

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

STATE PROJECT REFERENCE NO.	SHEET NO.
B - 4 1 0 1	TCP-1

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

B-4101

**ROADWAY STANDARD DRAWINGS**

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS"-ROADWAY DESIGN 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
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGERS
1165.01	TRUCK MOUNTED IMPACT ATTENUATOR
1180.01	SKINNY-DRUMS
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	PAVEMENT MARKER SPACING
1251.01	RAISED PAVEMENT MARKERS (TEMPORARY & PERMANENT)
1261.01	GUARDRAIL & BARRIER DELINEATOR SPACING
1261.02	GUARDRAIL & BARRIER DELINEATOR TYPES
1262.01	GUARDRAIL END DELINEATION
1264.01	OBJECT MARKERS
1264.02	PLACEMENT OF OBJECT MARKERS

**INDEX OF SHEETS**

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TCP-1	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, INDEX OF SHEETS AND TEMPORARY PAVEMENT MARKING SCHEDULE
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TCP-4 AND TCP-5	PHASE I DETAILS
TCP-6	PHASE II OVERVIEW AND PHASING
TCP-7 AND TCP-8	PHASE II DETAILS
TCP-9	DETAIL DRAWING FOR TWO-WAY UNDIVIDED AND URBAN FREEWAYS ADVANCE WORK ZONE WARNING SIGNS
TCP-10	PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS
PM-1	FINAL PAVEMENT MARKING SCHEDULE

**TEMP. PAV'T. MARKING SCHEDULE**

SYMBOL	DESCRIPTION	QUANTITY BREAKDOWN	PAY ITEM	TOTAL QUANTITY
PAVEMENT MARKING LINES				
PA	WHITE EDGELINE 2X	7,308 LF	PAINT (4")	
PI	YELLOW DOUBLE CENTER LINE 2X	7,308 LF		
TOTAL				14,616 LF
PAVEMENT MARKERS				
MH	YELLOW & YELLOW	68 EA	TEMPORARY RAISED	
TOTAL				68 EA

NOTE: FOR EACH PAINT PAVEMENT MARKING ITEM, 1X IMPLIES A SINGLE APPLICATION, 2X IMPLIES TWO APPLICATIONS, AND 3X IMPLIES THREE APPLICATIONS.

**LEGEND**

- GENERAL**
- DIRECTION OF TRAFFIC FLOW
  - NORTH ARROW
  - PROPOSED PVMT. EXIST. PVMT.
  - PROPOSED CONSTRUCTION
  - REMOVAL OF DETOUR, DETOUR BRIDGE AND EXISTING PAVEMENT

**TRAFFIC CONTROL DEVICES**

- TYPE I BARRICADE
- TYPE II BARRICADE
- TYPE III BARRICADE
- CONE
- DRUM
- FLASHING ARROW PANEL (TYPE C)
- TYPE 'B' WARNING LIGHT
- STATIONARY SIGN
- PORTABLE SIGN
- STATIONARY OR PORTABLE SIGN
- WARNING FLAGS
- 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:

9/17/2007 P:\TIP\Group45\B4101.ko\B4101\TrafficControl\TCP\000\B4101\_TC\_TopL\_title.dgn KO & Associates, P.C.

PLAN REVIEWED BY: N.C.D.O.T. WORK ZONE TRAFFIC CONTROL UNIT J. S. BOURNE, P.E. WORK ZONE TRAFFIC CONTROL ENGINEER G. L. GETTIER, PE TRAFFIC CONTROL PROJECT ENGINEER J. W. WOOLARD, PE TRAFFIC CONTROL PROJ. DESIGN ENGINEER _____ TRAFFIC CONTROL DESIGN ENGINEER _____ TRAFFIC CONTROL DESIGN TECHNICIAN	APPROVED: <i>Michael T. Rzepka</i> DATE: 9-19-07 SEAL 	PLAN PREPARED FOR N.C.D.O.T. BY:  M. T. RZEPKA, P.E. PROJECT ENGINEER B. L. MARIOTTE DESIGN ENGINEER B. L. MARIOTTE DESIGN TECHNICIAN
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# PROJECT NOTES

PROJ. REFERENCE NO.	SHEET NO.
B-4101	TCP-2

Plans prepared by:  
**KO & ASSOCIATES, P.C.**  
Consulting Engineers  
101 SCRUBB DR, SUITE #202  
RALEIGH, N.C. 27606  
For Division of Highways

## 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.

### TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
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1. SR 1741, WALLBURG - HIGH POINT RD.	6:00 AM - 8:00 AM MONDAY THRU FRIDAY
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B) DO NOT STOP TRAFFIC FOR MORE THAN 15 MINUTES AS FOLLOWS:

ROAD NAME	OPERATIONS
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1. SR 1741, WALLBURG - HIGH POINT RD.	PAVING TIE-INS, PAVEMENT MARKINGS, SHIFTS
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### LANE AND SHOULDER CLOSURE REQUIREMENTS

C) 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.

D) 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.

E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT (1.5m) 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.

F) 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.

G) 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.

H) DO NOT PERFORM WORK INVOLVING HEAVY EQUIPMENT WITHIN 15 FT OF THE EDGE OF TRAVELWAY WHEN WORK IS BEING PERFORMED BEHIND A LANE CLOSURE ON THE OPPOSITE SIDE OF THE TRAVELWAY.

I) DO NOT INSTALL MORE THAN ONE LANE CLOSURE, IN ANY ONE DIRECTION, ON SR 1741, WALLBURG - HIGH POINT RD.

### PAVEMENT EDGE DROP OFF REQUIREMENTS

J) 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 WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

K) 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

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

### SIGNING

M) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

N) PROVIDE PERMANENT SIGNING.

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

### TRAFFIC CONTROL DEVICES

P) SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH), EXCEPT 10 FT ON-CENTER IN RADII, 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.

