



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY  
GOVERNOR

ANTHONY J. TATA  
SECRETARY

March 23, 2015

**Addendum No. 2**

**Certified Mail**

Re: Contract ID DL00083  
WBS # 45342.2.FR7  
Lincoln County  
**Intersection of NC 150 and SR 1371 in Lincoln County.**

**March 24, 2015 Letting**

To whom it may concern:

Reference is made to the proposal form recently furnished to you on the above project.

The following information is being provided for the signs shown on the signal plans on plan sheets Sig1 thru Sig 3:

- Please find the attached sign design plan sheets Sign-1 and Sign-2 showing the required dimensions for the signs associated with the signal flasher.
- Please find the attached sealed Special Provisions associated with the proposed signal flasher.
- Please find the corrected bid form showing the description for line item #85 as Lead-in Cable (14-2).

Due to the number of items in this addendum and the short time before bid opening, please note the bid opening date has been delayed to give time for bids to be adjusted if necessary. The new bid opening date is **Wednesday April 1, 2015 at 10:00 AM in the Division 12 Office located at 1710 East Marion St. Shelby, NC 28152.**

Please replace the proposal cover, instructions to bidders, and bid form originally supplied to you with the attached. Please insert the signal special provisions into your contract proposal and the sign design plan sheets into you plan set.

Any bids received on March 24, 2015 will be returned and the contractor notified.

Sincerely,

A handwritten signature in black ink that reads "RD Chandler". The letters are cursive and somewhat stylized.

R.D. Chandler, PE  
Division Engineer, Twelfth Division

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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
HIGHWAY DIVISION 12

## PROPOSAL

**DATE AND TIME OF BID OPENING: April 1, 2015 AT 10:00 AM**

**CONTRACT ID: DL00083**

**WBS ELEMENT NO.: 45342.3.FR7**

**FEDERAL AID NO.: HSIP-0150(31)**

**COUNTY: Lincoln County**

**TIP NO.: W-5212G**

**MILES: 0.253 MILES**

**ROUTE NO.: NC 150 / SR 1371**

**LOCATION: LINCOLN**

**TYPE OF WORK: GRADING, PAVING, DRAINAGE, PAVEMENT MARKINGS AND MARKERS**

**NOTICE:**

ALL BIDDERS SHALL COMPLY WITH ALL APPLICABLE LAWS REGULATING THE PRACTICE OF GENERAL CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA WHICH REQUIRES THE BIDDER TO BE LICENSED BY THE N.C. LICENSING BOARD FOR CONTRACTORS WHEN BIDDING ON ANY NON-FEDERAL AID PROJECT WHERE THE BID IS \$30,000 OR MORE, EXCEPT FOR CERTAIN SPECIALTY WORK AS DETERMINED BY THE LICENSING BOARD. BIDDERS SHALL ALSO COMPLY WITH ALL OTHER APPLICABLE LAWS REGULATING THE PRACTICES OF ELECTRICAL, PLUMBING, HEATING AND AIR CONDITIONING AND REFRIGERATION CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA. NOTWITHSTANDING THESE LIMITATIONS ON BIDDING, THE BIDDER WHO IS AWARDED ANY FEDERAL - AID FUNDED PROJECT SHALL COMPLY WITH CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA FOR LICENSING REQUIREMENTS WITHIN 60 CALENDAR DAYS OF BID OPENING.

