

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION 11

PROPOSAL

DATE AND TIME OF BID OPENING: OCTOBER 19, 2023 AT 2:00 PM

CONTRACT ID: DK00386

WBS ELEMENT NO.: 33879.2.101

FEDERAL AID NO.: FEDERAL AID

COUNTY: SURRY COUNTY

TIP NO.: N/A

ROUTE NO.: I-77 SOUTHBOUND

LOCATION: I-77 SOUTHBOUND MILE POST 2.65 NEAR NORTH OF MOUNT AIRY

TYPE OF WORK: WEIGH IN MOTION SYSTEM, TRUCK BYPASS SYSTEM, TIRE MONITORING SYSTEM, AUTOMATED LICENSE PLATE READER

NOTICE:

ALL BIDDERS 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 BIDDER 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. BIDDERS 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. NOTWITHSTANDING THESE LIMITATIONS ON BIDDING, THE BIDDER WHO IS AWARDED ANY FEDERAL - AID FUNDED PROJECT SHALL COMPLY WITH CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA FOR LICENSING REQUIREMENTS WITHIN 60 CALENDAR DAYS OF BID OPENING.

THIS IS A ROADWAY PROJECT.

BID BOND IS REQUIRED.

NAME OF BIDDER

ADDRESS OF BIDDER

**PROPOSAL FOR THE CONSTRUCTION OF
CONTRACT No. DK00386 IN SURRY COUNTY, NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION,
RALEIGH, NORTH CAROLINA**

The Bidder has carefully examined the location of the proposed work to be known as Contract No. **DK00386**; has carefully examined the plans and specifications, which are acknowledged to be part of the proposal, the special provisions, the proposal, the form of contract, and the forms of contract payment bond and contract performance bond; and thoroughly understands the stipulations, requirements and provisions. The undersigned bidder agrees to be bound upon his execution of the bid and subsequent award to him by the Department of Transportation in accordance with this proposal to provide the necessary contract payment bond and contract performance bond within fourteen days after the written notice of award is received by him. The undersigned Bidder further agrees to provide all necessary machinery, tools, labor, and other means of construction; and to do all the work and to furnish all materials, except as otherwise noted, necessary to perform and complete the said contract in accordance with *the 2018 Standard Specifications for Roads and Structures* by the dates(s) specified in the Project Special Provisions and in accordance with the requirements of the Engineer, and at the unit or lump sum prices, as the case may be, for the various items given on the sheets contained herein.

The Bidder shall provide and furnish all the materials, machinery, implements, appliances and tools, and perform the work and required labor to construct and complete State Highway Contract No. **DK00386** in **Surry County**, for the unit or lump sum prices, as the case may be, bid by the Bidder in his bid and according to the proposal, plans, and specifications prepared by said Department, which proposal, plans, and specifications show the details covering this project, and hereby become a part of this contract.

The published volume entitled *North Carolina Department of Transportation, Raleigh, Standard Specifications for Roads and Structures, January 2018* with all amendments and supplements thereto, is by reference incorporated into and made a part of this contract; that, except as herein modified, all the construction and work included in this contract is to be done in accordance with the specifications contained in said volume, and amendments and supplements thereto, under the direction of the Engineer.

If the proposal is accepted and the award is made, 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 over the signature of the said Contract Officer or Division Engineer.

The quantities shown in the itemized proposal for the project are considered to be approximate only and are given as the basis for comparison of bids. The Department of Transportation may increase or decrease the quantity of any item or portion of the work as may be deemed necessary or expedient.

An increase or decrease in the quantity of an item will not be regarded as sufficient ground for an increase or decrease in the unit prices, nor in the time allowed for the completion of the work, except as provided for the contract.

Accompanying this bid is 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 Bidder shall fail 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 him, as provided in the Standard Specifications; otherwise said deposit will be returned to the Bidder.

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INSTRUCTIONS TO BIDDERS

PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE PREPARING AND SUBMITTING YOUR BID.

All bids shall be prepared and submitted in accordance with the following requirements. Failure to comply with any requirement may cause the bid to be considered irregular and may be grounds for rejection of the bid.

For preparing and submitting the bid electronically, refer to Article 102-8(B) of the *2018 Standard Specifications*.

Bidders that bid electronically on Raleigh Central-Let projects will need a separate Digital Signature from the approved electronic bidding provider for Division Contracts.

ELECTRONIC ON-LINE BID:

1. Download entire proposal from Connect NCDOT website. Download the electronic submittal file from the approved electronic bidding provider website.
2. If the *Interested Parties List* provision SP01 G02 is part of the proposal prior to submitting a bid on a project, the bidder shall sign up on the *Interested Parties List* in conformance with Interested Parties List provision SP01 G02.
3. Prepare and submit the electronic submittal file using the approved electronic bidding provider software.
4. Electronic bidding software necessary for electronic bid preparation may be downloaded from the Connect NCDOT website at: <https://connect.ncdot.gov/letting/Pages/Electronic-Bidding.aspx> or from the approved electronic bidding provider website.
5. Questions should be emailed 7 calendar days prior to the bid opening to **Bethany Elmore** at **belmore@ncdot.gov**. Contact with any other NCDOT personnel concerning this project is strictly prohibited, unless otherwise noted, and may result in bids being considered non-responsive.

PROJECT SPECIAL PROVISIONS**GENERAL****CONTRACTOR PREQUALIFICATION:**

(10-18-22)(Rev. 7-18-23)

102

SP1 G01

Revise the *2018 Standard Specifications* as follows:

Page 1-9, Subarticle 102-2(A)(1) Bidder Prequalification, lines 34-36, delete and replace the first sentence with the following:

Applicant shall submit a completed Department Prequalification Application and *Bidder Experience Questionnaire*, along with any additional supporting information requested by the Department, as noted in the application and experience questionnaire package.

Page 1-10, Subarticle 102-2(A) Bidder Prequalification, lines 30-31, delete and replace the first sentence with the following:

Prospective bidders shall obtain prequalification approval at least two business days prior to any letting in which they intend to submit a bid. It is recommended that the prospective bidder file all required statements and documents with the State Prequalifications Engineer no less than 4 weeks before a given letting.

Page 1-10, Subarticle 102-2(B) Purchase Order Bidder Prequalification, lines 34-39, delete and replace the title and first paragraph with the following:

(B) Purchase Order (PO) Prime Contractor Prequalification

Contractors who have been approved to be placed on the Prequalified Bidders' List as noted above may perform work for the Department as a Purchase Order (PO) Prime Contractor and need not apply further. However, Purchase Order (PO) Prime Contractors will not be placed on the Prequalified Bidders' List unless they submit through the prequalification process described above.

Page 1-9, Subarticle 102-2(B)(1) Purchase Order Bidder Prequalification, lines 40-42, delete and replace the first sentence with the following:

Applicant shall submit a completed Department Prequalification Application along with any additional supporting information requested by the Department, as noted in the application.

Page 1-11, Subarticle 102-2(B) Purchase Order Bidder Prequalification, lines 16-18, delete and replace the first sentence with the following:

Prospective bidders shall obtain prequalification approval at least two business days prior to any letting in which they intend to submit a bid. It is recommended that the applicant file all required statements and documents with the State Prequalifications Engineer no less than 4 weeks before a

given bid opening for their bid to be considered.

Page 1-11, Subarticle 102-2(C) Subcontractor Prequalification, lines 22-26, delete and replace the first paragraph with the following:

Contractors who have been approved to be placed on the Prequalified Bidders' List or the Purchase Order (PO) Prime Contractor's List as noted above may perform work for the Department as a subcontractor and need not apply further. However, subcontractors will not be placed on the Prequalified List or the Purchase Order (PO) Prime Contractor's List unless they submit through the prequalification process described above.

Page 1-11, Subarticle 102-2(C)(1) Subcontractor Prequalification, lines 27-28, delete and replace the first sentence with the following:

Applicant shall submit a completed Department Prequalification Application along with any additional supporting information requested by the Department, as noted in the application.

Page 1-11, Subarticle 102-2(C) Subcontractor Prequalification, lines 44-45, delete and replace the first sentence with the following:

The subcontractor shall file all required statements and documents with the State Prequalifications Engineer no less than 4 weeks before beginning work.

Page 1-12, Subarticle 102-2(E) Renewal and Requalification, lines 38-40, delete and replace the first sentence with the following:

It is recommended that the renewing or requalifying firm file all required statements and documents with the State Prequalifications Engineer no less than 4 weeks before a given letting for their bid to be considered.

INTERESTED PARTIES LIST:

(6-21-22)(Rev. 7-19-22)

102

SP1 G02

Revise the *2018 Standard Specifications* as follows:

Page 1-12, Article 102-3 PROPOSALS AND PLAN HOLDER LISTS, lines 45-49, delete and replace with the following:

102-3 PROPOSALS AND INTERESTED PARTIES LIST

On Department projects advertised, the prospective bidder shall sign up on the *Interested Parties List* no later than one business day prior to the Letting day of that project, for which he intends to submit a bid. There is no cost for signing up on the *Interested Parties List* that can be found on the Department's website at connect.ncdot.gov/letting.

Page 1-12, Article 102-3 PROPOSALS AND PLAN HOLDER LISTS, lines 1-3, delete and replace the first sentence of the second paragraph with the following:

The proposal will state the location of the contemplated construction and show a schedule of contract items with the approximate quantity of each of these items for which bid prices are invited.

Page 1-14, Article 102-8 PREPARATION AND SUBMISSION OF BIDS, lines 30-31, delete and replace the first paragraph with the following:

Prior to submitting a bid on a project, the bidder shall sign up on the *Interested Parties List* in conformance with Article 102-3. The bidder shall submit a unit or lump sum price for every item in the proposal other than items that are authorized alternates to those items for which a bid price has been submitted.

BOND REQUIREMENTS:

(06-01-16)

102-8, 102-10

SPD 01-420A

A Bid Bond is required in accordance with Article 102-10 of the *2018 Standard Specifications for Roads and Structures*.

Contract Payment and Performance Bonds are required in accordance with Article 103-7 of the *2018 Standard Specifications for Roads and Structures*.

BUILD AMERICA, BUY AMERICA (BABA):

(11-15-22)

106

SP1 G04

Revise the *2018 Standard Specifications* as follows:

Page 1-53, Article 106-1 GENERAL REQUIREMENTS, add the following after line 27:

(C) Build America, Buy America (BABA)

All manufactured products and construction materials permanently incorporated into any project must meet requirements of the Build America, Buy America (BABA) Act of the Infrastructure Investment and Jobs Act (IIJA). Before any material or product shown on the Department's Build America, Buy America (BABA) List is included for payment on a monthly estimate, the Contractor shall furnish the Engineer with a notarized certification certifying that the items conform to the BABA Act. The Department's Build America Buy America (BABA) List can be found on the Department's website.

<https://connect.ncdot.gov/letting/LetCentral/NCDOT%20BABA%20Materials%20List.pdf>

Each purchase order issued by the Contractor or a subcontractor for items on the BABA List to be permanently incorporated into any project shall contain in bold print a statement advising the supplier that the manufactured products and construction materials must be produced in the United States of America. The Contractor and all affected subcontractors shall maintain a separate file for BABA List items so that verification of the Contractor's efforts to purchase items produced in the United States can readily be verified by an authorized representative of the Department or the Federal Highway Administration (FHWA).

LIABILITY INSURANCE:

(5-16-23)

107

SP1 G05

Revise the *2018 Standard Specifications* as follows:

Page 1-64, Article 107-15 LIABILITY INSURANCE, replace the first sentence with the following:

The Contractor shall at its sole cost and expense obtain and furnish to the Department an original standard Association for Cooperative Operations Research and Development (ACORD) certificate of liability insurance evidencing commercial general liability with a limit for bodily injury and property damage in the amount of \$5,000,000 per occurrence and \$5,000,000 general aggregate, covering the Contractor from claims or damages for bodily injury, personal injury, or for property damages that may arise from operating under the contract by the employees and agents of the Contractor.

CONTRACT TIME AND LIQUIDATED DAMAGES:

(7-1-95) (Rev. 12-18-07)

108

SP1 G10 A

The date of availability for this contract is **November 13, 2023**.

The completion date for this contract is **June 30, 2024**.

Except where otherwise provided by the contract, observation periods required by the contract will not be a part of the work to be completed by the completion date and/or intermediate contract times stated in the contract. The acceptable completion of the observation periods that extend beyond the final completion date shall be a part of the work covered by the performance and payment bonds.

The liquidated damages for this contract are **Seven Hundred Dollars (\$ 700.00)** per calendar day.

INTERMEDIATE CONTRACT TIME NUMBER 1 AND LIQUIDATED DAMAGES:

(2-20-07)

108

SP1 G14 A

The Contractor shall complete the required work of installing, maintaining, and removing the traffic control devices for lane closures and restoring traffic to the existing traffic pattern. The Contractor shall not close or narrow a lane of traffic on **I-77** during the following time restrictions:

DAY AND TIME RESTRICTIONS

**MONDAY THROUGH SUNDAY
6:00 AM TO 7:00 PM**

In addition, the Contractor shall not close or narrow a lane of traffic on **I-77**, detain and/or alter the traffic flow on or during holidays, holiday weekends, special events, or any other time when traffic is unusually heavy, including the following schedules:

HOLIDAY AND HOLIDAY WEEKEND LANE CLOSURE RESTRICTIONS

1. For **unexpected occurrence** that creates unusually high traffic volumes, as directed by the Engineer.
2. For **New Year's Day**, between the hours of **6:00 AM** December 31st and **7:00 PM** January 2nd. If New Year's Day is on a Friday, Saturday, Sunday or Monday, then until **7:00 PM** the following Tuesday.
3. For **Easter**, between the hours of **6:00 AM** Thursday and **7:00 PM** Monday.
4. For **Memorial Day**, between the hours of **6:00 AM** Friday and **7:00 PM** Tuesday.
5. For **Independence Day**, between the hours of **6:00 AM** the day before Independence Day and **7:00 PM** the day after Independence Day.

If **Independence Day** is on a Friday, Saturday, Sunday or Monday, then between the hours of **6:00 AM** the Thursday before Independence Day and **7:00 PM** the Tuesday after Independence Day.
6. For **Labor Day**, between the hours of **6:00 AM** Friday and **7:00 PM** Tuesday.
7. For **Thanksgiving Day**, between the hours of **6:00 AM** Tuesday and **7:00 PM** Monday.
8. For **Christmas**, between the hours of **6:00 AM** the Friday before the week of Christmas Day and **7:00 PM** the following Tuesday after the week of Christmas Day.

Holidays and holiday weekends shall include New Year's, Easter, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas. The Contractor shall schedule his work so that lane closures will not be required during these periods, unless otherwise directed by the Engineer.

The time of availability for this intermediate contract work shall be the time the Contractor begins to install all traffic control devices for lane closures according to the time restrictions listed herein.

The completion time for this intermediate contract work shall be the time the Contractor is required to complete the removal of all traffic control devices for lane closures according to the time restrictions stated above and place traffic in the existing traffic pattern.

The liquidated damages are **Seven Hundred Dollars (\$ 700.00)** per hour.

NO MAJOR CONTRACT ITEMS:

(2-19-02) (Rev. 8-21-07)

104

SP1 G31

None of the items included in this contract will be major items.

NO SPECIALTY ITEMS:

(7-1-95)

108-6

SP1 G34

None of the items included in this contract will be specialty items (see Article 108-6 of the *2018 Standard Specifications*).

FUEL PRICE ADJUSTMENT:

(11-15-05) (Rev. 11-15-22)

109-8

SP1 G43

Revise the *2018 Standard Specifications* as follows:

Page 1-87, Article 109-8, Fuel Price Adjustments, add the following:

The base index price for DIESEL #2 FUEL is \$ **2.9176** per gallon. Where any of the following are included as pay items in the contract, they will be eligible for fuel price adjustment.

The pay items and the fuel factor used in calculating adjustments to be made will be as follows:

Description	Units	Fuel Usage Factor Diesel
Unclassified Excavation	Gal/CY	0.29
Borrow Excavation	Gal/CY	0.29
Class IV Subgrade Stabilization	Gal/Ton	0.55
Aggregate Base Course	Gal/Ton	0.55
Sub-Ballast	Gal/Ton	0.55
Erosion Control Stone	Gal/Ton	0.55
Rip Rap, Class	Gal/Ton	0.55
Asphalt Concrete Base Course, Type _____	Gal/Ton	0.90 or 2.90
Asphalt Concrete Intermediate Course, Type _____	Gal/Ton	0.90 or 2.90
Asphalt Concrete Surface Course, Type _____	Gal/Ton	0.90 or 2.90
Open-Graded Asphalt Friction Course	Gal/Ton	0.90 or 2.90
Permeable Asphalt Drainage Course, Type _____	Gal/Ton	0.90 or 2.90
Sand Asphalt Surface Course, Type _____	Gal/Ton	0.90 or 2.90
Ultra-thin Bonded Wearing Course	Gal/Ton	0.90 or 2.90
Aggregate for Cement Treated Base Course	Gal/Ton	0.55
Portland Cement for Cement Treated Base Course	Gal/Ton	0.55
> 11" Portland Cement Concrete Pavement	Gal/SY	0.327
Concrete Shoulders Adjacent to > 11" Pavement	Gal/SY	0.327
9" to 11" Portland Cement Concrete Pavement	Gal/SY	0.272
Concrete Shoulders Adjacent to 9" to 11" Pavement	Gal/SY	0.272
< 9" Portland Cement Concrete Pavement	Gal/SY	0.245
Concrete Shoulders Adjacent to < 9" Pavement	Gal/SY	0.245

For the asphalt items noted in the chart as eligible for fuel adjustments, the bidder may include the *Fuel Usage Factor Adjustment Form* with their bid submission if they elect to use the fuel usage factor. The *Fuel Usage Factor Adjustment Form* is found at the following link:

<https://connect.ncdot.gov/letting/LetCentral/Fuel%20Usage%20Factor%20Adjustment%20Form%20-%20Starting%20Nov%202022%20Lettings.pdf>

Select either 2.90 Gal/Ton fuel factor or 0.90 Gal/Ton fuel factor for each asphalt line item on the *Fuel Usage Factor Adjustment Form*. The selected fuel factor for each asphalt item will remain in effect for the duration of the contract.

Failure to complete the *Fuel Usage Factor Adjustment Form* will result in using 2.90 gallons per ton as the Fuel Usage Factor for Diesel for the asphalt items noted above. The contractor will not be permitted to change the Fuel Usage Factor after the bids are submitted.

SCHEDULE OF ESTIMATED COMPLETION PROGRESS:

(7-15-08) (Rev. 6-20-23)

108-2

SP1 G58

The Contractor's attention is directed to the Standard Special Provision entitled *Availability of Funds Termination of Contracts* included elsewhere in this proposal. The Department of Transportation's schedule of estimated completion progress for this project as required by that Standard Special Provision is as follows:

<u>Fiscal Year</u>	<u>Progress (% of Dollar Value)</u>
2024	(7/01/23 - 6/30/24) 100% of Total Amount Bid

The Contractor shall also furnish his own progress schedule in accordance with Article 108-2 of the *2018 Standard Specifications*. Any acceleration of the progress as shown by the Contractor's progress schedule over the progress as shown above shall be subject to the approval of the Engineer.

DISADVANTAGED BUSINESS ENTERPRISE (DIVISIONS):

(10-16-07)(Rev. 8-17-21)

102-15(J)

SP1 G62

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 of bid 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 of bid 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 bidder confirming the Contractor'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 Contractor.

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 Contractor 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. This form is for paper bid projects only.
<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.

<http://connect.ncdot.gov/projects/construction/Construction%20Forms/DBE%20MBE%20WBE%20Replacement%20Request%20Form.pdf>

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

<http://connect.ncdot.gov/projects/construction/Construction%20Forms/Subcontract%20Approval%20Form%20Rev.%202012.zip>

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>

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 of bid.

<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. This form is for paper bids only.

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

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

Disadvantaged Business Enterprises **0.0** %

- (A) *If the DBE goal is more than zero*, the Contractor 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 Contractor 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](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 of bid, bidders 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 of bid will be used toward the Department's overall race-neutral goal. Only those firms with current DBE certification at the time of bid opening will be acceptable for listing in the bidder's submittal of DBE participation. The Contractor shall indicate the following required information:

(A) Electronic Bids

Bidders shall submit a listing of DBE participation in the appropriate section of the electronic submittal file.

- (1) Submit the names and addresses of DBE firms identified to participate in the contract. If the bidder uses the updated listing of DBE firms shown in the electronic submittal file, the bidder may use the dropdown menu to access the name and address of the DBE firm.
- (2) Submit the contract line numbers of work to be performed by each DBE firm. When no figures or firms are entered, the bidder will be considered to have no DBE participation.
- (3) The bidder shall be responsible for ensuring that the DBE is certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the bid-letting, that DBE's participation will not count towards achieving the DBE goal.

(B) Paper Bids

- (1) *If the DBE goal is more than zero,*
 - (a) Bidders, at the time the bid 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 bid to be considered responsive. Bidders shall indicate the total dollar value of the DBE participation for the contract.

- (b) If bidders 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.** Bids submitted that do not have DBE participation indicated on the appropriate form will not be read publicly during the opening of bids. The Department will not consider these bids for award and the proposal will be rejected.
 - (c) The bidder shall be responsible for ensuring that the DBE is certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the bid-letting, that DBE’s participation will not count towards achieving the DBE goal.
- (2) *If the DBE goal is zero, entries on the Listing of DBE Subcontractors are not required, however any DBE participation that is achieved during the project shall be reported in accordance with requirements contained elsewhere in the special provision.*

DBE Prime Contractor

When a certified DBE firm bids 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 bidder. In most cases, a DBE bidder 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 bidder and any other DBE subcontractors will count toward the DBE goal. The DBE bidder 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% and the DBE bidder will only perform 40% of the contract work, the prime will list itself at 40%, and the additional 5% 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 or B listed under *Listing of DBE Subcontractor* just as a non-DBE bidder would.

Written Documentation – Letter of Intent

The bidder shall submit written documentation for each DBE that will be used to meet the DBE goal of the contract, indicating the bidder’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 Engineer no later than 2:00 p.m. of the fifth calendar day following opening of bids, unless the fifth day falls on Saturday, Sunday or an

official state holiday. In that situation, it is due in the office of the Engineer no later than 10:00 a.m. on the next official state business day.

If the bidder fails to submit the Letter of Intent from each committed DBE to be used toward the DBE goal, or if the form is incomplete (i.e. 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 Contractor shall submit evidence of good faith efforts, completed in its entirety, to the Engineer no later than 2:00 p.m. on the eighth calendar day following opening of bids, unless the eighth day falls on Saturday, Sunday or an official state holiday. In that situation, it is due in the office of the Engineer no later than 10:00 a.m. on the next official state business day.

Submission of Good Faith Effort

If the bidder fails to meet or exceed the DBE goal the apparent lowest responsive bidder shall submit to the Department documentation of adequate good faith efforts made to reach the DBE goal.

One complete set and 0 copies of this information shall be received in the office of the Engineer no later than 2:00 p.m. of the fifth calendar day following opening of bids, unless the fifth day falls on Saturday, Sunday or an official state holiday. In that situation, it is due in the office of the Engineer no later than 10:00 a.m. on the next official state business day.

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 bidder 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 bidder 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 bidder has made. Listed below are examples of the types of actions a bidder 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 bidder must solicit this interest within

at least 10 days prior to bid opening 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 bidder 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 (2nd and 3rd 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 bidder'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, so as 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 bidder 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 bidder'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 bidder of the responsibility to make good faith efforts. Bidding contractors 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 bidder'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 bidder'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 bidder.
- (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 7 days from the bid opening the Business Opportunity and Work Force Development Unit at BOWD@ncdot.gov to give notification of the bidder's inability to get DBE quotes.
- (I) Any other evidence that the bidder submits which shows that the bidder has made reasonable good faith efforts to meet the DBE goal.

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

- (1) Whether the bidder's documentation reflects a clear and realistic plan for achieving the DBE goal.
- (2) The bidders' past performance in meeting the DBE goals.
- (3) The performance of other bidders in meeting the DBE goal. For example, when the apparent successful bidder fails to meet the DBE goal, but others meet it, you may reasonably raise the question of whether, with additional reasonable efforts the apparent successful bidder could have met the goal. If the apparent successful bidder fails to meet the DBE goal, but meets or exceeds the average DBE participation obtained by other bidders, the Department may view this, in conjunction with other factors, as evidence of the apparent successful bidder having made a good faith effort.

If the Department does not award the contract to the apparent lowest responsive bidder, the Department reserves the right to award the contract to the next lowest responsive bidder that can satisfy to 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 Engineer will notify the contractor verbally and in writing of non-good faith. A contractor may appeal a determination of non-good faith made by the Goal Compliance Committee. If a contractor wishes to appeal the determination made by the Committee, they shall provide written notification to the Engineer. The appeal shall be made within 2 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 Contractor.

(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 Contractor 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 contractor may count toward its DBE requirement 60 percent of its expenditures for materials and supplies required to complete the contract and obtained from a DBE regular dealer and 100 percent of such expenditures from a DBE manufacturer.

(F) Manufacturers and Regular Dealers

A contractor 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 Contractor 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 Contractor 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 display clearly 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 Contractor 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 contractor shall not terminate the DBE subcontractor for convenience. This includes, but is not limited to, instances in which the Contractor 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 Contractor must give notice in writing both by certified mail and email 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 Contractor must give the DBE subcontractor five (5) business days to respond to the Contractor'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 Contractor 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 Contractor 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 of bid 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 of bid 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 Contractor 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 Contractor.
- (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 Contractor 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 Contractor 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 Contractor 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 overall goal.

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 Contractor fails to follow this procedure, the Contractor may be disqualified from further bidding for a period of up to 6 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 Contractor 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 Contractor'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 Contractor 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 Contractor shall seek participation by DBEs unless otherwise approved by the Engineer.

When the Contractor requests changes in the work that result in the reduction or elimination of work that the Contractor committed to be performed by a DBE, the Contractor 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 Contractor 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 Contractor shall furnish the Engineer a copy of the agreement. The documentation shall also indicate the percentage (60% or 100%) of expenditures claimed for DBE credit.

Reporting Disadvantaged Business Enterprise Participation

The Contractor 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 contractor 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 Contractor to submit the required information in the time frame specified may result in the disqualification of that contractor and any affiliate companies 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 contractor and any affiliate companies from being approved for work on future projects until the required information is submitted.

Contractors 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 Contractor 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 *2018 Standard Specifications* may be cause to disqualify the Contractor.

CERTIFICATION FOR FEDERAL-AID CONTRACTS:

(3-21-90)

SP1 G85

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.

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 prospective participant also agrees by submitting his or her bid or 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 subrecipients shall certify and disclose accordingly.

