

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

STATE PROJECT REFERENCE NO.	SHEET NO.
B-4176	TCP-01

**PLAN FOR PROPOSED  
TRAFFIC CONTROL, MARKING, & DELINEATION  
LINCOLN COUNTY**

B-4176

**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 JULY 2006 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
1115.01	FLASHING ARROW PANELS
1130.01	DRUMS
1135.01	CONES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1165.01	TRUCK MOUNTED IMPACT ATTENUATOR
1170.01	PORTABLE CONCRETE BARRIER
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	PAVEMENT MARKER SPACING
1251.01	RAISED PAVEMENT MARKERS - (TEMPORARY & PERMANENT)
1253.01	SNOWPLOWABLE RAISED PAVEMENT MARKERS
1261.01	GUARDRAIL & BARRIER DELINEATOR SPACING
1261.02	GUARDRAIL & BARRIER DELINEATOR TYPES
1262.01	GUARDRAIL END DELINEATION

TEMPORARY PAVEMENT MARKING SCHEDULE	
SYMBOL	DESCRIPTION
PAVEMENT MARKINGS PAINT (4")	
PA	WHITE EDGELINE
PI	YELLOW DOUBLE CENTER
MARKERS RAISED PAVEMENT MARKERS	
MH	YELLOW/YELLOW

**INDEX OF SHEETS**

SHEET NO.	TITLE
TCP-01	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, INDEX OF SHEETS, LEGEND, AND TEMPORARY PAVEMENT MARKING SCHEDULE
TCP-02	PROJECT NOTES
TCP-2A	TEMPORARY SHORING DATA
TCP-03	PHASING
TCP-04 - TCP-05	PHASE I DETAILS
TCP-06 - TCP-07	PHASE II DETAILS
TCP-08	PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS
TCP-09	WORK ZONE WARNING SIGNS

**LEGEND**

- GENERAL**
- DIRECTION OF TRAFFIC FLOW
  - NORTH ARROW
  - PROPOSED PVMT. EXIST. PVMT.
  - WORK AREA
  - REMOVAL OF EXISTING PAVEMENT
- TRAFFIC CONTROL DEVICES**
- TYPE I BARRICADE
  - TYPE II BARRICADE
  - TYPE III BARRICADE
  - CONE
  - DRUM SKINNY DRUM
  - FLASHING ARROW PANEL (TYPE C)
  - STATIONARY SIGN
  - PORTABLE SIGN
  - STATIONARY OR PORTABLE SIGN
  - CRASH CUSHION
  - CHANGEABLE MESSAGE SIGN
  - TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
  - POLICE
  - FLAGGER
- PAVEMENT MARKINGS**
- CRYSTAL/CRYSTAL PAVEMENT MARKER
  - YELLOW/YELLOW PAVEMENT MARKER
  - CRYSTAL/RED PAVEMENT MARKER
  - PAVEMENT MARKING SYMBOLS

TIP PROJECT:

APPROVED:	PLAN PREPARED BY: N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
DATE: <i>October 19, 2010</i>	
SEAL	J. S. BOURNE, P.E. STATE TRAFFIC MANAGEMENT ENGINEER
	J. S. KITE, P.E. TRAFFIC CONTROL PROJECT ENGINEER
	D. W. BISSETTE, P.E. TRAFFIC CONTROL PROJECT DESIGN ENGINEER
	R. M. GARRETT TRAFFIC CONTROL DESIGN ENGINEER / TECHNICIAN

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# PROJECT NOTES

PROJ. REFERENCE NO.	SHEET NO.
B-4176	TCP-02

## 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 UNDESIRED 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.

A) DO NOT CLOSE ROADS AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
-Y1- ELM GROVE ROAD (SR 1221)	5:00 A.M. TO 8:00 P.M. MON. - SAT.

B) 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.

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) 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.

F) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

### 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) 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) INSTALL ADVANCE WORK ZONE WARNING SIGNS NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

K) PROVIDE PERMANENT SIGNING.

L) 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.

M) 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.

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

### TRAFFIC BARRIER

O) 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.

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

### TRAFFIC CONTROL DEVICES

Q) SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH), EXCEPT 10 FT ON-CENTER IN RADIUS, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY WHEN LANE CLOSURES ARE NOT IN EFFECT. WHEN SKINNY DRUMS ARE ALLOWED REFER TO SECTION 1180 OF STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES OR AS SHOWN IN THE PLANS.

R) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

### PAVEMENT MARKINGS AND MARKERS

S) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS SHOWN IN THE PAVEMENT MARKING PLAN.

T) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
ALL ROADS	PAINT	TEMPORARY RAISED PAVEMENT MARKER

U) 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.

V) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

W) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

## LOCAL NOTES

1) NCDOT DIVISION CONSTRUCTION PERSONNEL SHALL NOTIFY THE FOLLOWING AGENCIES 30 DAYS PRIOR TO CONSTRUCTION:

- a) LINCOLN COUNTY DIVISION OF SCHOOL TRANSPORTATION DIRECTOR AT (704) 732-2261.
- b) LINCOLN COUNTY EMERGENCY MANAGEMENT SERVICES (EMS) AT (704) 736-9385.

2) CONTACT THE ENGINEER TO INSURE THE PUBLIC INFORMATION COMPONENT HAS BEEN INITIATED NOTIFYING ALL IMPACTED RESIDENTS AND BUSINESS OWNERS OF ACCESSIBILITY ISSUES PRIOR TO AND DURING CONSTRUCTION ACTIVITIES.

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# TEMPORARY SHORING DATA

### TEMPORARY SHORING NO. 1

FOR TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.

DO NOT USE STANDARD TEMPORARY SHORING FROM STATION 17+95.00± -L-, 30.1 FT. LEFT OF -L-, TO STATION 19+25.00±, 30.1 FT. LEFT OF -L-.

USE A TEMPORARY MSE WALL FROM STATION 17+95.00± -L-, 30.1 FT. LEFT OF -L-, TO STATION 19+25.00±, 30.1 FT. LEFT OF -L-.

WHEN USING CONTRACTOR DESIGNED SHORING FROM STATION 17+95.00± -L-, 30.1 FT. LEFT OF -L-, TO STATION 19+25.00±, 30.1 FT. LEFT OF -L-.

USE THE FOLLOWING SOIL PARAMETERS:  
 UNIT WEIGHT OF SOIL ABOVE WATER TABLE,  $\gamma = 120$  PCF  
 UNIT WEIGHT OF SOIL BELOW WATER TABLE,  $\gamma = 60$  PCF  
 FRICTION ANGLE,  $\phi = 30$  DEGREES  
 COHESION,  $c = 0$  PSF

FOR CONTRACTOR DESIGNED SHORING, SURVEY THE SHORING LOCATION TO DETERMINE EXISTING ELEVATIONS AND ACTUAL DESIGN HEIGHTS BEFORE BEGINNING DESIGN.

FOR PORTABLE CONCRETE BARRIERS ABOVE AND BEHIND TEMPORARY SHORING, USE AN NCDOT PORTABLE CONCRETE BARRIER (UNANCHORED OR ANCHORED) OR AN OREGON TALL F-SHAPE CONCRETE BARRIER IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS.

NO SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF THE TEMPORARY SHORING FROM STATION 17+95.00± -L-, 30.1 FT. LEFT OF -L-, TO STATION 19+25.00±, 30.1 FT. LEFT OF -L-. THE INFORMATION PROVIDED FOR DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

A 30 INCH DUCTILE IRON SEWER AND A 4" FORCE MAIN ARE PRESENT BETWEEN STATIONS 17+11.81± -L-, 184.75 FT LEFT, AND 19+60.10± -L-, 77.6 FT RIGHT. THE STATIONS, OFFSETS, AND DEPTH OF THE SEWER SHALL BE VERIFIED IN THE FIELD PRIOR TO DESIGNING OR INSTALLING THE SHORING SYSTEM. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROTECT AND MAINTAIN OPERATION OF THE SEWER FOR THE DURATION OF THE PROJECT. NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR SHORING MODIFICATIONS THAT RESULT FROM THE SEWER.

### TEMPORARY SHORING NO. 2

FOR TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.

DO NOT USE STANDARD TEMPORARY SHORING FROM STATION 20+40.00± -L-, 30.1 FT. LEFT OF -L-, TO STATION 21+50.00±, 30.1 FT. LEFT OF -L-.

