



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

July 11, 2018

Addendum No. 3

Contract No.: C 203970
TIP No.: I-5507 / R-0211EC / U-4714AB
County: Mecklenburg
Project Description: I-485 from I-77 to US 74 (Independence Boulevard); I-485 / Weddington Road Interchange; and I-485 / East John Street – Old Monroe Road Interchange

RE: Addendum No. 3 to Final RFP

August 21, 2018 Letting

To Whom It May Concern:

Reference is made to the Final Request for Proposals dated May 7, 2018 recently furnished to you on the above project. We have since incorporated changes, and have attached a copy of Addendum No. 3 for your information. Please note that all revisions have been highlighted in gray and are as follows:

The first, second and third pages of the *Table of Contents* have been revised. Please void the first, second and third pages in your proposal and staple the revised first, second and third pages thereto.

Page No. 5 of the *Submittal of Quantities, Fuel Base Index Price and Opt-Out Option* Project Special Provision has been revised. Please void Page No. 5 in your proposal and staple the revised Page No. 5 thereto.

Page No. 64 of the *Price Adjustments for Asphalt Binder* Project Special Provision has been revised. Please void Page No. 64 in your proposal and staple the revised Page No. 64 thereto.

Page Nos. 281, 282 and 289 of the *Roadway* Scope of Work have been revised. Please void Page Nos. 281, 282 and 289 in your proposal and staple the revised Page Nos. 281, 282 and 289 thereto.

Page Nos. 304 and 308 of the *Pavement Management* Scope of Work have been revised. Please void Page Nos. 304 and 308 in your proposal and staple the revised Page Nos. 304 and 308 thereto.

Page No. 312 of the *Hydraulics* Scope of Work has been revised. Please void Page No. 312 in your proposal and staple the revised Page No. 312 thereto.

Mailing Address:
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CONTRACT STANDARDS AND
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1020 BIRCH RIDGE DRIVE
RALEIGH, NC 27610

Page No. 344 of the *Transportation Management* Scope of Work has been revised. Please void Page No. 344 in your proposal and staple the revised Page No. 344 thereto.

Page No. 395 of the *AET Toll Zone Facilities Infrastructure* Scope of Work has been revised. Please void Page No. 395 in your proposal and staple the revised Page No. 395 thereto.

If you have any questions or need additional information, I can be reached by telephone at (919) 707-6900.

Sincerely,

DocuSigned by:

F81B6038A47A442...
Ronald E. Davenport, Jr., PE
State Contract Officer

Cc: Ron Hancock, PE
Scott Cole, PE
Teresa Bruton, PE
File

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The Design-Build Team shall prepare an Estimate of Quantities that they anticipate incorporating into the completed project and upon which the Price Proposal was based. The quantity breakdown shall include all items of work that appear in the *Fuel Usage Factor Chart and Estimate of Quantities* sheet. Only those items of work which are specifically noted in the *Fuel Usage Factor Chart and Estimate of Quantities* sheet will be subject to fuel price adjustments.

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

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

(B) Base Index Price

The Design-Build Team’s Estimate of Quantities will be used on the various partial payment estimates to determine fuel price adjustments. The Design-Build Team shall submit a payment request for quantities of work completed based on the work completed for that estimate period. The quantities requested for partial payment shall be reflective of the work actually accomplished for the specified period. The Design-Build Team shall certify that the quantities are reasonable for the specified period. The base index price for DIESEL #2 FUEL is **\$2.1965** per gallon.

(C) Opt Out of Fuel Price Adjustment

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

(D) Change Option

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

(E) Failure to Submit

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

Submittals for Review During Construction

The Design-Build Team shall submit the unconfined compressive strength test results for review and acceptance.

PRICE ADJUSTMENTS FOR ASPHALT BINDER

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

DB6 R25

Price adjustments for asphalt binder for plant mix will be made in accordance with Section 620 of the 2018 *Standard Specifications for Roads and Structures*.

