exclusions, or areas where the CREF package does not represent the full RFC plan information;
(9) Design-Build Team point of contact for questions regarding the CREF package;
(10) Identification of native DGN/CADD reference files included with the package, if applicable;
(11) Export interval table or export interval settings used to prepare applicable surface, alignment, profile, and breakline files, when applicable.

Use the Department’s file naming conventions or other naming convention identified by the Department at the Digital Delivery kickoff meeting. Maintain the submitted CREF packages, file indices, and associated digital deliverables in the Department-designated file exchange location through Final Acceptance, unless otherwise directed by the Engineer. Additional post-acceptance hosting, access to working model files, or file retention beyond the deliverables required by this Project Special Provision is not required unless required elsewhere in the Contract.

(F) CREF Review and Corrections

Perform quality control before submitting each CREF package. At a minimum, review exported CREF files for completeness, correct coordinate system and units, general consistency with the corresponding RFC Plans, successful export in the required format, and consistency with the template drop interval spacing or export interval settings included in the transmittal, when applicable.

The Department may review CREF deliverables for pilot completeness, usability, and consistency with the corresponding RFC Plans. Department review of CREF deliverables is for pilot evaluation and coordination purposes and does not constitute approval of a construction model or relieve the Design-Build Team of responsibility for the signed and sealed design.

Correct and resubmit affected required digital deliverables when the Department identifies a missing required file, incorrect file format, incorrect coordinate system, incorrect units, corrupted file, or material inconsistency with the corresponding RFC Plans that prevents use of the CREF package for the pilot.

Corrections to CREF deliverables shall not alter the governing contract documents unless incorporated through signed and sealed plans or other contract documents.

VII. PILOT ITEM 2 — STORMWATER (DRAINAGE NETWORK) MODEL AND DATA

(A) General

The Design-Build Team shall develop and submit a three-dimensional stormwater / drainage network model and associated drainage attribute data for permanent drainage features designed by the Design-Build Team. This deliverable shall be coordinated with the Hydraulics Scope of Work found elsewhere in this RFP.

The purpose of this pilot item is to evaluate whether drainage model information and associated attributes can be captured during design and carried forward for construction review, digital as-built workflows, and future asset management uses.

The Design-Build Team is not required to create custom drainage assets, custom feature definitions, custom item types, custom cells, or workspace modifications solely for this pilot item unless required elsewhere in this RFP. Document in the drainage model transmittal any limitations encountered where the NCDOT OpenRoads Designer workspace or default drainage tools do not support a drainage feature, attribute, or workflow identified in this Project Special Provision.

(B) Timing of Drainage Model Deliverables

Submit the applicable drainage network model and associated attribute data with the corresponding RFC drainage plans or roadway plans that include the permanent drainage features represented in the model.

When permanent drainage design is submitted by work package, phase, area, or discipline, submit the corresponding drainage model deliverable for the same work package, phase, area, or discipline.

When an accepted design revision or construction revision materially changes information previously submitted as part of a drainage model deliverable, submit an updated drainage model file or revised affected data for the affected files and affected limits of work with the corresponding revised RFC Plans or accepted construction revision, unless the Department approves another submittal schedule. A minor drainage revision, field adjustment, or field modification does not require an updated drainage model file or revised affected data unless it materially changes required modeled drainage information or required drainage attribute data for the affected limits of work.

(C) Drainage Model Format

Develop the drainage network model using the NCDOT OpenRoads Designer workspace identified for the project, unless otherwise approved by the Department. This requirement is independent of this Digital Delivery Pilot and applies as required elsewhere in this RFP.
Submit the drainage network model in native DGN format. When requested by the Department, provide an IFC export of the drainage network model for pilot evaluation when the IFC export can be generated directly from the submitted native DGN model using the NCDOT OpenRoads Designer workspace identified for the project, Bentley Infrastructure Cloud, or another Department-designated export workflow. Do not prepare a separate model or perform additional modeling, remodeling, or data cleanup solely to produce the IFC export unless required elsewhere in this RFP or incorporated by written contract modification.
The drainage network model shall use the project coordinate system, vertical datum, and units required elsewhere in this RFP and shall be consistent with the corresponding accepted design submittal or RFC Plans.

(D) Drainage Model Content

Include permanent drainage assets designed by the Design-Build Team and represented in the corresponding RFC Plans when the asset type is supported by the NCDOT OpenRoads Designer workspace drainage network tools and can be modeled without creating custom drainage assets, custom feature definitions, custom item types, custom cells, or nonstandard modeling workflows.

Include the following, as applicable:

(1) Storm drainage pipes;
(2) Culverts represented in the RFC drainage plans when supported by the NCDOT OpenRoads Designer workspace drainage network tools;
(3) Inlets;
(4) Catch basins;
(5) Junction boxes;
(6) Manholes;

(7) Standard headwalls and endwalls when supported by the NCDOT OpenRoads Designer workspace drainage network tools; and
(8) Other permanent drainage network features supported by the NCDOT OpenRoads Designer workspace and applicable to the project.

Large culverts, nonstandard headwalls, nonstandard endwalls, and other drainage-related features not supported by the NCDOT OpenRoads Designer workspace drainage network tools are not required to be modeled as drainage network assets under this Project Special Provision unless required elsewhere in this RFP. Document these features as limitations encountered in the drainage model transmittal.

Temporary drainage, erosion control devices, construction phasing drainage, and other temporary features are not required to be included in the drainage network model unless required elsewhere in this RFP.

(E) Drainage Attribute Data

Populate drainage attribute data using the applicable feature definitions, item types, and properties available in the NCDOT OpenRoads Designer workspace. At a minimum, populate the attributes listed below when the attribute is applicable to the asset type, available in the NCDOT OpenRoads Designer workspace, and developed as part of the Design-Build Team's normal drainage design or shown in the corresponding RFC Plans. The Design-Build Team is not required to create custom attributes, custom item types, or asset-management fields solely for this pilot item. Identify unavailable or unsupported attributes in the drainage model transmittal.

Pipe Data:

(1) Material;
(2) Shape;
(3) Pipe size;
(4) Number of barrels;
(5) Length;
(6) Location, including station and offset or other project location reference where available;
(7) Upstream and downstream invert elevations where applicable; and
(8) Associated drainage structure connections where available.

Inlet Data:

(1) Inlet type;
(2) Grate type, grate material, or applicable standard number;
(3) Number of grates;
(4) Box material;
(5) Depth;
(6) Location, including station and offset or other project location reference where available; and
(7) Rim, grate, throat, or other controlling elevation where applicable.

Junction Box / Manhole Data:

(1) Junction box, manhole, or blind box designation;
(2) Lid material;
(3) Lid count and size;
(4) Box material;
(5) Depth;
(6) Location, including station and offset or other project location reference where available; and
(7) Rim or lid elevation where applicable.

Where the NCDOT OpenRoads Designer workspace provides additional attribute fields applicable to the project, populate those attributes when the information is developed as part of the Design-Build Team's normal drainage design.

The Design-Build Team is not responsible under this Project Special Provision for direct integration of the drainage model or drainage attribute data into any Department asset management system. The Department will use the drainage model and associated data to evaluate future digital as-built and asset management workflows.

(F) Drainage Model Review

Department review of the drainage model and drainage attribute data is for pilot evaluation, design coordination, and potential downstream workflow development. Department review of the drainage model does not replace review of the signed and sealed drainage plans and does not relieve the Design-Build Team of responsibility for satisfying the Hydraulics Scope of Work and other applicable contract requirements.

Correct and resubmit affected required drainage model deliverables when the Department identifies a missing required drainage model file, incorrect file format, incorrect coordinate system, incorrect units, corrupted file, or material inconsistency with the corresponding RFC Plans that prevents use of the drainage model deliverable for the pilot.

VIII. PILOT ITEM 3 — DESIGN MODEL REVIEW INTEGRATION

(A) General

The Design-Build Team shall make the applicable roadway and drainage model information available to the Department as a supplemental reference during the Department's standard design and constructability review process as described in Section VIII(B). The Design-Build Team may also make other model information available for pilot evaluation when the information is already developed to support the corresponding formal design submittal. Model review access shall be provided through the project file exchange process used for formal design submittals or another Department-designated file exchange process confirmed at the Digital Delivery kickoff meeting. The Design-Build Team is not required to purchase, license, or adopt a separate review platform, convert files to a format not otherwise required by this Project Special Provision, or prepare a

separate model solely for Department model review unless required elsewhere in this RFP or incorporated by written contract modification. The model review process is intended to supplement, not replace, the standard plan-based review process.

The purpose of model review integration is to allow Department staff to better understand the relationship between the Design-Build Team's model information, the plan sheets, CREF deliverables, drainage model information, and construction-related digital workflows. Pilot Item 3 does not require the Design-Build Team to model design elements beyond the roadway CREF deliverables and drainage model deliverables required by Sections VI and VII solely for model review. If other model information is made available for pilot evaluation, Department review of that information does not make the information a required digital deliverable under Sections VI or VII, change its contractual status, or alter the limitations in Section VIII(E).

(B) Design Review Integration

At formal roadway or drainage design submittals before RFC where model-based roadway or drainage design information is already developed to support the corresponding submittal, provide access to applicable model views, reference files, or native design model files already developed for that submittal.

This access is for supplemental model review only and is not a CREF package or drainage model deliverable. CREF deliverables are required only as described in Section VI(B), and drainage model deliverables are required only as described in Section VII(B).

This section does not require the Design-Build Team to create, update, or submit model files solely to support permit submittals, right-of-way acquisition, or other non-RFC project milestones unless required elsewhere in this RFP.

The Department may use the model as a supplemental reference during design review and constructability review. Department comments resulting from model review will be reconciled against the signed and sealed plans, design criteria, RFP requirements, and other governing contract documents before being issued as formal review comments. Model review comments, if any, will be provided through the Department's standard design review comment process and within the review period applicable to the corresponding formal design submittal. Model review under this section does not create a separate review period, separate approval action, or separate revise-and-resubmit cycle for pre-RFC model access. Incomplete or in-progress model information made available before RFC will not, by itself, be considered a deficiency or require model resubmittal, provided the condition is consistent with the level of design development represented by the corresponding formal design submittal and does not independently indicate noncompliance with the RFP or other governing contract documents.

(C) Review Platform

The Department may use Bentley Infrastructure Cloud, ProjectWise, OpenRoads Designer, the project file exchange process used for formal design submittals, or another Department-designated

platform to review model information. The Department will identify the initial review platform or file exchange process at the Digital Delivery kickoff meeting.

The Design-Build Team is not required to purchase, license, or adopt any construction platform, field equipment platform, automated machine guidance platform, asset management platform, or construction modeling platform solely for this pilot unless the platform is otherwise required elsewhere in this RFP. This requirement does not alter requirements elsewhere in this RFP for use of OpenRoads Designer, the NCDOT OpenRoads Designer workspace, ProjectWise, or other design software or design delivery process required for the project.

Provide the model files and digital deliverables required by this Project Special Provision in the required formats and through the Department-designated file exchange process.

(D) Model Review Workshops

Participate in in-person Digital Delivery model review and feedback meetings as described below, unless the Department approves virtual or hybrid attendance:

(1) One Digital Delivery kickoff meeting as described in Section IV, not to exceed two hours;

(2) Up to three model review / feedback meetings during design and construction, each not to exceed two hours, unless otherwise agreed by the Design-Build Team and the Department; and

(3) One construction model / CREF lessons-learned workshop, not to exceed four hours, if requested by the Department after one or more CREF packages have been used or evaluated for construction-related purposes.

The Department will schedule the meetings in coordination with the Design-Build Team and will identify the meeting location. Meetings will be held in person unless the Department approves virtual or hybrid attendance.

The Department may request written responses to focused pilot questions before a scheduled model review or feedback meeting. When requested, provide written responses no later than five business days before the meeting, unless otherwise agreed by the Department and Design-Build Team. Written responses shall be limited to the pilot items, deliverables, workflows, and meeting topics described in this Project Special Provision.

The Department’s intent is to obtain practical feedback from the Design-Build Team, including the contractor, designer, surveyor, construction modeler, automated machine guidance personnel, and other relevant personnel when applicable. The Design-Build Team is not required to include all such personnel at every meeting. Attendance shall be appropriate to the meeting topic.

(E) Model Review Limitations

Model review integration shall not be construed as:

(1) Approval of the Design-Build Team's design model;
(2) Approval of a construction model;
(3) Approval of construction layout;
(4) Acceptance, certification, or validation of CREF deliverables for construction control;
(5) Direction to revise the Design-Build Team's construction means or methods;
(6) A substitute for signed and sealed plans or other required design submittals;
(7) A basis for relieving the Design-Build Team of responsibility for errors or omissions in the design; or
(8) A basis for creating additional Department responsibility for the Design-Build Team's design, construction model, automated machine guidance model, survey workflow, or field technology workflow.

IX. FEEDBACK AND LESSONS LEARNED

The Department intends to use the pilot to evaluate Digital Delivery implementation benefits and issues, including what digital information is most useful, what information requires additional refinement, what information is difficult to use, and what future requirements should be considered before broader implementation.

The Department may use automated machine guidance files, construction models, survey files, or other construction-related digital files required elsewhere in this RFP or voluntarily made available by the Design-Build Team for pilot evaluation and lessons learned. This Project Special Provision does not require the Design-Build Team to submit those files unless they are required elsewhere in this RFP. Voluntary access to files not otherwise required by the Contract is for pilot evaluation and lessons learned only. Voluntary access does not make those files required deliverables under this Project Special Provision, does not change their contractual status and does not create additional obligations for either party. Nothing in this paragraph modifies requirements elsewhere in this RFP for automated machine guidance files, construction models, survey files or other construction-related digital files.

Provide feedback to the Department regarding the effort, value, and practicality of the pilot deliverables based on available project information and the Design-Build Team's use or evaluation of the pilot deliverables. Feedback may include:

(A) Whether the CREF deliverables were directly usable, partially usable, or not usable for construction-related workflows;

(B) What information had to be recreated, assumed, interpreted, or supplemented;

(C) What file formats, data structures, or workflow steps created inefficiency;

(D) Whether the deliverables supported construction model development, survey, staking, automated machine guidance, inspection, or construction documentation;

(E) Whether the drainage model and attribute data were practical to develop and maintain;

(F) Whether the timing of the CREF and drainage model deliverables aligned with design and construction needs;

(G) Whether model review integration improved Department understanding of the design;

(H) Recommendations for improving future Digital Delivery requirements; and

(I) Estimated order-of-magnitude effort required to prepare, update, and coordinate the pilot deliverables.

Feedback provided under this Project Special Provision is intended for Department learning, process improvement, guidance development, and future pilot refinement. Feedback shall not be used to evaluate the Design-Build Team's performance, designer performance, or contractor performance unless the feedback independently identifies a failure to satisfy an express requirement of the Contract.

X. SUBMITTAL SUMMARY

Submit the following Digital Delivery Pilot deliverables:

(A) Digital Delivery kickoff coordination:
One kickoff meeting within 60 calendar days after contract execution, or as otherwise directed by the Engineer, to confirm process, file exchange, points of contact, and schedule.

(B) CREF deliverables:
CREF packages submitted with, or no later than 30 calendar days after, the corresponding RFC Plans are accepted for construction for each applicable work package , phase, area, or discipline. Each package shall include the file types and transmittal information required by this Project Special Provision.

(C) Updated CREF deliverables:
Updated affected files when accepted design revisions or construction revisions materially change previously submitted CREF information.

(D) Drainage network model and data:
Native DGN drainage model files submitted with the corresponding RFC drainage plans or roadway plans that include the permanent drainage features represented in the model. Provide IFC export files when requested by the Department and when the IFC export can be generated directly from the submitted native DGN model using the NCDOT OpenRoads Designer workspace identified for the project, Bentley Infrastructure Cloud, or another Department-designated export workflow, without preparing a separate model or performing additional modeling, remodeling, or data cleanup solely to produce the IFC export.

(E) Updated drainage model and data:
Updated affected drainage model files or attribute data when accepted design revisions or construction revisions materially change previously submitted drainage model information.

(F) Model review access:
Access to applicable model views, reference files, or native design model files already developed to support formal roadway or drainage design submittals before RFC where model-based roadway or drainage design information is included, as described in Section VIII(B).

(G) Digital Delivery feedback:
Participation in the meetings described in this Project Special Provision and written responses to focused pilot questions when requested by the Department.

XI. CROSS-REFERENCES

Reference the Roadway Scope of Work found elsewhere in this RFP for roadway design requirements associated with the design elements represented in the CREF deliverables.

Reference the Hydraulics Scope of Work found elsewhere in this RFP for drainage design requirements associated with the stormwater / drainage network model and data.

Reference the Structures Scope of Work, ITS Scope of Work, Traffic Signals and Signal Communications Scope of Work, Transportation Management Scope of Work, Utilities Coordination Scope of Work and other applicable scopes of work found elsewhere in this RFP for discipline-specific design and construction requirements that may interface with the roadway CREF deliverables, drainage model deliverables, model review coordination, or construction-related digital workflows. This provision does not require separate digital pilot deliverables for those disciplines unless required elsewhere in this RFP or incorporated by written contract modification.

In the event of a conflict, discipline-specific scopes of work govern design and construction requirements, and this Project Special Provision governs the digital pilot deliverables. The Contract may be modified only in writing in accordance with the applicable provisions of the RFP and Standard Specifications.

PIPE REHABILITATION

(11-2-22)(Rev. 6-11-2026)

Description

Rehabilitate existing storm water pipes, or culverts by the method or methods specified at the designated locations described in the plans developed by the Design-Build Team and this Project Special Provision.

Use pipe liner systems for rehabilitation that are on the NCDOT APL as subject to limitations for use as specified herein, by site-specific limitations for those locations listed in the contract, or limitations as shown on the NCDOT APL for the specific liner system. Review the contract to determine the method or methods that are permitted at each rehabilitation location.

Liners provided per this special provision shall be designed in accordance with the NCDOT Pipe Liner Manual. Hydraulic and Structural calculations shall be provided as part of the contract submittals.

Provide contract submittals as described in this special provision to the Engineer, Department's Materials and Tests Unit, and Department's Hydraulics Unit, a minimum of 10 days prior to start of installation for review and approval.

Materials

(A) Category A - Cured-In-Place Pipe (CIPP) liners

This liner lines an existing culvert by either pulling or inverting a resin-impregnated fabric tube and curing the tube in place. When CIPP liners are specified in the contract, the liner system supplied by the Design-Build Team shall conform to the following requirements and be provided in contract submittals for review and approval:

(1) Host pipe diameter ranges for which the product is applicable;
(2) Indicate corrosion potential/acid reaction potential;
(3) List cure method (e.g., UV, steam, hot water, etc.);
(4) List typical, minimum, maximum application thicknesses;
(5) Calculated minimum thickness of liner;
(6) Designation of air or water inversion or pull-in-place method;
(7) Maximum allowable pulling force;
(8) Site specific cure time;
(9) Minimum pressure to hold liner tight against the host pipe;
(10) Maximum pressure to ensure liner does not sustain damage;
(11) Maximum and minimum cure temperatures;
(12) Post cure temperature to hold during cool down, as well as duration of cool down period;
(13) Sample of temperature and pressure log to be used for monitoring the curing process;
(14) Certification on manufacturer's letterhead indicating that the Design-Build Team is approved by the fabric tube and resin manufacturer to perform CIPP installation work;
(15) Material safety data sheets for all hazardous chemicals that will be used on the job site including resin, catalyst, cleaners, and repair agents;
(16) List which of the following ASTM specifications that the installation will comply with;
(17) Provide third party, independent lab test results that demonstrate compliance with the applicable specifications, and specifications referenced by those listed below (For example, there is no ASTM F1216 lab test. However, ASTM F1216 references ASTM D790 for flexural properties and ASTM D543 for chemical resistance. In the case of a proposed ASTM F1216-compliant installation, the submittal must include ASTM D790 and ASTM D543 lab test results.);

    (a) ASTM F1216 for inverted CIPP

(b) ASTM F1743 for pulled-in-place CIPP
(c) ASTM F2019 for pulled-in-place GRP CIPP
(d) ASTM F2599 for sectional inverted CIPP (applies to pipe sections, not full length)
(e) ASTM F3541 for sectional repair CIPP; pushed or pulled in place

(18) Long Term Modulus of Elasticity required for use in calculations = 150,000 psi. Third Party, Independent lab test results may be submitted by vendors or subcontractors to justify use of alternate Long Term Modulus of Elasticity in calculations. The value will be extrapolated from ASTM D2990, 10000-hour test, or will be 50% of the initial modulus value from ASTM D790. Design value of Long Term Modulus of Elasticity may be no greater than 50% of Initial Modulus of Elasticity. Tested value of 50% of Initial Modulus of Elasticity of samples taken during construction must be greater than or equal to value used in design equations;

(19) Initial Modulus of Elasticity required for use in calculations = 300,000 psi. Third Party, Independent lab test results may be submitted by vendors or subcontractors to justify use of alternate Initial Modulus of Elasticity in calculations. The value will be from ASTM D790. Tested value of samples taken during construction must be greater than or equal to value used in design equations;

(20) Long Term Flexural Strength required for use in calculations = 2250 psi. Third Party, Independent lab test results may be submitted by vendors or subcontractors to justify use of alternate Long Term Flexural Strength in calculations. The value will be extrapolated from ASTM D2990, 10000-hour test, or will be 50% of the initial flexural strength value from ASTM D790. Tested value of samples taken during construction must be greater than or equal to value used in design equations.

(B) Category B Fold and Form flexible liners

When Fold and Form flexible liners are specified in the contract, the liner system supplied by the Design-Build Team shall conform to the following requirements and be provided in contract submittals for review and approval:

(1) List host pipe diameter ranges for which the product is applicable;
(2) Indicate corrosion potential/acid reaction potential;
(3) List type of reforming method (steam, hot water, etc.);
(4) Certification on manufacturer's letterhead indicating that the Design-Build Team is approved by the manufacturer to perform installation work;
(5) Material safety data sheets for all hazardous chemicals that will be used on the job site. Identify the proposed use for each hazardous chemical and where it will be used in the work;
(6) Calculated minimum thickness of liner;
(7) Maximum allowable pulling force;
(8) Site specific reforming & cooling time;
(9) Minimum pressure to hold liner tight against the host pipe;
(10) Maximum pressure to ensure liner does not sustain damage;
(11) Maximum and minimum forming temperatures;
(12) Ambient temperature range for installation;

(13) Sample of temperature and pressure log to be used for monitoring the curing process;

(14) Must provide and comply with specification for installation, and in accordance with Article 106-3 of the Standard Specifications provide Type 1 or Type 4 material certification of compliance with material specifications as applicable to the list below, or equivalent as approved by the Engineer:

(a) ASTM D1784 defines PVC cell class referenced below
(b) ASTM F1504 for PVC cell classification 12334 or 13223
(c) ASTM F1533 for polyethylene
(d) ASTM F714 for polyethylene min. cell classification 335420 and 2-4% carbon black
(e) ASTM F1606 for deformed polyethylene
(f) ASTM F1947 for folded PVC
(g) ASTM F1867 for folded / formed PVC Type A
(h) ASTM F1871 for PVC Type A

(15) Submit to the Engineer Type 2 or Type 5 material certifications in accordance with Article 106-3 of the Standard Specifications by vendors or subcontractors for proof of long-term modulus of elasticity, 50-year sustained loading value, if the following values are not used in design calculations: 22,000 psi shall be used for HDPE, PE, PP; and 140,000 psi shall be used for PVC; or use values in accordance with AASHTO LRFD Bridge Design Specifications, Table 12.12.3.3-1, Mechanical Properties of Thermoplastic Pipe, if different and approved by the Engineer.

Construction Methods

For all categories the Design-Build Team shall perform pre-installation inspection, pipe cleanout, grout host pipe, inlet and outlet sealing, dewatering, and submit a disposal plan as follows:

(A) Pre-Installation Inspection

Perform a pre-installation video inspection of pipe using NASSCO certified personnel. Place the camera that is mounted on a rubber tired or tracked pipe rover that allows for a 360-degree inspection at the centerline of the pipe. Inspection equipment shall be capable of measuring protrusions and obstructions of 1/2 inch or greater. Provide a pipe profile, on which deflections that may affect the installation of the liner are located and noted. The inspection shall be performed in the presence of the Engineer, unless waived by the Engineer. Dewater the host pipe to the satisfaction of the Engineer, and in accordance with NCDOT's Best Management Practices for Construction and Maintenance Activities. A thorough culvert inspection is required to determine the number of existing "pipe to pipe" connections and the extent, if any, of obstruction removal and voids. Perform inspection by experienced personnel trained in locating breaks, obstacles, voids and service connections. Video inspections shall be clearly labeled on the media with the time, date, and location of the pipe inspected. Furnish a copy of the video inspection to the Engineer at least 10 days prior to the start of rehabilitative construction. In the event the Design-Build Team's inspection shows the method of rehabilitation the Design-Build Team has selected is no longer

viable at that location as verified by the Engineer, select another allowable method, if specified, from those designated in the Designated Locations and Allowable Methods table found earlier in this special provision or as found elsewhere in this RFP.

(B) Pipe Clean-out

Clear the existing pipe(s) designated for rehabilitation of any debris, sediment, protrusions greater than 1/2 inch in height, and any other potential obstructions prior to the start of rehabilitation efforts. Thoroughly clean and prepare the host pipe prior to the liner installation. Conform to the cleaning recommendations of the liner manufacturer, and any additional requirements of this special provision of which the more stringent shall apply. In the absence of manufacturer recommendations, submit the proposed method for cleaning and preparing the host pipe for the Engineer's review and acceptance at least 10 working days prior to beginning the work at that location.

(C) Grouting Host Pipe

Perform grouting work described in the contract, prior to pipe liner installation to fill voids in the soil around the existing host pipe. Grouting to fill voids in the soil around the host pipe is not included in the scope of pipe lining described by this special provision and will be paid for as extra work in accordance with Subarticle 104-8(A) of the 2024 NCDOT *Standard Specifications for Roads and Structures (Standard Specifications)* at the unit price of $500.00 per cubic yard.

(D) Inlet & Outlet Sealing

All pipe liner installations shall fit tightly to the host pipe at the terminal ends of the liner to prevent flow between the liner and host pipe.

(E) De-Watering

Install all pipe liners and grout in dry conditions. De-water by diverting, pumping, or bypassing any water flow through an existing pipe or drainage system prior to and during the lining process. The method of de-watering is to be determined by the Design-Build Team but must be approved by the Engineer prior to implementing.

(F) Disposal Plan

Submit a disposal plan to the Engineer a minimum of 10 days prior to installation. The disposal plan shall indicate how by-products and waste are to be contained, captured, transported offsite, and disposed of in accordance with project permits and local, state and federal regulations. It shall be the Design-Build Team's responsibility to report and take appropriate corrective actions to remediate any water quality alteration resulting from lining operations in accordance with project permits and applicable local, state or federal regulations. The cost for such remediation shall be at the Design-Build Team's expense.

Category A – Cured-In-Place Pipe Liner Construction Methods

Fabricate and install the cured-in-place pipe liner system in such a manner as to result in a maintained full contact tight fit to the internal circumference of the host pipe for its entire length. The installation shall adhere to the cure times and temperatures stipulated in the manufacturer's recommended installation and cure specifications and the finished product shall be free of de-lamination, bubbling, rippling or other signs of installation failure.

Install per specification or standard practice for installation in accordance with (ASTM F1216 for inverted CIPP, or ASTM F1743 for pulled-in-place CIPP, or ASTM F2019 for pulled-in-place GRP CIPP, or ASTM F2599 for sectional inverted CIPP, or ASTM F3541 for sectional CIPP pushed or pulled in place unless otherwise approved by the Engineer).

Pulled-in-place liner installation must be accomplished without significant liner twisting, or stretching the liner greater than 1% of its original length during installation. At no time shall the pulling force, as measured by a Design-Build Team-provided dynamometer or load cell, exceed that established by the liner manufacturer. For liner lengths greater than 100 feet, protect the pipe liner end using a device that uniformly distributes the applied load around the perimeter of the liner.

Curing for styrene-based, epoxy-based, and vinyl ester-based CIPP may be accomplished by water, steam or ultraviolet light and shall be in accordance with the liner manufacturer's recommendations.

Installation and curing requirements of pipe sections shall be in accordance with the manufacturer's recommendations for the specific product, as applicable. Furnish installation and curing requirements for the various flexible liners including individual components of the system, tube type (reinforced or non-reinforced), manufacturer name and type of resin including catalyst, volume of resin required to achieve proper impregnation and curing. All components of the systems shall be in accordance with manufacturer's recommendations for the specific system used, and all components shall include lot numbers and expiration dates.

Place an impermeable barrier immediately upstream and downstream of the host pipe, prior to liner insertion, to capture any possible raw resin spillage during installation and dispose of any materials in accordance with the submitted and approved disposal plan.

Where the pulled-in-place method of installation is used, install a semi-rigid plastic slip sheet over any interior portions of the host pipe that could tear the outer film or over any significant voids in the host pipe.

Reconnect the existing storm drain lateral connections immediately after the liner has been cured in place. Use robotic cutting devices to re-establish tie-ins in non-man accessible pipes.

Monitor temperature via a minimum of three thermocouples on the outer surface (interface between the host pipe and liner) of the liner (one each at the upstream and downstream ends and one approximately mid-length of the host pipe). Monitor pressure during inversion and curing, and

maintain pressure between minimum and maximum allowable pressures as provided by the manufacturer. Log cure time-temperature and time-pressure data at 5-minute intervals and provide such information in a format acceptable to the Engineer for review and approval within 48 hours after completing the resin-curing process.

Thoroughly rinse the cured lined pipe with clean water prior to re-introducing flow.

Capture all cure water and/or steam condensate and rinse water and dispose of, in accordance with the submitted and approved disposal plan.

Within 21 days of completing the resin curing at a given culvert location, submit the test results from an ISO 17025 lab approved by the Engineer. The report must be signed by a representative of the independent testing lab. The report must include:

(1) Thickness measurements as well as flexural strength and flexural modulus test results for field samples.
(2) Description of the defects in the tested samples in terms of the effect on CIPP performance.

Make cured samples from the identical materials (tube, resin and catalyst) to be used for the CIPP. Identify each sample by date, contract number, drainage system number of the corresponding culvert, thickness, name of resin, and name of catalyst. The samples must be 6 by 16 inches in size, so that the testing lab can cut the sample into five pieces for testing. Comply with the following sampling procedures unless UV cured:

(1) One sample will be made for each setup of the lining apparatus and tested for thickness and flexural properties. A setup is defined as the lining equipment being used to line one run of storm sewer with one continuous liner bag that undergoes one heating/curing/cooling cycle, which may contain multiple pipes and drainage structures in series.
(2) Place one aluminum-plate clamped mold containing a flat plate sample, inside the downtube when heated circulated water is used, and in the silencer when steam is used during the resin curing period.
(3) Seal each flat plate sample in a heavy-duty plastic envelope inside the mold.
(4) Remove the cured flat plate sample after draining all of the moisture from the cured CIPP.

If UV cured, comply with field sampling procedures under ASTM F2019, Section 7: Recommended Inspection Practices.

Test the samples for flexural properties under ASTM D790, ASTM D5813, ASTM F1216, ASTM F1743, ASTM F2019, or ASTM F3541 as applicable unless otherwise approved by the Engineer. Verify that physical properties of the field samples comply with the minimum values under:

(1) ASTM F1216, Table 1 (modified values), for heat cured polyester, vinyl ester, and epoxy resins. The flexural strength must be at least 5,000 psi. The flexural modulus must be at least 300,000 psi.
(2) ASTM F2019, Table 1, for UV cured CIPP. The flexural strength must be at least 6,500 psi. The flexural modulus must be at least 725,000 psi. Comply with sampling and testing procedures under ASTM F2019, Section 7: Recommended Inspection Practices.

Test the samples for thickness. If heat cured, remove the film from the inner lining or preliner. If UV cured, remove the film from the inner and outer foil.

Measure the thickness of the liner at 3 spots on each deburred sample. Calculate the thickness as an average of the measurements.

If UV cured, comply with sampling and testing procedures under ASTM F2019, Section 7: Recommended Inspection Practices. If the culvert material is corrugated metal, measure the thickness at 3 spots that are along a line corresponding to the corrugation crests. Calculate the thickness as an average of at least 6 measurements.

CIPP may be rejected by the Engineer if any of the following occur:
(1) Actual temperature and curing time and schedule do not comply with those shown in the authorized work plan;
(2) Pressure deviates more than 1 psi from the required pressure;
(3) At any time during installation the manufacturer's required minimum cool-down time or maximum cool-down rate is violated;
(4) There are defects including;
    (a) Concentrated ridges, including folds and wrinkles exceeding 8 percent of the CIPP diameter
    (b) Dry spots
    (c) Lifts
    (d) Holes
    (e) Tears
    (f) Soft spots
    (g) Blisters or bubbles however this does not include superficial bubbles in the inner plastic liner that do not penetrate into the felt
    (h) Delaminations
    (i) Gaps in the length of the CIPP
    (j) Gaps or a loose fit between the exterior of the CIPP and the culvert
(5) Test results indicate one of the following:
    (a) If heat cured, the average of the test results for one prepared sample cut into pieces for testing does not have the specified modulus of elasticity, the specified flexural strength, nor either the specified modulus of elasticity or the specified flexural strength
    (b) If UV cured, the average of the test results for one prepared sample cut into pieces for testing does not have the specified modulus of elasticity, the

specified flexural strength, nor either the specified modulus of elasticity or the specified flexural strength

(6) The liner thickness is less than the greater of either one of the following:
  (a) Specified thickness
  (b) Calculated minimum thickness shown in your authorized work plan
(7) Materials and installation methods are not those shown in your authorized installation plan;
(8) Defects are excessive or unrepairable;
(9) CIPP is not continuous or does not fit tightly for the full length of the culvert;
(10) If UV cured, and post installation inspections reveal signs of incomplete curing

(dripping resin, etc.), trim liner obscuring uncured liner, re-wet, and re-cure with UV.

Category B - Fold and Form Flexible Liners Construction Methods

Install per specification or standard practice for installation (ASTM F1606 deformed polyethylene, ASTM F1867 folded/formed PVC Type A, or ASTM F1947 folded PVC unless otherwise approved by the Engineer).

Fabricate and install the liner system in such a manner as to result in a maintained full contact tight fit to the internal circumference of the host pipe for its entire length. The installation shall adhere to the reforming pressures and temperatures stipulated in the manufacturer's recommended installation specifications and the finished product shall be free of bubbling, rippling or other signs of installation failure.

Installation and reforming requirements of pipe sections shall be in accordance with the manufacturer's recommendations for the specific product. All components of the systems shall be as recommended by the manufacturer for the specific system used, and all components shall include lot numbers. Submit documentation from the manufacturer to verify compliance with the requirements of this paragraph as well as installation recommendations to the Engineer for review and approval.

Reconnect the existing storm drain lateral connections immediately after the liner has been installed in place. Use robotic cutting devices to reestablish tie-ins in non-man accessible pipes.

Monitor temperature via a minimum of two thermocouples (one each at the upstream and downstream ends of the host pipe). The Design-Build Team shall automatically log cure time-temperature and time-pressure data at 30 second intervals with a data logger and provide such information in a format acceptable to the Engineer.

Submit the tape and log of recorded temperatures to the Engineer within 48 hours after completing the lining process. Submit the recorded pressure to the Engineer within 48 hours after completing the lining process.

Liner may be rejected by the Engineer if any of the following occur:

(1) Actual temperature and curing time and schedule do not comply with those shown in the authorized work plan;
(2) There are defects including:
    (a) Concentrated ridges, including folds and wrinkles exceeding 8 percent of the liner diameter
    (b) Lifts
    (c) Holes
    (d) Tears
    (e) Soft spots
    (f) Blisters or bubbles
    (g) Gaps in the length of the liner
    (h) Gaps or a loose fit between the exterior of the liner and the culvert
(3) The liner thickness is less than the greater of either one of the following:
    (a) Specified thickness
    (b) Calculated minimum thickness shown in your authorized work plan
(4) Materials and installation methods are not those shown in installation plan;
(5) Defects are excessive or unrepairable;
(6) Liner is not continuous or does not fit tightly for the full length of the culvert.

(G) Post Installation Inspection

In addition to the inspection performed by the Department, the Design-Build Team shall perform two post-installation video inspections using NASSCO certified personnel. The first inspection shall take place between 90 and 100 calendar days after completion of installation for each culvert or system to a single outfall. The second inspection shall take place 30 calendar days prior to the end of the liner warranty period (5 years, secured by construction bond). The camera shall be situated at the centerline of the pipe, and shall be mounted on a rubber tired or tracked pipe rover that allows for a 360-degree inspection. Inspection equipment shall be capable of measuring protrusions and obstructions of 1/2 inch or greater. The inspection shall be performed in the presence of the Engineer. Dewater the host pipe to the satisfaction of the Engineer. Video inspections shall be clearly labeled on the media with the time, date, and location of the pipe inspected. A copy of the video inspection shall be furnished to the Engineer for review and approval prior to acceptance of the work.

The finished liner may be rejected if not continuous over its entire length and free from visual defects such as foreign inclusions, joint separation, cracks, insufficient liner thickness, material loss, roughness, deformation, dry spots, pinholes, insufficient bonding to host pipe, delamination, or other material or installation deficiencies as described herein.

(H) Remedies for rejection of liner

In the event the first post inspection of the installation reveals defects in localized areas of the liner pipe (comprising less than 20 percent of the pipe length) the localized defects shall be repaired as specified by the manufacturer. Where defects occur on 20 percent or more of the pipe length the defects shall be repaired, however, the Design-Build Team will not be allowed to continue with his methodology of installation and/or the liner system used until he can demonstrate to the

Engineer that he has remedied his operations to a sufficient level of quality as determined by the Engineer. All such remedial efforts shall be at the Design-Build Team's expense. Further failure(s) to perform a proper installation may result in the disallowance of the use of that liner system and an adjustment in the cost or non-payment of the failed installations depending on the severity of the failure.

In the event the first post installation inspection is not conducted until all or most of the locations in the contract permitting this methodology have been performed, and the inspection reveals defects on 20 percent or more of the host pipe's length, then an adjustment in the cost or non-payment of the failed installations may be made by the Engineer depending on the severity of the failure.

In the event the second post inspection of the installation reveals defects, the Department may execute the option to call the construction bond to reimburse the Department for repairs or corrections, or to act as an adjustment in the cost, or both.

HOST PIPE BEFORE LINING

(1-16-18)(Rev. 1-21-25) PSP

Description

Fill voids below and around a culvert that have been found during cleaning and inspection, or are apparent by inverts perforated by corrosion either mid-pipe or at the ends.

Wherever pipe liners are used in pipes of sufficient size to gain access, fill voids before installing pipe liners.

Materials

Refer to Section 1003 of *Standard Specifications*.

Construction Methods

Prevent the flow of cementitious material and water from construction activities into waterways and drainage facilities. Follow provisions of the *NCDOT Best Management Practices for Construction and Maintenance Activities Manual* found on the Department's website.

Install grout ports at locations directed by the Engineer. Install valves or removable plugs at grout ports. Probe at each grout port location. The probe must be at least four feet long, fit through the grout ports, and be rigid enough to sense probe refusal. Grout ports must be watertight. If authorized, you may screw grout ports in place or attach them by other methods. Do not weld grout ports to galvanized surfaces.

Where practicable, pump from downstream/downhill end of pipe toward upstream/uphill end of pipe. Pump grout into voids until it appears that all water and air has been ejected. Where possible, pump until grout escapes from adjacent, unplugged ports. Plug grout ports or close port valves as soon as pumping the grout ceases.

Utilize multiple grouting stages if necessary to close invert, annular, or joint perforations, as well as inject grout into remaining voids surrounding pipe.

Block or sandbag culvert ends to retain grout during grouting procedure. Remove sandbags or blockages after curing.

Finish grout that surcharges from perforations or cracks to a smooth surface.

The maximum injection pressure at the nozzle must not exceed five psi for fluid, unsanded grout mix. Pressure shall be monitored by a pressure gauge.

Monitor the culvert for deformation and cracks. If cracking occurs in a concrete culvert or lining, reduce the grout injection pressure. If deformation of the existing structure exceeds 1/2 inch at any location, reduce the injection pressure. Grouting in lifts may be required to prevent deformation.

Repair any permanent deformations or cracks resulting from your grouting work.

CONCRETE PENETRANT SEALER TREATMENT FOR DECK (SPECIAL)

GENERAL

This work consists of the preparation, furnishing and application of concrete penetrant sealer to concrete deck surfaces identified on the plans or contract documents to seal minor cracks in those surfaces. Prepare the concrete surfaces and apply the concrete penetrant sealer in accordance with this special provision and as indicated on the plans, or as approved by the Engineer.

The Design-Build Team shall select one of the concrete penetrant sealers below:

(A) Alkylalkoxysilane (Silane) Penetrant Sealer
(B) Soy Methyl Ester with Polystyrene (SME-PS) Concrete Penetrant Sealer

Work includes: concrete surface preparation, placement of concrete penetrant sealer, and any incidentals necessary to complete the project, as specified or as indicated on the plans.

Interchanging concrete penetrant sealer materials requirements between selected concrete penetrant sealer types shall not be permitted unless approved by the Engineer.

SUBMITTALS

Submit for approval the following requested items and any other relevant documents:

(A) A safety data sheet (SDS) for each shipment of the concrete penetrant sealer materials.

(B) Concrete penetrant sealer material information and manufacturer's written preparation and application instructions.

(C) Certification from an independent testing laboratory that the materials meet the requirements of these provisions. Do not incorporate these materials into the project until the Engineer has accepted and approved the certification for the material.

(D) The dates of manufacture of the concrete penetrant sealer materials, their lot numbers and date of shelf-life expiration for each lot number.

(E) A table indicating the likely cure time, in minutes, to allow vehicular traffic on the bridges where the deck have been treated. Provide time for the allowable ambient temperature range, in increments of 10º F (6º C).

(F) A work plan for each structure that includes estimated times for surface preparation and concrete penetrant sealer application.

(G) Working drawing of proposed plan to protect waterways, bridge components, boat traffic, vegetation, and any other items or areas below or near the bridge from abrasive blasting or pressure washing activities as well as any concrete penetrant materials being applied.

MATERIAL DELIVERY AND STORAGE

Store sufficient quantities of concrete penetrant sealer materials to perform the entire application.

Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Ensure that each container is clearly marked by the manufacturer with the following information:
(A) Manufacturer's name and address.
(B) Product name.
(C) Date of manufacture.
(D) Expiration date.
(E) Lot identification number.
(F) Container serial number.

Provide the Engineer a certification from the manufacturer, confirming that the concrete penetrant sealer materials meet the requirements of this special provision. Do not incorporate these materials into the project until the Engineer has accepted and approved the certification for the material. Submit such certification for each lot of material delivered to the project. In each certification, identify the serial or lot numbers of the containers certified.

The Engineer may require samples from each lot or container of materials delivered to the project or from containers at the point of use. When samples are required, furnish samples in accordance with the Engineer's instructions.

Store concrete penetrant sealer materials in unopened containers in a clean, dry area between 40° F and 90° F. Store containers in a manner that prevents leakage or spillage in a storage facility that provides protection from the elements, and provides safe and secure storage of materials.

MANUFACTURER'S REPRESENTATIVE

Provide a manufacturer's representative on site for the duration of the surface preparation and concrete penetrant sealer application work, to provide expert assistance on surface preparation, storage, mixing, application, clean-up, and disposal of materials.

MATERIALS

Use specific concrete penetrant sealer material requirements only for the selected concrete penetrant sealer type. Interchanging sealer materials requirements between sealer types shall not be permitted.

(A) Alkylalkoxysilane (Silane) Penetrant Sealers

Provide silane from a single manufacturer that conforms to requirements indicated in Table 1, below.

Table 1
SILANE PROPERTIES

Property	Test Method	Requirement
Silane Content		100%
VOC content	EPA method 24	Less than 350 g/l
Surface Appearance after Application		Unchanged
Flash Point	ASTM D3278	140° F, minimum
Resistance to Chloride Ion Penetration	AASHTO T259 and T260	Less than: 0.52 pounds/yd^3(criteria of 1.5) at 1/2 inch level; 0.00 pounds/yd^3(criteria of 0.75) at 1 inch level
Water absorption test	ASTM C 642	0.50% maximum/48 hours; 1.5% maximum/50 days
Scaling resistance	ASTM C 672	(non-air-entrained concrete) 0 rating "No Scaling" (100 cycles)
NCHRP 244		
Water weight gain	Series II - cube test	85% reduction, minimum
Absorbed chloride		87% reduction, minimum
Absorbed chloride	Series IV - Southern climate	95% reduction, minimum

(B) Soy Methyl Ester with Polystyrene (SME-PS) Concrete Penetrant Sealer

Provide SME-PS from a single manufacturer that conforms to the requirements in Table 2, below.

Table 2
SME-PS PROPERTIES

Property	Minimum Requirement
Soy Methyl Ester by mass	95%
Polystyrene	2%
Kinematic Viscosity @ 73º F (23º C)	See Manufacturer Specification

The SME-PS penetrant sealer will be accepted on kinematic viscosity and a certificate of compliance from the manufacturer confirming the product meets the contract material requirements.

A 5-pound sample of the SME-PS penetrant sealer shall be sampled in the presence of the Engineer and sent to NCDOT Material and Test Unit for viscosity and materials acceptance.

SURFACE PREPARATION

(A) Alkylalkoxysilane (Silane) Penetrant Sealers

Prepare the concrete surfaces for application of silane using the appropriate techniques in order to remove all existing grease, slurry, oils, paint, dirt, striping, curing compound, rust, membrane, weak surface mortar, or any other contaminants that could interfere with proper adhesion, penetration, and the curing of the silane material.

Prepare a final concrete surface that adheres to the following requirements:

(1) Prior to silane application, protect cracks on the concrete surfaces from materials that can interfere with the penetration and the curing of the silane material. Just prior to placement of the silane, remove, by magnets, oil-free compressed air and vacuuming, any loose particles, such that no excess particles remain.

(2) If the concrete surfaces become contaminated before placing silane treatment abrasive blast the contaminated areas to the satisfaction of the Engineer, at no additional cost.

(3) Prior to silane application the concrete surfaces shall be completely dry.

(4) The silane manufacturer may suggest cleaning and preparation methods other than those detailed by this special provision. The Engineer must approve such alternative methods prior to implementation.

The following are surface preparation requirements specific to concrete deck surfaces:

(1) For areas to receive silane deck treatment, clean by abrasive blasting. Select the size of abrasive and travel speed of the equipment to provide a uniformly clean surface with a uniform profile. Remove striping to the maximum extent determined to be practical by the Engineer using up to three (3) passes with abrasive blasting or other approved equipment.

(2) Power washing will not be allowed.

(3) Do not expose the cleaned surfaces to vehicular traffic unless approved by the Engineer.

(B) Soy Methyl Ester with Polystyrene (SME-PS) Concrete Penetrant Sealer

Prepare the concrete surfaces for application of SME-PS using the appropriate techniques to remove substances such as dust, grime, dirt, stains, mineral deposit, oil, bituminous materials, debris and all other materials.

Prepare a final concrete surface that adheres to the following requirements:

(1) For areas to receive SME-PS penetrant sealer treatment, clean the surface by a mechanical broom followed by blow cleaning with compressed air or by power washing as appropriate. Surfaces, joints, and cracks that become contaminated before the SME-PS penetrant sealer application shall be recleaned to bare concrete. If the surface is contaminated with bituminous residue, asphalt, or soil, an abrasive blaster may be used.

(2) Prior to SME-PS application, surface stains, marks and unwanted materials shall be removed by using water blasting equipment of sufficient operating capacity and pressure in accordance with the SME-PS penetrate sealer manufacturer's recommendations. Reclean concrete surfaces which become contaminated at no additional cost to the Department prior to the application of the SME-PS penetrant sealer.

(3) The water blasting duration shall be limited to provide a light abraded surface. Do not allow surface abrasion to exceed 0.016 inches. No further cleaning of stains will be required after abrading to a depth of 0.016 inches. Avoid exposure of coarse aggregate by water blasting.

(4) The concrete surface shall dry for a minimum of 24 hours after last exposure of water and all visible moisture has dissipated from water blasting, precipitation or power washing, prior to application of SME-PS penetrant sealer.

CONCRETE PENETRANT SEALER APPLICATION

(A) Test Area

(1) Alkylalkoxysilane (Silane) Penetrant Sealers

(a) Test a small area of the deck surface (minimum 5 ft. by 5 ft.) before general application of silane to ensure desired performance results, aesthetics, application rates and to verify application technique. Allow 5–7 days for the product to react fully before evaluating.

(b) Application rates may vary depending on field conditions and the substrate to be treated.

(c) Conduct at least one absorption test in the test area, using a Rilem Tube Test. Acceptable results are no loss of water in the Rilem tube over a period of 20 minutes. Adjust application to achieve required repellent performance.

(d) The manufacturer's representative shall assist the Design-Build Team in determining the application rates. Use test applications on actual surfaces to determine accurate application rates. Extremely porous surfaces may require two (2) coats of silane.

(e) Do not begin production application of silane until the Engineer has approved the test area, including approval of aesthetics, color, texture, and appearance.

(2) Soy Methyl Ester with Polystyrene (SME-PS) Concrete Penetrant Sealer

(a) Test a small area (minimum 2 ft. by 2 ft.) of the concrete surface before general application of SME-PS. Tape a clean plastic sheet to the test surface of the prepared concrete with duct tape for a minimum of 2-hours during daylight hours. The duct tape shall be placed around the perimeter of the plastic for an air-tight seal. If condensation is observed during the 2-hour evaluation period, additional drying time will be required, and the plastic test repeated and passed before application of the SME-PS penetrant sealer.

(b) A control strip of at least 6 panels or equivalent area for vertical surfaces shall be used to establish the coverage rate and drying time of SME-PS concrete penetrant sealer. Determine the actual coverage rate in square feet per gallon in the field trials (control strip).

(c) The Resident Engineer may approve and may adjust the application rate of the sealer based on the geometry and porosity of the concrete. The Engineer may adjust the pressure to minimize vaporization and sealant loss.

(B) Application

(1) Alkylalkoxysilane (Silane) Penetrant Sealers

Immediately before placing silane, all exposed concrete surfaces shall be completely dry and blown clean with oil-free compressed air to remove any loose dust and debris. Apply silane as soon as practical after the exposed surfaces have been properly prepared and conditions are satisfactory.

(a) Stir material thoroughly before and during application.

(b) Maintain operating pressures in sprayers used for application of the silane penetrant sealer material sufficiently low so that atomization or misting of the material does not occur.

(c) Apply even distribution of silane. Take care when applying the silane, so that running or ponding does not occur.

(d) Avoid application with hand pump sprayers. For small areas of silane application, the use of hand pump sprayers must be approved by the Engineer.

(e) Apply silane in a single application to the concrete surface with enough material to saturate the surface, remove and dispose of excess material appropriately. If a second coat is required, it should be applied "wet on wet" before first coat dries.

(f) Design-Build Team shall protect from overspray all pedestrians, vehicles, plants and vegetation, and other areas not receiving silane application. Damages that occur due to overspray shall be the responsibility of the Design-Build Team.

(g) Allow product to penetrate the concrete surface and dry, as required by the manufacturer.

The following applications are specific to concrete deck treatment:

(a) Apply silane with low-pressure spray or by flooding, followed by brooming or squeegeeing for even distribution, in accordance with manufacturer's instructions.

(b) Begin the application of the silane at the lowest elevation and proceed upward, toward higher elevations, unless otherwise approved by the Engineer.

(c) Remove excess material from the concrete deck with a broom or squeegee and dispose appropriately.

(d) Allow product to penetrate the bridge deck and dry, as required by the manufacturer, prior to opening to traffic.

(2) Soy Methyl Ester with Polystyrene (SME-PS) Concrete Penetrant Sealer

(a) Immediately before placing SME-PS, all exposed concrete surfaces shall be completely dry and blown clean with oil-free and moisture-free compressed air using air compressor capable of producing a minimum of 180 cfm to remove all dust and loose material.

(b) Apply SME-PS only to concrete surfaces which have been prepared in accordance with this special provision, manufacturer's recommendation, and approved by the Engineer.

(c) Apply SME-PS with airless hand sprayers capable of applying penetrant sealer at 10 psi to 25 psi for applications for less than 1,500 square yards.

(d) Apply SME-PS with airless mechanical distributors capable of applying at 10 psi to 40 psi pressure for applications greater than 1,500 square yards. Calibrate mechanical distributors at the control strip. Replace spray tips with excessive wear and clean clogged nozzles.

(e) Hand application of SME-PS shall require the individual applying the penetrant sealer to account for the rate of application based on the length and width of application and the volume of solution discharged per unit area.

(f) For vertical hand applications, apply the sealer at a rate of 10 to 25 psi from bottom up with a low-pressure sprayer or roller so as to thoroughly saturate the concrete.

(g) Mechanical distributor application of SME-PS shall be demonstrated to produce a uniform application by the nozzle angles, spray bar height and overlap planned for the project. Additional control strips may be necessary until the Design-Build Team can demonstrate uniform, accurate application of penetrant sealer.

(h) Apply SME-PS when the ambient temperature is above 40º F and in a uniform manner without running or ponding. Redistribute any penetrant sealer material which is applied and subsequently ponds in low areas over the concrete surfaces by use of squeegee.

(i) Apply SME-PS to all cracks that are wider than $^{1}/_{16}$ inch; the application width shall be a 2-foot-wide band on both sides of all cracks. The penetrating sealer shall be sprayed directly into cracks, when possible; a small reservoir of sealant shall be applied in the bottom of crack if the crack holds liquid. In addition, penetrating sealer shall be applied to all exposed surfaces on top of the deck slab unless directed otherwise by the Engineer.

(j) The Engineer shall approve the SME-PS application when it is determined that the Design-Build Team has properly cleaned all surface areas to receive treatment and has applied the penetrant sealer within the required rates of application.

(k) Vehicular traffic shall not be allowed on sealed deck surfaces until no tracking of sealer material is apparent.

LIMITATIONS OF OPERATIONS

(A) Prior to application of any concrete penetrant sealer, cure concrete or concrete repairs for a minimum of 28 days or as required by the concrete penetrant sealer manufacturer.

(B) Do not use penetrant sealer material after the shelf-life date.

(C) Do not return unused material in opened containers to storage for later use. Either apply such material to appropriate areas on concrete surfaces or remove and appropriately dispose of it at offsite locations provided by the Design-Build Team.

(D) If expansion joints are not being replaced or have been replaced prior to surface preparation, they shall be protected from damage from deck surface preparation. Deck drains and areas of curb or railing above the proposed surface shall be protected from the surface preparation operations.

(E) Cover deck joint seal and elastomeric material, plug deck drain scuppers, seal cracks on underside of deck, and use other necessary protective measures to prevent leakage of penetrating sealant below the concrete deck surface to protect waterways, bridge components, pedestrians, vehicles, roadway, vegetation, and any other items or areas below or near the bridge.

(F) The Design-Build Team shall provide suitable coverings (e.g. heavy-duty drop cloths) as needed to protect all exposed areas not to receive surface preparation and concrete penetrant sealer treatment, such as asphalt pavement, curbs, sidewalks, parapets, etc.

(G) Pick up and store all blast media and contaminants in a vacuum unit. Do not create dust during the abrasive blasting operation that will obstruct the view of motorists in adjacent roadways. Store, handle, and dispose of blast media and contaminants in accordance with all applicable local, state, and federal requirements.

(H) Protect vehicular, boat, and pedestrian traffic from rebound, dust, overspray, and construction activities. Provide appropriate shielding, as required and/or directed by the Engineer. Damage that occurs due to the Design-Build Team's operations shall be the responsibility of the Design-Build Team.

(I) Application of penetrant sealants by spray methods will not be permitted during windy conditions, if in the opinion of the Engineer, unsatisfactory results will be obtained. Other application methods or rescheduling will be required.

(J) Clean and/or repair all damage or defacement resulting from Design-Build Team's operations to the Engineer's satisfaction at no additional cost to the Department.

(K) The equipment used for penetrant sealer application must be clean of foreign materials and approved by the Engineer before use.

(L) The surface, air, and material temperatures shall be between 40°F and 90°F during application.

(M) Apply concrete penetrant sealer during the lowest temperature period of the day, typically between 1:00 a.m. and 9:00 a.m., when the cracks are open to the greatest extent.

(N) Protect prepared surfaces from precipitation and heavy dew during and after the application of the sealer.

(O) Conduct the work in a continuous operation, with the concrete penetrant sealer application as soon as practical following surface preparation.

(P) Clean up, dispose of any surplus material, and restore any disturbed areas unless otherwise directed.

(Q) Work crews should wear appropriate personal protection equipment and follow manufacturers' recommendations when applying penetrant sealers. Refer to the SDS and all applicable local, state, and federal laws, and rules and regulations of authorities having jurisdiction over the project, for specific guidance for personal and environmental protection and safety requirements.

(1) Alkylalkoxysilane (Silane) Penetrant Sealers

The following are limitations specific to Alkylalkoxysilane (Silane) Penetrant Sealers:

(a) The surface to receive silane penetrant sealer shall be dry for at least 48 hours before treatment and shall be free from sand, surface dust and dirt, oil, grease, chemical films, and other contaminants prior to application of the deck sealant.

(b) Do not apply silane materials during cold, hot, or wet weather conditions or when adverse weather conditions are forecast within 12 hours of the completion of the silane application. Correct any coating damaged by rain or moisture by an additional application or as required by the silane manufacturer.

(c) 100% Silane is a combustible liquid; take appropriate precautions during handling, storage, and operations. KEEP AWAY FROM OPEN FLAME.

(2) Soy Methyl Ester with Polystyrene (SME-PS) Concrete Penetrant Sealer

The following are limitations specific to Soy Methyl Ester with Polystyrene (SME-PS) Concrete Penetrant Sealers:

(a) The surface to receive SME-PS concrete penetrant sealer shall be dry for 24 hours prior to application of sealant.

(b) Do not apply SME-PS penetrant sealer when the temperature is below the dew point, when winds are 15 mph or more, when sealant drifts from the intended application site, during rainfall, or when water spray or mist is present. If rainfall occurs within 6 hours of application, a second application shall be repeated in areas after rainfall has ended and surfaces are dry.

(c) Do not apply SME-PS penetrant sealer if the concrete surface to receive treatment has previously been treated with sealer material or has been painted.

BRIDGE DECK AND APPROACH SLAB RIDEABILITY (IRI)

(7-22-26)

GENERAL

The Design Build Team shall perform all work necessary to achieve the required bridge deck rideability and surface texture, including smoothness acceptance testing and diamond grinding where required by the RFP. Provide a surface finish in accordance with Article 420-14(B) of the Standard Specifications, except that bridge decks designated for diamond grinding shall be diamond ground in accordance with this provision in lieu of the transverse grooving requirements of Article 420-14(B). When required, perform smoothness acceptance testing after completion of diamond grinding.

TESTING Requirements

Perform smoothness acceptance testing using an Inertial Profiler of the longitudinal profile of the finished bridge deck and approach slabs in the presence of the Engineer. Submit a proposed plan of action and schedule for profiler testing to the Engineer.

Prior to smoothness testing, placement of the bridge deck, approach slabs, joints, and barrier rail within the section to be tested shall be complete. Remove all obstructions from the bridge deck

and sweep the surface clean of debris prior to profiler testing. Surface openings may be excluded in the IRI measurement by masking with dark non-reflective tape.

The Inertial Profiler shall be calibrated and verified in accordance with the most current version of AASHTO M 328. Provide certification documentation that the profiler meets AASHTO M 328 to the Engineer before the first day the Inertial Profiler is used on the project.

Configure the profiler to record the actual elevation of the pavement surface. Do not use the profiler's internal IRI calculation mode. The profile data shall be filtered with a 300 feet Butterworth high-pass filter. The interval at which relative profile elevations are reported shall be a maximum of one inch.

Provide IRI data in accordance with the most current version of ASTM E1926. Provide the user selected Inertial Profiler settings to the Engineer for the project records.

Use personnel trained to record and evaluate IRI data. Provide an Inertial Profiler Operator that has been certified by the Department's Profiler and Operator Certification Program as administered by the Materials and Tests Unit.

In the presence of the Engineer, at the beginning of each day's data collection, perform a block test to verify the Inertial Profiler's ability to accurately collect elevation data is met and perform a bounce test to verify that the Inertial Profiler's accelerometers are performing correctly.

Operate the Inertial Profiler in the direction of the final traffic pattern. Collect IRI data from both wheel paths during the same run. Define a "wheel path" as three feet from the edge of the travel lane. MRI values are the average of the IRI values from both wheel paths. When using an inertial profiler that collects a single trace per pass, take care to ensure that the measurements from each trace in a travel lane start and stop at the same longitudinal locations. Unless otherwise specified, multiple runs are not necessary for data collection.

To ensure accurate locating of MRI and Localized Roughness on the report and project, employ the automatic triggering method at all times unless impractical. A tape stripe or traffic cone wrapped with reflective material may be used to alert the profiler's automatic triggering sensor to begin data collection. Use the profiler's built-in event markers or other means to accurately locate and annotate joints during data collection. The profiler should reach operating speed before entering the test section. The run-up and run-out distances should be sufficient to obtain operating speed and to slow down after testing is completed. Operate the profiler at any speed as per the manufacturer's recommendations, however, the speed must be constant to within ± three MPH of the intended speed and any required acceleration should be as gradual as possible.

The evaluation of the profiles will be performed on a section basis. A section is 0.05 mile (264.0 feet) of a single travel lane. After testing, transfer the electronic profile data from the profiler's portable computer hard drive to a USB flash drive or media approved by the Engineer. Submit electronic data on the approved media to the Engineer, labeled with the Project number, Contract number, Route, Bridge number, County, date of run(s), and termini of the profile data. This media will not be returned to the Design-Build Team.

Use testing and recording software to produce electronic inertial road profiles in a format compatible with the latest version of FHWA's ProVAL (Profile Viewing and Analysis) software. Use the most current version of ProVAL to determine the MRI and areas of Localized Roughness of both wheel paths for every lane that is to be collected and analyzed. Perform smoothness tests on the finished surface of the completed project or at the completion of a major stage of construction as approved by the Engineer. Coordinate with and receive authorization from the Engineer before starting smoothness testing. Perform smoothness tests within seven days after receiving authorization and submit raw data results to the Engineer within 24 hours of data collection. Any testing performed without the Engineer's presence, unless otherwise authorized, may be ordered retested at the Design-Build Team's expense.

Submit an evaluation for each section to the Engineer within ten days after completion of the smoothness testing. Submit the electronic files compatible with ProVAL and the evaluation in tabular form with each 0.05-mile segment occupying a row. Include each row with the beginning and ending station for the section, the length of the section, the IRI values from each wheel path, and the MRI value for the section. Each continuous run for a section will occupy a separate table and each table will have a header that includes the following: the project contract number, county, the roadway number or designation, a lane designation, bridge number, the dates of the smoothness runs, and the beginning and ending station of the continuous run. Summarize each table at the bottom. The signature of the Operator shall be included with the submitted IRI trace and electronic files.

If necessary, traffic control and all associated activities included in the smoothness testing of the bridge deck surface will be the responsibility of the Design-Build Team.

IRI and MRI numbers in inches per mile will be established for each 0.05-mile section (264.0 feet) for each travel lane of the bridge deck.

The following table provides the acceptance quality rating scale of the bridge deck and approach slabs, based on the final rideability determination.

MRI after Completion [Inches Per Mile]	**Acceptance Per Travel Lane (0.05-mile section)**
Less than or equal to 120.0	Acceptable
Greater than 120.0	Corrective Work Required

Localized Roughness:

Report local IRI values for each wheel path using IRI measurements and a 25-foot sliding baseline. Report areas of localized roughness for each wheel path. Areas of localized roughness are defined as being one of the following two types:

Type 1: Area having a local IRI value greater than 180 in/mile based on a 25-foot analysis segment not containing a bridge expansion joint.

Type 2: Area having a local IRI value greater than 250 in/mile based on a 25-foot analysis segment containing a bridge expansion joint.

Diamond Grinding Requirements:

When bridge deck diamond grinding is required by the RFP or included in an accepted Corrective Action Plan, perform work in accordance with this section. Prior to beginning any diamond grinding operations, schedule a pre-grinding meeting with the Engineer. The Design-Build Team and grinding subcontractor shall attend.

For bridge decks designated in the RFP for diamond grinding, perform an initial full-width diamond grinding of all travel lanes and shoulders after installation of the bridge deck joints and prior to smoothness acceptance testing.

Submit grinding equipment specifications to the Engineer for approval before any grinding is performed. Use a grinding machine with diamond tipped saw blades gang mounted on a power driven self-propelled machine capable of removing a minimum of three feet of width with each pass. Multiple passes may be needed to achieve the required depth of removal. Completely lap adjacent passes with no unground surface remaining between passes and no overlap of more than 1½ inches. Adjacent passes shall be within ⅛ inch of the same elevation as measured with a three-foot straightedge. Hand grinding may be required to remove vertical steps between passes.

The ground surface shall consist of between 50 and 60 evenly spaced grooves per foot (305 mm) of width. The grooves shall be between 0.09” (2.3 mm) and 0.15” (3.8 mm) in width and 0.0625” (1.6 mm) in depth. The area between the grooves shall be between 0.06” (1.5 mm) and 0.13” (3.3 mm) in width. The final concrete texture shall be uniform.

Construct and operate the grinding machine such that it will not cause strain or damage to the deck surface, excessive ravels, aggregate fractures, spalls, or disturbance of transverse joints. Should any of the above problems occur, immediately suspend operations. Do not perform diamond grinding within 1.5 feet of a steel armored expansion joint system. Perform longitudinal grinding parallel to the roadway centerline.

Continuously remove all slurry or other debris resulting from the grinding operations by vacuum pick up or other approved methods. Prevent the slurry from flowing into floor drains, onto the ground or into the body of water under the bridge. Dispose of all residues in accordance with the project permits, applicable local and federal laws, and as approved by the Engineer.
Limit the cumulative depth of all diamond grinding such that the final reinforcement cover is not less than the plan cover minus ½ inch (12 mm). If additional diamond grinding required to achieve the specified rideability would reduce the reinforcement cover below this limit, discontinue grinding and notify the Engineer. Perform additional corrective work as directed by the Engineer.

Corrective Action Plan:

For areas of localized roughness and non-conforming segment roughness, submit a proposed corrective action plan to the Engineer for review. Include proposed repair locations, limits, and

procedures. Repair procedures may include additional diamond grinding, full or partial deck replacement, joint replacement, or other methods approved by the Engineer. Diamond grinding may not be permitted where it would be detrimental to the structure or ride quality. In order to produce a uniform cross section, the Engineer may require correction to the adjoining traffic lanes or shoulders. Do not begin corrective action until submittal acceptance by the Engineer. Notify the Engineer 5 days prior to commencement of the corrective action.

When additional diamond grinding is proposed as the corrective measure, perform the work in accordance with the diamond grinding requirements of this provision.

Following repair, repeat surface testing and submit IRI and MRI measurements to verify segment MRI is 120 in/mile or less and wheel paths no longer contain areas of localized roughness as defined herein.

DYNAMIC TRAVELER INFORMATION SYSTEM

(09/28/2026)

Description

Provide, install, relocate, operate, maintain, and remove an automated, stand-alone, real-time Dynamic Traveler Information System meeting the requirements noted herein, for the duration of the project.

A Dynamic Traveler Information System is a group of devices that work together using software to automatically detect traffic conditions and respond using preprogrammed response algorithms. The purpose of this system is to provide advance notification to motorists of traffic delays and queues in advance of long-term work zones in order to reduce the likelihood of high-speed crashes.

The Dynamic Traveler Information System shall detect the presence of slow/stopped traffic queues that develop in the work zone and display travel times or slowed/stopped traffic messages to the integrated message boards.

Materials and System Operational Requirements

A. General

These specifications cover the general operational requirements for the Dynamic Traveler Information System. The Dynamic Traveler Information System devices shall be approximately positioned along US-1 North as follows:

- One sensor every mile starting just before NC-55 interchange and ending just after Walnut Street interchange (8 total)
- One PCMS starting 1 mile before NC-55 interchange and additional PCMSs located between the next four interchanges up to the Cary Parkway interchange (4 total). Final PCMSs locations shall be reviewed and approved by the Work Zone Traffic Control Unit and the Traffic Systems Operations Group.

Provide physical and electronic/software protections for all components of the system and processes pertaining thereto prevent access by unauthorized parties.

Provide the following for this project:

- Customized website integrated with each Dynamic Traveler Information System for NCDOT and project partners.
- Traffic Management Software capable of analyzing data and accurately supplying the indicated information.

Provide the following equipment for the Dynamic Traveler Information System:

- 8 Traffic Speed Sensors capable of detecting traffic in all lanes of US-1 North
- 4 Portable Changeable Message Signs used exclusively for the Dynamic Traveler Information System.
- Communication equipment for all above devices to include all components and communication methods necessary to allow each device to send and receive data to and from the website and Traffic Management Software.

B. Documentation

Provide a set of complete specifications and literature on the selected Dynamic Traveler Information System. Address all the requirements of the Contract Documents in the submittal. Provide documents for each device containing all information necessary to determine product specification compliance. Provide the detailed security plan and protocol used to protect data and communications of the Dynamic Traveler Information System to the Department for approval at least 10 days prior to the delivery of the Dynamic Traveler Information System. This plan includes physical locking mechanisms where the locks are unique for this Dynamic Traveler Information System (a key to be provided to NCDOT), password handling techniques, and limited static IPs for remote access to equipment.

C. Power Source

Provide power for devices for continuous operation, as defined in the section Malfunctions, Maintenance, and Inspection below. All utility hookups, solar panels, batteries and other power sources are incidental.

D. Installation

Locate and aim the devices to ensure data accuracy. Coordinate installation locations and details with the Department prior to installation.

E. Traffic Sensors

Provide sensors to withstand, without deterioration, inclement weather and visibility conditions including sunlight, light precipitation, temperature, light, fog, darkness, excessive dust and road debris.

Provide sensors which:

- Collect and report individual vehicle data;
- Collect and report data on a per lane basis;
- Collect speed, volume, and lane occupancy data, for the required direction(s) of traffic; and

- Communicate data to the Traffic Management Software at least once per minute.

Install and maintain sensors to continuously detect all public traffic on US-1 North. Configure sensors to allow active and inactive collection zones, so that construction traffic is differentiated from public traffic. At a minimum, detect speed, volume, and occupancy levels in each lane, each minute. Summarize data in 5 minute bins for data storage and transfer. Do not block or shield critical locations from the sensor. Test each sensor and re-test as needed to confirm the accuracy of the data reported.

Collect and report data to the Traffic Management Software which meets the following requirements at any given time during testing and operation:

- Per direction volume accuracy: greater than 90%;
- Per lane volume accuracy: greater than 90%; and
- Per direction average speed accuracy: greater than 90%.

F. Portable Changeable Message Signs (PCMS)

Provide and maintain continuous full matrix Portable Changeable Message Signs (PCMS) capable of displaying the travel time and/or slow/stopped traffic advisories to motorists. The PCMS shall be fully compliant with the Connected Changeable Messgae Sign special provision included in this RFP. Provide PCMS that meet or exceed the material and functional requirements as described in the Contract Documents. The PCMS shall be capable of communicating wirelessly with and being controlled by the Traffic Management Software. Provide signs which display messages and log the date, time and text of the messages when being controlled by the Traffic Management Software. PCMS messages shall be in compliance with the MUTCD.

No more than 1 pixel illumination failure on the board shall be allowed at any given time during testing and operation. Continuously monitor PCMS status. Include in the monitoring procedure an evaluation of power levels, communication connections, and the number of unlit pixels. Also, use a human observer periodically to document that the correct message is displayed with the correct date and time.

G. Traffic Management Software (Software)

The software has two main functions: Queue Warning and Travel Time notification. Use software that meets or exceeds the following requirements for each function:

Queue Warning

The intent of the Queue Warning function is to detect traffic congestion and queue formation and notify approaching drivers of the conditions. Queue Warning is the most critical function of the system. Continuously monitor traffic and report the required operational characteristics to the software each minute. Use a combination of real-time speed and percent lane occupancy information reported by traffic sensors, compared with configurable thresholds, to initiate a slow or stopped traffic message. Message examples include “SLOW TRAFFIC AHEAD/REDUCE SPEED AHEAD,” and “STOPPED TRAFFIC AHEAD/PREPARE TO STOP,” Configure Queue Warning messages to override all other messages on a PCMS. Send communication to project personnel when traffic conditions violate predetermined thresholds.

Data collected by the Dynamic Traveler Information System will be owned by NCDOT and must be in a file format compatible with the STOC's operating platform.

Include human observation in the monitoring procedure to document posted messages and times during an actual event. Compare those messages with the information available from the software. Complete software monitoring as needed and when requested by the Department.

Travel Time Notification

The intent of the travel time function is to detect when no queues are present and notify approaching drivers of the travel times through the work zone. Travel time notification is the secondary function and serves as the default function when Queue Warning is inactive

Include human observation in the monitoring procedure to document posted messages when a Queue Warning event is not occurring.

Reporting and Operational Requirements

Communicate with and/or control all of the devices belonging to the Dynamic Traveler Information System. Poll the sensors and PCMS a minimum of once per minute, and update the PCMS with new messaging no more frequently than once every three minutes, and not less than once every six minutes. Collect from each device, as applicable, and store in configurable bins the following data: device name and location, 50th percentile and 85th percentile speeds, volume, lane occupancy, message sign history, as well as battery status and communication status. Make historical data available to NCDOT staff at all times for the duration of work zone activity. Provide an electronic copy of all data, including date and duration of system malfunctions, to NCDOT staff after all work zone activity is completed and the Dynamic Traveler Information System has been removed.

H. Website

The purpose of the website is to be a real time traffic operations dashboard showing current traffic conditions, real time speeds, and posted messages to the nearest minute. Display a full color map of the project area, using Google Maps or equivalent, which shows roadways impacted by project activities and for which data is being collected. Display current average speed at each traffic sensor for which data is available. Display a representation of each device in its approximate location, relative to the roadway and other nearby features, and indicate the operational status of each device. Display the messages posted on the message signs. Refresh information at least once per minute. In the event devices are moved to a new location in the field, automatically reflect these changes to the system layout on the website.

I. Traffic Control Devices

Provide traffic control devices as needed to set up, operate, maintain and tear down Dynamic Traveler Information System as shown in the Contract Documents. Coordinate device placement with other Contractors as needed to meet or exceed placement requirements in the Contract Documents.

J. Malfunctions, Maintenance, and Inspection

Operate the Dynamic Traveler Information System, including all components listed above, continuously (24 hours per day, 7 days per week) when deployed on the project, until project completion.

Continuously operate the Dynamic Traveler Information System with no major malfunctions throughout the entire contract. Malfunctions include, but are not limited to; the inability of the equipment to provide accurate, real-time traffic data, inability of the equipment to determine lane closure status from connected lane closure devices; inability to withstand a construction roadside environment or normal weather conditions; or interference from construction equipment. Monitor and inspect equipment and data, and on a regular basis to avoid malfunctions. Upon discovery or notification of malfunction, make all necessary corrections to the components of the system such that system malfunctions are corrected within a 24-hour period through repair or replacement of the equipment. Components include sensors, message signs, communications equipment and all hardware and software required to place the real time information on the devices to operate according to Contract Documents.

It is the responsibility of the Design-Build Team to detect data malfunctions. Monitor, inspect, and maintain sensors so that malfunctions in data collection can be detected as soon as possible. Causes of malfunction may include high winds, shifting earth beneath or around the device, or interference by construction equipment/activities. Monitoring, at a minimum, includes evaluation and documentation of power levels, communication connections, and accuracy of data provided to the Traffic Management Software. Monitoring data accuracy may include re-calibration and aiming of the device or retesting accuracy using human observers. Monitor as needed and when requested by the Department.

K. Complete and Operational System

Direct and indirect costs associated with operating the Dynamic Traveler Information System are incidental and may include FCC licensing, cellular communication, wireless data networks, satellite and internet subscription charges, solar power system support and battery charging and maintenance.

Construction Methods

A. System Manager

Provide one person, available 24 hours per day, as the System Manager for the Dynamic Traveler Information System. Provide this person's 24-hour contact information to the Department. Provide a system manager who is locally available to supervise, monitor, and maintain the system components including the website, relocate devices as necessary, and respond to emergencies.

B. Dynamic Traveler Information System Deployment

Deliver all of the required devices to the place and time designated by the Department and confirm they are in good condition and in working order. Each PCMS shall be in like-new condition when delivered to the project site. Coordinate with the Department to determine final sensor locations,

then deploy and install sensors. Complete stand-alone tests, system operational tests, final deployment, and system initiation prior to impacting traffic.

Stand-alone Testing
Conduct stand-alone tests of each device. Test sensors from their installed locations. PCMS may be tested in other locations. Turn all PCMS away from traffic during testing.

Complete a stand-alone test for each PCMS prior to installation, and to verify that the unit operates as specified. Include in the stand-alone test procedure tests for the following functions:

- Turning the sign on and off;
- Displaying and removing a test message;
- Counting pixels not illuminated (no more than 1 malfunctioning pixel);
- Checking message logs for accuracy; and
- Measuring sign legibility and visibility.

If a unit fails to pass the stand-alone test, repair or replace the unit, and repeat the test until successful.

System Operational Testing
Provide a System Operational Testing Plan to the Department for approval, at least 7 days prior to beginning testing. The Plan shall detail a five-day operational test procedure of the System Operational Requirements. Include in the plan procedures operation of the software using real time information from sensors already tested and installed and tested signs located in an off-project location. Begin testing 14 days prior to implementation to verify the system operates in a fully functional manner and as described. After the system is tested and approved for use on the project, collect baseline traffic data for a minimum of 10 days prior to any modification to traffic operations.

Provide complete operations support from the Software supplier during the operational test, if applicable. Provide verification that the reported drive times, speeds, and volumes through the work zone accurately reflect actual field conditions. Use a human observer to monitor and document the posted messages. Post test messages two times per day during the test period to verify functionality and communications and verification that proper messages are being posted to the PCMS. If any equipment malfunctions occur for a combined period of two hours or more during the operational test on any day, restart the five-day test and no credit will be given for that day of the operational test period.

The Design-Build Team shall be responsible for replacing all defective equipment at no additional cost to the Department.

Indicate the date and time of any activity necessary to maintain operation of the Dynamic Traveler Information System during the operational test period. Include in each entry, at a minimum, the following information:

- A description of the malfunction;
- Identity of the malfunctioning equipment;
- Cause of equipment malfunction (if known);

- A description of the type of work performed; and
- Time and date of repair completion.

Once the operational test report is received and approved by the Department, the Dynamic Traveler Information System will be considered operational, and the system will be accepted for use.

GENERAL

The State will not be bound by oral explanations or instructions given at any time during the bidding process or after award. Only information that is received in response to this RFP will be evaluated; reference to information previously submitted will not suffice as a response to this solicitation.

NO CONTACT CLAUSE

To ensure that information is distributed equitably to all short-listed Design-Build Teams, all questions and requests for information shall be directed to the State Contract Officer through the Design-Build e-mail address. This precludes any Design-Build Team member, or representative, from contacting representatives of the Department, other State Agencies or Federal Agencies either by phone, e-mail or in person concerning the Design-Build Project.

USE OF TERMS

Throughout this RFP and all manuals, documents and standards referred to in the RFP the terms Contractor, Bidder, Design-Builder, Design-Build Team, Team, Firm, Company and Proposer are synonymous.

Throughout this RFP and all manuals, documents and standards referred to in the RFP, the terms NCDOT, Department, Engineer and State are synonymous.

Throughout this RFP and all documents referred to in the RFP, references to the Technical Proposal include all Technical Proposal supplemental information that may be submitted in response to a Best and Final Offer RFP.

DESIGN REFERENCES

Design references developed and published by NCDOT and those developed and published by other agencies and adopted for use by NCDOT which are to be used in the design of this project may be obtained by contacting the Contract Standards and Development Unit within the Field Support Division. Standard prices for materials, which the Department normally sells for a fee, will be in effect. The Design-Build Team shall be responsible for designing in accordance with the applicable documents and current revisions and supplements thereto.

REVIEW OF SUBMITTALS

Major design milestones and required design submittals shall be identified as activities on a CPM, bar chart or other scheduling tool. This schedule shall be submitted to the Alternative Delivery Unit and Resident Engineer concurrently with the first design submittal, or within 30 days of the contract award, whichever is earlier. The schedule shall be revised and resubmitted as design milestones change or as directed by the Alternative Delivery Unit. Unless stipulated otherwise in the Scope of Work, submittals will be reviewed within the timeframe the Design-Build Team indicates on the design submittal or ten working days (15 days for temporary structures, overhead sign assemblies, MSE walls, FEMA compliance documents, curved steel girder working drawings and temporary shoring), whichever is greater. All review timeframes, including but not limited to

the aforementioned ten-day and 15-day review timeframes, shall begin on the first working day after the Department receives the submittal, regardless of the time the submittal is received. All submittals shall be prepared and submitted in accordance with the *Alternative Delivery Submittal Guidelines*, which by reference are incorporated and made a part of this contract. All submittals shall be made simultaneously to the Alternative Delivery Unit and the Resident Engineer. The Department will not accept subsequent submittals until prior submittal reviews have been completed for that item. The Design-Build Team shall prioritize multiple submittals that are submitted concurrently. All submittals shall include pertinent Special Provisions. No work shall be performed prior to the Department's review and acceptance of the design submittals.

For all design disciplines, the Design-Build Team shall inform the Alternative Delivery Unit, in writing, of all proposed changes / revisions to the NCDOT preliminary design, the Design-Build Team's Technical Proposal and / or previously reviewed / accepted submittals, including but not limited to changes / revisions to RFC Plans, and obtain approval prior to incorporation. Failure to provide the aforementioned written notification of changes with the appropriate design submittal could result in the Department 1) suspending the design submittal until documentation is provided and extending the contractual design submittal review timeframe by an amount of time equal to the time it takes for the Department to receive the required documentation, or 2) returning the unreviewed design submittal to the Design-Build Team and requiring a resubmittal. Unless noted otherwise elsewhere in this RFP, all proposed design changes / revisions shall be subject to the Department's review and acceptance, including but not limited to changes to RFC Plans.

OVERVIEW

The Design-Build Project I-5701 / I-5703 adds lanes on I-40 from the I-440 / US 1 / US 64 interchange to Lake Wheeler Road (SR 1009) and reconstructs the existing interchange of I-40 with I-440 / US-1 / US-64 within the City of Raleigh and the Town of Cary in Wake County. The project is approximately 4.9-miles and provides an eight-lane divided facility along I-40.

Project services shall include, but are not limited to:

- **Design Services** - completion of construction plans
- **Construction Services** - necessary to build and ensure workmanship of the designed facility
- **Intelligent Transportation System -** design and construction of ITS components, including CCTV cameras, dynamic message signs (DMS), fiber-optic communications cable and conduit, and ITS integration
- **Permit Preparation / Application** - development of all documents for required permits
- **Right of Way** - acquisition of right of way necessary to construct project
- **As-Constructed Drawings**
- **As-Built Plans**

****NOTE**** Deleted bullet stating Division would develop as-constructed drawings

Construction Engineering Inspection will be provided by the NCDOT Division personnel or will be performed under a separate contract.

The following project planning documents have been completed:

- The I-5701 Categorical Exclusion (CE) was approved on January 19, 2024.
- The I-5703 Categorical Exclusion (CE) was approved on January 19, 2024.

GENERAL SCOPE

The scope of work for this project includes design, construction and management of the project. The design widens approximately 4.9 miles of I-40 and reconstructs the existing interchange of I-40 with I-440 / US-1 / US-64. Unless allowed otherwise elsewhere in this RFP, the designs shall meet all appropriate latest versions of AASHTO *Policy on Geometric Design of Highways and Streets*, AASHTO *LRFD Bridge Design Specifications, Manual of Uniform Traffic Control Devices* and all NCDOT design policies that are current as of the Technical Proposal submittal date or the Best and Final Offer submittal date, whichever is later.

Unless noted otherwise elsewhere in this RFP, all documents referenced herein shall be the edition / version, including all interim revisions, effective on the Technical Proposal submittal date or the Best and Final Offer submittal date, whichever is later.

Construction shall include, but not be limited to, all necessary clearing, grading, roadway, drainage, structures, utility coordination and relocation, and erosion and sediment control work items for the proposed four-lane facility and installation of the control of access fence. Construction engineering and management shall be the responsibility of the Design-Build Team. Construction shall comply with 2024 NCDOT *Standard Specifications for Roads and Structures* and any special provisions.

Areas of work required for this project shall include, but are not limited to the following items:

Roadway Design
Structure Design
Permit Application / Modification
Hydraulic Design
Geotechnical Engineering
GeoEnvironmental
Subgrade Stabilization
Foundation Design for Structures and Roadway
Erosion and Sedimentation Control Design and Implementation
Transportation Management Plan Design and Implementation
Pavement Marking Design
Intelligent Transportation Systems (ITS) Design
Sign Design
Traffic Signals and Signal Communications
Construction
Project Management
Design and Construction Management
Lighting (Construction Only)
Utility Construction
R/W Utilities, Conflicts and / or Construction

Construction Surveying
Location and Surveys
Right of Way Acquisition
Public Involvement and Information

All post award designs shall be in Bentley Open Roads Designer (ORD).

DESIGN AND CONSTRUCTION PERFORMED BY DESIGN-BUILD TEAM

The design work consists of the preparation of all construction documents to widen approximately 4.9 miles of I-40 and reconstruct the existing interchange of I-40 with I-440 / US-1 / US-64. as outlined in the Scope of Work section of this RFP. The Design-Build Team shall prepare final designs, construction drawings and special provisions.

Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall acknowledge that project documents furnished by the Department are preliminary and provided solely to assist the Design-Build Team in the development of the project design. The Design-Build Team shall be fully and totally responsible for the accuracy and completeness of all work performed under this contract and shall save the State harmless and shall be fully liable for any additional costs and all claims against the State which may arise due to errors, omissions and negligence of the Design-Build Team in performing the work required by this contract.

There shall be no assignment, subletting or transfer of the interest of the Design-Build Team in any of the work covered by the Contract without the written consent of the State, except that the Design-Build Team may, with prior written notification of such action to the State, sublet property searches and related services without further approval of the State.

The Design-Build Team shall certify all plans, specifications, estimates and engineering data furnished by the Design-Build Team.

All work by the Design-Build Team shall be performed in a manner satisfactory to the State and in accordance with the established customs, practices, and procedures of the North Carolina Department of Transportation, and in conformity with the standards adopted by the American Association of State Highway Transportation Officials, and approved by the U.S. Secretary of Transportation as provided in Title 23, U.S. Code, Section 109 (b). The decision of the Engineer / State / Department shall control in all questions regarding location, type of design, dimension of design, and similar questions.

The Design-Build Team shall be solely responsible for all design and construction methods adhering to all requirements herein, as well as all applicable guidelines, standards and polices. If the applicable guidelines, standards and / or policies have desirable and / or minimum values, the Design-Build Team shall use the desirable values unless noted otherwise elsewhere in this RFP. Similarly, in the event of conflicting design parameters in the requirements herein and / or the applicable guidelines, standards and polices, the proposed design shall adhere to the most conservative values. The Department’s acceptance of plans, reports, calculations, analyses, etc. shall not relieve the Design-Build Team of any and all obligations to design and construct the project in accordance with the RFP requirements and all applicable guidelines, standards and policies.

Alternate designs, details and / or construction practices (such as those employed by other states, but not standard practice in NC) are subject to Department review and approval, and will be evaluated on a case by case basis.

The Design-Build Team shall not change team members, subconsultants or subcontractors identified in the Statement of Qualifications (SOQ) or Technical Proposal without written consent of the Engineer or the State Contract Officer. In addition, subconsultants and subcontractors not identified in the SOQ or Technical Proposal shall not perform any work without written consent by the Engineer. Individual offices of the Design-Build Team not identified in the SOQ or the Technical Proposal submitted shall not perform any work without written consent by the Engineer. Failure to comply with this requirement may be justification for removing the Team from further consideration for this project and disqualification from submitting on future Design-Build Projects.

All firms shall be prequalified by the Department for the work they are to perform. Joint Ventures, LLCs or any legal structure that are different than the existing prequalification status must be prequalified prior to the Price Proposal submittal deadline. Subcontractors need only be prequalified prior to performing the work. Design firms should be prequalified prior to the Technical Proposal submittal deadline. If not prequalified at the time of the Technical Proposal submittal deadline, the prime contractor shall be solely responsible for either (1) ensuring that the design firm is prequalified prior to its first design submittal or (2) replacing that firm with a prequalified firm.

ACCESS TO PROVIDED MATERIALS

To facilitate distribution of documents that may be helpful to the Design-Build Teams in their development of a Technical and Price Proposal and subsequent designs, project material will be made accessible through a secure web portal. Access to the web portal will be given to each short-listed prime contractor and lead design firm. No distribution of Provided Materials will be possible prior to the Department announcing the short-listed Design-Build Teams and establishing the access privileges.

Access privileges will only be given to the individuals listed in the prime contractor's and lead design firm's Active Directory Group. It shall be solely the prime contractor's and lead design firm's responsibility to maintain their Active Directory Group. Once access has been established, individuals may enter the "Connect" site and login with their NCID account. Once logged in, the Teamsite "I-5701 & I-5703" link will be apparent on the left side of the webpage.

Please note that all material provided, including the material provided through this portal, is provided for informational purposes only and is provided solely to assist the Design-Build Team in the development of the project design unless noted otherwise elsewhere in this RFP. By submitting a Technical Proposal and Price Proposal, the Design-Build Team acknowledges that they are fully and totally responsible for the project design, including the use of portions of the Department design, modification of such design, or other designs as may be submitted by the Design-Build Team, unless noted otherwise elsewhere in this RFP. The Design-Build Team further acknowledges that they are fully and totally responsible for the accuracy and completeness of all work performed, including the determination of the accuracy of the information provided through this portal, and to the extent that the Design-Build Team chooses to rely on such information.

ELECTRONIC PLAN SUBMITTALS AND E-SIGNATURES

The Design-Build Team shall submit all Release for Construction Plans in accordance with the NCDOT e-Signature requirements, including but not limited to providing signed and sealed searchable .pdf files. Reference the website noted below for additional information:

https://connect.ncdot.gov/business/consultants/Pages/Guidelines-Forms.aspx

ETHICS POLICY

Employees employed by the Design-Build Team or employees employed by any subconsultant for the Design-Build Team to provide services for this project shall comply with the Department's Ethics Policy. Failure to comply with the Ethics Policy will result in the employee's removal from the project and may result in removal of the Company from the Department's appropriate prequalified list.

APPROVAL OF PERSONNEL

The Department will have the right to approve or reject any personnel, assigned to a project by the Design-Build Team.

In the event of engagement of a former employee of the Department, the Design-Build Team and their subcontractors shall restrict such person or persons from working on any Design-Build procurement / project in which the person or persons were "formerly involved" while employed by the State. The restriction period shall be for the duration of the Design-Build procurement / project with which the person was involved. *Former Involvement* shall be defined as active participation in any of the following activities:

- Developing the Request for Proposals / Design-Build contract, including any Supplemental Agreements
- Selecting or evaluating the Design-Build Team, including evaluating any document submitted by a Design-Build proposer
- Developing or negotiating the contract / Supplemental Agreement cost, including calculating manhours or fees
- Administering the Design-Build contract

An exception to these terms may be granted when recommended by the Secretary and approved by the Board of Transportation.

The Design-Build Team and their subconsultants / subcontractors shall restrict all personnel embedded within the Department, including but not limited to Design Units and Divisions, from working on any Design-Build procurement / project. Except as allowed otherwise below, the Design-Build Team shall provide a list of all embedded personnel to the Department and a signed Confidentiality Agreement for each embedded employee, as well as their employer and NCDOT Unit Manager. If the Design-Build Team has previously provided a signed Confidentiality Agreement for an embedded employee who's employer and / or NCDOT Unit Manager have not

changed, the Design-Build Team shall 1) indicate on the aforementioned list when the original Confidentiality Agreement was provided to the Alternative Delivery Unit (date and TIP Project), 2) provide a copy of the original signed Confidentiality Agreement, or 3) provide a new signed Confidentiality Agreement. The Design-Build Team shall submit the aforementioned list and Confidentiality Agreements to Mr. Jon Weathersbee, P.E., State Contract Officer, within ten business days of the issuance of the Industry Draft RFP, and provide updated lists and Confidentiality Agreements, as appropriate, throughout the project procurement / duration.

Failure to comply with the terms stated above in this section may be grounds for termination of this contract and / or not being considered for selection of work on future contracts for a period of one year.

SUBMITTAL OF TECHNICAL AND PRICE PROPOSALS

Technical and / or Price Proposals that do not adhere to all the requirements noted below may be considered non-responsive and may result in the Department not considering the Design-Build Team for award of the contract or reading their Price Proposal publicly. The Department will only evaluate the maximum number of allowable pages noted below. Thus, the Department may 1) reject submissions that exceed the page limitations or 2) remove the page(s) that exceed the page limitations prior to evaluating the submission. The Department will notify the Proposer in writing of the reason(s) for the rejection or the details of the altered submission.

TECHNICAL PROPOSAL

Technical Proposals will be accepted until **3:00 p.m. Local Time on Tuesday, February 23, 2027**, at the office of the State Contract Officer:

Jon Weathersbee, PE
Contract Standards and Development
1020 Birch Ridge Drive
Century Center Complex - Building B
Raleigh, NC 27610

No Technical Proposals will be accepted after the time specified.

TECHNICAL PROPOSAL – Electronic Copy

Volume 1

8 ½-inch by 11-inch
Maximum number of allowable pages shall be 50 pages
Double-spaced
Font size 12 - Within embedded tables, charts, and graphics only, minimal font size 10 is permissible

Volume 2

A copy of the Department's approval letter for each incorporated Formal ATC
Maximum 24-inch by 36-inch fold out sheets shall only be allowed to present interchange plans in the 11-inch by 17-inch plan sheets
Double-spaced

The aforementioned introductory letter to Jon Weathersbee, PE shall include a statement acknowledging that the NCDOT may destroy all Technical Proposals not retained by the Department, **or** a statement that the NCDOT should return all Technical Proposals not retained by the Department.