CONTRACTOR'S LICENSE REQUIREMENTS:

(7-1-95)

102-14

SP1 G88

If the successful bidder does not hold the proper license to perform any plumbing, heating, air conditioning, or electrical work in this contract, he will be required to 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).

RESTRICTIONS ON ITS EQUIPMENT AND SERVICES:

(11-17-20)

SP01 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.

USE OF UNMANNED AIRCRAFT SYSTEM (UAS):

(8-20-19)

SP1 G092

The Contractor 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 *Small UAS Rule*, NC GS 15A-300.2 *Regulation of launch and recovery sites*, NC GS 63-95 *Training required for the operation of unmanned aircraft systems*, NC GS 63-96 *Permit required for commercial operation of unmanned aircraft system*, and NCDOT UAS Policy. The required operator certifications include possessing a current Federal Aviation Administration (FAA) Remote Pilot Certificate, a NC UAS Operator Permit as well as operating a UAS registered with the FAA.

Prior to beginning operations, the Contractor shall complete the NCDOT UAS – Flight Operation Approval Form and submit it to the Engineer for approval. 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.

EQUIPMENT IDLING GUIDELINES:

(1-19-21)

107

SP1 G096

Exercise reduced fuel consumption and reduced equipment emissions during the construction of all work associated with this contract. Employees engaged in the construction of this project should turn off vehicles when stopped for more than thirty (30) minutes and off-highway 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 is in safe operating condition.
3. Idling for testing, servicing, repairing or diagnostic purposes.
4. Idling necessary to accomplish work for which the vehicle 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.
8. Idling when the propulsion engine is providing auxiliary power for other than heating or air conditioning. (such as hydraulic systems for pavers)
9. When specific traffic, safety, or emergency situations arise.
10. If the ambient temperature is less than 32 degrees Fahrenheit. Limited idling to provide for the safety of vehicle occupants (e.g. to run the heater).
11. If the ambient temperature is greater than 90 degrees Fahrenheit. Limited idling to provide for the safety of vehicle occupants of off-highway equipment (e.g. to run the air conditioning) no more than 30 minutes.
12. Diesel powered vehicles may idle for up to 30 minutes to minimize restart problems.

Any vehicle, truck, or equipment in which the primary source of fuel is natural gas or electricity is exempt from the idling limitations set forth in this special provision.

U.S. DEPARTMENT OF TRANSPORTATION HOTLINE:

(11-22-94)

108-5

SP1 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 is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

ELECTRONIC BIDDING:

(2-19-19)

101, 102, 103

SP1 G140

Revise the *2018 Standard Specifications* as follows:

Page 1-4, Article 101-3, DEFINITIONS, BID (OR PROPOSAL) *Electronic Bid*, line 1, replace “Bid Express®” with “the approved electronic bidding provider”.

Page 1-15, Subarticle 102-8(B), Electronic Bids, lines 39-40, replace “to Bid Express®” with “via the approved electronic bidding provider”.

Page 1-15, Subarticle 102-8(B)(1), Electronic Bids, line 41, delete “from Bid Express®”

Page 1-17, Subarticle 102-9(C)(2), Electronic Bids, line 21, replace “Bid Express® miscellaneous folder within the .ebs” with “electronic submittal”.

Page 1-29, Subarticle 103-4(C)(2), Electronic Bids, line 32, replace “.ebs miscellaneous data file of Expedite” with “electronic submittal file”

AWARD LIMITS:

(4-19-22)

103

SP1 G141

Revise the *2018 Standard Specifications* as follows:

Page 1-29, Subarticle 103-4(C), Award Limits, line 4-8, delete and replace the first sentence in the first paragraph with the following:

A bidder who desires to bid on more than one project on which bids 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 bid 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.

PROJECT SPECIAL PROVISIONS**ROADWAY****PORTLAND CEMENT CONCRETE PRODUCTION AND DELIVERY:**

(9-15-20)

1000, 1014, 1024

SP10 R01

Revise the 2018 *Standard Specifications* as follows:

Page 10-6, Table 1000-1, REQUIREMENTS FOR CONCRETE, replace with the following:

Class of Concrete	Min. Compressive Strength at 28 days	Maximum Water-Cement Ratio				Consistency Maximum Slump		Cement Content			
		Air-Entrained Concrete		Non-Air-Entrained Concrete		Vibrated	Non-Vibrated	Vibrated		Non-Vibrated	
		Rounded Aggregate	Angular Aggregate	Rounded Aggregate	Angular Aggregate			Min.	Max.	Min.	Max.
		Units	psi					inch	inch	lb/cy	lb/cy
AA	4500	0.381	0.426	---	---	3.5 ^A	---	639	715	---	---
AA Slip Form	4500	0.381	0.426	---	---	1.5	---	639	715	---	---
Drilled Pier	4500	---	---	0.450	0.450	---	5 - 7 dry 7 - 9 wet	---	---	640	800
A	3000	0.488	0.532	0.550	0.594	3.5 ^A	4.0	564	---	602	---
B	2500	0.488	0.567	0.559	0.630	1.5 machine placed 2.5 ^A hand placed	4.0	508	---	545	---
Sand Light-weight	4500	---	0.420	---	---	4.0 ^A	---	715	---	---	---
Latex Modified	3000 (at 7 days)	0.400	0.400	---	---	6.0	---	658	---	---	---
Flowable Fill excavatable	150 max. (at 56 days)	as needed	as needed	as needed	as needed	---	Flowable	---	---	40	100
Flowable Fill non-excavatable	125	as needed	as needed	as needed	as needed	---	Flowable	---	---	100	as needed

Pavement	4500 Design, field 650 flexural, design only	0.559	0.559	---	---	1.5 slip form 3.0 hand placed	---	526	---	---	---
Precast	See Table 1077-1	as needed	as needed	---	---	6.0	as needed	as needed	as needed	as needed	as needed
Prestressed	per contract	See Table 1078-1	See Table 1078-1	---	---	8.0	---	564	as needed	---	---

- A. The slump may be increased to 6 inches, provided the increase in slump is achieved by adding a chemical admixture conforming to Section 1024-3. In no case shall the water-cement ratio on the approved design be exceeded. Concrete exhibiting segregation and/or excessive bleeding will be rejected. Utilizing an Admixture to modify slump does not relinquish the contractor’s responsibility to ensure the final product quality and overall configuration meets design specifications. Caution should be taken when placing these modified mixes on steep grades to prevent unintended changes to the set slope.

MATERIALS FOR PORTLAND CEMENT CONCRETE:

(9-15-20)

1000, 1024

SP10 R24

Revise the *2018 Standard Specifications* as follows:

Page 10-52, Article 1024-4, WATER, lines 3-6, delete and replace with the following:

Test water from wells at all locations. Test public water supplies from all out of state locations and in the following counties: Beaufort, Bertie, Brunswick, Camden, Carteret, Chowan, Craven, Currituck, Dare, Gates, Hyde, New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrell and Washington unless the Engineer waives the testing requirements.

Page 10-52, Table 1024-2, PHYSICAL PROPERTIES OF WATER, replace with the following:

Property	Requirement	Test Method
Compression Strength, minimum percent of control at 3 and 7 days	90%	ASTM C1602
Time of set, deviation from control	From 1:00 hr. earlier to 1:30 hr. later	ASTM C1602
pH	4.5 to 8.5	ASTM D1293 *
Chloride Ion Content, Max.	250 ppm	ASTM D512 *

Total Solids Content (Residue), Max.	1,000 ppm	SM 2540B *
Resistivity, Min.	0.500 kohm-cm	ASTM D1125 *

*Denotes an alternate method is acceptable. Test method used shall be referenced in the test report.

GEOSYNTHETICS:

(03-21-23)(Rev. 4-18-23)

1056

SP10 R56

Revise the *Standard Specifications* as follows:

Page 10-77, Article 1056-1 DESCRIPTION, lines 13-16, delete and replace the second sentence in the second paragraph with the following:

Steel anchor pins shall have a diameter of at least 3/16 inch, a length of at least 18 inches, a point at one end and a head at the other end that will retain a steel washer with an outside diameter of at least 1.5 inches.

Page 10-77, Article 1056-2 HANDLING AND STORING, lines 20-21, delete and replace the third sentence in the first paragraph with the following:

Geosynthetics with defects, flaws, deterioration or damage will be rejected by the Engineer.

Page 10-77, Article 1056-3 CERTIFICATIONS AND IDENTIFICATION, lines 25-27, delete and replace the first sentence in the first paragraph with the following:

Provide Type 1, Type 2 or Type 4 material certifications in accordance with Article 106-3 for geosynthetics except certifications are not required for Type 1 through Type 5 geotextiles.

Page 10-77, Article 1056-3 CERTIFICATIONS AND IDENTIFICATION, lines 32-35, delete the second paragraph.

Page 10-77, Article 1056-3 CERTIFICATIONS AND IDENTIFICATION, lines 36-41, delete and replace the third paragraph with the following:

Allow the Engineer to visually identify geosynthetic products before installation. Open packaged geosynthetics just before use in the presence of the Engineer to verify the correct product. Geosynthetics that are missing original packaging or product labels or that have been unwrapped or previously opened will be rejected unless otherwise approved by the Engineer.

Page 10-77, Article 1056-4 GEOTEXTILES, lines 43-45, delete the first paragraph.

Page 10-78, Article 1056-4 GEOTEXTILES, before line 1 and lines 1-5, delete Table 1056-1 and lines 1-5 and replace with the following:

TABLE 1056-1 GEOTEXTILE REQUIREMENTS						
Property ^A	Requirement (MARV ^A)					Test Method
	Type 1	Type 2	Type 3 ^B	Type 4	Type 5 ^C	
<i>Typical Application</i>	<i>Shoulder Drains</i>	<i>Under Rip Rap</i>	<i>Silt Fence Fabric</i>	<i>Soil Stabilization</i>	<i>Subgrade Stabilization</i>	
Elongation (MD & CD)	≥ 50%	≥ 50%	≤ 25%	< 50%	< 50%	ASTM D4632
Grab Strength (MD & CD) ^A			100 lb			ASTM D4632
Tear Strength (MD & CD) ^A	Table 1 ^D , Class 3	Table 1 ^D , Class 1	–	Table 1 ^D , Class 3	–	ASTM D4533
Puncture Strength			–			ASTM D6241
Ultimate Tensile Strength (MD & CD) ^A	–	–	–	–	Table 12 ^D , Class 4A	ASTM D4595
Permittivity	Table 2 ^D , 15% to 50% <i>in Situ</i> Soil	Table 6 ^D , 15% to 50% <i>in Situ</i> Soil	Table 7 ^D	Table 5 ^D	Table 12 ^D , Class 4A	ASTM D4491
Apparent Opening Size	Passing 0.075 mm	Passing 0.075 mm				ASTM D4751
UV Stability (Retained Strength)						ASTM D4355

A. MD, CD and MARV per Article 1056-3.

B. Minimum roll width of 36 inches required.

C. Minimum roll width of 13 feet required unless otherwise approved by the Engineer for the application.

D. Per AASHTO M 288.

Page 10-78, Article 1056-5 GEOCOMPOSITE DRAINS, before line 9 and lines 9-10, delete Table 1056-2 and lines 9-10 and replace with the following:

Property	Requirement			Test Method
	Sheet Drain	Strip Drain	Wick Drain	
Width	≥ 12"	12" ±1/4"	4" ±1/4"	N/A
In-Plane Flow Rate ^A (with gradient of 1.0 and 24-hour seating period)	6 gpm/ft @ applied normal compressive stress of 10 psi	15 gpm/ft @ applied normal compressive stress of 7.26 psi	1.5 gpm ^B @ applied normal compressive stress of 1.45 psi	ASTM D4716

A. MARV per Article 1056-3.

B. Per foot of width tested.

Page 10-79, Article 1056-5 GEOCOMPOSITE DRAINS, before line 3, delete Table 1056-3 and replace with the following:

Property	Requirement		Test Method
	Sheet Drain	Strip Drain	
Thickness	1/4"	1"	ASTM D1777 or D5199
Compressive Strength ^A	40 psi	30 psi	ASTM D6364

A. MARV per Article 1056-3.

Page 10-79, Article 1056-5 GEOCOMPOSITE DRAINS, before line 6 and lines 6-11, delete Table 1056-4, lines 6-7 and the last paragraph and replace with the following:

Property	Requirement	Test Method
Elongation	≥ 50%	ASTM D4632
Grab Strength	Table 1 ^A , Class 3	ASTM D4632
Tear Strength		ASTM D4533
Puncture Strength		ASTM D6241
Permittivity ^B	0.7 sec ⁻¹	ASTM D4491
Apparent Opening Size (AOS)	Table 2 ^A , > 50% <i>in Situ</i> Soil Passing 0.075 mm	ASTM D4751
UV Stability (Retained Strength)		ASTM D4355

A. Per AASHTO M 288.

B. MARV per Article 1056-3.

For wick drains with a geotextile fused to both faces of a corrugated drainage core along the peaks of the corrugations, use wick drains with an ultimate tensile strength of at least 1,650 lbs.

per 4 inch width in accordance with ASTM D4595 and geotextiles with a permittivity, AOS and UV stability that meet Table 1056-4.

Page 10-80, Article 1056-6 GEOCELLS, before line 1 and lines 1-4, delete Table 1056-5 and lines 1-4 and replace with the following:

Property	Requirement	Test Method
Cell Depth	4"	N/A
Fully Expanded Cell Area	100 sq.in. max	N/A
Sheet Thickness	50 mil -5%, +10%	ASTM D5199
Density	58.4 pcf min	ASTM D1505
Carbon Black Content	1.5% min	ASTM D1603 or D4218
ESCR ^A	5000 hr min	ASTM D1693
Coefficient of Direct Sliding (with material that meets AASHTO M 145 for soil classification A-2)	0.85 min	ASTM D5321
Short-Term Seam (Peel) Strength (for 4" seam)	320 lb min	USACE ^C Technical Report GL-86-19, Appendix A
Long-Term Seam (Hang) Strength ^B (for 4" seam)	160 lb min	

A. Environmental Stress Crack Resistance.

B. Minimum test period of 168 hours with a temperature change from 74°F to 130°F in 1-hour cycles.

C. US Army Corps of Engineers (USACE).

MATERIAL AND EQUIPMENT STORAGE & PARKING OF PERSONAL VEHICLES:

11-17-21(Rev. 8-16-22)

1101

SP11 R03

Revise the *2018 Standard Specifications* as follows:

Page 11-2, Article 1101-8 MATERIAL AND EQUIPMENT STORAGE, line 35-38, delete and replace with the following:

When work is not in progress, keep all personnel, equipment, machinery, tools, construction debris, materials and supplies away from active travel lanes that meets Table 1101-1.

Posted Speed Limit (mph)	Distance (ft)
40 or less	≥ 18
45-50	≥ 28
55	≥ 32
60 or higher	≥ 40

When vehicles, equipment and materials are protected by concrete barrier or guardrail, they shall be offset at least 5 feet from the barrier or guardrail.

Page 11-2, Article 1101-9 PARKING OF PERSONAL VEHICLES, line 40-41, delete and replace with the following:

Provide staging areas for personal vehicle parking in accordance with Article 1101-8 or as directed by the Engineer before use.

WORK ZONE INSTALLER:

(7-20-21)(Rev. 8-16-22)

1101, 1150

SP11 R04

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. 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. If multiple temporary traffic control installations or removals are occurring simultaneously, then each shall have a qualified work zone installer.

The work zone installer shall be qualified by an NCDOT approved training agency or other NCDOT approved training provider in the safe and competent set up of temporary traffic control. For a complete listing of approved training agencies, see the Work Zone Safety Training webpage.

A work zone supervisor, in accordance with Article 1101-13 of the *Standard Specifications*, may fulfill the role of the work zone installer during the setup, installation, and removal of temporary traffic control within the highway right of way provided they are on site and directing the installation and removal of temporary traffic control.

All other individuals participating in the setup, installation, and removal of temporary traffic control within the 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.

Provide the name and contact information of all qualified work zone installers to the Engineer prior to or at the preconstruction conference. Additionally, provide a qualification statement that all other individuals participating in the setup, installation, and removal of temporary traffic control are qualified flaggers that have been properly trained through an NCDOT approved training agency or other NCDOT approved training provider.

All certification records for qualified work zone installers and flaggers shall be uploaded by the approved training agency or other NCDOT approved training provider to the Department's Work Zone Education Verification App (WZ-EVA) prior to the qualified work zone installer or flagger performing any traffic control duties on the project. For more information about WZ-EVA, see the Work Zone Safety Training webpage.

STANDARD SPECIAL PROVISION
AVAILABILITY OF FUNDS – TERMINATION OF CONTRACTS

(5-20-08)

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 *2018 Standard Specifications*.

STANDARD SPECIAL PROVISION**ERRATA**

(10-16-18) (Rev. 6-20-23)

Z-4

Revise the *2018 Standard Specifications* as follows:

Division 1

Page 1-1, Article 101-2 Abbreviations, line 13, replace " American National Standards Institute, Inc." with "American National Standards Institute".

Page 1-1, Article 101-2 Abbreviations, line 32, replace "Equivalent Single Axis Load" with "Equivalent Single Axle Load".

Page 1-16, Subarticle 102-9(A) General, line 26, replace "10 U.S.C. 2304(g)" with "10 U.S.C. 3205".

Page 1-43, Article 104-13 RECYCLED PRODUCTS OR SOLID WASTE MATERIALS, line 4, replace "104-13(B)(2)" with "104-13(B)".

Page 1-52, Article 106-1 RECYCLED PRODUCTS OR SOLID WASTE MATERIALS, line 25, replace "13 NCAC 7CF.0101(a)(99)" with "29 CFR 1910.1200".

Page 1-79, Article 109-1 MEASUREMENT AND PAYMENT, Test Method prior to line 34, replace "AASHTO M 32" with "AASHTO M 336".

Division 2

Page 2-5, Article 210-2 CONSTRUCTION METHODS, line 21, replace " NCGS §§ 130A-444 to -452" with "NCGS §§ 130A-444 to -453".

Page 2-13, Article 225-2 EROSION CONTROL REQUIREMENTS, line 17, replace "the Sedimentation and Pollution Control Act" with "Article 107-12".

Page 2-20, Subarticle 230-4(B)(3) Reclamation Plan, line 12, replace " Department's borrow and waste site reclamation procedures for contracted projects" with "Department's *Borrow Waste and Staging Site Reclamation Procedures for Contract Projects*".

Page 2-25, Subarticle 235-3(E) Surcharges and Waiting Periods, line 21 and 27, delete "Department's Materials and Tests Unit".

Page 2-27, Article 240-4 MEASUREMENT AND PAYMENT, line 23, replace "Section 225" with "Article 225-7".

Page 2-30, Article 275-4 MEASUREMENT AND PAYMENT, line 33, replace "Section 815" with "Article 815-4".

Division 4

Page 4-18, Subarticle 411-5(C)(3) Coring, line 11, replace “in accordance with ASTM D5079” with “with methods acceptable to the Engineer”.

Page 4-50, Article 430-2 MATERIALS, prior to line 15, replace Section “1080-9” with “1080-7”.

Page 4-53, Article 440-2 MATERIALS, prior to line 6, replace Section “1080-9” with “1080-7”.

Page 4-58, Article 442-2 MATERIALS, prior to line 15, replace Section “1080-6” with “1080-12”.

Page 4-59, Subarticle 442-7(A) Blast Cleaning, line 36, replace Article “1080-6” with “1080-12”.

Page 4-76, Article 454-2 MATERIALS, prior to line 24, replace Section “815-2” with “1044”.

Page 4-79, Article 455-2 MATERIALS, prior to line 21, replace Section “815” with “1044”.

Page 4-80, Subarticle 455-3(B) Precast Gravity Wall Designs, line 23 and lines 25-26, replace “AASHTO LRFD specifications” with “*AASHTO LRFD Bridge Design Specifications*”.

Page 4-84, Article 458-5 MEASUREMENT AND PAYMENT, line 31, replace article number “454-1” with “458-1”.

Division 6

Page 6-7, Article 609-1 DESCRIPTION, line 29, replace article number “609-10” with “609-9”.

Page 6-10, Subarticle 609-6(C) Control Charts, line 17, replace Section number “7021” with “7.20.1”.

Page 6-13, Article 609-9 QUALITY ASSURANCE, line 31, replace Section number “7.60” with “7.6”.

Page 6-26, Subarticle 610-13(A)(1) Acceptance for New Construction, line 31, replace Table number “610-7” with “610-8”.

Page 6-29, Subarticle 610-13(B) North Carolina Hearne Straightedge, line 32, replace Table number “610-8” with “610-9”.

Page 6-31, Article 610-14 DENSITY ACCEPTANCE, Specified Density prior to line 30 and line 32, replace Table number “610-6” with “610-7”.

Page 6-37, Article 650-5 CONSTRUCTION METHODS, line 10, replace Section number “9.5(E)” with “9.5.1(E)”.

Page 6-44, Subarticle 660-8(B) Asphalt Mat and Seal, line 40, replace Subarticle number “660-8(A)” with “660-8(C)”.

Page 6-44, Subarticle 660-8(B) Asphalt Mat and Seal, line 42, replace Subarticle number “660-8(C)” with “660-8(A)”.

Division 7

Page 7-11, Subarticle 700-15(E) Compressive Strength, line 5, replace “AASHTO T 23” with “AASHTO R 100”.

Page 7-24, Article 723-4 Very High Early Strength Concrete for Concrete Pavement Repair, line 4, replace “AASHTO T126” with “AASHTO R 39”.

Page 7-24, Article 723-5 MEASUREMENT AND PAYMENT, line 34, replace "Section 225" with “Article 225-7”.

Page 7-24, Article 723-5 MEASUREMENT AND PAYMENT, line 36, replace "Section 270" with “Article 270-4”.

Page 7-27, Article 725-1 MEASUREMENT AND PAYMENT, line 4, replace article number “725-1” with “724-4”.

Page 7-28, Article 725-1 MEASUREMENT AND PAYMENT, line 10, replace article number “725-1” with “725-3”.

Division 8

Page 8-11, Article 815-1 MATERIALS, after line 35, replace “1080-12” with “1080-10”.

Page 8-13, Article 816-1 MATERIALS, after line 28, replace “1080-12” with “1080-10”.

Page 8-17, Article 825-1 Description, line 5, delete “853” and “855”.

Division 10

Page 10-2, Subarticle 1000-3(B) Air Entrainment, line 33, replace “Chase” with “Chace”.

Page 10-4, Subarticle 1000-4(A) Composition and Design, after line 17, replace “T23” with “R100”.

Page 10-4, Subarticle 1000-4(B) Air Entrainment, line 31 and 33, replace “Chase” with “Chace”.

Page 10-4, Subarticle 1000-4(C) Strength of Concrete, line 39 and 41, replace “T 23” with “R 100”.

Page 10-15, Subarticle 1000-11(B) Mixing Time for Central Mixed Concrete, after line 35, replace “T 23” with “R 100”.

Page 10-22, Article 1003-3 COMPOSITION AND DESIGN, line 9, replace “Engineer” with “engineer”.

Page 10-23, Article 1003-4 GROUT REQUIREMENTS, line 16 and 18, replace “T 23” with “R 100”.

Page 10-26, Article 1005-4 TESTING, after line 26, replace “1014-2€(6)” with “1014-2€(6)” in C. of Table 1005-1 footnote and replace “Lightweight^B” with “Lightweight^C”.

Page 10-29, Subarticle 1012-1(B)(4) Flat and Elongated Pieces, line 44, delete “SF9.5A”

Page 10-36, Subarticle 1012-2(E) Toughness (Resistance to Abrasion), line 31, replace “course” with “coarse”.

Page 10-37, Article 1012-4, LIGHTWEIGHT AGGREGATE, line 4, replace Table number “1012-8” with “1012-5”.

Page 10-48, Subarticle 1020-10(A) Mineral Fibers, line 27, replace “Table 1012-5” with “Table 1020-2”.

Page 10-52, Article 1024-5 FLY ASH, line 12, replace “Table 2” with “Table 3”.

Page 10-60, Subarticle 1032-6(F) Joint Materials, line 15, replace “AASHTO M 198” with “ASTM C990” and delete “Type B”.

Page 10-61, Article 1034-3 CONCRETE SEWER PIPE, line 33, replace “AASHTO M 198” with “ASTM C990” and delete “Type A or B”.

Page 10-64, Article 1040-1 BRICK, line 12, replace “ASTM C62” with “ASTM C62 or ASTM C216”.

Page 10-67, Article 1044-7 CORRUGATED PLASTIC PIPE AND FITTINGS, line 24, replace “AASHTO M 294 for heavy duty tubing” with “Article 1032-7 and AASHTO M 252”.

Page 10-68, Subarticle 1046-3(D) Offset Blocks, lines 30-32, delete “Before beginning the installation of recycled offset block, submit the FHWA acceptance letter for each type of block to the Engineer for approval.”

Page 10-69, Subarticle 1046-3(D) Offset Blocks, before line 1, replace “WIRE DIAMETER” with “COMPOSITE OFFSET BLOCKS” as the title of Table 1046-1, delete “Testing” property and associated requirement from Table 1046-1, and replace “Approval” requirement of “Approved for use by the FHWA” with “Approved for use on the NCDOT APL” in Table 1046-1.

Page 10-80, Article 1060-2 FERTILIZER, line 18, replace “North Carolina Fertilizer Law” with “North Carolina Commercial Fertilizer Law”.

Page 10-83, Article 1060-9 WATER, line 9, replace “15 NCAC 2B.0200” with “15A NCAC 02B.0200”.

Page 10-86, Article 1070-3 COLD DRAWN STEEL WIRE AND WIRE REINFORCEMENT, line 23 and 25, replace “M 32” and “M 55” with “M 336”.

Page 10-87, Article 1070-6 DOWELS AND TIE BARS FOR PORTLAND CEMENT CONCRETE PAVEMENT, line 17, replace “AASHTO M 32” with “AASHTO M 336”.

Page 10-88, Subarticle 1070-7(D) Handling, Storage and Transportation, line 40, replace “Section” with “Subarticle”.

Page 10-89, Article 1070-8 SPIRAL COLUMN REINFORCING STEEL, line 21, replace “AASHTO M 32” with “AASHTO M 336”.

Page 10-91, Article 1072-3 BEARING PLATE ASSEMBLIES, line 44, replace “Article 1080-9” with “Article 1080-7”.

Page 10-92, Subarticle 1072-5(A) General, after line 30, replace “SAMPLING REQUIREMENTS FOR HIGH STRENGTH BOLTS, NUTS AND WASHERS” with “SAMPLING REQUIREMENTS FOR HIGH STRENGTH BOLTS, NUTS AND WASHERS TO INCLUDE DIRECT TENSION INDICATORS” as the title of Table 1072-1.

Page 10-95, Subarticle 1072-5(D)(7)(a) Mill Test Report(s), line 18, replace title with “Mill Test Report(s) (MTR)”.