When it is determined that the monthly selling price of asphalt binder on the first business day of the calendar month during which the last day of the partial payment period occurs varies either upward or downward from the Base Price Index, the partial payment for that period will be adjusted. The partial payment will be adjusted by adding the difference (+ or -) of the base price index subtracted from the monthly selling price multiplied by the total theoretical quantity of asphalt binder authorized for use in the plant mix placed during the partial payment period involved.

The base price index for asphalt binder for plant mix is **\$535.56** per ton.

This base price index represents an average of F.O.B. selling prices of asphalt binder at supplier's terminals on **July 1, 2018**.

PRICE ADJUSTMENTS - ASPHALT CONCRETE PLANT MIX

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

DB6 R26

Revise the 2018 *Standard Specifications for Roads and Structures* as follows:

Page 6-15, Article 609-11 and Page 6-31, Article 610-14

Add the following paragraph before the first paragraph:

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

FIELD OFFICE

(6-1-07) (Rev. 8-3-15)

DB 08-01

Description

This work consists of furnishing, erecting, equipping, and maintaining a field office for the exclusive use of Department Engineers and Inspectors at a location on the project approved by the Engineer. Provide a field office that complies with the current A.D.A. Design and Accessibility Standards, the National Electric Code, local, state, and federal regulations, and the following:

and construct a minimum 26-foot median. Throughout the project limits, the Design-Build Team shall design and construct Type “T” double-faced concrete median barrier on the aforementioned full depth median pavement.

- Throughout the project limits, the Design-Build Team shall design and construct a delineation area between the express lane and the general purpose lanes at the minimum widths shown on the Design Map. Unless noted otherwise elsewhere in this RFP, the Design-Build Team may shift the express lane entry and exit points a maximum of 500 feet, in either direction, from the locations shown on the Design Map. (Reference the Pavement Marking Scope of Work found elsewhere in this RFP). For the weave lanes between Johnston Road and Rea Road, the entry and exit points shall adhere to the location requirements noted below:
 - For the I-485 westbound express lane exit point, the 1000-foot lane change (to move from the weave lane to the general purpose lane) shall be located between Station 429+00 -L- and Station 439+00 -L-.
 - For the I-485 westbound express lane exit point, the 500-foot lane change (to move from the express lane to the weave lane) shall be located between Station 439+00 -L- and Station 444+00 -L-.
 - For the I-485 eastbound express lane entry point, the 500-foot lane change (to move from the general purpose lane to the weave lane) shall be located between Station 439+50 -L- and Station 444+50 -L-.
 - For the I-485 eastbound express lane entry point, the 1000-foot lane change (to move from the weave lane to the express lane) shall be located between Station 444+50 -L- and Station 454+50 -L-.

The Design-Build Team shall include all preconstruction costs and construction costs required to design and construct the entry and exit points between Johnston Road and Rea Road at the locations noted above in the lump sum price bid for the entire project. The Design-Build Team will not be required to include any designs associated with the aforementioned entry or exit points in the Technical Proposal.

- From Endhaven Lane to Elmstone Drive, the Design-Build Team shall design and construct Elm Lane with 1) two 12-foot travel lanes, 2) one 12-foot center turn lane, 3) 2’-6” curb and gutter on both sides of the roadway, 4) a minimum 21-foot berm with 12-foot sidewalk on the west side and, 5) a minimum 17-foot berm with eight-foot sidewalk on the east side. (Reference the Structures Scope of Work found elsewhere in this RFP)
- Immediately beyond the guardrail anchor units, the Design-Build Team shall transition the proposed Ballantyne Road bridge width to the existing roadway facility with 8:1 tapers. (Reference the Structures Scope of Work found elsewhere in this RFP)
- The Design-Build Team shall design and construct a minimum 450-foot long exclusive northbound left turn lane and taper on East Westinghouse Boulevard that accesses Old Nations Ford Road.
- The Design-Build Team shall design and construct a minimum 350-foot long exclusive northbound right turn lane and taper on East Westinghouse Boulevard that accesses the -Y1DCA- Direct Connector (I-485 eastbound).
- The Design-Build Team shall design and construct a minimum 300-foot long exclusive westbound right turn lane and taper on the -Y1DCA- Direct Connector that accommodates the I-485 westbound to East Westinghouse Boulevard northbound movement.
- The Design-Build Team shall design and construct observation and enforcement areas that adhere to the design parameters in the December 1, 2016 Concept Plan for *I-5507 Observation and*

