

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

ADDENDUM #2

TO

SECOND INDUSTRY DRAFT REQUEST FOR PROPOSAL



DESIGN-BUILD PROJECT

TIP U-5713 / R-5777A & B

March 12, 2019



VOID FOR BIDDING

DATE AND TIME OF TECHNICAL AND PRICE PROPOSAL SUBMISSION: **MAY 30, 2019 BY 4:00 PM**

DATE AND TIME OF PRICE PROPOSAL OPENING: **JUNE 18, 2019 AT 2:00 PM**

CONTRACT ID: C 204225

WBS ELEMENT NO. 50111.3.1

FEDERAL-AID NO. N/A

COUNTY: Craven

ROUTE NO. U.S. 70

MILES: 5.1

LOCATION: U.S. 70 from the eastern approach of the Neuse River Bridge to approximately one (1) mile east of S.R. 1116 (Thurman Road)

TYPE OF WORK: DESIGN-BUILD AS SPECIFIED IN THE SCOPE OF WORK
CONTAINED IN THE REQUEST FOR PROPOSALS

NOTICE:

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

5% BID BOND OR BID DEPOSIT REQUIRED

Geotechnical Instrumentation and Monitoring Plan Special Provision

Include in the Geotechnical Instrumentation and Monitoring Plan (GIMP) a detailed program for monitoring settlement where ground improvement methods are used.

Develop, implement, and maintain a GIMP to include the following information:

- Instrument types to be used
- Locations of each instrument
- Installation procedures
- Zone of influence for each instrument
- Critical readings and frequency of readings

For embankment monitoring, use automated sensing and data acquisition systems. Do not use manual data acquisition and sensing systems. Install and monitor geotechnical instruments. At a minimum, monitor the following parameters:

- Settlement and settlement rates of embankments
- Pore water pressures
- Groundwater levels
- Stability of walls and slopes

Design the program to:

- Be specific and appropriate to evaluate the performance of the type of Work to be performed in the area
- Be appropriate for the successful short- and long-term monitoring of the specific construction, means, and methods (e.g., the program will be different for construction employing lightweight fill than for ground improvement/replacement/stabilization, or structural solutions)
- Accurately and precisely record the behavior of the structure/embankment from the beginning of structure/embankment placement through the Project Warranty period
- Comprehensively monitor and evaluate structure/embankment performance and the associated impact on the existing and new roadways
- Consist of the evaluation of the magnitude and rate of movement by measuring and recording deflection, obtaining data with respect to stress, strain, tilt (inclination), pressure, and monitoring overall embankment movement and stability in both the subsurface soils and embankment fill
- Reliably define the embankment behavior at a minimum of one cross sections of the roadway within each area of interest
 - Retain the same instrumentation in each cross section and provide enough data to reliably evaluate individual cross-section behavior relative to adjacent cross sections. Provide the same model and brand for sensors used on the Project.

Provide and monitor instrumentation starting at the beginning of structure/embankment construction to capture results and to compare with the predictions of the geotechnical design, to validate (or invalidate) the design, and to aid in determinations as to whether design changes or remediation activities are necessary for the successful completion of the Work.

Repair or replace sensors or survey targets that fail or are otherwise compromised immediately. In critical monitoring areas, provide redundant instrumentation. A critical monitoring area is either an area where large stresses, strains, or pressures are predicted or where large stresses, strains, or pressures are occurring during the monitoring period.

Protect sensors, survey targets, data collectors, power supplies, and related equipment from weather, construction, and rodent damage. Secure enclosures with locks to prevent unauthorized entry. Route data and power cables through appropriate protective conduit. Ensure components perform from time of installation through the Project Warranty period.

The table below provides the minimum data reading and reporting requirements for the program. Obtain more frequent readings for particular sensors and cross sections if anomalous or unanticipated data is reported which indicates potential failures or the probability of deleterious impacts to the Work.

Data and Program Reporting Requirements

Time Period	Reporting and Data Reading Schedule
During active embankment construction	Daily reporting—Readings every four hours
After embankment construction but prior to Substantial Completion	Weekly reporting—Readings twice per day
Initial six months after Substantial Completion	Reporting every two months—Readings every two days
Remaining Warranty period	Reporting every six months with final report at end of Warranty period—Readings every three days

Use near-real-time web-based site data reporting to meet reporting requirements provided that NCDOT has immediate access to the Project sensor and survey target monitoring data, including graphical representations of time-domain behavior and data magnitude information.

Provide plan, profile, and cross section sheets showing the program instrumentation, including locations (X, Y, Z) of sensors, cables, and associated cabinets. Show sensor types, measurement ranges, and related data on the plans. Conduct a meeting to coordinate details of the monitoring program with NCDOT and program implementation staff.

EVALUATIONS

Decisions based on cost alone will not establish the design standards for the project. Technical Proposals shall address the technical elements of the design and construction of the project. The Technical Review Committee will consider the understanding of the project, the anticipated problems and the solutions to those problems, in addition to other evaluation criteria identified herein.

The Design-Build Team's Technical Proposal shall be developed using narratives, tables, charts, plots, drawings and sketches as appropriate. The purpose of the Technical Proposal is to document the Design-Build Team's understanding of the project, demonstrate the Design-Build Team's capabilities to complete the project, document their selection of appropriate design criteria and state their approach and schedule for completing all design and construction activities.

The review of design plans by the Department is not intended to reflect a reviewer's personal preferences, but rather to ensure that all contract requirements are met, sound engineering judgment is exercised by the Design-Build Team, and that the Design-Build Team adheres to all referenced documents, including but not limited to, design standards, codes, memos and manuals. As such, the Award of the Design-Build contract does not in any way imply that the NCDOT accepts the details of the Technical Proposal submitted by the Design-Build Team.

The Technical Proposal will be evaluated in each of the following major categories:

	EVALUATION FACTORS	POINTS
1.	Management	7
2.	Responsiveness to Request for Proposal	20
3.	Long Term Maintenance	4
4.	Schedule and Milestones	32
5.	Innovation	4
6.	Maintenance of Traffic and Safety Plan	30
7.	Oral Interview	3

TECHNICAL PROPOSAL EVALUATION CRITERIA

1. Management – 7 points

Provide a comprehensive Organizational Chart that identifies the design, quality and construction management, and the relationships with subconsultants / subcontractors. The Chart shall identify all firms and personnel changes (additions, substitutions, deletions) to the Design-Build Team since submittal of the Statement of Qualifications.

Design-Build Team Management

- Describe the Design-Build Team's concept of design management, and identify key positions and subordinate organizational units.

- Describe how the various design disciplines will be coordinated, including how designs developed by different firms and offices will be integrated / consistent.
- Describe how design personnel will interface with the construction personnel.
- List projects, including description and similarity to the subject project that the Design-Build Team's designer(s) have developed Transportation Management Plans; Pavement Marking Plans; ITS, Traffic Signal, and Signal System Timing Plans; and Signing Plans.
- List projects, including description and similarity to the subject project, that the Design-Build Team's right of way firm has performed right of way acquisition services.

Quality Management

- Describe how the Design-Build Team will comply with the design and construction quality control requirements. Specifically, include a narrative that describes the Design-Build Team's understanding of the Department's quality control philosophy and how the Design-Build Team will implement it for this project.
- Describe any significant design and / or construction quality control issues experienced on NCDOT projects in the last ten years and how those issues will be addressed for this project.

Construction Management

- Describe the Design-Build Team's concept of the project construction management organization and how it interrelates with the other elements of the Design-Build Team's organization for the project.
- Provide a brief narrative of the Design-Build Team's proposed plan for performing construction. This description shall include at least the following:
 - Indicate if, and how, the Design-Build Team intends to divide the project into work segments to enable optimum construction performance.
 - Identify operations, if any, that will be performed at night and the reason(s) why.
 - Describe the work categories that the Design-Build Team anticipates will be performed by the Design-Build Team's own direct labor force and those categories that will be performed by subcontractors.
 - Describe the Design-Build Team's plans and procedures to insure timely deliveries of materials to achieve the project schedule.
 - Describe the Design-Build Team's approach to site access and material staging to limit the number of dump trucks intermingling with commuter traffic.

Engagement of Local Workforce

As part of the ongoing partnering with the James City Community, the Design-Build Team shall make every reasonable effort to engage and utilize locally-owned businesses and local labor (skilled or unskilled) during the design and construction of the Project. For clarity, a locally-owned business is a business owned by a resident of the James City community; local labor (skilled or unskilled) means a person who's place of residence is within the James City community; and the James City community refers to the census-designated place and unincorporated area in Craven County, North Carolina.

- The Design-Build Team shall submit an approach stating how the Design-Build Team will engage and utilize locally-owned businesses and local labor during the design and construction of the Project. Such approach shall be no longer than one page and will become a part of the Design-Build contract between the Design-Build Team and the Department.

