



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

May 24, 2017

ADDENDUM # 2

To: Plan Holders
From: Wanda H. Austin, PE
Division 14 Project Team Lead

DS
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RE: **Addition of Pay Items, Project Special Provision, Revision of Quantities, and Answers to Bidder Questions.**
Contract ID: DN00122
County: Polk
Letting Date: **May 30, 2017**

The above contract proposal has been experienced the following changes:

1. Bidder inquired whether the portable barriers are to be water-filled or concrete. It has been determined that the **portable barriers are to be concrete.**
2. On page **G-3**, on the line above the words "Erosion Control" **insert** the following text:

TRAFFIC CONTROL..... TC
3. Between pages G-84 and EC-1 insert pages TC-1 through TC-4 (see attached).
4. Pay Item Number **4465000000-N, Temporary Crash Cushions**, has been added.
5. Pay Item Number **4470000000-N, Reset Temporary Crash Cushion**, has been added.
6. Pay Item Number **4485000000-E, Portable Concrete Barrier**, has been added.
7. Pay Item Number **4600000000-N, Generic Traffic Control Item (Portable Traffic Signal System, Pre-Timed; 2 Head)**, has been added.
8. The **quantity** for Pay Item Number **4400000000-E, Work Zone Signs (Stationary)**, has been revised; it is now **192 SF.**

9. In both the **DN00122 STANDARD PDF PLANS – ROADWAY** and the **DN00122 INDIVIDUAL PLAN SHEETS – ROADWAY**, **replace** the existing SHEET NO. SIG-1, with **revised SHEET NO. SIG-1** (see attachment)

Please access ebs addenda files on Bid Express®.

Please insert this letter into the addendum section of the proposal and sign the verification. Thank you for your attention to this matter.

PROJECT SPECIAL PROVISIONS**TRAFFIC CONTROL****PORTABLE TRAFFIC SIGNAL SYSTEM****DESCRIPTION**

Furnish, install, place in operation, repair, maintain, relocate, and remove portable traffic signal systems. Comply with the provisions of Section 1700 of the 2012 *Standard Specifications for Roads and Structures*.

MATERIALS

Provide a complete portable traffic signal system that is totally mobile and capable of being relocated as traffic conditions demand. Design the system for operation both with and without an external power source. Furnish two signal control trailers with two vehicle signal heads per trailer and one operator unit for each portable traffic signal system. Furnish transmitters, generators, batteries, controls, back-up systems and all other components necessary to operate the system.

Ensure each system meets the physical display and operational requirements of conventional traffic signals as specified in PART IV of the *Manual on Uniform Traffic Control Devices (MUTCD)* and the *North Carolina Supplement to the MUTCD* in effect on the date of advertisement.

Used equipment will be acceptable if the equipment is in good working condition. Contractor retains ownership of the portable traffic signal systems.

Provide yellow 12-inch aluminum or polycarbonate vehicle signal heads with 10-inch tunnel visors, backplates and Light Emitting Diode (LED) modules. Provide aluminum signal heads and backplates listed on the Department's Qualified Products List (QPL) for traffic signal equipment. Provide polycarbonate signal heads and visors that comply with the provisions pertaining to Signal Heads within these *Project Special Provisions* with the following exceptions:

Fabricate signal head housings, end caps, and visors from virgin polycarbonate material. Provide U.V. stabilized polycarbonate plastic with a minimum thickness of 0.1 ± 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):

Test	Required	Method
Specific Gravity	1.17 minimum	ASTM D 792
Vicat Softening Temperature, °F	305-325	ASTM D 1525
Brittleness Temperature, °F	Below -200	ASTM D 746
Flammability	Self-extinguishing	ASTM D 635
Tensile Strength, yield, PSI	8500 minimum	ASTM D 638
Elongation at yield, %	5.5-8.5	ASTM D 638
Shear, strength, yield, PSI	5500 minimum	ASTM D 732
Izod impact strength, ft-lb/in [notched, 1/8 inch]	15 minimum	ASTM D 256
Fatigue strength, PSI at 2.5 mm cycles	950 minimum	ASTM D 671

To minimize signal head movement due to wind, mount top and bottom of signal heads to the signal head supports.