**THIS IS A ROADWAY PROJECT. BID BONDS ARE REQUIRED.**

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NAME OF BIDDER

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ADDRESS OF BIDDER

## INSTRUCTIONS TO BIDDERS

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

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

#### TRADITIONAL PAPER BIDS:

1. Download the entire proposal from the Connect NCDOT website and return the entire proposal with your bid.
2. All entries on the itemized proposal sheet (bid form) shall be written in ink or typed.
3. The Bidder shall submit a unit price for every item on the itemized proposal sheet. The unit prices for the various contract items shall be written in figures. Unit prices shall be rounded off by the Bidder to contain no more than FOUR decimal places.
4. An amount bid shall be entered on the itemized proposal sheet for every item. The amount bid for each item shall be determined by multiplying each unit bid by the quantity for that item, and shall be written in figures in the "Amount" column of the form.
5. The total amount bid shall be written in figures in the proper place on the bid form. The total amount bid shall be determined by adding the amounts bid for each item.
6. Changes to any entry shall be made by marking through the entry in ink and making the correct entry adjacent thereto in ink. A representative of the Bidder shall initial the change in ink. Do not use correction fluid, correction tape or similar product to make corrections.
7. The bid shall be properly executed on the included **Execution of Bid – Non-collusion Affidavit, Debarment Certification and Gift Ban Certification** form. All bids shall show the following information:
  - a. Name of corporation, partnership, limited liability company, joint venture, individual or firm, submitting bid.  
Corporations that have a corporate seal should include it on the bid.
  - b. Name of individual or representative submitting bid and position or title held on behalf of the bidder.
  - c. Name, signature, and position or title of witness.
  - d. Completed attestation by Notary Public
- Note: Signer, Witness and Notary Public must be different individuals.**
8. The bid shall not contain any unauthorized additions, deletions, or conditional bids.
9. The Bidder shall not add any provision reserving the right to accept or reject an award, or to enter into a contract pursuant to an award.
10. **THE PROPOSAL WITH THE ITEMIZED PROPOSAL SHEET ATTACHED SHALL BE PLACED IN A SEALED ENVELOPE AND SHALL BE DELIVERED TO AND RECEIVED IN THE NCDOT DIVISION 12 OFFICE, LOCATED AT P. O. Box 47, P. O. Box 47, BY 10:00 AM ON, Wednesday, April 1, 2015.**
11. The sealed bid must display the following statement on the front of the sealed envelope:

**QUOTATION FOR: DL00083**

**DESCRIPTION: GRADING, PAVING, DRAINAGE, PAVEMENT MARKERS AND MARKINGS IN LINCOLN COUNTY.**

TO BE OPENED AT 10:00 AM ON, WEDNESDAY, APRIL 1, 2015 AT THE DIVISION 12 OFFICE  
LOCATED AT 1710 EAST MARION ST. IN SHELBY.

12. If delivered by mail, the sealed envelope shall be placed in another sealed envelope and the outer envelope shall be addressed as follows:

N. C. DEPARTMENT OF TRANSPORTATION  
ATTN: R. D. Chandler, PE  
P. O. Box 47  
Shelby, NC 28151-0047

County : Lincoln

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
<b>ROADWAY ITEMS</b>						
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	0000400000-N	801	CONSTRUCTION SURVEYING	Lump Sum	L.S.	
0003	0043000000-N	226	GRADING	Lump Sum	L.S.	
0004	0050000000-E	226	SUPPLEMENTARY CLEARING & GRUB-BING	1 ACR		
0005	0134000000-E	240	DRAINAGE DITCH EXCAVATION	10 CY		
0006	0196000000-E	270	GEOTEXTILE FOR SOIL STABILIZATION	5 SY		
0007	0318000000-E	300	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	120 TON		
0008	0320000000-E	300	FOUNDATION CONDITIONING GEO-TEXTILE	350 SY		
0009	0343000000-E	310	15" SIDE DRAIN PIPE	20 LF		
0010	0344000000-E	310	18" SIDE DRAIN PIPE	44 LF		
0011	0366000000-E	310	15" RC PIPE CULVERTS, CLASS III	256 LF		
0012	0372000000-E	310	18" RC PIPE CULVERTS, CLASS III	632 LF		
0013	0378000000-E	310	24" RC PIPE CULVERTS, CLASS III	88 LF		
0014	0995000000-E	340	PIPE REMOVAL	300 LF		
0015	1489000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	310 TON		
0016	1498000000-E	610	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	390 TON		
0017	1519000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	550 TON		
0018	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	70 TON		

