

PROJECT SPECIAL PROVISIONS

Roadway

7-1-95

SP1R01

DESIGN AND CONSTRUCT THE WIDENING OF BRIDGE NO. 57 ON NC 274 OVER NORFOLK SOUTHERN RAILROAD:**General:**

Design and construct the widening of Bridge No. 57 on NC 274 over Norfolk Southern RR. The Contractor shall also be responsible for obtaining plan approval and a signed legal agreement with Norfolk Southern Railroad and NCDOT. The agreement is required prior to beginning construction of the bridge widening.

Review and Approval of Design Submittals:

Major design milestones and required design submittals shall be identified as activities on the approved CPM for the project. Submittals will be reviewed within 10 working days of the activity date identified on the approved CPM unless otherwise stipulated in the scope of work. All submittals (four full size copies) shall be made simultaneously to the Resident Engineer (two hard copies) and to the designated person in the Highway Design Branch (two hard copies) unless otherwise stated in the scope of work. No work shall be performed prior to the approval of the design submittals.

Design and Construction Work Performed by the Contractor:

The design work consists of the preparation of all construction documents for the widening of Bridge No. 57 on NC 274 over the Railroad as outlined in the Scope of Work below. The Contractor shall prepare final designs, construction drawings and special provisions. All final plans and special provisions shall be sealed by the responsible designing Engineer. The Engineer must be duly registered to practice engineering in North Carolina. The Contractor shall provide a complete set of final plans for the widening of Bridge No.57 to the Department.

The Contractor shall be fully and totally responsible for the accuracy and completeness of all work performed under this contract and shall save the State harmless and shall be fully liable for any additional costs and all claims against the State which may arise due to errors, omissions and negligence of the Contractor in performing the work.

There shall be no assignment, subletting or transfer of the interest of the Contractor in any of the work covered by the Contract without the written consent of the State, except that the Contractor may, with prior notification of such action to the State, sublet property searches and related services without further approval of the State.

The Contractor shall certify all plans, specifications, estimates and engineering data furnished by him. The Contractor shall use an Engineering Firm on the Department's approved listing of Registered Qualified Engineering Firms to perform the design for the widening of Bridge No. 57 on NC 274 over the Railroad.

All work by the Contractor is to be done in a manner satisfactory to the State and in accordance with the established customs, practices, and procedures of the North Carolina Department of Transportation and in conformity with the standards adopted by the American Association of State Highway Transportation Officials, and approved by the Secretary of Transportation as provided in Title 23, US Code, Section 109 (b). The decision of the State is to control in all questions regarding location, type of design, dimension of design, and similar questions.

Ethics Policy:

Employees employed by the Contractor or employees employed by any subconsultant for the Contractor to provide services for this project shall comply with the DEPARTMENT'S ethics policy. Failure to comply with the ethics policy will result in the employee's removal from the project and may result in removal of the Company from the DEPARTMENT'S listing of Registered Qualified Engineering Firms.

STRUCTURES SCOPE OF WORK:

The contractor's primary design firm shall be on the Highway Design Branch list of firms qualified for Structure Design and maintain an office in North Carolina.

Design shall be in accordance with the Sixteenth Edition AASHTO Standard Specifications for Highway Bridges, NCDOT Structure Design Manual (including policy memos), and NCDOT Bridge Policy Manual, and Norfolk Southern Corporation (NSC) "Guidelines for the Design of Grade Separation Structures" and AREMA. Construction and Materials shall be in accordance with 2002 NCDOT Standard Specifications For Roads and Structures, NCDOT Structure Design Unit Project Special Provisions, NCDOT Structure Design Unit Standard Drawings, and Norfolk Southern Corporation special provisions and State-Railroad Agreement.

Alternate designs, details, or construction practices (such as those employed by other states, but not standard practice in NC) are subject to Department review and will be evaluated on a case by case basis.

Structure to be Widened:

Bridge No. 57 on NC 274 over Norfolk Southern RR

The existing bridge shall be widened a minimum of 3.450m on the left side and 1.800m on the right side for a total out to out dimension of 18.050m. The dimensions are based on the existing deck being cut at 6.4 m from the centerline of the existing bridge. Widen the existing approach slab accordingly.

The bridge shall meet approved Roadway typical sections and grades. Bridge geometry (width, length, skew, span arrangement, etc.) shall be in accordance with the approved Structure Recommendation (available upon request).

Bridge railing shall not be in accordance with the approved Structure Recommendation (3-bar metal rail on the east side, jersey barrier on the west side). The bridge railing shall be parapet and 2 bar metal rail (Standards BMR2SM and BMR34SM) with the parapet height increased 50mm or approved equal. Sidewalk will be required on the east side of the bridge.

Bridge design and construction shall be subject to applicable agreement restrictions and conditions.

Hangers and conduit for fiber optic communications cable will be required on the bridge. Casting of conduit in bridge deck or railings will not be allowed.

Existing bridge location and survey data will be the responsibility of the design build team.

Required Submittals:

Sufficient data, including items previously approved by other NCDOT units (Roadway, Geotechnical, Hydraulics, Traffic, etc.) shall be submitted with (or prior to) all plan submittals to facilitate review.

A. Submittals for Review:

For bridges, the required plan submittals for review are six half size (11"X17") sets of Preliminary General Drawings and six half size sets of final plans. For culverts or other permanent structures, the required plan submittals for review are six half size sets of final plans. Two complete sets of project special provisions shall also be submitted for review.

Preliminary General Drawings shall contain sufficient details (drawings or narrative) to explain the scope of design and construction intended for the bridge, and shall list all anticipated special provisions and notes describing design data and material properties (for guidance, refer to NCDOT Structure Design Manual Section 5, General Drawings). Final Plans are expected to have all plan details and notes completed for final review. The RFC's (optional) and Final Plans submittals may be separated into substructure and superstructure or other submittals as necessary to accommodate construction schedules.

All comments by NCDOT or FHWA on all submittals shall be addressed in writing and by making appropriate changes to designs or drawings before construction of those elements begins. Re-submittal of plans may be required.

B. Submittals for Record Keeping:

One complete full size original set of Release For Construction (RFC) plans shall be submitted to the structure design unit for record keeping along with the complete set of original design files and one complete set of project special provisions. The record set RFCs, design files, and project special provisions shall bear the seal of a North Carolina registered Professional Engineer.

C. Working Drawing Submittals:

Working drawing submittals shall be in accordance with the "Submittal of Working Drawings" project special provision. Sufficient data shall be submitted prior to or with the working drawings to facilitate review. This data shall include one half size copy of the appropriate RFC drawing or drawings related to the submittal.

D. Other:

The Contractor shall be responsible for all additional copies of structure plans for other units as requested (including but not limited to As Built Plans).

Railroad Criteria:

Railroad overhead bridge designs shall meet Norfolk Southern Corporation "Guidelines for the Design of Grade Separation Structures" and AREMA, and Norfolk Southern special provisions and all provisions required by the agreement. Only NSC may grant exceptions to their guidelines or AREMA.

Crashwalls may be required by the Railroad on widened sections of interior bents. The Department's policy is to avoid use of crashwalls at interior bents where possible. . See Theoretical Section for Norfolk Southern Railway.

The Design/Build Team shall coordinate with J. N. Carter, Jr., Chief Engineer, Bridges and Structures, Norfolk Southern Corporation, 99 Spring Street, S. W., Atlanta GA 30303-0142, (contact is David Wyatt at telephone number 404-527-1641) to obtain plan approval and a signed legal agreement with Norfolk Southern Railway and the Department of Transportation as the parties in the agreement for overhead bridges crossing Norfolk Southern Railway in the vicinity of Piedmont Division Milepost 403.10. The Department will review agreement prior to submittal to Norfolk Southern Railway. The Department will execute and distribute the Agreement within 14 calendar days of receipt. Agreement shall include necessary Force Account items such as preliminary engineering, construction engineering, flagging, and signal and communication lines. The Department will be responsible for payment of the Railroad's Force Account work; however, the Design/Build Team shall reimburse the Department for these costs including any Force Account estimate overruns. The Department will provide copies of the railroad's invoices to the team upon request for the team's review. The team will have ten (10) days to provide comments to the Department, after which the Department will pay the invoice. The team will be responsible for maintaining records to verify the invoice items.

Passenger train track Railroad Protective Liability Insurance to be provided by the Design-Build Team for Bodily Injury Liability, Property Damage Liability, and Physical Damage to Property is typically \$5,000,000 Per Occurrence and \$10,000,000 Aggregate Per Annual Policy Period. Norfolk Southern Corporation may require additional insurance or coverage.

Per Norfolk Southern Corporation there are an average of 23 freight trains a day through this bridge site at a maximum speed of 60 miles per hour and 2 passenger trains a day at a maximum speed of 79 miles per hour.

Coordination With Norfolk Southern Corporation:

The preliminary plan submittal to Norfolk Southern Corporation shall include bridge plans, NSC's "Overhead Grade Separation Data Sheet," appropriate roadway plan sheets showing impacts to NSC Right of Way, erosion control plans, and drainage calculations for any drainage on or across NSC Right of Way. A minimum of five (5) half size sets of preliminary plans and data shall be submitted to NSC. If NSC requires RFCs and/or final plans, then five (5) half size sets shall be provided to NSC. If any re-submittals of plans or any additional information is required, five (5) half size sets shall be submitted to NSC. Working Drawings affecting NSC Operations and Right of Way shall follow submittal process as outlined in the Standard Specifications or Special Provisions.

Requirements for Cables Crossing Railroads**1. Railroad Crossings**

Do not commence cable routings over or under railroad-owned facilities until notification and coordination with Engineer and the appropriate railroad company has occurred. All affected railroad facilities on this project are owned by the Norfolk Southern Railway Company herein called the Railroad Company. It is the responsibility of the Design-Build firm to make contact with the Railroad Company or any party acting on their behalf regarding any wireline agreements necessary for crossing over or under any railroad facilities at the address and phone number given below. This contact is not limited to any fees required by either the DMJM + HARRIS or the Norfolk Southern Railway Company.

DMJM + HARRIS
260 South Broad Street
Suite 1500
Philadelphia, PA 19102
Attention: NS Pipe and Wire Administrator
Telephone: (215) 735-0832
Website: www.dhprojects.com
E-Mail NSUtilities@dmjmharris.com

2. Requirements for Insurance

In addition to any other forms of insurance or bonds required elsewhere in the contract documents and prior to commencing any work, the Contractor will be required to provide coverage conforming to the requirements of the Federal-Aid Policy Guide outlined under 23 CFR 646A for all work to be performed on the Railroad rights(s) of way under the terms of the contract by carrying insurance of the following kinds:

A. CONTRACTOR’S GENERAL LIABILITY AND PROPERTY DAMAGE INSURANCE

i. Furnish a copy of the certificate of insurance to the Department of Transportation as evidence that, with respect to the operations performed on railroad right of way, Contractor’s General Liability Insurance providing for limits of liability as follows:

<u>COVERAGE</u>	<u>MINIMUM COMBINED LIMITS OF LIABILITY</u>
Bodily Injury Liability	\$2,000,000 Per Occurrence
Property Damage Liability	\$2,000,000 Aggregate

ii. If any part of the work is sublet, similar insurance and evidence thereof in the same amounts as required of the Prime Contractor, shall be provided by the subcontractor to cover his operations on railroad right of way. As an alternative, the Prime Contractor may provide for the subcontractor by means of separate and individual policies.

iii. Certificates shall make reference to the project, milepost and county. Certificates of Insurance holder are to be the address given below.

Norfolk Southern Corporation
Attn. David Fries, Director – Risk Management
Three Commercial Place
Norfolk, VA 23510

iv. All policies and certificates shall contain a clause requiring that thirty (30) days written notice be given the Department of Transportation and the Railroad Company prior to cancellation or change. The notices shall make reference to the project, milepost and county.

NOTICE TO:
Norfolk Southern Corporation
Attn. David Fries, Director – Risk Management
Three Commercial Place
Norfolk, VA 23510

COPY NOTICE TO:
Department of Transportation
Utilities Coordination Unit
c/o State Railroad Agent
1546 Mail Service Center
Raleigh, NC 27699-1546

v. Carry all insurance herein specified until the final inspection and acceptance of the project, or that portion of the project within railroad right of way, by the Department of Transportation or, in the case of subcontractors, until the Contractor furnishes a letter to the Engineer stating that the subcontractor has completed his subcontracted work within railroad right of way to the satisfaction of the Contractor and the Contractor will accomplish any additional work necessary on railroad right of way with his own forces. It is understood that the amounts specified are

minimum amounts and that the Contractor may carry insurance in larger amounts if he so desires. As to "aggregate limits", if the insurer establishes loss reserves equal to or in excess of the aggregate limit specified in any of the required insurance policies, immediately notify the Department of Transportation and cease all operations until the aggregate limit is reinstated. If the insurer establishes loss reserves equal to or in excess of one/half of the aggregate limit, arrange to restore the aggregate limit to at least the minimum amount stated in these requirements. Any insurance policies and certificates taken out and furnished due to these requirements shall be approved by the Department of Transportation and the Railroad Company as to form and amount prior to beginning work on railroad right of way.

No extra allowance will be made for the insurance required hereunder. The entire cost shall be included in the unit contract bid price for other pay items.

vi. Furnish evidence of insurance as required above for review to the Department of Transportation at the address shown below after which it will be forwarded by the Department of Transportation to the Railroad.

Send to Department:
Department of Transportation
Utilities Coordination Unit
c/o State Railroad Agent
1546 Mail Service Center
Raleigh, NC 27699-1546

3. Delays Caused By Operations of Others

Neither the Department of Transportation nor the Railroad Company assumes any responsibility for any work performed by others in connection with the construction of the project, and the Contractor shall have no claim whatsoever against the Department of Transportation, or the Railroad Company for any inconvenience, delay, or additional cost incurred by him on account of such operations by others.

4. Cooperation With Others

Cooperate with others participating in the construction of the project to the end that all work may be carried on to the best advantage.

5. Authority of Railroad Engineer

The authorized representative of the Railroad Company hereinafter referred to as the Railroad Engineer, shall have the final authority in all matters affecting the safe maintenance of railroad traffic of his company.

6. Interference With Railroad Operations

Arrange and conduct work so that there will be no interference with railroad operations, including train, signal, telephone and telegraphic services, or damage to the property of the Railroad Company or to the poles, wire, and other facilities of tenants on the rights of way of the Railroad Company. Wherever work is liable to affect the operations or safety of trains, the method of doing such work shall first be submitted to the Railroad Engineer for approval, but such approval shall not relieve the Contractor from liability.

Should conditions arising from or in connection with the work, require that immediate and unusual provisions be made to protect train operations and property of the Railroad Company, it shall be a part of the required services by the Contractor to make such provisions and if, in the judgement of the Railroad Engineer such provisions is insufficient, the Railroad Engineer or the Department of Transportation, may at the expense of the Contractor, require or provide such provisions as may be deemed necessary.

7. Storage of Materials

Materials and equipment shall not be stored where they will interfere with railroad operations, nor on the rights of way of the Railroad Company without first having obtained permission from the Railroad Engineer, and such permission will be with the understanding that the Railroad Company will not be liable or damage to such material and equipment from any cause and that the Railroad Engineer may move or require the Contractor to move, at the Contractor's expense, such material and equipment.

8. Flagging Protection or Watchman Service

The Contractor shall give 72 hours advance notice to the Railroad Company in order that flagging service can be arranged and provided. No work shall be undertaken until the flagman is at the job site.

9. Completion and Acceptance of Work

Upon completion of the work, remove from within the limits of the railroad right of way all machinery, equipment, surplus materials, or rubbish and leave said rights of way in a neat and orderly condition. After the final inspection has been made and work found to be completed in a satisfactory manner acceptable to the Department of Transportation and the Railroad Company, the Department of Transportation will be notified of the Railroad Company's acceptance in writing by the Railroad Company.

ROADWAY DESIGN SCOPE OF WORK:

All work shall be done within the existing right of way. Any additional right of way or easements that are needed due to the widening of Bridge No. 57 shall be obtained by the Contractor. No reinforced bridge approach fill is required.