2. Responsiveness to RFP – 20 points

Natural Environmental Responsibility

- Describe the Design-Build Team's approach to addressing environmental concerns within the project boundaries.
- Describe the efforts to minimize excavation within the contaminated sites and associated disturbance to underlying soil.
- Identify efforts to minimize impacts on wetlands, streams, riparian buffers and other environmentally sensitive areas. Describe any temporary impacts and associated minimization approaches.
- Describe the Design-Build Team's understanding of the overall approach to permitting and the Team's comfort level with obtaining the required permits within the allowed timeframe.
- Identify methods of construction in wetlands, streams and riparian buffers.
- Describe all project / construction related Notice of Violations (NOVs) received by any team member within the last five years on projects in the United States and the disposition of each listed NOV.
- Describe the Design-Build Team's approach to Sedimentation and Erosion Control for the project.
- Provide a narrative overview of the Design-Build Team's Vegetation Management Procedure

Design Features

- Show plan view of design concepts with key elements noted.
- Identify preliminary horizontal and vertical alignments of all roadway elements.
- Identify the appropriate design criteria for each feature, if not provided herein.
- Identify proposed design exceptions and justify why the design exception is necessary.
- Identify proposed deviations to the preliminary design provided by the Department.
- Show mainline typical sections.
- Specify the mainline pavement Alternate chosen. The pavement Alternate chosen for the mainline will not be a part of the Technical Proposal evaluation and the selection thereof will not impact the Technical Scores.
- Specify the proposed subgrade stabilization, or combination, with approximate limits of each type.
- If applicable, specify where all underlying longitudinal joints will be located and demonstrate how the underlying longitudinal joint location will minimize reflective cracking.
- Indicate how longitudinal joints will be located on a lane line or lane midpoint.
- “If applicable, specify the extent of impacts to properties with contaminated soils, indicating the anticipated contamination excavation limits.”
- Identify drainage modifications and designs to be implemented.
- Identify all hydraulically deficient storm drainage systems and the proposed mitigation on the plans.
- Identify all hydraulically deficient storm drainage systems within the existing / proposed right of way and their proposed mitigation.
- Identify the months the Department should schedule the interagency hydraulic design review meeting and interagency permit impacts meeting.
- Provide a *Box Culverts and Cross Pipes Hydraulic Assessment Table* that contains the box culvert and cross pipe attributes noted in the *Hydraulics* Scope of Work found elsewhere in this RFP.
- Provide a *Box Culverts and Cross Pipes Hydraulic Deficiency Assessment and Proposed Mitigation Table* that contains the box culvert and cross pipe attributes noted in the *Hydraulics* Scope of Work found elsewhere in this RFP.

- Discuss the extent and limits of the rise in water elevation in the floodplain(s), identify potentially impacted insurable structures, specify areas anticipated to require additional surveys and estimate the anticipated additional right of way impacts outside the project construction limits.
- Identify all bridge types to be constructed, including any special design features or construction techniques needed.
- Indicate the type and number of bridge expansion joints.
- Identify types of any retaining walls and / or sound barrier walls, if applicable.
- Identify locations of any proposed sound barrier walls on the plans sheets, if applicable.
- Describe any geotechnical investigations to be performed by the Design-Build Team and note any deviations to NCDOT requirements for subsurface investigations noted in the *Geotechnical Engineering* Scope of Work found elsewhere in this RFP.
- Specifically identify any soil improvement techniques that will be utilized to overcome poor soil conditions. If multiple techniques are utilized, identify each technique and the location that technique will be utilized.
- Identify any aesthetic considerations not required herein that will be part of the design.
- Describe how utility conflicts will be addressed and any special utility design considerations. Describe how the Design-Build Team's design and construction methods minimize the Department's utility relocation costs.
- Describe how the design will affect the Department's right of way costs.
- Provide a Preliminary Signing Concept Map that includes, at a minimum, all anticipated DMS locations, all proposed overhead sign structure locations, all overhead signs, and all ground mounted guide signs.
 - Describe how the Design-Build Team will maintain or reduce the right of way acquisitions and impacts shown in the Preliminary Roadway Plan provided by the Department. If additional right of way beyond those acquisitions shown in the Preliminary Roadway Plans is required, explain why such additional acquisitions are needed and provide a list of impacted properties that includes property owner's name, property address, property owner's address (if other than the impacted property address), and approximate acquisition area.

3. Long Term Maintenance – 4 points

- Describe any special materials, not referenced elsewhere in this RFP, incorporated into the project that would result in long term reduction in maintenance.

- Describe any special designs or construction methods that would reduce future maintenance costs to the Department.
- Estimate a minimum ten-year cost saving resulting from incorporation of these special materials, design or construction methods into the project.

4. Schedule and Milestones – 32 points

- Provide a detailed schedule for the project including both design and construction activities. The schedule shall show the sequence and continuity of operations, as well as the month of delivery of usable segments of the project.
- Indicate how the Design-Build Team will maintain the project schedule if the right of way acquisition process, railroad agreements and / or utility relocations are delayed.
- Identify any self-imposed liquidated damages and associated Intermediate Contract Time(s), if applicable.
- Describe how operations will be performed to alleviate any sections being left idle while traffic is in an altered pattern. Specifically, describe anticipated duration of settlement periods, how they can be reduced, and what operation(s) will be performed during the settlement periods to reduce the overall schedule.
- Describe where concurrent operations on major items of work can occur and where multiple crews can be utilized to reduce the overall schedule and limit the length of an altered traffic pattern and its respective duration.
- The schedule shall also include the Design-Build Team's final completion date and, if proposed, their substantial completion date. **These dates shall be clearly indicated on the Project Schedule and labeled "Final Completion Date" and "Substantial Completion Date"**.

5. Innovation – 4 points

- Identify any aspects of the design or construction elements that the Design-Build Team considers innovative. Include a description of alternatives that were considered whether implemented or not.

6. Maintenance of Traffic and Safety Plan – 30 points

Maintenance of Traffic

- Provide a Transportation Management Phasing Concept (TMPC).
- Identify the type of positive median cross-over protection proposed and replacement / resetting requirements.

- Describe the traffic control measures that will be used for each construction phase.
- Describe how traffic will be maintained as appropriate and describe the Design-Build Team's understanding of any time restrictions noted in the RFP.
- Specifically describe how business, school, residential and airport access will be maintained in an acceptable condition at all times.
- Identify alternate routes that could be utilized during construction and describe how the Design-Build Team will advertise these alternate routes through public outreach, Changeable Message Signs, work zone signs and/or other means or methods.
- Address how hauling will be conducted, including but not limited to, hauling of materials to and from the site and hauling of materials within NCDOT right of way and what measures will be taken to mitigate the impacts to through traffic. Specifically, describe the team's approach to addressing the amount of borrow that is expected on this project.
- Describe the Design-Build Team's approach to providing the public with communication access to project personnel to inquire as to traffic impacts, including vehicular and pedestrian.
- If a temporary portable barrier system will be utilized, provide the type and why it is needed.
- If temporary shoring will be required, provide the type and why it is required.
- Include all proposed road closure detour routes, justifications and durations.
- Identify the need for a Work Zone Speed Limit Reduction Ordinance.
- Identify the need for a Speeding Penalty Ordinance.
- Address where and how law enforcement officers will be used.
- Describe how pedestrian traffic will be maintained during construction.

Safety Plan

- Describe the safety considerations specific to the project.
- Discuss the Design-Build Team's overall approach to safety for its personnel, pedestrians, and the motoring public.
- Describe any proposed improvements that will be made prior to or during construction that will enhance the safety of the work force and / or travelling public both during and after the project construction.

7. Oral Interview – 3 points

- The Design-Build Team’s Project Management Team shall present a brief introduction of the project team and design / construction approach.
- Introductory comments shall be held to no more than 30 minutes.
- The Department will use this interview to ask specific questions about the Design-Build Team’s Technical Proposal, background, philosophies and project approach.
- Presentation, questions, and answers shall not exceed 90 minutes. No more than ten people from the Design-Build Team may attend.

The Department will use the information presented in the oral interview to assist in the Technical Proposal evaluation.

Additional Warranty and / or Guarantee

- **The Extra Credit for this project shall be a Maximum of 5 Points.**

A twelve-month guarantee, as outlined in the *Twelve-Month Guarantee* Project Special Provision found elsewhere in this RFP, is required for this project. However, the Design-Build Team may provide additional warranties and / or guarantees at their discretion. The Design-Build Team may be awarded additional points as “extra credit” to be added to the Technical Score.