Project team members, identified in the Statement of Qualifications, shall not be modified in the Technical Proposal without written approval of the Department. Any such request should be sent to the attention of Jon Weathersbee, PE, at the address below:

NCDOT- Contract Standards and Development
Century Center Complex - Building B
1020 Birch Ridge Drive
Raleigh, NC 27610

The electronic copy of the Technical Proposal shall be submitted in a sealed package. The electronic copy 1) shall be in a searchable .pdf format, 2) shall not contain any hyperlinks, 3) shall be scaled to reproduce to the appropriate page format, as defined above, and 4) shall be created by converting the original MicroStation / GeoPak files. The outer wrapping shall clearly indicate the following information:

Technical Proposal - Electronic Copy
Submitted By: (Design-Build Team's Name)
Design-Build Team Address
Contract Number C205177
TIP Number I-5701 / I-5703
Wake County
I-40 from I-440 / US 1 / US 64 to SR 1009 (Lake Wheeler Road) - Widening;
I-40 / I-440 / US 1 / US 64 Interchange Reconstruction

Electronic copies of the Technical Proposals delivered in person shall be delivered to Door B3 of the Century Center Complex - Building B. The delivery person shall call Marsha Sample at (919) 707-6915 or Josh Sellers (919) 707-6908 to accept delivery. If delivered by mail, the sealed package shall be placed in another sealed package that is addressed to the Contract Officer as stated in the Request for Proposals. The outer package shall also bear the statement "Technical Proposal for the Design-Build of State Highway Contract No. C205177"

PRICE PROPOSAL

Price Proposals will be accepted until **3:00 p.m. Local Time on Thursday March 4, 2027**, at the office of the State Contract Officer:

Jon Weathersbee, PE
Contract Standards and Development
1020 Birch Ridge Drive
Century Center Complex - Building B
Raleigh, NC 27610

No Price Proposals will be accepted after the time specified.

Price Proposals shall be submitted in a sealed package. The outer wrapping shall clearly indicate the following information:

Price Proposal
Submitted by (Design-Build Team's Name)
Design-Build Team Address
Contract Number C205177
TIP Number I-5701 / I-5703
Wake County
I-40 from I-440 / US 1 / US 64 to SR 1009 (Lake Wheeler Road) - Widening;
I-40 / I-440 / US 1 / US 64 Interchange Reconstruction

The Price Proposal shall be submitted by returning the Request for Proposals with the item sheets completed, and all required signatures and bonds. Failure to execute the required documents may render the Price Proposal non-responsive. (Reference the Steel Price Adjustment Project Special Provision found elsewhere in this RFP for additional requirements that are concurrent with the Price Proposal submittal)

Price Proposals delivered in person shall be delivered to Door B3 of the Century Center Complex - Building B. The delivery person shall call Marsha Sample at (919) 707-6915 or Josh Sellers (919) 707-6908 to accept delivery. If delivered by mail, the sealed package shall be placed in another sealed package that is addressed to the Contract Officer as stated in the Request for Proposals. The outer package shall also bear the statement "Price Proposal for the Design-Build of State Highway Contract No. C205177".

EVALUATIONS

Decisions based on cost alone will not establish the design standards for the project. Technical Proposals shall address the technical elements of the design and construction of the project. The Technical Review Committee will consider the understanding of the project, the anticipated problems and the solutions to those problems, in addition to other evaluation criteria identified herein.

The Design-Build Team's Technical Proposal shall be developed using narratives, tables, charts, plots, drawings and sketches as appropriate. The purpose of the Technical Proposal is to document the Design-Build Team's understanding of the project, demonstrate the Design-Build Team's capabilities to complete the project, document their selection of appropriate design criteria and state their approach and schedule for completing all design and construction activities.

The review of design plans by the Department is not intended to reflect a reviewer's personal preferences, but rather to ensure that all contract requirements are met, sound engineering judgment is exercised by the Design-Build Team, and that the Design-Build Team adheres to all referenced documents, including but not limited to, design standards, codes, memos and manuals. As such, the Award of the Design-Build contract does not in any way imply that the NCDOT accepts the details of the Technical Proposal submitted by the Design-Build Team.

The Technical Proposal will be evaluated in each of the following major categories:

	EVALUATION FACTORS	POINTS
1.	Design-Build Team	5
2.	Responsiveness to Request for Proposal	30
3.	Schedule and Milestones	25
4.	Innovation / Added Value	10
5.	Maintenance of Traffic and Safety Plan	25
6.	Oral Interview	5

TECHNICAL PROPOSAL EVALUATION CRITERIA

1. Design-Build Team - 5 points

Provide a comprehensive Organizational Chart that identifies the design, quality and construction team members, and the relationships with subconsultants / subcontractors. The Organizational Chart shall identify all firms and personnel changes (additions, substitutions, deletions) to the Design-Build Team since submittal of the Statement of Qualifications.

- Confirm that the key personnel identified in the Statement of Qualifications have not changed and identify all team member additions.
- If different firms and / or offices will develop designs for the project, indicate how the designs will be integrated / consistent.
- Describe the work categories that the Design-Build Team anticipates will be performed by the Design-Build Team's own direct labor force and those categories that will be performed by subcontractors.
- Describe how the Design-Build Team will implement design and construction quality control for this project.
- Describe any significant design and / or construction quality control issues experienced on NCDOT projects in the last five years and how those issues will be addressed for this project
- Describe all project / construction related Notice of Violations (NOVs) received by any team member within the last five years on projects in the United States and the disposition of each listed NOV.

2. Responsiveness to RFP - 30 points

Natural Environmental Responsibility

- Identify efforts to minimize impacts on wetlands, streams, riparian buffers and other environmentally sensitive areas. Describe any temporary impacts and associated minimization approaches.
- Describe the Design-Build Team's understanding of the overall approach to permitting.
- Identify methods of construction in wetlands, streams and riparian buffers.
- Describe the Design-Build Team's approach to Sedimentation and Erosion Control for the project.
- Describe efforts to minimize excavation within the contaminated sites and associated disturbance to underlying soil. If applicable, specify the extent of impacts to properties with contaminated soils, indicating the anticipated contamination excavation limits.

****NOTE**** Deleted bullet to indicate specific construction activities outside jurisdictional resources

- Provide a narrative overview of the Vegetation Management Procedure.

Design Features

- Show plan view of design concepts with key elements noted.
- Identify preliminary horizontal and vertical alignments of all roadway elements.
- Identify the appropriate design criteria for each feature, if not provided herein.
- Identify proposed design exceptions and justify why the design exception is necessary.
- Identify proposed deviations to the preliminary design provided by the Department, not required herein.
- Show mainline typical sections.
- Identify efforts to reduce impacts to the Duke Energy Transmission line. Provide the extent of any impacts and justification.
- Specify the I-440 / US 1 / US 64 pavement Alternate chosen. The pavement Alternate chosen for I-440 / US 1 / US 64 will not be a part of the Technical Proposal evaluation

and the selection thereof will not impact the Technical Scores. **DELETED** reference to pavement design ATCs

- Specify the pavement option chosen for the I-440 / US 1 / US 64 median and outside shoulders, if applicable.
- Specify the base option chosen (ABC or asphalt) for all -Y- Lines, ramps, loops, service roads and roundabouts.
- If applicable, specify where all underlying longitudinal joints will be located and demonstrate how the underlying longitudinal joint location will minimize reflective cracking.
- Indicate how longitudinal joints will be located on a lane line or lane midpoint.
- Identify drainage modifications and designs to be implemented.
- Provide a brief summary of the mainline hydroplaning risk assessment and proposed mitigation.
- Provide a *Box Culverts and Cross Pipes Hydraulic Deficiency Assessment and Proposed Mitigation Table* that contains the box culvert and cross pipe attributes noted in the Hydraulics Scope of Work found elsewhere in this RFP.
- Provide a *Box Culverts and Cross Pipes Hydraulic Assessment Table* that contains the box culvert and cross pipe attributes noted in the Hydraulics Scope of Work found elsewhere in this RFP.
- Identify the months the Department should schedule the interagency hydraulic design review meeting and the interagency permit impacts meeting OR the Concurrence Point 4B Meeting and the Concurrence Point 4C Meeting.
- Discuss the extent and limits of an allowable rise in water elevation in the floodplain(s), identify potentially impacted insurable structures, specify areas anticipated to require additional surveys and estimate the anticipated additional right of way impacts outside the project construction limits.
- Identify all bridge types to be constructed, including any special design features or construction techniques needed.
- Describe how the Design-Build Team will minimize the use of bridge deck joints.
- Identify types of any retaining walls and / or sound barrier walls, if applicable.
- Describe any geotechnical investigations to be performed by the Design-Build Team and note any deviations to NCDOT requirements for subsurface investigations noted in the Geotechnical Engineering Scope of Work found elsewhere in this RFP.
- Identify the approximate location of new permanent ITS devices and when they will be installed and operational in their permanent location.
- Identify any aesthetic considerations not required herein that will be part of the design.
- Describe how utility conflicts will be addressed and any special utility design considerations. Describe how the Design-Build Team's design and construction methods minimize the Department's utility relocation costs.
- Describe how the design will affect the Department's right of way costs.
- Provide a Preliminary Signing Concept Map that includes, at a minimum, all anticipated DMS locations, all proposed overhead sign structure locations, all overhead signs, and all ground mounted Type A and B guide signs.
- Provide a list of projects, including description and similarity to the subject project, for which the PEF developed Signing Plans
- Provide a list of projects, including description and similarity to the subject project, for which the PEF developed Pavement Marking Plans.

- Describe any proposed special materials, designs and / or construction methods, not referenced elsewhere in this RFP, that will reduce long term maintenance costs.

3. Schedule and Milestones - 25 points

- Provide a brief narrative description of the Design-Build Team's proposed plan for performing construction on the project. The description shall include at least the following:

  - Indicate if, and how, the Design-Build Team intends to divide the project into work segments to enable optimum construction performance.
  - Describe the Design-Build Team's plans and procedures to ensure timely deliveries of materials to achieve the project schedule.

- Provide a detailed schedule for the project including both design and construction activities. The schedule shall show the sequence and continuity of operations, as well as the month of delivery of usable segments of the project.
- Indicate the specific construction activities that will occur outside jurisdictional resources prior to obtaining the environmental permits and their anticipated start date.
- Indicate how the Design-Build Team will maintain the project schedule if the right of way acquisition process and / or utility relocations are delayed.
- Identify any self-imposed liquidated damages and associated Intermediate Contract Time(s), if applicable.
- Specify the duration, in days, for ICT #10.
- Specify the duration, in days, for ICT #11.
- Specify the duration, in days, for ICT #12.
- Specify the duration, in days, for ICT #13.
- Specify the duration, in days, for ICT #14.
- Specify the completion date for ICT #15.
- Specify the duration, in days, for ICT #16.
- Specify the duration, in days, for ICT #17.
- The schedule shall also include the Design-Build Team's construction completion date and, if proposed, their substantial completion date. **These dates shall be clearly indicated on the Project Schedule and labeled "Construction Completion Date" and "Substantial Completion Date"**.

4. Innovation / Added Value - 10 points

- Identify any aspects of the design or construction elements that the Design-Build Team considers innovative.
- If applicable, describe design parameters / construction methods that provide added value to the Department.
- Provide a summary of all Alternative Technical Concepts (ATC) submitted, regardless of inclusion or approval status. At a minimum, include innovative and / or added value details associated with each ATC in the aforementioned summary. It is recommended, but not required, that this summary be provided as part of the 11-inch by 17-inch plan sheets.

5. Maintenance of Traffic and Safety Plan - 25 points

Maintenance of Traffic

- Provide a Transportation Management Phasing Concept (TMPC).
- Identify the type of positive median cross-over protection proposed and replacement / resetting requirements.
- Describe any traffic control measures that will be used for each construction phase.
- Describe how traffic will be maintained as appropriate and describe the Design-Build Team's understanding of any time restrictions noted in the RFP.
- Describe the Design-Build Team's approach to site access and material staging.
- Specifically describe how business, school and residential access will be maintained, if applicable.
- Address how hauling will be conducted, including but not limited to, hauling of materials to and from the site and hauling of materials within NCDOT right of way.
- Describe the Design-Build Team's approach to providing the public access to project personnel for inquiries on vehicular and pedestrian traffic impacts.
- If a temporary portable barrier system will be utilized, provide the type and why it is needed.
- If temporary shoring will be required to maintain traffic, provide the type and why it is required.
- Include all proposed road closures, detour routes, durations and justifications.
- Identify the need for a Work Zone Speed Limit Reduction Ordinance.
- Identify the need for a Speeding Penalty Ordinance.
- Address where and how law enforcement officers will be used.
- Identify a Traffic Control Supervisor and briefly describe their qualifications for this role.

****NOTE**** Deleted second bullet addressing hauling

Safety Plan

- Describe the safety considerations specific to the project.
- Describe any proposed improvements that will be made prior to or during construction that will enhance the safety of the work force and / or travelling public both during and after the project construction.

6. Oral Interview - 5 points

- The Design-Build Team's Project Management Team shall present a brief introduction of the project team and design / construction approach.
- Introductory comments shall be held to no more than 30 minutes.
- The Department will use this interview to ask specific questions about the Design-Build Team's Technical Proposal, background, philosophies and project approach.
- Presentation, questions, and answers shall not exceed 90 minutes. No more than ten people from the Design-Build Team may attend.

The Department will use the information presented in the oral interview to assist in the Technical Proposal evaluation, including but not limited to impacting the other evaluation criteria both positively and negatively.

Additional Warranty and / or Guarantee

- **The Extra Credit for this project shall be a Maximum of 5 Points.**

A twelve-month guarantee, as outlined in the *Twelve-Month Guarantee* Project Special Provision found elsewhere in this RFP, is required for this project. However, the Design-Build Team may provide additional warranties and / or guarantees at their discretion. The Design-Build Team may be awarded additional points as "extra credit" to be added to the Technical Score.

The Design-Build Team may provide warranties and / or guarantees for major components of the project. Examples of major components are pavements, bridge components and sign structures. If additional warranties and / or guarantees are offered, the Design-Build Team shall indicate in the Technical Proposal the general terms of the warranties and / or guarantees, a list of the items covered, performance parameters, notification and response parameters for corrective action, and evaluation periods. The Department will be responsible for annual inspections of the components covered by all warranties and / or guarantees offered by the Design-Build Team that extend beyond the required twelve-month guarantee. The warranties and / or guarantees shall also define how disputes will be handled.

No direct payment will be made for warranties and / or guarantees. Payment will be considered incidental to the lump sum price for the contract.

SELECTION PROCEDURE

There will be a Technical Review Committee (TRC) composed of five or more senior personnel from involved engineering groups that will evaluate the Technical Proposal on the basis of the criteria provided in the Request for Proposals.

The selection of a Design-Build Team will involve both technical quality and price. The Technical Proposals will be presented to the TRC for evaluation. The TRC shall first determine whether the Technical Proposals are responsive to the Request for Proposals requirements. The Department reserves the right to ask for clarification on any item in the Technical Proposal. A written response to this request for clarification shall be provided to the Department prior to the opening of the Price Proposals. The contents of the written response may affect the Technical Review Committee's determination of the Technical Proposal's responsiveness and / or the overall evaluation of the Technical Proposal. If any commitments or clarifications provided in the written response conflict with the contents of the Technical Proposal, the contents of the written response shall govern and be incorporated into the contract.

Each responsive Technical Proposal shall be evaluated based on the rating criteria provided in the Request for Proposals. The TRC will submit an overall consensus Technical Score for each Design-Build Team to the State Contract Officer.

The State Contract Officer will use a table based on the maximum quality credit percentage to assign a Quality Credit Percentage to each Technical Proposal based on that proposal's overall consensus Technical Score. The maximum quality credit percentage for this project will be **30%.** The Technical Review Committee may elect to assign point values to the nearest one-half of a point (e.g. 90.5). In this event, the Quality Credit Percentage will be determined by linearly interpolating within the table entitled "Quality Credit Percentage for Technical Proposals".

Quality Credit Percentage for Technical Proposals

Technical Score	Quality Credit (%)	Technical Score	Quality Credit (%)
100	30.00	84	14.00
99	29.00	83	13.00
98	28.00	82	12.00
97	27.00	81	11.00
96	26.00	80	10.00
95	25.00	79	9.00
94	24.00	78	8.00
93	23.00	77	7.00
92	22.00	76	6.00
91	21.00	75	5.00
90	20.00	74	4.00
89	19.00	73	3.00
88	18.00	72	2.00
87	17.00	71	1.00
86	16.00	70	0.00
85	15.00		

The maximum Technical Score, including any extra credit given for warranties or guarantees, shall not exceed 100 points in determining the Quality Credit percentage.

If any of the Technical Proposals are considered non-responsive, the State Contract Officer will notify those Design-Build Teams of that fact. The State Contract Officer shall publicly open the sealed Price Proposals and multiply each Design-Build Team's Price Proposal by the Quality Credit Percentage earned by the Design-Build Team's Technical Proposal to obtain the Quality Value of each Design-Build Team's Technical Proposal. The Quality Value will then be subtracted from each Design-Build Team's Price Proposal to obtain an Adjusted Price based upon Price and Quality combined. Unless all Technical Proposals are non-responsive or the Department elects to proceed with the Best and Final Offer process, the Department will recommend to the State Transportation Board that the Design-Build Team having the lowest adjusted price be awarded the contract. The cost of the Design-Build contract will be the amount received as the Price Proposal.

The following table shows an example of the calculations involved in this process.

An Example of Calculating Quality Adjusted Price Ranking

Proposal	Technical Score	Quality Credit (%)	Price Proposal ($)	Quality Value ($)	Adjusted Price ($)
A	95	25.00	3,000,000	750,000	2,250,000
B	90	20.00	2,900,000	580,000	2,320,000
C *	90	20.00	2,800,000	560,000	2,240,000
D	80	10.00	2,700,000	270,000	2,430,000
E	70	0.00	2,600,000	0	2,600,000
* Successful Design-Build Team - Contract Cost $2,800,000					

Opening of Price Proposals

Prior to opening the Price Proposals, the State Contract Officer will provide to each Design-Build Team their Technical Score in a sealed envelope. The sealed envelope will only contain that Design-Build Team's Technical Score.

At the time and date specified, the State Contract Officer will open the Price Proposals and calculate the percentage difference between the Price Proposals submitted and the Engineer's Estimate.

Should all of the Price Proposals be within an acceptable range or below the Engineer's Estimate, the State Contract Officer will proceed to calculate the quality credit and publicly read the Price Proposals, Technical Scores and Adjusted Prices as outlined in the selection procedure above.

Should any one or more of the Price Proposals be within an acceptable range or below the Engineer's Estimate and the remaining Price Proposals exceed an acceptable range of the Engineer's Estimate, the State Contract Officer will go to a separate location to calculate the quality credit and determine if the Design-Build Team with the lowest Adjusted Price is within an acceptable range of the Engineer's Estimate. Should the Price Proposal of the Design-Build Team with the lowest Adjusted Price be within an acceptable range of the Engineer's Estimate or below the Engineer's Estimate, the State Contract Officer will proceed to publicly read the Price Proposals, Technical Scores and Adjusted Prices. Should the Price Proposal of the Design-Build Team with the lowest Adjusted Price exceed an acceptable range of the Engineer's Estimate, the State Contract Officer will publicly read the Price Proposals only and the Department will then determine whether to proceed to request a Best and Final Offer (BAFO) as outlined below.

Should all Price Proposals submitted exceed an acceptable range of the Engineer's Estimate, the State Contract Officer will publicly read the Price Proposals only. The Department will then determine whether to proceed to request a Best and Final Offer (BAFO) as outlined below.

In the event that the Department elects not to proceed with a Best and Final Offer (BAFO), then the State Contract Officer will schedule a date and time to publicly reiterate all Price Proposals, and read all Technical Scores and Adjusted Prices.

Provided the Department elects to proceed to request a Best and Final Offer (BAFO), at the date and time specified, the State Contract Officer will open the Best and Final Offer Price Proposals and proceed to publicly read all Price Proposals, Technical Scores and Adjusted Prices.

Best and Final Offer

In the event initial Price Proposals exceed an acceptable range of the Engineer's Estimate or if the Department feels it is necessary, for any reason, the Department may choose to make amendments to the details of the RFP and request a Best and Final Offer from all the previously short-listed teams. Alternately, the Department may choose to redistribute to the short-listed Design-Build Teams another RFP for the project with no amendments to the RFP scope.

After receipt of the redistributed RFP, the Design-Build Team has the option of changing the Technical Proposal details to adhere to the RFP modifications. If the Design-Build Team changes any component of the Technical Proposal, the TRC will review those amended components of the Technical Proposal and reevaluate the scores accordingly. The Design-Build Team shall highlight the changes to bring them to the Department's attention. A revised consensus Technical Score will be calculated, if appropriate, based on these amendments to the Technical Proposal.

Additional oral interviews will not be held. The Design-Build Teams shall submit both a revised Price Proposal and a revised Technical Proposal (if applicable) at the time, place and date specified in the redistributed RFP. A revised Quality Credit Percentage (if required) and Adjusted Price will be determined. This will constitute the Design-Build Team's Best and Final Offer. Award of the project may be made to the Design-Build Team with the lowest Adjusted Price on this Best and Final Offer.

Stipend

A stipulated fee of **$825,000.00** will be awarded to each short-listed Design-Build Team that provides a responsive, but unsuccessful, Design-Build Proposal. If a contract award is not made, all short-listed Design-Build Teams that provide a responsive Design-Build Proposal shall receive the stipulated fee. Once award is made, or a decision is made not to award, unsuccessful Design-Build Teams can apply for the stipulated fee by notifying the State Contract Officer in writing and providing an original invoice within 60 days of Award. If the Design-Build Team accepts the stipulated fee, the Department reserves the right to use any ideas or information contained in the Design-Build Proposal and / or Alternative Technical Concepts, whether incorporated into the Design-Build Proposal or not, in connection with any contract awarded for the project, or in connection with any subsequent procurement, with no obligation to pay additional compensation to the unsuccessful Design-Build Team. The stipulated fee shall be paid to eligible Design-Build Teams within ninety days after the contract award or the decision not to award. Unsuccessful Design-Build Teams may elect to refuse payment of the stipulated fee and retain any rights to its Design-Build Proposal and the ideas and information contained therein.

In the event that the Department suspends or discontinues the procurement process prior to the Technical Proposal or Price Proposal submittal date current at the time of the suspension, no stipulated fee will be paid.

ROADWAY SCOPE OF WORK (10-7-26)

Throughout this RFP, references to the Preliminary Roadway Plans shall denote the I-5701 February 7, 2022 and I-5703 May 8, 2020, MicroStation files and the I-5701 and I-5703 Public Meeting Maps dated March 2023.

Throughout this RFP, references to the mainline, -L- Line, and -L- shall denote I-40 and -Y1- Line, and -Y1- shall denote I-440 / US 1 / US 64.

Project Details

- From the I-40 / I-440 / US 1 / US 64 interchange to I-40 / SR 1009 (Lake Wheeler Road) interchange the Design-Build Team shall design and construct an eight-lane typical section of I-40 by converting the existing I-40 auxiliary lanes located between the interchanges into through lanes and converting the existing paved shoulder into new auxiliary lanes. Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design and construct the mainline, including all ramps and loops, providing the same or better access, widening, improvements and traffic measures of effectiveness, in the Department's sole discretion, included in the Preliminary Roadway Plans provided by the Department. The mainline, including all ramps and loops, construction limits shall be of sufficient length to tie to existing based upon the current NCDOT guidelines and standards. The mainline shall be designed and constructed to meet a 70-mph design speed for a rolling urban freeway designed to interstate standards. The mainline shall be designed and constructed in accordance with the 2018 AASHTO *A Policy on Geometric Design of Highways and Streets*, Table 3-10 (e_{max} = 8%). The Design-Build Team shall provide all other design criteria in the Technical Proposal.

- The Design-Build Team shall design and construct interchange modifications at the I-40 / I-440 / US 1 / US 64 interchange. Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design and construct the mainline, including all ramps and loops, providing the same or better access, widening, improvements and traffic measures of effectiveness, in the Department's sole discretion, included in the Preliminary Roadway Plans provided by the Department. The mainline, including all ramps and loops, construction limits shall be of sufficient length to tie to existing based upon the current NCDOT guidelines and standards. The mainline shall be designed and constructed to meet a 70-mph design speed for a rolling urban freeway designed to interstate standards. The mainline shall be designed and constructed in accordance with the 2018 AASHTO *A Policy on Geometric Design of Highways and Streets*, Table 3-10 (e_{max} = 8%). The Design-Build Team shall provide all other design criteria in the Technical Proposal.

- Unless noted otherwise elsewhere in this RFP, along I-40 (-L-), excluding the transitions required to tie to the existing outside shoulders at the project limits, the Design-Build Team shall design and construct minimum 14-foot outside shoulders (twelve-foot useable shoulder width plus two feet), 12-foot of which shall be full depth paved shoulders, including all acceleration, deceleration and auxiliary lanes, and ramps / loops to the back of the gore (12-foot width).

- The Design-Build Team shall design and construct a minimum 10-foot outside shoulder adjacent to the existing noise wall on the I-40 westbound shoulder located at approximately STA 158+00 to STA 166+00.

- Unless noted otherwise elsewhere in this RFP, excluding the transitions required to tie to the existing median widths at the project limits, the Design-Build Team shall maintain the existing median widths and paved shoulders along the -L- Line.

- From approximately Station 135+00 -L- to the eastern end of the project limit to as shown on the I-5701 Preliminary Roadway Plans provided by the Department, the Design-Build Team shall transition from the existing I-40 six-lane typical section to the proposed mainline eight-lane typical section in accordance with the following:

  - Beginning from -21CDEB-, the Design-Build Team shall design and construct the new eastbound outside lane. The -21CDEB- outside entrance ramp shall become the outside I-40 eastbound "Exit Only" lane onto SR 1571 (Gorman Street) at Exit 295 -RP4C- shall be designed as a single lane, parallel exit. The Design-Build Team shall convert the existing "Exit Only" lane to a through lane.

  - Beginning from -RP4D-, the Design-Build Team shall design and construct the new eastbound outside lane. The -RP4D- entrance ramp shall become the outside I-40 eastbound "Exit Only" lane onto SR 1009 (Lake Wheeler Road) at Exit 297 -RP6C- shall be designed as a single lane, parallel exit. The Design-Build Team shall convert the existing "Exit Only" lane to a through lane.

  - Beginning from approximately Station 320+00 -L-, the Design-Build Team shall design and construct the new westbound outside lane. The new the outside I-40 westbound "Exit Only" lane onto SR 1571 (Gorman Street) at Exit 295 -RP4A- shall be designed as a single lane, parallel exit.

  - Beginning from -RP4B-, the Design-Build Team shall design and construct the new westbound outside lane. The -RP4B- entrance ramp shall become the outside I-40 westbound "Exit Only" lane onto I-440 / US 1 / US 64 at Exit 293 -21CDWB- shall be designed as a two lane, parallel exit.

- As shown on the I-5703 Preliminary Roadway Plans provided by the Department, the Design-Build Team shall design and construct a six-lane, -Y1-, typical section in accordance with the following:

  - Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design and construct minimum 14-foot outside shoulders (twelve-foot useable shoulder width plus two feet), 12-foot of which shall be full depth paved shoulders, or the match existing width, whichever is greater.

  - Along the South Hills Mall and Plaza property, 1) the Design-Build Team shall not acquire additional right of way beyond the limits shown on the Preliminary Roadway Plans

provided by the Department without the Department's written approval; 2) the construction limits, including but not limited to all walls, fill slopes, drainage ditches, shall remain within the existing / proposed right of way; and 3) all existing and proposed slopes shall be 2:1 or flatter, requiring the Design-Build Team to flatten all existing slopes steeper than 2:1. The aforementioned written approval shall occur through 1) the ATC Process prior to Award or 2) coordination and / or submittals to the Alternative Delivery Unit after Award. (Reference the *Alternative Technical Concepts and Confidential Questions* Project Special Provision found elsewhere in this RFP).

- Under the Walnut Street and Crossroads connector bridges the -Y1- minimum inside and outside shoulders widths shall meet what is shown in the Preliminary Plans.

- Along I-440 / US 1 / US 64, starting at the end of the barrier (approximate STA 29+00) to the limit of the existing median barrier on the U-2719 project, the Design-Build Team shall design and construct a closed median with full depth median paved shoulders and barriers. The design shall meet the following conditions:

    - Twelve-foot minimum full depth median paved shoulder
    - 14-foot maximum full depth median paved shoulder
    - Ten-foot maximum capped width between the barriers

    Note 1: Capped median barrier shall be backfilled No. 57 stone and capped with four inches of concrete.

    Note 2: Design-Build Team shall design the median barrier to retain the overhead sign located at approximately 35°46'08.9"N 78°43'38.7"W.

- In lieu of the US 1 / US 64 north bound ramps to Dillard Drive and the realigning of Dillard Drive and Piney Plains Road, the Design-Build Team shall design and construct elongated ramp and loop connections to the existing signalized ramp intersection with Walnut Street. The design shall meet the following conditions:

    - The preliminary plan gore spacing between the SR 1313 (Walnut Street) and I-40 interchanges shall not be reduced
    - At Walnut & US 1 / US 64 NB Ramps
        - SR 1313 (Walnut Street)
            - One channelized right turn lane on south bound SR 1313 (Walnut Street) onto the US 1 / US 64 entrance ramp providing 100 feet of storage
            - Two left turn lanes on north bound SR 1313 (Walnut Street) onto the US 1 / US 64 entrance ramp providing the maximum storage achievable*
        - US 1 Ramps
            - The first curve, for exiting traffic in the north bound exit ramp from US 1 /US 64, shall have a design speed of 60 mph. Starting

with the second curve, for exiting traffic to the signalized intersection the exit ramp, shall have a design speed of 50 mph.
- Three left turn lanes on the US 1 exit ramp onto north bound SR 1313 (Walnut Street) providing 600 feet of storage
- Two right turn lanes on the US 1 exit ramp onto south bound SR 1313 (Walnut Street) providing 600 feet of storage
- Two receiving lanes on the US 1 entrance ramp for 1,700 feet plus appropriate taper

o At SR 1313 (Walnut Street) & Meeting Street
  - Two –south bound left turn lanes on SR 1313 (Walnut Street) onto Meeting Street providing 250 feet of storage

* Walnut Street left turn storage onto US 1 NB Loop Ramp & Meeting Street are back-to-back. The northbound left turn storage at US 1 NB Ramps should be maximized after accommodating the two Walnut Street at Meeting Street left turn lanes.

- Unless noted otherwise elsewhere in this RFP, all ramps shall have 14-foot outside shoulders, four-foot of which shall be full depth paved shoulders and 12-foot inside shoulders, four-foot of which shall be full depth paved shoulders.

- From the back of the gore to a point 100-feet before the ramp's intersection with each -Y- line, the following ramps shall have 14-foot outside shoulders, 12-foot of which shall be full depth paved:

  - All Gorman Street Ramps
  - -RP6B- Lake Wheeler Road
  - -RP6C- Lake Wheeler Road

****NOTE**** Deleted bullet referencing to the removal of existing US 1/ US 64 / SR 1313 (Walnut Street) exit and entrance ramps.

- The Design-Build Team shall design and construct one-lane ramps that provide a minimum 16-foot lane width. The Design-Build Team shall design and construct two-lane ramps that provide minimum 12-foot lanes. All ramps shall have 14-foot outside shoulders, four-foot of which shall be full depth paved shoulder and 12-foot inside shoulders, four-foot of which shall be full depth paved shoulder.

- Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design and construct all ramps to meet a 60 mph design speed. The Design-Build Team shall design flyover ramps using the 0.06 maximum superelevation table. The Design-Build Team shall design and construct all bridges on directional ramps with a four-foot outside bridge rail offset and a 12-foot inside bridge rail offset.

- The Design-Build Team shall design and construct the following ramps to meet a 50-mph design speed:

    - CD to CD ramps
        - -21RC-
        - -21RCA-
        - -21RB-
    - -21RA-
    - -21RD-

- The Design-Build Team shall design and construct the following ramps to meet a 45-mph design speed:

    - Flyover ramps
        - -21RAC-
        - -21RDB-

- The Design-Build Team shall design and construct loops that adhere to Tables 3-27 and Table 3-28, *Design Widths of the Traveled Way for Turning Roadways* and *Design Width Modifications for Edge Conditions of the Traveled Way for Turning Roadways,* shown in the 2018 AASHTO *A Policy on Geometric Design of Highways and Streets* - Case II / Condition C for one-lane loops; Case III / Condition C for two-lane loops. All loops shall have 12-foot outside shoulders, four-foot of which shall be full depth paved shoulders. All loops shall have 2'-6" curb and gutter along the inside edge of pavement, with a 10-foot berm. The minimum loop design shall be a 20-foot lane width and 30 mph design speed with a minimum 230-foot radius, unless stated otherwise in the RFP.

- The minimum loop radius for the I-40 / I-440 / US 1 / US 64 interchange shall be 150’ or existing, whichever is greater.

- Unless noted otherwise elsewhere in this RFP, the maximum allowable cut and fill slope shall be 3:1. (Reference the Geotechnical Engineering Scope of Work found elsewhere in this RFP) The slopes in the interchange area shall follow the requirements set forth in the NCDOT *Roadway Design Manual*.

    - The Design-Build Team may use 2:1 cut and fill slopes on outside roadway slopes to minimize right of way impacts pending review and approval of the Department.

- Unless required otherwise elsewhere in this RFP, the elimination of any retaining walls along the elevated sections of the mainline or -Y1-, including all ramps, that result in additional relocatees beyond those required by the Department’s Preliminary Roadway Plans, shall require an approved ATC.

****NOTE**** Deleted bullet stating lane widths on Dillard Drive and Piney Plains Road

****NOTE**** Deleted bullet stating the design speed on Dillard Drive and Piney Plains Road

****NOTE**** Deleted bullet to install monolithic island closing Walnut Street intersection

- Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design and construct -Y- Lines, service roads, multi-use paths / greenways, and cul-de-sacs / turnarounds providing the same or better access, widening, improvements and traffic measures of effectiveness, in the Department's sole discretion, included in the Preliminary Roadway Plans provided by the Department. The limits of -Y- Line and service road construction shall be of sufficient length to tie to existing based upon the current NCDOT guidelines and standards.

- Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design and construct at-grade intersections with the lane configurations noted in the I-5703 *2047 TOTM Addendum_Draft_05222026* and I-5701 *Capacity Operation Technical Memorandum* provided by the Department. At all intersections impacted by the Design-Build Team's design and / or construction, excluding resurfacing, the Design-Build Team shall design and construct turn lanes that adhere to the greater of the following:

  - All turn lane lengths shall adhere to the NCDOT Recommended Treatment for Turn Lanes. These lengths shall be determined by adding 1) the storage length defined in the aforementioned Memorandum or Section 8.7.2.2 of the NCDOT *Roadway Design Manual (RDM)*, if not provided in the aforementioned Memorandum, and 2) the desirable deceleration length, as defined in the *RDM* Figure 8-11.

  - Right turn lanes / tapers shall be provided in accordance with the NCDOT Right Turn Lane Warrants, as defined in the *RDM* (Reference Section 8.7, Figure 8-9).

  - Taper only right turn lanes shall be a minimum of 230-feet, 265-feet, and 300-feet for design speeds of 40 mph, 50 mph, and 60 mph respectively.

- For all interchange / intersection design modifications, the Design-Build Team shall provide a traffic analysis that adheres to the March 25, 2022, NCDOT *Congestion Management Capacity Analysis Guidelines* for the Department's review and acceptance.

- Unless otherwise noted elsewhere in this RFP, the Design-Build Team will not be required to design or construct ramps or bridges to accommodate future loops or future auxiliary lanes.

- The Design-Build Team shall design and construct all -Y- Lines such that the through movement is not required to change lanes throughout the project limits.

- The Design-Build Team shall design and construct the following ramps such that the inside lane is not required to change lanes:

  - -21RAC- beginning with the -21RA- gore to the US 1 / US 64 southbound gore
  - -21RDB- beginning with the -21RD- gore to the I-40 westbound gore

- At all intersections with restricted movements impacted by the Design-Build Team's design and / or construction methods, excluding resurfacing, the Design-Build Team shall provide five-inch keyed-in concrete monolithic channelization islands, regardless of the island dimensions, unless directed otherwise by the Engineer. (Reference 2024 NCDOT *Roadway Standard Drawings (Standard Drawing)* No. 852.01)

- In accordance with the NCDOT Right of Way Manual, the Design-Build Team shall develop Service Road Studies for all land-locked parcels and / or as required by variations to the Department's design. If the aforementioned Service Road Studies indicate that service roads are required that are not shown on the Preliminary Roadway Plans provided by the Department, the design and construction costs of the additional service roads shall be as follows:

  - If the Design-Build Team demonstrates, to the Department's sole satisfaction, that the additional service road(s) are required for the Department's preliminary design, the service road(s) design and construction, including all associated NEPA requirements, will be paid for as extra work in accordance with Subarticle 104-8-(A) of the 2024 NCDOT *Standard Specifications for Roads and Structures (Standard Specifications)*.

  - If variations to the Department's proposed design and / or construction methods require additional service road(s), the service road(s) design and construction, as well as all associated NEPA requirements, shall be included in the Design-Build Team's lump sum bid for the entire project.

  - The Design-Build Team shall not eliminate any service roads shown on the Preliminary Roadway Plans provided by the Department without the Department's written approval. The aforementioned written approval shall occur 1) through the ATC Process prior to Award or 2) through coordination and / or submittals to the Alternative Delivery Unit after Award. (Reference the *Alternative Technical Concepts and Confidential Questions* Project Special Provision found elsewhere in this RFP).

- Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design and construct all modifications, realignments and improvements to existing service roads in accordance with the following requirements:

  - Travel lane widths shall be the greater of 1) the width required for the functional classification and design year traffic, 2) the width shown in the Preliminary Roadway Plans provided by the Department, or 3) the existing width.

  - Provide paved shoulders from the edge of travel lane to the face of concrete barrier. All other shoulder widths (turf and paved) shall be the greater of 1) the width required for the functional classification and design year traffic or 2) the width shown in the Preliminary Roadway Plans provided by the Department.

- The Design-Build Team shall provide cul-de-sacs on all paved roads that are dead-ended. All cul-de-sacs shall be designed and constructed with a minimum 30-foot radius. The Design-

Build Team shall provide turnarounds on all nonpaved roads that are dead-ended. All turnarounds shall accommodate a S-BUS-36 and be constructed with 8" ABC.

- The Design-Build Team shall design and construct new service roads to meet a minimum 40 mph design speed using the 0.04 superelevation chart. The Design-Build Team shall design and construct all new service roads with two 11-foot lanes and six-foot minimum shoulders with a Type "B" ditch, as per the *RDM.*

- Unless noted otherwise elsewhere in this RFP, the mainline grade point and crown point shall be located such that the inside lane in each direction of travel slope towards the median and the remaining lanes slope towards the outside. Unless allowed otherwise below, the I-40 and I-440 / US 1 / US 64 normal crown cross slope shall be 0.02. The normal crown cross slope for the outermost lane(s) in each direction of travel are to be steepened as required to minimize hydroplaning potential, not to exceed 0.03. The Design-Build Team shall transition the proposed mainline pavement cross slope and crown point / grade point at the eastern project limit over 200-feet to tie to existing. (Reference the Hydraulics Scope of Work found elsewhere in this RFP)

- I-40 / I-440 / US 1 / US 64 are full control of access facilities. The Design-Build Team shall bring to the Alternative Delivery Unit's attention any deviations from the proposed control of access and / or right of way shown on the Preliminary Roadway Plans provided by the Department. The proposed control of access and / or right of way limits may deviate in proximity to cultural, historic, or otherwise protected landmarks, including cemeteries, to eliminate / minimize impacts. Prior to negotiating right of way, easements and / or control of access with property owners, the Department shall accept the Right of Way Plans developed by the Design-Build Team.

- Throughout the project limits, the Design-Build Team shall remove and dispose of all existing control of access fence and install new control of access fence. Prior to installation, the Design-Build Team shall be responsible for coordinating with, and obtaining approval from, the NCDOT for the control of access fence placement. The Design Build Team shall be responsible for installation of the control of access fence as noted below:

  - The Design-Build Team shall install woven wire fence along I-40 and I-440.

  - The Design-Build Team shall install four-foot chain-link fence along US 1 / US 64. The chain-link fencing shall begin at the beginning of control of access on the -Y-line and extend along the ramp to the main line tie in.

  - Throughout the construction limits, excluding areas that consist solely of pavement marking obliterations / revisions, the Design-Build Team shall replace, in kind, all existing damaged control of access fence and all control of access fence that is damaged during construction.

  - The Design-Build Team shall install all missing control of access fence, matching the adjacent fence type.

- The Department will provide an approved I-5703 Interchange Access Report (IAR) based on the Preliminary Roadway Plans provided by the Department. If the Design-Build Team revises the roadway design such that the approved I-5703 IAR is nullified or an approved IAR is required for other interchanges, the Design-Build Team shall re-analyze the interchange(s) and complete a revised I-5703 IAR, if necessary, for NCDOT and FHWA review and approval. The Department will not honor any requests for additional contract time or compensation for any effort required to complete the aforementioned activities, including but not limited to additional design effort, additional construction effort, FHWA coordination / approvals, and / or environmental agency coordination / approvals.

- Except as required elsewhere in this RFP and / or to eliminate a design exception, the Design-Build Team shall not further impact any cultural, historical or otherwise protected landmark or topographic feature beyond that shown on the Preliminary Roadway Plans provided by the Department. Unless approved otherwise by the Department, in writing, the Design-Build Team shall not acquire right of way, easements and / or control of access from a parcel with the aforementioned features unless shown on the Preliminary Roadway Plans provided by the Department.

- Unless otherwise noted elsewhere in this RFP, the Design-Build Team shall design and construct all retaining walls a minimum of ten feet inside the right of way.

- Retaining wall anchor systems contained in permanent easement areas that extend beyond the right of way limits will be considered along the -21CDSB- alignment.

- In accordance with the *Standard Drawings*, the Design-Build Team shall provide milled rumble strips along the mainline and -Y1- outside and median paved shoulders, including ramp and loop terminals, and acceleration, deceleration and auxiliary lanes.

- For all bridges over roadways, the Design-Build Team shall submit vertical and horizontal clearance design calculations at all critical points. The Design-Build Team shall submit post construction survey points for the aforementioned critical points that verify construction adhered to the vertical and horizontal clearances accepted by the Department. The Design-Build Team shall be responsible for all costs associated with correcting vertical and horizontal clearances resulting from any construction variation from the design accepted by the Department.

- Throughout construction areas that consist solely of pavement marking obliterations / revisions, the Design-Build Team shall provide a uniform mill and overlay or design and construct a resurfacing grade. Excluding construction areas that consist solely of pavement marking obliterations / revisions that are uniformly overlaid and areas uniformly milled and overlaid, the Design-Build Team shall, at a minimum, design and construct resurfacing grades for all roadways impacted by construction and all roadways shown to be resurfaced on the I-5701 and I-5703 Public Meeting Maps dated March 2023 provided by the Department. All uniform overlays and resurfacing grades shall 1) completely cover the entire pavement surface

(travel lanes and paved shoulders) and 2) be extended on a one-way roadway of a divided facility, as required, to provide the same limits for both directions of travel.

All resurfacing grades shall adhere to the design criteria and standards, provide all required pavement wedging and adhere to the minimum requirements noted below. For purposes of determining the required resurfacing limits only, collector distributor roads shall not be considered a one-way roadway of a divided facility and the term "construction" below will not apply to construction areas that consist solely of pavement marking obliterations / revisions. (Reference the Pavement Management Scope of Work found elsewhere in this RFP)

- The Design-Build Team shall resurface all lanes and shoulders of an undivided facility throughout the limits of proposed widening and construction.

- At a minimum, the Design-Build Team shall resurface all lanes and shoulders of -Y- Lines and service roads to the resurfacing limits shown on the I-5701 and I-5703 Public Meeting Maps dated March 2023 provided by the Department.

- Unless noted otherwise elsewhere in this RFP, for both divided and undivided facilities, the Design-Build Team shall resurface all lanes and shoulders within the outermost construction limits of all proposed widening and construction, including **all** gaps along the facility where construction activities are not required.

- The Design-Build Team shall provide a uniform mill and overlay for all ramps below:

    - All Walnut Street ramps
    - All Gorman Street ramps
    - -RP6B- Lake Wheeler Road
    - -RP6C- Lake Wheeler Road

- Excluding greenways / multi-use paths located on berms adjacent to curb and gutter, all greenway / multi-use path typical sections shall 1) consist of a minimum ten-foot paved facility with two-foot turf shoulders and 2) be designed and constructed in accordance with the 2012 AASHTO Guide for the Development of Bicycle Facilities, except those sections of greenways / multi-use paths that are steeper than five percent shall be designed and constructed in accordance with the FHWA Designing Sidewalks and Trails for Access. (Reference the *Greenways and Multi-Use Paths* Project Special Provision and the Pavement Management Scope of Work found elsewhere in this RFP) The Design-Build Team shall design and construct all greenways / multi-use paths located on berms adjacent to curb and gutter as minimum ten-foot wide sidewalks with a minimum 15-foot berm.

- Unless noted otherwise elsewhere in this RFP, all sidewalk shall be a minimum of 5-foot wide.

  ****NOTE**** Deleted Piney Plains Road MUP bullet

- Sidewalk transitions, from proposed sidewalk width to existing sidewalk width, shall be a minimum of 10 feet.

- Prior to submitting the Technical Proposal and Price Proposal, the Design-Build Team shall investigate to determine the possibility of load limit restrictions being placed on any of the proposed haul roads. The Department will determine if load limit restrictions are warranted, or removal of existing load limit restrictions are appropriate through agreement in accordance with Section 105-15 of the *Standard Specifications*.

- Excluding the modifications required herein, the Design-Build Team shall inform the Alternative Delivery Unit, in writing, of all proposed design revisions, including but not limited to the following:

  - The Design-Build Team shall note in the Technical Proposal any proposed deviations to the preliminary design shown on the Preliminary Roadway Plans provided by the Department. The Design-Build Team shall be responsible for all activities, as deemed necessary by the Department or the FHWA, resulting from changes to the NCDOT preliminary design, including but not limited to, public involvement, NEPA re-evaluation and / or coordination with other stakeholders. The Department will not honor any requests for additional contract time or compensation for completion of the required activities resulting from changes to the NCDOT preliminary design.

  - After the contract has been Awarded, the Design-Build Team shall inform the Alternative Delivery Unit, in writing, of all proposed changes to the design shown in the Technical Proposal.

  - After the Department has reviewed and accepted the Design-Build Team's design submittals, the Design-Build Team shall inform the Alternative Delivery Unit, in writing, of any changes to previously reviewed submittals, including but not limited to changes to RFC Plans.

  The proposed design revisions noted above shall be subject to the Department's review and acceptance.

- Excluding locations where horizontal curvature reduces the mainline stopping sight distance along the median paved shoulder, and locations where bridge piers, concrete barrier, or overhead sign assemblies reduce the mainline median shoulder width to less than ten feet design exceptions will not be allowed for the -L- Line, including all ramps and loops. Design exceptions will not be allowed for service road vertical alignments over drainage pipes. The Department prefers not to have design exceptions for the -Y- Lines and service roads. If the Design-Build Team anticipates any allowable design exceptions, they shall be clearly noted in the Technical Proposal. Prior to requesting / incorporating a design exception into the Preliminary Roadway Plans developed by the Design-Build Team, the Design-Build Team must obtain prior conceptual approval from the Alternative Delivery Unit. If conceptual approval is obtained, the Design-Build Team shall be responsible for the development and approval of all design exceptions. A design exception will only be approved if the design exception request demonstrates, in the Department's sole discretion, that a design exception is warranted and that it cannot be reasonably and / or feasibly eliminated.

- Prior to recording the Right of Way Plans, the Design-Build Team shall locate and install right of way markers that delineate the proposed right of way for all parcels within the project limits. The Design-Build Team will be allowed to temporarily delineate the aforementioned proposed right of way with temporary metal caps and fiberglass markers prior to recording the Right of Way Plans. However, prior to final project acceptance, the Design-Build Team shall locate and install permanent concrete right of way markers to delineate the aforementioned proposed right of way

  The Design-Build Team shall remove and dispose of all metal caps and fiberglass markers used to temporarily delineate the proposed right of way.

  For all parcels, the Design-Build Team shall locate and install metal caps with fiberglass markers that delineate all proposed permanent easements within the project limits. The Design-Build Team shall replace all existing right of way and permanent easement markers / monuments damaged and / or relocated during construction.

  In accordance with NCDOT Policy, the Department will furnish the metal caps with fiberglass markers.

- The Department has provided an accepted I-5701 & I-5703 Traffic Noise Report (TNR) that is based on the Department's preliminary design. The Design-Build Team shall reevaluate the **entire** I-5701 / I-5703 project and develop the Design Noise Report (DNR) based on the plans developed by the Design-Build Team, regardless of changes to the Department's preliminary design. The Design-Build Team shall complete TNM model validation, including but not limited to the collection of additional noise measurement data, regardless of what was included in the TNR. The DNR shall be developed in accordance with the NCDOT 2021 Traffic Noise Policy and the NCDOT 2022 Traffic Noise Manual; and be reviewed and accepted by NCDOT. In accordance with the NCDOT 2022 Traffic Noise Manual, this means the DNR must evaluate noise impacts beyond the project limits: specifically, 800 feet for freeway improvement projects. Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall include all design and construction costs for all sound barrier walls required by the accepted DNR, as well as all costs associated with performing any additional geotechnical investigations necessary to design the foundations, in the lump sum price bid for the entire project. However, the Design-Build Team will not be required to include any designs associated with the proposed sound barrier walls in the Technical Proposal. Prequalification under Discipline Code 441 shall be required for the firm developing the DNR.

  The Design-Build Team is cautioned that the TNR is provided to show the general location of potential walls. Thus, as with all information provided by the Department, the TNR is provided for informational purposes only; and the Department will not honor any requests for additional contract time or compensation for any variations between the accepted TNR and the approved DNR.

  The Department will ballot all benefited receptors to determine which sound barrier walls recommended in the accepted DNR will be constructed. The Design-Build Team shall (1) develop and provide the information required by the Department to complete the balloting

process, and (2) attend and / or speak at all balloting meetings and workshops. The Department will require four months to complete the balloting process. The Department will not honor any requests for additional contract time or compensation for the sound barrier wall construction unless the aforementioned four-month timeframe is exceeded. If time were granted, it would only be for that time exceeding the four-month period, which shall begin on the date the Department accepts the DNR developed by the Design-Build Team. The Design-Build Team shall not construct any sound barrier walls until the balloting process has been completed by the Department.

In accordance with Subarticle 104-8(A) of the *Standard Specifications*, if the accepted DNR (including any subsequent DNR Addenda) and balloting process require more than 1) 171,400.0 square feet of sound barrier wall on the shoulder, and / or 2) 254,900.0 square feet of sound barrier wall off the shoulder, the amount over the aforementioned square foot areas will be paid for as extra work at the unit prices noted below:

- Sound barrier walls constructed on the shoulder - $65.00 per square foot

- Sound barrier walls constructed off the shoulder - $60.00 per square foot

- All work tasks required to design and construct the additional sound barrier walls, including but not limited to traffic control, pavement, drainage, concrete barrier, geotechnical investigation, utility coordination / construction, supplemental surveys, bridge attachments / modifications, and earthwork shall be considered inclusive in the aforementioned unit prices.

The amount of square footage to be paid for as extra work shall be determined by deducting all additional sound barrier wall square footage required as a result of horizontal and / or vertical alignment changes to the Preliminary Roadway Plans provided by the Department from the accepted DNR and balloting process sound barrier wall total square footage.

The Design-Build Team shall only credit the Department the construction cost of all sound barrier walls eliminated by the balloting process. The construction costs of all sound barrier walls eliminated solely by the balloting process shall be deducted from the lump sum amount bid for the entire project at the aforementioned unit prices.

The Design-Build Team shall provide absorptive-faced sound barrier walls at the following locations:

- Where a sound barrier wall is located on the opposite side of the highway from impacted noise sensitive receptors that are not receiving a sound barrier wall and at least two of those receptors are located within ten times the average height of the proposed sound barrier wall.

- Where the parallel barrier analysis (PBA), including PBAs for a single wall configuration with a minimum six-foot high retaining wall on the opposite side of the highway, shows

that the noise reduction degradation results in noise levels and / or insertion loss values cause the sound barrier wall to not be feasible and reasonable.

- Where the PBA, including PBAs for a single wall configuration with a minimum six-foot high retaining wall on the opposite side of the highway, results in impacted receptors no longer being benefited.

At all sound barrier walls, the Design-Build Team shall provide 1) a four-foot berm between the wall and fill / cut slopes steeper than 6:1 and 2) a parallel concrete ditch at locations where the final grade slopes toward the wall.

The Design-Build Team shall design and construct all sound barrier walls a minimum of ten feet inside the right of way.

For all sound barrier walls, the Design-Build Team shall design and construct maintenance access points, as necessary and / or as directed by the Engineer.

To satisfy the FHWA's Abatement Measure Reporting requirements, the Design-Build Team shall prepare and concurrently submit a summary of the sound barrier walls to be constructed on the project with the final sound barrier wall working drawings submittal. The Design-Build Team shall submit the sound barrier wall summary directly to the NCDOT Traffic Noise and Air Quality Group and include the information noted in Title 23 Code of Federal Regulations Part 772 Section 772.13(f), including but not limited to overall cost and unit cost per square foot.

General

- Unless noted otherwise elsewhere in this RFP, the design shall be in accordance with the 2018 AASHTO *A Policy on Geometric Design of Highways and Streets*, and 2019 Errata, *RDM*, including all revisions effective on the Technical Proposal submittal date, *Standard Drawings*, or as superseded by detail sheets located at:

  https://connect.ncdot.gov/resources/Specifications/Pages/2024-Roadway-Standard-Drawings.aspx

  Roadway Design Policy and Procedure Manual, Standard Specifications, the Highway Capacity Manual, 6th Edition, and the 2011 AASHTO *Roadside Design Guide*, 4th Edition and 2015 Errata.

- If the *RDM*, including all revisions, the 2018 AASHTO *A Policy on Geometric Design of Highways and Streets* and 2019 Errata, the *Standard Drawings* and / or any other guidelines, standards or policies have desirable and / or minimum values, the Design-Build Team shall use the desirable values unless noted otherwise elsewhere in this RFP. Similarly, in case of conflicting design parameters, and / or ranges, in the various resources, the proposed design shall adhere to the most conservative values, unless noted otherwise elsewhere in this RFP.

- The Design-Build Team shall provide a Drainage Summary Sheet, Earthwork Summary Sheet, Guardrail Summary Sheet, (permanent and temporary), Shoulder Drain and Under Drain Summary Sheet, and Pavement Removal Summary Sheet in the Final Roadway Plans and RFC Roadway Plans.

- At all intersections, the Design-Build Team shall not exceed a 0.05 roll-over between the outside edge of travel lane of the primary roadway and the beginning of the proposed grade for the secondary roadway.

- Unless noted otherwise elsewhere in this RFP, all bridge rail offsets shall be the greater of 1) the bridge rail offset as indicated in the *RDM*, 2) the approach roadway paved shoulder width, or 3) the offset required to achieve stopping sight distance (maximum 12-foot). Narrower bridge rail offsets based on bridge length will not be allowed. The Design-Build Team will not be required to widen existing bridges solely to provide the aforementioned minimum bridge rail offsets. Where retaining walls are located along the -L- Line outside shoulder approaching a bridge, the minimum outside bridge rail offset for bridges on the -L- Line shall be 12 feet.

- Outside the project limits, the Design-Build Team will not be allowed to use the NCDOT right of way and / or property for borrow or waste sites. Within the project limits, the Design-Build Team shall adhere to the following:

  - No material may be wasted within the NCDOT right of way or property.

  - Excluding crushed concrete, debris shall not be buried within the NCDOT right of way or property.

  - Normal grading operations shall occur, including but not limited to, grading to drain all existing embankments supporting removed roadway sections.

- Unless noted otherwise elsewhere in this RFP, all guardrail / guiderail placement shall be in accordance with the *Standard Drawings* and / or approved details in lieu of standards. Along all 3:1 fill slopes, constructed at fill heights that are equal to or greater than 12 feet, the Design-Build Team shall install guardrail. Along all fill slopes steeper than 3:1, constructed at fill heights that are equal to or greater than six feet, the Design-Build Team shall install guardrail. Excluding construction areas that consist solely of pavement marking obliterations / revisions, the Design-Build Team shall upgrade all existing guardrail in the construction limits in accordance with the aforementioned requirements and the requirements noted below, regardless if the Design-Build Team's design and / or construction impacts the guardrail.

  - For existing guardrail that extends 100 feet or less outside the construction limits, the Design-Build Team shall replace all the existing guardrail.

  - For existing guardrail that extends more than 100 feet outside the construction limits, the Design-Build Team shall tie the proposed guardrail to the existing guardrail outside the construction limits.

- In areas that are resurfaced solely to adhere to the resurfacing limits shown in the Preliminary Plans provided by the Department, the Design-Build Team will not be required to widen the existing shoulders. (Reference the Pavement Management Scope of Work found elsewhere in this RFP)

The guardrail / guiderail design shall be submitted for review with the Preliminary Roadway Plans submittal.

- The Design-Build Team shall provide a 2" x 6" treated wooden rub rail mounted to the back side of all guardrail leading to or trailing from parapets that separate MUPs and travel lanes on bridges. (Reference Standard Drawing No. 862.01)

- The total outside shoulder width for all facilities with defined usable shoulders shall equal the usable shoulder plus two feet.

- The Design-Build Team shall provide continuous single face concrete barrier between two segments of single face concrete barrier when 1) the two segments are less than 300 feet apart, and 2) guardrail would be required between the two segments.

- At all locations where back to back single face concrete barrier is provided, including but not limited to bridge piers and sign supports, the Design-Build Team shall fill the area between the single face concrete barriers with gravel and cap with four inches of concrete when the area is ten feet wide or less.

- The Design-Build Team shall be responsible for the evaluation of the algebraic difference in rates of cross slope (roll-over) between existing shoulders and roadways and the associated suitability for carrying traffic during construction, if necessary. In the event that the roll-over is found to be unacceptable for the proposed temporary traffic patterns, the Design-Build Team shall be responsible for providing cross slopes that meet design standards and eliminate roll-over concerns.

- Unless noted otherwise elsewhere in this RFP, the design speed for all roadways shall be the greater of the minimum design speed for the facility type, as specified in the 2018 AASHTO *A Policy on Geometric Design of Highways and Streets*, and 2019 Errata or the anticipated / actual posted speed plus five mph. If a speed limit is not physically posted on an existing facility outside the municipal limits, General Statues mandate the speed limit as 55 mph, resulting in a 60 mph design speed. If a speed limit is not physically posted on an existing facility within the municipal limits, General Statutes mandate the speed limit as 35 mph, resulting in a 40 mph design speed.

- The NCDOT shall review and accept the Design-Build Team's Design Criteria prior to the Preliminary Roadway Plans submittal.

- The Design-Build Team will not be required to submit separate Structure Recommendations as required by the Design-Build Submittal Guidelines. Instead, in accordance with the NCDOT

Roadway Design Manual Sections 5.3.1.1, 5.3.1.2, and 5.3.1.3, the Design-Build Team shall submit the roadway design information required to develop the Structure General Drawings with the Preliminary Roadway Plans submittal.

- Within the vehicle recovery area, the Design-Build Team shall design and construct single face concrete barrier in front of the traffic face of all shoulder piers, sound barrier walls, retaining walls, and all elements acting as a retaining wall. The aforementioned concrete barrier shall be located 1) beyond the typical section shoulder point and / or 2) a minimum of 12-foot behind the face of curb and gutter, requiring the Design-Build Team to widen the outside shoulder / berm beyond the typical section width. Between the single face concrete barrier and all shoulder piers, sound barrier walls, retaining walls, and all elements acting as a retaining wall, the Design-Build Team shall install minimum one-inch thick expansion joint material. (Reference Section1028-1 of the *Standard Specifications*)

- The Design-Build Team shall design and construct all depressed grass medians and raised medians in accordance with the following:

  - The minimum width of all depressed grass medians shall be eight feet. At all locations where a depressed grass median becomes narrower than eight feet, the Design-Build Team shall design and construct a five-inch keyed-in concrete monolithic island in lieu of the depressed grass median.

  - The Design-Build Team shall install a four-inch concrete cap on all raised medians that are eight feet wide or narrower, measured face to face from the surrounding mountable concrete curb and gutter.

  - All grass covered raised medians shall be designed and constructed with topsoil and appropriate cross slope and median drain with pipe to prevent groundwater and surface water infiltration into the adjacent subgrade and / or pavement structure. Prior to construction of the grass covered raised median and / or median drain with pipe, the Design-Build Team shall submit to the Alternative Delivery Unit, for review and acceptance, the proposed number of drains, drain locations within the typical section, topsoil specifications and construction details. Within all proposed grass covered raised median limits, the Design-Build Team shall completely remove and dispose of the existing pavement structure.

- Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design and construct all lane drops from the outside of the travel way.

- A sag vertical curve low point will not be allowed on any proposed bridge or approach slab.

- Excluding -Y1-, all -Y- Line / -Y- Line intersection radius points, including service roads, the minimum -Y- line pavement width shall be 30 feet.

- Excluding grades required to tie to existing, the minimum longitudinal grade shall be 0.50% or 0.30% with Department approval, unless noted otherwise elsewhere in this RFP. Along -Y-

Lines with turf shoulders, a 0.00% grade will be allowed, provided all hydraulic requirements are met. (Reference the Hydraulics Scope of Work found elsewhere in this RFP)

- At all intersections impacted by the Design-Build Team's design and / or construction methods, excluding resurfacing and intersections within diverging diamond interchanges, the following design vehicles shall be required for all turning movements:

  - WB-62 at all ramp / loop intersections with -Y- Lines (For side-by-side turning maneuvers, WB-62 for the outside movement only and SU-30 for inside movement)

  - WB-62 at all other intersections (For side-by-side turning maneuvers, WB-62 for the outside movement only and SU-30 for inside movement)

  - At all intersections, with existing / proposed pedestrian facilities, impacted by the Design-Build Team's design and / or construction methods, the Design-Build Team shall retrofit / upgrade all existing substandard curb ramps to current standards.

- Any variations in the Department's proposed design and / or construction methods that nullify any decisions reached between the Department and the environmental agencies; and / or require additional coordination with the environmental agencies shall be the sole responsibility of the Design-Build Team. The Department will not allow any contract time extensions or additional compensation associated with any coordination or approval process resulting from design and / or construction modifications. (Reference the Environmental Permits Scope of Work found elsewhere in this RFP)

- Excluding parcels restricted by Control of Access and undeveloped parcels, the Design-Build Team shall design and construct a minimum of one driveway per parcel. The Design-Build Team shall design and construct all driveways to adhere to the most recent version, in effective on the Technical Proposal submittal date, of the NCDOT *Policy on Street and Driveway Access to North Carolina Highways* and the minimum requirements noted below. Excluding the maximum grade requirement, if the NCDOT *Policy on Street and Driveway Access to North Carolina Highways* and the requirements noted below have conflicting design parameters, the proposed design shall adhere to the aforementioned Policy:

  - The Design-Build Team shall provide horizontal and vertical alignments for all driveways that require 100 feet or longer to tie to existing.

  - Unless shown on the Preliminary Roadway Plans provided by the Department, driveways shall not be installed in roundabouts, right turn lanes, including their taper, or within the limits of splitter islands.

  - Excluding grades required to tie to existing, the maximum driveway grade shall be 10.0%.

  - For shoulder sections, the minimum driveway turnout for residential and commercial properties shall be 16'-0" and 24'-0", respectively, or the existing width, whichever is greater. For curb and gutter sections, the minimum driveway turnout for residential and

commercial properties shall be 20'-0" and 28'-0", respectively, or the existing width, whichever is greater.

- For commercial driveways the Design-Build Team shall backfill and pave all roadway cuts for installing driveway pipes prior to opening the driveway back to traffic.

- The Design-Build Team shall contact Mr. Gary W. Thompson, North Carolina Geodetic Survey Chief, prior to disturbing any geodetic monument.

- The Design-Build Team shall identify the need for any special roadway design details (i.e. any special drainage structures, rock embankment, rock plating, special guardrail, retaining walls, concrete barrier designs, etc.) and shall provide special design drawings. The Contract Standards and Development Unit may have special details available that can be provided to the Design-Build Team upon request.

- A 4:1 back slope shall extend from the back of the expressway gutter to the clear zone limit. Beyond that, a maximum 2:1 cut slope will be acceptable. The expressway gutter centerline shall be located at the hinge / shoulder point. Expressway gutter shall not be installed in fill sections. Expressway gutter shall only be used to minimize impacts to 1) existing structures; and / or 2) cultural, historical or otherwise protected landmarks.

- Excluding locations to minimize impacts to existing 1) natural gas regulator stations; 2) sanitary sewer lift / pump stations; 3) structures; and / or 4) cultural, historical or otherwise protected landmarks, the front slope of all roadway ditches, including special drainage cut ditches, shall be in accordance with the desirable front slopes for the facility classification. Ditches located adjacent to the -L- Line and all ramps shall be designed and constructed in accordance with the desirable Ditch Type "A", as shown in the *RDM* Section 4.4.6, Figure 4-4. Along -Y- Lines and along the outside of existing service roads that are modified, realigned and / or improved, the Design-Build Team will be allowed to use the minimum ditch widths for the facility classification.

- At all locations with paved shoulders that extend beyond the typical width (e.g. to the face of single face barrier, guardrail, edge of expressway / shoulder berm gutter, etc.) or to existing pavement at tie-in points, the Design-Build Team shall taper the wider paved shoulder width to the typical paved shoulder width using an 8:1 taper. (Reference the Pavement Management Scope of Work found elsewhere in this RFP)

- Excluding areas that could impact cultural, historic or otherwise protected landmarks, the Department prefers that all berm widths behind curb and gutter shall be a minimum of ten feet. Thus, justification, in the Department's sole discretion, shall be provided for all berm widths that are less than 10-foot outside the aforementioned areas.

- Shoulder berm gutter shall be installed in all fill sections with both guardrail and fill slopes steeper than 4:1, including but not limited to areas of guardrail replacement. Shoulder berm gutter shall not be installed in cut sections. Unless required by hydraulic design, the Design-

Build Team is not required to install shoulder berm gutter on the high side of superelevated curves with guardrail.

- Cut and fill slope transitions shall not exceed one increment (e.g. 3:1 to 4:1) per 50 feet where tying to existing topography does not control.

- The Design-Build Team shall design and construct horizontal and vertical curves at all Points of Intersections (PIs) on the horizontal and vertical alignments, respectively.

NCDOT Information Supplied

- The NCDOT will provide copies of the I-5701 / I-5703 Categorical Exclusion, the latest list of environmental commitments, municipal agreements and all pertinent approvals and correspondence. Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall adhere to all commitments stated in the environmental documents.

- The NCDOT will provide electronic surveys to the Design-Build Team. Any supplemental surveys, including but not limited to additional topography, existing and proposed roadway, structure sites, underground and overhead utilities, existing and proposed drainage, wetland delineation, right of way, parcel names, and deed research and descriptions shall be the responsibility of the Design-Build Team to acquire and process. All supplemental surveys shall adhere to the Location and Survey Unit's September 28, 2018 *Proc 2018-4 - L&S Implementation of SharePoint Site Guidelines* and *Proc 2018-6 - L&S Required PEF Attestations for Individually Developed Survey Products* Memorandums. The Design-Build Team shall modify / incorporate boundary information used for the determination and valuation of property solely under the direct supervision of a Professional Land Surveyor registered in North Carolina. Known existing utilities have been located and will be included with the survey data. The Design-Build Team shall be responsible for confirming the location of the utilities and the type / size of facilities. All supplemental Subsurface Utility Engineering (SUE) work shall be the responsibility of the Design-Build Team.

- The NCDOT will provide the I-5701 / I-5703 Public Meeting Maps. The Design-Build Team is cautioned that the preliminary designs shown on the aforementioned Maps and electronic design files are provided solely to assist the Design-Build Team in the development of the project design. The Design-Build Team shall be fully and totally responsible for the accuracy and completeness of the project design, including, but not limited to, the use of the NCDOT's design, the use of portions of the NCDOT's design or modifications to the NCDOT's design.

- The NCDOT will provide the I-5701 / I-5703 electronic design files.

- The NCDOT will provide final pavement designs for I-5701 / I-5703. The Design-Build Team shall be responsible for all temporary pavement designs. (Reference the Pavement Management Scope of Work found elsewhere in this RFP)

- The NCDOT will provide a Geotechnical Subsurface Investigation for I-5701 / I-5703. The Design-Build Team shall be responsible for any additional geotechnical information, all

geotechnical recommendations, as well as supplemental structural and roadway investigations. (Reference the Geotechnical Engineering Scope of Work found elsewhere in this RFP)

ENVIRONMENTAL PERMITS SCOPE OF WORK (10-5-26)

General

The Design-Build Team shall prepare all designs and documents necessary for the Department to obtain the environmental permits for the project construction. Permit applications shall be required for the US Army Corps of Engineers (USACE) Section 404 Permit and the NC Department of Environmental Quality (DEQ) Division of Water Resources (NCDWR) Section 401 Water Quality Certification, and Neuse Riparian Buffer Authorization (if applicable).

The Design-Build Team shall not begin ground-disturbing activities, including utility relocations, within the project until NCDOT has received concurrence from the U.S. Fish and Wildlife Service, to document compliance with Section 7 of the Endangered Species Act, for those species requiring such concurrence. Informal concurrence with USFWS will be conducted for the Neuse River Waterdog (Necturus lewisi), Atlantic Pigtoe (Fusconaia masoni), Green Floater (Lasmigona subviridis) and Michaux's Sumac (Rhus michauxii). The Neuse River Waterdog, Atlantic Pigtoe, and Green Floater were last surveyed for in June 2025 and were determined to be May Affect, Not Likely to Adversely Affect. Michaux's Sumac was last surveyed for in October 2025, and the species was determined to be No Effect. The programmatic biological opinion (PBO) will be utilized for consultation on the tricolored bat (Perimyotis subflavus).

The US Fish and Wildlife Service has issued a programmatic conference opinion (PCO) in conjunction with the Federal Highway Administration (FHWA), the US Army Corps of Engineers (USACE), and NCDOT for the tricolored bat (TCB) (Perimyotis subflavus) in eastern North Carolina. The PCO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. NCDOT, FHWA, and USACE have agreed to conservation measures which will avoid / minimize take to TCBs. These conservation measures apply to all counties in Divisions 1-8. The programmatic determination for TCB for the NCDOT program is **May Affect, Likely to Adversely Affect**. Once the TCB is officially listed, the PCO will become the PBO by formal request from FHWA and USACE. The PBO will ensure compliance with Section 7 of the Endangered Species Act for approximately five years (effective through December 31, 2028) for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Wake County, where the projects I-5701 and I-5703 are located.

The Monarch Butterfly was proposed for federal listing under the Endangered Species Act (ESA) in December 2024. However, no regulatory protections will take effect until the listing is finalized. Until that time, proposed species do not receive formal ESA protections. However, federal action agencies are still required to ensure that their actions do not jeopardize the continued existence of the species. Federal action agencies may initiate consultation with the U.S. Fish and Wildlife Service (USFWS) to obtain a conference opinion. If and when the listing is finalized, and at the agency's request, the Service may adopt the conference opinion as a biological opinion—provided no relevant new information has emerged and no substantial changes to the proposed action have occurred.

Excluding investigative borings covered under a Nationwide Permit No. 6, the Design-Build Team shall not begin ground-disturbing activities, including utility relocations, in jurisdictional areas until the environmental permits have been issued.

In accordance with the following, the Design-Build Team may perform geotechnical investigative borings covered under a Nationwide Permit No. 6:

- The Design-Build Team shall coordinate with the Alternative Delivery Unit to determine if a Preconstruction Notification (PCN) is required for the Nationwide Permit No. 6.
- If a PCN is required, the Design-Build Team shall submit all necessary documents and forms to the Alternative Delivery Unit for submittal to the appropriate agencies; and shall not perform any geotechnical investigative work within the jurisdictional resource(s) requiring a PCN prior to obtaining the required approval.
- If a PCN is not required, the Design-Build Team may proceed with geotechnical investigations inside and outside jurisdictional resources, provided all of the Nationwide Permit No. 6 General Conditions are followed.

The Design-Build Team may begin construction activities prior to obtaining the aforementioned environmental permits provided that (1) the Department has reviewed and accepted the appropriate design submittal(s); (2) the Department is notified in writing and provides written approval prior to beginning work; (3) the Design-Build Team coordinates with the Department to ensure federally-protected species surveys have been performed and resolved, and that the Department has received concurrence from the U.S. Fish and Wildlife Service, to document compliance with Section 7 of the *Endangered species Act*, for those species requiring such concurrence, and (4) such activities are outside jurisdictional resources. The Design-Build Team is encouraged to advance as many construction activities as possible outside jurisdictional resources prior to issuance of the environmental permits. The Design-Build Team shall indicate the specific construction activities that will occur outside jurisdictional resources prior to obtaining the environmental permits and their anticipated start date in the Technical Proposal.

The Department will not allow any direct contact between the Design-Build Team and representatives of the environmental agencies. No contact between the Design-Build Team and the environmental agencies shall be allowed either by phone, e-mail or in person, without representatives of the Department's Environmental Analysis Unit (EAU) - Environmental Coordination and Permitting Group (ECAP) or the Division's Environmental Officer (DEO) present. A representative from the Alternative Delivery Unit shall be included on all correspondence.

This project is not a part of the 404/NEPA Merger Process. However, the Design-Build Team shall participate and present information for an informal Concurrence Point 4B and Concurrence Point 4C to the agencies.

Unless stipulated otherwise in the Technical Proposal, the Department will schedule the 4B Meeting and 4C Meeting for September 2027 and November 2027, respectively. The Design-Build Team shall clearly identify in the Technical Proposal what months they would like the Department

to schedule these meetings. Failure on the part of the Design-Build Team to meet the dates shown in the Technical Proposal shall place all responsibility for delays resulting from missing these dates solely in the hands of the Design-Build Team.

Unless noted otherwise elsewhere in this RFP, the Department will not honor any requests for additional contract time or compensation for any efforts required in order to obtain any permit or permit modification, including but not limited to public involvement, additional design effort, additional construction effort, and / or additional environmental agency coordination and approvals.

Permit Application Process and Timeframe for all Permits except the Nationwide Permit No. 6 for Geotechnical Investigations

It shall be the Design-Build Team's responsibility to provide permit impact sheets (drawings) depicting the design and construction details to the Department as part of the permit application. The aforementioned permit impact sheets shall be reviewed and accepted by the Department prior to the permit application submittal. The Design-Build Team shall be responsible for developing the permit application for all jurisdictional impacts. The permit application shall include all utility relocations required by the project.

At a minimum, the permit package shall consist of the following deliverables:

- Cover Letter
- Completed forms (Section 404 ENG 4345, etc.) appropriate for impacts
- NCDOT Mitigation Site debit ledger and / or Division of Mitigation Acceptance Letter
- Stormwater Management Plan
- Permit drawings with and without contours and, if necessary, utility drawings with and without contours.
- Wetland Permit Impact Summary Sheets
- Half-size plans
- Mitigation Plan (if required by the Design-Build Team's design and / or construction methods)

The Department will re-verify and update, as needed, the required environmental data that expires prior to permit issuance. These include, but are not limited to, federally protected species, re-verification of wetland jurisdictional areas, historic and archaeological sites, and 303(d) (impaired) streams.

Excluding the Nationwide Permit No. 6 for geotechnical investigations, the Design-Build Team shall submit one permit application for the entire project. The Design-Build Team shall not submit multiple applications to develop a "staged permitting" process to expedite construction activities in a phased fashion.

Any temporary construction measures, including de-watering, construction access, etc. shall be addressed in the permit application. Impacts that result from so-called temporary measures may not be judged to be temporary impacts by the environmental agencies. These issues shall be

addressed by the Design-Build Team and reviewed by EAU prior to the 4B Meeting and the 4C Meeting; and resolved with the environmental agencies during the aforementioned meetings.

The Design-Build Team shall clearly indicate the location and impacts of haul roads and utility relocations in jurisdictional areas. The Design-Build Team shall also identify all proposed borrow and waste sites. Further, the Design-Build Team shall describe the construction methods for all structures that impact jurisdictional resources. The temporary impact descriptions (haul roads, utility relocations, work bridges, etc.) shall include restoration plans, schedules and disposal plans. The aforementioned information, descriptions and details shall be presented during the 4B Meeting and the 4C Meeting and be included in the permit application.

The NCDOT hereby commits to ensuring, to the greatest extent practicable, that the footprint of the impacts in areas under the jurisdiction of the Federal Clean Water Act will not be increased during the Design-Build effort. In accordance with the Department of Water Resources' NCG 010000, all fill material shall be stabilized and maintained to prevent sediment from entering adjacent waters or wetlands. The Design-Build Team shall be responsible for ensuring that the design and construction of the project will not impair the movement of aquatic life.

Permit modification requests are strongly discouraged and shall only be allowed if the Engineer determines it to be in the best interest of the Department. The Design-Build Team shall not take an iterative approach to hydraulic design issues. Prior to submitting the permit application, the hydraulic design shall be complete and accepted by the Department.

Direct coordination between the Design-Build Team, the Alternative Delivery Unit, Resident Engineer, DEO, Hydraulics Unit, and EAU shall be necessary to ensure proper permit application development. Upon completion of the draft permit application, the Design-Build Team shall concurrently forward the permit application to the Alternative Delivery Unit, Resident Engineer, DEO, Hydraulics Unit and EAU for review and approval. The Design-Build Team shall allow 20 working days for the Department to review and approve the draft permit application. If a revised draft permit application is necessary, allow an additional 10 working days for review and approval of the draft permit application. After all revisions are complete, the Department will subsequently forward the "complete" permit application to the appropriate environmental agencies.

The Design-Build Team should expect it to take up to seven months to accurately and adequately complete all designs necessary for the permit application and develop the permit application. The Design-Build Team shall assume the environmental agencies will take up to 120 days to review the complete permit application and issue the permits and certifications. No requests for additional contract time or compensation will be allowed if the environmental agencies issue the permits and certifications within this 120-day period. The Department will only consider requests for contract time extensions for the environmental agencies' review if the 120-day period has been exceeded. If time were granted, it would be only for that time exceeding the 120-day period. The 120-day period is considered to begin on the date the Department submits a fully complete and 100% accurate permit application to the environmental agencies; and does not include the time required for commitment reconciliation or obtaining signatures after the permits and certifications are received from the environmental agencies.

Mitigation Responsibilities of the Design-Build Team

As required by the NEPA Process and the USACE / EPA Section 404(b)(1) Guidelines, to offset potential wetland and stream impacts, the Department has reviewed the roadway project corridor for potential on-site mitigation opportunities. Since no on-site mitigation opportunities were identified, the Department will acquire compensatory mitigation for unavoidable impacts to wetlands and streams due to the I-5701 / I-5703 project construction from the NC Division of Mitigation Services.

Any changes proposed by the Design-Build Team to any design or construction details provided by the Department shall be approved by the Department prior to being submitted to the environmental agencies for their approval.

Should additional jurisdictional impacts result from design revisions that are not required elsewhere in this RFP and / or construction methods, suitable compensatory mitigation for wetlands and / or streams shall be the sole responsibility of the Design-Build Team. Therefore, it is important to note that additional mitigation will have to be approved by the environmental agencies and such approval shall require, at a minimum, the preparation and approval of a Mitigation Plan before permits are approved. To mitigate for these additional jurisdictional impacts, the Design-Build Team shall be responsible for all costs associated with acquiring suitable mitigation. Construction of any on-site mitigation shall be performed by a contractor that has successfully constructed similar on-site mitigation. In the absence of suitable on-site mitigation, the Design-Build Team shall be responsible for acquiring all additional mitigation from the NC Division of Mitigation Services or an approved compensatory mitigation banking source.

The Design-Build Team shall analyze all new areas to be impacted that have not been analyzed during the NEPA Process, including but not limited to borrow sites, waste sites, haul roads and staging areas that are located outside the project right of way. This analysis shall include performing all environmental assessments. These assessments shall require the Design-Build Team to engage the services of a NCDOT prequalified environmental consultant to conduct a full environmental investigation to include, but not be limited to, Federally Listed Threatened and Endangered Species, wetlands, streams, avoidance and minimization in jurisdictional areas, compensatory mitigation, FEMA compliance, and historical, archaeological, and cultural resource surveys in these areas. The environmental consultant shall obtain concurrence, through EAU, from the U. S. Fish and Wildlife Service, to document compliance with Section 7 of the *Endangered Species Act* for those species requiring such concurrence. In addition, the Design-Build Team shall identify additional mitigation required and fulfill all other requirements that the environmental agencies impose to obtain the permit. Any contract time extensions resulting from additional environmental assessments required by the Design-Build Team's design and / or construction methods impacting areas outside those previously analyzed through the NEPA Process shall be solely at the Department's discretion.

Commitments

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize wetland and stream impacts; and to provide full compensatory mitigation of all remaining wetland and stream impacts. Avoidance measures were taken during the planning and NEPA Process and minimization measures were incorporated as part of the preliminary design provided by the Department. The Design-Build Team shall incorporate avoidance and minimization features identified during the 4B / 4C meetings into the design and / or construction methods at no additional cost or contract time extension. Descriptions of the avoidance and minimization features incorporated into the development and design of the project shall be listed in the appropriate section of the Stormwater Management Plan.

All work by the Design-Build Team must be accomplished in strict compliance with the plans submitted with the permit application and in compliance with all conditions of the permits and certifications issued by the environmental agencies. The Design-Build Team shall provide each of its contractors and / or agents associated with the construction or maintenance of this project with a copy of the permits and certifications.

Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall strictly adhere to these commitments, as well as others, including but not limited to, those included in the I-5701 / I-5703 Categorical Exclusion, all permits, all interagency meetings, and all site visits.

Cultural Resources

If the Design-Build Team's design or construction activities 1) impact any property that has been determined eligible for the National Register of Historic Places (NRHP) beyond the impacts shown in the Department's Preliminary Roadway Plans, or 2) go outside the limits of the APEs, consultation with NCDOT, North Carolina State Historic Preservation Office (NC-HPO), and FHWA , as appropriate, must occur prior to any construction activities occurring in that area. If the consultation requires additional NRHP evaluation / surveys and / or Section 106 mitigation, the Design-Build Team shall engage the services of a NCDOT prequalified historic architecture and / or archaeology consultant to conduct further historic architecture and / or archaeology evaluation / surveys and / or determine potential mitigation. The Design-Build Team shall be responsible for all costs associated with the additional impacts, including but not limited to any additional design effort, additional construction, historic architecture and / or archaeology evaluations / surveys, coordination with NCDOT, NC-HPO and FHWA, and any required commitments and / or mitigation. The Department will not honor any requests for additional contract time or compensation for any efforts required for the aforementioned activities, including but not limited to public involvement, additional design effort, required evaluations / surveys, required commitments / mitigation, additional construction effort, and / or additional environmental agency coordination and approvals.

If the Design-Build Team discovers any undocumented historic or archaeological resources while conducting the authorized work, they shall immediately suspend activities in that area and notify, in writing, the Alternative Delivery Unit, the NCDOT Historic Architecture Team Leader, the

NCDOT Archaeology Team Leader and the NCDOT Project Development Engineer listed below. Upon receipt of notification, the Department will perform an initial assessment and initiate any required State / Federal coordination. Should the initial resource assessment and agency coordination completed by NCDOT determine that additional NRHP evaluation and / or Section 106 mitigation is necessary, the Design Build Team shall engage the services of a NCDOT prequalified historic architecture and / or archaeology consultant to conduct further historic architecture and / or archaeology evaluation and / or mitigation.

The inadvertent or accidental discovery of human remains shall be handled in accordance with North Carolina General Statutes 65 and 70. All questions regarding these discoveries shall be addressed to Mary Pope Furr, NCDOT Historic Architecture Team Leader at (919) 707-6068, Jason Elliott, NCDOT Assistant Unit Head at (919) 707-6114, or Sara Sherman, PE, NCDOT Project Manager at (919) 707-6303.

EROSION AND SEDIMENTATION CONTROL SCOPE OF WORK (10-6-26)

The NCDOT Roadside Environmental Unit will review and accept all Erosion and Sedimentation Control (E&SC) Plans. Clearing & Grubbing and Final Grade Release for Construction (RFC) Erosion Control Plans shall be submitted, accepted and distributed to all NCDOT personnel listed in the Design-Build Submittal Guidelines before **any** land disturbing activities, including clearing and grubbing, can commence. If the Design-Build Team chooses to perform the work in discrete sections, then a complete set of Clearing & Grubbing and Final Grade RFC Erosion Control Plans shall be submitted, accepted, and distributed, as noted above, prior to land disturbing activities, including clearing and grubbing, commencing in that section. No land disturbing activities, including clearing and grubbing, shall occur in any location that does not have accepted Clearing & Grubbing and Final Grade RFC Erosion Control Plans. Refer to the most recent version of the NCDOT *Erosion and Sediment Control Design and Construction Manual* and the NCDEQ - *Erosion and Sediment Control Planning and Design Manual* for erosion control design guidelines not addressed in this Scope of Work.

The design requirements stated herein are minimum criteria for the acceptance of the E&SC Plans by the NCDOT under the authority delegated by the North Carolina Sediment Control Commission. These minimum requirements do not exempt the Design-Build Team from taking all actions necessary, including but not limited to, modification of the design of the E&SC plan, installation and maintenance of E&SC devices, to comply with the performance standards of the Sediment Pollution Control Act and the NCG-010000 General Construction Stormwater Permit.

To ensure adherence with the NCG-010000 General Construction Permit, issued by the North Carolina Department of Environmental Quality, Division of Water Resources, the Design-Build Team shall formally submit a project-wide Vegetation Management Procedure for the Department's review and acceptance prior to any land disturbing activities. After this initial review, the Design-Build Team shall concurrently provide the Resident Engineer and NCDOT Roadside Environmental Field Operations Engineer updated versions of the Vegetation Management Procedure on a monthly basis. These updated versions will not require formal submittal to the Alternative Delivery Unit, but will be subject to review comments by the aforementioned field personnel. All versions of the Vegetation Management Procedure shall include, but not be limited to:

- **i.** Schedule for initiation of land disturbing activities with schedule for completion of subdivided areas, and areas designated as ESAs detailing anticipated and actual times of completion
- **ii.** Schedule of temporary groundcover with timeframes noting anticipated and actual completion dates in accordance with NCG-01000 for the areas noted in (i)
- **iii.** Anticipated and actual dates of completion of permanent groundcover for areas noted in (i) to obtain the required 80% permanent vegetation as defined in the NCG-01000 as well as provisions for the early establishment of grasses / vegetation, in accordance with the *Permanent Vegetation Establishment* Project Special Provision found elsewhere in this RFP and any enhancement areas required by permit or commitment by the project final completion date
- **iv.** Procedure for identifying areas of deficient vegetation establishment and details and dates of corrective actions taken or amendments applied to remedy the deficiencies of noted areas

v. Details and schedule for fertilizer topdressing, supplemental seeding, mowing and repair seeding

All portions of the Vegetation Management Procedure shall be closely coordinated with the grading and hauling operations and adhered to as practical. Variances shall be documented and approved by the Engineer. The Design-Build Team shall provide a narrative overview of the Vegetation Management Procedure in the Technical Proposal. Guidance for development of the Vegetation Management Procedure may be found at:

https://connect.ncdot.gov/resources/roadside/Pages/Soil-Water.aspx

From the beginning through the end of construction, the Design-Build Team shall maintain comprehensive "red-line" As-Constructed Drawings that detail when and where permanent / temporary / repair seeding and fertilizer topdressing have been performed.

Erosion and Sedimentation Control Plans shall at a minimum address the following:

I. Complete Set of Plans

A. Clearing and Grubbing Phase

1. Use correct NCDOT symbology.
2. Protect existing drainage structure inlets with Rock Inlet Sediment Trap Type 'A' (RIST-A), Rock Inlet Sediment Trap Type 'C' (RIST-C), Rock Pipe Inlet Sediment Trap Type 'A' (PIST-A), etc.
3. Utilize adequate perimeter controls (temporary silt ditches (TSD)), temporary silt fence (TSF), etc.).
4. Clean Water Diversions (CWD) shall not be used to divert offsite runoff through the project construction limits.
5. All jurisdictional streams shall be delineated with a 50-foot from top of bank Environmentally Sensitive Area (ESA) on Clearing and Grubbing Plans.
6. Utilize skimmer basins and rock measures with sediment control stone (Temporary Rock Sediment Dam Type 'B' (TRSD-B), Temporary Rock Silt Check Type 'A' (TRSC-A), etc.) at drainage outlets.
7. Take into account topography and show existing contour lines on Clearing & Grubbing Plans only.
8. Utilize Temporary Rock Silt Checks Type 'B' (TRSC-B) or wattles to reduce velocity in existing ditches with spacing of 250 feet divided by percentage of ditch grade. Also utilize TRSC-Bs in proposed TSDs and temporary diversions (TD).
9. Protect existing streams; do not place erosion control devices in live streams unless permitted by the Division of Water Resources 401 Certification and the Army Corps of Engineers 404 Permit.
10. Sediment basins shall be sized to provide adequate silt storage for 3,600 cubic feet per disturbed acre with surface area equal to 435 square feet per cubic foot per second (cfs) of the peak inflow rate, Q25, using 25-year peak rainfall data (NCDEQ - *Erosion and Sediment Control Planning and Design Manual* or NOAA's National Weather

Service website **https://hdsc.nws.noaa.gov/pfds/** for partial duration (ARI) time series type). A Sediment Basin Designer Spreadsheet will be provided by the NCDOT Roadside Environmental Unit upon request.

11. Skimmer Basins shall be sized to provide adequate silt storage for 1,800 cubic feet per disturbed acre with surface area equal to 325 square feet per cubic foot per second (cfs) of the peak inflow rate, Q25, using the 25-year peak rainfall data (NCDEQ - *Erosion and Sediment Control Planning and Design Manual* or NOAA's National Weather Service website **https://hdsc.nws.noaa.gov/pfds/** for partial duration (ARI) time series type). Skimmer Basins shall be designed to dewater in two to three days. A Skimmer Basin Designer Spreadsheet will be provided by the NCDOT Roadside Environmental Unit upon request.
12. Design Riser Basins to the following standards:

    - Surface Area shall be determined by Equation A (sq. feet) = Q25 (cfs) * 435.
    - Volume requirement shall be 1,800 cubic feet per disturbed acre draining to the riser basin.
    - Riser Pipe shall have a cross-sectional area 1.5 times that of the barrel pipe.
    - The riser pipe shall be non-perforated with a skimmer attached to the bottom of the pipe, one foot from the bottom of the basin.
    - See NCDEQ - *Erosion and Sediment Control Planning and Design Manual* for additional design criteria.

13. The minimum and maximum length to width ratio of all Sediment Basins shall be 2:1 and 6:1, respectively.
14. Coir Fiber Baffles shall be installed in all silt basins and sediment dams at drainage outlets. For silt basins with a 20-foot or longer length, three Coir Fiber Baffles shall be installed with a spacing of 1/4 the basin length. For silt basins with a length less than 20 feet, a minimum of two Coir Fiber Baffles shall be installed, with a spacing of 1/3 the basin length. The Design-Build Team will not be required to show the individual baffles on the Erosion Control Plans, but shall be required to incorporate the Coir Fiber Baffle Detail on the Erosion Control Plans.
15. Include any culvert and / or pipe construction sequence plan sheets in the Clearing & Grubbing Plans; all pipes 48 inches or larger, or any combination of pipes that total 48 inches or more, in jurisdictional streams shall require a construction sequence. Prior to installation of pipes smaller than 48 inches in jurisdictional streams, the Design-Build Team shall submit a phasing plan for managing the watercourse to the Resident Engineer for review and acceptance. The phasing plan shall be in accordance with the *Best Management Practices for Construction and Maintenance Activities*.
16. During construction, provide temporary sediment basins that dewater from the surface at all permanent stormwater devices.
17. In accordance with the NCDOT *Erosion and Sediment Control Design and Construction Manual,* utilize Excelsior / Coir Fiber Wattles with Flocculant and / or TRSC-As with Matting and Flocculant in temporary and permanent, existing and proposed ditches in areas where sediment basins are not feasible at drainage outlets, and in areas where sediment basins at drainage outlets with sediment traps (e.g. PIST-A, RIST-A, etc.) cannot be properly sized to surface area and / or sediment

storage requirements due to safety concerns, right of way restrictions, utility conflicts, or other construction limitations approved by the NCDOT Roadside Environmental Unit.

18. Place devices utilizing flocculant at all sediment basin inlets.
19. At a maximum spacing of 200 feet, at all sag points and as directed, utilize Special Sediment Control Fence or Coir Fiber Wattles as drainage breaks in silt fence.
20. Do not place erosion control devices that require excavation (e.g. sediment basins, silt ditches, etc.) in wetlands unless permitted by the Division of Water Resources 401 Certification and the Army Corps of Engineers 404 Permit.
21. Within the entire project limits, provide disturbed and undisturbed drainage area delineations in MicroStation Format.
22. For all drainage outlets where the runoff cannot be treated with a sediment basin and / or the sediment basin cannot be constructed to the required sediment storage or surface area requirements, provide a written explanation.
23. Excluding Sediment Basins that will function only during Clearing and Grubbing operations, all perimeter Sediment Basins shall be placed outside of fill slopes.