Page 10-95, Subarticle 1072-5(D)(7)(b) Manufacturer Certified Test Report(s), line 24, replace title with “Manufacturer Certified Test Report(s) (MCTR)”.

Page 10-96, Subarticle 1072-5(D)(7)(c) Distributor Certified Test Report(s), line 1, replace title with “Distributor Certified Test Report(s) (DCTR)”.

Page 10-98, Subarticle 1072-5(F) Galvanized High Strength Bolts, Nuts and Washers, line 11, replace “Article 1080-9” with “Article 1080-7”.

Page 10-111, Subarticle 1072-18(B) General, line 24, replace “Structural Welding Code-Reinforcing Steel” with “Structural Welding Code-Steel Reinforcing Bars”.

Page 10-117, Article 1074-1 WELDING, lines 21-22, replace “Structural Welding Code-Reinforcing Steel” with “Structural Welding Code-Steel Reinforcing Bars”.

Page 10-119, Article 1074-7(B) Gray Iron Castings, line 16, replace “M306” with “AASHTO M 306”.

Page 10-121, Article 1076-7, REPAIR OF GALVANIZING, line 8, replace article number “1080-9” with “1080-7”.

Page 10-125, Subarticle 1077-5(B) Testing, line 31, replace “T 23” with “R 100”.

Page 10-131, Subarticle 1078-4(A) Composition and Design, after line 23, in Table 1078-2 replace “T 23” with “R 100”.

Page 10-135, Subarticle 1078-4(J)(2) Mixing Time for Central Mixed Concrete, line 46, replace “Table 1078-2” with “Table 1078-3”

Page 10-136, Subarticle 1078-4(J)(2) Mixing Time for Central Mixed Concrete, after line 17, replace “T23” with “R100”.

Page 10-153, Subarticle 1079-1 PREFORMED BEARING PADS, line 8, replace “MIL-C882-D” with “MIL-C-882-E”.

Page 10-154, Subarticle 1079-2(A) General, line 6, delete “and 1079-2(E)”.

Page 10-156, Article 1080-5 SELF-CURING INORGANIC ZINC PAINT, line 8, replace “AASHTO M 252” with “AASHTO M 300”.

Page 10-156, Article 1080-5 SELF-CURING INORGANIC ZINC PAINT, line 20, replace “AASHTO M 253” with “AASHTO M 300”.

Page 10-156, Subarticle 1080-9(A) Composition, line 40, replace “Tables 1080-7 through 1080-14” with “Tables 1080-1 through 1080-3”.

Page 10-157, Subarticle 1080-9(B) Properties, line 5, replace “Tables 1080-7 through 1080-14” with “Tables 1080-1 through 1080-3”.

Page 10-157, Subarticle 1080-9(B) Properties, line 35, replace “Materials and Tests Standards CLS-P-1.0” with “*Structural Steel Shop Coatings Program*”.

Page 10-159, Subarticle 1080-9(E) Color Variation, Table 1080-1, replace “ASTM D1159” with “ASTM D1199”.

Page 10-159, Subarticle 1080-9(E) Color Variation, Table 1080-1, replace “NCDOT M&T P-10” with “ASTM D6280”.

Page 10-161, Subarticle 1080-9(E) Color Variation, Table 1080-3, replace “ASTM D13278” and “ASTM D3278”.

Page 10-161, Subarticle 1080-9(E) Color Variation, Table 1080-3, replace “NCDOT M&T P-10” and “Structural Steel Shop Coatings Program”.

Page 10-161, Subarticle 1080-9(E) Color Variation, Table 1080-3, add Test Method “ASTM D4400” for the Leneta Sag Test property in Table 1080-3.

Page 10-161, Subarticle 1080-9(E) Color Variation, Table 1080-3, add Test Method “ASTM D523” for the Gloss, Specular property in Table 1080-3.

Page 10-161, Subarticle 1080-9(E) Color Variation, Table 1080-3, replace Test Method “ASTM” with “ASTM E70” for the pH property in Table 1080-3.

Page 10-162, Article 1080-50 PAINT FOR VERTICAL MARKERS, line 1, replace article number “1080-50” with “1080-10”.

Page 10-162, Article 1080-61 EPOXY RESIN FOR REINFORCING STEEL, line 5, replace article number “1080-61” with “1080-11”.

Page 10-162, Article 1080-72 ABRASIVE MATERIALS FOR BLAST CLEANING STEEL, line 22, replace article number “1080-72” with “1080-12”.

Page 10-163, Article 1080-83 FIELD PERFORMANCE AND SERVICES, line 25, replace article number “1080-83” with “1080-13”.

Page 10-166, Subarticle 1081-1(E) Prequalification, line 24, replace “Value Management Unit” with “Product Evaluation Program”.

Page 10-168, Subarticle 1081-3(A) Physical Requirements, after line 25, replace “Subarticle 1081-4(B)” with “Subarticle 1081-3(B)” in Table 1081-2.

Page 10-168, Subarticle 1087-2(A) Paint Composition, lines 19-20, replace “Federal Specification TTP 1952F” with “Federal Specification TT-P-1952”.

Page 10-200, Subarticle 1090-1(C) Anchor Bolts, line 38, replace ASTM number “A325” with “F3125”.

Page 10-202, Subarticle 1091-3(F) Solid Wall HDPE Conduit, line 5, replace “, Table 1091-1, 1091-2 and 1091-3” with “and Table 1091-1”.

Page 10-208, Subarticle 1094-1(A) Breakaway or Simple Steel Beam Sign Supports, line 19, replace ASTM number “A325” with “F3125”.

Page 10-209, Subarticle 1094-1(D) Steel Square Tube Posts, line 10, replace ASTM number “A123” with “A653”.

Page 10-209, Subarticle 1094-1(E) Wood Supports, line 17, replace “Article 1082-2 and 1082-3” with “Section 1082”.

Page 10-212, Subarticle 1098-1(H) Electrical Service, line 21, replace “NEMA Type 3R” with “NEMA 3R”.

Page 10-212, Subarticle 1098-1(H) Electrical Service, line 36, replace “UL Standard 231” with “UL Standard UL-231”.

Page 10-212, Subarticle 1098-1(H) Electrical Service, line 37, replace “UL Standard 67” with “UL Standard UL-67”.

Page 10-224, Subarticle 1098-14(H)(1) Type I – Pedestrian Pushbutton Post, line 3, replace ASTM number “325” with “F3125”.

Page 10-224, Article 1098-16 CABINET BASE ADAPTER/EXTENDER, line 33, replace Section number “6.7” with “6.8”.

Division 14

Page 14-11, Subarticle 1401-2(B) Lowering Device, line 36, replace Military Specification “MIL-W-83420E” with “MIL-DTL-83420”.

Page 14-22, Article 1412-2 MATERIALS, line 29, replace UL Standard “1572” with “1598”.

Division 15

Page 15-6, Subarticle 1510-3(B) Testing and Sterilization, line 40, replace Section number “4.4.3” with “4.4”.

Page 15-14, Article 1525-2 MATERIALS, line 9, replace “AASHTO M 198” with “ASTM C990”.

Page 15-14, Article 1525-2 MATERIALS, lines 17-18, delete “in the Grout Production and Delivery provision”.

Page 15-19, Article 1550-2 MATERIALS, line 16, replace “*AASHTO LRFD Bridge Design Specifications*” with “*AASHTO LRFD Bridge Construction Specifications*”.

Division 16

Page 16-9, Article 1630-3 MEASUREMENT AND PAYMENT, line 7, replace "Section 225" with “Article 225-7”.

Page 16-9, Article 1630-3 MEASUREMENT AND PAYMENT, line 8, replace "Section 230" with “Article 230-5”.

Page 16-16, Article 1637-5 MEASUREMENT AND PAYMENT, line 17, replace "Section 310" with “Article 310-6”.

Division 17

Page 17-15, Article 1715-4 MEASUREMENT AND PAYMENT, lines 42-44, replace the second sentence with the following:

An example is an installation of a single 1.25 inch HDPE conduit would be paid as:

Directional Drill (1)(1.25") Linear Foot

Page 17-15, Subarticle 1715-3(E) Bore and Jack, line 5, replace article number “1540-4” with “1550-4”.

Page 17-15, Subarticle 1715-3(E) Bore and Jack, lines 10 & 11, replace "*NCDOT Policies and Procedures for Accommodating Utilities on Highway Rights of Way*" with "*NCDOT Utilities Accommodations Manual*".

STANDARD SPECIAL PROVISION**PLANT AND PEST QUARANTINES****(Imported Fire Ant, Gypsy Moth, Witchweed, Emerald Ash Borer, Guava Root Knot Nematode, And Other Noxious Weeds)**

(3-18-03) (Rev. 5-21-19)

Z-04a

Within Quarantined Area

This project may be within a county regulated for plant and/or pests. If the project or any part of the Contractor'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/plantindustry/Plant/quaran/table2.htm> 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 to present a hazard of spreading imported fire ant, gypsy moth, witchweed, emerald ash borer, guava root knot nematode, or other noxious weeds.

STANDARD SPECIAL PROVISION**TITLE VI AND NONDISCRIMINATION:**

(6-28-77)(Rev 6/19/2018)

Z-6

Revise the *2018 Standard Specifications* as follows:

Replace Article 103-4(B) with the following:

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 U.S.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 Civil Rights, 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 Civil Rights 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. (<i>Executive Order 13166</i>)
Color	Color of skin, including shade of skin within a racial group	Black, White, brown, yellow, etc.	
National Origin (<i>Limited English Proficiency</i>)	Place of birth. Citizenship is not a factor. (<i>Discrimination based on language or a person's accent is also covered</i>)	Mexican, Cuban, Japanese, Vietnamese, Chinese	
Sex	Gender. The sex of an individual.	Women and Men	1973 Federal-Aid Highway Act; 49 U.S.C. 5332(b); 49 U.S.C. 47123.

	<i>Note:</i> Sex under this program does not include sexual orientation.		
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) <i>(Religion/ Creed in all aspects of any aviation or transit-related construction)</i>	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. <i>Note:</i> 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. <i>(49 U.S.C. 5332(b); 49 U.S.C. 47123)</i>

(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 PROVISION**MINORITY AND FEMALE EMPLOYMENT REQUIREMENTS**

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 for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the executive Order and the regulations in *41 CFR Part 60-4*. Compliance with the goals will be measured against the total work hours performed.

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%

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

- I. General
- II. Nondiscrimination
- III. Non-segregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
- XI. Certification Regarding Use of Contract Funds for Lobbying
- XII. Use of United States-Flag Vessels:

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under title 23, United States Code, as required in 23 CFR 633.102(b) (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services). 23 CFR 633.102(e).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider. 23 CFR 633.102(e).

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services) in accordance with 23 CFR 633.102. The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in solicitation-for-bids or request-for-proposals documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract). 23 CFR 633.102(b).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work

performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract. 23 CFR 633.102(d).

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR Part 230, Subpart A, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal Employment Opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (*see* 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140, shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR Part 35 and 29 CFR Part 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract. 23 CFR 230.409 (g)(4) & (5).

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, sexual orientation, gender identity, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action or are substantially involved in such action, will be made fully cognizant of and will implement the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

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

a. The contractor will conduct periodic inspections of project sites to ensure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action

within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs (i.e., apprenticeship and on-the-job training programs for the geographical area of contract performance). In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. 23 CFR 230.409. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide

sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established thereunder. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors, suppliers, and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurances Required:

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

- (1) Withholding monthly progress payments;
- (2) Assessing sanctions;
- (3) Liquidated damages; and/or
- (4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women.

a. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of more than \$10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, the contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location under the contractor's control where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway

Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages (29 CFR 5.5)

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b.(1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the 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.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding (29 CFR 5.5)

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics,

including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records (29 CFR 5.5)

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b.(1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency.

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or

subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5(a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees (29 CFR 5.5)

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State

Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the

corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. 23 CFR 230.111(e)(2). The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract as provided in 29 CFR 5.5.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract 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 (29 CFR 5.5)

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

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 watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek. 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. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph 1 of this section, in the sum 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. 29 CFR 5.5.

* \$27 as of January 23, 2019 (See 84 FR 213-01, 218) 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.

The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 2 of this section. 29 CFR 5.5.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs 1 through 4 of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1 through 4 of this section. 29 CFR 5.5.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" in paragraph 1 of Section VI refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions: (based on longstanding interpretation)

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;

(2) the prime contractor remains responsible for the quality of the work of the leased employees;

(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and

(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or

equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), the contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. Pursuant to 23 CFR 635.116(c), the contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract. (based on longstanding interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR Part 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract. 23 CFR 635.108.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR Part 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704). 29 CFR 1926.10.

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance

with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR Part 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 11, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of \$150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.326.

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 200.326.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200. 2 CFR 180.220 and 1200.220.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction. 2 CFR 180.320.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default. 2 CFR 180.325.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances. 2 CFR 180.345 and 180.350.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900-180.1020, and 1200. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant

who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction. 2 CFR 180.330.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold. 2 CFR 180.220 and 180.300.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>). 2 CFR 180.300, 180.320, and 180.325.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default. 2 CFR 180.325.

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.335;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property, 2 CFR 180.800;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification, 2 CFR 180.700 and 180.800; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

3. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders, and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances. 2 CFR 180.365.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900 – 180.1020, and 1200. You may contact the person to which this proposal is

submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contractor). "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 to 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.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(a) 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;

(b) 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

(c) 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)

2. 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.

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000. 49 CFR Part 20, App. A.

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

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

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier

subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

XII. USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.
2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS (23 CFR 633, Subpart B, Appendix B)

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

STANDARD SPECIAL PROVISION**ON-THE-JOB TRAINING**

(10-16-07) (Rev. 4-21-15)

Z-10

Description

The North Carolina Department of Transportation will administer a custom version of the Federal On-the-Job Training (OJT) Program, commonly referred to as the Alternate OJT Program. All contractors (existing and newcomers) will be automatically placed in the Alternate Program. Standard OJT requirements typically associated with individual projects will no longer be applied at the project level. Instead, these requirements will be applicable on an annual basis for each contractor administered by the OJT Program Manager.

On the Job Training shall meet the requirements of 23 CFR 230.107 (b), 23 USC – Section 140, this provision and the On-the-Job Training Program Manual.

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.

Minorities and Women

Developing, training and upgrading of minorities and women toward journeyman level status is a primary objective of this special training 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 Manager, will assign training goals for a calendar year based on the contractors' past three years' activity and the contractors' anticipated upcoming year's activity with the Department. At the beginning of each year, all contractors eligible 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 provide a self-imposed on-the-job training program for the calendar year. This agreement will include a specific number of annual training goals agreed to by both parties. The number of training assignments may range from 1 to 15 per contractor per calendar year. The Contractor shall sign an agreement 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. Preference shall be given to providing training in the following skilled work classifications:

Equipment Operators	Office Engineers
Truck Drivers	Estimators
Carpenters	Iron / Reinforcing Steel Workers
Concrete Finishers	Mechanics
Pipe Layers	Welders

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 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 apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment.

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 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 employed by him on the contract work who is currently enrolled or 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
MINIMUM WAGES
GENERAL DECISION NC20230086 01/06/2023 NC86

Z-086

Date: January 6, 2023

General Decision Number: NC20230086 01/06/2023 NC86

Superseded General Decision Numbers: NC20220086

State: North Carolina

Construction Type: HIGHWAY

COUNTIES:

Alleghany	Jackson	Surry
Ashe	Lincoln	Swain
Avery	Macon	Transylvania
Cherokee	McDowell	Watauga
Clay	Mitchell	Wilkes
Cleveland	Polk	Yancey
Graham	Rutherford	

HIGHWAY CONSTRUCTION PROJECTS (excluding tunnels, building structures in rest area projects & railroad construction; bascule, suspension & spandrel arch bridges designed for commercial navigation, bridges involving marine construction; and other major bridges).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least \$16.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2023.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least \$12.15 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2023.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number
0

Publication Date
01/06/2023

SUNC2014-001 11/13/2014

	Rates	Fringes
BLASTER	21.83	
CARPENTER	12.54 **	
CEMENT MASON/CONCRETE FINISHER	14.10 **	
ELECTRICIAN		
Electrician	19.19	2.39
Telecommunications Technician	15.13 **	
IRONWORKER	14.53 **	
LABORER		
Asphalt Raker and Spreader	12.23 **	
Asphalt Screed/Jackman	15.22 **	
Carpenter Tender	10.00 **	
Cement Mason/Concrete Finisher Tender	12.26 **	
Common or General	10.68 **	
Guardrail/Fence Installer	13.43 **	
Pipelayer	12.22 **	
Traffic Signal/Lighting Installer	15.85 **	
PAINTER		
Bridge	19.62	
POWER EQUIPMENT OPERATORS		
Asphalt Broom Tractor	11.00 **	
Bulldozer Fine	16.20	
Bulldozer Rough	13.89 **	
Concrete Grinder/Groover	24.66	
Crane Boom Trucks	14.44 **	.53
Crane Other	19.59	
Crane Rough/All-Terrain	21.25	
Drill Operator Rock	15.25 **	
Drill Operator Structure	20.92	
Excavator Fine	16.11 **	
Excavator Rough	13.10 **	
Grader/Blade Fine	19.24	
Grader/Blade Rough	13.07 **	
Loader 2 Cubic Yards or Less	13.38 **	
Loader Greater Than 2 Cubic Yards	16.01 **	
Material Transfer Vehicle (Shuttle Buggy)	17.39	
Mechanic	18.51	
Milling Machine	13.88 **	
Off-Road Hauler/Water Tanker	13.87 **	

	Rates	Fringes
Oiler/Greaser	14.98 **	
Pavement Marking Equipment	13.33 **	
Paver Asphalt	15.68 **	.05
Roller Asphalt Breakdown	14.05 **	.06
Roller Asphalt Finish	14.98 **	.04
Roller Other	11.75 **	
Scraper Finish	13.87 **	
Scraper Rough	11.53 **	
Slip Form Machine	20.79	
Tack Truck/Distributor Operator	14.67 **	.06
TRUCK DRIVER		
GVWR of 26,000 Lbs or Less	11.72 **	
GVWR of 26,001 Lbs or Greater	13.50 **	

Welders – Receive rate prescribed for craft performing operation to which welding is incidental.

** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$16.20) or 13658 (\$12.15). Please see the Note at the top of the wage determination for more information.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <http://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which

in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

- 1.) Has there been an initial decision in the matter? This can be:
 - * an existing published wage determination
 - * a survey underlying a wage determination
 - * a Wage and Hour Division letter setting forth a position on a wage determination matter
 - * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the David-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U. S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

- 2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

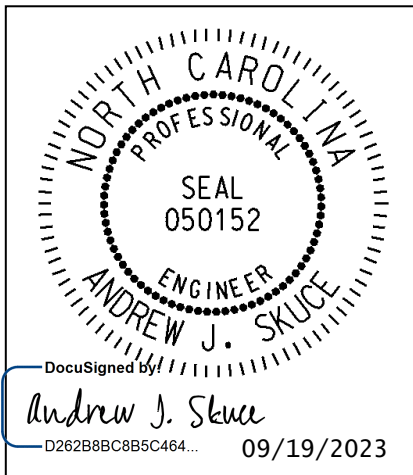
The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

- 3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

- 4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION



WBS: 33879.2.101
UPGRADE EXISTING I-74 SOUTHBOUND WEIGH STATIONS WITH AUTOMATED VEHICLE IDENTIFICATION SYSTEM, WEIGH-IN-MOTION, TIRE MONITORING SYSTEM, AUTOMATED LICENSE PLATE READER, AND OTHER DEVICES
PROJECT SPECIAL PROVISIONS

This seal is for sections 1-16 only.

Not Valid Unless Signed

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1. GENERAL REQUIREMENTS

1.1. DESCRIPTION

A. General

Conform to these Project Special Provisions; the Plans; the *2018 Standard Specifications for Roads and Structures* (hereinafter referred to as the “Standard Specifications”) including the revisions described below; and the *2018 NCDOT Roadway Standard Drawings* (hereinafter referred to as the “Standard Drawings”).

In the event of a conflict between these Project Special Provisions and the Standard Specifications, these Project Special Provisions shall govern.

Conform to the NC Statewide Information Technology Standards and Policies as described at <http://it.nc.gov>

B. System Description

This project consists as a minimum of furnishing and installing the following technologies in Surry County at the southbound I-74 approach to the Weigh Station(s) (near Mile Marker #103) to form an Automated Commercial Vehicle Processing System and Credential Screening System to be operated by the Highway Patrol. The overall function and operation of the Automated Commercial Vehicle Processing System and credential screening system is to provide information to the scale house and commercial vehicle driver as to actions required. This project consists of installing equipment at five (5) locations throughout the project limits as listed below:

1) ADVANCE LOCATION

- a) Automated Vehicle Identification System -Transponder equipment - (AVI)
- b) Weigh-in-Motion (WIM)
- c) Overview Camera
- d) Automatic License Plate Reader (ALPR)
- e) Automated Tire Monitoring System (ATM)
- f) Inductive Loops
- g) Regulatory Signs

2) NOTIFICATION LOCATION

- a) Automated Vehicle Identification System -Transponder equipment - (AVI)
- b) Changeable Message Signs (CMS) on support structure
- c) Inductive Loops

3) COMPLIANCE LOCATION

- a) Inductive Loops (main line)
- b) Inductive Loops (ramp)

5) SCALE HOUSE LOCATION

- a) Static Scales (Existing)
- b) Centralized Equipment

The individual systems as listed above and their supportive components, monitors, electronics, wiring including support structures will form an Automated Commercial Vehicle Processing System and Credential Screening System to be operated by the Highway Patrol.

1.2. Required System Operations

Provide a fully operational Automated Commercial Vehicle Processing System and Credential Screening System. Credential screening will be based on hierarchy requirements as shown below:

- a) 1st Tier Priority: Weigh in Motion, Tire Anomaly System
- b) 2nd Tier Priority: In Cab-Device/Geo-Fencing system data. Data provided by these systems will be their approved NCSHP screening data and vehicle file ID information. **(Any future reference to an In-Cab device shall imply either a Transponder System and/or Geo-Fencing Type System, where applicable).**
- c) 3rd Tier Priority: Automated License Plate Reader

The required operations of this system are based on processing criteria established for the WIM, ATM, AVI systems (Transponder/Geo-Fencing systems with criteria established in their NCSHP approved screening data and vehicle file ID information), ALPR & Overview Camera information, while the vehicles are traveling on the mainline of the Interstate. The CMS will direct the commercial vehicles in compliance based on the Tier Priorities listed above to bypass the weigh station, thus ensuring greater efficiencies for both the commercial vehicles and the weigh station. Vehicles not meeting the established Tier Priority criteria, or selected for a random pull-in, will be notified by the CMS to enter the weigh station for further processing. The Automated Commercial Vehicle Processing System and Credential Screening System will be responsible for making the sort decision.

The system shall ensure that all Commercial Vehicles that are equipped with an In-Cab device receive a Sort Decision and the Vehicles ID record/information from the Credential Screening System. The Sort Decision will also be displayed on the CMS. Additionally, each **Roadside Transponder System and/or Geo-Fencing Type System** is required to send back to the Credential Screening System's "Confirmation Database", a confirmation record consisting of the information received from the Credential Screening System and the sort decision.

Data obtained from the ALPR identification system will be used as a 3rd tier data source in instances where 1) the AVI Systems (Transponder & Geo-Fencing System) does not supply their NCSHP approved screening data and vehicle file ID information and/or 2) for those vehicles not participating in a Transponder/Geo Fencing type system.

A. Processing of Commercial Vehicles

The following scenario describes how commercial vehicles will be processed:

- 1) All trucks approaching the weigh station will be directed into the right lane of I-74 by means of static signing located prior to the Advance Location.

As a truck passes the Advance Location, the equipment in the right-most lane will collect vehicle Weight in Motion (WIM) data consisting of axle weight and spacing, gross vehicle weight, vehicle speed, classification, vehicle length and Automatic Tire Monitoring (ATM) data. Vehicles equipped with an In-Cab Transponder or Geo-Fencing type system will push their data (NCSHP approved screening data and vehicle file ID information) for their Vehicles to the Automated Commercial Vehicle Processing System and Credential Screening System.

Additionally, an Automated License Plate Reader (ALPR) camera/system will take a photo of the vehicles license plate for character recognition for comparison to the database records along with an overview CCTV camera that captures images of each truck as they travel past the location. Images of the vehicles are transmitted to the Scale House Server and become part of the Vehicle ID Record that will be comprised of the WIM data, ATM data, Transponder/Geo-Fencing data and ALPR. All Vehicle ID data/record will be forwarded to the Scale House Server for processing.

- 2) At the Classification Station embedded loop sensors provide tracking information related to the vehicle with regards to vehicle speed, classification, and vehicle length.
- 3) At the Notification Location, all commercial vehicles are directed by the CMS as to either Enter or Bypass the Weigh Station based on the Tier Priority data established above. Commercial vehicles not equipped with In-Cab Device will be directed by the CMS to either Enter or Bypass the Weigh Station for further processing based on evaluated results obtained from the WIM, ATM and data received (credential & Safety) from the ALPR. Commercial Vehicles equipped with an In-Cab Device that has been pre-cleared by the sort system (based on weight, tire pressures and other criteria listed above) are allowed to bypass the weigh station. All vehicles are subject to a random pull in requirement.
- 4) The scale house operator uses the information obtained from the Advance Location to identify why a truck was required to report to the station (i.e. credentials check, weight check, tire anomaly, or random pull-in) and processes the truck accordingly.

1.3. MATERIAL

A. Qualified Products

Furnish new equipment, materials, and hardware unless otherwise required. Inscribe manufacturer's name, model number, serial number, and any additional information needed for proper identification on each piece of equipment housed in a case or housing.

Furnish factory assembled cables without adapters, unless otherwise approved by the Engineer, for all cables required to interconnect any field or central equipment.

Ensure all Contractors-furnished equipment, including pieces and components of equipment, hardware, firmware, software, middleware, internal components, and subroutines which perform any date or time recognition function, calculation, or sequencing will support a four-digit year format for a period of at least 50 years and will support user-definable parameters for setting the start and end dates for daylight savings time.

Certain equipment listed in these Project Special Provisions must be pre-approved on the Department's ITS & Signals Qualified Products List (QPL) by the date of installation. Equipment, material, and hardware not pre-approved when required will not be allowed for use on the project.

The QPL is available on the Department's website at the following address:

<https://connect.ncdot.gov/resources/safety/Pages/ITS-and-Signals-Qualified-Products.aspx>

B. Warranties

Unless otherwise required herein, provide manufacturer's warranties on Contractors-furnished equipment for material and workmanship that are customarily issued by the equipment manufacturer and that are at least 3 years in length from the successful completion of the 30-day observation period. Include unconditional coverage for all parts and labor necessary or incidental to repair of defective equipment or workmanship and malfunctions that arise during warranty period.