The Design-Build Team may provide warranties and / or guarantees for major components of the project. Examples of major components are pavements, bridge components and sign structures. If additional warranties and / or guarantees are offered, the Design-Build Team shall indicate in the Technical Proposal the general terms of the warranties and / or guarantees, a list of the items covered, performance parameters, notification and response parameters for corrective action, and evaluation periods. The Department will be responsible for annual inspections of the components covered by all warranties and / or guarantees offered by the Design-Build Team that extend beyond the required Twelve-Month Guarantee. The warranties and / or guarantees shall also define how disputes will be handled. Prior to the first partial payment, the Design-Build Team shall submit a document that provides additional warranty / guarantee specifics in sufficient detail that allows the document to be made a part of the contract through supplemental agreement.

No direct payment will be made for warranties and / or guarantees. Payment will be considered incidental to the lump sum price for the contract.

SELECTION PROCEDURE

There will be a Technical Review Committee (TRC) composed of five or more senior personnel from involved engineering groups that will evaluate the Technical Proposal on the basis of the criteria provided in the Request for Proposals.

The selection of a Design-Build Team will involve both technical quality and price. The Technical Proposals will be presented to the TRC for evaluation. The TRC shall first determine whether the

proposals are responsive to the requirements of the Request for Proposals. The Department reserves the right to ask for clarification on any item in the Technical Proposal. A written response to this request for clarification shall be provided to the Department prior to the opening of the Price Proposals. The contents of the written response may affect the Technical Review Committee's determination of the Technical Proposal's responsiveness and / or the overall evaluation of the Technical Proposal. If any commitments or clarifications provided in the written response conflict with the contents of the Technical Proposal, the contents of the written response will govern and be incorporated into the contract.

Each responsive Technical Proposal shall be evaluated based on the rating criteria provided in the Request for Proposals. The TRC will submit an overall consensus Technical Proposal score for each Design-Build Team to the State Contract Officer.

Quality Credit Evaluation Factors for Technical Proposals

Management	7
Responsiveness to Request for Proposal	20
Long Term Maintenance	4
Schedule and Milestones	32
Innovation	4
Maintenance of Traffic and Safety Plan	30
Oral Interview	3
Maximum Score	100

The State Contract Officer will use a table based on the maximum quality credit percentage to assign a Quality Credit Percentage to each proposal based on the proposal's overall Technical Score. The maximum quality credit percentage for this project will be **25%**. The Technical Review Committee may elect to assign point values to the nearest one-half of a point (e.g. 90.5). In this event, the Quality Credit Percentage will be determined by linearly interpolating within the table entitled "Quality Credit Percentage for Technical Proposals".

ROADWAY SCOPE OF WORK (1-3-2018)

1. General

- 1.1 Unless allowed otherwise in this RFP, roadway designs shall be in accordance with the following documents in order of precedence:
- (a) The requirements of this RFP;
 - (b) 2011 AASHTO A Policy on Geometric Design of Highways and Streets, 2013 Errata.
 - (c) NCDOT Roadway Design Manual, including all revisions effective on the Technical Proposal submittal date;
 - (d) 2018 NCDOT Standard Drawings, or as superseded by the detail sheets found at:

<https://connect.ncdot.gov/resources/Specifications/Pages/2018-Roadway-Standard-Drawings.aspx>

- 1.2 All pavement designs shall be in accordance with the Pavement Management Scope of Work found elsewhere in this RFP.
- 1.3 All limits of construction along the Mainline, Cross Streets, Service Roads and Ramps shall be of sufficient length to tie into existing conditions based upon the documents set forth in Section 1.1 of this Roadway Scope of Work.
- 1.4 Crown points and cross slopes along the Mainline, Cross Streets, Service Roads and Ramps shall be in accordance with the Hydraulics Scope of Work, found elsewhere in this RFP and with the documents set forth in Section 1.1 of this Roadway Scope of Work. The Hydraulics Scope of Work shall take precedence over the documents set forth in Section 1.1.
- 1.5 Unless otherwise noted in this RFP, the Design-Build Team shall design and construct the Mainline, all Cross Streets, Ramps, and Service Roads providing the same or better access, widening, improvements, and traffic measures of effectiveness, in the Department's sole discretion, included in the Preliminary Roadway Plans Provided by the Department.
- 1.6 Unless otherwise required in this RFP, all new curb and gutter along outside edge of pavement and within the Project limits shall be 2' – 6" curb and gutter in accordance with Standard #846.01 (*Roadway Standard Drawing for Concrete Curb, Gutter and Curb & Gutter*) of the 2018 Roadway Standard Drawings.

- 1.7 The Design-Build Team shall design and construct all medians within the Project limits as monolithic concrete islands in accordance with Standard #852.01 (*Roadway Standard Drawing for Concrete Islands*) and associated standard drawings of the 2018 *Roadway Standard Drawings*. Where required, curb and gutter along median edges shall be 1'-6". Planted medians will not be permitted.
- 1.8 The Design-Build Team shall design and construct all Cross Streets and Service Roads such that the through movement is not required to change lanes throughout the Project limits except where tying into existing.
- 1.9 NSR / NCRR At-Grade Railroad Crossings with -Y- Lines:
 - (a) if any portion of the design and / or construction of the -Y- Lines comes within 10 feet of the centerline of the NSR / NCRR railroad tracks running parallel to the Mainline, the Design-Build Team shall upgrade the existing signals at such at-grade crossings.
- 1.10 A longitudinal zero percent grade along the roadway profile is acceptable under temporary conditions only. The final, permanent longitudinal grade shall be no less than 0.3%.
- 1.11 Throughout this Roadway Scope of Work, the following definitions shall apply:
 - (a) the term "**Mainline**" or "**-L- Line**" refers to US 70.
 - (b) the terms "**Cross Streets**" and "**-Y- Lines**" refers to the following streets:

Cross Streets (-Y- Lines) as shown on the Preliminary Roadway Plans	
R-5777A & B	U-5713
Day Star Lane (SRY21C2)	Garner Road (Y1)
Thurman Road (Y21)	Grantham Road (Y2)
Taberna Way (Y22)	Airport Road (Y3)
	Williams Road (Y4)
Note: The Design-Build Team is advised that the alignment names herein shown are for illustrative purposes only, not contractual and shown in accordance with the definition of Preliminary Roadway Plans. The Design-Build Team has the option to utilize the alignment names herein shown or use new alignment names that fit the need of its proposed designs.	

- (c) the term "**Service Roads**" refers to the following alignments shown in the Preliminary Roadway Plans:

Service Roads as shown on the Preliminary Roadway Plans	
R-5777A & B	U-5713
SRY21B	SR1
SRY21B2	SR2
SRY21AY22B	SR3_ALT

SRY22A	SR4
SRY21C	SR5
SRY21D	SR6
SRY22D	SR7
<p>Note: The Design-Build Team is advised that the alignment names herein shown are for illustrative purposes only, not contractual and shown in accordance with the definition of Preliminary Roadway Plans. The Design-Build Team has the option to utilize the alignment names herein shown or use new alignment names that fit the need of its proposed designs.</p>	

- (d) the term “**Ramps**” refers to the following alignments shown in the Preliminary Roadway Plans:

Ramps as shown on the Preliminary Roadway Plans	
R-5777A & B	U-5713
Y21RPA	RPAY2
Y21RPB	RPBY2
Y21RPC	RPCY2
Y21RPD	RPDY2
Y22RPA	RPAY3
Y22RPB	RPBY3
Y22RPC	RPCY3
Y22RPD	RPDY3
	RPAY4
	RPBY4
	RPCY4
	RPDY4
	RPA55
	RPB55
<p>Note: The Design-Build Team is advised that the alignment names herein shown are for illustrative purposes only, not contractual and shown in accordance with the definition of Preliminary Roadway Plans. The Design-Build Team has the option to utilize the alignment names herein shown or use new alignment names that fit the need of its proposed designs.</p>	

2. Preliminary Roadway Plans provided by the Department

- 2.1 Throughout this Roadway Scope of Work, any references to the Preliminary Roadway Plans shall include the following, in order of precedence:
- (a) the preliminary roadway plans with corresponding roadway profiles, roadway cross sections and typical cross sections for each alignment encompassing STIP Projects U-5713 and R-5777A & B provided by the Department; and
 - (b) the most recent public meeting maps provided by the Department.
- 2.2 Except were indicated in this Roadway Scope of Work, the Preliminary Roadway Plans are provided by the Department for reference only and shall not be a part of the Design-Build contract between the Design-Build Team and the Department.

Any references to the Preliminary Roadway Plans throughout this Roadway Scope of Work are for illustrative purposes only and are not intended to be contractual. The Department shall not be responsible for any omissions, errors, or any information shown or stated on the Preliminary Roadway Plans.