Provide 120V AC powered LED modules listed on the QPL, or provide 12V DC powered LED modules that meet the *ITE VTCSH Part 2: Light Emitting Diode (LED) Vehicle Signal Modules (Interim Purchase Specification)* with the exception of paragraphs 5.2, 5.3, 5.7, and testing associated with 120V AC. Ensure DC powered LED modules operate with input power between 9V DC and 15V DC.

Provide trailers that have durable paint in highway orange, Federal Standard 595C Color Chip ID # 12473 with a minimum paint thickness of 2.5 mils.

Provide trailers with a 12-volt trailer lighting system complying with *Federal Motor Carrier Safety Regulations 393*, safety chains, and a 2-inch ball hitch. When provided, locate generators, fuel tanks, batteries and electronic controls in protective housings that are provided with locks to restrict access.

Design the trailer assembly and signal supports to withstand an 80 MPH wind load with the signal supports raised in the operating position. Provide independent certification from a registered Professional Engineer that the assembly meets this 80 MPH wind load requirement. Provide a reliable hydraulic, electric or manual means for raising and lowering the signal support members. Provide screw-type stabilizing and leveling devices with a self-leveling foot to support the unit in the operating position on slopes 1V:3H or flatter when detached from the transporting vehicle.

During manual operation, ensure the system provides a means of informing the operator of signal indications, such as a light on the back of each signal head that illuminates when the signal displays a red indication.

Design the portable traffic signal system to perform without interruption during the time it is in operation.

Where a traffic actuated system is required, provide a system control unit that is capable of pre-timed operation, traffic actuated operation, a variable green time interval dependent upon vehicle actuations, and programmable yellow clearance and red clearance intervals. Furnish all sensors to monitor vehicle demands for vehicle actuation per the Project Special Provisions and Section 1098 of the Standard Specifications.

Design the systems to be fail-safe. Ensure the system monitors the following conditions: lack of green, yellow, and red signal indication voltage, total loss of indication on any approach, presence of multiple signal indications on any approach, conflicting green/yellow signal

indications, and low power condition. In the event any of these conditions are detected, immediately begin flashing operation of red indications in all directions.

Provide either hard-wired, microwave, or radio controlled type communications for pre-timed and traffic actuated portable traffic signal systems. In the event a loss of communication is detected, immediately begin flashing operation of red indications in all directions.

Ensure systems that use wireless communication links continuously monitor and verify proper transmission and reception of data used to monitor and control each signal head. Ensure ambient mobile or other radio transmissions or adverse weather conditions do not affect the system. Encode signal transmissions digitally to protect radio transmissions from interference. Do not violate FCC regulations and ensure radio frequencies are appropriate for portable signal equipment applications.

Upon detecting a malfunction, ensure all signals go to a flashing red condition and the operator is notified by a reliable means approved by the Engineer. Provide a battery back-up system for generator and direct current powered signal systems to power the warning means and "flashing red" condition. Provide a back-up system with a 72-hour minimum reserve.

Ensure the system meets the Environmental Standards for traffic signals in accordance with NEMA TS-1, Section 2.

CONSTRUCTION METHODS

Do not use portable traffic signal systems in a work area with intersecting streets or driveways, unless directed by the Engineer.

Do not install portable traffic signal within 300 feet of at-grade railroad crossing.

During automatic operation, ensure the motorist has an unobstructed view of opposing traffic.

Ensure the distance between signal units does not exceed 500 feet unless otherwise shown on the plans or directed by the Engineer. If modification to the distance between signal units is required after the units are positioned, relocate the signals or the system and make the necessary timing revisions only as directed by the Engineer.

Submit a traffic signal timing plan to the Engineer for approval a minimum of two weeks prior to installation. Include the following items in the plan: distance between stop bars, speed limit to be posted during operation, each approach grade, recommended yellow change interval, recommended red clearance interval, recommended minimum and maximum green intervals. Make timing changes to approved signal timing plan only as authorized by the Engineer. Keep a written record of all timing changes.

Allow only trained operators to set up and operate the system. Provide an experienced operator at all times for each portable traffic signal system during periods of manual operation. Do not violate yellow change and red clearance intervals during periods of manual operation. During manual operation, ensure the operator has an unobstructed view of the motorists and all signal head units. Locate the operator as close to the center of the operation as possible.

