STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

August 15, 2006

Addendum No. 1

RE: Contract ID: C201278
TIP Number: R-2813B
Buncombe County
Project Description: NC 146 (Long Shoals Rd.) from West of Clayton Road (SR 3501) to East of I-26

December 21, 2006 Letting

To Whom It May Concern:

Reference is made to the Request for Proposal recently furnished to you on the above project. The following revisions have been made to the Request for Proposal:

On the RFP Cover Sheet, the dates for the Technical and Price Proposal Submission, Price Proposal Opening and Type of Work have been revised. Please void Cover Sheet in your proposal and staple the revised Cover Sheet thereto.

The *Table of Contents* has been revised. Please void the *Table of Contents* and staple the revised *Table of Contents* thereto.

On Page 1, the *Contract Time and Liquidated Damages* Project Special Provision has been revised. Please void Page No.1 in your proposal and staple the revised Page No.1 thereto.

On Page 6, the *Fuel Price Adjustment* Project Special Provision has been revised. Please void Page No.6 in your proposal and staple the revised Page No.6 thereto.

On Page 9, the *Schedule of Estimated Completion Progress* Project Special Provision has been revised. Please void Page No.9 in your proposal and staple the revised Page No.9 thereto.

On Page 32, the *Price Adjustment for Asphalt Binder* Project Special Provision has been revised. Please void Page No.32 in your proposal and staple the revised Page No.32 thereto.

On Pages 32-32I, the *Footing for Signs* Project Special Provision has been added. Please void Page No.32 in your proposal and staple the revised Page No.32 thereto and add Page Nos. 32A-32I in your proposal.

Pages 32I-32P, the *Sign Support* Special Provision has been added. Please add Page Nos.32I-32P in your proposal.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT SERVICES UNIT
1591 MAIL SERVICE CENTER
RALEIGH NC 27699-1591

TELEPHONE: 919-250-4128
FAX: 919-250-4119

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC

On Pages 32P-32U, the *Sign Lighting Systems* Special Provision has been added. Please add Page Nos.32p-32U in your proposal.

On Pages 34,37 and 40, the *General Section* have been revised. Please void Page Nos. 34,37 and 40 in your proposal and staple the revised Page Nos. 34,37 and 40 thereto.

On Pages 46 and 47, the *Roadway Scope of Work* has been revised. Please void Page Nos. 46 and 47 in your proposal and staple the revised Page Nos. 46 and 47 thereto.

On Page51, the *Structures Scope of Work* has been revised. Please void Page No. 51 in your proposal and staple the revised Page No. 51 thereto.

On Page 57, the *Hydraulics Scope of Work* has been revised. Please void Page 57 in your proposal and staple the revised Page No. 57 thereto.

On Page 60, the *Geotechnical Engineering Scope of Work* has been revised. Please void Page 60 in your proposal and staple the revised Page No. 60 thereto.

On Page 76, the *Geoenvironmental Scope of Work* has been revised. Please void Page 76 in your proposal and staple the revised Page No. 76 thereto.

On Page 80, the *Traffic Control Scope of Work* has been revised. Please void Page 80 in your proposal and staple the revised Page No. 80 thereto.

On Page 93, the *Traffic Signals Scope of Work* has been revised. Please void Page 93 in your proposal and staple the revised Page No. 93 thereto.

On Page 96, the *Right Of Way Scope of Work* has been revised. Please void Page 96 in your proposal and staple the revised Page No. 96 thereto.

On Page 99, the *Utilities Coordination Scope of Work* has been revised. Please void Page 99 in your proposal and staple the revised Page No. 99 thereto.

On Pages 104, 105 and 108 the *Environmental Permits Scope of Work* has been revised. Please void Pages 104, 105 and 108 in your proposal and staple the revised Page Nos. 104, 105 and 108 thereto.

On Pages 115-121A, the *Utility Construction Scope of Work* has been revised. Please void Pages 115-121 in your proposal and staple the revised Page Nos. 115-121 thereto and add Page No. 121A in your proposal.

Sincerely,

R.A. Garris, P.E.
Contract Officer

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

FINAL RFP

DESIGN-BUILD PROJECT

TIP R-2813B

May 8, 2006

VOID FOR BIDDING

DATE AND TIME OF TECHNICAL AND PRICE PROPOSAL SUBMISSION: **November 21, 2006** AT **4:00 PM**

DATE AND TIME OF PRICE PROPOSAL OPENING: **December 21, 2006** AT **10:00 AM**

CONTRACT ID:	C 201278
WBS ELEMENT NO.	34505.3.3
FEDERAL-AID NO.	STP-146(5)
COUNTY:	Buncombe
ROUTE NO.	NC 146
MILES:	1.012
LOCATION:	NC 146 (Long Shoals Rd.) from west of Clayton Road (SR 3501) To east of I-26
TYPE OF WORK:	DESIGN-BUILD AS SPECIFIED IN THE SCOPE OF WORK CONTAINED IN THE FINAL RFP

NOTICE:

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

_____

5% BID BOND OR BID DEPOSIT REQUIRED

_____

TABLE OF CONTENTS

STANDARD SPECIAL PROVISIONS (YELLOW SHEETS)

*** PROJECT SPECIAL PROVISIONS ***

CONTRACT TIME AND LIQUIDATED DAMAGES (Projects with Permits, DBT Acquiring)

The date of availability for this contract is **February 5, 2007**, except that work in jurisdictional waters and wetlands shall not begin until a meeting between the DOT, Regulatory Agencies, and the Design-Build Team is held, and the permits acquired, as stipulated in the Environmental Permits Scope of Work contained elsewhere in this proposal. The Design-Build Team shall consider this factor in determining the proposed completion date for this project.

The completion date for this contract is defined as the date proposed in the Request For Proposals by the proposer who is awarded the project. The completion date thus proposed shall not be later than **November 15, 2010**.

The actual completion date proposed by the Design-Build Team is (to be filled in by NCDOT after award).

When observation periods are required by the special provisions, they are not a part of the work to be completed by the completion date and/or intermediate contract times. Should an observation period extend beyond the final completion date, the acceptable completion of the observation period shall be a part of the work covered by the performance and payment bonds.

The liquidated damages for this contract are **Two Thousand Eight Hundred Dollars ($2,800.00)** per calendar day. As an exception to this amount, where the contract has been determined to be substantially complete as defined in Section 105-18 contained elsewhere in this proposal, the liquidated damages will be reduced to **One Thousand Dollars ($1,000.00)** per calendar day.

Where the Design-Build Team who is awarded the contract has proposed a completion date for the contract as required above, but also has proposed an earlier date for substantial completion, then both of these proposed dates will become contract requirements.

Liquidated damages of **Two Thousand Eight Hundred Dollars ($2,800.00)** per calendar day will be applicable to the early date for substantial completion proposed by the bidder. Liquidated damages of **One Thousand Dollars ($1,000.00)** per calendar day will be applicable to the final completion date proposed by the bidder where the Design-Build Team has proposed an earlier date for substantial completion.

DB1 G04

OTHER LIQUIDATED DAMAGES (1/20/06)

- **Refer to the Traffic Control Scope of Work for more information on the following time restrictions and liquidated damages:**

  Liquidated Damages for the lane narrowing, lane closure, holiday and special event time restrictions for I-26 are **$10,000.00** per hour for this Intermediate Contract Time.

  Liquidated Damages for the lane narrowing, lane closure, holiday and special event time restrictions for NC 146 (Long Shoals Road) and SR 3501 (Clayton Road) are **$5,000.00** per hour for this Intermediate Contract Time.

B = Base Index Price
A = Average terminal price
Q = Partial payment quantity for contract item
F = Fuel factor for contract item

The average terminal price in effect on the first day of the month in which the partial payment period ends will be used to make payment adjustments for fuel whether or not more than one price fluctuation has occurred within a single partial payment period.

The fuel price adjustment for the specified item will be determined by multiplying the cumulative fuel price adjustment made for that specified item for the previous estimate period(s) by the adjusted quantity for that specified item and divided by the total quantity of work paid for the previous estimates for the specified item

The Design-Build Team shall prepare, and present with their Price Proposal, an Estimate of Quantities of which they anticipate incorporating into the completed project and upon which the Price Proposal was based. The quantity breakdown shall include all items of work, which appear in the Fuel Usage Factor Chart. This chart is found in the back of this RFP following the Itemized Proposal sheet. The quantity estimate submitted in the Price Proposal is the final total quantity for which fuel price adjustments will be made for each item, regardless of supplemental agreements. The Department shall review the Estimate of Quantities to insure its reasonableness to the proposed design. Agreement of quantities is a prerequisite prior to execution of the contract.

The Design-Build Team's Estimate of Quantities shall be utilized on the various partial payment estimates to determine fuel price adjustments. The Design-Build Team shall submit a payment request for quantities of work completed based on the work completed for that estimate period. The quantities requested for partial payment shall be reflective of the work actually accomplished for the specified period. A licensed Professional Engineer shall sign and seal that the quantities are reasonable for the specified period. Only those items of work which are specifically noted in the Fuel Usage Factor Chart will be subject to fuel price adjustments.

If the Design-Build Team elects **not** to pursue reimbursement for Fuel Price Adjustments, a quantity of zero should be entered for all quantities in the Fuel Usage Factor Chart (found immediately after the Item Proposal Sheet) and the declination box checked. Failure to complete this form will be taken as declining Fuel Price Adjustments for this project.

The base index price for DIESEL #2 FUEL is **$ 2.0767 per gallon**.

DB1 G43

PARTNERING

As a part of its quality management program, the North Carolina Department of Transportation intends to encourage the formation of a cohesive relationship with the Design-Build Team and its principal subcontractors and suppliers. This relationship will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objectives are safe, effective, and efficient contract performance; and completion within budget, on schedule, and in accordance with the plans and specifications.

VALUE ANALYSIS (9-27-05)

Value Engineering Construction Proposals (VECP), as identified in Article 104-12 of the Standard Special Provisions, Division 1 (found elsewhere in this proposal), will be accepted. Only proposals, which alter the requirements of the RFP issued by the Department, will be considered as Value Engineering Construction Proposals.

DB1 G57

SCHEDULE OF ESTIMATED COMPLETION PROGRESS (9-27-05)

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

Fiscal Year	Progress (Dollar Value)
2007 (7/01/06 – 6/30/07)	10 % of Total Amount Bid
2008 (7/01/07 – 6/30/08)	25 % of Total Amount Bid
2009 (7/01/08 – 6/30/09)	27 % of Total Amount Bid
2010 (7/01/09 – 6/30/10)	31 % of Total Amount Bid
2011 (7/01/09 – 6/30/10)	07 % of Total Amount Bid

The Design-Build Team shall also furnish his own progress schedule in accordance with the Project Special Provision entitled PROJECT SCHEDULE (found elsewhere in this proposal). Any acceleration of the progress as shown by the Design-Build Team's progress schedule over the progress as shown above shall be subject to the approval of the Engineer.

DB1 G58

DISADVANTAGED BUSINESS ENTERPRISE (2/24/04)

POLICY

It is the policy of the North Carolina Department of Transportation that Disadvantaged Business Enterprises shall have the opportunity to participate in the performance of contracts financed in whole or in part by Federal Funds in order to create a level playing field.

The Design-Build Team is also encouraged to give every opportunity to allow DBE participation in Supplemental Agreements.

OBLIGATION

The Design-Build Team, subcontractor, and sub-recipient shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Design-Build Team shall carry out applicable requirements of 49 CFR 26 in the award and administration of federally assisted contracts as approved by the Federal Highway Administration.. Failure by the Design-Build Team to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the Department deems necessary.

This obligation shall be incorporated into any subsequent contract at any level that is executed under the terms of this contract.

variable pipe lengths and thread lengths in coupling. Results of settlement gauge readings shall be forwarded to NCDOT Geotechnical Engineering Unit along with the letter by the prequalified geotechnical firm releasing the embankment from the waiting period.

DB2 R75

PRICE ADJUSTMENTS FOR ASPHALT BINDER (11-21-00)

Adjustments will be made to the payments due the Design-Build Team for each grade of asphalt binder when it has been determined that the monthly average terminal F.O.B. Selling Price of asphalt binder, Grade PG 64-22, has fluctuated from the Base Price Index for Asphalt Binder included in this Project Special Provision. The methods for calculating a Base Price Index, for calculating the monthly average terminal F.O.B. Selling Price and for determining the terminals used are in accordance with procedures on file with the Department's Construction Unit.

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

The Base Price Index for this project is **$ 408.93** per ton

DB6 R25

PRICE ADJUSTMENTS - ASPHALT CONCRETE PLANT MIX (2-6-06)

Revise the 2002 Standard Specifications as follows:

Page 6-20, Article 609-8 and Page 6-36, Article 610-13

Add the following paragraph before the first paragraph:

The "Asphalt Price" used to calculate any price adjustments set forth in this section shall be $35 per theoretical ton. This price shall apply for all mix types.

FOOTING FOR SIGNS

Revise the 2002 Standard Specifications as follows:

Delete Section 902 and insert the following:

DESCRIPTION

The work covered by this provision consists of the design and construction of overhead sign foundations in accordance with the submitted approved plans and this provision. Design and construct either spread footing type foundations and/or drilled pier type foundations for each overhead sign unless otherwise directed by the Engineer.