B. Final Grade Phase

1. Use correct NCDOT symbology.
2. Protect existing and proposed drainage structure inlets with RIST-A, RIST-C, PIST-A, etc.
3. Utilize adequate perimeter controls (TSD, TSF, etc.).
4. Clean Water Diversions (CWD) shall not be used to divert offsite runoff through the project construction limits.
5. Utilize TRSC-Bs or wattles to reduce velocity in existing and proposed ditches with spacing of 250 feet divided by percentage of ditch grade. Also utilize TRSC-Bs in proposed TSDs and TDs.
6. Utilize temporary slope drains and earth berms at top of fill slopes eight feet or higher and a fill slope steeper than 4:1, or where there are superelevations above 0.04 and fills are greater than three feet. Maximum slope drain spacing shall be 200 feet.
7. Utilize a rock energy dissipater at the outlet of all slope drains.
8. Devices at all drainage turnouts shall utilize skimmer or sediment control stone (TRSD-B, TRSC-A, etc.) and a spillway with an adequately designed base length to distribute outflow.
9. Sediment basins shall be sized to provide adequate silt storage for 3,600 cubic feet per disturbed acre with surface area equal to 435 square feet per cubic foot per second (cfs) of the peak inflow rate, Q25, using 25-year peak rainfall data (NCDEQ - *Erosion and Sediment Control Planning and Design Manual* or NOAA's National Weather Service website **https://hdsc.nws.noaa.gov/pfds/** for partial duration (ARI) time series type). A Sediment Basin Designer Spreadsheet will be provided by NCDOT Roadside Environmental Unit upon request.
10. Skimmer Basins shall be sized to provide adequate silt storage for 1,800 cubic feet per disturbed acre with surface area equal to 325 square feet per cubic foot per second (cfs) of the peak inflow rate, Q25, using the 25-year peak rainfall data (NCDEQ - *Erosion and Sediment Control Planning and Design Manual* or NOAA's National

Weather Service website **https://hdsc.nws.noaa.gov/pfds/** for partial duration (ARI) time series type). Skimmer Basins shall be designed to dewater in two to three days. A Skimmer Basin Designer Spreadsheet will be provided by the NCDOT Roadside Environmental Unit upon request.

11. Design Riser Basins to the following standards:

    - Surface Area shall be determined by Equation A (sq. feet) = Q25 (cfs) * 435.
    - Volume requirement shall be 1,800 cubic feet per disturbed acre draining to the riser basin.
    - Riser Pipe shall have a cross-sectional area 1.5 times that of the barrel pipe.
    - The riser pipe shall be non-perforated with a skimmer attached to the bottom of the pipe, one foot from the bottom of the basin.
    - See NCDEQ - *Erosion and Sediment Control Planning and Design Manual* for additional design criteria.

12. In accordance with the requirements below, install erosion control in all ditch lines, including but not limited to temporary ditch lines (TDs) utilized to divert offsite runoff around construction areas:

    - Install straw matting in all ditch lines where the velocity is greater than 2.0 feet / sec, and the shear stress is 1.25 psf or less.
    - Install excelsior matting in all ditch lines with a shear stress above 1.25 psf, but not greater than 2.55 psf.
    - Excluding locations where rip rap is not allowed (e.g. clear recovery zone, etc.), install Permanent Soil Reinforcement Mat or rip rap in all ditch lines with a sheer stress greater than 2.55 psf.
    - At locations where rip rap is not allowed, install Permanent Soil Reinforcement Mat in all ditch lines with a sheer stress greater than 2.55 psf.

13. Unless otherwise approved by the Roadside Environmental Field Operations Engineer, provide matting for erosion control on all slopes (cut and fill) that are steeper than 4:1 and a height of eight feet or greater.
14. Install matting for erosion control on all disturbed slopes adjacent to jurisdictional areas regardless of height and slope. Rolled erosion control products used within wetlands or riparian areas shall be non-poly mesh nettings.
15. Along all slopes (cut and fill) that are 30 feet or higher, place parallel rows of minimum nine-inch Excelsior Wattles at a spacing height of 20 feet.
16. The minimum and maximum length to width ratio of all Sediment Basins shall be 2:1 and 6:1, respectively.
17. Coir Fiber Baffles shall be installed in all silt basins and sediment dams at drainage outlets. For silt basins with a 20-foot or longer length, three Coir Fiber Baffles shall be installed with a spacing of 1/4 the basin length. For silt basins with a length less than 20 feet, a minimum of two Coir Fiber Baffles shall be installed, with a spacing of 1/3 the basin length. The Design-Build Team will not be required to show the individual baffles on the Erosion Control Plans, but shall be required to incorporate the Coir Fiber Baffle Detail on the Erosion Control Plans.

18. During construction, provide temporary sediment basins that dewater from the surface at all permanent stormwater devices.
19. In accordance with the NCDOT *Erosion and Sediment Control Design and Construction Manual* Utilize Excelsior / Coir Fiber Wattles with Flocculant and / or TRSC-As with matting and flocculant in temporary and permanent, existing and proposed ditches in areas where sediment basins are not feasible at drainage outlets, and in areas where sediment basins at drainage outlets with sediment traps (e.g. PIST-A, RIST-A, etc.) cannot be properly sized to surface area and / or sediment storage requirements due to safety concerns, right of way restrictions, utility conflicts, or other construction limitations approved by the NCDOT Roadside Environmental Unit.
20. Place devices utilizing flocculant at all sediment basin inlets.
21. At a maximum spacing of 200 feet, at all sag points, and as directed, Utilize Special Sediment Control Fence or Coir Fiber Wattles as drainage breaks in silt fence.
22. Do not place erosion control devices that require excavation (e.g. sediment basins, silt ditches, etc.) in wetlands unless permitted by the Division of Water Resources 401 Certification and the Army Corps of Engineers 404 Permit.
23. Within the entire project limits, provide disturbed and undisturbed drainage area delineations in MicroStation Format.
24. For all drainage outlets where the runoff cannot be treated with a sediment basin and / or the sediment basin cannot be constructed to the required sediment storage or surface area requirements, provide a written explanation.
25. All perimeter Sediment Basins shall be placed outside of fill slopes.

C. Intermediate Phase

Intermediate Erosion Control Plans shall be required if design modifications and / or site conditions require additional erosion control design or design revisions to the RFC Clearing and Grubbing and / or RFC Final Grade Erosion Control Plans, including but not limited to all detours where construction stormwater is not captured in the Erosion Control Plans. Intermediate Erosion Control Plans shall be submitted for review and shall be accepted prior to construction of any aspect impacted by the revised erosion control design. For any intermediate phase, comply with Section B, “Final Grade Phase” above.

II. Detail Sheets and Notes

A. Provide project specific special notes and details, including but not limited to, skimmer basin, coir fiber wattle with flocculant, etc.
B. Provide matting summary sheet(s): matting for erosion control (straw and excelsior), permanent soil reinforcement mat, and coir fiber mat.
C. Provide reforestation sheet(s): regular, wetland, streambank and / or buffer showing appropriate species.

III. Title Sheet and Legend Sheet

A. Show correct notes: NCG-01, HQW, ESA, clearing and grubbing, etc.
B. Show correct standards for the project
C. List of standard NCDOT symbology
D. Show name and certification number of Level III certified individual responsible for designing and / or reviewing Erosion and Sedimentation Control Plans

IV. Special Provisions

A. Erosion Control Special Provisions are available at the following website:

https://connect.ncdot.gov/resources/roadside/Pages/Soil-Water.aspx

B. References in Erosion Control Special Provisions from the aforementioned website to Method of Measurement, Basis of Payment, or any other statement regarding direct payment for Erosion & Sediment Control measures shall be disregarded.

C. *Erosion & Sediment Control / Stormwater Certification* Project Special Provision found elsewhere in this RFP.

V. Miscellaneous

A. Plan submittals shall include all pertinent design information required for review, such as design calculations, drainage areas, etc.
B. The NCDOT Roadside Environmental Unit will provide a sample set of Erosion and Sedimentation Control Plans (including any special details or special provisions used by the NCDOT Roadside Environmental Unit) and MicroStation Erosion Control Workspace to the Design-Build Team for reference upon request.
C. The Erosion and Sedimentation Control Plans shall address any environmental issues raised during the permitting process.
D. The Design-Build Team shall allow sufficient time in the proposed schedule to address any comments to the Erosion and Sedimentation Control Plans, as deemed necessary by the NCDOT Roadside Environmental Unit.
E. Temporary access and haul roads, other than public roads, constructed or used in connection with the project shall be considered a part of the project and addressed in the Erosion and Sedimentation Control Plans. Temporary access and haul roads located within the footprint and / or the right of way / easement corridor of the project shall be part of the highway Erosion and Sedimentation Control Plans. Temporary access and haul roads associated with borrow pits and staging areas shall be included in the Reclamation Plan.
F. At a minimum, the Design-Build Team shall install Floating Turbidity Curtains at ponds, lakes, and other standing water bodies, both jurisdictional and non-jurisdictional, where 1) construction activities create surface fill impacts or 2) sufficient erosion and sediment control devices cannot be installed to contain sediment and / or turbidity impacts.
G. To contain concrete waste water and associated concrete mix from washing out ready-mix trucks, drums, pumps, or other equipment, provide Concrete Washout Structures at egress points. Concrete Washout Structures must collect and retain all concrete waste water and solids so that this material does not migrate to surface waters or into the ground water. The Concrete Washout Structures are not intended for concrete waste not associated with

washout operations. The Concrete Washout Structures may include devices above or below ground and / or commercially available devices designed specifically to capture concrete waste water. Concrete Washout Structure options may be found in the special provision, available at the website noted in Section IV above. For construction details of an above grade and below grade Concrete Washout Structure, reference the website noted below:

https://connect.ncdot.gov/resources/roadside/SoilWaterDocuments2024/Concrete%20Washout%20Structure.pdf

H. Borrow or waste areas that are part of the project shall require a separate Reclamation Plan, unless the borrow or waste activity is regulated under the *Mining Act of 1971*, or is a landfill regulated by the NCDEQ - Division of Waste Management (DWM). For newly created borrow pit(s) that require dewatering, Borrow Pit(s) Dewatering Basins shall be required and shall be in accordance with the applicable special provisions available at the website noted in Section IV above. The Design-Build Team shall submit the location and permit number for waste / borrow sites covered by the aforementioned Mining Act or regulated by the NCDEQ - DWM concurrently to the Alternative Delivery Unit and the Resident Engineer. For Reclamation Procedures, see:

https://connect.ncdot.gov/resources/roadside/FieldOperationsDocuments/Contract%20Reclamation%20Procedures.pdf

I. Whenever the Engineer determines that significant erosion and sedimentation continues despite the installation of approved protective practices, the Design-Build Team shall be required to, and shall, take additional protective action to maintain environmental compliance. In accordance with Division One found elsewhere in this RFP, all additional efforts to maintain environmental compliance shall be considered maintenance of the project and shall not be considered additional work.

J. An accepted Erosion and Sedimentation Control Plan shall not exempt the Design-Build Team from making every effort to contain sediment onsite. As directed by the Engineer, sediment losses shall be recovered and associated damages repaired. In accordance with Division One found elsewhere in this RFP, the work necessary to recover and repair areas affected by sediment losses shall be considered maintenance of the project and shall not be considered additional work.

K. Any Erosion Control Design revisions made during construction of the project shall be submitted to the NCDOT Roadside Environmental Unit, via the Alternative Delivery Unit, for review and acceptance. At anytime requested by the Engineer or the NCDOT Roadside Environmental Unit, the Design-Build Team shall provide an updated version of the Erosion and Sedimentation Control Plans for distribution to all parties involved in the construction process.

L. The Design-Build Team shall comply with the North Carolina Administrative Code *Title 15A Environmental Quality* Chapter 4, Sedimentation Control.

M. A pre-submittal meeting shall take place between the NCDOT Roadside Environmental Unit Soil & Water Engineering Section, the Design-Build Team, and any other pertinent NCDOT personnel before any Erosion and Sedimentation Control Designs are submitted to the NCDOT Roadside Environmental Unit. Erosion and Sedimentation Control Plan submittals shall only be reviewed and accepted by the NCDOT Roadside Environmental

Unit after the Erosion and Sedimentation Control Pre-Submittal Meeting. The Design-Build Team shall be required to submit a tentative Erosion and Sedimentation Control Plan submittal schedule at the pre-submittal meeting.

N. At a minimum, the Design-Build Team shall bring one erosion control plan sheet with a clearing and grubbing erosion control design to the Erosion and Sedimentation Control Pre-Submittal Meeting.

O. All RFC Erosion and Sedimentation Control Plans, including any red line revisions, shall be kept on site at all times throughout the duration of the project.

P. Immediately after the clearing and grubbing erosion control measures have been installed for the entire project, or for individual sections if the Design-Build Team has divided the project into construction segments, the Design-Build Team's erosion and sedimentation control designer shall field verify constructed dimensions and installation of all erosion control devices. After this initial inspection(s), the aforementioned designer shall review the project conditions a minimum of every 30 days during the heavy grading operations, and as directed by the Engineer, to verify the field conditions of disturbed areas draining to erosion control devices and to ensure that the erosion control devices provide the current field condition requirements for sediment storage and surface area. During construction, the NCDOT may conduct separate field inspections of the project conditions and the erosion control devices throughout the entire project limits. The erosion and sedimentation control designer shall make appropriate design revisions to the Clearing and Grubbing, Intermediate Erosion Control Plans and / or Final Grade Erosion Control Plans resulting from / required by the Design-Build Team, the Departmental field inspections for the Department's review and acceptance, in accordance with the Design-Build Submittal Guidelines. The Design-Build Team shall concurrently provide written documentation of all field verifications / inspections performed by the Design-Build Team to the NCDOT Roadside Environmental Unit, Soil and Water Engineering and Field Operations Section, the Resident Engineer as appropriate. At a minimum, this documentation shall detail what was observed during the field verification / inspection and all resulting required actions with a timeframe for implementation. The Department will determine when the project conditions no longer warrant inspections by the erosion and sedimentation control designer.

Q. The Design-Build Team's erosion and sedimentation control designer shall submit design calculations, for the Department's review and acceptance, for all modifications to the Erosion and Sedimentation Control Plans that result in dimension modifications and / or relocations, other than minor shifts to accurately place, to the devices noted below:

- Riser Basin
- Skimmer Basin and all devices with Skimmers
- Temporary Rock Sediment Dam Type A
- Temporary Rock Sediment Dam Type B
- Temporary Rock Silt Check Type A
- Culvert Construction Sequences
- Temporary and Permanent Stream Channel Relocations

R. Erosion & Sediment Control / Stormwater Certification shall be required according to the Project Special Provision found elsewhere in this RFP.

S. Prior to installation of any erosion control devices, the Design-Build Team shall verify boundaries of jurisdictional areas and ESA areas in the field, and delineate with Safety Fence or flagging. For guidance on Safety Fence and flagging in jurisdictional areas, see:

https://connect.ncdot.gov/resources/roadside/Pages/Field-Operations-Documents.aspx

T. Once RFC Erosion and Sedimentation Control Plans are issued, any major design change or addition, any change that involves calculations, and any addition, deletion, or relocation of a sediment basin shall be submitted to the NCDOT Roadside Environmental Unit, via the Alternative Delivery Unit, for review and acceptance. Minor changes such as moving silt fence, adding or moving temporary ditches (unless adding new runoff flow to a sediment basin), and adding or moving slope drains shall be reviewed in the field by the Engineer for the entire project.

U. All erosion control measures with stone extending beyond the construction limits shall be considered temporary fill. If impacted wetland areas are permitted as Hand Clearing, then the aforementioned temporary fill shall be permitted as Temporary Fill in Hand Cleared Areas for Erosion Control. (Reference the Environmental Permits Scope of Work found elsewhere in this RFP)

V. Sediment basins that drain directly into jurisdictional water or have a total drainage area of one acre or more shall be designed and constructed with outlet structures that only withdraw water from the surface. For sediment basins that do not drain directly into jurisdictional water and have less than one acre of total drainage area, surface dewatering outlets or stone outlets may be provided.

W. In accordance with the requirements noted herein, the Design-Build Team shall be responsible for erosion control design, erosion control plans, erosion control plan implementation and maintenance of erosion control measures for all utility installation and relocation work performed by the Design-Build Team. To ensure that the Design-Build Team's erosion control designs, erosion control plan implementation and / or maintenance of erosion control measures do not conflict with the erosion control design, erosion control plan implementation and / or maintenance of erosion control measures for utility installation and / or relocation work performed by others, the Design-Build Team shall coordinate with the utility companies performing Utilities by Others (UBO) work.

X. Structural controls installed to manage construction materials stored or used on site shall be shown on the Erosion and Sedimentation Control Plans in compliance with Section F, Materials Management of the current version of the NCG-010000 General Construction Permit.

Y. Following the date of availability, the Design-Build Team shall conduct monthly litter pick-up and disposal of construction and non-construction waste within the project limits and as directed by the Engineer. Disposal of these waste materials shall be in accordance with local and state regulations.

On the pickup date, the Design-Build Team shall report the number of bags of litter and all recycling collected on the following NCDOT Litter Management website:

https://apps.ncdot.gov/LM

An access code ('Pickup Key') for the online reporting portal may be obtained via emailing the Roadside Environmental Unit Litter Management Section at **ncdot.clr@ncdot.gov**. Prior to starting initial litter collection operations, the Design-Build Team shall request access to the litter removal reporting website and obtain an access code.

Z. Ground Cover Stabilization Requirements - NCG010000 (7 - 14 Days)

Ground cover stabilization shall comply with the timeframe guidelines specified by the current version of the North Carolina Department of Environmental Quality, Division of Water Resources NCG-010000 General Construction Permit. Excluding the slopes noted below, temporary and permanent ground cover stabilization shall be provided within seven calendar days from the last land-disturbing activity. The Design-Build Team shall label all slopes subject to the seven-day ground cover stabilization requirements on all Erosion and Sedimentation Control Plans submitted to the Department for review and acceptance.

For the slopes noted below, temporary and / or permanent ground cover stabilization shall be provided within 14 calendar days from the last land-disturbing activity:

Slopes between 2:1 and 3:1, with a slope length of ten feet or less
Slopes 3:1 or flatter, with a slope length of 50 feet or less
Slopes 4:1 or flatter

Temporary and / or permanent ground cover stabilization shall be provided in accordance with the provisions in this RFP, the Vegetation Management Procedure developed by the Design-Build Team and the current version of the NCG-010000 General Construction Permit.

AA. Additional Ground Cover Stabilization Requirements

Once the Design-Build Team identifies the area for stabilization due to inactivity, the Design-Build Team shall obtain concurrence from the Engineer and adhere to the following options based on the estimated amount of time the area will remain inactive. If the area stabilized exceeds the estimated timeframe, the Design-Build Team shall implement the next level of stabilization as directed by the Engineer.

All application rates noted below are in pounds per acre.

Short Term Stabilization - For areas that will remain inactive for up to 21 days

Erodible areas shall be stabilized utilizing non-vegetative cover. Non-vegetative cover options include straw mulch, hydraulic applied erosion control products or rolled erosion control products. If straw mulch is used, it shall provide 100% groundcover and be tacked sufficiently to hold the mulch in place for the duration of the inactive period. All other methods shall be installed according to the manufacturer's directions.

Mid-Term Stabilization -For areas that will remain inactive for up to 90 days

Erodible areas shall be stabilized utilizing the following stabilization protocol:

March 1 - August 31	**September 1 - February 28**
50# German or Browntop Millet	50# Rye Grain or Wheat
500# Fertilizer	500# Fertilizer
4000# Limestone	4000# Limestone

At the Engineer's sole discretion, the use of limestone may be eliminated for Mid-Term (temporary) seeding. The Design-Build Team shall consult with, and obtain written approval from, the NCDOT Roadside Environmental Unit prior to eliminating limestone.

Upon obtaining written approval from the Engineer, the Design-Build Team may use wood mulch and / or ground clearing and grubbing debris as an option for Mid-Term Stabilization. If approved, the aforementioned mulch and / or debris shall be installed at a thickness that prevents erosion.

Long Term Stabilization - For areas that will remain inactive for more than 91 days

Erodible areas shall be stabilized utilizing the following stabilization protocol:

All Roadway Areas

March 1 – August 31	**September 1 – February 28**
10# Centipede *	10# Centipede *
50# Tall Fescue Cultivars **	50# Tall Fescue Cultivars **
25# Bermuda (unhulled)	35# Bermuda (hulled)
500# Fertilizer	500# Fertilizer
4000# Limestone	4000# Limestone

* On cut and fill slopes 2:1 or steeper, the Design-Build Team shall apply centipede at a rate of five pounds per acre.

Riparian and Wetland Locations

March 1 – August 31	**September 1 – February 28**
18# Creeping Red Fescue Cultivars ***	18# Creeping Red Fescue Cultivars ***
6# Indiangrass	6# Indiangrass
8# Little Bluestem	8# Little Bluestem
4# Switchgrass	4# Switchgrass
25# Browntop Millet	35# Rye Grain
500# Fertilizer[1]	500# Fertilizer[1]
4000# Limestone[1]	4000# Limestone[1]

[1]Fertilizer and limestone applications within wetlands and riparian areas may be reduced or omitted at the discretion of the Engineer.

Areas Beyond the Mowing Pattern, Waste and Borrow Areas

March 1 – August 31	**September 1 – February 28**
75# Tall Fescue Cultivars **	75# Tall Fescue Cultivars **
25# Bermuda (hulled)	35# Bermuda (unhulled)
500# Fertilizer	500# Fertilizer
4000# Limestone	500# Fertilizer

**** Approved Tall Fescue Cultivars**

06 Dust	Escalade	Kalahari	Serengeti
2nd Millennium	Essential	Kitty Hawk 2000	Shelby
3rd Millennium	Evergreen 2	Legitimate	Shenandoah III
Avenger	Faith	Lexington	Shenandoah Elite
Bar Fa	Falcon IV	LifeGuard	Sheridan
Barlexas	Falson NG	LSD	Sidewinder
Barlexas II	Falcon V	Magellan	Signia
Barrera	Fat Cat	Masterpiece	Silver Hawk
Barrington	Fesnova	Millennium SRP	Skyline
Barrobusto	Fidelity	Monet	Solara
Barvado	Finelawn Elite	Mustang 4	Southern Choice II
Biltmore	Finelawn Xpress	Naturally Green	Speedway
Bingo	Finesse II	Ninja 2	Spyder LS
Bizem	Firebird	Ol' Glory	Sunset Gold
Black Tail	Firecracker LS	Padre	Taccoa
Blackwatch	Firenza	Patagonia	Tahoe II
Blade Runner II	Five Point	Pedigree	Talladega
Bonsai	Focus	Picasso	Tanzania
Braveheart	Forte	Piedmont	Temple

Bravo	Garrison	Plantation	Terrano
Bullseye	Gazelle II	Proseeds 5301	Thor
Cannavaro	GLX Aced	Prospect	Thunderstruck
Catalyst	Gold Medallion	Quest	Titanium LS
Cayenne	Grande 3	RainDance	Titan LTD
Cezanne RZ	Greenbrooks	Raptor II	Tracer
Chipper	Greenkeeper	Rebel IV	Traverse SRP
Cochise IV	Gremlin	Rebel Exeda	Trio
Constitution	Greystone	Rebel Sentry	Tulsa Time
Corgi	Guardian 21	Regenerate	Turbo
Corona	Guardian 41	Regiment II	Turbo RZ
Coyote	Hemi	Rembrandt	Tuxedo
Cumberland	Honky Tonk	Rendition	Ultimate
Darlington	Hot Rod	Reunion	Umbrella
DaVinci	Hunter	Rhambler 2 SRP	Van Gogh
Desire	Inferno	Riverside	Venture
Diablo	Integrity	RNP	Watchdog
Dominion	Jaguar 3	Rocket	Wolfpack II
Dynamic	Jamboree	Saltillo	Xtremegreen
Dynasty	Justice	Scorpion	

***** Approved Creeping Red Fescue Cultivars**

Aberdeen	Boreal	Epic	Cindy Lou

From January 1 – December 31, the Design-Build Team shall apply an additional 20# of Sericea Lespedeza on cut and fill slopes 2:1 or steeper.

Fertilizer shall be 10-20-20 analysis or a different analysis that provides a 1-2-2 ratio applied at a rate that provides the same amount of plant food as a 10-20-20 analysis and as directed.

Soil Analysis

For borrow source material used to construct shoulders and plate slopes, the Design-Build Team shall take soil samples for lab analysis and apply soil amendments, at rates necessary to correct the deficiency, to establish vegetation prior to placement.

If vegetation establishment indicates a deficiency in soil nutrients or an incurred pH level is present, the Design-Build Team shall take soil samples and apply additional soil amendments to the affected area and as directed.

Fertilizer Topdressing

In accordance with the requirements noted below, the Design-Build Team shall apply a minimum of one Fertilizer Topdressing application to all permanently seeded areas

immediately prior to completion of the project, twice during every growing season from April 1st through September 30th, and at other times as directed.

Fertilizer used for topdressing shall be 10-20-20 analysis applied at a rate of 500 pounds per acre; or a different analysis that provides a 1-2-2 ratio applied at a rate that provides the same amount of plant food as a 10-20-20 analysis and as directed.

Fertilizer used for waste and borrow areas shall be 16-8-8 grade applied at a rate of 500 pounds per acre; or a different analysis that provides a 2-1-1 ratio applied at a rate that provides the same amount of plant food as a 16-8-8 analysis and as directed.

Supplemental Seeding

For all supplemental seeding, the kinds of seed and proportions shall be the same as specified above for *Long Term Stabilization*. The rate of application for supplemental seeding shall be between 25# to 75# per acre. Prior to topdressing, the Design-Build Team shall determine the actual rate per acre for supplemental seeding and submit the supplemental seeding rate and areas to the Department for review and acceptance.

To prevent disturbance of existing vegetation, minimum tillage equipment, consisting of a sod seeder, shall be used to incorporate seed into the soil where degree of slope allows. Where degree of slope prevents the use of a sod seeder, a clodbuster (ball and chain) may be used.

Mowing

Following the date of availability, the Design-Build Team shall, at a minimum, mow areas not under active construction within the project limits within 14 calendar days prior to the Memorial Day, Independence Day, Labor Day, and Veterans Day holidays, the 2029 US Open Golf Tournament, the beginning of the North Carolina State Fair, and as directed by the Engineer.

Monthly litter management cleanups shall be timed to occur just prior to planned mowing activities. With prior written approval, mowing dates may be modified to occur with Division mowing cycles. The Design-Build Team shall conduct an additional project mowing prior to final acceptance, as directed by the Engineer.

The minimum mowing height shall be four inches.

Intermediate Contract Time(s) #28 and #29 for Mowing and Litter Pickup

Intermediate Contract Times (ICTs) for mowing and litter pickup on the project, plus any additional mowing as directed by the Engineer. The Design-Build Team shall complete a mowing cycle work within 14 calendar days prior to the Memorial Day, Independence Day, Labor Day, and Veterans Day holidays, the 2029 US Open Golf Tournament, and the

beginning of the North Carolina State Fair. The Design-Build Team shall time monthly litter management cleanups to occur just prior to planned mowing activities.

Liquidated Damages for Intermediate Contract Time #28 for failure to complete a mowing cycle within 14 calendar days prior to the Memorial Day, Independence Day, Labor Day, and Veterans Day holidays, the 2029 US Open Golf Tournament, and the beginning of the North Carolina State Fair are $500.00 per calendar day or any portion thereof.

Liquidated Damages for Intermediate Contract Time #29 for failure to complete monthly litter management cleanups just prior to planned mowing activities are $2,000.00 per failure.

EROSION CONTROL COORDINATION MEETINGS

Preliminary Construction Meeting

Prior to any land disturbing activity, the Engineer will schedule a meeting with Division construction personnel, Design-Build Team senior management, Design-Build Team project staff, NCDOT project staff, consultant engineering / inspection staff, NCDOT Construction Unit, NCDOT Roadside Environmental Unit, Land Quality, Department of Water Resources and any other party associated with activities that impact the overall effectiveness of the project's erosion control.

During this meeting, the attendees shall review the Design-Build Team's Traffic Control Plans and identify potential erosion control issues. All attendees will provide comments, recommendations and supportive information to help facilitate resolution to the aforementioned potential erosion control issues.

Construction Meetings

Once construction begins, the Engineer will schedule monthly meetings to review the erosion control status. All parties listed above for the Preliminary Construction Meeting shall participate in these monthly construction meetings.

During the construction meetings, the erosion control efforts / issues to date will be reviewed and discussed. Additionally, the upcoming construction phases will be reviewed to identify potential erosion control issues. After the construction meeting, a project review may occur to identify site specific issues and identify solutions. The Design-Build Team shall be responsible for all actions, corrections and / or resolutions resulting from the construction meetings and / or subsequent site visits.

The NCDOT senior management will discuss issues that are repeatedly identified on inspection reports and / or discussed during the construction meetings with the Design-Build Team's senior management.

If project activities do not change the erosion control status / conditions, the Engineer may elect to change the construction meeting frequency or cancel a meeting.

EROSION CONTROL DAMAGES

The Design-Build Team shall observe and comply with Federal and State Laws, Local Laws, Ordinances, and Regulations; as well as Orders and Decrees of Bodies having any jurisdiction or authority in accordance with Section 107 of the 2024 NCDOT *Standard Specifications for Roads and Structures (Standard Specifications)*.

The Design-Build Team shall take all reasonable precautions to comply with all regulations of all authorities having jurisdiction over public and private land governing the protection of erosion and sedimentation. Any fines, remediation required or charges levied against the Department for failing to comply with all rules and regulations concerning erosion and sediment control, due to the Design-Build Team's negligence, carelessness, or failure to implement the Erosion and Sedimentation Control Plans and Specifications; or failure to maintain an approved Storm Water Pollution Prevention Plan (SWPPP), regardless of absence of neglect, shall be deducted from monies due the Design-Build Team. In addition to said fines, remediation required, or charges levied, any associated engineering costs or actions taken by the Department in order for the Department to comply with rules and regulations, as a result of the Design-Build Team's negligence, carelessness, or failure to implement the Erosion and Sedimentation Control Plans and Specifications; and / or the SWPPP, regardless of absence of neglect, shall be deducted from the monies due to the Design-Build Team.

GEOENVIRONMENTAL SCOPE OF WORK (01/27/2026)

I. DEFINITION

For the purpose of this Scope of Work, contamination / contaminants are defined as any substance that when discharged in any quantity may present an imminent and substantial danger to public health or welfare. Petroleum is defined as any petroleum-derived product of any kind and in any form, including but not limited to, crude oil, diesel fuel, fuel oil, gasoline, lubrication oil, oil refuse, oil mixed with other waste, oil sludge, petroleum related products or by-products, and all other liquid hydrocarbons, regardless of specific gravity, whether occurring singly or in combination with other substances.

II. DESCRIPTION OF WORK

Sites of concern were identified in the May 29, 2019, *GeoEnvironmental Planning Report* for I-5701 and the August 30, 2019 *GeoEnvironmental Planning Report (revised)* for I-5703. After submittal of the Right of Way / 60% Roadway Plans developed by the Design-Build Team, the Design-Build Team shall hold a right of way consultation with the Department's GeoEnvironmental staff, Alternative Delivery Unit, and key Design-Build Team members.

Sites of concern within the proposed right of way that were noted in the May 29, 2019, *GeoEnvironmental Planning Report* for I-5701 and the August 30, 2019 *GeoEnvironmental Planning Report (revised)* for I-5703, plus any other sites identified during the right of way consultation with the Design-Build Team, will be investigated by the Department. The Department shall require 90 days from the date of the aforementioned consultation to investigate and provide Right of Way Recommendations. The Right of Way Recommendations shall be completed prior to the Design-Build Team making offers to purchase the right of way on these sites of concern.

The Design-Build Team shall notify the Alternative Delivery Unit, in writing, of any underground storage tanks (USTs) containing petroleum, chemicals, or heating oil tanks discovered during property appraisals. The Department will require 90 days from the date of the written notification to investigate and provide Right of Way Recommendations. The Right of Way Recommendations shall be completed prior to the Design-Build Team making offers to purchase the right of way on sites containing USTs.

The Design-Build Team shall adhere to all Right of Way Unit procedures regarding the acquisition of contaminated property and all Right of Way Recommendations provided by the Department. (Reference the Right of Way Scope of Work found elsewhere in this RFP)

After the parcels with identified contamination and / or underground storage tanks (USTs) are acquired and cleared of all above ground structures, the Department will 1) remove from the right of way USTs identified in the *Right of Way Recommendations* and discovered during the property appraisals, and 2) the Engineer will determine if all associated contaminated soil anticipated to require excavation to complete the project is removed by the Department or the Design-Build Team. The Department will remove the aforementioned USTs and contaminated soil within 60 days of written notification that the

above-ground structures have been removed. All contaminated soil not required for removal to complete the project shall be left in place and undisturbed.

If groundwater is encountered and dewatering is required in areas of known contamination, the Design-Build Team shall containerize the groundwater in vessels provided by the Department. The Department will be responsible for the sampling and disposal of the water.

It is important to note that petroleum contaminated soil may be encountered during any earthwork activity on this project.

III. INFORMATION PROVIDED BY NCDOT

- GeoEnvironmental Planning Reports, I-5701 – May 29, 2019 / I-5703 - April 12, 2019 / I-5703 - August 30, 2019
- MicroStation files identifying sites of concern (I-5701 / I-5703, 20 sites)

IV. UNKNOWN CONTAMINATED SITES

The Design-Build Team shall immediately notify the Department if the Design-Build Team's operations encounter or expose any abnormal condition that may indicate the presence of a hazardous, contaminated, and / or toxic material not previously identified. If the Engineer elects to have the Design-Build Team remove and dispose of contaminated material, the removal and disposal of this material shall be performed as extra work in accordance with Article 107-25 of the *Standard Specifications.*

GEOTECHNICAL ENGINEERING SCOPE OF WORK (5-13-26)

I. GENERAL

All geotechnical data, tests, computations and supporting subsurface investigations and documentation submitted by the Design-Build Team shall be provided in English Units.

Obtain the services of a firm prequalified for geotechnical work by the NCDOT Geotechnical Engineering Unit. A list of prequalified firms and the Discipline Code requirements can be found at the websites noted below:

https://www.ebs.nc.gov/VendorDirectory/search.html?s=pc&a=new

https://connect.ncdot.gov/resources/Geological/Pages/default.aspx

The prequalified geotechnical firm shall use the personnel and office location(s) that were submitted to the Department for their latest prequalification approval.

The prequalified geotechnical firm shall prepare foundation design recommendation reports for use in designing structure foundations, roadway foundations, retaining walls, sound barrier foundations, overhead sign structure foundations, and temporary structures.

The Engineer of Record who prepares the foundation design recommendation reports shall be a Professional Engineer registered in the State of North Carolina who has completed a minimum of three geotechnical design projects of scope and complexity similar to that anticipated for this project using the load and resistance factor design (LRFD) method and in accordance with the latest edition of the AASHTO *LRFD Bridge Design Specification*.

The prequalified geotechnical firm shall also determine if additional subsurface information, other than that required and noted elsewhere in this RFP, is required based upon the subsurface information provided by the NCDOT and the final roadway and structure designs. If a determination is made that additional subsurface information is required; the Design-Build Team shall use a prequalified geotechnical firm to perform all additional subsurface investigation and laboratory testing in accordance with the current NCDOT Geotechnical Engineering Unit *Guidelines and Procedures Manual for Subsurface Investigations*. Submit additional information collected by the Design-Build Team to the Geotechnical Engineering Unit, via the Alternative Delivery Unit, for review and acceptance. The Design-Build Team shall provide the final Subsurface Investigation report in electronic and hardcopy format to the NCDOT for its records.

Unless noted otherwise herein, the Design-Build Team shall design foundations (except for sign foundations), embankments, slopes, retaining walls, and sound barrier walls in accordance with the current edition of the AASHTO *LRFD Bridge Design Specifications*, NCDOT *LRFD Driven Pile Foundation Design Policy,* all applicable NCDOT Geotechnical Engineering Unit Standard Provisions and Policies, NCDOT *Structures Management Unit Manual* and NCDOT *Roadway Design Manual*. The NCDOT *LRFD Driven Pile Foundation Design Policy* is located on the NCDOT Geotechnical Engineering Unit's website at:

https://connect.ncdot.gov/resources/Geological/Pages/default.aspx

For *Geotechnical Guidelines for Design-Build Projects*, the Design-Build Team shall adhere to the guidelines located at the following website:

https://connect.ncdot.gov/projects/AlternativeDelivery/Pages/default.aspx

A minimum of 2 standard penetration test (SPT) / rock core borings shall be required per bent for all bent lengths of 50 feet or less. Additional SPT / rock core borings shall be required across the roadway typical section for each bent more than 50 feet long and the borings shall be spaced no greater than 50 feet apart. All borings for pile-supported bents shall be located within 25 feet of the centerline of each bent location to be counted for these minimum requirements. All borings for bents with spread footing or drilled pier foundations shall be performed at opposite ends of each bent, but not greater than 50 feet apart along the bent line as required by bent length noted above, to be counted for these minimum requirements. All drilled piers and other types of bridge foundations shall be located within 25 feet of a SPT/rock core boring. For structure sites with multiple bridges, borings may be performed between bridges along the bent projection provided the distance between any two borings does not exceed 50 feet.

The Design-Build Team shall extend all borings to a depth of 15 feet or four foundation element diameters, whichever is greater, below the foundation element to show a complete subsurface profile. The Design-Build Team shall be responsible for obtaining the borings noted above for all bents where subsurface information is not sufficient or is warranted by variability in the geology unless the prequalified geotechnical firm submits documented justification that the subsurface investigation provided by the NCDOT is adequate for design purposes and the justification is acceptable to the Department. Any deviations to the requirements noted above shall require acceptance from the NCDOT Geotechnical Engineering Unit prior to the foundation design submittal.

The maximum spacing between borings for retaining walls and sound barrier walls shall be 100 feet, with a minimum of two borings; one at each end of the wall. Drill borings for retaining walls a minimum depth below the bottom of the wall equal to twice the maximum wall height. Boring depths for sound barrier walls shall be to a minimum depth below the bottom of the wall equal to the maximum wall height or to SPT refusal.

Borrow material or unclassified excavation containing Triassic soil or Triassic rock (weathered and non-crystalline) shall not be used on the project for any purpose and shall not be wasted within the NCDOT right of way and/or property.

Bridge embankments shall be defined as those sections of embankment within 100 feet of a bridge end bent. Roadway embankments shall be defined as all other sections of existing or future embankment associated with the project.

II. ADDITIONAL DESIGN REQUIREMENTS

A. Structure Foundations

- Key in spread footings of structures crossing streams a minimum of full depth below the 100-year scour elevation and provide scour protection in accordance with the scour protection detail in the NCDOT *Structures Management Unit Manual*.

- Permanent steel casings shall be required for drilled piers that are constructed in six inches or more of water. Permanent steel casings shall also be required for drilled piers constructed on stream banks and within 10 feet of the tops of stream banks.

- Analyze drilled pier and pile bent foundations using either LPile or FB-Pier. Design drilled piers and vertical piles in pile bents with a sufficient embedment in soil and / or rock to achieve "fixity".

- In accordance with Section 7.3.6 of FHWA Publication No. FHWA-NHI-16-009 (Geotechnical Engineering Circular No. 12) dated July 2016, compute and mitigate downdrag loads on piles.

- When the weathered rock or rock elevation is below the 100-year hydraulic scour elevation, the 100-year and 500-year design scour elevations are equal to the 100-year and 500-year hydraulic scour elevations from the structure survey report developed by the Design-Build Team and accepted by the NCDOT Hydraulics Unit. When the weathered rock or rock elevation is above the 100-year hydraulic scour elevation, the 100-year design scour elevation may be considered equal to the top of the weathered rock or rock elevation, whichever is higher, and the 500-year design scour elevation may be set two feet below the 100-year design scour elevation.

- End slopes are required for bridges crossing water (streams, rivers, lakes, etc.) Do not use abutment walls or retaining walls for bridges crossing water.

- End bent fill slopes up to 35 feet in height (defined as the difference between grade point elevation and finished grade at toe of slope) shall be 1.5:1 (H:V) or flatter. End bent fill slopes with heights greater than 35 feet shall be 2:1 (H:V) or flatter. All end bent cut slopes shall be 2:1 or flatter. For 1.5:1 fill slopes, extend end bent slope protection from the toe of slope to berm and to 1.75:1 (H:V) slope or to the limits of the superstructure. For end bent cut slopes and for 2:1 or flatter end bent fill slopes, extend end bent slope protection from the toe of slope to berm and to the limits of the superstructure.

- For box culverts, the Design-Build Team shall provide the following to the Geotechnical Unit, via the Alternative Delivery Unit, for review and acceptance:

- Details for undercut of unsuitable material or recommendations for use of more than one foot of conditioning material.

- Total and differential settlement along the culvert and perpendicular to the culvert.

- Retaining walls or taller headwalls / end walls shall not be used to reduce the length of proposed box culverts.

- Calculate and report the estimated total settlement and the rate of settlement for the full embankment height for bridge embankments. Add waiting periods, settlement monitoring, and soil improvement techniques to keep long term settlement equal to or less than ½ inch 15 years after reaching final grade. Soil improvement techniques to mitigate long term settlement problems or to transfer the embankment load to a deeper bearing stratum are acceptable means to accelerate construction.

B. Roadway Foundations

- Mitigate all unsuitable soils to the extent required to improve the stability of the proposed embankment, walls, and subgrade. When employing shallow undercut, in accordance with Section 505 of the *Standard Specifications* use Select Material, Class IV to backfill undercut areas. For undercut backfilling in water, use Select Material, Class III.

- Unless noted otherwise herein, all unreinforced proposed fill slopes, except bridge end bent slopes (Reference Section A – Structure Foundations), shall be 2:1 (H:V) or flatter. Unless the slopes are designed with adequate reinforcement to provide the required stability, all proposed soil cut slopes shall be 2:1 (H:V) or flatter.

- Proposed reinforced soil slopes shall 1) only be used to minimize impacts to existing structures, and/or cultural, historical or otherwise protected landmarks and 2) be approved by the Geotechnical Engineering Unit, via the Alternative Delivery Unit prior to incorporation. All reinforced soil slopes shall meet the requirements of the NCDOT Geotechnical Standard Detail Nos. 1802.01 and/or 1802.02 unless detailed design calculations and a slope stability analysis are submitted for review and accepted by the Department prior to construction. Maximum primary and secondary grid spacings for reinforced soil slope designs shall be 32 inches and 16 inches, respectively.

- Design and construct roadway embankments such that no more than 2 inches of settlement occurs after the waiting period or settlement monitoring ends. Long term settlement calculations for estimating settlement magnitude and the wait times necessary to meet the settlement limits above shall account for both primary and secondary consolidation for a time span of 25 years. Do not begin any waiting period until the embankment fill is constructed to subgrade elevation. Soil

improvement techniques to mitigate long term settlement problems or to transfer the embankment load to a deeper bearing stratum are allowed to accelerate construction. Soil improvement techniques shall follow the current industry standard practices and the guidelines of Ground Improvement Methods FHWA publication NHI-04-001 or Geosynthetic Design and Construction Guidelines FHWA-HI-95-038.

- Monitor embankment settlement when a waiting period of more than one month for approach fill or two months for roadway embankment is recommended in the foundation design recommendation reports developed by the Design-Build Team. Monitor settlement using settlement gauges (Geotechnical Standard Detail 1804.01) in accordance with the following:

    - A minimum of two embankment settlement gauges shall be required at each end bent of each bridge (dual bridges do not count as one bridge). Settlement gauges shall be spaced at a maximum interval of 50 feet.

    - Settlement gauges shall be installed prior to placement of embankment fill.

    - Monitor settlement across the width of the roadway embankment at a maximum spacing interval of 50 feet.

    - Install and level the settlement gauge base one to two feet below existing grade. Backfill and compact excavation to existing grade.

    - Settlement gauges shall be placed at a maximum interval of 100 feet parallel to the centerline of survey.

- In all new embankments over 10 feet in height including, but not limited to, a widened embankment section, the Design-Build Team shall add a high strength geotextile (Type 5) in accordance with the *Geotextile for Subgrade Stabilization* Project Special Provision found elsewhere in this RFP. In cut sections, a Type 5 geotextile shall be placed immediately beneath the Aggregate Base Course. The geotextile shall extend one foot outside the limits of the pavement structure.

- Maintain a minimum six-foot vertical separation between the groundwater table and the bottom of the pavement structure (asphalt base course/ABC).

- Coarse aggregate (No. 57 stone) shall be used for subsurface/pipe underdrains and shoulder drains.

- All subsurface and / or slope drainage designed for either subgrade or slope stability shall be installed regardless of site conditions at the time of construction.

- Document and provide spring boxes or other subsurface drainage features for all springs located under proposed fill sections.

- Conduct proofrolling in accordance with Section 260 of the *Standard Specifications*. A minimum load capacity of 50 tons shall be required.

C. Soil Improvement Methods

- Soil improvement techniques to mitigate long term settlement problems or to transfer the embankment load to a deeper bearing stratum are acceptable means to accelerate construction. All soil improvement techniques shall follow the current industry standard practices and the guidelines of *Geotechnical Engineering Circular No. 13 Ground Modification Methods Reference Manual FHWA publication FHWA-NHI-16-027 and FHWA-NHI-16-028* or *Geosynthetic Design and Construction Guidelines FHWA-HI-95-038*.

- Geofoam design and construction shall be in accordance with the *Geofoam Applications in the Design and Construction of Highway Embankments, Prepared for National Cooperative Highway Research Program (NCHRP) Project 24-11, Transportation Research Board of the National Academies,* July 2004 and *Guidelines and Recommended Standard for Geofoam Applications in Highway Embankments, NCHRP Report 529*, Transportation Research Board of the National Academies, 2004.

- Submit soil improvement design recommendations and calculations to the NCDOT Geotechnical Engineering Unit, via the Alternative Delivery Unit, for review and acceptance a minimum of 30 days prior to beginning embankment construction. The Design-Build Team shall not begin any embankment construction activities until the Department has accepted the aforementioned recommendations and calculations. Only the following soil improvement methods or combination of methods will be allowed to improve the foundation soil conditions:

    - Excavation and replace with granular soils
    - Wick drains and / or surcharge and / or waiting periods
    - Lightweight fill – ultralightweight and lightweight aggregate
    - Lightweight fill - foamed (cellular) lightweight concrete
    - Lightweight fill - expanded polystyrene (EPS Geofoam Blocks)
    - High strength geosynthetics
    - Column Supported Embankments (CSE) with a Load Transfer Platform (LTP) - Columns shall consist of aggregate columns as defined in Chapter 5 of FHWA GEC 013, vibro concrete columns (VCC), controlled modulus columns (CMC), or stiff piles as defined in 3.1.1 (first three paragraphs) of Chapter 6 of FHWA GEC 013. Helical Screw Piles will not be allowed for columns.

Aggregate columns shall consist of coarse aggregate. Refer to FHWA GEC 013 Chapter 6 for design of the LTP.

D. Permanent Retaining Wall Structures

- Roadway retaining walls will not be allowed at any location with scour beneath the bottom of the wall without the use of deep foundations.

- For design and construction of mechanically stabilized earth (MSE) retaining walls, refer to FHWA GEC 011 and the NCDOT *Policy for Mechanically Stabilized Earth Retaining Walls* which can be found at the NCDOT Geotechnical Engineering Unit's website at:

  https://connect.ncdot.gov/resources/Geological/Pages/Products.aspx

  The Design Build Team may substitute lightweight aggregate or other lightweight material for the fine or coarse aggregate required in the reinforced zone of MSE retaining walls. All lightweight aggregate and other lightweight material shall adhere to the aggregate pH and aggregate electrochemical requirements for coarse aggregate noted in the NCDOT Geotechnical Engineering Unit's Standard MSE Wall Provision. Prior to incorporation, 1) the Design-Build Team shall provide documentation that supports the lightweight aggregate and other lightweight material parameter assumptions to the Department for review, and 2) the aforementioned parameter assumptions shall be accepted by the Department.

  To accommodate wall settlement, the Design Build Team may stage construct MSE retaining walls.

- Walls shall include drainage methods / mediums to drain water behind the wall.

- With the exception of walls covered by a Geotechnical Engineering Unit Standard Detail, design and construct permanent retaining walls in accordance with the applicable NCDOT Geotechnical Engineering Unit Project Special Provisions, unless noted otherwise elsewhere in this RFP. The NCDOT Geotechnical Engineering Unit Project Special Provisions can be provided upon request by the Design-Build Team. Geotechnical Provisions and Notes can be found at the NCDOT Geotechnical Engineering Unit's website at:

  https://connect.ncdot.gov/resources/Geological/Pages/Geotech_Provisions_Notes.aspx

- Submit a wall layout and design for each retaining wall. At a minimum, the wall layout submittal shall include the following:

  - Wall envelope with top of wall, bottom of wall, existing ground, and finished grade elevations at incremental stations

  - Wall alignment with stations and offsets
  - Typical sections showing top and bottom of wall, drainage, embedment, slopes, barriers, fences, etc.
  - Roadway plan sheets showing the wall (half size)
  - Roadway cross sections sheets showing the wall (half size)
  - Traffic Control Plans showing the wall (half size)

- For project retaining walls requiring a design not covered by a Geotechnical Engineering Unit Standard Detail, the wall layout submittal shall also include the following:
  - Calculations for sliding, overturning, bearing capacity, global stability, and settlement
  - Details of conflicts with utilities and drainage structures

- The NCDOT Geotechnical Unit Standard Detail No. 453.01 (Standard Cast in Place (CIP) Gravity Retaining Wall) does not consider traffic impact loads applied to the top of the wall and shall not be used along roadways where moment slabs and crash barriers are required at the top of the wall.

- Locate retaining walls at toes of slopes unless restricted by right of way limits or project commitments. The Design-Build Team shall submit global stability calculations for slopes at retaining walls and obtain acceptance from the NCDOT prior to construction. All fill slopes behind walls shall be 2:1 (H:V) or flatter.

- Cut wall (e.g., soil nail walls, soldier pile walls) anchors (where necessary) shall be located within the project right-of-way or within a permanent construction easement.

- Drainage over the top of retaining walls and sags in the top of walls shall not be allowed. Direct runoff above and below walls away from walls, if possible, or collect runoff at the walls and transmit it away. Curb and gutter or cast-in-place single faced barrier with paving up to the wall shall be required when runoff cannot be directed away from the back or front of the wall. In accordance with the NCDOT *Roadway Design Manual* - Section 5.5.1.2, Figure 5-25, the Design-Build Team shall design and construct a paved concrete ditch, with a minimum 12-inch depth, at the top of all retaining walls with slopes draining towards the wall, and a four-foot bench between the wall and fill / cut slopes steeper than 6:1 (H:V).

- Cast-in-place or precast coping shall be required for walls without a cast-in-place face with the exception of when a barrier is integrated into the top of the wall. Extend coping or cast-in-place face a minimum of 12 inches above where the finished or existing grade intersects the back of the wall.

- The Design-Build Team shall provide a fall protection chain-link fence immediately behind, or on top of the facing, coping or barrier of 1) all proposed and existing retaining walls where the delta in elevation of the finished grade and top of wall is 30.0 inches or more. If installed on top of the facing, on top of the coping or behind the aforementioned walls, the fence shall be six feet tall. If installed on top of the barrier, the fence shall extend six feet above the paved shoulder at the face of the barrier, measured from the highest finished grade. For all proposed abutment walls located at dual bridges, the Design-Build Team shall provide a four-foot chain-link fence or handrail, as directed by the Engineer, on top of the facing, on top of the coping or immediately behind the abutment wall between the dual bridges.

- When using abutment retaining walls with deep foundations, the end bent deep foundation shall be designed and constructed with one of the following:

    - A single row of plumb piles with brace piles battered toward the wall

    - A single row of plumb piles with MSE reinforcement connected to the back of the cap

    - An integral abutment with a single row of plumb piles and no reinforcement connected to the back of the cap in accordance with FHWA GEC 11, pages 6-8 through 6-10. Use pile sleeves backfilled with loose sand to account for lateral loads from integral abutments.

    - Drilled Piers

- All deep foundations for end bents with abutment retaining walls shall extend a minimum of ten feet below the retaining wall foundation or leveling pad.

- A design friction angle greater than 40 degrees shall not be used for retaining walls, even if the measured friction angle of the material is greater than 40 degrees.

- The Design-Build Team shall use a cohesion value of zero pounds per square foot (psf) for retained materials for all analyses.

E. Temporary Structures

- Design temporary retaining structures, which include earth retaining structures and cofferdams, in accordance with current allowable stress design AASHTO *Guide Design Specifications for Bridge Temporary Works,* the *Temporary Shoring* Standard Special Provision found elsewhere in this RFP and the applicable NCDOT Project Special Provisions available upon request by the Design-Build Team. The only submittal required to use the standard sheeting design is the "Standard Shoring Selection Form".

- Traffic control barrier on top of walls shall be in accordance with the NCDOT Work Zone Traffic Control Unit details available upon request by the Design-Build Team. If anchored barrier is required, then anchor the barrier in accordance with 2024 NCDOT *Roadway Standard Drawing* No. 1170.01.

III. ADDITIONAL CONSTRUCTION REQUIREMENTS

- All construction and materials shall be in accordance with the NCDOT 2024 Standard Specifications for Roads and Structures and current NCDOT Project Special Provisions, unless stated otherwise elsewhere in this Scope of Work. Prior to incorporating recommended remedial measures into the project, the Design-Build Team shall investigate, propose, and submit proposed remedial measures to the NCDOT Geotechnical Engineering Unit for review and acceptance for any construction problems related to the features below. The recommended remedial measures shall be accepted by the NCDOT Geotechnical Engineering Unit prior to construction.

    - Foundations
    - Retaining walls
    - Sound barrier walls
    - Subgrades
    - Settlement
    - Slopes
    - Construction vibrations

- The Design-Build Team shall be responsible for any damage and/or claim caused by construction including, but not limited to, damage caused by vibration (see Article 107-14 of the 2024 NCDOT Standard Specifications for Roads and Structures). The Design-Build Team shall be responsible for deciding what, if any, pre- and post-construction monitoring and inventories need to be conducted. Any monitoring and inventory work shall be performed by a prequalified consulting firm.

- The Design-Build Team shall not drive, re-drive, and/or re-strike piles at end bents with abutment walls after the abutment walls have been built in order to eliminate down drag (negative skin friction) loads. Prior to beginning construction of an abutment wall, all abutment wall piles shall be driven.

- The prequalified geotechnical firm that prepares the embankment designs for a bridge or roadway fill shall review the settlement monitoring data (at least weekly during fill placement and a minimum of every two weeks once full height is achieved) and provide monthly updates to the NCDOT Geotechnical Engineering Unit via the Alternative Delivery Unit. This same firm shall issue a release letter ending the wait period for an embankment fill once the settlement criteria listed elsewhere in this RFP is met. Settlement monitoring data and recommendations shall be submitted to the NCDOT Geotechnical Engineering Unit, via the

Alternative Delivery Unit, for review and acceptance prior to issuing the release letter.

- The prequalified geotechnical firm that prepares the foundation designs shall review and approve all pile driving hammers and drilled pier construction sequences. After the prequalified geotechnical firm has approved these submittals, the Design-Build Team shall submit them to the NCDOT Geotechnical Engineering Unit, via the Alternative Delivery Unit for review and acceptance prior to beginning construction. Hammer approvals shall be submitted prior to performing any pile driving, including Pile Driving Analyzer testing, and shall be performed using GRLWEAP Version 2010 or later.

- The prequalified geotechnical firm that prepares the original foundation designs shall be responsible for any changes to the foundation designs revising analysis, recommendations, and reports as needed. All changes shall be based upon additional information, subsurface investigation and/or testing. Send copies of revised designs, including additional subsurface information, calculations and any other supporting documentation, sealed by a professional engineer registered in the State of North Carolina, to the NCDOT Geotechnical Engineering Unit, via the Alternative Delivery Unit for review and acceptance.

- Install piles in accordance with Section 450 of the 2024 NCDOT Standard Specifications for Roads and Structures. Prequalification of contractors is not required for pile excavation or drilled-in pile holes that are 30 inches in diameter or less. Class A concrete or grout shall be required to backfill holes for drilled-in piles.

- Use Pile Driving Analyzer (PDA) testing on a minimum of two production piles for each pile size and type for each bridge with driven piles using the approved hammer driving system for the pile.

- Each PDA tested pile shall be driven to the maximum RDR for the end bent/bent(s) the PDA tested pile covers. The spacing between PDA tested piles shall not exceed 200 feet and at least one PDA tested pile shall be located at an end bent. Additional PDA testing shall be performed at other end bent/interior bents as needed to stay within the maximum spacing requirement. Changes in hammer driving systems and/or additional similar hammer driving systems shall require additional PDA testing.

- Additional PDA testing may be warranted / required based on AASHTO LFRD Bridge Design Specifications and shall be recommended as needed by the geotechnical foundation design engineer and submitted to the NCDOT Geotechnical Engineering Unit, via the Alternative Delivery Unit for review and acceptance. Dual bridges shall not be considered as a single bridge when determining the amount and location of required PDA testing.

- A prequalified PDA consultant shall perform the required PDA testing, provide PDA reports, and develop pile driving criteria. All PDA consultants shall be prequalified a minimum of 30 days prior to performing any pile driving on the project. Geotechnical Contractor Prequalification requirements can be found at the NCDOT Geotechnical Engineering Unit's website at:

  https://connect.ncdot.gov/resources/Geological/Documents/19-05-01_Contractor%20Prequalification%20Requirements.pdf

- PDA reports shall conform to the current NCDOT requirements and format and be signed and sealed by a Professional Engineer registered in the State of North Carolina who meets the experience requirements for the PDA Engineer in responsible charge of the PDA report. In addition, the recommendations within the PDA report shall address the cause of any Integrity Factor (BTA) values less than 100 and clarify the condition of the pile. PDA reports with driving criteria recommendations shall be reviewed and accepted by NCDOT prior to driving any production piles at the end bents/bents the PDA tested pile covers. PDA reports for miscellaneous piles tested to confirm ultimate resistance or acceptable pile integrity shall be reviewed and accepted by NCDOT prior to incorporating the pile into an end bent, bent or footing.

- Continuous Flight Auger (CFA) piles will be allowed for sound barrier walls.

- For drilled piers the following shall apply.

  - Use current NCDOT inspection forms for drilled piers available on the NCDOT Geotechnical Engineering Unit's webpage. Construct and inspect drilled piers in accordance with Section 411 of the *Standard Specifications* and the *Drilled Piers* Project Special Provision located on the NCDOT Geotechnical Engineering Unit's website.

  - The Department will inspect drilled piers using the Shaft Inspection Device (SID) for any pours using the wet method of concrete placement and for any drilled pier excavations that cannot be visually inspected or have remained open longer than 24 hours and cannot be dewatered due to unstable soil or rock. The Design-Build Team shall notify Joseph Barbour, PE by e-mail (jdbarbour2@ncdot.gov) a minimum of five days prior to required SID testing, followed by a confirmation two days prior to required SID testing. The Design-Build Team shall notify Joseph Barbour of all SID testing cancellations as soon as possible at the e-mail address noted above and at (919) 329-4015.

  - Install Crosshole Sonic Logging (CSL) tubes in all drilled piers. CSL test a minimum of 25% of drilled piers at each bridge or one per bent, whichever is greater. If a CSL test identifies any defect in the drilled pier, the Department has the right to request additional CSL testing and / or tomography as needed. The Department will determine which piers will be

CSL tested. Submit CSL and tomography test information and results to the Geotechnical Engineering Unit, via the Alternative Delivery Unit, for review and acceptance.

- Drilled pier tip elevations shall not be changed during construction unless the prequalified geotechnical firm which prepares the bridge foundation design redesigns the drilled pier from either an SPT / rock core boring, performed in accordance with ASTM standards at the subject pier location, or observations of the drilled pier excavation. If a drilled pier is designed based on a boring, do not drill a boring inside an open drilled pier excavation. Locate the boring within three pier diameters of the center of the subject pier and drill to a depth of two pier diameters below the revised tip elevation. If a drilled pier is redesigned based upon observations of the drilled pier excavation, the geotechnical engineer of record shall be present during the excavation to determine the actual subsurface conditions.

- The geotechnical grade point shall be defined as the location where the proposed subgrade and natural ground intersect. At all geotechnical grade points, the Design-Build Team shall undercut the existing soils within two feet of the bottom of the proposed subgrade in accordance with the requirements below.

  - The undercut shall extend along the profile to a point where the elevation difference from the bottom of the proposed subgrade to natural ground is greater than two feet, or to 25 feet on each side of the geotechnical grade point, whichever is less.

  - The lateral extent of the undercut shall extend to a point where the elevation difference from the bottom of the proposed subgrade to natural ground is greater than two feet or to one foot outside of the paved shoulder / face of curb of the proposed roadway typical section, whichever is less.

  - The base of the undercut shall parallel the proposed subgrade.

  - Grade point undercuts can be backfilled with soil that meets Section 235 of the 2024 NCDOT Standard Specifications for Roads and Structures.

- Send copies of any inspection forms related to foundations, settlement, sound barrier walls, or retaining wall to the NCDOT for review and acceptance.

IV. PROJECT CLOSE OUT REQUIREMENTS

- The Design-Build Team shall submit to NCDOT, via the Alternative Delivery Unit, the following items prior to the close out of the project:

    - One Half-size Plan set of all submissions.
    - Digital files of all submissions [PDF format].
    - Boring files [gINT format]

HYDRAULICS SCOPE OF WORK (10-6-26)

Project Details

- The Design-Build Team shall employ a private engineering firm(s) to perform hydraulic design for all work required under this contract. The private engineering firm must be prequalified for Tier II hydraulic design work under the Department's normal prequalification procedures prior to the Technical Proposal submittal date.

- The Design-Build Team shall hold a pre-design meeting with the Alternative Delivery Unit and Hydraulics Review Engineer after acceptance of the Preliminary Roadway Plans developed by the Design-Build Team.

Design Freeboard for Box Culverts and Pipes

- For all existing and proposed box culverts and pipes (including all extensions) under routes functionally classified as Major Arterials (interstates and primary routes), including all ramps and loops, a minimum 1.5-foot freeboard shall be required below the shoulder point during the design storm. For all other facilities, including greenways and multi-use trails, the design year water surface elevation shall not exceed the lowest upstream shoulder point elevation of the roadway.

- The Design-Build Team shall not steepen slopes, reduce easements and / or reduce right of way solely to obtain the aforementioned freeboard requirement.

Storm Drainage System Design

- The Design-Build Team shall design all storm drainage systems using Open Roads Drainage and Utilities, including but not limited to incorporating discharges from allowable routing programs.

- Raised median island cuts will not be allowed.

- Unless noted otherwise elsewhere in this RFP, slotted concrete median barrier will not be allowed for permanent installations.

- Slotted concrete barrier will be allowed separating vehicular travel lanes from non-vehicular areas, such as multi-use paths and sidewalks. Slotted barrier discharge shall not drain towards any vehicular travel lanes after passing through the barrier. Slotted concrete barrier will not be allowed for use as an outside bridge rail in permanent conditions or where such use results in direct discharge into waterways or onto any existing / future greenway, railway right of way, travel lane or paved shoulder.

- All drainage system improvements shall be contained within the right of way. When tying directly to existing downstream systems located outside the right of way that are hydraulically

deficient during the design storm, the Design-Build Team shall provide an Open Throat Catch Basin (OTCB) or 2GI within the right of way limits.

- The Design-Build Team shall use a minimum ditch grade of 0.3% and avoid constructing ditches in wetlands. Ditch grades less than 0.3% may be allowed post award if the Design-Build Team can demonstrate, in the Department's sole discretion, that a 0.3% grade cannot practically be achieved.

- At a minimum, the Design-Build Team shall install traffic bearing grated drop inlets with steel frames and flat steel grates at the following locations:

  - Within a temporary travel lane
  - Within four feet of a temporary and / or permanent travel lane
  - Inside a roundabout or within 50 feet of a roundabout

- Existing and proposed longitudinal pipe (trunkline) shall not be located beneath the proposed roadway travel lanes or beneath proposed barrier rails.

- At all pipe outlets with a ten-year partial flow velocity greater than 15 fps, the Design-Build Team shall provide additional outlet protection that mitigates erosive velocities to receiving downstream channels.

- Where corrugated steel pipe (CSP) is permitted i.e. down slopes or elsewhere the Design-Build Team shall use rod & lug with sleeve gasket connectors to join the sections of CSP together. Likewise, if elbows are needed and used, they shall be watertight with sleeve gasket connectors also.

Hydraulic Spread

- The hydraulic spread shall not encroach into any operational lane beyond the limits noted below:

  - For roadways with shoulders, including those with expressway gutter and shoulder berm gutter, the hydraulic spread shall not exceed 10 feet, shall not encroach into an operational permanent travel lane and shall not encroach into an operational temporary travel lane or turn lane.

  - For all other roadways, the hydraulic spread shall not exceed the values specified in Table 10-1 of the current *North Carolina Department of Transportation Guidelines for Drainage Studies and Hydraulics Design*.

  - Unless allowed otherwise elsewhere in this RFP, for bridges, the hydraulic spread shall not encroach into an operational permanent through lane or an operational temporary through lane. The hydraulic spread shall not encroach more than a distance that equals half the lane width or six feet, whichever is less, into an operational permanent exclusive turn lane or an operational temporary exclusive turn lane.

- For bridges in urban curb and gutter section roadways and that are classified as a minor arterial, collector, or local road, spread may be allowed into the travel lane consistent with that allowed along the approaches to the bridge.

- For existing bridges with no alteration to the travel lanes or shoulders (location and / or widths), hydraulic spread will be allowed to encroach into an operational travel lane to an extent equal to that present in the existing (pre-project) conditions.

- The Design-Build Team shall analyze spread for all bridges within the project limits and, as necessary, provide mitigation that adheres to the hydraulic spread requirements noted above. If required, the Design-Build Team shall adhere to the bridge drainage system requirements noted below:

  - Unless allowed otherwise elsewhere in this RFP, the Design-Build Team shall design bridge drainage without the use of bridge scuppers (open grated inlets) or closed / suspended drainage systems. If deck drains are used on the bridge, they shall be vertical pipes at the flow line through the deck with no elbow and shall be consistent with that shown in the current NCDOT Stormwater Best Management Practices Toolbox.

  - The Design-Build Team shall use 4-inch deck drains adjacent to pedestrian facilities.

  - Unless allowed otherwise elsewhere in this RFP, the Design-Build Team shall provide bridge drainage features that prevent direct discharge into waterways or onto any existing / future greenway, railway right of way, travel lane or paved shoulder.

  - The Design-Build Team will be allowed to retain existing deck drains with direct discharge into a waterway for temporary conditions during construction. The Design-Build Team will be allowed to retain existing deck drains with direct discharge into a waterway for permanent conditions where: (1) such deck drains don't require modification for proposed permanent conditions, (2) the total direct discharge to the waterway in the permanent condition is no more than the total direct discharge to the waterway under existing conditions, and (3) the discharge from the drain will not drain directly onto any bridge structure element.

  - The maximum allowable deck drain spacing shall be 12-foot on center.

Hydroplaning Analysis

- The Design-Build Team shall perform a hydroplaning risk assessment in accordance with the NCDOT Guidelines for Drainage Studies and Hydraulic Designs, including all addenda, memos and revisions and the requirements herein. The Design-Build Team shall provide mitigation that minimizes hydroplaning risk for all new and existing roadways within the construction limits, as necessary.

- Mitigation strategies may include optimization of geometric design and pavement surface improvements. Mitigation strategies must meet all other requirements of this RFP. The Design-Build Team shall not use signage or public education as hydroplaning mitigation strategies.

- The Design-Build Team shall include a brief summary of the mainline hydroplaning risk assessment in the Technical Proposal.

- For all interstate facilities, the Design-Build Team shall use a 70-mph speed or the design speed, whichever is greater, for the hydroplaning analysis.

- The Design-Build Team shall give particular attention to areas with zero superelevation in a crest and / or sag vertical curve, and superelevation reversal points.

- The Design-Build Team shall develop a Final Design Hydroplaning Risk Assessment Report that shall be included with the Preliminary Roadway Plans submittal for the Department's review and acceptance.

- In addition to Final Design Hydroplaning Risk Assessment Report, the Design-Build Team shall develop a Construction Hydroplaning Risk Assessment and Mitigation Plan Report that shall be included with the Traffic Control Plans submittal for the Department's review and acceptance. The aforementioned Report shall identify a process that evaluates and avoids concentrated flow across travel lanes where speeds are in excess of 45 mph during construction phasing. (Reference the Transportation Management Scope of Work found elsewhere in this RFP)

Stormwater Management

- In accordance with the NCDOT Post-Construction Stormwater Program, NCDOT's Stormwater Best Management Practices Toolbox, and NCDOT's Guidelines for Drainage Studies and Hydraulics Design, the Design-Build Team shall develop a Stormwater Management Plan that, at a minimum, demonstrates the following:

  - Compliance with the requirements described in the NCDOT Post-Construction Stormwater Program dated May 2022.

  - To the maximum extent practicable, on-site stormwater control measures shall be employed to minimize water quality impacts.

  - Underground detention will not be allowed.

  - Unless noted otherwise elsewhere in this RFP, no additional right of way will be acquired solely for stormwater management.

- In accordance with the NCDOT *Guidelines for Drainage Studies and Hydraulics Design*, including all addenda, memos and revisions, the Design-Build Team shall prepare Outlet

Analyses for the increases in discharge due to the proposed project and take appropriate action to ensure that any increases are appropriately mitigated. Velocity mitigation shall be implemented in compliance with NC Administrative Code 15A NCAC 04B .0109 and associated *NCDOT Compliance Documentation Workflow for Rule 15A NCAC 04B .0109*. Such mitigation measures shall first consider long-term maintenance of the proposed mitigation. Except as otherwise noted, improvements to receiving channels shall be implemented before implementing any detention basin structures.

- Direct connections from impervious surfaces to the receiving waters shall be minimized to the maximum extent practicable.

****NOTE**** Deleted bullet on discharge to railroads

Drainage Structures

Throughout this RFP, the term *drainage structures* shall include box culverts, cross pipes, drainage boxes and storm drainage systems.

- Excluding 1) pipes noted elsewhere in this RFP to be retained, 2) pipes noted elsewhere in this RFP to be repaired, and 3) pipes the Design-Build Team inspects and analyzes and then determines may be retained or repaired - subject to Department approval, the Design-Build Team shall replace **all** hydraulically and / or structurally deficient existing pipes within the existing / proposed right of way of the mainline, and all -Y-Lines, service roads, ramps, loops and interchange quadrants that are less than 48 inches and all metal pipes 48 inches or larger within the project limits, including mill and fill operations or resurfacing in accordance with the *Drainage Pipe* Project Special Provision found elsewhere in this RFP. The Department may reconsider replacement after the selected Design-Build Team conducts analysis of drainage structures as described elsewhere in this RFP. The schedule submitted with the proposal shall reflect pipe replacement for pipes not included in the Department's structural integrity assessment or not designated elsewhere in this RFP for retention and / or repair.

  During procurement the Design-Build Team may elect to structurally and / or hydraulically evaluate pipes and box culverts as described elsewhere in this RFP. The Design-Build Team may submit ATC(s) with multiple pipes and /or box culverts each for Department review and approval on a per pipe or per box culvert basis for structural rehabilitation, hydraulic mitigation (supplementation), retention, and / or replacement. Pipes and box culverts not evaluated during procurement shall be analyzed after award as described elsewhere in this RFP.

- The Department has completed a structural integrity assessment of accessible existing pipes within the project limits. Unless specified otherwise elsewhere in this RFP, the Design-Build Team shall follow the pipe recommendations in the *I-5701 - I-5703 Pipe Evaluation Memo Final Aug20206*, dated 10 August 2026 and located at the GO!NC GIS site below. In the event of conflicting information between the GIS site and Memo, the proposed design shall adhere to the Memo. In the event pipe records are only listed either on the GIS site or in the Memo, the available information shall govern on a per-pipe basis.

https://ncdot.maps.arcgis.com/apps/mapviewer/index.html?layers=ab2b93a6769048a0af591c095ce7acca

- Pipes recommended as replace shall be replaced.
- Pipes recommended to retain may be retained, providing they are hydraulically adequate.
- Pipes recommended to be repaired may be retained, providing they are hydraulically adequate and all recommended repairs are made. All retained pipes recommended to be repaired shall be lined using full structural replacement Cured in Place Pipe (CIPP) or Fold and Form methods per the NCDOT pipe liner manual, and grout voids (if any) surrounding the host pipe prior to liner installation.
- Unless otherwise noted elsewhere in this RFP, pipes in the Department's structural integrity assessment noted as "incomplete - needs cleaning", "other", and / or "inaccessible", shall be replaced. The Department may reconsider replacement after the selected Design-Build Team conducts analysis of drainage structures as described elsewhere in this RFP.
- The Design-Build Team is not required to repair pipes outside the project limits for those pipes to remain.
- To gain access to the GO!NC GIS site the Design-Build Team shall provide the Department with the first and last names and email addresses for at most five users.

- The Design-Build Team shall remove and replace any existing drainage box except for drainage boxes where an existing pipe connection is being retained and no more than one pipe connection is being removed or replaced.

- The Design-Build Team shall remove or fill with flowable fill all existing pipes not retained for drainage.

- The Design-Build Team shall not install permanent elliptical pipe. Elliptical pipe will only be allowed in temporary conditions and all elliptical pipe shall be removed prior to final project acceptance.

- The Design-Build Team shall develop discharges for final design for all drainage structures based upon the future build-out land use projections. At a minimum, the Design-Build Team shall use a level of future urbanization with a percent impervious area of no less than 35% throughout the project. The Design-Build Team shall submit mapping to substantiate the percent impervious to the Department as part of the hydraulic design process. The value for time of concentration shall be based on future watershed conditions and have a maximum of 30 minutes for Rational Method. The Design-Build Team shall not include the effects of storage when computing discharges for hydraulic design and analysis unless it is for the purpose of designing retention / detention facilities proposed for providing flow attenuation as part of NCDOT's post construction stormwater management compliance. Drainage structures accepting flow from detention / retention facilities shall be designed without flow attenuation from the upstream facilities. EPA SWMM, USACE HMS, Win TR-20, HydroCAD or equivalent are acceptable programs for routing. A storm drainage duration of 24 hours shall be used in developing the hydrograph. NRCS hydrology methods (TR-55, etc.) may only be used for calculations involving detention / retention facilities.

- On US 1 / US 64 and I-40 grass medians that are 26 feet or less in width shall be treated as paved surfaces for impervious surface calculations. Grass medians that exceed 26 feet in width shall be treated as a 13-foot width adjacent to the proposed pavement along each side of the median as paved surfaces for impervious surface calculations. This requirement applies to proposed design calculations and does not apply to outlet analyses comparing pre-project and post-project conditions.

- The Design-Build Team shall retain Structure No. 910587 (the 3@9-ft x9-ft RCBC) on Walnut Creek without supplement and without structural inlet improvements

- The Design-Build Team shall provide scour repairs to both the inlet and outlet of Structure No. 910587. Repairs shall remain within the existing Right of Way.

- For the existing RCBC, BP-092-2017**,** located between Lake Wheeler Road and Trailwood Drive with upstream end near 35°45'13.3"N 78°40'56.8"W:

  - The existing RCBC will be retained and not lined as per the definitions associated with the Department's structural integrity assessment.
  - The Design-Build Team shall provide scour repairs to the outlet of BP-092-2017. Repairs shall remain within the existing Right of Way.
  - The existing RCBC has a span of 8ft.
  - The sewer line running along the length of the culvert has a diameter of 18".
  - The Design-Build Team shall use one of three methods to represent the equivalent area of the sewer line blockage.
    - Uniformly block the bottom of the barrel.
    - Insert a fully blocked round culvert into the RCBC barrel.
    - Modify the internal cross sections to block a portion of the barrel

- The Department assigns the following flow rates to be used at the existing pipe indicated on the survey CAD file as a 78" and / or 72" CMP, crossing I-40, downstream of Crossroads Plaza, with upstream end near 35.76345° N, 78.73526° W:

  - 2-year = 340 cfs
  - 5-year = 400 cfs
  - 10-year = 430 cfs
  - 25-year = 450 cfs
  - 50-year = 460 cfs
  - 100-year = 470 cfs
  - 500-year = 500 cfs

- Existing pipes near the following locations shall be retained and repaired as per the definitions associated with the Department's structural integrity assessment:
  - Upstream end located at 35.756942 N, -78.723640 W
  - Upstream end located at 35.756156 N, -78.719942 W. Applies to all sizes of pipe along the pipe run.
  - Upstream end located at 35.753860 N, -78.714385 W

- Upstream end located at 35.753535 N, -78.713585 W
- Downstream end located at 35.753406 N, -78.689517 W

- Revise the *Guidelines for Drainage Studies and Hydraulic Design as follows:*

  - Chapter 7 Table 1, Design Frequency

    - Along I-40 and I-440 / US 1 / US 64, use the 50-year frequency as the design storm for Bridges, Culverts, and Cross Pipes. Along I-40 and I-440 / US 1 / US 64 the Design-Build Team shall analyze the 100-year frequency for Bridges, Culverts, and Cross Pipes

    - Along I-40 and I-440 / US 1 / US 64, use the 50-year frequency for Storm Drain Systems at Sags (without relief)

    - Design frequency for Temporary / Detours, Storm Drain System on Grade shall be ten years.

    - Design frequency for Temporary / Detours, Storm Drain Systems at Sags (without relief) shall be 25 years.

  - Chapter 7 Table 2, Peak Discharge Method Selection

    - Delete the NCDOT Hwy. Hydrologic Charts column

  - Delete Section 7.4.4 NCDOT Highway Hydrologic Charts

  - Delete Section 7.7, Additional Documentation

  - Section 15.6 Temporary Encroachment in Regulatory Floodway

    - Section 15.6 is not applicable on this project. The Design-Build Team shall assume all liability for any flood damages resulting from the temporary encroachment.

- Unless allowed otherwise elsewhere in this RFP, a maximum HW/D = 1.2 shall not be exceeded for all existing and proposed box culverts and pipes during the design storm.

- Revise the NCDOT *Pipe Material Selection Guide* as follows:

  - For the Open End Cross Pipes, delete the No. 5 superscript from “Interstate” and “Primary” and add a No. 5 superscript to “Open End Cross Pipes”.

  - Delete Note No. 5 and replace with the following:

    - All open-end cross pipes on interstates and primary routes (US and NC routes), including all ramps, loops and interchange quadrants, shall be upsized by a minimum

of six inches in diameter above that which would be hydraulically and / or jurisdictionally required. Upsizing shall be in addition to any upsizing required due to burial below the streambed.

- All open-end cross pipes on secondary routes that are beneath a fill height that is equal to or greater than fifteen (15) feet, as measured from the top of the pipe to the corresponding road surface above the pipe, shall be upsized by a minimum of six inches in diameter above that which would be hydraulically and / or jurisdictionally required. Upsizing shall be in addition to any upsizing required due to burial below the streambed.

- All storm drainage systems shall maintain a hydraulic grade line that is a minimum of 0.5 feet below the inlet rim elevation or top of junction box; and shall adhere to all other requirements as identified in Chapter 10 of the *Guidelines for Drainage Studies and Hydraulic Design*.

- In the Technical Proposal, Volume II, the Design-Build Team shall provide a *Box Culverts and Cross Pipes Hydraulic Assessment Table* that contains the attributes noted below for all new box culverts and cross pipes 18 inches in diameter or greater:

  - Station
  - Proposed drainage structure details
  - Drainage Area
  - Percent Impervious or "C" value used
  - Discharge method used
  - Built-Out Discharges (Design Year and 100 Year)
  - FEMA Crossing (Yes / No)
  - Water Surface Elevation Natural Condition
  - Water Surface Elevation with Drainage Structure
  - HW/D for Build-out Discharges
  - Hydraulic Freeboard for Build-out Discharges
  - Comments

- Unless allowed otherwise elsewhere in this RFP, all proposed drainage boxes, including but not limited to catch basins, drop inlets and junction boxes, shall have a grate or manhole access.

- The Design-Build Team is not required to provide manhole access to junction boxes that can be accessed through an open-ended pipe inlet or outlet that is 48-inches or greater.

- All proposed drainage boxes that are greater than 20-foot in depth, including but not limited to catch basins, drop inlets, grated inlets, and junction boxes, the Design-Build Team shall install a minimum 6-foot by 6-foot inside dimension or a 6-foot inside diameter box.

- Walled Roadway Sections are any section of roadway where a retaining wall is located on one or both sides of the roadway. A retaining wall (wall) is a structure that holds soil or other material in place. The Wall Zone is the area within a Walled Roadway Section behind the wall for a width equal to twice the wall height and for the full length of the retaining wall. The

height of the wall shall be measured as the difference in elevation between the bottom of the deepest retaining wall component and the top of the highest wall component. When a Walled Roadway Section includes walls on both sides of the roadway that are coincidental to a range of project centerline survey stations, the Wall Zone shall be expanded to include the entire roadway section between the walls. Areas beneath a bridge substructure element (foundation), beneath an approach slab, and under a retaining wall shall be considered a Wall Zone and shall meet the Wall Zone requirements. The depth of Wall Zones shall not be limited and are considered to extend to the center of the earth. Median barriers shall not be considered retaining walls for the purpose of determining the Wall Zone when the height of the barrier, measured as the vertical distance from the proposed surface on one side of the barrier to the proposed surface on the other side of the barrier, is less than 4 feet.

The Design Build Team should try to avoid the design of drainage systems within walled roadway sections and Wall Zones. When such systems are unavoidable, storm drainage systems within the wall zone, beneath a retaining wall, or beneath a bridge substructure element shall be sealed/closed systems meeting the following requirements:

- Storm drainage pipe located under travel lanes, gore areas, paved shoulders, or a retaining wall shall be Sealed RCP with joints conforming to ASTM C990 and wrapped at 18-inches width per ASTM C877 or welded steel pipe (WSP) with wall thickness as stated in the Hydraulics Guidelines or a minimum wall thickness of 0.5 inches, whichever is greater. Pipe considered cross drainage shall be welded steel pipe across the entire walled roadway section.
- Storm drainage pipe parallel to retaining walls within a Wall Zone or under a bridge approach slab shall be Sealed RCP with joints and wrapping as described above or WSP as described above or Polypropylene Pipe with watertight joints per ASTM D3212.
- Storm drainage pipes shall not pass through a retaining wall.
- The sealed/closed system requirements and pipe connection requirements apply to the full length of any pipe that passes through a wall zone. For example, a pipe that passes through a wall zone and then exits the wall zone before connecting to a drainage structure, must meet sealed system requirements for the full length of the pipe and meet the pipe connection to drainage structures requirements at the drainage structure even if the drainage structure is outside of the wall zone.
- Resilient connectors conforming to ASTM C923 or the pipe collar alternative shall be used at all sealed system pipe connections to drainage structures even if outside the Wall Zone. A Pipe Collar Drainage Structure Detail will be provided by the Department.
- Pipes shall extend 6 inches into the drainage structure at all pipe connections to drainage structures using resilient connectors.
- Where resilient connectors are used, the Design Build Team shall design the storm drain system such that pipe connections to drainage structures are as close to 90 degrees horizontally and 0.3% vertical slope as possible to minimize the deflection angle at the connection. The deflection angle between the pipe and drainage structure shall not exceed what is specified in ASTM C923.
- Drainage structures such as inlets, manholes, and junction boxes, within the wall zone or directly connected to a pipe that passes through a wall zone shall be precast. Traffic bearing

pre-cast drainage structures shall be used under travel lanes, gore areas, paved shoulders, and within four feet of a travel lane.

- Drainage structure depth shall be limited to the maximums in the 2024 NCDOT *Roadway Standard Drawings (Standard Drawings)*.
- Elbows may be used to avoid exceeding the maximum structure depth and to reduce deflection where a drainage pipe connects to a drainage structure using resilient connectors.
- The Design-Build Team shall perform a post-construction inspection of all drainage system components within walled roadway sections within 15 calendar days after the completion of installation. Inspections shall be performed by NASSCO certified personnel using a Closed Circuit Television Video (CCTV) steerable pipe crawler/rover that is tethered to a cable reel. Other types of equipment should only be used with prior agreement of the NCDOT Construction Engineer. Equipment must be capable of capturing 360-degree views from within the pipe or storm drain system and all required data and measurements. Documentation of each inspection shall be provided to NCDOT for review and acceptance. At a minimum, the documentation shall include a video inspection and a corresponding report.

  The camera must be centered in the pipe during video inspections and must show the entire circumference of the pipe. Video inspections should provide accurate distance measurements of features in the pipe or network and footage measurements shall be displayed and documented in the video. Video should be continuously metered. A maximum video size of 1.5GB is recommended. Acceptable file formats are .avi, .mkv, mp4, mpeg, .mpg, or .wmv with .mp4 being the preferred format.

  The inspection report shall identify the following:

  - Structural integrity of each pipe joint connector, including welded steel pipe joints, and each pipe connection to a drainage structure including, but not limited to, joint or connector damage, failure, separation, and offsets.
  - Length between the end of the pipe and the internal wall of the drainage structure at each pipe connection to a drainage structure
  - Longitudinal, transverse, circumferential, and multidirectional cracking or deflection
  - Seepage and infiltration into the pipe
  - Pipe or connection failures including, but not limited to, differential settlement, material deformation, and puncture holes.
  - The location of each item noted as measured from the outlet of the pipe.

  Prior to inspection, pipes should be clean enough to ensure all defects, features and observations are seen and logged. Any pipe cleanout required prior to inspections governed by this guidance shall be considered incidental and will not be paid for as extra work. The contractor shall get approval from the NCDOT Construction Engineer prior to performing any necessary cleanout.

- Throughout the project limits, the Design-Build Team shall to the Maximum Extent Practicable (MEP) propose no impacts within the Walnut Creek Floodplain.

- The Design-Build Team shall provide the Department with a pre / post analysis at the inlet of Culvert No. 910588 on Walnut Creek under I-440 near Jones Franklin Road.

- Throughout the project limits, the Design-Build Team shall analyze all drainage structures that are located within the existing / proposed right of way for hydraulic and structural deficiencies, unless allowed otherwise elsewhere in this RFP. Within -Y- Line construction limits, the Design-Build Team will not be required to hydraulically analyze existing cross pipes that will not be lengthened if no additional discharge from the project is being generated. Using the hydraulic discharges required in this Scope of Work, drainage structures that do not adhere to the requirements in Sections 9.6.1.4 and 9.6.2.3 of the Guidelines for Drainage Studies and Hydraulic Design, including all addenda, memos and revisions, and / or the freeboard and HW/D requirements noted above, shall be deemed hydraulically deficient. Based on these analyses, the following shall be adhered to:

  - The Design-Build Team shall provide the appropriate hydraulic mitigation for 1) all hydraulically deficient drainage structures, including but not limited to replacement and 2) structural rehabilitation for all structurally deficient drainage structures, including but not limited to replacement. For major hydraulic crossings (crossings requiring a hydraulically effective waterway opening of thirty (30) square feet or more, excluding any area that is buried below the streambed and any area provided solely for upsizing requirement), the Design-Build Team shall 1) remove or rehabilitate and supplement all hydraulically, or hydraulically and / or structurally, deficient box culvert(s) and / or pipe(s), unless allowed otherwise elsewhere in this RFP, and 2) if replacement is necessary, replace the box culvert(s) with a box culvert(s) and / or pipe(s) with either a box culvert(s) or pipe(s). Inlet improvements outside the right of way shall not be allowed to mitigate for hydraulically deficient box culverts and / or pipes. Based on build-out discharges, the Design-Build Team shall identify all hydraulically deficient drainage structures and note their proposed mitigation in the Technical Proposal. At a minimum, in the Technical Proposal, Volume II, the Design-Build Team shall 1) identify all hydraulically deficient storm drainage systems and the proposed mitigation on the plans, and 2) provide a *Box Culverts and Cross Pipes Hydraulic Deficiency Assessment and Proposed Mitigation Table* that contains the box culvert and cross pipe attributes noted below:

    - Station
    - Existing Box Culvert / Cross Pipe Details
    - Drainage Area
    - Percent impervious or “C” value used
    - Discharge method used
    - Build-out Discharges (Design Year and 100 year)
    - Hydraulically Deficient (Yes / No) for Build-out Discharges\
    - Proposed Mitigation Structures(s) Details
    - HW/D for Build-out Discharges at Existing Structure without Mitigation
    - HW/D for Build-out Discharges at Existing Structure with Mitigation
    - Hydraulic Freeboard at Sag for Build-out Discharges at Mitigation Structure(s)
    - Comments

- All headwalls, proposed and existing, associated with cross structures proposed for the purpose of hydraulic mitigation to supplement an existing hydraulically insufficient cross structure shall be constructed to a uniform height.

- Pipes within storm drainage systems that intercept and / or convey any offsite water from one side of a roadway to the other shall be considered a cross pipe if any of the following inlet conditions apply:

  - Open end
  - Berm Drainage Outlet (BDO)
  - Open Throat Catch Basin (OTCB)

  The cross pipe designation shall apply to all pipes in the storm drainage system that convey the offsite water flow from the aforementioned inlet to the outlet.

- Excluding welded steel pipes installed using trenchless construction methods, the maximum pipe diameter shall be 72 inches.

- For all proposed cross structures requiring a hydraulically effective waterway opening of thirty square feet or more, excluding any area that is buried below the streambed and any area provided solely for upsizing requirements, a reinforced concrete box culvert shall be required. The minimum reinforced concrete box culvert barrel height (inside dimension) shall be six feet, with a minimum six-foot clear opening height above the streambed. The minimum reinforced concrete box culvert barrel width (inside dimension) shall be six feet. This requirement shall not apply to cross structures proposed or installed for hydraulic mitigation to supplement an existing hydraulically insufficient cross structure.

- Cross drainage shall be conveyed with a single drainage structure (pipe or box culvert) or single drainage structures in series. More than one line of pipe and / or three (3) box culvert barrels serving the same watershed shall not be allowed. This requirement shall not apply to cross structures proposed or installed for hydraulic mitigation to supplement an existing hydraulically insufficient cross structure.

- After award, to ensure all pipes and box culverts retained for drainage purposes are structurally sound, excluding pipes the Department has recommended to retain or repair, the Design-Build Team shall provide appropriate documentation, in the Department's sole discretion, for the Department's review and approval prior to any hydraulic design submittal. At a minimum, the aforementioned documentation shall include a video inspection of each pipe and box culvert retained for drainage purposes, and a corresponding inspection report. The video inspection shall be performed with a Closed Circuit Television Video (CCTV) steerable pipe crawler / rover that is tethered to a cable reel and capable of capturing 360° views from within the pipe or box culvert. The inspection report shall identify the elements noted below for each pipe and box culvert retained for drainage purposes:

- Structural integrity of each joint, in its entirety, including but not limited to joint failure, joint separation and joint offsets
- Longitudinal, transverse circumferential and multi-direction cracking
- Spalling
- Seepage and infiltration into the pipe
- Pipe failures, including but not limited to deferential settlement, material deformation and puncture holes

The Design-Build Team shall also provide the location of each item noted above, as measured from the outlet end of the pipe. If, for any reason, the video inspection or report is incomplete or inconclusive, the Design-Build Team shall perform another inspection and develop another report at no additional cost to the Department.

NOTE Deleted extra work provisions for clean outs and structural mitigation for drainage structures inspected by the Design-Build team

Permit Coordination

- Although this project is not in the merger process the DBT still has an obligation to prepare permit drawings and impacts while still coordinating with a permit application specialist to insure the appropriate permits are applied for and obtained (Reference the Environmental Permits Scope of Work found elsewhere in this RFP).

FEMA Regulated Streams

- For all FEMA regulated streams impacted by the Design-Build Team's design and / or construction, the Design-Build Team shall adhere to the current *Guidelines for Drainage Studies* and *Hydraulics Design*, including all addenda, memos and revisions, and the following requirements:

  - The Design-Build Team shall prepare a CLOMR or MOA package for the Department's submittal to the North Carolina Floodplain Mapping Program (NCFMP). The Design-Build Team shall obtain NCFMP approval prior to performing any construction activity in a FEMA regulated floodplain.

  - Where a CLOMR is required, the structure shall be designed such that no more than 0.5 feet of rise occurs between the Corrected Effective and the Revised Conditions for the 100-year water surface elevation.

  - The Design-Build Team shall notify the Alternative Delivery Unit, in writing, of all structures that may require purchase due to an increase in the 100-year water surface elevation. The Department will be responsible for all surveys to ascertain insurable structures within the impacted area of the floodplain(s). The Design-Build Team shall discuss the extent and limits of the rise in water elevation in the floodplain(s), identify potentially impacted structures, specify areas anticipated to require additional surveys and estimate the anticipated additional right of way impacts outside the project construction

limits in the Technical Proposal. (Reference the Right of Way Scope of Work found elsewhere in this RFP.)

- The Department will be responsible for all fees associated with the CLOMR(s) and / or MOA(s).

- The Design-Build Team shall ensure that construction and / or removal of all structures in FEMA regulated floodplains adheres to the approved CLOMR(s) and / or MOA(s). Within three months of completion of work in a FEMA-regulated floodplain, the Design-Build Team shall provide As-Built Plans of the site, and a completed As-Built Certification Review Form that verifies construction and / or removal adheres to the approved CLOMR(s) and / or MOA(s).

- The Design-Build Team shall prepare a new FEMA model and / or package and be responsible for all associated costs resulting from any construction variation from the approved CLOMR(s) and / or MOA(s).

- The Department will allow no direct contact between the Design-Build Team and the NCFMP representatives. No contact between the Design-Build Team, the NCFMP and / or personnel under contract with NCFMP shall be allowed by phone, e-mail, or in person, without Department representatives present. A representative from the Alternative Delivery Unit shall be included on all correspondence.