County : Lincoln

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0019	1693000000-E	654	ASPHALT PLANT MIX, PAVEMENT REPAIR	80 TON		
0020	2253000000-E	840	PIPE COLLARS	1 CY		
0021	2264000000-E	840	PIPE PLUGS	0.8 CY		
0022	2275000000-E	SP	FLOWABLE FILL	6.5 CY		
0023	2286000000-N	840	MASONRY DRAINAGE STRUCTURES	9 EA		
0024	2364000000-N	840	FRAME WITH TWO GRATES, STD 840.16	5 EA		
0025	2365000000-N	840	FRAME WITH TWO GRATES, STD 840.22	1 EA		
0026	2374000000-N	840	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (TYPE F)	2 EA		
0027	2549000000-E	846	2'-6" CONCRETE CURB & GUTTER	400 LF		
0028	2612000000-E	848	6" CONCRETE DRIVEWAY	60 SY		
0029	3649000000-E	876	RIP RAP, CLASS B	20 TON		
0030	4413000000-E	SP	WORK ZONE ADVANCE/GENERAL WARNING SIGNING	96 SF		
0031	4457000000-N	SP	TEMPORARY TRAFFIC CONTROL	Lump Sum	L.S.	
0032	4700000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)	100 LF		
0033	4710000000-E	1205	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)	65 LF		
0034	4725000000-E	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)	4 EA		
0035	4847000000-E	1205	POLYUREA PAVEMENT MARKING LINES (4", *****) (HIGHLY REFLECTIVE ELEMENTS)	6,350 LF		
0036	4905000000-N	1253	SNOWPLOWABLE PAVEMENT MARKERS	30 EA		

County : Lincoln

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0037	5776000000-E	1525	5' DIA UTILITY MANHOLE	1		EA
0038	5882000000-N	SP	GENERIC UTILITY ITEM (12" INSERTION VALVE SLEEVE)	2		EA
0039	5882000000-N	SP	GENERIC UTILITY ITEM (12" MJ 45 DEG. BEND)	4		EA
0040	5882000000-N	SP	GENERIC UTILITY ITEM (12" MJ GATE VALVE)	3		EA
0041	5882000000-N	SP	GENERIC UTILITY ITEM (12" MJ PLUG)	2		EA
0042	5882000000-N	SP	GENERIC UTILITY ITEM (12"x12" MJ TEE)	2		EA
0043	5882000000-N	SP	GENERIC UTILITY ITEM (12"x12" TAPPING SLEEVE & VALV E WITH BOX)	2		EA
0044	5882000000-N	SP	GENERIC UTILITY ITEM (12"x8" MJ TEE)	1		EA
0045	5882000000-N	SP	GENERIC UTILITY ITEM (6" 45 DEG. BEND FOR SEWER)	6		EA
0046	5882000000-N	SP	GENERIC UTILITY ITEM (8" MJ 45 DEG. BEND)	2		EA
0047	5882000000-N	SP	GENERIC UTILITY ITEM (8" MJ GATE VALVE)	1		EA
0048	5882000000-N	SP	GENERIC UTILITY ITEM (AIRE RELEASE TEST)	1		EA
0049	5882000000-N	SP	GENERIC UTILITY ITEM (DISINFECTION, PRESSURE TEST & BAC T TEST)	1		EA
0050	5888000000-E	SP	GENERIC UTILITY ITEM (12" PVC WATERLINE)	1,180		LF
0051	5888000000-E	SP	GENERIC UTILITY ITEM (6" PVC SEWER)	445		LF

County : Lincoln

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0052	5888000000-E	SP	GENERIC UTILITY ITEM (8" PVC WATERLINE)	131 LF		
0053	5888000000-E	SP	GENERIC UTILITY ITEM (TRACER WIRE FOR SEWER)	131 LF		
0054	5888000000-E	SP	GENERIC UTILITY ITEM (TRACER WIRE FOR WATER)	1,180 LF		
0055	5894000000-E	SP	GENERIC UTILITY ITEM (CONCRETE FOR THRUST BLOCK)	8.5 CY		
0056	6000000000-E	1605	TEMPORARY SILT FENCE	150 LF		
0057	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	32 TON		
0058	6012000000-E	1610	SEDIMENT CONTROL STONE	56 TON		
0059	6015000000-E	1615	TEMPORARY MULCHING	0.25 ACR		
0060	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	50 LB		
0061	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEED- ING	0.25 TON		
0062	6030000000-E	1630	SILT EXCAVATION	200 CY		
0063	6036000000-E	1631	MATTING FOR EROSION CONTROL	2,000 SY		
0064	6037000000-E	SP	COIR FIBER MAT	8 SY		
0065	6038000000-E	SP	PERMANENT SOIL REINFORCEMENT MAT	1,000 SY		
0066	6042000000-E	1632	1/4" HARDWARE CLOTH	240 LF		
0067	6071010000-E	SP	WATTLE	400 LF		
0068	6071020000-E	SP	POLYACRYLAMIDE (PAM)	10 LB		
0069	6071030000-E	1640	COIR FIBER BAFFLE	52 LF		
0070	6084000000-E	1660	SEEDING & MULCHING	2 ACR		