2.3 The Design-Build Team is allowed and encouraged to proposed modifications to the Preliminary Roadway Plans. Such proposed modifications by the Design-Build Team:

- (a) shall not reduce the posted speed limit of the Mainline;
- (b) shall fully comply with the Project commitments outlined in the Categorical Exclusion document for U-5713 / R-5777A & B provided by the Department;
- (c) shall not place the Cross Streets alignments over the Mainline, under any circumstances. Alternative Technical Concepts proposing Cross Street alignments over the Mainline will be rejected; and
- (d) shall comply with the interchange type set forth in Section 4.2 of this Roadway Scope of Work.

2.4 Modifications to the Roadway Preliminary Plans that are in compliance with items 2.3(a) through 2.3(d) shall not require the submittal of an Alternative Technical Concept, unless an Alternative Technical Concept is required due to deviations from the requirements included in other sections of this RFP.

2.5 Design Exceptions in the Preliminary Roadway Plans:

- (a) The Department is aware of the following design exceptions:

R-5777A & B	
Service Road - SRY21AY22B-	PI Sta. 63+66.57 Design Speed = 25 mph
U-5713	
Service Road -SR4-	PI Sta. 25+68.10 Design Speed = 20 mph
Service Road -SR7-	PI Sta. 18+82.38 Design Speed = 20 mph
Service Road -Y3-	PI Sta. 27+30.29 Design Speed = 20 mph (stop condition)

Mainline -L- Northbound and Southbound	Distance between ramps in both directions, between Airport Road and Williams Road shall be no less than the distance shown in the Preliminary Roadway Plans.
Grantham Road -Y2-	Storage length for left turn movement into Service Road -SR1- shall be no less than 275 feet.
Ramp -RPAY4-	Minimum width of ramp inside shoulder shall be no less than 4 feet.
Ramp -RPBY4-	
Ramp -RPCY4-	

- (b) All design exceptions, whether included in Section 2.5(a) of this Roadway Scope of Work, or as proposed by the Design-Build Team that are not included in the list provided under Section 2.5(a), shall undergo the design exceptions process established by the Department.

3. Mainline Specifications

3.1 Mainline Project Limits:

- (a) The overall project limit on the south side of the Project is approximately one (1) mile east of Thurman Road, generally station 212+00 on the Preliminary Roadway Plans.
- (b) At the south end of the Project, the Department notes the following:
 - 1. The Mainline Project limit at the south end of the Project is Mainline station 245+00;
 - 2. the limit for Service Road -SRY21C- goes east to approximately Mainline station 217+80.00, beyond the Mainline project limit. The intent is to provide a continuation to the existing service road from approximately -SRY21C- station 10+00.00 to -SRY21C- station 20+00.00;
 - 3. the existing access apron between the existing service road and the Mainline, between Mainline stations 212+00 and 216+50, shall be removed; and
 - 4. the Design-Build Team shall mark the Project limit at the south end of the Project as Mainline station 212+00.
- (c) The overall project limit on the north side of the Project is approximately 0.7 mile north of Williams Road, generally station 155+00 on the Preliminary Roadway Plans.

- (d) The limit of construction along the ramps on the northern terminus of the project are as follows: for ramp -RPB55-, the project limit shall be approximately -RPB55- station 22+58.81. For ramp -RPA55-, the project limit shall be approximately -RPA55- station 22+54.55.
- 3.2 The Mainline shall be designed and constructed to meet a 60-mph design speed for a level urban freeway (in an urban area with right of way constraints) designed to interstate standards, except where as specified in this RFP. A maximum grade of 4% along the Mainline is allowable.
 - 3.3 The width of mainline travel lanes throughout the length of the Project shall be 12 feet.
 - 3.4 Mainline superelevation shall be designed and constructed in accordance with AASHTO *A Policy on Geometric Design of Highways and Streets*, Table 3-10b (Minimum Radii for Design Superelevation Rates, Design Speeds, and $e_{\max}=8\%$). The Design-Build Team shall provide all other design criteria in the Technical Proposal.
 - 3.5 For the transition between segments R-5777A & B and U-5713 (between the Taberna Way and the Grantham Road interchanges, and around Garner Road), the Design-Build Team shall design and construct all appropriate transitions and taper lengths in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work.
 - 3.6 To the extent practicable, all lane drops and / or lane additions shall be on the outside of the Mainline.
 - 3.7 R-5777A & B:
 - (a) From the south project limit to Garner Road (R-5777A & B), the typical cross section for the Mainline consists of a four-lane divided facility with a 46-foot median, which shall be cable guiderail divided.
 - (b) For the transition between the proposed condition and the existing condition at the southern project terminus (between Mainline station 245+00.00 and Thurman Road), the Design-Build Team shall design and construct all appropriate transitions and taper length in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work.
 - (c) The total width for outside Mainline shoulders along segment R-5777A & B shall be 12 feet of clear, usable width. The 12 feet shall be measured from edge of the travelled way to either face of barrier or shoulder breakpoint.
 - (d) The total width for inside Mainline shoulders (median side) along segment R-5777A & B shall be six (6) feet of which 4 feet shall be full depth paved shoulder.

- (e) All median features designed and constructed by the Design-Build Team shall be in accordance with all documents set forth in Section 1.1 of this Roadway Scope of Work.
- (f) The inside shoulder of the bridges carrying the Mainline over Thurman Road and Taberna Way shall be governed by the requirement set forth in Section 3.9(b) of this Roadway Scope of Work.

3.8 U-5713:

- (a) From Garner Road to the north project limit (U-5713), the typical cross section for the Mainline consists of a six-lane divided facility with a 22-foot paved median, which shall include a Type "T" double-faced concrete median barrier along the center.
- (b) The transition from the proposed condition at the north terminus of the project to the existing condition at the south approach of the Neuse River Bridge, for both the Mainline and ramps, shall be of sufficient length in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work.
- (c) The total width for outside Mainline shoulders along segment U-5713 shall be no less than 12 feet of clear, usable width. The 12 feet shall be measured from edge of the travelled way to either face of barrier or shoulder breakpoint.
- (d) The total width for inside Mainline shoulders along U-5713 shall be no less than 10 feet.
- (e) All median features designed and constructed by the Design-Build Team shall be in accordance with all requirements of this RFP, and with documents set forth in Section 1.1 of this Roadway Scope of Work.
- (f) The Department is aware that the distance between the interchanges of the Mainline with Airport Road and Williams Road, as shown on the Preliminary Roadway Plans, is not in compliance with the documents set forth in Section 1.1 of this Roadway Scope of Work. The Department notes that the Design-Build Team is not required to address this non-compliance. The Design-Build Team, however, shall not further reduce the distance between interchanges, ramps and ramp elements, beyond what is shown on the Preliminary Roadway Plans.
- (g) The Design-Build Team shall design and construct 12-foot auxiliary lanes, in both directions, between the interchanges of the Mainline with Airport Road and Williams Road, in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work. The minimum shoulder width along this segment shall be 12 feet in accordance with Section 3.8(c) of this Roadway Scope of Work.

3.9 Mainline Bridges

- (a) The Design-Build Team shall design and construct the bridges carrying the Mainline over Thurman Road, Taberna Way, Grantham Road, Airport Road, and Williams Road in accordance with the Structures Scope of Work found elsewhere in this RFP.
- (b) The inside shoulder of the bridges carrying the Mainline over Thurman Road and Taberna Way shall be of sufficient width to accommodate future inside widening (toward the Mainline median) of a third 12-foot lane plus shoulder. Such future shoulders shall be designed and constructed in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work. However, at final completion the bridges carrying the Mainline over Thurman Road and Taberna Way shall provide pavement marking for the Mainline's two (2) through lanes in each direction. The future third lane and shoulder shall be considered and marked as shoulder.

3.10 Mainline Access:

- (a) The Design-Build Team shall design and construct the Mainline as a full control of access facility.
- (b) All access from the Mainline onto existing or proposed service roads and / or properties within the Mainline project limits shall be removed.
- (c) In addition to the requirements of the preceding item 3.10(b), Mainline access at approximately Mainline stations 216+00.00, 227+35.00 and 240+25.00 shall be removed.
- (d) All median crossovers within the Mainline project limits shall be removed, including the median crossover at approximately Mainline station 240+25.00.
- (e) The at-grade intersection of the Mainline and Garner Road shall be removed and no access shall be provided from the Mainline onto Garner Road.

3.11 Retaining Walls:

- (a) The Design-Build Team shall design and construct all required retaining walls along the Mainline, Ramps and Service Roads in accordance with the Structures Scope for Work found elsewhere in this RFP. Traffic protection for retaining wall shall be in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work.
- (b) The length and amount of retaining walls within the project limits shall depend the Design-Build Team's design.