- Temporary impacts due to construction and / or on-site detour traffic that 1) last longer than one year and / or 2) encroach into the floodway, shall be reviewed by the Design-Build Team for changes in the water surface elevations that could impact structures or have adverse impacts to the surrounding property. The results of the review shall be submitted to the Hydraulics Unit in a report format for the Department's coordination with NCFMP. The report shall include the effects of the temporary impact on the floodplain under a 1% chance flood (100-year flood) and identify all insurable structures affected by any increase in Base Flood Elevation (BFE) during a 1% chance flood event. State Floodplain Compliance (SFC) or Conditional Letters of Map Revision (CLOMR) approvals are not required for the temporary encroachment into the FEMA-regulated floodway, provided there is no permanent modifications, and the site of the temporary encroachment is returned to pre-project conditions.

Right of Way / 60% Roadway Plans

- To ensure that all NCDOT hydraulic comments have been addressed, the Design-Build Team shall concurrently submit a copy of the Right of Way / 60% Roadway Plans and revised 100%

Hydraulics Design Plans to the Hydraulics Unit for review and acceptance with the Right of Way / 60% Roadway Plans submittal.

General

- The Design-Build Team's design shall be in accordance with the information on the following website, the version of the following references effective on the Technical Proposal submittal date, and the contract requirements contained herein:

  - The North Carolina Division of Highways Hydraulics Unit website:

    https://connect.ncdot.gov/resources/hydro/pages/default.aspx

  - The North Carolina Division of Highways *Guidelines for Drainage Studies and Hydraulics Design,* including all addenda, memos and revisions, excepted as may be amended herein

  - The 2024 NCDOT *Roadway Standard Drawings (Standard Drawing)*

  - The NCDOT *Best Management Practices for Construction and Maintenance Activities*

  - The NCDOT *Stormwater Best Management Practices Toolbox*

  - The NCDOT *Post-Construction Stormwater Program*

  - The NCDOT *Design-Build Submittal Guidelines*

- In case of conflicting design parameters, and / or ranges, in the various resources, the proposed design shall adhere to the *Guidelines for Drainage Studies and Hydraulics Design,* including all addenda, memos and revisions, unless noted otherwise elsewhere in this RFP.

ITS SCOPE OF WORK (9-24-26)

GENERAL

Design, furnish, and install new ITS Communications fiber as described in this RFP. Integrate the new fiber with the existing ITS devices as well as any existing ITS fiber within the project limits. ITS devices include but are not limited to CCTV Cameras, Dynamic Message Signs and Traffic Signal Systems. Major items of work include, but are not limited to, the following:

- Install new and/or relocate fiber optic communications infrastructure, Drop Cables, and / or ITS devices as required to maintain connectivity.
- Installation of Ten (10) CCTV cameras on metal poles.
- Installation of One (1) CCTV camera on wood a pole
- Installation of Two (2) new DMS on pedestal structure.
- Integration of Two (2) existing DMS on pedestal structures.
- Installation of One (1) new HUB Cabinet
- Junction boxes (Electrical, Oversized, and Special Oversized)
- Metal and Wood Poles
- Electrical services & equipment

Furnish and install guardrail to protect ITS devices and ITS Fiber Hub Cabinets as required.

A pre-design/kickoff meeting shall take place in Division 5 between the NCDOT ITS Section, the Design-Build Team, the Division 5 Traffic Engineer, the Regional ITS Engineer, Statewide Transportation Operations Center (STOC) Engineer, the ITS Design Unit, and any other pertinent NCDOT personnel before ITS designs begin. The pre-design meeting shall, at a minimum, address equipment types, intended placement locations and scheduled installation and removal of devices. ITS Plan submittals shall only be reviewed and accepted by the NCDOT ITS Section after this pre-design meeting.

Device or cabinet locations on preliminary plans or conceptual plans created for permitting purposes are general locations and NOT indicative of final device locations. The Design-Build Team shall evaluate each device location for optimal device operation and get approval for all final device locations in accordance with this RFP and the applicable standards and project special provisions.

Acceptance of plans does not relieve the Design-Build Team of any obligation to design and build a complete system that meets the functional requirements of the RFP. The Design-Build Team is solely responsible for the correctness and constructability of the designs meeting all applicable standards.

The Design-Build Team shall coordinate with the Division Traffic Engineer, the Regional Traffic Engineer, the TSMOU, and the STOC throughout the project duration.

Prior to any underground work, locate existing utilities, communications cable, power cable, and adjust work activities to protect these facilities. Immediately cease work and notify the Engineer and the affected owners if damage to existing utilities occurs. The Design-Build Team shall be responsible for repairs at no additional cost to the Department.

Perform all work in accordance with ITUT, IEEE and TIA standards as well as in accordance with the relevant ITS Project Special Provisions found elsewhere in this RFP, the 2024 NCDOT *Standard Specifications for Roads and Structures,* the 2024 NCDOT *Roadway Standard Drawings* and the *ITSS Project Special Provisions – PSP - Version 24.3* or the latest version at the time of letting found at the following website:

https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx

PROJECT OPERATION REQUIREMENTS

It is the Department's desire to provide uninterrupted traffic incident management and traveler information operations throughout the life of the project. Thus, the Design-Build Team shall identify the approximate location of the existing and new ITS devices and when they will be removed and/or installed and operational in their permanent location in the Technical Proposal.

The Design-Build Team shall provide a portable device that is integrated with the "Statewide ITS Network" at all new ITS device locations and all existing ITS device locations that will be offline longer than 24 hours when being modified or replaced until a final permanent ITS device is installed and integrated with the "Statewide ITS Network". The portable ITS devices shall be installed and integrated with the "Statewide ITS Network" prior to beginning any activity that will impede the traffic on I-40, US 1, US 64, or I-440. All portable ITS devices shall communicate with the "Statewide ITS Network" by means of a Department supplied cell modem. Portable ITS device deployments shall comply with the requirements of the applicable Project Special Provisions found elsewhere in this RFP.

For unplanned disconnections to permanent or temporary ITS devices, where communications cannot be restored within 24 hours, a replacement portable device capable of communicating with the "Statewide ITS Network" shall be provided at no additional cost to the Department. Portable ITS devices used at proposed locations shall be in addition to the portable ITS device and/or CMS required for work zone traffic control and incident management during construction. (Reference the Transportation Management Scope of Work found elsewhere in this RFP)

The NCDOT fiber network shall remain operational through the duration of the project. The Design-Build Team shall relocate NCDOT fiber as necessary to avoid construction impacts and keep the ITS network operational.

Intermediate Contract Time #19 for Failure to Report a Damaged NCDOT Communications Infrastructure.

The Design-Build Team shall report damage to existing communication infrastructure caused by the Design-Build Team to the Engineer, Regional ITS Engineer, and the STOC within one (1) hour of the damage occurring. The Design-Build Team shall be responsible for all costs associated with the repair of the damaged communications infrastructure at no additional cost to the department. Communications infrastructure includes, but is not limited to, Fiber-optic cable, underground conduit, micro-duct conduit, junction boxes, tracer wire, electrical service conductors, grounding arrays, equipment cabinets and electrical services.

Liquidated Damages for Intermediate Contract Time #19 for failure to report a damaged NCDOT fiber optic communications infrastructure within one hour are $1,000.00 per hour or any portion thereof.

Intermediate Contract Times #20 and #21 for Failure to Reestablish NCDOT Fiber Optic Communications After a Planned Disruption

During construction, the Design-Build Team shall coordinate any planned disruption in NCDOT fiber optic communications with the Engineer, the NCDOT Division Traffic Engineer, and the STOC. The Design-Build Team shall notify the Engineer, the NCDOT Division Traffic Engineer, and the STOC a minimum of fourteen (14) days prior to all planned disruptions in fiber optic communications. The Design-Build Team shall reestablish the NCDOT fiber optic communication within eight hours of a planned disruption.

A minimum of 30 calendar days prior to any planned disruption in NCDOT fiber optic communications, the Design-Build Team shall develop and provide a plan for the Department's approval that defines 1) an anticipated planned disruption timeframe and 2) a plan of action for reestablishing NCDOT communications within eight hours of the planned disruption.

Liquidated Damages for Intermediate Contract Time #20 for failure to reestablish NCDOT fiber optic communications within eight hours of a planned disruption are $1,000.00 per hour or any portion thereof.

Liquidated Damages for Intermediate Contract Time #21 for failure to provide a plan 30 calendar days prior to work that defines 1) an anticipated planned disruption timeframe, 2) a plan of action for reestablishing NCDOT communications within eight hours of the planned disruption are $10,000.00 per failure.

Intermediate Contract Time #22 for Failure to Restore Operation/Communication to ITS Device after an unplanned disruption

The Design-Build Team shall maintain the operation of all permanent and temporary ITS devices integrated with the "Statewide ITS Network" included in the project. If device operation is disrupted, the Design-Build Team shall restore operation within 24 hours or provide a replacement/portable ITS device at no cost to the Department. If a replacement device is provided, it shall be integrated with the "Statewide ITS Network" within 24 hours.

Liquidated Damages for Intermediate Contract Time #22 for failure to restore operation/communication to ITS devices or provide a replacement device within 24 hours are $500.00 per hour or any portion thereof.

Intermediate Contract Times #23 and #24 for Failure to Reestablish ITS Device Operation after a Planned Disruption

During construction, the Design-Build Team shall coordinate any planned disruption in the operation of an ITS Device with the Engineer, the Division Traffic Engineer, and the STOC. The Design-Build Team shall notify the Engineer, the Division Traffic Engineer, and the STOC a minimum of seven calendar days prior to all planned disruptions in ITS Device Operations. The Design-Build Team shall reestablish ITS Device operation within: 72 hours of a planned disruption to a DMS and 24 hours of a planned disruption to any other ITS device, including full access and control from the STOC and the Regional TMC via fiber optic cable or cellular modem. This ICT only applies when a temporary ITS Device is not in place.

A minimum of 21 calendar days prior to any planned disruption in the ITS Device operation, the Design-Build Team shall develop and provide a plan for the Department's approval that defines 1) an anticipated disruption timeframe and 2) a plan of action for reestablishing ITS Device operations, including full access and control from the STOC and the Regional TMC via fiber optic cable or cellular modem, within seventy-two (72) hours for a DMS and twenty-four (24) hours for any other ITS device.

Liquidated Damages for Intermediate Contract Time #23 for failure to reestablish ITS Device operation within the timeframe specified above after a planned disruption are $500.00 per hour or any portion thereof.

Liquidated Damages for Intermediate Contract Time #24 for failure to provide a plan that defines 1) an anticipated ITS device planned disruption timeframe and 2) a plan of action for reestablishing ITS device operation a minimum of 21 calendar days prior to a planned disruption are $10,000.00 per failure.

DESIGN REQUIREMENTS

- **Communications**

The Design-Build Team shall install a new ITS conduit system as described later in this RFP along I-40 from Lake Wheeler Road to the new HUB cabinet at the I-40 and I-440/US 1/ US 64 interchange. The Design-Build Team shall install a 288-fiber "Device Line" and a 96-fiber "trunk line" in the new conduits as specified later in this RFP. The Design-Build Team shall terminate all of the fibers in the "Device line" and "Trunk line" in interconnect centers in the new HUB Cabinet.

The existing ITS fiber-optic cables on I-440, US 1, and I-40 west of the interchange shall be re-routed into the new HUB cabinet at the I-40 and I-440/US 1/ US 64 interchange in new conduit systems as described elsewhere in this RFP. The design-Build Team shall terminate all fibers from these cables in interconnect centers in this HUB cabinet. The Design-Build

Team shall replace the existing 48-fiber cable along US 1 heading south with a new 144-fiber cable to the southern project limits. The Design-Build Team shall connect the new 144-fiber cable heading south on US 1 to the existing 48-fiber cable in a splice enclosure. The Design-Build Team may maintain and/or re-route the existing 48-fiber cable during construction and install the final 144-fiber cable once construction is complete and the conduit is in the final location.

If any sections of the Existing NCDOT fiber-optic network conflict with the I-5701 / I-5703 Project and require relocation, the Design-Build Team shall relocate the conduit and / or fiber prior to beginning any ground disturbing construction activities in proximity to the existing conduit and / or fiber. Prior to cutting or splicing the NCDOT fiber, the Design-Build Team shall install new conduit, fiber-optic cable, junction boxes and all other required ITS infrastructure as required by this RFP. Once the conduit systems are in the final location, after any necessary relocation of existing NCDOT fiber-optic cable, the Design-Build team shall replace the full length of any of the existing fiber-optic cables that have any repair splices or reel-to-reel splices between the HUB cabinet and the project limits.

In conjunction with the cut-over and splicing of a relocated fiber-optic communications cable, the Design-Build Team shall perform OTDR testing to allow for minimum downtime and faster acceptance time. Downtime for any relocated fiber-optic cable shall not exceed eight hours. (Reference ICT Nos. 17 and 18)

In each junction box, the Design-Build Team shall label all relocated fiber cables as follows:

- Label 96-fiber cable “NCDOT ITS TRUNK LINE”
- Label 144-fiber cable “NCDOT DEVICE LINE”
- Label 288-fiber cable “NCDOT DEVICE LINE”

ITS devices shall be spliced into the 144-fiber or 288-fiber device lines depending on location, **NOT** into the 96-fiber ITS trunk line.

- **NCDOT 12-Fiber Drop Cable**

  The Design-Build Team shall design, furnish and install 12-fiber drop cables from the 144-fiber or 288-fiber ITS device line to each permanent ITS device. Drop cables shall be spliced into the 144-fiber or 288-fiber ITS device line with a splice enclosure. The Design-Build Team shall terminate **ALL** fibers of each drop cable in an interconnect center in each ITS device cabinet.

  In all junction boxes and device cabinets, the Design-Build Team shall label the 12-fiber drop cables and their interconnect centers “<DEVICE ID> DROP CABLE”. The Design-Build Team shall store 20 feet of spare drop cable in each device cabinet.

Field Ethernet Edge Switch

Ethernet edge switches will be furnished, installed, and programmed by the Design-Build Team. DIT will provide the edge switch programming information to the Design-Build Team. Design-Build Team will provide Ruggedcom model RS900G or Comnet model CNGE11FX3TX8MS edge switches with minimum 2 100/1000 Base X fiber-optic ports and 4 copper RJ45 ports.

Ensure that all fiber-optic ports operate at 1310 or 1550 nanometers in single mode. Design all SFP ranges according to the actual distance between devices in the field. Provide Type LC connectors for the optical ports. Do not use mechanical transfer registered jack (MTRJ) type connectors. Ensure that each optical port consists of a pair of fibers; one fiber will transmit (TX) data and one fiber will receive (RX) data. Ensure that the optical ports have an optical power budget of at least 15 dB. NCDOT utilizes a "2-fibers in 2-fibers out" network design from device to device.

Ensure all copper ports are RJ-45 and auto-negotiate speed (i.e., 10/100/1000 Base) and duplex (i.e., full or half). Ensure that all are compliant with the IEEE 802.3 standard pinouts.

CCTV Cameras

The Design-Build Team shall design, furnish and install ten (10) new CCTV cameras and remove and replace one (1) CCTV camera at the locations listed below. The Design-Build Team shall install new CCTVs with all new equipment on new 50-foot metal poles or 70-foot metal poles as shown below, with lowering devices at locations that provide optimum viewing of the primary route and any arterial routes. All CCTV camera installations, including equipment cabinets and metal poles, shall comply with the requirements of the Project Special Provisions found on the NCDOT ITS and Signals Unit Design Resources website.

New proposed locations:

- US 1 / US 64 at MM 100 (50-foot)*
- I-40 west side of Jones Franklin Road (50-foot)
- I-40 at Gorman Street Exit 295 (50-foot)
- I-40 at I-440 / US 1 / US 64 interchange - four (4) cameras on separate poles with maximum view of the entire interchange. (70-foot with lowering device)

Existing locations:

- US 1 / US 64 at Walnut Street (50-foot)
- I-40 east side of Avent Ferry Road. (50-foot)
- I-40 at Lake Wheeler Road (50-foot)

At I-40 east side of Trailwood Drive remove and replace the existing CCTV Cabinet, Camera, and equipment on existing wood pole at this location.

* The intent of this camera is to have a clear view of the new ramp locations for US 1 Northbound exit 101 and can be collocated with DMS. CCTV may be mounted to the DMS pedestal structure only if this mounting option provides the best field of view for the camera. CCTV cameras shall not be mounted to static sign structures. CCTV cameras within 220 feet of an existing or new DMS location may be powered from the DMS cabinet via a POE connection.

Design-Build Team shall perform a drone survey for all CCTV locations being installed on new poles.

Unless otherwise noted in the RFP, the Design-Build Team shall remove existing CCTV equipment and poles. Existing CCTV locations shall only be taken out of service once the replacement CCTV is installed, operational, and integrated with the Statewide ITS network or a portable CCTV in deployed in its place.

Determine the exact location of each CCTV camera, obtain the Regional ITS Engineer's written approval of the locations, and install the cameras. All components required for the CCTV installations shall be new. Furnish site surveys, including but not limited to bucket truck surveys or drone surveys, to ensure camera coverage areas are acceptable.

Furnish and install new electrical service equipment at all new CCTV locations. The Design-Build Team shall utilize step-up/step-down transformers when necessary to avoid the use of solar assemblies. Comply with the National Electrical Code (NEC), the National Electrical Safety Code (NESC), the 2024 NCDOT *Standard Specification for Roads and Structures*, the Project Special Provisions (PSP), and all local ordinances. All work involving electrical service shall be coordinated with the appropriate utility company and the Engineer.

****NOTE**** Deleted paragraph to maintain CCTV communications with existing cell modems

****NOTE**** Deleted paragraph for cameras on metal poles

Dynamic Message Signs (DMS)

Design, furnish and install Type 2C DMS assemblies, pedestal structures, electrical services, fiber-optic drop cables, fiber-optic interconnect centers and field ethernet switches at the following locations.

- US 1 - mile marker 100 Southbound – replace existing*
- US 1 - mile marker 100 Northbound – install new*
- I-40 - mile marker 294 – existing – install drop cable only
- I-40 - mile marker 296 – existing – install drop cable only

* Design-Build Team shall remove existing DMS, update existing electrical service to new PSP requirements, and install a new DMS sign assembly. Design-Build team shall coordinate the DMS location and structure type with the signing plans.

****NOTE**** Deleted double asterisk note regarding removal of existing DMS assembly

Determine the exact location of each DMS, obtain the Engineer's written approval of the locations, and install the DMS. All components required for the DMS installations shall be new.

DMS shall only be co-located on static signing structures when no other option for a shoulder or median pedestal structure exists. DMS co-located on signing structures shall be accessible via a catwalk with access ladder from the shoulder wherever possible.

The Design-Build Team shall not remove existing DMS until it becomes necessary due to construction conflicts and until a portable CMS is ready to be deployed in its place or the replacement permanent DMS is installed and operational.

The Design-Build Team shall deploy a full matrix Connected CMS that is connected to the State ITS network via department supplied cellular modem at the new DMS locations at the start of construction until the final DMS is installed and operational. These Connected CMS are separate and in addition to any CMS used for traffic control or incident management. Connected CMS signs are listed on the ITS & Signals Qualified Products List (QPL) and may also be submitted for review and approval but the NCDOT ITS Design Unit.

Determine the exact location of each DMS, obtain the Regional ITS Engineer's written approval of the locations, and install the DMS.

Install new electrical service equipment at all new and relocated DMS locations. The Design-Build Team shall use step-up and/or step-down transformers if necessary to provide power. Comply with the National Electrical Code (NEC), the National Electrical Safety Code (NESC), the Standard Specification, the Project Special Provisions, and all local ordinances. All work involving electrical service shall be coordinated with the appropriate utility company and the Engineer.

NCDOT ITS Fiber Hub Cabinet

Design, furnish and install an ITS Fiber Hub Cabinet as specified in the project special provisions and detail drawings included with this RFP. The hub cabinet should be a climate controlled, NEMA 4, 332D Style ITS cabinet adequately sized to accommodate all electrical equipment and communications equipment including but not limited to four (4) minimum 288-fiber interconnect centers, one (1) Ethernet hub switch, one (1) UPS and the cabinet air conditioning system. Approximate hub cabinet locations are as follows:

- HUB cabinet at the I-40 and I-440/US 1/US 64 interchange*

*Dual cabinet location – To accommodate the large cable sizes at this HUB location, the Design-Build Team shall install a second 332D style double door HUB cabinet next to the first HUB cabinet to act as a splice cabinet. The 288-fiber cable and the 144-fiber cables shall be routed into this second cabinet. The 96-fiber cables shall be routed into the first HUB cabinet. Two 144-fiber cables shall be run between these two cabinets and terminated in interconnect centers for jumper connections between cabinets. This second HUB cabinet is not required to be powered or climate controlled.

HUB numbers on plan sheets are for the purposes of this project only. Do not mark or label the HUB cabinets, splice trays, or interconnect centers with these numbers. Contact the STOC for proper device naming and labeling schema.

The Design-Build Team shall coordinate with the Engineer and NCDIT for the installation of the HUB switch. NCDIT will provide all HUB switches required on this project. The Design-Build Team shall allow for a 12-week lead time for the HUB switch installation.

MATERIALS & CONSTRUCTION

Furnish and install new materials and hardware unless stated otherwise elsewhere in this RFP. Adhere to the requirements of the ITUT, IEEE and TIA standards as well as the 2024 NCDOT *Standard Specifications for Roads and Structures,* the 2024 NCDOT *Roadway Standard Drawings,* the *ITS & Signals Generic Project Special Provisions Version 24.2* or latest version at time of letting and the project special provisions included with the RFP.

- **Conduit**

  - **Power Conduit**
    Furnish and install conduit (for power) and all necessary hardware by trenching, plowing or directional drilling in accordance with Section 1715 of the 2024 NCDOT *Standard Specifications for Roads and Structures* for installing the power service to the ITS devices. Conduit shall not be placed in the median or under the roadway, (travel lanes and shoulders), except for perpendicular crossings. (Reference the Electrical Service Section below)

  - **Communications Conduit**
    - Main Trunk Line Conduit – Furnish and install:
      - Two (2) – 1.25-inch conduits and One (1) 2-inch conduit for NCDOT communications trunk line
        - One Orange conduit with imbedded tracer wire for the ITS Device Line
        - One blue conduit for the ITS Trunk Line (this conduit may be also be a spare depending on location)
        - One Green conduit for spare (this conduit is the 2-inch conduit)

    - Drop Cable Conduit – Furnish and Install

- Two (2) 1.25-inch conduits for NCDOT drop cables passing under the roadway. Spare drop cable conduit under roadway shall have pull tape.
- One (1) 1.25-inch conduit for NCDOT drop cables not passing under the roadway
- Drop cable conduits shall be White

Furnish and install conduit for fiber optic communication and all necessary hardware by trenching, plowing or directional drilling in accordance with the Project Special Provisions found elsewhere in this RFP and on the ITS and Signals Unit Design Resources website. Conduit shall not be placed in the median or under the roadway (travel lanes and shoulders), except for perpendicular crossings. Seal all conduits with mechanical sealing devices as described in the Standard Specifications. The Design-Build Team shall imbed tracer wire in the blue conduit and the white drop cable conduit.

Bundled 1.25-inch conduits are allowed for NCDOT use as long as they meet all specifications and requirements stated in this RFP and are approved by the Engineer. Micro-duct conduit is not approved for use on this project.

All communications conduits shall be installed through the sidewall of all Junction Boxes to allow for fiber jetting.

The Design-Build team shall install fiber via jetting/blowing where feasible in accordance with *Conduit and Jetting Fiber* Project Special Provisions found elsewhere in this RFP.

The Design-Build team may use couplers when installing conduit as long as they meet the requirements of this RFP and are approved by the Engineer. When trenching or plowing conduit, no more than one coupler shall be allowed between junction boxes. When directional drilling conduit, no more than four couplers shall be allowed between junction boxes. When transitioning from plowing/trenching to directional drilling, a coupler is allowed. The maximum number of couplers in a 3000 foot section of conduit between junction boxes is six.

Couplers shall be:
- All metal
- press-fit style,
- air-tight,
- water-tight
- Minimum PSI rating of 175 PSI
- Resistant to acidic soil

- **Junction Boxes**

  - **Electrical**

    Furnish and install “Tier 22” junction boxes (pull boxes) for electrical services with all necessary hardware in accordance with *Junction Boxes (Limited Access Facilities)*

Project Special Provision found elsewhere in this RFP. Provide standard size junction boxes in accordance with Limited Access Junction Box specifications for electrical service. Electrical junction boxes shall be protected with a concrete collar/skirt of 8-inch depth, 6 inches wide all around, and flush with the top surface. Install electrical junction boxes at maximum intervals of three hundred (300) feet or at locations where underground splicing is necessary. For concrete collar/skirt requirements reference the *Junction Box (Limited Access Facilities*) Project Special Provisions and Junction Box detail drawings included with this RFP. Install delineator markers at all electrical junction boxes in accordance with the special provisions included with this RFP.

Provide junction box covers with standard "Electric" logo, pull slots and stainless-steel pins.

- **Communications**

Furnish and install junction boxes (pull boxes) with all necessary hardware in accordance with the Project Special Provisions included with this RFP. Provide Tier 22 load rated junction boxes accordance with Limited Access Junction Box specifications, with "mouse holes" to accommodate horizontal conduit entrances into the junction box for fiber installations.

For communications junction boxes install a concrete collar/skirt of 8-inch depth, 6 inches wide all around, and flush with the top surface grade. For concrete collar/skirt requirements reference the Project Special Provisions and Junction Box detail drawings included with this RFP.

Install locate balls and delineator markers at all communications junction boxes in accordance with the special provisions included with this RFP.

Provide Tier 22 junction box covers with standard "NCDOT Fiber Optic" logo, pull slots and stainless-steel pins.

Space trunk line junction boxes roughly 3000 feet apart between interchanges.

Install communications junction boxes at the base of each ITS device pole/cabinet and at each hub cabinet within six feet.

Every junction box shall house 50 feet of spare cable for each NCDOT cable entering the junction box.

Every junction box with a splice enclosure shall house 100 feet of spare cable for each direction of the cables being spliced. (i.e. 50 feet of spare trunk line in each direction and 50 feet of spare of each drop cable)

Ground all tracer wires in junction boxes designated for communications fiber in accordance with the *Junction Boxes (Limited Access Facilities)* PSP and details drawings included with this RFP.

Communications cables and power cables shall NOT share junction boxes.

- **Wood Poles**

Furnish and install wood poles, with all necessary grounding systems and hardware necessary in accordance with Section 1720 of the 2024 NCDOT *Standard Specifications for Roads and Structures*. Provide wood poles sized as necessary for the intended application.

- Use 60-foot Class 3 wood poles as defined in the ITS Project Special Provision for CCTV installations where required by this RFP.

- Use 40-foot Class 4 wood poles for approved applications.

- Use 6" x 6" x 8' treated wood posts for underground electrical service structures.

Furnish and install related items of work including but not limited to risers with weatherhead or heat shrink tubing, Air terminals and all necessary hardware in accordance with Section 1720 of the 2024 NCDOT *Standard Specifications for Roads and Structures* and the *Air Terminal and Lightning Protection System* Project Special Provision included with this RFP.

- **Electrical Service**

Furnish and install new electrical services rated 100 Amps for overhead service or 200 Amps for underground service, 240/120 VAC service drops for the each new ITS device. In accordance with Section 1700 of the *Standard Specifications* and the *Electrical Service for ITS Devices* Project Special Provisions found on the NCDOT ITS and Signals Unit Design Resources website, furnish and install related items of work, including, but not limited to service entrance equipment, service conductors, feeder conductors, disconnects, junction boxes, risers, guy assemblies and wood poles with all necessary hardware. (Reference the Utilities Coordination Scope of Work found elsewhere in the RFP for additional coordination / approval requirements and payment responsibilities)

Electrical Services and Service Disconnects with regards to voltage drop calculations shall be rated to accommodate the following breaker sizes:

- CCTV = 15 AMPS
- DMS = 50 AMPS

Calculations using actual equipment load amperage for CCTV or DMS shall not be allowed.

The Desing-Build Team shall combine electrical services wherever possible.

The Design-Build Team shall be responsible for all costs associated with installing new or modifying existing electrical services that fall under this ITS Scope of work, regardless of what is stated in other sections of this RFP.

- **Generator Hookups**

For devices listed above as "Critical" devices, the Design-Build team shall install an external generator connection port on the device cabinet exterior. The port should be designed and sized for the appropriate electrical requirements of the cabinet it is for. ALL hub cabinet locations are considered "Critical". Other critical devices, if any, are noted in the lists earlier in this RFP. Supplying generators is not required as part of this project.

QUALIFIED PRODUCTS LIST

Submit a listing of items on the NCDOT 2024 Qualified Products List (QPL) to receive approval for use on the project. Catalog cuts will not be required for items on the QPL. The QPL website is:

https://apps.ncdot.gov/products/qpl/

ADDITIONAL REQUIREMENTS

For all ITS devices and components within the entire project limits, the Design-Build Team shall comply with the following requirements:

- **Maintenance and Repair**

The Design-Build Team shall maintain and repair all ITS components within the project scope, including but not limited to, ITS devices, ITS conduit system, and all related ITS components, from the beginning of construction until the final acceptance of the project by the NCDOT. After acceptance of the project, the Design-Build Team shall be responsible for repairing the system due to faulty materials or workmanship in accordance with the *Twelve-Month Guarantee* Project Special Provision found elsewhere in this RFP, or longer if the Design-Build extends the aforementioned warranty period.

- **Plan of Record Documentation**

Prepare and submit to the Department Plan of Record (POR) documentation that depicts the conduit and ITS device locations. Submit final POR documentation in electronic PDF and Excel format as well as hard copy format for Department approval. Provide electronic plans in MicroStation (latest release in use by the Department) format as well. Submit hard copy documentation on 11-inch x 17-inch plan sheets. POR documentation shall include the final location and depth of conduits, wiring external to the cabinets, locations of splice enclosures, junction box locations, and Single Mode Fiber Optics (SMFO) cable terminations. Include in the POR documentation real world coordinates for all ITS devices, splice enclosures, junction boxes, and equipment cabinets installed or utilized under this project. See Standard Specifications section 1716-3 for additional details. Provide the coordinates in feet units using

the North Carolina State Plane coordinate system (1983 North American Datum also known as NAD ’83). Furnish coordinates that do not deviate more than 1.7 feet in the horizontal plane and 3.3 feet in the vertical plane. Global positioning system (GPS) equipment able to obtain the coordinate data within these tolerances may be used. All ITS POR documentation described above shall be provided to the Engineer and the NCDOT ITS & Signals Management Section, via the Alternative Delivery Unit.

Provide a digital copy of all the information required to populate the point feature classes in NCDOT’s Fiber Asset Management System (FAMS) Tool Microsoft spreadsheet template “NAME” that is available on the ITS Design Resources website.

https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx

Provide this information to the Engineer and the NCDOT ITS (TSMO) Unit.

- **Integration**

Upon completion of the ITS device installations, coordinate with DIT to integrate all ITS devices with the NCDOT ITS network and verify accessibility of all devices at the STOC unless instructed otherwise by this RPF or by the Engineer.

Coordinate with DIT and the Engineer to modify, as necessary, the existing central hardware and software modules including, but not limited to databases, to provide operators access to new devices through the operators’ Graphical User Interface.

- **Testing**

Develop unit and system test plans and procedures for each ITS device and all associated components, in accordance with the appropriate testing requirements found in the Project Special Provisions included with this RFP and submit to the Engineer for review and approval.

Upon completion of the ITS device installations, conduct unit and system tests according to the approved test plan and procedures. Provide all necessary test equipment.

In case of failures and substandard performance, the Design-Build Team shall identify the cause, repair or replace the faulty parts and components and repeat the test. If the problem persists, the entire unit causing the problem shall be replaced prior to retest.

After successful completion of all unit and system tests, submit the test reports along with the record of repairs and part replacements to the Engineer.

The ITS device inspection shall not occur until OTDR results and POR documentation has been received, reviewed and accepted by the ITS & Signals Management Section.

OTHER CODES AND STANDARDS

All ITS materials shall conform to the latest version of the applicable standards of the National Electrical Code (NEC), National Electric Manufacturer's Association (NEMA), the Underwriters' Laboratories, Inc. (UL), the Electronic Industries Association (EIA), the International Municipal Signal Association (IMSA), and the National Electrical Safety Code (NESC). All materials and workmanship must conform to the requirements of the NESC, standards of the American Society for Testing and Materials (ASTM); and the American National Standards Institute (ANSI). Comply with all federal laws, state laws, and city codes in accordance with the 2024 NCDOT *Standard Specifications for Roads and Structures*.

SUBMITTALS

Submit a set of 75% preliminary plans, 90% unsealed set of project plans, including specifications for materials, catalog cuts, and installation and testing requirements for review. 75% and 90% submittals will have separate 10-day review periods. Upon acceptance by the Department, provide an RFC set of sealed plans and specifications to the Department. No construction of the ITS devices and infrastructure shall begin until the Department has accepted the RFC sealed plans and specifications. Provide the Department with a minimum of 10 working days for each review.

LIGHTING SCOPE OF WORK (10/5/26)

NEW LIGHTING SYSTEMS

The Design-Build Team shall provide and install roadway lighting equipment and materials, in accordance with the Final Lighting Plans provided by the Department, Division 14 of the 2024 NCDOT *Standard Specifications for Roads and Structures*, and the *Roadway Standard Drawings*, except as amended below. Prior to the Technical Proposal submittal date, the NCDOT will provide the Preliminary Lighting Plans. The Department will finalize the lighting design based upon the Design-Build Team's Release for Construction (RFC) Roadway Plans.

The Design-Build Team shall include all costs required to relocate the existing NCDOT owned lighting in conflict with construction at the I-40 / Lake Wheeler Road Interchange, I-40 / Gorman Street Interchange, I-40 / US 1 /US 64 / I-440 Interchange, and US 1 / US 64 / Walnut Street Interchange and construct the new roadway lighting and conduit systems shown in the aforementioned Preliminary Lighting Plans provided by the Department in their lump sum price bid for the entire project. The Department shall only compensate the Design-Build Team for additional lighting construction costs that result from design revisions incorporated at the direction of the Department and / or that result from errors or omissions in the Department's Preliminary Lighting Plans. The Design-Build Team shall be solely responsible for all additional lighting construction costs that result from design revisions incorporated by the Design-Build Team.

If any design revision, including but not limited to those incorporated at the Department's discretion, those incorporated at the Design-Build Team's discretion and / or those incorporated due to errors or omissions in the Department's preliminary lighting design, results in the removal and / or reduction of lighting equipment from the Preliminary Lighting Plans provided by the Department, all costs associated with the removal and / or reduction of lighting equipment shall be deducted from monies due the Design-Build Team.

After the RFC Roadway Plans have been accepted by the Department, the Design-Build Team shall submit MicroStation files of the RFC Roadway Plans for the Department to complete the lighting design. The Design-Build Team shall allow the Department 25 days after this submittal to update and finalize the lighting design.

The Design-Build Team shall allow ten days for Department review of each submittal for all materials including poles and foundation designs. An additional ten days shall be required for pole submittals from vendors that do not commonly do business with the Department.

Reference the Transportation Management Scope of Work found elsewhere in this RFP for time restrictions and lane closure requirements.

Reference the Lighting Project Special Provisions found elsewhere in this RFP for additional requirements.

MAINTENANCE

Assume responsibility for routine maintenance of the newly installed lighting system(s) and any newly installed and / or components associated with the existing lighting system(s) for the duration of the contract in accordance with Division 14 of the *Standard Specifications*, except as amended below.

NCDOT will assume maintenance responsibility for the completed lighting systems after the project is accepted, and there is no chance of construction-related damage.

The Design-Build Team shall replace any newly installed non-functional lighting system components within the project limits. All luminaires must be fully operational at project acceptance. Where a significant amount (> 10%) of newly installed luminaires fail during the warranty period for the contract, the Design-Build Team shall replace failed luminaires at no cost to the Department within 60 days of notification of luminaire failure.

PAVEMENT MANAGEMENT SCOPE OF WORK (10-6-26)

I-40 REQUIREMENTS

The pavement design for widened areas of the I-40 travel lanes, the I-40 median paved shoulders and the I-40 outside paved shoulders shall consist of the following throughout the project limits.

ASPHALT PAVEMENT (AGGREGATE BASE COURSE) FROM THE WESTERN PROJECT LIMITS TO THE WESTERN LIMITS OF THE EXISTING BRIDGE OVER I-440 / US 1 / US 64 (APPROXIMATE STATION 109+50)

The pavement design for the I-40 travel lanes, I-40 median paved shoulder and I-40 outside paved shoulder shall consist of the following:

5/8" Ultra-Thin Bonded Wearing Course (UTBWC)
3.0" S9.5D
4.0" I19.0C
6.0" B25.0C
8.0" ABC
12" Type 1 Aggregate Subgrade (*in accordance with Section 505 of the Standard Specifications*)

The UTBWC shall only extend 6.0" onto the median and outside shoulders.

Note 1: The outside paved shoulders within these limits shall be removed and replaced with the design listed above.

ASPHALT PAVEMENT (FULL-DEPTH ASPHALT) FROM THE EASTERN LIMITS OF THE EXISTING BRIDGE OVER I-440 / US 1 / US 64 (APPROXIMATE STATION 113+00) TO THE EASTERN PROJECT LIMITS

I-40 Travel Lane, Median Shoulder and Outside Shoulder Pavement Design (new construction and widening locations)

The pavement design for the I-40 travel lanes, I-40 median paved shoulder and I-40 outside paved shoulder shall consist of the following:

5/8" Ultra-Thin Bonded Wearing Course (UTBWC)
3.0" S9.5D
4.0" I19.0C
10.0" B25.0C
12" Type 1 Aggregate Subgrade (*in accordance with Section 505 of the Standard Specifications*)

The UTBWC shall only extend 6.0" onto the median and outside shoulders.

Note 1: Some areas with widened shoulders, as indicated in the (FORTIFY) plans, consist of partial depth asphalt shoulders. The Design-Build Team shall remove these partial depth shoulders and replace with the design listed above in areas that are to become proposed travel lane or proposed 12' shoulder

I-40 Pavement Resurfacing / Uniform Overlay

For I-40 travel lanes from the western project limits to the western limits of the existing bridge over US-1/I-440 (approximate station 109+50), the Design-Build Team shall mill off and replace the existing UTBWC (5/8" milling & replacement) only in areas as required to revise pavement markings. The UTBWC shall only extend 6.0" onto the median and outside shoulders.

For the I-40 travel lanes from the eastern limits of the existing bridge over I-440 / US 1/ US 64 (approximate station 113+00) to the eastern project limits, the Design-Build Team shall uniformly mill the I-40 pavement that remains in place (travel lanes and shoulders*), including areas that consist solely of pavement marking obliterations and / or revisions, to a minimum depth of 1.5" and replace with a minimum uniform overlay of 1.5" S9.5D and a 5/8 Ultra-Thin Bonded Wearing Course (UTBWC). The UTBWC shall only extend 6.0" onto the median and outside shoulders.

*Unless otherwise required, or to revise rumble stripes, markings, or drainage, the milling and replacement of the median shoulders shall extend a minimum of 6.0" into the shoulder, and the remaining median shoulder shall be fog sealed.

I-440 / US 1 / US 64 REQUIREMENTS

Southern Project limits to Y1RT (Northbound US 1) approximate Station 79+33 and Y1LT (Southbound US 1) approximate Station 71+66 to the Southern Project Limits and Y21RC from approximate Station 39+28 to Station 63+10, Areas of existing concrete lanes to remain in place (existing concrete with 15 ft. joint spacing)

For the existing travel lanes (existing through lanes and auxiliary lanes) from the southern project limits to approximate stations above, the following design shall be used for all travel lane and auxiliary lane widening.

Travel Lane/Auxiliary Lane Concrete Widening Pavement Design

11.0" doweled jointed concrete
2.0" of PADC Type P-78M
1.25" of S9.5B
12" Type 1 Aggregate Subgrade (*in accordance with Section 505 of the Standard Specifications*)

Note 1: The Design-Build Team shall locate the exact northern terminus of the northbound mainline concrete widening which shall be defined by the existing pavement joint between the

concrete pavement with 15 ft. joint spacing constructed in 2006 and the concrete constructed with 30 ft. joint spacing (constructed in 1962 and / or 1984).

Note 2: The existing full width outside concrete shoulders that do not contain rumble strips from the southern project limits to approximate station 79+33 may be used as part of future travel lanes or auxiliary lanes, as records indicate that they were originally constructed as concrete pavement, with dowels.

Note 3: Any asphalt shoulders, narrow width concrete shoulders, or concrete shoulders with rumble strips, within these areas shall be removed and replaced with the Travel Lane/Auxiliary Lane Concrete Widening pavement design if located in areas that are to become proposed travel lanes.

Note 4: The Design-Build Team shall locate the exact northern terminus of the existing partial depth asphalt shoulders adjacent to the existing concrete, which is the existing pavement joint between the concrete pavement, with 15 ft. joint spacing, constructed in 2006 and the new asphalt travel lanes constructed as part of U-2179, and the exact southern terminus which is the existing pavement joint between the existing concrete shoulder placed in 2006 and the new partial depth asphalt shoulders placed as part of U-2719.

Note 5: This pavement design shall be used for Y21RD up to the gore area with Y1RT.

The Design Build Team shall design and construct either concrete or asphalt shoulders adjacent to the areas of widened concrete travel lanes using one of the following options:

Full-Depth Median Shoulder and Outside Shoulder Pavement Design - Tied Concrete Shoulder Option

11.0” jointed concrete (without dowels)
12” Type 1 Aggregate Subgrade (*in accordance with Section 505 of the Standard Specifications*)

The transverse joints shall be uniformly spaced 15 feet apart.

Full-Depth Median Shoulder and Outside Shoulder Pavement Design – Roller Compacted Concrete Shoulder Option **

11.0” roller compacted concrete shoulder
12” Type 1 Aggregate Subgrade (*in accordance with Section 505 of the Standard Specifications*)

Note 1: The required width of the outside travel lane widening shall be increased by 1.0’ if roller compacted concrete shoulders are constructed.

Full-Depth Median Shoulder and Outside Shoulder Pavement Design - Asphalt Shoulder Option **

3.0" S9.5C
4.0" I19.0C
4.0" B25.0C
12" Type 1 Aggregate Subgrade (*in accordance with Section 505 of the Standard Specifications*)

Note 1: The required width of the outside travel lane widening shall be increased by 1.0' if asphalt shoulders are constructed.

Note 2: For the existing southbound through lanes of Y1LT from approximate station 71+66 to approximate station 46+86, the outside asphalt paved shoulders that are not located in areas to become a portion of any proposed travel lane or auxiliary lane shall be removed and replaced with the above tied concrete shoulder option only.

In accordance with the *Diamond Grinding Concrete Pavement* Project Special Provision found elsewhere in this RFP, the Design-Build Team shall diamond grind the new concrete in the widened areas. An overlay will not be required on either the new or existing concrete in the aforementioned station range. The Design-Build Team shall include new shoulder drains in the widened areas and tie existing drainage structures to proposed drainage structures, as required, to ensure drainage of the entire pavement structure. The shoulder drain design and outlet locations for the widened areas shall be submitted to the Design-Build Unit for review and acceptance.

US-1 / I-440 -Y1RT- Approximate Station 79+33 to 104+60
REMOVAL AND REPLACEMENT OF CONCRETE PAVEMENT

For Y1RT from the pavement joint between the existing concrete lanes to remain in place (approximate station 79+33) to the end of the existing concrete pavement to be removed (approximate station 104+60), the Design-Build Team shall remove and dispose of / recycle the existing concrete pavement for the mainline travel lanes, mainline median shoulders and mainline outside shoulders to the top of the soil subgrade; and construct new pavement in accordance with one of the pavement alternates below.
Note The Design-Build Team shall locate the exact southern terminus of concrete lanes to be removed, which is the existing pavement joint between the concrete pavement constructed in 2006 (with ~15 ft. joint spacing) and concrete constructed with 30 ft. joint spacing (constructed in 1962 and/or 1984), and the exact northern terminus which is joint between the existing concrete constructed with 30 ft. joint spacing (constructed in 1962 and/or 1984) and the new asphalt lanes constructed as part of the U-2719 project.

ALTERNATE 1 – CONCRETE PAVEMENT (CONCRETE SHOULDERS)

US-1/I-440 Travel Lane Pavement Design

The pavement design for the mainline travel lanes shall consist of the following:

11.5" doweled jointed concrete
Nonwoven Geotextile Drainage Interlayer *
1.25" S9.5B
12" Type 1 Aggregate Subgrade (*in accordance with Section 505 of the Standard Specifications*)

* The Nonwoven Geotextile Drainage Layer shall be in accordance with Section 724 of the 2024 NCDOT *Standard Specifications for Roads and Structures*. The Nonwoven Geotextile Drainage Interlayer and the S9.5B layer shall extend to the shoulder drains.

The transverse joints shall be uniformly spaced 15 feet apart.

In accordance with the *Diamond Grinding Concrete Pavement* Project Special Provision found elsewhere in this RFP, the Design-Build Team shall diamond grind the new concrete pavement.

US-1/I-440 Full-Depth Median Shoulder and Outside Shoulder Pavement Design

The pavement design for the mainline median paved shoulder and the mainline outside paved shoulder shall consist of the following:

11.5" jointed concrete (without dowels)
1.25" S9.5B
12" Type 1 Aggregate Subgrade (*Aggregate Subgrade* Standard Special Provision found elsewhere in this RFP)

The transverse joints shall be uniformly spaced 15 feet apart.

ALTERNATE 2 – CONCRETE PAVEMENT (ASPHALT SHOULDERS)

US-1/I-440 Travel Lane Pavement Design

The pavement design for the mainline travel lanes shall consist of the following:

11.5" doweled jointed concrete
Nonwoven Geotextile Drainage Interlayer *
1.25" S9.5B

12” Type 1 Aggregate Subgrade (*in accordance with Section 505 of the Standard Specifications*)

* The Nonwoven Geotextile Drainage Layer shall be in accordance with Section 724 of the 2024 NCDOT *Standard Specifications for Roads and Structures*. The Nonwoven Geotextile Drainage Interlayer and the S9.5B layer shall extend to the shoulder drains.

The transverse joints shall be uniformly spaced 15 feet apart.

In accordance with the *Diamond Grinding Concrete Pavement* Project Special Provision found elsewhere in this RFP, the Design-Build Team shall diamond grind the new concrete pavement.

US-1/I-440 Full-Depth Median Shoulder and Outside Shoulder Pavement Design

The pavement design for the mainline median paved shoulder and the mainline outside paved shoulder shall consist of the following:

3.0” S9.5C
4.0” I19.0C
4.5” B25.0C
12” Type 1 Aggregate Subgrade (*in accordance with Section 505 of the Standard Specifications*)

Note 1: The required width of the outside travel lane widening shall be increased by 1.0’ if asphalt shoulders are constructed.

ALTERNATE 3 – CONCRETE PAVEMENT (ROLLER COMPACTED CONCRETE SHOULDERS)

US-1/I-440 Travel Lane Pavement Design

The pavement design for the mainline travel lanes shall consist of the following:

11.5” doweled jointed concrete
Nonwoven Geotextile Drainage Interlayer *
1.25” S9.5B
12” Type 1 Aggregate Subgrade (*in accordance with Section 505 of the Standard Specifications*)

* The Nonwoven Geotextile Drainage Layer shall be in accordance with Section 724 of the 2024 NCDOT *Standard Specifications for Roads and Structures*. The Nonwoven Geotextile Drainage Interlayer and the S9.5B layer shall extend to the shoulder drains.

The transverse joints shall be uniformly spaced 15 feet apart.

In accordance with the *Diamond Grinding Concrete Pavement* Project Special Provision found elsewhere in this RFP, the Design-Build Team shall diamond grind the new concrete pavement.

US-1/I-440 Full-Depth Median Shoulder and Outside Shoulder Pavement Design

The pavement design for the mainline median paved shoulder and the mainline outside paved shoulder shall consist of the following:

11.5" roller compacted concrete (two lifts)
12" Type 1 Aggregate Subgrade (*in accordance with Section 505 of the Standard Specifications*)

Note 1: The required width of the outside travel lane widening shall be increased by 1.0' if roller compacted concrete shoulders are constructed.)

ALTERNATE 4 – ASPHALT PAVEMENT (FULL-DEPTH ASPHALT)

US-1/I-440 Travel Lane, Median Shoulder and Outside Shoulder Pavement Design

The pavement design for the mainline travel lanes shall consist of the following:

3.0" S9.5D
4.0" I19.0C
8.0" B25.0C
12" Type 1 Aggregate Subgrade (*in accordance with Section 505 of the Standard Specifications*)

ALTERNATE 5 – ASPHALT PAVEMENT (AGGREGATE BASE COURSE)

US-1/I-440 Travel Lane, Median Shoulder and Outside Shoulder Pavement Design

The pavement design for the mainline travel lanes shall consist of the following:

3.0" S9.5D
4.0" I19.0C
3.5" B25.0C
10.0" ABC
12" Type 1 Aggregate Subgrade (*in accordance with Section 505 of the Standard Specifications*)

US-1 / I-440 Approximate Station -Y1RT- 104+60 to Northern Project Limits and Approximate Station -Y1LT- 71+66 to the Northern Project Limits
AREAS OF EXISTING ASPHALT LANES TO REMAIN IN PLACE

The following areas consist of existing asphalt travel lanes to remain in place with partial depth asphalt shoulders: Y1RT from the end of the existing concrete pavement to be removed (approximate station 104+60) to the northern project limits, and Y1LT from the northern project limits to the existing concrete travel lanes to remain in place (approximate station 71+66), and 21CDSB from the northern project limits to approximate station 13+54.

In these areas, all existing asphalt paved shoulders that are located in areas of proposed travel lanes or auxiliary lanes in the final proposed configuration, shall be removed and replaced with the following pavement design.

US-1/I-440 Travel Lane, Median Shoulder and Outside Shoulder Pavement Widening Design

The pavement design for the mainline travel lanes shall consist of the following:

3.0” S9.5D
4.0” I19.0C
5.5” B25.0C
10.0” ABC
12” Type 1 Aggregate Subgrade (*in accordance with Section 505 of the Standard Specifications*)

In these areas, the existing asphalt travel lanes to remain in place shall be milled to a depth of 1.5” and replaced with 1.5” S9.5D. This does not include additional operations that may be required for traffic control, temporary pavement marking revisions, or drainage.

In areas where existing travel lanes do not shift onto the existing partial depth shoulders, and only shoulder widening is required, the following partial depth shoulder widening design shall consist of the following:

3.0” S9.5C
4.0” I19.0C
3.0” B25.0C
10.0” ABC

Note 1: The requirement to remove the shoulder for travel lanes encroaching into the shoulder applies to the final proposed configuration. The Design-Build Team may still evaluate the use of existing shoulders for suitability to carry temporary traffic as noted elsewhere in this RFP.

Note 2: The contractor shall construct all pavement widening in such a manner as to ensure an offset of longitudinal joints in each layer from that in the layer immediately below by a

minimum of 6 inches. Any adjustments needed in the existing pavement to accomplish this shall be incidental to the work of constructing the pavement widening. Longitudinal joints in the final layer shall be located between designated travel lanes of the final traffic pattern, unless otherwise approved by the Engineer. The Design-Build Team shall provide a detail illustrating any bench milling needed. Longitudinal joints of all surface course layers shall not be located in the final traffic pattern wheel path.

OTHER REQUIREMENTS

For concrete alternates, unless noted otherwise elsewhere in this RFP, all longitudinal joints shall be located on a lane line or lane midpoint. Solely to shift a longitudinal joint to one of the aforementioned locations, a maximum 840-foot transition, that locates the longitudinal joint elsewhere, will be allowed. The Design-Build Team shall indicate in the Technical Proposal how longitudinal joints will be located on a lane line or lane midpoint.

Unless specified otherwise in the RFP, the following ramps, loops, and collector distributor lanes shall be removed, and in areas where required, replaced with the designs listed in Table 1 below.

- Eastbound I-40 Collector Distributor: from the western gore with the mainline travel lanes to the existing pavement joint between the existing concrete pavement and the asphalt pavement constructed as part of the I-5338 project (approximate CD station 14+40 to approximate station 59+64).

- Westbound I-40 Collector Distributor: From the existing pavement joint between the existing concrete pavement and the asphalt pavement constructed as part of the I-5338 project to the gore with the westbound travel lanes (approximate CD station 16+56 to approximate 21RDB station 68+72).

- Southbound I-440 / US-1 / US 64 Collector Distributor: (which overlap with/are in the vicinity of multiple proposed alignments including 21CDSB from approximate station 13+54 to approximate station 38+00, and Y21RC from approximate station 27+00 to approximate station 39+28).

Unless specified elsewhere in the RFP, all ramps and loops shown in the Preliminary Plans within the I-40 / I-440 / US 1 interchange the Design-Build Team shall remove and dispose of / recycle the pavement structure, in its entirely, to the top of the soil subgrade, including but not limited to the removal and disposal of existing aggregate base course and replaced with the designs listed in Table 1 and Table 2 below.

Table 1: I-40 & US-1/I-440 Interchange Ramps and Collector Distributer Roads

Lines	Surface	Intermediate	Base	ABC	Stab
I-40 / I-440 / US 1 / US 64 Collector Distributer Roads	3.0" S9.5D	4.0" I19.0C	7.0" B25.0C	-	Yes
I-40 / I-440 / US 1 / US 64 Ramps and Loops	3.0" S9.5D	4.0" I19.0C	4.0" B25.0C	-	Yes

*Note: On Y21RD from the Y1RT gore to the 21RDB gore the base layer shall be 7.0" B25.0C.

Table 2: Other Pavement Designs

Lines	Surface	Intermediate	Base	ABC	Stab
Walnut Street Ramps & Loops (Quadrants B, C, & D)	3.0" S9.5D	4.0" I19.0C	3.0 B25.0C	-	Yes
Gorman St. Ramps & Lake Wheeler Rd. Ramps	3.0" S9.5D	4.0" I19.0C	5.5" B25.0C	-	-
Buck Jones Rd.	3.0" S9.5C	4.0" I19.0C	4.0" B25.0C	-	-
Walnut St.	3.0" S9.5C	4.0" I19.0C	5.0" B25.0C		-

For the -Y- Line, collector distributor road, ramp, and loop pavement designs noted in **Table 1 and Table 2** above, the Design-Build Team may substitute an ABC layer for some or all of the thickness of the asphalt base course layer. If such an alternative is proposed, the thickness of the ABC layer used as a substitute for some or all of the asphalt base course thickness shall be equal to twice the proposed asphalt base course thickness substituted up to a maximum substitution of 10.0" of ABC.

The Design-Build Team shall maintain the same pavement design throughout the -Y- Line, ramp, collector distributor road, and loop construction limits. In the Technical Proposal, the Design-Build Team shall specify the base option chosen (ABC or asphalt) for all -Y- Lines, ramps, loops, service roads and roundabouts.

Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall uniformly mill and overlay the existing pavement of all -Y- Lines (excluding I-440 / US-1 / US 64 [Y1RT, Y1LT]) and ramps with a minimum depth that equals the full thickness of the surface course as provided in the table(s) above. (Reference the Roadway Scope of Work found elsewhere in this RFP). In areas where the existing grade of the -Y- Lines (excluding I-440 / US-1 / US 64 [Y1RT, Y1LT]) and ramps must be maintained, the Design-Build Team shall mill the existing pavement to a depth of 3.0 inches and replace with the full thickness of the surface course as provided in the table(s) above.

****NOTE**** Deleted paragraph referencing pavement design for multi-use paths

Throughout the -Y- Line, ramp, loop and service road construction limits that consist solely of pavement marking obliterations and / or revisions, the Design-Build Team shall uniformly overlay the existing pavement (travel lanes and shoulders) with a minimum pavement depth

that equals half the full thickness of the surface course as provided in **Table 1 and Table 2** above. In these areas, if the existing profile grades must be maintained, a minimum of 1.5 inches shall be milled and replaced.

As required by the Transportation Management Scope of Work found elsewhere in this RFP to conceal pavement markings, the Design-Build Team has the option to uniformly overlay areas of I-40 and I-440 / US-1 / US 64, including all ramps and loops, with 1.5" S9.5C or S9.5D. If S9.5C is utilized, prior to placing any subsequent layer of the final pavement design, the Design-Build Team shall mill off the aforementioned uniform overlay. (Reference the Transportation Management Scope of Work found elsewhere in this RFP). The Design-Build Team is cautioned that the milling required to remove the temporary surface course layers installed to conceal pavement markings shall be in addition to all other milling requirements found elsewhere in this RFP.

Unless noted otherwise elsewhere in the RFP, on all interchange ramps, collector distributor lanes and loops connecting to through lanes, the adjacent through lane pavement design shall extend to the back of the gore (12-foot width).

On all interchange ramps and loops connecting to collector distributor lanes, the adjacent collector distributor lane pavement design shall extend to the back of the gore(12-foot width).

Longitudinal joints of all surface course layers shall not be located in the final traffic pattern wheel path. If applicable, the Design-Build Team shall indicate in the Technical Proposal where all underlying longitudinal joints will be located and demonstrate how the underlying longitudinal joint location will minimize reflective cracking.

Unless noted otherwise elsewhere in this RFP, the minimum narrow widened width shall be eight feet. The minimum narrow widened width may be reduced to four feet only if the Design-Build Team demonstrates that their equipment properly compacts narrow widening and obtains prior Department written approval. Tapers that tie proposed pavement to existing pavement are excluded from the narrow widening requirements noted above.

In areas where the existing -Y- Line, service road or ramp paved shoulders are proposed to be incorporated into a permanent travel lane, the Design-Build Team shall be responsible for evaluating the existing paved shoulder regarding its suitability for carrying the projected traffic volumes. In the event that the existing paved shoulder is found to be inadequate, the Design-Build Team shall be responsible for upgrading the existing paved shoulder to an acceptable level or replacing the existing paved shoulder. The Design-Build Team shall submit their evaluation and proposed use of existing paved shoulders to the Alternative Delivery Unit for review and acceptance or rejection.

Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall pave from 1) the edge of all paved shoulders to the face of all single face barrier / guardrail, including but not limited to areas that consist solely of guardrail replacement, 2) from the edge of all paved shoulders to the edge of all expressway / shoulder berm gutter and 3) from the edge of all paved shoulders to the face of proposed retaining walls and sound barrier walls located on the outside

shoulder with 6" ABC (or 4" B25.0C), a split seal and at least two lifts of surface course. If a split seal is not used, the ABC pavement design shall require prime coat at the normal application rate. In these areas, the Design-Build Team's installation of ABC or black base shall be consistent with the pavement type for the specific roadway. As an alternative to the above pavement design for paving the shoulders to the face of the aforementioned features, the Design-Build Team may use the adjacent travel lane pavement design. Along I-40 and I-440 / US-1 / US 64 the Design-Build Team shall use the adjacent travel lane pavement design for paving the shoulders to the face of the aforementioned features. Along ramps, the Design-Build Team shall provide a continuous paved shoulder width between segments of single face concrete barrier and /or guardrail when the segments are less than 800 feet apart.

In accordance with the NCDOT *Roadway Standard Drawing* No. 862.01, Sheet 2 of 11, 1) the Design-Build Team will not be required to pave to the face of guardrail protecting median sign supports; and 2) the special layer of pavement shall consist of 1.5" S9.5C and 6" ABC - prime coat will not be required.

The Design-Build Team shall place a minimum of 6" ABC or 4" B25.0C under all single face barrier, expressway / shoulder berm gutter, curb and gutter, and concrete truck aprons.

All driveways, up to the radius point, shall be constructed with the full-depth pavement design of the intersecting roadway. The entire impacted length of all non-concrete driveways with a 10% grade shall be constructed with 1.5" S9.5B (or S9.5C) and 8" ABC with prime coat. Unless otherwise noted above, the Design-Build Team shall adhere to the following for all driveway construction:

- For existing gravel and soil driveways, use 8" ABC.
- For existing asphalt driveways, use 1.5" S9.5B (or S9.5C) and 8" ABC with prime coat, or 2.0" S9.5B (or S9.5C) and 6" ABC with prime coat.
- For existing concrete driveways, use 6" jointed concrete reinforced with woven wire mesh.

The Design-Build Team shall be responsible for the design of all temporary pavements and for the evaluation of existing shoulders and roadways regarding their suitability for carrying traffic during construction, if necessary. In the event that the existing shoulders and / or roadways are found to be inadequate for the proposed temporary traffic volumes and duration, the Design-Build Team shall be responsible for upgrading the pavement to an acceptable level in accordance with the NCDOT *Pavement Design Procedure - AASHTO 1993 Method* dated January 4, 2019, including all revisions. Temporary pavement designs and associated calculations shall be submitted for review and acceptance using the Design-Build submittal process prior to incorporation. The expected duration for traffic on temporary pavement must be included as part of the submittal. Unless approved by the Engineer, new pavements for -Y-lines, service roads, and ramps / loops, either completely built or partially built as part of this project, are not considered "existing pavement" and are not allowed for the use of detouring traffic from I-40 or I-440 / US-1 / US 64.

The rate of application and the maximum and minimum thickness per application and layer shall be in accordance with the latest NCDOT Roadway Design Manual and the latest Asphalt QMS manual.

For I-40 & I-440 / US-1 / US 64, Shoulder drains will be required in areas of new median and outside shoulder construction and reconstruction as follows:

- Excluding the high side of superelevated sections, the Design-Build Team shall design and construct continuous median and outside shoulder drains and outlets for the I-440 / US 1 / US 64 concrete pavement alternates and widening areas.

- Excluding the high side of superelevated sections, the Design-Build Team shall design and construct median and outside shoulder drains and outlets at the locations noted below for the I-40 and I-440 / US-1 / US 64 mainline asphalt pavement alternates and widening areas:

    - Throughout crest vertical curves located in cut sections
    - Throughout all sag vertical curves
    - Where the grade is less than 1%.

Where installed on the outside shoulder, outlets shall be provided approximately every 300 feet. Where installed on the median shoulder, outlet locations shall not exceed 500 feet. All outlets shall be located at drainage structures when available. Shoulder drains shall be placed to drain the entire pavement structure. The shoulder drain design and outlet locations shall be submitted to the Alternative Delivery Unit for review and acceptance.

When a uniform overlay or resurfacing grade ties to an existing curb, bridge and / or pavement, the Design-Build Team shall perform incidental milling, such that the new pavement ties flush with the existing feature(s). In superelevated sections of facilities with existing curb on both sides of the typical section, the Design-Build Team shall uniformly mill the entire pavement width to a depth that equals the required surface layer pavement thickness noted above. When tying to the aforementioned feature(s), the Design-Build Team shall not reduce the minimum required surface layer pavement thickness noted above. At existing pavement ties at bridges and the beginning / end of construction, the Design-Build Team shall perform incidental milling for 25 feet per surface course. To tie into existing curb and gutter, the Design-Build Team shall perform incidental milling for a minimum of six feet. The Design-Build Team shall not perform incidental milling more than 72 hours prior to placement of the asphalt surface layer.

Intermediate Contract Time #30 for Temporary Repair and Overlay of the southbound I-440 / US-1 / US 64 Collector Distributor

The Design Build Team shall provide a temporary pavement repair for the southbound I-440 / US-1 / US 64 Collector Distributor from the existing gore with 21RB to the existing gore with 21RC where the previous UBWC has been milled off by others. This temporary pavement repair shall be completed by December 15, 2027.

As directed by the Engineer, the Design-Build Team shall repair the underlying concrete pavement prior to placing a temporary 1.0" S4.75A layer in accordance with the following requirements:

- If, at the direction of the engineer, the concrete slabs must be replaced in order to support traffic on a temporary basis, the Design Build Team shall remove, dispose of / recycle, the existing concrete slab and replace the damaged concrete pavement slab with an equal thickness of asphalt that shall include 1.5" S9.5C and a depth of B25.0C required to equal the existing slab thickness (approximately 9.0" total). All temporary concrete slab replacement work shall adhere to the requirements of Subarticles 654-1, 654-2, and 654-3 of the 2024 *Standard Specifications of Roads and Structures.* In accordance with Subarticle 104-8(A) of the 2024 *Standard Specifications of Roads and Structures,* all temporary concrete slab replacements will be paid for as extra work at the unit price of $425.00 per square yard. All work tasks required to replace the jointed concrete pavement slabs temporarily, including but not limited to traffic control and portable lighting, shall be incidental to the unit cost noted above.

- If, at the direction of the engineer, concrete spalls must be repaired in order to support traffic on a temporary basis, the Design Build Team shall remove the loose areas of concrete pavement and replace the voided area with S9.5C or S9.5D. In accordance with Subarticle 104-8(A) of the 2024 *Standard Specifications of Roads and Structures* the temporary concrete spall repairs will be paid for as extra work at the unit price of $250.00 per square foot. All work tasks required to repair the spalled concrete pavement slabs temporarily, including but not limited to traffic control and portable lighting, shall be incidental to the unit cost noted above.

Liquidated Damages for Intermediate Contract Time #30 for Temporary Repair and Overlay of the southbound I-440 / US-1 / US 64 Collector Distributor by December 15, 2027 are $1,500.00 per calendar day or any portion thereof.

ALTERNATIVE TECHNICAL CONCEPTS

Alternative Technical Concepts (ATC) that provide an alternate I-5701 / I-5703 pavement design will not be considered.

PAVEMENT MARKINGS SCOPE OF WORK (8-23-26)

General

The Design-Build Team shall prepare Pavement Marking Plans in accordance with the information on the following websites, the version of the following references effective on the Technical Proposal submittal date, and the contract requirements contained herein:

- The Signing and Delineation Unit website

  https://connect.ncdot.gov/resources/safety/Pages/Signing-and-Delineation.aspx

- Signing and Delineation Unit Procedures Manual

  https://connect.ncdot.gov/resources/safety/Pages/Signing-and-Delineation.aspx

- Traffic Engineering Practices, Policies, and Legal Authority (TEPPL)

  https://connect.ncdot.gov/resources/safety/Teppl/Pages/Teppl-Select-Topics.aspx

- FHWA *Manual on Uniform Traffic Control Devices* (MUTCD) 11th Edition

  https://mutcd.fhwa.dot.gov/kno_11th_Edition.htm

****NOTE** Deleted Guidelines for Preparation of Signing and Final Pavement Marking Plans for Design-Build Projects**

- *Design-Build Submittal Guidelines*

  https://connect.ncdot.gov/projects/AlternativeDelivery/Pages/default.aspx

- 2024 NCDOT *Standard Specifications for Roads and Structures (Standard Specifications)*

- 2024 NCDOT *Roadway Standard Drawings (Standard Drawings)*

In case of conflicting design parameters, and / or ranges, in the various resources, the proposed design shall adhere to the most conservative values, unless noted otherwise elsewhere in this RFP.

Final Pavement Marking Plan Requirements

The Design-Build Team shall select a Private Engineering Firm (PEF) that has experience designing and sealing Pavement Marking Plans for NCDOT on comparable projects.

The Design-Build Team shall list projects in the Technical Proposal, including description and similarity to the subject project, for which the PEF developed Pavement Marking Plans.

The Design-Build Team shall develop Pavement Marking Plans that maintain all types of traffic (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities, in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) as defined by the MUTCD.

If sidewalk is constructed, the Design-Build Team shall show and station all curb ramps in the Pavement Marking Plans for signalized intersections, non-signalized intersections and points of pedestrian crossings. Curb ramps shall be constructed per current ADA standards and with guidance from the *Standard Drawings*. If the roadway geometry does not allow for the use of standard details, contact the Contract Standards and Development Unit for alternate approved curb ramp designs.

Final Pavement Marking Project Limits

The Design-Build Team shall install all pavement markings and markers located within and outside the project limits, resulting from the project construction. The Final Pavement Marking Plans shall address all required modifications to existing pavement markings and markers located outside the project limits to ensure appropriate tie-ins. At a minimum, the Design-Build Team shall modify existing pavement markings and markers located outside the project limits to ensure that all lanes in each direction are open to traffic.

Pavement Markings, Markers and Delineation

The Design-Build Team shall submit a complete set of Final Pavement Marking Plans that includes the -L- Line, and all -Y- Lines, ramps / loops, and service roads for review and acceptance. The Design-Build Team shall not place any final pavement markings or markers until the aforementioned Final Pavement Marking Plans are reviewed and accepted by the Department.

The Design-Build Team shall coordinate with the Transportation Management Plans for necessary traffic control devices that will remain at the completion of the project.

The Design-Build Team shall use pavement marking and marker products that conform to all NCDOT requirements and are listed on the NCDOT's Approved Products List. The use of any devices that are not shown on the Approved Products List shall require written approval from the NCDOT Signing and Delineation Unit prior to incorporation.

The Design-Build Team shall install pavement markings and markers in accordance with the *Standard Specifications*, and in accordance with the manufacturer's procedures and specifications.

In accordance with the *Standard Drawing* No. 1205.08, Sheet 1 of 9, and guidance found on the Signing and Delineation Unit's website, the Design-Build Team shall install wrong-way ramp arrow pavement markings and markers on all exit ramps / loops.

The Design-Build Team shall install longitudinal pavement markings and pavement markers on the final surface as follows:

Road	Marking	Marker
Asphalt Surfaces	Extruded Thermoplastic with High Performance Glass Beads	**Roadways** • Polycarbonate H-shaped Markers • Match existing on all other roadways **Bridge Decks** • Raised markers on mainline bridge decks • Match existing on -Y- Line bridge decks
Concrete Surfaces	• Cold Applied Plastic Type 3 - Skip lines, Contrast Marking Lines • Cold Applied Plastic Type 3-- All other roadway lines (lane lines, edge lines, and gore lines, etc.)	

In accordance with the Black - White Combination (10’ White Skip Lines / 10’ Black Skip Lines) Detail provided by the Department and the *Black Epoxy Pavement Marking Material* Project Special Provision found elsewhere in this RFP, the Design-Build Team shall place black epoxy contrast markings on concrete pavement.

On concrete surfaces, the Design-Build Team shall install Heated-in-Place Thermoplastic or Cold Applied Plastic (Type 3) markings for stop bars, symbols, characters, crosswalks, and diagonals.

On asphalt surfaces, the Design-Build Team shall install Heated-in-Place Thermoplastic or Extruded Thermoplastic markings for stop bars, symbols, characters, crosswalks, and diagonals.

Prior to placing pavement marking material on concrete surfaces that are diamond ground, the Design-Build Team shall use an acceptable method to grind ridges smooth where pavement markings will be installed.

On all Full Control of Access interstate facilities and US Routes the Design-Build Team shall install six-inch wide pavement markings, (i.e., lane line, edge line and skips) for the final pavement marking. The Design-Build Team shall install gore lines that are twice the edge line width.

Using approved methods, the Design-Build Team shall remove residue and surface laitance on concrete bridge decks prior to placing final pavement marking materials. In accordance with approved methods and the *Standard Specifications*, the Design-Build Team shall remove curing compound from all other concrete surfaces prior to placing final pavement marking materials.

The Design-Build Team shall only remove pavement markings from asphalt surfaces by grinding.

The Design-Build Team shall only remove pavement markings from concrete surfaces by hydroblasting.

The Design-Build Team shall tie proposed pavement marking lines to existing pavement marking lines.

The Design-Build Team shall replace any pavement markings that have been damaged by the end of each day's operation.

PUBLIC INVOLVEMENT AND INFORMATION SCOPE OF WORK (8-13-26)

General

The Department will lead the public involvement and information efforts in collaboration with the Design-Build Team, NCDOT Division 5 (Division), NCDOT Public Involvement Team (Public Involvement Team), NCDOT Division 5 Communications Officers (Communications Officers), and the Public Involvement Technician (PI Technician). The Design-Build Team shall designate a single contact for public involvement and information inquiries / coordination.

Within eight weeks after the project Award date, the selected Design-Build Team shall hold an initial project coordination meeting with the Division, Communications Officers, Public Involvement Team, PI Technician, and the Alternative Delivery Unit to discuss project impacts to the public. This information will be used by the PI Technician to create a Public Involvement Plan (PIP). The Design-Build Team shall meet with the Division, Communications Officers, Public Involvement Team, PI Technician, and the Alternative Delivery Unit at least six to eight weeks prior to the start of construction to discuss project impacts to the public. This information will be used by the PI Technician to amend / refine the Public Involvement Plan (PIP).

The Design-Build Team shall prepare all required corridor and design maps as needed by the PI Technician for the PIP. The Design-Build Team shall prepare any / all public hearing maps in accordance with the Public Involvement Map Information Guide and the Corridor Public Hearing Map Checklist and / or Design Public Hearing Map Checklist located at the following website:

https://connect.ncdot.gov/projects/Roadway/Pages/Guidelines--Standards.aspx

The PI Technician shall develop, with assistance from the Design-Build Team, the specific list of target audiences for this project. At a minimum the following groups are identified as typical target audiences to receive informational materials:

- Governmental agencies;
- Municipalities directly affected by construction;
- Transportation services;
- Emergency services;
- Hospitals;
- Neighborhood groups and private homes;
- Industry and businesses;
- Chamber of Commerce(s);
- Individual schools affected by the project;
- County / City school systems, and;
- Any other organization as deemed necessary by the Department.

The PI Technician will be responsible for, maintaining and updating a project website. However, throughout the project duration, the Design-Build Team shall coordinate public involvement activities with the PI Technician and the Public Involvement Officer assigned to the project; and

provide weekly updates, photos and other needed announcements to the Communications Officers to ensure the accuracy of the aforementioned project website.

The Design-Build Team shall discuss in the Technical Proposal their approach to providing the public access to project personnel for inquiries on vehicular and pedestrian traffic impacts.

The Design-Build Team shall include in their lump sum bid for the project all costs associated with their involvement in the Public Involvement and Information Scope of Work.

Public Involvement

Unless noted otherwise elsewhere in this RFP, the PI Technician will be responsible for the activities noted below:

- Shall maintain the stakeholder list and public database using NCDOT's subscription to PublicInput.com.
- Distributing e-blasts, tracking public inquiries via phone and email, responding to citizen inquiries.
- Organizing public meetings, including venue selection, reservation and fee
- Developing and producing informational print materials for all meetings and workshops
- Project webpage and social media updates
- Project Videos
- If necessary, developing and producing informational print materials for Limited English Proficiency (LEP) outreach

To ensure consistency with the Department's policy and standards, the activities above shall be coordinated with the Communication Officers, and the Public Involvement Officer assigned to the project.

The Design-Build Team shall also coordinate with the PI Technician to promote public awareness for this project. The amount of public involvement required for this project shall be directly based on the Design-Build Team's Transportation Management Plans and construction details. The Design-Build Team's responsibilities shall include, but are not limited to, the following:

- Assisting the Department in the development of the target audience area;
- Providing information requested by the PI Technician to develop and produce informational printed and digital materials for all meetings;
- Developing and providing corridor and / or design public hearing maps for presentation at all public meetings;
- Providing details surrounding the impacts to the public;
- At a minimum, the Design-Build Team shall provide monthly operational updates to the Division, Communications Officers, Public Involvement Team, PI Technician, and the Alternative Delivery Unit. The Department will use the monthly operational updates for posting to the webpage and dissemination to subscriber lists by email; and to the Communications Officers for dissemination to the project area residents via press release

or social media as deemed appropriate, during construction, to update stakeholders on the status of the project and upcoming construction activities;
- Providing advance notice to the Department of upcoming project impacts;
- Provide initial, prior to construction, drone footage of the project and monthly drone coverage once construction begins;
- Attending and / or speaking at public meetings, and;
- Hand delivery of time sensitive informational materials.

The minimum public involvement requirements for the Design-Build Team solely associated with the Transportation Management Plans shall include, but are not limited to the following:

- Public Meetings – Attend and speak at a Beginning of Construction meeting for area businesses and residents.

- Distribution of Informational Materials – For beginning of construction and for all road closures with detour routes, the Design-Build Team shall be responsible for providing time sensitive informational material to the Department, directly to the target audiences. If the Design-Build Team informs the Department of the aforementioned activities less than thirty (30) calendar days in advance, the Design-Build Team shall hand deliver the materials to the impacted target audiences.

Identifying a PI Technician:

If the selected firm has an internal candidate that is experienced in public involvement and qualified to fill the PI Technician role, that candidate may be included in the scope of work after an interview with NDOT's Public Involvement Group. If the selected firm cannot provide such a candidate, the Public Involvement Group will provide one for the project

Public Information

Unless noted otherwise elsewhere in this RFP, the Communications Officers will be responsible for the activities noted below:

- Providing and / or reviewing and approving media announcements, including social media;
- Scheduling interviews, as needed, and;
- Website updates related to project progress.

To ensure that project information can be distributed to the public using standard methods including, but not limited to, notifying media outlets and updating the project website, the Design-Build Team shall inform the Department at least thirty (30) calendar days in advance of any construction activity that will significantly impact the public. These activities shall include, but are not limited to, the start of construction, major traffic shifts, road closures, ramp closures, detours, night work and project completion.

Coordination

Prior to construction the Design-Build Team shall provide monthly updates to the PI Technician. Throughout construction, the Design-Build Team contact shall provide weekly updates to the PI Technician, including, but not limited to, traffic control phasing, graphic illustrations, project pictures.

RIGHT OF WAY SCOPE OF WORK (02-20-26)

**** NOTE ** Prior to negotiating property acquisition with property owners, the Design-Build Team shall meet with the appropriate NCDOT Location and Surveys, Right of Way and Alternative Delivery personnel.**

- The Design-Build Team shall employ qualified, competent personnel who are currently **approved by the NCDOT Right of Way Unit,** herein after referred to as the Department, to provide all services necessary to perform all appraisal (except appraisal reviews and updated appraisals required solely for condemned parcels), negotiation and relocation services required for all right of way, control of access and easements, including but not limited to utility easements, necessary for completion of the project in accordance with G.S. 136-28.1 of the General Statutes of North Carolina, as amended, and in accordance with the requirements set forth in the *Uniform Appraisal Standards and General Legal Principles for Highway Right of Way*, the *North Carolina Department of Transportation's Right of Way Manual*, the *North Carolina Department of Transportation's Rules and Regulations for the Use of Right of Way Consultants*, the *Code of Federal Regulations*, and Chapter 133 of the *General Statutes of North Carolina* from Section 133-5 through 133-18, hereby incorporated by reference, including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. The Design-Build Team shall field stake all right of way, control of access and easements, including but not limited to utility easements, in accordance with the requirements noted above. For a list of firms currently approved, the Design-Build Team should contact Ms. Deneane Williams, in the NCDOT Right of Way Unit, at 919-707-4374 The Design-Build Team shall perform the services as set forth herein and furnish and deliver to the Department reports accompanied by all documents, including but not limited to all revisions and electronic design files, necessary for the settlement of claims and the recordation of deeds, or necessary for condemnation proceedings covering said properties. The Design-Build Team, acting as an agent on behalf of the State of North Carolina, shall provide right of way acquisition services for TIP I-5701 / I-5703 in Wake County.

  Acquisition services required outside of the project construction limits due solely to an allowable rise in the floodplain water elevation on insurable structures will be considered extra work and paid for in accordance with Article 104-7 of the *Standard Specifications*.

The Design-Build Team shall carry out the responsibilities as follows:

- With respect to the payments, costs and fees associated with the acquisition of right of way, easements and / or control of access, the Department will be responsible for only direct payments to property owners for negotiated settlements, recording fees, any relocation benefits, and deposits and fees involved in the filing of condemnation claims. The Department will assume responsibility for all costs associated with the litigation of condemned claims, including testimony by the appraiser(s). The Design-Build Team shall be responsible for all other acquisition services related to payments, costs and fees, including but not limited to attorney fees required for all non-condemnation acquisitions.

- A Department representative will be available to provide technical guidance on right of way acquisition procedures and to make timely decisions on approving relocation benefits and

approving administrative adjustment settlements on behalf of the Department over and above the authority granted to the Department Right of Way Consultant Project Managers.

- The Design-Build Team shall verify / determine the prior rights and / or compensable interest for an existing utility prior to acquiring any corresponding utility easement. The Design-Build Team will be responsible for all Cross-Connection Control / Back Flow Preventer systems work in accordance with Department policy & procedure. (Reference the Utilities Coordination Scope of Work found elsewhere in this RFP)

- The relocation and / or replacement of commercial and residential backflow preventers shall not be a Cost-to-Cure item and shall not be included in any appraisal (reference the Utilities Scope of Work found elsewhere in this RFP). The Design Build team is responsible for securing an estimate for the cost to move the backflow preventer. The report and estimate will then be sent to the Division Agent to perform a redline on the approved appraisal. This should only be done if negotiations have completely stalled and the claim is close to being filed for condemnation. The agent should always stress the convenience of signing Agreement For Entry-Cross Connection Control to the property owner, even if a settlement cannot be reached.

- The Department will provide a list indicating if existing billboards located within or adjacent to the project limits are conforming or non-conforming to the NCDOT *Regulations for The Control of Outdoor Advertising in North Carolina*, dated 2000. Prior to contacting any property owner(s) or billboard owner(s), the Design-Build Team shall meet with the appropriate Regional Outdoor Advertising Technician and the Area Negotiator to determine relocation eligibility and relocation benefits, and possible leasehold interest if the billboard is on leased property.

- The Design-Build Team shall submit a right of way project tracking report and right of way quality control plan to the Department. The Department standard forms and documents shall be used to the extent possible and follow the Department's policy and procedures for electronic records.

- The Design-Build Team shall provide a current title certificate for each parcel as of the date of closing or the date of filing of condemnation, unless required otherwise in the NCDOT *Right of Way Manual,* updated June 10, 2024.

- The Department will prepare all Condemnation Maps. The Design-Build Team shall prepare all Final Condemnation Reports and provide updated MicroStation CADD files, upon request, to the Department for preparation of the Condemnation Maps. Upon approval of the Final Condemnation Report, the Department will require a minimum of eight weeks to file the condemnation claim. For all plan revisions on condemned parcels that modify the area acquired, modify the control of access and / or impact the appraised value, the Design-Build Team shall be responsible for the following:

    - The Design-Build Team shall notify the Division Right of Way Agent, the Area Negotiator, Area Appraiser, Location and Surveys Unit, and the Attorney General, in writing, that revisions have been made that impact a condemned parcel, and provide updated plan sheets, revised MicroStation CADD files, and revised area takes.

- The Design-Build Team shall consult with the Attorney General and the Area Negotiator, Area Appraiser and the Assistant State Negotiator to determine the status of the negotiations and appraisal(s).

- If the Attorney General and / or Area Appraiser recommend an updated appraisal, the Design-Build Team shall provide an updated Summary Sheet to the Area Appraiser for the Department's use in obtaining an updated appraisal(s).

- Upon receipt of the approved updated appraisal(s), the Design-Build Team shall develop a revised written offer. If settlement is not reached, the Design-Build Team shall submit an updated Final Condemnation Report and revised MicroStation CADD files. If settlement is reached, the Design-Build Team shall notify the Attorney General and Area Appraiser, in writing, and submit an updated Final Condemnation Report with all necessary documentation, including but not limited to, revised MicroStation CADD files.

- The Department will be responsible for payment for the additional deposit to the Attorney General's Office and the Attorney General will prepare and file an Amendment to the Declaration of Taking.

- The following shall be required:

  - Unless otherwise approved by the NCDOT Assistant State Negotiator, in writing, the Design-Build Team shall provide right of way, control of access and easement descriptions in metes and bounds format (bearings and distances). The Design-Build Team shall provide exhibits, diagrams and / or other information required to verify the aforementioned descriptions.

  - In accordance with the NCDOT *Right of Way Manual*, updated June 10, 2024, the Design-Build Team may prepare red-line adjustments for parcels that are not condemned. The Department must approve a red-line adjustment, in writing, prior to the Design-Build Team making an offer based on the red-line adjustment.

  - The Design-Build Team shall prepare, execute and record documents conveying title to acquired properties to the Department with the Register of Deeds.

  - The Design-Build Team shall deliver all executed and recorded deeds and easements to the Department.

  - For all property purchased in conjunction with the project, title shall be acquired in fee simple or easement and shall be conveyed to "The North Carolina Department of Transportation", free and clear of all liens and encumbrances except permitted encumbrances.

- In accordance with the Location and Survey Unit's September 28, 2018, *Proc 2018-3 - Creating NCDOT Right of Way Plan Sheets for LET Projects* and *Proc 2018-5 - Elimination*

of Need to Request Control Sheets and Property Ties and RW Series Development Timeline Memorandums (references to timelines in the aforementioned Memos shall be disregarded), the Design-Build Team shall develop the following right of way items:

- Right of Way series of plan sheets ("R/W" series of plan sheets) that delineate the existing property information, property ties, proposed centerline data, existing and proposed right of way, existing and proposed easements, and existing and proposed control of access. The "R/W" series of plan sheets shall be signed and sealed by a Professional Land Surveyor registered in the State of North Carolina. The Professional Land Surveyor's signature and seal shall attest that the right of way monuments were placed under their responsible charge.

- A table of control points for the proposed centerline alignments ("D series of plan sheets).

- A table of proposed right of way and permanent easement control points ("E" series of plan sheets) that shall be signed and sealed by a Professional Land Surveyor registered in the State of North Carolina.

- It is understood and agreed by and between the parties hereto that all reports, surveys, studies, specifications, memoranda, estimates, etc., secured by and for the Design-Build Team shall become and remain the sole property of the Department upon termination or completion of the work, and the Department shall have the right to use same for any public purpose without compensation to the Design-Build Team.

- The Design-Build Team shall prepare appraisals in accordance with the Department's *Uniform Appraisal Standards and General Legal Principles for Highway Right of Way Acquisitions*. The Design-Build Team's appraiser shall be on the Department's approved state certified appraiser list. The Design-Build Team may request its state certified appraiser(s) be added to the approved state certified appraiser list, subject to approval by the Department's Area Appraiser and State Appraiser. At the request of the Department, the Design-Build Team's appraiser(s) shall be compelled to testify in court and at trials in condemnation cases with their related work.

- The Department will develop or contract with a private firm to develop and provide a second appraisal for parcels as noted below:

  - All parcels where the initial appraisal indicates damages to the remaining property equal to or greater than one million dollars ($1,000,000), where damages to the remaining property are defined as a loss in value to the remaining land, and / or improvements and / or a cost to cure.

- The NCDOT, or its agent, will provide appraisal reviews complying with the Department's *Uniform Appraisal Standards and General Legal Principles for Highway Right of Way Acquisitions*. The reviewer will ensure that the appraisal meets the Department's guidelines and requirements, conforms to acceptable appraisal standards and techniques, does not include any non-compensable items or exclude any compensable items and that the value conclusions are reasonable and based on facts presented in the appraisal. The reviewer has the authority to

approve, adjust, request additional data or corrections, or not to recommend and request another appraisal. Within fifteen business days from the date of receipt, all appraisals and / or appraisal corrections will be reviewed by NCDOT Review Appraisers or Review Appraisers under contract to the corresponding NCDOT Area Appraisal Office. The NCDOT will sign as approving any and all appraisals to be used in acquisitions.

- The NCDOT will provide relocation reviews and approvals for all Replacement Housing Payment calculations and all Rent Supplement Payment calculations prior to the Design-Build Team making any offers to the displacees. Within five business days of the receipt of the Replacement Housing Payment or Rent Supplement Payment calculation documentation, which shall include all documentation required for an Evaluation Package, the Department will approve the calculation, and the signed FRM15-D will be returned to the Design-Build Team, or a request for an updated calculation or documentation will be presented to the Design-Build Team for further handling. At this time, the Relocation Coordinator in the NCDOT Right of Way Unit is the approving authority for the aforementioned calculations.

- The Design-Build Team shall coordinate with the Health Department to determine if septic systems can be relocated / modified to remain operational. To assist with the aforementioned determinations, the Design-Build Team may utilize a third-party consultant to perform the septic system inspections only if the Health Department approves the third-party consultant, in writing, prior to the inspections beginning. The Department will only be responsible for the Health Department fees and / or third-party fees associated with these determinations. The Design-Build Team shall determine the relocation / modification design and construction costs required for the septic systems to remain operational and include these costs in the property right of way appraisals. (Reference the Utilities Coordination Scope of Work found elsewhere in this RFP)

- All Claims for Payment involving relocation benefits must be submitted to the NCDOT Relocation Coordinator in the Right of Way Unit for approval and processing.

- At the conclusion of the right of way acquisition process, the Design-Build Team shall provide a right of way certification to the Division Right of Way Agent.

- The Design-Build Team shall prepare Right of Way Claim Reports, Transmittal Summaries and / or Narrative Appraisals for all right of way, control of access and easement acquisitions.

- All Claim reports shall be signed by a Department Right of Way Supervisor as stated in section 4.10 of the NCDOT Right of Way Manual, updated June10, 2024.

- Prior to acquiring right of way, control of access and / or easement from any parcel with contaminated soil, the Design-Build Team shall provide a written priority list of all properties with contaminated soil that require right of way, control of access and / or easement acquisition to the Division Right of Way Agent, the Area Negotiator, the Area Appraiser, and the Eastern Assistant State Negotiator, Lois Little. At a minimum, the aforementioned priority list shall contain the following information:

    - Project TIP Number, description and county

- Parcel number(s) requiring acquisition of contaminated soil
- Acquisition Appraisal(s)
- GeoEnvironmental Impact Evaluation and Hazardous Materials Report provided by the Department
- Description, with metes and bounds, of the area(s) to be acquired

SIGNING SCOPE OF WORK (10-5-26)

Project Description

The Design-Build Team shall prepare Signing Plans for the entire project limits, including but not limited to, advance and other necessary signing outside of the roadway construction limits.

Websites and References

The Design-Build Team shall prepare Signing Plans in accordance with the information on the following websites, the version of the following references effective on the Technical Proposal submittal date, and the contract requirements contained herein:

- The Signing and Delineation Unit website

  https://connect.ncdot.gov/resources/safety/Pages/Signing-and-Delineation.aspx

- Signing and Delineation Unit Procedures Manual

  https://connect.ncdot.gov/resources/safety/Pages/Signing-and-Delineation.aspx

- Traffic Engineering Practices, Policies, and Legal Authority (TEPPL)

  https://connect.ncdot.gov/resources/safety/Teppl/Pages/Teppl-Select-Topics.aspx

- FHWA *Manual on Uniform Traffic Control Devices* (MUTCD) 11th Edition (including latest revisions)

  https://mutcd.fhwa.dot.gov/kno_11th_Edition.htm

- *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals* (AASHTO)

  https://bookstore.transportation.org/collection_detail.aspx?ID=126

- *Signing and Delineation Unit Design Guidelines*

  https://connect.ncdot.gov/resources/safety/Signing%20and%20Delineation%20Library/Design%20Guidelines.pdf

- *Design Guidelines for Submittals*

  https://connect.ncdot.gov/resources/safety/Pages/Signing-and-Delineation.aspx

- 2024 NCDOT *Standard Specifications for Roads and Structures (Standard Specifications)*
- 2024 NCDOT *Roadway Standard Drawings (Standard Drawings)*

In case of conflicting design parameters, and / or ranges, in the various resources, the proposed design shall adhere to the most conservative values, unless noted otherwise elsewhere in this RFP.

Signing Requirements for Technical Proposal

The Design-Build Team shall select a Private Engineering Firm (PEF) that has experience in the preparation, design, and sealing of Signing Plans for NCDOT on comparable projects. The Technical Proposal shall list projects, where the Signing Plans were developed by the PEF, including description and similarity to the subject project.

The Design-Build Team shall include a Preliminary Signing Concept Map in the Technical Proposal. At a minimum, the aforementioned Concept Map shall include all anticipated DMS locations, all proposed overhead sign structure locations, all overhead signs, and all ground mounted Type A and B guide signs.

Signing Plans Submittal Requirements

The Design-Build Team shall concurrently submit the 25% Preliminary Signing Plans to the recipients in the Design-Build Submittal Guidelines and the ITS Unit for review of the DMS locations.

Prior to submitting the 50% Preliminary Signing Plans, the Design-Build Team, the Division Traffic Engineer, the Regional Traffic Engineer, the Signing and Delineation Regional Engineer and the Alternative Delivery Unit shall meet to discuss and review the Design-Build Team's 25% Preliminary Signing Plans.

The Design-Build Team shall provide 25% Pavement Markings Plans that have been reviewed and accepted by the Department and the latest Roadway Plans with the 50% Preliminary Signing Plans submittal.

Signs to be Furnished by Design-Build Team

The Design-Build Team shall furnish signs in accordance with the specifications provided by the NCDOT.

Signing Project Limits

Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design, fabricate and install all Type A, B, D, E and F signs and supports (including overhead sign structures) required through the construction limits of the mainline, as well as all -Y- Lines, all service roads, all turn-arounds / cul-de-sacs, all roundabouts, all ramps and all loops. Unless noted otherwise

elsewhere in this RFP, the Design-Build Team shall design, fabricate and install all signs required beyond the roadway construction limits of the mainline, all -Y- Lines, all service roads, all turn-arounds / cul-de-sacs, all roundabouts, all ramps and all loops to ensure adequate advance signage and spacing is provided. The Design-Build Team shall coordinate with all current and future projects (if plans available) to assure proper signing has been addressed for current and future installations.

Excluding Logo signs, the Design-Build Team shall replace all existing sign panels within 500 feet of the construction limits. Do not replace signs on -Y- Lines that cross I-40 but do not interchange with I-40.

The Design-Build Team shall provide two (2) advanced guide signs on overhead structures for the proposed Walnut Street interchange ramp on US 1 / US 64 Northbound. The existing supplemental guide sign for the Farmers Market / Raleigh Downtown at US 1 milepost 101 shall be removed and disposed of with a new supplemental sign erected north of the proposed Walnut Street exit.

The Design-Build Team shall provide two (2) Arrow Per Lanes signs on overhead structures for the I-40 Eastbound Exit 293: the exit directional sign and one advanced guide sign.

The Design-Build Team shall provide new signing for the ramps and -Y- line for the Gorman Street interchange. Logo signs are addressed separately within this scope.

The Design-Build Team shall remove and dispose of all guide signing structures on US 1/ US 64 Northbound for the Exit 101 to Walnut Street quadrant C.