MATERIALS

Portland Cement Concrete Production and Delivery .....Section 1000
Reinforcing Steel .....Section 1070
Anchor Bolts .....Article 1072-6
Structural Steel and Overhead Sign Structures .....Section 1072 and 1096

CONSTRUCTION METHODS

General

A North Carolina Licensed Professional Engineer must seal all design calculations, drawings and recommendations. Design foundations for the effects of dead, wind and ice loads in accordance with the wind zone load shown on the plans and Section 3 of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals* (including interims). Use either spread footing or drilled pier foundations. In some instances, conflicts with drainage structures may dictate a certain type of foundation. Spread footings or dual drilled pier foundations are required for full span overhead signs (no single drilled pier foundations). When designing dual drilled pier foundations, a rectangular grade beam with a moment of inertia approximately equal to either of the drilled piers is required to connect the pier tops.

Provide reinforced concrete design in accordance with either Section 13.7.2 or 13.6.2 (whichever is applicable), allowable stress design method, of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals* (including interims).

Consider sloping ground in the design, if applicable. Do not exceed an allowable bearing pressure of 3 ksf for spread footings. For drilled pier foundations, do not exceed an allowable lateral soil pressure of 4 ksf for AASHTO Group II Loading. Use the following default soil parameters and groundwater elevation for foundation design in the absence of a site-specific subsurface investigation in accordance with this provision.

Total Unit Weight = 120 pcf
Friction Angle = 30 degrees
Cohesion = 0 psf

Assume the groundwater elevation is at a depth of 7 feet below the ground surface. If the groundwater is encountered at a depth shallower than 7 feet, the overhead sign foundation must be redesigned based upon the actual field conditions. The default soil parameters and allowable pressures do not apply to very soft or loose soil, muck (generally, SPT blow counts per foot less than 4), weathered rock or hard rock (generally, SPT refusal). If soft or loose soil, muck, weathered rock or hard rock conditions are present, a site-specific subsurface investigation and foundation design is required in accordance with this provision.

Design spread footings in accordance with Sections 4.4.1 through 4.4.10, allowable stress design method, of the *AASHTO Standard Specifications for Highway Bridges* (including interims).

Restrict uplift due to the eccentricity of the loading to one corner of the footing and the tension area may not exceed 25% of the total bearing area of the spread footing.

Design drilled piers in accordance with Sections 4.6.1 through 4.6.5, allowable stress design method, of the *AASHTO Standard Specifications for Highway Bridges* (including interims). If drilled piers are designed for skin friction only, increase the required length of each drilled pier a minimum of 6 inches to allow for sediment. If drilled piers are designed for end bearing, no additional length is required; however, the drilled piers shall be subject to the cleanliness requirements in Section B under "Drilled Pier Construction:" below. Clearly state on the plans whether end bearing was accounted for in the foundation design.

Calculate expected vertical, lateral and torsional movements for single drilled pier foundations. Provide drilled pier foundations that result in a horizontal lateral movement of less than 1 inch at the top of the pier and a horizontal rotational movement of less than 1 inch at the edge of the pier. Also, use a factor of safety of 2.0 for lateral and torsion failure. Preliminary design methods described in Section 13.6.1.1 of the *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals* (including interims) may be used to incorporate a factor of safety in foundation design for lateral failure. Wings are required to increase torsion resistance for cantilever signs supported by a single drilled pier.

If a site-specific subsurface investigation is performed, use only an NCDOT Highway Design Branch Pre-Qualified Geotechnical Engineering Firm to provide a site specific foundation design.

Subsurface Investigation

If the default soil parameters or allowable pressures referenced above are not applicable for a given overhead sign foundation site, the Engineer may require a site-specific subsurface investigation. If the Engineer requires a site-specific subsurface investigation, the Department shall perform the borings and provide the data to the Design-Build Team. The subsurface investigation shall be provided within two weeks of being notified by the Design-Build Team that the site is at rough grade and accessible to a drill rig.

The Design-Build Team may elect to conduct a site specific subsurface investigation at each proposed overhead sign foundation location in accordance with the requirements listed below, in lieu of using the default soil parameters and allowable pressures referenced above.

Perform a boring at each overhead sign foundation location and provide boring data on an NCDOT Standard Boring Log form. Download this form from the NCDOT site at:

http://www.ncdot.org/doh/preconstruct/highway/geotech/contractserv/investigation/Documents/BoringLogs.zip.

A licensed geologist or a professional engineer registered in the State of North Carolina and employed by an NCDOT Highway Design Branch pre-qualified Geotechnical Engineering Firm must seal each boring log. Use only an NCDOT Highway Design Branch pre-qualified

Geotechnical Engineering Firm to conduct the subsurface investigation. Perform the investigation only after rough grade (within 3 feet of final grade) is achieved. Locate each boring within 3 feet of the center of the overhead sign foundation. Drill the boring to a minimum depth of 10 feet below the required spread footing bearing or drilled pier tip elevation, whichever is deeper. Conduct Standard Penetrating Tests at 1 ft, 2.5 ft, 5 ft, 7.5 ft, 10 ft, and every 5-ft after 10 ft below the rough grade in accordance with ASTM D-1586. A boring may be terminated above the minimum depth required (10 ft below the foundation elevation) if one of the following conditions occur: (a) a total of 100 blows have been applied in any 2 consecutive 6-in.intervals; (b) a total of 50 blows have been applied with less than 3-in. penetration.

FOUNDATION CONSTRUCTION

Excavate footings for overhead sign structures in accordance with the applicable provisions of Section 410 of the 2006 Standard Specifications. Construct footings for overhead sign structures in accordance with Section 825 of the 2006 Standard Specifications. Construct all footings with Class A concrete. Where rectangular forms are used, use forms that have a chamfer strip at all corners for at least that distance protruding above finished ground. Use chamfers, which measure one-inch along the diagonal face.

Securely brace anchor bolts positioned in the form and hold in proper position and alignment. Provide a rubbed finish on concrete surfaces to be exposed above finished ground in accordance with Section 825-6 (D) of the 2006 Standard Specifications. Do not erect overhead sign structures on foundations until the concrete has reached a minimum compressive strength of 3000 psi. Determine concrete compressive strength by nondestructive test methods or compressive strength tests made in accordance with AASHTO T22 and T23. Furnish equipment used for nondestructive tests and obtain Engineer's approval before performing the tests.

Drilled Pier Construction

A. Excavation

Perform excavations for drilled piers to the required dimensions and lengths including all miscellaneous grading and excavation necessary to install the drilled pier. Depending on the subsurface conditions encountered excavation in hard rock, weathered rock or removal of boulders and debris may be required.

Dispose of drilling spoils as directed by the Engineer and in accordance with Section 802 of the 2006 Standard Specifications. Drilling spoils consist of all material excavated including water or slurry removed from the excavation either by pumping or with augers.

Construct drilled piers within the tolerances specified herein. If tolerances are exceeded, provide additional construction as approved by the Engineer to bring the piers within the tolerances specified. Construct drilled piers such that the axis at the top of the piers is no more than 3 inches in any direction from the specified position. Build drilled piers within 1% of the plumb deviation for the total length of the piers. When a grade beam is not required at the top of a pier, locate the top of pier elevation between 18 inches above and

6 inches above the finished grade elevation. Form the top of the pier such that the concrete is smooth and level.

If unstable, caving or sloughing soils are anticipated or encountered, stabilize drilled pier excavations with steel casing and/or polymer slurry. Steel casing may be either the sectional type or one continuous corrugated or non-corrugated piece. All steel casings should consist of clean watertight steel of ample strength to withstand handling and driving stresses and the pressures imposed by concrete, earth or backfill. Use steel casings with an outside diameter equal to the specified pier size and a minimum wall thickness of 1/4 inch. . Extract all temporary casings during concrete placement in accordance with this provision unless the Design-Build Team chooses to leave the casing in place in accordance with the requirements below.

Any steel casing left in place shall be considered permanent casing. When installing permanent casing do not drill or excavate below the tip of the permanent casing at any time such that the permanent casing is against undisturbed soil. The Design-Build Team may excavate a hole with a minimum diameter of 12 inches smaller than the specified size of the pier in order to facilitate permanent casing installation provided the sides of the excavation do not slough during drilling such that the hole diameter becomes larger than the inside diameter of the casing. Permanent steel casings are only allowed for full span overhead signs as approved by the Engineer and prohibited for cantilever overhead signs.

If the Design-Build Team elects to use polymer slurry to stabilize the excavation, use one of the polymers listed in the table below:

PRODUCT	MANUFACTURER
SlurryPro EXL	KB Technologies Ltd 3648 FM 1960 West Suite 107 Houston, TX 77068 (800) 525-5237
Super Mud	PDS Company 105 West Sharp Street El Dorado, AR 71730 (800) 243-7455
Shore Pac GCV	CETCO Drilling Products Group 1500 West Shure Drive Arlington Heights, IL 60004 (800) 527-9948

Use slurry in accordance with the manufacturer's guidelines and recommendations unless approved otherwise by the Engineer. The Design-Build Team should be aware that polymer slurry might not be appropriate for a given site. Polymer slurry should not be

used for excavations in very soft or loose soils. If the excavation can not be stabilized with polymer slurry, the Engineer may require a site-specific subsurface investigation (if not done during design) and the use of steel casing. No additional time or compensation shall be provided if both steel casing and polymer slurry are required to stabilize the excavation.

Construct all drilled piers such that the piers are cast against undisturbed soil. If a larger casing and drilled pier are required as a result of unstable or caving material during drilling, backfill the excavation before removing the casing to be replaced. No additional time or compensation shall be provided for substituting a larger diameter drilled pier in order to construct a drilled pier cast against undisturbed soil.

Any temporary steel casing that becomes bound or fouled during pier construction and cannot be practically removed may constitute a defect in the drilled pier. Improve such defective piers to the satisfaction of the Engineer by removing the concrete and enlarging the drilled pier, providing a replacement pier or other approved means. All corrective measures including redesign as a result of defective piers shall not be cause for any claims or requests for additional time or compensation.

B. Bottom Cleanliness:

After a drilled pier excavation is complete and immediately before concrete placement, demonstrate acceptable bottom cleanliness of the drilled pier excavation to the Engineer for approval if the plans indicate end bearing was used in the design. Provide any equipment, personnel and assistance required for the Engineer to inspect the drilled pier excavation. The pier excavation bottom is considered clean if no portion of the bottom area has more than 3 inches of sediment as determined by the Engineer.

C. Reinforcing Steel:

Completely assemble a cage of reinforcing steel consisting of longitudinal and spiral bars and place cage in the drilled pier excavation as a unit immediately upon completion of drilling unless the excavation is entirely cased. If the drilled pier excavation is entirely cased down to the tip, immediate placement of the reinforcing steel and the concrete is not required.

Lift the cage so racking and cage distortion does not occur. Keep the cage plumb during concrete placement operations and casing extraction. Check the position of the cage before and after placing the concrete.

Securely crosstie the vertical and spiral reinforcement at each intersection with double wire. Support or hold down the cage so that the vertical displacement during concrete placement and casing extraction does not exceed 2 inches.

Do not set the cage on the bottom of the drilled pier excavation. Place plastic bolsters under each vertical reinforcing bar that are tall enough to raise the rebar cage off the bottom of the drilled pier excavation a minimum of 3 inches.

In order to ensure a minimum of 3 inches of concrete cover and achieve concentric spacing of the cage within the pier, tie plastic spacer wheels at five points around the cage perimeter. Use spacer wheels that provide a minimum of 3 inches "blocking" from the outside face of the spiral bars to the outermost surface of the drilled pier. Tie spacer wheels that snap together with wire and allow them to rotate. Use spacer wheels that span at least two adjacent vertical bars. Start placing spacer wheels at the bottom of the cage and continue up along its length at maximum 10-foot intervals. Supply additional peripheral spacer wheels at closer intervals as necessary or as directed by the Engineer.

D. Concrete:

Begin concrete placement immediately after inserting reinforcing steel into the drilled pier excavation.

1) Concrete Mix

Provide the mix design for drilled pier concrete for approval and, except as modified herein, meeting the requirements of Section 1000 of the 2006 Standard Specifications.

Designate the concrete as Drilled Pier Concrete with a minimum compressive strength of 4500 psi at 28 days. The Design-Build Team may use a high early strength mix design as approved by the Engineer. Make certain the cementitious material content complies with one of the following options:

Provide a minimum cement content of 640 lbs/yd^3 and a maximum cement content of 800 lbs/yd^3; however, if the alkali content of the cement exceeds 0.4%, reduce the cement content by 20% and replace it with fly ash at the rate of 1.2 LB of fly ash per LB of cement removed.

If Type IP blended cement is used, use a minimum of 665 lbs/yd^3 Type IP blended cement and a maximum of 833 lbs/yd^3 Type IP blended cement in the mix.

Limit the water-cementitious material ratio to a maximum of 0.45. Do not air-entrain drilled pier concrete.

Produce a workable mix so that vibrating or prodding is not required to consolidate the concrete. When placing the concrete, make certain the slump is between 5 and 7 inches for dry placement of concrete or 7 and 9 inches for wet placement of concrete.