For light emitting diode (LED) signal modules, provide a written warranty against defects in materials and workmanship for a period of 60 months after installation of the modules. During the warranty period, the manufacturer must provide replacement modules within 45 days of receipt of modules that have failed at no cost to the Department.

Upon successful completion of the 30-day observation period, transfer manufacturer's warranties with proper validation by the manufacturer to the Department or its designated maintaining agency.

C. Firmware and Licensing Upgrades

Provide the Department with backups of the System roadside operations software and operating system, application programs, data files and any other element necessary to restore any of the roadside operations controller servers and workstations to normal operation after repair or replacement. Provide this material on compact disk or other approved media. Include instructions for restoring the software and data.

Provide three (3) copies of all software packages on CD-ROM.

Ensure software performance upgrades that occur during the contract period up through final acceptance of the project are available to the Department at no additional cost.

Software upgrades that are developed to correct operating characteristics shall be available to the Department at no additional cost until the warranty period expires.

Provide licensed copies of all software/firmware to the Department for any programmable devices furnished by the Contractor and installed in this project for which licensed software has not already been provided by the Department. The Department shall have the right to install any software/firmware for maintenance and support on all hardware provided under this contract. Provide software/firmware for maintenance and support of the system including support software, utility software, roadside equipment software, and Camera systems, and all other programmable devices provided by the Contractor.

D. Plan of Record Documentation

Comply with all requirements of Article 1098-1(F) of the Standard Specifications for providing plan of record documentation for all work performed under this Project.

1.4. CONSTRUCTION METHODS

A. General

Unless otherwise stated in these Project Special Provisions, perform work that meets the requirements of the *Standard Specifications* and these Project Special Provisions. In the event of a conflict between these Project Special Provisions and the *Standard Specifications*, these Project Special Provisions shall govern.

Locate all underground utilities before beginning drilling, digging, and trenching operations.

Immediately cease work and notify the Engineer and affected owners if damage to existing utilities, cables, or equipment occurs. Make all required repairs and replacements at no additional cost to the Department.

B. Regulations and Codes

Furnish material and workmanship conforming to the *National Electric Code* (NEC), *National Electric Safety Code* (NESC), Underwriters Laboratories (UL), or other listing agencies approved by the North Carolina Department of Insurance, and all local safety codes in effect on the date of advertisement. Comply with Article 4, Chapter 87 of the *North Carolina General Statutes* (Licensing of Electrical Contractors). Comply with the Plans, all previously referenced specifications, and all applicable local ordinances and regulations before and during all stages of the electrical work.

When required by the local ordinances and governmental agencies, upon completion of the work, have all systems inspected and approved in writing by the authorized governmental electrical inspector for the area. Furnish written certification of the authorized inspector's approval to the Engineer. Inspection by the authorized governmental electrical inspector does not eliminate nor take the place of the inspections by the Engineer. Upon the Engineer's receipt of written certification and the Contractor's written request for a final inspection of the installations, the Engineer will perform a final inspection.

Where required, conform to ITE, AASHTO, and ASTM standards in effect on the date of advertisement.

C. Maintenance and Repair of Material

Furnish the Engineer with the name, office telephone number, cellular (mobile) telephone number, and pager number of the supervisory employee who will be responsible for maintenance and repair of equipment during all hours.

Maintain and repair all Contractor-furnished and installed communications related equipment within the project construction limits until completion of the Observation Period and receipt of written notification of final acceptance of the project. This requirement for maintaining and repairing said equipment shall remain in effect in the event of severe weather (see NOAA National Severe Storms Laboratory website <http://www.nssl.noaa.gov/primer/>) or a natural disaster, including but not limited to floods, winter weather, lightning, damaging winds, hail, tornado, tropical storm or hurricane.

Remove and replace all equipment that fails. The Department will furnish the Contractor replacement equipment for Department-furnished equipment that fails.

D. Wire and Cable

For installation in a conduit system, lubricate cable and wires before installing in conduit. Use lubricant that will not physically or chemically harm cable jacket, wire insulation, and conduit.

Only splice lead-in cables in junction boxes using UL[®]-approved, underground splice connectors using gel-filled splice connectors in accordance with Standard Drawing 1725.01. Splice all other electrical wire and cable inside equipment cabinets, and cabinet base extenders/adapters at nickel-plated brass, recessed-screw, barrier-type terminal blocks or using gel-filled splice connectors. Unless specifically allowed, connect no more than two conductors to the same terminal screw. Do not splice any electrical wire or cable other than lead-in cables in junction boxes.

Maintain color-coding of wires through splices.

Protect ends of wire and cable from water and moisture.

Place permanent labels on all wires and cables to clearly identify each one. Use an indelible black ink marker or approved labeling devices to write on the permanent labels when required.

Install all wire and cable with necessary hardware including, but not limited to shoulder eyebolts, washers, nuts, thimbleyelets, three-bolt clamps, J-hooks, split bolt connectors, grounding clamps, and lashing material.

E. Inductive Loop Tests and Grounding

Submit a completed Inductive Loop & Grounding Test Form available on the Department's website. The form is located on the Department's website at:

<https://connect.ncdot.gov/resources/safety/Pages/ITS-and-Signals.aspx>

Provide a length of marker tape 6 to 12 inches below finished grade directly over grounding electrodes and conductors.

F. Electrical Bonding

Using an approved termination means, connect a number 14 AWG minimum 19-strand copper conductor (Type THWN) with green insulation to serve as an equipment grounding conductor to metal poles and other metallic components which are not otherwise bonded, through means approved by the Engineer.

1.5. MEASUREMENT AND PAYMENT

There will be no direct payment for work covered in this section. Payment at the contract unit prices for the various items in the contract will be full compensation for all work covered by this section. Include the incidental costs for furnishing and/or installing materials and equipment expressly required under the contract for successful completion of the contract, but whose measurement and payment is not specifically stated under any of the contract pay items, into the unit cost(s) for the various items in the contract.

2. BASE MOUNTED EQUIPMENT CABINET**2.1. DESCRIPTION**

Furnish and install Type 332 base mounted equipment cabinets and all necessary hardware. Conform to CALTRANS Traffic Signal Control Equipment Specifications except as required herein. Furnish CALTRANS Model 332 base mounted equipment cabinet.

Furnish all foundation mounting hardware, one Corbin Number 2 cabinet key, surge protection, lighting fixtures, grounding systems, thermostatically controlled exhaust fan, and all necessary hardware.

The Base Mounted Equipment Cabinet will serve as an equipment cabinet to house various system components located throughout the project limits. Any reference to Roadside Equipment Cabinets will imply the use of a Base Mounted Equipment Cabinet as described herein.

2.2. MATERIAL

Material, equipment, and hardware furnished under this section shall be pre-approved on the Department's QPL.

Provide moisture resistant coating on all circuit boards.

Provide a power line surge protector that is a two-stage device that will allow connection of the radio frequency interference filter between the stages of the device. Ensure that the maximum continuous current is at least 10A at 120V. Ensure that the device can withstand a minimum of 20 peak surge current occurrences at 20,000A for an 8x20 microsecond waveform. Provide a maximum clamp voltage of 280V at 20,000A with a nominal series inductance of 200 μ h. Ensure that the voltage does not exceed 280V.

A. Type 332 Cabinet Electrical Requirements

Furnish two sets of non-fading cabinet wiring diagrams and schematics in a paper envelope or container and placed in the cabinet drawer.

Provide surge suppression in the cabinet for each type of cabinet device. Provide surge protection for the full capacity of the cabinet.

All AC+ power is subject to radio frequency signal suppression.

Install a UL listed, industrial, heavy-duty type power outlet strip with a maximum rating of 15 A / 125 VAC, 60 Hz. Provide a strip that has a minimum of 3 grounded outlets. Ensure the power outlet strip is mounted securely; provide strain relief if necessary.

Provide a terminal mounted loop surge suppresser device for each set of loop terminals in the cabinet. For a 10x700 microsecond waveform, ensure that the device can withstand a minimum of 25 peak surge current occurrences at 100A, in both differential and common modes. Ensure that the maximum breakover voltage is 170V and the maximum on-state clamping voltage is 30V. Provide a maximum response time of less than 5 nanoseconds. Ensure that off-state leakage current is less than 10 μ A. Provide a nominal capacitance less than 220pf for both differential and common modes.

Provide surge suppression on each communications line entering or leaving a cabinet. Ensure that the communications surge suppresser can withstand at least 80 occurrences of an 8x20 microsecond wave form at 2000A and a 10x700 microsecond waveform at 400A. Ensure that the maximum clamping voltage is suited to the protected equipment. Provide a maximum response time less than 1 nanosecond. Provide a nominal capacitance less than 1500pf and a series resistance less than 15 Ω .

Provide conductors for surge protection wiring that are of sufficient size (ampacity) to withstand maximum overcurrent which could occur before protective device thresholds are attained and current flow is interrupted.

Furnish a LED fixture in the rear across the top of the cabinet and another LED fixture in the front across the top of the cabinet at a minimum. Ensure that the fixtures provide sufficient light to illuminate all terminals, labels, switches, and devices in the cabinet. Conveniently locate the fixtures so as not to interfere with a technician's ability to perform work on any devices or terminals in the cabinet. Provide a protective diffuser to cover exposed bulbs. Furnish all bulbs with the cabinet. Provide door switch actuation for the fixtures.

Furnish a quad power outlet (four 15 amp sockets) for use by network equipment.

Furnish power allocations for network equipment. Total power made available to network and telephone company equipment not to exceed 20 amps at 115VAC.

B. Type 332 Cabinet Physical Requirements

Provide a surge protection panel with loop protection devices that allows sufficient free space for wire connection/disconnection and surge protection device replacement.

Provide permanent labels that indicate the slot and the pins connected to each terminal. Label and orient terminals so that each pair of inputs is next to each other. Ensure that a Number 4 AWG green wire connects the surge protection panel assembly ground bus to the main cabinet equipment ground.

Provide a minimum 14 x 16 inch pull out, hinged top shelf located immediately below controller mounting section of the cabinet. The shelf must extend fully to allow the table surface to retract outside the cabinet approximately even with the bottom of the controller. Ensure the shelf has a storage bin interior which is a minimum of 1 inch deep and approximately the same dimensions as the shelf. Provide an access to the storage area by lifting the hinged top of the shelf. Fabricate the shelf and slide from aluminum or stainless steel and ensure the assembly can support the controller plus 15 pounds of additional weight. Ensure shelf has a locking mechanism to secure it in the fully extended position and does not inhibit the removal of the controller when fully extended. Provide a locking mechanism that is easily released when the shelf is to be returned to its non-use position directly under the controller.

2.3. CONSTRUCTION METHODS

Install base mounted equipment cabinets and all necessary hardware as required to provide a fully operational System.

Ensure space in equipment cabinet allows for all system components and network equipment.

2.4. MEASUREMENT AND PAYMENT

Base mounted equipment cabinet will be measured and paid as the actual number of base mounted equipment cabinets furnished, installed and accepted.

No measurement will be made for cabling, connectors, cabinet attachment assemblies, conduit, condulets, grounding equipment, surge protectors, or any other equipment or labor required to install the equipment cabinet and integrate it with the localized system components as these will be considered incidental to furnishing and installing the base mounted equipment cabinet.

Payment will be made under:

Pay Item	Pay Unit
Base Mounted Equipment CabinetEach

3. MODIFY ELECTRICAL SERVICE

3.1. Description

Modify existing electrical service equipment as shown in the Plans. Comply with the National Electrical Code (NEC), the National Electrical Safety Code (NESC), the *Standard Specifications*, the Project Special Provisions, and all local ordinances. All work involving electrical service shall be coordinated with the appropriate utility company and the Engineer.

Obtain the maximum available ground fault current from the utility company. Print this information on a durable label and adhere to the dead front of the disconnect.

3.2. Materials

A. Modify Electrical Service

Modify existing meter base/disconnect combination panels at locations shown in the Plans. Provide meter base/disconnect combination panels that have a minimum 125A main service disconnect and a minimum of four (8) additional spaces. Furnish a single pole 15A circuit breaker each with a minimum of 10,000 RMS symmetrical amperes short circuit current rating in a lockable NEMA 3R enclosure. Ensure meter base/disconnect combination panel is listed as meeting UL Standard UL-67 and marked as being suitable for use as service equipment. Ensure circuit breakers are listed as meeting UL-489. Place barriers so that no uninsulated, ungrounded service busbar or service terminal is exposed to inadvertent contact by persons or maintenance equipment while servicing load terminations. Fabricate enclosure from galvanized steel and electrostatically apply dry powder paint finish, light gray in color, to yield a minimum thickness of 2.4 mils. All exterior surfaces must be powder coated steel. Provide ground bus and neutral bus with a minimum of four terminals and a minimum wire capacity range of number 14 through number 2/0 AWG.

Furnish 6" x 6" x 8' wood pedestals for electrical service equipment as shown in the Plans.

Furnish NEMA Type 3R meter base rated 100A minimum for overhead service and 200A minimum for underground service that meets the requirements of the local utility. Provide meter base with ampere rating of meter sockets based on sockets being wired with insulated wire rated at least 167°F. With each meter base, provide a blank meter socket cover made from UV stabilized polycarbonate or metal and that is either clear or gray in color to prevent access to interior of meter base until meter is installed by the local power company.

Furnish 4 terminal, 600 volt, single phase, 3-wire meter bases that comply with the following:

- Line, Load, and Neutral Terminals accept 2/0 AWG and smaller Copper/Aluminum wire,
- With or without horn bypass,
- Made of galvanized steel,

- Listed as meeting UL Standard US-414,
- Overhead or underground service entrance specified.

Furnish 1.5” watertight hub (i.e., meter socket hub) for threaded rigid conduit with meter base. Furnish and install 1.5” riser assemblies with weatherheads and clamp-on galvanized pole attachment fittings and all necessary hardware for overhead service.

At the main service disconnect, furnish and install UL-approved lightning arrestors that meet the following requirements:

- Type of design Silicon Oxide Varistor
- Voltage 120/240 Single Phase, 3 wire
- Maximum current 100,000 amps
- Maximum energy 3,000 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

B. 1 KVA Single Phase Step-up/Step-Down Transformer

As shown in the Plans, furnish and install a double-wound, dry type general purpose transformer to isolate the line side voltages from the load side voltages to effectively step up a 120V circuit to 480V and step down 480V to provide a 120V circuit to the WIM system. Provide the transformer with the following specifications:

- 1 KVA power rating
- Electrostatic shielding between primary and secondary windings.
- Epoxy-silica encapsulated core and coil.
- Copper windings and copper lead wire terminations.
- Multiple front and bottom knockout for the conduit entry/exit.
- Ground studs for conduit bonding.

Provide the transformers in a NEMA 3R enclosure suitable for mounting to a 6” x 6” wood pedestal.

C. Transformer/Equipment Cabinet Disconnect

Use two 2-pole circuit breakers with an interrupting capacity of at least 14,000 amps that are appropriately rated for the WIM system and CMS sign circuits. Install the disconnect in a NEMA 3R enclosure. The enclosure should be primed and painted with a premium grade exterior paint before installation to increase corrosion resistance. Install an equipment ground bar and provide a lock in accordance with Article 1400-8 of the Standard Specifications.

D. 6" X 6" X 8' Treated Wood Pedestals

Furnish 6"x6"x8' treated wood pedestals for mounting electrical service equipment as shown in the Plans. Furnish treated wood poles that comply with the requirements in the Standard Specs.

- Meets ASTM B-3 and B-8 or B-787 standards.

E. 3-Wire Copper Feeder Conductors

Furnish 3-wire stranded #8 AWG copper service feeder conductors with THWN rating for supplying power to the meter base/disconnects. Provide conductors with black, white and green insulation that are intended for power circuits at 600 Volts or less and comply with the following:

- Listed as meeting UL Standard UL-83,
- Meets ASTM B-3 and B-8 or B-787 standards.

F. Grounding System

Furnish 5/8"x10' copper clad steel grounding electrodes (ground rods), #4 AWG solid bare copper conductors, and irreversible mechanical crimps for grounding system installations. Comply with the NEC, *Standard Specifications*, these Project Special Provisions, and the Plans.

3.3. Construction Methods

All work involving electrical service shall be coordinated with the appropriate electric utility company. Coordinate with the utility company to ascertain the feasibility of installing electrical service at each location before performing any work. Obtain all required local permits before beginning work.

Permanently label cables at all access points using nylon tags labeled with permanent ink. Ensure each cable has a unique identifier. Label cables immediately upon installation. Use component name and labeling scheme approved by the Engineer.

Direct bury pedestals that support combination panel at a minimum embedment depth of 24 inches below grade.

A. Modify Electrical Service

Install meter base/disconnect combination panels with lightning arrestors as called for in the Plans. Route the feeder conductors from the meter base/disconnect to the equipment cabinets in conduit. Provide rigid galvanized conduit for above ground and either PVC or HDPE for below ground depending on the installation method required by the plans. Install wood pedestals in compliance with all requirements of Section 1720-3 of the Standard Specifications.

B. 1KVA Single Phase Step-up/Step-down Transformer

As shown in the Plans, furnish and install a single-phase general-purpose step-down transformer in a NEMA 3R enclosure. Route the conductors from the transformer secondary to the equipment cabinet disconnect in new conduit. Bond the equipment cabinet disconnect in accordance with the NEC. Provide all mounting hardware and other parts and labor necessary to successfully install the transformer.

C. Transformer/Equipment Cabinet Disconnect

Install a transformer disconnect as called for in the Plans. Route the conductors from the transformer disconnect to the transformer cabinet in rigid galvanized steel conduit. Bond the transformer disconnect in accordance with the NEC. Ensure that the grounding system complies with the Electrical Service grounding requirements of these Project Special Provisions.

D. 6" X 6" X 8' Treated Wood Pedestals

Install 6" x 6" x 8' treated wood pedestals a minimum of 3 feet below grade.

E. 3-Wire Copper Feeder Conductors

At locations shown in the Plans, install 3-wire THWN stranded copper feeder conductors to supply 120 VAC. Size the conductors in accordance with the NEC. Comply with the *Standard Specifications* and Standard Drawings and all applicable electrical codes.

F. Grounding System

Install ground rods as indicated in the Plans. Connect the #4 AWG grounding conductor to ground rods using an irreversible mechanical crimping process. Test the system to ensure a ground resistance of 20-ohms or less is achieved. Drive additional ground rods as necessary or as directed by the Engineer to achieve the proper ground resistance.

Submit to the Engineer a completed Inductive Loop & Grounding Test Form available on the Department's website at:

<https://connect.ncdot.gov/resources/safety/Pages/ITS-and-Signals.aspx>

3.4. Measurement and Payment

Modify Electrical Service will be measured and paid as the actual number of complete and functional meter base/disconnect combination panel service locations furnished, installed and accepted. Breakers, lightning arrestors, steel banding and clamps, exposed vertical conduit runs to the cabinet, and any remaining hardware, fittings, and conduit bodies to connect the electrical service to the cabinet will be considered incidental to meter base/disconnect combination panels. All other required feeder conductors will be paid for separately.

1 KVA Single Phase Step-up/Step-down Transformer will be measured and paid as the actual number of complete and functional 1 KVA transformers furnished, installed and accepted. Enclosures, mounting hardware, and any remaining hardware, fittings and conduit bodies to connect the transformer will be considered incidental to the 1 KVA Single Phase Transformer.

Transformer/Equipment Cabinet Disconnect will be measured and paid as the actual number of complete and functional transformer disconnects furnished, installed and accepted. Breakers, exposed vertical conduit runs to the cabinet and any remaining hardware and conduit to connect the equipment cabinet disconnect to the cabinet will be considered incidental to the Transformer Disconnect.

No measurement will be made of 6” x 6” x 8’ wood pedestals as these will be incidental to furnishing and installing the Meter base/Disconnect combination panel and 1KVA Transformer/Transformer Disconnect.

3-Wire copper feeder conductors will be measured and paid as the actual linear feet of 3-wire THWN stranded copper feeder conductors furnished, installed and accepted. Payment is for all three conductors. Measurement will be for the actual linear footage of combined conductors after all terminations are complete. No separate payment will be made for each individual conductor. No separate payment will be made for different wire sizes. No payment will be made for excess wire in the cabinets.

5/8” X 10’ grounding electrode (ground rod) will be measured and paid as the actual number of 5/8” copper clad steel ground rods furnished, installed and accepted. No separate payment will be made for irreversible mechanical crimps as they will be considered incidental to the installation of the ground rod.

#4 solid bare grounding conductor will be measured and paid as the actual linear feet of #4 AWG solid bare copper grounding conductor furnished, installed and accepted. Measurement will be along the approximate centerline from the base of the electrical service disconnect to the last grounding electrode.

Payment will be made under:

Pay Item	Pay Unit
Modify Electrical Service.....	Each
1 KVA Single Phase Step-up/Step-down Transformer.....	Each
Transformer/Equipment Cabinet Disconnect	Each
3-Wire Copper Feeder Conductors	Linear
Foot	
5/8” X 10’ Grounding Electrode.....	Each
#4 Solid Bare Grounding Conductor	Linear
Feet	

4. WEIGH IN MOTION SYSTEM

4.1. DESCRIPTION

The following is a Performance Based Specification. Furnish and install a Weigh in Motion System (WIM) on the mainline, consisting of in road sensors and roadside electronics. Ensure

the WIMs data is transmitted from the roadside controller to the scale house server to be utilized in the Credential Screening Processes.

As part of the Credential Screening System Requirements the data obtained from the WIM system shall be packaged and made available to all Commercial Vehicle Supplier’s which host an In-Cab Device. The weight data will be made part of vehicle record that will include date, time and vehicle speed, and other information typically supplied with a WIM system.

4.2. Materials

Ensure the piezoelectric quartz sensors shall meet or exceed the performance criteria of Type III WIM Systems, ASTM E 1318-09 Standard Specification for Highway WIM Systems with User Requirements and Test Methods.

Furnish piezoelectric quartz sensors that have an uncompensated temperature coefficient of sensitivity of no more than +/-0.02%/°C.

The piezoelectric quartz sensors shall automatically and accurately weigh, with the tolerances set forth herein, each axle of a multi-axle vehicle and calculate the gross weight of the vehicle by summing the individual axle weights. Each vehicle having a gross weight of 39,000 pounds or more shall be checked for compliance with the Bridge Formula Weights (23 U.S.C. 127, 23 CRF 658) as defined by the Federal Highway Administration. The piezoelectric quartz sensors shall perform these measurements and calculations while the vehicle passes over the piezoelectric quartz sensors but not to exceed 5 seconds.

The gross and individual axle weights of each vehicle shall be accurately established to within the error limits listed in Table 1. These error limits shall be maintained within a confidence level of two standard deviations (95%) for a minimum sample of 100 vehicles. The sample shall consist of a variety of multiple-axle trucks passing over the sensors at speeds ranging from a minimum of 10 mph to a maximum of 100 mph. Tank trucks, livestock, car haulers and those vehicles whose suspension characteristics are determined to affect the scale performance shall not be included in the sample nor shall trucks whose speed varies by 10% or more.

Table 1 - Piezoelectric Quartz Sensors Accuracy

PARAMETER	TOLERANCE
Single Axle Weight	± 15% of actual weight
Axle Group (2 or more) Weight	± 10% of actual weight
Gross Weight	± 6% of actual weight
Axle Spacing	± 6 inches
Vehicle Speed	± 1 mph
Temperature Coefficient of Sensitivity	-.02% per degree C

The actual weight is defined as the vehicle weight established by static weighing on a multi-platform truck scale properly operating within the appropriate tolerance as established for a Class IIIIL device as defined by the National Institute of Standards and Technology Handbook 44. The piezoelectric quartz sensors shall operate over an ambient temperature range of -40 to +134 degrees F with 10 to 100% humidity.

Supply a list of at least five installations where piezoelectric quartz sensors have been installed in similar environmental conditions with the same or higher traffic volume and speeds for a minimum of five years. Also, supply clients' contact information for the five installations.

The piezoelectric quartz sensors shall perform the following functions:

- Operate at vehicle speeds between 10 and 100 mph.
- Determine the compliance of each vehicle based on single-axle weight, axle group weight, and GVW.
- For each vehicle in excess of 39,000 pounds GVW, determine the compliance of the on-sensor vehicle with the Bridge Formula.
- Store data (including images) by truck classification broken down by day, month, and calendar year.
- The piezoelectric quartz sensor classifier/controller shall be capable of downloading all data stored on its internal or external storage device.
- The piezoelectric quartz sensor classifier/controller shall be capable of receiving executable control command.
- Suitably demonstrate that the piezoelectric quartz sensors will provide a service life exceeding 7 years. This can be provided by documented customer feedback on operating sites in use and by life cycle cost evaluation.

Attach the piezoelectric quartz sensors to a lead-in cable, which extends from the piezoelectric sensor to the equipment cabinet. The lead-in cable shall be a two-conductor 18 AWG twisted shielded cable.

The necessary hardware and software will be standard with the WIM. The processing components of the system shall generate a data output that is sent to the Scale house along with the ATM, ALPR, Transponder Data, Overview Camera Image, etc..

A. Sensor Sealant

Provide a sand-epoxy resin sealant/grout to secure and seal the sensor and lead-in cable into the pavement. Provide a shrink-free material that adheres to both concrete and asphalt.

Provide a sealant that meets the following requirements:

- Pot Life: 20-40 minutes at 32 degrees F,
- Minimum Curing Temperature: 46 degrees F and
- Density: 1 ounce/cubic inch.

Provide a sealant that meets the following mechanical requirements after seven days:

- Compressive strength: > 8,365 tons/ft.²

- Flexural strength: > 365 tons/ft.²
 - Compressive strength: > 8,365 tons/ft.²
 - Adhesive strength on steel: > 42 tons/ft.²
- Adhesive strength on concrete: > 10 tons/ft.²

4.3. CONSTRUCTION METHODS

A. Installation

Install and space apart from each other the individual piezoelectric quartz sensors as shown in the Plans and as recommended by the manufacturer.

The piezoelectric quartz sensor configurations shall be installed in accordance with the manufacturer's recommendations and shall be designed to monitor a single lane of traffic. Ensure the design and layout of the piezoelectric quartz sensor configurations shall ensure the system independently weighs both sides of the vehicle thus obtaining weight information sufficient to determine any side-to-side balance condition of the vehicle.

The saw slots including tail and lead-in sections for the piezoelectric quartz sensor configurations, must be dry and free of debris prior to their installation. Use compressed air to remove debris and moisture from the saw slot as necessary.

The piezoelectric quartz sensor slot in the pavement shall be no larger than 3.5" wide and extend no deeper than 2.8". Mount piezoelectric quartz sensors precisely flush with the surface of roadway.

Seal the piezoelectric quartz sensors and associated lead-in cable in an epoxy sealant to prevent moisture penetration. Install piezoelectric quartz sensors in such a manner that they will not be damaged by road maintenance such as snow removal. Warranty piezoelectric quartz sensors for a minimum of three (3) years against defects in materials or workmanship.