USE A TEMPORARY MSE WALL FROM STATION 20+40.00± -L-, 30.1 FT. LEFT OF -L-, TO STATION 21+50.00±, 30.1 FT. LEFT OF -L-.

WHEN USING CONTRACTOR DESIGNED SHORING FROM STATION 20+40.00± -L-, 30.1 FT. LEFT OF -L-, TO STATION 21+50.00±, 30.1 FT. LEFT OF -L-.

USE THE FOLLOWING SOIL PARAMETERS:  
 UNIT WEIGHT OF SOIL ABOVE WATER TABLE,  $\gamma = 120$  PCF  
 UNIT WEIGHT OF SOIL BELOW WATER TABLE,  $\gamma = 60$  PCF  
 FRICTION ANGLE,  $\phi = 30$  DEGREES  
 COHESION,  $c = 0$  PSF

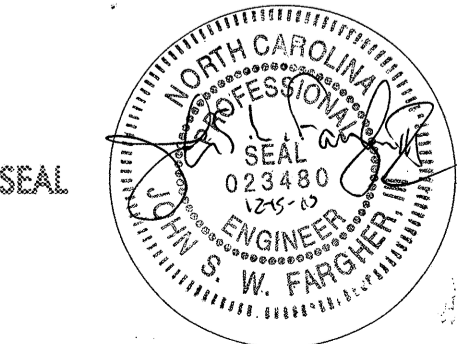
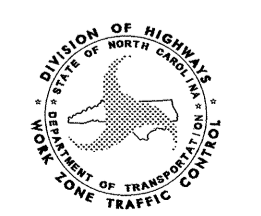
FOR CONTRACTOR DESIGNED SHORING, SURVEY THE SHORING LOCATION TO DETERMINE EXISTING ELEVATIONS AND ACTUAL DESIGN HEIGHTS BEFORE BEGINNING DESIGN.

FOR PORTABLE CONCRETE BARRIERS ABOVE AND BEHIND TEMPORARY SHORING, USE AN NCDOT PORTABLE CONCRETE BARRIER (UNANCHORED OR ANCHORED) OR AN OREGON TALL F-SHAPE CONCRETE BARRIER IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS.

NO SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF THE TEMPORARY SHORING FROM STATION 20+40.00± -L-, 30.1 FT. LEFT OF -L-, TO STATION 21+50.00±, 30.1 FT. LEFT OF -L-. THE INFORMATION PROVIDED FOR DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

A 30 INCH DUCTILE IRON SEWER AND A 4" FORCE MAIN ARE PRESENT BETWEEN STATIONS 17+11.81± -L-, 184.75 FT LEFT, AND 19+60.10± -L-, 77.6 FT RIGHT. THE STATIONS, OFFSETS, AND DEPTH OF THE SEWER SHALL BE VERIFIED IN THE FIELD PRIOR TO DESIGNING OR INSTALLING THE SHORING SYSTEM. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROTECT AND MAINTAIN OPERATION OF THE SEWER FOR THE DURATION OF THE PROJECT. NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR SHORING MODIFICATIONS THAT RESULT FROM THE SEWER.

SYSTEM\$\$\$\$  
 \$\$\$\$SDGN\$\$\$\$  
 \$\$\$\$SERNAME\$\$\$\$

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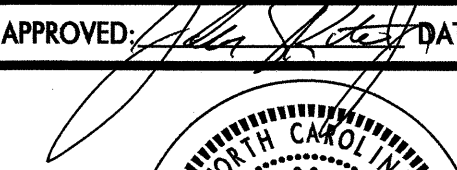


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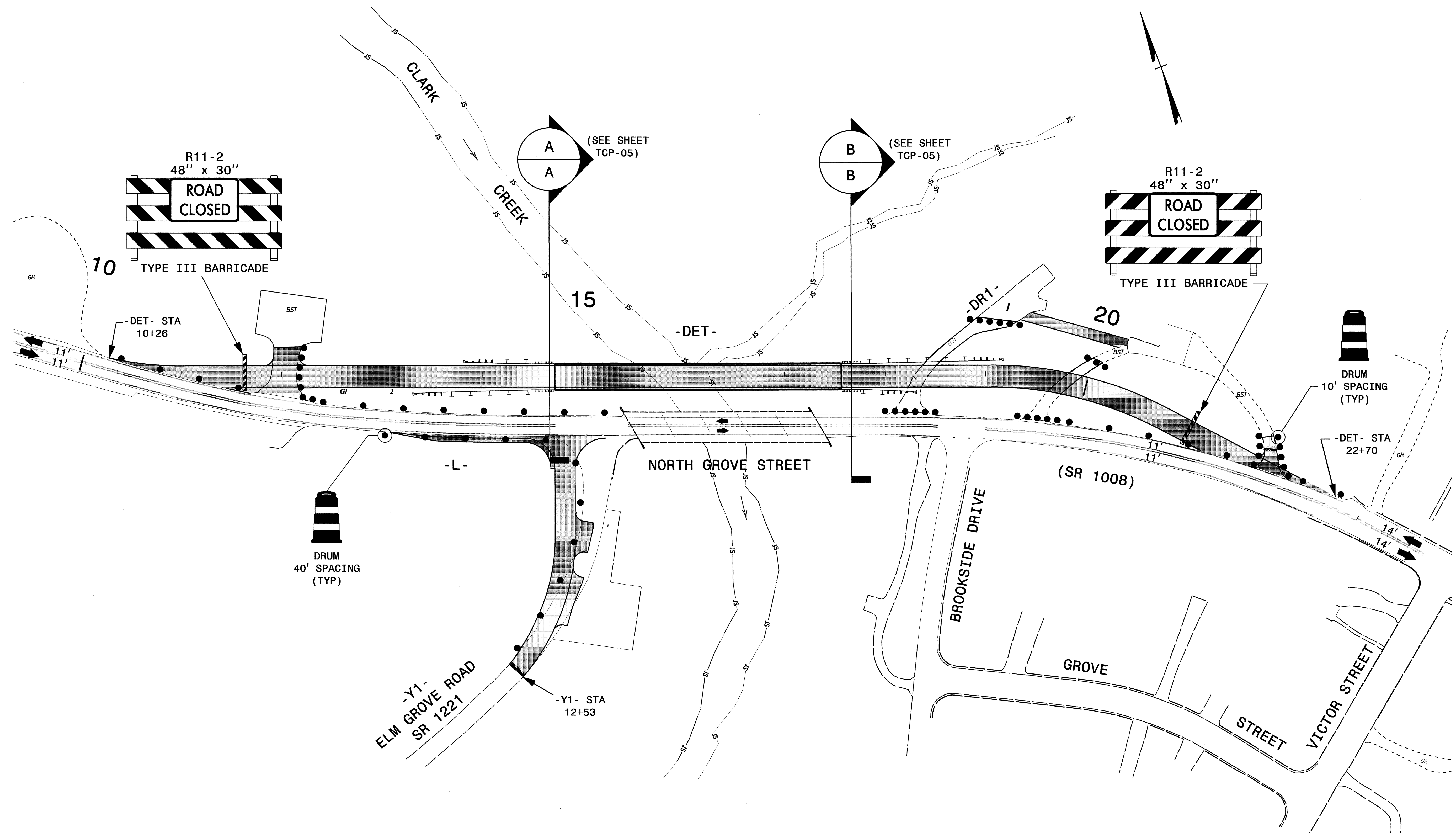
- STEP 1 INSTALL DRUMS, BARRICADES, AND ADVANCE WARNING SIGNS AS SHOWN ON TCP-04 AND TCP-09.
- STEP 2 USING ROADWAY STANDARD DRAWING 1101.02 SHEET 1 OF 9 AND FLAGGERS AS NEEDED:  
 -BEGIN CONSTRUCTION OF THE -DET- STRUCTURE AND APPROACHES AS SHOWN ON TCP-04 WHILE MAINTAINING TRAFFIC ON -L-.  
 -BEGIN CONSTRUCTION OF -Y1- ELM GROVE ROAD (SR 1221).  
 -MAINTAIN DRIVEWAY ACCESS THROUGHOUT CONSTRUCTION.
- STEP 3 ONCE THE -DET- STRUCTURE AND APPROACHES ARE COMPLETED, USE ROADWAY STANDARD DRAWING 1101.02 SHEET 1 OF 9 AND FLAGGERS AS NEEDED TO:  
 -PLACE TEMPORARY PAVEMENT MARKINGS ON -DET- AS SHOWN ON TCP-06 AND IN ACCORDANCE WITH THE TEMPORARY PAVEMENT MARKING SCHEDULE ON TCP-01, REMOVING ANY CONFLICTING EXISTING PAVEMENT MARKINGS ALONG -L-.  
 -MOVE DEVICES TO CLOSE -L- AND BROOKSIDE DRIVE AS SHOWN ON TCP-06.  
 -SHIFT TRAFFIC ONTO -DET- (SEE LOCAL NOTE 2).