Use Type I or Type II cement or Type IP blended cement and either No. 67 or No. 78M coarse aggregate in the mix. Use an approved water-reducer, water-reducing retarder, high-range water-reducer or high-range water-reducing retarder to facilitate placement of the concrete if necessary. Do not use a stabilizing admixture as a retarder in Drilled Pier Concrete without approval of the Engineer. Use admixtures that satisfy AASHTO M194 and add admixtures at the concrete plant when the mixing water is introduced into the concrete. Redosing of admixtures is not permitted.

Place the concrete within 2 hours after introducing the mixing water. Ensure that the concrete temperature at the time of placement is 90°F or less.

1) Concrete Placement

Place concrete such that the drilled pier is a monolithic structure. Temporary casing may be completely removed and concrete placement may be temporarily suspended when the concrete level is within 42 to 48 inches of the ground elevation to allow for placement of anchor bolts and construction of grade beam or wings. Do not pause concrete placement if unstable caving soils are present at the ground surface. Remove any water or slurry above the concrete and clean the concrete surface of all scum and sediment to expose clean, uncontaminated concrete before inserting the anchor bolts and conduit. Resume concrete pouring within 2 hours.

Do not dewater any drilled pier excavations unless the Engineer approves the dewatering and the excavation is entirely cased down to tip. Do not begin to remove the temporary casing until the level of concrete within the casing is in excess of 10 feet above the bottom of the casing being removed. Maintain the concrete level at least 10 feet above the bottom of casing throughout the entire casing extraction operation except when concrete is near the top of the drilled pier elevation. Maintain a sufficient head of concrete above the bottom of casing to overcome outside soil and water pressure. As the temporary casing is withdrawn, exercise care in maintaining an adequate level of concrete within the casing so that fluid trapped behind the casing is displaced upward and discharged at the ground surface without contaminating or displacing the drilled pier concrete. Exerting downward pressure, hammering or vibrating the temporary casing is permitted to facilitate extraction.

Keep a record of the volume of concrete placed in each drilled pier excavation and make it available to the Engineer.

After all the pumps have been removed from the excavation, the water inflow rate determines the concrete placement procedure. If the inflow rate is less than 6 inches per half-hour, the concrete placement is considered dry. If the water

Dry Placement: Before placing concrete, make certain the drilled pier excavation is dry so the flow of concrete completely around the reinforcing steel can be certified by visual inspection. Place the concrete by free fall with a central drop method where the concrete is chuted directly down the center of the excavation.

Wet Placement: Maintain a static water or slurry level in the excavation before placing concrete. Place concrete with a tremie or a pump in accordance with the applicable parts of Sections 420-4 and 420-5 of the 2006 Standard Specifications. Use a tremie tube or pump pipe made of steel with watertight joints. Passing concrete through a hopper at the tube end or through side openings as the tremie is retrieved during concrete placement is permitted. Use a discharge control to prevent concrete contamination when the tremie tube or pump pipe is initially placed in the excavation. Extend the tremie tube or pump pipe into the concrete a minimum of 5 feet at all times except when the concrete is initially introduced into the pier excavation. If the tremie tube or pump pipe pulls out of the concrete for any reason after the initial concrete is placed, restart concrete placement with a steel capped tremie tube or pump pipe.

Once the concrete in the excavation reaches the same elevation as the static water level, placing concrete with the dry method is permitted. Before changing to the dry method of concrete placement, remove any water or slurry above the concrete and clean the concrete surface of all scum and sediment to expose clean, uncontaminated concrete.

Vibration is only permitted, if needed, in the top 10 feet of the drilled pier or as approved by the Engineer. Remove any contaminated concrete from the top of the drilled pier and wasted concrete from the area surrounding the drilled pier upon completion.

1) Concrete Placement Time:

Place concrete within the time frames specified in Table 1000-2 of the 2006 Standard Specifications for Class AA concrete except as noted herein. Do not place concrete so fast as to trap air, water, fluids, soil or any other deleterious materials in the vicinity of the reinforcing steel and the annular zone between the rebar cage and the excavation walls. Should a delay occur because of concrete delivery or other factors, reduce the placement rate to maintain some movement of the concrete. No more than 45 minutes is allowed between placements.

D. Scheduling and Restrictions:

If caving or sloughing occurs, no additional compensation shall be provided for additional concrete to fill the resulting voids.

During the first 16 hours after a drilled pier has achieved its initial concrete set as determined by the Engineer, do not drill adjacent piers, do not install adjacent piles and do not allow any heavy construction equipment loads or "excessive" vibrations to occur at any point within a 20 foot radius of the drilled pier.

In the event that the procedures described herein are performed unsatisfactorily, the Engineer reserves the right to shut down the construction operations or reject the drilled piers. If the integrity of a drilled pier is in question, use core drilling, sonic or other approved methods at no additional cost to the Department and under the direction of the Engineer. Dewater and backfill core drill holes with an approved high strength grout with a minimum compressive strength of 4500 psi. Propose remedial measures for any defective drilled piers and obtain approval of all proposals from the Engineer before implementation. No additional time or compensation shall be provided for losses or damage due to remedial work or any investigation of drilled piers found defective or not in accordance with this provision or the plans.

SIGN SUPPORTS

Revise the 2002 Standard Specifications as follows:

Delete Section 903 and insert the following:

DESCRIPTION

Design, fabricate, furnish and erect various types of overhead sign assemblies with maintenance walkways, when specified in the plans, in accordance with the requirements of the plans. Fabricate supporting structures using tubular members of either aluminum or steel. Tubular members made of aluminum are not allowed for Dynamic Message Sign (DMS) structures. Only one type of material may be used throughout the project. The types of overhead sign assemblies included in this specification are span structures, cantilever structures, and sign structures attached to bridges. Dynamic Message Signs (DMS) shall be mounted on four (4) chord (box) truss. Cantilevered DMS signs shall not be allowed.

MATERIALS

Structural Steel……..……. Section 1072
Overhead Structures……. Section 1096
Signing Materials ……..……... Section 1092
Organic Zinc Repair Paint …… Article 1080-9
Reinforcing Steel ……..... Section 1070

CONSTRUCTION METHODS

A. General

Fabricate overhead sign assemblies in accordance with the details shown in the approved working drawings and the requirements of these specifications.

No welding, cutting, or drilling in any manner shall be permitted in the field, unless approved by the Engineer.

Drill bolt holes and slots to finished size. Holes may also be punched to finished size, provided the diameter of the punched holes is at least twice the thickness of the metal being punched. Flame cutting of bolt holes and slots shall not be permitted.

Erect sign panels in accordance with the requirements for Type A or B signs as indicated in the plans or roadway standard drawings. Field drill two holes per connection in the Z bars for attaching signs to overhead structures. Use two bolts at each connection.

Use two coats of a zinc-rich paint to touch up minor scars on all galvanized materials.

A. Shop Drawings

Design the overhead sign supports, including foundations, prior to fabrication. Submit computations and working drawings for the designs to the Engineer for review and acceptance.

Have a professional engineer registered in the State of North Carolina perform the computations and render a set of sealed, signed, and dated drawings detailing the construction of each structure.

Submit to the Engineer for review and acceptance complete design and fabrication details for each overhead sign assembly, including foundations and brackets for supporting the signs, maintenance walkways (when specified in the plans), electrical control boxes, and lighting luminaires. Base design upon the revised structure line drawings, wind load area and the wind speed shown in the plans, and in accordance with the *Standard Specifications for Structural Structures for Highway Signs, Luminaires and Traffic Signals*.

Submit thirteen (13) copies of completely detailed working drawings and one (1) copy of the design computations including all design assumptions for each overhead sign assembly to the Engineer for approval prior to fabrication. Working drawings include complete design and fabrication details (including foundations); provisions for attaching signs, maintenance walkways (when applicable), lighting luminaries to supporting structures; applicable material specifications, and any other information necessary for procuring and replacing any part of the complete overhead sign assembly.

Allow 40 days (**15 days for Design-Build projects**) for initial working drawing review after the Engineer receives them. If revisions to working drawings are required, additional time shall be required for review and approval of final working drawings.

Approval of working drawings by the Engineer shall not relieve the Design-Build Team of responsibility for the correctness of the drawings, or for the fit of all shop and field connections and anchors.

C. Design and Fabrication

The following criteria governs the design of overhead sign assemblies:

Design shall be in accordance with the *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 4th Edition, 2001*, and the latest Interim Specifications.

Within this Specification, there are several design criteria that are owner specified. They include:

- The wind pressure map that is developed from the 3-second gust speeds, as provided in Article 3.8, shall be used.
- Overhead cantilever sign structures shall include galloping loads (exclude four-chord horizontal trusses), truck-induced gust loading and natural wind gust loading in the fatigue design, as provided for in Article 11.7.1, 11.7.4 and 11.7.3 respectively.
- The natural wind gust speed in North Carolina shall be assumed to be 11.6 mph for inland areas, 15.7 mph for coastal areas. The coastal area shall be defined as any area within 2 miles from the waterfront facing the ocean or sound and all area where the design basic wind speed is above 120 mph, as shown in Figure 3-2.
- The fatigue importance category used in the design, for each type of structure, as provided for in Article 11.6, Fatigue Importance Factors, shall be Category II unless otherwise shown on the contract plans.
- Wind drag coefficient for Dynamic Message Sign enclosures shall be 1.7.

The following Specification interpretations or criteria shall be used in the design of overhead sign assemblies:

- For design of supporting upright posts or columns, the effective length factor for columns "K", as provided for in Appendix B, Section B.5, shall be taken as the following, unless otherwise approved by the Engineer:

Case 1 - For a single upright post of cantilever or span type overhead sign structure, the effective column length factor, "K", shall be taken as 2.0.

Case 2 - For twin post truss-type upright post with the post connected to one chord of a horizontal truss, the effective column length factor for that column shall be taken as 2.0.

Case 3 - For twin post truss-type upright post with the post connected to two truss chords of a horizontal tri-chord or box truss, the effective column length factor for that column shall be taken as 1.65

- For twin post truss-type upright post, the unbraced length shall be from the chord to post connection to the top of base plate.

- For twin post truss-type upright post, that is subject to axial compression, bending moment, shear, and torsion the post shall satisfy *Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals* Equations 5-17, 5-18 and 5-19. To reduce the effects of secondary bending, in lieu of Equation 5-18,the following equation may be used:

$$\frac{f_a}{F_a} + \frac{f_b}{\left(1 - \frac{0.6f_a}{F_é}\right)F_b} + \left(\frac{f_v}{F_v}\right) \leq 1.0$$

Where

fa = Computed axial compression stress at base of post

- The base plate thickness for all uprights and poles shall be a minimum of 2" but not less than that determined by the following criteria and design.

Case 1 - Circular or rectangular solid base plates with the upright pole welded to the top surface of base plate with full penetration butt weld, and where no stiffeners are provided. A base plate with a small center hole, which is less than 1/5 of the upright diameter, and located concentrically with the upright pole, may be considered as a solid base plate.

The magnitude of bending moment in the base plate, induced by the anchoring force of each anchor bolt shall be, $M = (P \times D_1) / 2$.

Case 2 - Circular or rectangular base plate with the upright pole socketed into and attached to the base plate with two lines of fillet weld, and where no stiffeners are provided, or any base plate with a center hole that is larger in diameter than 1/5 of the upright diameter

The magnitude of bending moment induced by the anchoring force of each anchor bolt shall be $M = P \times D_2$.

- M, bending moment at the critical section of the base plate induced by one anchor bolt
- P, anchoring force of each anchor bolt
- D_1, horizontal distance between the center of the anchor bolt and the outer face of the upright, or the difference between the radius of the bolt circle and the outside radius of the upright
- D_2, horizontal distance between the face of the upright and the face of the anchor bolt nut

- The critical section shall be located at the face of the anchor bolt and perpendicular to the radius of the bolt circle. The overlapped part of two adjacent critical sections shall be considered ineffective.

- The thickness of base plate of Case 1 shall not be less than that calculated based on formula for Case 2.

- Uprights, foundations, and trusses that support overhead signs or dynamic message signs shall be designed in accordance with the Overhead Sign Foundation Special Provision for the effects of torsion. Torsion shall be considered from dead load eccentricity of these attachments, as well as for attachments such as walkways, supporting brackets, lights, etc., that add to the torsion in the assembly. Truss vertical and horizontal truss diagonals in particular and any other assembly members shall be appropriately sized for these loads.

- Uprights, foundations, and trusses that support overhead mounted signs or dynamic message signs shall be designed for the proposed sign wind area and future wind areas. The design shall consider the effect of torsion induced by the eccentric force location of the center of wind force above (or below) the center of the supporting truss. Truss vertical and horizontal truss diagonals in particular and any other assembly members shall be appropriately sized for these loads.

Fabricate all overhead sign assemblies, including foundations in accordance with the details shown in the approved shop drawings and with the requirements of these specifications.

Fabricate the span and cantilever supporting structures using tubular members of either aluminum or steel, using only one type of material throughout the project. Sign support structures that are to be attached to bridges may be fabricated using other structural shapes.

Horizontal components of the supporting structures for overhead signs may be of a truss design or a design using singular (monotube) horizontal members to support the sign panels. Singular (monotube) horizontal members shall not be allowed for DMS signs. Truss or singular member centerline must coincide with centerline of sign design area shown on the structure line drawing. Provide permanent camber in addition to dead load

camber in accordance with the *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*. Indicate on the shop drawings the amount of camber provided and the method employed in the fabrication of the support to obtain the camber.