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

R) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES DRUMS PERPENDICULAR TO THE EDGE OF TRAVEL WAY ON 500 FT CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.

### PAVEMENT MARKINGS AND MARKERS

S) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
1. SR 1741, WALLBURG - HIGH POINT RD.	POLYUREA	PERMANENT RAISED

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

ROAD NAME	MARKING	MARKER
1. SR 1741, WALLBURG - HIGH POINT RD.	PAINT	TEMPORARY RAISED

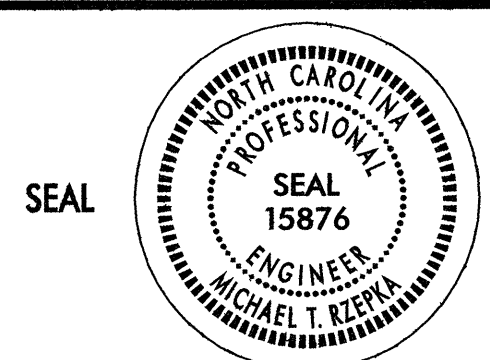
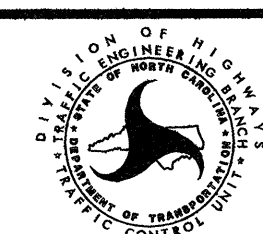
U) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

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

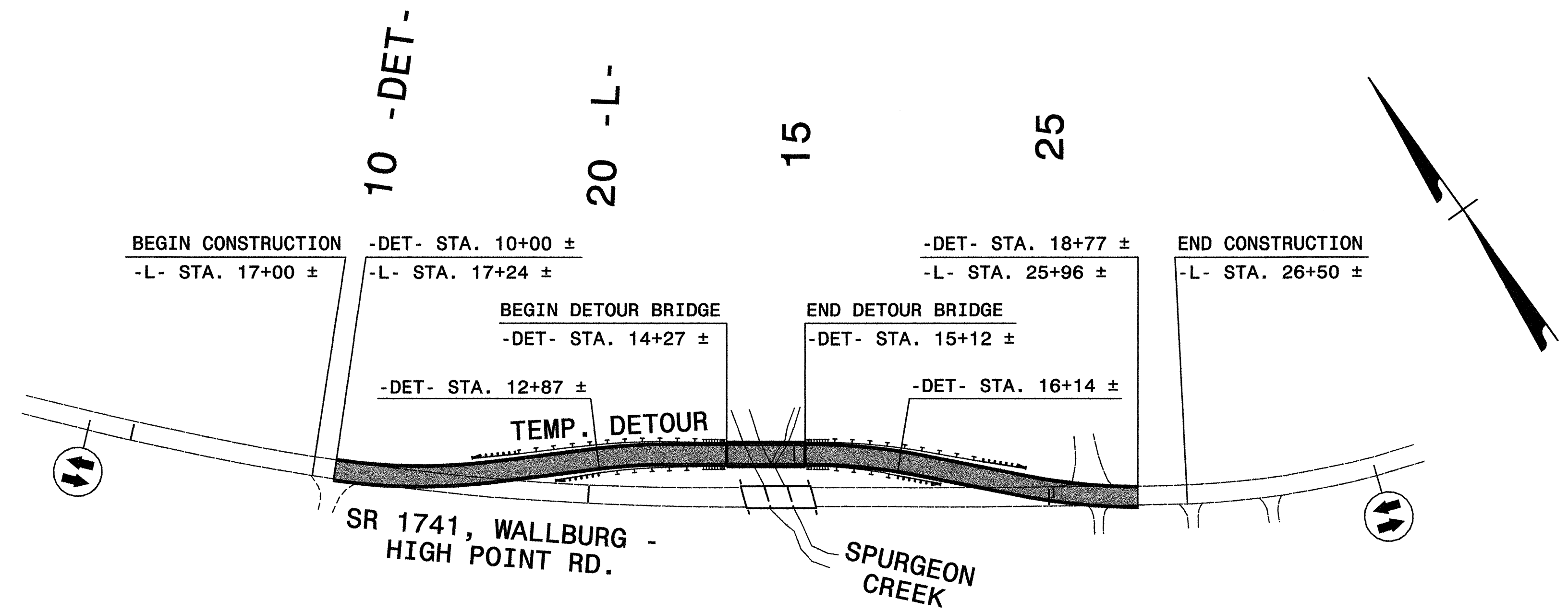
W) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAYS OPERATION.

### MISCELLANEOUS

X) MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES.

APPROVED: <i>Michael T. Kiermaier</i> DATE: 9-25-07  <div style="text-align: center;">  </div>	<h2 style="margin: 0;">PROJECT NOTES</h2>	<table border="1" style="width: 100%; border-collapse: collapse; font-size: 8px;"> <tr> <td>SCALE:</td> <td>NONE</td> </tr> <tr> <td>DATE:</td> <td>9-07</td> </tr> <tr> <td>DWG. BY:</td> <td>BLM</td> </tr> <tr> <td>DESIGN BY:</td> <td>BLM</td> </tr> <tr> <td>REVIEWED BY:</td> <td>MTR</td> </tr> </table>	SCALE:	NONE	DATE:	9-07	DWG. BY:	BLM	DESIGN BY:	BLM	REVIEWED BY:	MTR
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KO & ASSOCIATES, P.C.



### PHASE I

STEP 1: - INSTALL WORK ZONE WARNING SIGNS (SEE SHEET TCP-9).

COMPLETE THE FOLLOWING WORK IN PHASE I, STEPS 2 AND 3 USING ROADWAY STANDARD DRAWING NUMBER 1101.04, SHEET 1 OF 1.