Enforcement Areas Memorandum. West of Rae Road, the Design-Build Team shall not overlap any portion of the eastbound and westbound observation and enforcement areas. The Design Build Team shall design and construct observation and enforcement areas at the following locations:

➤ I-485 Eastbound

- AET 1.2 - The observation area shall be 100 feet beyond the tolling point. The enforcement area shall be between Westinghouse Boulevard and NC 51 / Pineville-Matthews Road.
- AET 2.2 – The observation area shall be 100 feet beyond the tolling point. The enforcement area shall be within the wider median shoulder section east of Rea Road.
- AET 3.2 – The observation area shall be 100 feet beyond the tolling point. The enforcement area shall be immediately beyond the observation area, between Providence Road and Weddington Road.

➤ I-485 Westbound

- AET 3.1 – The observation area shall be 100 feet beyond the tolling point. The enforcement area shall be immediately beyond the observation area, between John Street and Weddington Road.
 - AET 2.1 – The observation area shall be 100 feet beyond the tolling point located west of the Ballantyne Commons Parkway overpass. The enforcement area shall be immediately beyond the observation area, east of the Rea Road interchange.
 - AET 1.1 – The observation area shall be 100 feet beyond the tolling point. The enforcement area shall be immediately beyond the observation area, between Johnston Road and NC 51 / Pineville-Matthews Road
- The Design-Build Team shall design and construct Weddington Road in accordance with the June 18, 2018 Weddington Road typical section provided by the Department.
 - The Design-Build Team shall coordinate with Projects U-4714A and U-4714B design and construction to ensure accurate hydrology, capacity, and horizontal and vertical ties that adhere to the design criteria. The Design-Build Team shall not make any design or construction revisions that impact the design or construction of projects U-4714A and U-4714B without prior written approval from the Design-Build Unit (Reference the *Cooperation Between Contractors Project Special Provision* found elsewhere in this RFP).
 - Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall design and construct -Y- Lines, ramps, loops and Direct Connections providing the same or better access, widening, improvements and traffic measures of effectiveness, in the Department’s sole discretion, included in the Design Map provided by the Department. The limits of -Y- Line construction shall be of sufficient length to tie to existing based upon the current NCDOT guidelines and standards.
 - The Design-Build Team shall design and construct all -Y- Lines such that the through movement is not required to change lanes throughout the limits of construction.
 - Excluding Direct Connectors, the Design-Build Team shall design and construct one-lane ramps that provide a minimum 16-foot lane width, and two lane ramps that provide minimum 12-foot lanes. Excluding Direct Connectors, all ramps shall have 14-foot outside shoulders, four-foot of which shall be full depth paved shoulders and 12-foot inside shoulders, four-foot of which shall be full depth paved shoulders.

month period, which shall begin on the date the Department accepts the DNR developed by the Design-Build Team. The Design-Build shall not construct any sound barrier walls until the balloting process has been completed by the Department.