Perform all maintenance operations required by the system manufacturer including periodic cleaning of the systems. Ensure properly skilled and trained maintenance personnel are available to maintain the system in good working order and to perform all emergency and preventive maintenance as recommended by the system manufacturer.

Furnish the Engineer with the name, office telephone number, cellular (mobile) telephone number, and pager number of the supervisory employee who will be responsible for maintenance and repair of equipment during all hours.

For all failures, malfunctions, or damage to this equipment, begin necessary repairs within four hours of notification. Complete repairs within eight hours of notification. Comply with Section 150 for maintenance of traffic flow. The inability to contact the supervisory employee or prearranged alternate will not extend repair time requirements.

In the event that the system becomes inoperative, be prepared at all times to revert to flagging operations or suspend all construction activities requiring the use of the portable traffic signal system until the system is restored to proper operation. Implement flagging operations as shown on 2012 Roadway Standard Drawing No. 1101.02 Sheet 1 (Closure of one lane of a Two-lane, Two-way Highway).

When not in operation, remove signal heads from the view of traffic or cover signal heads with burlap bags or bags made of non-ripping material specifically designed for covering signal heads. Do not use trash bags of any type. Remove, cover, fold, or turn all inappropriate signs so that they are not readable by oncoming traffic.

MEASUREMENT AND PAYMENT

Actual number of portable traffic signal systems furnished, installed, operated, removed, and accepted.

No measurement will be made for operation, relocation, maintenance, removal of each system, or use of flaggers during repair periods as these will be considered incidental to furnishing, installing, and operating the portable traffic signal systems.

No measurement will be made for signal controller, communication cable, messenger cable, wireless communication, inductive loop sawcut, loop emulator detection system, machine vision detection system, microwave detection system, detector channel/unit, detector lead-in cable, trenching, vehicle signal heads, signal head support assemblies, signal cable, and traffic signal software as these will be considered incidental to furnishing, installing, and operating the portable traffic signal systems.

Payment will be made under:

Portable Traffic Signal System (actuated)	Each
Portable Traffic Signal System (pre-timed)	Each

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County : Polk

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
ROADWAY ITEMS						
0001	0000100000-N	800	MOBILIZATION	Lump Sum	L.S.	
0002	0000400000-N	801	CONSTRUCTION SURVEYING	Lump Sum	L.S.	
0003	0008000000-E	200	SUPPLEMENTARY CLEARING & GRUB-BING	1 ACR		
0004	0036000000-E	225	UNDERCUT EXCAVATION	50 CY		
0005	0043000000-N	226	GRADING	Lump Sum	L.S.	
0006	0195000000-E	265	SELECT GRANULAR MATERIAL	50 CY		
0007	0196000000-E	270	GEOTEXTILE FOR SOIL STABILIZATION	50 SY		
0008	0199000000-E	SP	TEMPORARY SHORING	630 SF		
0009	0318000000-E	300	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	10 TON		
0010	0320000000-E	300	FOUNDATION CONDITIONING GEOTEXTILE	20 SY		
0011	0372000000-E	310	18" RC PIPE CULVERTS, CLASS III	60 LF		
0012	0995000000-E	340	PIPE REMOVAL	41 LF		
0013	1099700000-E	505	CLASS IV SUBGRADE STABILIZATION	50 TON		
0014	1220000000-E	545	INCIDENTAL STONE BASE	70 TON		
0015	1489000000-E	610	ASPHALT CONC BASE COURSE, TYPE B25.0B	180 TON		
0016	1519000000-E	610	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	250 TON		
0017	1575000000-E	620	ASPHALT BINDER FOR PLANT MIX	23 TON		
0018	3030000000-E	862	STEEL BM GUARDRAIL	150 LF		
0019	3150000000-N	862	ADDITIONAL GUARDRAIL POSTS	5 EA		