- (c) The Design-Build Team shall design and construct all retaining walls a minimum of ten (10) feet inside the right of way. If an exception for the offset distance between the edge of the traveled way and the retaining wall or noise wall, as the case may be, is required, the Design-Build Team shall submit such design exception request to the Department and seek Department's acceptance for such design exception prior to its implementation.

4. Interchanges

- 4.1 The Design-Build Team shall design and construct interchanges at the following intersections along the Mainline:
 - (a) Thurman Road;
 - (b) Taberna Way;
 - (c) Grantham Road;
 - (d) Airport Road; and
 - (e) Williams Road.
- 4.2 The Design-Build Team shall design and construct all compact diamond interchanges (CDI).
- 4.3 Alternative Technical Concepts for different types of interchanges may be submitted.
- 4.4 Without exception, all interchanges shall be designed and constructed with the Mainline over the intersecting roadway. No Alternative Technical Concepts proposing any portion of the Mainline under an intersecting roadway will be accepted.
- 4.5 Ramps:
 - (a) The Design-Build Team shall design and construct all ramps in accordance with AASHTO *A Policy on Geometric Design of Highways and Streets*, Table 10-1 (Guide Values for Ramp Design Speed as Related to Highway Design Speed). The maximum longitudinal grade for ramps within the U-5713 segment shall be 7%. Ramps within the R-5777A & B segment shall comply with the documents set forth in Section 1.1 of this Roadway Scope of Work.
 - (b) The minimum storage length for all ramps (as defined in Section 9-1 of the NCDOT *Roadway Design Manual*) shall be the most conservative length of either the storage length required in the U-5713 & R-5777 A/B Traffic Operations Analysis Technical Memorandum or the length shown in the Preliminary Roadway Plans. In any case, the storage length shall be no less than the minimum required in Section 9-1 of the NCDOT *Roadway Design Manual*.

- (c) For single-lane ramps, the minimum width for ramp lanes shall be 16 feet.
- (d) In those areas where ramps have two (2) or more lanes, the minimum lane width shall be 12 feet.
- (e) Minimum width for ramp shoulders shall be 4 feet for inside shoulders and 8 feet for outside shoulders.

5. Service Roads

- 5.1 Unless specified elsewhere in this RFP, the minimum lane width for Service Roads shall be 14 feet, except where tying into existing, in which case the appropriate transition length and taper as required by the documents set forth in Section 1.1 of this Roadway Scope of Work shall be utilized.
- 5.2 All Service Roads shall consist of a two-lane cross section, with one lane in each direction, and 2'-6" curb and gutter.
- 5.3 All Service Roads within segment R-5777A & B shall be designed and constructed to meet a minimum speed of 30 mph, except where indicated in Section 2.5(a) of this Roadway Scope of Work. Within this segment, all superelevation along Service Roads shall be in accordance with AASHTO *A Policy on Geometric Design of Highways and Streets, Table 3-8 (Minimum Radii for Design Superelevation Rates, Design Speeds, and $e_{max}=4%$)*.
- 5.4 All Service Roads within segment U-5713 shall be designed and constructed to meet a minimum design speed of 25 mph, except where indicated in Section 2.5(a) of this Roadway Scope of Work. Within this segment, all superelevation along Service Roads shall be in accordance with AASHTO *A Policy on Geometric Design of Highways and Streets, Table 3-8 (Minimum Radii for Design Superelevation Rates, Design Speeds, and $e_{max}=4%$)*.
- 5.5 Service Road -SRY21C- (southeast quadrant of the Mainline / Thurman Road interchange): The construction limit for Service Road -SRY21C- starts approximately 0.5 mile east of the Mainline reconstruction limit.
- 5.6 Service Roads -SRY21B- and -SRY21B2- (southwest quadrant of the Mainline / Thurman Road interchange):
 - (a) This Service Road shall extend from Thurman Road south to approximately station 240+00.00 of the Mainline.
 - (b) At least one point of access shall be provided at each of the parcels within the length of the Service Road, and between the Mainline right of way and the North Carolina Railroad right of way.
 - (c) To the greatest extent possible, the design and construction of the Service Road shall avoid the wetlands shown on the Preliminary Roadway Plans.

- (d) This Service Road shall be designed and constructed to meet a minimum design speed of 50 mph. All superelevation along this Service Road shall be in accordance with AASHTO *A Policy on Geometric Design of Highways and Streets, Table 3-8 (Minimum Radii for Design Superelevation Rates, Design Speeds, and $e_{\max}=4\%$)*.
- 5.7 All service roads shall be designed and constructed so as to provide access to properties and side streets in accordance with NCDOT standards and guidelines.
- 5.8 Service Road Study:
- (a) The Design-Build Team shall conduct a Service Road Study to determine whether parcels that no longer have direct access will be provided access to the service roads or will become a total take.
 - (b) The Design-Build Team shall submit such Service Road Study to the Division Construction Engineer and Resident Engineer for review and approval prior to finalizing the designs.
 - (c) If the Design-Build Team demonstrates, to the Department's sole satisfaction, that additional service road(s) are required, the design and construction of the service road(s), including all associated NEPA requirements, will be paid for as extra work in accordance with Subarticle 104-8(A) of the NCDOT Standard Specifications for Roads and Structures.
 - (d) If the Design-Build Team's design and construction methods require additional service road(s), the design and construction of the service road(s), as well as associated NEPA requirements, shall be included in the Design-Build Team's lump sum bid for the entire project.

6. Cross Streets

- 6.1 Along segments that include one single lane in each direction, the minimum lane width for Cross Streets shall be 14 feet. Along segments that include two or more lanes in either direction, the minimum lane width for Cross Streets shall be 12 feet.
- 6.2 The Design-Build Team shall design and construct all cross streets to meet the following minimum design speeds:
- (a) Day Star Lane: 40 mph
 - (b) Thurman Road: 40 mph
 - (c) Taberna Way: 30 mph
 - (d) Garner Road: 40 mph
 - (e) Grantham Road: 40 mph
 - (f) Airport Road: 50 mph
 - (g) Williams Road: 50 mph

6.3 Day Star Lane:

- (a) The Design-Build Team shall remove and replace Day Star Lane. The new Day Star Lane shall be within the Department's right of way, except for the 300 feet closest to Old Cherry Point Road, where the new Day Star Lane shall align with the existing Gibbs Road centerline.

6.4 Thurman Road:

- (a) Reconstruction limits for Thurman Road shall be, at a minimum, the intersecting points with proposed Service Roads east and west of the Mainline.
- (b) Between the intersecting points of Thurman Road with proposed Service Roads east and west of the Mainline, Thurman Road shall be designed and constructed with a minimum of two (2) through lanes in each direction and a raised median of variable width.
- (c) At its eastern limit, past the intersecting point with proposed Service Roads -SRY21C- and -SRY21D-, Thurman Road shall transition from a 4-lane cross section to the existing 2-lane cross section. Such transition shall be of sufficient length to tie into existing and in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work.
- (d) At the intersection of Thurman Road with the interchange ramps, turning lanes and channelization in the form of raised concrete islands shall be provided in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work.

6.5 Taberna Way

- (a) The western reconstruction limit for Taberna Way shall be, at a minimum, the intersecting point with proposed Service Roads -SRY21AY22B- and -SRY22A-.
- (b) The eastern reconstruction limit for Taberna Way shall be Old Cherry Point Road. The new alignment of Taberna Way east of the Mainline shall connect with Old Cherry Point Road. This new intersection with Old Cherry Point Road does not need to include turning lanes, unless specifically requested by the Department.
- (c) Between the intersecting points of Taberna Way with proposed Service Roads east and west of the Mainline, Taberna Way shall be designed and constructed with a minimum of two (2) through lanes in each direction and raised median of variable width.
- (d) At its eastern limit, past the intersecting point with proposed Service Road -SRY22D-, Taberna Way shall transition from a 4-lane cross section to a 2-

lane cross section. Such transition shall be of the length required by the documents set forth in Section 1.1 of this Roadway Scope of Work.

- (e) At the intersection of Taberna Way with the interchange ramps, turning lanes and channelization in the form of raised concrete islands shall be provided in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work.

6.6 Garner Road

- (a) The existing intersection of the Mainline and Garner Road will be eliminated, including the existing paved median cross over on the Mainline shall be removed.
- (b) Garner Road, east and west of the Mainline shall be connected to the Service Roads.
- (c) Reconstruction limits for Garner Road east and west of the Mainline shall be limited to new intersections with Service Roads, as generally shown in the Preliminary Roadway Plans, and match the existing condition on Garner Road.