Furnish on-site engineering consulting by the manufacturer for the installation of the piezoelectric quartz sensors.

Connect the ends of the lead-in cable coaxial cable to the equipment controller's charge amplifier inputs as directed by the manufacturer. Program the equipment controller as instructed by the manufacturer's representative. Establish communications between the equipment controller and downstream equipment controller and the Scale House via the fiber optic cable system and perform calibrations test as required.

B. Calibration and Acceptance

Perform calibration using a single calibration truck within 72 hours of installation. The five (5) axle, test vehicle shall be of a tractor/trailer combination (3S2), complete with air ride suspension and a non-shifting static load. Load the truck to within 90 to 100% of allowable Gross Vehicle Weight for the road under test.

Conduct the calibration procedure as follows:

- Weigh the vehicle using the static weigh scales. Record the weight information on the front (single axle), drive (tandem axle group), and trailer (tandem axle group). Calculate the Gross Vehicle Weight (GVW) of the vehicle by adding the three weights together,
- Measure and record the distance between the five (5) individual axles on the truck,
- Use the test vehicle and make three (3) test passes over the system under test at a selected speed, which is indicative of the truck traffic at the site. Make adjustments on site during this time to fine tune the axle spacing, and weight output of the WIM system, and
- Once all initial adjustments have been made, make two (2) additional test passes with the test vehicle to confirm the accuracy of the adjustments. If all the readings fall within the ASTM ranges for the WIM, continue the tests. If this is not the case, make additional adjustments and make two (2) more confirming passes with the test truck.

Demonstrate through the acceptance tests that the system passes all criteria according to ASTM E1318 Standard, achieving ASTM accuracy Type III. Perform the acceptance test as follows:

- Using the test truck, make an additional ten (10) passes at a selected speed that is indicative of the truck traffic at the test site;
- Place all of the data into a spreadsheet with the approval of the Department;
- Calculate the mean error and standard deviation for all recorded measurements at the end of the ten (10) test passes. Perform the calculations as follows:

For weight measurements, calculate the percent error for each test pass using the following formula,

$$[(\text{WIM Weight} - \text{Static Weight})/\text{Static Weight}] \times 100 = \% \text{ error,}$$

Calculate the mean error for each weight type (single, group, GVW) as follows (with each weight type calculated individually):

- % errors for single, group or GVW/# of samples = Mean error,
- Calculate the error for individual axle spacings using the following formula (each of the four axle spacings calculated individually), and
- $10 \text{ of } [(\text{WIM Axle Spacings} - \text{Actual Axle Spacing})]/10 = \text{Mean Axle Spacing Error,}$
- Enter all of the calculated errors into the spreadsheet;
- Check the calculated result against the acceptable range for the ASTM values. There will be one of two results:
 - If 95% of all recorded test results, (single axles, axle groups, GVW, axle spacing) fall within the ASTM specified tolerance then the system will have passed the requirements, or

- If less than 95% of the calculated differences fall within the ASTM specified tolerance, then readjust the system make and an additional ten (10) test passes to retest the system.

4.4. MEASUREMENT AND PAYMENT

Weigh In Motion System will be measured and paid as the actual number of Weigh In Motion Systems furnished, installed, and accepted. Measurement will be made for the equipment controller and software, cables, amplifiers, epoxy, Piezoelectric quartz sensors, miscellaneous conductors, Ethernet (3 foot or 6 foot) cables, conduit and condulets under ten feet, and conduit fittings located between the sensors and the equipment cabinet, acceptance testing, testing vehicle and set-up, as this will be considered incidental to furnishing and installing the Weigh in Motion System.

Junction boxes, electrical feeder conductors and conduit runs longer than ten feet are accounted for under separate pay items.

Payment will be made under:

Pay Item	Pay Unit
Weigh In Motion System	Each

5. AUTOMATED TIRE MONITORING SYSTEM

5.1. DESCRIPTION

The following is a Performance Based Specification. Furnish and install an Automated Tire Monitoring System (ATM) on the mainline, consisting of in road sensors and roadside electronics. Ensure the ATM data is transmitted from the roadside controller to the scale house server to be utilized in the Credential Screening Processes.

As part of the Credential Screening System Requirements the data obtained from the ATM system shall be packaged and made available to all Commercial Vehicle Supplier’s which host an In-Cab Device. The Tire Anomaly Data will be made part of vehicle record that will include tire type, underinflated and flat tire flags and other information typically supplied with an ATM System.

5.2. Requirements

Furnish and install an ATM consisting of in road sensors and roadside electronics that will interpolate tire pressures, missing tires and identification of single tires, dual tires and wide based tires (super singles).

The ATM must be able to detect tire anomalies of commercial vehicles at highway speeds (20 to 75 mph) in steady state traffic flows. Ensure, in general, the sensors for the ATM can operate successfully when installed in a mainline or ramp application at WIM locations where

trucks are being weighted and screened for enforcement activities. For this project the ATM will be installed along the mainline.

The ATM shall be able to detect Wide Based Tires, Single Tires, Dual Tires and flat tires. The system shall have a referenceable accuracy exceeding 80%.

The ATM detection sensors must be able to be installed in existing highway pavements without the need for special concrete slabs or site preparation. The sensors shall be of a size that will afford installation in the existing pavement without overly distressing or reducing the life of the existing pavement. Installation of sensors shall be accomplished by installing the sensors in a prepared cut in the existing pavement and secured and encapsulated with a vendor supplied adhesive grout. Sensors shall be replaceable upon failure.

A. Sensor Sealant

Provide an epoxy grout to secure and seal the sensor in the pavement that has minimum flexural strength of 10,000 psi and is approved by the manufacturer of the ATM sensor.

5.3. CONSTRUCTION METHODS

A. Installation

Install the in-road sensor equipment as directed by the manufacturer and as shown in the Plans. The saw slots including tail and lead-in sections for the sensor configurations, must be dry and free of debris prior to their installation. Use compressed air to remove debris and moisture from the saw slot as necessary.

Mount and install the sensors precisely flush with the surface of roadway and/or as directed by the manufacturer.

Seal the sensors and associated lead-in cable in an epoxy sealant to prevent moisture penetration. Install sensors in such a manner that they will not be damaged by road maintenance such as snow removal. Warranty sensors for a minimum of three (3) years against defects in materials or workmanship.

Furnish on-site engineering consulting by the manufacturer for the installation of the sensors.

Connect the ends of the lead-in cable to the roadside electronics equipment as directed by the manufacturer. Program the roadside electronics as instructed by the manufacturer's representative. Establish communications between the ATM and the Scale House via the fiber optic cable system.

B. Acceptance Testing

Perform acceptance test using a five (5) axle, test vehicle/tractor/trailer combination (3S2), complete with air ride suspension and a non-shifting static load. Load the truck to within 50% of allowable Gross Vehicle Weight for the road under test. The State will furnish the test vehicle.

Conduct the acceptance test procedure as recommend by the manufacturer using the calibration vehicle as necessary. As a minimum, using the test vehicle with a missing tire to simulate a tire anomaly.

Demonstrate through the acceptance tests that the system passes all criteria and accuracy reporting.

- Using the test truck, make a minimum of ten (10) passes at a selected speed that is indicative of the truck traffic at the test site;
- Record the number of times the system indicates a tire anomaly to ensure the system meets an 80% or better accuracy rate in reporting a Tire Anomaly.

5.4. MEASUREMENT AND PAYMENT

Automated Tire Monitoring System will be measured and paid as the actual number of Automated Tire Monitoring System furnished, installed, and accepted. Measurement will be made for the equipment controller and software, cables, epoxy, sensors, electrical conductors, Ethernet (3 foot or 6 foot) cables, conduit, condulets and conduit fittings located between the sensors and the equipment cabinet, acceptance testing, testing vehicle and set-up, as this will be considered incidental to furnishing and installing the Automated Tire Monitoring System.

Payment will be made under:

Pay Item	Pay Unit
Automated Tire Monitoring System	Each

6. AUTOMATED LICENSE PLATE READER SYSTEM

6.1. Description

Furnish and install an Automated License Plate Rader System (ALPR) equipment with all necessary hardware and software in accordance with the Plans and these Project Special Provisions. Provide an overview image of the vehicle and automatically locate and identify with the corresponding alphanumeric information and jurisdiction/location of issue.

The ALPR system must be capable of producing an ALPR image and an overview image of the passing commercial vehicles.

Ensure the captured still frame image and data captured by the ALPR system is transmitted with the vehicle record from the roadside controller to the scale house server to form an Automated Commercial Vehicle Processing System and credential screening system.

Ensure the ALPR still frame image correspond with the matching Overview Camera images as discussed elsewhere in these Project Special Provisions.

Furnish an ALPR system that produces multiple state and alphanumeric license plate interpretations per vehicle with varying flash, shutter and gain settings to ensure a high quality image regardless of weather or lighting conditions. At a minimum, the ALPR system must read and interpret license plates from the following states:

- 1) North Carolina

- 2) South Carolina
- 3) Virginia
- 4) Florida
- 5) Georgia
- 6) Tennessee
- 7) Indiana
- 8) Pennsylvania
- 9) Illinois
- 10) Ohio
- 11) Texas
- 12) New Jersey

The system must provide effective license plate capture at night using IR illuminators and no other external lighting source.

Furnish an ALPR system with a plate read rate of better than 80% (all characters correctly read for 80% of readable license plates) at speeds up to 75 miles per hour.

Provide a system with an operator interface to include database remote query functionality.

Provide at least one reference from an accredited law enforcement agency currently using the proposed ALPR system in a non-static weigh station application.

ALPR Camera systems meeting the intent of these specifications will be considered as being in "Substantial Conformance".

6.2. Material

A. Camera

Furnish an ALPR camera that complies with the following:

- Self-illuminating Infrared (IR) illuminators utilizing driver safe non-visible light (greater than 750nm) and only activated when images are being captured.
- IR light-emitting diodes (LEDs) utilized must be "pulsed" to enhance license plate capture.
- IR camera illumination certified to be "eye safe" by an independent testing agency.
- Ultra high resolution with dual color/black white image capture and digital signal processing to reduce color noise.
- Enhanced low light resolution (1.2 million pixels).
- Shutter speed of 1/10,000 sec exposure setting.
- Vibration resistance: 10G (20Hz-200Hz).
- Integrate the camera and ALPR processor into a single, sealed housing enclosure that is impervious to weather and environmental elements and tested to IP68 standards.

- Produces multiple license plate images, with no moving parts in the dual-lens cameras, per vehicle with varying flash, shutter and gain settings to ensure a high quality image regardless of weather or lighting conditions. Lens must capture up to 60 frames per second.
- Integrated ALPR processor with hardware AES encryption to NIST FIPS 197 with optional hardware data encryption.
- ALPRs weighing no more than 16 lbs. (including housing) and operating on less than 25S, 48V DC power with an external trigger mode and a “self trigger mode” to detect the presence of a commercial motor vehicle license plate in the camera’s field of view.
- A camera with day/night capabilities is required. Night overview images will be black and white. Daylight images will be in color.
- Operates during typical rain and snow events.
- Triggered by embedded loops in the roadway.

B. ALPR System Software

Furnish ALPR System Software with the following requirements:

- Provide variants of the Optical Character Recognition (OCR) engine that are designed specifically for NC and regional license plates. Provide OCR updates for new plate designs as required.
- Utilizes internal camera controls to facilitate automated setting for optimum flash, gain and shutter configurations.
- Integrates into a wide variety of systems via relay output, RS232, TCP/IP Ethernet with socket and FTP protocols, as well as IP connectivity.
- Offer standard software JPEG compression, with optional hardware JPEG compression.
- Fully web-enabled and IP-addressable.
- Provide a feature to enable or disable, at the user’s discretion, “fuzzy logic” plate matching to enable the system to match common number character issues (o/0 and 8/B) or unknown characters.
- Captures a live, corresponding color overview image of the vehicle and simultaneously displaying the captured license plate, along with the date and time stamp of the image and a percentage of confidence rate for each license plate. The confidence level is defined as the percentage of time that an interpretation of that confidence will be correct. For example, an interpretation with a confidence of 95 percent should be correct 95 percent of the time.
- Allow a minimum of 16 GB of optional compact flash storage to allow for buffering of data.
- Provides a permanent record of all interpretations and captured images in a chronological order rate of up to 45 images per minutes as determined by the operator. The operator can directly input whether the interpretation is correct while viewing the image. The system must keep a record of the operator inputs.
- Operator interface that allows reviewing and modifying license plate records associated with each vehicle record.
- Decode license plate numbers into a digital string and associate the captured image and license plate number into a single vehicle record file.

- Provide a still image capture of each commercial motor vehicle for identification purposes; include the original image of the license plate number in the field of view.
- Attaches unique identifying information to each license plate number image capture in order to ensure data integrity and proper vehicle image association with other collection data.
- Provide dynamic exposure control including automated recalibration process to optimize the license plate number decode performance.
- Provide an operator interface to include database remote query functionality.

C. Camera Housing

Furnish the camera housing to meet the following requirements:

- LPR camera enclosure must be rated IP-65 or higher.
- Fabricate from corrosion resistant aluminum, finished in a neutral color of weather resistant enamel or polyester powdercoat.
- Equipped with tempered glass front window.
- Equipped with sunshield.
- Equipped with surge suppressors on all underground conductors.
- Include mounting hardware to match mounting bracket. Provide mounting hardware specifically for vendor's ALPR.

D. Surge Suppression

Protect all equipment at the top of the pole with grounded metal oxide varistors connecting each power conductor to ground.

Protect coaxial cable from each camera with a surge protector at each end of the cable.

6.3. Construction Methods

Comply with the manufacturer's recommendations for installation, conforming to these Project Special Provisions and following the following requirements:

- Install ALPR camera as directed by the Manufacturer to achieve the most accurate and desirable image.
- Install ALPRs with a fixed focal point or target distance.
- Furnish all cabling and camera connectors from the same manufacturer as the ALPR system.
- Use stainless steel banding to attach the ALPRs to the pole.
- Protect all equipment by a surge protector at each end of the cable and connecting each power conductor to ground. Integrate the camera and its output images into the ALPR system including the ALPR software and database search engines to form a part of the Automated Commercial Vehicle Processing System and credential screening system.

6.4. MEASUREMENT AND PAYMENT

Automated License Plate Reader System will be measured and paid as the actual number of ALPR systems furnished, installed, and accepted. No separate measurement will be made for integration, database search engines, software, camera, camera assemblies, IR illuminators, cabling, connectors, Ethernet (3 foot or 6 foot) cables, attachment assemblies, condulets, grounding equipment, surge protectors, testing, training or any other equipment or labor required to install the ALPR system as these will be considered incidental to furnishing and installing the ALPR system.

Payment will be made under:

Pay Item	Pay Unit
Automated License Plate Reader System.....	Each

7. OVERVIEW CAMERA ASSEMBLY

7.1. Description

Furnish and install an overview camera assembly with all necessary hardware, cabling and software in accordance with these Project Special Provisions.

The overview camera located at the Advance Location captures side view images of each commercial motor vehicle as they travel past the location. Ensure the side view images is transmitted with the vehicle record from the roadside controller to the scale house server. Ensure the Overview images correspond with the matching ALPR images as discussed elsewhere in these Project Special Provisions.

Camera systems meeting the intent of these specifications will be considered as being in “Substantial Conformance”.

7.2. Material

A. Dual Channel CCTV Camera

Furnish one side fired overview camera that complies with the following:

The overview camera shall meet the following specifications:

- Dual Channel Design:
 - Color – Day
 - Black & White – Night (with a self-illuminating infrared [IR] light source)
- Lens:
 - 40-240mm afl (Day Channel)
 - 40-240 mm afl (Night Channel)
 - Light Sensitivity:
 - 2 lux w/digital backlight compensation (Day Channel)
 - 0.6 lux (Night Channel)
- Faceplate
 - Horizontal Resolution:

- 480 Lines (Day Channel)
- 570 Lines (Night Channel)
 - Signal to Noise Ratio:
- 50dB (Day Channel)
- 46dB (Night Channel)
 - Geometric Distortion: None
 - Video Output: 1.0 Vp-p NTSC Composite, 75 ohms/BNC
 - Humidity: 100%
 - Operating Temperature Range: -58° F to +140° F w/ sun shield
 - Enclosure – all aluminum weather proof enclosure complete with thermostat, heater, blower, and defrost/defogger
 - Power Input:
- 24 VAC +5%
- 34 Watts (at night w/heater and blower engaged)

B. Camera Housing

Furnish the camera housing to meet the following requirements:

- Fabricate from corrosion resistant aluminum, finished in a neutral color of weather resistant enamel or polyester powder coat.
- Equipped with tempered glass front window.
- Equipped with sunshield.
- Equipped with surge suppressors on all underground conductors. Furnish video surge suppressors specifically for coaxial video transmission lines.
- Include mounting hardware to match mounting bracket.

C. Mounting Bracket

Provide the camera mounting bracket to be a horizontal arm that attaches to a vertical pole, which meets the following requirements:

- Maximum supported weight: 40 lbs.
- Mounted on a vertical pole.
- Attachment to pole: a minimum of two (2) stainless steel bands, approximately five (5) inches apart.
- Pan adjustment: unlimited (360 degrees).
- Tilt adjustment: +/- 75 degrees.
- All aluminum with polyester powder coat finish.

D. Cables

Provide a composite cable carrying power and video between the camera housing and the equipment cabinet. Size the power and video conductors to correspond to the load and the distance. Furnish cable recommended by the manufacturer for underground conduit installation. Furnish crimp-on type connectors. Terminate the video conductors in the equipment cabinet on surge protectors like those in the camera housing.

7.3. Construction Methods

Mount the overview camera to metal poles to capture a side view image of the vehicle in accordance with the manufacturer’s recommendations using stainless steel banding.

Ensure that the camera is aimed to provide optimum coverage. Adjust the camera’s position as necessary until the Department agrees that the position is optimal from the point of view of the users. Adjust the light threshold for the color/monochrome video switch as necessary until the Department agrees that the threshold is optimal from the point of view of the users.

7.4. MEASUREMENT AND PAYMENT

Overview Camera Assembly will be measured and paid as the actual number of overview camera assemblies furnished, installed, and accepted. No separate measurement will be made for integration, software, IR illuminators, cabling, connectors, attachment assemblies, condulets, grounding equipment, surge protectors, testing, training or any other equipment or labor required to install the overview camera assembly as these will be considered incidental to furnishing and installing the Overview Camera Assembly system.

Poles to support the overview camera assembly will be measured and paid for elsewhere in these Project Special Provisions

Payment will be made under:

Pay Item	Pay Unit
Overview Camera Assembly	Each

8. CHANGEABLE MESSAGE SIGNS

8.1. Description

Furnish and install Changeable Message Signs (CMS) at the locations shown on the plans.

Changeable Message Signs meeting the intent of these specifications will be considered as being in “Substantial Conformance” where applicable.

8.2. Material

Furnish CMS that are UL-listed and have a minimum character height of 18 inches. Ensure the CMS meets the following minimum specifications:

- Sign Dimensions: 40” H x 124” L single faced display
- The Sign enclosure shall be watertight, painted matte black, with a matte black finish.
- The Sign shall be double stroke LED. Face
- Two lines of text with 18-inch characters.
- Message visibility: 30-degree cone centered about the optical axis.
- Up to a minimum of 13 characters per line

- The Sign shall have three levels of dimming controlled by photosensors. Dimming levels shall be for day, night, and over bright conditions.
- Operating Temperature of -40°F to 120°F
- Power requirements shall be no more than 120 VAC 2.5 A continuous and shall have a maximum inrush current of 7A.
- Polycarbonate shield with anti-glare coating covering the display face.
- Ensure the sign is accessible from the front and that the polycarbonate shield covering the display face and sign face panel and can be easily hinged up to allow access to the inner workings of the sign to perform maintenance and repair when needed. Ensure that the hinging system securely locks the polycarbonate shield covering display and sign face into a safe position so as not to injure the worker when performing maintenance on the signs.

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.

8.3. Messages

Ensure each CMS is designed to display the following two (2) messages:

Message 1:

TRUCK ENTER
WEIGH STATION

Message 2:

TRUCK BYPASS
WEIGH STATION

The appropriate message will be activated for the particular truck being processed. A message shall be displayed for every commercial vehicle.

8.4. Construction Methods

Install the CMS at the locations on the plans with a minimum height of 17 feet from the bottom of the CMS sign face to the highest point of the travel lane. It is the contractor's responsibility to verify the S-dimensions for the CMS to determine the proper post lengths. Install the CMS according to the manufacturer's recommendations using galvanized steel poles and hardware in concrete foundations.

Label and identify all wires and cabling as to their intended function to aid in future servicing of the CMS. Provide a labeling method that is approved by the Engineer.

Install signal cable in continuous lengths between the roadside controller cabinet and the CMS. Route the signal cable to minimize the length of signal cable installed and the number

of cables and conductors in each run. Pull 36 inches of additional signal cable into the roadside controller cabinet and the CMS sign structure for maintenance purposes.

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 controllers and electric utilities that conform to NEC standards. Provide feeder conductors and disconnects to power the CMS that are sized in accordance with the NEC.

Inductive loops installed in the roadway at the CMS locations trigger the CMS system to turn on and off the sign in relation to the commercial vehicles' location in route to the weigh station.

Use the Roadside Equipment Cabinet to house electrical equipment and signal processing equipment necessary to operate the CMS. Install a new 2" conduit between the Roadside Equipment Cabinet and the support structure base entrance using conduit stub-outs.

The CMS message will notify the commercial vehicle to "Bypass" or "Enter" the weigh station based on the screening criteria.

In accordance with the Plan, Loop 5 activates CMS 1. Loop 6 activates CMS 2 and turns off CMS 1. When no vehicles are being processed ensure the CMS goes into blank state

8.5. MEASUREMENT AND PAYMENT

Changeable Message Sign will be measured and paid as the actual number of *Changeable Message Signs* furnished, installed, and accepted.

Each *Changeable Message Sign* consists of a sign enclosure with the pre-identified messages, electrical and signal processing equipment, communications equipment, strapping hardware, conduit, fittings, couplings, sweeps, conduit bodies, condulets, wire, feeder conductors and disconnects, signal cable between the roadside equipment cabinet and the *Changeable Message Sign* enclosure, connectors, photo-electric sensors, tools, materials, all related testing, cost of labor, cost of transportation, incidentals, and all other equipment necessary to furnish and install the CMS system.

Foundation and sign supports are paid for under the Signing Plan.

Payment will be made under:

Pay Item	Pay Unit
Changeable Message Sign.....	Each

9. COMMUNICATIONS HARDWARE

19.1 DESCRIPTION

Furnish and install all equipment described below for a fully functional minimum 100/1000 Mbps Ethernet network for communication to the weigh station.

A. Ethernet Edge Switch

Furnish and install a hardened, field Ethernet edge switch (hereafter “edge switch”) for field devices. Ensure that the edge switch provides wire-speed, Ethernet connectivity at each device location to the managed Ethernet switch. Provide adequate number of copper ports for communication with the device at 100/1000 Mbps speed. Provide the switch with adequate number of fiber ports and fiberoptic transceivers to communicate with the existing managed switch in the scale house.

9.2. MATERIALS

A. General

Ensure that the edge switches are fully compatible and interoperable with the Ethernet network interface and that the Ethernet switches support half and full duplex Ethernet communications.

Furnish edge switches that provide 99.999% error-free operation, and that complies with the Electronic Industries Alliance (EIA) Ethernet data communication requirements using single-mode fiber-optic transmission medium and copper transmission medium. Ensure that the edge switches have a minimum mean time between failures (MTBF) of 10 years, or 87,600 hours, as calculated using the Bellcore/Telcordia SR-332 standard for reliability prediction.

Provide all SMFO jumpers required to connect the managed Ethernet switches and proposed edge switches with the connector panels of fiber-optic splice centers. Provide SMFO jumpers that are factory-assembled with Type LC connectors. Provide SMFO jumpers that are a minimum of 3 feet in length for edge switches inside equipment cabinets. Ensure SMFO jumpers meet the operating characteristics of the SMFO cable with which it is to be coupled.

B. Ethernet Edge Switch

(1) Standards

Ensure that the edge switches comply with all applicable IEEE networking standards for Ethernet communications, including but not limited to:

- IEEE 802.1D standard for media access control (MAC) bridges used with the Spanning Tree Protocol (STP),
- IEEE 802.1P standard for Quality of Service (QoS),
- IEEE 802.1Q standard for port-based virtual local area networks (VLANs),
- IEEE 802.1Q-2005 standard for MAC bridges used with the Multiple Spanning Tree Protocol,
- IEEE 802.1w standard for MAC bridges used with the Rapid Spanning Tree Protocol (RSTP),
- IEEE 802.1x standard for port-based network access control, including RADIUS,
- IEEE 802.3 standard for local area network (LAN) and metropolitan area network (MAN) access and physical layer specifications,
- IEEE 802.3u supplement standard regarding 100 Base TX/100 Base FX,
- IEEE 802.3x standard regarding flow control with full duplex operation, and
- RFC 783 – TFTP
- RFC 854 – Telnet Protocol Specification,

- RFC 1112 – IGMP v1,
- RFC 1541 – Dynamic Host Configuration Protocol for IPv4,
- RFC 2030 – SNTP
- RFC 2068 – HTTP
- RFC 2236 – IGMP v2,
- RFC 2865 – RADIUS
- RFC 3414 – SNMPv3-USM
- RFC 3415 – SNMPv3-VACM.

Ensure that the edge switches have a minimum mean time between failures (MTBF) of 10 years, or 87,600 hours, as calculated using the Bellcore/Telcordia SR-332 standard for reliability prediction.

(2) Functional

Ensure that the edge switches support all Layer 2 management features and certain Layer 3 features related to multicast data transmission. These features shall include, but not be limited to:

- An STP healing/convergence rate that meets or exceeds specifications published in the IEEE 802.1D standard,
- An RSTP healing/convergence rate that meets or exceeds specifications published in the IEEE 802.1w standard,
- An Ethernet edge switch that is a port-based VLAN and supports VLAN tagging that meets or exceeds specifications as published in the IEEE 802.1Q standard, and has a minimum 4-kilobit VLAN address table (254 simultaneous),
- A forwarding/filtering rate that is a minimum of 14,880 packets per second for 10 megabits per second and 148,800 packets per second for 100 megabits per second,
- A minimum 4-kilobit MAC address table,
- Support of Traffic Class Expediting and Dynamic Multicast Filtering,
- Support of, at a minimum, snooping of Version 2 of the Internet Group Management Protocol (IGMP),
- Support of remote and local setup and management via telnet or secure Web-based GUI and command line interfaces,
- Support of the Simple Network Management Protocol version 3 (SNMPv3). Verify that the Ethernet edge switch can be accessed using the resident EIA-232 management port, a telecommunication network, or the Trivial File Transfer Protocol (TFTP),
- Port security through controlling access by the users. Ensure that the Ethernet edge switch has the capability to generate an alarm and shut down ports when an unauthorized user accesses the network,
- Support of the TFTP and SNTP. Ensure that the Ethernet edge switch supports port mirroring for troubleshooting purposes when combined with a network analyzer.