In accordance with Subarticle 104-8(A) of the 2018 *Standard Specifications for Roads and Structures*, if the accepted DNR and balloting process require more than 940,000 square feet (sf) of sound barrier wall (excluding any required square footage resulting from the existing sound barrier wall evaluations noted above), the amount over 940,000 sf will be paid for as extra work at the unit price of \$40.00 per square foot. All work tasks required to design and construct the additional sound barrier walls, including but not limited to traffic control, pavement, drainage, concrete barrier, geotechnical investigation and earthwork shall be considered inclusive in the aforementioned unit price. The amount of extra work shall be determined by deducting 1) all additional sound barrier wall square footage required as a result of horizontal and / or vertical alignment changes to the Preliminary Roadway Plans provided by the Department, 2) all sound barrier wall square footage required to raise an existing sound barrier wall, and 3) all sound barrier wall square footage required to replace an existing sound barrier wall from the accepted DNR and balloting process sound barrier wall total square footage.

The Design-Build Team shall only credit the Department the construction cost of all sound barrier walls eliminated by the balloting process. The construction costs of all sound barrier walls eliminated solely by the balloting process shall be deducted from the lump sum amount bid for the entire project.

At all sound barrier walls, the Design-Build Team shall provide 1) a minimum four-foot berm between the wall and fill / cut slopes steeper than 6:1 and 2) a parallel concrete ditch at locations where the final grade slopes toward the wall.

To satisfy the FHWA's Abatement Measure Reporting requirements, the Design-Build Team shall prepare and concurrently submit a summary of the sound barrier walls to be constructed on the project with the final sound barrier wall working drawings submittal. The Design-Build Team shall submit the sound barrier wall summary directly to the NCDOT Traffic Noise and Air Quality Group and include the information noted in Title 23 Code of Federal Regulations Part 772 Section 772.13(f), including but not limited to overall cost and unit cost per square foot.

General

- Unless allowed otherwise elsewhere in this RFP, the design shall be in accordance with the 2011 AASHTO *A Policy on Geometric Design of Highways and Streets*, and 2013 *Errata*, 2002 NCDOT *Roadway Design Manual*, including all revisions effective on the Technical Proposal submittal date, 2018 NCDOT *Roadway Standard Drawings*, or as superseded by detail sheets located at <https://connect.ncdot.gov/resources/Specifications/Pages/2018-Roadway-Drawings.aspx>, *Roadway Design Policy and Procedure Manual*, *Roadway Design Guidelines for Design-Build Projects*, 2018 NCDOT *Standard Specifications for Roads and Structures* and the 2011 AASHTO *Roadside Design Guide*, 4th Edition and 2015 *Errata*.
- If the NCDOT *Roadway Design Manual*, including all revisions, the 2011 AASHTO *A Policy on Geometric Design of Highways and Streets* and 2013 *Errata*, the 2018 NCDOT *Roadway Standard Drawings* and / or any other guidelines, standards or policies have desirable and / or minimum values, the Design-Build Team shall use the desirable values unless noted otherwise elsewhere in this RFP. Similarly, in case of conflicting design parameters, and / or ranges, in the various resources, the proposed design shall adhere to the most conservative values, unless noted otherwise elsewhere in this RFP.
- The Design Build Team shall provide a Drainage Summary Sheet, Earthwork Summary Sheet and Guardrail Summary Sheet (Permanent, Temporary and Future) in the Final and RFC Roadway Plans.

PAVEMENT MANAGEMENT SCOPE OF WORK (7-10-18)

Unless noted otherwise elsewhere in this RFP, the pavement design for the mainline widening, mainline median paved shoulders, and mainline outside paved shoulders at locations where the existing outside paved shoulder is removed shall consist of one of the following alternates:

| <u>Alternate 1</u> | <u>Alternate 2</u> | <u>Alternate 3</u> |
|------------------------|------------------------|---------------------|
| OGFC * | OGFC * | Deleted Alternate 3 |
| 3.0” S9.5D ** | 3.0” S9.5D ** | |
| 4.0” I19.0C | 4.0” I19.0C | |
| 8.5” B25.0C | 4.0” B25.0C | |
| Subgrade Stabilization | 10.0” ABC | |
| | Subgrade Stabilization | |

* The Open Graded Asphalt Friction Course (OGFC) shall be Type FC-1 Modified at a rate of 90 lbs/sq yd. (Reference the *Open Graded Asphalt Friction Course, Permeable Asphalt Drainage Course, and Ultra-Thin Bonded Wearing Course* Project Special Provision found elsewhere in this RFP). The width of the OGFC shall extend to a minimum of one foot outside of the travel lane lines.