TRAFFIC CONTROL SCOPE:

Conduct the structure widening to correlate with the phasing shown in the existing Traffic Control Plan for the rest of the project.

Submittal Requirements

A separate Traffic Control plan and pavement marking plan is not required for this project. The Contractor will be required to handle any required revision to the existing traffic control plan and pavement marking plans as a result of this nested Design Build scope of work.

The Contractor designer will only be responsible for any revision to the plan. If you choose not to hire Sepi Engineering to complete the changes and another Professional Engineer seals the revision use the follow requirements for revising a sealed plan.

1. Place the following note in the seal box in the lower right hand comer. This is required to show who originally sealed the plan and when it was originally sealed.

**THIS DOCUMENT ORIGINALLY
SEALED BY**

JOHN DOE, P.E.

ON

X/XX/XX

PE # XXXXXX

2. Place a note explaining why the plan was revised, an example is shown below:

10/21/01 REPLACED SIGN W2-1 WITH SIGN W2-3.

3. A professional engineer in direct supervision of the revision, should seal, sign and date the revision in the seal box on the plan sheet and use the same date as used in the note.

GEOTECHNICAL ENGINEERING UNIT SCOPE OF WORK:

I. GENERAL:

For the bridge widening portion of the project, obtain the services of a firm prequalified for geotechnical work from the Highway Design Branch List. The prequalified geotechnical firm should prepare foundation design recommendation reports for use in designing structure widening foundations, roadway foundations, and temporary structures. The prequalified geotechnical firm should also determine if additional subsurface information is required based upon the subsurface information provided by NCDOT and the final roadway and structure designs. Perform any additional subsurface investigation and laboratory testing in accordance with the current NCDOT *Geotechnical Unit Guidelines and Procedure Manual*. A minimum of 2 standard penetration test (SPT)/rock core borings is required per bent for all bridges except dual bridges. A minimum of 3 SPT/rock core borings is required per bent for both right and left lane dual bridges.

II. DESCRIPTION OF WORK:

Design foundations, embankments, slopes, and temporary structures in accordance with the current allowable strength design AASHTO *Standard Specifications for Highway Bridges*, NCDOT *Structure Design Manual*, NCDOT *Roadway Design Manual* and the *Geotechnical Engineering Unit Roadway and Structure Foundation Guidelines*.

Structure Foundations

Design foundations with concrete footings, prestressed concrete piles, steel piles or drilled piers. Steel reinforcement is required for concrete foundations. Design spread footings with the bottom of footing elevation at or below the weathered rock or hard rock elevation.

Piles must have at least 10 feet (3 meters) of embedment below the lowest of the following: bottom of footing elevation, finished or existing grade elevation.

End bent fill slopes up to 35 feet (10.7 meters) in height (defined as the difference between grade point elevation and finished grade at toe of slope) must be 1.5:1 (H:V) or flatter. End bent slopes with heights greater than 35 feet (10.7 meters) or end bent cut slopes must be 2:1 or flatter. Extend end bent slope protection from the toe of slope to berm and to 1.75:1 (H:V) slope for 1.5:1 fill slopes or to the limits of the superstructure for cut slopes and for 2:1 or flatter fill slopes.

Design foundations for service loads using allowable stress design. The ultimate bearing capacity of all piles will be determined by "Method B - Wave Equation Analysis" outlined in Division II, Section 4.4 of the current allowable stress design AASHTO *Standard Specifications for Highway Bridges*.

Analyze drilled pier and pile bent foundations using either Lpile or FB-Pier. Drilled piers and vertical piles must be "fixed" in the soil/rock such that a decrease in pier or pile length will not significantly increase the top deflection. The D/B team structural engineer must approve deflections greater than 1 inch (25 mm) in the free head condition for either top of pile for a pile bent or top of column for post and beam construction on drilled piers.

Roadway Foundations

Design all unreinforced fill slopes for a slope of 2:1 (H:V) or flatter except bridge end bent slopes (see Section A) and a minimum stability factor of safety of 1.3. Design all cut slopes for a slope of 1.5:1 (H:V) or flatter and a minimum stability factor of safety of 1.5. Use limiting equilibrium methods, such as Modified Bishop, Simplified Janbu, Spencer or any other generally accepted method for slope stability analysis.

Temporary Structures

Design temporary retaining structures, which include earth retaining structures and cofferdams, in accordance with Section 4 of the 1995 or current allowable stress design AASHTO *Guide Design Specifications for Bridge Temporary Works* and the NCDOT Temporary Shoring for Maintenance of Traffic Special Provision. The only submittal required to use the standard sheeting design is the "Standard Shoring Selection Form".

Design and construct temporary retaining walls in accordance with the applicable NCDOT *Project Special Provision*. For temporary retaining walls, do not place a barrier within 5 feet (1.5 meters) of the face of the wall. If the barrier is between

5 and 9 feet (1.5 to 2.7 meters) from the face of the wall, anchor the barrier in accordance with Roadway Standard Detail No. 11.70.01.

III. SUBMITTALS:

Submit all structure and roadway foundation design recommendation reports, reinforced slope designs and temporary structure designs for review. A separate structure foundation design recommendation report is required for each structure and one roadway foundation design recommendation report is required for the entire project. Seal all foundation design recommendation reports, plans, special provisions and calculations by a registered professional engineer licensed in the state of North Carolina.

IV. CONSTRUCTION REQUIREMENTS:

All construction and materials must be in accordance with the NCDOT 2002 *Standard Specifications* and current NCDOT *Project Special Provisions*. The D/B team is responsible for investigating and proposing remedial measures for any construction problems related to foundations, subgrades, settlement, slopes, and construction vibrations. The NCDOT Geotechnical Engineering Unit will review and approve these proposals.

Do not allow vibratory compaction of fill within 100 feet (30 meters) of any existing structure. Do not allow pile driving or subsurface drilling of foundations within 500 feet (150 meters) of any existing structure. If these requirements can not be met or damage occurs to any existing structure, employ the services of a qualified private engineering firm experienced in the effects of construction on existing structures to do a study of the structure's response to vibration. The purpose of this study is to set vibration limits to avoid damage to the existing structure and provide modifications to construction methods as necessary. Any existing structure is not intended to include existing bridges unless they are historic or will remain in service upon completion of construction. Existing bridges used for detours that will be taken out of service upon completion of construction should be protected from vibration damage to the extent necessary for the safety of the traveling public.

The prequalified geotechnical firm that did the foundation designs must review and approve all pile driving hammers and drilled pier construction sequences. The NCDOT Geotechnical Engineering Unit will review these approvals.

Perform hammer approvals with GRLWEAP Version 2002 or later and in accordance with the NCDOT 2002 Standard Specifications. Provide pile driving inspection charts or tables for all approved pile hammers. A minimum of 30 blows per foot (300 mm) is required to verify the design bearing capacity with a minimum factor of safety of two. Stresses during driving may not exceed the limits outlined in the FHWA manual "Design and Construction of Driven Pile Foundations". If prestressed concrete piles are used, test a minimum of one prestressed concrete pile for each bridge for bearing and stresses with a pile driving analyzer (PDA).

Use current NCDOT inspection forms for drilled piers available on the DOH website under Geotechnical Engineering Unit Forms in "Doing Business with NCDOT". The Department will use the Shaft Inspection Device (SID) in accordance with the Drilled

Piers Special Provision to inspect the first drilled pier excavation that is not hand cleaned for each bridge location. Install Crosshole Sonic Logging (CSL) tubes in all drilled piers. CSL testing may be required for up to a third of the drilled piers for each bridge. The NCDOT and/or the construction engineering inspection (CEI) firm will determine which piers will be CSL tested. The NCDOT Geotechnical Engineering Unit will determine if the CSL results are acceptable.

Verify bearing on rock for spread footings in the field during construction.

Provide field quality control for all bridge foundations including pile driving records and drilled pier inspection forms. Provide field quality control for all retaining wall and sound barrier foundations including verifying subsurface conditions for drilled piers and bearing for shallow foundations.

The prequalified geotechnical firm that did the original design must perform any changes to the foundation designs. All changes must be based upon additional information, subsurface investigation and/or testing. Drilled pier tip elevations may not be changed during construction unless the prequalified geotechnical firm that did the bridge foundation design redesigns the drilled pier from an SPT/rock core boring in accordance with ASTM standards at the subject pier location or observations of the drilled pier excavation. If a drilled pier is designed based on a boring, do not drill a boring inside an open drilled pier excavation. Locate the boring within three pier diameters of the center of the subject pier and drill to a depth of two pier diameters below the revised tip elevation. If a drilled pier is redesigned based upon observations of the drilled pier excavation, the geotechnical engineer of record must be present during the excavation to determine the actual subsurface conditions. Send copies of revised designs including additional subsurface information, calculations and any other supporting documentation sealed by a professional engineer registered in the State of North Carolina to NCDOT Geotechnical Engineering Unit. Also, send copies of any inspection forms related to foundations or settlement to the Geotechnical Engineering Unit.

Geotechnical Engineering Unit **ROADWAY AND STRUCTURE FOUNDATION GUIDELINES**

The geotechnical firm is responsible for (but not limited to) addressing the following items for the roadway and structure foundation design of the bridge widening portion of the project.

1. Analyze the stability of embankments and utilize recognized geotechnical engineering designs and construction methods to ensure embankment stability.
2. Analyze embankment settlement and if necessary, recommend mitigation through the use of undercut or soil improvement methods such as surcharges, waiting periods, wick drains, etc.

3. Address the following regarding embankment problems:
 - a. The feasibility of using geo-textiles to achieve stability, reduce excavation of soft soils and reduce the effect of settlement on the roadway.
 - b. The need for settlement gages, slope inclinometers and other embankment monitoring devices and their placement and location.
4. Design all temporary shoring in accordance with the current allowable stress design AASHTO *Standard Specifications for Highway Bridges* and applicable FHWA manuals.
5. Determine amount of and recommend methods to mitigate any differential settlement problems at locations of culverts and utilities.
6. Analyze the stability of cut sections. Utilize recognized geotechnical engineering designs and construction methods to ensure cut slope stability.
7. Analyze the stability of roadway approaches (to the distance from the bridge that affects the stability and design of the bridge foundations) and particularly the end slopes under the bridge, utilizing recognized geotechnical engineering designs and construction methods to ensure stability.
8. Recommend pile, drilled pier or spread footing foundations for structures with regard to bearing capacity, lateral stability, buckling analysis for piles, scour, settlement and constructability.
9. Recommend allowable bearing pressure for spread footings considering settlement, adjacent foundations, water table, etc.
10. Address the following regarding pile and/or drilled pier foundations:
 - a. Method of support – skin friction, tip bearing or combination of both.
 - b. Tip elevations no higher than and estimated pile lengths.
 - c. Allowable axial load.
 - d. Settlement.
 - e. Number and location of test piles or piers and dynamic and/or static load testing.
 - f. Wave equation analysis using an appropriately chosen pile hammer and cushion material for each bent.
 - g. Necessity of using steel pile tips for concrete piles or pile points for steel piles.
 - h. Effects of vibration on adjacent construction or existing structures.
 - i. Corrosion effects of various soils and water (See Structure Design Unit's Policy Manual).
 - j. Downdrag on piles or piers.
 - k. Lateral stability and allowable horizontal deflections.
 - l. Point of fixity or point of rotation.
 - m. Lateral squeeze for piles.
11. Include in the geotechnical recommendations report a summary table of the bridge foundation recommendations including the following:
 - a. State project number, TIP number, county, description and bridge station.
 - b. Bent (work point) stations, types of foundations, allowable loads, bottom of cap or footing elevations, estimated pile lengths and tip elevations.

12. Address the following items, when applicable, as notes on plans or comments and attach to the summary table:

- a. All appropriate notes on plans (See Structure Design Unit's Standard Foundation Notes on Plans).
- b. End slope and extent of slope protection.
- c. Waiting periods for approach slab construction or end bent construction.
- d. Battered piles.
- e. Point of fixity or point of rotation elevations.
- f. Tip elevations no higher than.
- g. Steel pile points for steel piles or steel pile tips for concrete piles.
- h. Number and location of test piles or piers, load tests, dynamic and/or static testing.
- i. Required rock socket for drilled piers.
- j. Need for permanent steel casing including casing tip elevations, SPT, SID Inspection, CSL and slurry use in accordance with the Drilled Piers Special Provision.
- k. Range of allowable hammer energies for concrete and pipe piles.

Address any other items affecting the foundation design on the summary sheets and include all final recommendations on the summary sheets.

The geotechnical firm's attention is directed to the latest design guide entitled *Soils and Foundations Workshop Manual*, NHI Course No. 13212, Publication No. FHWA HI-88-009, published by the FHWA.

ROADSIDE ENVIRONMENTAL SCOPE OF WORK:

Use correct NCDOT symbology for all phases of erosion control design. Utilize adequate perimeter controls(Temporary Diversions, Silt Fence, etc.). Devices at all drainage turnouts should utilize sediment control stone(TRSC-A, TRSD-B). Protect existing streams and existing and proposed inlets, catch basins, etc. with RIST-A, RIST-C, PIST-A, etc. Provide adequate silt storage for 130 cubic meters per hectare(1800 cubic feet per acre) of land disturbance, and sediment basins should be sized with surface area equal to .01 times the peak inflow rate using the 10-year peak runoff data(NCDENR-Land Quality's Erosion and Sediment Control Planning and Design Manual). Utilize temporary slope drains and earth berms at top of fill slopes 3 meters(10 ft.) or higher or where there are super elevations above .04 and fills are greater than 1.5 meters (5 ft.). Provide rock energy dissipater at slope drain outlets. Use matting on all ditch lines(non-jurisdictional streams) with 1.25% grade or larger and all cut/fill slopes 2:1 or greater where it is difficult to establish vegetation and/or slope failure is occurring. Plan submittal must include all pertinent design information required for review, such as design calculations, drainage areas, etc. The NCDOT Roadside Environmental Unit(REU) will provide a sample set of Erosion and Sedimentation Control Plans(including any special details or special provisions used by the NCDOT REU) and Microstation Erosion Control Tool Palette to the Designer/Planner for reference if requested. Sufficient time must be allowed for the Designer/Engineer to make any changes to the Erosion and Sediment Control Plans deemed necessary by the NCDOT REU. All Erosion and Sediment Control Plans must be approved by the NCDOT REU before any land disturbing activities can commence.

BASIS OF PAYMENT:

All work covered by this provision will be paid for at the contract lump sum price for "Design and Construct the widening of Bridge No. 57 on NC 274 over the Norfolk Southern Railroad". Such price and payment will be full compensation for all design, design drawings, Railroad agreement any additional right of way, equipment, labor, tools, materials and construction for the widening of the Bridge No. 57 on NC 274 over the Railroad. There will be no measurement of any quantities associated with the widening of Bridge No. 57 on NC 74 over the Railroad, except that temporary and permanent pavement markings and portable barrier for traffic control will be paid for at the contract unit prices established elsewhere in this contract.

CLEARING AND GRUBBING:**9-17-02**

Perform clearing on this project to the limits established by Method "II" shown on Standard No. 200.02 of the Roadway Standards.

The 2002 Standard Specifications shall be revised as follows:

Page 2-3, Article 200-5

Delete the first sentence of this article and insert the following:

The property owner will have no right to use or reserve for his use any timber on the project. All timber cut during the clearing operations is to become the property of the Contractor, and shall be either removed from the project by him, or else shall be satisfactorily disposed of as hereinafter provided.

SP2R01

BURNING RESTRICTIONS:**7-1-95**

Open burning is not permitted on any portion of the right-of-way limits established for this project. Do not burn the clearing, grubbing or demolition debris designated for disposal and generated from the project at locations within the project limits, off the project limits or at any waste or borrow sites in this county. Dispose of the clearing, grubbing and demolition debris by means other than burning, according to state or local rules and regulations.