New signing and structures are not required for the advanced guide or exit directional signs for the US 1 / US 64 Southbound Exit 99 to Cary Parkway.

Unless impacted by the proposed design, the existing cantilevered sign structure on US-1 Southbound Exit 101A to Walnut Street in quadrant B, located south of the Walnut Street bridge, shall not require replacement. The existing signs and lighting on this structure shall be removed and replaced with new signs. No additional adjustments or replacements to the existing guide signs on the Walnut Street ramp for this exit will be required.

Unless impacted by the proposed design, the existing cantilevered sign on I-440 Eastbound for the Exit 1C ramp to Jones Franklin Road, located in quadrant C, west of the Jones Franklin Road bridge, shall remain in its current configuration and shall not require any adjustments. Any

adjustments, modifications or replacements to the existing advanced guide signing for this exit will be the responsibility of the Design-Build Team.

Signing for Roundabouts

The Design-Build Team shall utilize the MUTCD and Signing and Pavement Marking Typicals, located on the Signing and Delineation Unit website, for Urban and Interchange Roundabouts in developing the 25% Preliminary Signing Plans.

Sign Designs

The Design-Build Team shall include all sign designs in the Signing Plans. All sign designs shall be prepared using the latest version of GuideSign software.

The Design-Build Team shall design, fabricate, and install all signs required for the mainline, all -Y- Lines, all ramps, all loops, all service roads, all roundabouts, and all turnarounds / cul-de-sacs, including Type A and B overhead signs, Type A, B, and D ground mounted signs, and exit gore signs. The Design-Build Team shall size and locate all Type E signs (warning and regulatory) and Type F signs (route marker assemblies).

The Design-Build Team shall design, fabricate and install mile markers for I-40 at **1/2-mile** intervals along both sides of the mainline and use 1-mile intervals along US 1 / US 64. The Design-Build Team shall install each mile marker on one three-pound U-channel post. Mile markers shall be located at the outside shoulder point or a maximum of 15 feet from the edge of travel lane or barrier mounted supports if no shoulders are available. The Design-Build Team shall install mile markers such that the bottom of the mile marker shall be four feet above the edge of travel lane (edgeline) elevation. Mile marker designs shall be in accordance with the Reference Location Signs (D10-2) referenced in the latest Standard Highway Signs Manual.

The Design-Build Team shall design, fabricate and install mile markers and exit numbers in accordance with the mile numbers provided by the Department.

At all interchange exit loops and / or ramps or as required by the MUTCD Table 2C-4 and Figure 2C-3, the Design-Build Team shall fabricate and install all devices to be used in advance of, and / or along, a horizontal curve.

The Design-Build Team shall design, fabricate and install enhanced multi-lane crossroad signing, as shown in Figures 2D-17 through 2D-22 of the MUTCD, for all interchanges that meet the requirements per the MUTCD.

Prior to submittal of RFC Signing Plans, the Design-Build Team shall coordinate with the Signing and Delineation Unit and the Alternative Delivery Unit on destination cities and / or street names on guide signs.

Logo Signs (Blue Service Signs with Specific Business Panels, including but not limited to, Specific Business Panels on U-channel posts)

The Design-Build Team will not be responsible for designing, locating or installing any additional Logo Signs not located within the project limits on the Technical Proposal submittal date. The NC Signing Program contact representative shall be notified when a LOGO or TODS (Service Signs) are removed during construction and not immediately relocated. Logo signing contact information for the NC Signing Program is available on the NCDOT Signing and Delineation Unit's website.

https://connect.ncdot.gov/resources/safety/Pages/Signing-and-Delineation.aspx

Prior to project completion, the Design-Build Team shall relocate, reinstall and / or replace all existing Logo Signs located within the project limits on the Technical Proposal submittal date that are impacted by the Design-Build Team's design and / or construction methods.

If damage occurs to the Logo Signs and / or the business panels during construction, the Design-Build Team shall immediately notify the NC Signing Program contact representative. The Design-Build Team shall replace all Logo Signs and / or business panels that are damaged during construction. If the Logo Signs are replaced, the Design-Build Team shall remove the business panels and deliver them to the NC Signing Program contact representative. During project construction, the Design-Build Team shall maintain the Logo Signs order of preference in accordance with the MUTCD Section 2I-3.

Sign Sheeting Requirements for Overhead Signs

The Design-Build Team shall design and fabricate all overhead signs with Grade A retro-reflective sheeting for sign legends (text), borders, and all Interstate, US and NC route shields and arrows. The Design-Build Team shall design and fabricate all overhead signs with Grade C retro-reflective sheeting for the background.

Black non-reflective sheeting shall be used for all black arrows, legends (text), and borders on overhead signs.

Speed Limit

The posted speed limit for mainline I-40 and I-440 / US 1 / US 64 shall be posted 65 mph. (Reference the Roadway Scope of Work found elsewhere in this RFP)

Interstate, US and NC Route Designation

The Design-Build Team shall coordinate all interstate, US and NC highway routing with the Transportation Mobility and Safety Division of NCDOT. Prior to designing any signs that display new or revised Interstate, US or NC routes, the Design-Build Team shall confirm all highway routes with the Department. Concurrent with the Release for Construction (RFC) Signing Plans submittal, the Design-Build Team shall notify the State Signing and Delineation Engineer, in writing, of all new or revised Interstate, US or NC routes.

Sign Locations

The Design-Build Team shall determine the station location of all signs and sign structures.

The Design-Build Team shall provide a minimum of two advanced guide signs for all freeway / expressway interchange approaches.

To avoid placing a sign or sign structure in a location that might be in conflict with future roadway projects and / or limit its usefulness / lifespan, the Design-Build Team shall coordinate all proposed sign designs and locations with the Department.

Ground Mounted Sign Supports

The Design-Build Team shall design, fabricate and install ground mounted sign supports in accordance with the *Standard Drawing*. The associated software for the design of Type A and B ground mounted sign supports, may be referenced on the website noted below:

https://connect.ncdot.gov/resources/safety/Pages/Signing-and-Delineation.aspx

Prior to installation, the Design-Build Team shall 1) field verify all Type A and B ground mounted sign supports, 2) recalculate the field verified S-Dimensions, using the latest edition of the design software on the website noted above, and 3) revise the beam sections, where applicable. The Design-Build Team shall use the most recent version of the ground mounted sign support selection workbook tool, in accordance with the submittal schedule outlined in the “Instructions” tab of the tool.

Unless otherwise approved by the Department, the vertical mounting height for ground mounted Type D, E and F signs shall be a minimum of seven feet and maximum of eight feet from the edge of the travel lane to the bottom of the sign.

On freeways and expressways, the minimum lateral offset for Type A and B ground mounted signs on breakaway supports shall be 30 feet, unless approved otherwise by the Department. The lateral offset shall be measured from the edge of the travel lane closest to the shoulder to the closest sign edge.

On freeways and expressways, all Type A and B ground mounted signs on simple (non-breakaway) supports shall be protected by guardrail, barrier or another form of approved positive protection. The minimum lateral distance between the face of guardrail and the closest sign edge shall be six feet.

Unless noted otherwise elsewhere in this RFP, all Type D, E and F signs shall be installed on U-channel posts in accordance with the *Standard Drawing*. Type D signs shall not exceed eight feet in width and / or 24 square feet. Unless positively protected, all Type D signs shall be installed on a maximum of two U-channel posts.

Proposed Overhead Sign Structures

The Design-Build Team shall consider the proposed roadway geometry, number of lanes, and all advisory signing needs when selecting the type of overhead signing for a given location. At a minimum, the Design-Build Team shall provide overhead signing at the locations identified in the MUTCD, Section 2E.28 - Signing for Interchange Lane Drops, Section 2A.14 - Overhead Sign Installations, Items A - M, and the following locations, unless allowed otherwise elsewhere in this RFP:

- An option lane at a freeway / expressway multi-lane exit or freeway / ramp split (use Arrow Per Lane signs). Provide a minimum of two overhead (2) Arrow-Per Lane sign structures; the exit directional sign at the appropriate MUTCD defined lane divergence location, and one advanced overhead Arrow Per Lane sign structure.
- A minimum of two (2) overhead sign structures for freeway lane ends (freeway lane drop)
- Three or more lanes on a freeway

The wind speed for the overhead sign structure and foundation designs for this project shall be 120 mph.

The Design-Build Team shall design, fabricate and install overhead sign supports and foundations in accordance with Section 906 of the *Standard Specifications*, the *Foundations and Anchor Rod Assemblies for Metal Poles*, and *Overhead and Dynamic Message Sign Foundations* Project Special Provisions found elsewhere in this RFP.

The vertical clearance beneath all proposed overhead sign assemblies shall be no less than 17 feet and no greater than 18 feet. For all proposed overhead sign assemblies, the Design-Build Team shall submit documentation that verifies the actual vertical clearance at all critical points.

For all overhead sign assemblies mounted on concrete median barrier, the Design-Build Team shall design, fabricate and install median barrier footing and median transitional barrier in accordance with *Standard Drawing* No. 854.05.

The maximum span length for cantilever overhead sign structures shall be 52 feet.

Lighting and walkways will not be required on any overhead sign assembly.

Overhead signs shall not be attached to existing or proposed bridges.

Excluding Interchange Sequence Signs on median barrier, pedestal mounted overhead signs will not be allowed.

Overhead Sign Structure Inventory Numbers

The Design-Build Team shall provide information related to the design of each overhead sign structure (full-span, cantilever, pedestal mount) to the Signing and Delineation Unit and shall be

archived electronically (PDF format) within the Design-Build Submittals folder on NCDOT Connect. The design elements to be archived by the Design-Build Team are:

- Overhead Sign Structure line drawings (RFC Signing Plans)
- Overhead Sign Designs
- Plan Sheets that include Overhead Sign Assemblies

The Design-Build Team shall submit an excel spreadsheet that includes all proposed overhead sign structure locations with the overhead sign structure line drawings. This spreadsheet shall also include the type of structure (cantilever, full span, pedestal) as well as geographic coordinate information shown in the example below:

Structure Number	Sign Structure	Type	Station	Latitude (Degrees)	Longitude (Degrees)
XXXXXX	A	Cantilever	Outside Project Limits on NB US 29	35.929633	-80.002204
XXXXXX	B	Full Span	-L- Sta. 12+50	35.932891	-79.995279
XXXXXX	C	Cantilever	-L- Sta. 35+50	35.966724	-79.988283
XXXXXX	D	Pedestal	Outside Project Limits on NB US 29	35.949003	-79.967006

Coordinates of the overhead sign structures shall be located within 50 feet of the center of the structure.

The Department will use the aforementioned spreadsheet, as well as the overhead sign structure line drawings, to determine Overhead Sign Structure Inventory Numbers for all overhead sign structures. Once the Overhead Sign Structure Inventory Numbers are assigned, the Department will provide the numbers to the Design-Build Team to be included on each structure line drawing in the RFC Signing Plans. The geographic coordinate information of the proposed overhead sign structure locations shall not be included in the structure line drawings in the RFC Plans. Reference the *Signing and Delineation Unit (SDU) Procedure Manual* for further guidance.

Proposed Overhead Wind Load Area

Overhead sign structures shall be designed for proposed and future signs. The Design-Build Team shall determine wind load areas and include the wind load areas on the overhead sign structure drawings. The wind load area for the sign structures shall be determined in accordance with the following:

- **Case A**, Identified Future Signs: For sign structures that have an identified need for larger future signs, the future signs shall be designed and shown on the overhead sign structure drawings. Future sign messages, sizes, and positions shall be shown on the elevation drawings. The largest potential wind load area shall be used for the design of the overhead structure.

- **Case B**, General Future Wind Load Area: For overhead signs without identified future signs, the structure shall be designed for a larger wind load area to accommodate future signs that are not identified at the time of the structure design. General future wind load area sizes and positions shall be shown on the elevation drawings. The general future wind load area shall be computed as follows:

- The wind load area shall be rectangular for each primary sign including secondary and supplemental signs.

- The wind load area width shall extend two feet outside the proposed primary sign on each side of the sign. In cases where the wind load areas of two signs intersect, the taller area shall take priority. For cantilever structures, the wind load area shall be flush with the edge of the primary sign at the cantilevered end, such that the future four-foot wind load area does not extend past the end of a cantilever sign structure.

- The wind load area height shall extend two feet below the bottom of each sign and two feet above the top of each sign, including secondary and supplemental signs as well as the spacing between signs according to *Standard Drawing* No. 904.20, and excluding temporary "all traffic exit" signs. The minimum vertical clearance shall be measured from the bottom of the lowest wind load area.

- **Case C**, Exceptions from Case B: The following are exempted from Case B, general future wind load areas:

  - Arrow Per Lane Signs

  - Interchange Sequence Signs on median barrier

Existing Overhead Structures

The Design-Build Team shall perform a structural analysis of the overhead sign structure prior to modifying the existing overhead sign assembly to accommodate proposed signs that exceed the original wind load area. The Design-Build Team shall obtain Department acceptance of the structural analysis prior to construction. The Design-Build Team shall replace all existing overhead sign assemblies determined to be structurally inadequate for the proposed modifications, in the Department's sole discretion. The Design-Build Team may modify an existing overhead sign assembly to accommodate proposed signs that do not exceed the original wind load area without performing the aforementioned structural analysis.

When the aforementioned structural analysis determines that an existing overhead sign structure is structurally adequate to be retained or the proposed wind load area does not require a structural analysis, the Design-Build Team shall remove and dispose of all the existing overhead signs. The Design-Build Team shall install new signs on the retained existing overhead sign structure that adhere to the requirements herein. The Design-Build Team shall prepare Structure Line Drawings that depict 1) the existing signs to be removed, 2) the existing sign sizes, 3) the new sign designs, 4), the vertical clearance of all new signs, 5) the new signs positioning over travel lanes, 6) the lateral placement from supports, 7) the original wind load area, and 8) confirmation that the proposed wind load area does not exceed the original wind load area.

The Design-Build Team shall remove and dispose of lighting systems and walkways on all existing overhead sign structures that are retained.

If the Department cannot provide existing overhead structure line drawings or shop drawings of the existing overhead sign structure, the Design-Build Team shall design and install new overhead sign structures.

The minimum vertical clearance beneath all existing overhead sign assemblies that are retained shall be 17 feet. For all existing overhead sign assemblies retained, the Design-Build Team shall submit documentation that verifies the actual vertical clearance at all critical points.

Shop Drawings for Overhead Sign Structures

The Design-Build Team shall prepare a shop drawing for each proposed and modified overhead sign structure for the Department's review and acceptance. For shop drawing design and submittal requirements, see *Guidelines for Preparation of Signing and Final Pavement Marking Plans for Design-Build Projects* and the *Standard Specifications.*

Guardrail or other Positive Protection for Overhead Sign Supports

Except as allowed otherwise below, overhead sign supports shall be located a minimum of 40 feet from the edge of the outside travel lane to the center of the sign supports. To minimize right of way, utility, drainage and / or jurisdictional impacts, or to allow a cantilever overhead sign assembly in lieu of a full-span overhead sign assembly, the minimum 40-foot offset may be reduced, at the Department's sole discretion. All overhead sign supports that are not located a minimum of 40 feet from the edge of the outside travel lane to the center of the sign support shall be protected by guardrail or other NCDOT approved positive protection. When an overhead sign support is protected by guardrail, the face of the guardrail shall be located a minimum of eight feet from the center of the sign support.

The Design-Build Team shall review the protection for all existing overhead structure supports that are retained to determine if the existing positive protection meets current requirements. If the positive protection does not meet current requirements, the Design-Build Team shall design and construct new positive protection that adheres to the current requirements.

Cable-guide rail shall not be used as positive protection for overhead sign supports.

Verification of Theoretical Information shown on Structure Line Drawings

The Design-Build Team shall verify the information on the Structure Line Drawings prior to submittal of shop drawings for the Department's review and acceptance. At a minimum, the aforementioned verification shall include confirmation of the sign(s) positioning over lanes, span length, sign offsets, "s" drops, and the slopes at the center line of the support / upright. When theoretical dimensions or slopes are revised during construction, the Design-Build Team shall submit a revised Structure Line Drawing with the shop drawing.

Removal and Disposal of Existing Signs

The Design-Build Team shall determine which existing signs, sign supports, overhead signs, and / or overhead sign supports will not be needed or relevant when the project is completed. The Design-Build Team shall remove and dispose of these signs and sign supports.

Temporary Sign and Support Design

The Design-Build Team shall locate, design and install all temporary signs and sign supports. (Reference the Signing Requirements Section of the Transportation Management Scope of Work found elsewhere in this RFP for additional temporary signing requirements)

Sign Maintenance

During project construction, the Design-Build Team shall maintain all existing signs within the project limits (including all Logo Signs and temporary sign installations that may be required by the Transportation Management Plans) to ensure the signs are in good condition, perform as intended, and are visible to motorists. (Reference Articles 901-4 and 1092-2 of the *Standard Specifications*) All signs and supports remaining / existing at the completion of this project shall be plumb, oriented correctly and adhere to AASHTO requirements.

Unless approved by the NC Signing Program contact representative, in writing, all Logo and TOD signs shall be immediately relocated to a temporary or permanent location. If a temporary removal is granted, the Design-Build Team shall notify the NC Signing Program contact representative in writing at least seven days prior to removal and deliver the business panels to the NC Signing Program contact representative once removed. Logo signing contact information for the NC Signing Program is available on the NCDOT Signing and Delineation Unit's website.

CADD Files

After acceptance of RFC Signing Plans, the Design-Build Team shall provide the final Signing Plans to the Department in .pdf and MicroStation format.

Construction Revisions

After submittal of RFC Signing Plans, the Design-Build Team shall submit all construction revisions to the Department for review and acceptance prior to incorporation. The Design-Build Team shall provide an updated excel spreadsheet with all construction revisions that modify an overhead sign structure's geographic coordinate information. (Reference the Overhead Sign Structures Inventory Numbers section above)

As-Built Plans

After project completion, the Design-Build Team shall provide final electronic Signing Plans to the Department. At a minimum, these Signing Plans shall include all revisions that occurred during construction, as well as field verifications for ground mounted sign supports and overhead structures. These Signing Plans shall be provided in .pdf and MicroStation format.

STRUCTURES SCOPE OF WORK (10-7-26)

Project Details

The Design-Build Team shall design and construct the structures necessary to complete the project, including but not limited to, the following:

- All bridges required for I-40 and I-440 / US 1 / US 64 interchange improvement
- All bridges listed in *Rehabilitation of Existing Structures*
- All retaining walls required by the Design-Build Team's design
- All sound barrier walls required by the Design-Build Team's design (Reference the Roadway Scope of Work found elsewhere in this RFP)
- All reinforced concrete box culverts / reinforced concrete box culvert extensions required by the Design-Build Team's design

****NOTE**** Relocated paragraph requiring diamond grinding

All bridges shall meet the geometric criteria shown in the accepted Preliminary Roadway Plans developed by the Design-Build Team.

The minimum vertical clearance for bridges over all local and collector roads shall be 15'-6". The minimum vertical clearance for bridges over I-40 and / or I-440 / US 1 / US 64 shall be 17'-0". For existing bridges over I-40 and / or I-440 / US 1 / US 64 the existing minimum vertical clearance shall be maintained. The minimum vertical clearance for straddle bents shall be 16'-6" over all local and collector roads and 18'-0" over I-40 and I-440 / US 1 / US 64.

Bridge barrier rails on new bridges shall be per the most current version of Standard Drawing CBR1.

The height and width of median barrier rails at bridges shall be as required by the roadway typical section.

The minimum horizontal setbacks from the closest edge of travel lane to face of barrier in front of walls shall be 14'-0" for bridges over interstates, freeways, and arterials.

End bents shall be integral if the criteria listed in the NCDOT *Structures Management Unit Manual* is met. The criteria in Section 6.2.3.2 of the NCDOT *Structures Management Unit Manual* shall apply to all roadways, including Secondary Routes that meet the criteria for North Carolina Routes.

****NOTE**** Deleted diaphragms for integral end bents note.

End bents and end slopes at each end of a bridge (excluding multi-span flyover bridges) shall have the same appearance.

Prestressed concrete girders shall be designed to provide a minimum of ½-inch of final camber.

Deck drains shall be vertical and extend to the bottom of girder.

The *Bridge Deck and Approach Slab Rideability (IRI)* Project Special Provision, found elsewhere in the RFP, shall be applied to all bridges over 550 feet in length.

Bridge Decks and approach slabs of all new I-40 interchange bridges and all existing bridges on I-40 and collector distributors that are overlaid as part of this project shall be diamond ground in accordance with the *Bridge Deck and Approach Slab Rideability (IRI)* Project Special Provision and shall have an added sacrificial thickness of at least ¼-inch to account for the diamond grinding. A concrete penetrant sealer treatment shall be applied to the deck after diamond grinding per the special provisions. Penetrant sealers will not be required on bridge deck overlays.

The load rating for the new interchange bridges on this project shall be based on non-interstate traffic.

Unless noted otherwise elsewhere in this RFP, the following will not be allowed on the project:

- Cored slab, box beam, nonredundant steel tension members, deck girder and cast-in-place deck slab bridges
- Precast bridge barrier rails
- Precast reinforced box culverts
- Metal plate arch culverts
- Interior pile bents at roadway grade separations or railroad grade separations
- Attachment of sign structures to bridges
- Bridge attachments (excluding ITS) in the overhang of roadway grade separation structures
- Casting of conduit in the bridge deck or barrier rail for roadway bridges (excluding lighting conduit where required by lighting plans)
- For new bridges (excluding multi-span flyover bridges), bridge piers adjacent to a roadway shoulder, excluding interior median piers (see Section 6.1.2, Structure Design Manual)
- Modular expansion joints on concrete girder bridges
- Modular expansion joints on steel girder bridges with joint movement less than 9-inches
- Monotube or cantilever DMS (if required on project) support structures
- Integral End Bents on Shallow foundations behind MSE abutment walls
- Bridges with less than four (4) girder lines
  ****NOTE**** Deleted bullet excluding multiple girder depths for new bridges
- For bridge widenings, girder types and span lengths that are different from the existing bridge
- Sound barrier walls constructed on top of retaining walls
- Epoxy Polymer Concrete
- Steel Straddle Bents

Rehabilitation of Existing Structures

The Design-Build Team shall rehabilitate bridges in accordance with the requirements noted below, the special provisions found elsewhere in this RFP, the Structures Management Unit website and the rehab provisions provided as Materials Available. Unless noted otherwise

elsewhere in this RFP, the Design-Build Team shall perform all rehabilitation work for the entire bridge. Rehabilitation work not listed below will be paid for as extra work in accordance with Subarticle 104-8(A) of the 2024 NCDOT *Standard Specifications for Roads and Structures (Standard Specifications)*.

****NOTE**** Deleted rehab for Bridge 910290 on Lake Wheeler Road over I-40

****NOTE**** Deleted rehab for Bridge No. 910286 on Trailwood Drive over I-40

Bridge No. 910281 on I-40 Westbound over Gorman Street

- Bolted beam repair plating to bottom flange and web at Bent 1 end of Beams 3, 4, & 5, Span 1
- Bolted beam repair plating to bottom flange and web at Bent 2 end of Beams 2, 3, 4, & 5, Span 3

Bridge No. 910276 on I-40 Eastbound over Gorman Street

- Repair slope protection, End Bent 1

****NOTE**** Deleted rehab for Bridge No. 910271 on Lake Dam Road over I-40

****NOTE**** Deleted rehab for Bridge No. 910558 on Avent Ferry Road over I-40

****NOTE**** Deleted rehab for Bridge No. 910253 on Jones Franklin Road over I-40

Bridge No. 910582 on I-40 Eastbound CD over I-440 / US 1 / US 64

- Repair spalls and delamination on Bents 1-4 columns and cap
- Repair spalls and delamination on End Bent 2 cap
- Bolted beam repair plating to bottom flange and web at Bent 1 end of Beams 2 & 3, Span 1
- Bolted beam repair plating to bottom flange at Bent 1 end of Beam 5, Span 1
- Welded beam repair plating to web at Bent 1 end of Beam 4, Span 1
- Bolted beam repair plating to bottom flange and web at Bent 1 end of Beams 2 & 3, Span 2
- Welded beam repair plating to web at Bent 4 end of Beam 5, Span 5
- Repair 3 diaphragms Span 1, both ends of Beam 4, Bent 1 end of Beam 1
- Install new foam joint seals at Bents 1, 2, 3, & 4 after overlay is complete. (no concrete repair anticipated at joint headers)
- Install new joint sealer material at End Bent 1 and End Bent 2 (no concrete repair anticipated at end bent joint headers)
- Replace NW Guardrail and end terminal
- Properly prepare existing concrete bridge deck and approach slabs and apply Polymer Concrete (PC) overlay. PC overlay shall be after all major traffic shifts have been completed
- Paint ends of girders

Bridge No. 910583 on I-40 Westbound CD over I-440 / US 1 / US 64

- Repair spalls and delamination on Bents 1, 2, 3, & 4 columns and cap
- Install new foam joint seals at Bents 1, 2, 3, & 4 after overlay is complete. (no concrete repair anticipated at joint headers)
- Install new joint sealer material at End Bent 1 and End Bent 2 (no concrete repair anticipated at end bent joint headers)
- Welded beam repair plating to web at Bent 1 end of Beam 2, Span 1
- Bolted beam repair plating to flange and web at Bent 1 end of Beam 3, Span 1
- Welded beam repair plating to web at Bent 1 end of Beams 2, 3, & 4, Span 2
- Welded beam repair plating to web at Bent 4 end of Beam 4, Span 5
- Properly prepare existing concrete bridge deck and approach slabs, and apply PC overlay. PC overlay shall be after all major traffic shifts have been completed
- Paint ends of girders

Bridge No. 910584 on I-40 Eastbound over I-440 / US 1 / US 64

- Repair spalls and delamination on Bents 1 & 4 columns and cap
- Replace NW Guardrail
- Completely remove existing LMC overlay on bridge deck and approach slabs, properly prepare existing concrete surfaces, and apply PC overlay. PC overlay shall be after all major traffic shifts have been completed
- Remove existing elastomeric concrete headers and replace with PPC and new foam joint seals

Bridge No. 910585 on I-40 Westbound over I-440 / US 1 / US 64

- Repair spalls and delamination on Bent 1 columns and cap
- Add plating to web at end bent end of Beams 3 & 4, Span 1
- Completely remove existing LMC overlay on bridge deck and approach slabs, properly prepare existing concrete surfaces, and apply PC overlay. PC overlay shall be after all major traffic shifts have been completed
- Remove existing elastomeric concrete headers and replace with PPC and new foam joint seals.
- Bridge Joint Demolition is anticipated at certain locations at the Bent 2 joint. Repair prior to PPC and joint replacement.

NOTE Deleted rehab for Bridge No. 910228 on Buck Jones Road over I-40

NOTE Deleted rehab for Bridge No. 910580 on Cary Towne Blvd. over I-40

Bridge No. 910649 on Crossroads Blvd. over US 1 / US 64

- Repair/Replace damaged guardrail end terminal

Bridge No. 910178 on Walnut Street over US 1 / US 64

- Repair spall and delamination on Bents 1, 2, & 4 columns and cap

Box Culvert No. 910303

- Repair guardrail in NBL

Box Culvert No. 910587

- Repair scour at inlet toe wall. Fill any voids underneath culvert with grout. Rip Rap inlet.
- Repair toe wall exposure at outlet. Add CL II Rip Rap to prevent undermining
- Remove drift
- Repair Southwest Wingwall (rotation, horizontal cracking at base

Box Culvert No. 910588

- Remove drift
- Repair cracks and spalls (NE wingwall, Span 3 joint & transverse cracking, minor cracks in Span 1)

All plating to bottom flange and web, repairs to fix spalls on concrete slope protection, filling voids underneath slope protection, adding rip rap to eroded slope protection, repairs of spalls and delamination on bents, replacement of bottom diaphragm members on beams, anchor bolt replacements, PPC overlay and bridge joint demolition, and concrete for deck repair shall be paid for as extra work in accordance with Subarticle 104-8(A) of the 2024 NCDOT *Standard Specifications for Roads and Structures (Standard Specifications)* at the unit prices noted below.

- All plating to bottom flange and web repairs will be paid for at the unit price of $189.42 per pound of steel.
- All repairs to fix spalls on concrete slope protection will be paid for at the unit price of $1,013.75 per cubic foot.
- All filling voids underneath slope protection with foam will be paid for at the unit price of $9.29 per pound of foam.
- All adding rip rap to eroded slope protection will be paid for at the unit price of $400 per ton.
- All repairs of spalls and delamination on bents will be paid for at the unit price of $1,013.75 per cubic foot.

****NOTE**** Deleted bullet for replacement of joints

- All replacement of bottom diaphragm members on beams will be paid for at the unit price of $175 per pound of steel.
- All anchor bolt replacements will be paid for at the unit price of $1,850 per each.
- All PPC overlay will be paid for at the unit price of $2,990 per cubic yard
- All bridge joint demolition will be paid for at the unit price of $88.46 per linear foot
- All concrete for deck repair will be paid for at the unit price of $682.18 per cubic foot

Prior to performing plating to bottom flange and web, repairs to fix spalls on concrete slope protection, filling voids underneath slope protection, adding rip rap to eroded slope protection, repairs of spalls and delamination on bents, replacement of bottom diaphragm members on beams, anchor bolt replacements, PPC overlay and bridge joint demolition, and concrete for deck repair, the Design-Build Team shall obtain approval from the Engineer, in writing. All work tasks

required to complete the rehabilitation activities, including but not limited to traffic control, surveys and portable lighting, shall be incidental to the unit prices.

Box Culverts

As required by the Design-Build Team's design, the Design-Build Team shall design and construct all proposed reinforced concrete box culverts and lengthen or replace all existing reinforced concrete box culverts. Reinforced concrete box culvert designs shall be in accordance with the Hydraulic Culvert Survey Reports prepared by the Design-Build Team and accepted by the Department. (Reference the Hydraulics Scope of Work found elsewhere in the RFP)

Sound Barrier Walls and Retaining Walls

Unless noted otherwise elsewhere in this RFP, all ground mounted sound barrier walls shall be detailed in accordance with Structure Standard Drawings that utilize concrete piles. (Reference the *Sound Barrier Wall* and *Architectural Concrete Surface Treatment* Project Special Provisions, the Geotechnical Engineering Scope of Work, and the Roadway Scope of Work found elsewhere in this RFP)

The Design-Build Team shall apply non-sacrificial anti-graffiti coating on all exposed surfaces of sound barrier walls and all retaining walls, including MSE walls.

General

The Design-Build Team's primary design firm shall be on the Department's list of firms qualified for structure design and maintain an office in North Carolina.

The Design-Build Team shall only submit a single structure per submittal. Multiple structures in a submittal will not be accepted for review.

Unless allowed or directed otherwise in this RFP, designs shall be in accordance with the latest editions of the *AASHTO LRFD Bridge Design Specifications* (with exceptions noted in the NCDOT *Structures Management Unit Manual*), NCDOT *LRFD Driven Pile Foundation Design Policy*, NCDOT *Structures Management Unit Manual* (including Policy Memos) and NCDOT *Roadway Design Manual, Chapter 5.*

Use of Florida Department of Transportation Prestressed Florida I-Beams (FIB), the Prestressed Concrete Committee for Economic Fabrication (PCEF) prestressed concrete girders, and Modified Bulb Tee girders will be allowed. However, the structural details associated with the items, including but not limited to mild reinforcing and reinforcing cover, shall be subject to Department review and acceptance post-award.

Unless allowed or directed otherwise in this RFP, all construction and materials shall be in accordance with *Standard Specifications*, NCDOT *Structures Management Unit Project Special Provisions* and NCDOT *Structures Management Unit Standard Drawings*. Reference the Structures Management Unit website below:

https://connect.ncdot.gov/resources/Structures/Pages/default.aspx

Alternate designs, details or construction practices (such as those employed by other states, but not standard practice in NC) are subject to Department review and approval and will be evaluated on a case-by-case basis.

The Design Build Team shall be responsible for assuring that material deliveries do not exceed weight limits of bridges on the delivery routes.

TRAFFIC SIGNALS AND SIGNAL COMMUNICATIONS SCOPE OF WORK (10-6-26)

I. GENERAL

The Design-Build Team shall design and prepare plans for the temporary traffic signal installations required by the construction phasing and / or detour routes, permanent traffic signal installations, traffic signal revisions, and signal communication plans for connection to the existing Town of Cary Signal System. This work shall include, but not be limited to, the preparation of Traffic Signal Plans, Metal Pole Loading Diagrams, Electrical and Programming Details, Utility Make-Ready Plans, Signal Communication Fiber Optic Communication and Splicing Plans, Wireless Communication Plans, and Project Special Provisions. These plans shall be prepared in accordance with the *Design-Build Submittal Guidelines* available on the NCDOT Connect - Alternative Delivery Unit's website and the *Guidelines for the Preparation of Traffic Signal & Signal Communications Plans by Private Engineering Firms* available on the NCDOT Connect - Transportation Systems Management and Operations Unit's website.

The Design-Build Team shall select a Private Engineering Firm (PEF) that has experience designing and sealing Traffic Signal, Electrical Detail, and Signal Communications Plans for NCDOT on comparable projects. The PEF selected shall also have experience preparing Utility Make Ready plans. The PEF shall be prequalified with NCDOT for the appropriate codes corresponding to the type of design work required for this project (including, but not limited to, 207, 208, and 209). The Technical Proposal shall list projects, including description and similarity to the subject project, for which the PEF has developed Traffic Signal, Electrical Detail, and Signal Communications Plans.

A pre-design meeting shall take place between the NCDOT Transportation Systems Management & Operations Unit (TSMO), the Work Zone Traffic Control Group, the Design-Build Team, the Alternative Delivery Unit, the Division Traffic Engineer, the Regional Traffic Engineer, Statewide Operations Center (STOC), the Town of Cary Transportation Department, Town of Cary "IS" Department, and any other pertinent NCDOT personnel before signal submittals begin. Traffic Signal, Electrical Detail, and Signal Communications Plan submittals shall only be reviewed and accepted by the Department after this pre-design meeting. All Traffic Signal and Signal Communications Plans shall be reviewed by the TSMO Unit. Additionally, plans shall be concurrently submitted to the appropriate authorities in which the plans are associated (e.g. Town of Cary, Division 5 Traffic personnel, etc.) for comments, however, final approval on all Traffic Signal and Signal Communications Plans submittals will ultimately be the responsibility of the NCDOT TSMO Unit. All Traffic Signal Plans and Signal Communication Plans shall be accepted by the TSMO Unit prior to beginning traffic signal construction or plan implementation.

The Design-Build Team shall coordinate and implement all signal designs at the appropriate time as directed by the Engineer. Prior to final design and installation, the Design-Build Team shall coordinate all signal phasing recommendations with the Division Traffic Engineer, the Regional Traffic Engineer, the Town of Cary Transportation Department, and the TSMO Unit. Prior to placing traffic in a new pattern, all traffic signals shall be installed and operational, including but not limited to, signal system timing plans and interconnection to the Cary Signal System.

Except as noted otherwise elsewhere in this RFP, the Design-Build Team shall maintain, monitor and adjust the traffic signals, both vehicle and pedestrian, as needed throughout the project construction. The Design-Build Team shall be responsible for the design and implementation of all temporary signal designs, including but not limited to signal system timing plans, needed to maintain vehicular and pedestrian traffic during construction, and all final traffic signal timing plans for the final traffic configurations. If necessary, temporary traffic signal designs and implementation, shall include, but not be limited to, new local controller, signal timing, inductive loops / vehicle detection, cables, poles, signal span, controllers, cabinets, and / or signal heads. Prior to implementation, all signal timing plans shall be reviewed and accepted by the TSMO Unit.

Where construction activities necessitate a detour, the Design-Build Team shall evaluate the effects of that detour on all traffic signals along the detour route. The Design-Build Team shall make operational changes as necessary and as directed by the Engineer.

Throughout the project construction, the Design-Build Team shall maintain full actuation of the traffic signals located within the project limits, unless allowed otherwise by the Engineer in writing.

The Design-Build Team shall incorporate all traffic signals on this project into the Cary Signal System as detailed below. To connect sidewalk networks, the Design-Build Team shall provide crosswalks and pedestrian signal heads for all approaches, as appropriate, based on field conditions. Crosswalks and pedestrian signal heads will not be required where there is no sidewalk.

The existing signals on the project may retain the existing supports if they can support the required additional loading. If new supports are required, they shall be galvanized metal poles with mast arms. All temporary signal installations, if needed, may utilize wood poles for signal supports. All plans and associated design material and specifications shall be reviewed and accepted by NCDOT and / or the Town of Cary before installation. See Section II below for final traffic signal requirements.

The Design-Build Team shall deliver all existing cabinets and their contents, including but not limited to fiber modems, telephone modems, and radio equipment, and metal poles and mast arms that are not reinstalled on this project to the Division 5 Traffic Services Office located at 1076 Prison Camp Road, Durham, 27705. The Design-Build Team shall dispose of and / or retain ownership of all other traffic signal equipment.

Signal Inventory Numbers (SIN) will be assigned for each new signalized location by the NCDOT TSMO Unit. Once all the traffic signal locations have been finalized and accepted by the Department, the Design-Build Team shall submit a written request for the SINs to the NCDOT TSMO Unit, via the Alternative Delivery Unit. At a minimum, this request shall list each signal location that requires a SIN and include the following:

- County
- Nearest Municipality
- Names of all intersecting roads that will be under signal control, including state route numbers (Interstate, US, NC or SR) and common street names
- The dominant through movement

- Latitude and Longitude coordinates to the middle of the intersection

The Design-Build Team shall be responsible for providing a safe and economical design for the public. The Design-Build Team shall prepare all plans and designs in accordance with the current NCDOT TSMOU design standards, including but not limited to, the version of the following documents effective on the Technical Proposal submittal date:

- NCDOT *Standard Specifications for Roads and Structures (Standard Specifications)*
- NCDOT *Standard Roadway Drawings (Standard Drawings)*
- Signals and ITS Project Special Provisions
- ITS and Signals Design Manual
- FHWA *Manual on Uniform Traffic Control Devices* (MUTCD)
- *North Carolina Supplement to the Manual on Uniform Traffic Control Devices (NCMUTCD)*
- *Guidelines for the Preparation of ITS & Signal Plans by Private Engineering Firms*
- NCDOT *Signal System Timing Philosophy Manual*

Links to additional TSMO Unit design standards and aides are available on website noted below:

https://connect.ncdot.gov/resources/safety/Pages/TSMO.aspx

II. TRAFFIC SIGNALS

Unless allowed otherwise elsewhere in this RFP, the Design-Build Team shall modify two (2) existing signals within the project limits. All signals shall be interconnected into the Cary Signal System as noted in the tables below (Reference Section III below for the system interconnection requirements). The traffic signal detection for the final traffic patterns shall be inductive loop detection. The Design-Build Team shall provide multi-zone microwave detection for temporary traffic patterns if needed during construction. The out-of-street detection shall be approved by the Department, in writing, prior to incorporation, and appear on the NCDOT Qualified Products List. Unless allowed otherwise elsewhere in this RFP, the required traffic signal work and signal communications for the intersections are listed below:

****NOTE**** Deleted proposed signal at Dillard Drive and Piney Plains

****NOTE**** Deleted removal of signal at Walnut Street

NCDOT – Cary – Modify Existing Traffic Signal		
Signal Inventory Number	**Intersection Description**	**Work Requirements**
05-0270	SR 1313 (Walnut Street) and US 1 NB / US 64 EB Ramps	Modify this existing traffic signal as needed to match all temporary construction phasing and the proposed final traffic pattern. This may require signal phasing changes, signal head changes, system detectors and/or system interconnection equipment. Modify existing fully actuated traffic signal. Use 2070LX controller operating ASC/3 Software in a NEMA TS-2 cabinet. Provide Flashing Yellow Arrow signal heads at all protected/permissive and permissive left turns and U-turns, if appropriate, including time of day (alternate) phasing options. Install Flashing Yellow Arrow signal heads for protected/permissive and permissive right turns when possible. If new signal supports are required, the Design-Build Team shall install new galvanized metal poles as required. The Design-Build Team shall provide crosswalks and **pedestrian signal heads** at each approach with existing or proposed sidewalk. Pedestrian signal designs shall include Accessible Pedestrian Signal (APS) equipment and provide for a Leading Pedestrian Interval (LPI) as appropriate. At the option of the town of Cary, the signal may be designed to include a GPS activated Emergency Vehicle Preemption System.

Cary – Modify Existing Traffic Signal		
Signal Inventory Number	**Intersection Description**	**Work Requirements**
N/A	Crossroads Blvd. at Caitboo Ave.	Modify this existing traffic signal as needed to match all temporary construction phasing and the proposed final traffic pattern. This may require signal phasing changes, signal head changes, system detectors and/or system interconnection equipment. Existing wood poles may be retained; wood poles are permissible for any required new poles. This signal is part of the Cary Signal System. This signal is not on the state highway system and does not have a state inventory number. It is maintained by the Town of Cary but is owned by the owner(s) of the Crossroads Plaza, Kimco Realty. Modify existing fully actuated traffic signal. Use 2070LX controller operating ASC/3 Software in a NEMA TS-2 cabinet. Provide Flashing Yellow Arrow signal heads at all protected/permissive and permissive left turns and U-turns, if appropriate, including time of day (alternate) phasing options.

III. SIGNAL COMMUNICATION PLANS

Prior to construction, the Design-Build Team shall provide a detailed set of Communications Cable & Conduit Routing Plans, Splice Plans, and Project Special Provisions for the Department's review and approval. No construction related to the installation of the communications system shall begin until NCDOT has approved the RFC plans and specifications.

The Communications Cable & Conduit Routing Plans, and Project Special Provisions shall consist of three major items listed below:

- Communications Cable & Conduit Routing Plans
- Cable Termination Plans (Splice Plans)
- Project Special Provisions
- Catalog Cut Sheets

MAINTAIN CITY OF TOWN OF CARY SIGNAL SYSTEM

The Design-Build Team shall be required to maintain signal communications to the Town of Cary Signal System throughout the course of the project with exception of the small timeframe given to cutover to the newly installed SMFO cable. *CONTACT TOWN OF CARY 10 DAYS PRIOR TO ANY WORK ON THE TOWN OF CARY SIGNAL SYSTEM FIBER OPTIC CABLE.* The following signal locations are in the existing Town of Cary Signal System:

1. ***SIGNAL TO BE INTERCONNECTED INTO THE TOWN OF CARY SIGNAL SYSTEM WITH ASSOCIATED TRAFFIC CAMERA :***

   SIN #05-0270 - SR 1313 (Walnut Street) at US 1 NB-64 EB Ramps

If Walnut Street will be widened to accommodate signal modifications for existing signal **SIN #05-0270** - SR 1313 (Walnut Street) at US 1 NB-64 EB Ramps the Design-Build Team shall:

1. Maintain the system throughout the course of the project. The Design Build Team shall determine if the Town of Cary prefers to use cell modems or to require the Design-Build Team to develop Pre-let Signal Communications plans to route new SMFO cable to replace the existing fiber prior to widening construction.

2. Work with the utility pole owners to obtain utility working drawing to determine the new pole line and determine attachment heights for the new SMFO cable along Walnut Street on the new pole line (normally 40 inches below power or the bottom utility). If **any** poles along the new Walnut Street SMFO cable route remain in place, perform utility walk-through to investigate new pole attachments heights with the pole owners and other attached utilities. Perform utility make-ready work to ensure all cable attachments meet the NESC requirements.

The Design-Build Team shall be responsible for splicing configuration to show the cutover to newly installed SMFO cable along Walnut Street of **SIN #05-0270** - SR 1313 (Walnut Street) at US 1 NB-64 EB Ramps into the Cary Signal System. **Cutover to new fiber shall be completed within 24-hours.**

If cable is routed to new poles along Walnut Street to accommodate widening, the Design-Build Team shall be required to install a new splice enclosure and new 12-fiber SMFO drop cable to the new/existing cabinet location for **SIN #05-0270** SR 1313 (Walnut Street) at US 1 NB-64 EB Ramps.

The Design Build Team is responsible for ensuring that the Cary Signal System is back up to normal function upon completion of splice terminations. Work is not complete until the Cary Signal System is back up and operational.

Ensure that the communications cable infrastructure and electronic field equipment provided under this project is compatible and fully interoperable with the existing system hardware.

The Department, upon request, will supply the Design-Build Team with copies of any available documentation pertaining to the existing signal system, with regards to these intersections.

All existing main trunk line fibers shall remain the same size or larger upon completion of the project.

SIGNAL SYSTEM CCTV CAMERA

The Design-Build Team shall be required to maintain the Traffic Signal CCTV on the existing Signal Pole if the Signal Pole remains in place. The Design-Build Team shall be responsible for moving the existing Traffic Signal CCTV to any new Signal Pole location and the Design-Build Team shall ensure that the existing CCTV camera - for **SIN #05-0270 -** SR 1313 (Walnut Street) at US 1 NB-64 EB Ramps is installed on the signal pole quadrant that provides optimum viewing as determined by the Town of Cary Traffic Engineering Supervisor. All CCTV camera installations, including equipment cabinets, shall comply with the requirements of the *Digital CCTV Camera Assembly* and *CCTV Field Equipment Cabinet* Project Special Provisions for the Town of Cary Signal System. The *ITSS Project Special Provisions – PSP - Version 24.3* or the latest version at the time of letting found at the following website:

https://connect.ncdot.gov/resources/safety/Pages/TSMO-Design-Resources.aspx

****NOTE**** Deleted signal at Piney Plains Road and Dillard Drive

Existing Signal with CCTV Camera to be interconnected into the Cary Signal System		
Signal Inventory Number	**Intersection Description**	**Work Requirements**
05-0270	SR 1313 (Walnut Street) at US 1 NB-64 EB Ramps	If widening is required to accommodate modification to this signal: The Design-Build Team shall maintain operation of the Cary Signal System using Temporary Communications (cell-modem) or prepare Pre-let signal communications plans to route new SMFO cable on the new pole line prior to widening construction to interconnect the existing signal. The Design-Build Team shall perform investigation and perform any utility make-ready work, as required. The Design-Build Team shall investigate the optimal fiber route and install a 24-36 fiber trunk line along SR 1313 (Walnut Street) to this existing signal. The Design-Build Team shall install aerial or underground fiber optic splice enclosure at or near the new traffic signal.

		The Design-Build Team shall install a new Ethernet switch in each new and existing signal and camera cabinet. The Design Build Team shall install new fiber optic interconnect centers, fiber optic pigtails, and fiber optic jumpers in the existing traffic signal and camera cabinet. Reuse existing Town of Cary Ethernet switch. If existing CCTV Traffic Signal Camera Pole is replaced during signal modifications of the intersection the Design-Build Team shall move the existing CCTV to a new signal pole that provides optimal viewing of the intersection as determined by the Town of Cary. The Design-Build Team is responsible for recording existing splicing configuration to for updated splicing configuration if required for **SIN #05-0270** SR 1313 (Walnut Street) at US 1 NB-64 EB Ramps from the Cary Signal System. Provide any discrepancies from supplied splice plans to the Town of Cary Traffic Engineering Supervisor. The Design-Build Team shall ensure that any cutover operation from existing to new fiber along Walnut Street shall not exceed 24-hrs. The Design Build Team is responsible for ensuring that the Cary Signal System is back up to normal function upon completion of any splice termination. Work is not complete until Cary Signal System is back up and operational.

PLANS AND SUBMITTALS

The Signal Communications Plans shall consist of the three major items listed below:

- Signal Communications Plans, including Splice Plans
- Project Special Provisions
- Catalog Cut Sheets

The Design-Build Team shall install all traffic signal equipment, communications cables and conduit systems in such a manner that avoids conflicts with other utilities. All aerial communications cable installations shall be installed in accordance with the National Electrical Safety Code. The Design-Build Team shall be responsible for coordinating all Utility Make-Ready Work with the proper utility representatives.

Prior to construction, the Design-Build Team shall provide a detailed set of Signal Communications Plans, Project Special Provisions and Catalog Cut Sheets as required above for the Department's review and acceptance. No construction related to the installation of the communications system shall begin until NCDOT has accepted the RFC Signal Communications Plans, Project Special Provisions and Catalog Cut Sheets.

UTILITY MAKE-READY PLANS

In conjunction with the development of the Traffic Signal and Signal Communications Plans, the Design-Build Team shall also develop, if applicable, a set of Utility Make-Ready Plans.

The Design-Build Team shall coordinate with all affected utilities to make necessary utility adjustments and / or pole change outs for all new fiber optic cable to be installed aerially. The Design-Build Team shall schedule coordination meetings with each affected utility owner and pertinent NCDOT personnel.

JUNCTION BOXES

For all underground splice enclosure locations, the Design-Build Team shall furnish and install new *Special Oversized Heavy-Duty Junction Boxes* that meet the requirements of Sections 1098-6 and 1716 of the *Standard Specifications* and have minimum inside dimensions of 36" (l) x 24" (w) x 24" (d).

For all other locations, the Design-Build Team shall furnish and install new *Oversized Heavy-Duty Junction Boxes* that meet the requirements of Sections 1098-6 and 1716 of the *Standard Specifications* and have minimum inside dimensions of 30" (l) x 15" (w) x 24" (d).

Store 50 feet of spare cable, for each cable, in all junction boxes; and 20 feet of spare cable in all signal cabinets.

Furnish junction box lids with "NCDOT Fiber Optic" logo for NCDOT fiber optic cable.

MATERIALS

When existing equipment (signal cabinets, hub cabinets, Ethernet equipment, electronic equipment, fiber, conduit, messenger cable, etc.) is replaced, the Design-Build Team shall replace existing equipment with new equipment. All material, equipment and work shall adhere to the *Standard Specifications* requirements. Materials, where applicable, shall be pre-approved on the Department's Qualified Products List (QPL). The QPL web site is:

https://connect.ncdot.gov/resources/safety/Pages/QPL-Introduction.aspx

Prior to incorporation, the Design-Build Team shall provide detailed specifications for all material, equipment and / or work that is not covered in the *Standard Specifications* for Department approval. The Design-Build Team shall provide specifications and plans that address the material requirements and construction methods. No equipment or material shall be installed until it has been approved by the Department, in writing. Catalog cuts will not be

required for items on the QPL. Items not listed on the QPL will require Department written approval prior to incorporation.

Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall return all existing electronic equipment and devices to the Town of Cary Signal System Operations Facility. A minimum of one week prior to removal of electronic equipment, the Design-Build Team shall be required to contact the Town of Cary Signal System Project Manager, Thomas Reilly at (919) 469-4203 to coordinate a specific day and time for the Design-Build Team to deliver the salvaged material to the Department. Prior to delivery to the Department, the Design-Build Team shall stockpile all salvaged material to prevent damage.

MAINTENANCE AND REPAIR REQUIREMENTS

From the beginning of construction until the final project acceptance, the Design-Build Team shall maintain and repair all system components within the project scope, including but not limited to, signal cabinets, loops, signal heads, conduit systems, communications lines, hub cabinets, etc. After project acceptance, the Design-Build Team shall perform all system repairs resulting from faulty materials and / or workmanship, in accordance with the *Twelve Month Guarantee* Project Special Provision found elsewhere in this RFP, or longer if the Design-Build Team extends the aforementioned warranty period.

A. PLAN OF RECORD DOCUMENTATION

The Design-Build Team shall prepare and submit to the Department Plan of Record (POR) documentation that depicts the conduit and equipment device locations. The Design-Build Team shall submit final POR documentation in electronic and hard copy format for acceptance by the Department. At a minimum, the POR documentation shall include, but not be limited to, the following:

- Electronic plans in MicroStation (latest release in use by the Department) format on CD
- Final location and depth of conduits, wiring external to the cabinets, locations of splice closures, junction box locations, and single mode fiber optic (SMFO) cable terminations
- Real world coordinates for all devices, splice enclosures, junction boxes, and equipment cabinets installed or utilized under this project
- Coordinates in English units using the North Carolina State Plane coordinate system (1983 North American Datum also known as NAD ’83)
- Coordinates that do not deviate more than 1.7 feet in the horizontal plane and 3.3 feet in the vertical plane. Global positioning system (GPS) equipment able to obtain the coordinate data within these tolerances may be used.

B. LOCAL AREA NETWORK

For the Ethernet based system the Design-Build Team shall furnish equipment that complies with IEEE Standard 802. The Design-Build Team shall collaborate with the Town of Cary’s Network Operator to furnish the necessary network configuration data, including but not limited the Project IP addresses, default gateway, subnet mask, VLAN, and configuration files to program the field Ethernet switches. Furnish all necessary equipment for a complete

LAN, including but not limited to field-hardened Field Ethernet Switches. LAN equipment shall be fully integrated, providing local device failover and fault tolerance, virus protection, user authentication, and security functions to prevent unauthorized user and data from entering the LAN.

The Design-Build Team shall ensure that the field Ethernet edge switch installed in the signal cabinets are fully compatible with the Town of Cary's existing Network Management Software.

The Design-Build Team shall ensure that all plans and designs conform to the NCDOT and NC Statewide IT Policies and Standards as described at:

https://it.nc.gov/resources/state-it-policies

The Design-Build Team shall submit all architecture of the IT modules for review and approval by NCDOT IT and the NC Office of Information Technology architecture groups.

C. INTEGRATION & TESTING

The Design-Build Team shall integrate each system device with its respective system, and work with the system operator to ensure that each device is functioning properly within the system.

The Design-Build Team shall develop unit and system test plans and procedures for each device and component and submit to the Engineer for review and approval. This includes, but is not limited to, signal equipment, fiber optic communications cable, local and central equipment. Upon completion of the system installation and integration, the Design-Build Team shall conduct unit and system tests according to the approved test plans and procedures. The Design-Build Team shall be responsible for providing all necessary test equipment.

In case of failures and substandard performance, the Design-Build Team shall identify the cause of failure and / or substandard performance, repair or replace the faulty parts and components and repeat the test. If the problem persists, the Design-Build Team shall replace the entire unit causing the problem prior to repeating the test at no additional cost.

After successful completion of all units and system test, the Design-Build Team shall submit the test reports, along with the record of repairs and part replacements, to the Engineer.

IV. PROJECT OPERATION REQUIREMENTS

Intermediate Contract Time #25 for Failure to Repair a Damaged Town of Cary Signal System Fiber Optic Communications Cable and Restore Communication.

The Design-Build Team shall repair all existing fiber optic communication cables damaged during construction. The Design-Build Team shall immediately report damages to the Engineer and the Town of Cary Signal System Operator. The Design-Build Team shall repair all damages within 24 hours at no cost to the Department to bring the Town of Cary Signal System fiber optic communication cables back online within the same 24 hours. A "damaged" Town of Cary fiber

optic communications cable is any fiber optic communications cable that is determined damaged due to an accidental or unscheduled outage event.

Liquidated Damages for Intermediate Contract Time #25 for failure to repair a damaged Town of Cary fiber optic communications cable and restore communications within 24 hours are $500.00 per hour or any portion thereof.

Intermediate Contract Times #26 and #27 for Failure to Reestablish Town of Cary Signal System Fiber Optic Communications.

During construction, the Design-Build Team shall coordinate any disruption in Town of Cary Signal System fiber optic communications with the Engineer the Town of Cary Signal System Operator. The Design-Build Team shall notify the Engineer and the Town of Cary Signal System Operator, a minimum of seven days prior to all proposed disruptions in service. A minimum of 21 days prior to any disruption in Town of Cary Signal System fiber optic communications the Design-Build Team shall develop and provide a plan for the Department's and the Town of Cary's as appropriate, approval that defines 1) an anticipated disruption timeframe and 2) a plan of action for reestablishing Town of Cary's Signal System Fiber Optic communications within 24 hours.

Liquidated Damages for Intermediate Contract Time #26 for failure to reestablish Town of Cary Signal System fiber optic communications within 24 hours are $500 per hour or any portion thereof.

Liquidated Damages for Intermediate Contract Time #27 for failure to provide a plan that defines 1) an anticipated Town of Cary Signal System fiber optic communications disruption timeframe, and 2) a plan of action for reestablishing the Town of Cary Signal System fiber optic communications a minimum of 21 calendar days prior to a proposed disruption in service are $10,000.00 per failure.

V. SIGNAL SYSTEM TIMING PLANS

Temporary signal system timing plans shall be developed to maintain coordination while accommodating changes to signal phasing or lane configuration changes due to temporary traffic signal plans. Final signal system timing plans shall include the design, implementation and fine-tuning of signal timing plans, and evaluation of the final operational benefits associated with work performed on the project. The signal timing plans shall be designed to address all possible traffic needs within the project construction limits, including but not limited to:

- Roadway capacity modifications due to construction, including but not limited to, through / turn lane additions / removals, signal phasing changes, and traffic pattern changes
- Weekday peak / non-peak traffic periods (e.g. a.m., p.m., noon, off-peak, etc.)
- School / Universities start / end and / or class change peak traffic periods
- Seasonal traffic patterns
- Pre-scheduled holiday(s) traffic patterns
- Incident management traffic patterns (e.g. detour routes, hurricane evacuations, etc.)
- Other special events traffic patterns

The Design-Build Team shall select a Private Engineering Firm (PEF) that is prequalified by NCDOT in *Discipline Code 210 - Signal System Timing Development and Implementation* and under the direct charge of a North Carolina certified Professional Engineer.

The Design Build Team shall coordinate the number of final signal system timing plans with the Division, the Signal System Timing and Operations (SSTO) Section, Town of Cary–Traffic Engineer, as appropriate. The Design Build Team shall collect turning movement counts at relevant intersections to inform the design of the final signal system timing plans, and submit a preliminary set signal system timing plans, with supporting *Tru-Traffic*, *SYNCHRO* 11, and *Translink32* database files, to the SSTO Section, Division, and the Town of Cary, as appropriate. All Signal System Timing Plans shall be reviewed and approved by the SSTO Section prior to implementation. The Design-Build Team shall coordinate the development and implementation of all signal system timing plans at the appropriate times, as directed by the Engineer.

The Design Build Team shall field implement signal system timing plans in accordance with the SSTO Section, Division, Town of Cary's requirements. In the event of conflicting design parameters in the requirements noted above, the proposed design shall adhere to the most conservative values. The Design-Build Team shall:

- Ensure all signal system timing plans are operational in the Central Control Center, Master and local controller(s)
- Observe new traffic operations at the intersections and along the corridor and collect trip logs for each signal system timing plan implemented, by riding the system with Tru-Traffic synched with the plan in operation at the time
- Fine-tune signal system timing plans, as necessary, for optimal system performance.

The Design Build Team will use final signal plans to configure the map graphics and intersection information for all signalized intersections in Kinetic Signals (the Department's central traffic signal management system). Within Kinetic Signals, the Design Build Team will complete all pertinent information contained in the tabs labeled "Details", "Devices", "Lanes", "Maneuvers", "Crosswalks", and "Detectors". These intersections shall be set up to include the following information:

- Road and Intersection Labels, including NCDOT Asset Numbers
- Arrows for each lane, movement or phase
- Phase numbers for each lane, movement or phase, including pedestrian phases
- Detectors

Prior to Final Project Acceptance, the Design-Build Team shall submit a final report, including final implemented signal timing plans and all supporting documents in *SYNCHRO* 11.0, *Tru-Traffic* Reports and data, *Translink32* database files to the SSTO Section, Division, and the Town of Cary, as appropriate. All intersections shall be entered in Kinetic Signals and operational.

Please note, the Department is developing signal timing plans designed to prioritize I-40 traffic diverted from the freeway during incidents. These signal timing plans will be designed, implemented, maintained, and activated by the Department throughout the course of the project.

These signal timing plans shall not be removed, edited, or otherwise changed by the Design-Build Team.

TRANSPORTATION MANAGEMENT SCOPE OF WORK (10-5-26)

LAWS, STANDARDS, AND SPECIFICATIONS

The Design-Build Team shall design the Transportation Management Plan (TMP) in accordance with the requirements of this RFP and the version of the standards listed below that are effective on the Technical Proposal submittal date.

- 2024 NCDOT *Standard Specifications for Roads and Structures (Standard Specifications)*
- 2024 NCDOT *Roadway Standard Drawings (Standard Drawings)*
- FHWA *Manual on Uniform Traffic Control Devices* (MUTCD) 11th Edition
- NCDOT *Supplement to the Manual on Uniform Traffic Control Devices* (NCSMUTCD)
- AASHTO *A Policy on Geometric Design of Highways and Streets*
- NCDOT *Roadway Design Manual*
- AASHTO *Roadside Design Guide*
- Americans with Disabilities Act of 1990 (ADA)
- FHWA *Standard Highway Signs*
- NCDOT *Design-Build Submittal Guidelines*
- FHWA *Rule on Work Zone Safety and Mobility* (23 CFR 630 Subpart J and K)
- Transportation Research Board *Highway Capacity Manual*
- NCDOT *Transportation Management Plans Design Manual*

References

The Design-Build Team shall use the references provided on the site below as supplementary guidelines and requirements for the design and implementation of the TMP.

https://connect.ncdot.gov/projects/WZTC/

Prequalification

The Design-Build Team shall select a Private Engineering Firm (PEF) that has experience developing TMPs on comparable projects for the North Carolina Department of Transportation (NCDOT) and prequalified through NCDOT in Work Code 00541 (Traffic Management Plan - Level 1 and 2) and maintains prequalification throughout the project duration.

TRANSPORTATION MANAGEMENT PLANS

A pre-design meeting shall take place between the NCDOT Transportation Systems Management & Operations Unit (TSMOU), the Work Zone Traffic Control Group, the Design-Build Team, the Alternative Delivery Unit, the Division Traffic Engineer, the Regional Traffic Engineer, Statewide Traffic Operations Center (STOC), local municipalities (if applicable), and any other pertinent

NCDOT personnel. TMP submittals shall only be reviewed and accepted by the Department after this pre-design meeting.

The Design-Build Team shall prepare TMPs that include Temporary Traffic Control Plans (TTCP), an Incident Management Plan (IMP), and a Traffic Operations Plan (TOP), the requirements of which are included in this Scope of Work. In accordance with the Public Involvement and Information Scope of Work found elsewhere in this RFP, the Design-Build Team shall assist the Department in the development of a Public Involvement and Information Plan (PIIP).

The Design-Build Team shall produce TMPs for each phase of work that impacts road users. The TMPs shall include details of all planned detours, traffic control devices, striping, and signage applicable to each phase of work. The information on the TMP shall be of sufficient detail to allow verification of design criteria and safety requirements, including but not limited to, typical sections, alignment, striping layout, drop off conditions, and temporary drainage. The Design-Build Team shall develop TMPs that include procedures to communicate TMP information to the public about road and travel conditions within the work zone and affected roadway network.

Transportation Management Phasing Concept

A Transportation Management Phasing Concept (TMPC) shall be prepared by the Design-Build Team to present the Design-Build Team's approach to all areas covered under the TMP, including but not limited to, hauling of materials to, from, and within the project right of way. The Design-Build Team shall include the TMPC in the Technical Proposal. The Design-Build Team shall submit the TMPC for Department review and acceptance and shall address NCDOT comments on the TMPC prior to commencing production of the TMP for each phase of work or any construction. Any changes to the TMPC after acceptance by NCDOT shall require a submittal for review prior to any future phasing submittals.

Incident Management Plan

The I-5701 / I-5703 Design-Build Team will be responsible for developing an IMP and as construction progresses, updating the IMP as needed per coordination activities.

The Design-Build Team shall develop an IMP that documents 1) the roles and responsibilities of each response agency that may participate in traffic incident management activities, and 2) the procedural and coordination aspects of managing unplanned incidents on I-40 or US 1 / I-440 / US 64 that impact the flow of traffic. These incidents shall include, but are not limited to, environmental events, stalled vehicles, multi-vehicle crashes, and hazardous materials incidents that impact the shoulder, travel lane or close the entire roadway. The objective of the IMP is to reduce the severity of the capacity reduction, incident duration, and / or traffic demand around the incident scene. The IMP shall be reviewed, revised and updated as necessary throughout the project construction.

The IMP shall be developed in coordination with the Division Traffic Engineer, State Traffic Operations Engineer and response agencies; and shall be reviewed and accepted by the Department

and the STOC. During development of the IMP, a minimum of two coordination meetings shall take place between the Design-Build Team and all relevant NCDOT incident management personnel and response agencies. Once accepted by the Department and the STOC, the Design-Build Team shall share the IMP with all response agencies to ensure they have a clear understanding of the procedures and available resources for responding to, processing of, and clearing unplanned incidents.

Excluding work required by Intermediate Contract Time #13, the Design-Build Team shall not begin any construction activity that disrupts traffic operations on I-40 or US 1 / I-440 / US 64, the project, at the Department's sole discretion, until 1) the Department and the STOC have accepted the IMP, 2) the Design-Build Team has installed all portable ITS devices for incident management and they are communicating with the STOC and Statewide ITS Network, and 3) the Design-Build Team has installed all temporary stationary signing for all Incident Management Routes.

At a minimum, the IMP shall include the following components:

IMP - Incident Levels and Associated Actions

Incident levels define the extent and duration of the impact anticipated on the roadway. For consistency across NCDOT, the STOC, Regional TMCs, and NCDOT administered towing contracts, the Design-Build Team shall utilize the following incident levels and document the actions that shall occur for each incident level:

- **Minor:** Minor traffic incidents are typically disabled vehicles and minor crashes with minimal disruption to the flow of traffic. On-scene responders are typically law enforcement, towing companies, and occasionally Incident Management Assistance Patrol (IMAP). Impacts to the traveled roadway are estimated to be less than 30 minutes with no lane blockage.

- **Intermediate:** Intermediate traffic incidents typically affect travel lanes for a time period. Full roadway closures might be needed for short periods during traffic incident clearance to allow traffic incident responders to accomplish their tasks. Impacts to the traveled roadway are estimated to be greater than 30 minutes, but less than two hours with lane blockages, but not necessarily a full closure of the roadway.

- **Major:** Major traffic incidents typically involve hazardous materials, fatal traffic crashes, and other natural or man-made disasters. These traffic incidents typically involve closing all or part of a roadway facility. Congestive impact to traveled roadway is estimated to be greater than two hours or the roadway is fully closed in a single direction.

IMP List of Response Agencies

The Design-Build Team shall develop a list of response agencies for NCDOT review and acceptance. This list may include, but is not limited to the following:

- NCDOT
- Municipalities (e.g. Raleigh, Cary)
- Law enforcement
- Tow contractor
- Fire / Rescue
- 911 dispatch
- Emergency Medical Service (EMS)
- Hazardous materials
- Media
- Emergency Management

During construction, the Design-Build Team shall hold monthly meetings with incident management personnel and response agencies. These meetings may be incorporated into regular Maintenance of Traffic (MOT) or Traffic Task Force Meetings. Additionally, the Design-Build Team shall participate in After Action Review meetings with incident management personnel, response agencies, and all other relevant parties following fatal and major traffic incidents.

IMP Contact Information

The Design-Build Team shall develop a contact matrix of local emergency response agencies and Design-Build Team points of contact for traffic incidents.

****NOTE**** Deleted duplicate paragraph requiring regular meetings with incident management personnel and emergency responders

IMP Incident Management Routes

Preliminary Incident Management Routes with portable incident management ITS device locations will be provided by the Department. The Design-Build Team shall provide, install and maintain a minimum of ten (10) Connected CMS signs along the Department's Preliminary Incident Management Routes.

If the Design-Build Team's design or construction methods impact the Preliminary Incident Management Routes provided by the Department, the Design-Build Team shall develop alternate routes and alternate Incident Management Route Plans, as necessary, to mitigate impacts to the Department's Preliminary Incident Management Routes. Prior to incorporation, the alternate Incident Management Route Plans shall be reviewed and accepted by STOC and NCDOT. At a minimum, the alternate Incident Management Route Plans shall include:

- All incident management routes

****NOTE**** Deleted bullet for changeable and /or static trailblazer sign locations

- The location (map and GPS coordinate table) of ITS devices for incident management (portable changeable message signs (PCMS) and portable Closed-Circuit Television (CCTV) cameras)
- Existing stationary and temporary alternate route signing locations
- Police traffic control during incident response plan activation (e.g. at stop-controlled intersections)
- Traffic signal locations with owners
- Median access locations available for emergency response vehicles on I-40 and US 1 / I-440 / US 64
- Route identification using NCDOT naming convention (e.g. I-40E292-297)

Prior to routing traffic on an Incident Management Route, 1) the Design-Build Team shall install all portable incident management ITS devices and signs, 2) the Design-Build Team shall modify traffic signals, if necessary, and 3) all ITS devices shall be communicating with the Statewide ITS Network & STOC. (Reference the Traffic Signals and Signal Communications Scope of Work found elsewhere in this RFP)

LANE AND ROAD CLOSURE NOTIFICATION

Lane Closure Notice (LCN)

For the first instance of lane closures, the Design-Build Team shall issue a LCN to NCDOT and affected government entities a minimum of thirty (30) calendar days prior to the publication of any notices or placement of any traffic control devices associated with lane closures, detour routing, or other change in traffic control requiring lane closures. The Design-Build Team shall issue a LCN to NCDOT on a weekly basis for subsequent lane closures for the duration of the project. The Design-Build Team will be allowed to issue a single LCN for multiple / consecutive lane closures that occur in the same location. For a LCN utilizing a non-NCDOT controlled facility, the Design-Build Team shall secure concurrence, in writing, from the controlling government entity.

A LCN shall contain the estimated date, time, duration, and location of the proposed work. The Design-Build Team shall keep NCDOT informed of any and all changes or cancellations of proposed lane closures prior to the date of their implementation.

If an emergency condition should occur, a LCN shall be provided to NCDOT within two (2) days after the event. For non-NCDOT controlled facilities, the Design-Build Team shall immediately notify the controlling government entity.

Road Closure Notice (RCN)

Proposed road closures on any road shall be approved by the Engineer prior to incorporation in the TMP and shall adhere to the following requirements:

- Unless allowed otherwise elsewhere in this Scope of Work, all roads, ramps, and loops shall remain open. Once proposed ramps and/or loops are opened to traffic they also shall remain open.

- The Design-Build Team shall not concurrently close -Y- Lines with overlapping detours.

- The Design-Build Team shall not permanently close any existing ramp or loop until the proposed replacement ramp or loop that provides the same traffic movement as the movement to be closed is open to traffic in the final pattern.

Unless required otherwise by this RFP, the Design-Build Team shall issue a RCN to NCDOT and affected government entities a minimum of thirty (30) calendar days prior to the publication of any notices or placement of any traffic control devices associated with road closures, detour routing, or other change in traffic control requiring road closures. For a RCN utilizing a non-NCDOT controlled facility, the Design-Build Team shall secure concurrence, in writing, from the controlling government entity.

A RCN shall contain the estimated date, time, duration, and location of the proposed work. The Design-Build Team shall keep NCDOT and any other affected government entity informed of any and all changes or cancellations of proposed road closures prior to the date of their implementation.

If an emergency condition should occur, a RCN shall be provided to NCDOT within two (2) days after the event. For non-NCDOT controlled facilities, the Design-Build Team shall immediately notify the controlling government entity.

STOC Coordination

Lane Closures

In addition to the aforementioned minimum thirty (30) calendar day and weekly notices for a LCN, the Design-Build Team shall notify the STOC when the process of closing a lane, ramp, loop or paved shoulder begins. The day of the lane closure, the Design-Build Team shall notify the STOC a minimum of 30 minutes before the lane closure to activate additional DMS/CMS messages.

Lane Opening

The Design-Build Team shall notify the STOC when the process of re-opening a lane, ramp, loop or paved shoulder begins, and again when the lane, ramp, loop or paved shoulder is completely open.

GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS

Maintenance of Access

Maintain access to all businesses, schools, residences, bus stops, mass transit facilities, park and ride lots, and emergency services at all times. Prior to incorporation, obtain written approval from the Engineer on the method to maintain access.

In accordance with the Department's Policy on Evaluating Temporary Accommodations for Pedestrians during Construction, found on the website noted below, the Design-Build Team shall maintain pedestrian accommodations in all areas as follows:

Roadway	Minimum Level of Pedestrian Accommodation
Walnut St Buck Jones Rd Jones-Franklin Rd Lake Wheeler Road	Basic
I-40 US 1 / I-440 / US 64 Crossroads Blvd	Absence of Need

https://connect.ncdot.gov/projects/WZTC/Pages/PedSafety.aspx

Pedestrian counts have not been conducted. The Design-Build Team shall provide level of accommodations as listed above and/or what pedestrian volumes indicate and require. The Design-Build Team can obtain pedestrian volumes from the Engineer, should they have that information. Should the pedestrian counts yield a level different from what is listed above; the Design-Build Team can have the levels of accommodation listed above adjusted.

On all roadways within the project limits, the Design-Build Team shall provide safe access for wide-loads and oversized permitted vehicles through the work zone. Safe access shall include, but not be limited to, a sufficient pavement structure (Reference the Pavement Management Scope of Work found elsewhere in this RFP), maintaining the existing vertical clearance of overhead structures, providing the required vertical clearance of proposed overhead structures, and providing the minimum horizontal clear widths as follows:

Roadway	Minimum Clear Width *
Interstates, US Routes, NC Routes, and all Collector Distributor (CD) roads, ramps, and loops	20 feet
All other roadways	18 feet

** For temporary alignments, the Design-Build Team shall provide the wider of the width in the Table above or the required design criteria found elsewhere in this Scope of Work.*

TMP Designer Inspections

Within 72-hours after traffic on I-40 or US 1 / I-440 / US 64, including ramps, loops, and CD-roads, has been shifted into a new phase for the entire project, or for individual sections if the Design-Build Team has divided the project into construction segments, the Design-Build Team's work zone traffic control designer shall verify the placement and condition of all traffic control devices and ensure that the traffic control devices provide the appropriate warnings and messages to motorists for the traffic pattern. After this initial inspection(s), the aforementioned designer shall conduct follow-up reviews of the project conditions a minimum of every 30 days, and as directed by the Engineer. For the purposes of this section, the work zone traffic control designer may review video footage collected by others in the field to verify traffic control devices. The work zone traffic control designer shall submit a report detailing their findings to the Engineer within seven days of the review.

During construction, the Department may conduct separate field inspections of the project conditions. The work zone traffic control designer shall make appropriate design revisions to the Transportation Management Plans resulting from / required by the Design-Build Team and / or the Departmental field inspections for the Department's review and acceptance, in accordance with the Design-Build Submittal Guidelines.

The Design-Build Team shall concurrently provide written documentation of all field verifications / inspections performed by the Design-Build Team to the NCDOT Work Zone Traffic Control Unit and the Resident Engineer. At a minimum, this documentation shall detail what was observed during the field verification / inspection and all resulting required actions with a timeframe for implementation. The Department will determine when the project conditions no longer warrant inspections by the work zone traffic control designer.

Traffic Control Supervisor

The Design-Build Team shall furnish a Traffic Control Supervisor for the project who is knowledgeable of TMP design, devices, and application, and has full authority to ensure traffic is maintained in accordance with the plans and specifications.

The Traffic Control Supervisor shall be on the project site overseeing all road closures and median crossover operations to ensure traffic control devices are properly installed and adjusted as

necessary. The Traffic Control Supervisor shall also make necessary changes to the traffic control operations and aide in the monitoring of traffic queuing.

The Design-Build Team shall identify a Traffic Control Supervisor in their Technical Proposal that has the following qualifications:

- A minimum 24 months of On-the-Job Training in supervision and work zone set up and implementation on similar projects.

- Be certified by an approved NCDOT training provider. If the Design-Build Contractor or their traffic control subcontractor is approved by NCDOT to train their own staff, a notarized certification letter shall be furnished to the Engineer at the preconstruction meeting. The letter shall state certification and re-certification dates. It shall also state the Traffic Control Supervisor has the knowledge and experience as well as the authority to ensure traffic is maintained in accordance with the contract documents.

The Traffic Control Supervisor for the project shall perform the following:

- During construction, be available or on call 24 hours per day, 7 days per week to address mobility and / or safety concerns within the work zone and direct / make any necessary changes in the traffic control operations in a timely and safe manner. The Design-Build Team shall provide NCDOT the name of the Traffic Control Supervisor and support personnel, and the phone number(s) where they can be reached 24 hours per day, seven days per week.

- Coordinate and cooperate with traffic control supervisors of adjacent, and overlapping construction projects, as well as construction projects in proximity to the subject project, to ensure safe and adequate traffic control is maintained throughout the project at all times, including periods of construction inactivity.

- Coordinate and cooperate with the NCDOT Division Incident Management staff and Resident Engineer.

- Coordinate and cooperate with the STOC to ensure proper messages are displayed on the DMSs and any PCMSs that are required to communicate with the Statewide ITS NetworkSTOC.

- Coordinate with Hospitals, EMS, Fire Departments, and Law Enforcement throughout construction to alert these entities to traffic control impacts that may affect their services.

- Prior to the start of construction activities that could result in school bus delays, coordinate with Wake County Schools.

- Provide traffic control setup that ensures safe traffic operations and workers' safety throughout the construction area.

- Attend all scheduled traffic control coordination meetings, as required by the Engineer.
- Monitor traffic delays and backups within the work zone.
- Ensure all employees working inside NCDOT right of way have received the proper training appropriate to the job decisions each individual is required to make.
- Responsible for the Dynamic Traveler Information System *(*Reference the *Dynamic Traveler Information System* Project Special Provision found elsewhere in this RFP).

Work Zone Installer

The Design-Build Team shall provide the service of at least one qualified work zone installer during the setup, installation, and removal of temporary traffic control devices within any highway right of way. The qualified work zone installer shall serve as crew leader and shall be on site and directing the installation and removal of temporary traffic control devices. If multiple temporary traffic control installations and / or removals are occurring simultaneously, then each crew leader shall be a qualified work zone installer.

The work zone installer shall be qualified by an NCDOT approved training agency in the safe and competent set up of temporary traffic control. For a complete listing of approved training agencies, reference the Work Zone Safety Training webpage noted below:

https://connect.ncdot.gov/projects/WZTC/Pages/Training.aspx

In accordance with Article 1101-14 of the *Standard Specifications*, a work zone supervisor may fulfill the role of the work zone installer during the setup, installation, and removal of temporary traffic control devices within any highway right of way, provided they are on site and directing the installation and removal of temporary traffic control devices.

At a minimum, all other individuals participating in the setup, installation, and removal of temporary traffic control devices within any highway right of way shall be certified as a qualified flagger in accordance with Article 1150-3 of the *Standard Specifications*, even if flagging is not being performed as part of the traffic control operation.

Prior to or at the preconstruction conference, the Design-Build Team shall provide the name and contact information of all qualified work zone installers to the Engineer. Additionally, the Design-Build Team shall provide a qualification statement that all other individuals participating in the setup, installation, and removal of temporary traffic control devices are qualified flaggers that have been properly trained through an NCDOT approved training agency.

The Work Zone Installer does not replace or change the requirements of the Traffic Control Supervisor described above.

Traffic Control Devices

The Design-Build Team shall use traffic control devices that conform to all NCDOT requirements and are listed on the NCDOT Approved Products List. The Approved Products List may be referenced on the website noted below:

https://apps.ncdot.gov/vendor/approvedproducts/

The use of any devices that are not shown on the NCDOT Approved Products List shall require written approval from the Alternative Delivery Unit prior to incorporation.

Excluding areas within 1,000 feet of a signalized intersection, channelizing device spacing shall not exceed a distance in feet equal to twice the posted speed limit. When channelizing devices are installed within 1,000 feet of a signalized intersection, their spacing shall not exceed a distance in feet equal to the posted speed limit. Channelizing devices shall be spaced ten feet on-center in radii. Channelizing devices shall be three feet off the edge of an open travelway when lane closures are not in effect. Skinny drums shall only be allowed as defined in Section 1180 of the *Standard Specifications*.

Place Type III barricades, with "ROAD CLOSED" signs (R11-2) attached, of sufficient length to close entire roadway. Stagger or overlap barricades as needed to allow for ingress or egress.

PCMS should be placed off the shoulder of the roadway and behind a traffic barrier, if practical. Where placement of a traffic barrier is not practical to shield the PCMS, the PCMS should be placed off the shoulder and outside of the clear zone. If a PCMS must be placed on the roadway shoulder or within the clear zone, it shall be delineated with retroreflective temporary traffic control (TTC) devices. When PCMSs are not being used to display TTC messages, they shall be relocated such that they are outside of the clear zone or shielded behind a traffic barrier and turned away from traffic.

If any trailer mounted traffic control device must be placed on the roadway shoulder or within the clear zone, it shall be delineated with retroreflective temporary traffic control (TTC) devices.

All traffic control devices, including but not limited to, temporary or permanent barrier systems, shall be placed / located a minimum two-foot offset (shy distance) from the edge of an open travel lane.

Temporary Portable ITS Devices for Incident Management

In addition to the PCMSs required by the *Standard Drawings* and portable devices required in the ITS Scope of Work and the *Dynamic Traveler Information System* Project Special Provision found elsewhere in this RFP, the Design-Build Team shall provide a minimum of twenty-two (22) temporary PCMSs and two (2) portable CCTV cameras to be used solely for incident management.

The Design-Build Team shall provide additional temporary PCMSs and portable CCTV cameras for incident management, as necessary, along alternate Incident Management Routes developed by the Design-Build Team. (Reference the IMP Incident Management Routes Section of this Scope of Work) The Design-Build Team will be allowed to relocate temporary PCMSs and portable CCTV cameras from an inactive Incident Management Route to an active Incident Management Route. Tree trimming will be part of the Design-Build scope to ensure sight lines for the portable CCTV's.

The PCMSs for incident management shall be used to display alternate route information ahead of detour points for incidents in the project area. The Design-Build Team shall coordinate with the STOC when alternate route information needs to be displayed. In the event of an incident, the STOC will control the applicable PCMSs to provide incident management information to motorists.

The temporary portable ITS devices for incident management shall be installed, relocated as necessary, operated, and maintained from the initiation of project construction to project completion or completion of their usefulness as determined by the Engineer.

A preliminary location plan for the incident management ITS devices has been provided by the Department. Final locations and positioning of these devices shall be coordinated with the STOC and NCDOT and included in the IMP for STOC and NCDOT for review and acceptance prior to installation. Once the location of the ITS devices for incident management have been accepted by the STOC and NCDOT, the locations shall not be changed without STOC and NCDOT approval.

Unless noted otherwise elsewhere in this Scope of Work, all portable ITS devices shall be capable of communicating with the "Statewide ITS Network" and existing software utilized by the STOC and have the functionality to be operated locally in the field and controlled remotely from the STOC. All portable ITS devices provided must be fully National Transportation Communications for ITS Protocol (NTCIP) compliant and on the NCDOT ITS and Signals QPL or the NCDOT Approved Products List as of the Technical Proposal submittal date. No vendor specific or third-party software shall be allowed. PCMSs used solely by the Design-Build Team for daily traffic control operations do not need to communicate with the STOC.

The Department will provide cellular modems to establish the communications link between the portable ITS devices for incident management and the STOC. The portable ITS devices shall have a fully configurable, standard ethernet port for connection to the cellular modem. Devices with built-in or onboard modems shall have an available ethernet port to allow communications with the Department-furnished modem. Devices designed specifically for serial communications and devices without an available ethernet port shall not be accepted. All modems provided by the NCDOT shall be returned to the NCDOT once the project is complete or the Engineer determines the device is no longer needed. (Reference the ITS Scope of Work found elsewhere in this RFP)

Temporary Traffic Barrier Systems

Placement of temporary traffic barrier systems shall be shown on the TMPC and shall be designed in accordance with the requirements below.

The Design-Build Team shall maintain all existing positive median cross-over protection for the entire I-40 and US 1 / I-440 / US 64 project limits. The Design-Build Team shall indicate in the Technical Proposal the type of positive protection proposed and replacement / resetting requirements.

Determine the need for temporary traffic barrier in accordance with the FHWA *Rule on Temporary Traffic Control Devices* (23 CFR 630 Subpart K). Reference the NCDOT Work Zone Traffic Control website noted below for examples and *Guidelines for the Use of Positive Protection in Work Zones*.

https://connect.ncdot.gov/projects/WZTC/Pages/Design-Resources.aspx

The Design-Build Team shall adhere to the AASHTO *Roadside Design Guide* in determining the length of need, flare rate, and clear zone. The Design-Build Team shall adhere to the maximum deflections from crash testing of the proposed temporary traffic barrier system in accordance with NCHRP-350 *Recommended Procedures for the Safety Performance Evaluation of Highway Features* and 2016 AASHTO *Manual for Assessing Safety Hardware* (MASH).

The Design-Build Team shall only use an NCDOT approved temporary traffic barrier system.

The temporary traffic barrier system shall not be installed more than two weeks prior to beginning work in any location. Once the temporary traffic barrier system is installed at any location, the Design-Build Team shall proceed in a continuous manner to complete the proposed work in that location.

Excluding water filled barrier, protect the approach end of temporary traffic barrier systems from oncoming traffic at all times with a truck mounted impact attenuator (maximum 72-hour duration) or an approved end unit such as a temporary crash cushion unless the approach end of the temporary traffic barrier system is offset from oncoming traffic as follows:

Posted speed limit (mph)	Minimum offset (feet)
40 or less	15
45 - 50	20
55	25
60 mph or higher	30

Crash cushions shall be installed according to the manufacturer's recommendations, including offsets from fixed objects.

The Design-Build Team shall provide the proper connection between the existing guardrail or bridge rail and the temporary traffic barrier system. Connection details shall be included in the TTCP.

Install temporary traffic barrier system with the traffic flow, beginning with the upstream side of traffic. Remove the temporary traffic barrier system against the traffic flow, beginning with the downstream side of traffic.

All temporary traffic barrier systems utilized for traffic control shall be placed on a paved surface. A minimum two-foot width of 1) paved surface, 2) standard sloped turf shoulder, or 3) a combination of paved surface and standard sloped turf shoulder shall extend behind all unanchored barrier, unless permitted otherwise by the Department, in writing. The aforementioned standard sloped turf shoulder shall adhere to *Standard Drawing* Nos. 560.01 and 560.02.

When the anchored K wall is shielding an excavation, there shall be a minimum of 24" of paved asphalt surface between the back (non-traffic) side of the K wall and the excavation. If the 24" of paved asphalt surface cannot be attained, then an alternative shall be submitted by the Design-Build Team and approved by the Department.

When temporary barrier is used continuously on one or both sides of a direction of mainline travel for a distance greater than one mile, the Design-Build Team shall provide a paved motorist breakdown area on the right side of the mainline travel way every mile, unless the outside paved shoulder width (clear distance between edge of travel lane and face of barrier) is ten feet or greater. All breakdown areas shall be a minimum of one thousand feet long and fourteen feet wide, ten feet of which shall be pavement. The breakdown areas shall be identified on the project by use of Changeable Message Signs or Stationary Signs placed in advance of each breakdown area, as approved by the Department. Prior to incorporation, the Design-Build Team shall submit a temporary pavement design for the breakdown areas. (Reference the Pavement Management Scope of Work found elsewhere in this RFP)

The Design-Build Team shall use a minimum six-foot offset to temporary traffic barrier along any shifting or merging taper, including but not limited to, existing, temporary, and / or proposed shifting or merging tapers. At the start of a taper, temporary traffic barrier shall continue along the tangent to achieve this six-foot offset. For all ramp / loop merge tapers, temporary traffic barrier shall continue parallel to the travel lanes a minimum of 200 feet beyond the start of the merge taper before flaring back towards the travel lanes in accordance with *Standard Drawing* No. 1101.11, Sheet 3.

When temporary traffic barrier is placed on a roadway shoulder, the Design-Build Team shall install shoulder closure signs and devices in advance of the barrier in accordance with the *Standard Drawings*.

The Design-Build Team shall not place temporary traffic barrier in any paved gore area. If the work cannot be safely performed without placing temporary traffic barrier in the paved gore area, the Design-Build Team shall temporarily close the ramp or loop in accordance with ICT #7.

Temporary traffic barrier used for traffic control shall not act as a retaining wall.

Temporary Alignments and Traffic Shifts

The Design-Build Team shall notify the Engineer in writing at least thirty (30) calendar days prior to any traffic pattern alteration. (Reference the Public Involvement and Information Scope of Work found elsewhere in this RFP)

Excluding median crossovers, the design speed for temporary alignments of interstates, US routes, and NC routes shall not be lower than the current posted speed limit. The minimum allowable design speed for temporary alignments on secondary roads shall be the higher of 10 mph below the posted speed limit or 35 mph.

All on-site detours shall meet the minimum number of existing lanes per direction and shall adhere to all temporary alignment requirements noted elsewhere in the RFP. All pavement transitions, including but not limited to cross slopes / superelevation, at on-site detour tie-ins shall adhere to the on-site detour design speed.

The Design-Build Team shall provide a smooth pavement surface for traffic at all times. The Design-Build Team shall not place traffic on lanes containing rumble strips unless the Design-Build Team mills the rumble strips and installs a uniform overlay on the lane prior to placing traffic on the lane. (Reference the Pavement Management Scope of Work found elsewhere in this RFP)

For temporary traffic patterns that will remain in place for a period longer than three days, including but not limited to traffic shifts, merges, and temporary alignments, breaks in the superelevation and / or breaks in a normal crown section will not be allowed within the shifting taper. Excluding the aforementioned temporary traffic patterns, breaks in the superelevation and / or breaks in a normal crown section shall only occur on a lane line or lane midpoint, and shall not exceed 0.04.

The Design-Build Team shall provide proper drainage for all temporary alignments and / or traffic shifts.

The *Standard Drawing* No. 1101.11, Sheet 1, shall be used to calculate the length of temporary merges for lane closures and temporary traffic shifts. All straight-line traffic shifts on interstate and US routes shall be designed for the full L distance (L = width of traffic shift times speed limit in mph).

Straight line traffic shifts of six feet or greater shall have the appropriate lane shift warning signs and solid white line pavement markings that separate the travel lanes. For straight line traffic shifts less than six feet, the need for signing and solid line pavement markings shall be determined by the Design-Build Team and accepted by the Department.

Temporary traffic shifts that are not covered by a standard and / or require vertical grades shall be considered a temporary alignment. All temporary alignments shall adhere to the NCDOT *Roadway Design Manual*, including all revisions, 2018 AASHTO *A Policy on Geometric Design of*

Highways and Streets and the most current Transportation Research Board *Highway Capacity Manual*.

Lane and Shoulder Requirements

Unless permitted otherwise elsewhere in this RFP, maintain the existing number of travel lanes on all roads. The Design-Build Team shall adhere to the minimum lane width requirements noted below. Maintaining these requirements will not be considered lane narrowing:

- Existing travel lanes that are equal to or greater than 11-feet wide, maintain minimum 11-foot travel lanes.
- Existing travel lanes that are narrower than 11-feet, maintain the existing travel lane widths.
- Travel lanes shall not exceed 18-feet wide at any time for the duration of the project.

The Design-Build Team shall maintain a minimum of two lanes along the I-440 South CD-road (-21CDSB-) to US 1 South (-Y1LT-) until the -21RAC- flyover is open to traffic.

For all temporary travel lanes (through lanes and exclusive turn lanes), excluding temporary traffic shift transitions and tapers, the wheel path of all design vehicles listed in Table 2-4a, *Design Vehicle Dimensions (U.S. Customary Units)* of the 2018 AASHTO *A Policy on Geometric Design of Highways and Streets* shall not be located within one-foot of a temporary or permanent longitudinal pavement joint line. The aforementioned one-foot measurements shall occur with the design vehicles centered within the temporary travel lanes.

Maintain a minimum inside and outside paved shoulder width of four feet in each direction of I-40 and US 1 / I-440 / US 64 unless temporary traffic barrier is placed on the paved shoulder. This requirement may be reduced to two feet paved shoulders under structures and one-foot paved shoulders along ramps. If temporary traffic barrier is placed on the shoulder, refer to the Traffic Control Devices and Temporary Traffic Barrier Systems subsections for shy distance and placement requirements.

On two-lane, two-way facilities, the Design-Build Team shall not install more than one (1) mile of lane closure in any one direction on any roadway within the project limits or in conjunction with this project, measured from the beginning of the merge taper to the end of the lane closure.

On multi-lane facilities, the Design-Build Team shall not install more than two (2) miles of lane closure in any one direction, measured from the beginning of the merge taper to the end of the lane closure.

For simultaneous lane closures in any one direction on any road within the project limits, a minimum of three (3) miles shall be provided between lane closures including those occurring in neighboring projects. The distance between lane closures shall be measured from the end of one closure to the beginning of the taper of the next lane closure.

Through traffic traveling in the same direction shall not be split, including separation by any type of barrier, bridge piers, existing or proposed median, or any other device.

The Design-Build Team shall remove lane closure devices from the lane when work is not being performed behind the lane closure or when a lane closure is no longer needed.

Place sets of three drums perpendicular to the edge of the travelway on 500-foot centers when unopened lanes are closed to traffic. These drums shall be in addition to channelizing devices.

When personnel and / or equipment are working within 15-feet of an open travel lane, the Design-Build Team shall close the nearest open shoulder using the *Standard Drawings*, unless the work area is protected by an approved temporary traffic barrier or guardrail.

When personnel and / or equipment are working withing 5-feet of an open travel lane on an undivided facility, the Design-Build Team shall, at a minimum, close the nearest open travel lane using the *Standard Drawings*, unless the work area is protected by an approved temporary traffic barrier or guardrail.

When personnel and / or equipment are working within 10-feet of an open travel lane on a divided facility, the Design-Build Team shall, at a minimum, close the nearest open travel lane using the *Standard Drawings*, unless the work area is protected by an approved temporary traffic barrier or guardrail.

When personnel and / or equipment are working within a lane of travel of an undivided or divided facility, the Design-Build Team shall, at a minimum, close the lane using the *Standard Drawings*. The Design-Build Team shall conduct the work so that all personnel and / or equipment remain within the closed travel lane.

The Design-Build Team shall not perform work involving heavy equipment within 15-feet of the edge of travelway when work is being performed behind a lane closure on the opposite side of the travelway.