6.7 Grantham Road:

- (a) Reconstruction limit for Grantham Road west of the Mainline shall be at -Y2- station 12+00.00.
- (b) Reconstruction limit for Grantham Road east of the Mainline shall be the point of intersection with the proposed Service Road north of the Mainline (-SR7-).
- (c) Through the Mainline interchange, Grantham Road shall provide a minimum of two (2) through lanes in each direction.
- (d) At the intersection of Grantham Road with the interchange ramps, turning lanes and channelization in the form of raised concrete islands shall be provided in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work.
- (e) All transitions along Grantham Road from the proposed condition back into existing shall be of sufficient length to tie into existing and in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work.

6.8 Airport Road:

- (a) Reconstruction limit for Airport Road west of the Mainline shall be approximately at -Y3- station 8+60.00.

- (b) Reconstruction limit for Airport Road east of the Mainline shall be its intersection with Old Cherry Point Road. The Design-Build Team shall be required to install appropriate signage at the intersection of Airport Road and Old Cherry Point Road, however, the Design-Build Team is not required to reconstruct or reconfigure the entire intersection, except where indicated (i.e. the west leg, or Airport Road leg, of the intersection with Old Cherry Point Road). The Design-Build Team is not required to add turning lanes to Old Cherry Point Road, unless specifically requested by the Department. In the event the Department requests turning lanes at the intersection of Old Cherry Point Road with Airport Road, such revisions to the plans, along with any additional studies required shall be paid by the Department as extra work in accordance with Subarticle 104-8(A) of the NCDOT Standard Specifications for Roads and Structures.
- (c) Between the proposed Service Road west of the Mainline, going across the Mainline, and continuing to Old Cherry Point Road east of the Mainline, Airport Road shall provide two (2) through lanes in each direction.
- (d) West of the Mainline, from the proposed Service Road going west to Airport Road's reconstruction limit approximately at -Y3- station 8+60.00, Airport Road shall transition into existing. Such transition shall be of sufficient length to tie into existing and shall be in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work.
- (e) At the intersection of Airport Road with the interchange ramps, turning lanes and channelization in the form of raised concrete islands shall be provided in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work.

6.9 Williams Road:

- (a) Reconstruction limit for Williams Road west of the Mainline shall be approximately at -Y4- station 11+18.00.
- (b) Reconstruction limit for Williams Road east of the Mainline shall be its intersection with Old Cherry Point Road. The Design-Build Team shall be required to install appropriate signage at the intersection of Williams Road and Old Cherry Point Road, however, the Design-Build Team is not required to reconstruct or reconfigure the entire intersection except where indicated (i.e. the west leg, or Williams Road leg, of the intersection with Old Cherry Point Road). The Design-Build Team is not required to add turning lanes to Old Cherry Point Road, unless specifically requested by the Department. In the event the Department requests turning lanes at the intersection of Old Cherry Point Road with Williams Road, such revisions to the plans, along with any additional studies required shall be paid by the Department as extra work in accordance with Subarticle 104-8(A) of the NCDOT Standard Specifications for Roads and Structures.

- (c) Between the proposed Service Road west of the Mainline, going across the Mainline, and continuing to Old Cherry Point Road east of the Mainline, Williams Road shall provide a minimum of two (2) through lanes in each direction.
- (d) West of the Mainline, from the proposed Service Road going west to Williams Road's reconstruction limit approximately at -Y4- station 11+18.00, Williams Road shall transition into existing. Such transition shall be of sufficient length to tie into existing and shall be in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work.
- (e) At the intersection of Williams Road with the interchange ramps, turning lanes and channelization in the form of raised concrete islands shall be provided in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work.

6.10 Elder Street:

- (a) The existing access from Elder Street into the northbound lanes of the Mainline (i.e. pavement between Plum Street and the Mainline providing access onto Elder Street) shall be removed.
- (b) East of the Mainline, Elder Street shall end at its intersection with Plum Street. No work on Elder Street shall be required on the west side of the Mainline.
- (c) No bridge carrying the Mainline over Elder Street will be required at this location. The Design-Build Team may design and construct the Mainline to match the existing US 70 vertical alignment at this location.

7. Pedestrian Accommodations

- 7.1 All existing sidewalk impacted by the Project shall be replaced in kind and in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work.
- 7.2 Without exception, the following Cross Streets must include sidewalk along both sides:
 - (a) Grantham Road;
 - (b) Airport Road; and
 - (c) Williams Road.
- 7.3 Alternative Technical Concepts that eliminate sidewalks at the locations stated in Item 7.2 will be rejected.
- 7.4 All new sidewalk within the Project limits shall only be added at those locations shown on the Preliminary Roadway Plans, and shall be designed and constructed

in accordance with the documents set forth in Section 1.1 of this Roadway Scope of Work. All new sidewalk shall have a minimum width of 5 feet plus a 2-foot utility strip between the sidewalk and back of curb.

- 7.5 Sidewalk transitions, from proposed sidewalk width to existing sidewalk width, shall be a minimum of 50 feet.

8. Additional Requirements

- 8.1 Due to right of way constraints, the Design-Build Team will be allowed to design and construct minimum ditch widths for the facility functional classification.
- 8.2 Unless noted otherwise elsewhere in this RFP, all bridge rail offsets shall be the greater of 1) the bridge rail offset as indicated in the NCDOT Roadway Design Manual, 2) the approach roadway paved shoulder width, or 3) the offset required to achieve stopping sight distance (maximum 12-foot). Narrower bridge rail offsets based on bridge length will not be allowed.
- 8.3 For all intersection design modifications, the Design-Build Team shall provide a traffic analysis that adheres to the July 1, 2015 NCDOT Congestion Management Capacity Analysis Guidelines for the Department's review and acceptance.
- 8.4 At all intersections with restricted movements impacted by the Design-Build Team's design and / or construction methods, excluding resurfacing or overlays, the Design-Build Team shall provide five-inch keyed-in concrete monolithic channelization islands, regardless of the island dimensions. (Reference Roadway Standard Drawing No. 852.01.)
- 8.5 The mainline is a full control of access facility. The Design-Build Team shall bring to the Division's attention any deviations from the proposed control of access shown on the Preliminary Roadway Plans provided by the Department. The proposed right of way and / or control of access limits may deviate in proximity to cultural, historic, or otherwise protected landmarks, including cemeteries, to eliminate / minimize impacts. Prior to negotiating right of way, easement and / or control of access with property owners, the Department shall accept the Right of Way Plans developed by the Design-Build Team.
- 8.6 Prior to installation, the Design-Build Team shall be responsible for coordinating with, and obtaining approval from, the NCDOT for the control of access fence placement. The Design Build Team shall be responsible for installation of woven wire control of access fence as noted below:
- (a) Throughout the construction limits, excluding areas that consist solely of pavement marking obliterations / revisions, the Design-Build Team shall remove and dispose of all existing control of access fence, and install new control of access fence.

- (b) The Design-Build Team shall replace all control of access fence damaged during construction.
 - (c) The Design-Build Team shall install all missing control of access fence.
- 8.7 Except as required elsewhere in this RFP and / or to eliminate a design exception, the Design-Build Team shall not further impact any cultural, historical or otherwise protected landmark or topographic feature beyond that shown on the Preliminary Roadway Plans provided by the Department.
- 8.8 The Design-Build Team shall provide milled rumble strips along the mainline outside and median paved shoulders, including ramp and loop terminals, and acceleration, deceleration and auxiliary lanes, in accordance with the NCDOT Roadway Standard Drawings No. 665.01.
- 8.9 For all bridges, the Design-Build Team shall submit vertical and horizontal clearance design calculations at all critical points. The Design-Build Team shall submit post construction survey points for the aforementioned critical points that verify construction adhered to the vertical and horizontal clearances accepted by the Department. The Design-Build Team shall be responsible for all costs associated with correcting vertical and horizontal clearances resulting from any construction variation from the design accepted by the Department.

9. Noise Abatement

The Department will provide an approved Traffic Noise Report (TNRA) and associated Preliminary Noise Wall Recommendation Memorandum that is based on the Department's preliminary design. The Design-Build Team shall evaluate the entire Project and develop the Design Noise Report (DNR) based on the plans developed by the Design-Build Team, regardless of changes to the Department's preliminary design. The DNR shall be developed in accordance with the NCDOT 2016 *Traffic Noise Policy* and the NCDOT 2016 *Traffic Noise Manual*; and be reviewed and accepted by NCDOT. The Design-Build Team shall include all design and construction costs for all sound barrier walls required by the accepted DNR, as well as all costs associated with performing any additional geotechnical investigations necessary to design the foundations, in the lump sum price bid for the entire project. However, the Design-Build Team will not be required to include any designs associated with the proposed sound barrier walls in the Technical Proposal. Prequalification under Discipline Code 441 shall be required for the firm developing the DNR.

The Design-Build Team is cautioned that the TNR and Preliminary Noise Wall Recommendation Memorandum are provided to show the general location of potential walls. Thus, as with all information provided by the Department, the TNR and Preliminary Noise Wall Recommendation Memorandum are provided for informational purposes only and; the Department will not honor any requests for additional contract time or compensation for any variations between the approved TNR and the approved DNR.