SP2R05

BUILDING REMOVAL:**01-01-02**

Remove the buildings and appurtenances listed below in accordance with Section 215 of the Standard Specifications and the following provisions:

Prior to removal of any building, comply with the notification requirements of Title 40 Code of Federal Regulations, Part 61, Subpart M, which are applicable to asbestos. Give notification to the North Carolina Department of Health and Human Services, Division of Epidemiology, Asbestos Hazard Management Branch and/or the appropriate county agency when enforcement of the Federal Regulation is performed by the county. Submit a copy of the notification to the Engineer prior to the building removal.

The Department has performed asbestos assessments for building items identified below. Copies of this report may be obtained through the Division Right-of-Way Agent. When asbestos is discovered after the opening of bids for the project, the cost of asbestos removal and disposal will be paid for in accordance with Article 104-7 of the Standard Specifications. Perform removal and disposal of asbestos in accordance with the requirements of Title 40 Code of Federal Regulations.

When a building has had or will have asbestos removed and the Contractor elects to remove the building such that it becomes a public area, the Contractor is responsible for any additional costs incurred including final air monitoring.

Comply with all Federal, State and local regulations when performing building removal and/or asbestos removal and disposal. Any fines resulting from violations of any regulation are the sole responsibility of the Contractor and the Contractor agrees to indemnify and hold harmless the Department against any assessment of such fines.

Prior to removal of any Underground Storage Tank (UST), comply with the notification requirements of the Title 40 Code of Federal Regulations, Part 280.71(a). Give notification to the appropriate regional office of the North Carolina Department of Environment, and Natural Resources, Division of Environmental Management, Groundwater Section. Submit a copy of the notification to the Engineer prior to the removal of the underground storage tank.

Permanently close UST systems by removal and dispose of in compliance with the regulations set forth in Title 40, Code of Federal Regulations, Part 280.71 and North Carolina Administrative Code Title 15A, Chapter 2, Subchapter 2N and any applicable local regulations. Assess Underground Storage Tank sites at closure for the presence of contamination as required in NCAC Title 15A, Chapter 2, Subchapter 2N, Section .0803 and as directed by the appropriate Regional Office of the Division of Environmental Management. Remove and dispose of UST systems and contents in a safe manner in conformance with requirements of American Petroleum Institute Bulletin 1604, "Removal and Disposal of Used Underground Petroleum Storage Tanks", Chapters 3 through 6. (Note: As an exception to these requirements, the filling of the tank with water as a means of expelling vapors from the tank as described in section 4.2.6.1 of API Bulletin 1604, will not be allowed. Where underground storage tanks are indicated below, there will be no direct payment for the closure or assessment. When the contract does not indicate the presence of storage tanks and storage tanks are discovered after the opening of bids for the project, the cost of closure, assessment and/or removal will be paid for in accordance with Article 104-7 of the Standard Specifications.

Disposition of any contaminated material associated with underground storage tanks will be made as provided in Article 107-26 of the Standard Specifications.

Building Removal (Item #1)
Parcel 003 - Left of Survey Station 11+70, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #2)

Parcel 003 - Left of Survey Station 11+75, Survey Line L
Shed

Building Removal ((Item #3)

Parcel 004 - Left of Survey Station 12+20, Survey Line L
One-Story Block Business

Building Removal ((Item #4)

Parcel 005 - Left of Survey Station 12+80, Survey Line L
One Story Frame Building

Building Removal ((Item #5)

Parcel 009 - Left of Survey Station 10+80, Survey Line Y-2A
Sign

Building Removal ((Item #6)

Parcel 011 - Left of Survey Station 15+10, Survey Line L
Metal Canopy

Building Removal ((Item #7)

Parcel 018 - Right of Survey Station 23+10, Survey Line L
Monopole Sign

Building Removal ((Item #8)

Parcel 019 - Left of Survey Station 24+00, Survey Line L
One-Story Brick Business

Building Removal ((Item #9)

Parcel 019 - Left of Survey Station 24+20, Survey Line L
Shed

Building Removal ((Item #10)

Parcel 019 - Left of Survey Station 24+40, Survey Line L
Shed

Building Removal ((Item #11)

Parcel 020 - Right of Survey Station 24+20, Survey Line L
One-Story Block Business

Building Removal ((Item #12)

Parcel 020 - Right of Survey Station 23+60, Survey Line L
Shed

Building Removal ((Item #13)

Parcel 021 - Right of Survey Station 24+80, Survey Line L
Sign

Building Removal ((Item #14)
Parcel 026 - Right of Survey Station 28+60, Survey Line L
Sign

Building Removal ((Item #15)
Parcel 028 - Right of Survey Station 29+25, Survey Line L
Sign

Building Removal ((Item #16)
Parcel 030 - Right of Survey Station 29+30, Survey Line L
Sign

Building Removal ((Item #17)
Parcel 031 - Right of Survey Station 30+20, Survey Line L
Sign

Building Removal ((Item #18)
Parcel 034 - Right of Survey Station 35+60, Survey Line L
Fencing

Building Removal ((Item #19)
Parcel 034 - Right of Survey Station 35+60, Survey Line L
Three (3) Signs

Building Removal ((Item #20)
Parcel 037 - Left of Survey Station 37+50, Survey Line L
Dual Pole Sign

Building Removal ((Item #21)
Parcel 037 - Left of Survey Station 38+05, Survey Line L
Sign

Building Removal ((Item #22)
Parcel 037 - Left of Survey Station 37+20, Survey Line L
Fencing

Building Removal ((Item #23)
Parcel 038 - Right of Survey Station 37+60, Survey Line L
Sign

Building Removal ((Item #24)
Parcel 038 - Right of Survey Station 37+60, Survey Line L
Flagpole

Building Removal ((Item #25)
Parcel 038 - Right of Survey Station 37+40, Survey Line L
Fencing & Gate

Building Removal ((Item #26)

Parcel 040 - Left of Survey Station 38+70, Survey Line L
One-Story Brick Business

Building Removal ((Item #27)

Parcel 040 - Left of Survey Station 38+70, Survey Line L
Canopy

Building Removal ((Item #28)

Parcel 040 - Left of Survey Station 38+70, Survey Line L
Shed

Building Removal ((Item #29)

Parcel 044 - Right of Survey Station 42+70, Survey Line L
Sign

Building Removal ((Item #30)

Parcel 047 - Left of Survey Station 43+50, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #31)

Parcel 050 - Left of Survey Station 43+90, Survey Line L
Two-Story Frame Dwelling

Building Removal ((Item #32)

Parcel 051 - Left of Survey Station 44+10, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #33)

Parcel 052 - Right of Survey Station 44+20, Survey Line L
Sign

Building Removal ((Item #34)

Parcel 053 - Left of Survey Station 44+40, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #35)

Parcel 054 - Left of Survey Station 44+60, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #36)

Parcel 054 - Left of Survey Station 44+60, Survey Line L
Shed

Building Removal ((Item #37)

Parcel 055 - Left of Survey Station 44+70, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #38)

Parcel 056 - Left of Survey Station 45+20, Survey Line L
½ of Two-Story Block Business

Building Removal ((Item #39)

Parcel 056 - Left of Survey Station 45+25, Survey Line L
One (1) Sign

Building Removal ((Item #40)

Parcel 056 - Left of Survey Station 45+55, Survey Line L
Two (2) Signs

Building Removal ((Item #41)

Parcel 061 - Left of Survey Station 45+90, Survey Line L
One-Story Brick Business

Building Removal ((Item #42)

Parcel 061 - Left of Survey Station 46+05, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #43)

Parcel 062 - Right of Survey Station 10+40, Survey Line Y-17
One-Story Brick Business

Building Removal ((Item #44)

Parcel 062 - Right of Survey Station 10+40, Survey Line Y-17
Sign

Building Removal (Item #45)

Parcel 063 - Left of Survey Station 10+30, Survey Line Y-18
Gate

Building Removal ((Item #46)

Parcel 066 - Left of Survey Station 10+50, Survey Line Y-17
One-Story Brick Dwelling

Building Removal ((Item #47)

Parcel 066 - Right of Survey Station 45+80, Survey Line L
Sign

Building Removal ((Item #48)

Parcel 067 - Left of Survey Station 10+80, Survey Line Y-17
Garage

Building Removal ((Item #49)

Parcel 070 - Left of Survey Station 46+30, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #50)
Parcel 070 - Left of Survey Station 46+20, Survey Line L
Shed

Building Removal ((Item #51)
Parcel 071 - Left of Survey Station 47+15, Survey Line L
Fuel Dispensers & Metal Canopy

Building Removal ((Item #52)
Parcel 072 - Right of Survey Station 47+00, Survey Line L
Sign

Building Removal ((Item #53)
Parcel 076 - Right of Survey Station 47+75, Survey Line L
One-Story Brick Dwelling

Building Removal ((Item #54)
Parcel 077 - Left of Survey Station 47+90, Survey Line L
One-Story Block Business

Building Removal ((Item #55)
Parcel 077 - Left of Survey Station 47+85, Survey Line L
Sign

Building Removal ((Item #56)
Parcel 082 - Right of Survey Station 48+20, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #57)
Parcel 082 - Right of Survey Station 48+20, Survey Line L
Garage

Building Removal ((Item #58)
Parcel 084 - Right of Survey Station 48+50, Survey Line L
Two-Story Frame Dwelling

Building Removal ((Item #59)
Parcel 084 - Right of Survey Station 48+55, Survey Line L
Garage

Building Removal ((Item #60)
Parcel 088 - Right of Survey Station 49+00, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #61)
Parcel 088 - Right of Survey Station 49+00, Survey Line L
Shed

Building Removal ((Item #62)
Parcel 088 - Right of Survey Station 49+00, Survey Line L
Garage

Building Removal ((Item #63)
Parcel 089 - Right of Survey Station 49+40, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #64)
Parcel 089 - Right of Survey Station 49+50, Survey Line L
Shed

Building Removal ((Item #65)
Parcel 092 - Right of Survey Station 49+60, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #66)
Parcel 092 - Right of Survey Station 49+60, Survey Line L
Garage

Building Removal (Item #67)
Parcel 093 - Left of Survey Station 49+80, Survey Line L
Fencing

Building Removal ((Item #68)
Parcel 094 - Right of Survey Station 49+80, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #69)
Parcel 094 - Right of Survey Station 49+80, Survey Line L
Garage

Building Removal ((Item #70)
Parcel 094 - Right of Survey Station 49+80, Survey Line L
Shed

Building Removal ((Item #71)
Parcel 096 - Right of Survey Station 50+35, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #72)
Parcel 099 - Right of Survey Station 50+70, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #73)
Parcel 099 - Right of Survey Station 10+40, Survey Line Y-25
Garage

Building Removal ((Item #74)
Parcel 101 - Right of Survey Station 51+20, Survey Line L
One-Story Business

Building Removal ((Item #75)
Parcel 101 - Right of Survey Station 51+30, Survey Line L
Sign

Building Removal ((Item #76)
Parcel 102 - Left of Survey Station 10+50, Survey Line Y-25
One-Story Brick Dwelling

Building Removal ((Item #77)
Parcel 107 - Right of Survey Station 52+30, Survey Line L
Monopole Sign

Building Removal ((Item #78)
Parcel 109 - Right of Survey Station 52+80, Survey Line L
One-Story Frame Business

Building Removal ((Item #79)
Parcel 112 - Right of Survey Station 53+50, Survey Line L
One-Story Frame Business

Building Removal ((Item #80)
Parcel 114 - Right of Survey Station 53+80, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #81)
Parcel 118 - Right of Survey Station 55+30, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #82)
Parcel 118 - Right of Survey Station 55+50, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #83)
Parcel 903 - Left of Survey Station 42+80, Survey Line L
One-Story Brick Business

Building Removal ((Item #84)
Parcel 903 - Left of Survey Station 42+80, Survey Line L
Monopole Sign

Building Removal ((Item #85)
Parcel 903 - Left of Survey Station 43+30, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #86)
Parcel 903A - Left of Survey Station 43+70, Survey Line L
One-Story Frame Dwelling

Building Removal ((Item #87)
Parcel 903A - Left of Survey Station 43+45, Survey Line L
Shed

Building Removal ((Item #88)
Parcel 904 - Right of Survey Station 50+50, Survey Line L
One-Story Frame Dwelling

When the description of the work for an item indicates a building partially inside and partially outside the right of way and/or construction area, but does not require the building to be cut off, the entire building shall be removed.

TEMPORARY DETOURS:

7-1-95

Construct temporary detours required on this project in accordance with the typical sections in the plans or as directed.

Payment for the construction of the detours will be made at the contract unit prices for the various items involved. After the detours have served their purpose, remove the portions deemed unsuitable for use as a permanent part of the project as directed by the Engineer. Salvage within the right of way, as directed by the Engineer, for removal by State Forces. Pipe culverts and stockpile the aggregate base course removed from the detours at locations removed from the detours remain the property of the Contractor. Remove pipe culverts from the project when they are no longer needed. Place pavement and earth material removed from the detour in embankments or dispose of in waste areas furnished by the Contractor. Aggregate base course and earth material that is removed will be measured and will be paid for at the contract unit price per cubic yard (cubic meter) for "Unclassified Excavation". Pavement that is removed will be measured and will be paid for at the contract unit price per square yard (square meter) for "Removal of Existing Pavement". Pipe culverts that are removed will be measured and will be paid for at the contract unit price per linear foot (meter) for "Pipe Removal". Such prices and payments will be full compensation for the work of removing, salvaging, and stockpiling aggregate base course; placing and removing pipe culverts; and for placing earth material and pavement in embankments or disposing of earth material and pavement in waste areas.

SP2R30

SHALLOW UNDERCUT:

2-19-02_R

Perform undercut excavation and place a combination of fabric for soil stabilization and Class IV Subgrade Stabilization at locations as directed by the Engineer. Work includes performing undercut excavation, disposing of unsuitable material, furnishing and placing fabric for soil stabilization; and furnishing, placing and compacting Class IV Subgrade Stabilization.

MATERIALS

Fabric for Soil Stabilization.....Section 270
 Class IV Subgrade Stabilization.....Section 1016-3, Class IV; or
 Material meeting gradation
 requirements of Table 520-1,
 Column C

CONSTRUCTION METHODS

Perform undercut excavation in accordance with Section 225 and/or Section 226.
 Place fabric for soil stabilization in accordance with Section 270.
 Place Class IV Subgrade Stabilization by back dumping material on previously placed fabric.
 Compact material to 95% of AASHTO T-99, Method "D" density or compact material to the
 highest density that can be reasonably obtained.

METHOD OF MEASUREMENT

Undercut Excavation will be measured in accordance with Section 225 and/or Section 226.
 Fabric for Soil Stabilization will be measured in accordance with Article 270-4.
 Class IV Subgrade Stabilization, as accepted in place, will be measured by the ton (metric ton),
 in accordance with Section 106-7.

BASIS OF PAYMENT

Payment will be made for quantities as measured above for the pay items listed below:
 Undercut Excavation.....Cubic Yard (Cubic Meter)
 Fabric for Soil Stabilization.....Square Yard (Square Meter)
 Class IV Subgrade Stabilization.....Ton (Metric Ton)
 SP2R35

BORROW EXCAVATION:

2-19-02

Revise the 2002 Standard Specifications as follows:

Page 2-20, Article 230-6

After the first paragraph, insert the following paragraph:

"No direct payment will be made for the work of Evaluation of Potential Wetlands and
 Endangered Species as outlined above. Payment at the contract unit price for the pay item
 'Borrow Excavation' or 'Grading - Lump Sum' will be considered full compensation for this
 work.'

SP2R37

SHOULDER AND FILL SLOPE MATERIAL:

5-21-02

General:

Perform the required shoulder and slope construction for this project in accordance with the applicable requirements of Section 560 and Section 235 of the Standard Specifications except as follows:

Construct the top 6 inches (150-mm) of shoulder and fill slopes with soils capable of supporting vegetation.

Provide soil with a P.I. greater than 6 and less than 25 and with a pH ranging from 5.5 to 6.8. Remove stones and other foreign material 2 inches (50 mm) or larger in diameter. All soil is subject to test and acceptance or rejection by the Engineer.

Obtain material from within the project limits or approved borrow source.

