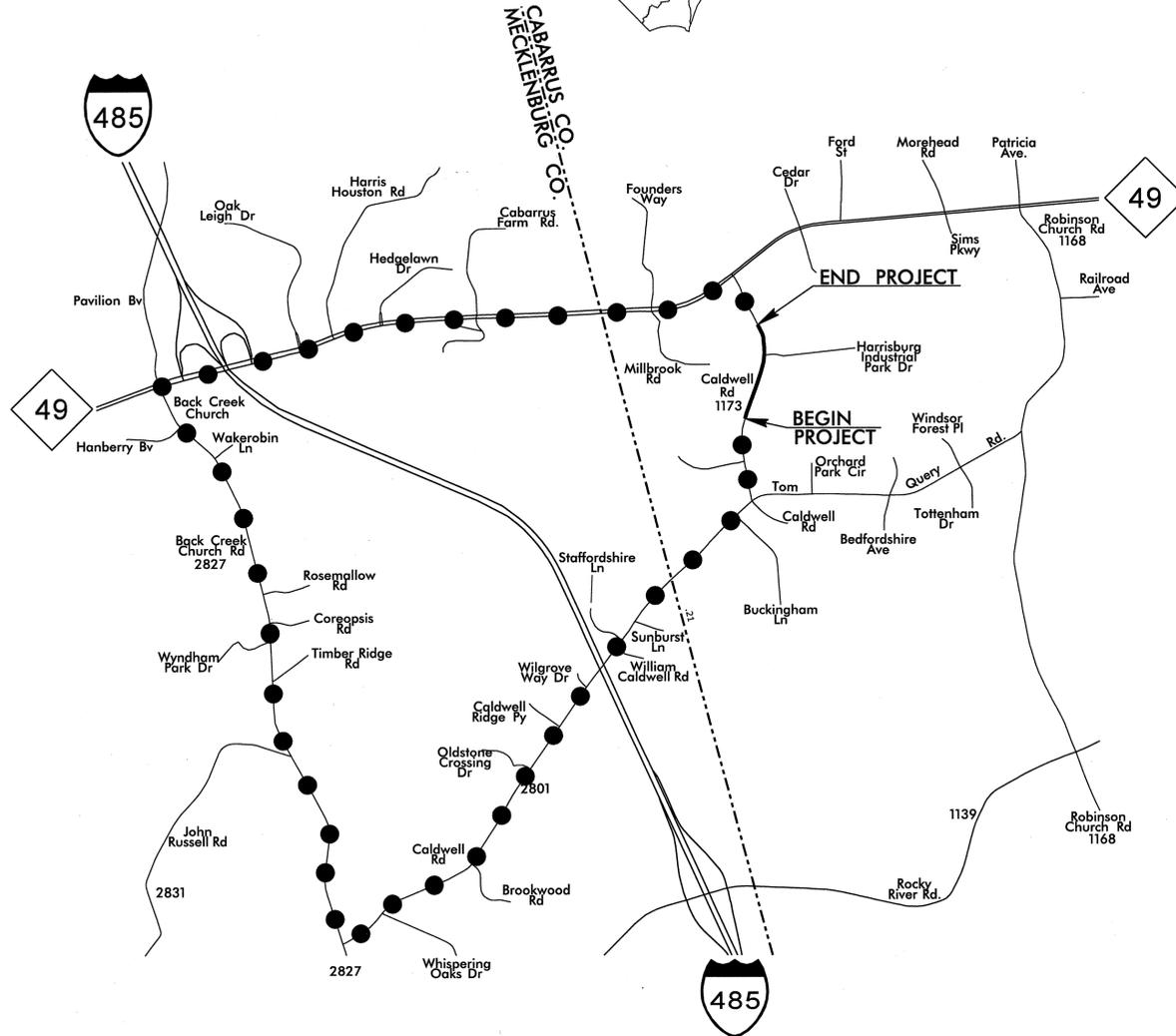


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN
CABARRUS COUNTY



SHEET NO.	TITLE
TMP-1	TITLE SHEET, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, AND TEMPORARY PAVEMENT MARKING
TMP-1B AND TMP-1C	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES AND LOCAL NOTES)
TMP-2	PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS
TMP-2A	TEMPORARY SHORING DATA
TMP-3	TEMPORARY TRAFFIC CONTROL PHASING (PHASE I)
TMP-4 THRU TMP-6	TEMPORARY TRAFFIC CONTROL PHASE I DETAILS
TMP-7	TEMPORARY TRAFFIC CONTROL PHASING (PHASE II)
TMP-8 AND TMP-9	TEMPORARY TRAFFIC CONTROL PHASE II DETAILS
TMP-10	TEMPORARY TRAFFIC CONTROL PHASING (PHASE III)
TMP-11 THRU TMP-13	TEMPORARY TRAFFIC CONTROL PHASE III DETAILS
SD-1,2	SPECIAL SIGN DESIGN(S)

P-5208F

TIP PROJECT:

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N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 773-2800 FAX: (919) 771-2745

J. S. BOURNE, P.E. STATE TRAFFIC MANAGEMENT ENGINEER
LAWRENCE GETTIER, P.E. TRAFFIC CONTROL PROJECT ENGINEER
JESSIE GILSTRAP TRAFFIC CONTROL PROJECT DESIGN ENGINEER
TRAFFIC CONTROL DESIGN ENGINEER



ETHERILL ENGINEERING
559 Jones Franklin Rd. Suite 164
Raleigh, N.C. 27606
License No. F-25377
Bus: 919 851 8077
Fax: 919 851 8107

APPROVED: *[Signature]*
DATE: 1/21/13

SEAL

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ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1170.01	PORTABLE CONCRETE BARRIER
1180.01	SKINNY - DRUM
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - (PERMANENT AND TEMPORARY)

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING
- WORK AREA
- REMOVAL
- TEMPORARY PAVEMENT

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- DRUM
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

TEMPORARY PAVEMENT MARKING

		Pavement Marking Schedule TIP Project # P-5208F	
SYMBOL	DESCRIPTION		
TEMPORARY PAVEMENT MARKINGS			
CA	WHITE EDGELINE	COLD APPLIED PLASTIC (4")	Type4 - Removable Tape
CI	YELLOW DOUBLE CENTER		
		COLD APPLIED PLASTIC (24")	Type4 - Removable Tape
C2	WHITE STOP BAR		
PA	WHITE EDGELINE		PAINT(4")
PI	YELLOW DOUBLE CENTER		
			PAINT(24")
P2	WHITE STOP BAR		
MARKERS			
MH	YELLOW & YELLOW		TEMPORARY RAISED PAVEMENT MARKERS

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<p>559 Jones Franklin Rd. Suite 164 Raleigh, N.C. 27606 License No. F-0377 Bus: 919 851 8077 Fax: 919 851 8107</p> <p style="font-size: small;">TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION</p>	APPROVED: <i>Bob A. May</i> DATE: <i>12/12/12</i> 		<h2 style="margin: 0;">ROADWAY STANDARD DRAWINGS & LEGEND</h2>
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MANAGEMENT STRATEGIES

CONSTRUCTION ON SR 1173 (CALDWELL ROAD) WILL BE PERFORMED UTILIZING A ROAD CLOSURE WITH THRU TRAFFIC DETOURED OFF-SITE. LOCAL TRAFFIC WILL BE MAINTAINED TO EXISTING BUSINESSES AND HARRISBURG INDUSTRIAL PARK DRIVE AT ALL TIMES.

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRABLE OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

- A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.
- B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.
- C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.
- D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

- E) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.
PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.
- F) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

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Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

APPROVED: *Bob A. May* DATE: *1/21/13*

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21116 BOB A. MAY



TRANSPORTATION OPERATIONS PLAN

GENERAL NOTES (CONT'D)

PAVEMENT EDGE DROP OFF REQUIREMENTS

- G) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:
- BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.
- BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.
- BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.
- H) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 500 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

- I) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

- J) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC BARRIER

- K) INSTALL TEMPORARY BARRIER ACCORDING TO THE TRAFFIC CONTROL PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRAFFIC CONTROL PLANS OR AS DIRECTED BY THE ENGINEER.

DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE/RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRAFFIC CONTROL PLANS, TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.

INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.

INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER CAN BE PLACED OR AFTER THE TEMPORARY BARRIER IS REMOVED.

- L) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED IMPACT ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS:

POSTED SPEED LIMIT	MINIMUM OFFSET
40 OR LESS	15 FT
45 - 50	20 FT
55	25 FT
60 MPH or HIGHER	30 FT

TRAFFIC CONTROL DEVICES

- M) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS) FOR ADDITIONAL REQUIREMENTS.
- N) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.
- O) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.
- P) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.
- Q) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

LOCAL NOTES

- 1) COORDINATE THE FOLLOWING WORK WITH THE ENGINEER:

-L- STA. 29+90+/- TO STA. 33+75.00 AND -DRRT3- SHALL BE CONSTRUCTED DURING NON-BUSINESS HOURS UNTIL COMPLETION IN ORDER TO AVOID IMPACTS TO THE EXISTING BUSINESS LOCATED AT -L- STA. 30+25+/- (RIGHT) AND AS SHOWN ON TMP-12 (ALSO SEE TMP-10 FOR PHASING).

IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 1000 FT AND 500 FT RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF UNPAVED ROADWAY AREAS.