Use cantilever sign structures that meet the following design criteria:

a. Do not exceed an L/150 vertical dead load deflection at the end of the arm due to distortions in the arm and vertical support, where L is the length of the arm from the center of the vertical support to the outer edge of the sign.

b. Do not exceed an L/40 horizontal deflection at the end of the arm due to distortions in the arm and vertical support, as a result of design wind load.

Attach the overhead sign assemblies to concrete foundations by the use of galvanized anchor bolts with galvanized nuts, flat washers, and lock washers. For cantilever structure use a minimum of eight anchor bolts. Provide anchor bolts that have an anchor plate with nut at the end to be embedded in concrete.

Fabricate attachment assemblies for mounting signs in a manner that allows easy removal of sign panels for repair. Provided adequate supporting frames for mounting the lighting luminaires in the positions shown in the plans or approved shop drawings for all overhead sign assemblies to be illuminated.

Maintenance Walkways

When plans require maintenance walkways, provide maintenance walkways with an open, skid-resistant surface, and safety railings on all overhead structures unless specifically stated otherwise in the plans. Requirements for design and fabrication of the walkways are shown in the plans. Provide a walkway that is continuous and extends from 3 feet outside the edge of pavement over the shoulder to the farthest edge of any sign on the structure. If a sign is to be located such that it extends more than three feet outside the edge of pavement, extend the walkway for the full length of that sign. Provide walkways with a safety railing along the front side that can be folded, when not in use, to a horizontal position that will not obscure the signs.

To accommodate lighting luminaires, (when required by the plans), extend supports for the walkways in front of the walkway and railing. If external ballast is required, make provisions adjacent to the walkway and between the walkway and sign to accommodate ballast boxes for lighting circuits in a manner readily accessible from the walkway. Provide ballast box, brackets, and fastening devices which shall withstand the loading requirements for the walkway, and mount so that the top of the box shall be flush with the top of the walkway.

The walkway sections are to be connected rigidly where sections join to avoid an uneven walking surface. Attach the walkway directly to the walkway brackets.

Install a 4-inch x 4-inch safety angle in back of and parallel to the walkway and extend it the entire length of the walkway, except in the area occupied by ballast boxes. Design the safety angle to withstand a loading in keeping with the walkway.

Fabricate folding safety railing in lengths not exceeding 10 feet and install for the full length of the walkway. Join each folding safety railing post to walkway supports through a hinge support of appropriate design that shall rotate freely. Provide a hinge support that has a locking or latching device and holds the railing in a steady manner, free of movement while in the raised position. Maximum allowable displacement from vertical at the top of the railing shall be 1 inch.

Install fixed safety railing along the sign side of the walkway from the beginning of the walkway to the edge of the first sign. Provide fixed safety rails between signs when they are greater than 12 inches apart. Provide one fixed safety rail below any sign having a clearance between the bottom of the sign and the walkway grating of greater than 24 inches and less than 42 inches. Provide two fixed rails when the clearance between the bottom of a sign and the walkway exceeds 42 inches.

Provide a walkway in which the open ends have a galvanized steel coil safety chain attached on one end near the top of the safety railing, and on the other end to the walkway hanger, or other fixed member of the structure. When the railing is folded, the chain must not hang below the walkway bracket.

Where offsets in the walkway and safety railing are necessitated by variable luminaires provide safety chains between the offset handrail sections.

Anchor Rods

Ensure material used in steel anchor rods conforms to AASHTO M 314, and yield strength does not exceed 55,000 psi. Compute the required projection of the anchor rod above the foundation top. Compute the total projection based on the following:

- Provide between 3 and 5 threads of anchor rod projection above the top nut after tightening is complete. Avoid any additional projection, or a normal depth socket torque wrench can not be used on top nuts.
- Include the sum of the thickness of top nut, top nut flat washer or top nut beveled washers, base plate, leveling nut flat washer or leveling nut beveled washers, leveling nut.
- Set the maximum distance between the bottom of the leveling nut and the foundation top to one nut height to avoid excessive bending stresses in the anchor rod under service conditions.
- Do not use lock washers.

Installation Procedure

Place a leveling nut and washer on each anchor rod and install a template on top of the leveling nuts to verify that the nuts are level and uniformly contact the template. Use beveled washers if the leveling nuts cannot be brought into firm contact with the template. Verify that the distance between the bottom of the leveling nuts and the top of the concrete is no more than one nut height.

Install the structural element on the anchor rods, and tighten nuts in compliance with steps 3, 4, and 5 below. Do not attach cantilever arms or overhead truss components to the vertical post until all of the top nuts and leveling nuts have been properly tightened on the anchor rods.

Install top nuts and washers. Install flat washers under the top and leveling nuts. Use beveled washers if the nuts cannot be brought into firm contact with the base plate. Lubricate threads of the anchor rods, nuts, and bearing surface of the nuts and tighten to a snug-tight condition with a spud wrench following a star pattern (using at least two increments). Snug-tight condition is defined as 20% to 30% of the verification torque (600 ft-lbs.). Lubricant shall be beeswax, stick paraffin, or other approved lubricant.

After the top nuts have been snug tightened, snug tighten the bottom nuts up to the base plate using the same procedure as described above. The base-plate must be in firm contact with both the top and bottom nuts to achieve the proper pretension in the anchor rods.

Prior to further turning of the nuts, mark the reference position of the top nut in the snug-tight condition by match marking each nut, bolt shank, and base plate. Use ink or paint that is not water-soluble.

Turn the top nuts in increments using the star pattern (using at least two full tightening cycles) to 1/6 of a turn. Use a torque wrench to verify that at least 600 ft-lbs. is required to further tighten the top nuts. At least 48 hours after the entire structure and any attachments are erected, use a torque wrench again to verify that at least 600 ft-lbs. is still required to tighten the top nuts. Verify that the leveling nuts remain in firm contact with the base plate.

Do not place non-shrink grout between the base plate and foundation. This will allow for future inspection of leveling nuts and for adequate drainage of moisture.

SIGN LIGHTING SYSTEMS

Revise the 2002 Standard Specifications as follows:

Delete Section 905 and insert the following:

DESCRIPTION

Furnish and install all electrical equipment and components, luminaires, service poles and related service equipment, conduit, wire, and all other hardware; design alternate luminaire systems; and test to provide complete lighting systems for overhead sign structures.
Perform all work in accordance with the *National Electrical Code (NEC)*.
These specifications are for materials and equipment to construct and put in working order the proposed lighting system(s); however, they may not show or describe every fitting, minor detail, or feature. Perform the work according to the best practice of the trade.
Have a license of the proper classification from the North Carolina State Board of Examiners of Electrical Contractors in accordance with *Article 4 of Chapter 87 of the General Statutes* for those actually performing the work.

MATERIALS

(A) General:

Refer to Division 10:

Sign Lighting Systems ..... Section 1097
Organic zinc repair paint ..... Article 1080-9

(B) Submittals:

Submit for approval catalog cuts and/or shop drawings for materials propose for use on the project. Allow 30 days (**10 days for Design-Build projects**) for review on each submittal. Do not use materials that have not been approved on the project. Submit eight copies of each catalog cut and/or drawing and show on each the material description, brand name, stock number, size, rating, and manufacturer's specification. Include in the submittals sufficient information to verify compliance with the specifications, and reference each material to the appropriate contract pay item. In addition to catalog cuts, include in submittals for luminaires the manufacturer's isofoot-candle charts and coefficient of utilization graphs, ballast replacement part numbers, and wiring diagrams.
Catalog cut transmittals shall be generated using the NCDOT Signing Section's online qualified products list (SQPL). The online SQPL is located at:

http://www.doh.dot.state.nc.us/preconstruct/traffic/congestion/SIGN/qpl/qpl.html

If a product complies with the requirements of the *NCDOT Standard Specifications for Roads and Structures* and isn't contained in the online SQPL, the submittal process guidelines are online at:

http://www.doh.dot.state.nc.us/preconstruct/traffic/congestion/SIGN/qpl/equipment_submittal.html

CONSTRUCTION METHODS

(A) Layout:

The Engineer shall establish the actual location of service poles. The plans show the approximate location of service poles based on available project data. Mark the proposed location of circuits, ducts, and all other components for approval prior to installation.

Submit a drawing showing all underground conduits and cable dimensioned from fixed objects or station marks.

(B) Conduit Installation:

Install conduit as shown in the plans, and in accordance with *NEC* requirements for an approved watertight raceway.

Attach the conduit system to and install along the structural components of the overhead sign assembly. Attach conduit to structural components with beam clamps or stainless

steel strapping. Install strapping according to the strapping manufacturer's recommendations. Do not use welding or drilling to fasten conduit to structural components.

Support conduit suspended from concrete portions of a bridge by galvanized clamps. Attach clamps to the concrete with 1/4 inch concrete expansion anchors.

Space the conduit fasteners at no more than 4 feet for conduit 1 1/2 inch and larger, or at no more than 6 feet for conduit 1 1/4 inches and smaller. Place fasteners no more than 3 feet from the center of bends, fittings, boxes, switches, and devices.

Locate underground conduit as shown in the plans at a minimum depth of 30 inches and extend a minimum of 2 feet past the edge of pavement or paved shoulder. Either metallic or nonmetallic underground conduit may be used.

Where conduit is required beneath pavement, bury the conduit at the required depth prior to paving, or bore and jack the conduit beneath the pavement. Do not cut pavement to install conduit or use "water jetting" as an installation method. Produce openings by boring and jacking which are not more than 1 inch larger than the outside diameter of the conduit. Plug any abandoned opening for bored and jacked conduit as the Engineer directs.

Install buried conduit in a trench with essentially vertical walls that is no wider than necessary for easy installation of the conduit. Backfill in accordance with *Article 300-7*.

Clean conduit after installation by "snaking" with a mandrel of a diameter not less than 85% of the nominal diameter of the conduit. Seal the ends of underground conduit with temporary caps and, after installation of circuits; plug the ends with oakum. Coat field cut threads and other uncoated metal or damaged galvanizing with 2 coats of organic zinc repair paint. Ream the ends of rigid conduit.

(C) Wiring Methods:

Bury underground circuits at the depth shown in the plans and surrounded with at least 3 inches of sand or earth backfill free of rocks and debris. Compact backfill in 6 inch layers. Do not splice underground circuits unless specifically noted in the plans.

Color code all conductors per the *NEC* (grounded neutral-WHITE; grounding-BARE or GREEN), and use BLACK and RED phase conductors. Approved marking tape, paint, or sleeves may be used in lieu of continuous colored conductors for No. 8 AWG and larger. Do not mark a white conductor in a cable assembly any other color. It is permissible to strip a white, red, or black conductor to be used as a bare equipment grounding conductor.

Install joints, taps, and splices only at locations indicated in the plans.

Make joints, taps, and splices in junction boxes and enclosures by either of the following methods:

1. Cut and remove the insulation only as far as necessary to make a secure mechanical and electrical connection. Use a removable type connector (split-

bolt, set screw, wire nut, etc.), and cover with self-vulcanizing rubber tape, applied in half-lap layers to give a smooth covering at least twice the thickness of the original insulation. Use a self-fusing type putty rubber tape in tape form that can be wrapped, stretched, or molded around irregular shapes for smooth insulation build-up. Apply two layers of vinyl plastic tape, half-lap, over the rubber tape. Use vinyl plastic tape that is 7-mil, (0-2200 degrees F, and ultraviolet, abrasion, moisture, alkali, acid, and corrosion resistant.

2. Install an approved manufactured mechanical or compression connector, with factory-made waterproof insulating boots, in accordance with procedures and tools specified by the manufacturer.

Make joints, taps, and splices located underground in direct buried circuits as follows: Cut and remove the insulation only as far as necessary to make a secure mechanical and electrical connection. Use a compression type connector, installed according to procedures and tools specified by the manufacturer. Apply vinyl plastic tape over the connector and bare conductor. Encase the entire connection with a manufactured splicing kit. Use a kit with an insulating and moisture-sealing field-mixed epoxy resin compound and snap-together mold forms. Install the kit as specified by the manufacturer. Encase no more than one "leg" (phase, neutral, or equipment grounding conductor) in each epoxy resin compound mold for individual conductor circuits. For cabled conductor circuits, encase no more than one circuit in each epoxy resin compound mold.

(D) Grounding and Bonding:

Include an equipment grounding conductor of the type and size shown in the plans, with each set of circuit conductors.

Bond all metal conduit, enclosures, luminaires, and structures together and ground with the equipment grounding conductor to the grounding electrode.

Protect grounding electrode conductors with rigid galvanized steel conduit that is bonded to the grounding electrode conductor at each end.

(E) Equipment Mounting:

Mount equipment securely at locations and dimensions shown in the plans and make sure it is plumb and level. Install fasteners as recommended by the manufacturer, and space them evenly. Use all mounting holes and attachment points for attaching enclosures to structures.

Locate straps and buckles as shown in the plans and install them per the manufacturer's instructions.

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

Provide one key operated, pin tumbler, dead bolt padlock, with brass or bronze shackle and case, conforming to *Military Specification MIL-P-17802E* (Grade I, Class 2, Size 2, Style A), for each electrical panel and switch on the project. Key all padlocks alike and provide 6 keys to the Engineer.