Compensation:

When the Contractor elects to obtain material from an area located beneath a proposed fill sections which does not require excavation for any reason other than to generate acceptable shoulder and fill slope material, the work of performing the excavation will be considered incidental to the item of "Borrow Excavation" or "Shoulder Borrow". If there is no pay item for "Borrow" or "Shoulder Excavation" in the contract, this work will be considered incidental to "Unclassified Excavation". Stockpile the excavated material in a manner to facilitate measurement by the Engineer. Fill the void created by the excavation of the shoulder and fill slope material with suitable material. Payment for material used from the stockpile will be made at the contract unit price for "Borrow Excavation" or "Shoulder Borrow". If there is no pay item for "Borrow Excavation" or "Shoulder Borrow", then the material will be paid for at the contract unit price for "Unclassified Excavation". The material used to fill the void created by the excavation of the shoulder and fill slope material will be made at the contract unit price for "Unclassified Excavation", "Borrow Excavation", or "Shoulder Borrow", depending on the source of the material.

Material generated from undercut excavation, unclassified excavation or clearing and grubbing operations that is placed directly on shoulders or slope areas, will not be measured separately for payment, as payment for the work requiring the excavation will be considered adequate compensation for depositing and grading the material on the shoulders or slopes.

When undercut excavation is performed at the direction of the Engineer and the material excavated is found to be suitable for use as shoulder and fill slope material, and there is no area on the project currently prepared to receive the material generated by the undercut operation, the Contractor may construct a stockpile for use as borrow at a later date. Payment for the material used from the stockpile will be made at the contract unit price for "Borrow Excavation" or "Shoulder Borrow".

When shoulder material is obtained from borrow sources or from stockpiled material, payment for the work of shoulder construction will be made at the contract unit price per cubic yard (cubic meter) for "Borrow Excavation" or "Shoulder Borrow" in accordance with the applicable provisions of Section 230 or Section 560 of the Standard Specifications.

SP2R50

" (mm) WELDED STEEL PIPE:

1-15-02

Use ___" (mm) welded steel pipe as shown on the plans that conforms to Section 330 of the Standard Specifications.

Install the pipe by dry boring and jacking. Carefully dry bore the pipe true to the line and grade given. Hold the bore to a minimum to insure that there is no settlement. Remove and replace any pipe that has been damaged due to the Contractor's operation at no cost to the Department. Completely fill all voids around the outside of the pipe to the satisfaction of the Engineer.

Measurement will be made in accordance with Article 330-4 of the Standard Specifications.

The quantity of pipe as measured above will be paid for at the contract unit price per linear foot (meter) for "___" (mm) Welded Steel Pipe, ___" (mm) Thick, Grade B (By Boring and Jacking)". Such price and payment will be full compensation for all work described herein including dry boring, jacking, tools, materials, labor, workmanship, and all other incidentals necessary to complete the work.

SP3R25

Payment will be under:

___" (mm) Welded Steel Pipe, ___" (mm) Thick, Grade B
(By Boring and Jacking) Linear Foot (Meter)

FLOWABLE FILL:

9-17-02

Provide and install flowable fill material in accordance with Articles 340-2 of the Standard Specifications.

Discharge flowable fill material directly from the truck into the space to be filled, or by other approved methods. The mix may be placed full depth or in lifts as site conditions dictate. The Contractor shall provide a method to plug the ends of the existing pipe in order to contain the flowable fill.

At locations where flowable fill is called for on the plans and a pay item for flowable fill is included in the contract, the quantity of flowable fill to be paid for will be the actual number of cubic yards (cubic meters) of flowable fill that have been satisfactorily placed and accepted.

The quantity of flowable fill, measured as provided above, will be paid for at the contract unit price per cubic yard (cubic meter) for "Flowable Fill". Such price and payment will be full compensation for all work covered by this provision including but not limited to the mix design, furnishing, hauling, placing and containing the flowable fill.

SP3R30

Payment will be made under:

Flowable Fill Cubic Yard (Cubic Meter)

PREPARATION OF SUBGRADE AND BASE:

1-16-96

On mainline portions and ramps of this project, prepare the subgrade and base beneath the pavement structure in accordance with the applicable sections of the Standard Specifications except use an automatically controlled fine grading machine utilizing string lines, laser controls, or other approved methods to produce final subgrade and base surfaces meeting the lines, grades, and cross sections required by the plans or established by the Engineer.

No direct payment will be made for the work required by this provision as it will be considered incidental to other work being paid for by the various items in the contract.

SP5R05

ASPHALT PAVEMENTS - SUPERPAVE

01-18-05

Revise the 2002 *Standard Specifications* as follows:

PRIME COAT

Page 6-2, Article 600-9

Delete the first paragraph and substitute the following:

The quantity of prime coat to be paid will be the number of gallons (liters) of prime coat material that has been satisfactorily placed on the roadway. Each distributor load of prime coat material delivered and utilized on the project will be measured.

ASPHALT TACK COAT

Page 6-4, Article 605-8

Insert the following after paragraph one.

Take necessary precautions to limit the tracking and/or accumulation of tack coat material on either existing or newly constructed pavements. Excessive accumulation of tack may require corrective measures.

FIELD VERIFICATION AND JOB MIX FORMULA ADJUSTMENTS

Page 6-7, **Article 609-4**

Delete the first paragraph and substitute the following:

Conduct field verification of the mix at each plant within 30 calendar days prior to initial production of each mix design, when required by the Allowable Mix Adjustment Policy and when directed as deemed necessary.

Page 6-8, **Article 609-4**

Delete the first paragraph and substitute the following:

Retain records of these calibrations and mix verification tests, including Superpave Gyratory Compactor (SGC) printouts, at the QC laboratory. In addition, furnish copies, including SGC printouts, to the Engineer for review and approval within one working day after beginning production of the mix.

Page 6-8, **Article 609-4**

Add the following sentence at the end of the last paragraph:

Any mix produced that is not verified may be assessed a price reduction at the Engineer's discretion in addition to any reduction in pay due to mix and/or density deficiencies.

Quality control minimum sampling and testing schedule:

Page 6-8, **Subarticle 609-5(A)**

Delete the second sentence in the fourth paragraph and substitute the following:

This person is responsible for monitoring all roadway paving operations and all quality control processes and activities, to include stopping production or implementing corrective measures when warranted.

Page 6-9, **Subarticle 609-5(C)1**

Delete the second sentence in the second paragraph and substitute the following:

Retain the QC compacted volumetric test specimens for 5 calendar days, commencing the day the specimens are prepared.

Page 6-9, **Subarticle 609-5(C)2**

At the bottom of this page, delete the sentence directly above the Accumulative Production Increment and substitute the following:

Sample and test the completed mixture from each mix design at the following minimum frequency during mix production:

Page 6-10, **Subarticle 609-5(C)2**

Revise Items B, C, D and E on this page as follows:

- B. Gradation on Recovered Blended Aggregate from Mix Sample (AASHTO T 30 Modified) Grade on all sieves specified on JMF
- C. Maximum Specific Gravity (AASHTO T 209 or ASTM D 2041), optional (ASTM D 6857)
- D. Bulk Specific Gravity of Compacted Specimens (AASHTO T166), optional (ASTM D 6752), Average of 3 specimens at N_{des} gyrations (AASHTO T 312)
- E. Air Voids (VTM) (AASHTO T 269), Average of 3 specimens at N_{des} gyrations

Page 6-11, **Subarticle 609-5(C)2**

At the top of this page, delete Item B.,” Reclaimed Asphalt Pavement...” and substitute the following:

- B. Reclaimed Asphalt Pavement (RAP) Binder Content and Gradation (AASHTO T 308 Modified or T 164 and AASHTO T 30 Modified) (sampled from stockpiles or cold feed system at beginning of production and weekly thereafter). Have RAP approved for use in accordance with Article 1012-1(G). (Split Sample Required)

Page 6-11, **Subarticle 609-5(C)2**

Insert the following sampling and testing at the end of this Subarticle:

- F. Uncompacted Void Content of Fine Aggregate, AASHTO T 304, Method A (natural sand only). Performed at Mix Design and when directed as deemed necessary. (Split Sample Required)
- G. Reclaimed Asphalt Shingle Material (RAS) Binder Content and Gradation (AASHTO T 308 Modified or T 164 and AASHTO T 30 Modified) (sampled from stockpiles or cold feed system at beginning of production and weekly thereafter). Have RAS approved for use in accordance with Article 1012-1(F). (Split Sample Required)

CONTROL CHARTS

Page 6-11, **Subarticle 609-5(C)3**

Delete the first paragraph and substitute the following:

Maintain standardized control charts furnished by the Department at the field laboratory. For mix incorporated into the project, record full test series data from all regularly scheduled random

samples or directed samples which replace regularly scheduled random samples, on control charts the same day the tests are obtained.

In addition, partial test series results obtained due to reasons outlined in Subarticle 609-5(C)2 will be reported to Quality Assurance personnel on the proper forms, but will not be plotted on the control charts.

Page 6-12, **Subarticle 609-5(C)3**

Delete item 3 in the list below the second full paragraph and substitute the following:

3. If failure to stop production after two consecutive moving averages exceed the warning limits occurs, but production does stop at a subsequent time, re-establish a new moving average beginning at the actual production stop point.

Page 6-12, **Subarticle 609-5(C)3**

Delete the first and second sentence in the third full paragraph and substitute the following:

In addition, re-establish the moving averages for all mix properties.

CONTROL LIMITS

Page 6-12, **Subarticle 609-5(C) 4**

At the bottom of this page, delete the table and substitute the following:

CONTROL LIMITS

Mix Control Criteria	Target Source	Warning Limit	Moving Average Limit	Individual Limit
2.36mm Sieve	JMF	±4.0 %	±5.0 %	±8.0 %
0.075mm Sieve	JMF	±1.5 %	±2.0 %	±2.5 %
Binder Content	JMF	±0.3 %	±0.5 %	±0.7 %
VTM @ N _{des}	JMF	±1.0 %	±1.5 %	±2.0 %
VMA @ N _{des}	Min. Spec. Limit	-0.5%	-0.8%	-1.0%
P _{0.075} / P _{be} Ratio	Max. Spec. Limit	0.0	N/A	+0.4%
%G _{mm} @ N _{ini}	Max. Spec. Limit	N/A	N/A	+2.0%
TSR	Min. Spec. Limit	N/A	N/A	-15.0%

Allowable Retesting for Mix Deficiencies:

Page 6-14, **Subarticle 609-5C(7)**

In the first paragraph, insert the following as the fourth sentence:

The Contractor under the supervision of the Department's QA personnel will perform these retests.

FIELD COMPACTION QUALITY CONTROL

Page 6-15, **Subarticle 609-5(D)1**

Delete the first and second sentences in the fourth paragraph and substitute the following:

Base and intermediate mix types (surface mixes not included) utilized for pavement widening of less than 4.0 feet and all mix types used in tapers, irregular areas and intersections (excluding full width travel lanes of uniform thickness), will not be subject to the sampling and testing frequency specified above provided the pavement is compacted using approved equipment and procedures. However, the Engineer may require occasional density sampling and testing to evaluate the compaction process.

Page 6-16, **Subarticle 609-5(D)1**

Delete item number 2 at the top of this page. Item number 3 should be re-numbered as 2 after the specified deletion.

Pavement Samples (Cores)

Page 6-16, **Subarticle 609-5(D)(2)**

In the first paragraph, delete the second sentence and insert the following as the last sentence in that paragraph:

The use of a separator medium beneath the layer to be tested is prohibited.

LIMITED PRODUCTION PROCEDURE

Page 6-17, **Subarticle 609-5(D) 5**

Delete the first paragraph and substitute the following:

Proceed on limited production when, for the same mix type, one of the following items occur:

- (1) Two consecutive failing lots, excluding lots representing an individual resurfacing map or portion thereof.

- (2) Three consecutive failing lots, with each lot representing an individual resurfacing map or portion thereof.
- (3) Two consecutive failing nuclear control strips.

Pavement within each construction category (New and Other), as defined in Article 610-13, and pavement placed simultaneously by multiple paving crews will be evaluated independently for limited production purposes.

Delete the first sentence in the last paragraph and substitute the following:

If the Contractor does not operate by the limited production procedures as specified above, the two consecutive failing density lots, three consecutive failing lots with each lot representing an individual resurfacing map or portion thereof, or two consecutive failing nuclear control strips, whichever is applicable, and all mix produced thereafter will be considered unacceptable.

DOCUMENTATION (RECORDS)

Page 6-18, **Subarticle 609-5(E)**

Delete the third and fourth sentence in the first full paragraph and substitute the following:

Maintain all QC records, forms and equipment calibrations for a minimum of 3 years from their completion date.

Delete the second full paragraph and substitute the following:

Falsification of test results, documentation of observations, records of inspection, adjustments to the process, discarding of samples and/or test results, or any other deliberate misrepresentation of the facts will result in the revocation of the applicable person's QMS certification. The Engineer will determine acceptability of the mix and/or pavement represented by the falsified results or documentation. If the mix and/or pavement in question is determined to be acceptable, the Engineer may allow the mix to remain in place at no pay for the mix, asphalt binder and other mix components. If the mix and/or pavement represented by the falsified results is determined not to be acceptable, remove and replace with mix, which complies with the Specifications. Payment will be made for the actual quantities of materials required to replace the falsified quantities, not to exceed the original amounts.

QUALITY ASSURANCE

Page 6-18, **Article 609-6**

In Item 1 under Plant Mix Quality Assurance, substitute “5 percent” for “10 percent”.

In Item 2 under Plant Mix Quality Assurance, substitute “sampling and testing procedures” for “tests”.

In Item 4 under Plant Mix Quality Assurance, add “for that increment” after the word “sample”.

In Item 5 under Plant Mix Quality Assurance, add “at a frequency equal to or greater than 10 percent of the QC sample frequency”; or

Insert the following after Item 5 under Plant Mix Quality Assurance:

6. By any combination of the above.

Delete the paragraph below Plant Mix Quality Assurance, and replace with the following:

The Engineer will conduct assurance tests on both split QC samples taken by the Contractor and verification samples taken by the Department. These samples may be the regular quality control samples or a sample selected by the Engineer from any location in the process or verification samples taken at random by the Department. The frequency will be equal to or greater than 5 percent of that required of the Contractor as stated in Subarticle 609-5(C)2. The Engineer may select any or all samples for assurance testing.

In Item 1 under Density Quality Assurance, delete the wording at the end of the sentence “at a frequency equal to or greater than 10 percent of the frequency required of the Contractor”.

In Item 3 under Density Quality Assurance, substitute 5 percent for 10 percent.

Page 6-19, **Article 609-6**

In Item 4 under Density Quality Assurance, add “at a frequency equal to or greater than 10 percent of the QC sample frequency.”

Insert the following after Item 4 under Density Quality Assurance:

5. By periodically directing the recalculation of random numbers for the Quality Control core or nuclear density test locations. The original QC test locations may be tested by QA and evaluated as verification tests.

LIMITS OF PRECISION

Page 6-19, **Article 609-6**

In the limits of precision table, delete the last three rows and substitute the following:

QA retest of prepared QC Gyrotory Compacted	
Volumetric Specimens	± 0.015
Retest of QC Core Sample	± 1.2% (% Compaction)
Comparison of QA Core Sample	± 2.0% (% Compaction)
QA Verification Core Sample	± 2.0% (% Compaction)
Nuclear Comparison of QC Test	± 2.0% (% Compaction)
QA Nuclear Verification Test	± 2.0% (% Compaction)

In the first sentence of the paragraph below the limits of precision table, insert “or verification test results” after “quality assurance test results”.

In the third sentence of the second paragraph below the limits of precision table, insert “or verification test results” after “quality assurance test results”.

ASPHALT CONCRETE PLANT MIX PAVEMENTS – DESCRIPTION

Page 6-20, **Article 610-1**

Insert the following after the last paragraph:

A high frequency of asphalt plant mix, density, or mix and density deficiencies occurring over an extended duration of time may result in future asphalt, which is represented by mix and/or density test results not in compliance with minimum specification requirements, being excluded from acceptance at an adjusted contract unit price in accordance with Article 105-3. This acceptance process may apply to all asphalt produced and /or placed and may continue until the Engineer determines a history of quality asphalt production and placement is reestablished.