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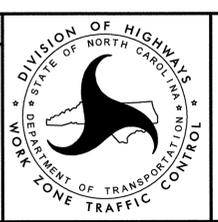
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TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

APPROVED: *bl. G. May* DATE: *12/12*

SEAL

NORTH CAROLINA
 PROFESSIONAL
 SEAL
 21116
 ENGINEER
 BOB A. MAY



TRANSPORTATION OPERATIONS PLAN

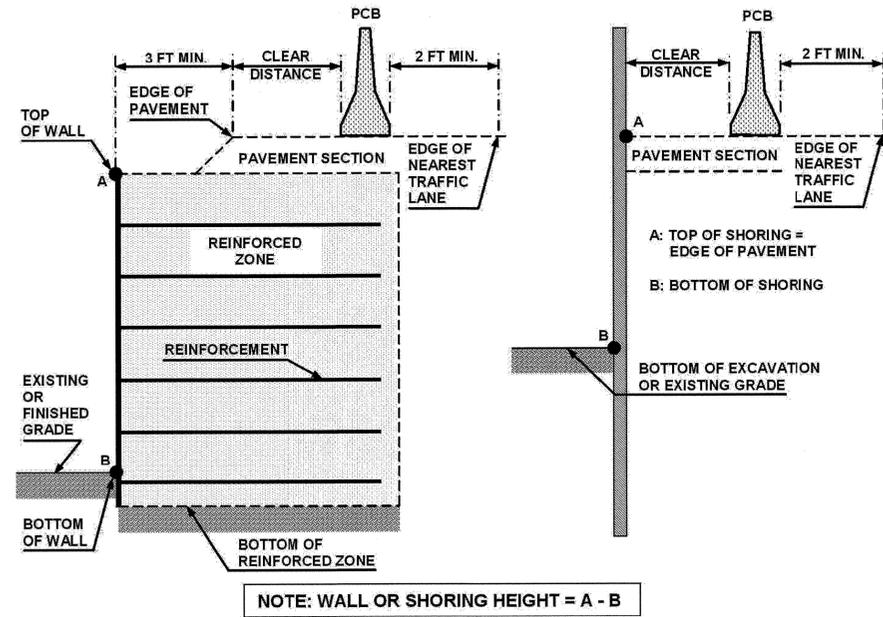


FIGURE A

NOTES

- REFER TO THE TRAFFIC CONTROL PLANS FOR TEMPORARY SHORING LOCATIONS AND NOTES.
- REFER TO THE "TEMPORARY SHORING" PROJECT SPECIAL PROVISION FOR INFORMATION ABOUT TEMPORARY SHORING AND PORTABLE CONCRETE BARRIER (PCB).
- PCB IS REQUIRED IF TEMPORARY SHORING IS LOCATED WITHIN THE CLEAR ZONE IN ACCORDANCE WITH THE AASHTO ROADSIDE DESIGN GUIDE. DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE. (CONTACT NCDOT PAVEMENT MANAGEMENT UNIT FOR APPLICABLE PAVEMENT DESIGN).
- BASED ON THE CLEAR DISTANCE, OFFSET, DESIGN SPEED AND PAVEMENT TYPE, CHOOSE AN UNANCHORED OR ANCHORED PCB FROM THE TABLE SHOWN IN FIGURE B. CLEAR DISTANCE IS DEFINED AS SHOWN IN FIGURE A AND OFFSET IS DEFINED AS SHOWN IN FIGURE B.
- AT THE CONTRACTOR'S OPTION OR IF THE MINIMUM REQUIRED CLEAR DISTANCE IS NOT AVAILABLE, SET PCB NEXT TO AND UP AGAINST THE TRAFFIC SIDE OF THE TEMPORARY SHORING EXCEPT FOR BARRIER ABOVE TEMPORARY WALLS. PCB WITH THE MINIMUM REQUIRED CLEAR DISTANCE IS REQUIRED ABOVE TEMPORARY WALLS.
- USE NCDOT PORTABLE CONCRETE BARRIER (PCB) IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1170.01 AND SECTION 1170 OF THE STANDARD SPECIFICATIONS.
- PCB REQUIREMENTS FOR TEMPORARY WALLS APPLY TO TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS AND TEMPORARY SOIL NAIL WALLS.
- SET PCB WITH A MINIMUM HORIZONTAL DISTANCE OF 2 FT BETWEEN THE FRONT FACE OF THE BARRIER AND THE EDGE OF THE NEAREST TRAFFIC LANE AS SHOWN IN FIGURE A UNLESS OTHERWISE SHOWN IN THE PLANS AND OR AS APPROVED BY THE ENGINEER.
- FOR PCB ABOVE AND BEHIND TEMPORARY WALLS, PROVIDE A MINIMUM DISTANCE OF 3 FT BETWEEN THE EDGE OF PAVEMENT AND THE WALL FACE AS SHOWN IN FIGURE A. IF THESE MINIMUM REQUIRED DISTANCES ARE NOT AVAILABLE, CONTACT THE ENGINEER.
- TABLE SHOWN IN FIGURE B IS BASED ON NCDOT RESEARCH PROJECT NO. 2005-010 WITH VEHICLE TYPE USED FOR NCHRP 350 CRASH TESTS. BARRIER DEFLECTIONS AND RESULTING MINIMUM REQUIRED CLEAR DISTANCES MIGHT VARY SIGNIFICANTLY FOR LARGER HEAVIER VEHICLES, RUNS OF BARRIER LESS THAN 200 FT IN LENGTH AND WET OR DRY PAVEMENT.

MINIMUM REQUIRED CLEAR DISTANCE, inches

Barrier Type	Pavement Type	Offset * ft	Design Speed, mph					
			<30	31-40	41-50	51-60	61-70	71-80
Unanchored PCB	Asphalt	<8	24	26	29	32	36	40
		8-14	26	28	31	35	38	42
		14-20	27	29	34	36	39	43
		20-26	28	31	35	38	40	44
		26-32	29	32	36	39	42	45
		32-38	30	34	38	41	43	46
		38-44	31	34	41	43	45	48
		44-50	31	35	41	43	46	49
		50-56	32	36	42	44	47	50
	>56	32	36	42	45	47	51	
	Concrete	<8	17	18	21	22	25	26
		8-14	19	20	23	25	26	29
		14-20	22	22	24	26	28	31
		20-26	23	24	26	27	30	34
		26-32	24	25	27	28	32	35
		32-38	24	26	27	30	33	36
		38-44	25	26	28	30	34	37
		44-50	26	26	28	32	35	37
50-56		26	26	28	32	35	38	
>56	26	27	29	32	36	38		
Anchored PCB	Asphalt	All Offsets	24 for All Design Speeds					
Anchored PCB	Concrete (including bridge approach slabs)	All Offsets	12 for All Design Speeds					

* See Figure Below

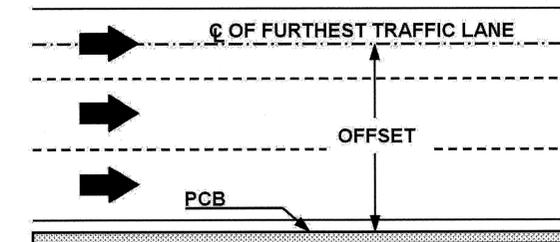
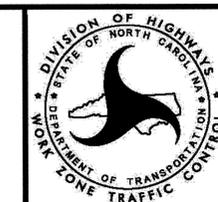


FIGURE B



PORTABLE CONCRETE BARRIER
AT
TEMPORARY SHORING LOCATIONS

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DGN

TEMPORARY SHORING LINE NO. 1

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING SPECIFICATION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM -L- STATION 23+45, 68' LEFT TO -Y2- STATION 14+00, 10' RIGHT FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

UNIT WEIGHT (γ) = 120 LB/CF
 FRICTION ANGLE (ϕ) = 30 DEGREES
 COHESION (c) = 0 LB/SF
 GROUNDWATER ELEVATION = 6' FROM BOTTOM OF SHORING

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM -L- STATION 23+45, 68' LEFT TO -Y2- STATION 14+00, 10' RIGHT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

AT THE CONTRACTOR'S OPTION, USE A STANDARD TEMPORARY WALL FOR TEMPORARY SHORING FROM -L- STATION 23+45 68' LEFT TO -Y2- STATION 14+00, 10' RIGHT. SEE STANDARD DRAWING NO. 1801.02 FOR STANDARD TEMPORARY WALLS.

WHEN BACKFILL FOR BRIDGE APPROACH FILLS OVERLAPS WITH THE REINFORCED ZONE OF TEMPORARY WALLS, USE SHORING BACKFILL OR BACKFILL MATERIAL REQUIRED FOR BRIDGE APPROACH FILLS, WHICHEVER IS BETTER, IN THE REINFORCED ZONE OF TEMPORARY WALLS.

TEMPORARY SHORING LINE NO. 2

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING SPECIFICATION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM -L- STATION 16+00, 6' RIGHT TO -L- STATION 23+45, 6' RIGHT FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

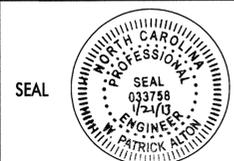
UNIT WEIGHT (γ) = 120 LB/CF
 FRICTION ANGLE (ϕ) = 30 DEGREES
 COHESION (c) = 0 LB/SF
 GROUNDWATER ELEVATION = 6' FROM BOTTOM OF SHORING

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING FROM -L- STATION 16+00, 6' RIGHT TO -L- STATION 23+45, 6' RIGHT. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

AT THE CONTRACTOR'S OPTION, USE A STANDARD TEMPORARY WALL FOR TEMPORARY SHORING FROM -L- STATION 16+00 6' RIGHT TO -L- STATION 23+45, 6' RIGHT. SEE STANDARD DRAWING NO. 1801.02 FOR STANDARD TEMPORARY WALLS.

WHEN BACKFILL FOR BRIDGE APPROACH FILLS OVERLAPS WITH THE REINFORCED ZONE OF TEMPORARY WALLS, USE SHORING BACKFILL OR BACKFILL MATERIAL REQUIRED FOR BRIDGE APPROACH FILLS, WHICHEVER IS BETTER, IN THE REINFORCED ZONE OF TEMPORARY WALLS.