### PHASE II


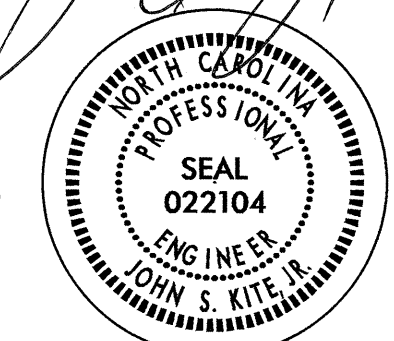
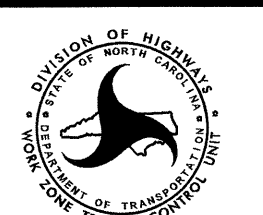
- STEP 1 WHILE MAINTAINING TRAFFIC ON -DET- AND USING ROADWAY STANDARD DRAWING 1101.02 SHEET 1 OF 9 AND FLAGGERS AS NEEDED:  
 -COMPLETE -Y1- ELM GROVE ROAD (SR 1221) UP TO BUT NOT INCLUDING THE FINAL SURFACE LAYER.  
 -REMOVE THE EXISTING -L- STRUCTURE.  
 -AS SHOWN ON TCP-06 INSTALL TEMPORARY SHORING, CONSTRUCT THE PROPOSED -L- STRUCTURE, PARTIAL CONSTRUCTION OF PROPOSED EMBANKMENT/SLOPE PROTECTION, AND BEGIN CONSTRUCTION OF -L- UP TO BUT NOT INCLUDING THE FINAL SURFACE LAYER.
- STEP 2 USING ROADWAY STANDARD DRAWING 1101.02 SHEET 1 OF 9 AND FLAGGERS AS NEEDED:  
 -INSTALL PORTABLE CONCRETE BARRIER ALONG THE LEFT SIDE OF -L- AS SHOWN ON TCP-06.  
 -INSTALL TEMPORARY PAVEMENT MARKINGS IN THE FINAL PATTERN ALONG -L-.  
 -REMOVE SIGNS AND DEVICES CLOSING -L- AND BROOKSIDE DRIVE AND SHIFT TRAFFIC ONTO -L- IN THE FINAL PATTERN.
- STEP 3 WHILE MAINTAINING TRAFFIC ON -L- AND USING ROADWAY STANDARD DRAWING 1101.02 SHEET 1 OF 9 AND FLAGGERS AS NEEDED:  
 -REMOVE ONSITE DETOUR STRUCTURE AND APPROACHES.  
 -COMPLETE CONSTRUCTION OF PROPOSED -L-, DRIVEWAYS, AND PROPOSED GUARDRAIL.  
 -REMOVE PORTABLE CONCRETE BARRIER.  
 -INSTALL FINAL SURFACE LAYER AND FINAL PAVEMENT MARKINGS AND MARKERS ON -L- AND -Y1-.
- STEP 4 REMOVE ADVANCE WARNING SIGNS AND TRAFFIC CONTROL DEVICES.

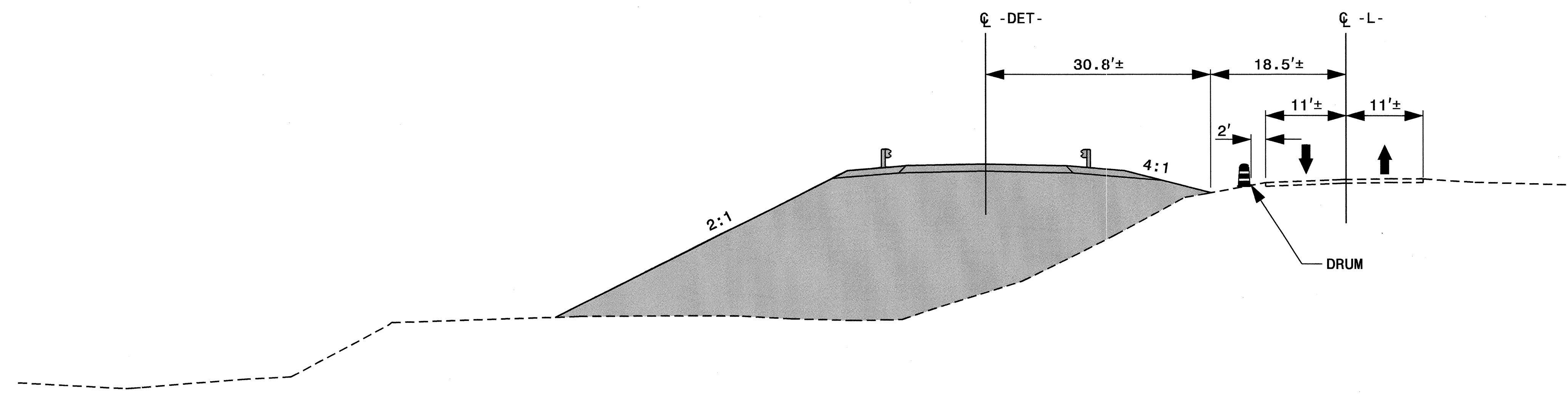
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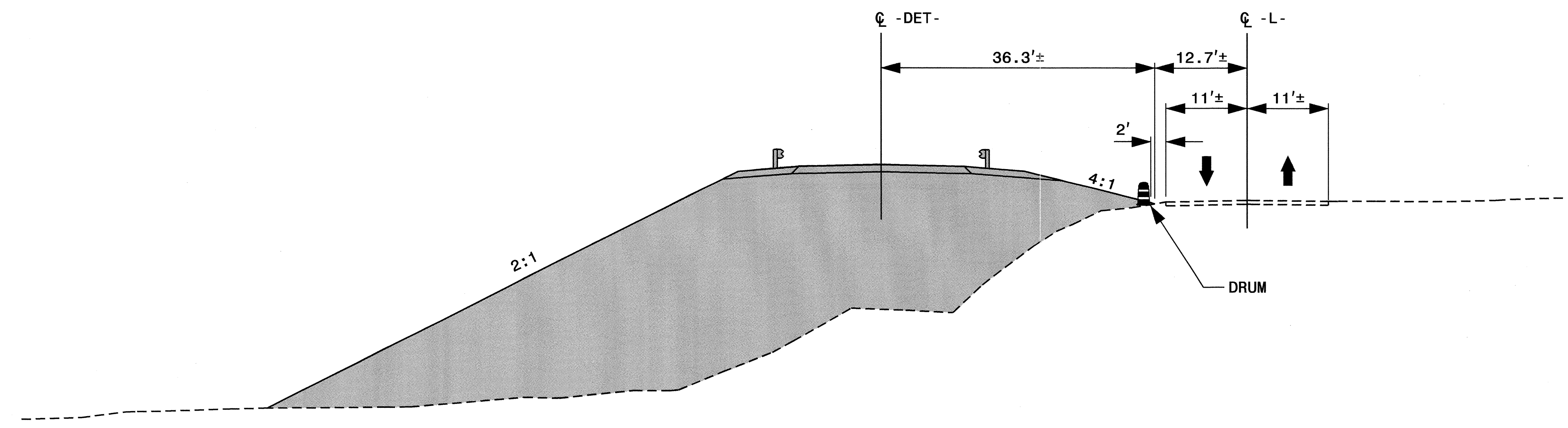


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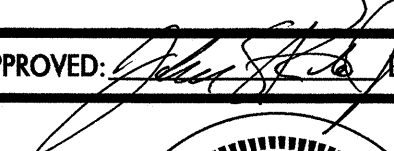