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0020	3165000000-N	SP	GUARDRAIL ANCHOR UNITS, TYPE ***** (TYPE 350 TL-2)	4	EA	
0021	3380000000-E	862	TEMPORARY STEEL BM GUARDRAIL	81.3	LF	
0022	3387000000-N	862	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE ***** (TYPE 350 TL-2)	2	EA	
0023	3649000000-E	876	RIP RAP, CLASS B	2	TON	
0024	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	7	SY	
0025	4400000000-E	1110	WORK ZONE SIGNS (STATIONARY)	192	SF	
0026	4410000000-E	1110	WORK ZONE SIGNS (BARRICADE MOUNTED)	20	SF	
0027	4430000000-N	1130	DRUMS	26	EA	
0028	4445000000-E	1145	BARRICADES (TYPE III)	32	LF	
0029	4810000000-E	1205	PAINT PAVEMENT MARKING LINES (4")	4,680	LF	
0030	4835000000-E	1205	PAINT PAVEMENT MARKING LINES (24")	20	LF	
0031	4870000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES (24")	20	LF	
0032	6000000000-E	1605	TEMPORARY SILT FENCE	530	LF	
0033	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	65	TON	
0034	6012000000-E	1610	SEDIMENT CONTROL STONE	65	TON	
0035	6015000000-E	1615	TEMPORARY MULCHING	0.5	ACR	
0036	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	100	LB	
0037	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEED- ING	0.5	TON	

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Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0038	6024000000-E	1622	TEMPORARY SLOPE DRAINS	100		LF
0039	6029000000-E	SP	SAFETY FENCE	200		LF
0040	6030000000-E	1630	SILT EXCAVATION	90		CY
0041	6036000000-E	1631	MATTING FOR EROSION CONTROL	1,060		SY
0042	6037000000-E	SP	COIR FIBER MAT	100		SY
0043	6042000000-E	1632	1/4" HARDWARE CLOTH	65		LF
0044	6070000000-N	1639	SPECIAL STILLING BASINS	2		EA
0045	6071010000-E	SP	WATTLE	90		LF
0046	6071020000-E	SP	POLYACRYLAMIDE (PAM)	10		LB
0047	6084000000-E	1660	SEEDING & MULCHING	0.5		ACR
0048	6090000000-E	1661	SEED FOR REPAIR SEEDING	50		LB
0049	6093000000-E	1661	FERTILIZER FOR REPAIR SEEDING	0.25		TON
0050	6096000000-E	1662	SEED FOR SUPPLEMENTAL SEEDING	50		LB
0051	6108000000-E	1665	FERTILIZER TOPDRESSING	0.5		TON
0052	6111000000-E	SP	IMPERVIOUS DIKE	285		LF
0053	6117000000-N	SP	RESPONSE FOR EROSION CONTROL	7		EA
0054	6132000000-N	SP	GENERIC EROSION CONTROL ITEM (ONSITE CONCRETE WASHOUT STRUCTURE)	1		EA
0063	4465000000-N	1160	TEMPORARY CRASH CUSHIONS	2		EA
0064	4470000000-N	1160	RESET TEMPORARY CRASH CUSHION	1		EA
0065	4485000000-E	1170	PORTABLE CONCRETE BARRIER	110		LF

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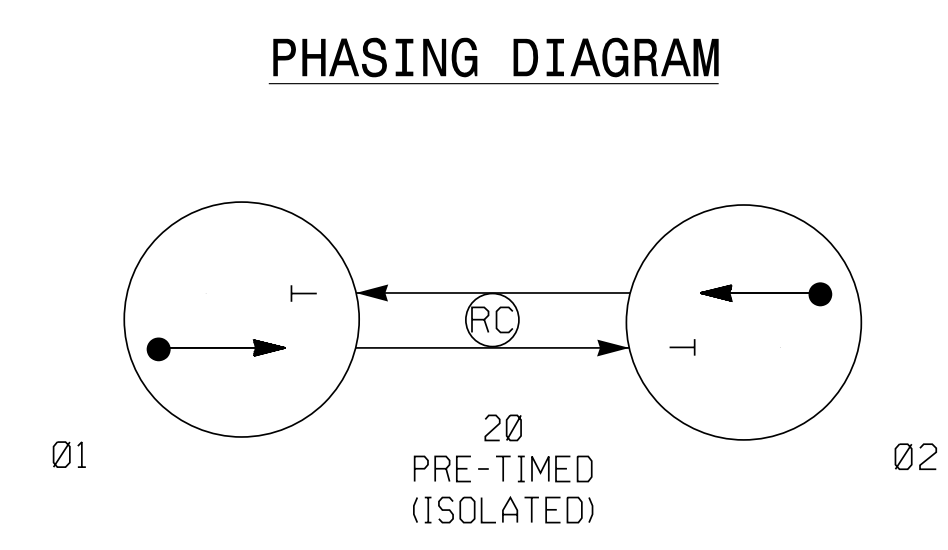
Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0066	4600000000-N	SP	GENERIC TRAFFIC CONTROL ITEM (PORTABLE TRAFFIC SIGNAL SYSTEM, PRE-TIMED; 2 HEAD)	1	EA	