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APPROVED: <i>Patrick Alton</i> DATE: 1/21/13		<p>TEMPORARY SHORING DATA</p>
		

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PHASE I

- STEP 1. INSTALL OFF-SITE DETOUR TRAILBLAZE SIGNS FOR CALDWELL RD. AND HARRISBURG INDUSTRIAL PARK DRIVE (SEE TMP-6).
 LOCATE 2 CHANGEABLE MESSAGE BOARDS ON CALDWELL ROAD FOR A 7-DAY COUNTDOWN-TO-CONSTRUCTION SEQUENCE AS SHOWN ON TMP-6.
 REFER TO TMP-4 AND TMP-5 FOR THE FOLLOWING WORK IN STEP 2 THRU STEP 5:
- STEP 2. INSTALL TYPE III BARRICADES AND SIGNS TO CLOSE CALDWELL RD. TO THRU TRAFFIC (SEE RSD 1101.03 SHT. 1 OF 9).
 TEMPORARILY INSTALL DRUMS TO PROVIDE A LEFT TURN ONLY MOVEMENT FROM EXISTING HARRISBURG INDUSTRIAL PARK AVENUE ONTO CALDWELL ROAD SOUTH UNTIL PLACEMENT OF TEMPORARY MARKINGS AND PORTABLE CONCRETE BARRIER.
- STEP 3. BEGIN PROPOSED -L- RAILROAD STRUCTURE AND APPROACHES FROM -L- STA. 23+50 TO STA. 29+90+/-.

WORK IN A CONTINUOUS MANNER TO COMPLETE THE FOLLOWING WORK OF STEP 4 IN TWO WEEKENDS FROM 7:00AM SATURDAY TO 6:00AM MONDAY (SEE INTERMEDIATE CONTRACT TIMES AND LIQUIDATED DAMAGES):

- STEP 4. USING RSD 1101.02, SHT. 1 OF 15, PLACE TRAFFIC IN A ONE-LANE, TWO-WAY PATTERN ON HARRISBURG INDUSTRIAL PARK DRIVE AND INSTALL PROPOSED 48" RCP-IV SECTIONS UNDER EXISTING PAVEMENT AS MUCH AS POSSIBLE. BACKFILL WITH INCIDENTAL STONE AS APPROVED BY THE ENGINEER AND RESTORE TRAFFIC TO A TWO-LANE, TWO-WAY OPERATION.
- STEP 5. USING RSD 1101.02, SHT. 1 OF 15, INSTALL TEMPORARY PAVEMENT MARKING EDGELINE AND TEMPORARY PORTABLE CONCRETE BARRIER ON -Y2- FOR THE TEMPORARY TWO-LANE, TWO-WAY TRAFFIC PATTERN IN STEP 6. SHIFT -Y2- TRAFFIC TO THE TEMPORARY PATTERN.
- STEP 6. BEGIN CONSTRUCTION OF 28' PROPOSED -Y2- (LEFT) ON HARRISBURG INDUSTRIAL PARK DRIVE. INSTALL TEMPORARY SHORING LINE ① ALONG -Y2- BEHIND PORTABLE CONCRETE BARRIER.
 CONSTRUCT 17' TEMPORARY PAVEMENT UP TO THE EDGE OF EXISTING PAVEMENT FROM -L- STA. 12+04 TO STA. 23+18 (RIGHT).

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 Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

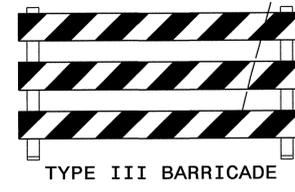
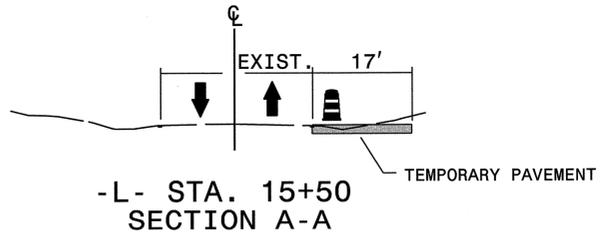
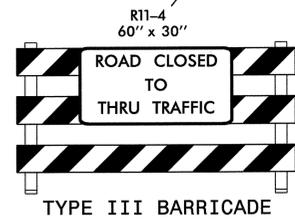
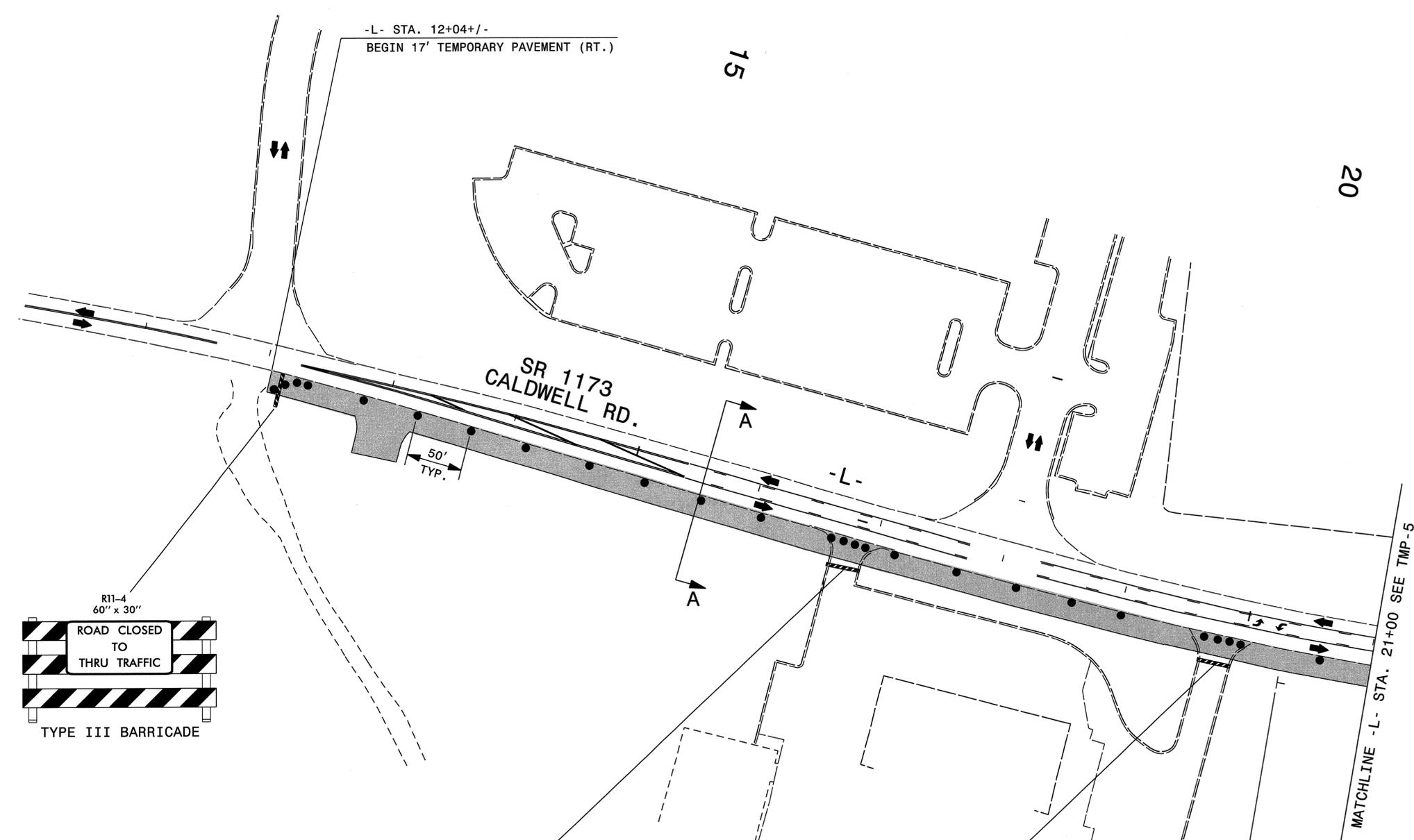
APPROVED: *Bob A. Wall* DATE: *1/11/13*

SEAL




PHASE I

0515DEL_P21a2



NOTES: SEE RSD 1101.03, SHEET 1 OF 9, FOR ADDITIONAL CALDWELL RD. ROAD CLOSURE WARNING SIGNING.
PAVEMENT MARKINGS SHOWN ARE EXISTING UNLESS OTHERWISE NOTED.