MATERIALS

Page 6-21, **Article 610-2**

Delete reference of Anti-strip additive (chemical) to **Article 1020-2** and substitute **Article 1020-8**.

COMPOSITION OF MIXTURES (MIX DESIGN AND JOB MIX FORMULA)

Page 6-21, **Subarticle 610-3(A)**

At the end of the second paragraph, add the following sentence:

In addition, submit Superpave gyratory compactor printouts for all specimens compacted at N_{des} and N_{max} during the mix design process.

Insert the following paragraph after the second paragraph:

For the final surface layer of the specified mix type, use a mix design with an aggregate blend gradation above the maximum density line on the 2.36 mm and larger sieves.

Insert the following at the end of the third paragraph:

When the percent of binder contributed from RAS or a combination of RAS and RAP exceeds 20 percent of the total binder in the completed mix, the virgin binder PG grade shall be one grade below (both high and low temperature grade) the binder grade specified in Table 610-2 for the mix type.

Delete the fourth paragraph and substitute the following:

For Type S 12.5D mixes, the maximum percentage of reclaimed asphalt material is limited to 15% and shall be produced using virgin asphalt binder grade PG 76-22. For all other recycled mix types, when the percentage of RAP is 15 percent or less of the total mixture, the virgin binder PG grade shall be as specified in Table 610-2 for the specified mix type. When the percentage of RAP is greater than 15 but not more than 25 percent of the total mixture, the virgin binder PG grade shall be one grade below (both high and low temperature grade) the specified grade for the mix type. When the percentage of RAP is greater than 25 percent of the total mixture, the Engineer will establish and approve the asphalt binder grade.

Page 6-22, **Subarticle 610-3(A)**

Insert the following sentence at the end of the Item 4:

If natural sand is utilized in the proposed mix design, determine and report the Uncompacted Void Content of the natural sand in accordance with AASHTO T-304, Method A.

Page 6-23, **Subarticle 610-3(A)**

Under the quantities of mix components insert the following sentence:

When requested by the Engineer, submit to the Department's Materials and Tests Unit, in Raleigh, six (6) Superpave Gyratory Compactor specimens compacted to a height of 75 mm and to a void content (VTM) of 4.0% +/- 0.5% for performance rut testing with the Asphalt Pavement Analyzer.

JOB MIX FORMULA

Page 6-24, **Subarticle 610-3(C)**

Delete Table 610-1 and associated notes. Substitute the following:

**TABLE 610-1
SUPERPAVE AGGREGATE GRADATION DESIGN CRITERIA**

Standard d	Percent Passing Criteria (Control Points)											
	Mix Type (Nominal Maximum Aggregate Size)											
Sieves	4.75 mm (a)		9.5 mm (c)		12.5 mm (c)		19.0 mm		25.0 mm		37.5 mm	
(mm)	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
50.0												100.0
37.5									100.0	90.0	100.0	100.0
25.0							100.0	90.0	100.0	100.0		90.0
19.0					100.0	90.0	100.0	100.0	90.0			
12.5				100.0	90.0	100.0	90.0					
9.5	100.0		90.0	100.0		90.0						
4.75	90.0	100.0		90.0								
2.36	65.0	90.0	32.0(b)	67.0(b)	28.0	58.0	23.0	49.0	19.0	45.0	15.0	41.0
1.18												
0.600												
0.300												
0.150												
0.075	4.0	8.0	4.0	8.0	4.0	8.0	3.0	8.0	3.0	7.0	3.0	6.0

- (a) For Type S 4.75A, a minimum of 50% of the aggregate components shall be manufactured material from the crushing of stone.
- (b) For Type SF 9.5A, the percent passing the 2.36mm sieve shall be a minimum of 60% and a maximum of 70%.
- (c) For the final surface layer of the specified mix type, use a mix design with an aggregate blend gradation above the maximum density line on the 2.36 mm and larger sieves.

Page 6-25, Subarticle 610-3(C),

Delete Table 610-2 and associated notes. Substitute the following:

**TABLE 610-2
SUPERPAVE MIX DESIGN CRITERIA**

Mix	Design	Binder	Compaction Levels			Volumetric Properties (c)			
	ESALs	PG	No. Gyration @			VMA	VTM	VFA	%Gmm
Type	millions	Grade	N _{ini}	N _{des}	N _{max}	% Min.	%	Min. - Max.	@ N _{ini}
(f)	(a)	(b)							
S-4.75A	<0.3	64 -22	6	50	75	20.0	7.0-15.0		
SF-9.5A	<0.3	64 -22	6	50	75	16.0	3.0 - 5.0	70 - 80	≤ 91.5
S-9.5B	0.3 - 3	64 -22	7	75	115	15.0	3.0 - 5.0	65 - 80	≤ 90.5
S-9.5C	3 - 30	70 -22	8	100	160	15.0	3.0 - 5.0	65 - 76	≤ 90.0
S-12.5C	3 - 30	70 -22	8	100	160	14.0	3.0 - 5.0	65 - 75	≤ 90.0
S-12.5D	> 30	76 -22	9	125	205	14.0	3.0 - 5.0	65 - 75	≤ 90.0
I-19.0B	< 3	64 -22	7	75	115	13.0	3.0 - 5.0	65 - 78	≤ 90.5
I-19.0C	3 - 30	64 -22	8	100	160	13.0	3.0 - 5.0	65 - 75	≤ 90.0
I-19.0D	> 30	70 -22	9	125	205	13.0	3.0 - 5.0	65 - 75	≤ 90.0
B-25.0B	< 3	64 -22	7	75	115	12.0	3.0 - 5.0	65 - 78	≤ 90.5
B-25.0C	> 3	64 -22	8	100	160	12.0	3.0 - 5.0	65 - 75	≤ 90.0
B-37.5C	> 3	64 -22	8	100	160	11.0	3.0 - 5.0	63 - 75	≤ 90.0
	<i>Design Parameter</i>				<i>Design Criteria</i>				
All	1. %G _{mm} @ N _{max}				≤ 98.0% (d)				
Mix	2. Dust to Binder Ratio (P _{0.075} / P _{be})				0.6 - 1.4				
Types	3. Retained Tensile Strength (TSR) (AASHTO T 283 Modified)				85 % Min. (e)				

- Notes:**
- (a) Based on 20 year design traffic.
 - (b) When Recycled Mixes are used, select the binder grade to be added in accordance with Subarticle 610-3(A).
 - (c) Volumetric Properties based on specimens compacted to N_{des} as modified by the Department.
 - (d) Based on specimens compacted to N_{max} at selected optimum asphalt content.
 - (e) AASHTO T 283 Modified (No Freeze-Thaw cycle required). TSR for Type S 4.75A, Type B 25.0 and Type B 37.5 mixes is 80% minimum.
 - (f) Mix Design Criteria for Type S 4.75A may be modified subject to the approval of the Engineer

WEATHER, TEMPERATURE, AND SEASONAL LIMITATIONS FOR PRODUCING AND PLACING ASPHALT MIXTURES

Page 6-26, Article 610-4, Table 610-3

Delete the title of Table 610-3 and substitute the following title:

ASPHALT PLACEMENT- MINIMUM TEMPERATURE REQUIREMENTS

In the first column, third row; delete reference to the ACSC Types S 9.5A and S 12.5B mix.

Add the following minimum placing temperatures for mix types S 4.75A and SF 9.5A.

Asphalt Concrete Mix Type	Minimum Air Temperature	Minimum Road Surface Temperature
ACSC, Type S 4.75A, SF 9.5A	40°F (5°C)	50°F (10°C)

SPREADING AND FINISHING

Page 6-32, Article 610-8

Insert the following after the second sentence within the sixth paragraph.

Take necessary precautions during production, loading of trucks, transportation, truck exchanges with paver, folding of the paver hopper wings, and conveying material in front of the screed to prevent segregation of the asphalt mixtures.

Page 6-32, Article 610-8

Delete the last paragraph beginning on this page and continuing on the next page and substitute the following:

Use pavers equipped with an electronic screed control that will automatically control the longitudinal profile and cross slope of the pavement. Control the longitudinal profile through the use of either a mobile grade reference(s), including mechanical, sonic and laser grade sensing and averaging devices, an erected string line(s) when specified, joint matching shoe(s), slope control devices or the approved methods or combination of methods. Unless otherwise specified, use a mobile grade reference system capable of averaging the existing grade or pavement over a minimum 30 foot (9.1 meter) distance or by non-contacting laser or sonar type ski with at least four referencing stations mounted on the paver at a minimum length of 24 feet. Establish the position of the reference system such that the average profile grade is established at the approximate midpoint of the system. The transverse cross-slope shall be controlled as directed by the Engineer.

Page 6-33, **Article 610-8**

Delete the second full paragraph on this page and substitute the following:

Use the 30 foot (9.1 meter) minimum length mobile grade reference system or the non-contacting laser or sonar type ski with at least four referencing stations mounted on the paver at a minimum length of 24 feet to control the longitudinal profile when placing the initial lanes and all adjacent lanes of all courses, including resurfacing and asphalt in-lays, unless other specified or approved. A joint matching device short (6 inch [152.4 mm] shoes) may be used only when approved.

At the end of the third full paragraph, add the following sentence:

Waiver of the use of automatic screed controls does not relieve the Contractor of achieving plan grades and cross-slopes.

Insert the following as the last paragraph:

Repair any damage caused by hauling equipment across structures at no additional cost to the Department.

DENSITY REQUIREMENTS

Page 6-34, **Article 610-10,**

Delete **Table 610-4** and substitute the following table and associated notes:

**Table 610-4
MINIMUM DENSITY REQUIREMENTS**

MIX TYPE	MINIMUM % of G_{mm}
SUPERPAVE MIXES	(Maximum Specific Gravity)
S 4.75A	85.0 ^(a,b)
SF 9.5A	90.0
S 9.5X, S 12.5X, I 19.0X, B 25.0X, B 37.5X	92.0

- (a) All S 4.75A pavement will be accepted for density in accordance with Article 105-3
- (b) Compaction to the above specified density will be required when the S 4.75 A mix is applied at a rate of 100 lbs/sy (55 kg/m²)

Page 6-34, **Article 610-10**

Delete the second paragraph and substitute the following:

Compact base and intermediate mix types (surface mixes not included) utilized for pavement widening of less than 4.0 feet (1.2 meters) and all mix types used in tapers, irregular areas and intersections (excluding full width travel lanes of uniform thickness), using equipment and procedures appropriate for the pavement area width and/or shape. Compaction with equipment other than conventional steel drum rollers may be necessary to achieve adequate compaction. Occasional density sampling and testing to evaluate the compaction process may be required. Densities lower than that specified in Table 610-4 will be accepted, in accordance with Article 105-3, for the specific mix types and areas listed directly above.

SURFACE REQUIREMENTS AND ACCEPTANCEPage 6-35, **Article 610-12**

Delete the first paragraph and substitute the following:

Construct pavements using quality paving practices as detailed herein. Construct the pavement surface smooth and true to the plan grade and cross slope. Immediately correct any defective areas with satisfactory material compacted to conform with the surrounding area. Pavement imperfections resulting from unsatisfactory workmanship such as segregation, improper longitudinal joint placement or alignment, non-uniform edge alignment and excessive pavement repairs will be considered unsatisfactory and if allowed to remain in place will be accepted in accordance with Article 105-3.

When directed due to unsatisfactory laydown or workmanship, operate under the limited production procedures. Limited production for unsatisfactory laydown is defined as being restricted to the production, placement, compaction, and final surface testing (if applicable) of a sufficient quantity of mix necessary to construct only 2500 feet (750 meter) of pavement at the laydown width.

Remain on limited production until such time as satisfactory laydown results are obtained or until three consecutive 2500 foot (750 meter) sections have been attempted without achieving satisfactory laydown results. If the Contractor fails to achieve satisfactory laydown results after three consecutive 2500 foot (750 meter) sections have been attempted, cease production of that mix type until such time as the cause of the unsatisfactory laydown results can be determined. As an exception, the Engineer may grant approval to produce a different mix design of the same mix type if the cause is related to mix problem(s) rather than laydown procedures.

Mix placed under the limited production procedures for unsatisfactory laydown or workmanship will be evaluated for acceptance in accordance with Article 105-3.

DENSITY ACCEPTANCE

Page 6-36, **Article 610-13**

Delete the second paragraph and substitute the following:

The pavement will be accepted for density on a lot by lot basis. A lot will consist of one day's production of a given job mix formula on a contract. As an exception, separate lots will be established when the one of the following occurs:

- (1) Portions of pavement are placed in both "New" and "Other" construction categories as defined below. A lot will be established for the portion of the pavement in the "New" construction category and a separate lot for the portion of pavement in the "Other" construction category.
- (2) Pavement is placed on multiple resurfacing maps, unless otherwise approved prior to paving. A lot will be established for each individual resurfacing map or portion thereof.
- (3) Pavement is placed simultaneously by multiple paving crews. A lot will be established for the pavement placed by each paving crew.
- (4) Pavement is placed in different layers. A lot will be established for each layer.
- (5) Control strips are placed during limited production.

The Engineer will determine the final category and quantity of each lot for acceptance purposes.

Page 6-36, **Article 610-13**

Delete the first sentence in the third paragraph and insert the following:

The "New" construction category will be defined as pavements of uniform thickness, exclusive of irregular areas, meeting all three of the following criteria:

Delete the sixth paragraph and substitute the following:

A failing lot for density acceptance purposes is defined as a lot for which the average of all test sections, and portions thereof, fails to meet the minimum specification requirement. If additional density sampling and testing, beyond the minimum requirement, is performed and additional test sections are thereby created, then all test results shall be included in the lot average. In addition, any lot or portion of a lot that is obviously unacceptable will be rejected for use in the work.

Page 6-36, **Article 610-13**

Delete the last paragraph and substitute the following:

Any density lot not meeting minimum density requirements detailed in Table 610-4 will be evaluated for acceptance by the Engineer. If the lot is determined to be reasonably acceptable, the mix will be paid at an adjusted contract price in accordance with Article 105-3. If the lot is determined not to be acceptable, the mix will be removed and replaced with mix meeting and compacted to the requirement of these specifications.

BASIS OF PAYMENT, ASPHALT PAVEMENTS

Page 6-37, **Article 610-16**

Add the following to the second paragraph:

The quantity of hot mix asphalt pavement, measured as provided in Article 610-15, will be paid for at the contract unit prices per ton (metric ton) for “Asphalt Concrete Surface Course, Type S 4.75A, and SF 9.5A”.

Add the following to the payment item description:

Asphalt Concrete Surface Course, Type S 4.75A	Ton (Metric Ton)
Asphalt Concrete Surface Course, Type SF 9.5A	Ton (Metric Ton)

Delete reference to the Asphalt Concrete Surface Course, Types S 9.5A and S 12.5B in both the second paragraph and in the payment description.

ASPHALT BINDER FOR PLANT MIX - METHOD OF MEASUREMENT

Page 6-39, **Article 620-4**

Delete the first sentence of the second paragraph and substitute the following:

Where recycled plant mix is being produced, the grade of asphalt binder to be paid for will be the grade for the specified mix type as required in Table 610-2 unless otherwise approved.

OPEN-GRADED ASPHALT FRICTION COURSE CONSTRUCTION REQUIREMENTS

Page 6-43, **Article 650-5**

Add the following paragraph after the first paragraph:

Do not place open-graded asphalt friction course between October 31 and April 1 of the next year, unless otherwise approved. Place friction course, Type FC-1 mixes, only when the road surface temperature is 50°F (10°C) or higher and the air temperature is 50°F (10°C) or higher.

The minimum air temperature for Type FC-1 Modified and FC-2 Modified mixes will be 60°F (15°C).

AGGREGATES FOR ASPHALT PLANT MIXES

Page 10-34, **Subarticle 1012-1(B)4**

Delete and substitute the following:

(4) Flat and Elongated Pieces:

Use coarse aggregate meeting the requirements of Table 1012-1 for flat and elongated pieces when tested in accordance with ASTM D 4791 (Section 8.4) on the No. 4 (4.75 mm) sieve and larger with a 5:1 aspect ratio (maximum to minimum) for all pavement types, except there is no requirement for Types S 4.75A, SF 9.5A, and S 9.5B.