The Design-Build Team shall provide paved motorist pull-offs along any full control of access freeway facility in accordance with the Motorist Pull-Off Area detail found on the NCDOT Work Zone Traffic Control's webpage below. The Design-Build Team shall submit a temporary pavement design for the pull off areas to the Department for review and acceptance prior to installation. (Reference the Pavement Management Scope of Work found elsewhere in this RFP).

https://connect.ncdot.gov/projects/WZTC/Pages/Design-Resources.aspx

Off-site Detours

Prior to incorporation, obtain written approval from the Engineer for all road and / or access point closures. Access point closures will only be allowed for locations that have multiple access points and all access point closures shall be coordinated with the property owner and the Engineer.

All offsite detour routes shall receive Department written approval prior to incorporation. All roads and lanes along the detour route shall remain open to traffic while the detour is in effect. Submit detour routes and all associated sign designs for review and acceptance prior to incorporation.

The Design-Build Team shall investigate all proposed detour routes. At a minimum, this investigation shall include analyzing the detour route capacity and geometry / characteristics to ensure the additional volume can be supported, investigating impacts to emergency services (access and response times) and schools, and investigating the structural integrity of the bridges and pavement along the detour route, including the existing shoulders. The Design-Build Team shall submit recommendations resulting from the aforementioned investigations / analyses for the Department's review and acceptance. The recommendations shall include mitigation for any impacts to emergency services (access and response times).

As determined by the Engineer, the Design-Build Team shall provide all improvements required to accommodate detoured traffic prior to utilizing detour routes.

Offsite detours that have non-signalized at-grade railroad crossings shall not be allowed.

Unless approved otherwise by the controlling governmental or private entity, in writing, use only state-maintained roads for off-site detour routes and / or haul roads.

All proposed road closures, detour routes, durations, and justifications shall be incorporated into the Technical Proposal. (All proposed road closures, detour routes, durations and justifications incorporated into the Technical Proposal shall require Department approval.)

Impacts to Other Network Roadways

The Design-Build Team shall coordinate with the Division Maintenance Engineer, Resident Engineer, Division Traffic Engineer, Rail Division, and STOC to manage traffic operations within the work zone and other roadways within the network that may be affected by the work zone activities. Coordination shall include, but not be limited to, providing notification of planned lane or road closures, traffic detours, public information, traffic management, access management, and incidents.

On all roads, the Design-Build Team shall make all modifications to existing pavement markings, markers, and / or signing located outside the project limits that are necessitated by the TMP. Additionally, the Design-Build Team shall readjust the markings, markers, and / or signing located outside the project limits to the existing / proposed pattern when the temporary changes are no longer needed.

The Design-Build Team shall take steps to minimize disruptions to existing roadway facilities during construction and shall demonstrate in the TMPC how the traffic control phasing minimizes inconvenience to motorists on all roads.

Pavement Edge Drop-off Requirements

The Design-Build Team shall mitigate longitudinal pavement edge or terrain drop-off conditions created by construction operations in accordance with the *NCDOT Transportation Management Plans Design Manual*.

Signing

The Design-Build Team shall install advance work zone warning signs when work is within 40 feet from the edge of travel lane. The advance work zone warning signs shall be installed no more than three days prior to beginning construction.

When no work is being conducted for a period longer than one week, the Design-Build Team shall remove or cover all advance work zone warning signs, as directed by the Engineer. Stationary work zone warning signs shall be covered with an opaque material that prevents reading of the sign at night by a driver traveling in either direction.

When portable work zone signs are not in use for periods longer than 30 minutes, the Design-Build Team shall lay the portable work zone sign flat on the ground and collapse the sign stand and lay it flat on the ground.

The Design-Build Team shall install and maintain all detour signing and devices required for road closures. The Design-Build Team shall cover or remove all detour signs and devices required for road closures, within and outside of the project limits, when a detour is not in operation.

The Design-Build Team shall ensure proper signing is in place at all times during construction as required by the MUTCD. Guide signs shall be maintained and modified, as required by the TMP, throughout the entire project construction duration. Temporary or modified Type A or B guide signs may be stationary mounted on temporary supports or on a portable movable system. Temporary guide signs that are not overhead-mounted shall be installed such that the bottom of the sign is a minimum of 7 feet and no more than 10 feet above the pavement surface and shall be rigid enough to withstand 90 MPH winds. Laterally, the outer edge of the guide sign shall not be more than 60 feet from the edge of travel. All temporary signing shall be shown on the TTCP, IMP, and / or Temporary Signing Plans to be reviewed and approved by the Work Zone Traffic Control Section, the Signing and Delineation Unit and STOC as appropriate, prior to incorporation.

Temporary Pavement Markings, Markers, and Delineation

The Design-Build Team shall install pavement markings and markers in accordance with the *Standard Specifications*, and in accordance with the manufacturer's procedures and specifications.

The Design-Build Team shall install temporary pavement markings and markers for temporary traffic patterns as follows.

Road	Marking	Marker
I-40, US 1 / I-440 / US 64 including all CD roads, ramps, and loops (excluding structures)	Work Zone Performance Pavement Markings (Reference the *Work Zone Performance Pavement Markings* Project Special Provision found elsewhere in this RFP)	Raised Temporary
All other roads	Any Marking on the Approved Product List	Raised Temporary

Prior to shifting traffic to a new pattern, the Design-Build Team shall 1) remove all conflicting markers and snowplowable marker castings, and patch all casting holes, and 2) remove or conceal all conflicting markings in accordance with the following requirements: (Reference the *Pavement Management Scope of Work* found elsewhere in this RFP)

- Pavement markings on concrete surfaces shall only be removed by hydroblasting.

- For traffic patterns in place for at least 30 days:
    - Pavement markings on asphalt surfaces of I-40 or US 1 / I-440 / US 64, including all CD roads, ramps, and loops, shall be either milled and filled, removed per the *Work Zone Blank Canvas* Project Special Provision, or concealed by applying a uniform overlay. At a minimum, the mill and fill, removal, or uniform overlay shall cover the entire width of any shifted travel lane(s) containing the conflicting markings and extend to the outside edge of any conflicting markings on shoulders.
    - Pavement markings on ultra-thin bonded wearing courses of I-40 or US 1 / I-440 / US 64, including all CD roads, ramps, and loops, shall be removed by milling the existing ultra-thin bonded wearing course and overlay with an ultra-thin bonded wearing course.

- Conflicting pavement markings on all other asphalt surfaces shall be concealed (in accordance with the requirements above), removed, or milled and filled.

Unless noted otherwise elsewhere in this RFP, removal of the temporary pavement markings on asphalt surfaces (other than I-40 or US 1 / I-440 / US 64, including all CD roads, ramps, and loops) shall be accomplished by an NCDOT approved system to minimize damage to the road surface. Pavement markings shall not be obscured with any type of black pavement markings (paint or

other material). The Design-Build Team shall remove all temporary pavement markings without removing more than 1/32 inch of the pavement surface.

By the end of each day's operation, and in accordance with the requirements above, the Design-Build Team shall conceal, remove, or mill and fill, as appropriate, all conflicting markings, replace all damaged markings, and remove / replace all conflicting / damaged markers.

Excluding pavement markings and markers not visible to traffic, conflicting pavement markings and markers shall be defined as any pavement marking or marker not being used for the current traffic pattern which is within six feet of any pavement marking required for the current traffic pattern.

The Design-Build Team shall tie proposed pavement marking lines to existing pavement marking lines.

The Design-Build Team shall show temporary pavement markings on the TMP that meet the requirements of the RFP and the NCDOT *Transportation Management Plans Design Manual*.

The Design-Build Team shall only use pavement marking and marker products that conform to all NCDOT requirements and are listed on the NCDOT Approved Products List. The use of any devices that are not shown on the NCDOT Approved Products List shall require written approval from the Alternative Delivery Unit prior to incorporation.

The Design-Build Team shall install temporary pavement markings that are the same width as existing pavement markings. For roadways that do not have existing pavement markings, the Design-Build Team shall install temporary pavement markings that are the same width required for the final pavement markings in the Pavement Markings Scope of Work found elsewhere in this RFP.

For Work Zone Performance Pavement Markings, the Design-Build Team shall maintain a minimum retroreflectivity in accordance with the *Work Zone Performance Pavement Markings* Project Special Provision found elsewhere in this RFP. The Design-Build Team shall submit a request to NCDOT for retroreflectivity readings within 10 days after a minimum of 2000 feet of temporary pavement markings are installed.

For all other pavement markings, the Design-Build Team shall maintain a minimum retroreflectivity for existing and temporary pavement markings at all times during construction as follows:

White:	125 mcd/lux/m2
Yellow:	100 mcd/lux/m2

When using Cold Applied Plastic Type 4 pavement markings, place temporary raised markers half on and half off edge lines and centerlines to help secure the tape to the roadway. Markers shall be spaced an appropriate distance apart as described by the *Standard Drawing* No. 1250.01, Sheet 1.

The Design-Build Team shall trace existing and / or proposed monolithic island locations with the proper color pavement marking prior to removal and / or installation. The Design-Build Team shall place drums to delineate existing and / or proposed monolithic islands after the removal and / or before installation.

The Design-Build Team shall not place temporary markings other than Cold Applied Plastic Type 4 - Removable Tape on any final pavement surface unless the temporary markings are placed in the exact location of the final pavement markings, or an alternate approved by the Engineer

The Design-Build Team shall readjust the markings, markers, and / or signing located outside the project limits to the existing / proposed pattern when the temporary changes are no longer needed.

Temporary Traffic Signals

At all intersections, multi-lane turn lanes shall be 15 feet in width at the midpoint of the turn.

If the Design-Build Team proposes temporary traffic signals for maintenance of traffic, include the following as part of the TMP General Notes:

- Notify the Engineer in writing a minimum of two months before a temporary traffic signal installation is required.

- Shift and revise all signal heads as shown on the accepted Traffic Signal Plans.

Lighting

The Design-Build Team shall provide portable temporary construction and equipment lighting to conduct night work in accordance with the *Standard Specifications*.

For nighttime lane closures along I-40 and US 1 / I-440 / US 64, furnish and install Sequential Flashing Warning Lights. (Reference Section 1140 of the *Standard Specifications* for *Sequential Flashing Warning Lights*)

Smart Work Zone Devices

For lane closures at any time along I-40 and US 1 / I-440 / US 64, furnish and install *Connected Lane Closure System* Project Special Provision found elsewhere in this RFP.

Temporary Shoring for Maintenance of Traffic

Temporary shoring for the maintenance of traffic shall be defined as shoring necessary to provide lateral support to the side of an excavation or embankment parallel to an open travelway when a theoretical 2:1 (H:V) slope from the bottom of the excavation or embankment intersects the existing ground line closer than five feet from the edge of pavement of the open travelway.

The Design-Build Team shall be responsible for all required temporary shoring including designing, furnishing, installing, maintaining, and removing the shoring.

The Design-Build Team shall identify where temporary shoring will be used for maintenance of traffic on the TMPC and include cut sections showing offsets to the travelway.

The Design-Build Team shall install temporary traffic barrier as shown on the "PCB at Temporary Shoring Locations" detail available on the Work Zone Traffic Control website noted below. This detail provides design information on the temporary traffic barrier location in relation to the temporary shoring and traffic location. Notes related to Temporary Shoring are not required in the General Notes sheet for the TMP.

The NCDOT Geotechnical Engineering Unit and Work Zone Traffic Control websites contain more information on the design and use of temporary shoring. The Design-Build Team shall adhere to all additional requirements for temporary shoring located on the websites below:

https://connect.ncdot.gov/resources/Geological/Pages/default.aspx

https://connect.ncdot.gov/projects/WZTC/Pages/Design-Resources.aspx

Law Enforcement

Law enforcement officers shall be used to direct traffic when installing / removing / shifting traffic signal heads at intersections and during flagging operations at signalized intersections. Law enforcement officers shall be a presence for all lane closures on I-40, I-440 and US 1 / US 64 by using their blue lights to regulate / control speeds. Law enforcement officers may be used to maintain traffic through other work areas and / or unsignalized intersections. The use of law enforcement officers shall adhere to article 1190 of the *Standard Specifications* and the following requirements:

- The Design-Build Team shall be responsible for coordinating with the law enforcement agency for the use of law enforcement officers.

- The Design-Build Team shall only utilize officers who are outfitted with law enforcement uniforms and marked vehicles equipped with proper lights mounted on top of the vehicle and agency emblems.

- The Design-Build Team shall coordinate with the Engineer where and how law enforcement officers will be used during construction.

The Design-Build Team shall address where and how law enforcement officers will be used in the Technical Proposal.

Shoulder Sweeping

At a minimum, the Design-Build Team shall conduct sweeping operations every two weeks, unless directed otherwise by the Engineer, on shoulders within the project and a minimum of one mile beyond the project limits in each direction on I-40 and US 1 / I-440 / US 64.

The Design-Build Team shall perform weekly removal of debris from the shoulders that is too large to be swept.

Work Zone Speed Limits

All speed limits shall have an ordinance provided by the State Traffic Engineer in order to have a lawfully enforceable speed limit; therefore, no speed limit messages / signs shall be installed prior to receiving a signed ordinance. NCDOT has sole authority of the speed limits displayed within the work zone.

Work Zone Variable Speed Reduction and $250 Speeding Penalty Ordinances

A Work Zone Variable Speed Reduction is intended to temporarily reduce the speed within the work zone at spot locations of short duration (1 day up to 30 days) where the temporary traffic control is usually to be removed within the same day. A Work Zone Variable Speed Limit cannot be in operation continuously (24/7) for a period exceeding 30 calendar days.

The Design-Build Team may request a Work Zone Variable Speed Limit Reduction and a $250 Speeding Penalty for all speed limit conditions on I-40 or US 1 / I-440 / US 64 to include but not limited to lane closure operations. The Design-Build Team shall request these measures in writing to the State Work Zone Engineer four weeks before construction is to begin in order to provide proper time to approve an ordinance for each of these. All speed limits shall be displayed on Digital Speed Limit Signs. (Reference the *Work Zone Digital Speed Limit Signs* Project Special Provision found elsewhere in this RFP)

When the digital speed limit signs are installed, the Design-Build Team shall cover or remove any existing speed limit signs located within the active work area.

The speed limit shall be returned to the current posted speed limit when the Work Zone Variable Speed Limit period has expired or is removed, and traffic is returned to the existing pattern.

The Design-Build Team shall be responsible for coordinating with the Engineer when the Work Zone Variable Speed Limits are to be changed and shall obtain approval from the Engineer before the Speed Limit is changed.

For all other operations, the Transportation Management Plan shall be designed to accommodate the current posted speed limit.

Digital Speed Limit Signs (DSLS)

The Design-Build Team shall furnish and install Work Zone Digital Speed Limit Signs (DSLS) to continuously display the work zone speed limit. (Reference the *Work Zone Digital Speed Limit Signs Project* Special Provision found elsewhere in this RFP.)

Work Zone Speed Limit Reduction Ordinance

If, at the Department's sole discretion, the Design-Build Team can justify that the TMPs cannot be designed to adhere to the existing I-40 or US 1 / I-440 / US 64 posted speed limit requirements, the Design-Build Team shall submit a formal Work Zone Speed Limit Reduction Ordinance request to the Design-Build Unit for approval. The request shall state the type of ordinance requested, why the ordinance is needed and why the TMPs cannot be designed to avoid the need. The request shall also include an Engineering Study that justifies the need for a Work Zone Speed Limit Reduction Ordinance. (Reference the criteria listed in the NCDOT Work Zone Traffic Control Guidelines) Upon receipt of the formal request, the Design-Build Team shall allow six weeks for the Work Zone Speed Limit Reduction Ordinance to be approved. The Design-Build Team shall provide and install proper signing for all approved Work Zone Speed Limit Reduction Ordinances. The Design-Build Team shall identify the need for a Work Zone Speed Limit Reduction Ordinance in the Technical Proposal.

Project Coordination

The Design-Build Team shall coordinate with all Contractors and NCDOT Resident Engineers in charge of any project in the vicinity of this project for any work that may affect the construction, traffic operations, and placement of temporary traffic control devices (including advance warning signs) on all roads within the project limits and associated with this project.

At a minimum, the Design-Build Team shall coordinate with the Division Traffic Engineer, Law Enforcement, Emergency Services and the Work Zone Traffic Control Section to schedule and attend Traffic Safety and Operations Meetings. These meetings shall be held to monitor and assess safety and mobility during construction. The Traffic Safety and Operations Meetings shall be held on an as needed basis during project construction. Additional Traffic Safety and Operations Meetings shall be held to address any specific issue, as directed by the Engineer.

PROJECT REQUIREMENTS AND TIME RESTRICTIONS

All time restrictions and notes shall be included in the TMP General Notes, unless noted otherwise elsewhere in this RFP.

In the event any self-imposed liquidated damages are included in the Technical Proposal, an Intermediate Contract Time(s) shall be established and shall become part of the contract.

Intermediate Contract Times #3, #4, #5, #6, and #7 for Lane Narrowing, Lane Closure, Holiday and Special Event Restrictions

Except as allowed otherwise elsewhere in this RFP, the Design-Build Team shall maintain the existing traffic pattern and shall not close or narrow a lane of traffic during the times listed below. Construction operations requiring a lane closure on a CD road, ramp, or loop section with a single lane shall be defined as a road closure and shall be subject to the intermediate contract times for road closures noted in ICT #9 found elsewhere in this Scope of Work.

Intermediate Contract Time	Facility	Days	Time Restrictions
#3	I-40 and US 1 / I-440 (Single-Lane Closure), including lane closures on any multilane CD road, ramps, and loops	Monday through Friday	5:00 a.m. to 9:00 p.m.
		Saturday and Sunday	7:00 a.m. to 9:00 p.m.
#4	I-40 and US 1 / I-440 / US 64 (Double-Lane Closure)	Monday through Friday	5:00 a.m. to midnight
		Saturday and Sunday	6:00 a.m. to midnight
#5	Walnut Street and Jones-Franklin Road (Single-Lane Closure)	Monday through Friday	6:00 a.m. to 8:00 p.m.
		Saturday and Sunday	9:00 a.m. to 9:00 p.m.
#6	Walnut Street (Double-Lane Closure)	Monday through Friday	5:00 a.m. to 11:00 p.m.
		Saturday and Sunday	6:00 a.m. to midnight
#7	Crossroads Blvd	Monday through Friday	6:00 a.m. to 8:00 p.m.
		Saturday and Sunday	9:00 a.m. to 9:00 p.m.

In addition, the Design-Build Team shall not close or narrow a lane of traffic on the aforementioned facilities, detain, and / or alter the traffic flow on or during holidays, holiday weekends, special events, or any other time when traffic is unusually heavy. At a minimum, these requirements / restrictions shall apply to the following schedules:

- For any unexpected occurrence that creates unusually high traffic volumes, as directed by the Engineer.

- For New Year's between the hours of 5:00 a.m. December 31st and 9:00 p.m. January 2nd. If New Year's Day is on a Friday, Saturday, Sunday or Monday then between the hours of 5:00 a.m. December 31st and 9:00 p.m. the following Tuesday.

- For Easter, between the hours of 5:00 a.m. Thursday and 9:00 p.m. Monday.

- For Memorial Day, between the hours of 5:00 a.m. Friday and 9:00 p.m. Tuesday.

- For Independence Day, between the hours of 5:00 a.m. July 3rd and 9:00 p.m. July 5th. If Independence Day is on a Friday, Saturday, Sunday or Monday, then between the hours of

5:00 a.m. the Thursday before Independence Day and 9:00 p.m. the Tuesday after Independence Day.

- For Labor Day, between the hours of 5:00 a.m. Friday and 9:00 p.m. Tuesday.
- For Thanksgiving Day, between the hours of 5:00 a.m. Tuesday and 9:00 p.m. Monday.
- For Christmas, between the hours of 5:00 a.m. the Friday before the week of Christmas Day and 9:00 p.m. the following Tuesday after the week of Christmas Day.
- For the North Carolina State Fair, every day the State Fair is open to the public from 9:00 a.m. to midnight.
- For football games at Carter-Finley Stadium, from three (3) hours before the beginning of an event to two (2) hours after the end of an event.

Liquidated Damages for Intermediate Contract Time #3 for the above lane narrowing, lane closure, holiday and special event time restrictions for a single lane on I-40 or US 1 / I-440 / US 64, including lane closures on any multilane CD road, ramps, and loops, are $1,250.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #4 for the above lane narrowing, lane closure, holiday and special event time restrictions for two or more lanes on I-40 or US 1 / I-440 / US 64 are $2,500.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #5 for the above lane narrowing, lane closure, holiday and special event time restrictions on Walnut Street or Jones-Franklin Rd are $750.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #6 for the above lane narrowing, lane closure, holiday and special event time restrictions for two lanes on Walnut Street, are $1,500.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #7 for the above lane narrowing, lane closure, holiday and special event time restrictions on Crossroads Blvd are $500.00 per 15-minute period or any portion thereof.

Intermediate Contract Times #8 and #9 for Road Closure Restrictions for Construction Operations

Unless allowed otherwise elsewhere in this RFP, at a minimum, the Design-Build Team shall maintain the existing traffic pattern and follow the road closure restrictions for all roadways listed below. When a road closure is used, the Design-Build Team shall reopen the travel lanes by the end of the road closure duration to allow the traffic queue to deplete before re-closing the roadway.

Unless allowed otherwise elsewhere in this RFP, the Design-Build Team shall not close any direction of travel on the following roads or any ramps / loops during the times noted below; and only close the following roads or any ramps / loops for the operations listed in this intermediate contract time. Using a median crossover, exclusively for the operations listed below, shall be defined as a closure of a direction of travel.

A crossover providing one lane in each direction on I-40 or US 1 / I-440 / US 64 will be allowed for the purpose of bridge demolition, and girder, overhang, and falsework installation and / or removal during the times set forth below. No other roads shall be put in a crossover pattern. If the Design-Build Team elects to use a crossover for the aforementioned activities, during the times set forth below, the crossover shall be designed and constructed to meet a design speed of no more than 20 mph below the posted speed limit prior to implementation of a reduced work zone speed limit. Unless approved otherwise by the Engineer, in writing, the maximum allowable distance between the crossovers shall be 2,750 feet. The Design-Build Team shall monitor the traffic queue during operation of the crossover. Should the traffic queue extend to the advance warning signs, traffic shall be returned to the existing number of lanes in each direction until the traffic queue is depleted.

Intermediate Contract Time	Facility	Days	Time Restrictions
#8	I-40 or US 1 / I-440 / US 64	Monday through Friday	5:00 a.m. to midnight
		Saturday and Sunday	Midnight. to 1:00 a.m. and 6:00 a.m. to midnight
#9	Any CD road, ramp, or loop	Monday through Friday	5:00 a.m. to 9:00 p.m.
		Saturday and Sunday	7:00 a.m. to 10:00 p.m.

For the operations noted below, with an approved offsite detour, the above roadways may be closed according to the time restrictions listed in the appropriate Road Closure ICT for the operations listed below:

- Bridge demolition
- Girder, overhang, and falsework installation and / or removal
- Installation overhead sign assemblies and / or work on existing overhead sign assemblies over travel lanes, or traffic signal poles and cables across roadways
- Tie-in work to implement or remove an on-site detour

- For roadways listed in Intermediate Contract Time #9, paving operations, striping, or barrier installation and / or removal on single lane ramps/loops

Proposed road closures for any road within the project limits shall be approved by the Engineer, in writing, prior to incorporation in the TMP.

Liquidated Damages for Intermediate Contract Time #8 for the above road closure time restrictions for construction operations on I-40 or US 1 / I-440 / US 64 are $5,000.00 per 15-minute period or any portion thereof.

Liquidated Damages for Intermediate Contract Time #9 for the above road closure time restrictions for construction operations on any CD road, ramp, or loop are $2,500.00 per 15-minute period or any portion thereof.

Intermediate Contract Times #10, #11, #12, #13 and #14 for Ramp, Loop, or CD Reconstruction

One road closure, with an approved offsite detour, will be permitted for the reconstruction for the maximum durations listed below. The Design-Build Team shall not concurrently close more than one ramp or loop at the same interchange. The Design-Build Team shall not concurrently close any ramps or loops at adjacent interchanges. The Design-Build Team shall not concurrently close any ramp or loop, and associated -L- or -Y-. The Design-Build Team shall not close any ramp or loop that creates an overlapping detour with other closures. Intermediate Contract Times Contract Times #10, #11, #12, #13 and #14 shall not impose restrictions during the Intermediate Contract Times #3, #4, #5, #6, and #7 Holiday and Special Event schedules.

Intermediate Contract Time	Ramp / Loop / CD	Duration (Per ramp, loop, or CD)
#10	-21RA-	15 consecutive calendar days
#11	Existing Loop C & I-40 South CD Road starting after Loop D and ending at Existing Ramp D	15 consecutive calendar days
#12	Existing Loop D & I-40 South CD Road starting at Existing Ramp C and ending at existing Loop C	15 consecutive calendar days
#13	Ramps at Gorman Street	56 consecutive hours
#14	Ramps at Lake Wheeler Road	56 consecutive hours

The date of availability for Intermediate Contract Times #10, #11, and #12 shall be the date the Design-Build Team elects to close the ramp / loop. The date of availability for Intermediate Contract Times #13 and #14 shall be 9:00 PM on the Friday that the Design-Build Team elects to close the ramp / loop. The Design-Build Team shall provide the Engineer a minimum of 30 days written notice prior to the date of availability. The date of completion shall be the number of consecutive hours or days proposed by the Design-Build Team in the Technical Proposal, and such number of consecutive hours or days proposed shall not be greater than the days noted above.

Liquidated Damages for Intermediate Contract Time #10, #11, and #12 for the above road closure time restrictions for ramp, loop, or CD reconstruction are $10,000.00 per calendar day or any portion thereof.

Liquidated Damages for Intermediate Contract Time #13 and #14 for the above road closure time restrictions for ramp, loop, or CD reconstruction are $2,000.00 per hour or any portion thereof.

Intermediate Contract Time #15 for the installation of Work Zone Performance Pavement Markings

Intermediate Contract Time #15 is for the Design-Build Team to install Work Zone Performance Pavement Markings to refresh all existing markings on I-40 and I-440 / US 1 / US 64, including all CD roads, ramps, and loops (Reference the *Work Zone Performance Pavement Markings* Project Special Provision found elsewhere in this RFP). The Design-Build Team shall adhere to any lane closure restrictions found elsewhere in this RFP. This work will not be subject to a completed IMP or the installation of portable ITS devices for incident management as described elsewhere in this RFP.

The Date of Availability for Intermediate Contract Time #15 is the date of availability for this contract.

The completion date for Intermediate Contract Time #15 is defined as the date proposed in the Technical Proposal by the proposer who is awarded the project. The completion date thus proposed shall not be later than October 1, 2027.

Liquidated Damages for Intermediate Contract Time #15 for the installation of Work Zone Performance Pavement Markings on I-40, US 1 / I-440 / US 64, including CD roads, ramps, and loops are $250.00 per day or any portion thereof

Intermediate Contract Time #16 for Lane Reduction for Pavement Replacement

The Design-Build Team may reduce US 1 / I-440 / US 64 North to two (2) through lanes between the -21RD- gore and the -R21RA- gore for pavement replacement contingent on the following conditions being met:

- Crossroads Blvd. to US 1 / I-440 / US 64 North Ramp D is closed to traffic

AND

- US 1 / I-440 / US 64 North to I-40 West Loop A is closed and Flyover -21RDB- is open

OR

- US 1 / I-440 / US 64 North to I-40 West Loop A is accessed by a CD-road separated from US 1 / I-440 / US 64 North

The Date of Availability for Intermediate Contract Time #16 shall be the date the Design-Build Team elects to reduce lanes on US 1 / I-440 / US 64 North and when the above conditions are met. The Design-Build Team shall provide the Engineer a minimum of 30 days written notice prior to the date of availability

The date of completion shall be the number of consecutive days proposed by the Design-Build Team in the Technical Proposal, and such number of consecutive days proposed shall not be greater than 215 calendar days. Intermediate Contract Time #16 shall not coincide with the North Carolina State Fair.

Liquidated Damages for Intermediate Contract Time #16 for Lane Reduction for Pavement Replacement on US 1 / I-440 / US 64 North are $10,000.00 per day or any portion thereof.

Intermediate Contract Time #17 for Lane Reduction for Pavement Replacement

The Design-Build Team may reduce US 1 / I-440 / US 64 South to two (2) through lanes between the quadrant B southbound CD gore and the -21RAC- gore for pavement replacement.

The Date of Availability for Intermediate Contract Time #17 shall be the date the Design-Build Team elects to reduce lanes on US 1 / I-440 / US 64 South. The Design-Build Team shall provide the Engineer a minimum of 30 days written notice prior to the date of availability

The date of completion shall be the number of consecutive days proposed by the Design-Build Team in the Technical Proposal, and such number of consecutive days proposed shall not be greater than 215 calendar days. Intermediate Contract Time #17 shall not coincide with the North Carolina State Fair.

Liquidated Damages for Intermediate Contract Time #17 for Lane Reduction for Pavement Replacement on US 1 / I-440 / US 64 South are $10,000.00 per day or any portion thereof.

Intermediate Contract Time #18 for Failure to Repair a Damaged or Malfunctioning Dynamic Traveler Information System Device

The Design-Build Team shall provide uninterrupted, continuous operation of all devices included in the Dynamic Traveler Information System Project Special Provision found elsewhere in this RFP. The Design-Build Team shall immediately report device damages and malfunctions to the

Engineer, the TRTMC, and the STOC. The Design-Build Team shall repair all damages and malfunctions, and bring all devices back online within 24 hours at no cost to the Department.

Liquidated Damages for Intermediate Contract Time #18 for failure to repair a damaged or malfunctioning Dynamic Traveler Information System device and restore operation within 24 hours are $250.00 per calendar day or any portion thereof.

Hauling Restrictions

The Design-Build Team shall adhere to the hauling restrictions noted in the *Standard Specifications*.

The Design-Build Team shall conduct all hauling operations as follows:

- The Design-Build Team shall not conduct any hauling operations against the flow of traffic of an open travelway unless an approved temporary traffic barrier or guardrail separates the traffic from the hauling operation.

- All entrances, exits and crossings for hauling to and from the work zone shall be shown on the TMP. Entrances and exits for access to and from medians shall be in accordance with the *Standard Drawings* and the *Typical Median Access Areas* Project Special Provision found elsewhere in this RFP.

- Haul vehicles shall not enter and / or exit an open travel lane at speeds more than 10 mph below the posted speed limit. Haul vehicle acceleration to within 10 mph of the posted speed limit shall only occur on a paved surface.

- Signs with activated Beacons or LED flashers shall be installed and used when hauling from the median. These signs shall be activated once haul vehicles are detected to warn motorists of vehicles entering the highway from the median. (Reference the *Typical Median Access Areas* Project Special Provision found elsewhere in this RFP)

- Hauling operations that perpendicularly cross a roadway shall require Transportation Management Plans and shall be subject to the lane narrowing / lane closure time restrictions, and holiday and special event time restrictions listed in ICT #1 - ICT #5.

Excluding hauling operations that are conducted entirely behind a temporary traffic barrier or guardrail, single and multi-vehicle hauling shall not be allowed ingress and egress from any open travel lane during the following time restrictions:

Single Vehicle Hauling

Facility	Days	Time Restrictions
I-40 or US 1 / I-440 / US 64, including any ramp or loop	Monday through Friday	6:00 a.m. to 9:00 a.m. and 3:00 p.m. to 6:00 p.m.

Multi-Vehicle Hauling

Facility	Days	Time Restrictions
I-40 or US 1 / I-440 / US 64, including any ramp or loop	Monday through Sunday	5:00 a.m. to 9:00 p.m.

The Design-Build Team shall address how hauling will be conducted in the Technical Proposal, including: identifying work area access locations; hauling of any materials to and from the site; and hauling material within the NCDOT right of way.

NCDOT Contract Towing

The NCDOT anticipates administering a Towing Contract in conjunction with this project. The Design-Build Team will be responsible for coordinating with the tow contractor for the Incident Management Plan. The Design-Build Team shall be responsible for the following:

- Prior to any construction activity, the Design-Build Team shall participate in towing coordination meetings with the Alternative Delivery Unit, Division, STOC, towing contractor(s), State Highway Patrol (SHP), and local law enforcement. The meeting shall finalize the locations where vehicles will be towed, the process by which specific towing information will be conveyed to the appropriate personnel and confirm the towing requirements. Potential recovery vehicle staging and safety tow locations shall also be identified

UTILITIES SCOPE OF WORK (10-2-26)

**** NOTE ** Within 45 days of contract execution, the Design-Build Team and their Utility Firm(s) shall meet with representatives of all the utility companies and the appropriate NCDOT Utility and Alternative Delivery personnel.**

GENERAL

The Design-Build Team Utilities work shall include, but is not limited to, the following:

- Utilities Coordination for the relocation, removal, and protection of all utilities in conflict with the project.
- Designing, permitting, and constructing all water and sewer facilities that conflict with the project.
- Preparing all utility agreements as required for review and execution by NCDOT.

The Design-Build Team shall obtain the services of a Professional Services Firm (PSF) that has performed utility coordination on at least two similarly sized projects for NCDOT and is prequalified through NCDOT for Utility Coordination (discipline code 00270).

The Design-Build Team shall obtain the services of a Professional Engineering Firm (PEF) that has performed water and sewer engineering design on at least two similarly sized projects for NCDOT and is prequalified through NCDOT for Public Water Distribution Systems (discipline code 00173), Public Water Transmission Systems (discipline code 00174), Sanitary Sewer Collection Systems (discipline code 00173), and Sanitary Sewer Outfall Systems (discipline code 00173).

The prequalified utility coordination PSF shall provide a qualified representative to act as the Utilities Coordinator for the project.

The prequalified water and sewer engineering design PEF shall provide a qualified representative to act as the Utilities Design Engineer for the project.

For the Utility Scope of Work, the term 'Utility Firm(s)' shall refer to both the PSF and PEF utility firms working on behalf of the Design-Build Team.

Project Roles

The Utilities Coordinator shall coordinate the relocation activities of all utilities on the project and act as the primary contact for the Design-Build Team when coordinating with the utility owners and NCDOT for all utility relocation activities.

The Utilities Design Engineer shall be responsible for all engineering design and permitting of relocations for water and sewer facilities for the project.

General Utility Requirements

During the procurement phase and throughout the project duration, the Design-Build Team shall only be allowed direct contact with the utility owners when the Utility Firm is present.

In accordance with the requirements herein, the Utility Firm shall coordinate and the Design-Build Team shall relocate all existing facilities that are:

(A) Parallel to a roadway in full control of access,

(B) In physical conflict with the project,

(C) If structurally inadequate utility facilities are encountered on the project, they shall be relocated by the Design-Build Team and will be paid for as extra work in accordance with Subarticle 104-8(A) of the *Standard Specifications.*

(D) Within the existing or proposed right of way, any pipe used for pressure application and constructed from an unsuitable pipe material including asbestos cement, PVC SDR 26, and lead-jointed pipe.

Proposed / relocated underground facilities that are located beneath the pavement structure shall only be allowed to cross the roadway at as close to perpendicular as possible.

The Design-Build Team shall be responsible for coordination of utility installation, removal, and relocation within railroad right of ways or easements between the railroads and utility providers for all existing facilities in physical conflict with the project.

The Design-Build Team and their Utility Firm shall be responsible for ensuring the utilities are relocated both horizontally and vertically, in accordance with the accepted utility relocation plans. Unless otherwise directed by the Department, additional compensation for coordination and relocations after the initial relocation shall be at no additional cost to the Department and any additional costs of the utility owner shall be the responsibility of the Design-Build Team.

The Design-Build Team shall not commence work at points where the highway construction operations are adjacent to utility facilities, until making arrangements with the utility owner to protect against damage that might result in expense, loss, disruption of service or other undue inconvenience to the public or utility owner. The Design-Build Team shall be responsible for damage to the existing or relocated utilities resulting from the Design-Build Team's operations. In the event of service interruption of any utilities, the Design-Build Team and their Utility Firm shall promptly notify the utility owner and cooperate with the utility owner in the prompt restoration of service.

The Design-Build Team shall accommodate any utility adjustments, reconstruction, new installation or routine maintenance work that may be underway or take place during the progress of the contract.

The Utility Firm shall coordinate Utilities work with other projects within or adjacent to the limits of this project (Reference the *Cooperation Between Contractors* Project Special Provision found elsewhere in this RFP).

The Design-Build Team shall be responsible for providing construction staking services for all project elements necessary to support utility coordination and installation. This includes, but is not limited to, the following:

- Public Utility Easements (PUE)
- Right-of-Way (ROW) boundaries
- Drainage infrastructure (e.g., pipes, culverts)
- Mechanically Stabilized Earth (MSE) walls
- Structures (bridges, retaining walls, sound walls, etc.)
- Other walls and related features

The Design-Build Team shall ensure that staking is performed accurately and in compliance with project plans, specifications, and applicable standards to facilitate utility owner's operations and construction activities.

The Design-Build Team shall be responsible for performing all tree clearing and trimming necessary within the Right-of-Way (ROW) and Public Utility Easements (PUE) to facilitate the relocation of utilities for the project. Tree clearing shall be performed from ground to sky to ensure full clearance for utility installation and to provide future maintenance corridor. If both overhead and underground utilities will occupy the space to be cleared, the DBT shall coordinate clearing and grubbing activities with the respective utility owners to avoid conflicts and ensure proper sequencing.

Utility Details

The Utility Firm shall be responsible for verifying the utility locations, type of facilities, and identifying the utility owners in order to coordinate the relocation of any utilities, known and unknown, in conflict with the project. The following utilities are known to be located within the project construction limits:

Utility Owner List		
Utility Type	**Utility Owner**	**Anticipated Cost Responsibility**
Water / Sewer	City of Raleigh	Design-Build Team
Water / Sewer	Town of Apex	Design-Build Team
Water / Sewer	Town of Cary	Design-Build Team
Gas	Enbridge Gas	Utility Company or NCDOT (w / accepted Prior Rights)
Power (Transmission)	Duke Energy	Utility Company or NCDOT (w / accepted Prior Rights)
Power (Distribution)	Duke Energy	Utility Company or NCDOT (w / accepted Prior Rights)
Telecommunications	Duke Energy Fiber	Utility Company or NCDOT (w / accepted Prior Rights)
Telecommunications	AT&T (Distribution)	Utility Company or NCDOT (w / accepted Prior Rights)
Telecommunications	Verizon (MCI)	Utility Company or NCDOT (w / accepted Prior Rights)
Telecommunications	Charter Communications	Utility Company
Telecommunications	Lumen (Formerly Centurylink / Level 3)	Utility Company
Telecommunications	Segra	Utility Company
Telecommunications	Celito	Utility Company
Telecommunications	Crown Castle	Utility Company
Telecommunications	Google Fiber (Access)	Utility Company
Telecommunications	Google Fiber (Distribution)	Utility Company
Telecommunications	MCNC	Utility Company

Please refer to the Utility Contact List in the *Materials Provided* folder for list of initial utility owner contact information.

Town of Apex

The Department has initiated utility relocation coordination efforts on this project with Town of Apex for their existing sewer facilities. The Town of Apex maintains an existing 18-inch sewer force main that serves as an emergency backup and discharges to a Raleigh Water gravity sewer line in the vicinity of Ramp -21RA-. This sewer force main must remain operational throughout the duration of the project, except when temporary shutdowns are necessary to make connections if it conflicts with the project.

The Town of Apex also has a metering facility along Ramp -21RA- that is currently located outside the existing C/A and within the proposed C/A as shown in the preliminary plans. The metering facility is labeled as "CONC PAD W/ SS VAULT". There is no existing metering equipment at this facility. Therefore, if relocation is required, the metering facility infrastructure shall be designed, permitted and relocated; however, no new metering equipment shall be required.

Please refer to the *Materials Provided* folder for drawings for this existing sewer force main and metering facility. The metering facility plan and profile are shown on Sheet No. 16 of 21 and the metering facility details are shown on sheet 18 of 21 of the provided.

The Utility Firm shall be responsible for continued coordination efforts with Town of Apex after award of the project.

Duke Energy Transmission

The Department has initiated utility relocation coordination efforts on this project with Duke Energy Transmission for their existing facilities. The following transmission towers are in conflict with the preliminary plans:

- Existing 230KV H-frame transmission tower (Str 42), located near the Piney Plains Rd / Dillard Dr intersection in the vicinity of proposed Ramp -3RC- at approximate STA 31+00, and proposed Ramp -3LD- at approximate STA 22+50*.

- Existing 230KV transmission tower, located near the proposed off-ramp from US 64 onto I-40 East within the southwest quadrant (Ramp D) in the vicinity of proposed Ramp -21RD- at approximate STA 39+00.

* The Department has revised the Roadway Scope of Work in this area, and this tower is no longer in conflict with the project. Refer to Roadway Scope of Work for additional information.

Due to the proximity of the Cary Piney Plains Substation located near Piney Plains Road, both transmission lines / towers cannot be taken out of service or relocated concurrently during the project. Accordingly, the Design-Build Team shall assume the following:

NOTE Deleted bullet on the Utility Relocation Agreement (URA) for for both identified transmission structure conflicts

- Relocation of a single transmission structure conflict shall be completed within 24 months after execution of a URA.

The Design-Build Team shall be responsible for coordinating execution of any URA after award.

The Design-Build Team shall identify in the Technical Proposal efforts to reduce impacts to the Duke Energy Transmission line . Provide the extent of any impacts and justification.

To avoid impacts to the Duke Energy Transmission structure located just outside the existing Right of Way at approximately Station 39+00 -21RD-, the Design-Build Team shall not acquire any additional right of way or easements, temporary or permanent, from approximate Stations 38+50 to 40+20 -21RD-.

Please refer to the *Materials Provided* folder for additional information provided by Duke Energy Transmission for this project.

Standards & Guidelines

Unless noted otherwise elsewhere in this RFP, the Design-Build Team's Utility Firm utilities coordination and engineering designs shall, at a minimum, be in accordance with the standards and guidelines, effective on the Technical Proposal submittal date, as set forth in the following:

(A) NCDOT *Utilities Accommodation Manual,* posted on the following website:

https://connect.ncdot.gov/municipalities/Utilities/Pages/UtilitiesManuals.aspx

(B) *Federal Aid Policy Guide* - Subchapter G, Part 645, Subparts A & B

(C) *Federal Highway Administration's Program Guide, Utility Adjustments & Accommodations on Federal Aid Highway Projects*

(D) NCDOT *Construction Manual* - Section 105-8

(E) NCDOT *Right of Way Manual* - Chapter 16 Utility Relocations

(F) NCDOT *Roadway Standard Drawings*

(G) *NCDEQ Public Water Supply* - Rules Governing Public Water Supply

(H) *NCDEQ Division of Water Resources* - Title 15A - Environment and Natural Resources

(I) *NCDEQ Division of Water Resources* – Minimum Design Criteria for Gravity Sewers

(J) *NCDEQ Division of Water Resources* – Minimum Design Criteria for Pump Stations and Force Mains

WATER AND SEWER DESIGN

After the Department accepts the Preliminary Roadway Plans developed by the Design-Build Team, the Utilities Coordinator shall conduct a pre-design meeting between the water and sewer utility owners, the Utilities Design Engineer, the Design-Build Team, and the appropriate NCDOT Utilities Unit and Alternative Delivery Unit representatives prior to the submission of the Preliminary Water and / or Sewer Plans.

The Utilities Design Engineer shall provide an anticipated submittal schedule to the utility owner and NCDOT that identifies all anticipated water and sewer design submittals and their expected dates. This schedule shall be submitted at least forty-five (45) calendar days prior to transmitting any water or sewer design submittals to the utility owner and NCDOT.

The Utilities Design Engineer shall prepare all water and sewer plans required for utility agreements and permits; prepare and submit all required permits directly to the regulatory agencies and obtain approval from the agencies. The Design-Build Team shall be responsible for all permit fees.

The Utility Firm shall provide water and sewer designs for all water and sewer facilities impacted by the project, including, but not limited to, all haul roads and temporary conditions resulting from the Design-Build Team's methods of operation or sequence of work. **All** water and sewer designs, including all temporary relocations and / or protection of existing water and sewer facilities, shall be coordinated with the NCDOT Utilities Unit and the respective utility owner(s).

The Design-Build Team shall relocate / replace all commercial and residential backflow preventors impacted by the project in accordance with the local authority's design Policies and Regulations (i.e. Town, City, County, etc.). The Department will provide a list of field identified backflow devices located within the limits of the project. The locations of these devices are in a spreadsheet (*BFP Table – I-5701, I-5703)*, provided by the Department, in the materials provided folder. Please confirm size and location with utility owner and parcel owner. Please be advised other backflow devices could be present within the project limits.

The relocation and protection of all water and sewer facilities shall be done in accordance with the NCDOT policies and standards, as well as the latest water and sewer design requirements and specifications for each individual utility company that are current as of the Technical Proposal submittal date or the Best and Final Offer submittal date, whichever is the later. In the event of conflicting design parameters in the requirements noted above, the proposed design shall adhere to the most conservative values. The materials and appurtenances proposed by the Design-Build Team shall require acceptance by both NCDOT and the appropriate utility owner prior to installation. Protection of water and sewer facilities shall include, but not be limited to, encasement, lining and bridging.

The Design-Build Team and their Utility Firm shall design and construct water / sewer facility extensions to all parcels with access to existing water and / or sewer facilities, including parcels subdivided by the project. The aforementioned water facility extensions shall be installed completely within the right of way. The aforementioned sewer facility extensions shall be installed completely within the right of way or a recorded easement.

Excluding water and / or sewer extensions due to encroachment into wells or septic systems, all costs associated with the design and construction for relocation, extension, and protection of water and / or sewer facilities shall be the responsibility of the Design-Build Team and shall be included in the lump sum bid for the entire project.

If total property acquisition is unavoidable due to encroachment into wells and / or septic systems, the Utility Firm shall investigate and determine if extending water and / or sewer lines to the affected property is cost effective. If the Department concurs with the determination that a utility extension is cost effective, the costs associated with the utility design and construction shall be paid for as extra work in accordance with Article 104-7 of the *Standard Specifications*.

Any shutdowns that are required for connection to existing water or sewer shall be limited to a single 4-hour period. The Design-Build Team shall provide temporary bypass water or sewer service if any disruption of service exceeds a single 4-hour period.

The Design-Build Team shall concurrently submit all water and sewer design submittals to the NCDOT State Utilities Manager, via the Alternative Delivery Unit, and to the appropriate utility owner for review and acceptance. All water and sewer design submittals shall include a title sheet, legend and notes sheets, detail sheets, plan sheets, profile sheets and special provisions, as required. All water and sewer design submittals shall be one full size set, submitted electronically in .pdf and .dgn format. Excluding the Release for Construction Water and / or Sewer Plans, the Design-Build Team shall allow the utility owners 30 days to review each water or sewer design submittal. The Utilities Design Engineer shall issue a reminder to the utility owner on day 21 and notify NCDOT on day 30 if comments from the utility owner are outstanding.

Prior to (re)submitting any subsequent water and sewer design submittals, the Design-Build Team shall receive and address review comments from the Department and the utility owner for the previous submittal.

The Utilities Design Engineer shall conduct a design review meeting with the utility owner and NCDOT no sooner than 7 calendar days and no later than 14 calendar days after the design submittal has been transmitted to the utility owner. The purpose of this meeting is to review the design plans and address any questions from the utility owner prior to the utility owner submitting formal comments.

At a minimum, the water and / or sewer design submittals shall be as follows:

(A) Preliminary Water and / or Sewer Design Submittal, shall be submitted after the Department accepts the 100% Hydraulic Plans.

(B) Final Water and / or Sewer Design Submittal, shall be submitted after the Department accepts the Right of Way / 60% Roadway Plans.

(C) Release for Construction Water and / or Sewer Design Submittal, shall be submitted after the Department accepts the Final Water and / or Sewer Plans.

The Utility Design Engineer shall provide the Agreement Package, which shall include the Release for Construction Plans, color coded in accordance with the NCDOT Agreement Plans Color Coding requirements, special provisions, and a construction estimate with unit quantities. The Department will send the appropriate utility agreement (Utility Construction Agreement (UCA) or Use & Occupancy Agreement (U&O)), with the Agreement Package, to the utility owner for their review and execution. The Agreement Package documents shall be submitted concurrently with the RFC Water and Sewer Design Submittal. Acceptance of the RFC Water and Sewer Submittal is contingent upon the submission of an acceptable Agreement Package.

No water or sewer relocation work shall commence on site until the Utility Construction Agreement has been fully executed. No betterment work shall be installed or shown on the Utility Construction Plans without written authorization from the applicable utility owner. Any betterment work performed prior to receiving such written authorization shall be completed at the Design Build Team's sole expense.

Upon completion of the water and sewer relocations and protective measures, the Design-Build Team shall provide the following:

(A) Lump sum construction costs for the relocations and protective measures that are separated by individual utility owner and TIP project to the Department; and

(B) As-Built Plans to the Department and the utility owner. At a minimum, the As-Built Plans shall include all revisions that occurred during construction, as well as all field adjustments. The As-Built Plans shall be in accordance with NCDOT requirements and the utility owner's requirements, whichever is more conservative. The As-Built Plans shall be provided in .pdf format and MicroStation (.dgn) format to the Department and in the CADD format and / or other format, paper, mylar, etc., as required by the utility owner.

(C) Any procedures required to close-out permits for the water and sewer work including, but not limited to, signed and sealed as-built drawings and engineer's certification in the format required by the Permitting Agency.

All designs shall be developed in Bentley MicroStation format (.dgn) and in the same project coordinate system and unit of measure. AutoCAD (.dwg) files and Microstation files converted from AutoCAD (.dwg) will not be accepted.

UTILITIES COORDINATION

The Utilities Coordinator shall be responsible for coordinating all utility relocations, removals, and adjustments where the Design-Build Team and utility owner, with concurrence from the Department, determine that such work is essential for highway safety and performance of the required highway construction. Coordination shall be for all utilities, whether or not they are specifically identified herein, and shall include all necessary utility agreements.

The Utilities Coordinator shall conduct regular utility coordination meetings, at least once a month, starting no later than 45 days after contract execution and continuing until all utility relocations are completed. These meetings shall include representatives from all utility owners, the Design-Build Team, and NCDOT. The purpose of these meetings shall include, but not be limited to, reviewing design progress, upcoming utility submittals, relocation schedules, identifying conflicts, and coordinating field activities among all parties.

The Utilities Coordinator shall conduct regular utility progress meetings, at least twice a month, starting no later than 45 days after contact execution and continuing until all utility relocations are complete. This meeting series shall include the Utilities Coordinator, NCDOT Utilities Unit, and Division Utilities representatives. The purpose of these meetings is to review relocation progress against the schedule, address outstanding issues, and confirm compliance with project requirements.

In accordance with the NCDOT's Project Delivery Network, the Utility Firm shall develop a preliminary Utility Risk Analysis and Inventory (URAI) to identify potential utility conflicts, determine preliminary alignments and schedules for the relocation of each utility, and identify any anticipated Permanent Utility Easements (PUE) and Aerial Utility Easements (AUE).

The Utilities Coordinator shall maintain contact with the utilities, maintain the Utilities Relocation Schedule, and continue coordination to resolve relocation issues, until the relocations by all utilities are complete.

Relocation Scheduling Conferences: Upon receiving each Utility Authorization from NCDOT, the Utilities Coordinator shall schedule and conduct the Relocation Scheduling Conference for the utility relocation. Attendees shall include the utility owner, the utility owner's contractor, the Design-Build Team, Resident Engineer, Utilities Unit, and others, as required.

Individual Utility Relocation Construction: The Utilities Coordinator shall maintain weekly contact with each utility during their relocation construction. The Utilities Coordinator shall monitor the progress of each relocation and determine if intervention is needed to keep the utility relocation on schedule. When intervention is needed, the Utilities Coordinator shall involve appropriate resources or recommend and implement strategies to maintain the relocation schedules to support the overall project schedule.

The Utilities Coordinator shall review all new utility encroachment requests for the installation of new facilities within the project limits, ensuring no conflicts with the project or existing utilities.

The Utilities Coordinator shall prepare the agenda and meeting minutes for all meetings specified herein, as well as for all meetings with individual utility companies. NCDOT Utilities Lead shall be invited to all meetings with utility companies.

Utility Relocation Plans and Utilities Coordination Working Plans

Excluding water and sewer conflicts, if the Design-Build Team's design or construction creates a utility conflict, the Utilities Coordinator shall request that the utility owner submit Utility

Relocation Plans that show existing utilities and proposed utility relocations for acceptance by NCDOT, and by railroad companies where applicable. The Utilities Coordinator shall provide Roadway Design Plans to the utility owners for their use in developing the Utility Relocation Plans.

The Utilities Coordinator shall compile each of the Utility Relocation Plans into the Utilities Coordination Working Plans. The Utilities Coordination Working Plans shall also show the proposed water and sewer designs. Utilities Coordination Working Plans shall be submitted in .pdf format and .dgn format. At a minimum, the Utilities Coordination Working Plans submittals shall be as follows:

(A) Initial Utilities Coordination Working Plans Submittal, submitted after the Department accepts the 100% Hydraulic Plans.

(B) Utilities Coordination Working Plans Progress Submittals, submitted monthly, 2 days prior to each monthly utility coordination meeting.

(C) Final Utilities Coordination Working Plans Submittal, submitted after the Department accepts the Right of Way / 60% Roadway Plans submittal and after all utility relocations have been completed.

As part of the Utility Agreement packages, the Design-Build Team shall electronically submit a full-size set of the Utility Relocation Plans, in .pdf format, to the NCDOT State Utilities Manager, via the Alternative Delivery Unit, for review and acceptance. The Utility Firm shall include a cover letter with the Utility Relocation Plans verifying that the proposed utility relocations are not in conflict with the Design-Build Team's proposed design or construction activities. The Department shall accept the Utility Relocation Plans prior to any utility relocation work beginning. See Utility Agreements Section found elsewhere in this Scope of Work for additional requirements regarding utility agreement packages. After the review process is complete, the NCDOT Utilities Unit will submit an electronic copy of the authorization letter to the Design-Build Team. If the Utility Relocation Plans are accepted subject to changes, the Utilities Coordinator shall coordinate these changes with the appropriate utility owner.

Prior Rights and Compensable Interest

The Utility Firm shall be responsible for evaluating and submitting recommendations regarding cost responsibility for utility relocations, including prior rights and compensable interests, to NCDOT for review. NCDOT shall make the final determination of acceptable prior rights and compensable interests.

The Design-Build Team and their Utility Firm shall provide supporting documentation obtained from the utility owner to substantiate its recommendations. Prior rights and compensable interests shall be determined prior to developing utility agreements, finalizing PUE limits, and Permanent Utility Easement acquisition.

A compensable interest for a conflicting utility shall be identified as follows:

(A) Existing or prior easement rights within the project limits, either by recorded right of way or adverse possession.

(B) Entities covered under *General Statute 136-27.1* and *136-27.2.* Statute requires the NCDOT to pay the non-betterment cost for certain water, sewer and gas relocations.

The Design-Build Team shall be responsible for all costs associated with utility relocations due to haul roads and/or any other temporary conditions resulting from the Design-Build Team's methods of operation or sequence of work.

CATV

The NCDOT will not permit CATV to place poles within the highway right of way but will allow down guys for their facilities within the highway right of way. Under most circumstances, the CATV Company will continue a joint-use attachment with the local power and telephone company. If the CATV proposed relocation places buried facilities within the highway right of way, then plans and encroachment agreements shall be required by the NCDOT.

Communication Cables / Electrical Services for ITS

Prior to establishing the location for new meter poles, the Design-Build Team and their Utility Firm shall coordinate with the local power distribution company concerning accessibility of E/C service and safety in maintenance of the meter.

Prior to installation, the Design-Build Team shall provide plans for review and acceptance for all service taps, lines and meters that require a parallel installation within the control of access (C/A).

Parallel service installation within a C/A shall be buried and located as close to the right of way line as practical. Only due to unusual circumstances will parallel aerial service installations within the C/A be allowed. The Design-Build Team shall justify the allowance of parallel aerial service installation and obtain NCDOT written acceptance prior to installation.

The Design-Build Team shall be responsible for all coordination activities, including permit applications and deposit / application / connection fees, required for the utility company to provide service taps and meters. The permit application shall be sent to the Resident Engineer for processing. Prior to the Design-Build Team developing the associated design and / or instructing the utility company to proceed with providing the service taps, the Design-Build Team shall obtain written approval of the service tap locations from the NCDOT Resident Engineer.

The Design-Build Team shall be responsible for all costs associated with providing communication cables / electrical service from the service tap to the ITS devices.

Adjusting Existing Utilities due to Proposed Traffic Management Systems Fiber Optic Communications Cables

The Design-Build Team shall be responsible for all costs for coordinating and adjusting any existing utilities that are in conflict with any proposed communication cables to be installed as part of the project.

Utility Agreements

If a utility company provides acceptable evidence of prior rights of way or a compensable interest in their facilities, the Utilities Coordinator shall coordinate the non-betterment utility relocation costs with the utility company and develop the Utility Relocation Agreement (URA).

The NCDOT State Utilities Manager must execute accepted agreements for this project. The URA and Encroachment Agreement forms are available from the NCDOT Utilities Unit. Refer to the *NCDOT Utilities Accommodation Manual* for the different types of Encroachment Agreements available for use.

The Design-Build Team shall submit all utility agreements, and all supporting documents to the NCDOT State Utilities Manager, via the Alternative Delivery Unit, in electronic format. Prior to submittal, all agreements shall be signed electronically by an authorized representative of the utility owner. These electronic agreement packets will be reviewed, accepted and signed electronically by the NCDOT State Utilities Manager, or designated representative, before being distributed to the field.

The Utility Firm shall use the NCDOT Standard Utility Encroachment Agreements, as necessary, in relocating utilities. The Encroachment Agreements shall be used under the following conditions:

(A) If a utility company is not occupying a valid right of way / compensable interest and the proposed relocation will place the relocated utilities within the existing or proposed highway right of way.

(B) For **all** new utility installations, not covered under a Utility Construction Agreement and within the existing or proposed highway right of way. This includes all water, sewer and gas lines owned by entities covered under *General Statute 136-27.1* and *136-27.2.*

Work Not Required by the Project and Performed by Design-Build Team for Utility Owners

If the Design-Build Team elects to make arrangements with a utility owner for proposed utility construction not required herein, in which the utility owner shall be responsible for the costs of work to be performed by the Design-Build Team, the Design-Build Team shall be responsible for negotiating all costs associated with the proposed construction. Once the Design-Build Team and the utility owner agree on a plan and a lump sum estimated cost for the utility construction, the

Design-Build Team shall submit the following to the NCDOT State Utilities Manager, via the Alternative Delivery Unit, for further handling:

- One full size set of utility construction drawings, submitted electronically in .pdf format. The utility construction drawing set shall include a title sheet, legend and notes sheets, detail sheets, plan sheets, profile sheets and special provisions, as required.

- A letter from the utility owner agreeing to the plans and lump sum cost, and

- A letter from the Design-Build Team verifying the proposed utility construction is not in conflict with the Design-Build Team's proposed design or construction activities.

The NCDOT will reimburse the Design-Build Team the estimated lump sum cost under a Supplemental Agreement. The necessary UCA to the utility owner for reimbursement shall be a two-party agreement between the NCDOT and the utility owner; and will be developed and executed by the Department.

If the Design-Build Team is requested, in writing, by a utility owner to relocate facilities not impacted by the project, upgrade existing facilities and / or incorporate new facilities as part of the highway construction, designs shall be coordinated with the utility owner and NCDOT Utilities Unit. The associated design and construction costs shall be negotiated and agreed upon between the Design-Build Team and the utility owner. The Design-Build Team shall develop designs; prepare all plans for needed agreements and permits; submit permits directly to the agencies and obtain approval from the agencies. The Design-Build Team shall be responsible for all permit fees.

***** STANDARD SPECIAL PROVISIONS *****

AWARD OF CONTRACT

(1-16-18)(Rev. 4-10-24) 103 DB1 G01

Revise the 2024 *Standard Specifications for Roads and Structures* as follows:

Page 1-24, Subarticle 103-4(A) General, first paragraph, replace the 3rd and 4th sentences with the following:

Where award is to be made, the notice of award will be issued within 60 days after the opening of bids or upon issuance of any necessary debt instrument, whichever is later, but not to exceed 120 days; except with the consent of the successful proposer the decision to award the contract to such proposer may be delayed for as long a time as may be agreed upon by the Department and such proposer. In the absence of such agreement, the successful proposer may withdraw his bid at the expiration of 120 days without penalty if no notice of award has been issued.

HAUL ROADS

(7-16-24) 105 DB1 G04

Revise the *Standard Specifications* as follows:

Page 1-45, Article 105-15 RESTRICTION OF LOAD LIMITS, line 31, add the following after second sentence of the second paragraph:

At least 30 days prior to use, the Design-Build Team shall notify the Engineer of any public road proposed for use as a haul road for the project.

RESTRICTIONS ON ITS EQUIPMENT AND SERVICES

(10-2-20) DB01 G090

All telecommunications, video or other ITS equipment or services installed or utilized on this project must be in conformance with UNIFORM ADMINISTRATIVE REQUIREMENTS, COST PRINCIPLES, AND AUDIT REQUIREMENTS FOR FEDERAL AWARDS **2 CFR, § 200.216 Prohibition on certain telecommunications and video surveillance services or equipment.**

EQUIPMENT IDLING GUIDELINES

(1-19-21) 107 DB1 R096

Exercise reduced fuel consumption and reduced equipment emissions during the construction of all work associated with this contract. Except as allowed otherwise elsewhere in this project special provision, employees engaged in the construction of this project should turn off vehicles when stopped for more than thirty (30) consecutive minutes and off-highway equipment (equipment) should idle no longer than fifteen (15) consecutive minutes.

These guidelines for turning off vehicles and equipment when idling do not apply to:

1. Idling when queuing.
2. Idling to verify the vehicle / equipment is in safe operating condition.

3. Idling for testing, servicing, repairing or diagnostic purposes.
4. Idling necessary to accomplish work for which the vehicle / equipment was designed (such as operating a crane, mixing concrete, etc.).
5. Idling required to bring the machine system to operating temperature.
6. Emergency vehicles, utility company, construction, and maintenance vehicles where the engines must run to perform needed work.
7. Idling to ensure safe operation of the vehicle / equipment.
8. Idling when the propulsion engine is providing auxiliary power for other than heating or air conditioning, except as allowed below, such as hydraulic systems for pavers.
9. When specific traffic, safety, or emergency situations arise.
10. Limited idling, no longer than 30 minutes, to provide for the safety of occupants (e.g. to run the heater) when the ambient temperature is less than 32 degrees Fahrenheit.
11. Limited idling, no longer than 30 minutes, to provide for the safety of occupants (e.g. to run the air conditioning) when the ambient temperature is greater than 90 degrees Fahrenheit.
12. Diesel powered vehicles / equipment may idle for up to 30 minutes to minimize restart problems.

Any vehicle or equipment in which the primary source of fuel is natural gas or electricity is exempt from the idling limitations set forth in this project special provision.

MAINTENANCE OF THE PROJECT

(11-20-07) (Rev. 1-16-24) 104-10 DB1 G125

Revise the *Standard Specifications* as follows:

Page 1-35, Article 104-10 Maintenance of the Project, line 3, add the following after the first sentence of the first paragraph:

All guardrail/guiderail within the project limits shall be included in this maintenance.

Page 1-35, Article 104-10 MAINTENANCE OF THE PROJECT, line 8, add the following as the last sentence of the first paragraph:

The Design-Build Team shall perform weekly inspections of guardrail and guiderail and shall report damages to the Engineer on the same day of the weekly inspection. *Where damaged guardrail or guiderail is repaired or replaced as a result of maintaining the project in* accordance with this article, such repair or replacement shall be performed within seven consecutive calendar days of such inspection report.

Page 1-35, Article 104-10 MAINTENANCE OF THE PROJECT, lines 20-22, replace the last sentence of the last paragraph with the following:

The Design-Build Team will not be directly compensated for any maintenance operations necessary, except for maintenance of guardrail / guiderail, as this work will be considered incidental to the work covered by the various contract items. The provisions of Article 104-7,

Extra Work, and Article 104-8, Compensation and Record Keeping will apply to authorized maintenance of guardrail / guiderail. Performance of weekly inspections of guardrail / guiderail, and the damage reports required as described above, will be considered to be an incidental part of the work being paid for by the various contract items.

ROCK AND BROKEN PAVEMENT FILLS

(12-29-15) (Rev.1-16-24) 235 DB2 R85

Revise the *Standard Specifications* as follows:

Page 2-23, Article 235-2 MATERIALS, add the following after Line 15:

Item	Section
Geotextile for Rock and Broken Pavement Fills, Type 2	1056

Provide Type 2 geotextile for filtration geotextiles. Use rip rap and No. 57 stone from either a quarry or onsite material to fill voids in rock and broken pavement fills. Provide small and large size rip rap with stone sizes that meet Class A and B in accordance with Table 1042-1 and No. 57 stone with a gradation that meets Table 1005-1 or use similar size onsite material approved by the Engineer.

Page 2-24, Subarticle 235-3(B) Embankment Formation, Lines 18 - 19, delete the third sentence in the seventh paragraph.

Page 2-24, Subarticle 235-3(B) Embankment Formation, **Lines 21 - 23**, replace the eighth paragraph with the following:

Before placing embankment fill material or filtration geotextiles over rock and broken pavement, fill voids in the top of rock and broken pavement fill with rip rap and No. 57 stone. Place and compact larger rip rap first followed by smaller rip rap. Then, fill any remaining voids with No. 57 stone so geotextiles are not torn, ripped or otherwise damaged when installed and covered. Compact rip rap and No. 57 stone with tracked equipment or other approved methods. Install filtration geotextiles on top of rock, broken pavement, rip rap and No. 57 stone in accordance with Article 270-3 before placing remaining embankment fill material.

Remove any rocks, debris or pavement pieces from the roadbed larger than two inches within 12 inches of the subgrade or finished grade, whichever is lower.

CULVERT PIPE

(7-1-19)(Rev. 1-16-24) 305, 310 DB3 R35

Revise the *Standard Specifications* as follows:

Page 3-5, Article 305-1 DESCRIPTION, Lines 12 - 14, replace with the following:

Where shown in the plans developed by the Design-Build Team, the Design-Build Team may use reinforced concrete pipe, aluminum alloy pipe, aluminized corrugated steel pipe, galvanized

corrugated steel pipe, HDPE pipe, polypropylene pipe, or PVC pipe in accordance with the following requirements.

Page 3-5, Article 305-2 MATERIALS, add the following after **Line 16:**

Item	Section
Galvanized Corrugated Steel Pipe	1032-1

Page 3-6, Article 310-2 MATERIALS, add the following after **Line 9**:

Item	Section
Galvanized Corrugated Steel Pipe	1032-3

Page 3-6, Article 310-4 SIDE DRAIN PIPE, Lines 24 - 25, replace the first sentence of the second paragraph with the following:

Where shown in the plans developed by the Design-Build Team, side drain pipe may be Class II, III, IV, or V reinforced concrete pipe, aluminized corrugated steel pipe, galvanized corrugated steel pipe, corrugated aluminum alloy pipe, polypropylene pipe, HDPE pipe or PVC pipe.

BRIDGE APPROACH FILLS

(1-16-18) (Rev. 1-16-24) 423 DB4 R02

Description

Bridge approach fills consist of backfilling behind bridge end bents with select material or aggregate to support all or part of bridge approach slabs. Install outlets and grade bridge approach fills to drain water through and away from approach fills. Install geotextiles to allow for possible future slab jacking and separate approach fills from embankment fills, natural ground and pavement sections as required. For bridge approach fills behind end bents with mechanically stabilized earth (MSE) abutment walls, reinforce bridge approach fills with MSE wall reinforcement connected to end bent caps as required. Construct bridge approach fills in accordance with the contract, accepted submittals and bridge approach fill *Roadway Standard Drawings*.

Define bridge approach fill types as follows:

Type 1 Approach Fill – Approach fill for bridge abutment in accordance with *Roadway Standard Drawing* No. 423.01;

Type 1A Approach Fill – Alternate approach fill for integral bridge abutment in accordance with *Roadway Standard Drawing* No. 423.02;

Type 2 Approach Fill – Approach fill for bridge abutment with MSE wall in accordance with *Roadway Standard Drawing* No. 423.03 and

Type 2A Approach Fill – Alternate approach fill for integral bridge abutment with MSE wall in

accordance with *Roadway Standard Drawing* No. 423.04.

At the Design-Build Team's option, use Type 1A or 2A approach fills instead of Type 1 or 2 approach fills, respectively, for integral bridge abutments. Type 1A and 2A approach fills consists of constructing an approach fill with a temporary geotextile wall before placing all or a portion of the concrete for the backwall and wing walls of the integral end bent cap. The temporary geotextile wall is designed for a construction surcharge, remains in place and is aligned so the wall face functions as a form for the integral end bent cap backwall and wing walls.

Materials

Refer to Division 10 of the *Standard Specifications*.

Item	**Section**
Geotextiles	1056
Portland Cement Concrete	1000
Select Materials	1016
Subsurface Drainage Materials	1044
Welded Wire Reinforcement	1070-3

Provide Type 1 geotextile for separation geotextiles, Type 4a geotextile for under bridge approach slabs and Class B concrete for outlet pads. Use Class V or Class VI select material for Type 1 and 1A approach fills and the same aggregate type approved for the reinforced zone in the accepted MSE wall submittal for Type 2 and 2A approach fills. For MSE wall aggregate, reinforcement and connector materials, see the *Mechanically Stabilized Earth Retaining Walls* provision. Provide outlet pipes and fittings for subsurface drainage materials. Provide 1/4" hardware cloth with 1/4 inch openings constructed from 24 gauge wire.

For temporary geotextile walls, use welded wire reinforcement for welded wire facing and Type 5a geotextile for reinforcement geotextiles. Use Type 5a geotextile with lengths as shown in *Roadway Standard Drawing* No. 423.02 or 423.04.

Construction Methods

Excavate as necessary for approach fills and, if applicable, temporary geotextile walls in accordance with the contract. Ensure limits of approach fills are graded to drain as shown in the bridge approach fill *Roadway Standard Drawings*. For Type 1 and 1A approach fills in embankment fills, place and compact a temporary 1.5:1 (H:V) fill slope in accordance with *Roadway Standard Drawing* No. 423.01 or 423.02 and in accordance with Subarticle 235-3(B) and 235-3(C) of the *Standard Specifications*. Density testing is required within the temporary fill slope and additional more frequent density testing is also required for bridge approach embankments. Wait three days before cutting the slope back to complete the approach fill excavation. Use excavated material elsewhere on the project to form embankments, subgrades, or shoulders. If a slope for an approach fill is excavated to flatter than what is required for access or any other reason, that same slope is required for the entire approach fill excavation. Do not backfill overexcavations that extend outside the approach fill limits shown on the *Roadway Standard Drawings* with embankment soils. Instead, expand approach fill limits to include overexcavations.

Notify the Engineer when embankment fill placement and approach fill excavation is complete. Do not place separation geotextiles or aggregate until approach fill dimensions and embankment materials below and outside approach fills are approved.

For Type 2 approach fills, cast MSE wall reinforcement or connectors into end bent cap backwalls within three inches of locations shown in the accepted MSE wall submittals. Install MSE wall reinforcement with the orientation, dimensions and number of layers shown in the accepted MSE wall submittals. If a Type 2 approach fill is designed with geogrid reinforcement embedded in an end bent cap, cut geogrids to the required lengths and after securing ends of geogrids in place, reroll and rewrap portions of geogrids not embedded in the cap to protect geogrids from damage. Before placing aggregate over any MSE wall geosynthetic reinforcement, pull reinforcement taut so that it is in tension and free of kinks, folds, wrinkles or creases.

For Type 1 and 1A approach fills, place pipe sleeves in wing walls so water drains towards outlets. Use sleeves that can withstand wing wall loads. Insert outlet pipes into pipe sleeves to direct water towards outlets. Attach hardware cloth in front of the outlet pipe at the wing. Connect outlet pipes and fittings with solvent cement in accordance with Article 815-3 of the *Standard Specifications* and place outlet pads in accordance with Roadway Standard Drawing No. 815.03.

Attach separation geotextiles to end bent cap backwalls and wing walls with adhesives, tapes or other approved methods. Overlap adjacent geotextiles of the same type at least 18 inches. Cover select material or aggregate with Type 4a geotextile at an elevation six inches below the bridge approach slab. Hold geotextiles in place with wire staples or anchor pins as needed. Contact the Engineer when existing or future obstructions such as foundations, pavements, pipes, inlets or utilities will interfere with geotextiles or MSE wall reinforcement.

For Type 1A and 2A approach fills, install temporary geotextile walls as shown in *Roadway Standard Drawing* No. 423.02 or 423.04. At the Contractor's option, construct the bottom portion of integral end bents before temporary geotextile walls as shown in the plans developed by the Design-Build Team. Erect and set welded wire facing for temporary geotextile walls so facing

functions as a form for the integral end bent cap backwall. Place welded wire facing adjacent to each other in the horizontal and vertical directions to completely cover the temporary geotextile wall face. Stagger welded wire facing to create a running bond by centering facing over joints in the row below. Wrap reinforcement geotextiles at the wall face in accordance with *Roadway Standard Drawing* No. 423.02 or 423.04 and cover geotextiles with at least three inches of select material or aggregate. Place layers of reinforcement geotextiles within three inches of locations shown in *Roadway Standard Drawing* No. 423.02 or 423.04. Install reinforcement geotextiles with the direction shown in *Roadway Standard Drawing* No. 423.02 or 423.04. Orient overlapping seams in reinforcement geotextiles perpendicular to the integral end bent cap backwall. Do not overlap reinforcement geotextiles so seams are parallel to the wall face. Before placing select material or aggregate over reinforcement geotextiles, pull geotextiles taut so they are in tension and free of kinks, folds, wrinkles or creases. Temporary geotextile walls are designed for a surcharge pressure in accordance with *Roadway Standard Drawing* No. 423.02 or 423.04. If loads from construction equipment will be more than what the wall is designed for, contact the Engineer before positioning equipment on top of temporary geotextile walls.

Place select material or aggregate in six inch to eight inch thick lifts. Compact fine aggregate for Type 2 and 2A approach fills in accordance with Subarticle 235-3(C) of the *Standard Specifications* except compact fine aggregate to a density of at least 98%. Compact select material for Type 1 and 1A approach fills and coarse aggregate for Type 2 and 2A approach fills with at least 4 passes of a trench roller in a direction parallel to the end bent cap backwall. Do not displace or damage geosynthetics or MSE wall reinforcement when placing and compacting select material or aggregate. End dumping directly on geosynthetics is not permitted. Do not operate heavy equipment on geosynthetics until they are covered with at least eight inches of select material or aggregate. Replace any damaged geosynthetics to the satisfaction of the Engineer. When approach fills extend beyond bridge approach slabs, wrap Type 4a geotextiles over select material or aggregate and back under approach slabs as shown in *Roadway Standard Drawing* No. 423.03 or 423.04.

AGGREGATE SUBGRADE IN LIEU OF CHEMICAL STABILIZATION

(6-16-15) (Rev. 1-20-26) 501, 505, 542 DB5 R17

Description

At the Design-Build Teams' option, and when approved by the Engineer, 8 inches of subgrade may be replaced with Type 2 aggregate subgrade in lieu of chemical stabilization in accordance with Section 501 or Section 542 of the *Standard Specifications*. This substitution is permitted only when applied uniformly across the full width of each roadway section constructed under the contract. In addition, substitutions shall be applied in a manner that avoids frequent transitions between chemical stabilization and aggregate subgrade and shall not result in chemically stabilized sections shorter than 1,000 feet, unless otherwise approved by the Engineer.

Materials

Material shall meet the requirements of Article 505-2 of the *Standard Specifications*.

Construction Methods

Perform this work in accordance with Section 505-3 of the *Standard Specifications* except as modified herein. Excavate as necessary to accommodate the required 8-inch aggregate subgrade and place Type 2 aggregate subgrade in accordance with Section 505-3 of the *Standard Specifications*.

ASPHALT CONCRETE PLANT MIX PAVEMENTS MILL AND FILL
(6-16-26) 610 DB6 R04R

Revise the *Standard Specifications* as follows:

Page 6-21 and 6-22, Article 610-8, **SPREADING AND FINISHING, lines 46-47 and lines 1-2**, replace the eighth paragraph with the following:

Operate the paver as continuously as possible. Sequence paving operations to promote uniformity, minimize longitudinal joints, and maintain ride quality. Pave the mainline roadway prior to paving intersections, auxiliary lanes, ramps, turn lanes, and other irregular areas, unless otherwise approved by the Engineer.

For mill and fill resurfacing operations where the existing pavement surface is milled and replaced in kind, the Design-Build Team may sequence paving operations in any order, including paving intersecting roads, ramps, auxiliary lanes, and adjacent areas in advance of the mainline, provided the sequence does not adversely affect longitudinal joint construction, density, or surface smoothness, and all requirements of the contract are met.

Place wedging or leveling courses where required by the contract or as directed by the Engineer.

FINAL SURFACE TESTING REQUIRED
(1-20-26) 610 DB6 R45B

Perform final surface testing in accordance with Article 610-13 of the *Standard Specifications* in areas that meet the criteria outlined in Article 610-13 of the *Standard Specifications* or otherwise delineated in the contract.

MILLED RUMBLE STRIPS ON ASPHALT CONCRETE SHOULDERS
(11-19-24) 665 DB6 R56

Revise the *Standard Specifications* as follows:

Page 6-53, Article 665-3 CONSTRUCTION METHODS, lines 20-21, delete and replace the first sentence of the second paragraph with the following:

Provide rumble strips that have finished dimensions of 7 inches ± 1/2 inch wide in the direction of travel and the length measured perpendicular to the direction of travel as specified in the contract.

SUBSURFACE DRAINAGE

(9-1-11) (Rev. 9-14-17) DB8 R05

Revise the 2024 *Standard Specifications for Roads and Structures* as follows:

Page 8-11, Article 815-1, delete the first sentence and replace with the following:

The Design-Build Team shall construct subsurface drains, underdrains, blind drains and other types of drains where groundwater is within six feet of subgrade.

IMPACT ATTENUATOR UNITS, TYPE TL-

(4-20-04)(Rev. 8-20-24) DB8 R75

Description

The Design-Build Team shall furnish and install impact attenuator units and any components necessary to connect the impact attenuator units in accordance with the manufacturer's requirement, the details in the plans developed by the Design-Build Team and at locations shown in the plans developed by the Design-Build Team.

Materials

The Design-Build Team shall furnish attenuator units listed on the NCDOT APL. Units shall not be modified by the manufacturer and installer once approved and on the NCDOT APL.

Prior to installation the Design-Build Team shall submit to the Engineer certified working drawings and assembling instructions from the manufacturer for each impact attenuator unit in accordance with Article 105-2 of the *Standard Specifications*.

No modifications shall be made to the impact attenuator unit without the express written permission from the manufacturer. Perform installation in accordance with the details in the plans developed by the Design-Build Team and details and assembling instructions furnished by the manufacturer.

Construction Methods

Perform installation in accordance with the plans and details and assembling instructions furnished by the manufacturer.

If the median width is 40 feet or less, the Design-Build Team shall supply NON-GATING Impact Attenuator Units.

If the median width is greater than 40 feet, the Design-Build Team may use GATING or NON-GATING Impact Attenuator Units.

COLD APPLIED CONTRAST PLASTIC PAVEMENT MARKING LINES

(1-1-24)
DBI

Description

The Design-Build Team shall install Cold Applied Contrast Plastic Pavement Marking Lines, Type 2 or 3 (9") in accordance with the applicable requirements of Section 1087 and 1205 of the *Standard Specifications,* and as directed by the Engineer. This line shall be a 10-foot skip line with a contrast white / black line. The white line shall be six inches wide with a 1.5-inch black border on each side. Any alteration to this design must be approved by the Engineer prior to installation.

Materials

Refer to Article 1205-6 of the *Standard Specifications.*

AASHTO TYPE IV / NCDOT STANDARD BEAD - DOUBLE DROPPED GLASS BEADS

(12-7-21) (Rev. 1-12-22)

Description

This work shall consist of applying NCDOT approved standard glass beads along with the application of AASHTO Type IV glass beads on extruded thermoplastic and polyurea pavement markings. Use NCDOT standard glass beads that are on the NCDOT Approved Products List and conform to Sections 1087 and 1205 of the *Standard Specifications*. Except for gradation requirements, AASHTO Type IV glass beads shall meet the same Standard Specifications and shall contain 80% true spheres. Prior to application, an independent lab test shall confirm both categories of glass beads.

Application

This combination of glass beads shall be applied concurrently. Two separate passes over the pavement marking binder shall not be allowed. Extruded thermoplastic shall contain intermixed glass beads conforming to the *Standard Specifications*. Glass beads shall be applied at the manufacturer's rate to meet the retroreflectivity requirements below within 30 days after application.

MINIMUM REFLECTOMETER REQUIREMENTS FOR AASHTO Type IV / NCDOT Standard Glass Beads		
Item	**Color**	**Reflectivity**
AASHTO Type IV / NCDOT Standard Glass Beads	White	450 mcd/lux/m^2
	Yellow	350 mcd/lux/m^2

ELECTRONIC TICKETING SYSTEM

(7-16-24)(Rev. 12-17-24) 1020 DB10 R20

Description

At the Design-Build Team's option, the use of an electronic ticketing system for reporting individual and cumulative asphalt material deliveries may be utilized on this project. At the preconstruction conference, the Design-Build Team shall notify the Engineer if they intend to utilize an electronic ticketing system for reporting individual and cumulative asphalt material deliveries to the project.

Electronic Ticketing Requirements

a. The electronic ticketing system must be fully integrated with the load read-out system at the plant. The system shall be designed so data inputs from scales cannot be altered by either the Design-Build Team or the Department.

b. Material supplier must test to confirm that ticketing data can be shared from the originating system no less than 30 days prior to project start.

c. After each truck is loaded, ticket data must be electronically captured, and ticket information uploaded via Application Programming Interface (API) to the Department.

d. Obtain security token from NCDOT for access to E-Ticketing portal (to send tickets). To request a Security Key, fill out the below E-Ticketing Security Request Form: https://forms.office.com/g/XnT7QeRtgt

e. Obtain API from NCDOT containing the required e-ticketing data fields and format. Download the API from the NCDOT E-ticketing Webpage: https://connect.ncdot.gov/projects/construction/E-Ticketing/Pages/default.aspx

f. Provide all ticket information in real time and daily summaries to the Department's designated web portal. If the project contains locations with limited cellular service, an alternative course of action must be agreed upon.

g. Electronic ticketing submissions must be sent between the Material Supplier and the Department.

h. The electronic ticket shall contain the following information:

Date
Time
Contract Number
Supplier Name
Contractor Name
Material
JMF
Gross Weight
Tare Weight
Net Weight
Load Number
Cumulative Weight
Truck Number
Weighmaster Certification
Weighmaster Expiration
Weighmaster Name
Facility Name
Plant Certification Number
Ticket Number
Hauling Firm (optional)
Voided Ticket Number (if necessary)
Original Ticket Number (if necessary)
Supplier Revision (If necessary)

The Design-Build Team / supplier can use the electronic ticketing system of their choice to meet the requirements of this provision.

TIMBER AND LUMBER

(4-21-26) 235, 866, 1046, 1050, 1082, 1084, 1089, 1540 DB10 R82

Page 2-23, Article 235-2 MATERIALS, line 26, add the following as the third sentence of the fourth paragraph.

Use pressure treated wood bases meeting the requirements of Section 1082.

Page 8-45, Article 866-2 MATERIALS, line 26, replace "1076-7" with "1050-8".

Page 10-73, Subarticle 1046-3(C) Treated Timber Posts, line 8, replace "treated southern pine" with "pressure treated southern pine".

Page 10-76, Subarticle 1050-2(A) General, line 3, replace "Use treated southern pine meeting Articles 1082-2 and 1082-3" with "Use pressure treated southern pine meeting Articles 1082-2 and 1082-3".

Page 10-76, Subarticle 1050-2(A) General, lines 15-16, replace "All round posts" with "All round wood posts and braces".

Page 10-76, Subarticle 1050-2(A) General, lines 19-20, delete the last sentence of the third paragraph and replace with the following:

The pieces shall show at least 3 annual rings per inch and shall be at least 30% summerwood. All timber and lumber shall conform to the material characteristics detailed in the Southern Pine Inspection Bureau (SPIB) grading rules for the designated grade and may bear the mark of an American Lumber Standards Committee (ALSC) accredited agency.

Page 10-177, Article 1082-1 GENERAL, lines 32-33, delete the first sentence of the first paragraph and replace with the following:

Use southern pine timber and lumber graded in accordance with the current grading rules of the SPIB and manufactured by a Department pre-approved producer/supplier. All timber and lumber shall conform to the material characteristics detailed in the SPIB grading rules for No. 1 Dense or Select Structural (Sel Str.) and bear the mark of an ALSC-accredited agency.

Page 10-177 and 10-178, Article 1082-1 GENERAL, lines 38-42 and line 1, delete the second through fourth sentence of the second paragraph and replace with the following:

Use approved inspection companies listed on the Department's pre-approved producer/suppliers list. The inspection agency must perform inspections of preservative treated materials in accordance with AWPA Standard M2. Each item shall bear the brand, hammer mark, ink stamp or tag of the inspection agency to indicate it has been inspected. In lieu of commercial inspection, materials in Section 1082 manufactured by a facility that is audited by an ALSC-accredited agency and bearing the quality mark of that agency shall be acceptable for use. In addition, the Supplier must furnish Type 4 – Certified Test Reports and Type 6 – Supplier's Certifications in accordance

with Article 106-3. Type 6 – Supplier's Certifications are required for each producer/supplier to include any chain of custody changes from the mill to the Department.

Page 10-178, Article 1082-2 UNTREATED TIMBER AND LUMBER, line 7, replace "Dense" with "Grade No. 1 Dense MC19".

Page 10-178, Subarticle 1082-3(A) General, line 13, replace "lumber" with "timber and lumber" and replace "will not" with "with".

Page 10-178, Subarticle 1082-3(B) Bridges, Fender Systems and Piles, lines 22 and 24, replace "Grade No. 1 Dense" with "Grade No. 1 Dense or Select Structural (Sel Str.)".

Page 10-178, Subarticle 1082-3(B) Bridges, Fender Systems and Piles, lines 24-27, delete the third and fourth sentence of the first paragraph and replace with the following:

Timbers for bridges or fender systems that are 5 inches and thicker along the least dimension shall conform to Grade No. 1 Dense or Select Structural (Sel Str.).

Page 10-178, Subarticle 1082-3(B) Bridges, Fender Systems and Piles, line 28, delete and replace the second paragraph with the following:

Timber for piles shall be southern pine and meet the requirements of ASTM D25.

Page 10-178, Subarticle 1082-3(C) Guardrail Posts, Blockouts and related components, lines 33-34, replace "Southern Pine, conforming to Grade No. 1. Rough lumber will be acceptable." with "southern pine, conforming to Grade No. 1 Dense.".

Page 10-178, Subarticle 1082-3(D) Fence Posts and Braces, lines 37-39, delete the first paragraph and replace with the following:

Sawn fence posts and braces shall be southern pine, S4S, and conform to Grade No. 1 Dense.

Page 10-178, Subarticle 1082-3(E) Sign Posts and Battens, lines 42-44, delete the first and second sentence of the first paragraph and replace with the following:

Lumber or timbers for sign posts shall conform to Structural Light Framing, Grade No. 1 Dense.

Page 10-178, Subarticle 1082-3(E) Sign Posts and Battens, line 46, delete the first sentence of the second paragraph.

Page 10-179, Subarticle 1082-3(F) Poles, lines 2-3, delete the first sentence of the first paragraph and replace with the following:

Timber for poles shall be either treated southern pine or coastal douglas-fir and meet the requirements of ANSI O5.1.

Page 10-179, Subarticle 1082-4(A) General, line 8, replace "AASHTO M 133 or AWPA Standards" with "AASHTO M 133 and AWPA Standards".

Page 10-179, Subarticle 1082-4(A) General, lines 14-15, delete the third paragraph.

Page 10-179, Subarticle 1082-4(A) General, line 19, replace ""areas include" with "areas including, but not limited to,".

Page 10-179, Subarticle 1082-4(B) Timber Preservatives, line 24, replace "AASHTO M 133 or AWPA Standards U1" with "AASHTO M 133 and AWPA Standards U1".

Page 10-179, Subarticle 1082-4(C) Bridges, Fender Systems and Piles, lines 27-28, replace "AASHTO M-133 or AWPA Standard U1" with "AASHTO M 133 and AWPA Standard U1".

Page 10-179, Subarticle 1082-4(D) Guardrail Posts, Blockouts and Related Components, lines 32-33, replace "AASHTO M-133 or AWPA Standard U1" with "AASHTO M 133 and AWPA Standard U1".

Page 10-179, Subarticle 1082-4(E) Fence Posts and Braces, lines 36 and 38, replace "AASHTO M-133 or AWPA Standard U1" with "AASHTO M 133 and AWPA Standard U1".

Page 10-179, Subarticle 1082-4(E) Fence Posts and Braces, line 39, replace "except require retention of preservative as below" with "Commodity Specification B. Posts, UC4A".

Page 10-180, Subarticle 1082-4(F) Sign Posts and Battens, line 2, replace "AASHTO M-133 or AWPA Standard U1" with "AASHTO M 133 and AWPA Standard U1".

Page 10-180, Subarticle 1082-4(G) Poles, line 9, replace "AASHTO M-133 or AWPA Standard U1" with "AASHTO M 133 and AWPA Standard U1".

Page 10-180, Subarticle 1084-1(A) Treated Timber Pile, line 16-17, delete and replace the first paragraph with the following:

Treated timber piles shall meet the requirements of Section 1082.

Page 10-195, Subarticle 1089-2(A)(1) Work Zone Signs (Stationary), line 44, add the following sentence to the second paragraph:

Pressure treat wood posts in accordance with Section 1082.

Page 15-18, Article 1540-2 MATERIALS, line 8, replace "1082-3" with "1082".

GLASS BEAD GRADATION FOR PAVEMENT MARKINGS

(9-17-24) 1087 DB10 R87

Revise the *Standard Specifications* as follows:

Page 10-187, Subarticle 1087-4(C), Gradation & Roundness, after line 6, delete and replace

Table 1087-2 with the following:

TABLE 1087-2
GLASS BEAD GRADATION REQUIREMENTS

Sieve Size	Gradation Requirements	
	Minimum	Maximum
Passing #20	100%	--
Retained on #30	5%	15%
Retained on #50	40%	80%
Retained on #80	15%	40%
Passing #80	0%	10%
Retained on #200	0%	5%

ELECTRICAL JUNCTION BOXES

(6-18-24) 1091 DB10 R91

Revise the *Standard Specifications* as follows:

Page 10-209, Subarticle 1091-5(A) General, add the following after line 27:

Boxes and covers shall meet all requirements and specifications of ANSI/SCTE 77. Structural load tests shall meet the Tier 15 application type.

Page 10-209, Subarticle 1091-5(B) Polymer Concrete (PC) Junction Boxes, lines 28, delete and replace the subarticle title with the following:

(B) Polymer Concrete (PC), Composite and Thermoplastic Junction Boxes

Page 10-209, Subarticle 1091-5(B) Polymer Concrete (PC) Junction Boxes, add the following after line 28:

For PC junction boxes, use polymer concrete material made of an aggregate consisting of sand and gravel bound together with a polymer and reinforced with glass strands to fabricate box and cover components.

Page 10-209, Subarticle 1091-5(B) Polymer Concrete (PC) Junction Boxes, line 29 replace "polymer concrete (PC) boxes" with "junction boxes".

Page 10-209, Subarticle 1091-5(B) Polymer Concrete (PC) Junction Boxes, lines 31-37, delete the second and third paragraph.

Page 10-209, Subarticle 1091-5(B) Polymer Concrete (PC) Junction Boxes, lines 40-41, delete the fourth sentence of the fourth paragraph and replace with the following:

Bodies of junction boxes shall be a single piece.

Polymer concrete, composite and thermoplastic junction boxes are not required to be listed electrical devices.

GROUND MOUNTED SIGN SUPPORTS
(9-15-26) 1094 DB10 R94

Revise the *Standard Specifications* as follows:

Page 10-214, Subarticle 1094-1(B) 3 lb Steel U-Channel Supports, line 12 and 15, replace "3/8" with "7/16".

Page 10-214, Subarticle 1094-1(B) 3 lb Steel U-Channel Supports, line 16, replace "5/16" with "3/8".

Page 10-214, Subarticle 1094-1(B) 3 lb Steel U-Channel Supports, lines 14-15, delete the fifth sentence of the first paragraph and replace with the following:

These supports shall be galvanized in accordance with ASTM A653 or ASTM A123 depending on the manufacturing process.

Page 10-214, Subarticle 1094-1(C) 2 lb Steel U-Channel Supports, lines 26-29, delete the third and fourth sentence of the second paragraph with the following:

Punch or drill 7/16 inch diameter holes on 1 inch centers, beginning 1 inch from the top of the post, for a minimum distance equal to the vertical dimension of the respective sign or mile marker. These supports shall be galvanized in accordance with ASTM A653 or ASTM A123 depending on the manufacturing process.

Page 10-214, Subarticle 1094-1(C) 2 lb Steel U-Channel Supports, line 30, replace "3/8" with "7/16".

Page 10-214, Subarticle 1094-1(C) 2 lb Steel U-Channel Supports, line 31, replace "5/16" with "3/8".

Page 10-214, Subarticle 1094-1(D) Steel Square Tube Supports, lines 36-43, delete and replace the first two paragraphs with the following:

Use steel square tube supports of variable length galvanized steel. The support cross section and gauge shall be in accordance with the plans developed by the Design-Build Team. These supports shall be manufactured using domestic steel conforming to ASTM 1011, Grade 50. Minimum yield strength after cold forming shall be 60,000 psi. These supports shall be galvanized in accordance

with ASTM A653 or ASTM A123 depending on the manufacturing process and meet G90 galvanizing requirements. Both the interior and exterior of the post shall be galvanized and all coating applications shall occur in the United States.