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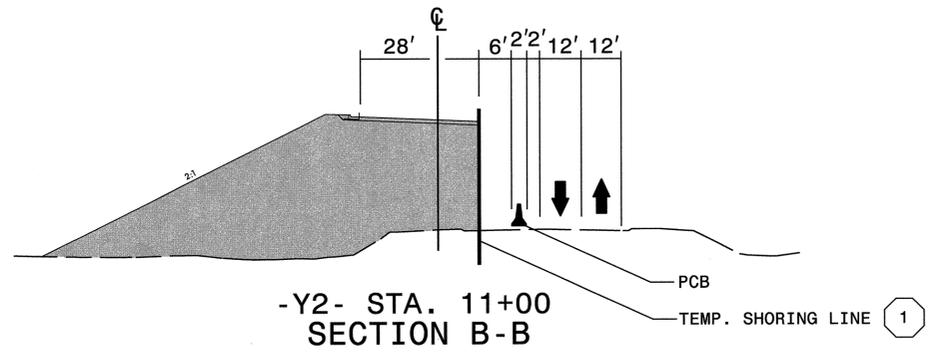
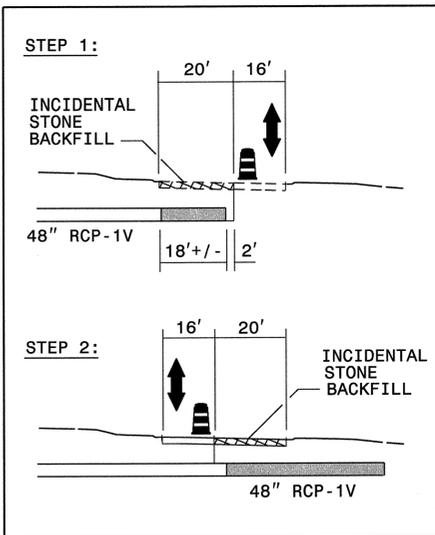
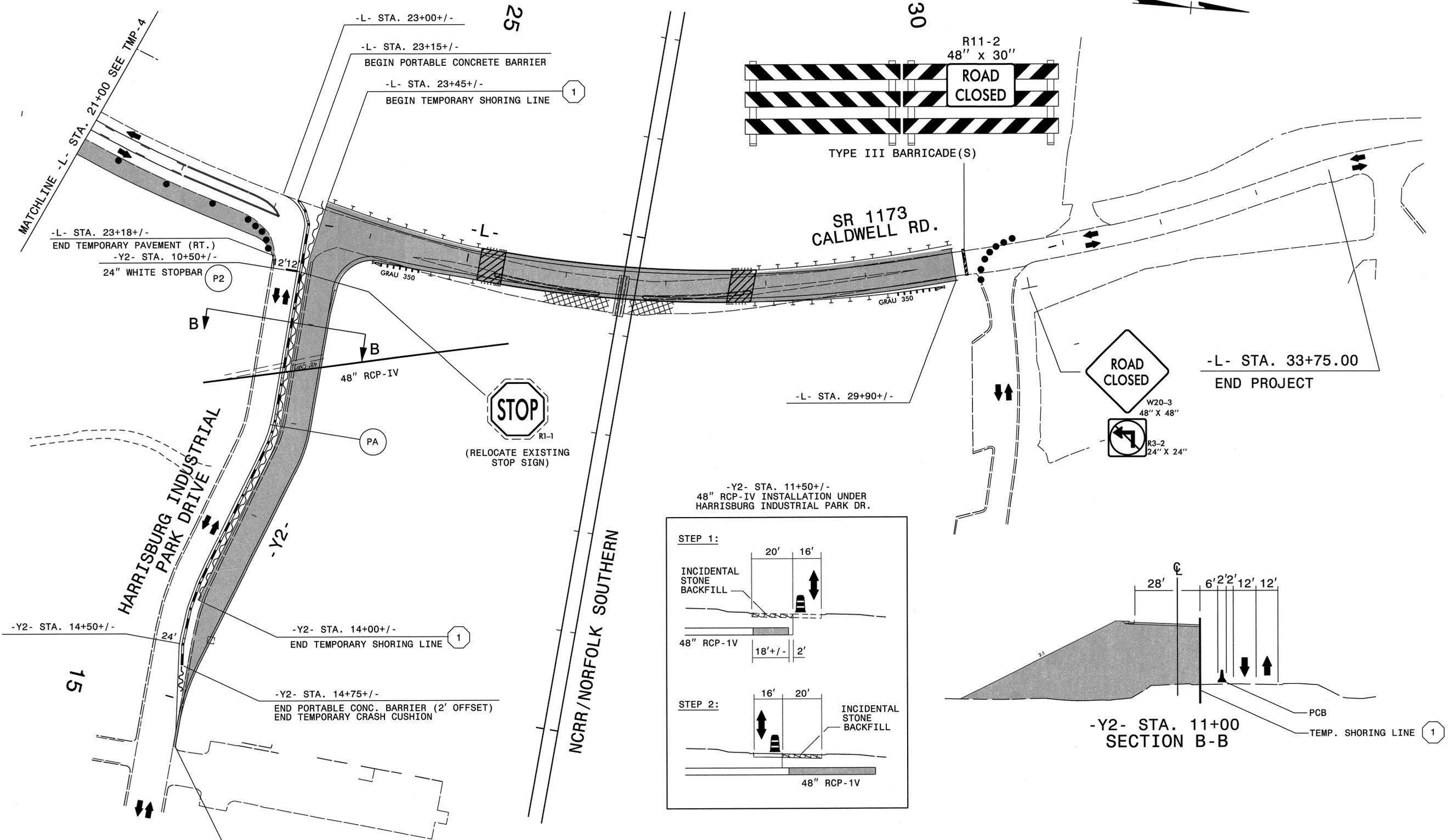
APPROVED: *Bob A. May* DATE: *11/10*

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1 QUANTITY = 11,300 SF

TEMPORARY SHORING
FROM STA. 23+45+/- -L-
TO STA. 14+00+/- -Y2-

(SEE SHEET TMP-2A FOR
TEMPORARY SHORING DATA)

SEE TMP-1A FOR TEMPORARY MARKING SCHEDULE

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CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

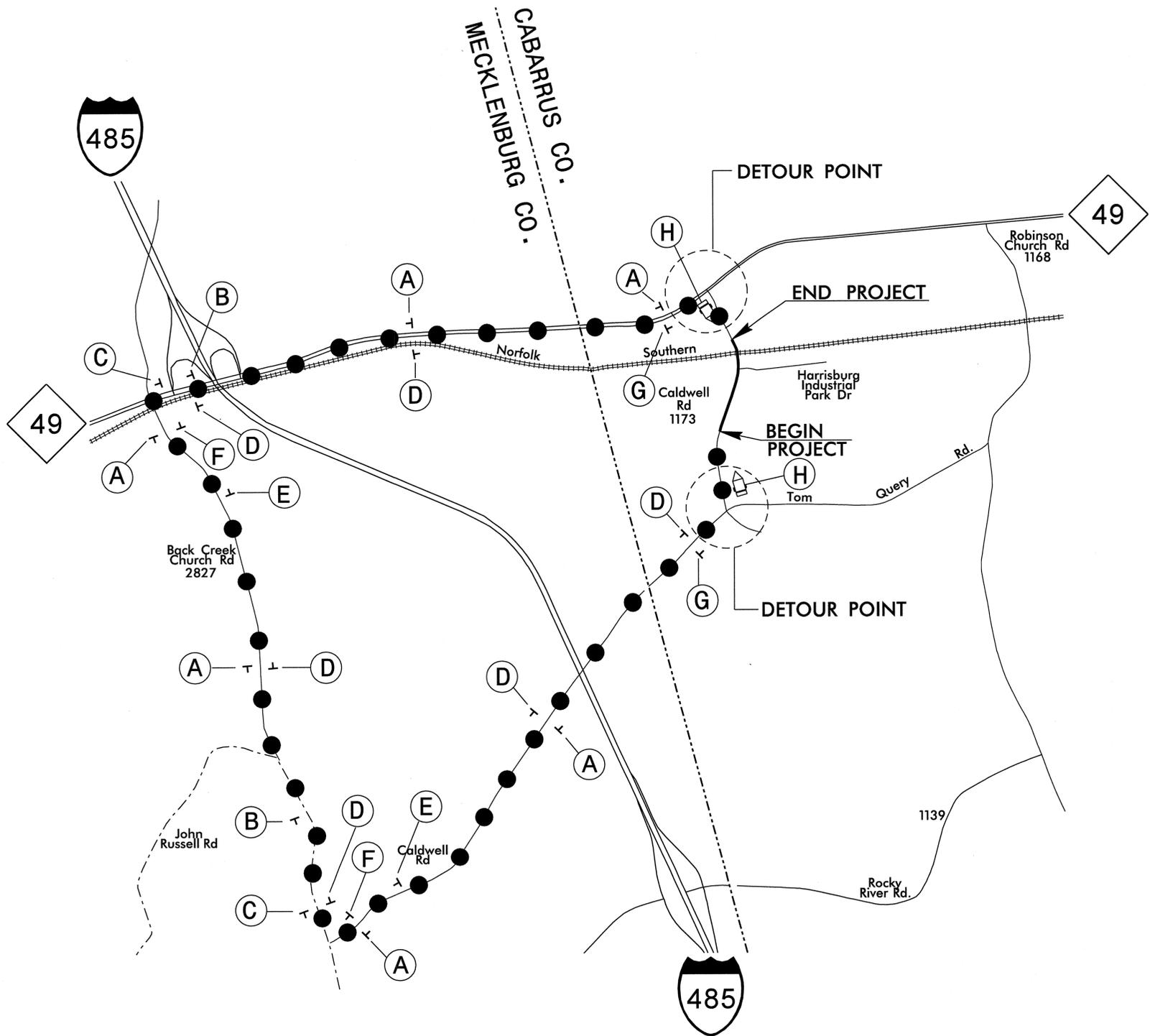
APPROVED: *W. G. May* DATE: 11/21/12

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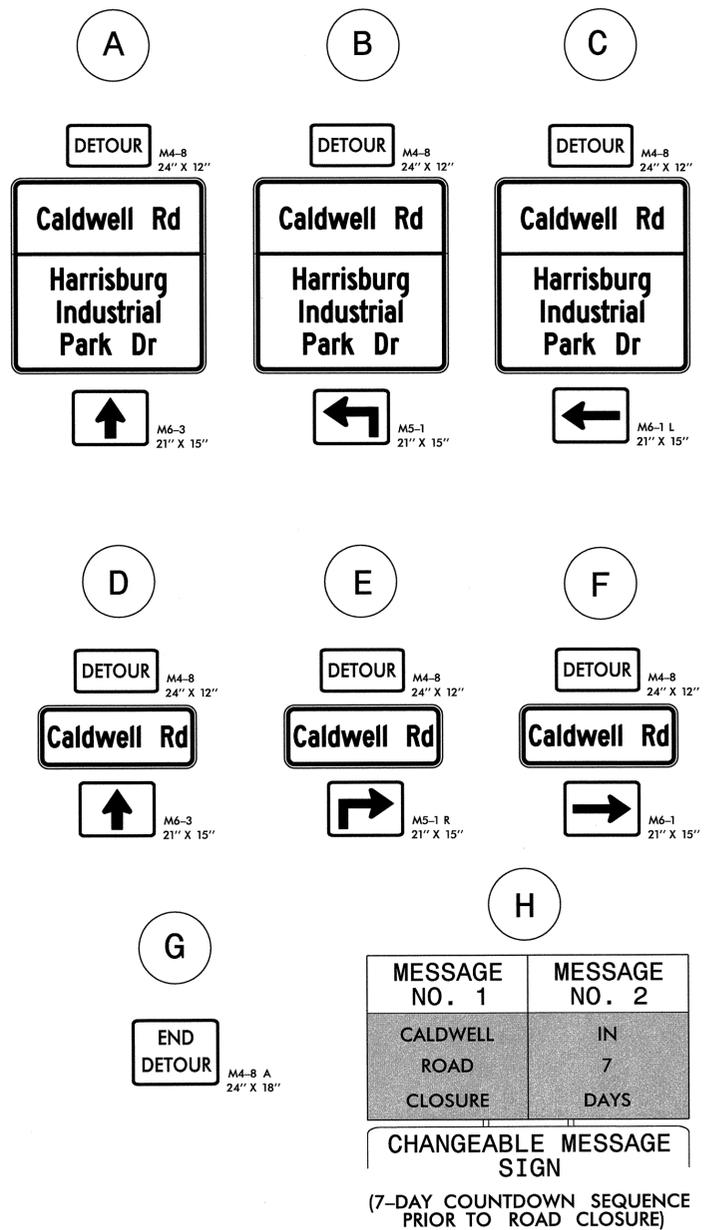
PHASE I

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0515DEL_P21a2



PHASES I & II OFF-SITE DETOUR "TRAILBLAZE" SIGNS



NOTES: REFER TO ROADWAY STANDARD DRAWING NO. 1101.03, SHEET 1 OF 9 "ROAD CLOSURE BEYOND DETOUR POINT" FOR ADDITIONAL ROAD CLOSURE SIGNING, SPACING, AND TYPE III BARRICADE PLACEMENT.