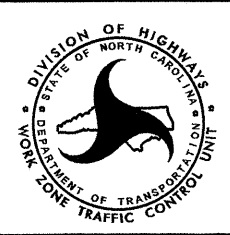


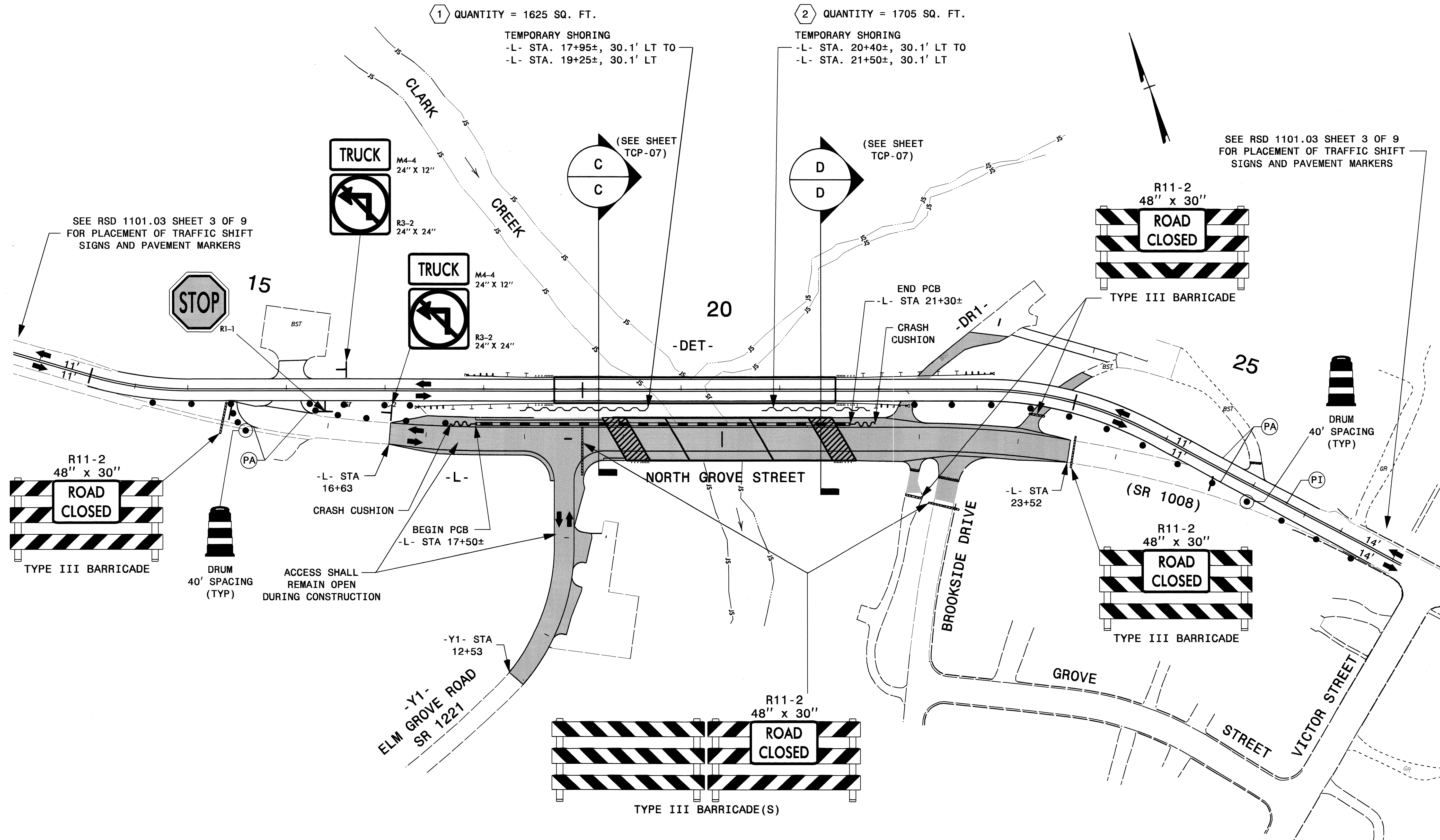
SECTION A - A  
 -DET- STA. 14+66.43  
 -L- STA. 18+25