STEP 2: - BEGIN CONSTRUCTION OF TEMPORARY DETOUR BRIDGE FROM -DET- STA. 14+27 ± TO -DET- STA. 15+12 ±, (SEE SHEET TCP-4 AND STRUCTURE PLANS).

STEP 3: - CONSTRUCT TEMPORARY DETOUR UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE AT THE FOLLOWING LOCATIONS (SEE SHEET TCP-4 AND ROADWAY PLANS):

- DET- STA. 12+87 ± TO -DET- STA. 14+27 ±
- DET- STA. 15+12 ± TO -DET- STA. 16+14 ±

- USING ROADWAY STANDARD DRAWING NUMBER 1101.02, SHEET 1 OF 9, CONSTRUCT PROPOSED DETOUR UP TO THE EXISTING EDGE AND ELEVATION OF SR 1741, WALLBURG - HIGH POINT RD., AT THE FOLLOWING LOCATIONS (SEE SHEET TCP-4 AND ROADWAY PLANS):

- DET- STA. 10+00 ± TO -DET- STA. 12+87 ±
- DET- STA. 16+14 ± TO -DET- STA. 18+77 ±

COMPLETE THE FOLLOWING WORK IN PHASE I, STEPS 4 AND 5 USING ROADWAY STANDARD DRAWING NUMBER 1101.04, SHEET 1 OF 1.

STEP 4: - COMPLETE CONSTRUCTION OF TEMPORARY DETOUR BRIDGE FROM -DET- STA. 14+27 ± TO -DET- STA. 15+12 ± (SEE SHEET TCP-4, AND STRUCTURE PLANS).

STEP 5: - CONSTRUCT GUARDRAIL LEFT AND RIGHT OF TEMPORARY DETOUR. (SEE SHEET TCP-4, AND ROADWAY PLANS).

COMPLETE THE FOLLOWING WORK IN PHASE I STEP 6 AS DIRECTED BY THE ENGINEER, REFER TO ROADWAY STANDARD DRAWING NUMBER 1101.03, SHEET 3 OF 9.

STEP 6: - INSTALL SIGNS W1-4R, W1-4L AND W13-1 KEEPING SIGNS COVERED. PLACE TEMPORARY PAVEMENT MARKINGS (PAINT) AND MARKERS (TEMPORARY RAISED) OFF THE PROJECT LIMITS.

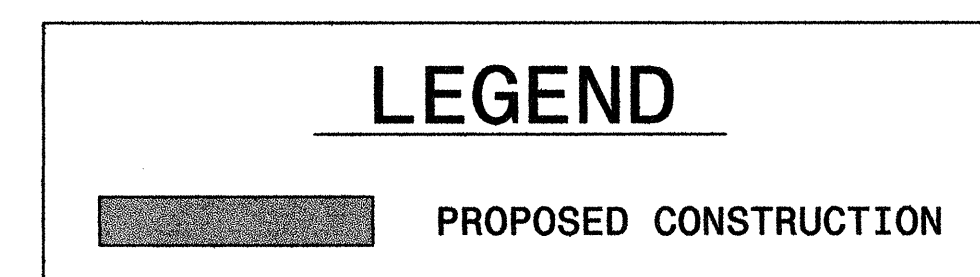
WORKING IN A CONTINUOUS MANNER, COMPLETE THE FOLLOWING WORK IN PHASE I, STEPS 7 AND 8 USING ROADWAY STANDARD DRAWING NUMBER 1101.02, SHEET 1 OF 9.

STEP 7: - PLACE TRAFFIC IN A ONE-LANE TWO-WAY PATTERN IN THE EXISTING EAST BOUND LANE OF SR 1741, WALLBURG - HIGH POINT RD.. PAVE / WEDGE THE PROPOSED WEST BOUND LANE OF TEMPORARY DETOUR INCLUDING THE FINAL LAYER OF SURFACE COURSE FROM -DET- STA. 10+00 ± TO -DET- STA. 18+77 ± (SEE ROADWAY PLANS).

- PLACE WHITE EDGELINE AND YELLOW DOUBLE CENTERLINE (PAINT) AND MARKERS (TEMPORARY RAISED) ON PROPOSED WEST BOUND LANE OF TEMPORARY DETOUR FROM -DET- STA. 10+00 ± TO -DET- STA. 18+77 ± (SEE SHEET TCP-5).

STEP 8: - PLACE CHANGEABLE MESSAGE SIGNS (CMS'S) AT EACH END OF THE PROJECT (SEE SHEET TCP-5) UNCOVER SIGNS W1-4R, W1-4L AND W13-1 AND PLACE TRAFFIC IN A ONE-LANE TWO-WAY PATTERN IN THE PROPOSED WEST BOUND LANE OF TEMPORARY DETOUR. PAVE / WEDGE THE PROPOSED EAST BOUND LANE OF TEMPORARY DETOUR INCLUDING THE FINAL LAYER OF SURFACE COURSE FROM -DET- STA. 10+00 ± TO -DET- STA. 18+77 ± (SEE ROADWAY PLANS).