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APPROVED: *[Signature]* DATE: 1/11/13

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 21116
 ENGINEER BOB A. MAY

DEPARTMENT OF TRANSPORTATION
 STATE OF NORTH CAROLINA
 WORK ZONE TRAFFIC CONTROL

**PHASES I & II
 OFF-SITE DETOUR
 CALDWELL ROAD**

0515DEL_P21a2

PHASE II

REFER TO TMP-8 AND TMP-9 FOR THE FOLLOWING WORK IN STEPS 1 THRU 5:

- STEP 1. INSTALL TEMPORARY PAVEMENT MARKINGS AND MARKERS AS MUCH AS POSSIBLE FOR TWO-LANE, TWO-WAY TRAFFIC OPERATION ON CALDWELL ROAD FROM -L- STA. 12+05+/- (RIGHT) TO -Y2- STA. 10+50+/-.
- PERFORM THE FOLLOWING WORK OF STEP 2 IN A CONTINUOUS MANNER:
- STEP 2. USING RSD 1101.02, SHT. 1 OF 15, SHIFT CALDWELL ROAD TRAFFIC TO A TEMPORARY TRAFFIC PATTERN ALONG THE RIGHT SIDE OF -L- FROM 12+05+/- TO -Y2- STA. 10+50+/- AND PLACE REMAINING MARKINGS AND MARKERS AS NECESSARY.
INSTALL DRUMS ADJACENT TO TRAFFIC UNTIL PORTABLE CONCRETE BARRIER CAN BE INSTALLED.
- STEP 3. USING RSD 1101.02, SHT. 1 OF 15, INSTALL PORTABLE CONCRETE BARRIER ON CALDWELL ROAD FROM -L- STA. 14+00+/- TO -Y2- STA. 10+50+/-.
PLACE TYPE III BARRICADE TO CLOSE EXISTING BUSINESS DRIVEWAY AT -L- STA. 18+00 (LEFT).
- STEP 4. USING TEMPORARY CONSTRUCTION SLOPES, CONSTRUCT PROPOSED -L- FROM STA. 12+50+/- (LEFT) TO STA. 16+00+/- (LEFT).
CONSTRUCT PROPOSED -L- FROM STA. 16+00+/- (LEFT) TO STA. 23+45+/- (LEFT) USING TEMPORARY SHORING LINE ② INCLUDING PROPOSED -DRLT1- AT -L- STA. 18+00+/- (LEFT).
- STEP 5. COMPLETE ALL PHASE I AND PHASE II -L-, -Y2-, AND -DRLT1- CONSTRUCTION.

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TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

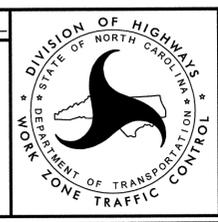
APPROVED: *[Signature]* DATE: *1/21/13*

SEAL

21116

ENGINEER

BOB A. MAI



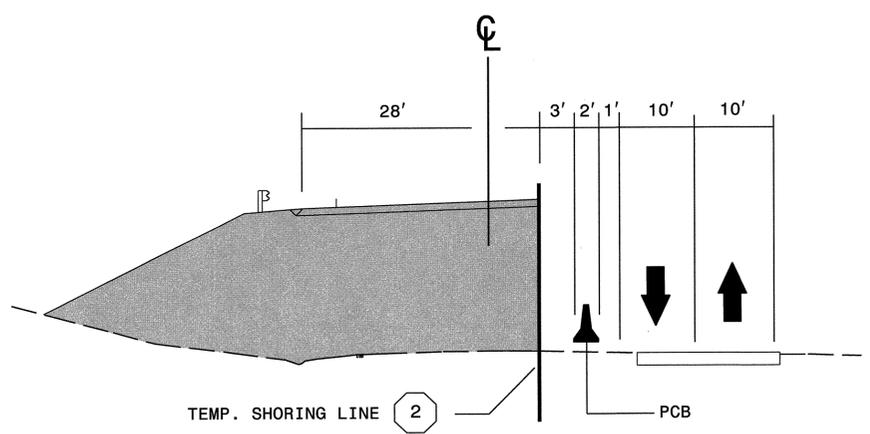
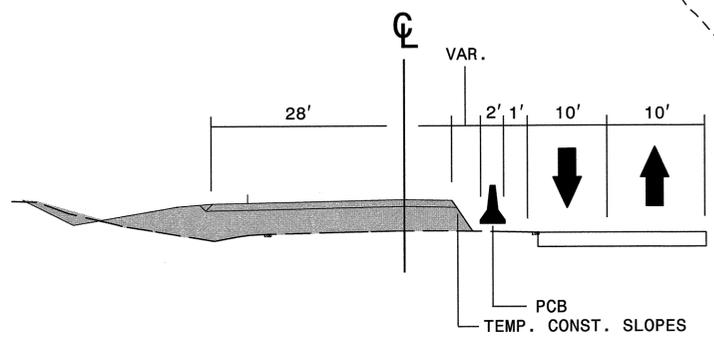
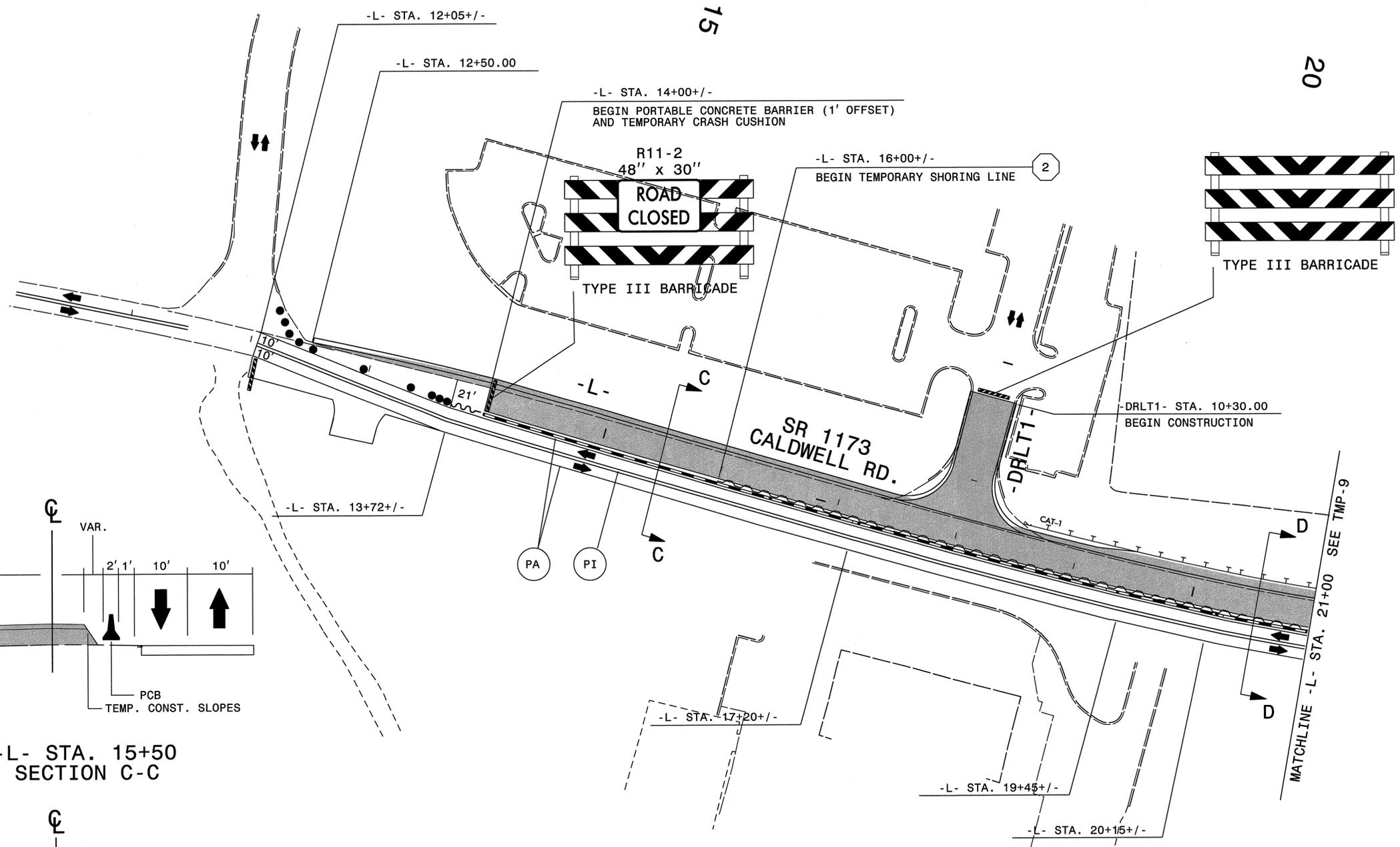
PHASE II