County : Lincoln

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0071	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	75 LB		
0072	6108000000-E	1665	FERTILIZER TOPDRESSING	0.375 TON		
0073	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	10 EA		
0074	7060000000-E	1705	SIGNAL CABLE	510 LF		
0075	7108000000-E	1705	VEHICLE SIGNAL HEAD (12", 1 SECTION)	8 EA		
0076	7264000000-E	1710	MESSENGER CABLE (3/8")	330 LF		
0077	7288000000-E	1715	PAVED TRENCHING (*****) (1 CONDUIT, 2 INCH)	125 LF		
0078	7300000000-E	1715	UNPAVED TRENCHING (*****) (1 CONDUIT, 2 INCH)	685 LF		
0079	7324000000-N	1716	JUNCTION BOX (STANDARD SIZE)	8 EA		
0080	7360000000-N	1720	WOOD POLE	4 EA		
0081	7372000000-N	1721	GUY ASSEMBLY	8 EA		
0082	7408000000-E	1722	1" RISER WITH WEATHERHEAD	1 EA		
0083	7420000000-E	1722	2" RISER WITH WEATHERHEAD	5 EA		
0084	7444000000-E	1725	INDUCTIVE LOOP SAWCUT	490 LF		
0085	7456000000-E	1726	LEAD-IN CABLE (*****) (14-2)	1,700 LF		
0086	7636000000-N	1745	SIGN FOR SIGNALS	4 EA		
0087	7708000000-N	1751	DETECTOR CARD (*****) (NEMA TS-1)	3 EA		

County : Lincoln

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0088	7912000000-N	1755	BEACON CONTROLLER ASSEMBLY & CABINET (*****) (TYPE F3)	1	EA	

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1414/Mar03/Q21651.675/D401011560000/E88

Total Amount Of Bid For Entire Project :

**TOTAL BID FOR PROJECT:** \_\_\_\_\_

CONTRACTOR \_\_\_\_\_

ADDRESS \_\_\_\_\_

Federal Identification Number \_\_\_\_\_ Contractors License Number \_\_\_\_\_

Authorized Agent \_\_\_\_\_ Title \_\_\_\_\_

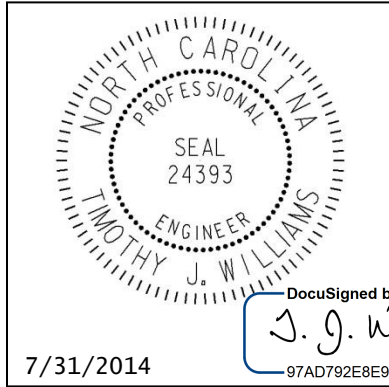
Signature \_\_\_\_\_ Date \_\_\_\_\_

Witness \_\_\_\_\_ Title \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

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CORPORATE SEAL



**Project Special Provisions**  
*(Version 12.3)*  
**Signals and Intelligent Transportation Systems**

Prepared By: MKM  
31-Jul-14

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**1. 2012 STANDARD SPECIFICATIONS FOR ROADS & STRUCTURES**

*The 2012 Standard Specifications are revised as follows:*

**1.1. Polymer Concrete (PC) Junction Boxes (1091-5(B))**

Page 10-202, revise paragraph starting on line 9 to read “Provide polymer concrete (PC) boxes which have bolted covers and open bottoms. Provide vertical extensions of 6" to 12" as required by project special provisions.”

Page 10-202, revise sentence beginning on line 14 to read “Other thermoplastic materials may be used for components which are not normally exposed to sunlight.”