The posts shall be corner welded and scarfed as necessary to allow sections to telescope within each other. The finished posts shall be machine straightened and have a smooth uniform finish free from cracks, flaws, injurious seams, laps, blisters, and edges which are ragged, sharp, and imperfect, or other defects affecting their strength, durability, or appearance. The maximum variation in straightness shall be no more than 1/4 inch in any 5 foot of length. For perforated square tubes, cut holes or knockout holes of 7/16 inch diameter shall be spaced on 1 inch centers, on the centerlines of all four sides in true alignment, and opposite to each other for back to back applications. All holes and sheared ends shall be free from burrs. The steel shall also be coated with a conversion coating and a clear organic polymer topcoat.

The zinc coating nor manufacturing process shall interfere with the telescoping properties of steel square supports. The zinc coating inside of the 7/16 inch diameter holes of perforated supports shall not exceed specification requirements enough to prevent a 3/8 inch diameter bolt from freely passing through. These supports shall contain a manufacturer's mark for traceability after installation. Provide a Type 2 material certification in accordance with Article 106-3 upon Engineer request.

TEMPORARY SHORING

(2-20-07) (Rev. 1-16-24) DB11 R02

Description

Temporary shoring includes cantilever, braced and anchored shoring and temporary mechanically stabilized earth (MSE) walls. Temporary shoring does not include trench boxes. At the Design-Build Team's option, use any type of temporary shoring, unless noted otherwise in the plans developed by the Design-Build Team or as directed.

Design and construct temporary shoring based on actual elevations and shoring dimensions in accordance with the contract, the plans developed by the Design-Build Team and accepted submittals. Construct temporary shoring at locations shown in the plans developed by the Design-Build Team and as directed. Temporary shoring shall be required to maintain traffic when a 2:1 (H:V) slope from the top of an embankment or bottom of an excavation will intersect the existing ground line less than five feet from the edge of pavement of an open travelway. This Standard Special Provision does not apply to pipe, inlet or utility installations unless noted otherwise in the plans developed by the Design-Build Team.

Positive protection includes concrete barrier and temporary guardrail. Provide positive protection for temporary shoring at locations shown in the plans developed by the Design-Build Team and as directed. Positive protection shall be required if temporary shoring is located in the clear zone in accordance with the AASHTO *Roadside Design Guide.*

(A) Cantilever and Braced Shoring

Cantilever shoring consists of steel sheet piles or H-piles with timber lagging. Braced shoring consists of sheet piles or H-piles with timber lagging and bracing such as beams, plates, walers, struts, rakers, etc. Define "piles" as sheet piles or H-piles.

(B) Anchored Shoring

Anchored shoring consists of sheet piles with walers or H-piles with timber lagging anchored with ground or helical anchors. Driven anchors may be accepted at the discretion of the Engineer. A ground anchor consists of a grouted steel bar or multi-strand tendon with an anchorage. A helical anchor consists of a lead section with a central steel shaft and at least one helix steel plate followed by extensions with only central shafts (no helixes) and an anchorage. Anchorages consist of steel bearing plates with washers and hex nuts for bars or steel wedge plates and wedges for strands. Use a prequalified Anchored Wall contractor to install ground anchors. Define "anchors" as ground, helical or driven anchors.

(C) Temporary MSE Walls

Temporary MSE walls include temporary geosynthetic and wire walls. Define "temporary wall" as a temporary MSE wall and "Temporary Wall Vendor" as the vendor supplying the temporary MSE wall. Define "reinforcement" as geotextile, geogrid, geostrip, welded wire grid or metallic strip reinforcement.

Temporary geosynthetic walls consist of geotextiles or geogrids wrapped behind welded wire facing or geostrips connected to welded wire facing. Define "temporary geotextile wall" as a temporary geosynthetic wall with geotextile reinforcement, "temporary geogrid wall" as a temporary geosynthetic wall with geogrid reinforcement and "temporary geostrip wall" as a temporary geosynthetic wall with geostrip reinforcement.

Temporary wire walls consist of welded wire grid or metallic strip reinforcement connected to welded wire facing. Define "Wire Wall Vendor" as the vendor supplying the temporary wire wall.

(D) Embedment

Define "embedment" for cantilever, braced and anchored shoring as the pile depth below the grade in front of shoring. Define "embedment" for temporary walls as the wall embedment below the grade at the wall face.

(E) Positive Protection

Define "unanchored or anchored portable concrete barrier" as portable concrete barrier (PCB) that meets *Roadway Standard Drawing* No. 1170.01. Define "concrete barrier" as unanchored or anchored PCB or an approved equal. Define "temporary guardrail" as temporary steel beam guardrail that meets *Roadway Standard Drawing* No. 862.02.

Materials

Refer to the *Standard Specifications*.

Item	Section
Concrete Barrier Materials	1170-2
Flowable Fill, Excavatable	1000-7
Geosynthetics	1056
Grout, Type 1	1003
Portland Cement	1024-1
Portland Cement Concrete	1000
Select Materials	1016
Steel Beam Guardrail Materials	862-2
Steel Plates	1072-2
Steel Sheet Piles and H-Piles	1084
Untreated Timber	1082-2
Water	1024-4
Welded Wire Reinforcement	1070-3

Provide Type 6 material certifications for shoring materials in accordance with Article 106-3 of the *Standard Specifications*. Use Class IV select material for temporary guardrail. Use Class A concrete that meets Article 450-2 of the *Standard Specifications* or Type 1 grout for drilled-in piles. Provide untreated timber with a thickness of at least three inches and a bending stress of at least 1,000 pounds per square inch for timber lagging. Provide steel bracing that meets ASTM A36.

(A) Shoring Backfill

Use Class II, Type 1, Class III, Class V or Class VI select material or material that meets AASHTO M 145 for soil classification A-2-4 with a maximum PI of 6 for shoring backfill except do not use A-2-4 soil for backfill around culverts.

(B) Anchors

Store anchor materials on blocking a minimum of 12 inches above the ground and protect it at all times from damage; and when placing in the work make sure it is free from dirt, dust, loose mill scale, loose rust, paint, oil or other foreign materials. Load, transport, unload and store anchor materials so materials are kept clean and free of damage. Bent, damaged or defective materials shall be rejected.

(1) Ground Anchors

Use high-strength deformed steel bars that meet AASHTO M 275 or seven-wire strands that meet ASTM A886 or Article 1070-5 of the *Standard Specifications*. Splice bars in accordance with Article 1070-9 of the *Standard Specifications*.

Do not splice strands. Use bondbreakers, spacers and centralizers that meet Article 6.3.5 of the AASHTO *LRFD Bridge Construction Specifications*.

Use neat cement grout that only contains cement and water with a water cement ratio of 0.4 to 0.5 which is approximately 5.5 gallons of water per 94 pounds of Portland cement. Provide grout with a compressive strength at three and 28 days of at least 1,500 and 4,000 psi, respectively.

(2) Helical Anchors

Use helical anchors with an ICC Evaluation Service, Inc. (ICC-ES) report. Provide couplers, thread bar adapters and bolts recommended by the Anchor Manufacturer to connect helical anchors together and to piles.

(3) Anchorages

Provide steel plates for bearing plates and steel washers, hex nuts, wedge plates and wedges recommended by the Anchor Manufacturer.

(C) Temporary Walls

(1) Welded Wire Facing

Use welded wire reinforcement for welded wire facing, struts and wires. For temporary wire walls, provide welded wire facing supplied by the Wire Wall Vendor or a manufacturer approved or licensed by the vendor. For temporary wire walls with separate reinforcement and facing components, provide connectors (e.g., bars, clamps, plates, etc.) and fasteners (e.g., bolts, nuts, washers, etc.) required by the Wire Wall Vendor.

(2) Geotextiles

Provide Type 2 geotextile for separation and retention geotextiles. Provide Type 5 geotextile for geotextile reinforcement with ultimate tensile strengths in accordance with the accepted submittals.

(3) Geogrid and Geostrip Reinforcement

Use geogrids with a roll width of at least four feet. Use geogrids for geogrid reinforcement and geostrips for geostrip reinforcement with an “approved” status code in accordance with the NCDOT Geosynthetic Reinforcement Evaluation Program. The list of approved geogrids and geostrips is available from:

connect.ncdot.gov/resources/Geological/Pages/Products.aspx

Provide geogrids and geostrips with design strengths in accordance with the accepted submittals. Geogrids and geostrips are approved for short-term design strengths (three-year design life) in the machine direction (MD) and cross-machine direction (CD) based on material type. Define material type from the website above for shoring backfill as follows:

Material Type	Shoring Backfill
Borrow	A-2-4 Soil
Fine Aggregate	Class II, Type 1 or Class III Select Material
Coarse Aggregate	Class V or VI Select Material

(4) Welded Wire Grid and Metallic Strip Reinforcement

Provide welded wire grid and metallic strip reinforcement supplied by the Wire Wall Vendor or a manufacturer approved or licensed by the vendor. Use welded wire grid reinforcement ("mesh", "mats" and "ladders") that meet Article 1070-3 of the *Standard Specifications* and metallic strip reinforcement ("straps") that meet ASTM A572 or A1011.

Preconstruction Requirements

(A) Concrete Barrier

Define "clear distance" behind concrete barrier as the horizontal distance between the barrier and edge of pavement. The minimum required clear distance for concrete barrier shall be shown in the plans developed by the Design-Build Team. At the Design-Build Team's option or if the minimum required clear distance is not available, set concrete barrier next to and up against traffic side of temporary shoring except for barrier above temporary walls. Concrete barrier with the minimum required clear distance shall be required above temporary walls.

(B) Temporary Guardrail

Define "clear distance" behind temporary guardrail as the horizontal distance between guardrail posts and temporary shoring. At the Design-Build Team's option or if clear distance for cantilever, braced and anchored shoring is less than four feet, attach guardrail to traffic side of shoring as shown in the plans developed by the Design-Build Team. Place ABC in clear distance and around guardrail posts instead of pavement. Do not use temporary guardrail above temporary walls.

(C) Temporary Shoring Designs

Before beginning temporary shoring design, survey existing ground elevations in the vicinity of shoring locations to determine actual design heights (H). Submit .pdf files of working drawings and design calculations for temporary shoring designs in accordance with Article 105-2 of the *Standard Specifications*. Submit working drawings showing plan

views, shoring profiles, typical sections and details of temporary shoring design and construction sequence. Do not begin shoring construction until a design submittal is accepted.

Have cantilever and braced shoring designed, detailed and sealed by an engineer licensed in the state of North Carolina. Use a prequalified Anchored Wall Design Consultant to design anchored shoring. Provide anchored shoring designs sealed by a Design Engineer approved as a Geotechnical Engineer (key person) for an Anchored Wall Design Consultant. Include details in anchored shoring working drawings of anchor locations and lock-off loads, unit grout / ground bond strengths for ground anchors or minimum installation torque and torsional strength rating for helical anchors and if necessary, obstructions extending through shoring or interfering with anchors. Include details in the anchored shoring construction sequence of pile and anchor installation, excavation and anchor testing.

Provide temporary wall designs sealed by a Design Engineer licensed in the state of North Carolina and employed or contracted by the Temporary Wall Vendor. Include details in temporary wall working drawings of geotextile and reinforcement types, locations and directions and obstructions extending through walls or interfering with reinforcement.

(1) Soil Parameters

Design temporary shoring for the assumed soil parameters and groundwater or flood elevations shown in the plans developed by the Design-Build Team. Assume the following soil parameters for shoring backfill:

(a) Unit weight (γ) = 120 pcf;

(b)

Friction Angle (ϕ)	**Shoring Backfill**
30°	A-2-4 Soil
34°	Class II, Type 1 or Class III Select Material
38°	Class V or VI Select Material

(c) Cohesion (c) = 0 psf.

(2) Traffic Surcharge

Design temporary shoring for a traffic surcharge of 250 pounds per square foot if traffic will be above and within H of shoring. This traffic surcharge shall not apply to construction traffic. Design temporary shoring for any construction surcharge if construction traffic will be above and within H of shoring. Design temporary shoring for a traffic (live load) surcharge in accordance with Article 11.5.6 of the AASHTO *LRFD Bridge Design Specifications*.

(3) Cantilever, Braced and Anchored Shoring Designs

Use shoring backfill for fill sections and voids between cantilever, braced and anchored shoring and the critical failure surface. Use concrete or Type 1 grout for embedded portions of drilled-in H-piles. Do not use drilled-in sheet piles.

Define "top of shoring" for cantilever, braced and anchored shoring as where the grade intersects the back of sheet piles or H-piles and timber lagging. Design cantilever, braced and anchored shoring for a traffic impact load of 2,000 pounds per foot applied 18 inches above top of shoring if concrete barrier is above and next to shoring or temporary guardrail is above and attached to shoring. Extend cantilever, braced and anchored shoring at least 32 inches above top of shoring if shoring is designed for traffic impact. Otherwise, extend shoring at least six inches above top of shoring.

Design cantilever, braced and anchored shoring for a maximum deflection of three inches if the horizontal distance to the closest edge of pavement or structure is less than H. Otherwise, design shoring for a maximum deflection of six inches. Design cantilever and braced shoring in accordance with the plans developed by the Design-Build Team and AASHTO *Guide Design Specifications for Bridge Temporary Works*.

Design anchored shoring in accordance with the plans developed by the Design-Build Team and Article 11.9 of the AASHTO *LRFD Bridge Design Specifications*. Use a resistance factor of 0.80 for tensile resistance of anchors with bars, strands or shafts. Extend the unbonded length for ground anchors and the shallowest helix for helical anchors at least five feet behind the critical failure surface. Do not extend anchors beyond right of way or easement limits. If existing or future obstructions such as foundations, guardrail posts, pavements, pipes, inlets or utilities will interfere with anchors, maintain a clearance of at least six inches between obstructions and anchors.

(4) Temporary Wall Designs

Use shoring backfill in the reinforced zone of temporary walls. Separation geotextiles shall be required between shoring backfill and backfill, natural ground or culverts along the sides of the reinforced zone perpendicular to the wall face. For Class V or VI select material in the reinforced zone, separation geotextiles shall also be required between shoring backfill and backfill or natural ground on top of and at the back of the reinforced zone.

Design temporary walls in accordance with the plans developed by the Design-Build Team and Article 11.10 of the AASHTO *LRFD Bridge Design Specifications*. Embed temporary walls at least 18 inches except for walls on structures or rock as determined by the Engineer. Use a uniform reinforcement length throughout the wall height of at least 0.7H or six feet, whichever is longer.

Extend the reinforced zone at least six inches beyond end of reinforcement. Do not locate the reinforced zone outside right of way or easement limits.

Use the simplified method for determining maximum reinforcement loads in accordance with the AASHTO LRFD specifications. For geotextile reinforcement, use geotextile properties approved by the Department or default values in accordance with the AASHTO LRFD specifications. For geogrid and geostrip reinforcement, use approved geosynthetic reinforcement properties available from the website shown elsewhere in this provision. Use geosynthetic properties for the direction reinforcement will be installed, a three-year design life and shoring backfill to be used in the reinforced zone.

Do not use more than four different reinforcement strengths for each temporary geosynthetic wall. Design temporary geotextile walls for a reinforcement coverage ratio (R_c) of 1.0. For temporary geogrid walls with an R_c of less than 1.0, use a maximum horizontal clearance between geogrids of three feet and stagger reinforcement so geogrids are centered over gaps in the reinforcement layer below.

For temporary geosynthetic walls, use "L" shaped welded wire facing with 18-inch to 24-inch long legs. Locate geosynthetic reinforcement so reinforcement layers are at the same level as the horizontal legs of welded wire facing. Use vertical reinforcement spacing equal to facing height. Wrap geotextile or geogrid reinforcement behind welded wire facing and extend reinforcement at least three feet back behind facing into shoring backfill. Attach geostrip reinforcement to welded wire facing with a connection approved by the Department.

For temporary wire walls with separate reinforcement and facing components, attach welded wire grid or metallic strip reinforcement to welded wire facing with a connection approved by the Department. For temporary geogrid, geostrip and wire walls, retain shoring backfill at welded wire facing with retention geotextiles and extend geotextiles at least three feet back behind facing into backfill.

(D) Preconstruction Meeting

The Engineer may require a shoring preconstruction meeting to discuss the construction, inspection and testing of the temporary shoring. If required, and if this meeting occurs before all shoring submittals have been accepted, additional preconstruction meetings may be required before beginning construction of temporary shoring without accepted submittals. The Resident, District or Bridge Maintenance Engineer, Area Construction Engineer, Geotechnical Operations Engineer, Design-Build Team and Shoring contractor Superintendent will attend preconstruction meetings.

Construction Methods

Control drainage during construction in the vicinity of shoring. Direct run off away from shoring and shoring backfill. Contain and maintain backfill and protect material from erosion.

Install positive protection in accordance with the contract and accepted submittals. Use PCB in accordance with Section 1170 of the *Standard Specifications* and *Roadway Standard Drawing* No. 1170.01. Use temporary guardrail in accordance with Section 862 of the *Standard Specifications* and *Roadway Standard Drawing* Nos. 862.01, 862.02 and 862.03.

(A) Tolerances

Construct shoring with the following tolerances:

(1) Horizontal wires of welded wire facing are level in all directions,

(2) Shoring location is within six inches of horizontal and vertical alignment shown in the accepted submittals, and

(3) Shoring plumbness (batter) is not negative and within two degrees of vertical.

(B) Cantilever, Braced and Anchored Shoring Installation

If overexcavation behind cantilever, braced or anchored shoring is shown in the accepted submittals, excavate before installing piles. Otherwise, install piles before excavating for shoring. Install cantilever, braced or anchored shoring in accordance with the construction sequence shown in the accepted submittals. Remove piles and if applicable, timber lagging when shoring is no longer needed.

(1) Pile Installation

Install piles with the minimum required embedment and extension in accordance with Subarticles 450-3(D) and 450-3(E) of the *Standard Specifications* except that a pile driving equipment data form is not required. Piles may be installed with a vibratory hammer as approved by the Engineer.

Do not splice sheet piles. Use pile excavation to install drilled-in H-piles. After filling holes with concrete or Type 1 grout to the elevations shown in the accepted submittals, remove any fluids and fill remaining portions of holes with flowable fill. Cure concrete or grout at least seven days before excavating.

Notify the Engineer if refusal is reached before pile excavation or driven piles attain the minimum required embedment. When this occurs, a revised design submittal may be required.

(2) Excavation

Excavate in front of piles from the top down in accordance with the accepted submittals. For H-piles with timber lagging and braced and anchored shoring, excavate in staged horizontal lifts with a maximum height of five feet. Remove

flowable fill and material in between H-piles, as needed, to install timber lagging. Position lagging with at least three inches of contact in the horizontal direction between the lagging and pile flanges. Do not excavate the next lift until timber lagging for the current lift is installed and, if applicable, bracing and anchors for the current lift are accepted. Backfill behind cantilever, braced or anchored shoring with shoring backfill.

(3) Anchor Installation

If applicable, install foundations located behind anchored shoring before installing anchors. Fabricate and install ground anchors in accordance with the accepted submittals, Articles 6.4 and 6.5 of the AASHTO *LRFD Bridge Construction Specifications* and the following unless otherwise approved:

(a) Materials in accordance with this provision shall be required instead of materials conforming to Articles 6.4 and 6.5.3 of the AASHTO LRFD Specifications,

(b) Encapsulation-protected ground anchors in accordance with Article 6.4.1.2 of the AASHTO LRFD specifications are not required, and

(c) Corrosion protection for unbonded lengths of ground anchors and anchorage covers are not required.

(d) Mix and place neat cement grout in accordance with Subarticles 1003-5, 1003-6 and 1003-7 of the *Standard Specifications*. Measure grout temperature, density and flow during grouting with at least the same frequency grout cubes are made for compressive strength. Perform density and flow field tests in the presence of the Engineer in accordance with American National Standards Institute / American Petroleum Institute Recommended Practice 13B-1 (Section 4, Mud Balance) and ASTM C939 (Flow Cone), respectively.

Install helical anchors in accordance with the accepted submittals and Anchor Manufacturer's instructions. Measure torque during installation and do not exceed the torsional strength rating of the helical anchor. Attain the minimum required installation torque and penetration before terminating anchor installation. When replacing a helical anchor, embed last helix of the replacement anchor at least three helix plate diameters past the location of the first helix of the previous anchor.

(4) Anchor Testing

Proof test and lock-off anchors in accordance with the accepted submittals and Article 6.5.5 of the AASHTO *LRFD Bridge Construction Specifications* except for the acceptance criteria in Article 6.5.5.5. For the AASHTO LRFD specifications,

"ground anchor" refers to a ground or helical anchor and "tendon" refers to a bar, strand or shaft.

(a) Anchor Acceptance

Anchor acceptance shall be based in part on the following criteria.

(i) For ground and helical anchors, total movement is less than 0.04 inches between the one and ten minute readings or less than 0.08 inches between the six and 60 minute readings.

(ii) For ground anchors, total movement at maximum test load exceeds 80% of the theoretical elastic elongation of the unbonded length.

(b) Anchor Test Results

Submit .pdf files of anchor test records including movement versus load plots for each load increment within 24 hours of completing each row of anchors. The Engineer will review the test records to determine if the anchors are acceptable.

If the Engineer determines an anchor is unacceptable, revise the anchor design or installation methods. Submit a revised anchored shoring design for acceptance and provide an acceptable anchor with the revised design or installation methods. If required, replace the anchor or provide additional anchors with the revised design or installation methods.

(C) Temporary Wall Installation

Excavate as necessary for temporary walls in accordance with the plans developed by the Design-Build Team and accepted submittals. If applicable, install foundations located in the reinforced zone before placing shoring backfill or reinforcement unless otherwise approved. Notify the Engineer when foundation excavation is complete. Do not place shoring backfill or reinforcement until excavation dimensions and foundation material are approved.

Erect welded wire facing so the wall position is as shown in the plans developed by the Design-Build Team and accepted submittals. Set welded wire facing adjacent to each other in the horizontal and vertical direction to completely cover the wall face with facing. Stagger welded wire facing to create a running bond by centering facing over joints in the row below.

Attach geostrip reinforcement to welded wire facing and wrap geotextile reinforcement and retention geotextiles behind welded wire facing as shown in the plans developed by the Design-Build Team and accepted submittals. Cover geotextiles with at least three inches of shoring backfill. Overlap adjacent geotextile reinforcement and retention and

separation geotextiles at least 18 inches with seams oriented perpendicular to the wall face. Hold geotextiles in place with wire staples or anchor pins as needed.

Place reinforcement within three inches of locations shown in the plans developed by the Design-Build Team and accepted submittals. Before placing shoring backfill, pull geosynthetic reinforcement taut so it is in tension and free of kinks, folds, wrinkles and creases. Install reinforcement with the direction shown in the plans developed by the Design-Build Team and accepted submittals. For temporary wire walls with separate reinforcement and facing components, attach welded wire grid or metallic strip reinforcement to welded wire facing as shown in the accepted submittals. Do not splice or overlap reinforcement so seams are parallel to the wall face. Contact the Engineer when unanticipated existing or future obstructions such as foundations, pavements, pipes, inlets or utilities will interfere with reinforcement.

Place shoring backfill in the reinforced zone in eight-inch to ten-inch thick lifts. Compact A-2-4 soil and Class II, Type 1 and Class III select material in accordance with Subarticle 235-3(C) of the *Standard Specifications*. Use only hand operated compaction equipment to compact backfill within three feet of welded wire facing. At a distance greater than three feet, compact shoring backfill with at least four passes of an eight-ton to ten-ton vibratory roller in a direction parallel to the wall face. Smooth wheeled or rubber tired rollers are also acceptable for compacting backfill. Do not use sheepsfoot, grid rollers or other types of compaction equipment with feet. Do not displace or damage reinforcement when placing and compacting shoring backfill. End dumping directly on geosynthetic reinforcement shall not be permitted. Do not operate heavy equipment on reinforcement until it is covered with at least eight inches of shoring backfill. Replace any damaged reinforcement to the satisfaction of the Engineer.

Backfill for temporary walls outside the reinforced zone in accordance with Article 410-8 of the *Standard Specifications*. Bench temporary walls into the sides of excavations where applicable. For temporary geosynthetic walls with top of wall within five feet of finished grade, remove top facing and incorporate top reinforcement layer into fill when placing fill in front of wall. Temporary walls remain in place permanently unless otherwise required.

WORK ZONE INSTALLER

(7-20-21) (Rev. 4-21-26) 1101 DB11 R004

Page 11-4, Article 1101-14 WORK ZONE INSTALLER, lines 25-26, delete the first sentence of the first paragraph and replace with the following:

When temporary traffic control consists of more than flagging operations, the Design-Build Team shall provide the service of at least one qualified work zone installer during the setup, installation, and removal of temporary traffic control within the highway right of way.

TEMPORARY CRASH CUSHIONS

(4-21-26) 1089, 1160 DB11 R006

Page 10-204, Subarticle 1089-8(A) General, lines 26-29, delete the third and fourth paragraph.

Page 10-204, Subarticle 1089-8(A) General, line 34, delete the last sentence of the fifth paragraph.

Page 11-14, Article 1160-2 MATERIALS, lines 32-35, delete the second and third sentence of the first paragraph.

Page 11-15, Article 1160-3 CONSTRUCTION METHODS, add the following after line 1:

Use a redirective, non-gating temporary crash cushion when adequate space for the lateral displacement of the crash cushion is not available or as required in the TMP.

Page 11-15, Article 1160-3 CONSTRUCTION METHODS, line 7, add the following to the second paragraph:

Temporary crash cushion shall not be placed on an unpaved surface.

FLAGGERS

(12-17-24) (Rev. 12-23-25) 1150 DB11 R50

Revise Section 1150 of the *Standard Specification* as follows:

Page 11-13, Article 1150-1, DESCRIPTION, add the following after line 31:

Alternatively, at the discretion of the Design-Build Team, the Design-Build Team may furnish, install, place in operation, repair, maintain, relocate, and remove remotely controlled Automated Flagging Assistance Devices (AFAD) or Temporary Portable Traffic Signal units (PTS units) to assist, supplement, or replace human flaggers for one-lane, two-way traffic maintenance during construction in accordance with this provision and the *Standard Specifications*.

For the purpose of this provision, an "approach" refers to a single lane of traffic moving in one direction toward a point of control or work zone. Flaggers, AFAD and PTS units are only used to control one lane of approaching traffic in a specific direction.

Page 11-13, Article 1150-2, MATERIALS, add the following after line 34:

Provide documentation to the Engineer that the AFAD or PTS units meets or exceeds the requirements of this special provision and is on the NCDOT APL or ITS and Signals QPL.

(A) Automated Flagging Assistance Devices (AFAD)

(1) AFAD General

Cover the automated gate arm with Department approved Type VII, VIII or IX retroreflective sheeting of vertical alternating red and white stripes at 16 inch intervals measured horizontally. When the gate arm is in the down position the minimum vertical aspect of the arm and sheeting shall be four inches. The retroreflectorized sheeting shall be on both sides of the gate arm. With the AFAD parked or positioned two feet outside or in a location deemed acceptable for the lane being controlled, the gate arm shall reach at least to the center of the lane but shall not exceed the width of the lane being controlled.

Design the system to be fail-safe. Provide a conflict monitor, malfunction monitoring unit, or similar device that monitors for malfunctions and prevents the display of conflicting indications. This system shall be electronic and operated by remote control.

(2) AFAD Type I System: RED / YELLOW

Provide a Red/Yellow AFAD with at least one set of CIRCULAR RED and CIRCULAR YELLOW lenses in a vertical configuration that are 12 inches in diameter. The bottom of the housing (including brackets) shall be at least seven feet (2.1 meters) above the pavement.

This system is required to have yellow 12-inch aluminum or polycarbonate vehicle signal heads with ten inch tunnel visors, backplates, and Light Emitting Diode (LED) modules. Provide signal heads, backplates, and LED modules listed on the ITS and Signals QPL available on the Department's website.

Provide an automated gate arm on the AFAD that descends to a down position across the approaching lane of traffic when the **s**teady CIRCULAR RED lens is illuminated and then ascends to an upright position when the flashing CIRCULAR YELLOW lens is illuminated. The automated gate arm is to be designed such that if a motorist pulls underneath the gate arm while lowering, no damage to the vehicle occurs.

A STOP HERE ON RED (R10-6 or R10-6a) sign shall be installed on the right-hand side of the approach at the point at which drivers are expected to stop when the steady CIRCULAR RED lens is illuminated.

To stop traffic, the AFAD shall transition from the flashing CIRCULAR YELLOW lens by initiating a <u>minimum 5 second steadily illuminated</u> CIRCULAR YELLOW lens followed by the CIRCULAR RED lens.

Once the CIRCULAR RED lens is displayed, the system is to have <u>a minimum 2 second delay</u> between the time the steady CIRCULAR RED is displayed and the time the gate arm begins to lower. The maximum delay between CIRCULAR RED and the

time the gate arm lowers is 4 seconds. To permit stopped road users to proceed, the AFAD shall display the flashing CIRCULAR YELLOW lens and the gate arm shall be placed in the upright position.

Ensure the system monitors for a lack of yellow or red signal voltage, total loss of indication in any direction, presence of multiple indications on any approach and low power conditions.

Additional sets of CIRCULAR RED and CIRCULAR YELLOW lenses located over the roadway or on the left side of the approach and operated in unison with the primary set, may be used to improve visibility of the AFAD. If the set of lenses is located over any portion of the roadway that can be used by motor vehicles, the bottom of the housing (including brackets) shall be at least 15 feet (4.6 meters) above the pavement.

(3) AFAD Type II System: STOP/SLOW

Provide STOP / SLOW signs that are octagonal in shape, made of rigid material, and at least 36 inch x 36 inch in size. Letters shall be a minimum of eight inches high. The STOP face shall have a red background with white letters and border.

The SLOW face shall be diamond shaped, orange, or yellow background with black letters and border. Cover both faces in a Department approved Type VII, VIII or IX retroreflective sheeting. The minimum mounting height for the sign faces shall be seven feet above the pavement to the bottom of the sign.

The AFAD's STOP / SLOW signs shall be supplemented with active conspicuity devices by incorporating a stop beacon (red lens) and a warning beacon (yellow lens). The stop beacon shall be no more than 24 inches above the STOP face. Mount the warning beacon no more than 24 inches above or beside of the SLOW face. Except for the mounting locations, the beacons shall conform to the provisions of Chapter 4L of the *Manual on Uniform Traffic Control Devices* (MUTCD) and have 12-inch signal lenses.

Strobe / flashing lights are an acceptable alternative to flashing beacons. If utilized, they shall be either white or red flashing lights located within the STOP face and white or yellow flashing lights within the SLOW face and conform to the provisions of Chapter 6D of the MUTCD. If used, the lens diameter shall be a minimum of 5 inches with a minimum height of 6 inches. Equip strobes / flashing lights for both dual and quad flash patterns.

Type B warning lights shall not be used in lieu of the beacons or the strobe lights.

The faces of the AFADs STOP / SLOW sign may include louvers. If louvers are used, design the louvers such that the aspect of the sign face to approaching traffic is a full sign face at a distance of 50 feet or greater.

A WAIT ON STOP (R1-7) sign and a GO ON SLOW (R1-8) sign shall be displayed to traffic approaching the AFAD. Position signs on the same support structure as the AFAD.

Both signs shall have black legends and borders on white Type III sheeting backgrounds. Each of these signs shall be rectangular in shape and be at least 24 inch x 30 inch size with letters at least six inches high.

Provide an automated gate arm on the AFAD that descends to a down position across the approaching lane of traffic when the STOP face is displayed and then ascends to an upright position when the SLOW face is displayed.

The automated gate arm is to be designed such that if a motorist pulls underneath the gate arm while lowering, no damage to the vehicle occurs.

A STOP HERE ON RED (R10-6 or R10-6a) sign shall be installed on the right-hand side of the approach at the point at which drivers are expected to stop when the STOP face is displayed.

When approaching motorists are to proceed, display the SLOW face and the warning beacon or strobes are to flash on the AFAD. When approaching motorists are will be stopped, display the STOP face and the stop beacon or strobes are to flash on the AFAD.

To stop traffic, the AFAD will transition from the SLOW face to the STOP face by initiating a minimum 5 second change cycle. First, the warning beacon is to be steadily illuminated for the change cycle. If strobes are used in lieu of a warning beacon, they are to be placed in the quad flash pattern. At the end of the change cycle, the STOP face is to be displayed with the stop beacon flashing and the warning beacon or strobes are to stop flashing. Once the STOP face is displayed, the system is to have a minimum 2 second delay between the time the STOP face is displayed and the time the gate arm begins to lower. The maximum delay between the time the STOP face is displayed and the time the gate arm lowers is 4 seconds.

To permit stopped road users to proceed, the gate arm shall be placed in the upright position and the AFAD shall display the SLOW face and the warning beacon or strobes are to flash in the dual flash pattern.

Do not flash the stop beacon when the SLOW face is displayed, and do not flash the warning beacon when the STOP face is displayed.

(B) Portable Traffic Signals (PTS) Units

Provide PTS units with at least one set of CIRCULAR RED, CIRCULAR YELLOW, and CIRCULAR GREEN lenses in a vertical configuration that are 12-inch diameter aluminum or polycarbonate vehicle signal heads with ten-inch tunnel visors, backplates, and Light Emitting Diode (LED) modules. All signal heads, tunnel visors, and backplates shall be yellow in color.

The bottom of the housing (including brackets) shall be at least seven feet above the pavement for single set units. Additional signal heads on units with more than one signal head shall be capable of extending over the travel lane.

Communication Requirements

All PTS units within the signal set up systems shall maintain communication at all times by either hardwire cable or wireless radio link communication. If the hardwire cable communication is utilized the communication cable shall be deployed in a manner that will not intrude in the direct work area of the project or obstruct vehicular and pedestrian traffic. Utilize radio communication with 900MHz frequency band and frequency hopping capability. The radio link communication system shall have a minimum range of one mile.

Fault Mode Requirements

Revert PTS units to a flashing red mode upon system default unless otherwise specified by the Engineer. Equip the PTS units with a remote monitoring system. Where cell communication availability exists, the remote monitoring system shall adhere to the remote monitoring system section of this provision.

Remote Monitoring System

The remote monitoring system (RMS) shall be capable of reporting signal location, battery voltage / battery history and system default. Provide a password protected website viewable from any computer with internet capability for the RMS. In the event of a system default, the RMS shall provide specific information concerning the cause of the system default (i.e. red lamp on signal number 1). Equip the RMS with a mechanism capable of immediately contacting a minimum of three previously designated individuals via text messaging and / or email upon a default.

The running program operating the PTS units shall be always available and viewable through the RMS website. Maintain a history of the RMS operating system in each signal including operating hours and events and the location of the PTS units.

Trailer / Cart

The AFAD and PTS units may be mounted on either a trailer or a moveable cart system.

Finish all exterior metal surfaces with Federal orange enamel per AMS-STD-595, color chip ID# 13538 or 12473 respectively with a minimum paint thickness of 2.5 mils (64 microns).

Design and test the AFAD or PTS units trailer / cart to withstand an 80 MPH wind load while in the operational position. Provide independent certification that the assembly meets the design wind load.

Equip the AFAD or PTS units with leveling jacks capable of stabilizing the unit in a horizontal position when located on slopes 6:1 or flatter.

Equip trailers in compliance with North Carolina Law governing motor vehicles and include a 12-volt trailer lighting system complying *with Federal Motor Carrier Safety Regulations 393*, safety chains and a minimum two-inch ball hitch.

Provide a minimum four-inch-wide strip of fluorescent conspicuity sheeting retroreflective sheeting to the frame of the trailer. Apply the sheeting to all sides of the trailer. The sheeting shall meet the ASTM requirements of Type VII, VIII or IX.

Power System

Design the systems to operate both with and without an external power source. Furnish transmitters, generators, batteries, controls and all other components necessary to operate the device.

Provide equipment that is solar powered and supplemented with a battery backup system that includes a minimum 110/120 VAC powered on-board charging system capable of powering the unit for seven continuous days with no solar power. Each unit shall also be capable of being powered by standard 110/120 VAC power sources, if applicable.

Locate batteries and electronic controls in a locked, weather and vandal resistant housings.

Page 11-14, Article 1150-3, CONSTRUCTION METHODS, add the following after line 11:

Flaggers shall have a path to escape an errant approaching vehicle at all times, unimpeded by barrier, guardrail, guiderail, parked vehicles, construction materials, slopes steeper than 2:1, or any other obstruction at all times. If an unimpeded path cannot be maintained, the Contractor shall use AFAD or PTS units in lieu of a flagger.

Provide documentation to the Engineer prior to deploying the device that the AFAD or PTS units operator(s) are qualified flagger(s) that have been properly trained through an NCDOT approved training agency or other NCDOT approved training provider and that the qualified flagger(s) have received manufacturer training to operate that specific device. This training shall include proper installation, remote control operation, central control systems and maintenance of the AFAD or PTS units. The training shall take place off the project site where training conditions are removed from live traffic. The documentation shall include the names of the authorized trainer, the trainees, the device on which they have been trained and the date of the training. Provide updated documentation to the Engineer prior to deploying any additional operators.

Install advance warning signs and operate AFADs in accordance with the attached detail drawings in this provision.

Install advance warning signs and operate PTS units in accordance with *NCDOT Roadway Standard Drawings* No. 1101.02, Sheet 17.

AFAD and PTS units shall only be used in situations where there is only one lane of approaching traffic in the direction to be controlled. **At no time shall an AFAD unit controlling traffic through the work area be placed in an autonomous mode and / or left unattended.**

Signal timing and operation of PTS units shall be field verified and accepted by the Engineer before use.

Do not use AFAD or PTS units in locations where queueing from the AFAD or PTS units will extend to within 150 feet of a signalized intersection or railroad crossing. Do not be use AFAD and PTS units as a substitute for or a replacement for a continuously operating temporary traffic control signal as described in Section 6F.84 of the MUTCD.

If used at night, illuminate each AFAD or PTS units as described in Section 6D of the MUTCD.

Provide a complete AFAD or PTS units that is capable of being relocated as traffic conditions demand.

If AFADs or PTS units become inoperative, be prepared at all times to replace the unit with the same type and model of AFAD or PTS units, revert to human flagging operations or terminate all construction activities requiring the use of the AFAD or PTS units until the AFAD or PTS units become operative or qualified human flaggers are available.

When the work requiring the AFAD or PTS units is not pursued for 30 minutes or longer, power off each AFAD or PTS units. Removed the AFAD or PTS units from the travel lane and relocated to a minimum of five feet from the edge line. AFAD gate arms shall be in the upright position. Remove all traffic control devices from the road, place two cones by each AFAD or PTS units and all signs associated with the lane closure operation shall be removed or laid down. At the end of each workday, remove all AFADs or PTS units from the roadway and shoulder areas.

Ensure the system's wireless communication links continuously monitor and verify proper transmission and reception of data used to monitor and control each AFAD or PTS units. Ensure ambient mobile or other radio transmissions or adverse weather conditions do not affect the system.

In the event of a loss of communications, immediately display the flashing RED or STOP indication on all AFAD or PTS units.

AFAD Specific Construction Methods

The flagger/operator controlling the AFAD units shall be on the project site at all times. If multiple AFAD units are used, one AFAD unit shall be the Main AFAD unit and all other units shall be remote AFAD units. Ensure that each device meets the physical display and operational characteristics as specified in the MUTCD.

Multiple AFAD units may be controlled with **one** flagger / operator when the AFAD units meet each of the following requirements:

(1) AFAD units are spaced no greater than the manufacturer's recommendations.

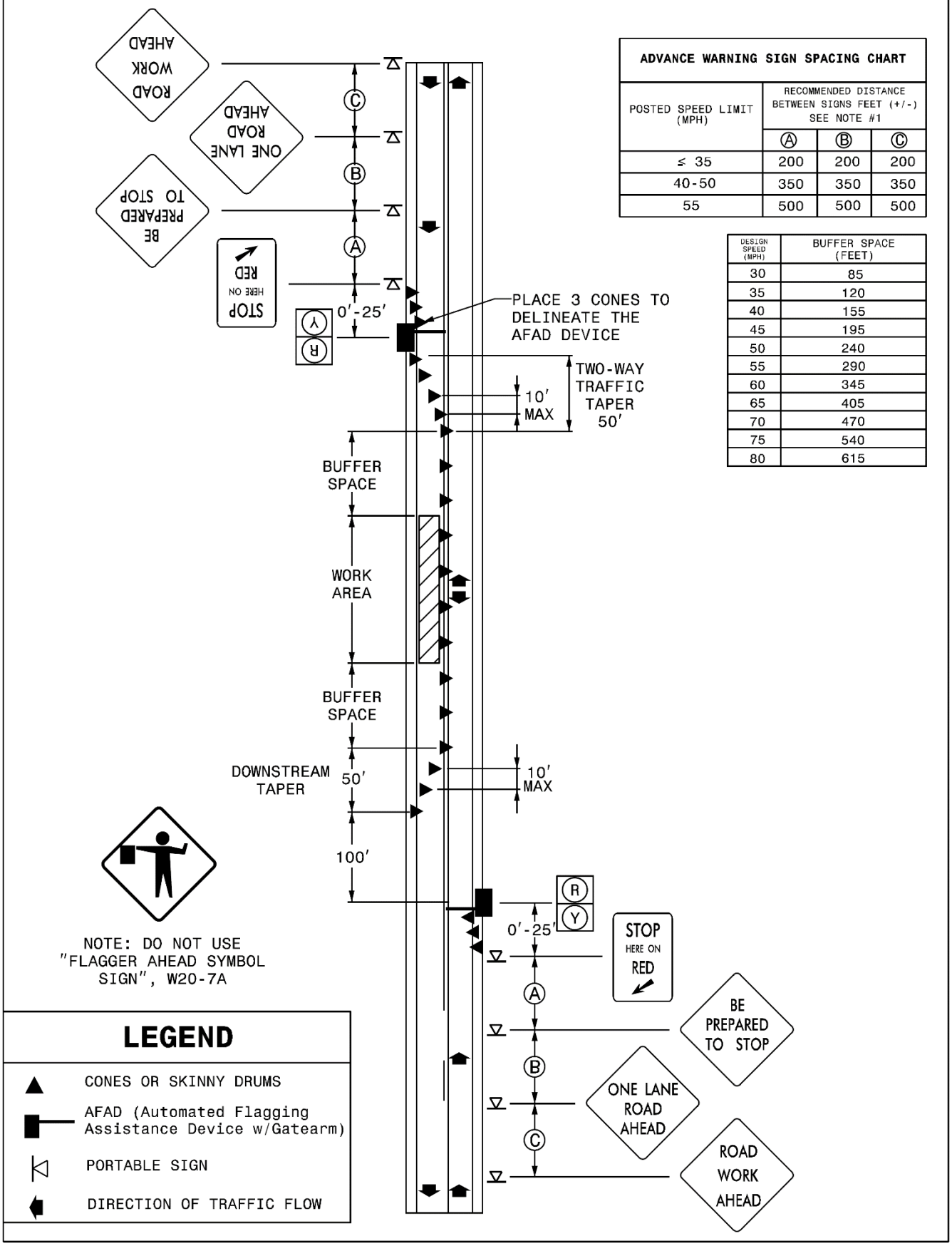
(2) Both AFAD units can be seen at the same time from the flagger / operator's position, or the AFAD is operating on its own secure network with malfunction detection and notification to the flagger/operator.

(3) The flagger / operator has an unobstructed view of approaching traffic in both directions from the flagger / operator position or the AFAD is operating on its own secure network, with cameras that provide the flagger / operator an unobstructed view of approaching traffic from both directions. The flagger / operator may control the AFAD units from a pilot vehicle.

If any of the above requirements are not met, flagger / operator control each AFAD unit.

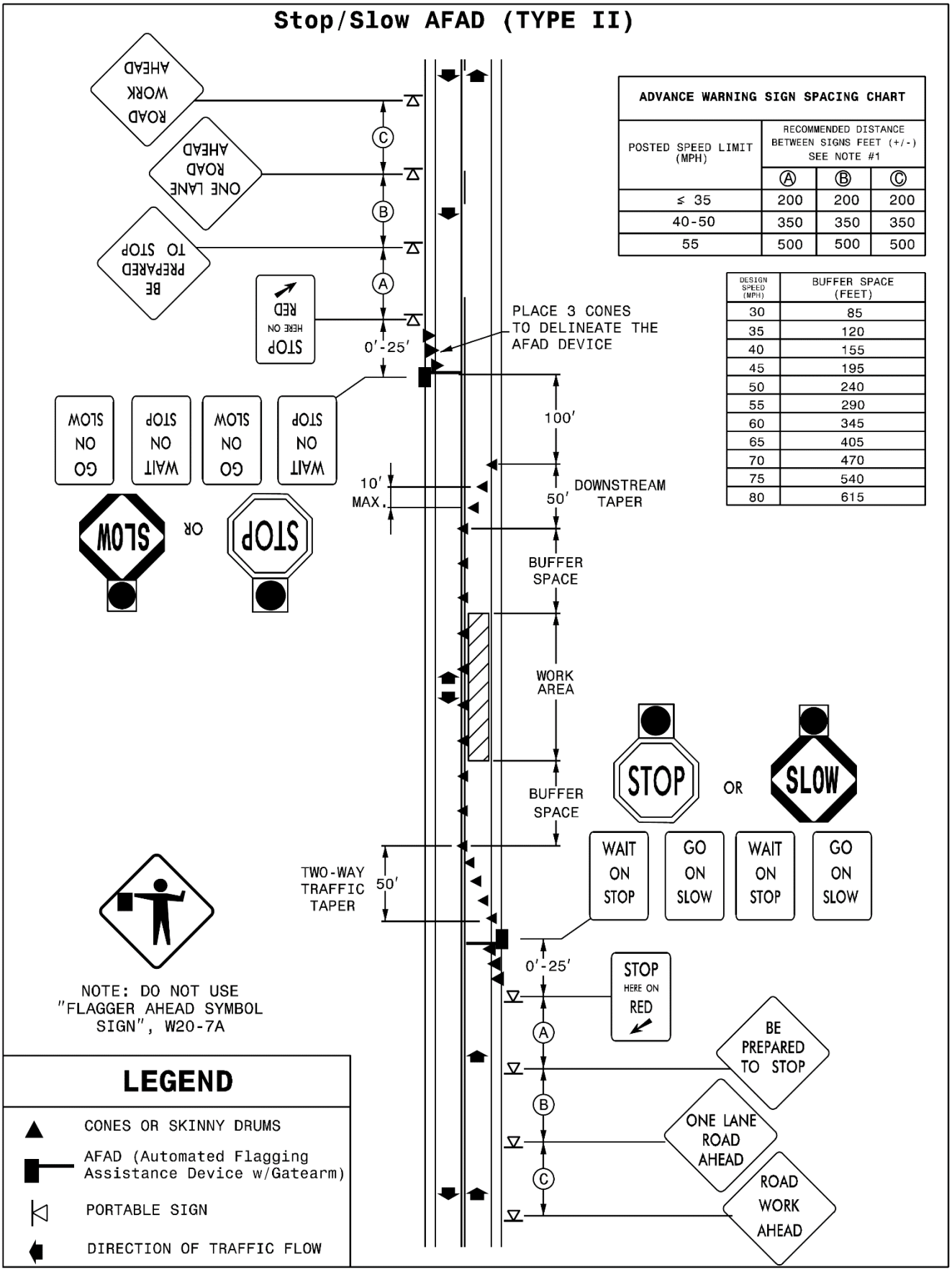
AFAD operators may either control traffic at side streets or driveways between the AFAD units or operate the pilot car while operating the AFAD system if approved by the Engineer. AFAD units must continue to be within clear sight of the operator during these work activities.

Red/Yellow Lens AFAD (TYPE I)



ADVANCE WARNING SIGN SPACING CHART			
POSTED SPEED LIMIT (MPH)	RECOMMENDED DISTANCE BETWEEN SIGNS FEET (+/-) SEE NOTE #1		
	Ⓐ	Ⓑ	Ⓒ
≤ 35	200	200	200
40-50	350	350	350
55	500	500	500

DESIGN SPEED (MPH)	BUFFER SPACE (FEET)
30	85
35	120
40	155
45	195
50	240
55	290
60	345
65	405
70	470
75	540
80	615



ADVANCE WARNING SIGN SPACING CHART

POSTED SPEED LIMIT (MPH)	RECOMMENDED DISTANCE BETWEEN SIGNS FEET (+/-) SEE NOTE #1		
	Ⓐ	Ⓑ	Ⓒ
≤ 35	200	200	200
40-50	350	350	350
55	500	500	500

DESIGN SPEED (MPH)	BUFFER SPACE (FEET)
30	85
35	120
40	155
45	195
50	240
55	290
60	345
65	405
70	470
75	540
80	615

PORTABLE CONCRETE BARRIER

(12-17-24) 1170 SP11 R70

Revise the *Standard Specifications* as follows:

Page 11-17, Subarticle 1170-3(A)(1) Portable Concrete Barrier, after line 25, add the following:

For MASH approved F-Shape K-Wall, install anchorage transitions between unanchored portable concrete barrier and temporary crash cushions, and between unanchored portable concrete barrier and portable concrete barrier (anchored) as shown in the *Roadway Standard Drawings*, No. 1170.01.

PAVEMENT MARKINGS

(5-19-26) (Rev. 6-16-26) 1087, 1205 DB12 R04

Revise the *Standard Specifications* as follows:

Page 10-185, Subarticle 1087-2(A) Paint Composition, line 15, replace "TT--P-1952" with "TT--P-1952, Type III".

Page 10-185, Subarticle 1087-2(C) Thermoplastic Composition, lines 28-33, replace the first through third paragraph and the table with the following:

(C) Thermoplastic and Integrated Multipolymer (IMP) Composition

Use thermoplastic alkyd/maleic pavement markings composed of the materials in Table 1087-1A and integrated multipolymer markings composed of the materials in Table 1087-1B.

TABLE 1087-1A
PHYSICAL PROPERTIES
OF THERMOPLASTIC PAVEMENT MARKINGS

Component	By Weight
Alkyd/Maleic Binder	18.0% Min
Premixed Glass Beads (AASHTO M 247 – Type 3)	40.0% Min
Titanium Dioxide Pigment (ASTM D476 Type 2)	10.0% Min. (white) 1.5% Min. (yellow)

TABLE 1087-1B PHYSICAL PROPERTIES OF INTEGRATED MULTIPOLYMER (IMP) PAVEMENT MARKINGS	
Component	**By Weight**
Binder	21.0% Min
Premixed Glass Beads (AASHTO M 247 – Type 3)	40.0% Min
Titanium Dioxide Pigment (ASTM D476 Type 2)	10.0% Min. (white only)
Inert Filler	15% Max white / 24% Max Yellow

Use white material that does not contain anatase titanium dioxide pigment. Use yellow material that does not contain any intentionally added lead chromate.

Calcium carbonate and inert fillers may be used by the manufacturer, providing all other qualifications are met.

Page 10-185, Subarticle 1087-2(C) Thermoplastic Composition, line 34, replace "thermoplastic" with "material".

Page 10-185, Subarticle 1087-2(C) Thermoplastic Composition, line 36, replace "alkyd/maleic binder" with "binder".

Page 10-185, Subarticle 1087-2(C) Thermoplastic Composition, line 38, replace "maleic-modified glycerol of resin" with "rosin ester".

Page 10-186, Subarticle 1087-2(C) Thermoplastic Composition, insert the following paragraph after line 2:

The integrated multipolymer binder shall consist of a mixture of modified rosin ester, polyamide and a copolymer (e.g. EVA) with waxes and/or plasticizers. At least 3% of the total formulation weight shall be 100% polyamide. The binder shall contain no petroleum hydrocarbon resins.

Page 10-186, Subarticle 1087-2(C) Thermoplastic Composition, lines 3, 6, 9 and 11, replace "thermoplastic material" with "material".

Page 10-186, Article 1087-3 COLOR, after line 27, replace "Crystal: Color No. 17886 (White)" with "White: Color No. 17925".

Page 10-186, Subarticle 1087-4(A) Composition, lines 31-34, replace the second paragraph with the following:

Manufacture the beads from 100% recycled or virgin non-pigmented glass from a composition designed to be highly resistant to traffic wear and to the effects of weathering. All intermix and drop-on glass beads shall be manufactured using 100% North American recycled glass cullet, virgin North American glass or a combination of the two.

Page 10-187, Subarticle 1087-4(C) Gradation & Roundness, lines 4-6, replace the first paragraph and table with the following:

Use drop-on and intermixed glass beads in all pavement markings with at least 80% true spheres when tested in accordance with ASTM D1155. Drop-on glass beads for permanent pavement markings shall be high performance glass beads listed on the NCDOT APL. If otherwise specified, or at the direction of the Engineer, other drop-on reflective media may be used on permanent markings. Drop-on glass beads used on any interim or temporary pavement markings shall meet Table 1087-2.

TABLE 1087-2
GLASS BEAD GRADATION REQUIREMENTS

Sieve Size	Gradation Requirements	
	Minimum	Maximum
Passing #20	95%	100%
Retained on #30	5%	20%
Retained on #50	40%	80%
Retained on #80	15%	50%
Passing #80	0%	10%
Retained on #200	0%	5%

Page 10-187, Article 1087-5 PACKAGING FOR SHIPMENT, line 31, replace "Thermoplastic pavement marking materials" with "Thermoplastic and integrated multipolymer pavement marking materials".

Page 10-188, Subarticle 1087-7(B) Thermoplastic Pavement Marking Material Composition, line 17, replace **"(B) Thermoplastic Pavement Marking Material Composition**" with "**(B) Thermoplastic and Integrated Multipolymer Pavement Marking Material Composition**".

Page 10-188, Subarticle 1087-7(C) Flash Point, line 22, replace "thermoplastic" with "thermoplastic and integrated multipolymer material".

Page 10-188, Subarticle 1087-7(D) Requirements, line 25, replace "thermoplastic material" with "thermoplastic and integrated multipolymer material".

Page 10-189, Subarticle 1087-7(D), after line 15, add the following:

(9) Tensile Elongation

The integrated multipolymer material shall have an elongation of at least 10% when tested in accordance with ASTM D638 (1"x 6", 0.25"/min).

(10) Abrasion Resistance

The integrated multipolymer material shall have no more than 0.40 g weight loss following taber abrasion with CS17 wheels for 1000 cycles with 1 kg weight per ASTM D4060.

Page 10-189, Article 1087-8 MATERIAL CERTIFICATION, lines 22-23, replace the third paragraph with the following:

Reflective media not covered in this, or other specifications must meet AASHTO M 247 Type 3 or 4 and a NCDOT Type 2 Material Certification must be provided.

Page 10-189, Article 1087-8 MATERIAL CERTIFICATION, after line 23, add the following to the table:

Integrated Multipolymer	Type 2 Material Certification and Type 3 Material Certification

Page 12-3, Subarticle 1205-3(F) Surface Preparation and Curing Compound Removal, line 8, add the following as a second sentence of the first paragraph:

Only apply markings to dry clean surfaces.

Page 12-4, Subarticle 1205-3(G)(1) General for all types of Pavement Markings, line 16, replace the first sentence of the eighth paragraph with the following:

Protect the pavement markings until they are track free before exposing them to traffic.

Page 12-4, Subarticle 1205-3(G)(1) General for all types of Pavement Markings, lines 22-24, delete the second sentence of the tenth paragraph.

Page 12-4, Subarticle 1205-3(G)(1) General for all types of Pavement Markings, after line 24, replace "White: Color No. 17886" with "White: Color No. 17295".

Page 12-5, Subarticle 1205-3(I) Removal of Pavement Markings, line 32, add the following as the third sentence of the seventh paragraph:

Before applying integrated multipolymer (IMP) pavement markings over existing thermoplastic pavement markings, remove at least 85% of the oxidized existing thermoplastic.

Page 12-5, Subarticle 1205-3(I) Removal of Pavement Markings, line 35, replace "thermoplastic" with "thermoplastic or IMP".

Page 12-6, Article 1205-4 THERMOPLASTIC, line 3, replace "**1205-4 THERMOPLASTIC**" with **"1205-4 THERMOPLASTIC AND INTEGRATED MULTIPOLYMER (IMP)".**

Page 12-6, Subarticle 1205-4(A) Application Equipment, lines 7, 16, 20, 24, 25, 27 and 29, delete "thermoplastic"

Page 12-6, Subarticle 1205-4(B) Weather Limitations and Seasonal Limitations, line 38, replace "thermoplastic pavement markings" with "thermoplastic or integrated multipolymer pavement markings".

Page 12-6, Subarticle 1205-4(B) Weather Limitations and Seasonal Limitations, line 42, delete “thermoplastic”.

Page 12-7, Subarticle 1205-4(C) Application, lines 2, 3, 10, 21 and 31, delete “thermoplastic”.

Page 12-7, Subarticle 1205-4(C) Application, after line 17, in Table 1205-2 MINIMUM REFLECTOMETER REQUIREMENTS FOR THERMOPLASTIC replace “Standard Glass Beads” with “High Performance Glass Beads” and for the Reflectivity of White replace “375 mcd/lux/m^2” with “425 mcd/lux/m^2” and Yellow replace “250 mcd/lux/m^2” with “325 mcd/lux/m^2”

Page 12-7, Subarticle 1205-4(C) Application, line 23, replace “thermoplastic pavement marking” with “final pavement marking”.

Page 12-7, Subarticle 1205-4(C) Application, after line 32, replace “**TABLE 1205-3 THICKNESS REQUIREMENTS FOR THERMOPLASTIC**” with “**TABLE 1205-3 THICKNESS REQUIREMENTS FOR THERMOPLASTIC AND INTEGRATED MULTIPOLYMER**”.

Page 12-9, Subarticle 1205-5(C) Observation Period, before line 1, replace “375 mcd/lux/m^2” with “425 mcd/lux/m^2” and replace “250 mcd/lux/m^2” with “325 mcd/lux/m^2”.

Page 12-11, Subarticle 1205-8(C) Application, lines 17-20, replace the first paragraph with the following:

Final pavement marking application of paint shall be placed in 1 application of 30 mils wet each and consist of reflective media applied at a rate to immediately obtain the minimum retroreflective values.

Page 12-11, Subarticle 1205-8(C) Application, line 26, delete “15 mil”.

Page 12-11, Subarticle 1205-8(C) Application, after line 31, replace Table 1205-6 with the following:

TABLE 1205-6
REFLECTOMETER REQUIREMENTS
FOR PAINT

Item	Color	Reflectivity
Standard Glass Beads	White	225 mcd/lux/m^2
	Yellow	200 mcd/lux/m^2
High Performance Glass Beads	White	425 mcd/lux/m^2
	Yellow	325 mcd/lux/m^2

SNOWPLOWABLE DELINEATIONS

(10-15-24) 1253 DB12 R53

Description

Furnish, install and maintain snowplowable delineation.

There are five snowplowable delineation alternate options approved for use in North Carolina. They include the following markers and markings options:

(1) Polycarbonate H-shaped Markers
(2) Inlaid Raised Pavement Markers
(3) 10-Feet Rumble Skips
(4) Inlaid Cradle Markers
(5) 10-Feet Inlaid Pavement Markings

Only one type of snowplowable delineation will be allowed on a single project.

Materials

Refer to Division 10 of the *Standard Specifications*.

Item	Section
Epoxy	1081
Pavement Markings	1087
Snowplowable Pavement Markers	1086-3

Any snowplowable pavement delineation shall conform to the applicable requirements of Sections 1086, 1087, and 1081 of the *Standard Specifications.* Use snowplowable delineation markers and markings listed on the NCDOT APL. Any treatment that requires pavement cutting or milling shall be installed within seven calendar days of the pavement cutting or milling operation.
Do not use Polycarbonate H-shaped Marker option in the following counties: Buncombe, Burke, Graham, Haywood, Jackson, Macon, Madison, McDowell, Mitchell, Rutherford, and Yancey.

Construction Methods

(A) General

For any snowplowable delineation, prior to installation, by brushing, blow cleaning, vacuuming or other suitable means, ensure that all materials and the pavement surface are free of dirt, grease, dust, oil, moisture, mud, grass, or any other material that would prevent adhesion to the pavement by brushing blow cleaning, or vacuuming. If required, apply a primer per manufactures recommendations to pavement surfaces before applying pavement marking material.

Install snowplowable delineation per manufacturer's specifications every 80 feet. Make sure pavement markers are oriented to traffic correctly and pavement markings are applied in a uniform thickness. Do not apply markings over longitudinal joints. Protect the pavement markings until they are tack free. Apply applicable Sections 1205 and 1250 of the *Standard Specifications*.

If damage occurs during installation the effected treatments shall be corrected or replaced. This work shall be considered incidental to the installation of the marking or marker.

(B) Polycarbonate H-shaped Markers and Inlaid Cradle Markers

Bond marker housings to the pavement with epoxy adhesive. Mechanically mix and dispense epoxy adhesives as required by the manufacturer's specifications. Place the markers immediately after the adhesive has been mixed and dispensed.

Install polycarbonate H-shaped markers and inlaid cradle markers castings into slots sawcut into the pavement. Make slots in the pavement to exactly duplicate the shape of the casting of the polycarbonate H-shaped markers and inlaid cradle markers.

If saw cutting, milling, or grooving operations are used, promptly remove all resulting debris from the pavement surface. Install the marker housings within seven calendar days after saw cutting, milling, or grooving the pavement. Remove and dispose of loose material from the slots by brushing, blow cleaning or vacuuming. Dry the slots before applying the epoxy adhesive. Install polycarbonate H-shaped markers and inlaid cradle markers according to the manufacturer's recommendations.

Protect the polycarbonate H-shaped markers or inlaid cradle markers until the epoxy has initially cured and is track free.

Construct inlaid cradle markers in accordance with the details in the plans developed by the Design-Build Team and as directed by the Engineer.

(C) Reflector Replacement

The following requirements only apply to polycarbonate H-shaped markers and inlaid cradle markers.

In the event that a reflector is damaged, replace the damaged reflector by using adhesives and methods recommended by the manufacturer of the markers and approved by the Engineer. This work is considered incidental if damage occurs during the initial installation of the marker housings and maintenance of initial polycarbonate H-shaped markers or inlaid cradle markers specified in this section.

If during reflector replacement it is discovered that the housing is missing or broken this will be paid as *Polycarbonate H-shaped Markers* or *Inlaid Cradle Markers*. Missing housings shall be replaced. Broken housings shall be removed and replaced. In both cases the slot for

the housings shall be properly prepared prior to installing the new housing; patch the existing marker slots as directed by the Engineer and install the new marker approximately one foot before

or after the patch. Removal of broken housings and preparation of slots will be considered incidental to the work of replacing housings

(D) Inlaid Raised Pavement Markers

Cut groove in accordance with the details in the plans developed by the Design-Build Team and as directed by the Engineer.

Use adhesive recommended by the manufacturer to install markers into the groove in accordance with Section 1251. The raised pavement markers are incidental to inlaid raised pavement markers.

(E) 10-Feet Rumble Skips

Construct 10-feet rumble skips on asphalt concrete in accordance with Section 665 for all centerline and shoulder rumble skips, details in the plans developed by the Design-Build Team and as directed by the Engineer. Construct 10-feet rumble skips on Portland cement concrete in accordance with Section 730 for all centerline and shoulder rumble skips, details in the plans developed by the Design-Build Team and as directed by the Engineer. The milled rumble strips are incidental to the rumble skips. Using polyurea or extruded 90 mil thermoplastic construct pavement markings in accordance with Section 1205.

(F) 10-Feet Inlaid Pavement Markings

The groove in which the marking is to be placed shall be one inch wider than the marking to be placed and 10 mils deeper than the thickness of the marking.

When using this method, use enhanced reflective media. The following retroreflectivity values shall be met:

MINIMUM INITIAL REFLECTOMETER READINGS		
Item	**Color**	**Reflectivity**
Enhanced Reflectivity Media	White	450 mcd/lux/m^2
	Yellow	350 mcd/lux/m^2

Using polyurea, extruded 90 mil thermoplastic or cold applied plastic construct pavement markings in accordance with Section 1205.

Maintenance

Maintain all installed snowplowable delineation before acceptance by the Engineer.

COIR FIBER MAT

(9-16-25) 1629 DB16 R05

Page 16-9, Article 1629-2 MATERIALS, lines 22-24, delete and replace the last paragraph with the following:

Provide #3 or #4 uncoated reinforcing steel anchors, 24 inches in length, bent into a U-shape with a 4-inch diameter bend and a 4-inch straight leg extending from the bend to catch and secure the coir fiber mat.

WATTLE DEVICES

(1-1-24) (Rev. 9-16-25) 1642 DB16 R10

Page 16-23, Subarticle 1642-2(B) Wattle, lines 10-12, delete and replace with the following:

(B) Wattle and Wattle Barrier

Wattles shall meet Table 1642-1.

TABLE 1642-1
100% CURLED WOOD (EXCELSIOR) FIBERS - WATTLE

Property	Property Value
Minimum Diameter	12 inches
Minimum Density	2.5 pcf +/- 10%
Net Material	Synthetic
Net Openings	1 inch x 1 inch
Net Configuration	Totally Encased
Minimum Weight	20 lb +/- 10% per 10 foot length

Coir Fiber Wattles shall meet Table 1642-2.

TABLE 1642-2
100% COIR (COCONUT) FIBERS WATTLE

Property	Property Value
Minimum Diameter	12 inches
Minimum Density	3.5 pcf +/- 10%
Net Material	Coir Fiber
Net Openings	2 inch x 2 inch
Net Strength	90 lb
Minimum Weight	2.6 pcf +/- 10%

Wattle Barriers shall meet Table 1642-3.

TABLE 1642-3 100% CURLED WOOD (EXCELSIOR) FIBERS – WATTLE BARRIER	
Property	**Property Value**
Minimum Diameter	18 inches
Minimum Density	2.9 pcf +/- 10%
Net Material	Synthetic
Net Openings	1 inch x 1 inch
Net Configuration	Totally Encased
Minimum Weight	5 pcf +/- 10%

Coir Fiber Wattle Barriers shall meet Table 1642-4.

TABLE 1642-4 100% COIR (COCONUT) FIBERS WATTLE BARRIER	
Property	**Property Value**
Minimum Diameter	18 inches
Minimum Density	5 pcf +/- 10%
Net Material	Coir Fiber
Net Openings	2 inch x 2 inch
Net Strength	90 lb
Minimum Weight	10 pcf +/- 10%

INDUCTIVE DETECTION LOOPS MILL AND FILL

(6-16-26) 1725 DB17 R25R

Revise the *Standard Specifications* as follows:

Page 17-20, Article 1725-3, **CONSTRUCTION METHODS, lines 27-31**, replace the second sentence of the third paragraph with the following:

For new construction, construction involving placement of two or more asphalt layers, or resurfacing where a new asphalt layer is placed over the existing pavement surface without milling, install inductive detection loops before placing final layer of asphalt surface course. For mill and fill resurfacing operations where the pavement is milled and replaced in kind with a single surface course layer, install inductive detection loops in the completed surface course unless otherwise required by the contract.

PLANT AND PEST QUARANTINES

(3-18-03) (Rev. 3-18-25) Z-04a

(Imported Fire Ant, Guava Root Knot Nematode, Spongy Moth (formerly known as gypsy moth), Witchweed, Cogon Grass, And Any Other Regulated Noxious Weed or Plant Pest)

Within Quarantined Area

This project may be within a county regulated for plant and / or pests. If the project or any part of the Design-Build Team's operations is located within a quarantined area, thoroughly clean all equipment prior to moving out of the quarantined area. Comply with federal / state regulations by obtaining a certificate or limited permit for any regulated article moving from the quarantined area.

Originating in a Quarantined County

Obtain a certificate or limited permit issued by the N.C. Department of Agriculture / United States Department of Agriculture. Have the certificate or limited permit accompany the article when it arrives at the project site.

Contact

Contact the N.C. Department of Agriculture / United States Department of Agriculture at 1-800-206-9333, 919-707-3730, or **https://www.ncagr.gov/divisions/plant-industry/plant-protection/plant-industry-plant-pest-quarantines** to determine those specific project sites located in the quarantined area or for any regulated article used on this project originating in a quarantined county.

Regulated Articles Include

1. Soil, sand, gravel, compost, peat, humus, muck, and decomposed manure, separately or with other articles. This includes movement of articles listed above that may be associated with cut / waste, ditch pulling, and shoulder cutting.
2. Plants with roots including grass sod
3. Plant crowns and roots
4. Bulbs, corms, rhizomes, and tubers of ornamental plants
5. Hay, straw, fodder, and plant litter of any kind
6. Clearing and grubbing debris
7. Used agricultural cultivating and harvesting equipment
8. Used earth-moving equipment
9. Any other products, articles, or means of conveyance of any character, if determined by an inspector present a hazard of spreading imported fire ant, guava root knot nematode, spongy moth (formerly known as gypsy moth), witchweed, cogon grass, or other regulated noxious weed or plant pest.

ON-THE-JOB TRAINING

(2-24-15) (Rev. 6-16-26) Z-10

Description

The North Carolina Department of Transportation administers a custom version of the Federal On-the-Job Training (OJT) Program, commonly referred to as the Alternative OJT Program. All Contractors will be automatically placed in the Alternative OJT Program.

The Alternate OJT Program will allow a Contractor to train employees on Federal, State and privately funded projects located in North Carolina. However, priority shall be given to training employees on NCDOT Federal-Aid funded projects.

On the Job Training shall meet the requirements of 23 CFR 230.107 (b), 23 USC – Section 140, this special provision and the NCDOT On-the-Job Training Program Manual.

Minorities and Women

Developing, training and upgrading of minorities and women toward journeyman level status is a primary objective of this special provision. Accordingly, the Contractor shall make every effort to enroll minority and women as trainees to the extent that such persons are available within a reasonable area of recruitment. 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.

Assigning Training Goals

The Department, through the OJT Program Unit, will assign annual training goals based on the Contractors' activity over the past three years' on federal projects with the Department. At the beginning of each year, all eligible Contractors will be contacted by the Department to determine the number of trainees that will be assigned for the upcoming calendar year. At that time the Contractor shall enter into an agreement with the Department to implement a self-imposed on-the-job training program for the calendar year. This agreement will specify the annual training goals agreed upon by both parties. The number of training assignments may range from 1 to 15 per Contractor per calendar year, unless a higher number is agreed to by the Contractor. The Contractor shall sign an agreement committing to fulfill their annual goal for the year.

Training Classifications

The Contractor shall provide on-the-job training aimed at developing full journeyman level workers in the construction craft / operator positions.

The Department has established common training classifications and their respective training requirements that may be used by the Contractors. However, the classifications established are not all-inclusive. Where the training is oriented toward construction applications, training will be allowed in lower-level management positions such as office engineers and estimators. Contractors shall submit new classifications for specific job functions that their employees are performing. The Department will review and recommend for acceptance to FHWA the new classifications proposed by contractors, if applicable. New classifications shall meet the following requirements:

Proposed training classifications are reasonable and realistic based on the job skill classification needs, and

The number of training hours specified in the training classification is consistent with common practices and provides enough time for the trainee to obtain journeyman level status.

The Contractor may allow trainees to be trained by a subcontractor provided that the Contractor retains primary responsibility for meeting the training and this special provision is made applicable to the subcontract. However, only the Contractor will receive credit towards the annual goal for the trainee.

Where feasible, 25 percent of trainees in each occupation shall be in their first year of 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.

No employee shall be employed as a trainee in any classification in which they have successfully completed a training course leading to journeyman level status or in which they have been employed as a journeyman.

Records and Reports

The Contractor shall maintain enrollment, monthly and completion reports documenting company compliance under these contract documents. These documents and any other information as requested shall be submitted to the OJT Program Manager.

Upon completion and graduation of the program, the Contractor shall provide each trainee with a certification Certificate showing the type and length of training satisfactorily completed.

Trainee Interviews

All trainees enrolled in the program will receive at minimum an initial and Trainee / Post graduate interview conducted by the OJT program staff.

Trainee Wages

Contractors shall compensate trainees on a graduating pay scale based upon a percentage of the prevailing minimum journeyman wages (Davis-Bacon Act). Minimum pay shall be as follows:

60 percent of the journeyman wage for the first half of the training period
75 percent of the journeyman wage for the third quarter of the training period
90 percent of the journeyman wage for the last quarter of the training period

In no instance shall a trainee be paid less than the local minimum wage. The Contractor shall adhere to the minimum hourly wage rate that will satisfy both the NC Department of Labor (NCDOL) and the Department.

Achieving or Failing to Meet Training Goals

The Contractor will be credited for each trainee currently enrolled or who becomes enrolled in an approved program and who receives training for at least 50 percent of the specific program

requirement. Trainees will be allowed to be transferred between projects if required by the Contractor's scheduled workload to meet training goals.

If a Contractor fails to attain their training assignments for the calendar year, they may be taken off the NCDOT's Bidders List.

Measurement and Payment

No compensation will be made for providing required training in accordance with these contract documents.

STANDARD SPECIAL PROVISION

AVAILABILITY OF FUNDS - TERMINATION OF CONTRACTS

(9-1-11) Z-2

General Statute 143C-6-11. (h) Highway Appropriation is hereby incorporated verbatim in this contract as follows:

"(h) Amounts Encumbered – Transportation project appropriations may be encumbered in the amount of allotments made to the Department of Transportation by the Director for the estimated payments for transportation project contract work to be performed in the appropriation fiscal year. The allotments shall be multiyear allotments and shall be based on estimated revenues and shall be subject to the maximum contract authority contained in General Statute 143C-6-11(c). Payment for transportation project work performed pursuant to contract in any fiscal year other than the current fiscal year is subject to appropriations by the General Assembly. Transportation project contracts shall contain a schedule of estimated completion progress, and any acceleration of this progress shall be subject to the approval of the Department of Transportation provided funds are available. The State reserves the right to terminate or suspend any transportation project contract, and any transportation project contract shall be so terminated or suspended if funds will not be available for payment of the work to be performed during that fiscal year pursuant to the contract. In the event of termination of any contract, the contractor shall be given a written notice of termination at least 60 days before completion of scheduled work for which funds are available. In the event of termination, the contractor shall be paid for the work already performed in accordance with the contract specifications."

Payment will be made on any contract terminated pursuant to the special provision in accordance with Subarticle 108-13(D), of the North Carolina Department of Transportation *Standard Specifications*, dated January 2024 and as amended by the Standard Special Provision, Division One found elsewhere in this RFP.

***** STANDARD SPECIAL PROVISIONS *****

NCDOT GENERAL SEED SPECIFICATIONS FOR SEED QUALITY

(5-7-11) Z-3

Seed shall be sampled and tested by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory. When said samples are collected, the vendor shall supply an independent laboratory report for each lot to be tested. Results from seed so sampled shall be final. Seed not meeting the specifications shall be rejected by the Department of Transportation and shall not be delivered to North Carolina Department of Transportation warehouses. If seed has been delivered it shall be available for pickup and replacement at the supplier's expense.

Any re-labeling required by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory, that would cause the label to reflect as otherwise specified herein shall be rejected by the North Carolina Department of Transportation.

Seed shall be free from seeds of the noxious weeds Johnsongrass, Balloonvine, Jimsonweed, Witchweed, Itchgrass, Serrated Tussock, Showy Crotalaria, Smooth Crotalaria, Sicklepod, Sandbur, Wild Onion, and Wild Garlic. Seed shall not be labeled with the above weed species on the seed analysis label. Tolerances as applied by the Association of Official Seed Analysts will NOT be allowed for the above noxious weeds except for Wild Onion and Wild Garlic.

Tolerances established by the Association of Official Seed Analysts will generally be recognized. However, for the purpose of figuring pure live seed, the found pure seed and found germination percentages as reported by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory will be used. Allowances, as established by the NCDOT, will be recognized for minimum pure live seed as listed on the following pages.

The specifications for restricted noxious weed seed refers to the number per pound as follows:

Restricted Noxious Weed	Limitations per Lb. of Seed	Restricted Noxious Weed	Limitations per Lb. of Seed
Blessed Thistle	4 seeds	Cornflower (Ragged Robin)	27 seeds
Cocklebur	4 seeds	Texas Panicum	27 seeds
Spurred Anoda	4 seeds	Bracted Plantain	54 seeds
Velvetleaf	4 seeds	Buckhorn Plantain	54 seeds
Morning-glory	8 seeds	Broadleaf Dock	54 seeds
Corn Cockle	10 seeds	Curly Dock	54 seeds
Wild Radish	12 seeds	Dodder	54 seeds
Purple Nutsedge	27 seeds	Giant Foxtail	54 seeds
Yellow Nutsedge	27 seeds	Horsenettle	54 seeds
Canada Thistle	27 seeds	Quackgrass	54 seeds
Field Bindweed	27 seeds	Wild Mustard	54 seeds
Hedge Bindweed	27 seeds		

Seed of Pensacola Bahiagrass shall not contain more than 7% inert matter, Kentucky Bluegrass, Centipede and Fine or Hard Fescue shall not contain more than 5% inert matter whereas a maximum of 2% inert matter will be allowed on all other kinds of seed. In addition, all seed shall not contain more than 2% other crop seed nor more than 1% total weed seed. The germination rate as tested by the North Carolina Department of Agriculture shall not fall below 70%, which includes both dormant and hard seed. Seed shall be labeled with not more than 7%, 5% or 2% inert matter (according to above specifications), 2% other crop seed and 1% total weed seed.

Exceptions may be made for minimum pure live seed allowances when cases of seed variety shortages are verified. Pure live seed percentages will be applied in a verified shortage situation. Those purchase orders of deficient seed lots will be credited with the percentage that the seed is deficient.

FURTHER SPECIFICATIONS FOR EACH SEED GROUP ARE GIVEN BELOW:

Minimum 85% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 83% pure live seed will not be approved.

Sericea Lespedeza
Oats (seeds)

Minimum 80% pure live seed; maximum 1% total weed seed; maximum 2% total other crop; maximum 144 restricted noxious weed seed per pound. Seed less than 78% pure live seed will not be approved.

Tall Fescue (all approved varieties)
Kobe Lespedeza
Korean Lespedeza
Weeping Lovegrass
Carpetgrass
Bermudagrass
Browntop Millet
German Millet - Strain R
Clover - Red / White / Crimson

Minimum 78% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 76% pure live seed will not be approved.

Common or Sweet Sundangrass

Minimum 76% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 74% pure live seed will not be approved.

Rye (grain; all varieties)
Kentucky Bluegrass (all approved varieties)
Hard Fescue (all approved varieties)
Shrub (bicolor) Lespedeza

Minimum 70% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 noxious weed seed per pound. Seed less than 70% pure live seed will not be approved.

Centipedegrass
Crownvetch
Pensacola Bahiagrass
Creeping Red Fescue
Japanese Millet
Reed Canary Grass
Zoysia

Minimum 70% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 5% inert matter; maximum 144 restricted noxious weed seed per pound.

Barnyard Grass
Big Bluestem
Little Bluestem
Bristly Locust
Birdsfoot Trefoil
Indiangrass
Orchardgrass
Switchgrass
Yellow Blossom Sweet Clover

STANDARD SPECIAL PROVISION

ERRATA

(1-16-24) (Rev. 6-16-26) Z-4

Revise the *2024 Standard Specifications* as follows:

Division 1

Page 1-1, Article 101-2 ABBREVIATIONS, line 25, replace "American Wood-Preservers' Association" with "American Wood Protection Association".

Page 1-18, Article 102-10 BID BOND OR BID DEPOSIT, line 26, replace " Subarticle 102-8(A)(8)(b)" with "Subarticle 102-8(A)(12)(b)".

Page 1-20, Subarticle 102-14(A) State Funded Projects, line 3, replace "$30,000" with "$40,000".

Page 1-20, Subarticle 102-14(B) Federal Aid Projects, line 7, replace "$30,000" with "$40,000".

Page 1-36, Subarticle 104-12(B) Evaluation of Proposals, line 21, replace "Design-Build Unit" with "Alternative Delivery Unit".

Page 1-36, Subarticle 104-12(D) Preliminary Review, line 37, replace "Design-Build Unit" with "Alternative Delivery Unit".

Page 1-37, Subarticle 104-12(E) Final Proposal, line 3, replace "Design-Build Unit" with "Alternative Delivery Unit".

Page 1-37, Subarticle 104-12(F) Design-Build VEPs, line 36, replace "Design-Build Unit" with "Alternative Delivery Unit".

Page 1-38, Subarticle 104-12(G) Modifications, line 1, replace "Design-Build Unit" with "Alternative Delivery Unit".

Division 3

Page 3-5, Article 305-2 MATERIALS, after line 16, replace " 1032-3(A)(7)" with "1032-3" and add the item "Galvanized Corrugated Steel Pipe" with Section "1032-3".

Page 3-6, Article 310-2 MATERIALS, after line 9, add the item "Galvanized Corrugated Steel Pipe" with Section "1032-3".

Division 6

Page 6-15, Article 610-1 DESCRIPTION, line 20, replace "The work includes" with "The work includes, but is not limited to,".

Page 6-15, Article 610-1 DESCRIPTION, line 22, replace “applying the tack coat as specified.” with “applying the tack coat in accordance with Section 605.”.

Page 6-30, Article 610-14 DENSITY ACCEPTANCE, line 39, replace “QC process.” with “QC process in accordance with Section 609.”.

Page 6-31, Article 610-16 MEASUREMENT AND PAYMENT, line 13, replace "*Hot Mix Asphalt Pavement*” with “*Asphalt Concrete _____ Course, Type _____*”.

Page 6-50, Subarticle 661-4(A) Equipment, lines 4-7, replace the first two sentences of the seventh paragraph with the following:

When an erected fixed stringline is utilized for longitudinal profile and cross slope control furnish and erect the necessary guide line for the equipment.

Division 7

Page 7-18, Subarticle 710-10(A) General, lines 7-8, delete “for *Surface Testing Concrete Pavement*” from the last paragraph.

Division 8

Page 8-27, Article 846-1 DESCRIPTION, line 8, delete “4 inch” from the first paragraph.

Division 9

Page 9-17, Article 904-4 MEASUREMENT AND PAYMENT, prior to line 1, replace " Sign Erection, Relocate Type (Ground Mounted)” with “Sign Erection, Relocate Type ___ (Ground Mounted)”.

Division 10

Page 10-51, Article 1024-4 WATER, prior to line 1, delete the “unpopulated blank row” in Table 1024-2 between “Time of set, deviation from control” and “Chloride Ion Content, Max.”.

Page 10-170, Subarticle 1081-1(C) Requirements, line 4, replace "maximum” with “minimum”.

Division 11

Page 11-15, Article 1160-4 MEASUREMENT AND PAYMENT, line 24, replace “Where barrier units are moved more than one” with “Where barrier units are moved more than once”.

Division 15

Page 15-10, Article 1515-4 MEASUREMENT AND PAYMENT, lines 11, replace " All piping" with "All labor, the manhole, other materials, excavation, backfilling, piping".

Division 16

Page 16-3, Article 1609-2 MATERIALS, after line 26, replace "Type 4" with "Type 4a".

Page 16-14, Article 1633-5 MEASUREMENT AND PAYMENT, line 20-24 and prior to line 25, delete and replace with the following " *Flocculant* will be measured and paid in accordance with Article 1642-5 applied to the temporary rock silt checks."

Page 16-25, Article 1644-2 MATERIALS, after line 22, replace "Type 4" with "Type 4a".

Page 16-27, Article 1644-5 MEASUREMENT AND PAYMENT, line 31, replace "Article 1630-4" with "Article 1630-3".

Division 17

Page 17-15, Article 1715-4 MEASUREMENT AND PAYMENT, line 23, delete and replace "1.25" with "1-1/4".

Page 17-15, Article 1715-4 MEASUREMENT AND PAYMENT, line 24, delete and replace ")(1.25" with ", 1-1/4".

***** STANDARD SPECIAL PROVISIONS *****

TITLE VI AND NONDISCRIMINATION

(6-28-77) (Rev 8-18-26) Z-6

The North Carolina Department of Transportation is committed to carrying out the U.S. Department of Transportation's policy of ensuring nondiscrimination in the award and administration of contracts.

The provisions of this section related to United States Department of Transportation (US DOT) Order 1050.2A, Title 49 Code of Federal Regulations (CFR) part 21, 23 United States Code (U.S.C.) 140 and 23 CFR part 200 (or 49 CFR 303, 49 U.S.C. 5332 or 49 U.S.C. 47123) are applicable to all North Carolina Department of Transportation (NCDOT) contracts and to all related subcontracts, material supply, engineering, architectural and other service contracts, regardless of dollar amount. Any Federal provision that is specifically required not specifically set forth is hereby incorporated by reference.

(1) **Title VI Assurances (USDOT Order 1050.2A, Appendix A)**

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

(a) Compliance with Regulations

The contractor (hereinafter includes consultants) shall comply with the Acts and the Regulations relative to Nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

(b) Nondiscrimination

The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

(c) Solicitations for Subcontractors, Including Procurements of Materials and Equipment

In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Nondiscrimination on the grounds of race, color, or national origin.

(d) Information and Reports

The contractor shall provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the FHWA to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor shall so certify to the Recipient or the FHWA, as appropriate, and shall set forth what efforts it has made to obtain the information.

(e) Sanctions for Noncompliance:

In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it and/or the FHWA may determine to be appropriate, including, but not limited to:

(i) Withholding payments to the contractor under the contract until the contractor complies; and/or

(ii) Cancelling, terminating, or suspending a contract, in whole or in part.

(f) Incorporation of Provisions

The contractor shall include the provisions of paragraphs (a) through (f) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor shall take action with respect to any subcontract or procurement as the Recipient or the FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

(2) **Title VI Nondiscrimination Program (23 CFR 200.5(p))**

The North Carolina Department of Transportation (NCDOT) has assured the USDOT that, as a condition to receiving federal financial assistance, NCDOT will comply with Title VI of the Civil Rights Act of 1964 and all requirements imposed by Title 49 CFR part 21 and related nondiscrimination authorities to ensure that no person shall, on the ground of race, color, national origin, limited English proficiency, sex, age, or disability (including religion/creed or income-level, where applicable), be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any programs, activities, or services conducted or funded by NCDOT. Contractors and other organizations under contract or agreement with NCDOT must also comply with Title VI and related authorities, therefore:

(a) During the performance of this contract or agreement, contractors (e.g., subcontractors, consultants, vendors, prime contractors) are responsible for complying with NCDOT's

Title VI Program. Contractors are not required to prepare or submit Title VI Programs. To comply with this section, the prime contractor shall:

1. Post NCDOT's Notice of Nondiscrimination and the Contractor's own Equal Employment Opportunity (EEO) Policy in conspicuous locations accessible to all employees, applicants and subcontractors on the jobsite.

2. Physically incorporate the required Title VI clauses into all subcontracts on federally-assisted and state-funded NCDOT projects, and ensure inclusion by subcontractors into all lower-tier subcontracts.

3. Required Solicitation Language. The Contractor shall include the following notification in all solicitations for bids and requests for work or material, regardless of funding source:

   "The North Carolina Department of Transportation, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 US.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award. In accordance with other related nondiscrimination authorities, bidders and contractors will also not be discriminated against on the grounds of sex, age, disability, low-income level, creed/religion, or limited English proficiency in consideration for an award."

4. Physically incorporate the FHWA-1273, in its entirety, into all subcontracts and subsequent lower tier subcontracts on Federal-aid highway construction contracts only.

5. Provide language assistance services (i.e., written translation and oral interpretation), free of charge, to LEP employees and applicants. Contact NCDOT OCR for further assistance, if needed.

6. For assistance with these Title VI requirements, contact the NCDOT Title VI Nondiscrimination Program at 1-800-522-0453.

(b) Subrecipients (e.g. cities, counties, LGAs, planning organizations) may be required to prepare and submit a Title VI Plan to NCDOT, including Title VI Assurances and/or agreements. Subrecipients must also ensure compliance by their contractors and subrecipients with Title VI. (23 CFR 200.9(b)(7))

(c) If reviewed or investigated by NCDOT, the contractor or subrecipient agrees to take affirmative action to correct any deficiencies found within a reasonable time period, not to exceed 90 calendar days, unless additional time is granted by NCDOT. (23 CFR 200.9(b)(15))

(d) The Contractor is responsible for notifying subcontractors of NCDOT's External Discrimination Complaints Process.

1. Applicability

   Title VI and related laws protect participants and beneficiaries (e.g., members of the public and contractors) from discrimination by NCDOT employees, subrecipients and contractors, regardless of funding source.

2. Eligibility

   Any person—or class of persons—who believes he/she has been subjected to discrimination based on race, color, national origin, Limited English Proficiency (LEP), sex, age, or disability (and religion in the context of employment, aviation, or transit) may file a written complaint. The law also prohibits intimidation or retaliation of any sort.

3. Time Limits and Filing Options

   Complaints may be filed by the affected individual(s) or a representative and must be filed no later than 180 calendar days after the following:

   (i) The date of the alleged act of discrimination; or

   (ii) The date when the person(s) became aware of the alleged discrimination; or

   (iii) Where there has been a continuing course of conduct, the date on which that conduct was discontinued or the latest instance of the conduct.

   Title VI and related discrimination complaints may be submitted to the following entities:

   - North Carolina Department of Transportation, Office of Economic Opportunity & Compliance, Title VI Program, 1511 Mail Service Center, Raleigh, NC 27699-1511; toll free 1-800-522-0453
   - Federal Highway Administration, North Carolina Division Office, 310 New Bern Avenue, Suite 410, Raleigh, NC 27601, 919-747-7010
   - US Department of Transportation, Departmental Office of Civil Rights, External Civil Rights Programs Division, 1200 New Jersey Avenue, SE, Washington, DC 20590; 202-366-4070

4. Format for Complaints

   Complaints must be in writing and signed by the complainant(s) or a representative, and include the complainant's name, address, and telephone number. Complaints received by fax or e-mail will be acknowledged and processed. Allegations received by telephone will be reduced to writing and provided to the complainant for confirmation or revision before processing. Complaints will be accepted in other languages, including Braille.

5. Discrimination Complaint Form

   Contact NCDOT Office of Economic Opportunity & Compliance to receive a full copy of the Discrimination Complaint Form and procedures.

6. Complaint Basis

   Allegations must be based on issues involving race, color, national origin (LEP), sex, age, disability, or religion (in the context of employment, aviation or transit). "Basis" refers to the complainant's membership in a protected group category.

TABLE 103-1
COMPLAINT BASIS

Protected Categories	Definition	Examples	Applicable Nondiscrimination Authorities
Race and Ethnicity	An individual belonging to one of the accepted racial groups; or the perception, based usually on physical characteristics that a person is a member of a racial group	Black/African American, Hispanic/Latino, Asian, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, White	Title VI of the Civil Rights Act of 1964; 49 CFR Part 21; 23 CFR 200; 49 U.S.C. 5332(b); 49 U.S.C. 47123. *(Executive Order 13166)*
Color	Color of skin, including shade of skin within a racial group	Black, White, brown, yellow, etc.	
National Origin *(Limited English Proficiency)*	Place of birth. Citizenship is not a factor. (*Discrimination based on language or a person's accent is also covered)*	Mexican, Cuban, Japanese, Vietnamese, Chinese	
Sex	Gender. The sex of an individual. *Note:* Sex under this program does not include sexual orientation.	Women and Men	1973 Federal-Aid Highway Act; 49 U.S.C. 5332(b); 49 U.S.C. 47123.
Age	Persons of any age	21-year-old person	Age Discrimination Act of 1975 49 U.S.C. 5332(b); 49 U.S.C. 47123.
Disability	Physical or mental impairment, permanent or temporary, or perceived.	Blind, alcoholic, para-amputee, epileptic, diabetic, arthritic	Section 504 of the Rehabilitation Act of 1973; Americans with Disabilities Act of 1990

Religion (in the context of employment) *(Religion/ Creed in all aspects of any aviation or transit-related construction)*	An individual belonging to a religious group; or the perception, based on distinguishable characteristics that a person is a member of a religious group. In practice, actions taken as a result of the moral and ethical beliefs as to what is right and wrong, which are sincerely held with the strength of traditional religious views. ***Note:*** Does not have to be associated with a recognized religious group or church; if an individual sincerely holds to the belief, it is a protected religious practice.	Muslim, Christian, Sikh, Hindu, etc.	Title VII of the Civil Rights Act of 1964; 23 CFR 230; FHWA-1273 Required Contract Provisions. *(49 U.S.C. 5332(b);* *49 U.S.C. 47123)*

(3) **Pertinent Nondiscrimination Authorities**

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest agrees to comply with the following non-discrimination statutes and authorities, including, but not limited to:

(a) Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.

(b) The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);

(c) Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), (prohibits discrimination on the basis of sex);

(d) Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.), as amended, (prohibits discrimination on the basis of disability) and 49 CFR Part 27;

(e) The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);

(f) Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);

(g) The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);

(h) Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42

U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;

(i) The Federal Aviation Administration's Nondiscrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);

(j) Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures Nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;

(k) Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of Limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);

(l) Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

(m) Title VII of the Civil Rights Act of 1964 (42 U.S.C. § 2000e et seq., Pub. L. 88-352), (prohibits employment discrimination on the basis of race, color, religion, sex, or national origin).

(4) **Additional Title VI Assurances**

***The following Title VI Assurances (Appendices B, C and D) shall apply, as applicable*

(a) Clauses for Deeds Transferring United States Property (1050.2A, Appendix B)

The following clauses will be included in deeds effecting or recording the transfer of real property, structures, or improvements thereon, or granting interest therein from the United States pursuant to the provisions of Assurance 4.

NOW, THEREFORE, the U.S. Department of Transportation as authorized by law and upon the condition that the North Carolina Department of Transportation (NCDOT) will accept title to the lands and maintain the project constructed thereon in accordance with the North Carolina General Assembly, the Regulations for the Administration of the Federal-Aid Highway Program, and the policies and procedures prescribed by the Federal Highway Administration of the U.S. Department of Transportation in accordance and in compliance with all requirements imposed by Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the U.S Department of Transportation pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. § 2000d to 2000d-4), does hereby remise, release, quitclaim and convey unto the NCDOT all the right, title and interest of the U.S. Department of Transportation in and to said lands described in Exhibit A attached hereto and made a part hereof.