0515DEL_P21a2

2 QUANTITY = 9,200 SF

TEMPORARY SHORING
FROM STA. 16+00+/- -L-
TO STA. 23+45+/- -L-

(SEE SHEET TMP-2A FOR
TEMPORARY SHORING DATA)



SEE TMP-1A FOR TEMPORARY MARKING SCHEDULE

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CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

APPROVED: *Bob A. May* DATE: *12/13*

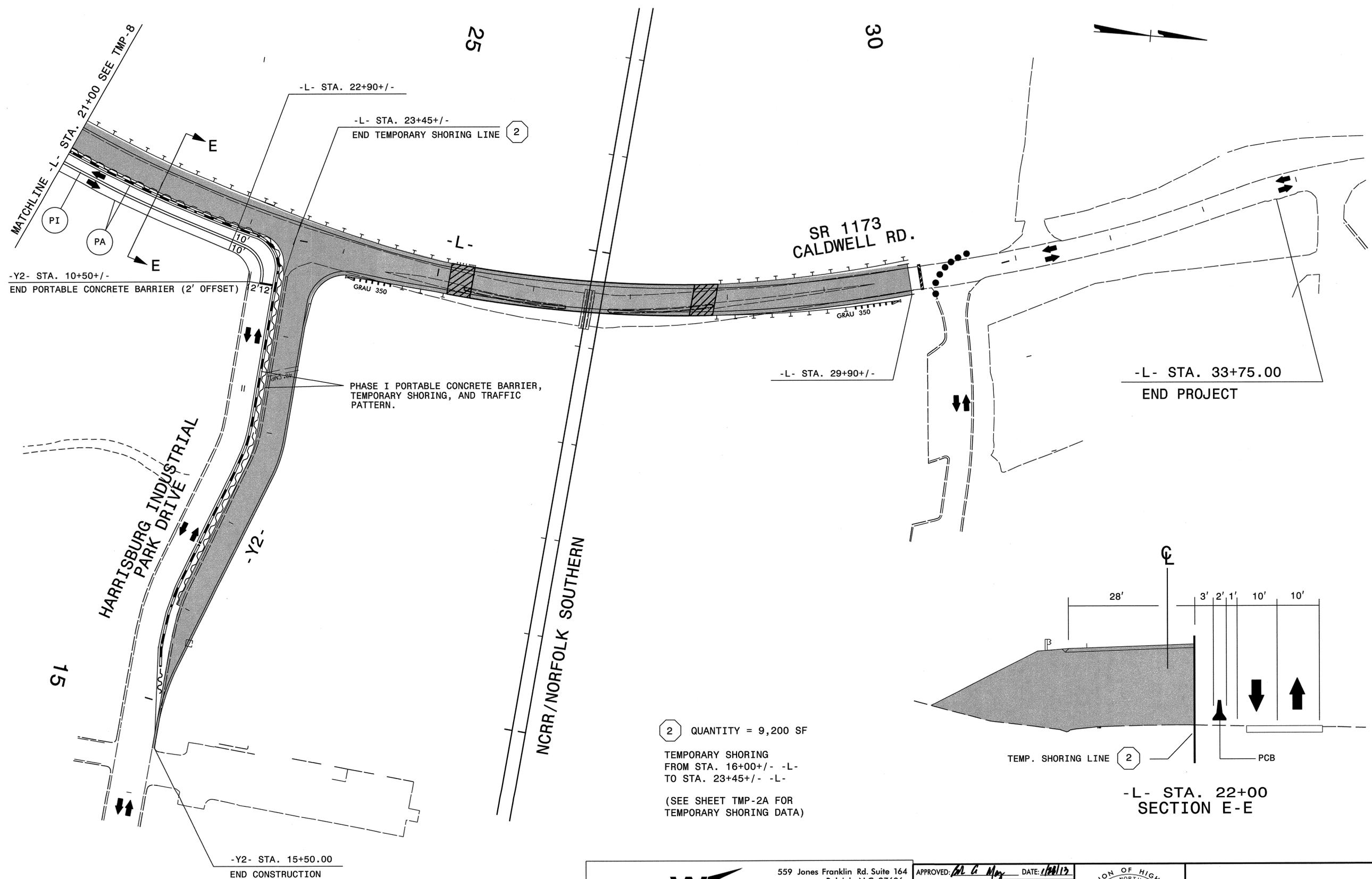
SEAL

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

PHASE II

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2 QUANTITY = 9,200 SF

TEMPORARY SHORING
FROM STA. 16+00+/- -L-
TO STA. 23+45+/- -L-

(SEE SHEET TMP-2A FOR
TEMPORARY SHORING DATA)

SEE TMP-1A FOR TEMPORARY MARKING SCHEDULE

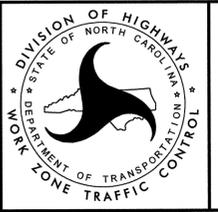


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TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

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PHASE II

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PHASE III

- STEP 1. WITH CALDWELL ROAD/HARRISBURG INDUSTRIAL PARK DRIVE TRAFFIC OPERATING IN THE PHASE II TEMPORARY TRAFFIC PATTERN, CONSTRUCT PROPOSED -L- ROADWAY FROM STA. 29+90+/- TO STA. 33+75.00 AND -DRRT3- ACCORDING TO LOCAL NOTE #1 ON TMP-1C AND AS SHOWN ON TMP-12.
- STEP 2. PLACE TEMPORARY MARKINGS, MARKERS, AND PORTABLE CONCRETE BARRIER AS MUCH AS POSSIBLE ON COMPLETED -L- AND -Y2- CONSTRUCTION FOR TEMPORARY TWO-LANE, TWO-WAY TRAFFIC OPERATIONS (SEE TMP-12).
- PERFORM THE FOLLOWING WORK OF STEP 3 AND STEP 4 ON A WEEKEND AS DIRECTED BY THE ENGINEER:
- STEP 3. MODIFY PHASE I/PHASE II TRAILBLAZE SIGN ASSEMBLIES FOR PHASE III OFF-SITE DETOUR OPERATIONS (SEE TMP-13).
- STEP 4. USING RSD 1101.02, SHT. 1 OF 15, SHIFT EXISTING CALDWELL ROAD AND HARRISBURG INDUSTRIAL PARK DRIVE TRAFFIC ONTO COMPLETED -Y2- ROADWAY SECTION AS SHOWN ON TMP-12. PLACE REMAINING MARKINGS AND MARKERS AS NECESSARY FOR A TWO-LANE, TWO-WAY PATTERN.
- STEP 5. CONSTRUCT PROPOSED -L- FROM STA. 12+50+/- TO STA. 23+45+/- (RIGHT) AND -Y2- CONSTRUCTION (RIGHT).
- STEP 6. USING RSD 1101.02, SHT. 1 OF 15, REMOVE TEMPORARY PORTABLE CONCRETE BARRIER FROM THE PROJECT.
- STEP 7. USING RSD 1101.02, SHT. 1 OF 15, PAVE FINAL LAYER OF SURFACE COURSE ON -L- FROM STA. 12+50.00 TO STA. 33+75.00, AND ON -Y2- STA. 10+00.00 TO STA. 15+50.00 AS SHOWN IN THE CONSTRUCTION PLANS.
- PLACE FINAL PAVEMENT MARKINGS, SYMBOLS, AND PERMANENT PAVEMENT MARKERS ON -L- (CALDWELL ROAD) ROADWAY AND STRUCTURE AS SHOWN IN THE FINAL PAVEMENT MARKING PLAN (PMP).
- INSTALL/COVER PERMANENT STOP SIGN AT THE -L- AND -Y2- INTERSECTION (SEE SIGNING PLAN).
- PERFORM THE FOLLOWING WORK OF STEP 8 IN A CONTINUOUS MANNER:
- STEP 8. REMOVE TYPE III BARRICADES AND REOPEN -L- (CALDWELL ROAD) TO THRU TRAFFIC.
- STEP 9. REMOVE ALL OFF-SITE DETOUR TRAILBLAZE SIGNS FOR CALDWELL ROAD AND HARRISBURG INDUSTRIAL PARK DRIVE.

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APPROVED: *Bob A. May* DATE: *12/17/12*