The Department will ballot all benefited receptors to determine which sound barrier walls recommended in the accepted DNR will be constructed. The Design-Build Team shall (1) develop and provide the information required by the Department to complete the balloting process, and (2) attend and / or speak at all balloting meetings and workshops. The Department will require four months to complete the balloting process. The Department will not honor any requests for additional contract time or compensation for the sound barrier wall construction unless the aforementioned four-month timeframe is exceeded. If time were granted, it would only be for that time exceeding the four-month period, which shall begin on the date the Department accepts the DNR developed by the Design-Build Team. The Design-Build shall not construct any sound barrier walls until the balloting process has been completed by the Department.

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 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.

10. Driveway Access

- 10.1 Excluding undeveloped properties and / or those properties identified as a total take, as determined by the Service Road Study, the Design-Build Team shall design and construct a minimum of one driveway per parcel.
- 10.2 The Design-Build Team shall design and construct all driveways in accordance with the most recent version of the NCDOT *Policy on Street and Driveway Access to North Carolina Highways*, and with the following minimum requirements:
 - (a) The Design-Build Team shall provide horizontal and vertical alignments for all driveways that require 100 feet or longer to tie to existing.
 - (b) Excluding grades required to tie to an existing limiting condition, the maximum driveway grade shall be 10.0%.
 - (c) For shoulder sections, the minimum driveway turnout for residential and commercial properties shall be 16'-0" and 24'-0", respectively, or the existing width, whichever is greater.

- (d) For curb and gutter sections, the minimum driveway turnout for residential and commercial properties shall be 20'-0" and 28'-0", respectively, or the existing width, whichever is greater.

GEOTECHNICAL ENGINEERING SCOPE OF WORK (3-11-19)

GENERAL

All geotechnical data, tests, computations and supporting subsurface investigations and documentation submitted by the Design-Build Team shall be provided in English Units.

Obtain the services of a firm prequalified for geotechnical work by the NCDOT Geotechnical Engineering Unit at:

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

The prequalified geotechnical firm shall prepare foundation design recommendation reports for use in designing structure foundations, roadway foundations, retaining walls, sound barrier foundations, and overhead sign structure foundations, and temporary structures.

The Engineer of Record who prepares the foundation design recommendation reports shall be a Professional Engineer registered in the State of North Carolina who has completed a minimum of three geotechnical design projects of scope and complexity similar to that anticipated for this project using the load and resistance factor design (LRFD) method and in accordance with the latest edition of the AASHTO *LRFD Bridge Design Specification*.

The prequalified geotechnical firm shall also determine if additional subsurface information, other than that required and noted elsewhere in this RFP, is required based upon the subsurface information provided by the NCDOT and the final roadway and structure designs. If a determination is made that additional subsurface information is required; the Design-Build Team shall use a prequalified geotechnical firm to perform all additional subsurface investigation and laboratory testing in accordance with the current NCDOT Geotechnical Engineering Unit *Guidelines and Procedures Manual for Subsurface Investigations*. Submit additional information collected by the Design-Build Team to the Geotechnical Engineering Unit, via the Division Construction Engineer or designee, for review and acceptance. The Design-Build Team shall provide the final Subsurface Investigation report in electronic and hardcopy format to the NCDOT for its records.

Unless noted otherwise herein, the Design-Build Team shall design foundations (except for sign foundations), embankments, slopes, retaining walls, and sound barrier walls in accordance with the current edition of the AASHTO *LRFD Bridge Design Specifications*, NCDOT *LRFD Driven Pile Foundation Design Policy*, all applicable NCDOT Geotechnical Engineering Unit Standard Provisions, NCDOT *Structures Management Unit Manual* and NCDOT *Roadway Design Manual*. The NCDOT *LRFD Driven Pile Foundation Design Policy* is located on the NCDOT Geotechnical Engineering Unit's website at:

<https://connect.ncdot.gov/resources/Geological/Pages/default.aspx>

For *Geotechnical Guidelines For Design-Build Projects*, the Design-Build Team shall adhere to the guidelines located at the following website:

<https://connect.ncdot.gov/letting/Pages/Design-Build-Resources.aspx>

A minimum of 2 standard penetration test (SPT) shall be required per bent for all bent lengths of 50 feet or less. Additional SPT borings shall be required across the roadway typical section for each bent more than 50 feet long and the borings shall be spaced no greater than 50 feet apart. All borings for pile-supported bents shall be located within 25 feet of the centerline of each bent location to be counted for these minimum requirements. For structure sites with multiple bridges, borings may be performed between bridges along the bent projection provided the distance between any two borings does not exceed 50 feet. The Design-Build Team shall extend all borings to a depth of 15 feet or four foundation element diameters, whichever is greater, below the foundation element to show a complete subsurface profile. The Design-Build Team shall be responsible for obtaining the borings noted above for all bents where subsurface information is not sufficient or is warranted by variability in the geology unless the prequalified geotechnical firm submits documented justification that the subsurface investigation provided by the NCDOT is adequate for design purposes and the justification is acceptable to the Department. Any deviations to the requirements noted above shall require acceptance from the NCDOT Geotechnical Engineering Unit prior to the foundation design submittal.

The maximum spacing between borings for retaining walls and sound barrier walls shall be 200 feet, with a minimum of two borings; one at each end of the wall. Drill borings for retaining walls a minimum depth below the bottom of the wall equal to twice the maximum wall height. Boring depths for sound barrier walls shall be to a minimum depth below the bottom of the wall equal to the maximum wall height or to SPT refusal.

ADDITIONAL DESIGN REQUIREMENTS

A. Structure Foundations

- Support all bridge bents on deep foundations.
- Use MSE walls for all bridge end bents.
- Moment slab barriers are required on top of all MSE walls.
- MSE walls must include an aesthetics package as to be submitted for review and acceptance by the Division.

B. Roadway Foundations

- Unless noted otherwise herein, all unreinforced proposed fill slopes, shall be 3:1 (H:V) or flatter. Unless the slopes are designed with adequate reinforcement to provide the required stability, all proposed soil cut slopes shall be 3:1 (H:V) or flatter. Reinforced soil slopes shall only be used if 1) the NCDOT Geotechnical Standard Details 1803.1 and / or 1803.2 are applicable, or 2) detailed design calculations and a slope stability analysis are submitted for review and acceptance prior to construction.
- Reinforced soil fill slopes shall only be used to minimize impacts to existing structures, and / or cultural, historical or otherwise protected landmark or topographic features.

- Check the overall final condition stability of reinforced and non-reinforced earth slopes including bridge abutments. Include internal, external, compound, and global investigations in the overall stability check. Meet the following performance criteria for fills slopes, cut slopes, and bridge abutments constructed under this Contract:
 - Global stability calculations: minimum Safety Factor of 1.5 for bridge abutments
 - Global stability calculations: minimum Safety Factor of 1.3 embankment fills
 - Global stability calculations: minimum Safety Factor of 1.5 for cut slopes
 - Lateral squeeze calculations: minimum Safety Factor of 2.0
- Design and construct bridge approach fills such that no more than 1 inch of settlement occurs, measured at the back of the approach slab, from the time the approach slab is cast until the end of the warranty period. Design roadway embankments such that no more than 2” of settlement is calculated from substantial completion to 15 years after substantial completion.
- Mitigate all unsuitable soils to the extent required to improve the stability of the proposed embankment or subgrade. Use any suitable material to backfill undercut areas except when employing shallow undercut in accordance with Section 505 of the NCDOT 2018 *Standard Specifications for Roads and Structures* which requires the use of Select Material, Class IV. For undercut backfilling in water, use Select Material, Class III.
- Proofrolling of subgrade with a 35-ton roller is required.

C. Ground Improvement Methods

Ground improvement techniques to mitigate long term settlement problems or to transfer the embankment load to a deeper bearing stratum are acceptable means to accelerate construction. All ground improvement techniques shall follow the current industry standard practices and the guidelines of *Geotechnical Engineering Circular No. 13 Ground Modification Methods Reference Manual FHWA publication FHWA-NHI-16-027 and FHWA-NHI-16-028* or *Geosynthetic Design and Construction Guidelines FHWA-HI-95-038*. For Geofabric design and construction, use the Geofabric Applications in the Design and Construction of Highway Embankments, Prepared for National Cooperative Highway Research Program (NCHRP) Project 24-11, Transportation Research Board of the National Academies, July, 2004 and Guideline and Recommended Standard for Geofabric Applications in Highway Embankments, National Cooperative Highway Research Program (NCHRP) Report 529, Transportation Research Board of the National Academies, 2004.