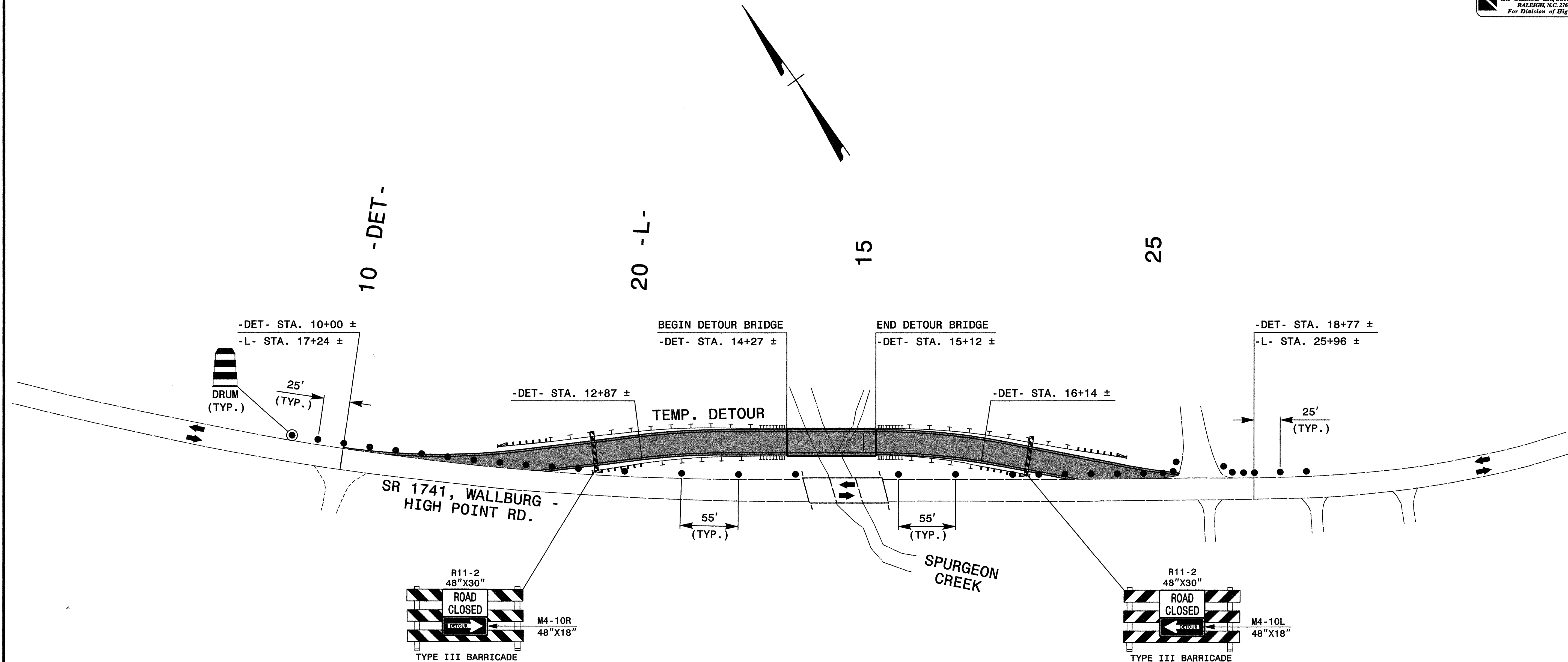
- PLACE WHITE EDGE LINE (PAINT) ON PROPOSED EAST BOUND LANE OF TEMPORARY DETOUR FROM -DET- STA. 10+00 ± TO -DET- 18+77 ± AND PLACE TRAFFIC IN A TWO-LANE TWO-WAY PATTERN (SEE SHEET TCP-5).



APPROVED: *Michael T. Keenan* DATE: 9-19-07

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 KO & Associates, P.C.

**LEGEND**

PROPOSED CONSTRUCTION

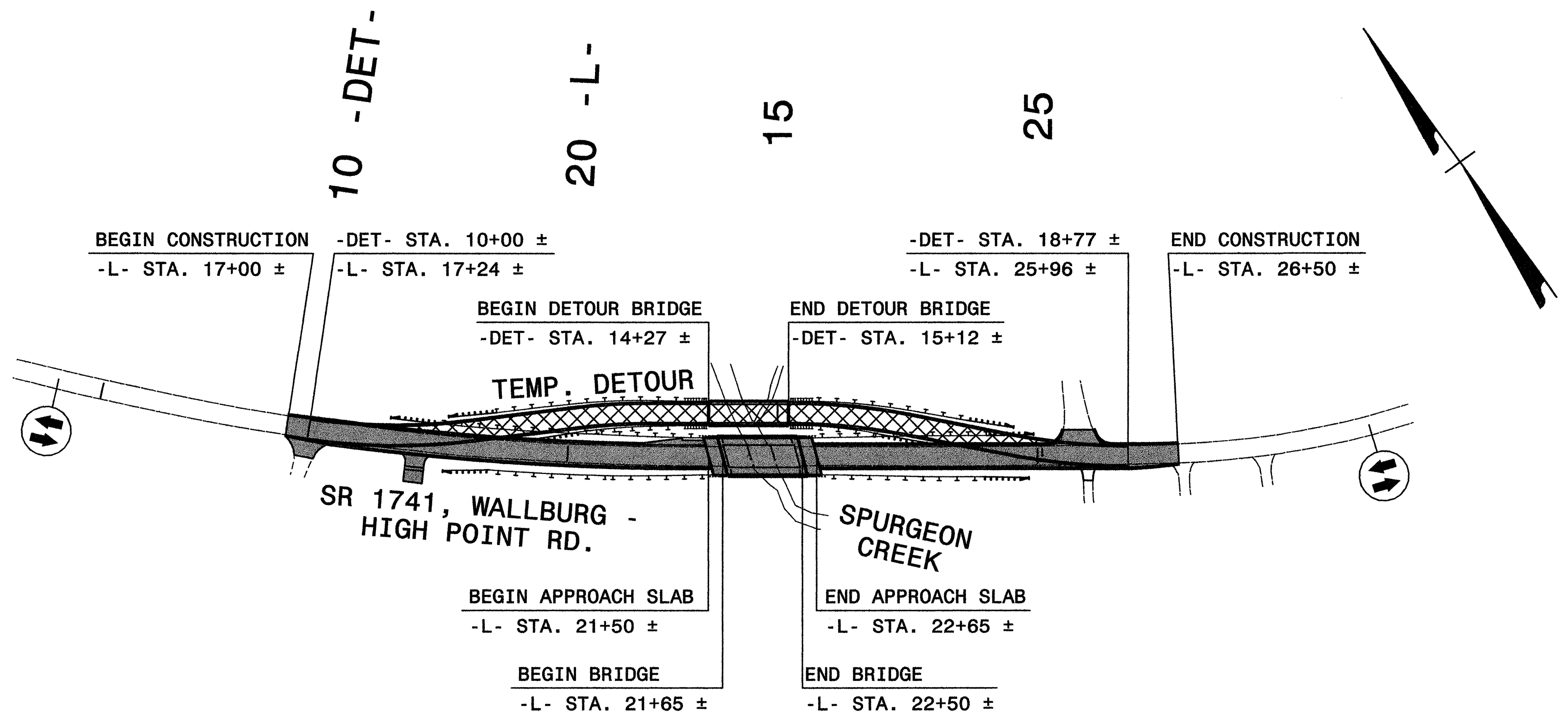
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**PHASE I DETAILS**