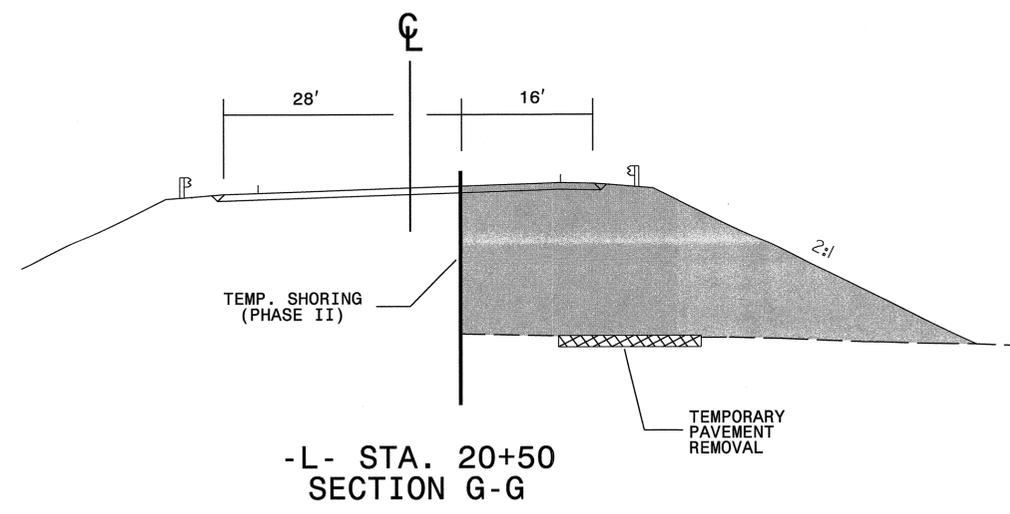
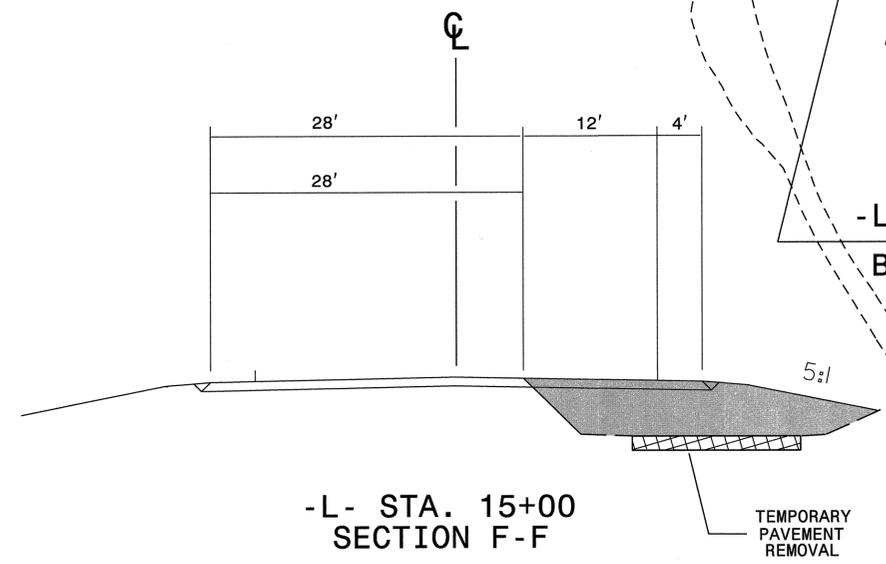
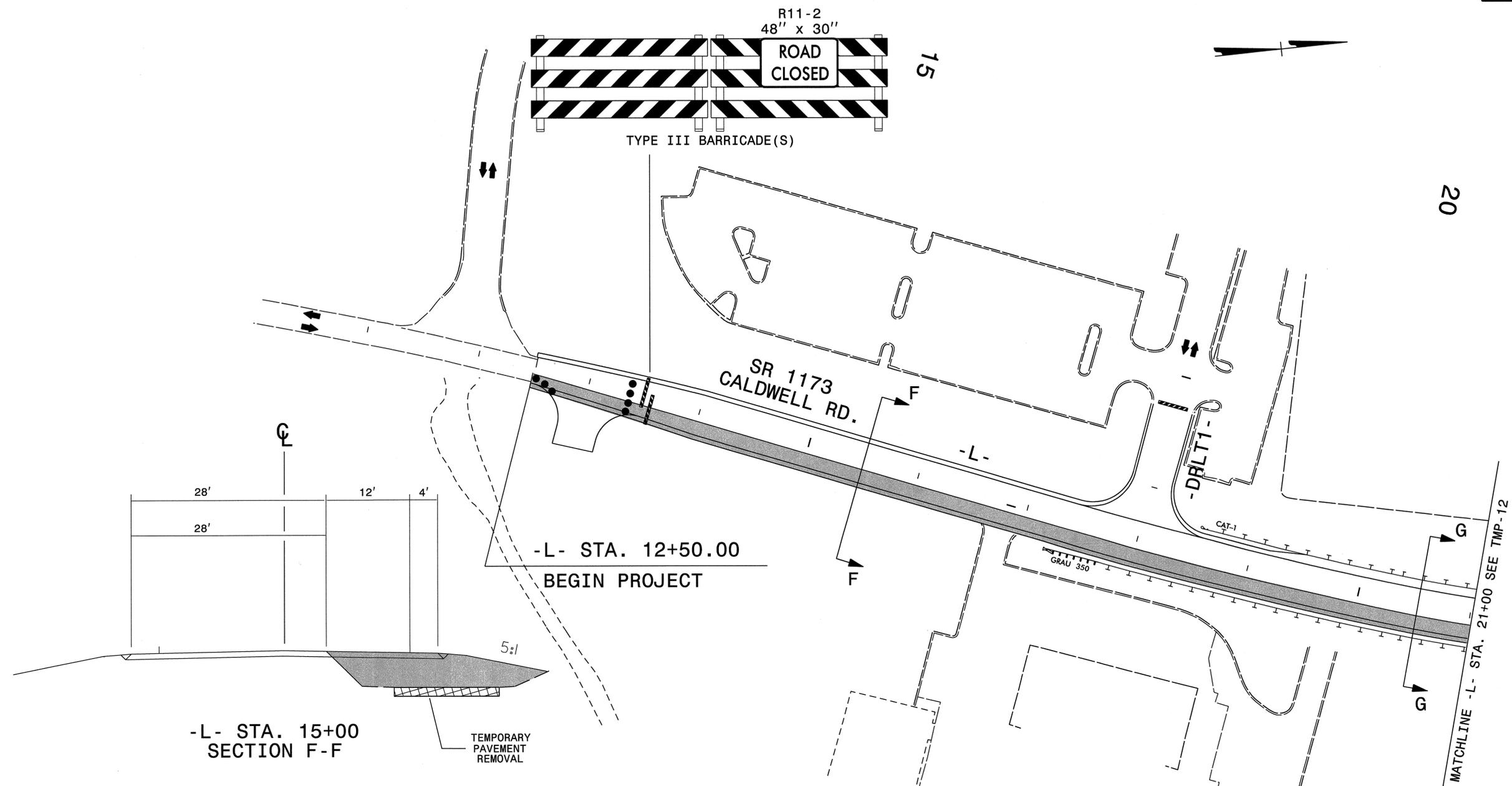
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PHASE III

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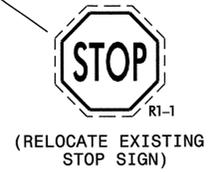
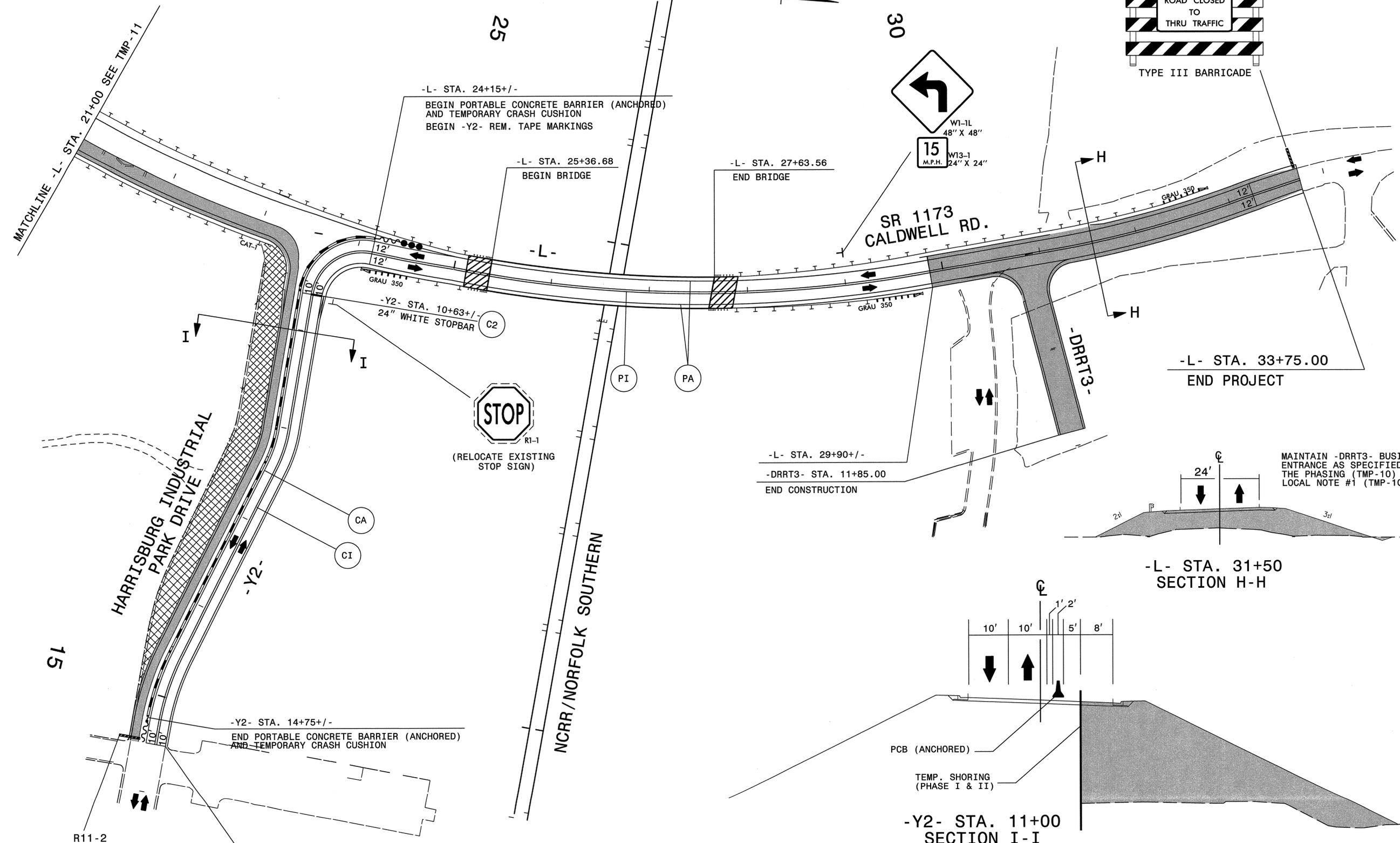
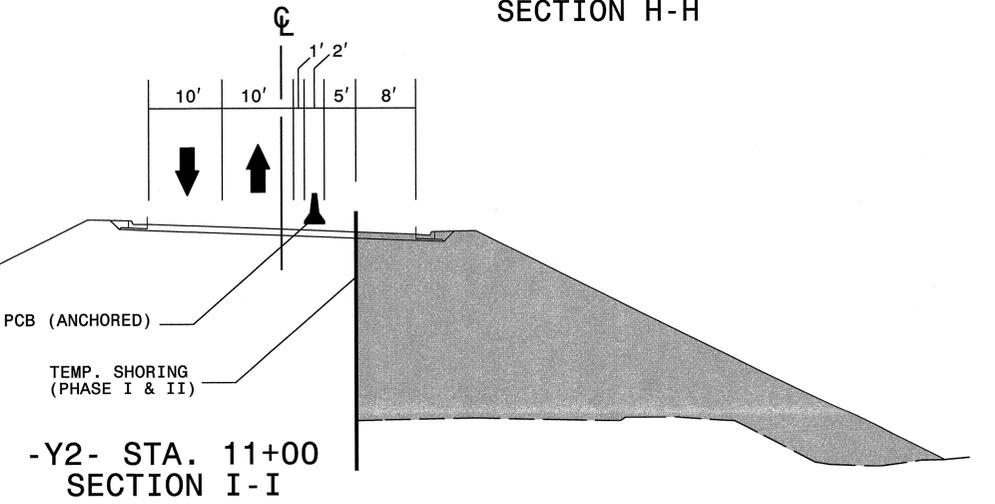
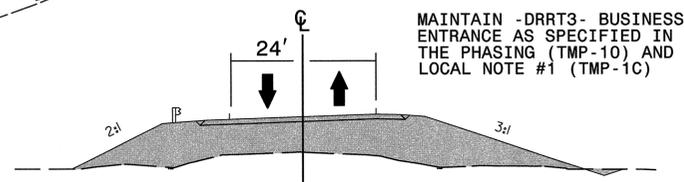
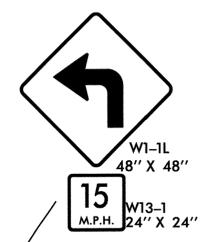
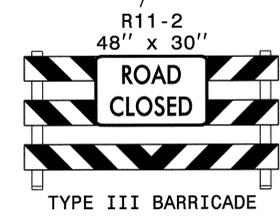
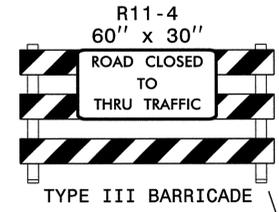
APPROVED: *[Signature]* DATE: *12/13*