If a new sign is to replace an existing sign, adjust the position of the luminaires in accordance with the plans for the new sign if necessary.

(F) Luminaires and Lamps:

Provide lamps for all luminaires and clearly mark the installation date on the mogul base of High Intensity Discharge (HID) lamps.

(G) Inspection:

Comply with all local ordinances and regulations. Prior to the start of any electrical work, apply for and obtain all permits and/or licenses required by local regulation. Be responsible for having each system inspected and approved by the licensed city, county, or state electrical inspector who has jurisdiction where the systems are located.

Inspection by the local electrical inspectors shall neither eliminate, nor take the place of, inspection by the Department.

Furnish written certification to the Engineer that the local electrical inspector having jurisdiction has approved the system(s). Provide this approved electrical inspection certificate prior to final acceptance of the project.

Be responsible for having the power turned on.

(H) Electrical Service:

Coordinate all work to ensure that electrical power of the proper voltage, phase, frequency, and ampacity is available to complete the project. Contact the utility company, make application, pay all deposits and other costs to provide necessary electrical service. The Design-Build Team will be reimbursed for the actual verified cost of any utility company charges.

The Engineer shall provide authorization to the Design-Build Team for electrical service to be obtained in the name of the Department and for the monthly power bills to be sent directly from the utility company to the Department. The Department shall be responsible for direct payment of monthly power bills received from the utility company.

(I) Performance Tests:

The Engineer shall not accept lighting systems for overhead sign structures until the lighting system is operational, including automatic control equipment and all other apparatus, without interruption or failure attributable to poor workmanship or defective material for a period of 2 consecutive weeks. The Engineer shall inspect all lights and equipment for normal operation. Perform these tests and make all repairs and replacements needed.

LUMINAIRE RETRIEVAL SYSTEMS

Luminaire retrieval system shop drawings shall be submitted directly to the NCDOT signing section for review and approval. The retrieval system must be capable of holding all sign luminaires at their designed positions and to allow all luminaires and electrical connections to be maintained from the roadway shoulder without lane closures. The system shall be capable of utilizing more than one circuit if required by plans.

ALTERNATE LUMINAIRES

If furnished luminaires, other than those shown on the plans are proposed for use, prepare and submit for approval a complete design for the proposed lighting system for each overhead sign assembly. Base such design on high pressure sodium luminaires and conform to *Illuminating Engineering Society (IES)* criteria. Design the luminaries for signs sized and spaced as shown in the plans.

Submit designs for alternate luminaires for approval prior to submitting shop drawings for the overhead sign structures. Coordinate the design for the lighting system with the design of the overhead sign assembly, and show any changes necessitated by the alternate luminaire design on appropriate shop drawings.

Provide photometric data for each sign for review of the alternate luminaire design. Include in the data a point-by-point foot-candle chart showing readings along the sign face at one-foot intervals, vertically and horizontally, based on the proposed alternate luminaire design spacing. Submit an isofoot-candle diagram for the luminaire. State the mounting height on the isofoot-candle diagram. If the mounting height shown on the isofoot-candle chart differs from the horizontal distance from the bottom of the sign face to the center of the luminaire, furnish the correction multiplier.

OVERVIEW

The proposed improvements consist of widening NC 146 (Long Shoals Road) to a multi-lane facility with wide outside lanes that accommodate cyclists. The Design-Build Team shall design and construct the multi-lane facility with an 18.5-foot raised median from west of Clayton Road to Ledbetter Road (SR 3498). The proposed facility will tie to the existing two-lane typical section at the western terminus. The project is located in Buncombe County.

Project services shall include but are not limited to:

- **Design Services** – completion of construction plans
- **Construction Services** – necessary to build and ensure workmanship of the designed facility.
- **Permit Preparation / Application**
  The EA was approved on November 26, 1997.
  The FONSI was approved on August 18, 1999.
- **Right of Way** – acquisition of right of way necessary to construct project.

Construction Engineering Inspection will be provided by NCDOT Division Personnel

The Design-Build Team shall be responsible for all As-Built Drawings, excluding Progress Energy facilities.

GENERAL SCOPE

The scope of work for this project will include design, construction and management of the project. The design work will include all aspects to widen the 2-lane highway to a multi-lane highway. The designs shall meet all appropriate latest versions of *AASHTO Policy on Geometric Design of Highways and Streets*, *AASHTO Standard Specifications for the Design of Highway Bridges, Manual of Uniform Traffic Control Devices* and all NCDOT design criteria, that are current as of the Technical and Price Proposal submission date or the Best and Final Offer submission date, whichever is later.

Construction will include, but not be limited to, all necessary roadway, drainage, utility coordination, and erosion and sediment control work items. Construction will comply with *NCDOT Standard Specifications for Roadways and Structures Edition of 2002* and any special provisions.

Areas of work required for this project will include, but are not limited to the following items:

Roadway Design
Preliminary and Final Bridge Design
Culvert Design
Hydraulics / Drainage Design
Foundation Design for Structures and Roadway
Erosion and Sediment Control Design and Implementation
Permit Application
R/W Utilities, Conflicts and Construction
Traffic Control and Pavement Marking Plans and Implementation
Sign Design
Traffic Management and Signal System Design
Lighting-Construction Only
Construction
Project Management
Construction Management

SUBMITTAL OF TECHNICAL AND PRICE PROPOSALS

GENERAL

Technical and Price Proposals will be accepted until **4:00 P.M. Local Time on Tuesday November 21, 2006**, at the office of the State Contract Officer:

Mr. Randy A. Garris, PE
Project Services Unit
1020 Birch Ridge Drive
Century Center Complex Bldg. B
Raleigh, NC
No Proposals will be accepted after the time specified.

Proposals shall be submitted in 2 separate, sealed parcels containing the Technical Proposal in one and the Price Proposal in the other parcel.

TECHNICAL PROPOSAL

Technical Proposals shall be submitted in a sealed package. The outer wrapping shall clearly indicate the following information:

Technical Proposal
Submitted By: (Design-Build Team's name)
Contract Number C201278
TIP Number R-2813B
Buncombe County
NC 146 (Long Shoals Road) from Clayton Road to east of I-26

Technical Proposal Requirements
12 Copies
8 ½ inch by 11 inch pages
No fold-out sheets allowed
Printed on one side only
Double-spaced
Font size 12
No more than 50 pages, excluding the 11 inch by 17 inch appropriate plan sheets
24 inch by 36 inch fold out sheets will be allowed for presentation of the interchange only (in the Plan Sheets)

Key Project Team members, identified in the Request For Qualifications, shall not be modified in the Technical Proposal without written approval of the Department. Any such request should be sent to the attention of Mr. Randy Garris, PE, at the address below:

NCDOT-Project Services Unit
Century Center-Building B
1020 Birch Ridge Drive
Raleigh, NC 27610

- It is expected that DBE design will be at least 5% of the overall design cost.
- The overall approach to ensuring DBE participation in all areas of work also needs to be addressed.

Natural Environmental Responsibility – 7 Points

- Describe the Design-Build Team's approach to addressing environmental concerns within the project boundaries.
- Identify efforts to minimize impacts on wetlands, streams, riparian buffers, and other environmentally sensitive areas.
- Identify innovative approaches to minimize any impacts in environmentally sensitive areas. Describe any temporary impacts and associated minimization approaches.
- Describe the Design-Build Team's understanding of the overall approach to permitting and the Team's comfort level with obtaining the required permit application / modification within the allowed timeframe.
- Identify methods of construction in wetlands and buffers.
- Describe any Notice of Violations (NOV's) or Immediate Corrective Actions (ICA's) the Design-Build Team has received and the disposition of any NOV's or ICA's.
- Describe the Design-Build Teams approach to Sedimentation and Erosion Control for the project.
- Describe efforts to minimize excavation within the contaminated sites and associated disturbance to underlying soil.

Design Features – 15 points

- Show plan view of design concepts with key elements noted.
- Identify preliminary horizontal and vertical alignments of all roadway elements.
- Show typical sections for the mainline of the project.
- Identify drainage modifications and designs to be implemented.
- Identify the appropriate design criteria for each feature if not provided.
- Identify all bridge types to be constructed, including any special design features or construction techniques needed.
- Identify any deviations, including proposed design exceptions, from the established design criteria that will be utilized. Explain why the deviation is necessary. Describe any Geotechnical investigations to be performed by the Design-Build Team.
- Identify any special aesthetics considerations that will be part of the design, including colors, textures, bridge rails, retaining walls, hand rails, etc. for the structures on the project.
- Describe how any utility conflicts will be addressed and any special utility design considerations.

3. Long Term Maintenance – 5 points

- Describe any special materials, not referenced elsewhere in the contract, incorporated into the project that would result in long term reduction in maintenance.
- Describe any special designs or construction methods that would reduce future maintenance costs to the Department.
- Estimate a minimum ten-year cost savings resulting from incorporation of these special materials, design, or construction methods into the project.

ROADWAY SCOPE OF WORK (08-15-06)

Project Details

- The Design-Build Team shall design and construct the widening of NC 146 (Long Shoals Road) from west of SR 3501 (Clayton Road) to east of Schenck Parkway. At the western terminus, the proposed Long Shoal Road improvements shall provide an exclusive eastbound left turn lane onto Clayton Road that accommodates the future turning volumes and ties to the existing two-lane shoulder facility. The eastern limits of the Long Shoals Road improvements shall be of sufficient length to tie to the R-2813C proposed improvements. The Design-Build Team shall design and construct a four-lane divided curb and gutter facility with an 18.5' raised median from Clayton Road to Ledbetter Road (SR 3498). The Design-Build Team shall design and construct a five-lane curb and gutter facility, with appropriate turn lanes, from Ledbetter Road to the beginning of Project R-2813C. Throughout the proposed improvements, the typical section shall include a 14'-0" outside lane to accommodate bicycle traffic. Sidewalks shall be limited to the French Broad River Bridge on this Project (see Structure Scope of Work). The Design-Build Team shall design and construct the -L- line (Long Shoals Road) providing access, widening and improvements as indicated on the Preliminary Design Map - December 2005 and the Preliminary Plans. The limits of all construction shall be of sufficient length to tie to the existing roadways based upon the current NCDOT guidelines and standards. Long Shoals Road shall be designed and constructed to meet a 50-mph design speed for mountainous terrain. West of I-26, Long Shoals Road is classified as a Major Collector. East of I-26, Long Shoals Road is classified as a Minor Arterial. The Design-Build Team shall provide all other design criteria in the Technical Proposal.

- The Design-Build Team shall design and construct a single point urban interchange (SPUI) at I-26 and Long Shoals Road that provides laneage as noted in the Congestion Management Unit's February 4, 2004 letter of recommendation. The Design-Build Team shall design the single point urban interchange (SPUI) in accordance with the *National Cooperative Highway Research Program Report 345 - Single Point Urban Interchange Design and Operations Analysis*, including but not limited to accommodating the sight distance for the off-ramp left turn movement along the cross road. The Design-Build Team shall design the interchange to accommodate the I-26 alignment over Long Shoals Road. The Design-Build Team shall include in their Technical Proposal the proposed grading details beneath the SPUI. The Design-Build Team will be evaluated on the future maintenance reduction measures that may be attributed to this proposed grading.

- The Design-Build Team shall design and construct all lane drops from the outside travelway.

- The Design-Build Team shall design and construct a seven-lane bridge, with a 4-foot monolithic island separating the traffic flow, on Long Shoals Road over the French Broad River.

- The Design-Build Team shall design and construct the -Y- lines and ramps providing access, widening and improvements as shown on the Preliminary Plans. The limits of

- construction shall be of a sufficient length to tie to the existing roadway based upon the current NCDOT guidelines and standards.

- The Design-Build Team shall design and construct one-lane ramps that provide a minimum 16-foot width. All ramps shall have four-foot full depth paved outside and inside shoulders.

- Functional classifications that have a defined usable shoulder width shall have the appropriately wider overall shoulder width.

- The Design-Build Team shall design and construct bridge rail offsets as indicated in the *NCDOT Roadway Design Manual* or that are equal to the approach roadway paved shoulders, whichever is greater. If the design year truck volumes are greater than 250 DDHV, the bridge rail offsets shall be equal to or greater than the width noted in the *NCDOT Roadway Design Manual* for consideration.

- The Design-Build Team shall not impact the fiber optic vault located in the northwest quadrant of the Long Shoals Road / Clayton Road intersection.

- The Design-Build Team shall design and construct U-Turn bulb-outs on Long Shoals Road at Clayton Road and Ledbetter Road that accommodate a westbound and eastbound vehicle, respectively. The design vehicle for the bulb-outs shall be a WB-50.

- The Design-Build Team shall coordinate with the Fire Chief of the Skyland Fire Department to determine if access to the standpipe located at the pond east of the intersection of Long Shoals and Clayton Road needs to be maintained during and after construction. If required, the Design-Build Team shall be responsible for relocating the standpipe and coordinating its location with the property owner and the Skyland Fire Department.

- The Design-Build Team shall design and construct resurfacing grades for all roadways impacted by construction, excluding haul roads. The Design-Build Team shall design and construct grades that adhere to the design criteria and standards, providing all required pavement wedging.