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### PHASE II

COMPLETE THE FOLLOWING WORK IN PHASE II, STEPS 1 THRU 4 USING ROADWAY STANDARD DRAWING NUMBER 1101.04, SHEET 1 OF 1.

- STEP 1: - REMOVE EXISTING STRUCTURE ON SR 1741, WALLBURG - HIGH POINT RD.
- STEP 2: - PLACE TEMPORARY SHORING 30' LEFT OF -L- AT THE FOLLOWING LOCATIONS (SEE SHEET TCP-7):
  - L- STA. 21+44 ± TO -L- STA. 21+64 ±
  - L- STA. 22+37 ± TO -L- STA. 22+57 ±
- STEP 3: - BEGIN CONSTRUCTION OF PROPOSED BRIDGE FROM -L- STA. 21+50± TO -L- STA. 22+65 ±, (SEE SHEET TCP-7 AND STRUCTURE PLANS).
- STEP 4: - CONSTRUCT PROPOSED -L-, UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE AT THE FOLLOWING LOCATIONS (SEE SHEET TCP-7, SECTION A-A AND ROADWAY PLANS):
  - L- STA. 20+50 ± TO -L- STA. 21+50 ±
  - L- STA. 22+65 ± TO -L- STA. 23+00 ±
- STEP 5: - USING ROADWAY STANDARD DRAWING NUMBER 1101.02, SHEET 1 OF 9, CONSTRUCT PROPOSED -L- UP TO THE EXISTING EDGE AND ELEVATION OF SR 1741, WALLBURG - HIGH POINT RD. AND TEMPORARY DETOUR, AT THE FOLLOWING LOCATIONS (SEE SHEET TCP-7 AND ROADWAY PLANS):
  - L- STA. 17+00 ± TO -L- STA. 20+50 ±
  - L- STA. 23+00 ± TO -L- STA. 26+50 ±

COMPLETE THE FOLLOWING WORK IN PHASE II, STEPS 6 AND 7 USING ROADWAY STANDARD DRAWING NUMBER 1101.04, SHEET 1 OF 1.

- STEP 6: - COMPLETE CONSTRUCTION OF PROPOSED BRIDGE FROM -L- STA. 21+50 ± TO -L- STA. 22+65 ±. REMOVE TEMPORARY SHORING (SEE SHEET TCP-7, AND STRUCTURE PLANS).
- CONSTRUCT PROPOSED GUARDRAIL RIGHT OF -L- (SEE SHEET TCP-7 AND ROADWAY PLANS).

WORKING IN A CONTINUOUS MANNER, COMPLETE THE FOLLOWING WORK IN STEPS 7 THRU 11 USING ROADWAY STANDARD DRAWING NUMBER 1101.02, SHEET 1 OF 9.

- STEP 7: - PLACE TRAFFIC IN A ONE-LANE TWO-WAY PATTERN IN THE EXISTING WEST BOUND LANE OF TEMPORARY DETOUR. PAVE / WEDGE THE PROPOSED EAST BOUND LANE OF PROPOSED -L- UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE AT THE FOLLOWING LOCATIONS (SEE ROADWAY PLANS):
  - L- STA. 17+00 ± TO -L- STA. 20+50 ±
  - L- STA. 23+00 ± TO -L- STA. 26+50 ±