** From a point at least 200 feet prior to each toll gantry to a point at least 200’ beyond each toll gantry, the mainline express lane, buffer and median shoulder pavement design shall consist of 3.5” S9.5D, with a final 2.0-inch lift. If the Design-Build Team does not lower the subgrade to accommodate the additional 0.5” S9.5D, 1) the full mainline typical section width, in a given direction, shall consist of the additional 0.5’ S9.5D between the aforementioned limits; and 2) the Design-Build Team shall transition the 3.5” S9.5D pavement structure to the 3.0” S9.5D pavement structure over a minimum 25-foot distance beyond the aforementioned limits. The additional 0.5” pavement structure depth shall not result in differential pavement elevations along or across the mainline.

The pavement alternate chosen shall be used for the entire length of the project. The Design-Build Team shall specify pavement alternate that will be used in the Technical Proposal.

West of I-77, the pavement design for the **mainline widening** and median paved shoulders shall consist of the following:

- 12.0” Doweled Jointed Concrete**
- 4.0” PADL
- 1.25” S9.5B
- Soil Stabilization

In accordance with the requirements noted below, the mainline subgrade stabilization shall consist of chemical stabilization or Class IV stabilization. In a given direction, the Design-Build Team will be allowed to use different subgrade stabilization alternates for the mainline median and outside widening. However, a consistent subgrade stabilization alternate shall be used for a minimum 1000-foot length. The Design-Build Team shall specify the proposed mainline subgrade stabilization, or combination, with approximate limits of each type clearly noted in the Technical Proposal.

- Chemical stabilization shall be to a minimum depth of eight inches for lime and seven inches for cement. The type of subgrade stabilization and the amount of stabilizing agent shall be

Excluding the 1.25" S9.5B drainage layer, the rate of application and the maximum and minimum thickness per application and layer shall be in accordance with the NCDOT Roadway Design Manual.

In areas of mainline widening, excluding the high side of the superelevated sections, the Design-Build Team shall design and construct median and outside shoulder drains and outlets at the locations noted below:

- Throughout crest vertical curves located in cut sections
- Throughout all sag vertical curves
- Where the grade is less than 1%

Where installed on the outside shoulder, outlets shall be provided approximately every 300 feet. Where installed on the median shoulder, outlets increments shall not exceed 500 feet and all outlets shall be located at drainage structures. Shoulder drains shall be placed to drain the entire pavement structure. The shoulder drain design and outlet locations shall be submitted to the Design-Build Unit for review and acceptance.

Unless noted otherwise elsewhere in this RFP, the Design-Build Team shall pave from 1) the edge of all paved shoulders to the face of all single face barrier / guardrail, including but not limited to all existing guardrail within the project limits to remain in place 2) from the edge of all paved shoulders to the edge of all expressway / shoulder berm gutter and 3) from the edge of all paved shoulders to the face of proposed retaining walls and sound barrier walls located on the outside shoulder with 6" of ABC (or 4" or B25.0C), a split seal and at least two lifts of surface course. If a split seal is not used, the ABC pavement design shall require prime coat at the normal application rate. In these areas, the Design-Build Team's installation of ABC or black base shall be consistent with the pavement type for the specific roadway. As an alternative to the above pavement design for paving the shoulders to the face of the aforementioned features, the Design-Build Team may use the adjacent travel lane pavement design.

When a resurfacing grade ties to an existing curb, bridge and / or pavement, the Design-Build Team shall perform incidental milling such that the new pavement ties flush with the existing feature(s). When tying to the aforementioned feature(s), the Design-Build Team shall not reduce the minimum required surface layer pavement thickness noted above. At existing pavement ties, the Design-Build Team shall perform incidental milling for a minimum distance of 25 feet at bridges and six feet at curb sections. The Design-Build Team shall not perform incidental milling more than 72 hours prior to placement of the asphalt surface layer.