**1.2. Junction Boxes (1098-5)**

Page 10-212, sub-Section 1098-5(C) Oversized Junction Boxes

Revise sentence to read, “Provide oversized junction boxes and covers with minimum inside dimensions of 28"(l) x 15"(w) x 22"(h).”

**1.3. Controllers with Cabinets – Material (1751-2)**

Page 17-37, Section 1751-2 Material

Add the following paragraph:

When the plans or specifications require a Type 2070L controller, contractor may provide a Type 2070E controller. Unless otherwise allowed by the Engineer, provide controllers of only one type.

**1.4. Pedestals (1743)**

Page 17-34, Add the following new sub-Section:

**1743-4 - Screw-In Helical Foundation Anchor Assembly**

**Description:**

Furnish and install screw-in helical foundation as an alternative to the standard reinforced concrete foundation specified in Article 1743 “Pedestals” of the Standard Specifications, for supporting Type I and Type II Pedestals. Do not use for Type III Pedestals.

**Materials for Type I – Pedestrian Pushbutton Post:**

Fabricate pipe assembly consisting of a 4” diameter x 56” long pipe, single helical blade and square fixed attachment plate. Furnish pipe in accordance with ASTM A-53 ERW Grade B and include a 2” x 3” cable opening in the pipe at 18” below the attachment plate. Furnish steel attachment plate and helical blade in accordance with ASTM A-36. Include (4) slotted mounting holes in the attachment plate to fit bolt circles ranging from 7-3/4” to 14-3/4” diameter. Furnish additional 3/4” keyholes at slotted holes to permit anchor bolt installation and replacement from top surface. Include combination bolt-head retainer and dirt scrapers at the attachment plate underside to allow for a level or flush-mount plate installation with respect to the finished grade. Galvanize pipe assembly components in accordance with AASHTO M 111 or an approved equivalent.

Furnish (4) 3/4"-10NC x 3” square head anchor bolts to meet the requirements of ASTM 325. Provide (4) 3/4” plain flat galvanized washers, (4) 3/16” thick galvanized plate washers and (4) 3/4” galvanized hex nuts. Galvanize in accordance with AASHTO M 111 or an approved equivalent.

**Construction Methods for Type I – Pedestrian Pushbutton Post:**

Advance or mechanically screw foundation into soil up until top of attachment plate is level with finished grade. Slide the anchor bolt heads through the keyhole openings and under the attachment

plate with threads pointing up. Bolt the pedestal base to the foundation attachment plate. For further construction methods, see manufacturer's installation drawings.

**Materials for Type II – Normal-Duty Pedestal:**

Fabricate pipe assembly consisting of a 6" diameter x 60" long, single helical blade, 1-1/4" diameter stinger rod and square fixed attachment plate. Furnish pipe in accordance with ASTM A-53 ERW Grade B using schedule 40 wall thickness and include a 2" x 3" cable opening in the pipe at 18" below the attachment plate. Furnish steel attachment plate, helical blade and stinger rod in accordance with ASTM A-36. Include (4) slotted mounting holes in the attachment plate to fit bolt circles ranging from 10" to 15" diameter. Furnish additional 1-1/4" keyholes at slotted holes to permit anchor bolt installation and replacement from top surface. Include combination bolt-head retainer and dirt scrapers at the attachment plate underside to allow for a level or flush-mount plate installation with respect to the finished grade. Galvanize pipe assembly components in accordance with AASHTO M 111 or an approved equivalent.

Furnish (4) 1"-8NC x 4" galvanized Grade 5 square head anchor bolts. Provide (4) 1" plain flat galvanized washers and (4) 1" galvanized hex nuts. Galvanize in accordance with AASHTO M 111 or an approved equivalent.

**Construction Methods for Type II – Normal-Duty Pedestal:**

Advance or mechanically screw foundation into soil up until top of attachment plate is level with finished grade. Slide the anchor bolt heads through the keyhole openings and under the attachment plate with threads pointing up. Bolt the pedestal base to the foundation attachment plate.

For further construction methods, see manufacturer's installation drawings.

Page 17-34, revise Measurement and Payment to sub-Section 1743-5.