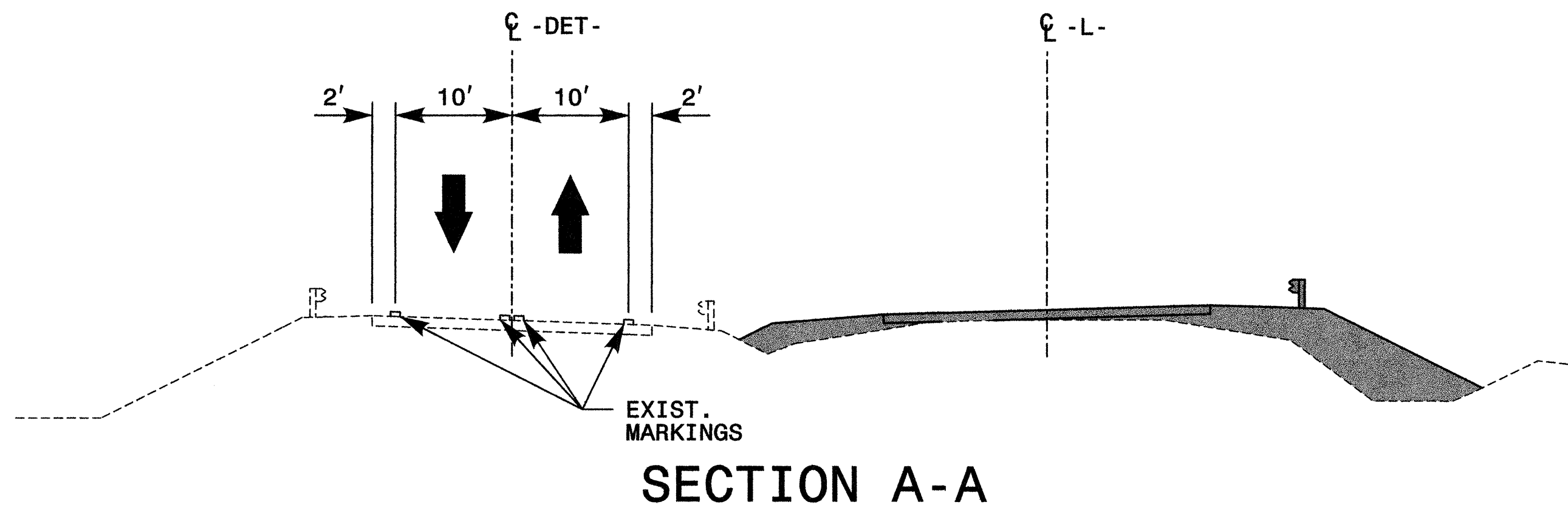
- STEP 8: - COVER OR REMOVE SIGNS W1-4R, W1-4L AND W13-1 (SEE ROADWAY STANDARD DRAWING NUMBER 1101.03, SHEET 3 OF 9)
- STEP 9: - PLACE TRAFFIC IN A ONE-LANE TWO-WAY PATTERN IN THE PROPOSED EAST BOUND LANE OF PROPOSED -L-. CONTRACTOR MAY BEGIN REMOVAL OF TEMPORARY DETOUR AND DETOUR BRIDGE. PAVE / WEDGE THE PROPOSED WEST BOUND LANE OF PROPOSED -L- UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE AT THE FOLLOWING LOCATIONS (SEE SHEET TCP-8 AND ROADWAY PLANS):
  - L- STA. 17+00 ± TO -L- STA. 20+50 ±
  - L- STA. 23+00 ± TO -L- STA. 26+50 ±
- STEP 10: - CONSTRUCT PROPOSED GUARDRAIL LEFT OF -L-, KEEPING GAPS IN GUARDRAIL AT BOTH ENDS OF THE PROPOSED STRUCTURE TO ALLOW FOR DETOUR AND DETOUR BRIDGE REMOVAL, KEEPING ENDS PROTECTED BY TEMPORARY ATTENUATORS (SEE SHEET TCP-8 AND ROADWAY PLANS).
- STEP 11: - PLACE TEMPORARY PAVEMENT MARKINGS (PAINT) AND MARKERS (TEMPORARY RAISED) ON PROPOSED -L- FROM -L- STA. 17+00 ± TO -L- STA. 26+50 ± AND PLACE TRAFFIC IN THE FINAL TWO-LANE TWO-WAY PATTERN (SEE SHEET TCP-8 AND SECTION B-B).
- STEP 12: - COMPLETE REMOVAL OF TEMPORARY DETOUR AND DETOUR BRIDGE FROM -DET- STA. 10+00 ± TO -DET- STA. 18+77 ± (SEE SHEET TCP-8 AND SECTION B-B) (REFER TO ROADWAY STANDARD DRAWING NUMBER 1101.02, SHEET 1 OF 9).
- STEP 13: - USING ROADWAY STANDARD DRAWING NUMBER 1101.02, SHEET 1 OF 9, PLACE THE FINAL LAYER OF SURFACE COURSE, FINAL PAVEMENT MARKINGS AND MARKERS (PERMANENT RAISED) ON PROPOSED -L- FROM -L- STA. 17+00 ± TO -L- STA. 26+50 ±, PER STANDARDS OR AS DIRECTED BY THE ENGINEER. REPLACE ANY ORIGINAL MARKINGS AND MARKERS, OFF THE PROJECT LIMITS, THAT WERE ALTERED OR AS DIRECTED BY THE ENGINEER.
- STEP 14: - REMOVE ALL TRAFFIC CONTROL DEVICES.

**LEGEND**

	PROPOSED CONSTRUCTION
	REMOVAL OF DETOUR AND DETOUR BRIDGE

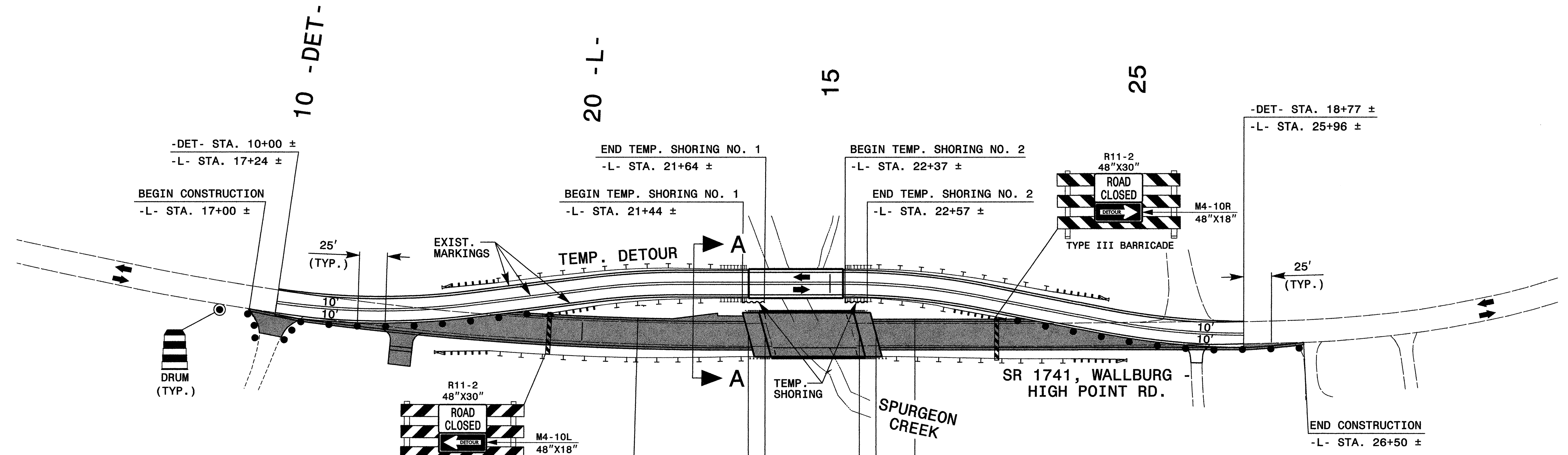
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 KO & ASSOCIATES, P.C.