(3) Physical Features

Mounting: Provide shelf mount edge switches. Optionally, if cabinet space dictates provide mounting kit to attach the edge switch to a vertical rack rail or a DIN rail in the cabinet. If the Contractor elects to use DIN rail mounting supply the DIN rail with the edge switch.

Ports: Provide 10/100/1000 mbps auto-negotiating ports (RJ-45) copper Ethernet ports for all edge switches. Provide auto-negotiation circuitry that will automatically negotiate the highest possible data rate and duplex operation possible with attached devices supporting the IEEE 802.3 Clause 28 auto-negotiation standard.

Optical Ports: Ensure that all fiber-optic link ports operate at 1310 or 1550 nanometers in single mode. Provide fully functional ports with Type LC connectors and the optics for the optical ports. Do not use mechanical transfer registered jack (MTRJ) or ST type connectors.

Provide 10/100/1000 mbps optical ports that consist of fiber pairs, one fiber will transmit (TX) data and one fiber will receive (RX) data. Provide optical ports that meet the following minimum requirements:

- Optical receiver sensitivity: -32 dBm,
- Optical transmitter power: -15.5 dBm,
- Typical transmission distance: 20 km, and
- Operating wavelength: 1310 nm.

Copper Ports: Provide edge switches that include a minimum of six copper ports. Provide Type RJ-45 copper ports and that auto-negotiate speed (i.e., 10/100/1000 Base) and duplex (i.e., full or half). Ensure that all 10/100/1000 Base TX ports meet the specifications detailed in this section and are compliant with the IEEE 802.3 standard pinouts. Ensure that all Category 5e unshielded twisted pair/shielded twisted pair network cables are compliant with the EIA/TIA-568-B standard.

Port Security: Ensure that the edge switches support/comply with the following (remotely) minimum requirements:

- Ability to configure static MAC addresses,
- Ability to disable automatic address learning per ports, known hereafter as Secure Port. Secure Ports only forward, and
- Trap and alarm upon any unauthorized MAC address and shutdown for programmable duration. Port shutdown requires administrator to reset manually the port before communications are allowed.

Network Capabilities: Provide edge switches that support/comply with the following minimum requirements:

- Provide full implementation of IGMPv2 snooping (RFC 2236),
- Provide full implementation of SNMPv1, SNMPv2c, and/or SNMPv3,
- Capable of mirroring any port to any other port within the switch,
- Meet the IEEE 802.1Q (VLAN) standard per port for up to four VLANs,
- Meet the IEEE 802.3ad (Port Trunking) standard for a minimum of two groups of four ports,
- Telnet/CLI,
- HTTP (Embedded Web Server) with Secure Sockets Layer (SSL), and
- Full implementation of RFC 783 (TFTP) to allow remote firmware upgrades.

Network Security: Provide edge switches that support/comply with the following (remotely) minimum network security requirements:

- Multi-level user passwords,
- RADIUS centralized password management (IEEE 802.1X),
- SNMPv3 encrypted authentication and access security,
- Port security through controlling access by the users: ensure that the Ethernet edge switch has the capability to generate an alarm and shut down ports when an unauthorized user accesses the network,
- Support of remote monitoring (RMON) of the Ethernet agent, and
- Support of the TFTP and SNTP. Ensure that the Ethernet edge switch supports port mirroring for troubleshooting purposes when combined with a network analyzer.

(4) Electrical Specifications

Ensure that the edge switches power on and operate properly with 115 VAC. Ensure that the edge switches have a minimum operating input of 110 VAC and a maximum operating input of 130 VAC. Ensure that if the device requires operating voltages other than 120 VAC, supply the required voltage converter. Ensure that the maximum power consumption does not exceed 50 watts. Ensure that the edge switches have diagnostic light emitting diodes (LEDs), including link, TX, RX, speed (for copper ports/RJ 45 only), and power LEDs.

(5) Environmental Specifications

Provide Ethernet edge switches that adhere to the following environmental constraints as defined in the environmental requirements section of the NEMA TS 2 standard if located within a climate-controlled environment:

- Operating temperature range: -30°F to 165°F,
- Storage temperature range: 14°F to 158°F, and
- Operating relative humidity range: 10% to 90%, non-condensing.

Verify that the edge switch manufacturer certifies their device has successfully completed environmental testing as defined in the environmental requirements section of the NEMA TS 2 standard. Verify that vibration and shock resistance meet the requirements of Sections 2.1.9 and 2.1.10, respectively, of the NEMA TS 2 standard. Ensure that the edge switch is protected from rain, dust, corrosive elements, and typical conditions found in a roadside environment.

The edge switches shall meet or exceed the following environmental standards:

- IEEE 1613 (electric utility substations),
- IEC 6185003 (electric utility substations),
- IEEE 61800-3 (variable speed drive systems), and
- IEC 61000-6-2 (generic industrial).

9.3. CONSTRUCTION METHODS

A. General

Ensure that all communications hardware is UL listed.

Verify that network/field/data patch cords meet all ANSI/EIA/TIA requirements for Category 5e four-pair unshielded twisted pair cabling with stranded conductors and RJ-45 connectors.

Provide a System Design Report identifying or mapping IP address for each device. Submit the System Design Report for approval along with submitting product submittal data prior to installing and configuring the computer and communications hardware.

Ensure that all project IP addresses are assigned as defined in the System Design Report. Ensure the as-built documentation includes the identification of all IP addresses and VLANs, and associated hardware devices and device locations. Configure the Ethernet network so the WIM equipment and CCTV cameras are in separate VLANs.

The Engineer will designate who their network administrator is for the LAN. Upon project completion, ensure that the network administrator will be able to manage remotely the Ethernet switches for switch configuration, performance monitoring, and troubleshooting.

- **Ethernet Edge Switch**

Ensure that all project IP addresses and VLAN IDs are assigned as defined in the System Design Report. Ensure that at a minimum, the switch configuration includes the following features: SNMP, STP, Port Security, all required VLANs. Ensure unused switch ports are disabled.

Mount the edge switch inside each field cabinet by securely fastening the edge switch to the vertical rail of the equipment rack or to a shelf using manufacturer-recommended or Engineer-approved attachment methods, attachment hardware, and fasteners. Ensure that the edge switch is mounted securely in the cabinet and is fully accessible by field technicians without blocking access to other equipment. Use fiber-optic jumpers that are factory assembled and connectorized and are certified by the fiber-optic jumpers’ manufacturer to meet the relevant performance standards required below. Verify that network/field/data jumper cables meet all ANSI/EIA/TIA requirements for Category 5e 4-pair unshielded twisted pair cabling with stranded conductors and RJ45 connectors.

Connect the Ethernet Edge Switches into the existing managed ethernet network switch in the scale house via the new fiber optic cable.

9.4. MEASUREMENT AND PAYMENT

Ethernet edge switch will be measured and paid as the actual number of Ethernet edge switches furnished, installed, and accepted.

The Ethernet switches include all appropriate ports, cabling, grounding, redundancies, labeling, and any integration between the switches and the communications network as necessary to make a fully working installation. All power supplies, power cords, adapters, mounting hardware, DIN rail mounting brackets, DIN rails, connectors, serial cables, signs, decals, disconnect switches, installation materials, and configuration software necessary to complete this work, will be included and will be incidental.

No separate measurement will be made for SMFO jumpers, communication cables, Ethernet patch cables, electrical cables, mounting hardware, nuts, bolts, brackets, connectors, grounding equipment, or surge suppression, as these will be considered incidental to the pay items listed above.

Payment will be made under:

Pay Item	Pay Unit
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Ethernet Edge Switch..... Each

10. ETHERNET CABLE

10.1. Description

Furnish and install Ethernet cable to serve as interconnect between Ethernet edge switches and co-located devices in the equipment cabinet and to interconnect the Managed Ethernet switch to workstation computers and other peripheral devices in the Scale House. Ensure Ethernet cable is rated for outdoor applications where it will be installed in conduits exposed to outside weather conditions or lashed to messenger cable.

10.2. Materials

Furnish Category 5 Enhanced (5e) Ethernet cable that complies with ANSI/TIA 568-B-5 standards for four-pair shielded twisted copper for Ethernet communications. The cable shall meet all of the mechanical requirements of ANSI/ECEA S-80-576. The Ethernet cable must be rated for medium-power, network-powered broadband communications circuits and must be Type BMU network-powered broadband communications medium-power cable.

Provide a minimum of 4-pair twisted copper Ethernet cable and connectors rated for an ambient operating temperature range of -30° F to 165° F. The cable shall be shielded, outdoor-rated and have a UV-resistant jacket. The void between the insulated copper pairs and the polyethylene outer jacket shall be injected with a water-resistant flooding compound. Furnish Ethernet cable with the following additional requirements:

- 24AWG (minimum) solid bare copper conductor
- High-density polyethylene insulation, PVC jacket
- UL/CSA listed
- Gel Filled
- Supports 10/100/1000 Mbps
- Mean Power Sum for Equal Level Far End Crosstalk (ELFEXT): 45dB/kft (minimum) at 772kHz
- Worst Pair Power Sum for ELFEXT: 40dB/kft (minimum) at 772kHz
- Mean Power Sum for Near-end Crosstalk (NEXT): 42dB/kft (minimum) at 772 kHz
- Average mutual capacitance: 90nf/mile (maximum)
- Ensure the jacket is printed with foot markings at a minimum of every 3 feet.

Have the manufacturer factory test the Ethernet cable on reels for each pair's mutual capacitance, crosstalk loss, insulation resistance, and conductor resistance. Furnish the Engineer with a certified report for each reel showing compliance with these Project Special Provisions,

the factory test results, and the manufactured date of the cable. The contractor shall not use Ethernet cable manufactured more than one year before the date of installation.

Pre-terminated cables in 3' to 6' lengths shall have their ends terminated at the factory. Long haul runs greater than 6' shall have the ends terminated in a punch down female RJ-45 jack.

No Ethernet patch cable shall exceed 295 feet.

10.3. Construction Methods

A. General

Install Ethernet cable on new or existing messenger cable and in conduits at locations shown in the Plans. Allow a minimum of 10 feet (3 meters) of cable slack.

Ethernet cables shall not be spliced.

All cables shall be labeled with waterproof, smear resistant labels that denote the equipment cabinets or housing they are run from and the device and identifier for that device to which they are connected.

B. Aerial Installation

Double lash the Ethernet cable to the messenger cable where installed aerially.

Wrap the Ethernet cable to the messenger cable using aluminum ribbon wraps where the wire supports other cables.

C. Underground Installation

Install underground Ethernet cable in conduit described in these Special Provisions and as shown in the Plans.

The contractor shall not exceed 80 percent of the manufacturer's maximum pulling tension when installing underground Ethernet cable. Use a clutch device (dynamometer) so as not to exceed the allowable pulling tension if the cable is pulled by mechanical means. Do not use a motorized vehicle to generate cable-pulling forces.

Keep tension on the cable reel and the pulling line at the start of each pull. Do not release the tension in the cable if the pulling operation is halted. Restart the pulling operation by gradually increasing the tension until the cable is in motion.

D. Equipment Cabinet and Scale House Cable Installation

For connections inside equipment cabinets to connect between switches and other co-located devices, provide pre-terminated jumper in 3' to 6' lengths.

Long haul cable terminations into RJ-45 jacks can have their ends installed in the field by qualified technician for connections between the Managed Ethernet switch and workstation computers and other peripheral devices.

10.4. Measurement and Payment

Ethernet Cable (Long Haul) will be measured and paid as linear feet of Ethernet Cable (Long Haul) furnished, installed, and accepted. Measurement will be taken by recording and calculating the difference in the foot marking along the cable jacket after the cable is terminated. If the foot marking cannot be recorded, then the cable length after termination will be determined by

measuring the horizontal distances along which the cable lays.

No measurement will be made for terminating and testing of the cable, connectors, cable identification markers, and grounding, as these will be considered incidental to the installation of the Ethernet cable.

Ethernet Cable (3 foot) and Ethernet Cable (6 foot) will be considered incidental as addressed elsewhere in the Project Special Provisions.

Payment will be made under:

Pay Item	Pay Unit
Ethernet Cable (Long Haul)	Linear Feet

11. COMPUTER HARDWARE AND PERIPHERALS

11.1. DESCRIPTION

Furnish and Install all materials with the most recently developed and approved product versions that meet or exceed all applicable standards, specifications, and requirements before the system is considered for acceptance. Ensure that all equipment features, functions, and performance measures are met.

Furnish and install one server, one printer, and one computer workstation in the scale house. Ensure that all workstation and server can access the LAN and can be used to monitor, interact, and control all weigh station operations.

A. UPS

Furnish and install rack-mounted uninterruptible power supply (UPS) units as described in this Project Special Provision for the equipment cabinets, managed Ethernet switches, and servers in the scale house. The UPS shall also include any ancillary equipment or incidental items, such as required mounting hardware and cabling. Furnish and install monitoring software to provide email alerts. Furnish all materials with the most recently developed and approved product versions that meet or exceed all applicable standards, specifications, and requirements before the system is considered for acceptance.

B. Equipment Rack

Furnish and install a 19” EIA equipment rack with power cord hook up and outlets to service equipment. Ensure outlets are surge protected. Ensure rack has sufficient space to accommodate all equipment required by this contract and has as minimum of an additional 6 spare rack positions available to house future equipment installs.

11.2. Materials

A. Server

Furnish and install a server in the scale house as described in the Plans and these Project Special Provisions. Connect the servers to the existing managed Ethernet switch. The server shall have the following minimum requirements.

- Rack Mounted Server Grade Machine
- Intel Xeon series 3.5 GHz 4 core 8 thread Processor
- 32GB of 2133 ECC RAM (Multi Channel)
- 4x 600GB 15K RPM 12-Gbps Server Grade HDD
- RAID controller with support for 4 pairs
- Hot Swappable Hard Drive Bays
- 4x USB Ports, minimum 2x USB 3.0 Ports
- Dual Power Supplies
- Dedicated Ethernet Management Port
- 2x 1Gbps onboard network ports
- 64-bit Windows Server 2016 Standard Edition with 5 device Client Access Licenses

The server shall integrate the workstations and allow video and data accessibility and exchange between various system components (i.e. WIM, ATM, AVI, ALPR, Overview Camera, etc.).

B. Computer Workstation

Furnish and install a computer workstation consisting of a CPU, monitor(s), keyboard, and mouse in the scale house scale room. The Computer workstation should meet the following minimum requirements.

- 4 core 3.2GHz Processor
- 8GB of RAM
- 500GB SATA Hard Drive
- 4 USB ports
- HDMI/DP/VGA port
- 24" monitor
- Windows 10 Professional

The computer workstation will operate the central control software over the Ethernet network in the scale house. The computer will be provided with one monitor.

C. Printer

Furnish and install one color laser printer in the scale house scale room.

D. UPS

Furnish UPS units that produce uninterruptible power and power conditioning for the WIM equipment, managed Ethernet switch, and video monitor in the scale house.

For the UPS located in the scale house, size the UPS units to provide at least 20 minutes of UPS power. For the equipment cabinets, size the UPS units to provide at least four hours of UPS power. Provide the UPS a 25% reserve of receptacles. Provide load calculations for each configuration of equipment connecting to a UPS.

a. Standards

Ensure that the UPS units comply with the following standards:

- ANSI
- ASTM
- CSA and
- UL.

b. Functional

Each UPS shall provide adequate capacity to run its respective equipment without commercial power for 20 minutes. Size the UPS units for the proposed loads. Provide load calculations for each configuration of equipment connecting to a UPS assuming a run time of 20 minutes.

Ensure that the UPS and its remote monitoring software perform the following functions:

- Remote environmental monitoring of temperature and humidity,
- Data logging,
- Event logging,
- Fault notification,
- Hibernation,
- Radius authentication,
- Protocols: HTTP, HTTPS, IPv4, IPv6, SMTP (v1-v3), Telnet, SSH v2, SSL,
- Manage all network UPS units,
- Operating system shutdown,
- Load shedding to turn off selected devices or groups of devices,
- Outlet control to turn off, reboot, or shutdown outlets,
- Power event summary,
- Recommended actions,
- Risk assessment summary,
- Run command file, and
- System event log integration.

c. Physical Features

Supply each UPS unit described above with 25 percent spare outlets. Ensure that the UPS meets the following material requirements:

- Rack-mounted and floor mounted as listed below in these Project Special Provisions.
- Sealed AGM type, maintenance free batteries,
- Minimum of nine NEMA 5-15R and two NEMA 5-20R outlets,
- NEMA L5-30P input plug,
- Ethernet network management card using 10/100/1000 Base TX communications,
- USB interface port,
- Remote environmental monitoring of temperature and humidity with telnet management,
- Status lights: power on, power source and overload,
- Alarms: audible and remote notification,
- Manual power on/off switch, and
- Supply UPS unit with multi-pole noise filtering. Supply UPS with a terminal for connecting the UPS to a surge protection device.

a. Environmental Specifications

Verify that the UPS meets all specifications and is capable of performing all of its functions during and after being subjected to:

- Operating temperature: 0° F to 104° F,
- Operating relative humidity: 95%,
- Storage temperature: 5° F to 113° F, and
- Storage relative humidity: 95%.

11.3. CONSTRUCTION REQUIREMENTS

A. General

Integrate all servers, workstations, and printers on the LAN so all applications will be fully functional. Install the operating system, software, and antivirus software to the NCSHP IS standards.

Furnish all tools, equipment, materials, supplies, manufactured hardware, and perform all operations and equipment integration necessary to provide a complete, operational network. All cabling shall be:

- Neatly tagged with permanent labels at both ends of every cable,
- Secured with wire ties and cable management hardware in the communications racks, and
- Grounded to rack grounding hardware.

Ensure that all project IP addresses are assigned as defined in the System Design Report. Ensure the as-built documentation includes the identification of all IP addresses and VLANs, and associated hardware devices and device locations.

B. Server

Install the server in the scale house. Install the software packages described in these Project Special Provisions.

Install all software necessary to support the central control software and to meet all of the data communications requirements described in these Project Special Provisions.

Connect the servers to the existing managed Ethernet switch. Furnish and install Ethernet patch cords between the Ethernet patch panel and the managed Ethernet switch in the scale house. Plug power supplies into outlets on separate circuits.

C. Computer Workstation

Install the computer workstation in the scale house. Connect the workstation to the LAN by furnishing and installing Ethernet patch cords between the Ethernet patch panel and the existing managed Ethernet switch in the scale house. Perform the following operational tests for each computer component in accordance with the test plans. After the equipment has been installed, perform the following:

- Connect all components (monitors, mice, keyboards, existing printers, network cables, power supplies),
- Install all software required in these Project Special Provisions,
- Configure network communications,
- Map network drives and existing printers,
- Run diagnostic utilities on the hardware, and
- Print test pages for each workstation on each existing printer to verify printer configuration.

D. Printer

Install a laser printer in the scale house scale as directed by the Engineer. Connect the printer to the Ethernet network, setup the workstations on the network to use the printer and print a test page from each printer.

E. UPS

Install UPS units with the following equipment connected to them:

- Roadside cabinets housing roadside computers
- Workstations
- Servers
- WIM electronics equipment in scale room

Place the power supply of the managed Ethernet switch on the UPS unit. Allocate the load of the equipment to balance the load while using 120 VAC.

Connect each UPS unit to a power outlet. Connect the UPS monitoring port to the managed Ethernet switch.

Install the UPS monitoring software on the weigh station LAN workstations to remotely monitor the UPS. Run the UPS diagnostics. Configure the remote monitoring to send email alerts.

Plug the power strip mounted on the respective rack frame into the UPS. Plug all communications hardware into the UPS or the power strip.

11.4. MEASUREMENT AND PAYMENT

Server will be measured and paid as the actual number of servers furnished, installed and accepted.

Computer Workstation will be measured and paid as the actual number of computer workstations with monitor(s), keyboard, UPS, mouse, operating system, and software furnished, installed and accepted.

Printer (Install) will be measured and paid as the actual number of printers furnished, installed and accepted.

UPS will be measured and paid as the actual number of UPS furnished, installed and accepted.

No separate measurement will be made for coaxial cables, communication cables, electrical cables, mounting hardware, equipment rack, nuts, bolts, brackets, connectors, risers, grounding equipment, or surge suppression, as these will be considered incidental to the pay items for servers, and workstation computers.

No separate measurement and payments for any additional equipment or components not provided by the Engineer. These items will be considered incidental to the pay items for installing servers and workstation computers.

Ethernet Cable (3 foot) and Ethernet Cable (6 foot) will be considered incidental as addressed elsewhere in the Project Special Provisions.

Payment will be made under:

Pay Item	Pay Unit
Server	Each
Computer Workstation	Each
Printer	Each
UPS	Each

12. CENTRAL CONTROL SOFTWARE

12.1. DESCRIPTION

A. General

Furnish and install central control software in accordance with the Plans and these Project Special Provisions. The system will operate automatically and continuously, with limited human intervention, weighing vehicles and interpreting tire anomalies, and screening trucks using their In-Cab devices and their NCSHP approved bypass programs as an integral part of the system to form an Automated Commercial Vehicle Processing System and Credential Screening System.

Operational requirements of the overall system are explained in Section 1 of these Project Special Provisions.

Ensure the Credential Screening System Software can capture WIM data, ATM data and ALPR data, and in-cab device ID data (if equipped) for each commercial vehicle in the right lane of I-74 southbound as they approach the weigh station. Ensure the Credential Screening System Software uses an automatic screening algorithm to receive all captured data to determine the sort decision of pull-in or bypass the Weigh Station. Additionally, ensure the Credential Screening System can push the sort decision along with the captured data back to the AVI Service Providers.

For Commercial Vehicles equipped with In-Cab Devices: Each bypass program will be responsible for providing its NCSHP approved screening data and vehicle ID information to the Credential Screening System to assist the Credential Screening System in making a final sort decision as to either bypass or pull-in the commercial vehicle. The Credential Screening System will in turn be configured to share the captured vehicle ID data and sort decision with the Service Providers sponsoring the in-cab devices. As a minimum the shared information will consist, but not be limited to; the Vehicle ID Data, WIM data, ATM data, AVI data received from the Service Providers, ALPR data, and Final Sort Decision.

Additionally, the AVI Service Providers will provide a return message to the Credential Screening System's Confirmation Database", a confirmation record consisting of the information received from the Credential Screening System and the sort decision. The confirmation records from the In-cab device systems shall report back to the "Confirmation Database".

Furnish and install software that distinguishes potential weight violators from the real-time traffic stream based on automatic weight measurements that exceed the established thresholds. Furnish and install software that identifies potential tire pressure anomaly's violators that exceed the established thresholds.

The specific major functions fulfilled by the baseline roadside operations software as part of the Credential Screening System are:

- Record all vehicle characteristics in a database,
- Produce reports of recorded vehicle characteristics,
- Screen vehicles for credential violations,

- Screen conjunctionally commercial vehicles with in-cab devices and commercial vehicles with out in-cab devices for safety violations,
- Screen conjunctionally commercial vehicles with in-cab devices and commercial vehicles without in-cab devices using operator defined hot lists,
- Allow duly authorized operators to adjust screening criteria and bypass rates based on whether vehicle identification is based on in-cab devices or ALPR sensor data, and to adjust screening criteria, and allow the operator to view vehicle screening results and overview camera shot information.
- Provide a database logging feature to store returned confirmation information from the AVI Service providers.

The software must maintain a configurable number of months, minimum of 3 months, maximum of 12 months, of historical vehicle data for analysis and reporting including the Confirmation Database. Additionally, the system shall be supplied with a user definable Scheduler Program to purge this data from the system on a weekly basis (i.e., once per week the software will examine all of the vehicle records to determine which are older than the specified expiry period and delete them from the database). The day and time at which this purging takes place shall be configurable by a system administrator. Set the purging to occur normally during Saturday or Sunday or during some other time when the weigh station is not busy.

Furnish the Automated Commercial Vehicle Processing System and Credential Screening System (Central Software) to produce printed reports detailing vehicle activity at the weigh station. This function is known as vehicle reporting.

Ensure the Automated Commercial Vehicle Processing System and Credential Screening System can interface to the state CVIEW system to update the local credential and safety database. This function is known as the CVIEW interface.

Ensure the system can maintain or access a vehicle record for each vehicle entered into the system.

Conform to the NC Statewide Information Technology Standards and Policies as described at <http://it.nc.gov>

B. Screening Criteria.

1. Operation Overview

Integrate the ALPR, with the existing CVIEW, SAFER, FuelTaCS, PRISM and NCIC programs currently in use by the NCSHP for commercial vehicle data screening and enforcement.

Provide the following major features:

- Snapshot screening database containing a local copy of NCIC, FuelTaCS, PRISM, CVIEW and SAFER data.
 Credential processing and screening software algorithms that include automated ALPR screening with PRISM status of the carrier and vehicle to determine if a Federal out-of-service order has been issued against the carrier or if the vehicle has been targeted; automated screening to retrieve the carrier safety information from the screening database, automated screening to check the FuelTaCS database of

carriers who have delinquent fines; and automated screening to check the NCIC database of vehicles which have been reported stolen.

- Automatically alert system users through audible and visual alarms of real-time CMV violators passing the System through user defined thresholds and the screening databases described herein.
- Windows-based graphical user interface (GUI) for accessing the snapshots and credential screening components. Furnish a user-friendly system with one GUI for accessing all screening components.

The specific major functions fulfilled by the Automated Commercial Vehicle Processing System and Credential Screening System (Central Software) software are:

- Record all vehicle characteristics in a database.
- Produce reports of recorded vehicle characteristics.
- Screen vehicles for credential violations.
- Screen vehicles for safety violations.
- Screen vehicles using operator defined hot lists.
- Allow duly authorized operators to adjust screening criteria and bypass rates
- Allow the operator to view vehicle screening results along with the details about the carrier, from the screening database.

Furnish software allowing purging to be configurable by day of week and time of day by a system administrator. Confirm purging schedule with the Engineer.

2. System Characteristics

a. Roadside Operations Requirements

Provide the System with the following functions:

- Vehicle screening.
- Vehicle display.
- Vehicle reporting.
- CVIEW interface.

The System shall use a live/real time connection to a database of the following: CVIEW, SAFER, FuelTaCS, NCIC, PRISM, over a secured connection. Additionally, the system shall be designed with an Operator defined Scheduler to download these databases on a daily basis to use as a backup in case the live feed is disrupted. Upon re-establishing a live/real time connection the system shall be programmed to revert back.

The System must produce printed reports detailing vehicle activity.

The System must maintain a vehicle record for each commercial vehicle passing the system.