Page 10-35, **Table 1012-1**

Delete **Table 1012-1** and substitute the following:

**Table 1012-1
AGGREGATE CONSENSUS PROPERTIES^(a)**

Mix Type	Course Aggregate Angularity ^(b)	Fine Aggregate Angularity % Minimum	Sand Equivalent % Minimum	Flat & Elongated 5 : 1 Ratio % Maximum
	ASTM D 5821	AASHTO T 304 Method A	AASHTO T 176	ASTM D 4791 Section 8.4
S 4.75 A		40	40	
SF 9.5 A S 9.5 B I 19.0 B B 25.0 B	75 / -	40	40	10 ^(c)
S 9.5 C S 12.5 C I 19.0 C B 25.0 C B 37.5 C	95 / 90	45	45	10
S 12.5 D I 19.0 D	100 / 100	45	50	10
OGAFC	100 / 100	N/A	N/A	10

- (a) Requirements apply to the course aggregate blend and/or fine aggregate blend
- (b) 95/90 denotes that 95% of the course aggregate (+No.4 or + 4.75mm sieve) has one fractured face and 90% has two or more fractured faces.
- (c) Does not apply to Mix Types SF 9.5 A or S 9.5 B



Page 10-36, **Subarticle 1012-1(C)1**

Insert the following after the fourth paragraph:

When natural sand is utilized in “C” or “D” level asphalt mixes, do not exceed the maximum natural sand percentage in the mix design and/or production aggregate blend detailed in Table 1012-1A.

Table 1012-1A

Uncompacted Void Content of Fine Aggregate AASHTO T 304 Method A	Maximum Percent Natural Sand Included in Mix Design and/or Production*
Less than 42.0	10
Equal to 42.0 to 44.9	15
Equal to 45.0 and greater	20

*Maximum percent natural sand may be exceeded with approval from Pavement Construction Engineer upon satisfactory evaluation of pavement performance testing

FINE AGGREGATE ANGULARITY

Page 10-36, **Subarticle 1012-1(C)6**

Delete reference to AASHTO TP 33 Method A and substitute AASHTO T 304, Method A.

Page 10-37, **Subarticle 1012-1(H)**

Delete this Subarticle. It is a duplicate of Subarticle 1012-1(F) located on Page 10-36.

ASPHALT BINDER

Page 10-46, **Article 1020-2**

Delete the first paragraph and substitute the following:

Use Performance Graded Asphalt Binder meeting the requirements of AASHTO M 320. See Article 610-3 for the specified grades. Submit a Quality Control Plan for asphalt binder production in conformance with the requirements of AASHTO R 26 to the Materials and Tests Unit.

SP6R01

ASPHALT BINDER CONTENT OF ASPHALT PLANT MIXES: **11-21-00_R**

The approximate asphalt binder content of the asphalt concrete plant mixtures used on this project will be as follows:

Asphalt Concrete Base Course, Type B 25.0__	4.3%
Asphalt Concrete Intermediate Course, Type I 19.0__	4.7%
Asphalt Concrete Surface Course, Type S 4.75A	7.0%
Asphalt Concrete Surface Course, Type SF 9.5A	6.5%
Asphalt Concrete Surface Course, Type S 9.5__	6.0%
Asphalt Concrete Surface Course, Type S 12.5__	5.5%

The actual asphalt binder content will be established during construction by the Engineer within the limits established in the Standard Specifications or Project Special Provisions.

SP6R15

ASPHALT PLANT MIXTURES: **7-1-95_c**

Place asphalt concrete base course material in trench sections with asphalt pavement spreaders made for the purpose or with other equipment approved by the Engineer.

SP6R20

PRICE ADJUSTMENT - ASPHALT BINDER FOR PLANT MIX: **11-21-00**

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

The base price index for asphalt binder for plant mix is \$239.44 per ton (metric ton).

This base price index represents an average of F.O.B. selling prices of asphalt binder at supplier's terminals on November 1, 2004.

SP6R25

FINAL SURFACE TESTING - ASPHALT PAVEMENTS (RIDEABILITY) **5-18-04**

Perform acceptance testing of the longitudinal profile of the finished pavement surface in accordance with these provisions using a North Carolina Hearne Straightedge (Model No. 1). Furnish and operate the straightedge to determine and record the longitudinal profile of the pavement on a continuous graph. Final surface testing is an integral part of the paving operation and is subject to observation and inspection by the Engineer as deemed necessary.

Push the straightedge manually over the pavement at a speed not exceeding 2 miles per hour (3 kilometers per hour). For all lanes, take profiles in the right wheel path approximately 3 ft (1 m) from the right edge of pavement in the same direction as the paving operation, unless otherwise approved due to traffic control or safety considerations. Make one pass of the straightedge in each full width travel lane. The full lane width should be comparable in ride quality to the area evaluated with the Hearne Straightedge. If deviations exist at other locations across the lane width, utilize a 10 foot non-mobile straightedge or the Hearne Straightedge to

evaluate which areas may require corrective action. Take profiles as soon as practical after the pavement has been rolled and compacted but in no event later than 24 hours following placement of the pavement, unless otherwise authorized by the Engineer. Take profiles over the entire length of final surface travel lane pavement exclusive of -Y- line travel lanes less than or equal to 300 feet (90 meters) in length, turn lanes less than or equal to 300 feet (90 meters) in length, structures, approach slabs, paved shoulders, loops, and tapers or other irregular shaped areas of pavement, unless otherwise approved by the Engineer. Test in accordance with this provision all mainline travel lanes, full width acceleration or deceleration lanes, -Y- line travel lanes greater than 300 feet (90 meters) in length, ramps, full width turn lanes greater than 300 feet (90 meters) in length, and collector lanes.

At the beginning and end of each day's testing operations, and at such other times as determined necessary by the Engineer, operate the straightedge over a calibration strip so that the Engineer can verify correct operation of the straightedge. The calibration strip must be a 100 ft (30 m) section of pavement that is reasonably level and smooth. Submit each day's calibration graphs with that day's test section graphs to the Engineer. Calibrate the straightedge in accordance with the current NCDOT procedure titled "North Carolina Hearne Straightedge - Calibration and Determination of Cumulative Straightedge Index". Copies of this procedure may be obtained from the Department's Pavement Construction Section.

Plot the straightedge graph at a horizontal scale of approximately 25 ft per inch (3 m per cm) with the vertical scale plotted at a true scale. Record station numbers and references (bridges, approach slabs, culverts, etc.) on the graphs, and distances between references/stations must not exceed 100 ft (30 m). Have the operator record the Date, Project No., Lane Location, Wheel Path Location, Type Mix, and Operator's Name on the graph.

Upon completion of each day's testing, evaluate the graph, calculate the Cumulative Straightedge Index (CSI), and determine which lots, if any, require corrective action. Document the evaluation of each lot on a QA/QC-7 form. Submit the graphs along with the completed QA/QC-7 forms to the Engineer, within 24 hours after profiles are completed, for verification of the results. The Engineer will furnish results of their acceptance evaluation to the Contractor within 48 hours of receiving the graphs. In the event of discrepancies, the Engineer's evaluation of the graphs will prevail for acceptance purposes. The Engineer will retain all graphs and forms.

Use blanking bands of 0.2 inches, 0.3 inches, and 0.4 inches (5 mm, 7.5 mm, and 10 mm) to evaluate the graph for acceptance. The 0.2 inch and 0.3 inch (5 mm and 7.5 mm) blanking bands are used to determine the Straightedge Index (SEI), which is a number that indicates the deviations that exceed each of the 0.2 inch and 0.3 inch (5 mm and 7.5 mm) bands within a 100 ft (30 m) test section. The Cumulative Straightedge Index (CSI) is a number representing the total of the SEIs for one lot, which consist of not more than 25 consecutive test sections. In addition, the 0.4 inch (10 mm) blanking band is used to further evaluate deviations on an individual basis. The Cumulative Straightedge Index (CSI) will be determined by the Engineer in accordance with the current procedure titled "North Carolina Hearne Straightedge - Calibration and Determination of Cumulative Straightedge Index".

The pavement will be accepted for surface smoothness on a lot by lot basis. A test section represents pavement one travel lane wide not more than 100 ft (30 m) in length. A lot will consist of 25 consecutive test sections, except that separate lots will be established for each travel lane, unless otherwise approved by the Engineer. In addition, full width acceleration or deceleration lanes, ramps, turn lanes, and collector lanes, will be evaluated as separate lots. For any lot which is less than 2500 feet (750 m) in length, the applicable pay adjustment incentive will be prorated on the basis of the actual lot length. For any lot which is less than 2500 feet (750 m) in length, the applicable pay adjustment disincentive will be the full amount for a lot, regardless of the lot length.

If during the evaluation of the graphs, more than 5 lots within the contract limits (mainline travel lanes and full width -Y- line travel lanes greater than 300 feet in length only) require corrective action, then proceed on limited production for unsatisfactory laydown in accordance with Article 610-12. Proceeding on limited production is based upon the Contractor's initial evaluation of the straightedge test results and must begin immediately upon obtaining those results. Additionally, the Engineer may direct the Contractor to proceed on limited production in accordance with Article 610-12 due to unsatisfactory laydown or workmanship.

Limited production for unsatisfactory laydown is defined as being restricted to the production, placement, compaction, and final surface testing of a sufficient quantity of mix necessary to construct only 2500 feet (750 meter) of pavement at the laydown width. Once this lot is complete, the final surface testing graphs will be evaluated jointly by the Contractor and the Engineer. Remain on limited production until such time as satisfactory laydown results are obtained or until three consecutive 2500 foot (750 meter) sections have been attempted without achieving satisfactory laydown results. The Engineer will determine if normal production may resume based upon the CSI for the limited production lot and any adjustments to the equipment, placement methods, and/or personnel performing the work. Once on limited production, the Engineer may require the Contractor to evaluate the smoothness of the previous asphalt layer and take appropriate action to reduce and/or eliminate corrective measures on the final surface course. Additionally, the Contractor may be required to demonstrate acceptable laydown techniques off the project limits prior to proceeding on the project.

If the Contractor fails to achieve satisfactory laydown results after three consecutive 2500 foot (750 meter) sections have been attempted, cease production of that mix type until such time as the cause of the unsatisfactory laydown results can be determined.

As an exception, the Engineer may grant approval to produce a different mix design of the same mix type if the cause is related to mix problem(s) rather than laydown procedures. If production of a new mix design is allowed, proceed under the limited production procedures detailed above.

If the Contractor does not operate by the limited production procedures as specified above, the 5 lots, which require corrective action, will be considered unacceptable and may be subject to removal and replacement. Mix placed under the limited production procedures for unsatisfactory laydown will be evaluated for acceptance in accordance with Article 105-3.

After initially proceeding under limited production, the Contractor shall immediately notify the Engineer if any additional lot on the project requires corrective action. The Engineer will determine if limited production procedures are warranted for continued production.

The pay adjustment schedule for the Cumulative Straightedge Index (CSI) test results per lot is as follows:

Pay Adjustment Schedule for Cumulative Straightedge Index (CSI) (Obtained by adding SE Index of up to 25 consecutive 100 ft. (30m) sections)				
*CSI	ACCEPTANCE CATEGORY	CORRECTIVE ACTION	PAY ADJUSTMENT	
			Before Corrective Action	After Corrective Action
0-0	Acceptable	None	\$300 incentive	None
1-0 or 2-0	Acceptable	None	\$100 incentive	None
3-0 or 4-0	Acceptable	None	No Adjustment	No Adjustment
1-1, 2-1, 5-0 or 6-0	Acceptable	Allowed	\$300 disincentive	\$300 disincentive
3-1, 4-1, 5-1 or 6-1	Acceptable	Allowed	\$600 disincentive	\$600 disincentive
Any other Number	Unacceptable	Required	Per CSI after Correction(s) (not to exceed 100% Pay)	

***Either Before or After Corrective Actions**

Correct any deviation that exceeds a 0.4 inch (10 mm) blanking band such that the deviation is reduced to 0.3 inches (7.5 mm) or less.

Corrective actions shall be performed at the Contractor's expense and shall be presented for evaluation and approval by the Engineer prior to proceeding. Any corrective action performed shall not reduce the integrity or durability of the pavement which is to remain in place. Corrective action for deviation repair may consist of overlaying, removing and replacing, indirect heating and rerolling. Scraping of the pavement with any blade type device will not be allowed as a corrective action. Provide overlays of the same type mix, full roadway width, and to the length and depth established by the Engineer. Tapering of the longitudinal edges of the overlay will not be allowed.

Corrective actions will not be allowed for lots having a CSI of 40 or better. If the CSI indicates "Allowed" corrective action, the Contractor may elect to take necessary measures to reduce the CSI in lieu of accepting the disincentive. Take corrective actions as specified if the CSI indicates "Required" corrective action. The CSI after corrective action should meet or exceed "Acceptable" requirements.

Where corrective action is allowed or required, the test section(s) requiring corrective action will be retested, unless the Engineer directs the retesting of the of the entire lot. No disincentive will apply after corrective action if the CSI is 40 or better. If the retested lot after corrective action has a CSI indicating a disincentive, the appropriate disincentive will be applied.

Incentive pay adjustments will be based only on the initially measured CSI, as determined by the Engineer, prior to any corrective work. Where corrective actions have been taken, payment will be based on the CSI determined after correction, not to exceed 100 percent payment.

Areas excluded from testing by the N.C. Hearne Straightedge will be tested by using a non-mobile 10-foot (3 m) straightedge. Assure that the variation of the surface from the testing edge of the straightedge between any two contact points with the surface is not more than 1/8 inch (3 mm). Correct deviations exceeding the allowable tolerance in accordance with the corrective actions specified above, unless the Engineer permits other corrective actions.

Furnish the North Carolina Hearne Straightedge(s) necessary to perform this work. Maintain responsibility for all costs relating to the procurement, handling, and maintenance of these devices. The Department has entered into a license agreement with a manufacturer to fabricate, sell, and distribute the N.C. Hearne Straightedge. The Department's Pavement Construction Section may be contacted for the name of the current manufacturer and the approximate price of the straightedge.

No direct payment will be made for the work covered by this section. Payment at the contract unit prices for the various items covered by those sections of the specifications directly applicable to the work constructed will be full compensation for all work covered by this section including, but not limited to, performing testing in accordance with this specification, any corrective work required as a result of this testing and any additional traffic control as may be necessary.

SP6R45

SEALING EXISTING PAVEMENT CRACKS:

7-1-95

Description of Work:

The work covered by this provision consists of sealing existing longitudinal and transverse pavement cracks with Sealant Type 2, PS/AR (hot-poured rubber asphalt) at locations as directed by the Engineer. The Contractor will not be required to seal the existing edge joints.

Materials:

Use Sealant Type 2, PS/AR (hot-poured rubber asphalt) meeting the requirements of Article 1028-2 of the Standard Specifications.

Construction Methods:

Install the sealant so that it forms a complete watertight bond with a high degree of elasticity, with maximum flexibility and longevity under extreme temperature ranges.

Use a HCA (hot compressed air) lance at all times to blast out any vegetation, dirt, dampness and loose materials from the cracks.

Use a concentrated hot air jet that is a minimum of 3000°F (1649°C) in temperature and that has a minimum air jet force of 3000 feet per second (914.4 meters per second) of blasting.

Force open asphalt cracks, clean warm and dry, and have ready for the application of the preheated sealant for maximum crack sealability.

Preheat the sealant to correct temperature, using the air jacketed flow method to prevent the burning of the modified rubber in the sealant. Perform this by means of a trailer mounted 190 gallon (719.2 liter) safety tested crack sealant preheater melter kettle, with a horizontally mounted full sweep double paddle agitator.

Apply sealant in the prepared cracks at a temperature range of 370°F (188°C) minimum and 420°F (216°C) maximum, using the pressure screed shoe to completely fill the crack, leaving a sealed 2" (50.8 mm) overband. Excessive overbanding or waste of sealant materials will not be tolerated.

Do not apply the PS/AR sealant when the surface temperature of the pavement is below 32°F (0°C).