CULVERT ITEMS

0055	8035000000-N	402	REMOVAL OF EXISTING STRUCTURE AT STATION ***** (STA 13+47.70)	Lump Sum	L.S.	
0056	8126000000-N	414	CULVERT EXCAVATION, STA ***** (STA 13+47.70)	Lump Sum	L.S.	
0057	8133000000-E	414	FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	65	TON	
0058	8196000000-E	420	CLASS A CONCRETE (CULVERT)	127.3	CY	
0059	8245000000-E	425	REINFORCING STEEL (CULVERT)	17,111	LB	
0060	8608000000-E	876	RIP RAP CLASS II (2'-0" THICK)	127	TON	
0061	8818000000-E	SP	GENERIC CULVERT ITEM (CHANNEL SUBSTRATE MATERIAL)	72	TON	
0062	8860000000-N	SP	GENERIC STRUCTURE ITEM (ASBESTOS ASSESSMENT)	Lump Sum	L.S.	

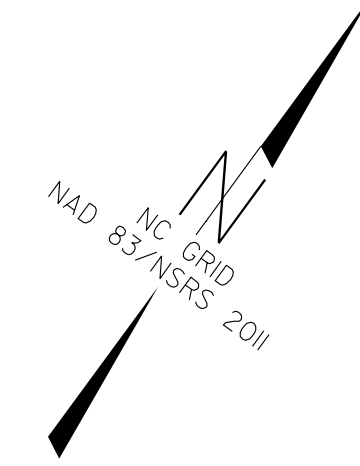
0959/May24/Q27220.85/D289559230000/E66

Total Amount Of Bid For Entire Project :



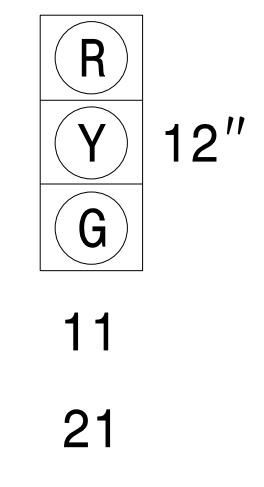
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT



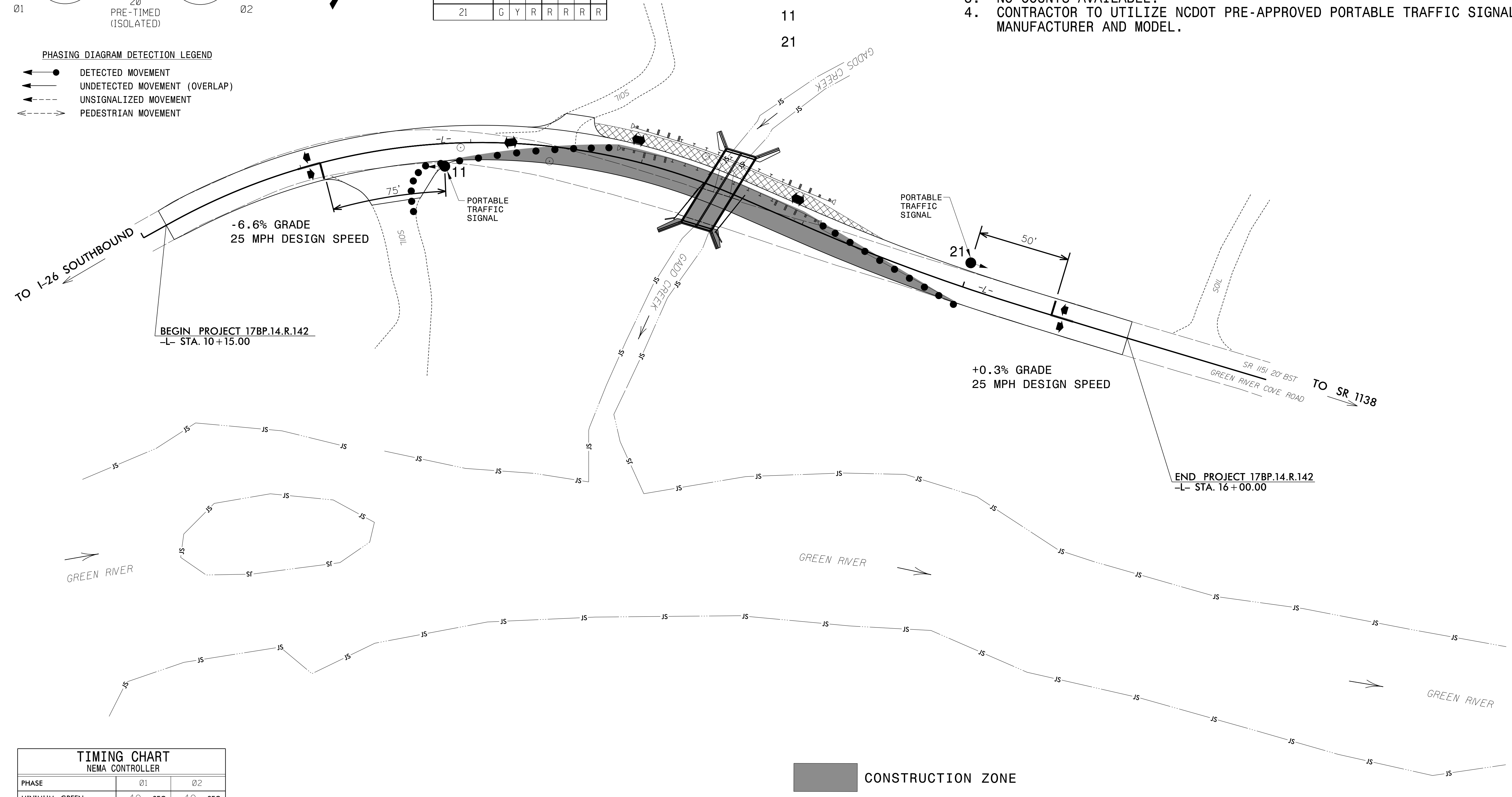
SIGNAL FACE	TABLE OF OPERATION				FLASH		
	02		01				
	R/W	CLEAR	R/W	CLEAR			
11	R	R	R	G	Y	R	R
21	G	Y	R	R	R	R	R

SIGNAL FACE I.D.



NOTES

1. PORTABLE TEMPORARY INSTALLATION.
2. SIGNAL HEADS SHALL BE NO CLOSER THAN 40 FEET FROM THE STOPLINE.
3. NO COUNTS AVAILABLE.
4. CONTRACTOR TO UTILIZE NCDOT PRE-APPROVED PORTABLE TRAFFIC SIGNAL MANUFACTURER AND MODEL.



TIMING CHART		
NEMA CONTROLLER		
PHASE	01	02
MINIMUM GREEN	40 SEC.	40 SEC.
PASSAGE GAP	0 SEC.	0 SEC.
YELLOW CHANGE INT.	4.0 SEC.	4.0 SEC.
RED CLEARANCE	20 SEC.	20 SEC.
MAX. 1	65 SEC.	65 SEC.
RECALL POSITION	MAX. RECALL	MAX. RECALL
VEHI. CALL MEMORY	-	-

CONSTRUCTION ZONE

Prepared in the Offices of:

Asheville, North Carolina 28833-2706

PORTABLE TRAFFIC SIGNAL PLAN
SR 1151 GREEN RIVER COVE ROAD

DIV. 14 POLK COUNTY

PLAN DATE: 2/26/15 REVIEWED BY: LDB

PREPARED BY: WCC REVIEWED BY:

SEAL

ENGINEER
LLOYD D. BROWN

DATE: 2/26/15

SCALE		REVISIONS		INIT.		DATE	
0	30						

4/7/2017 5:41:03 PM S:\mrsport\101\on31235-13_1441_Polk_189\TrafficControl\CP-100-51144\1_SIG-1.dgn User: jdoe