Furnish the System vehicle record containing the following information about each commercial vehicle:

- Unique vehicle identifier
- Vehicle number
- Time and date stamp
- ALPR data
- Axle counts
- Vehicle classification
- Overall vehicle weight
- Maximum gross vehicle weight
- Vehicle length
- Error code
- Vehicle speed
- Axle record type
- ESAL or MEPDG value
- Screening decision
- Transponder ID from DSRC transponder
- Vehicle identification number from DSRC transponder
- Carrier ID from DSRC transponder
- Carrier ID (USDOT number) from CVIEW data
- Axle weights and
- Axle spacing
- Tire Pressure Anomaly

Interface the System to the CVIEW and FuelTaCS databases for receiving commercial vehicle data over a secured connection, as described below.

b. Screening Requirements

Automatically screen the PRISM status of the CMV carrier and vehicle to determine if a Federal out-of-service order has been issued against the carrier or if the vehicle has been targeted.

Automatically screen and retrieve the carrier safety information from the screening database and provide an alert when the Gross Vehicle Weight exceeds the registered license weight.

Automatically screen against North Carolina's FuelTaCS database of carriers who have delinquent fines.

Automatically screen the NCIC database of vehicles which have been reported stolen.

Uniquely display each vehicle record including all associated roadside sensor data.

Maintain an operator-defined hot list of carriers regardless of their weight or safety credential status.

Include a carrier hot list with an active date range for each entry defining the period in which the entry is valid.

Include the following information on the carrier hot list:

- Carrier ID.
- License Plate data.

- USDOT numbers.
- Comments – the user can enter what action to take or any other information that would be useful.
- Start date – when the hot list status starts.
- End date – when the hot list status ends.
- Jurisdiction – identifies registering jurisdiction.

Maintain an operator-defined hot list of vehicles regardless of their weight or safety credential status.

Program the System to maintain a local database of carrier snapshot data received from CVIEW, PRISM, and the FuelTaCS systems.

Program the System to permit the operator to override each specific credential/safety screening check on a carrier by carrier basis.

c. Display Requirements

Program the System to provide a Screening Results Display/snapshot screen that permits the operator to do the following:

- View the ALPR system data.
- View the credentials and safety scores that were used in screening a particular vehicle.
- Display which credentials and safety scores failed.
- Display which credentials and safety scores a vehicle is currently failing (if the operator requested updated snapshot data from CVIEW, the screening results may no longer be accurate).
- Search all system components by date, time and vehicle record and allow user-defined alarm notifications to be configured to meet multiple threshold levels.
- Specify which credentials and safety items to use to screen vehicles.
- Enable or disable each individual screening criteria.
- Enter a minimum/maximum allowable value to be used for each safety item while screening vehicles.
- Save a default configuration of screening criteria to be recalled at some point in the future.
- Quickly and easily return all credential and safety score screening criteria to their default values.
- Permit the operator to retrieve current vehicle and carrier snapshot data from the screening database, and store it in the local screening results database.

- View snapshot data retrieved from CVIEW for any requested vehicle or carrier.
- Restrict access to system functions with a user identification and password scheme. The adjustment of screening criteria in particular must be restricted to only personnel with the required privileges.
- Produce reports on vehicle data.
- Permit the operator to view all historical, vehicle data for any vehicle that has passed the System in the last three months.
- Edit each of the hot lists.

d. Reporting Requirements

Program the System to produce the following reports:

- CLASS BY HOUR: showing the count of vehicles in each class for each hour of the day
- CLASS BY DAY: showing the count of vehicles in each class for each day of the week
- SPEED BY CLASS: showing the count of vehicles in each speed range for each class of vehicle
- SPEED BY HOUR: showing the count of vehicles in each speed range for each hour of the day
- FRONT AXLES: showing the count of all front axles recorded within different weight ranges for each vehicle class
- SINGLE AXLES: showing the count of all single axles recorded within different weight ranges for each vehicle class
- TANDEM AXLES: showing the count of all tandem axles recorded within different weight ranges for each vehicle class
- TRIDEM AXLES: showing the count of all tridem axles recorded within different weight ranges for each vehicle class
- QUADREM AXLES: showing the count of all quadrem axles recorded within different weight ranges for each vehicle class
- GROSS VEHICLE WEIGHT: showing the count of vehicles in each Gross Vehicle Weight range for each vehicle class. Display the total GVW in a separate column
- ERRORS: showing the hourly count of vehicle display errors reported by the system
- TOTAL ESAL: showing the hourly summary of Equivalent Single Axle Loads for each vehicle class
- LANE COUNT: showing the count of vehicles in each class for each lane at the weigh station
- WEIGHT VIOLATION BY CLASS: showing for each vehicle class, the total vehicle count, the number of valid vehicles, the number of warning vehicles, the

number of violating vehicles, what percentage of the total was violating, the number of single axle violations, and the number of tandem axle violations

- **WEIGHT VIOLATION BY HOUR:** showing for each hour of the day, the total vehicle count, the number of valid vehicles, the number of warning vehicles, the number of violating vehicles, what percentage of total was violating, the number of single axle violations, the number of tandem axle violations and the number of GVW violations
- **WEIGHT VIOLATION COUNT:** showing for each hour of the day and each vehicle's class, the total vehicle count, the number of valid vehicles, the number of warning vehicles, the number of violating vehicles, what percentage of total were violating, the number of single axle violations, the number of tandem axle violations and the number of GVW violations

Program the System to produce specific reports that are based on data stored in the System:

- ALPR system data
- Number of vehicles traveling down each lane
- List of a carrier's vehicles passing the System during a specific time period, include when the vehicle passes the weigh station.
- Report from the "Confirmation Database" to evaluate system Sort Decision against the message provided to the In-Cab device by the AVI Service Providers"

e. Credential Enforcement Screening Requirements

The System must screen data from the CVIEW, SAFER, FuelTaCS, PRISM, and/or the NCIC systems currently in use by the NCSHP for credentials, safety and oversize/overweight enforcements listed below using the field data collected by the System. Ensure that the screening tool allows an operator to enable and disable the screening tools in the setup screen and the vehicle display screen.

At a minimum, include the following Credential Enforcement Screening Requirements:

- UCR Credentials
- HazMat Credentials – As a minimum, Identify the status of the carrier's registration credentials.
- IRP Credentials
- IFTA Credentials
- Safety Enforcement
- Oversize/Overweight Enforcement based on WIM data

3. External Interface Requirements

Provide a secure connection to allow the exchange of carrier and vehicle snapshot data in XML format from the State CVIEW system to the System.

Program the System to continue normal operation while receiving and processing files from the state CVIEW system and to support the processing of data at a rate to be determined, but which may be as often as an update every 15 minutes.

Provide a secure connection to allow the exchange of data in XML format from the PRISM, FuelTaCS, and NCIC to the System.

C. Operator Interface and System Controls

Ensure the system allows operators to view and control system operations through a LAN connection on their laptops or desktop computers. Using laptops or desktop computers, users will view vehicle data collected by each of the detectors and sensors in the system, the ALPR system, view and print reports, identify and respond to system alarms, and view still shot images of violating vehicles. At a minimum, the user display screens will allow the users to view the following information:

a. ALPR Data

Display vehicle records for the lane collecting data in the System. Program the system to show data and images collected.

b. Vehicle Data

Program the system to show data collected by the in-road detectors.

c. Vehicle Data

Program the system to show data collected by the ATM detectors.

d. Individual Vehicle Data

Program the System to display all information on a specific vehicle collected by the System. Program the System to allow operators to view snapshot photographs taken of vehicles via the overview camera.

e. Alarms

Program the system to allow operators to review alarms reported by the System and to allow operators to view snapshot photographs taken by the overview CCTV camera and the ALPR system of violating vehicles.

f. Summary Data

Program the system to allow operators to review summary data for each travel lane in the system. Have the summary data include total vehicle counts, vehicle classifications, vehicle speeds, gross vehicle weights (by category), axle weights and system violations (by type including weight, length, over-height (if applicable), tire pressure anomalies and credentials).

D. System Reports

The software must provide the following reports:

- Targeted as Federal out-of-service

- Carrier safety information
- Delinquent fines
- Reported as stolen
- Violations
- Classification (by hour, by day of the month and by day of the week)
- Vehicle speed (by class and by hour)
- ESALs (Equivalent Single Axle Loads) or MEPDG (Mechanistic-Empirical Pavement Design) by Hour
- Weight violations (by hour and by class)
- Weight violations count
- Truck count (by day of the month and by day of the week)
- Truck count by gross vehicle weight
- Vehicle speeds (by class and by hour)
- System errors (errors reported by system diagnostics)
- Vehicle lengths
- ALPR records

E. Historical Search Queries

The software must provide an operator the ability to perform historical data queries. Furnish the ability to view the results of historical database queries on the user's screen and to optionally print the database queries in a format acceptable to the Department.

The software must maintain a configurable number of months, minimum of 3 months, maximum of 12 months, of historical vehicle data for analysis and reporting. Purge this data from the system on a weekly basis (i.e., once per week the software will examine all of the vehicle records to determine which are older than the specified expiry period and delete them from the database). Furnish software allowing purging to be configurable by day of week and time of day by a system administrator. Confirm purging schedule with the Engineer.

The historical search options shall include the ability to set selectable date/time range, search criteria and filter conditions as follows:

- Search criteria includes:
 - Transponder number
 - Carrier name
 - Statuses set
 - Statuses not set
 - License plate & jurisdiction
 - Minimum GVW

- Minimum length
- % of max GVW
- Sort decision
- Sign decision
- USDOT number
- Vehicle class range
- Error set, or no error
- Lanes
- Vehicle record number
- VIN
- Filter conditions include:
 - Speed change
 - Unequal axle count
 - Tailgating
 - Wrong lane (i.e. volunteer reporting to station after being told to bypass)
 - Running scale
 - Not WIM lane (i.e. a commercial vehicle in the AVC lane)
 - Overlength
 - Over GVW
 - Overheight (if applicable)
 - Random
 - Speed limit
 - Credential fail
 - Kingpin violation (when applicable)
 - Credential hotlist
 - Ramp backup

Furnish the ability to view the results of historical search on the user's screen and to optionally print the historical search results list.

12.2. MATERIAL

Provide reproducible and installable copies of all software packages on CD-ROM including third party applications such as database, report generation etc. if applicable. Provide an auto-setup executable file or application that will install all software packages with minimal human interaction. All initial software system configurations shall be handled by the auto-setup application to the extent possible

Furnish perpetual license for all software packages used throughout the system. Furnish all software pre-installed on controller hardware prior to installation.

Controller hardware used to run the software described in this Project Special Provision is accounted for in other specifications in this document.

Provide mockups for all operator screens and system reports prior to generating/developing the screens and reports. Make changes to the report formats and screen views based on the Department’s comments.

12.3. MEASUREMENT AND PAYMENT

Central Control Software will be paid for at the contract lump sum price. No measurement will be made for the interface with the individual components of the system, including but not limited to the WIM systems as these will be considered incidental to furnishing and installing the Central Control Software. No measurement will be made for the interface with the individual components of the system, including but not limited to the ALPR, AVI , ATM, inductive loops, and camera systems as these will be considered incidental to furnishing and installing the Central Control Software. No measurement will be made for software licenses and updates required during the System Warranty as these will be considered incidental to furnishing the System Warranty.

Payment will be made under:

Pay Item	Pay Unit
Central Control Software	Lump Sum

13. TESTING & ACCEPTANCE

13.1. DESCRIPTION

A. General

Test all equipment, cable and software furnished and installed under this Project. Conduct all testing in the presence of the Department. The Department reserves the right to perform any inspections deemed necessary to assure that the equipment conforms to the requirements required in these Project Special Provisions.

At a minimum, test the following items:

- ALPR
- WIM
- ATM
- CMS
- Camera equipment, including frame grabber
- Infrared Illuminators

Develop detailed test procedures and obtain Department approval before the tests are conducted. Allow 20 days for the review period. Demonstrate through the test procedures that all requirements defined in these Project Special Provisions, including but not limited to, functional/system performance requirements, electrical requirements, data

transmission/communication requirements, safety/password requirements, and interface requirements with other components of the System have been satisfied. During the testing, perform additional tests if the Department's representatives request such to confirm proper operation.

Compare the results of each test with the requirements specified in the Project Special Provisions and with the approved test procedures. Failure to conform to the requirements of any test will be considered as a complete failure and the equipment and software will be rejected. Make any corrections deemed necessary at no additional cost to the Department. Assume total responsibility for documenting the results of such tests and furnishing the documented test results to the Department.

The approval of test procedures and witness of such test will not relieve the Contractors of his responsibility to provide a completely acceptable and operating system that meets all requirements of these Project Special Provisions.

B. Operational Test

Conduct approved tests on all installed equipment and software. Perform these tests in the presence of the Department. The following separate tests are required:

- ALPR System (including the Overview Camera)

Use real vehicles to test the system. Test the system in day and night conditions over a 3 hour period each in full daylight and dusk to night.

- AVI System

Use real vehicles to test the system. Test the system to ensure proper operation with commercial vehicles using the transponder system.

- WIM System

Test the systems performance as described in the WIM System Specifications located in these Project Special Provisions.

- ATM System

Test the systems performance as described in the ATM System Specifications located in these Project Special Provisions.

- CMS System

Ensure during other tests that the CMS displays the correct message and that the dimming features of the sign function properly.

C. Observation Period

After all equipment and software comprising the System has been accepted, satisfactory completion of the System acceptance test, and after training is complete, a 30-day observation period begins. The NCSHP will be responsible for operating the system during this period.

The following conditions apply to the observation period:

During the observation period, ensure the system monitors all components of the System and performs all functions described in these Project Special Provisions.

If any hardware item provided under these Project Special Provisions fails, repair the item at the Contractor's expense. If a failure occurs, the observation period would begin for the full 30-day duration.

During the observation period, have personnel responding to the problem within 24 hours after being notified of a problem by the Department. Within two days, have personnel on-site, with replacement equipment, addressing and correcting any issues with the System.

If another problem is discovered, such as erroneous computations, the observation period will be suspended until the Contractor corrects the problem at his expense. Once the problem has been eliminated, the observation period will resume. If the problem was one that affected the entire system rather than just one field device, the observation period will not resume until the system has performed properly for at least 72 hours. During this 72-hour period, demonstrate that any corrections or modifications made are valid, that the problems which restricted system operation have been corrected, and no new problems have resulted from the changes.

Total system "down time" may not exceed 30 hours during the observation period. Down time includes the time of suspension of the observation period as described in the previous paragraph. Down time is a condition caused by failure of the central equipment, system software, field equipment or communications system, which causes the system to cease normal operation. If total system "down time" exceeds 30 hours, a full duration of the observation period will begin again.

Terminate the observation period if 10% or more of the total quantity of any individual hardware item fails. Commence a full observation period for that hardware item upon the repair of a failed hardware item.

Upon successful completion of the observation period, the Department will accept the system, providing that all errors and omissions in Contractor-supplied documentation have been corrected and all other requirements of the Project Special Provisions have been met. Final acceptance will be in writing from the Department.

The 30-day observation period is not considered part of the work to be completed by the project completion date.

13.2. MEASUREMENT AND PAYMENT

There will be no direct payment for the work covered in this section as it will be considered incidental to the work required herein.

14. DOCUMENTS AND SUBMITTALS

14.1. GENERAL

The submittals listed below complement requirements stated throughout these Project Special Provisions and do not replace them.

Submit for approval catalog cuts and/or shop drawings for materials proposed for use on the project. Allow 20 days for review of each submittal. Do not fabricate or order material until receipt of Engineer’s approval.

Submit 1 copies of each catalog cut and/or drawing and show for each component the material description, brand name, stock-number, size, rating, manufacturing specification and the intended use (identified by labeling all components with the corresponding contract line item number). Present the submittals neatly arranged in the same order as the contract bid items.

Electronic submittals of catalog cuts and drawings may be accepted in lieu of hard copies.

One hard copy and an electronic (PDF) copy of reviewed submittals will be returned to the Engineer.

Supplement each drawing by material cut sheets and parts list. Provide parts list in the following format:

Part ID	Source	Part number	Alternate source	Alternate Part number	Description

14.2. DRAWINGS AND DOCUMENTS’ CERTIFICATION

Provide plans for the equipment cabinet, mounting description, and shop drawings with documentation and calculations approved by a Professional Engineer registered in the state of North Carolina that bears his/her signature, seal, and date of acceptance (where applicable).

14.3. MECHANICAL

This set of submittals includes, but is not limited to, material specifications and parts list.

14.4. ELECTRICAL

This set of submittals includes, but is not limited to, material specifications, parts list, and wiring diagrams within the equipment cabinet and any electrical service equipment required.

14.5. ELECTRONICS

This set of submittals includes, but is not limited to, material specifications, parts list, and schematic diagrams for all electronics assemblies and sub-assemblies used in the system.

14.6. BLOCK DIAGRAMS AND USER MANUALS

Provide block diagrams with the material submittals along with user and Instruction Manuals prior to training for approval.

14.7. PROPRIETARY PARTS

Provide a list of all proprietary, non-warranty electronic component parts, along with its associated cost, at which the vendor will supply for a three year period after final project acceptance. Failure to supply this required proprietary part and price information may be grounds for rejection of the submitted item due to incomplete information. A part is considered to be a proprietary part if it is designed and manufactured exclusively for a specific hardware item and is not commercially available for sale to the general public. In addition, any item that is sole source (e.g. available only from the vendor or from a single known manufacturer) is considered to be proprietary and should be identified along with the sole source. Identify and quote a price for parts that are no longer being manufactured and identify the item as one that is no longer manufactured.

14.8. PROTECTION OF MANUFACTURER'S PROPRIETARY INFORMATION

NCDOT will use the above documentation (schematics, drawings, software, firmware, manuals, etc.) exclusively for the following purposes: diagnosing and performing repairs on malfunctioning equipment, equipment circuit boards, and malfunctioning systems; operational test of repaired equipment, circuit boards, systems; and performing authorized upgrades to equipment, circuit boards, and software supplied under this contract. NCDOT will not use or copy devices or software for any purpose other than diagnosis, repair, and testing or to perform authorized firmware or software upgrades.

Upon notification by the manufacturer, the Department agrees not to divulge any proprietary or otherwise confidential information contained in the above required documentation. NCDOT agrees to protect and secure any proprietary documentation identified by the manufacturer as proprietary or confidential. Upon request by the manufacturer, NCDOT agrees to sign a binding non-disclosure agreement with the manufacturer or other business that is providing documentation it considers proprietary or otherwise confidential.

14.9. MEASUREMENT AND PAYMENT

No measurement will be made of this work as these will be considered incidental to the work required herein.

15. TRAINING**15.1. DESCRIPTION**

Provide a one day, minimum of 6 hours training covering the operation of the equipment and software being supplied as part of this project for up to 2 sessions, 10 people per session. Enlist

manufacturer's representatives or personnel approved by the Department to conduct the training course.

Include both classroom instruction and practical experience on the System operations. Provide both an introduction to the system and the theory of its operation in the training session. At a minimum, include the components of the system, central software operation, and the configuration of the central and field equipment. Provide each trainee with hands-on experience with the computer and controller system. The course should cover the operation of all software provided in this project. The course should also cover the proper operating techniques. The training shall include:

- System overview supplemented by a detailed block diagram,
- Data-flow diagram,
- Major system's components identification and operation,
- System's theory of operation,
- System administration
- Overview of major system software packages and dependencies,
- Software installation and configuration
- Hardware/software Error codes identification and interpretation
- Troubleshooting tips and procedures
- System startup and reboot
- Software/firmware update procedure
- Warranty claim procedure
- Technical support contact information for regular and after-hour business

At least 40 days prior to commencement of each training course, submit detailed course curriculums, draft manuals and handouts, and resumes of the instructors. The Department will review and request modifications of that material as appropriate.

Conduct all courses on weekdays at times to be specified by the Department. The Department will furnish the training facility.

Provide training material generated for each course including manuals and other handouts for each attendee that serves not only as subject guidance, but as quick reference material for future use. The course must utilize, to the greatest extent possible, the documentation described in these Project Special Provisions. Use the training courses to familiarize the students with all documentation that has been provided as part of this project. Deliver all course material, in reproducible form, to the Department immediately following course completion.

Video record each training session and deliver the DVD to the Department at the conclusion of the training.

15.2. MEASUREMENT AND PAYMENT

Training will be measured and paid for at the contract lump sum price for work detailed in this section. No measurement will be made for instructors, material, and other items required for the training as these will be considered incidental.

Payment will be made under:

Pay Item	Pay Unit
Training	Lump Sum

16. SYSTEM WARRANTY

16.1. DESCRIPTION

A. General

Unconditionally warrant the performance of all systems and subsystems for a period of three (3) years from the successful completion of the 30-day observation period.

Provide the necessary labor, parts, materials, tools, test equipment and facilities required to address any warranty issues related to the system after it is installed.

The warranty coverage will be renewable on an annual basis for an additional five (5) years by mutual consent of both parties. Develop the cost for the renewable option through mutual agreement of both parties.

B. Scope of Warranty

Ensure the components of all systems are in good working condition and take appropriate action to remedy performance issues. Good working condition is defined under this project as equipment meeting the system specifications for acceptance, accuracy, and tolerances as defined in these Project Special Provisions.

Provide scheduled diagnosis and repair service and/or respond to repair malfunctioning equipment as outlined below:

- Complete scheduled preventative maintenance, diagnostic testing, and repairs (if needed) at six (6) month intervals. Preventative maintenance shall be completed in accordance with the equipment manufacturer’s recommendations and standard practices. Provide routine checks on all major systems, system components and ancillary equipment and take any corrective action to ensure proper long-term operation. The maintenance shall include, but not be limited to the following activities:
- Check installation of grout and sealant for loops and sensors. Repair or replace as required.
- Perform visual inspection of detector housings and repair or replace as required.
- Clean the interior and exterior of the System electronics, power supplies, controllers and communications equipment in the equipment cabinet. Repair or replace as required.
- Check condition of all System cables and connectors, terminal strips, and back-up batteries. Repair or replace as required.

- Perform visual inspection of the equipment cabinet. Repair as required.
- Test and visually inspect equipment cabinet ventilation fan and filter, thermostat, light and fused switch. Repair or replace as required.
- Test and verify control and sequence of operation of interface components.
- Test and verify all components of the System. Adjust, repair or replace as required.
- Provide one (1) session of a System operations course one (1) month prior to the end of the warranty period. The sessions should be a minimum of 5 hours in length. Include in the refresher course a hands-on demonstration of system functionality. The Department will provide facilities for the refresher course.
- Provide emergency repair services, on an as needed basis. The response time for emergency repair service shall be as follows:
 - 24 hours to acknowledge request
 - 48 hours to respond to request
 - 7 business days to repair any roadside equipment located in the equipment cabinet including any auxiliary support equipment located in either the equipment cabinet or in the Scale House and return System functionality. This excludes sensors located in the actual roadway as these items will require scheduling for lane closures and obtaining the proper equipment to replace the failed sensor. The repaired System shall function to the specifications defined in these Project Special Provisions for acceptance, accuracy, and tolerances. Document all activities performed under the warranty agreement, both preventative and emergency maintenance, in an electronic database that facilitates sorting the records by time period and/or device type.
- Submit for approval by the Department a maintenance and repair database proposal that tracks, at a minimum, the following events and information:
 - Date and time of scheduled preventative maintenance
 - All preventative maintenance activities completed.
 - All parts repaired or replaced during preventative maintenance.
 - Technician completing preventative maintenance work.
 - Repair history for all systems and subsystems
 - Date and time of emergency maintenance request
 - Date and time of technician on site to respond to emergency maintenance request.
 - Description of defective equipment or malfunctioning operations during emergency maintenance requests.

- Technician responding to emergency maintenance request.
- Corrective actions taken during emergency maintenance request.
- Date and time that operations restored after emergency maintenance request.
- Model and serial number of any equipment repaired and replaced during emergency maintenance request.

Provide both electronic and hardcopy records of the updated database within ten (10) days of each maintenance activity.

Document all itemized material, equipment, and labor costs incurred to maintain the System during the warranty period. The cost records shall differentiate between preventative and emergency maintenance costs. Provide these records to the Department on a semi-annual basis within fifteen (15) days after the end of the six-month period. These records are for informational purposes only and will not be used as a basis of payments to the Contractors. Ensure that these cost records are complete and accurate. The Department may perform an audit to verify the accuracy of the cost records.

Provide software upgrades for all new software revisions completed during the warranty period at no additional cost to the Department. Identify a cutover procedure for all software upgrades, which ensures that there is no interruption of service or failure of any operation as a result of upgrading the software. Also develop a contingency plan to re-install older versions of software, by the Contractors (at no additional cost to the Department), if any operation fails or any system degradation is encountered as a result of a software upgrade.

C. Warranty Evaluation

Two (2) months prior to the end of the warranty period, the Department will inspect the system thoroughly for potential system defects in presence of the contractor. This inspection will be done by the Department's personnel or representative. Assist the Department's personnel or representative during this inspection. Two (2) weeks prior to the inspection, provide a summary report of all preventative and emergency maintenance records. This report shall document and certify that all components have been maintained fully in accordance with the Project Special Provisions and manufacturer recommendations and that all manufacturer warranties that extend beyond the Contractor's warranty have been in no way compromised.

Following the inspection, the Department will determine if there are any unresolved defects with equipment hardware or software. The Department will provide a punch list to the Contractors for the replacement or repair of defective components or repairs to system software. Replace or repair equipment and software identified in the punch list within thirty days of receipt of the punch list. Also replace any components whose manufacturer warranty has been voided or compromised by any action/inaction on the part of the Contractors. Document all repairs or replacements completed, providing the documentation to the Department within two (2) months of receipt of the punch list.

D. Correction of Work

Re-execute any work that fails to conform to the requirements of the Contract and that appears during the process of the work. Remedy any defects due to faulty materials or workmanship which appear within the warranty period. The provisions of this article apply to work done by subcontractors as well as direct employees of the Contractors.

E. Traffic Control

Traffic control for all maintenance activities requiring lane closures will be provided by NCDOT in accordance with NCDOT standards.

16.2. MATERIALS

All replacement materials and equipment provided under the warranty shall meet or exceed the requirements as defined in the Plans and the Project Special Provisions. If during the warranty period a part or component of a system or subsystem is no longer available to the Contractors, obtain equipment which ensures that the systems and subsystems meet or exceed the specifications and functionality as defined in these Project Special Provisions.

Provide all labor, tools, test equipment and other equipment necessary in the maintenance, repair and replacement of all components furnished under this contract during the warranty period.

16.3. CONSTRUCTION METHODS

In replacing equipment under the maintenance agreement, meet or exceed the construction requirements for each component as defined in the Plans and Project Special Provisions.