SECTION B - B  
 -DET- STA. 17+66.43  
 -L- STA. 21+25

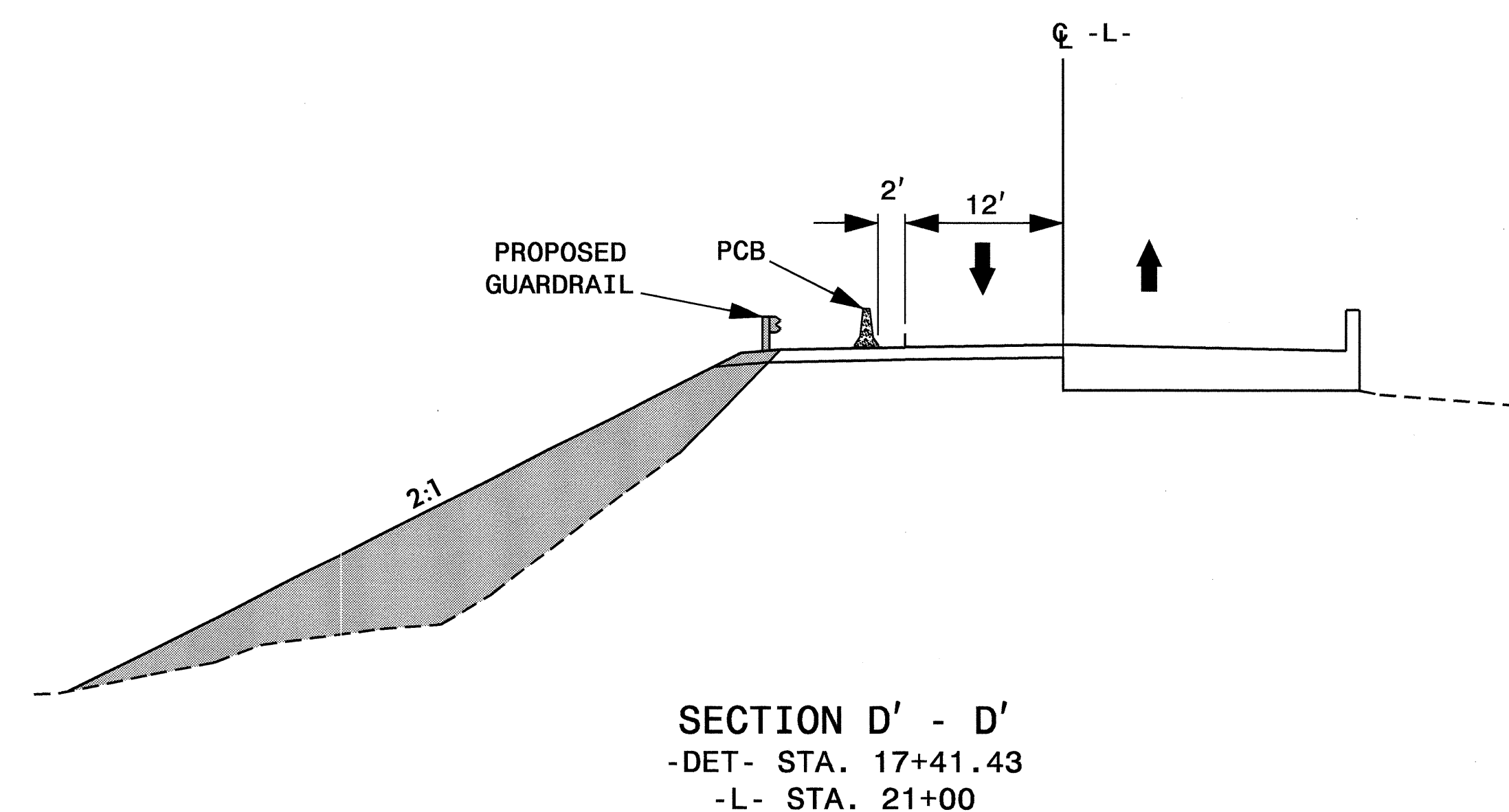
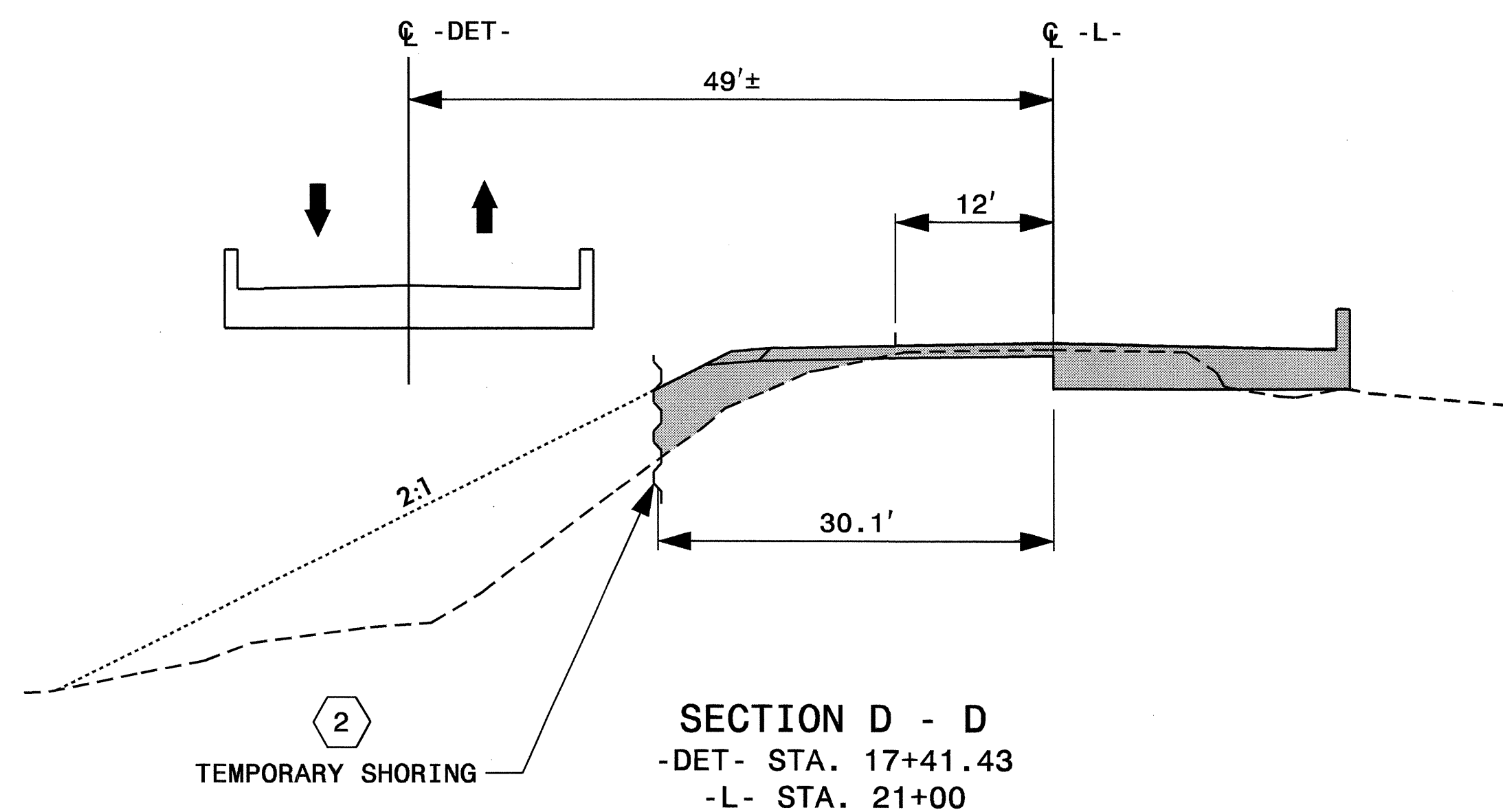
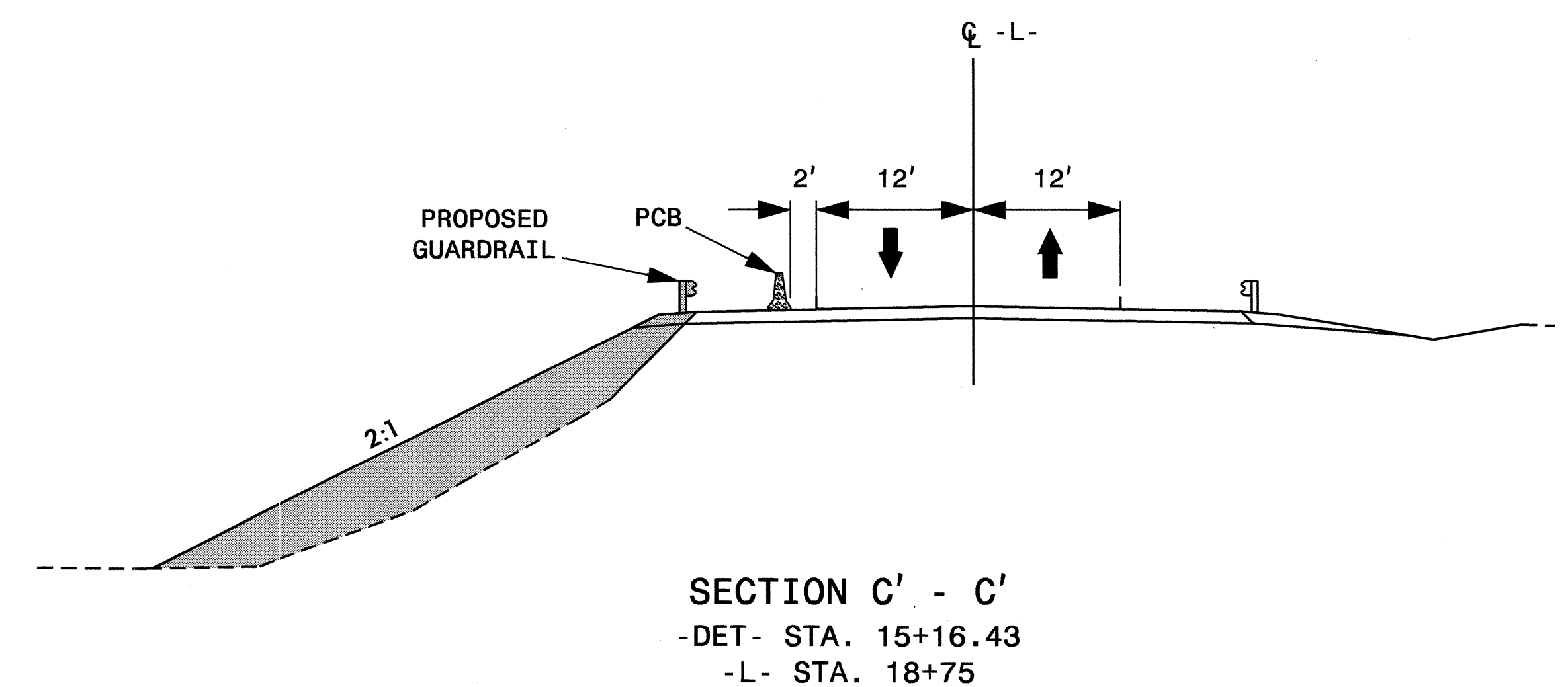
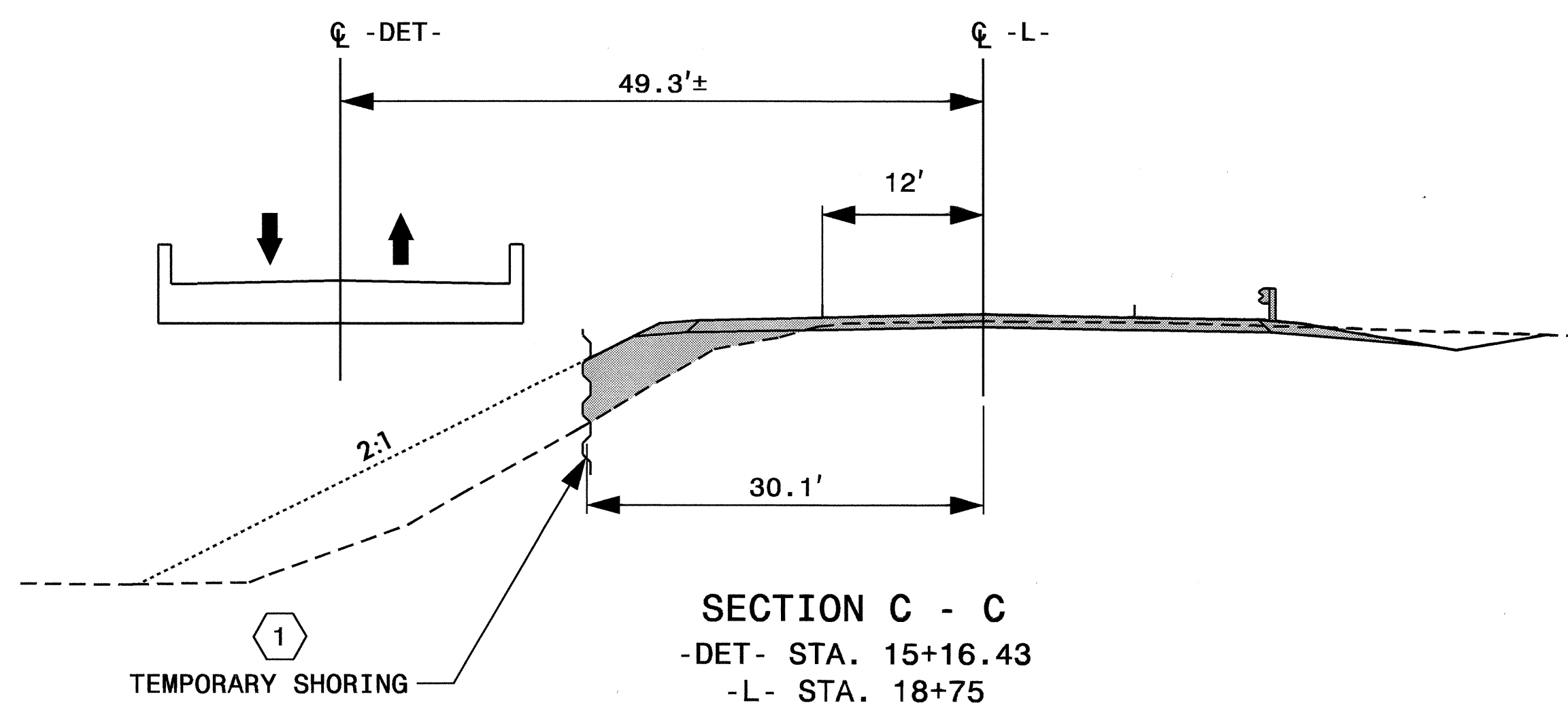
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 scmlbrt AT WZ TC248315