ALTERNATIVE TECHNICAL CONCEPTS

Alternative Technical Concepts that provide an alternate **mainline widening** pavement design will be considered subject to the following restrictions:

- ATCs on pavement design will only be permitted for the mainline widening and shall not be submitted until after issuance of the Second Industry Draft Request for Proposals.

Hydraulic Spread

- The hydraulic spread shall not encroach into any operational lane beyond the limits noted below:
 - For roadways, the hydraulic spread shall not exceed the values specified in Table 10-1 of the current North Carolina Division of Highways *Guidelines for Drainage Studies and Hydraulics Design* (2016).
 - For shoulder facilities, including those with expressway gutter and shoulder berm gutter, the hydraulic spread shall not encroach into a permanent travel lane and shall not encroach more than two feet into an operational temporary travel lane.
 - For bridges on alignments with design speeds greater than 45 mph, the hydraulic spread shall not encroach into an operational permanent or temporary through lane on a bridge. The hydraulic spread shall not encroach more than a distance that equals half the lane width or six feet, whichever is less, into an operational permanent or temporary exclusive turn lane.
 - For bridges on alignments with design speeds equal to or less than 45 mph, the hydraulic spread shall not encroach more than four (4) feet into an operational permanent or temporary through lane or exclusive turn lane.
 - For existing bridges with no alteration to the travel lanes or shoulders (location and / or widths), hydraulic spread will be allowed to encroach into an operational travel lane to an extent equal to that present in the existing (pre-project) conditions.
- The Design-Build Team shall analyze spread for all bridges identified in the Structures Scope of Work found elsewhere in this RFP and, as necessary, provide mitigation that adheres to the hydraulic spread requirements noted above. If required, the Design-Build Team shall adhere to the bridge drainage system requirements noted below:
 - The Design-Build Team shall design bridge drainage without the use of Bridge Scuppers (open-grated inlets). If deck drains are used on the bridge, they shall be vertical pipes at the flow line through the deck with no elbow and shall be consistent with that shown in the current NCDOT Stormwater Best Management Practices Toolbox. If a closed drainage system is used on a bridge, the closed drainage system shall use vertical pipes at the flow line through the deck with no elbow and shall be consistent with that shown in the current NCDOT Stormwater Best Management Practices Toolbox.
 - The Design-Build Team shall use 4" deck drains adjacent to pedestrian facilities.
 - The Design-Build Team shall provide bridge drainage features that prevent direct discharge into waterways or onto any existing / future greenway, railway right of way, travel lanes or paved shoulders.
 - The maximum allowable deck drain spacing shall be 12-foot on center.

Excluding hauling operations that are conducted entirely behind a temporary traffic barrier or guardrail, multi-vehicle hauling shall not be allowed ingress and egress from any open travel lane during the following time restrictions:

For Multi-Vehicle Hauling

| Road Name | Day and Time | Restrictions |
|--|-----------------------|---|
| All roads except Westinghouse Boulevard | Monday through Friday | 6:00 a.m. to 9:00 a.m. and 4:00 p.m. to 7:00 p.m. |

C. Lane and Shoulder Closure Requirements

On I-485, the Design-Build Team shall not install more than three (3) simultaneous lane closures in any one direction; and shall provide a minimum of two (2) miles between lane closures, measured from the end of one closure to the first sign of the next lane closure. The maximum length of each lane closure shall be two (2) miles for a single lane closure and two and a half (2.5) miles for a double lane closure, measured from the beginning of the first merge taper to the end of the lane closure.