- The maximum allowable cut slope or fill slope on this project shall be 2:1, unless noted otherwise in this RFP. The slopes in the interchange area shall follow the requirements set forth in the *Roadway Design Guidelines for Design-Build Projects* located on the Design-Build web site. The Design-Build Team shall include in their Technical Proposal the location and justification of proposed slopes within the interchange that are steeper than 4:1 and how those slopes will be minimized and stabilized.

- Along I-26, milled rumble strips shall be provided on the outside and inside paved shoulders.

- The Design-Build Team shall inform the State Alternative Delivery Systems Engineer of any proposed changes to the NCDOT preliminary design, Technical Proposal or previously reviewed submittals and obtain approval prior to incorporation. The Design-Build Team shall note

STRUCTURES SCOPE OF WORK (08-15-06)

Project Details:

The Design-Build Team shall be responsible for all structures necessary to complete the project.

- Bridge on I-26 over NC 146 (Long Shoals Road)
- Bridge on NC 146 (Long Shoals Road) over the French Broad River
- Replace and relocate single barrel 6' x 6' reinforced concrete box culvert located at approximately Station 24+15 -L- (See Hydraulic Scope of Work)
- Retaining walls at abutments and along approaches to Bridge on I-26 over NC 146
- All retaining walls visible from the travelway shall have an appearance that is consistent throughout the project. The wall surfaces shall not include a mix of cast-in-place concrete and precast panels. The Design-Build Team shall include a rendering (picture acceptable) of two wall finishes in their Technical Proposal. At least one of these finishes shall include an ashlar-type rock pattern. The Design-Build Team shall clearly indicate in the Technical Proposal which wall finish is included in their lump sum price for the entire project. This pattern will be subject to the Design Features evaluation criteria noted elsewhere in this RFP. The Design-Build Team shall include a lump sum price adjustment for the other wall finish with their Price Proposal. See Special Provision for "Retaining Walls Alternate Bid."

Bridge on I-26 over NC 146:

The following specific requirements apply to the Bridge on I-26 over NC 146:

- A single bridge shall be designed and constructed to accommodate an eight-lane facility on I-26. The bridge shall accommodate a minimum bridge rail offset in each direction of 10 feet in the median and 12 feet to the outside. The bridge shall have pavement markings and markers placed to maintain the position of the lanes as shown on the Preliminary Design Map – December 2005. The Design-Build Team shall investigate and include in their Technical Proposal guardrail transition details, barrier rail attachments and other design features to protect the traveling public in the transition from a four-lane approach roadway to the wider bridge width.
- Rails shall be Jersey shaped bridge rails with a standard median concrete barrier.
- The minimum vertical clearance required for the bridge over NC 146 shall be 16'–6".
- The full length of the retaining walls approaching and departing the Bridge on I-26 over NC 146 shall be located, designed, and constructed to allow for future roadway widening to accommodate an eight-lane interstate facility with a 22-foot median.
- All retaining walls on I-26 shall have a pedestrian safe hand rail with a minimum height of 42" atop the walls to ensure stranded motorist safety. Chain link fence with bar shall not be allowed. The hand rail will be subject to the Design Features evaluation criteria noted elsewhere in this RFP.

HYDRAULICS SCOPE OF WORK (08-15-06)

- The Design-Build Team shall hold a pre-design meeting with the NCDOT upon acceptance of the Preliminary Roadway Plans.

- The Design-Build Team shall develop all drainage designs in accordance with criteria provided in the North Carolina Division of Highways "*Guidelines for Drainage Studies and Hydraulics Design-1999*", the addendum *"Handbook of Design for Highway Drainage Studies-1973*" and the *NCDOT Hydraulic Unit website*.

- The Design-Build Team shall conduct an interagency meeting that includes NCDOT PDEA-NEU, NCDOT Hydraulic Unit and interested environmental agencies to review the hydraulic design and permit sites prior to submittal of the environmental permit applications. All work resulting from the hydraulics and permit reviews shall be the responsibility of the Design-Build Team. The Design-Build Team shall provide hydraulics plans and permit impact sheets to the State Alternative Delivery Systems Engineer a minimum of five weeks prior to this interagency meeting. The Design-Build Team shall take minutes of the meeting and provide them to the Department within three business days.

- Ditches shall not be allowed in wetlands.

- The minimum allowable ditch grade shall be 0.3%.

- The Design-Build Team shall be responsible for providing bridge drainage features that prevent direct discharge into the French Broad River.

- The Design-Build Team shall remove the existing box culvert located at approximately Station 24+15 -L-. The Design-Build Team shall design and construct a new box culvert at approximately Station 25+00 –L-, west of the existing driveway. Along the south side of Long Shoals Road, the Design-Build Team shall design and construct a channel relocation outside the construction that provides mitigation for the impacted stream. The channel relocation shall consist of a Type B step pool channel. The channel relocation length shall be as required by the environmental agencies. If the Design-Build Team proposes a channel relocation other than the Type B step pool, the Design-Build Team shall coordinate with and obtain approval from the environmental agencies prior to incorporating the alternate channel relocation. A channel relocation is not required along the north side of Long Shoals Road.

- The Design-Build Team shall be responsible for installing Spring Boxes that tie to the project drainage or as appropriate.

- For pipes up to 48" in diameter and not located under travelways or curb and gutter, Type S or Type D, HDPE pipe meeting the requirements of AASHTO M294 or Aluminized Corrugated Steel Pipe, Type IR meeting the requirements of Article 1032-3(A)-7 of the NCDOT Standard Specifications may be used instead of Reinforced Concrete Pipe, Class III. Installation of both alternate pipe materials shall conform to the requirements of Section 300 of the Standard Specifications for Method A, except that the minimum cover shall be at least 12 inches.

Piles shall have at least 10 feet of embedment below the lowest of the following: 100-year design scour elevation, bottom of footing elevation, finished or existing grade elevation. Obtain approval from the NCDOT Hydraulics Unit for any longitudinally battered piles for pile bents of structures crossing streams or wetlands. Permanent steel casings shall be required for drilled piers that are constructed in 6 inches or more of water. Permanent casings may be required where drilled piers are constructed on stream banks.

When the weathered rock or rock elevation is below the 100-year hydraulic scour elevation, the 100-year and 500-year design scour elevations are equal to the 100-year and 500-year hydraulic scour elevations from the structure survey report approved by the NCDOT Hydraulics Unit. When the weathered rock or rock elevation is above the 100-year hydraulic scour elevation, the 100-year design scour elevation may be considered equal to the top of the weathered rock or rock elevation, whichever is higher, and the 500-year design scour elevation may be set 2 feet below the 100-year design scour elevation.

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

Design foundations for service loads using allowable stress design. The ultimate bearing capacity of all piles shall 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 shall be "fixed" in the soil / rock such that a decrease in pier or pile length shall not significantly increase the top deflection. The Design-Build Team's structural engineer shall submit correspondence to the Department approving all 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.

B. 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 cut slopes for a slope of 1.5:1 (H:V) from Sta. 18+50 to Sta. 19+50 on L-Line. Design shall meet a minimum stability factor of safety of 1.5, and permanently control erosion. Design shall be submitted to the NCDOT Geotechnical Engineering Unit for review prior to construction. Design all other cut slopes for a slope of 2:1 (H:V) or flatter and a minimum stability factor of safety of 1.5. Use limiting equilibrium methods, such as Modified Bishop,

GEOENVIRONMENTAL SCOPE OF WORK (8-15-06)

General

The Right of Way Consultation approved on January 20, 2006 states that the underground storage tanks located on Parcel 1, Energy Mart #10 should not be disturbed during construction (Reference the Geotechnical Unit Section of the Project Commitments). This statement only applies to the R-2813C Project.

I. DESCRIPTION OF WORK

The Department identified one potentially contaminated area within the project corridor, the active Energy Mart #10 Gas Station, 380 Long Shoals Road.

The Department is responsible for removing the existing canopy, underground storage tanks, and any encountered contaminated soil that may impact construction. Note – no contaminated soil is anticipated at the site.

Right of Way Acquisition

The Design-Build Team shall acquire the right of way for the above site as early as possible. The Department will require 60 days after written notification that the right of way has been acquired to conduct the work noted above. The Design-Build Team shall adhere to all Right of Way Branch procedures regarding the acquisition of contaminated property and the right of way acquisition recommendations provided by the Department.

Contamination by Design-Build Team

The Design-Build Team shall be responsible for any costs (direct or indirect) associated with damage and or cleanup of a hazardous substance and / or oil spill caused by it or its agent. This responsibility shall extend to freight carriers hired by the Design-Build Team to deliver a commodity or service to the Department. The Design-Build Team shall comply with all Local, State, and Federal requirements for the proper handling of hazardous substances and / or oil. In addition, the Design-Build Team shall indemnify and hold the Department harmless against all claims, liabilities, and costs, including attorneys' fees, incurred in the defense of any claim brought against the Department resulting from such a spill.

II. INFORMATION PROVIDED BY NCDOT

- Energy Mart #10 Gas Station, 380 Long Shoals Road Assessment Report
- Right of Way Acquisition Recommendations
- GeoEnvironmental Areas of Restricted Excavation Plan Sheet

- Traffic shifts, including tie-in work and placement of pavement markings
- Installation of Overhead Sign Structures
- Installation of bridge girders

b) The Design-Build Team shall not close any direction of NC 146 (Long Shoals Road) or Clayton Road during the times listed below.

Monday through Sunday between the hours of 5:00 a.m. and 12:01 a.m.

Road Closures shall only be allowed for the operations and durations listed below:

- Maximum road closure duration of **120 minutes** shall be allowed for the following operations:

  - Traffic shifts, including tie-in work and placement of pavement markings
  - Installation of Overhead Sign Structures
  - Installation of Bridge Girders

Liquidated Damages for the above road and ramp closure time restrictions on I-26, are $2,500.00 per 15 minute period or any portion thereof for this Intermediate Contract Time.

Liquidated Damages for the above road time restrictions on NC 146 (Long Shoals Rd) or Clayton Rd, are $1,250.00 per 15 minute period or any portion thereof for this Intermediate Contract Time.

3. Hauling Restrictions

The Design-Build Team shall conduct all multi-vehicle hauling for this project outside the Lane Closure restrictions for I-26 listed above.

The Design-Build Team shall adhere to the hauling restrictions noted in the *2002 NCDOT Standard Specifications for Roads and Structures.*

The Design-Build Team shall not conduct any hauling operations against the flow of traffic of an open travelway unless the work area is protected by approved temporary traffic barrier or guardrail.

The Design-Build Team shall address how hauling will be conducted in the Technical Proposal.

B. Lane, Shoulder and Ramp Closure Requirements

The Design-Build Team shall not install more than 1.5 miles of lane closures on any roadway within the project limits, measured from the beginning of the merge taper to the end of the lane closure.

TRAFFIC SIGNALS SCOPE OF WORK (08-15-06)

I. TRAFFIC SIGNALS

The Design-Build Team shall design and prepare plans for the traffic signal installations. This work shall include, but not be limited to, the preparation of Traffic Signal Plans, Electrical and Programming Details, Utility Make-Ready Plans, Communications Cable & Conduit Routing Plans and Project Special Provisions. These plans shall be prepared in accordance with the "*Design-Build Submittal Guidelines*" and the "*Guidelines for Preparation of Traffic Signal & Intelligent Transportation System Plans on Design-Build Projects*" available on the Design-Build website.

A pre-design meeting shall take place between the NCDOT ITS & Signals Unit, the Design-Build Team, and any other pertinent NCDOT personnel before ITS and Signal designs begin. The ITS and Signal Plan submittals shall only be reviewed and accepted by the NCDOT ITS & Signals Unit after this pre-design meeting.

This work consists of installing one (1) proposed traffic signal at the new Single Point Urban Interchange (SPUI) at I-26, revising four (4) existing traffic signals along NC 146 and ensuring a communications link is established and maintained between these signals and the existing signals that are in the NC 146 closed loop signal system (just east of this project). The signal locations are listed below:

Signal Inventory Number	Intersection Description	Existing or Proposed	General Comments
13-0729	NC 146 (Long Shoals Road) at SR 3501 (Clayton Road)	Existing (to be shifted to the east)	Revise the existing traffic signal during construction to accommodate the traffic control phasing. Upgrade the traffic signal including 2070L equipment, **black** metal poles with mast arms, **black** signal heads, and **black** louvers for the final design. Incorporate this signal into the closed loop signal system along NC 146.
13-0672	NC 146 (Long Shoals Road) at I-26 EB ramps	Existing (to be removed)	Revise the existing traffic signal during construction to accommodate the traffic control phasing. This signal is included under TIP project R-2813C, which is currently under construction. It will be part of a closed loop traffic signal system located along NC 146. This signal shall be **removed** upon the construction of the new SPUI.
13-1216	NC 146 (Long Shoals Road) at I-26 (SPUI)	Proposed (SPUI)	Install a new traffic signal at the SPUI using 2070L equipment, **black** metal poles with mast arms, **black** signal heads and **black** louvers. Incorporate this signal into the closed loop signal system along NC 146.
13-0431	NC 146 (Long Shoals Road) at I-26 WB ramps	Existing (to be removed)	Revise the existing traffic signal during construction to accommodate the traffic control phasing. This signal is included under TIP project R-2813C, which is currently under construction. It will be part of a closed loop traffic signal system located along NC 146. This signal shall be **removed** upon the construction of the new SPUI.