FOR TEMPORARY SHORING NO. 1 AND TEMPORARY SHORING NO. 2, THE FOLLOWING SOIL PARAMETERS SHALL BE USED:  
 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

- ① QUANTITY = 100 sq. ft.
  - ② QUANTITY = 100 sq. ft.
- (SEE NOTES BELOW)



**TEMPORARY SHORING NO. 1**

FOR TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISIONS.

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 -L- STA. 21+44 ± LT. TO -L- STA. 21+64 ± LT.. THE INFORMATION PROVIDED FOR DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

**TEMPORARY SHORING NO. 2**

**TEMPORARY SHORING NO. 2**

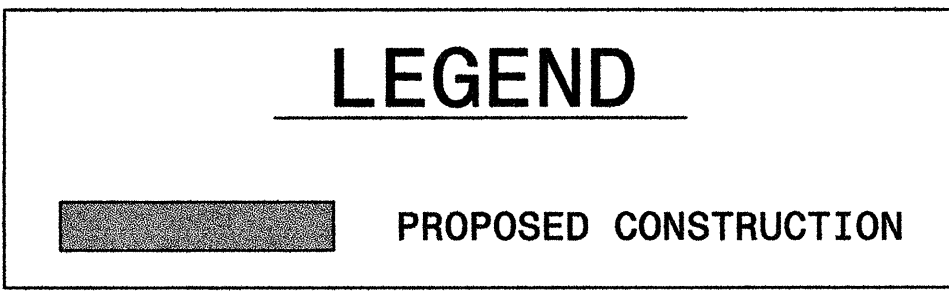
FOR TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISIONS.

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 -L- STA. 22+37 ± LT. TO -L- STA. 22+57 ± LT.. THE INFORMATION PROVIDED FOR DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

NOTE: FOR PAVEMENT MARKINGS BEYOND PROJECT LIMITS AND FOR SIGNING SEE ROADWAY STANDARD DRAWING NUMBER 1101.03, SHEET 3 OF 9.