All cracks sealed must have a minimum of 1/8" (3.2 mm) depth of sealant installed.

After the crack has been sealed, promptly remove any surplus sealer on the pavement. Do not permit traffic over the sealed cracks without approval by the Engineer.

The sealant is to be packaged in polyethylene bags and placed in boxes that weigh approximately 60 pounds (27.2 kg). The sealant may be packed in 60 pound (27.2 kg) boxes containing two polyethylene bags of sealant which weigh approximately 30 pounds (13.6 kg) each. Boxes of sealant are to be palletized for shipment. The pallets are to be protected with a weatherproof covering. The Contractor is responsible for storage.

Method of Measurement:

The amount of the sealant material to be paid for will be the actual number of pounds (kg) of material that has satisfactorily been used to seal pavement cracks in the designated highway. Any material that has been spilled, used in excessive overbanding, wasted, misapplied, or unsatisfactorily used in any way will be deducted in determining quantities for payment. The Engineer will determine the quantity, if any, to be deducted. The Engineer's decision on the quantity to be deducted will be final and binding.

Basis of Payment:

The quantity of sealant material, measured as provided above, will be paid for at the contract unit price per pound (kg) for "Sealing Existing Pavement Cracks". The above price and payment will be full compensation for all work required to seal the pavement cracks including but not limited to furnishing, hauling, loading and unloading, and storage of all sealant materials; cleaning and preparation of cracks to be sealed; application of sealant material in the prepared cracks; any clean-up; and any incidentals necessary to satisfactorily complete the work.

SP6R50

Payment will be made under:

Sealing Existing Pavement Cracks..... Pound (kg)

CONSTRUCTION SURVEYING:

01-20-04

Add the following after the first sentence of Section 801-1 of the January 2002 Standard Specifications:

Provide a stakeout of areas where an environmental permit is required prior to performing any construction in or adjacent to these areas. Stake out limits of the permitted work areas according to the approved permit drawings. Provide clear delineation by use of pink or other highly visible flagging. Insure construction limits do not exceed approved permitted work areas. Immediately notify the Resident Engineer of any variations of the stakeout limits when compared to the approved permit drawings.

Replace the fifth paragraph of Section 801-4 of the January 2002 Standard Specifications with the following:

Partial payments for the item of "Construction Surveying" will be made on each particular payment estimate based upon the percentage complete of the item of "Construction Surveying" as determined by the Engineer. The Contractor is required to submit a certified statement each month indicating the percentage of "Construction Surveying" work completed. The Resident Engineer will determine if the amount indicated is reasonably correct and the Resident Engineer will pay accordingly on the next partial pay estimate.

SP8R02

DISPOSAL OF WASTE AND DEBRIS:

2-19-02

Revise the 2002 Standard Specifications as follows:

Page 8-9, Subarticle 802-2(7. Buffer Zones:)

At the end of the last sentence in this subarticle, add the words "unless superseded by an environmental permit."

SP8R03

ENDWALLS:

6-18-02

Revise the 2002 Standard Specifications as follows:

Page 8-24, Article 838-2

Delete the last two paragraphs of this article and insert the following:

"Use either portland concrete, brick masonry, or precast concrete for the endwall unless otherwise specified on the Drainage Summary Sheet of the Plans."

SP8R27

GUARDRAIL POSTS AND OFFSET BLOCKS:

06-22-04

Revise the *2002 Standard Specifications* as follows:

Page 10-69, Subarticle 1046-3

Delete this sub-article in its entirety and replace with the following:

1046-3 POSTS AND OFFSET BLOCKS.**(A) General:**

The Contractor may at his option furnish either of the following types of steel guardrail posts. Only one type of post will be permitted at any one continuous installation. Use structural steel posts throughout the project, unless otherwise directed or detailed in the plans.

1. Steel W6 x 8.5 or W6 x 9.0 posts
2. Steel 4.5" x 6.0" "C" shape posts (C150 x 12.2 kg/m)

The Contractor may at his option furnish either of the following types of treated timber posts if specifically directed or detailed in the plans. Only one type of post will be permitted at any one continuous installation.

1. Timber 6" x 8" (152 mm x 203 mm) posts.
2. Timber 8" x 8" (203 mm x 203 mm) posts.

(B) Structural Steel Posts:

Fabricate steel posts for guardrail of the size and weight shown on the plans from structural steel complying with the requirements of Section 1072. Metal from which C shape posts are fabricated shall meet the requirements of ASTM A570 for any grade of steel, except that mechanical requirements shall meet the requirements of ASTM A36. Punch or drill the holes for connecting bolts. Burning will not be permitted. After fabrication, the posts shall be galvanized in accordance with Section 1076.

(C) Treated Timber Posts:

Timber guardrail posts shall be of treated southern pine meeting the requirements of Article 1082-2 and 1082-3.

Bore bolt holes to a driving fit for the bolts. A minus tolerance of 1 percent will be allowed in the length of the post. Perform all framing and boring before the posts receive preservative treatment.

(D) Offset Blocks:

Provide 8-inch deep recycled plastic or composite offset blocks that have been approved for use with the guardrail shown in the standard drawings and/or plans. Only one type of offset block will be permitted at any one continuous installation. Prior to beginning the installation of recycled offset block, submit the FHWA acceptance letter for each type of block to the Engineer for approval.

Treated timber offset blocks with steel beam guardrail will not be allowed unless required by Specifications, directed by the Engineer or detailed in the plans. Steel offset blocks with steel beam guardrail will not be allowed.

Recycled plastic or composite offset blocks shall be made from no less than 50% recycled plastic or composite, and shall meet the following minimum requirements:

- Specific Gravity: 0.950
- Compressive Strength in Lateral Direction:..... 1600 psi (11 MPa)
- Maximum Water Absorption: 10% by weight
- Maximum Termite and Ant Infestation:..... 10%
- Testing..... Shall pass NCHRP Report 350,
Test Level 3 by CRASH TESTING

Revise the *2002 Standard Roadway Drawings* as follows:

Sheet 4 of 6, Standard 862.03, delete the note and substitute the following:

Note: The midpost and offset block of the WTR section will require special bolt hole drilling in the thrie beam offset block and line post.

SP8R57

GUARDRAIL ANCHOR UNITS, TYPE 350:

04-20-04

DESCRIPTION

Furnish and install guardrail anchor units in accordance with the details in the plans, the applicable requirements of Section 862 of the Standard Specifications, and at locations shown in the plans.

MATERIALS

The Contractor may at his option, furnish any one of the guardrail anchor units.

Guardrail anchor unit (ET-2000) as manufactured by:

TRINITY INDUSTRIES, INC.
2525 N. STEMMONS FREEWAY
DALLAS, TEXAS 75207
TELEPHONE: 1-800-644-7976

The guardrail anchor unit (SKT 350) as manufactured by:

ROAD SYSTEMS, INC.
3616 OLD HOWARD COUNTY AIRPORT
BIG SPRING, TEXAS 79720
TELEPHONE: (915) 263-2435

Prior to installation the Contractor shall submit to the Engineer:

1. FHWA acceptance letter for each guardrail anchor unit certifying it meets the requirements of NCHRP Report 350, Test Level 3, in accordance with Section 106-2 of the Standard Specifications.
2. Certified working drawings and assembling instructions from the manufacturer for each guardrail anchor unit in accordance with Section 105-2 of the Specifications.

No modifications shall be made to the guardrail anchor unit without the express written permission from the manufacturer. Perform installation in accordance with the details in the plans, and details and assembling instructions furnished by the manufacturer.

CONSTRUCTION

Guardrail end delineation is required on all approach and trailing end sections for both temporary and permanent installations. Guardrail end delineation consists of yellow reflective sheeting applied to the entire end section of the guardrail in accordance with Section 1088-3 of the Standard Specifications and is incidental to the cost of the guardrail anchor unit.

MEASUREMENT AND PAYMENT

Measurement and payment will be made in accordance with Articles 862.5 and 862-6 of the Standard Specifications.

Payment will be made under:

Guardrail Anchor Units, Type 350..... Each

SP8R65

CONCRETE SIDEWALKS, DRIVEWAYS AND WHEELCHAIR RAMPS 10-21-03

Revise the 2002 Standard Specifications as follows:

PAGE 8-33, SECTION 848

Section 848-2 Add the following:

Detectable Warnings:

Detectable warnings may be either truncated dome concrete paving blocks or stamped concrete. Use Class "B" concrete.

Detectable warnings shall consist of raised truncated domes. Truncated Domes shall have a base diameter of no less than 0.9 inches (23 mm) to no more than 1.4 inches (36 mm), a top diameter of no less than 50 % to no more than 65% of the base diameter, and a height of 0.2 inches (5 mm). Truncated domes shall have center-to-center spacing of no less than 1.6 inches (41 mm) to no more than 2.4 inches (61 mm), and a base to base spacing of 0.65 inches (16 mm) minimum, measured between the most adjacent domes on square grid.

Section 848-3 Add the following:

Install 24 inches (600 mm) in length of truncated dome paving blocks along the bottom of the curb ramps in accordance the plans and details.

Obtain 70 percent contrast visibility with adjoining surfaces, either light-on-dark, or dark-on-light sequence covering the entire ramp.

Section 848-5

Add the following sentence to the third paragraph:

Such price will include furnishing and installing raised truncated domes.

SP8R120

STREET SIGNS AND MARKERS AND ROUTE MARKERS:

7-1-95

Move any existing street signs, markers, and route markers out of the construction limits of the project and install the street signs and markers and route markers so that they will be visible to the traveling public if there is sufficient right of way for these signs and markers outside of the construction limits.

Near the completion of the project and when so directed by the Engineer, move the signs and markers and install them in their proper location in regard to the finished pavement of the project.

Stockpile any signs or markers that cannot be relocated due to lack of right of way, or any signs and markers that will no longer be applicable after the construction of the project, at locations directed by the Engineer for removal by others.

The Contractor will be responsible to the owners for any damage to any street signs and markers or route markers during the above described operations.

No direct payment will be made for relocating, reinstalling, and/or stockpiling the street signs and markers and route markers as such work will be considered incidental to other work being paid for by the various items in the contract.

SP9R01

AGGREGATE PRODUCTION:**11-20-01**

Provide aggregate from a producer who utilizes the new Aggregate Quality Control/Quality Assurance Program that is in effect at the time of shipment.

No price adjustment is allowed to contractors or producers who utilize the new program. Participation in the new program does not relieve the producer of the responsibility of complying with all requirements of the Standard Specifications. Copies of this procedure are available upon request from the Materials and Test Unit.

SP10R05

CONCRETE BRICK AND BLOCK PRODUCTION:**11-20-01**

Provide concrete brick and block from a producer who utilizes the new Solid Concrete Masonry Brick/Unit Quality Control/Quality Assurance Program that is in effect on the date that material is received on the project.

No price adjustment is allowed to contractors or producers who utilize the new program. Participation in the new program does not relieve the producer of the responsibility of complying with all requirements of the Standard Specifications. Copies of this procedure are available upon request from the Materials and Test Unit.

SP10R10

FINE AGGREGATE:**11-19-02**

Revise the 2002 Standard Specifications as follows:

Page 10-17, Table 1005-2

Make the following change to the table:

For Standard Size 2MS the following gradation change applies.

The minimum percent shown for material passing the No. 8 (2.36mm) sieve has been changed from 84 to **80**.

SP10R15

BORROW MATERIAL

02-17-04

Revise the 2002 Standard Specifications as follows:

Page 10-44

Section 1018-2 II (b) Delete the last sentence in its entirety.

SP10R17

METAL POSTS AND RAILS:01-21-03_R

Revise the 2002 Standard Specifications as follows:

1050-3 METAL POSTS AND RAILS.

Page 10-72, (A) Chain Link Fence: Delete paragraphs 2 and 3, and replace with the following:

Steel H posts must have a minimum yield strength of 45,000 pi (310 MPa) and weigh 3.26 pounds per foot (4.85 kg/m). Galvanize steel H posts in accordance with ASTM F 1043 with a Type A coating. Aluminum H posts must weigh 1.25 pounds per foot (1.86 kg/m).

Roll formed steel line posts must be a 1.625" x 1.875" (41.3 mm x 47.6 mm) section weighing 2.40 lb/lf (3.57 kg/m) after galvanizing and be formed from 0.121" (3.1 mm) thick sheet having a minimum yield strength of 45,000 psi (310 MPa). Roll formed steel brace rails and top rails must be a 1.250" x 1.625" (31.8 mm x 41.3 mm) section weighing 1.35 lb/lf (2.01 kg/m) after galvanizing and be formed from 0.080" (2.0 mm) thick sheet steel having a minimum yield strength of 45,000 pi (310 Map). Galvanize all roll formed members after fabrication in accordance with ASTM F 1043 with a Type A coating.

Page 10-73, (A) Chain Link Fence: Delete sentence one of paragraph four and replace with the following:

Vinyl coated posts must be pipe posts meeting the requirements of AASHTO M 181, and have a fusion bonded vinyl coating of at least 6 mils (0.15 mm) thick.

Add the following as the penultimate paragraph:

For pipe 1.90" OD and under, the outside diameter at any point shall not vary more than 1/64" (0.4 mm) over nor more than 1/32" (0.8 mm) under the standard specified. For pipe 2.375" OD and over, the outside diameter shall not vary more than $\pm 1\%$ from the standard specified nor shall the minimum wall thickness at any point be more than 12.5% under the nominal wall thickness specified.

Page 10-73 (B) Woven Wire Fence: Add the following as the penultimate paragraph:

For pipe 1.90" OD and under, the outside diameter at any point shall not vary more than 1/64" (0.4 mm) over nor more than 1/32" (0.8 mm) under the standard specified. For pipe 2.375" OD and over, the outside diameter shall not vary more than $\pm 1\%$ from the standard specified nor shall the minimum wall thickness at any point be more than 12.5% under the nominal wall thickness specified.

1050-7 FITTINGS AND ACCESSORIES

Page 10-75, delete the last sentence of the last paragraph and replace with the following:
The vinyl coating must be at least 6 mils (0.15 mm) thick, except that the coating on tension wire, hog rings, and tie wires must be at least 20 mils (0.50 mm) thick.

SP10R20

COATED, PAVED AND LINED CORRUGATED STEEL CULVERT PIPE: 10-21-03

Revise the 2002 Standard Specifications as follows:

Section 1032-4(E) Optional Coatings for Bituminous Coated Pipe and Pipe Arch:

Page 10-58. Delete Numbers 2. and 3., and substitute the following;

2. Type B: In lieu of Type B, Half Bituminous Coated and Partially Paved galvanized pipe, aluminized pipe or polymeric coated pipe without bituminous coating and paving may be used.
3. Type C: In lieu of Type C, Fully Bituminous Coated and Partially Paved galvanized pipe, aluminized pipe or polymeric coated pipe without a bituminous coating and paving may be used.

SP10R25

TRAFFIC CONTROL

01-18-05

Revise the *2002 Standard Specifications* as follows:

Article 1089-1 WORK ZONE SIGNS is deleted. Substitute the following:

(A) General:

Rigid sign retroreflective sheeting requirements for Types VII, VIII and IX (prismatic) fluorescent are described in Tables 1089-A, 1089-B and 1089-C. Cover the entire sign face of the sign substrate with NCDOT approved Type VII, VIII or IX (prismatic) fluorescent orange reflective sheeting. Apply the reflective sheeting in a workmanlike manner so that there are no bubbles or wrinkles in the material.

Roll-up sign retroreflective requirements are described in Table 1089-D.

1. Work Zones Signs (Stationary)

Use Type VII, VIII or IX (prismatic) fluorescent orange retroreflective sheeting that meets the following reflective requirements in Tables 1089-A, 1089-B or 1089-C respectively. Use approved composite or aluminum for sign backing. Signs and sign supports must meet or exceed NCHRP 350 requirements for Breakaway Devices.