Revise the last paragraph to read:

No measurement will be made for pedestal foundations, pedestal screw-in helical foundations, grounding systems and any peripheral pedestal mounting hardware as these are incidental to furnishing and installing pedestals.

**2. SIGNAL HEADS**

**2.1. MATERIALS**

**A. General:**

Fabricate vehicle signal head housings and end caps from die-cast aluminum. Fabricate 12-inch and 16-inch pedestrian signal head housings and end caps from die-cast aluminum. Fabricate 9-inch pedestrian signal head housings, end caps, and visors from virgin polycarbonate material. Provide visor mounting screws, door latches, and hinge pins fabricated from stainless steel. Provide interior screws, fasteners, and metal parts fabricated from stainless steel or corrosion resistant material.

Fabricate tunnel and traditional visors from sheet aluminum.

Paint all surfaces inside and outside of signal housings and doors. Paint outside surfaces of tunnel and traditional visors, messenger cable mounting assemblies, pole and pedestal mounting assemblies, and pedestrian pushbutton housings. Have electrostatically-applied, fused-polyester paint in highway yellow (Federal Standard 595C, Color Chip Number 13538) a minimum of 2.5 to 3.5 mils thick. Do not apply paint to the latching hardware or rigid vehicle signal head mounting brackets for mast-arm attachments.

Have the interior surfaces of tunnel and traditional visors painted an alkyd urea black synthetic baking enamel with a minimum gloss reflectance and meeting the requirements of MIL-E-10169, “Enamel Heat Resisting, Instrument Black.”

Where required, provide polycarbonate signal heads and visors that comply with the provisions pertaining to the aluminum signal heads listed on the QPL with the following exceptions:

Fabricate signal head housings, end caps, and visors from virgin polycarbonate material. Provide UV stabilized polycarbonate plastic with a minimum thickness of  $0.1 \pm 0.01$  inches that is highway yellow (Federal Standard 595C, Color Chip 13538). Ensure the color is incorporated into the plastic material before molding the signal head housings and end caps. Ensure the plastic formulation provides the following physical properties in the assembly (tests may be performed on separately molded specimens):

<b>Test</b>	<b>Required</b>	<b>Method</b>
Specific Gravity	1.17 minimum	ASTM D 792
Flammability	Self-extinguishing	ASTM D 635
Tensile Strength, yield, PSI	8500 minimum	ASTM D 638
Izod impact strength, ft-lb/in [notched, 1/8 inch]	12 minimum	ASTM D 256

For pole mounting, provide side of pole mounting assemblies with framework and all other hardware necessary to make complete, watertight connections of the signal heads to the poles and pedestals. Fabricate the mounting assemblies and frames from aluminum with all necessary hardware, screws, washers, etc. to be stainless steel. Provide mounting fittings that match the positive locking device on the signal head with the serrations integrally cast into the brackets. Provide upper and lower pole plates that have a 1 ¼-inch vertical conduit entrance hubs with the hubs capped on the lower plate and 1 ½-inch horizontal hubs. Ensure that the assemblies provide rigid attachments to poles and pedestals so as to allow no twisting or swaying of the signal heads. Ensure that all raceways are free of sharp edges and protrusions, and can accommodate a minimum of ten Number 14 AWG conductors.

For pedestal mounting, provide a post-top slipfitter mounting assembly that matches the positive locking device on the signal head with serrations integrally cast into the slipfitter. Provide stainless steel hardware, screws, washers, etc. Provide a minimum of six 3/8 X 3/4-inch long square head bolts for attachment to pedestal. Provide a center post for multi-way slipfitters.

For light emitting diode (LED) traffic signal modules, provide the following requirements for inclusion on the Department’s Qualified Products List for traffic signal equipment.

1. Sample submittal,
2. Third-party independent laboratory testing results for each submitted module with evidence of testing and conformance with all of the Design Qualification Testing specified in section 6.4 of each of the following Institute of Transportation Engineers (ITE) specifications:
  - Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement
  - Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement

- Pedestrian Traffic Control Signal Indications –Light Emitting Diode (LED) Signal Modules.