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NORTH CAROLINA
 PROFESSIONAL
 SEAL
 21116
 ENGINEER
 BOB A. MAY

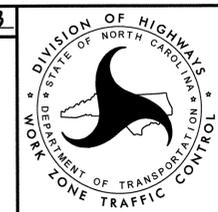


PHASE III



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PHASE III

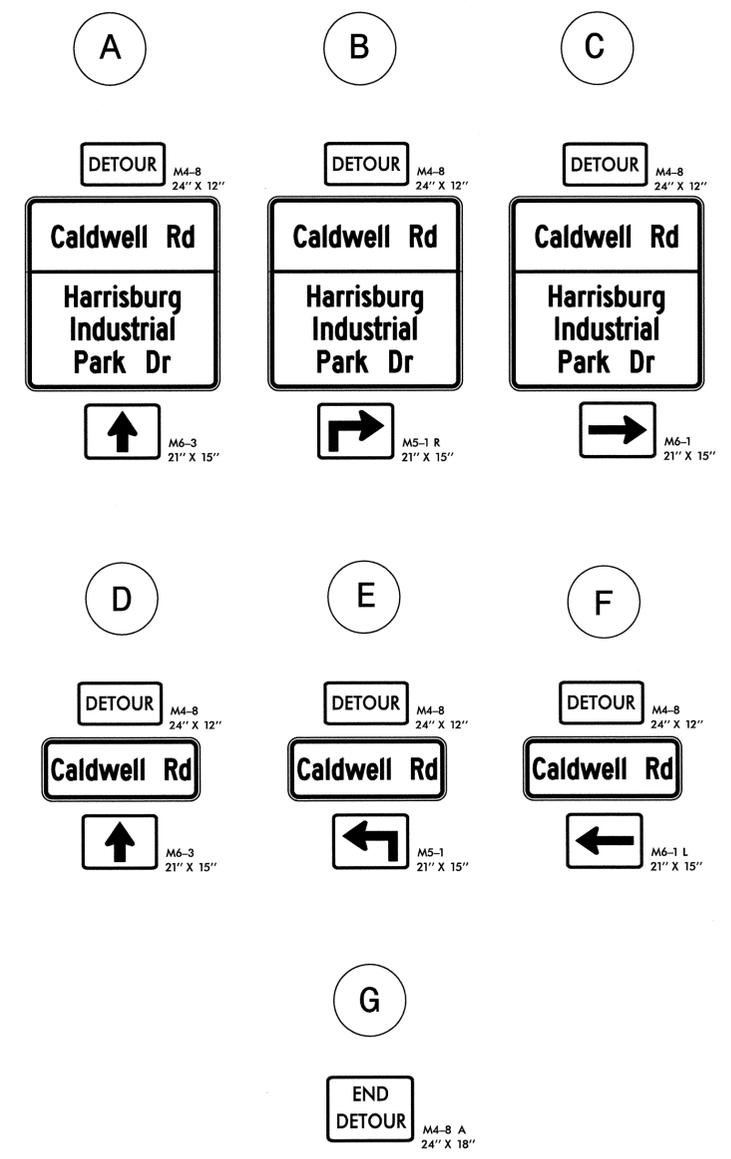
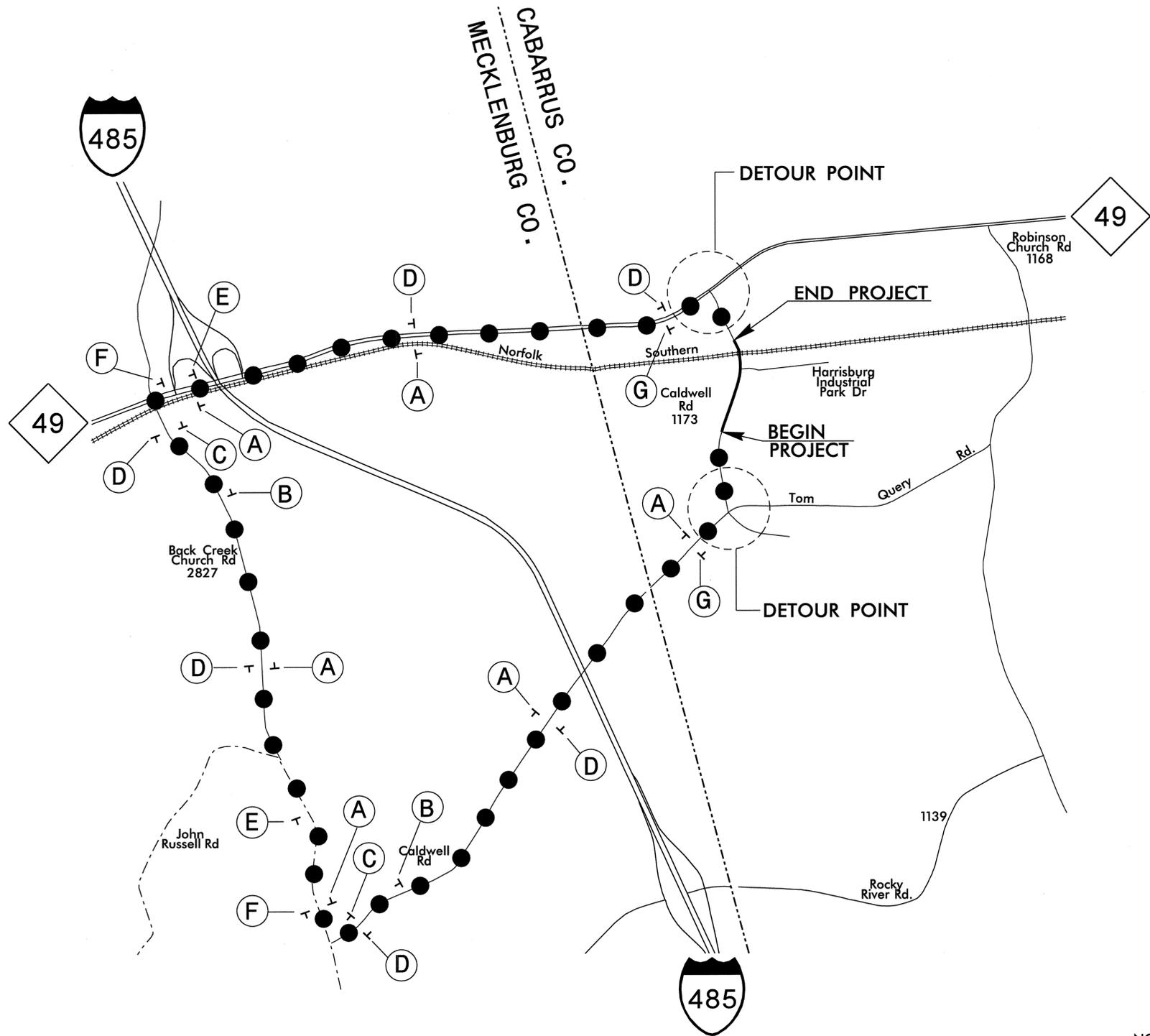
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

SEE TMP-1A FOR TEMPORARY MARKING SCHEDULE

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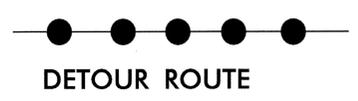
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PHASE III OFF-SITE DETOUR "TRAILBLAZE" SIGNS

NOTES: REFER TO ROADWAY STANDARD DRAWING NO. 1101.03, SHEET 1 OF 9 "ROAD CLOSURE BEYOND DETOUR POINT" FOR DETOUR SIGNING, SPACING, AND TYPE III BARRICADE PLACEMENT.

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APPROVED: *Bob A. May* DATE: 1/24/13

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 STATE OF NORTH CAROLINA
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**PHASE III
 OFF-SITE DETOUR
 CALDWELL ROAD**