APPROVED:  DATE: 10/19/10	<b>PHASE I</b>	
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	DATE: 10/09	
	DWG. BY: RMG	
	DESIGN BY: RMG	
REVIEWED BY: JSK	REVISIONS	

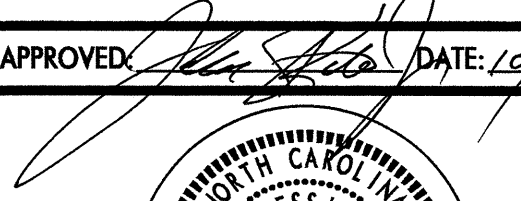
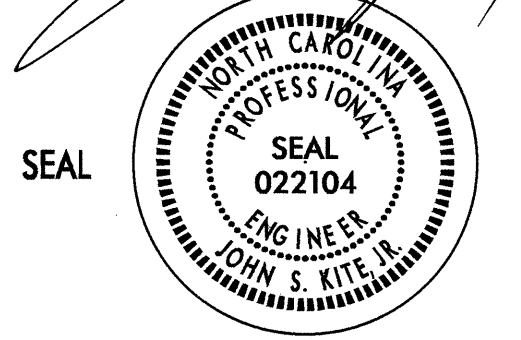



03-DEC-2010 09:40  
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 mgarrrett AT 12/24/10

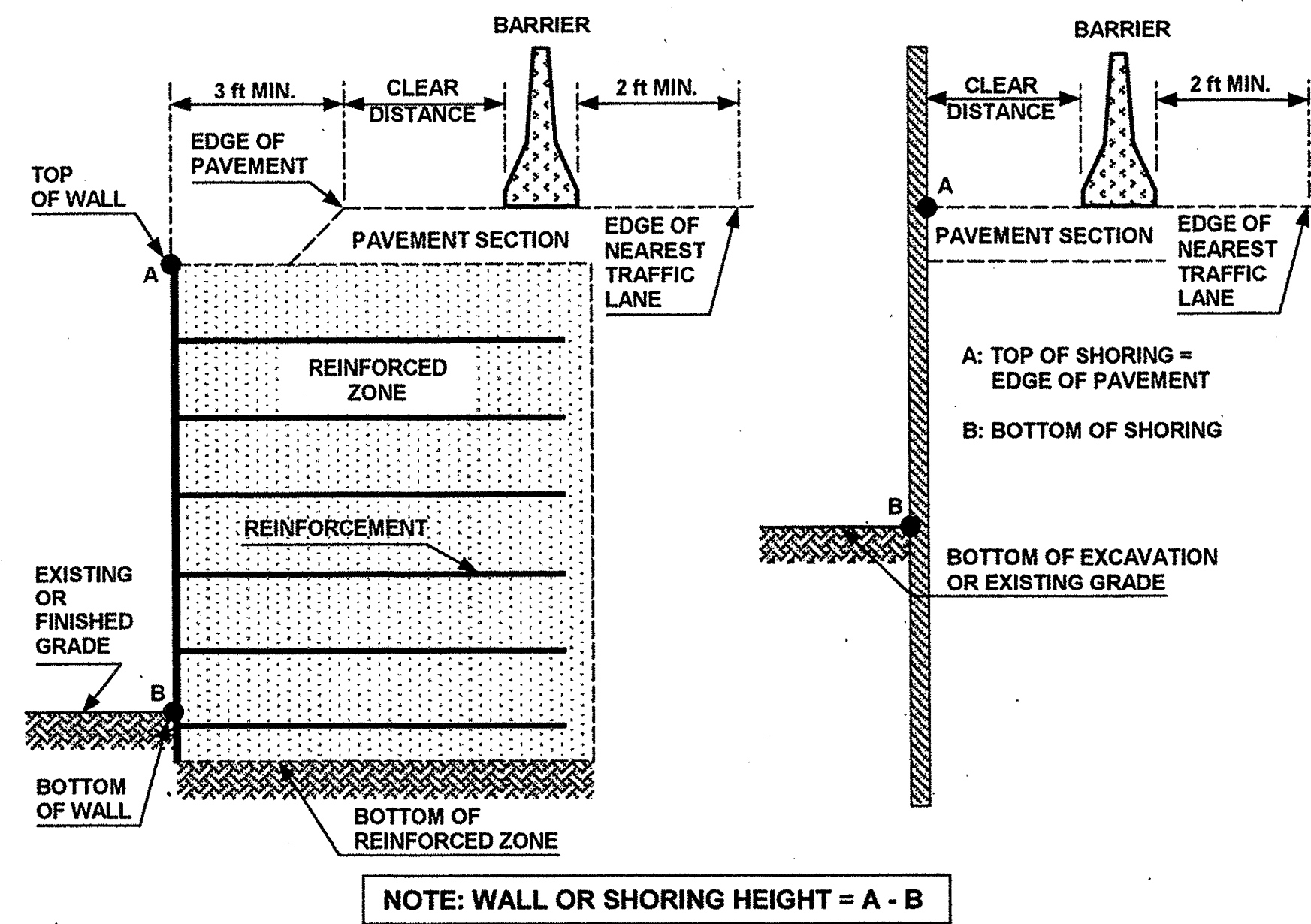
APPROVED: <i>[Signature]</i> DATE: 12/3/10	<b>PHASE II</b>							
	SCALE: NONE							
	DATE: 10/09							
	DESIGN BY: RMG							
	REVIEWED BY: JSK							
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REVISIONS								



12-OCT-2010 11:28 AM  
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 Somlier AT MZTC248915

APPROVED: 	DATE: 10/19/10	<b>PHASE II</b>	
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	DATE: 10/09		
	DWG. BY: RMG		
	DESIGN BY: RMG		
REVIEWED BY: JSK			CADD FILE