(HABENDUM CLAUSE)

TO HAVE AND TO HOLD said lands and interests therein unto the North Carolina Department of Transportation (NCDOT) and its successors forever, subject, however, to the covenants, conditions, restrictions and reservations herein contained as follows, which will remain in effect for the period during which the real property or structures are used for a purpose for which Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits and will be binding on the NCDOT, its successors and assigns.

The NCDOT, in consideration of the conveyance of said lands and interests in lands, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns, that (1) no person will on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over, or under such lands hereby conveyed [,] [and]* (2) that the NCDOT will use the lands and interests in lands and interests in lands so conveyed, in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations and Acts may be amended [, and (3) that in the event of breach of any of the above-mentioned nondiscrimination conditions, the Department will have a right to enter or re-enter said lands and facilities on said land, and that above described land and facilities will thereon revert to and vest in and become the absolute property of the U.S. Department of Transportation and its assigns as such interest existed prior to this instruction].*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary in order to make clear the purpose of Title VI.)

(b) Clauses for Transfer of Real Property Acquired or Improved Under the Activity, Facility, or Program (1050.2A, Appendix C)

The following clauses will be included in deeds, licenses, leases, permits, or similar instruments entered into by the North Carolina Department of Transportation (NCDOT) pursuant to the provisions of Assurance 7(a):

1. The (grantee, lessee, permittee, etc. as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree [in the case of deeds and leases add "as a covenant running with the land"] that:

(i.) In the event facilities are constructed, maintained, or otherwise operated on the property described in this (deed, license, lease, permit, etc.) for a purpose for which a U.S. Department of Transportation activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, the (grantee, licensee, lessee, permittee, etc.) will maintain and operate such facilities and services in compliance with all requirements imposed by the Acts and Regulations (as may be amended) such that no person on the grounds of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.

2. With respect to licenses, leases, permits, etc., in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will have the right to terminate the (lease, license, permit, etc.) and to enter, re-enter, and repossess said lands and facilities thereon, and hold the same as if the (lease, license, permit, etc.) had never been made or issued. *

3. With respect to a deed, in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will have the right to enter or re-enter the lands and facilities thereon, and the above described lands and facilities will there upon revert to and vest in and become the absolute property of the NCDOT and its assigns. *

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

(c) Clauses for Construction/Use/Access to Real Property Acquired Under the Activity, Facility or Program (1050.2A, Appendix D)

The following clauses will be included in deeds, licenses, permits, or similar instruments/ agreements entered into by the North Carolina Department of Transportation (NCDOT) pursuant to the provisions of Assurance 7(b):

1. The (grantee, licensee, permittee, etc., as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree (in the case of deeds and leases add, "as a covenant running with the land") that (1) no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities, (2) that in the construction of any improvements on, over, or under such land, and the furnishing of services thereon, no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, (3) that the (grantee, licensee, lessee, permittee, etc.) will use the premises in compliance with all other requirements imposed by or pursuant to the Acts and Regulations, as amended, set forth in this Assurance.

2. With respect to (licenses, leases, permits, etc.), in the event of breach of any of the above Non¬ discrimination covenants, the NCDOT will have the right to terminate the (license, permit, etc., as appropriate) and to enter or re-enter and repossess said land and the facilities thereon, and hold the same as if said (license, permit, etc., as appropriate) had never been made or issued. *

3. With respect to deeds, in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will there upon revert to and vest in and become the absolute property of the NCDOT and its assigns. *

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

***** STANDARD SPECIAL PROVISIONS *****

MINORITY AND FEMALE EMPLOYMENT REQUIREMENTS

(12-18-07) Z-7

NOTICE OF REQUIREMENTS FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (*EXECUTIVE NUMBER 11246*)

1. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, see as shown on the attached sheet entitled "Employment Goals for Minority and Female Participation".

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 area where the work is actually performed. With regard to this second area, the Contractor also is 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 effort to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project or 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.

2. As used in this Notice and in the contract resulting from this solicitation, the "covered area" is the county or counties shown on the cover sheet of the proposal form and contract.

EMPLOYMENT GOALS FOR MINORITY AND FEMALE PARTICIPATION

Economic Areas

Area 023 29.7%
Bertie County
Camden County
Chowan County
Gates County
Hertford County
Pasquotank County
Perquimans County

Area 024 31.7%
Beaufort County
Carteret County
Craven County
Dare County
Edgecombe County
Green County
Halifax County
Hyde County
Jones County
Lenoir County
Martin County
Nash County
Northampton County
Pamlico County
Pitt County
Tyrrell County
Washington County
Wayne County
Wilson County

Area 025 23.5%
Columbus County
Duplin County
Onslow County
Pender County

Area 026 33.5%
Bladen County
Hoke County
Richmond County
Robeson County
Sampson County
Scotland County

Area 027 24.7%
Chatham County
Franklin County
Granville County
Harnett County
Johnston County
Lee County
Person County
Vance County
Warren County

Area 028 15.5%
Alleghany County
Ashe County
Caswell County
Davie County
Montgomery County
Moore County
Rockingham County
Surry County
Watauga County
Wilkes County

Area 029 15.7%
Alexander County
Anson County
Burke County
Cabarrus County
Caldwell County
Catawba County
Cleveland County
Iredell County
Lincoln County
Polk County
Rowan County
Rutherford County
Stanly County

Area 0480 8.5%
Buncombe County
Madison County

Area 030 6.3%
Avery County
Cherokee County
Clay County
Graham County
Haywood County
Henderson County
Jackson County
McDowell County
Macon County
Mitchell County
Swain County
Transylvania County
Yancey County

SMSA Areas

Area 5720 26.6%
Currituck County

Area 9200 20.7%
Brunswick County
New Hanover County

Area 2560 24.2%
Cumberland County

Area 6640 22.8%
Durham County
Orange County
Wake County

Area 1300 16.2%
Alamance County

Area 3120 16.4%
Davidson County
Forsyth County
Guilford County
Randolph County
Stokes County
Yadkin County

Area 1520 18.3%
Gaston County
Mecklenburg County
Union County

Goals for Female

Participation in Each Trade

(Statewide) 6.9%

FHWA-1273 -- Revised June 25, 2026

CONTRACT PROVISIONS FOR
FEDERAL-AID CONSTRUCTION CONTRACTS

I. General
II. Nondiscrimination
III. Davis-Bacon and Related Act Provisions
IV. Contract Work Hours and Safety Standards Act Provisions
V. Subletting or Assigning the Contract
VI. Safety: Accident Prevention
VII. False Statements Concerning Highway Projects
VIII. Implementation of Clean Air Act and Federal Water Pollution Control Act
IX. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
X. Certification Regarding Use of Contract Funds for Lobbying
XI. 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. Historically, contracting agencies using Federal-aid highway funds were required to ensure Form FHWA-1273 was physically incorporated into all contracts and subcontracts. Effective June 10, 2026, this requirement was eliminated [91 FR 25492]. Future use of Form FHWA-1273 is now optional on the part of the contracting agency using Federal-aid highway funds. FHWA continues to make Form FHWA-1273 available as a convenience to contracting agencies. Contracting agencies must continue to ensure compliance with the provisions cited in Form FHWA-1273 in accordance with the provisions regardless of the use of Form FHWA-1273. Accordingly, the contracting agency retains the authority to determine whether the contractor must use Form FHWA-1273 to physically incorporate required contract provisions in each subcontract and in lower tier contracts. Where permitted by the contracting agency, the contractor may choose other ways to include required contract provisions in each subcontract, besides incorporating Form FHWA-1273. Contract provisions in Form FHWA-1273 are not required to be physically included in subcontracts for design services on Federal-aid design-build contracts, or in purchase orders, rental agreements and other agreements for supplies or services.

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor or 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.

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. 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

The contractor and all subcontractors must comply with the following policies: 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, including any amendments thereto.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with 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, including any amendments thereto.

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.

1. Assurances Required:

a. The requirements of 49 CFR Part 26, including any amendments thereto, 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, including any amendments thereto, 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, including any amendments thereto, are incorporated by reference. 49 CFR Part 21.

III. 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 IV, 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 reprocurement 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.

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) 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 journeyworkers 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 journeyworkers under this part must be in conformity with 29 CFR part 30, including any amendments thereto.

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 III. 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 journeyworkers 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 in any subcontracts the clauses set forth in paragraphs (1) through (11) of this section, 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.

IV. 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.

* $33 as of January 15, 2025 (See 90 FR 1859) 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 III 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 reprocurement 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.

V. 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 this section 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).

VI. 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).

VII. 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."

VIII. 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.

IX. 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 180.355(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.

* * * * *

X. 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.

XI. 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 381.7.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS (40 U.S.C. sections 14501(d) and 14701) and the Appalachian Regional Commission Code as authorized under 40 U.S.C. section 14302)
This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 40 U.S.C. 14501 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 SPECIAL PROVISION
MINIMUM WAGES
GENERAL DECISION NC20260090 05/18/2026 NC90

Z-090

Date: May 18, 2026

General Decision Number: NC20260090 05/18/2026 NC90

Superseded General Decision Numbers: NC20250090

State: North Carolina

Construction Type: HIGHWAY

COUNTIES:

Brunswick	Greene	Onslow
Cumberland	Hoke	Pender
Currituck	Johnston	Pitt
Edgecombe	Nash	Wake
Franklin	New Hanover	Wayne

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).

Modification Number	Publication Date
0	01/02/2026
1	05/18/2026

SUNC2014-005 11/17/2014

	Rates	Fringes
TRUCK DRIVER (GVWR of 26,001 Lbs or Greater)	12.37	
TRUCK DRIVER (GVWR of 26,000 Lbs or Less)	11.12	
POWER EQUIPMENT OPERATORS (Milling Machine)	15.36	
POWER EQUIPMENT OPERATORS (Mechanic)	17.55	
POWER EQUIPMENT OPERATORS (Tack Truck/Distributor Operator)	14.52	
POWER EQUIPMENT OPERATORS (Slip Form Machine)	16.50	
POWER EQUIPMENT OPERATORS (Scraper Rough)	11.35	
POWER EQUIPMENT OPERATORS (Scraper Finish)	12.71	
POWER EQUIPMENT OPERATORS (Roller Other)	11.36	
POWER EQUIPMENT OPERATORS (Roller Asphalt Finish)	13.85	
POWER EQUIPMENT OPERATORS (Roller Asphalt Breakdown)	12.45	
POWER EQUIPMENT OPERATORS (Paver Concrete)	18.20	
POWER EQUIPMENT OPERATORS (Paver Asphalt)	15.59	
POWER EQUIPMENT OPERATORS (Pavement Marking Equipment)	12.11	
POWER EQUIPMENT OPERATORS (Oiler/Greaser)	13.55	
POWER EQUIPMENT OPERATORS (Off-Road Hauler/Water Tanker)	11.36	
POWER EQUIPMENT OPERATORS (Material Transfer Vehicle (Shuttle Buggy))	15.18	
POWER EQUIPMENT OPERATORS (Loader Greater Than 2 Cubic Yards)	14.14	
POWER EQUIPMENT OPERATORS (Loader 2 Cubic Yards or Less)	13.76	
POWER EQUIPMENT OPERATORS (Grader/Blade Rough)	14.62	

	Rates	Fringes
POWER EQUIPMENT OPERATORS (Grader/Blade Fine)	18.47	
POWER EQUIPMENT OPERATORS (Excavator Rough)	14.00	
POWER EQUIPMENT OPERATORS (Excavator Fine)	16.60	
POWER EQUIPMENT OPERATORS (Drill Operator Structure)	21.14	
POWER EQUIPMENT OPERATORS (Drill Operator Rock)	14.38	
POWER EQUIPMENT OPERATORS (Crane Rough/All-Terrain)	20.67	
POWER EQUIPMENT OPERATORS (Crane Other)	20.08	
POWER EQUIPMENT OPERATORS (Crane Boom Trucks)	20.54	
POWER EQUIPMENT OPERATORS (Concrete Grinder/Groover)	20.34	2.30
POWER EQUIPMENT OPERATORS (Bulldozer Rough)	14.34	
POWER EQUIPMENT OPERATORS (Bulldozer Fine)	17.04	
POWER EQUIPMENT OPERATORS (Asphalt Broom Tractor)	11.85	
PAINTER (Bridge)	24.57	
LABORER (Pipelayer)	12.17	
LABORER (Common or General)	10.20	
LABORER (Traffic Signal/Lighting Installer)	14.89	
LABORER (Guardrail/Fence Installer)	12.87	
LABORER (Cement Mason/Concrete Finisher Tender)	12.54	
LABORER (Carpenter Tender)	12.88	
LABORER (Asphalt Screed/Jackman)	14.33	
LABORER (Asphalt Raker and Spreader)	12.46	
IRONWORKER	16.02	
ELECTRICIAN (Telecommunications Technician)	16.79	.63
ELECTRICIAN (Electrician)	17.97	
CEMENT MASON/CONCRETE FINISHER	14.48	
CARPENTER	13.72	
BLASTER	21.04	

Welders – Receive rate prescribed for craft performing operation to which welding is incidental.

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.

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to Executive Order 13658, the contractor must pay all covered workers at least $13.65 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract from May 11, 2026, through December 31, 2026. The applicable

Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(iii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than "SU", "UAVG", "SA", or "SC" denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate 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. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The "SU" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 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.

The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

"SU" wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The "SA" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the "SA" identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via mail to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

The request should be accompanied by a full statement of the interested party's position and 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, D.C. 20210

END OF GENERAL DECISION

***** STANDARD SPECIAL PROVISIONS *****

(10-23-17) (Rev. 3-15-26)

DIVISION ONE OF STANDARD SPECIFICATIONS

Division One of the 2024 NCDOT *Standard Specifications for Roads and Structures* (*Standard Specifications*) shall apply except as follows:

Definitions: Throughout Division One of the *Standard Specifications* , the term "Contractor" is replaced with "Design-Build Team", the term "Bidder" is replaced with "Proposer," the term "Bid" is replaced with "Price Proposal," and the phrase "lowest Responsible Bidder" is replaced with "responsible Proposer with the lowest adjusted price." Throughout Article 102-2, the term "State Contractual Services Engineer" is replaced with "State Prequalifications Engineer". The replacement of "Contractor" with "Design-Build Team" does not apply to Article 102-2. The replacement of the above terms also does not apply when the terms are part of a phrase (e.g. bid bond, prime contractor, total amount bid, etc.)

Deletions: Articles / Subarticles 102-3(B), 102-4, 102-8(B), 102-9(C)(2), 103-2(B), and 103-4(B) of the *Standard Specifications* are deleted from Design-Build Contracts.

Modifications: The remainder of this Standard Special Provision includes modifications to Division One of the *Standard Specifications*.

SECTION 101
DEFINITION OF TERMS

Page 1-3, Article 101-3, replace and add certain definitions as follows:

ADDITIONAL WORK

Additional work is that which results from a change or alteration to the contract and for which there are contract unit prices in the original contract or an executed supplemental agreement.

ADVERTISEMENT

The public advertisement inviting Statements of Qualifications for the design and construction of specific projects.

AWARD

The decision of the Department of Transportation to accept the Technical and Price Proposals of the selected Design-Build Team for work which is subject to the furnishing of payment and performance bonds, and such other conditions as may be otherwise provided by law, the Request for Proposals, and the *Standard Specifications*.

CONTRACT

The executed agreement between the Department and the successful Proposer, covering the performance of, and compensation for, the work. The term contract is all inclusive with reference to all written agreements affecting a contractual relationship and all documents referred to therein. The contract shall include, but not be limited to, the Request for Proposals, the Technical Proposal, the Price Proposal, the printed contract form and attachments, contract bonds, plans and associated special provisions prepared by the Design-Build Team, standard specifications and supplemental specifications, standard special provisions and project special provisions contained in the Request for Proposals or as developed by the Design-Build Team and accepted by the Department, and all executed supplemental agreements. The contract shall constitute one instrument.

DATE OF AVAILABILITY

That date, established as set forth in the Request for Proposals, by which it is anticipated that the Contract will be executed and sufficient design efforts or work sites within the project limits will be available for the Design-Build Team to begin the controlling operations or design.

DESIGN-BUILD

A form of contracting in which the successful Proposer undertakes responsibility for both the design and construction of a project.

DESIGN-BUILD TEAM

An individual, partnership, joint venture, corporation or other legal entity that furnishes the necessary design and construction services, whether by itself or through subcontracts.

DESIGN-BUILD PROPOSAL

A proposal to contract consisting of a separately sealed Technical Proposal and a separately sealed Price Proposal submitted in response to a Request for Proposals on a Design-Build project.

PLANS

The project plans, Standard Drawings, working drawings and supplemental drawings, or reproductions thereof, accepted by the Engineer, which show the location, character, dimensions and details of the work to be performed. Unless noted otherwise within the Request for Proposals, the term “plans” refers to plans as developed by the Design-Build Team and accepted by the Department.

(A) Standard Drawings

Drawings approved for repetitive use, showing details to be used where appropriate. All Standard Drawings approved by the Department plus subsequent revisions and additions. Standard Drawings are available for purchase from:

State Contract Officer
1591 Mail Service Center
Raleigh, NC 27699-1591

(B) Preliminary Plans

Department-furnished drawings distributed in concert with a Request for Proposals, or as developed by the Design-Build Team.

(C) Project Plans

Construction drawings prepared, sealed and completed by the Design-Build Team, or as provided by the Department, that contain specific details and dimensions peculiar to the work.

(D) Working Drawings and Supplemental Drawings

Supplemental design sheets, shop drawings, or similar data which the Design-Build Team is required to submit to the Engineer.

(E) As-Built Plans

Coordinately correct plans documenting the details, dimensions and locations of the completed work.

PRICE PROPOSAL

The offer of a Proposer, submitted on the prescribed forms, to perform the work and furnish the labor and materials at the price quoted.

PROPOSER

An individual, partnership, firm, corporation, LLC, or joint venture formally submitting a Technical Proposal and Price Proposal in response to a Request for Proposals.

REQUEST FOR PROPOSALS

The paper document provided by the Department that the Proposer uses to develop his paper offer to perform the work at designated bid prices.

RIGHT OF WAY

The land area shown on the plans as right of way within which the project is to be constructed.

SCHEDULE OF VALUES

A schedule of work items necessary to complete work, along with the progress of each work item, primarily for the purpose of partial payments.

TABLE OF QUANTITIES

A listing of work items (corresponding to the items in the Trns*port pay item list) that contributes to a project completion. The table shall include estimated quantities for each work item.

TECHNICAL PROPOSAL

A submittal from a Proposer, in accordance with the Request for Proposals requirements, for the purpose of final selection. The Technical Proposal is defined to also include any supplemental information requested by the Department from a Proposer prior to opening bids.

SECTION 102
PROPOSAL REQUIREMENTS AND CONDITIONS

Page 1-9, delete Article 102-1 and replace with the following:

102-1 INVITATION TO BID

After the advertisement has been made, an Invitation to Bid will be made available to known prequalified contractors and any other contracting firms, material suppliers and other interested parties who have requested they be placed on the Invitation to Bid mailing list, informing them that Statements of Qualifications and Design-Build Proposals will be received for the design and construction of specific projects. Such invitation will indicate the contract identification number, length, locations and descriptions; a general summary of the scope of work to be performed; and information on how to receive a Request for Qualifications.

All projects will be advertised in daily newspapers throughout the state before the Price Proposal opening.

Page 1-13, delete Article 102-3 and replace with the following:

102-3 CONTENTS OF REQUEST FOR PROPOSALS

A Request for Proposals will be furnished by the Department to the selected Proposers from among the respondents to the Request for Qualifications. Each Request for Proposals will be marked on the front cover by the Department with an identifier of the Proposer to whom it is being furnished. This Request for Proposals will state the location of the project and will show a schedule of contract items for which Technical and Price Proposals are invited. It will set forth the dates and times Technical and Price Proposals are to be submitted and when the Price Proposals will be opened. The Request for Proposals will also include special provisions or requirements that vary from or are not contained in any preliminary design information or standard specifications.

The Request for Proposals will also include the printed contract forms and signature sheets for execution by both parties to the contract. In the event the Proposer is awarded the contract, execution of the Request for Proposals by the Proposer is considered the same as execution of the contract.

Standard specifications, sealed plans specifically identified as the Department's responsibility and other documents designated in the Request for Proposals shall be considered a part of the Request for Proposals whether or not they are attached thereto. All papers bound to the Request for Proposals are necessary parts thereof and shall not be detached, taken apart, or altered.

The names and identity of each prospective Proposer that receives a copy of the Request for Qualifications for the purposes of submitting a Statement of Qualifications shall be made public, except that a potential Proposer who obtains a Request for Qualifications may, at the time of ordering, request that his name remain confidential.

One copy of the Final Request for Proposals will be furnished to each prospective Proposer. Additional copies may be purchased for the sum of $25 each. The copy of the Final Request for Proposals marked with the Proposer's name and prequalification number shall be returned to the Department as the Proposer's Price Proposal.

Page 1-14, Article 102-7, 4th paragraph, delete the first two sentences and replace with the following:

Details shown in the subsurface investigation report are preliminary only. The subsurface investigation and subsurface report, if provided, is done so for information purposes only.

Pages 1-14, delete Article 102-8 and replace with the following:

102-8 PREPARATION AND SUBMISSION OF BIDS

All Price Proposals shall be prepared and submitted in accordance with the following requirements:

1. The Request for Proposals provided by the Department shall be used and shall not be taken apart or altered. The Price Proposal shall be submitted on the same form, which has been furnished to the Proposer by the Department as identified by the Proposer's name marked on the front cover by the Department.

2. All entries including signatures shall be written in ink.

3. The Proposer shall submit a lump sum or unit price for every item in the Request for Proposals. The lump sum or unit prices bid for the various contract items shall be written in figures.

4. An amount bid shall be entered in the Request for Proposals for every item and the price shall be written in figures in the "Amount Bid" column in the Request for Proposals.

5. An amount bid shall be entered in the Request for Proposals for every item on which a unit price has been submitted. The amount bid for each item other than lump sum items shall be determined by multiplying each unit bid price by the quantity for that item and shall be written in figures in the Amount Bid column in the Request for Proposals.

6. The total amount bid shall be written in figures in the proper place in the Request for Proposals. The total amount bid shall be determined by adding the amounts bid for each lump sum item.

7. Changes in any entry shall be made by marking through the entry in ink and making the correct entry adjacent thereto in ink. A representative of the Proposer shall initial the change in ink.

8. The Price Proposal shall be properly executed. To constitute proper execution, the Price Proposal shall be executed in strict compliance with the following:

    a. If a Price Proposal is by an individual, it shall show the name of the individual and shall be signed by the individual with the word "Individually" appearing under the signature. If the individual operates under a firm name, the Price Proposal shall be signed in the name of the individual doing business under the firm name.

    b. If the Price Proposal is by a corporation, it shall be executed in the name of the corporation by the President, Vice President, or Assistant Vice President. It shall be attested by the Secretary or Assistant Secretary. The seal of the corporation shall be affixed. If the Price Proposal is executed on behalf of a corporation in any other manner than as above, a certified copy of the minutes of the Board of Directors of said corporation authorizing the manner and style of execution and the authority of the person executing shall be attached to the Price Proposal or shall be on file with the Department.

    c. If the Price Proposal is made by a partnership, it shall be executed in the name of the partnership by one of the general partners.

d. If the Price Proposal is made by a limited liability company, it shall be signed by the manager, member, or authorized agent.

e. If the Price Proposal is made by a joint venture, it shall be executed by each of the joint venturers in the appropriate manner set out above. In addition, the execution by the joint venturers shall appear below their names.

9. The Price Proposal shall not contain any unauthorized additions, deletions, or conditional bids.

10. The Proposer shall not add any provision reserving the right to accept or reject an award or to enter into a contract pursuant to an award.

11. The Price Proposal shall be accompanied by a bid bond on the form furnished by the Department or by a bid deposit. The bid bond shall be completely and properly executed in accordance with the requirements of Article 102-10 and as modified herein. The bid deposit shall be a certified check or cashier check in accordance with Article 102-10 and as modified herein.

12. The Price Proposal shall be placed in a sealed package and shall have been delivered to, and received by, the Department prior to the time specified in the Request for Proposals.

Page 1-18, Article 102-10, 3rd paragraph, delete the fifth sentence and replace with the following:

The condition of the bid bond or bid deposit is: the Principal shall not withdraw its bid within 75 days after the submittal of the same, and if the Department shall award a contract to the Principal, the Principal shall, within 14 calendar days after the written notice of award is received by him, give payment and performance bonds with good and sufficient surety as required for the faithful performance of the contract and for the protection of all persons supplying labor and materials in the prosecution of the work.

Page 1-18, Article 102-10, delete the end of the Article beginning with, and inclusive of, the 6th paragraph.

Pages 1-19, delete Article 102-12 and replace with the following:

102-12 WITHDRAWAL OR REVISION OF BIDS

A Design-Build Team will not be permitted to withdraw its Technical Proposal and / or Price Proposal after they have been submitted to the Department, unless allowed under Article 103-3 or unless otherwise approved by the Chief Engineer.

Page 1-19, delete Article 102-13 and replace with the following:

102-13 RECEIPT AND OPENING OF BIDS

Price Proposals from short-listed Proposers will be opened and read publicly on the date and time indicated in the Request for Proposals. The Technical Scores of the previously conducted evaluation of the Technical Proposals will also be read publicly in accordance with the procedures outlined in the Request for Proposals. Proposers, their authorized agents, and other interested parties are invited to be present.

Page 1-19, Article 102-14, replace the 1st paragraph with the following:

102-14 REJECTION OF BIDS

Any Price Proposal submitted which fails to comply with any of the requirements of Articles 102-8, 102-9 or 102-10, or with the requirements of the project scope and specifications shall be considered irregular and may be rejected. A Price Proposal that does not contain costs for all items in the Request for Proposals shall be considered irregular and may be rejected.

SECTION 103
AWARD AND EXECUTION OF CONTRACT

Page 1-21, delete Article 103-1 and replace with the following:

103-1 CONSIDERATION OF PRICE PROPOSALS

After the Price Proposals are opened and read, they will be tabulated. The Price Proposal and Technical Score of the Technical Proposal will be made available in accordance with procedures outlined in the Request for Proposals. In the event of errors, omissions, or discrepancies in the Price Proposal, corrections to the Price Proposal will be made in accordance with the provisions of Article 103-2. Such corrected bid prices will be used to determine the lowest adjusted price.

After the reading of the Price Proposals and Technical Scores, the Department will calculate the lowest adjusted price as described in the Request for Proposals.

The right is reserved to reject any or all Price Proposals, to waive technicalities, to request the Proposer with the lowest adjusted price to submit an up-to-date financial and operating statement, to advertise for new Price Proposals, or to proceed to do the work otherwise, if in the judgment of the Department, the best interests of the State will be promoted thereby.

Page 1-21, Subarticle 103-2(A), add items (8) and (9) as follows:

(8) Discrepancy in the "Total Amount Bid" and the addition of the "Amount Bid" for each line Item

In the case of the Total Amount Bid does not equal the summation of each Amount Bid for the line items, the summation of each Amount Bid for the line items shall be deemed to be the correct Total Amount Bid for the entire project.

(9) Omitted Total Amount Bid - Amount Bid Completed

If the Total Amount Bid is not completed and the Amount Bid for all line items is completed the Total Amount Bid shall be the summation of the Amount Bid for all the line items.

Page 1-24, Subarticle 103-4(A), first paragraph, replace the 3rd and 4th sentences with the following:

Where award is to be made, the notice of award will be issued within 75 days after the submittal of Price Proposals, except with the consent of the responsible Proposer with the lowest adjusted price the decision to award the contract to such bidder may be delayed for as long a time as may be agreed upon by the Department and such Proposer. In the absence of such agreement, the Proposer may withdraw his Price Proposal at the expiration of the 75 days without penalty if no notice of award has been issued.

Page 1-24, Subarticle 103-4(B), first paragraph, replace the first sentence with the following:

A Proposer who desires to submit a Price Proposal on more than one project on which Price Proposals are to be opened in the same letting and who desires to avoid receiving an award of more projects than he is equipped to handle, may submit a Price Proposal on any number of projects but may limit the total amount of work awarded to him on selected projects by completing the form Award Limits on Multiple Projects for each project subject to the award limit.

Page 1-25, Article 103-6, delete the 1st and 2nd paragraphs and replace with the following:

Checks that have been furnished as a bid deposit will be retained until after the contract bonds have been furnished by the successful Proposer, at which time the checks that were furnished as a bid deposit will be returned.

SECTION 104
SCOPE OF WORK

Page 1-26, delete Article 104-1 and replace with the following:

104-1 INTENT OF CONTRACT

The intent of the contract is to prescribe the work or improvements that the Design-Build Team undertakes to perform, in full compliance with the contract documents. In case the method of construction or character of any part of the work is not covered by the contract, this section shall apply. The Design-Build Team shall perform all work in accordance with the contract or as may

be modified by written orders, and shall do such additional, extra, and incidental work as may be considered necessary to complete the work to the full intent of the contract. Unless otherwise provided elsewhere in the contract, the Design-Build Team shall furnish all implements, machinery, equipment, tools, materials, supplies, transportation, and labor necessary for the design, prosecution and completion of the work.

Page 1-26 Article 104-3, replace "plans or details of construction" with "contract" in all instances within this Article.

Page 1-34, Article 104-8, add the following Subarticle to the end of this article:

(E) Coordination with CPM

If the Design-Build Team requests additional compensation in accordance with Articles 104-3, 104-7, and this Article, a fragmentary logic diagram (fragnet) shall be prepared and submitted with such request. The fragnet shall be developed with sufficient detail to clearly depict the alleged change to the current schedule of record.

The Design-Build Team shall prepare the fragnet depicting all activities and costs associated with the request for additional compensation. The fragnet shall identify all predecessor and successor activities, any changes in durations of existing activities and any activities added to or deleted from the current schedule or record as a direct result of the request for additional compensation.

If the request for additional compensation is agreeable to the Engineer, the Engineer will evaluate the provided fragnet within the current schedule of record as follows:

(1) The Design-Build Team shall provide the fragnet, supporting information, analysis, and narrative describing how the fragnet is incorporated (predecessors and successors) into the schedule referenced below.

(2) The Design-Build Team shall update the current schedule of record to the anticipated supplemental agreement effective date and provide this schedule to the Engineer for review.

(3) The Design-Build Team shall provide a separate updated schedule, as defined in item 2 above, with the fragnet inserted.

(4) The revised Scheduled Completion Date will be evaluated by the Engineer; and

(5) If the associated time difference in the above Scheduled Completion Dates (items 2 and 3 above) results in a time extension, per Article 108-10, such extension will be provided within the supplemental agreement, unless modified through compensation for acceleration or other mitigation strategy. If project float is created by the work, it will be encompassed within the modified and updated schedule of record.

Page 1-35, delete Article 104-10 and replace with the following:

104-10 MAINTENANCE OF THE PROJECT

The Design-Build Team shall maintain the project from April 1, 2027 until the project is finally accepted. For sections of facilities impacted by utility construction / relocation performed by the Design-Build Team prior to beginning construction on the roadway project, maintenance of the impacted sections of facilities shall be performed by the Design-Build Team beginning concurrently with the impact. This maintenance shall be continuous and effective and shall be prosecuted with adequate equipment and forces to the end that all work covered by the contract is kept in satisfactory and acceptable conditions at all times.

All existing and constructed guardrail / guiderail within the project limits shall be included in this maintenance. The Design-Build Team shall perform weekly inspections of all guardrail and guiderail and shall report damages to the Engineer on the same day of the weekly inspection. Where damaged guardrail or guiderail is repaired or replaced as a result of maintaining the project in accordance with this Article, such repair or replacement shall be performed within seven consecutive calendar days of such inspection report.

Removal of graffiti for all existing and constructed noise walls within the project limits shall be included in this maintenance. The Design-Build Team shall perform monthly inspections of all noise walls, retaining walls, and related surfaces and shall report all graffiti to the Engineer on the same day of the inspection. Where graffiti removal as a result of maintaining the project in accordance with this Article, such removal shall be performed within one month of such inspection report. At the sole discretion of the Department the Design-Build Team shall perform graffiti removal of graffiti deemed vulgar immediately as directed by the Engineer.

The Design-Build Team shall maintain all existing drainage facilities, except where the work consists of resurfacing only, such that they are in the same condition upon acceptance of the project as they were when the project was made available to the Design-Build Team. In the event that the Design-Build Team's work is suspended for any reason, the Design-Build Team shall maintain the work covered by the contract, as provided herein. When a portion of the project is accepted as provided in Article 105-17, immediately after such acceptance, the Design-Build Team will not be required to maintain the accepted portion. Should latent defects be discovered or become evident in an accepted portion of the project, the Design-Build Team shall repair or replace the defective work at no cost to the Department.

Where an observation period(s) is required that extends beyond the final acceptance date, the Design-Build Team shall perform any work required by the observation period until satisfactory completion of the observation period.

With the exception of the maintenance of existing and constructed guardrail / guiderail, the Design-Build Team will not be directly compensated for any maintenance operations. The Design-Build Team will not be compensated for the performance of weekly inspections of guardrail / guiderail, and the damage reports required as described above. Authorized maintenance activities for existing

and constructed guardrail / guiderail within the project limits will be paid for as extra work in accordance with Articles 104-7 and 104-8.

SECTION 105
CONTROL OF WORK

Pages 1-40, delete Article 105-2 and replace with the following:

105-2 PLANS AND WORKING DRAWINGS

All plans shall be supplemented by such approved working drawings as are necessary to adequately control the work. Working drawings furnished by the Design-Build Team and approved by the Engineer shall consist of such detailed drawings as may be required to adequately control the work. They may include stress sheets, shop drawings, erection drawings, falsework drawings, cofferdam drawings, bending diagrams for reinforcing steel, catalog cuts, or any other supplementary drawings or similar data required of the Design-Build Team. When working drawings are approved by the Engineer, such approval shall not operate to relieve the Design-Build Team of any of his responsibility under the contract for the successful completion of the work.

Changes on shop drawings after approval and / or distribution shall be subject to the approval of the Engineer and he shall be furnished a record of such changes.

Page 1-41, Article 105-3, add the following after the 3rd paragraph:

The Design-Build Team shall bear all the costs of providing the burden of proof that the nonconforming work is reasonable and adequately addresses the design purpose. The Design-Build Team shall bear all risk for continuing with nonconforming work in question until it is accepted.

The Engineer may impose conditions for acceptance of the nonconforming work. The Design-Build Team shall bear all costs for fulfilling the conditions.

The decisions whether the product satisfies the design purpose, whether the nonconforming work is reasonably acceptable and the conditions for acceptance are at the sole discretion of the Engineer.

Pages 1-41, delete Article 105-4 and replace with the following:

105-4 COORDINATION OF PLANS, SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS, AND SPECIAL PROVISIONS

The Request for Proposals, all construction Plans, the Standard Specifications, Supplemental Specifications and Special Provisions and all supplementary documents are essential parts of the contract and a requirement occurring in one is as binding as though occurring in all. They are complementary and describe and provide the complete contract.

In case of discrepancy or conflict, the order in which they govern shall be as follows:

(A) Request for Proposals, in which Project Special Provisions govern Standard Special Provisions

(B) Technical Proposal from the Design-Build Team

(C) Accepted Plans and Details from the Design-Build Team, or sealed plans provided by the Department, as applicable

(D) Standard Drawings

(E) Standard Specifications

Where dimensions on the plans are given or can be computed from other given dimensions they shall govern over scaled dimensions.

The Design-Build Team shall take no advantage of any error or omission in the plans, estimated quantities, or specifications. In the event the Design-Build Team discovers an error or omission, he shall immediately notify the Engineer.

Page 1-43, delete Article 105-9 and replace with the following:

105-9 CONTRUCTION STAKES, LINES, AND GRADES

The Design-Build Team shall be responsible for all surveying, construction staking and layout required in the performance of the work. The Design-Build Team shall be responsible for the accuracy of lines, slopes, grades and other engineering work which the Design-Build Team provides under this contract.

SECTION 106
CONTROL OF MATERIAL

Page 1-49, Article 106-2, add the following after the second paragraph:

Prior to beginning construction, the Design-Build Team shall provide a Table of Quantities as described in Article 101-3 of these specifications.

The Table of Quantities Work Items shall correspond to Pay Items as defined in the Standard Specifications. These Work Items have associated Materials and Conversion Factors. For non-standard Work Items, a Generic Work Item with the correct Unit of Measure and in an appropriate category will be used. For example, "GENERIC TRAFFIC CONTROL ITEM - EA" or "GENERIC RETAINING WALL ITEM - LF". For these Generic Work Items, Materials must be defined and appropriate conversion factors submitted.

An initial Table of Quantities shall be submitted no later than 30 calendar days after the date of award. The Table of Quantities shall be updated and resubmitted within 14 days of when a set of Plans is sealed as Release for Construction (RFC) Plans, and whenever there are substantial changes to the Quantities on previously incorporated RFC Plans.

A Certified Table of Quantities shall be submitted with each pay request. All Certified Tables of Quantities shall indicate that the information accurately represents the materials used for the work performed for which payment is requested, and be notarized by a Design-Build Team representative.

Page 1-50 Article 106-6, add the following after the last paragraph:

For items normally pretested by the Department, the Design-Build Team shall provide a minimum of 30 days notice prior to the beginning of production of the items for this project along with final approved shop drawings.

SECTION 107
LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

Page 1-60, delete Article 107-18 and replace with the following:

107-18 FURNISHING RIGHT OF WAY

The responsibility for coordinating the securing of all necessary rights of way is as outlined in the Request for Proposals.

SECTION 108
PROSECUTION AND PROGRESS

Page 1-63, delete Article 108-2 and replace with the following:

108-2 COST-LOADED CRITICAL PATH METHOD PROJECT SCHEDULE

(A) General Requirements

The Design-Build Team shall create a Cost-Loaded Critical Path Method Project Schedule (CPM Schedule). The Design-Build Team shall include in the CPM Schedule, the work of subcontractors, vendors, suppliers, utilities, railroads, permitting agencies, NCDOT, and all other parties associated with the project. The Design-Build Team shall provide adequate time in the CPM Schedule for all parties involved with the project to complete their work, including inspections, procurement activities and testing. The Design-Build Team's plan, as presented in the CPM Schedule, shall adhere to all contract requirements. The Design-Build Team shall assign a dollar value, even if the dollar value is zero, to each activity in the CPM Schedule. In accordance with Article 109-4(A) of this Standard Special Provision, the Design-Build Team shall use the CPM Schedule to prepare its payment applications. Failure by the Design-Build Team to include any element of its work or the work of others required for project completion shall not excuse the Design-Build Team from completing the project by the Contract Completion Date(s).

Acceptance of the CPM Schedule confirms only that the submittal meets the contract's scheduling requirements. Acceptance does not alter any contract requirement and does not validate the Design-Build Team's assumptions, logic, sequencing, planned production rates, resource allocations, or any other means and methods. The Design-Build Team remains solely responsible for planning, sequencing, and executing the work to meet all Project Milestones, Intermediate Contract Times, Substantial Completion requirements, and the Contract Completion Date.

The Design-Build Team may elect to resource-load their schedule; however, shall not submit a resource leveled CPM Schedule for the purposes of determining start and finish dates or the longest path of the CPM Schedule. Rather, the longest path and expected start and finish dates shall be determined by logic, durations, and calendars.

Scheduling Software - Unless approved otherwise by the Department, in writing, the Design-Build Team shall produce every schedule referenced in this Article and / or submitted to the Engineer using software that is wholly compatible with the most recent version of Primavera (P6) which has the capability of creating a back-up copy of the working schedule in ".XER" format. Submission of data from another software system where date conversion techniques or software is used to import into Primavera's scheduling software is not acceptable.

Definitions - The following definitions apply solely to the terms used in this Article. The following definitions do not modify in any way the definitions provided elsewhere in the Contract Documents.

Activity - A discrete, identifiable task or event that takes time, has definable start and stop dates, furthers the work's progress, and can be used to plan, schedule, and monitor a project.

Activity Calendar - A set of working hours and workdays including, non-work days, holidays, special event restrictions, normal adverse weather, seasonal limitations, and environmental restrictions assigned to an activity on which work associated with the activity may be scheduled. Activity Calendars shall be project specific.

Activity Code - Additional information assigned to an activity for purposes of grouping or filtering related activities. Common codes include phase, area, responsibility, subcontractor, type of work, and sub phase.

Activity ID - A unique, alphanumeric, identification code assigned to an activity.

Actual Dates - Actual Starts and Actual Finishes of activities in the schedule.

Actual Finish - The date when the work represented by a specific activity in the schedule was actually finished.

Actual Start - The date when the work represented by a specific activity in the schedule was actually started.

Activity Network Diagram - A graphic representation of a CPM Schedule that shows the relationships among activities.

Availability Date – The Contract Date of Availability provided in the *Contract Time and Liquidated Damages* Project Special Provisions found elsewhere in this RFP.

Bar Chart - A graphic representation of a schedule without relationships. A timescale appears along the horizontal axis.

Baseline Schedule - The first accepted CPM Schedule showing the accepted plan to complete the entire project.

CPM of Record - The most recent CPM Schedule accepted by the Engineer.

Calendar Day – A day shown on the calendar beginning and ending at midnight.

Constraint - A restriction imposed in a schedule, which fixes a value that would otherwise be calculated within the schedule. Examples of values that can be fixed by a constraint include float, start date, end date, and completion date.

Contract Time - The number of calendar days inclusive between the Date of Availability and the Contract Completion Date(s).

Contract Value - The Design-Build Team's lump sum bid for the entire project and any additional dollar value added through Supplemental Agreement(s).

Controlling Activity - The first incomplete activity on the Critical Path. This term shall be considered synonymous with "Controlling Operation."

Critical Delay - A delay to an activity on the critical path that extends the Scheduled Completion Date(s).

Critical Path - The longest path of activities that determines the scheduled project completion date(s). Activities on the critical path are critical activities.

Data Date - The earliest possible date identified in a schedule from which remaining activities can proceed.

Early Finish - The earliest date an activity can finish based on its duration and its predecessors.

Early Start - The earliest date an activity can start based on its predecessors.

Fragnet - The sequence of new activities that are proposed to be added to the current schedule to represent the cost and potential time impact(s).

Final Schedule - The last monthly updated CPM Schedule containing actual start and finish dates for every activity.

Free Float - The amount of time an activity can be delayed without delaying the early state date of any successor activity.

Lag - An offset of time from the predecessor to the successor. Lag shall be a numerical value that is not assigned a description or activity number.

Late Finish - The latest date an activity can finish based on its successors without causing a delay to the Scheduled Completion Date(s) of the project.

Late Start - The latest date an activity can start based on its successors and duration without causing a delay to the Scheduled Completion Date(s) of the project.

Logic - Plural or singular reference to the predecessor and successor relationships between activities in the schedule.

Longest Path – The longest sequence of continuous activities that determines the duration of the project.

Major Revision - Any revision that is not a "Minor Revision".

Milestone - An activity with no duration that is typically used to represent the beginning or end of the project or an interim phase. Includes, but is not limited to, Intermediate Completion Dates, Substation Completion Date(s), and the Contract Completion Date(s).

Minor Revision - A revision that does not affect the critical path of the work on the project and does not affect Near Critical Activities.

Near Critical Activities – Activities that are not currently critical and could potentially impact the project completion.

Normal Adverse Weather Impact - A Workday in which the controlling operation(s) is unable to progress as a result of weather or impacts resulting from weather for a period of half or more of the Workday shift duration, as defined in the Activity Calendar for the controlling operation(s).

Open End - The condition that exists when an activity has either no predecessor or no successor, or when an activity's only predecessor relationship is a finish-to-finish or only successor relationship is a start-to-start.

Original Duration - The original estimate of time, expressed in workdays, required to perform an activity.

Preceding Work - Work on the project that must be performed by entities under separate contract with the NCDOT prior to work being performed by the Design-Build Team.

Predecessor - An activity that is defined by schedule logic to precede another activity.

Progress Schedule - A CPM Schedule produced by incorporating the project's actual progress into the CPM of Record for purposes of reviewing payment applications prior to any major schedule revisions.

Punch Work - Minor corrective work typically performed at the end of construction that is necessary to bring the project into full compliance with the contract requirements.

Relationship - Interdependence between two activities. Relationships link an activity to predecessors and successors.

Remaining Duration - The estimated time, expressed in workdays, required to complete an activity.

Revised Schedule - A Schedule Update with Schedule Revisions.

Scheduled Completion Date(s) - The completion date(s) forecast by the CPM Schedule. The CPM Schedule may also forecast Intermediate Completion Dates for Milestones, Phases, or other portions of the project.

Schedule Representative – An individual with documented CPM scheduling experience in developing, cost-loading, updating, and revising CPM Schedules on projects of similar size, scope, complexity and having a thorough understanding of the project scope, Contract, plans, and associated project phasing and milestones.

Schedule Revision(s) - A change in calendars, along with adding / deleting activities, the method of calculation, relationships, sequence, or original duration of activities in the schedule; or a change in the remaining duration of a work activity that is not caused by the actual progress of the activity. Revisions can be considered either Major or Minor as noted in Section F below.

Schedule Update - A CPM Schedule produced by the Design-Build Team and provided to the Engineer on regular intervals, not to exceed once per month by incorporating the project's actual progress into the CPM of Record prior to any major schedule revisions.

Successor - An activity that is defined by schedule logic to succeed another activity.

Total Float - The amount of time an activity can be delayed without affecting the project's completion date(s) or an intermediate deadline; it is the difference between the late finish date and the early finish date.

Workday - calendar day during which construction operations are expected to proceed, normally excluding weekends, holidays, and other non-working periods.

(B) Design-Build Team's Schedule Representative

The Design-Build Team shall identify to the Engineer the person to serve as the Schedule Representative responsible for developing, updating, and revising the Design-Build Team's CPM Schedule. The Design-Build Team shall authorize the Schedule Representative to update and submit schedules, answer schedule-related questions, and incorporate revisions to the schedule, as necessary, to present a current and reliable plan of construction. If the accepted Schedule Representative is no longer assigned to the project, the Design-Build Team shall submit a new Schedule Representative for the Engineer's review within 14 days of receiving notice of the Schedule Representative's departure.

(C) Interim Schedule

The Design-Build Team may submit electronically to the Engineer an Interim Cost-Loaded Critical Path Method Project Schedule (Interim Schedule). The Interim Schedule shall be submitted electronically within 14 days of contract execution. The Interim Schedule shall be used to monitor the project progress and process the Design-Build Team's payment applications until such time that the Baseline Schedule has been submitted and accepted by the Engineer. The use of an Interim Schedule is optional.

The Interim Schedule shall meet the following requirements:

(1) The Interim Schedule shall start with an activity identified as "Availability Date."

(2) The last activity in the Interim Schedule shall be identified as "Project Completion." The Design-Build Team shall plan the other activities in the schedule so that the late finish date of "Project Completion" is calculated to occur on or before the Contract Completion Date. The Project Completion Date should be Constrained to the Contract Completion Date.

(3) The Design-Build Team shall identify all major work components in the Interim Schedule as activities. For the Interim Schedule, the Design-Build Team may present large work components, such as "construction of the project," as a single activity in the schedule, so long as the Interim Schedule meets the other requirements of this Article.

The Design-Build Team shall identify the following for each activity in the Interim Schedule.

(a) A unique alphanumeric activity ID

(b) A description of the work associated with each activity ID

(c) A duration

(i) The Design-Build Team shall limit activities to a maximum duration of 22 workdays. The Design-Build Team shall subdivide activities expected to take longer than 22 workdays so as to provide more detail and to meet this requirement. When proposing an activity duration exceeding 22 workdays, the Design-Build Team shall submit written justification explaining the basis for the proposed duration to the Engineer**.** For any activity approved to exceed the duration, the Design-Build Team shall provide a method for tracking progress that enables meaningful monitoring of work performance. Any duration provided by the Department, utilities, or other government agencies will be exempt from this requirement.

(ii) The Design-Build Team shall limit design activities to the required design submittal intervals or a maximum of 90 days, whichever is shorter. The Design-Build Team shall subdivide activities expected to take longer so as to provide more detail. When proposing a design activity duration exceeding 90 days, the Design-Build Team shall submit written justification explaining the basis for the proposed duration to the Engineer**.**

(d) Predecessors

(e) Successors

(f) Value of the Work

(i) The Design-Build Team shall assign an accurate dollar value to each activity based on estimated costs plus associated profit and overhead. The profit and overhead assigned by the Design-Build Team to the individual activities shall be equal to or less than the mark-up applied to the work when establishing the Design-Build Team's lump sum bid for the entire project.

(ii) The Design-Build Team shall limit the value of an activity to $500,000 or submit written justification for not subdividing the activity to the Engineer for review and approval. Mobilization, Bonds and Insurance, design activities and material procurement activities are exempt from this $500,000 requirement.

(iii) The Design-Build Team shall assign a dollar value, even if the dollar value is zero, to each activity in the Interim Schedule.

(iv) Activities may be assigned a value of zero dollars, as appropriate.

(v) The total value of all activities in the Interim Schedule shall be equal to the Design-Build Team's lump sum bid for the entire project.

(vi) Any activities that are incidental shall have a value of zero dollars.

(4) The Design-Build Team shall assign each activity in the Interim Schedule at least one predecessor and one successor, except the first activity and the last activity in the schedule.

(5) The Design-Build Team shall use scheduling software that adheres to the requirements found elsewhere in this Article to calculate the following data for each activity in the Interim Schedule:

(a) Early Start
(b) Early Finish
(c) Late Start
(d) Late Finish
(e) Total Float

(6) The Design-Build Team shall submit a written narrative with the Interim Schedule that explains the planned sequence of work, the critical path, proposed project phasing, and any other scheduling assumptions made by the Design-Build Team.

The Engineer may choose to reject the Interim Schedule if it does not conform to the requirements of this Article. If the Engineer rejects the Interim Schedule, the project shall be administered as if no Interim Schedule has been submitted.

(D) Baseline Cost-Loaded Critical Path Method Schedule

Within the later of (a) 60 days of contract execution or (b) a minimum of 90 days prior to the first scheduled construction Activity, the Design-Build Team shall submit electronically to the Engineer a Baseline Cost-Loaded Critical Path Method Project Schedule (Baseline Schedule) meeting the requirements of this Article and using industry-

accepted CPM scheduling practices as identified in the AGC's Construction Planning and Scheduling book, Second Edition.

Upon submission of the Baseline Schedule, the Engineer and Design-Build Team will attend a scheduling conference to discuss the Contractors' overall plan to accomplish the Work, their CPM Schedule structure, and address any outstanding scheduling questions. Within 21 days of receipt of the Design-Build Team's Baseline Schedule, the Engineer will complete the review. If the Engineer decides it is warranted, the Engineer will convene additional joint review conferences at which the Engineer and the Design-Build Team shall make any necessary corrections or adjustments to the Baseline Schedule. If a revision is necessary either from the Engineer's review or the joint review conference(s), the Design-Build Team shall submit a revised Baseline Schedule electronically within seven days of such joint review conference, unless a longer duration is mutually agreed to during the joint review conference, and the Engineer will review the revised Baseline Schedule within seven days of re-submittal. The Design-Build Team and the Engineer shall repeat this process until an acceptable Baseline Schedule is established.

Once accepted, the Baseline Schedule becomes the first CPM of Record for the project. If an Interim Schedule was submitted and accepted by the Engineer, the accepted Baseline Schedule replaces the Interim Schedule for all purposes, including payment.

The Design-Build Team shall submit a Baseline Schedule that meets the following requirements.

(1) The first activity in the schedule shall be the "Availability Date." The Design-Build Team shall constrain this activity to start on the contract Date of Availability identified elsewhere in this RFP. Except as indicated otherwise elsewhere in this Article or agreed in writing by the Engineer, the Design-Build Team shall not use constraints.

(2) If the Design-Build Team proposes a Substantial Completion Date in the Technical Proposal, the schedule shall include an activity identified as Substantial Completion.

(3) The Last Activity in the Schedule shall be identified as "Project Completion." The Design-Build Team shall plan the other activities in the schedule so that the expected finish of "Project Completion" is calculated to occur on or before the Contact Completion Date. The Project Completion Date shall be constrained to the Contract Completion Date.

(4) The Design-Build Team shall plan its work to meet all time-related contract requirements. This includes but is not limited to submittal review times, Milestones, Intermediate Contract Times, Substantial Completion Date(s), phasing requirements, and the date of completion, as appropriate.

(5) The Design-Build Team shall identify all the components of the work and the work of others on the project as activities in the Baseline Schedule.

(6) The Design-Build Team shall designate the following for each activity in the Baseline Schedule, including:

(a) A unique alpha numeric activity ID

(b) A description of the work associated with each activity ID

(c) A duration

i. The Design-Build Team shall limit activities to a maximum duration of 22 workdays. The Design-Build Team shall subdivide activities expected to take longer than 22 workdays so as to provide more detail and to meet this requirement. When proposing an activity duration exceeding 22 workdays, the Design-Build Team shall submit written justification explaining the basis for the proposed duration to the Engineer**.** For any activity approved to exceed the duration, the Design-Build Team shall provide a method for tracking progress that enables meaningful monitoring of work performance. Any duration provided by the Department, utilities, or other government agencies will be exempt from this requirement.

ii. The Design-Build Team shall limit design activities to the required design submittal intervals or a maximum of 90 days, whichever is shorter. The Design-Build Team shall subdivide activities expected to take longer so as to provide more detail. When proposing a design activity duration exceeding 90 days, the Design-Build Team shall submit written justification explaining the basis for the proposed duration to the Engineer**.**

iii. All activities with a dollar value greater than zero shall have a duration assigned to it, even if the duration is equal to zero.

(d) Predecessors - Each activity except for "Availability Date" shall have at least one predecessor.

(e) Successors - Each activity except for "Final Completion" shall have at least one successor.

(f) Activity Calendar - The Activity Calendar shall clearly identify the days when work could be performed on the activity and the days when work cannot be performed on the activity, in addition to the number of hours per day for a given work week. Normal adverse weather days shall be included as non-workdays in specific work type calendars. Weather shall not be accounted for in activity durations.

(g) Activity Code - Each activity in the schedule shall be assigned an activity code for the following categories:

i. Area of the Project
ii. Structure within the Area of the Project
iii. Phase of the Project
iv. Division of Work
v. Work Type
vi. Responsibility for the Work
- The Design-Build Team shall identify the entity responsible to perform each activity in the Baseline Schedule. Examples might include a particular subcontractor, the Department, the Design-Build Team, a design consultant, a utility company, etc.
- If more than one entity is performing a particular activity, then the activity code shall identify both entities.

- When the Baseline Schedule is submitted, the Design-Build Team shall provide a list to the Engineer of each activity code that assigns responsibility to entities that are not under the control of the Design-Build Team.

vii. Categories and Groupings
- The Design-Build Team shall assign different categories for items in separate Divisions within the *Standard Specifications for Roads and Structures* and at least one type of work shall be classified as punch work.
- The Design-Build Team shall choose a method of identifying the type of work that shall clearly communicate to the Engineer the nature of the work being performed.

(h) Value of the Work

i. The Design-Build Team shall assign an accurate dollar value to each activity based on a reasonable assignment of the value of that work when compared to the overall work being performed on the project.

ii. The Design-Build Team shall not assign a dollar value to an activity less than the estimated cost to perform that work.

iii. The Design-Build Team shall not assign a dollar value to the work being performed by the Department or other third parties.

iv. Activities scheduled to occur early in the project shall be assigned the same or lesser value than similar activities scheduled to occur later in the project, unless otherwise approved by the Department, in writing.

v. The Design-Build Team shall limit the value of an activity to $500,000 or submit written justification for not subdividing the activity to the Engineer for review and approval. Mobilization, Bonds and Insurance, design activities and material procurement activities are exempt from this $500,000 requirement.

vi. The Design-Build Team shall assign activities in the schedule representing tasks incidental to the performance of the work a value of zero dollars. Any activities that are incidental or not identified in the schedule shall have a value of zero dollars.

vii. Activities may be assigned a value of zero dollars when appropriate. Examples include the work of others, or tasks performed by subcontractors for which the contractor has no cost.

viii. Each Activity in the Baseline Schedule shall be cost-loaded so that the sum of the budgeted total costs for all activities equals the Contract Value. The budgeted total costs for each activity shall not change once the Baseline Schedule is approved as the first CPM of Record, unless authorized in writing by the Engineer.

ix. The Design-Build Team shall be limited to the total percentage and distribution percentages defined in the *Mobilization* Project Special Provision found elsewhere in this RFP for mobilization. The Design-Build Team shall assign costs that correspond to the aforementioned percentages to “Mobilization, Pre-Permit” and “Mobilization, Post-Permit” activities.

x. The Design-Build Team shall assign activities to both erosion and

sedimentation control device installation and device maintenance. The activity for erosion and sedimentation control device maintenance shall span the duration of the project construction and shall be cost-loaded in a linear manner.

xi. The Design-Build Team shall assign activities to both traffic control device installation and device maintenance. The activity for traffic control device maintenance shall span the duration of the applicable phase of construction and shall be cost-loaded in a linear manner.

xii. The Design-Build Team shall assign the greater of $100,000 or one-quarter of one percent of the lump sum bid for the entire project to the activity or activities representing punch work and project closeout.

xiii. All costs assigned to activities shall be evaluated on a linear basis with regard to payment unless a payment curve is provided and approved. Such curves shall be agreed to in the Baseline Schedule and shall not change unless authorized in writing by the Engineer.

(7) The Design-Build Team shall assign each activity in the Baseline Schedule at least one predecessor and one successor, except the first activity, "Availability Date" and the last activity, "Project Completion."

(8) The Design-Build Team shall not use start-to-finish relationships to connect predecessor and successor activities.

(9) The Design-Build Team shall limit the use of start-to-start and finish-to-finish relationships to connect predecessor and successor activities.

(10) The Design-Build Team shall not use negative lags in the Baseline Schedule. The Design-Build Team shall limit the use of lags in the Baseline Schedule and shall not use a lag greater than five days unless approved otherwise by the Engineer.

(11) The Design-Build Team shall use scheduling software that adheres to the requirements found elsewhere in this Article to calculate the following data for each activity in the Baseline Schedule:

(a) Early Start
(b) Early Finish
(c) Late Start
(d) Late Finish
(e) Total Float
(f) Free Float

(12) The longest path shall be dictated by schedule logic, durations, and calendar days, not by the leveling of resources.

(13) The Design-Build Team shall submit a written narrative with the Baseline Schedule that explains:

i. The planned work sequence, including proposed project phasing and maintenance of traffic

ii. The critical path and near critical activities,

iii. Activity calendars to include working hours and workdays including, non-workdays, holidays, special event restrictions, normal adverse weather, seasonal limitations, and environmental restrictions assigned to the activities,

iv. Milestone dates.
v. Procurement of materials,
vi. Permitting and environmental requirements,
vii. Coordination with other contractors,
viii. Coordination with local municipalities,
ix. Work to be performed by the Department, other government agencies, utility companies or other entities
x. Any other scheduling assumptions made by the Design-Build Team.

The Engineer will review the Baseline Schedule for compliance with the contract requirements and the requirements of this provision. The Engineer may reject the Baseline Schedule if it does not adhere to these requirements.

Use of float suppression techniques, such as preferential sequencing (arranging critical path through activities more susceptible to Department caused delay), special lead/lag logic restraints, zero total or free float constraints, extended activity times, or imposing constraint dates other than as required by the contract, shall be cause for rejection of the Baseline Schedule. The Design-Build Team shall not group, summarize, or otherwise combine activities in a manner that obscures logical relationships, conceals activity sequencing, or fails to accurately represent the flow of work and the resulting critical path. For example, grouping of Right of Way parcels, utility relocations or utility owners' individual responsibilities.

The Design-Build Team shall be responsible for the timely preparation of a Baseline Schedule that fully complies with the requirements of this Article and the contract.

(E) Schedule Updates

As the basis of its payment application request and as a requirement of this Article, the Design-Build Team shall submit electronically to the Engineer a Schedule Update to the CPM of Record using accepted scheduling practices. The Design-Build Team and Engineer will determine a mutually agreeable Data Date for the Schedule Updates. The Design-Build Team shall continue to provide the Engineer Schedule Updates until the final schedule is approved with 100% completion of all activities and all the project work. The Design-Build Team shall submit a Schedule Update within seven calendar days of its Data Date. The Engineer shall review the Schedule Update and provide a response to the Design-Build Team within seven calendar days of the submission. Upon the Engineer's acceptance, the Schedule Update shall become the new CPM of Record, replacing the previous CPM of Record, and shall be considered used from its Data Date until the Data Date of the next schedule accepted by the Engineer.

The Design-Build Team shall incorporate the following information into the previous CPM of Record and submit this as its Schedule Update:

(1) An updated Data Date

(2) The actual start of any activity that started prior to the Data Date of the Schedule Update

(3) The actual finish of any activity that finished prior to the Data Date of the Schedule Update

(4) The new remaining duration of any activity that began, but did not finish prior to the Data Date of the Schedule Update.

(5) The percent complete for every activity in the CPM Schedule. The Design-Build Team shall use both activity percent complete and resource percent complete for activities representing the purchase of materials and shall identify the resource percent complete of activities representing the purchase of materials for undelivered; delivered or fabricated; or installed material as 0%, 95% or 100% complete, respectively.

(6) If the Design-Build Team requests compensation in accordance with Article 109-5, a "Stored Materials" Activity should be added to the CPM Schedule with an initial value of zero dollars. When so authorized by the Engineer, the Design-Build Team shall re-allocate the dollar value(s) from previously assigned activities associated with the stored materials to the "Stored Materials" Activity, to coincide with 95% of the invoiced cost.

(7) The Design-Build Team shall use scheduling software to calculate the following data for each of the remaining activities in the Schedule Update:

a. Early Start
b. Early Finish
c. Late Start
d. Late Finish
e. Total Float
f. Free Float

The Design-Build Team shall provide a narrative as part of the Schedule Update, in addition to any of the other requirements identified in Article 109-4(A) of this Standard Special Provision for partial payment requests. The Design-Build Team shall include the following in the Schedule Update narrative:

(1) A description of the work performed during the update period and any deviations from the work scheduled.

(2) If progress is falling behind, a description of the reasons and any actions taken or proposed to mitigate.

(3) The status of any outstanding permits or submittals.

(4) The current Critical Path and near critical Activities.

(5) Any delays or disruptions to project milestone dates experienced during the update period, such as, Intermediate Contract Dates, Substantial Completion Date(s) and / or Final Completion Date

(6) If a milestone activity is scheduled to occur later than the date specified in the Contract, an explanation stating why the milestone date is scheduled to occur late and

any actions taken or proposed to mitigate.

(7) A list of the Controlling Operation Workdays delayed due to adverse weather during the current update period including a description and dates of the weather event(s); critical activities affected, how the activities were affected, and the duration of the impact. Also, a description of any actions taken or proposed to mitigate.

(8) Any significant changes in planned manpower or equipment

(9) Any foreseeable conflicts, delays or disruptions

(10) A list of any Minor Revisions made during the update period.

(11) Work planned for the next update period and any actions needed by the Department, Utility Owners, or other parties.

(12) Any other factors that have or may impact the project schedule.

A discussion of delays in the Schedule Update's narrative shall not constitute a written request for additional time or notice of intent to file a claim as required by the Contract.

The Design-Build Team shall not incorporate any revisions into a Schedule Update unless the revisions are minor. The Schedule Update narrative shall include documentation of any revisions previously approved by the Engineer.

The Engineer will review the Schedule Update submitted by the Design-Build Team for compliance with the contract requirements. Use of float suppression techniques, such as preferential sequencing (arranging critical path through activities more susceptible to Department caused delay), special lead/lag logic restraints, zero total or free float constraints, extended activity times, or imposing constraint dates other than as required by the contract, shall be cause for rejection of the Schedule Update. The use of Resource Leveling (or similar software features) used for the purpose of artificially adjusting activity durations to consume float and influence the critical path is expressly prohibited. The Engineer may reject the Schedule Update if it does not adhere to these or any other contract requirements, including a Schedule Update that 1) incorporates "Major Revisions", 2) includes actual dates on or after the Data Date, and / or 3) records incomplete or incorrect information on the work progress.

The Engineer will utilize the Schedule Update and the values assigned to Activities for developing partial payments per Article 109-4.

Additionally, the Engineer will review the Design-Build Teams submitted Controlling Operation Workdays delayed due to adverse weather during the current Schedule Update period, calculate the actual number of Controlling Operation Workdays delayed, and document the adverse weather delay. The Design Build Team will have 10 days to dispute the Engineers findings in writing. If disputed, the Engineer will conduct a joint scheduling conference with the Design-Build Team to resolve. After this 10-day dispute period, the decision will be final. The Design-Build Team's failure to submit normal adverse weather delays during a Schedule Update will be construed as zero weather delays encountered during that Schedule Update period. The collective sum of the Schedule Update's weather

delays, as determined by the Engineer, will be utilized to determine any time extension provided per Article 108-10(B).

(F) Revisions to the CPM of Record

In accordance with the requirements of this Article, the Design-Build Team shall revise the CPM of Record. With prior approval from the Engineer, the Design-Build Team may revise the CPM of Record for other circumstances.

The Design-Build Team shall incorporate minor revisions into the next Schedule Update and include a summary of these changes in the narrative.

The Engineer's determination as to whether a revision is minor or major shall be final. For major revisions, the Design-Build Team shall submit to the Engineer a Revised Schedule that meets all the requirements of the Baseline Schedule and is updated to reflect current progress. The Design-Build Team shall submit all Revised Schedules within seven days of its Data Date unless otherwise agreed by the Engineer, in writing. The Design-Build Team shall include a narrative with the Revised Schedule describing each revision and the reason for each revision. Every revision that was made to the Revised Schedule shall be listed in the narrative. The Design-Build Team shall include in the narrative any delays or potential delays identified in the Revised Schedule along with options to mitigate the delays or potential delays. The Design-Build Team shall also include in the narrative any foreseeable problems that may need to be overcome when implementing the Revised Schedule. A discussion of delays and potential delays in the Revised Schedule narrative shall not constitute a written request for additional time, per Article 108-10, or satisfy any requirement for written notice to file a claim as required by the contract, per Article 104-8(B).

If the Design-Build Team is re-allocating the dollar values assigned to activities, it shall include for the Engineer's review and approval a list of the activities affected by the revision, a list of any new activities added or deleted, and the difference in dollar value assigned to each activity. For changed work where the dollar value is disputed, the Design-Build Team shall assign dollar values to its work activities as directed by the Engineer, but shall include the designation "D-C" at the beginning of the activity's description for each activity affected by the change. For changes settled through a Supplemental Agreement, the Design-Build Team shall assign the agreed dollar amount among the new or existing activities, and shall include the designation SA# (where # represents the number of the Supplemental Agreement) at the beginning of the activity's description for each activity affected by the change.

Only CPM schedule revisions or updates directly attributable to work included in an approved Supplemental Agreement or approved claim shall be eligible for additional compensation. Efforts associated with preparing, supporting, or justifying the Supplemental Agreement or claim is expressly excluded. The Design-Build Team shall allocate sufficient resources to timely administer the CPM Schedule, including but not limited to all revisions, as required.

Within seven calendar days of submittal, the Engineer shall accept or reject proposed Revised Schedule(s). Upon the Engineer's acceptance, the Revised Schedule shall become the CPM of Record and shall be used from its Data Date until the Data Date of the next Revised Schedule or Schedule Update accepted by the Engineer.

The Engineer will accept Revised Schedules that appear to accurately reflect the Design-Build Team's current plan for completing the work on the project. The Engineer may accept a Revised Schedule that indicates the project is currently expected to finish earlier or later than required by the contract. However, the Engineer's acceptance of the Design-Build Teams' schedules does not relieve the Design-Build Team from its obligations to perform under the contract terms including but not limited to completion of the work within the contract time; or as granting, rejecting, or in any way acting on the Design-Build Team's requests for adjustment to the date(s) for completion of the work.

The Engineer may reject any CPM Schedule revision that 1) does not accurately reflect the Design-Build Team's current plan of construction; 2) requires additional and / or revised actions on the part of third parties or the Department; 3) changes the dollar value assigned to an activity, unless the Design-Build Team has correctly allocated this amount into new activities for additional detail; 4) materially alters the projected payout of the project; and / or 5) submitted more than seven calendar days after its Data Date, unless the Engineer had previously agreed to waive this requirement.

(G) Use of the CPM of Record to Assess Project Delays

If the Design-Build Team submits a written request for an extension to the contract time in accordance with Article 108-10 of this Standard Special Provision, the Engineer will rely upon the CPM of Record in effect at the time the delay is recognized or occurs, whichever is sooner, to assess the effects of changes and revisions or other potential causes of delay to the Scheduled Completion Date(s).

For purposes of calculating and withholding anticipated liquidated damages, as identified in the *Standard Specifications for Roads and Structures*, and as may be amended by this Standard Special Provision, the Engineer will rely on the Scheduled Completion Date(s) identified in the CPM of Record.

Pages 1-67, delete Article 108-8 and replace with the following:

108-8 FAILURE TO MAINTAIN SATISFACTORY PROGRESS

The Engineer will utilize the Critical Path Method Project Schedule to evaluate the Design-Build Team's progress at the time each partial pay request and schedule update is submitted. The Design-Build Team's progress may be considered as unsatisfactory if, according to the CPM of Record, the scheduled completion date exceeds the contract completion date

Pursuant to Article 109-4, the Engineer shall calculate and withhold anticipated liquidated damages based on the Scheduled Completion Date(s) as identified in the CPM of Record. If the Scheduled Completion Date(s) exceeds the Contract Completion Date(s) by more than 90 calendar days, the Engineer may withhold anticipated liquidated damages. The withheld amount shall be reviewed and adjusted in accordance with each subsequent CPM of Record.

The Design-Build Team's progress will be considered unsatisfactory if the CPM of Record, Scheduled Completion Date(s) falls behind the Contract Completion Date(s) by more than 180 days of the Contract Time. When the Design-Build Team's progress is found to be unsatisfactory, the Engineer may make written demand of the Design-Build Team to state in writing the reason for the unsatisfactory progress and produce such supporting data as the Engineer may require or the Design-Build Team may desire to submit. The Engineer will consider the justifications submitted by the Design-Build Team and extensions of the completion date(s) that have or may be allowed in accordance with Article 108-10 of this Standard Special Provision.

When the Design-Build Team cannot satisfactorily justify the unsatisfactory progress the Engineer may invoke one or more of the following sanctions:

1. Withhold anticipated liquidated damages from amounts currently due or which become due.
2. Remove the Design-Build Team and individual managing firms of the Design-Build Team and / or prequalified design firms from the Department's Prequalified Bidders List.

When any of the above sanctions have been invoked, they shall remain in effect until rescinded by the Engineer.

Page 1-69, delete Article 108-10 and replace with the following:

108-10 CONTRACT TIME AND INTERMEDIATE CONTRACT TIME

(A) General

The contract time will be as defined in Section 101. No extensions to the completion date will be authorized except as allowed by this Article. If an early completion date(s) is proposed, no time extension will be granted for any duration of time between such proposed date(s) and the Contract Completion Date(s) as float and float consumption belongs to the project. No modifications in the date of availability will be made for any reason whatsoever. NCDOT will only reimburse costs for delays as identified in Article 104-4 of the 2024 *NCDOT Standard Specifications for Roads and Structures*. Except for costs identified in Article 104-4, NCDOT will only evaluate requests for additional or unabsorbed overhead costs resulting from excusable delays (per 108-10(B)1 below).

Intermediate contract time, as defined in Section 101, will be that as allowed in the contract to complete a part, portion or phase of the total work covered in the contract. Intermediate completion dates and intermediate completion times set forth in the contract may be extended on the same basis as completion dates and as described in this Article.

When the liquidated damages stipulated in the contract are to be on an hourly basis, extensions, as described in this Article, will be considered on an hourly basis.

The Engineer will rely upon the CPM of Record in effect at the time the delay is recognized or occurs, whichever is earlier, to assess the effects of changes and revisions or other potential causes of delay to the scheduled completion date(s)

The Engineer will use the CPM of Record and the following guidelines to assess delays to the project:

1) The controlling operation of the work shall be the first activity on the critical path of the CPM of Record.

2) The Engineer will not grant a time extension for delays that result from schedule revisions of any sort, unless the revisions are necessary to mitigate unforeseeable and otherwise excusable delay, are required to incorporate changes to the work agreed to by the Engineer, or the revisions are expressly requested by the Engineer.

3) The Design-Build Team shall create the CPM of Record and shall be responsible for the accuracy and reliability of the CPM of Record. The Engineer will not grant a time extension for delays that result from improper planning, incorrect sequences, scheduling errors, scheduling omissions, missing work portions in the CPM of Record, or any other cause related to the Design-Build Team's failure to properly manage and / or schedule the work or the work of others. The Engineer will not consider a request for additional time from the Design-Build Team that relies on the assumption that the CPM of Record is inaccurate or erroneous.

4) When there are two or more causes for a critical delay, or in the case that two paths or activities are concurrently critical, the Engineer will only grant a time extension if all the causes for the critical delay are determined to be excusable per 108-10(B), in the Department's sole discretion.

5) The critical path is dynamic. The Engineer will assess the critical path on each day of an alleged delay. Only delays to the critical path will be eligible for consideration of a time extension.

6) The Engineer will use the CPM of Record in effect at the time of the delay to assess project delays after the occurrence. The Engineer will not use rejected schedules, later approved schedules, or new schedules, including "impacted" or "collapsed schedules,"

7) Float belongs to the project. Float shall not be for the exclusive use or benefit of either the NCDOT or the Design-Build Team.

(B) Completion Date, Substantial Completion Date, Intermediate Completion Date and Intermediate Completion Time Extensions

Only delays to activities which affect the completion date(s), Substantial Completion Date, intermediate contract date(s) and / or intermediate completion time(s) shall be considered for an extension of contract time. No extensions will be granted until a delay occurs which impacts the project's critical path, consumes all available float, and extends the work beyond

the contract completion dates(s), intermediate completion date(s), and / or intermediate completion time(s). Any extension to the completion date(s), intermediate completion date(s), and / or intermediate completion time(s) will be based on the number of calendar days the contract completion date(s), intermediate completion date(s), and / or intermediate completion time(s) is impacted as determined by the Engineer's analysis. No extension of the contract completion date(s), intermediate completion date(s), and / or intermediate completion time(s) will be allowed for any reason except as provided for below:

1) If the Design-Build Team's current controlling operation(s) are delayed by circumstances originating from work required under the contract and beyond the Design-Build Team's control, and without the Design-Build Team's fault or negligence, the Design-Build Team may, at any time prior to payment of the final estimate, make a written request to the Engineer for an extension of the contract completion date(s), intermediate completion date(s), and / or intermediated completion time(s). This request shall include the following:

    a) The circumstances resulting in the alleged delay and documentation of said circumstances as may be required by the Engineer
    b) The controlling operation(s) alleged to have been delayed
    c) The calendar dates or calendar dates and times on which the controlling operation(s) were delayed
    d) The number of calendar days or hours by which the Design-Build Team is requesting the contract completion date(s), intermediate completion date(s) and / or intermediate completion time(s) to be extended

    If the Engineer determines that the controlling operation(s) were delayed because of circumstances beyond the control of, and without the Design-Build Team's fault or negligence, and that the Design-Build Team has pursued the work in accordance with Article 108-1 of the *Standard Specifications for Roads and Structures,* the Engineer may grant the Excusable Delay and extend the contract completion date(s), intermediate completion date(s), and / or the intermediated completion time(s), unless otherwise precluded by other contract provisions.

2) Based upon historical weather data, the Department anticipates there will be 100 Workdays per year impacted by the combined effects of normal adverse weather and unfavorable conditions resulting from weather. The Design-Build Team shall develop Activity Calendars using reasonable industry-standard assumptions for anticipated weather impacts appropriate for the project location, season, and type of work being performed. For purposes of evaluating weather-related requests for time extensions in Contract Time, Intermediate Contract Time, Intermediate Completion Dates, and / or Substantial Completion Date(s), the Department will utilize 100 Workdays per year as the anticipated amount of Normal Adverse Weather Impacts. For partial years, the anticipated weather impacts will be prorated based on the duration of the applicable Contract Time or Intermediate Contract Time.

The Engineer will utilize the following formula to calculate the total anticipated Normal Adverse Weather Impacts for Intermediate Contract time(s) and Contract time:

Total Anticipated Normal Adverse Weather Impacts*	=	Total Intermediate Contract Time or Contract Time (Calendar Days)	/	365 (Days)	x	100 (Days)

*Partial day calculation will be rounded up to the next full day. For instance, 48.2 day calculation will be rounded up to 49 Total Anticipated Normal Adverse Weather Impact days.

Per Article 108-2, the Design Build Team shall include within each CPM Schedule Update narrative, a list of Controlling Operation Workdays delayed by Normal Adverse Weather Impacts. The Engineer will assess the alleged weather impacts and determine the validity of weather impacts to the Controlling Operation(s) based upon review of project records. A cumulative sum of approved weather impact days from each CPM Schedule Update will be retained by the Engineer for the duration of the completion date(s), intermediate completion date(s), and / or intermediate completion time(s), including any extensions in contract time.

Upon completing the work within the respective completion date(s), intermediate completion date(s), and / or intermediate completion time(s), should the cumulative sum of approved weather impact days exceed the Total Anticipated Normal Adverse Weather Impacts (per above formula) the Engineer will grant a time extension. No compensation, including extended overhead or indirect costs, or other consideration will be given for extensions in the completion date(s), intermediate completion date(s), and / or intermediate completion time(s) due to delays caused by weather.

Where the intermediate contract time is 96 hours or less, no consideration whatsoever will be given for an extension in the intermediate contract time due to weather or conditions resulting from weather.

3) If the Engineer ordered changes in the work from that originally contemplated in the contract and those changes result in a reduction in quantities, elimination of items, additional work and / or extra work the Engineer will allow an extension in the contract completion date(s), Substantial Completion Date, intermediate completion date(s), and / or intermediate completion time(s) as the Engineer may deem warranted by such changes. Pursuit of the work with adequate forces and equipment and efficiency of the Design-Build Team's operations will be considered by the Engineer in determining an extension in the contract completion date(s), Substantial Completion Date, intermediate completion date(s), and / or intermediate completion time(s). It shall be, however, the Design-Build Team's responsibility to show just cause for an extension in the contract completion date(s), Substantial Completion Date, intermediate completion date(s), and / or intermediate completion time(s) due to the aforesaid conditions.
The Design-Build Team's plea that insufficient contract time (days), intermediate contract time (days), and / or intermediate contract time (hours) was specified in the contract shall not be considered as a valid reason for an extension in the completion date,

Substantial Completion Date, intermediate completion date, and / or intermediate completion time.

When all work on the project is totally complete, with the exception of an item or items on which work is precluded by seasonal limitations set forth in the contract, the Engineer may, provided that the Design-Build Team has diligently pursued the work with adequate forces and equipment, waive the assessment of liquidated damages during the period of time from the date all work other than an item(s) precluded by seasonal limitations was completed until the seasonal limitations expiration date. The Design-Build Team shall make the request to waive the assessment of liquidated damages in writing prior to the requested waiver beginning date. The non-assessment of liquidated damages during the aforesaid period shall not operate to waive any other liquidated damages that may be assessable or any other contract terms.

Page 1-74, delete Article 108-13(D)(2) in its entirety.

SECTION 109
MEASUREMENT AND PAYMENT

Page 1-75, Article 109-2, delete the last sentence of the 1st paragraph and replace with the following:

Payment to the Design-Build Team will be made only for the work completed, certified and accepted in accordance with the terms of the contract.

Pages 1-80, delete Subarticle 109-4(A) and replace with the following:

109-4 PARTIAL PAYMENTS

(A) General

Partial payments will be based upon the Engineer's review of the Design-Build Team's payment requests. The Design-Build Team will prepare a payment request at least once each month on the date established by the Engineer. Partial payments may be made twice each month if in the judgement of the Engineer the amount of work performed is sufficient to warrant such payment. No partial payment will be made when the total value of work performed since the last partial payment, excluding mobilization, amounts to less than $10,000.00. Partial payments will be approximate only and will be subject to correction in the final estimate and payment.

The Design-Build Team shall use the most recent CPM of Record to estimate the value of the work performed and will submit this estimate as its payment request to the Engineer. The Design-Build Team shall submit the estimate of the value of Work performed and the Progressed CPM Schedule for each partial payment request.

Failure to submit either part of the partial payment request will result in the Engineer withholding payment. With each payment request, the Design-Build Team shall certify that is has reviewed the Cost-Loaded CPM, that the payment request presents an accurate assessment of the level of completion of each work activity for which payment is being sought, and that the dollar value assigned to each work activity is reasonable and consistent with the dollar values assigned to all other work activities. The Engineer will only accept payment requests that have been certified by the Design-Build Team.

The Design-Build Team will maintain and update the Cost-Loaded CPM as further described in Article 108-2 of this Special Provision.

If an acceptable Interim Schedule was submitted in accordance with Article 108-2 of this Standard Special Provision, the Engineer will utilize the values assigned to Activities for developing partial payments.

If the Design Build Team did not submit an acceptable Interim Schedule, the Engineer will issue payments for the mobilization costs (reference Article 800-2 of the Standard Specifications and the Project Special Provision, Mobilization), but will not otherwise process partial payment requests until the Design-Build Team submits an Baseline Cost-Loaded CPM and this CPM is accepted by the Engineer.

Interest or other compensation will not be paid to the Design-Build Team on payments that are withheld in accordance with the requirements of this Special Provision or any other provision of the contract. The Design-Build Team is not entitled to payment, damages, or any other form of compensation due to the withholding of partial payments in accordance with the requirements of this Special Provision or any other provision of the contract.

The Engineer will withhold an amount sufficient to cover anticipated liquidated damages per Article 108-8 as determined by the Engineer's review and analysis of the CPM Schedule (Article 108-2).

Page 1-81, Subarticle 109-5(D), delete the 4th and 5th paragraphs and replace with the following:

Partial payments will not be made on seed or any living or perishable plant materials.

Partial payment requests shall not be submitted by the Design-Build Team until those items requested have corresponding signed and sealed RFC Plans accepted by the Department.

ITEMIZED PROPOSAL FOR CONTRACT NO. C205177

County: WAKE

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
			CONTRACT ITEMS			
0001	0000996000-N	SP	DESIGN AND CONSTRUCTION	Lump Sum	L.S.	

1204/May20/Q1/D996000/E1

Total Amount Of Bid For Entire Project :

FUEL USAGE FACTOR CHART AND ESTIMATE OF QUANTITIES

Description of Work	Units	Fuel Usage Factor Diesel #2	Estimate of Quantities
Unclassified Excavation	Gal / CY	0.29	CY
Borrow Excavation	Gal / CY	0.29	CY
Class IV Subgrade Stabilization	Gal / Ton	0.55	Tons
Aggregate Base Course	Gal / Ton	0.55	Tons
Sub-Ballast	Gal / Ton	0.55	Tons
Erosion Control Stone	Gal / Ton	0.55	Tons
Rip Rap	Gal / Ton	0.55	Tons
Aggregate for Cement Treated Base Course	Gal / Ton	0.55	Tons
Portland Cement for Cement Treated Base Course	Gal / Ton	0.55	Tons
* Asphalt Concrete Base Course	Gal / Ton	_____ 0.90 _____ 2.90	Tons
* Asphalt Concrete Intermediate Course	Gal / Ton	_____ 0.90 _____ 2.90	Tons
* Asphalt Concrete Surface Course	Gal / Ton	_____ 0.90 _____ 2.90	Tons
* Open-Graded Asphalt Friction Course	Gal / Ton	_____ 0.90 _____ 2.90	Tons
* Permeable Asphalt Drainage Course	Gal / Ton	_____ 0.90 _____ 2.90	Tons
* Sand Asphalt Surface Course, Type SA-1	Gal / Ton	_____ 0.90 _____ 2.90	Tons
* Ultra-Thin Bonded Wearing Course	Gal / Ton	_____ 0.90 _____ 2.90	Tons
Portland Cement Concrete Pavement Through Lanes and Shoulders (> 11") Through Lanes and Shoulders (9" to 11") Through Lanes and Shoulders (<9")	Gal / SY	 0.327 0.272 0.245	 SY SY SY
** Structural Concrete (Cast-in-Place Only)	Gal / CY	0.98	CY

* Select 0.90 **OR** 2.90

** Structural Concrete shall be defined as cast-in-place Class A or Class AA concrete used in the construction of major structures for various work items identified in Division 4 of the *Standard Specifications*.

☐ The above quantities represent the estimate of total quantities for each item, as pertaining to Fuel Price Adjustments, for the design proposed in the Technical Proposal submitted under separate cover.

Or

☐ The Design-Build Team elects not to pursue reimbursement for Fuel Price Adjustments on this project.

The information submitted on this sheet is claimed as a "Trade Secret" in accordance with the requirements of G.S. 66-152(3) until such time as the Price Proposal is opened.

_____ _____

Signature, Title Dated

_____

Print Name, Title

(Submit a copy of this sheet in a separate sealed package with the outer wrapping clearly marked "Fuel Price Adjustment" and deliver with the Technical Proposal submittal.)

LISTING OF DBE SUBCONTRACTORS			Sheet _____ of _____	
Firm Name and Address	Item No.	Item Description	* Agreed upon Unit Price	** Dollar Volume of Item
Name Address				
Name Address				
Name Address				
Name Address				
Name Address				
Name Address				
Name Address				

This form must be completed in order for the Bid to be considered responsive and be publicly read.
Bidders with no DBE participation must so indicate this on the form by entering the word or number *zero*.

LISTING OF DBE SUBCONTRACTORS				Sheet _____ of _____
Firm Name and Address	Item No.	Item Description	* Agreed upon Unit Price	** Dollar Volume of Item
Name Address				
Name Address				
Name Address				
Name Address				
Name Address				
Name Address				
Name Address				

This form must be completed in order for the Bid to be considered responsive and be publicly read.
Bidders with no DBE participation must so indicate this on the form by entering the word or number *zero*.

LISTING OF DBE SUBCONTRACTORS				Sheet _____ of _____
Firm Name and Address	Item No.	Item Description	* Agreed upon Unit Price	** Dollar Volume of Item
Name Address				
Name Address				
Name Address				
Name Address				
Name Address				
Name Address				
Name Address				

This form must be completed in order for the Bid to be considered responsive and be publicly read.
Bidders with no DBE participation must so indicate this on the form by entering the word or number *zero*.

LISTING OF DBE SUBCONTRACTORS

Sheet _____ of _____

Firm Name and Address	Item No.	Item Description	* Agreed upon Unit Price	** Dollar Volume of Item
Name Address				
Name Address				
Name Address				
Name Address				

COST OF CONSTRUCTION WORK ONLY $ _____

*The Dollar Volume shown in this column shall be the Actual Price Agreed Upon by the Prime Contractor and the DBE subcontractor, and these prices will be used to determine the percentage of the DBE participation in the contract.

** Dollar Volume of DBE Subcontractor $ _____

Percentage of Total Construction Cost _____ %

(Including Right of Way Acquisition Services)

** - Must have entry even if figure to be entered is zero.

** - *If firm is a Material Supplier Only, show Dollar Volume as 60% of Agreed Upon Amount from Letter of Intent.*
If firm is a Manufacturer, show Dollar Volume as 100% of Agreed Upon Amount from Letter of Intent.

This form must be completed in order for the Bid to be considered responsive and be publicly read.
Bidders with no DBE participation must so indicate this on the form by entering the word or number *zero*.

NON-COLLUSION, DEBARMENT AND GIFT BAN CERTIFICATION

CORPORATION

The prequalified bidder, declares (or certifies, verifies, or states) under penalty of perjury under the laws of the United States that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. §133-24* within the last three years, and that the prequalified bidder intends to do the work with his own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the prequalified bidder is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. §133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

_____

Full name of Corporation

_____

Address as prequalified

Attest _____

Signature of **Secretary, Assistant Secretary**

Select appropriate title

_____

Print or type Signer's name

By _____

Signature of **President, Vice President, Assistant Vice President**

Select appropriate title

_____

Print or type Signer's name

CORPORATE SEAL

NON-COLLUSION, DEBARMENT AND GIFT BAN CERTIFICATION

PARTNERSHIP

The prequalified bidder, declares (or certifies, verifies, or states) under penalty of perjury under the laws of the United States that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the prequalified bidder is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

_____

Full name of Partnership

_____

Address as prequalified

_____ _____

Signature of Witness Signature of Partner

_____ _____

Print or type Signer's name Print or type Signer's name

NON-COLLUSION, DEBARMENT AND GIFT BAN CERTIFICATION

LIMITED LIABILITY COMPANY

The prequalified bidder, declares (or certifies, verifies, or states) under penalty of perjury under the laws of the United States that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the prequalified bidder is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

_____

Full name of Firm

_____

Address as prequalified

_____	_____
Signature of Witness	Signature of **Member, Manager, Authorized Agent** *Select appropriate title*
_____	_____
Print or type Signer's Name	Print or type Signer's Name

NON-COLLUSION, DEBARMENT AND GIFT BAN CERTIFICATION

JOINT VENTURE (2) or (3)

The prequalified bidder, declares (or certifies, verifies, or states) under penalty of perjury under the laws of the United States that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the prequalified bidder is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

Instructions: **2 Joint Venturers** Fill in lines (1), (2) and (3) and execute. **3 Joint Venturers** Fill in lines (1), (2), (3) and (4) and execute. On Line (1), fill in the name of the Joint Venture Company. On Line (2), fill in the name of one of the joint venturers and execute below in the appropriate manner. On Line (3), print or type the name of the other joint venturer and execute below in the appropriate manner. On Line (4), fill in the name of the third joint venturer, if applicable and execute below in the appropriate manner.

(1) _____
Name of Joint Venture

(2) _____
Name of Contractor

_____
Address as prequalified

By

_____ _____
Signature of Witness or Attest Signature of Contractor

_____ _____
Print or type Signer's Name Print or type Signer's Name

If Corporation, affix Corporate Seal

and

(3) _____
Name of Contractor

_____
Address as prequalified

By

_____ _____
Signature of Witness or Attest Signature of Contractor

_____ _____
Print or type Signer's Name Print or type Signer's Name

If Corporation, affix Corporate Seal

and

(4) _____
Name of Contractor

_____
Address as prequalified

By

_____ _____
Signature of Witness or Attest Signature of Contractor

_____ _____
Print or type Signer's Name Print or type Signer's Name

If Corporation, affix Corporate Seal

CORPORATE SEAL(S)

NON-COLLUSION, DEBARMENT AND GIFT BAN CERTIFICATION

INDIVIDUAL DOING BUSINESS UNDER A FIRM NAME

The prequalified bidder, declares (or certifies, verifies, or states) under penalty of perjury under the laws of the United States that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the prequalified bidder is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

Name of Prequalified Bidder _____

Print or type Individual Name

Trading and doing business as _____

Full name of Firm

_____

Address as prequalified

_____ _____

Signature of Witness Signature of Prequalified Bidder, Individual

_____ _____

Print or type Signer's Name Print or type Signer's Name

NON-COLLUSION, DEBARMENT GIFT BAN CERTIFICATION

INDIVIDUAL DOING BUSINESS IN HIS OWN NAME

The prequalified bidder, declares (or certifies, verifies, or states) under penalty of perjury under the laws of the United States that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the prequalified bidder is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

Name of Prequalified Bidder _____

Print or type Individual Name

_____

Address as prequalified

_____

Signature of Prequalified Bidder, Individually

_____

Print or type Signer's Name

_____

Signature of Witness

_____

Print or type Signer's name

DEBARMENT CERTIFICATION

Conditions for certification:

1. The prequalified bidder shall provide immediate written notice to the Department if at any time the bidder learns that his certification was erroneous when he submitted his debarment certification or explanation that is file with the Department, or has become erroneous because of changed circumstances.

2. The terms *covered transaction*, *debarred*, *suspended*, *ineligible*, *lower tier covered transaction*, *participant*, *person*, *primary covered transaction*, *principal*, *proposal*, and *voluntarily excluded*, as used in this provision, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. A copy of the Federal Rules requiring this certification and detailing the definitions and coverages may be obtained from the Contract Officer of the Department.

3. The prequalified bidder agrees by submitting this form, that he will not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in NCDOT contracts, unless authorized by the Department.

4. For Federal Aid projects, the prequalified bidder further agrees that by submitting this form he will include the Federal-Aid Provision titled *Required Contract Provisions Federal-Aid Construction Contract (Form FHWA PR 1273*) provided by the Department, without subsequent modification, in all lower tier covered transactions.

5. The prequalified bidder may rely upon a certification of a participant in a lower tier covered transaction that he is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless he knows that the certification is erroneous. The bidder may decide the method and frequency by which he will determine the eligibility of his subcontractors.

6. 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 provision. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

7. Except as authorized in paragraph 6 herein, the Department may terminate any contract if the bidder 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 by the Federal Government.

DEBARMENT CERTIFICATION

The prequalified bidder certifies to the best of his knowledge and belief, that he and his principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. 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;

c. 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 b. of this certification; and

d. Have not within a three-year period preceding this proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

e. Will submit a revised Debarment Certification immediately if his status changes and will show in his bid proposal an explanation for the change in status.

If the prequalified bidder cannot certify that he is not debarred, he shall provide an explanation with this submittal. An explanation will not necessarily result in denial of participation in a contract.

Failure to submit a non-collusion affidavit and debarment certification will result in the prequalified bidder's bid being considered non-responsive.

☐ Check here if an explanation is attached to this certification.

Contract No.: **C 205177**

County: **Wake County**

ACCEPTED BY THE
DEPARTMENT OF TRANSPORTATION

_____
Contract Officer

_____
Date

Execution of Contract and Bonds
Approved as to Form:

_____
Attorney General

Signature Sheet (Bid - Acceptance by Department)