- Submit ground improvement designs ecommendations and calculations including the Geotechnical Instrumentation and Monitoring Plan to the NCDOT Geotechnical Engineering Unit for acceptance 30 days prior to beginning embankment construction. Only the following Ground Improvement Methods or combination of methods are allowed to improve the foundation soil conditions:
 - Excavation and replace with granular soils
 - Wick drains and/or surcharge and/or waiting periods
 - Lightweight fill – Lightweight Aggregate
 - Lightweight fill – foamed (cellular) lightweight concrete
 - Lightweight fill – expanded polystyrene (EPS Geofoam Blocks)
 - Rigid Inclusions for Ground Improvement – Rigid inclusions may consist of drilled-in-place or driven piles, vibro concrete columns (VCC) , controlled modulus columns (CMC), or other elements suitable to the design application and all performance requirements. Helical Screw Piles are not allowed for rigid inclusions. If rigid inclusions are used, refer to FHWA-NHI-06-019 and 020 for design of Load Transfer Platform (LTP).
- A Geotechnical Instrumentation and Monitoring Plan (GIMP) is required to monitor settlement where ground improvement methods are used. Use automated sensing and data acquisition systems. See the Geotechnical Instrumentation and Monitoring Plan Special Provision for details. Submit the GIMP to NCDOT for along with the ground improvement designs.

D. Permanent Retaining Wall Structures

- For design and construction of mechanically stabilized earth (MSE) retaining walls, refer to the NCDOT *Policy for Mechanically Stabilized Earth Retaining Walls* which can be found at the NCDOT Geotechnical Engineering Unit’s website at:

<https://connect.ncdot.gov/resources/Geological/Pages/Products.aspx>

Limit transverse differential settlement for MSE walls to 1/200 from face of wall to back of strips. Where abrupt changes in settlement are anticipated, provide vertical slip joints.

Provide drainage for all walls and connect to a drainage feature.

- With the exception of walls covered by a Geotechnical Engineering Unit Standard Detail, design and construct permanent retaining walls in accordance with the applicable NCDOT Geotechnical Engineering Unit Project Special Provisions, which can be provided upon request by the Design Build Team. Geotechnical Provisions and Notes can be found at the NCDOT Geotechnical Engineering Unit's website at:

https://connect.ncdot.gov/resources/Geological/Pages/Geotech_Provisions_Notes.aspx

- Submit a wall layout and design for each retaining wall. The wall layout submittal shall include at least the following:
 - Wall envelope with top of wall, bottom of wall, existing ground, and finished grade elevations at incremental stations
 - Wall alignment with stations and offsets
 - Typical sections showing top and bottom of wall, drainage, embedment, slopes, barriers, fences, etc.
 - Roadway plan sheets showing the wall (half size)
 - Roadway cross sections sheets showing the wall (half size)
 - Traffic Control Plans showing the wall (half size)
- For project retaining walls requiring a design not covered by a Geotechnical Engineering Unit Standard Detail, the wall layout submittal shall also include the following:
 - Calculations for bearing capacity, global stability, and settlement
 - Details of conflicts with utilities and drainage structures
- Locate retaining walls at toes of slopes unless restricted by right of way limits. The Design-Build Team shall submit global stability calculations for slopes at retaining walls and obtain acceptance from the NCDOT prior to construction. All slopes behind walls shall be 4:1 (H:V) or flatter.
- Drainage over the top of retaining walls shall not be allowed. Direct runoff above and below walls away from walls, if possible, or collect runoff at the walls and transmit it away. Curb and gutter or cast-in-place single faced barrier with paving up to the wall shall be required when runoff cannot be directed away from the back or front of the wall. In accordance with the NCDOT *Roadway Design Manual* – Section 6-7A, Figure 3, the Design-Build Team shall design and construct a paved concrete ditch, with a minimum 12-inch depth, at the top of all retaining walls with

slopes draining towards the wall, and a four-foot bench between the wall and fill / cut slopes steeper than 6:1 (H:V).

- Precast or cast-in-place coping shall be required for walls without a cast-in-place face with the exception of when a barrier is integrated into the top of the wall. Extend coping or cast-in-place face a minimum of 12 inches above where the finished or existing grade intersects the back of the wall.
- When using abutment retaining walls with deep foundations, the end bent deep foundation shall be designed and constructed with one of the following and include any lateral loading resulting from the pile deflection in the design of the MSE walls:
 - A single row of plumb piles with brace piles battered toward the wall
 - A single row of plumb piles with MSE reinforcement connected to the back of the cap
 - An integral abutment with a single row of plumb piles and no reinforcement connected to the back of the cap in accordance with FHWA GEC 11 pages 6-8 through 6-10
- All deep foundations for end bents with abutment retaining walls shall extend a minimum of ten feet below the retaining wall foundation or leveling pad.

D. Temporary Structures

- Design temporary retaining structures, which include earth retaining structures and cofferdams, in accordance with current allowable stress design AASHTO *Guide Design Specifications for Bridge Temporary Works*, the *Temporary Shoring Standard Special Provision* found elsewhere in this RFP and the applicable NCDOT Project Special Provisions available upon request by the Design-Build Team. The only submittal required to use the standard sheeting design is the “Standard Shoring Selection Form”.
- Traffic control barrier on top of walls shall be in accordance with the NCDOT Work Zone Traffic Control Unit details available upon request by the Design-Build Team. If anchored barrier is required, then anchor the barrier in accordance with NCDOT 2018 Roadway Standard Drawing No. 1170.01.

ADDITIONAL CONSTRUCTION REQUIREMENTS

- The Design-Build Team shall investigate, propose, and submit proposed remedial measures to the NCDOT Geotechnical Engineering Unit for review and acceptance (prior to incorporating recommended remedial measures into the project) for any construction problems related to the following:
 - Foundations
 - Retaining walls

- Sound barrier walls
 - Subgrades
 - Settlement
 - Slopes
 - Construction vibrations
- The prequalified geotechnical firm which prepares the foundation designs shall review and approve all pile driving equipment and criteria. After the prequalified geotechnical firm has approved these submittals, the Design-Build Team shall submit them to the NCDOT for review and acceptance prior to beginning construction. Hammer approvals shall be submitted prior to performing any pile driving and shall be performed using GRLWEAP Version 2010 or later.
 - The prequalified geotechnical firm which prepares the original foundation designs shall be responsible for any necessary changes to the foundation designs revising analysis, recommendations, and reports as needed. All changes shall be based upon additional information, subsurface investigation and / or testing. Send copies of revised designs, including additional subsurface information, calculations and any other supporting documentation to the NCDOT for review and acceptance.
 - The Design-Build Team shall be responsible for any damage and / or claim caused by construction, including but not limited to damage caused by vibration (see Article 107-14 of the NCDOT 2018 *Standard Specifications for Roads and Structures*). The Design-Build Team shall be responsible for deciding if any pre- and post-construction monitoring and inventories need to be conducted. Any monitoring and inventory work shall be performed by a prequalified consulting firm.
 - Use Pile Driving Analyzer (PDA) testing on a minimum of two piles for each pile size and type for each bridge with driven piles using the approved hammer driving system for the pile. The two test piles shall not be located at the same bent. PDA test piles shall be spread out across the bridge to provide data across the entire bridge site. Drive criteria at each bent shall be based on the PDA test pile most representative of the conditions at the bent and shall be approved by NCDOT. PDA testing shall be performed during initial drive and as necessary for re-strikes of the tested pile. Changes in hammer driving systems and / or additional similar hammer driving systems shall require additional PDA testing. Additional PDA testing may be warranted based on AASHTO *LFRD Bridge Design Specifications* and shall be recommended as needed by the geotechnical foundation design engineer and submitted to the NCDOT for review and acceptance.
 - The PDA Consultant shall perform PDA testing, provide PDA reports, and develop pile driving inspection charts or tables. All recommendations shall be submitted to NCDOT for review and acceptance prior to driving any production piles at the applicable bridge.
 - The geotechnical grade point shall be defined as the location where the proposed subgrade and natural ground intersect. At all geotechnical grade points, the Design-Build Team shall undercut the existing soils within two feet of the bottom of the proposed subgrade in accordance with the requirements below.

- The undercut shall extend along the profile to a point where the elevation difference from the bottom of the proposed subgrade to natural ground is greater than two feet, or to 25 feet on each side of the geotechnical grade point, whichever is less.
- The lateral extent of the undercut shall extend to a point where the elevation difference from the bottom of the proposed subgrade to natural ground is greater than two feet or to one foot outside of the paved shoulder / face of curb of the proposed roadway typical section, whichever is less.
- The base of the undercut shall parallel the proposed subgrade.
- Send copies of any inspection forms related to foundations, settlement, sound barrier walls, or retaining wall to the NCDOT for review and acceptance.