RIGHT OF WAY SCOPE OF WORK (08-15-06)

The Design-Build Team, shall employ qualified, competent personnel who are currently **approved by the NCDOT Right of Way Branch,** herein after referred to as the Department, to provide all services necessary to perform all appraisal, appraisal review, negotiation and relocation services required for completion of the project in accordance with G.S. 136-28.1 of the General Statutes of North Carolina, as amended, and in accordance with the requirements set forth in the *Uniform Appraisal Standards and General Legal Principles for Highway Right of Way*, the *North Carolina Department of Transportation's Right of Way Manual*, the *North Carolina Department of Transportation's Rules and Regulations for the Use of Right of Way Consultants*, the *Code of Federal Regulations*, and *Chapter 133 of the General Statutes of North Carolina from Section 133-5 through 133-18*, hereby incorporated by reference, including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. For a list of firms currently approved, the Design-Build Team should contact Mr. Neal Strickland, in the NCDOT Right-of-Way Branch, at 919-733-7932, extension 317. The Design-Build Team shall perform the services as set forth herein and furnish and deliver to the Department reports accompanied by all documents necessary for the settlement of claims and the recordation of deeds, or necessary for condemnation proceedings covering said properties. The Design-Build Team, acting as an agent on behalf of the State of North Carolina shall provide right of way acquisition services for TIP R-2813B in Buncombe County.

The Design-Build Team should be aware that the Mac Bullock property located in the southeastern quadrant of the Long Shoals / Ledbetter Road intersection is a deeded conservation easement. The Design-Build Team shall coordinate the right of way acquisition from this parcel with RiverLink, Inc. and the property owner.

The Design-Build Team shall make every effort to purchase the right of way for contaminated areas as early as possible (reference the GeoEnvironmental Scope of Work).

If the construction along Long Shoals Road requires the Design-Build Team to build a new pump station, the Design-Build Team shall be responsible for coordinating the right of way / easement required for the proposed sanitary sewer pump station (See Utility Construction Scope of Work) with the Avery Creek Sanitary District and / or the pump station owner. All right of way / easement acquisition required for the sanitary sewer pump station shall be the Design-Build Team's responsibility.

The Design-Build Team shall carry out the responsibilities as follows:

- With respect to the payments, costs and fees associated with the acquisition of right of way in this contract, the Department shall be responsible for only direct payments to property owners for negotiated settlements, recording fees, any relocation benefits, and deposits and fees involved in the filing of condemnation an any claims. The Department shall assume responsibility for all costs associated with the litigation of condemned claims, including testimony by the appraiser(s). The Design-Build Team shall be responsible for all other acquisition related payments, costs and fees.

UTILITIES COORDINATION SCOPE OF WORK (08-15-06)

- **General**

There are existing Progress Energy and BellSouth pole lines running along Long Shoals Road that may or may not be in conflict with the design and construction of this project. There are also CATV lines running along Long Shoals Road. The Design-Build Team shall, to the greatest reasonable extent possible, avoid relocating or adjusting these utilities. If avoidance is not possible, the Design-Build Team shall be responsible for coordinating the relocation or adjustment of these facilities in accordance with the requirements of this scope of work.

Should any utilities not described in this scope of work or the Utility Construction Scope of Work be encountered during design or construction of this project, the Design-Build Team shall coordinate the relocation or adjustment of these utilities in accordance with this scope of work. Payment for coordination of unknown utilities shall be made in accordance with Article 104-7 of the Standard Special Provisions found elsewhere in this RFP

- **Overview**

The Design-Build Team shall obtain the services of a Private Engineering Firm (PEF) knowledgeable in the NCDOT Utility Coordination Process, involved with utility relocation / installation and highway construction. The Design-Build Team shall be responsible for coordinating all utility relocations. Coordination shall include any necessary utility agreements when applicable. The NCDOT will be responsible for non-betterment utility relocation cost when the utility company has prior rights of way / compensable interest. The utility company shall be responsible for the relocation costs if they can not furnish evidence of prior rights of way or a compensable interest in their facilities. The Design-Build Team shall be responsible for determining the cost responsibility for the utility relocations. The Design-Build Team shall be responsible for all costs associated with utility relocations due to haul roads and / or any other temporary conditions resulting from the Design-Build Team's methods of operation or sequence of work. NCDOT will be the approving authority for all utility agreements and approval of plans.

- **Preparation for relocating utilities within the existing or proposed highway Rights of Way**

I. The Design-Build Team shall be required to use the guidelines as set forth in the following:

(A) *NCDOT Utility Manual - Policies & Procedures for Accommodating Utilities on Highway Rights of Way*

(B) *Federal Aid Policy Guide- Subchapter G, Part 645, Subparts A & B*

(C) *Federal Highway Administration's Program Guide, Utility Adjustments & Accommodations on Federal Aid Highway Projects*

(D) *NCDOT Construction Manual Section 105-8*

(E) NCDOT Right of Way Manual - Chapter 16 Utility Relocations

ENVIRONMENTAL PERMITS SCOPE OF WORK (08-15-06)

It is anticipated that the Department will apply for and obtain a permit modification of the R-2813C Individual Permit prior to construction of the R-2813B Project. The Design-Build Team shall be responsible for providing all the R-2813B documents / information required for the Department to obtain this permit modification. However, should the environmental agencies require a stand alone Individual Permit for the R-2813B Project, the Design-Build Team shall be responsible for providing all the R-2813B documents / information required for the Department to obtain an individual permit.

References in this scope to permit "application" includes both permit application and permit modification application depending on the situation.

General

The Department will allow no direct contact between the Design-Build Team and representatives of the environmental agencies. No contact between the Design-Build Team and the environmental agencies shall be allowed either by phone, e-mail or in person, without representatives of the Department's Project Development & Environmental Analysis Branch's (PDEA) Branch and / or the Division's Environmental Officer present. A representative from Alternative Delivery Systems shall be included on all correspondence.

The Design-Build Team shall be responsible for preparing all documents necessary for the Department to obtain the environmental permits and / or modification of existing permits for this project. Permit applications shall be required for the US Army Corps of Engineers Section 404 Permit, the NC Department of Natural Resources (DENR), Division of Water Quality (DWQ) Section 401 Water Quality Certification and Tennessee Valley Authority Section 26a Permit. The Design-Build Team shall not begin ground-disturbing activities, including utility relocation, until all environmental permits have been issued (this does not include permitted investigative borings covered under a current Nationwide Permit #6).

Project R-2813B is not in the Merger 01 Process used by the environmental agencies and the Department to obtain environmental permits. On non-Merger Design-Build Projects, the Department has committed to coordination efforts with the environmental agencies. Thus, the Design-Build Team shall conduct an interagency meeting that includes NCDOT PDEA-NEU, NCDOT Hydraulic Unit and interested environmental agencies to review the hydraulic design and permit sites prior to submittal of the environmental permit applications. All work resulting from the hydraulics and permit reviews shall be the responsibility of the Design-Build Team. Failure on the part of the Design-Build Team to coordinate this interagency meeting places all responsibility for associated delays solely in the hands of the Design-Build Team.

The Design-Build Team shall be bound by the terms of all signed planning documents and commitments made during the aforementioned interagency meeting. The Design-Build Team shall be held accountable for meeting all permit conditions. The Design-Build Team shall be required to staff any personnel the Design-Build Team deems necessary to provide permit compliance.

Major Permit Application Process

It shall be the Design-Build Team's responsibility to acquire information and prepare permit drawings that reflect the impacts and minimization efforts resulting from the interagency coordination and as designed by the Design-Build Team. Further it shall be the Design-Build

Team's responsibility to provide these permit impact sheets (drawings) depicting the design and construction details to the Department as part of the permit application. The Design-Build Team shall be responsible for developing the permit application for all jurisdictional impacts. The permit application shall include all utility relocations. The permit application shall consist of, at a minimum, the following:

- Cover Letter
- Minutes from the interagency meeting
- Permit drawings
- Half-size plans
- Completed forms (Section 404, etc.) appropriate for impacts

The Department shall re-verify and update, as needed, the required environmental data that expires prior to the completion of the activity causing the impact in the jurisdictional areas. These include, but are not limited to, federally protected species, re-verification of wetland jurisdictional areas, historic and archaeological sites, and 303d (impaired) streams. The Design-Build Team shall draft a letter, for the Project Development & Environmental Analysis Branch's (PDEA) signature, requesting concurrence from the United States Fish and Wildlife Service to document compliance with Section 7 of the Endangered Species Act for those species requiring such concurrence. The original dates of verification / concurrence are listed below:

- Dates of verification for streams (June 23, 2006)
- Dates of verification for wetlands (June 23, 2006)
- USFWS concurrence on species (April 13, 2004)

Direct coordination between the Design-Build Team, the Department's Alternative Delivery Systems Engineer, Resident Engineer, and PDEA-NEU shall be necessary to ensure proper permit application development. Upon completion of the permit application package, the Design-Build Team shall concurrently forward the package to the State Alternative Delivery Systems Engineer, Resident Engineer, Division Environmental Officer (DEO) and PDEA-NEU for review and approval. The Department will subsequently forward the package to the appropriate agencies to have the permit application placed on public notice to reflect the details.

The Design-Build Team shall submit one permit application for the entire project. The Design-Build Team shall not submit multiple applications to develop a "staged permitting" process to expedite construction activities in a phased fashion.

Any temporary construction measures, including de-watering, construction access, etc. shall be addressed in the permit application. Impacts that result from so-called temporary measures may not be judged to be temporary impacts by the agencies. These issues must be addressed and reviewed by PDEA-NEU prior to the aforementioned interagency meeting and resolved with the agencies during the interagency meetings.

The Design-Build Team shall clearly indicate the location of and impacts of haul roads and utility relocations on jurisdictional areas. The Design-Build Team shall identify all proposed borrow and waste sites. These details shall be included in the permit application data. Further, the Design-Build Team shall describe the methods of construction of all structures. The description of the temporary impacts (haul roads, utility relocations, work bridges, etc.) shall include restoration plans, schedules, and disposal plans. This information shall be included in the permit application. This information shall also be part of the data presented during the interagency meeting. There

Commitments

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize wetland impacts and to provide full compensatory mitigation of all remaining wetland impacts. Avoidance measures were taken during the planning and NEPA Process and minimization measures were incorporated as part of the preliminary project design. The Design-Build Team shall incorporate these avoidance and minimization features, plus any minimization identified during the interagency meeting, into the design.

All work by the Design-Build Team shall be accomplished in strict compliance with the plans submitted with the Section 404, 401 and TVA Section 26a permit applications and in compliance with all conditions of the permits and certifications issued by the agencies. The Design-Build Team shall provide each of its contractors and / or agents associated with the construction or maintenance of this project with a copy of the permits.

The Design-Build Team shall strictly adhere to these commitments, as well as others, including but not limited to, those included in the EA, FONSI, all permits and interagency meetings, unless noted otherwise elsewhere in this RFP.

Archeological Sites

If the Design-Build Team discovers any previously unknown historic or archeological remains while accomplishing the authorized work, they shall immediately notify NCDOT Staff Archaeologist and / or NCDOT Project Development Manager, as listed below, who will initiate the required State / Federal coordination. A representative from Alternative Delivery Systems shall also be notified. All questions regarding these sites shall be addressed to Mr. Matthew Wilkerson, NCDOT Archaeology and Mr. Paul Mohler, NCDOT Staff Archaeologist or Mr. Eric Midkiff, PE, NCDOT Project Development Manager.

UTILITY CONSTRUCTION SCOPE OF WORK (08-15-06)

GENERAL

The design and construction of any utilities not specifically mentioned in this Scope of Work shall be handled and paid for in accordance with the Utilities Coordination Scope of Work.

The Department is entering into agreements with the utility companies as described below to provide design and construction services for their facilities associated with this project.

The Design-Build Team shall design, furnish, install, inspect and coordinate the certification of the following utility facilities in accordance with the *Utility Construction Criteria* dated April 20, 2006 and the *Bell System Practices* dated April 20, 2006:

- Water Line
- Telephone Conduits
- Gas Main
- Sanitary Sewer Force Main
- Sanitary Sewer

The Design-Build Team shall develop and provide As-Built Drawings for all utility facilities designed and constructed as part of this Scope of Work.

The existing utility facilities are to remain in place and functioning until the new facilities are certified as complete by the appropriate utility owner. The Design-Build Team shall abandon or remove the existing facilities.

The Design-Build Team shall coordinate and obtain approvals of the design and construction with the utility owner and the Department, as appropriate. The Design-Build Team shall submit two copies of the utility design to the State Alternative Delivery Systems Engineer for review and acceptance. The Design-Build Team shall provide the utility companies the appropriate number of copies for their review and approval.

The agreements for the Utility Construction described herein will be obtained by the Department and are not part of the Utilities Coordination work required by the Design-Build Team. Upon approval, the Design-Build Team shall provide five sets of ½-size plans for each of the utility owner's facilities to the State Utility Agent for addendum to the NCDOT / Utility Owner agreement. Concurrently with this submittal, the Design-Build Team shall submit one set of ½-size plans for each of the utility owner's facilities to the Alternative Delivery Unit, and one set of ½ -size plans to the Resident Engineer.