(Note: The Department currently recognizes two approved independent testing laboratories. They are Intertek ETL Semko and Light Metrics, Incorporated with Garwood Laboratories. Independent laboratory tests from other laboratories may be considered as part of the QPL submittal at the discretion of the Department,

3. Evidence of conformance with the requirements of these specifications,
4. A manufacturer’s warranty statement in accordance with the required warranty, and
5. Submittal of manufacturer’s design and production documentation for the model, including but not limited to, electrical schematics, electronic component values, proprietary part numbers, bill of materials, and production electrical and photometric test parameters.
6. Evidence of approval of the product to bear the Intertek ETL Verified product label for LED traffic signal modules.

In addition to meeting the performance requirements for the minimum period of 60 months, provide a written warranty against defects in materials and workmanship for the modules for a period of 60 months after installation of the modules. During the warranty period, the manufacturer must provide new replacement modules within 45 days of receipt of modules that have failed at no cost to the State. Repaired or refurbished modules may not be used to fulfill the manufacturer’s warranty obligations. Provide manufacturer’s warranty documentation to the Department during evaluation of product for inclusion on Qualified Products List (QPL).

**B. Vehicle Signal Heads:**

Comply with the ITE standard “Vehicle Traffic Control Signal Heads”. Provide housings with provisions for attaching backplates.

Provide visors that are 8 inches in length for 8-inch vehicle signal head sections. Provide visors that are 10 inches in length for 12-inch vehicle signal heads.

Provide a termination block with one empty terminal for field wiring for each indication plus one empty terminal for the neutral conductor. Have all signal sections wired to the termination block. Provide barriers between the terminals that have terminal screws with a minimum Number 8 thread size and that will accommodate and secure spade lugs sized for a Number 10 terminal screw.

Mount termination blocks in the yellow signal head sections on all in-line vehicle signal heads. Mount the termination block in the red section on five-section vehicle signal heads.

Furnish vehicle signal head interconnecting brackets. Provide one-piece aluminum brackets less than 4.5 inches in height and with no threaded pipe connections. Provide hand holes on the bottom of the brackets to aid in installing wires to the signal heads. Lower brackets that carry no wires and are used only for connecting the bottom signal sections together may be flat in construction.

For messenger cable mounting, provide messenger cable hangers, wire outlet bodies, balance adjusters, bottom caps, wire entrance fitting brackets, and all other hardware necessary to make complete, watertight connections of the vehicle signal heads to the messenger cable. Fabricate mounting assemblies from malleable iron or steel and provide serrated rings made of aluminum. Provide messenger cable hangers and balance adjusters that are galvanized before being painted. Fabricate balance adjuster eyebolt and eyebolt nut from stainless steel or galvanized malleable iron.



Provide messenger cable hangers with U-bolt clamps. Fabricate washers, screws, bolts, clevis pins, cotter pins, nuts, and U-bolt clamps from stainless steel.

For mast-arm mounting, provide rigid vehicle signal head mounting brackets and all other hardware necessary to make complete, watertight connections of the vehicle signal heads to the mast arms and to provide a means for vertically adjusting the vehicle signal heads to proper alignment. Fabricate the mounting assemblies from aluminum, and provide serrated rings made of aluminum. Provide stainless steel cable attachment assemblies to secure the brackets to the mast arms. Ensure all fastening hardware and fasteners are fabricated from stainless steel.

Provide LED vehicular traffic signal modules (hereafter referred to as modules) that consist of an assembly that uses LEDs as the light source in lieu of an incandescent lamp for use in traffic signal sections. Use LEDs that are aluminum indium gallium phosphorus (AlInGaP) technology for red and yellow indications and indium gallium nitride (InGaN) for green indications. Install the ultra bright type LEDs that are rated for 100,000 hours of continuous operation from -40°F to +165°F. Design modules to have a minimum useful life of 60 months and to meet all parameters of this specification during this period of useful life.

For the modules, provide spade terminals crimped to the lead wires and sized for a #10 screw connection to the existing terminal block in a standard signal head. Do not provide other types of crimped terminals with a spade adapter.

Ensure the power supply is integral to the module assembly. On the back of the module, permanently mark the date of manufacture (month & year) or some other method of identifying date of manufacture.