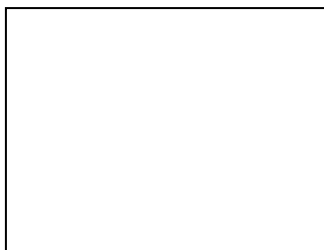
16.4. MEASUREMENT AND PAYMENT

System Warranty will be measured and paid for at the contract lump sum price for System Warranty. The System Warranty is not part of the Contract Time.

No measurement will be made for providing labor, parts, materials, shipping, vehicles, tools, test equipment, documentation and facilities as these will be considered incidental to furnishing the System Warranty.

Payment will be made under:

Pay Item	Pay Unit
System Warranty	Lump Sum



UPGRADE EXISTING I-74 SOUTHBOUND WEIGH STATIONS WITH AUTOMATED VEHICLE IDENTIFICATION SYSTEM, WEIGH-IN-MOTION, TIRE MONITORING SYSTEM, AUTOMATED LICENSE PLATE READER, AND OTHER DEVICES PROJECT SPECIAL PROVISIONS

This seal is for sections 17-22 only.

Not Valid Unless Signed

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17. WORK ZONE TRAFFIC CONTROL FOR INTERSTATE/FREEWAY ITS INSTALLATION

17.1. GENERAL REQUIREMENTS

Maintain traffic in accordance with Divisions 10, 11 and 12 of the *2018 Standard Specifications* and the following provisions:

Install Work Zone Advance Warning Signs in accordance with Standard Drawing No. 1101.01 of the *2018 Roadway Standard Drawings* prior to beginning any other work.

When personnel and/or equipment are working within 15 feet of an open travel lane, close the nearest open shoulder using Standard Drawing No. 1101.04 (Shoulder Closure on Divided Facilities) of the *2018 Roadway Standard Drawings* unless the work area is protected by barrier or guardrail or a lane closure is installed.

When personnel and/or equipment are working on the shoulder adjacent to a divided facility and within 10 feet of an open travel lane, close the nearest open travel lane using Standard Drawing No. 1101.02 of the *2018 Roadway Standard Drawings*.

When personnel and/or equipment are working within a lane of travel of a divided facility, close the lane using Standard Drawing No. 1101.02 of the *2018 Roadway Standard Drawings* or as directed by the Engineer. Conduct the work so that all personnel and/or equipment remain within the closed travel lane. Perform work only when weather and visibility conditions allow safe operations as directed by the Engineer.

A. Time Restrictions for Lane Closure and Road Closure Activities

All lane closure and road closure activities shall be performed in compliance with the day and time restrictions listed and defined in this Contract.

Any activities performed outside of these requirements will be subject to the liquidated damages unless approved by the Engineer prior to beginning the activity.

The Contractor may place/pre-stage all required signs and traffic control devices necessary for lane closures prior to the closure time as approved by the Engineer. However, flashing arrow boards and changeable message signs shall not indicate lane closure information until 30 minutes or less prior to the installation of the lane closure. Typical pre-staging times are 1 hour for a single lane closure and 2 hours for double and triple lane closures. The travel lane(s) are to be closed at the prescribed times defined in this Contract. When available, law enforcement should be onsite to shadow workers during pre-staging activities.

For removal, the lane(s) must be reopened in compliance with the times defined in this Contract. It is acceptable to remove the signs and traffic control devices from the shoulder/staging area after the lane(s) are reopened to traffic. All electronic lane closure messages and flashing arrow displays shall be off once lanes are opened. When available, law enforcement should remain on the project while workers remove and secure their signs and devices.

B. Work Zone Speed Limits and Digital Speed Limit Signs (DSLs)

All 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. No speed limit messages/signs shall be installed prior to receiving a signed ordinance.

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.

When lane closures are in effect, implement a Work Zone Variable Speed Limit Reduction as stated in the ordinance and in accordance with the attached provision and drawing.

Use Digital Speed Limit Signs (DSLS) to display the work zone speed limit as shown in the attached special provision and drawing. The speed limit shall be continuously displayed on the digital speed limit signs.

The Contractor will 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 before the speed limit is changed.

When the variable speed limit reductions are in effect, cover or remove any existing speed limit signs located within the active work area that conflict with the variable speed limit reduction.

The speed limit shall be returned to the existing speed limit when the lane closure is removed and traffic is returned to the existing pattern.

C. Connected Lane Closure Devices

Furnish and install Connected Lane Closure Devices that transmit the location of the lane closure to navigational companies and the Statewide Transportation Operations Center (STOC).

D. Work Zone Presence Lighting and Sequential Flashing Warning Lights

Provide the following for nighttime work activities in accordance with attached drawing and special provisions:

1. Furnish and install Work Zone Presence Lighting to supplement the Contractor's portable construction and equipment lighting for the purpose of alerting motorist to the existence of an active work zone and to encourage compliance with the reduced work zone speed limit. See attached special provision.

2. Furnish and install Sequential Flashing Warning Lights on drums used for merging tapers to assist motorists in determining which direction to merge and to decrease late lane merging. See attached special provision.

E. Law Enforcement

Use two (2) off duty, uniformed law enforcement officers and official law enforcement vehicles, equipped with blue lights during lane closure operations and two (2) additional law enforcement officers for ramp/loop closures when both operations occur simultaneously.

Use law enforcement officers to assist in the shadowing of workers during the installation and during the removal of lane closures.

Law enforcement vehicles shall not be parked within the buffer space. When possible, position one law enforcement officer downstream of the other to conduct enforcement operations. When space is confined, conduct enforcement outside of the lane closure area.

17.2. TEMPORARY TRAFFIC CONTROL (TTC)

Refer to Standard Drawing No. 1101.02, 1101.11, 1110.01, 1110.02, 1115.01, 1130.01, 1135.01, 1165.01, and 1180.01 of the *2018 Roadway Standard Drawings* when closing a lane of travel in a stationary work zone.

Drums are recommended for all lane closure operations occurring at night. However, if skinny drums are used at night, they shall be placed every 20' in the tangent sections of lane closure operations. Skinny drums shall not be used for upstream tapers.

When covering work zone signs, use an opaque material that prevents reading of the sign at night by a driver using high beam headlights. Use material which does not damage the sign sheeting.

17.3. TRAFFIC OPERATIONS

F. Project Requirements:

Failure to comply with the following requirements will result in a suspension of all other operations:

1. Prior to the commencement of construction activity, the Contractor shall submit a written construction sequence for traffic control and construction lighting to the Engineer at the first pre-construction meeting and the sequence must be approved before closing a lane of traffic. The Contractor and Engineer will coordinate with the State Work Zone Engineer at 919-814-5037 for additional traffic control guidance, as necessary.
2. The maximum length of lane closure is 1 mile unless permitted otherwise by the Engineer.
3. Perform work only when weather and visibility conditions allow safe operations as directed by the Engineer.
4. Obtain written approval of the Engineer before working in more than one location or setting up additional lane closures.
5. The Contractor on this and any adjacent projects, or subcontractors working within this project shall coordinate lane closure location, type, and direction with the Engineer to best maintain lane continuity through the limits of this and adjacent projects.

6. Operate equipment and conduct operations in the same direction as the flow of traffic. Maintain vehicular access in accordance with Article 1101-05 of the *2018 Standard Specifications*.
7. Provide appropriate construction lighting in accordance with Section 1413 of the *2018 Standard Specifications*.
8. Do not install proposed structures or equipment that are within 30 feet of an open travel lane prior to the installation of proposed guardrail.

G. Work Zone Signing:

1. Description

Install Work Zone Advance Warning Signs in accordance with Standard Drawing No. 1101.01 of the *2018 Roadway Standard Drawings* prior to beginning any other work.

Install and maintain signing in accordance with Divisions 11 and 12 of the *2018 Standard Specifications*.

2. Installation

All stationary Advance/General warning work zone signs require notification to existing Utility owners per Article 105-8 of the 2018 Standard Specifications and Special Provision SP1 G115 within 3 to 12 full working days prior to installation.

Install all Advance/General warning work zone signs before beginning work. If signs are installed more than seven (7) calendar days prior to the beginning of work, cover the signs until the work begins. Install each work zone Advance/General warning sign separately and not on the same post or stand with any other sign except where an advisory speed plate or directional arrow is used.

All sign locations to be verified by the Engineer prior to installation. Once the signs have been installed and accepted, any sign relocations requested by the Department will be compensated in accordance with Article 104-7. Any additional signs other than the ones required in this provision or attached drawings will be compensated in accordance with Article 104-7.

If there is a period of construction inactivity longer than 14 calendar days, remove or cover advance/general warning work zone signs. Uncover advance/general warning work zone signs no more than 7 calendar days before work resumes.

All other operations may be suspended upon failure to comply with the above requirements. Such suspended operations would not be resumed until the above requirements are fulfilled.

3. Sign Removal

Once the project is substantially complete, as determined by the Engineer, it is acceptable to remove the Stationary Work Zone Signs. Any remaining punch list items requiring traffic control are to be completed with portable work zone signing.

Stationary Work Zone Sign removal is a condition of final project acceptance.

4. Lane Closure Work Zone Signs

Install any required lane closure signing needed during the life of the project in accordance with the Standard Drawing No. 1101.02, 1101.11 and 1110.02 of the *2018 Roadway Standard Drawings*.

18. LUMP SUM PAYMENT FOR TRAFFIC CONTROL:

18.1. General

The Contractor shall provide, install and maintain all traffic control devices and maintain traffic on I-74 in accordance with the Work Zone Traffic Control for Interstate/Freeway ITS Installation Special Provision during construction or as directed by the Engineer.

The lump sum price bid for traffic control shall include labor, tools, equipment, and incidentals to furnish, install, maintain, and remove the following:

- Work Zone Signs (Stationary)
- Work Zone Signs (Portable)
- Flashing Arrow Board
- Portable Changeable Message Signs
- Drums
- Skinny Drums
- Truck Mounted Impact Attenuator
- Law Enforcement

18.2. Basis of Payment

Refer to the respective Sections of Division 11 and 12 of the 2018 Standard Specifications for the satisfactory installation and removal of temporary traffic control devices.

Partial payments will be made on each payment estimate based on the following: Fifty percent of the contract lump sum price bid will be paid on the first monthly estimate and the

remaining 50% of the contract lump sum price bid will be paid on each subsequent estimate based on the percent of the project completed.

Digital Speed Limit Signs, Connected Lane Closures, Sequential Flashing Warning Lights, and Work Zone Presence Lighting are paid separately in accordance with their respective special provisions.

Pay Item	Pay Unit
Traffic Control	Lump Sum

19. CONNECTED LANE CLOSURE DEVICES:

19.1. Description

Furnish, install, operate, maintain, relocate, and remove connected lane closure devices for use on Interstate and Freeway lane closures. The purpose of a Connected Lane Closure System (CLCS) is to transmit real-time information of active lane closures on Interstate and Freeways for use by the State Transportation Operations Center (STOC), Regional Transportation Management Centers (TMCs), and 511 systems; and for third party vendors (Mapping, Navigation, Connected Vehicles, etc.) to identify and provide advanced notification of active lane closures to approaching motorists.

19.2. Materials

The connected lane closure devices shall be designed and built to transmit the location of the real-time lane closure from the START to the END such that the full length of the lane closure is known. . The information transmitted shall be approved by each entity, conform to the current version of the USDOT’s Work Zone Data Exchange (WZDx) specification and be publicly 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. When the lane closure is removed, and the flashing arrow board turned off or changed to caution mode, the connected device shall automatically turn off simultaneously and its location shall no longer be transmitted. The device shall also 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 to the motorists.

The second connected device representing the END location shall be installed on a crashworthy (e.g. NCHRP 350 or MASH-16) 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 that 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. The second connected device representing the END location may be created virtually by a connected flashing arrow board.

The devices shall have battery life sufficient to maintain operation for the duration of the lane closure or have the ability to be recharged without deactivating the device or impacting the location of 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.

19.3. Construction Methods

Connected lane closure devices shall be used on all lane closures on freeways and interstates throughout the project.

A START and END location shall be established 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, and 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 be transmitting if equipped with connected devices. Subsequent lane closures occurring downstream of where all lanes have been reopened and 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.

Once installed, the Contractor 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.

19.4. Technical Requirements

The connected devices shall be run continuously during any active lane closures for the length of the contract.

The GPS within the connected devices shall have a horizontal accuracy of 10 feet, 95% of the time.

The connected device information, including the location, transmission status, and battery status shall be transmitted within five (5) minutes of initiation and updated every thirty (30) minutes to the central server.

The contractor 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 format and include data for date, display direction, 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 Contractor and be available to the NCDOT for at least one (1) year after the contract ends. Information shall include timestamps, device name, flashing arrow mode, communication status, battery voltage and GPS location.

The battery voltage shall be collected at least once an hour. The information shall be stored and available for troubleshooting. The system shall transmit an alert 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 pair.

19.5. Measurement and Payment

Connected Lane Closure Devices will be measured and paid as the maximum number of connected devices acceptably placed and in use at any one time during the life of the project. Each lane closure system may be satisfied by one of the following:

- Two (2) connected lane closure devices; one connected to the flashing arrow board and the other on a crashworthy device at the downstream end of the lane closure.
- One (1) connected lane closure device connected to the flashing arrow board that can generate a virtual END location with 50' accuracy.

All devices for each system must be functioning properly to receive payment for the system. No payment will be made for a system until all devices are satisfactorily installed and operational at

the device and on the vendors dashboard. A copy of the device status reporting should be provided by the contractor every 2 weeks.

The price for each connected lane closure system will cover all material, labor, maintenance, relocation, removal, and communication costs required for the duration of the project.

Flashing Arrow Boards will be measured and paid in accordance with Section 1115.

Crashworthy devices (such as drums) used to mount the downstream connected lane closure device shall be considered incidental.

Pay Item	Pay Unit
Connected Lane Closure System	Each

20. WORK ZONE DIGITAL SPEED LIMIT SIGNS

20.1. Description

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.

20.2. 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 Sign equipment shall be on the NCDOT Approved Products List.

20.3. 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.

A. 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.

B. 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.

20.4. 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 Contractor will 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.

20.5. Measurement and Payment

Work Zone Digital Speed Limit Signs will be measured and paid as the maximum number of Work Zone Digital Speed Limit Signs satisfactorily installed according to the attached detail and properly functioning at any one time during the life of the project.

This includes all materials and labor to install, maintain and remove all the Work Zone Digital Speed Limit Signs.

Pay Item
Work Zone Digital Speed Limit Signs

Pay Unit
Each

21. WORK ZONE PRESENCE LIGHTING

21.1. Description

Furnish and install Work Zone Presence Lighting during nightly lane closures on multilane roadways with speed limits of 55 mph or greater.

21.2. 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.

21.3. Construction Methods

Work Zone Presence Lighting is permitted to be pre-staged (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 Lighting 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.

21.4. 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:

Light Output (Lumens)	Illuminated Fixture Area (Sq. Ft.)	AREA 1		AREA 2	
		# 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

21.5. MEASUREMENT AND PAYMENT

Work Zone Presence Lighting will be measured and paid as the maximum number of lighting units satisfactorily placed, accepted by the Engineer, and in use at any one time during the life of the project.

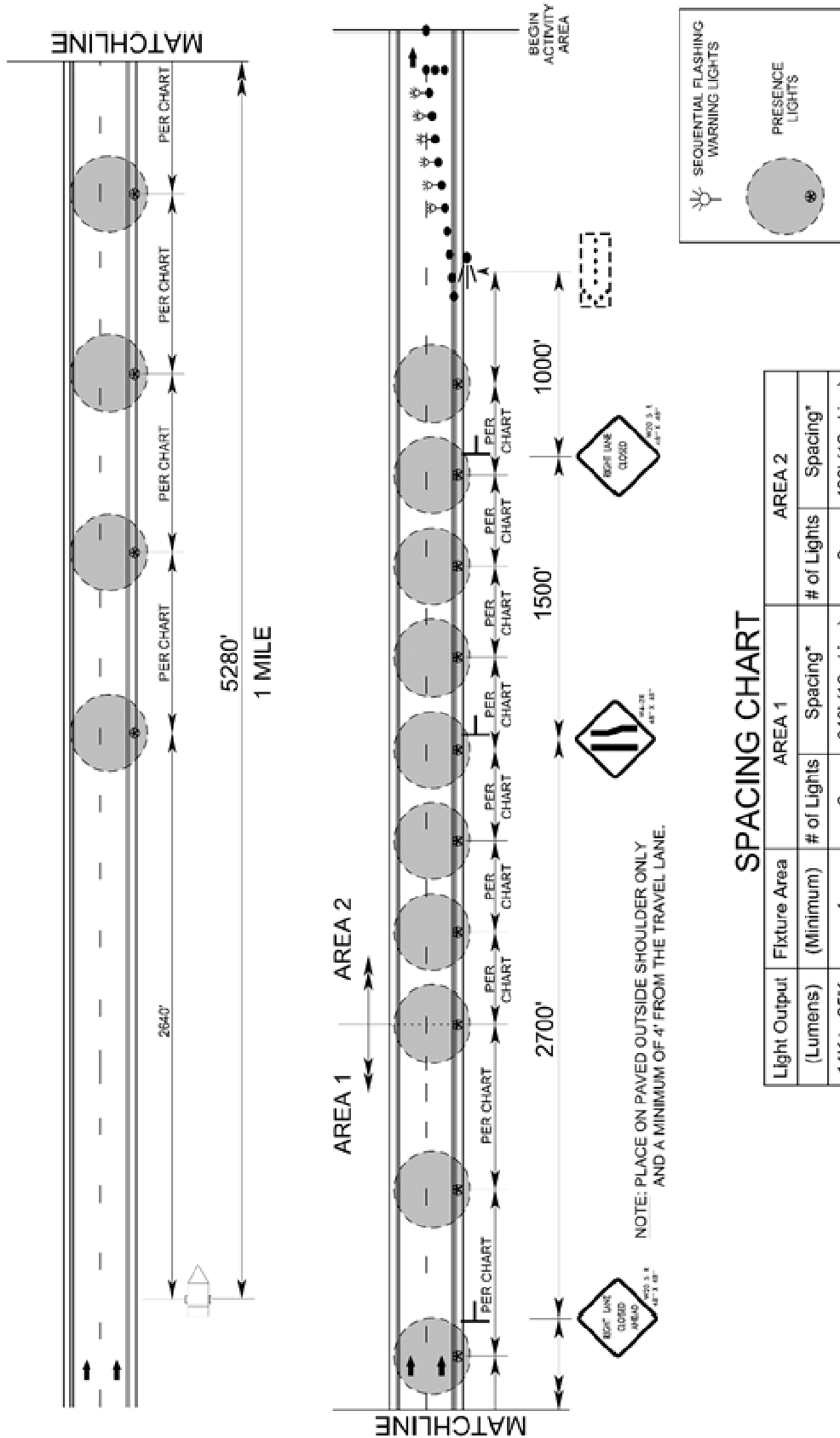
Relocation, replacement, repair, removal, and maintenance of Work Zone Presence Lighting units will be incidental to the work of this section. No measurement or separate payment will be made for power generators, batteries, or other power supply devices.

Pay Item

Work Zone Presence Lighting

Pay Unit

Each



SPACING CHART

Light Output (Lumens)	Fixture Area (Minimum)	AREA 1		AREA 2	
		# 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

NOTE: PLACE ON PAVED OUTSIDE SHOULDER ONLY AND A MINIMUM OF 4' FROM THE TRAVEL LANE.

22. SEQUENTIAL FLASHING WARNING LIGHTS

22.1. Description

Furnish, install, relocate, maintain, and remove sequential flashing warning lights on drums used for the merging tapers of nighttime lane closures.

Materials

Provide sequential flashing warning lights that meet all of the requirements for Type A warning lights in accordance with the Manual of Uniform Traffic Control Devices (MUTCD).

Each light unit shall be capable of operating fully and continuously for a minimum of 200 hours when equipped with a standard battery set.

Each light in the sequence shall be flashed at a rate of not less than 55 times per minute and not more than 75 times per minute. The flash rate and flash duration shall be consistent throughout the sequence.

The lights shall be weather independent and visual obstructions shall not interfere with the operation of the lights.

Use sequential flashing warning lights listed on the NCDOT Approved Products List.

22.2. Construction Methods

Use sequential flashing warning lights on all multilane roadways with speed limits of 55 mph or greater.

These lights shall flash sequentially beginning with the first light and continuing until the final light.

The sequential flashing warning lights shall automatically flash in sequence when placed on the drums that form the merging taper.

The number of lights used in the drum taper shall equal the number of drums used in the taper.

Drums are the only channelizing device allowed to mount sequential flashing warning lights.

The sequential flashing warning lights shall automatically sequence when placed in line in an open area with a distance between lights of 10 to 100 feet.

If one light fails, the flashing sequence shall continue. If more than 1 light fails, all of the lights are to be automatically turned to the “off” mode. Non-sequential flashing is prohibited.

When lane closures are not in effect, the sequential flashing warning lights shall be deactivated.

22.3. Maintenance

Periodically inspect sequential flashing warning lights. Replace any sequential flashing warning lights as needed.

22.4. Measurement and Payment

Sequential Flashing Warning Lights will be measured and paid as the maximum number of sequential flashing warning lights satisfactorily installed and properly functioning at any one time during the life of the project.

This includes all materials and labor to install, maintain and remove all the Sequential Flashing Warning Lights.

Pay Item	Pay Unit
Sequential Flashing Warning Lights	Each

County: SURRY

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
ROADWAY ITEMS						
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	4054000000-E	902	PLAIN CONCRETE SIGN FOUNDATIONS	1 CY		
0003	4060000000-E	903	SUPPORTS, BREAKAWAY STEEL BEAM	314 LB		
0004	4066000000-E	903	SUPPORTS, SIMPLE STEEL BEAM	930 LB		
0005	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) A	2 EA		
0006	4110000000-N	904	SIGN ERECTION, TYPE *** (GROUND MOUNTED) B	4 EA		
0007	4138000000-N	907	DISPOSAL OF SUPPORT, STEEL BEAM	1 EA		
0008	4141000000-N	907	DISPOSAL OF SUPPORT, WOOD	2 EA		
0009	4236000000-N	907	DISPOSAL OF SIGN, A & B (GROUND MOUNTED)	1 EA		
0010	4423000000-N	SP	WORK ZONE DIGITAL SPEED LIMIT SIGNS	2 EA		
0011	4424000000-N	SP	WORK ZONE PRESENCE LIGHTING	14 EA		
0012	4434000000-N	SP	SEQUENTIAL FLASHING WARNING LIGHTS	12 EA		
0013	4589000000-N	SP	GENERIC TRAFFIC CONTROL ITEM TRAFFIC CONTROL	Lump Sum	L.S.	
0014	4600000000-N	SP	GENERIC TRAFFIC CONTROL ITEM CONNECTED LANE CLOSURE SYSTEM	1 EA		
0015	7279000000-E	1715	TRACER WIRE	5,410 LF		
0016	7300000000-E	1715	UNPAVED TRENCHING (***** (1) 2"	4,625 LF		

County: SURRY

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0017	7300000000-E	1715	UNPAVED TRENCHING (*****) (2) 2"	1,540 LF		
0018	7300000000-E	1715	UNPAVED TRENCHING (*****) (3) 2"	690 LF		
0019	7301000000-E	1715	DIRECTIONAL DRILL (*****) (2) 2"	460 LF		
0020	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	10 EA		
0021	7348000000-N	1716	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)	25 EA		
0022	7360000000-N	1720	WOOD POLE	1 EA		
0023	7444000000-E	1725	INDUCTIVE LOOP SAWCUT	400 LF		
0024	7456000000-E	1726	LEAD-IN CABLE (*****) 18-2	2,500 LF		
0025	7516000000-E	1730	COMMUNICATIONS CABLE (** FIBER) 12-FIBER	1,400 LF		
0026	7540000000-N	1731	SPLICE ENCLOSURE	1 EA		
0027	7552000000-N	1731	INTERCONNECT CENTER	4 EA		
0028	7566000000-N	1733	DELINEATOR MARKER	10 EA		
0029	7684000000-N	1750	SIGNAL CABINET FOUNDATION	2 EA		
0030	7901000000-N	1753	CABINET BASE EXTENDER	2 EA		
0031	7980000000-N	SP	GENERIC SIGNAL ITEM 1KVA SINGLE PHASE STEP-UP/STEP- DOWN TRANSFORMER	2 EA		
0032	7980000000-N	SP	GENERIC SIGNAL ITEM 5/8" X 10' GROUNDING ELECTRODE	2 EA		
0033	7980000000-N	SP	GENERIC SIGNAL ITEM AUTOMATED LICENSE PLATE READER SYSTEM	1 EA		

County: SURRY

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0034	7980000000-N	SP	GENERIC SIGNAL ITEM AUTOMATED TIRE MONITORING SYSTEM	1 EA		
0035	7980000000-N	SP	GENERIC SIGNAL ITEM BASE MOUNTED EQUIPMENT CABINET	2 EA		
0036	7980000000-N	SP	GENERIC SIGNAL ITEM CHANGEABLE MESSAGE SIGN	2 EA		
0037	7980000000-N	SP	GENERIC SIGNAL ITEM COMPUTER WORKSTATION	1 EA		
0038	7980000000-N	SP	GENERIC SIGNAL ITEM ETHERNET EDGE SWITCH	2 EA		
0039	7980000000-N	SP	GENERIC SIGNAL ITEM MODIFY ELECTRICAL SERVICE	1 EA		
0040	7980000000-N	SP	GENERIC SIGNAL ITEM OVERVIEW CAMERA ASSEMBLY	1 EA		
0041	7980000000-N	SP	GENERIC SIGNAL ITEM PRINTER	1 EA		
0042	7980000000-N	SP	GENERIC SIGNAL ITEM SERVER	1 EA		
0043	7980000000-N	SP	GENERIC SIGNAL ITEM TRANSFORMER/EQUIPMENT CABINET DISCONNECT	2 EA		
0044	7980000000-N	SP	GENERIC SIGNAL ITEM UPS	3 EA		
0045	7980000000-N	SP	GENERIC SIGNAL ITEM WEIGH IN MOTION SYSTEM	1 EA		
0046	7985000000-N	SP	GENERIC SIGNAL ITEM CENTRAL CONTROL SOFTWARE	Lump Sum	L.S.	
0047	7985000000-N	SP	GENERIC SIGNAL ITEM SYSTEM WARRANTY	Lump Sum	L.S.	
0048	7985000000-N	SP	GENERIC SIGNAL ITEM TRAINING	Lump Sum	L.S.	
0049	7990000000-E	SP	GENERIC SIGNAL ITEM #4 SOLID BARE GROUNDING CONDUCTOR	90 LF		

County: SURRY

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0050	7990000000-E	SP	GENERIC SIGNAL ITEM 3-WIRE COPPER FEEDER CONDUCTORS	3,135 LF		

0051	7990000000-E	SP	GENERIC SIGNAL ITEM ETHERNET CABLE (LONG HAUL)	150 LF		

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Total Amount Of Bid For Entire Project :