Table 1089-A Minimum Coefficient of Retroreflection R_A for TYPE VII Fluorescent Orange Sheeting (Candelas per lux per square meter)		
Observation Angle	Entrance Angle	
	-4°	30°
0.1°	300	170
0.2°	230	130
0.5°	72	41

Table 1089-B Minimum Coefficient of Retroreflection R_A for TYPE VIII Fluorescent Orange Sheeting (Candelas per lux per square meter)		
Observation Angle	Entrance Angle	
	-4°	30°
0.1°	300	135
0.2°	210	95
0.5°	75	35

Table 1089-C Minimum Coefficient of Retroreflection R_A for TYPE IX Fluorescent Orange Sheeting (Candelas per lux per square meter)		
Observation Angle	Entrance Angle	
	-4°	30°
0.1°	200	110
0.2°	115	65
0.5°	72	41
1.0°	24	14

2. Work Zones Signs (Barricade Mounted)

Use approved composite or roll-up signs for barricade mounted sign substrates. Approved composite barricade mounted warning signs (black on orange) must be Type VII, VIII or IX sheeting which meet the retroreflective requirements of Table 1089-A, 1089-B or 1089-C. Roll-up mounted barricade warning signs (black on orange) must meet the retroreflective requirements in Table 1089-D. Sign and barricade assembly must meet or exceed the requirements of NCHRP 350 for Work Zone Category II Devices.

3. Work Zones Signs (Portable)

Use approved composite or roll-up sign substrates on portable sign stands.

Composite - Use Type VII, VIII or IX (prismatic) fluorescent orange retroreflective sheeting that meets the following reflective requirements in Tables 1089-A, 1089-B or 1089-C. Signs and sign supports must meet or exceed NCHRP 350 requirements for Breakaway Devices.

Roll-up Signs - Use fluorescent orange retroreflective roll-up signs that meet the following reflective requirements:

Table 1089-D		
Minimum Coefficient of Retroreflection R_A for Fluorescent Orange Roll-Up Signs (Candelas per lux per square meter)		
Observation Angle	Entrance Angle	
	-4°	30°
0.1°	300	120
0.2°	200	80
0.5°	90	34

Use roll up signs that have a minimum 3/16” x 1 1/4” horizontal rib and 38” x 1 1/4” vertical rib and has been crash test to meet NCHRP 350 requirements and Traffic Control qualified by the Work Zone Traffic Control Unit.

Add the following after 1089-1(C):

(D) Warranty

Warranty requirements for rigid sign retroreflective sheeting Types VII, VIII and IX are described in Section 1093-9 (F) and Tables 1089 A, B and C.

Roll-up fluorescent orange retroreflective signs will maintain 80% of its retroreflectivity (Table 1089-D) for years 1 – 2 and 50% for year 3.

Rigid and Rollup Fluorescent orange signs will maintain a Fluorescence Luminance Factor (Y_F)* of 13% for three (3) years.

*Fluorescence Testing Method is described in ASTM E2301 Test Methods for Fluorescent Retro reflective Sheeting.

Rigid and Roll up fluorescent orange signs shall maintain a total Luminance Factor (Y) of 25 for three (3) years and conform to the requirements of Table 1089-E when measured in accordance with ASTM D4956.

Table 1089-E
Fluorescent Orange colorimetric requirements

Color	1		2		3		4	
	x	y	x	y	x	y	x	y
Fluorescent Orange	0.583	0.416	0.535	0.400	0.595	0.351	0.645	0.355

BARRICADES

Article 1089-3(A) General, delete both paragraphs and substitute the following:

Type III Barricades shall be constructed of perforated square steel tubing and/or angle iron. Provide Type III barricades that use a cross member or stabilization bar and meet the requirements of NCHRP 350 for Work Zone Category II Devices with composite and roll-up signs attached.

Use approved composite or plastic barricade rails that have a smooth face and have alternating orange and white retroreflective stripes that slope at an angle of 45 degrees.

Article 1089-3(C) Reflective Sheeting, delete the first paragraph only and substitute the following:

Use Type VII, VIII or IX (prismatic) retroreflective fluorescent orange sheeting on both sides of the barricade rails. The rail sheeting retroreflectivity values shall meet the retroreflectivity requirements in Table 1089-A, 1089-B or 1089-C and shall be listed on the Department’s approved product list or accepted as traffic qualified by the Traffic Control Unit.

SP10R30

TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC:1-15-02_R

Revise the 2002 Standard Specifications as follows:

Delete Section 1175 and insert the following:

Description

Furnish, install, and remove sheeting, shoring, and bracing necessary to maintain traffic at locations shown on the Traffic Control Plans, and other locations determined during construction. Shoring required to maintain traffic is defined as shoring necessary to provide lateral support to the side of an excavation or embankment parallel to an open travelway when a theoretical 2:1 or steeper slope from the bottom of the excavation or embankment intersects the existing ground line closer than five (5) feet (1.5 m) from the edge of pavement of the open travelway. Contractor has option of submitting their own shoring design or using the Standard shoring design, unless otherwise noted in the plans.

Materials

Sheet piling must be hot rolled and conform to the requirements of ASTM A328.

Steel piles must conform to the requirements of ASTM A36.

Timber and lumber must conform to the requirements of Article 1082-1 in Standard Specifications.

Include all materials proposed for use in temporary shoring in the shoring design submittal described below.

Provide a Type 7 Contractor's Certification for all shoring materials used.

Contractor Shoring Design

Submit shoring design for review and approval by the Engineer prior to beginning construction.

Submit calculations and detail drawings in accordance with section 410-4 of the Standard Specifications.

Design all temporary shoring in accordance with the latest edition of AASHTO's Guide Design Specifications for Bridge Temporary Works.

If temporary concrete barrier is to be located within three (3) feet (1 m) of the top of the shoring, measured to the back face of the barrier, then design the temporary shoring to resist the lateral movement of the barrier when struck by a vehicle and extend the shoring out of the ground at least to the top elevation of the temporary concrete barrier. Design the temporary shoring to resist an impact load of two (2) kips/foot (29 kN/m) applied at one and half (1.5) feet (0.5 m) above ground. This shoring will be paid for as "Temporary Shoring - Barrier Supported". Temporary concrete barrier is paid for separately.

Standard Shoring Design

Select the appropriate shoring design from the “Standard Temporary Shoring for Maintenance of Traffic” detail drawing as shown in the plans.

Submit a “Standard Shoring Selection Form” to Engineer a minimum of fourteen (14) days prior to beginning construction of shoring.

Find Standard Shoring Selection Form as follows:

1. Go to NCDOT webpage (www.doh.dot.state.nc.us)
2. Click on Doing Business with NCDOT link
3. Scroll down and click on Soils and Foundation Design Section Forms link
4. Click on Standard Shoring Selection Form

Criteria for the Standard Shoring Designs

- Maximum height of shoring excavation is eleven (11) feet (3.35 meters).
- Groundwater table is not above bottom of shoring excavation.
- Traffic surcharge equal to 240 psf (11 kPa).
- Soldier pile spacing is six (6) feet (1.8 meters).
- Soldier pile embedment depths are for driven piles.
- Timber lagging must have minimum thickness of three (3) inches (76 mm).
- Timber must have a minimum allowable bending stress of 1000 psi (6895 kPa).

If conditions at the shoring location do not meet the criteria of the Standard shoring design as outlined above and in the plans, then Contractor must submit a shoring design to the Engineer for approval.

Construction Methods

Install and interlock steel sheet piles to a tolerance of not more than 3/8 inch per foot (30mm per meter) from vertical.

If soldier piles are used, then install piles to a tolerance of not more than 1/4 inch per foot (20mm per meter) from vertical.

If soldier piles are to be installed in drilled holes, then set piles in drilled holes and fill the holes as soon as practical after installing the piles.

Excavate or auger the soil and rock in two (2) foot (610 mm) diameter holes to the required embedment depth as shown on the approved design. Maintain holes, if required, by casing or other means. Set soldier piles to bottom of the hole prior to backfilling. Backfill holes with Class A concrete to the bottom of excavation. Fill remainder of hole with a lean sand-grout mixture to the ground surface. Remove mixture as necessary to install timber lagging.

Use timber lagging with a minimum three (3) inch (76mm) thickness perpendicular to the pile flange. Install timber lagging with a minimum bearing distance of three (3) inches (76 mm) on each pile flange. Backfill voids behind lagging with granular material or compacted excavated material to the satisfaction of the Engineer.

Backfill and compact fill for shoring excavation prior to removal of shoring.

If the design embedment depth is not achieved, then notify the Engineer immediately.

Method of Measurement

The quantity of temporary shoring to be paid for will be the actual number of square feet (square meter) of exposed face of the shoring measured from the bottom of the shoring excavation or embankment to the top of the shoring, with the upper limit for pay purposes not to exceed one (1) foot (0.3 m) above the retained ground elevation.

The quantity of temporary shoring - barrier supported to be paid for will be the actual number of square feet (square meter) of exposed face of the shoring measured from the bottom of the excavation or embankment to the top of the shoring, with the upper limit for pay purposes not to exceed one (1) foot (0.3 m) above the retained ground elevation.

Basis of Payment

Payment for temporary shoring will only be made at locations where it is required in order to maintain traffic. Trench boxes are not considered temporary shoring for the maintenance of traffic and will not be paid for under this special provision. Such payment will include, but not limited to, furnishing all labor, tools, equipment, and all incidentals necessary to install shoring and complete the work as described in this special provision.

The quantity of shoring necessary for the maintenance of traffic, measured as provided above, will be paid for at the contract unit price per square foot (square meter) of "Temporary Shoring".

The quantity of shoring with temporary concrete barrier located within three (3) feet (1.0 meter) of the shoring will be paid for at the contract unit price per square foot (square meter) of "Temporary Shoring - Barrier Supported".

Payment will be made under:

Temporary Shoring.....Square Feet (Square Meter)
Temporary Shoring - Barrier Supported.....Square Feet (Square Meter)

SP11R01

DRUMS:

07-16-02

Revise the 2002 Standard Specifications as follows:

Page 10-195, Subarticle 1089-5(C)

Delete the first (1st) sentence of the first (1st) paragraph and insert the following:

“Provide a minimum of three orange and two white alternating horizontal circumferential stripes covering the entire outside with each drum.”

SP11R05

PORTABLE CONCRETE BARRIER:

11-19-02

Portable Concrete Barrier used on this project must meet one of the following:

- NC Approved NCHRP 350 Portable Concrete Barrier (design can be found at <http://www.doh.dot.state.nc.us/preconstruct/traffic/congestion/TC/> or can be obtained by calling the Traffic Control Section at (919) 250-4159)
- Other NCHRP 350 Portable Concrete Barrier as approved by the Engineer and the Traffic Control Section
- NC Approved NCHRP 230 Portable Concrete Barrier in Roadway Standard Drawing 1170.01 manufactured before October 1, 2002

SP11R10

WORK ZONE SIGNS

01-18-05

Revise the *Standard Specifications* as follows:

DESCRIPTION

Page 11-5, Article 1110-1 Description

Replace the second paragraph with the following:

Furnish, install, maintain and relocate portable work zone signs and portable work zone sign stands in accordance with the plans and specifications. When portable work zone signs and portable work zone sign stands are not in use for periods longer than 30 minutes, collapse sign stand and reinstall once work begins.

Replace the last sentence in the third paragraph with the following:

Use work zone signs (portable) only with portable work zone sign stands specifically designed for one another. Work Zone Signs (portable) may be roll up or approved composite.

MATERIALS

Page 11-5, **Article 1110-2 Part (A) General:**

Add the following:

Barricade Mounted Signs.....Article 1089-3

MATERIAL QUALIFICATIONS

Page 11-5, **Article 1110-2 Part (B) Material Qualifications.**

Delete the first sentence in the first paragraph and replace with the following:

Provide portable work zone sign stands, portable signs and sign sheeting which are listed on the North Carolina Department of Transportation’s approved product list or accepted as traffic qualified by the Traffic Control Unit.

Delete “Traffic Control Section” in the second sentence of the first paragraph and insert “Traffic Control Unit”.

CONSTRUCTION METHODS

Page 11-6, Article 1110-3 CONSTRUCTION METHODS.

Replace **Article 1110-3 (B) Work Zone Signs (Barricade Mounted)** with the following:

Mount approved composite or roll-up signs to barricade rails so that the signs do not cover more than 50 percent of the top two rails or 33 percent of the total area of the three rails. Signs are to be mounted a minimum of 1’ from the ground to the bottom of the sign.

Replace **Article 1110-3 (C, 2) Work Zone Signs (Portable)** with the following:

Install portable work zone signs to carry roll-up or approved composite at a minimum height of 1’ from the bottom of the sign to the ground on two lane-two way roadways.

Install portable work zone signs to carry roll-up or approved composite at a minimum height of 5’ from the bottom of the sign to the ground on multi-lane roadways.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Method of Measurement and Basis of Payment will be in accordance with Section 1110-5 and 1110-6 of the *Standard Specifications*.

SP11R15

BARRICADES

01-18-05

Revise the 2002 *Standard Specifications* as follows:

Page 11- 12, **Article 1145-2 Materials**, delete the contents and substitute the following:

(A) General

Refer to Division 10:

Barricades..... Article 1089-3

(B) Material Qualifications

Provide Type III barricades and barricade rails that are listed on the North Carolina Department of Transportation's approved product list or accepted as traffic qualified by the Traffic Control Unit. For more information on the Traffic Qualification process, contact the Traffic Control Unit at Century Center Building B, 1020 Birch Ridge Drive, Raleigh, NC 27610; (919) 250-4159, or see the approved product list on the NCDOT web site at:

www.doh.dot.state.nc.us/construction/tc/Apv_Prod/apv_prod.htm

(C) Historical Performance:

Historical performance of Type III barricades and barricade rails will be used in determining future use of the material by the NCDOT, even if the Type III Barricade is traffic-qualified. Poor past or poor current performance of Type III Barricades at any site, whether or not related to a specific contract may be grounds for non-acceptance of a product on any project under contract.

MEASUREMENT AND PAYMENT

Method of Measurement and Basis of Payment will be in accordance with Section 1145-5 and 1145-6 of the *Standard Specifications*.

SP11R20

MM HDPE PIPE CULVERTS:

09-21-04

Furnish and install Type S or Type D HDPE pipe in lieu of concrete pipe shown on the plans up to 900MM in diameter, except that HDPE pipe will not be permitted for use under travelways.

HDPE pipe material shall conform to the requirements of Subarticle 1044-7 and installation shall conform to the requirements of Section 300 for Method A, except that the minimum cover shall be at least 12 inches (300 mm).

Measurement will be in accordance with Section 310-6 of the *Standard Specifications*.

Payment will be made for quantities measured as provided for above.

Payment will be made under:

___ MM HDPE Pipe Culverts.....Linear Meter

PAVEMENT MARKING GENERAL REQUIREMENTS:

07-16-02

Revise the 2002 Standard Specifications as follows:

Page 12-10, Subarticle 1205-3(J)

Delete the first (1st) sentence of the first (1st) paragraph and insert the following:

“Have at least one member of every pavement marking crew working on a project certified through the NCDOT Pavement Marking Technician Certification Process. For more information contact the Traffic Control, Marking and Delineation Section of the North Carolina Department of Transportation at 919-250-4151 or <http://www.doh.dot.state.nc.us/preconstruct/traffic/congestion/TC/>”

SP12R01

PERMANENT SEEDING AND MULCHING:

07-01-95

The Department desires that permanent seeding and mulching be established on this project as soon as practical after slopes or portions of slopes have been graded. As an incentive to obtain an early stand of vegetation on this project, the Contractor's attention is called to the following:

For all permanent seeding and mulching that is satisfactorily completed in accordance with the requirements of Section 1660, "Seeding and Mulching", and within the following percentages of elapsed contract times, an additional payment will be made to the Contractor as an incentive additive. The incentive additive will be determined by multiplying the number of acres of seeding and mulching satisfactorily completed times the contract unit bid price per acre for "Seeding and Mulching" times the appropriate percentage additive.

<u>Percentage of Elapsed Contract Time</u>	<u>Percentage Additive</u>
0% - 30%	30%
30.01% - 50%	15%

Percentage of elapsed contract time is defined as the number of calendar days from the date of availability of the contract to the date the permanent seeding and mulching is acceptably completed divided by the total original contract time.

SP16R01