Tint the red, yellow and green lenses to correspond with the wavelength (chromaticity) of the LED. Transparent tinting films are unacceptable. Provide a lens that is integral to the unit with a smooth outer surface.

**1. LED Circular Signal Modules:**

Provide modules in the following configurations: 12-inch circular sections, and 8-inch circular sections. All makes and models of LED modules purchased for use on the State Highway System shall appear on the current NCDOT Traffic Signal Qualified Products List (QPL).

Provide the manufacturer’s model number and the product number (assigned by the Department) for each module that appears on the 2012 or most recent Qualified Products List. In addition, provide manufacturer’s certification in accordance with Article 106-3 of the *Standard Specifications*, that each module meets or exceeds the ITE “Vehicle Traffic Control Signal Heads – Light Emitting Diode (LED) Circular Signal Supplement” dated June 27, 2005 (hereafter referred to as VTCSH Circular Supplement) and other requirements stated in this specification.

Provide modules that meet the following requirements when tested under the procedures outlined in the VTCSH Circular Supplement:

Module Type	Max. Wattage at 165° F	Nominal Wattage at 77° F
12-inch red circular	17	11
8-inch red circular	13	8
12-inch green circular	15	15

8-inch green circular	12	12
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For yellow circular signal modules, provide modules tested under the procedures outlined in the VTCSH Circular Supplement to insure power required at 77° F is 22 Watts or less for the 12-inch circular module and 13 Watts or less for the 8-inch circular module.

Note: Use a wattmeter having an accuracy of  $\pm 1\%$  to measure the nominal wattage and maximum wattage of a circular traffic signal module. Power may also be derived from voltage, current and power factor measurements.

**C. Signal Cable:**

Furnish 16-4 and 16-7 signal cable that complies with IMSA specification 20-1 except provide the following conductor insulation colors:

- For 16-4 cable: white, yellow, red, and green
- For 16-7 cable: white, yellow, red, green, yellow with black stripe tracer, red with black stripe tracer, and green with black stripe tracer. Apply continuous stripe tracer on conductor insulation with a longitudinal or spiral pattern.

Provide a ripcord to allow the cable jacket to be opened without using a cutter. IMSA specification 19-1 will not be acceptable. Provide a cable jacket labeled with the IMSA specification number and provide conductors constructed of stranded copper.

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PROJECT REFERENCE NO. W-5212G	SHEET NO. SIGN 2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SIGN NUMBER: B TYPE: B QUANTITY: 2 SIGN WIDTH: 9'-6" HEIGHT: 3'-0" TOTAL AREA: 28.5 Sq.Ft. BORDER TYPE: FLUSH RECESS: 0.63" WIDTH: 0.88" RADII: 2.25" NO. Z BARS: 2 LENGTH: 106.0	BACKG COLOR: Yellow COPY COLOR: Black	DESIGN BY: J.Navarrete PROJECT ID: W-5212G	CHECKED BY: DIV: 12	DATE: March 20, 2015
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SYMBOL	X	Y	WID	HT

MAT'L: 0.125" (3.2 mm) ALUMINUM

USE NOTES: 1,2

- Legend and border(except those that are colored black) shall be direct applied Grade B sheeting.
- Background shall be Grade C reflective sheeting.
- Shields; A, B, and C type arrows shall be on 0.032" (0.8mm) aluminum and demountable.

BORDER  
 R=2.25"  
 TH=0.88"  
 IN=0.63"

Spacing Factor is 1 unless specified otherwise

**LETTER POSITIONS**

**Letter spacings are to start of next letter**

																	Series/Size		
																	Text Length		
V	E	H	I	C	L	E	E	N	T	E	R	I	N	G			D 2000		
7.8	7.3	6.3	7.4	3	7.2	6.2	5	8	6.3	6.6	6.2	6.3	6.8	3.2	7.2	5.4	7.8	98.4	
W	H	E	N	F	L	A	S	H	I	N	G							D 2000	
14.8	8.3	7.4	6.3	5.4	8	6.2	5.4	7.4	6.8	7.4	3.2	7.2	5.4	14.8				84.5	

FILENAME: US 64-74

NORTH CAROLINA D.O.T. SIGN DETAIL