Unless noted otherwise, the Design-Build Team shall locate the new utility facilities as far from the roadway as possible while remaining within the Department's right of way. Except for crossings and transitions from existing lines and tie-ins to bridge attachments, utility lines shall be beyond a 1V: 1H distance and a minimum of five feet from edge of pavement.

STRUCTURE ATTACHMENTS

The following utilities may be attached to the French Broad River Bridge:

- 24" Water Line
- 4 BellSouth Conduits (with Fiber Optic Cable to be installed by BellSouth)
- Sanitary Sewer Force Main
- 12" Gas Main

Power shall not be attached to the French Broad River Bridge.

Attachments shall not be allowed to a bridge carrying a Control of Access freeway over streams, other roadways or railroads (e.g. No parallel utility installations within the C/A).

Attachments shall not be allowed to cored-slab or box beam girder bridges.

Attachments to structures shall meet the following criteria:

- No parts of the attachments are allowed to extend below the bottom of the beam or girders.
- No welding, drilling, or attachments to beams or girders allowed. Attachments should be suspended from the bottom of the bridge deck.
- Use restrained joint ductile iron pipe for pressurized pipelines such as water and sewer force mains.
- Maintain a minimum of 18" of clearance to beams and / or girders, if possible.
- Attachments shall be located between the bridge girders and shall not be allowed on the overhang.
- Connections to the bridge shall be made either with cast in place inserts or epoxy adhesive anchors.

COMPENSATION

All costs for the design and construction of the proposed facilities described herein shall be included in the lump sum Price Proposal. No additional payments shall be made either by the Department or the utility owners for the utility design or construction work outlined in this Scope of Work.

All references to Method of Measurement, Basis of Payment or any other statement regarding direct payment for utility design and / or construction noted in the *Utility Construction Criteria* and / or the *Bell System Practices* dated April 20, 2006 shall be disregarded.

WATER LINE

Owner: City of Asheville

Contact: Mr. David Hanks, (828) 259-5959

Description of Existing Facilities

The City has existing water lines along the entire length of Long Shoals Road (-L- Line) with branches at Clayton Road (-Y1-) and Ledbetter Road (-Y2-). The existing water lines are attached to the existing bridge carrying Long Shoals Road over the French Broad River.

Description of Proposed Facilities

The Design-Build Team shall design and construct a new 24" water line from Station 12+50 -Y1- to the new 24" water line along Long Shoals Road in the vicinity of Ramps A and B, that is being installed under TIP Project R-2813C.

The Design-Build Team shall design and construct a new 12" water line along Long Shoals Road from Station 10+50 -L- to the new 24" water line at Clayton Road. At approximately Station 10+50 -L-, the Design–Build Team shall connect the new 12" water line to both the existing 6" and 12" water lines.

The Design-Build Team shall design and construct a new 8" water line along Ledbetter Road from the new 24" water line to the existing water line at approximately Station 13+70 -Y2-.

The Design-Build Team shall replace with all new materials the fire protection vault and all appurtenances contained therein located at approximately Station 14+00 -Y1- outside of the roadway clear recovery area.

All existing water services and fire hydrants shall be abandoned. The Design-Build Team shall install new water services and new fire hydrants to replace all abandoned water services and fire hydrants, whether in their original or relocated position.

Standards

The Design-Build Team shall adhere to the *Utility Construction Criteria* dated April 20, 2006 unless otherwise noted below:

The Design-Build Team shall use ductile iron pipe with a minimum pressure class of 350.

The Design-Build Team shall maintain water service on the existing lines except for six-hour shutdowns for connecting the new lines to the existing lines. Water shutdowns must be scheduled with the City of Asheville at least five days in advance.

The Design-Build Team shall repair and re-establish any water service line damage and associated service interruption, resulting from construction activities immediately after the occurrence.

The Design-Build Team shall provide an insulation jacket for the water main on the French Broad River Bridge.

The Design-Build Team shall locate the proposed water mains according to the following requirements:

- The Design-Build Team shall locate water mains at least ten feet laterally, measured edge to edge from existing or proposed sanitary sewers, unless the elevation of the bottom of the water main is at least 18" above the top of the sanitary sewer with a horizontal separation of at least three feet.
- It is preferred that the Design-Build Team locate water mains at least ten feet laterally, measured edge to edge from existing or proposed storm sewers. The Design-Build Team shall locate water mains at least five feet laterally measured edge to edge from existing or proposed storm sewers, unless the elevation of the bottom of the water main is at least 12" above the top of the storm sewer with a horizontal separation of at least three feet.
- The Design-Build Team shall locate the new water lines on flat areas that are at least three feet from all other underground utilities, not noted above, or the road embankment. This horizontal separation shall also be adhered to for water lines attached to the bridge.
- The Design-Build Team shall locate the new water lines at least ten feet from any above ground structure / feature including guardrail. The Design-Build Team shall make every reasonable effort to prevent the water lines from crossing under guardrail.

TELEPHONE CONDUITS

Owner: BellSouth

Contact: Mr. J. (Scott) Addington, (828) 236-9312

Description of Existing Facilities

BellSouth has an existing abandoned conduit system along Long Shoals Road from the existing attachment on the existing bridge carrying Long Shoals Road over the French Broad River through the I-26 interchange.

Description of Proposed Facilities

The Design-Build Team shall provide a new duct consisting of 4 each of 4" conduits from Station 31+00 -L- to Station 48+00 -L-. It is preferred that the ducts be arranged two by two; however, four ducts arranged side by side is acceptable. Ducts may be bundled (i.e., no vertical or horizontal separation between ducts) except as noted in Section 622-340-201, Item 5.09 and Section 919-240-400, Item 2.05 of the *Bell System Practices* dated April 20, 2006.

Bridge conduits shall be D-Type plastic conduit or equivalent (reference Section 919-240-520BT, Item 3.3 of the *Bell System Practices* dated April 20, 2006).

The Design-Build Team shall terminate the conduit ends in an accessible location and place marker balls in the conduit ends. BellSouth will provide the marker balls.

The Design-Build Team will not be responsible for installing the fiber optic cable within the new duct. The Design-Build Team shall be responsible for coordinating the fiber optic installation with BellSouth and providing written notification concurrently to the State Alternative Delivery Systems Engineer and BellSouth that duct installation has been completed.

Standards

The Design-Build Team shall adhere to the *Utility Construction Criteria* dated April 20, 2006 and the *Bell System Practices* dated April 20, 2006 unless otherwise noted below:

The Design-Build contractor and all subcontractors shall execute a Non-Disclosure Agreement with BellSouth prior to receiving the Bell System Practices documents.

Direct buried ducts shall be Type C conduit (Schedule 40 PVC).

Minimum cover required shall be 30 inches; backfill and tamp per BellSouth Practices. Concrete encasement is not required except as noted in Section 622-340-201, Item 5.09 and Section 919-240-400, Item 2.05.

All joints shall be solvent-welded.

Section 622-340-201 of the Bell Systems Practices

Items 5.09 and 5.11 – Bend radii shall be 80 feet or larger; maximum one bend per direct buried section on each end of the bridge.

Item 8.01 – BellSouth requires documentation that the Design-Build Team has successfully completed conduit mandreling.

Item 9.02 – All ducts shall be plugged with solid rubber conduit plugs.

Section 919-240-400 of the Bell Systems Practices

Items 2.05 and 2.10 - Bend radii shall be 80 feet or larger; maximum one bend per direct buried section on each end of the bridge.

GAS MAIN

Owner: PSNC Energy

Contact: Mr. Scott Swindler, (704) 810-3230

Description of Existing Facilities

Note: The existing gas line located west of Clayton Road is a 6" pipeline, not an existing 8" pipeline as described in the PSNC Energy Criteria of the *Utility Construction Criteria* dated April 20, 2006. An 8" pipeline shall replace the existing 6" facility as described in the *Utility Construction Criteria* dated April 20, 2006.

The PSNC Energy has existing gas lines along the entire length of Long Shoals Road with a branch along Clayton Road.

The existing gas line is attached to the existing bridge carrying Long Shoals Road over the French Broad River.

Description of Proposed Facilities

See PSNC Energy specifications in the *Utility Construction Criteria* dated April 20, 2006.

PSNC Energy will perform the hot taps and stop-off operations. The Design-Build Team shall make all welds for connecting the piping to the taps and for any bypass piping. PSNC will put the gas on the new system with the Design-Build Team's assistance which shall include, but not be limited to, providing all labor and equipment required pre and post hot tap connection. Such taps are anticipated on Clayton Road, along Long Shoals Road near Station 11+00, along Long Shoals Road near McDonalds, and at the existing regulator stations. The Design-Build Team shall be responsible for coordinating the cut overs with PSNC Energy and providing written notification that final preparations for the cut overs have been completed. The Design-Build Team shall provide two weeks written notice to the Resident Engineer, PSNC Energy, and the State Alternative Delivery Systems Engineer prior to requiring the cut overs.

Standards

The Design-Build Team shall adhere to the *Utility Construction Criteria* dated April 20, 2006 unless otherwise noted below:

The below ground 12" pipeline shall adhere to the specifications shown on the 12" bridge attachment detail included in the *Utility Construction Criteria* dated April 20, 2006.

The Design-Build Team shall use the following specifications for the 8" pipeline:

- API 5L
- Grade X42
- Minimum Yield Strength: 52,000 psi
- Minimum Tensile Strength: 66,000 psi

Electric Resistance Welded

- Plain End
- 8.625" OD
- 0.219" WT
- Coating: Fusion – Bonded Epoxy Coated in Accordance with PSNC Specification FB-STD
- Nominal Length: 40'
- Domestic

All Specifications shall be as referenced by the current 49 CFR Part 192

The Design-Build Team shall use the following hydrostatic test pressure procedure for the 8" and 12" gas pipelines:

12" Pipeline

15 second spike test at 3,000 psig then 8 hours at 2,356 to 2,500 psig hydro.

8" Pipeline

Spike at 2,640 psig then 8 hours at 2,356 to 2,500 psig hydro.

The Design-Build Team shall determine if expansion joints are required in the pipeline. If required, the Design-Build Team shall provide the expansion joint specifications.

The Design-Build Team may use a manufacturer other than Grinnell to provide equivalent bridge attachment materials as specified in PSNC *Typical 12" Bridge Attachment Details* in the *Utility Construction Criteria* dated April 20, 2006. The Design-Build Team shall obtain approval from PSNC and the NCDOT State Alternative Delivery Engineer prior to the use of items not specified in the *Utility Construction Criteria* dated April 20, 2006.

PSNC shall provide the materials noted below to the Design-Build Team at no additional cost. The Design-Build Team shall provide two weeks written notice to the Resident Engineer, the State Alternative Delivery Systems Engineer and PSNC Energy prior to delivery of the requested material.

Expansion Joints (if required)
Cathodic Test Stations
Weld Insulator
Valve Boxes.

SANITARY SEWER FORCE MAIN

Owner: Avery Creek Sanitary District

Contact: Mr. Alvin Hutchinson, (828)684-3911

Description of Existing Facilities

The Avery Creek Sanitary District has an existing force main sanitary sewer line attached to the existing bridge carrying Long Shoals Road over the French Broad River and a pump station located southwest of the bridge.

Description of Proposed Facilities

The Design-Build Team shall provide a new force main sewer line attached to the new structure and other piping as needed to resolve conflicts with the highway project design and construction methods.

If the design and / or construction impacts the existing pump station, the Design-Build Team shall provide a new pump station located off of the NCDOT right of way (see Right of Way Scope of Work).

Standards

The Design-Build Team shall adhere to the *Utility Construction Criteria* dated April 20, 2006 unless otherwise noted below:

The Design-Build Team shall design and construct all elements of the force main sewer facility to be functionally similar to the existing facilities and in accordance with current DENR requirements. The Design-Build Team shall be responsible for all DENR coordination and approvals associated with the sanitary sewer force main.

The Design-Build Team shall maintain service on the existing lines except for permitted shutdowns for connecting the new lines to the existing lines.

The Design-Build Team shall determine if freeze protection is required for the force main sewer line and provide if required.

SANITARY SEWER

Owner: Metropolitan Sewerage District of Buncombe County

Description of Existing Facilities

The Metropolitan Sewerage District of Buncombe County (MSD) has existing sanitary sewer lines crossing Long Shoals Road at approximately Stations 39+10 -L- and 39+30 -L- and existing lines crossing I-26 at approximately Stations 22+20 -Y3- and 36+50 -Y3-.

Description of Proposed Facilities

The Design-Build Team shall, to the extent possible, avoid relocating or adjusting these facilities. Should the Design-Build Team's design and / or construction methods impact the existing sanitary sewer lines, the Design-Build Team shall be responsible for all costs associated with providing new sanitary sewer lines and appendages as needed to resolve conflicts.

The Design-Build Team shall be responsible for providing protective measures to the existing sanitary sewer lines that cross the French Broad River.

Standards

The Design-Build Team shall adhere to the *Utility Construction Criteria* dated April 20, 2006 unless otherwise noted below:

If necessary, the Design-Build Team shall adhere with DENR and MSD requirements and be responsible for all DENR coordination and approvals associated with the sanitary sewer line.