On all other multilane facilities, the Design-Build Team shall not install more than two (2) simultaneous lane closures in any one direction, and shall provide a minimum of two (2) miles between lane closures, measured from the end of one closure to the first sign of the next lane closure. The maximum length of each lane closure shall be two (2) miles for a single lane closure and two and a half (2.5) miles for a double lane closure, measured from the beginning of the first merge taper to the end of the lane closure.

On two-lane, two-way facilities, the Design-Build Team shall not install more than one (1) lane closure on any roadway within the project limits or in conjunction with the project, measured from the beginning of the merger taper to the end of the lane closure. The maximum length of lane closure shall be one (1) mile, measured from the beginning of the merge taper to the end of the lane closure.

The Design-Build Team shall remove lane closure devices from the lane when work is not being performed behind the lane closure or when a lane closure is no longer needed.

When barrier is placed on the roadway shoulder, the Design-Build Team shall install shoulder closure signs and devices in advance of the barrier using 2018 NCDOT *Roadway Standard Drawings*.

When personnel and / or equipment are working within 15 feet of an open travel lane, the Design-Build Team shall close the nearest open shoulder using 2018 NCDOT *Roadway Standard Drawings*, unless the work area is protected by an approved temporary traffic barrier or guardrail.

When personnel and / or equipment are working on the shoulder adjacent to an undivided facility and within five feet of an open travel lane, the Design-Build Team shall, at a minimum, close the nearest open travel lane using 2018 NCDOT *Roadway Standard*

AET Toll Zone Location

The Design-Build Team shall locate each AET Toll Zone at the general locations indicated on the February 1, 2018 NCTA ITS Concept Plans provided by the Department, with the exception of AET 2.2 which shall be located at Station 471+50 -L-. The Design-Build Team shall coordinate the final site location for the AET Toll Zones with the Department and the TSI. The Department shall approve the final location prior to the Design-Build Team proceeding with final design drawings.

The Design-Build Team shall locate AET Toll Zones away from sources of Electro Magnetic Interference (EMI), such as high voltage electric lines, electrical power supply transformers, motors, Magnetic Resonance Imaging (MRI) and X-ray equipment, radio transmitters, radar transmitters, and induction heating devices in order to minimize interference with future communications cabling.

Prior to developing the final design, the Design-Build Team shall provide GPS coordinates of the preliminary design toll zone locations to the Department for the spectrum analysis.

A Radio Frequency (RF) Spectrum Analysis will then be performed by the Department to determine whether or not the proposed AET Toll Zone is free from electromagnetic conditions that may cause interference with the Radio Frequency Identification (RFID) technology. The Department will need a minimum of six (6) weeks to conduct the survey and report on the results. If interference is found, the Design-Build Team shall re-locate the AET Toll Zone.

The Design-Build Team shall locate all AET Toll Zones in roadway areas where lane changing and weaving would not be expected. The Design-Build Team shall not locate AET Toll Zones under structures, on structures, or within 100 feet of a structure.

The Design-Build Team shall not construct drainage (or other) pipes within 25 feet of any AET gantry(s), conduit or junction box. The design and construction shall ensure that surface stormwater is intercepted and directed away from all in-ground junction boxes and equipment pads. The Design-Build Team shall closely coordinate the AET Toll Zone design with the roadway design. If needed, shoulder berm gutter and / or curb shall be designed and constructed to assure stormwater is directed away from the junction boxes and equipment pads.

As shown in the NCTA *AET Standard Drawings*, the Design-Build Team shall protect all gantry columns within the clear zone with barrier wall or guardrail.

AET Toll Zone Location Geometric Design

The Department prefers that the AET Toll Zone be located in a minimum 250-foot long horizontal tangent section, with limits of 125 feet before and after, in each direction, the AET gantry structure centerline.

In the event the AET Toll Zone cannot be located in a horizontal tangent section, it may be located in a horizontal curve with a radius of 2,000 feet or greater.

The Design-Built Team shall locate AET Toll Zones between at least 350 feet but no more than 2,640 feet (one-half mile), from the express lane entry or exit point.