**FIGURE A**

**NOTES**

- 1- REFER TO THE TRAFFIC CONTROL PLANS FOR SHORING LOCATIONS AND SOIL PARAMETERS.
- 2- REFER TO THE "TEMPORARY SHORING" PROJECT SPECIAL PROVISION FOR MORE INFORMATION ABOUT TEMPORARY SHORING, MEASUREMENT AND PAYMENT.
- 3- PROVIDE PORTABLE CONCRETE BARRIER TO PROTECT TEMPORARY SHORING IF SHORING IS LOCATED WITHIN THE CLEAR ZONE AS DEFINED IN 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).
- 4- BASED ON THE CLEAR DISTANCE, OFFSET, DESIGN SPEED AND PAVEMENT TYPE, CHOOSE AN UNANCHORED PCB, ANCHORED PCB OR AN OREGON BARRIER FROM THE TABLE SHOWN IN FIGURE B. FOR TRAFFIC LANES AND PORTABLE CONCRETE BARRIER LOCATED ABOVE AND BEHIND TEMPORARY SHORING, THE FOLLOWING ARE DEFINED AS:
 

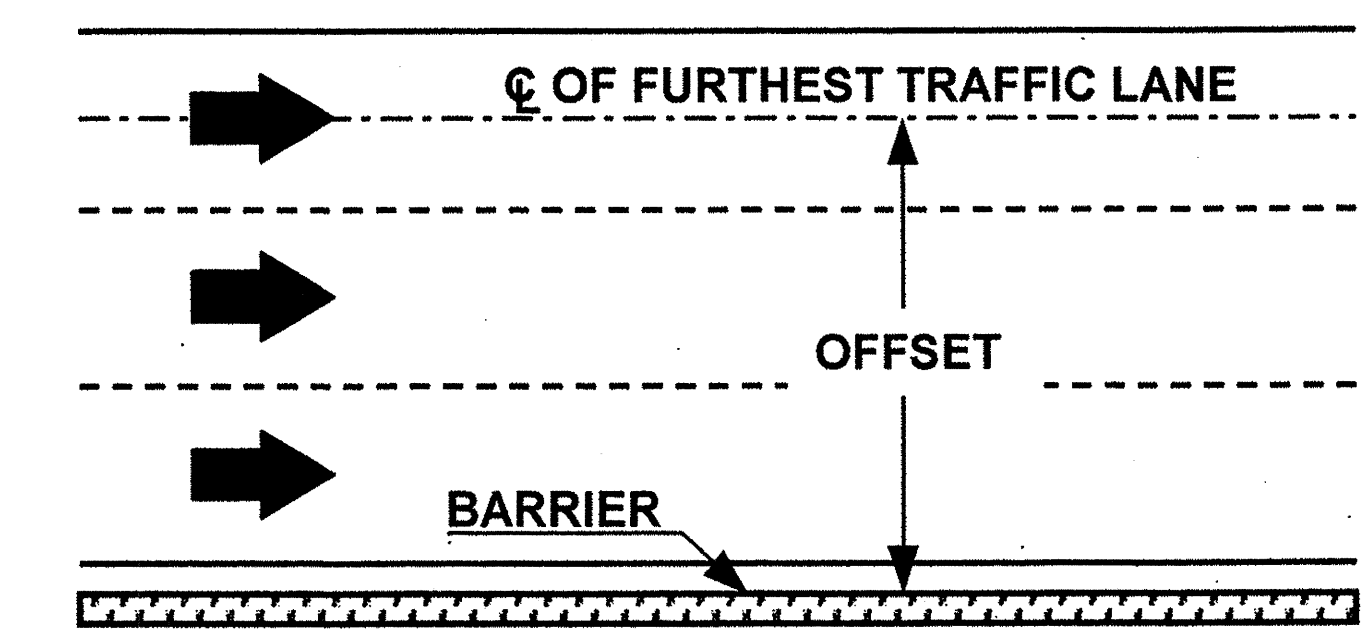
CLEAR DISTANCE - HORIZONTAL DISTANCE FROM THE BACK FACE OF THE BARRIER TO THE EDGE OF PAVEMENT FOR TEMPORARY MSE WALL OR TO THE FACE OF NON-ANCHORED TEMPORARY SHORING AS SHOWN IN FIGURE A.

OFFSET - HORIZONTAL DISTANCE FROM THE FRONT FACE OF THE BARRIER TO CENTERLINE OF THE FURTHEST TRAFFIC LANE AS SHOWN IN FIGURE B FOR 3 TRAFFIC LANES.
- 5- AT THE CONTRACTOR'S OPTION OR IF THE MINIMUM REQUIRED CLEAR DISTANCE IS NOT AVAILABLE, SET AN UNANCHORED PCB AGAINST THE TRAFFIC SIDE OF THE SHORING AND DESIGN SHORING FOR TRAFFIC IMPACT OR USE THE "SURCHARGE CASE WITH TRAFFIC IMPACT" FOR THE STANDARD TEMPORARY SHORING. DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE. (CONTACT NCDOT PAVEMENT MANAGEMENT UNIT FOR APPLICABLE PAVEMENT DESIGN).
- 6- USE NCDOT PORTABLE CONCRETE BARRIER (PCB) IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1170.01 AND SECTION 1170 OF THE STANDARD SPECIFICATIONS.
- 7- USE OREGON TALL F-SHAPE CONCRETE BARRIER IN ACCORDANCE WITH DETAIL DRAWING AND SPECIAL PROVISION OBTAINED FROM: WORK ZONE TRAFFIC CONTROL UNIT WEB PAGE.
- 8- UNLESS NOTED OTHERWISE ON THE PLANS, SET PORTABLE CONCRETE BARRIER WITH A MINIMUM DISTANCE OF 2 FT BETWEEN THE FRONT FACE OF THE BARRIER AND THE EDGE OF THE NEAREST TRAFFIC LANE AS SHOWN IN FIGURE A.
- 9- FOR PORTABLE CONCRETE BARRIER ABOVE AND BEHIND TEMPORARY MSE 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.
- 10- 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' 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 or Oregon Barrier	Asphalt	All Offsets	24 for All Design Speeds						
Anchored PCB or Oregon Barrier	Concrete (including bridge approach slabs)	All Offsets	12 for All Design Speeds						

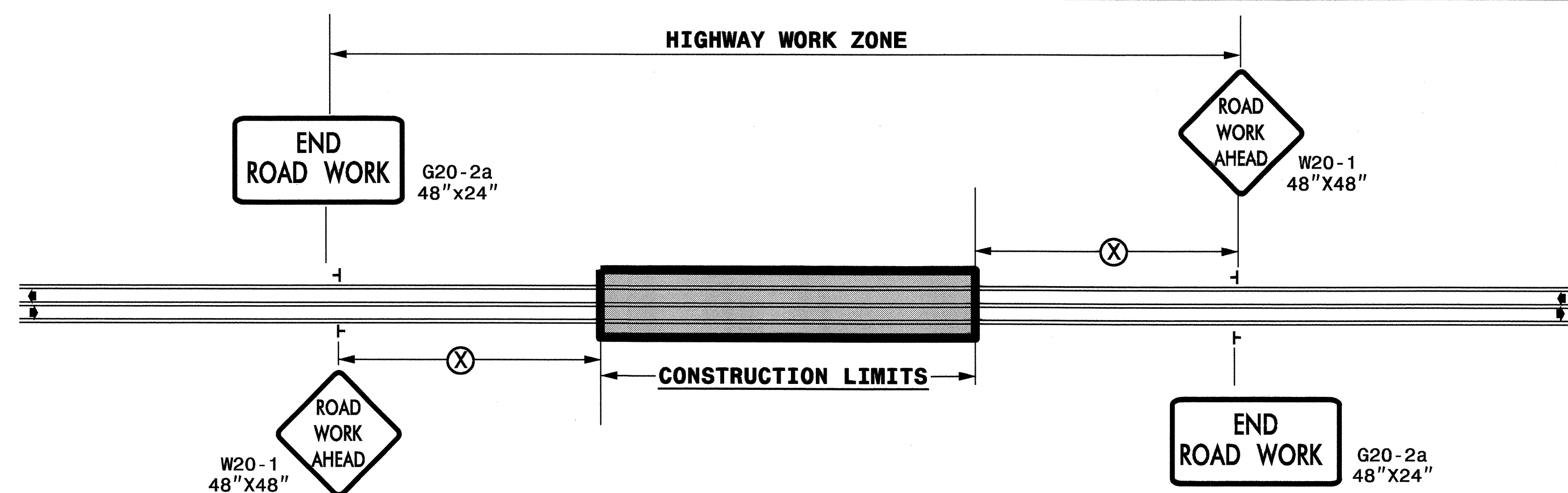
\* See Figure Below



**FIGURE B**

APPROVED: _____ DATE: _____		PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS

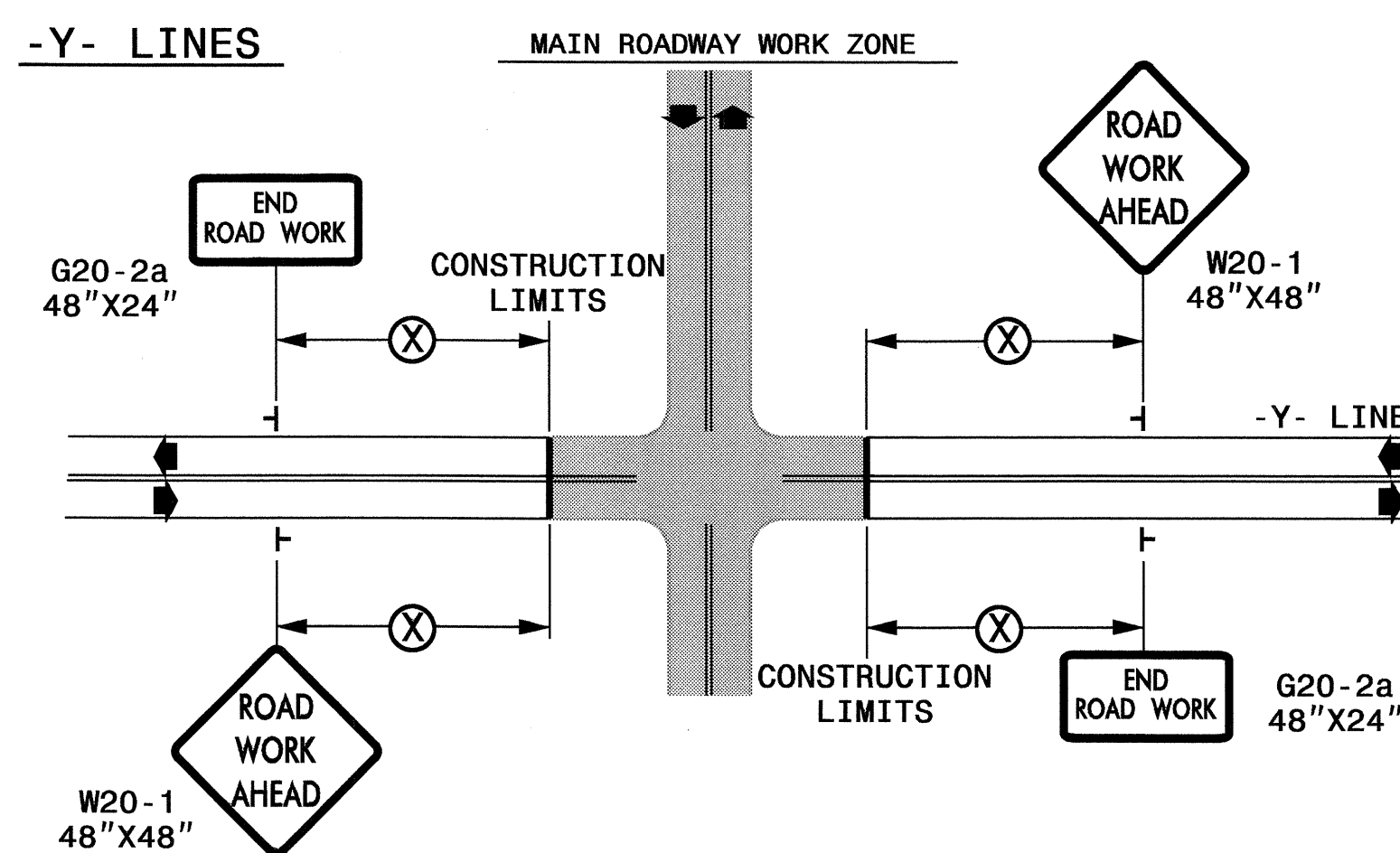
**TWO-WAY UNDIVIDED \*\* (L-LINES)**



POSTED SPEED LIMIT (M.P.H.)	RECOMMENDED MINIMUM SIGN SPACING
≤ 50	500'
≥ 55	1000'

STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

**ROADWAYS INTERSECTING ALONG 2 WAY UNDIVIDED WORK ZONE (Y-LINES)**



DETAIL DRAWING FOR  
TWO-WAY UNDIVIDED  
WORK ZONE WARNING SIGNS

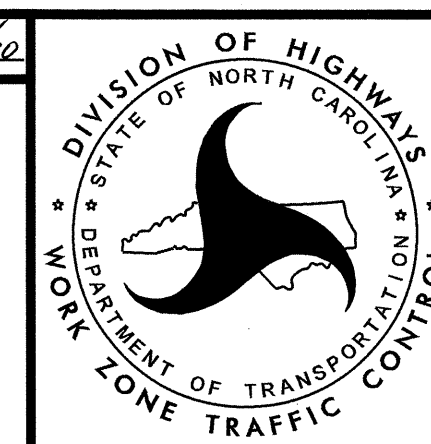
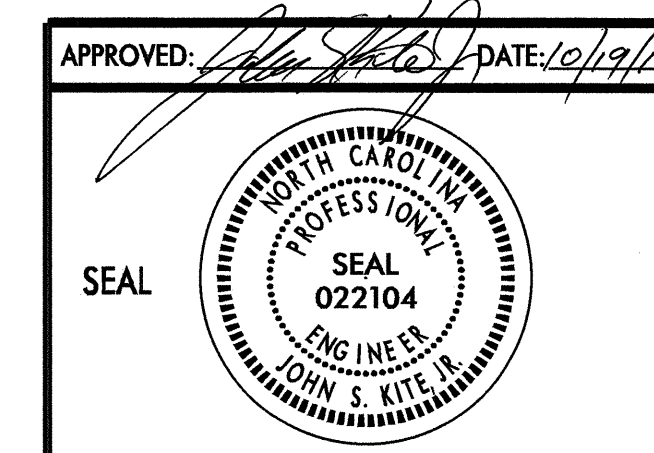
**GENERAL NOTES**

- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCED WORK ZONE SIGNS.
- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK.
- SIGNS SHOWN ARE REQUIRED FOR WORK ZONES THAT WILL REMAIN IN EFFECT OVERNIGHT. FOR SHORT-TERM DAILY MAINTENANCE TYPE OPERATIONS, THIS SIGNING APPLICATION IS OPTIONAL; MAY USE ONLY APPLICABLE ROADWAY STANDARD DRAWINGS INSTEAD. HOWEVER, IF THIS SIGNING APPLICATION IS USED, SIGNS MAY BE PORTABLE MOUNTED.
- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- USE 3LB STEEL U-CHANNEL POST OR 4" X 4" WOOD POST FOR ALL WORK ZONE SIGNS. 3LB STEEL U-CHANNEL POSTS MUST MEET THE REQUIREMENTS OF STANDARD SPECIFICATION SECTION 1094-1(B), MAY BE GALVANIZED STEEL, OR MAY BE PAINTED GREEN BY THE POST MANUFACTURER. SQUARE STEEL TUBING POSTS HAVING EQUIVALENT STRENGTH OF THE 3 LB STEEL U-CHANNEL POST ARE ALSO ACCEPTABLE FOR USE. ERECT SIGNS PER ROADWAY STANDARD DRAWING 1110.01. PAYMENT FOR WOOD POSTS, 3LB STEEL U-CHANNEL AND SQUARE STEEL TUBING POSTS WITH SIGNS WILL BE MADE ACCORDING TO STANDARD SPECIFICATION "WORK ZONE SIGNS" SECTION 1110.
- WHEN NECESSARY, USE SPLICING IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1110.01. REMOVE ENTIRE POST WHEN REMOVING SIGNS WITH SPLICED POSTS.
- DO NOT BACK BRACE SIGN SUPPORTS.
- \*\* TWO-WAY UNDIVIDED ADVANCE WARNING SIGN CONFIGURATION MAY BE USED ON URBAN MULTI-LANE FACILITIES WHERE CONDITIONS LIMIT THE USE OF DUAL MOUNTED SIGNS AS DETERMINED BY THE ENGINEER.

**LEGEND**

- ┆ STATIONARY SIGN
- ◀ DIRECTION OF TRAFFIC FLOW

SHEET 1 OF 1



DETAIL DRAWING FOR TWO-WAY UNDIVIDED AND URBAN FREEWAYS  
WORK ZONE WARNING SIGNS