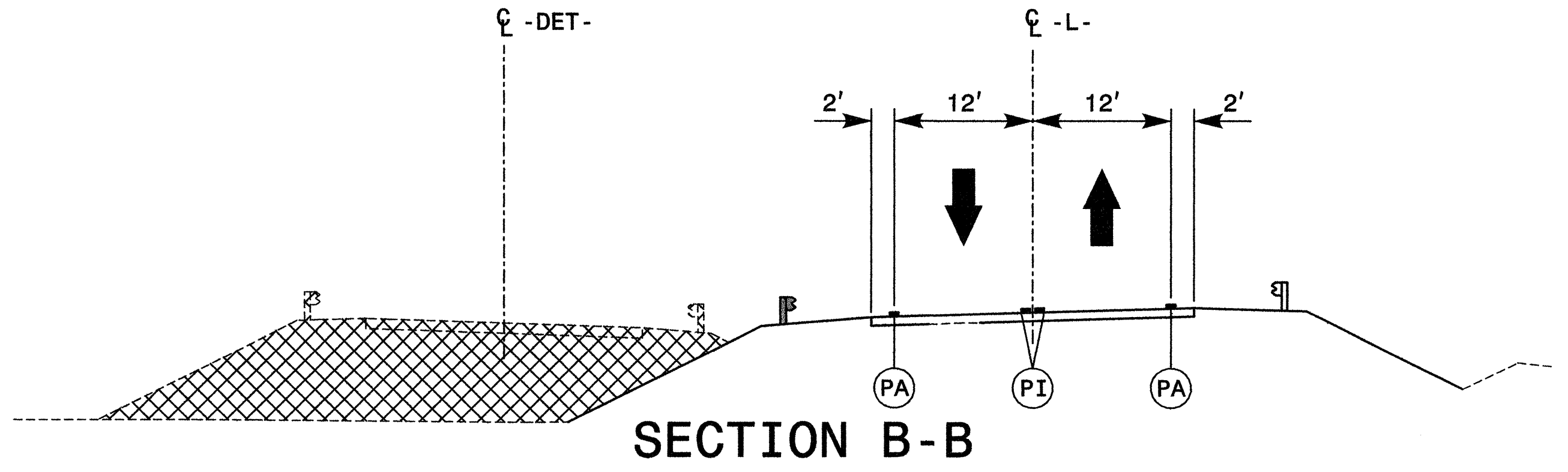


APPROVED: *Michael T. Kerna* DATE: 9-19-07

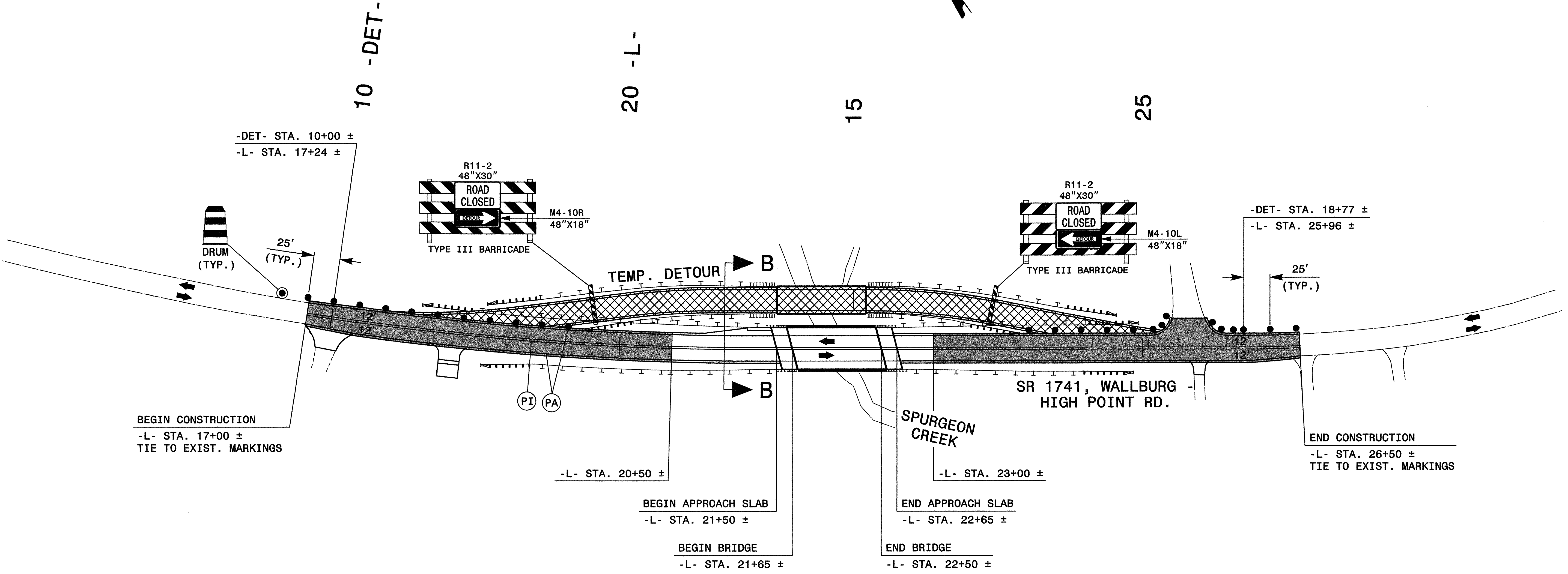
SEAL

<b>PHASE II DETAILS</b>	
SCALE: NONE	REVISIONS
DATE: 9-07	
DWG. BY: BLM	
DESIGN BY: BLM	
REVIEWED BY: MTR	

9/17/2007  
 P:\TIP\Group45\B4101\ko\B4101\TrafficControl\TCP\000\B4101.LC\_Top7\_ph2detils.dgn  
 KO & Associates, P.C.



**SECTION B-B**



9/17/2007  
 K:\p\Group45\B4101\ko\B4101\Traffic\TrafficControl\TCP\002\B4101\_TC\_Top8\_ph2detls.dgn  
 KO & Associates, P.C.

**LEGEND**

- PROPOSED CONSTRUCTION
- REMOVAL OF DETOUR AND DETOUR BRIDGE

APPROVED: *Michael T. Kierma* DATE: 9-19-07

SEAL

**PHASE II DETAILS**

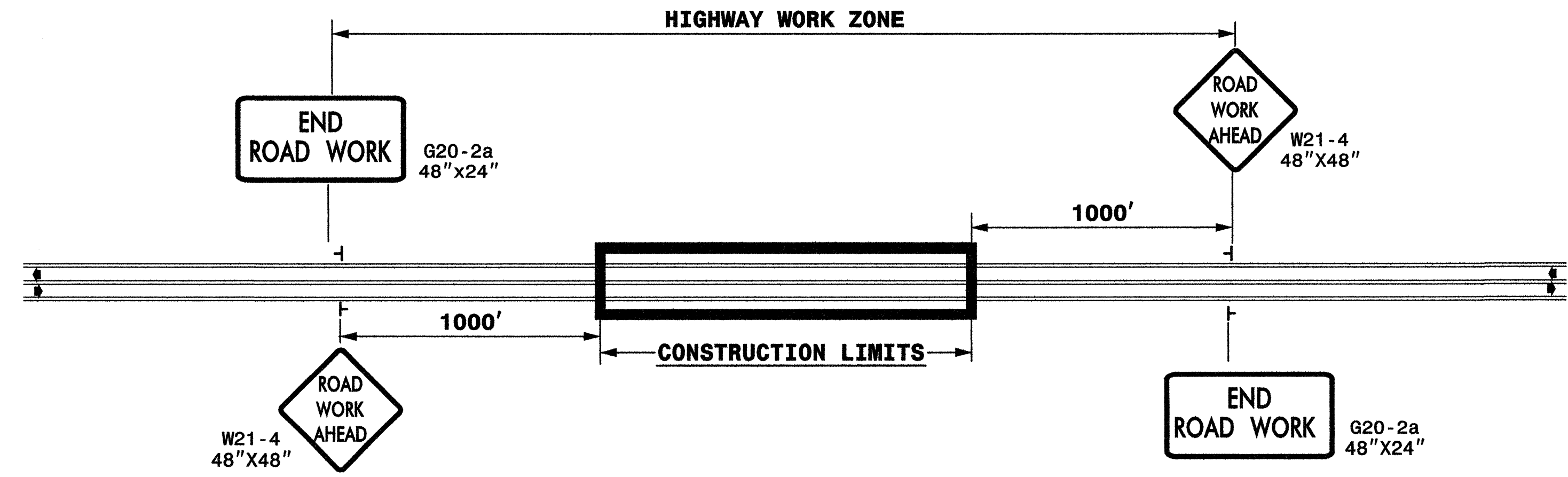
SCALE: NONE  
 DATE: 9-07  
 DWG. BY: BLM  
 DESIGN BY: BLM  
 REVIEWED BY: MTR

REVISIONS	



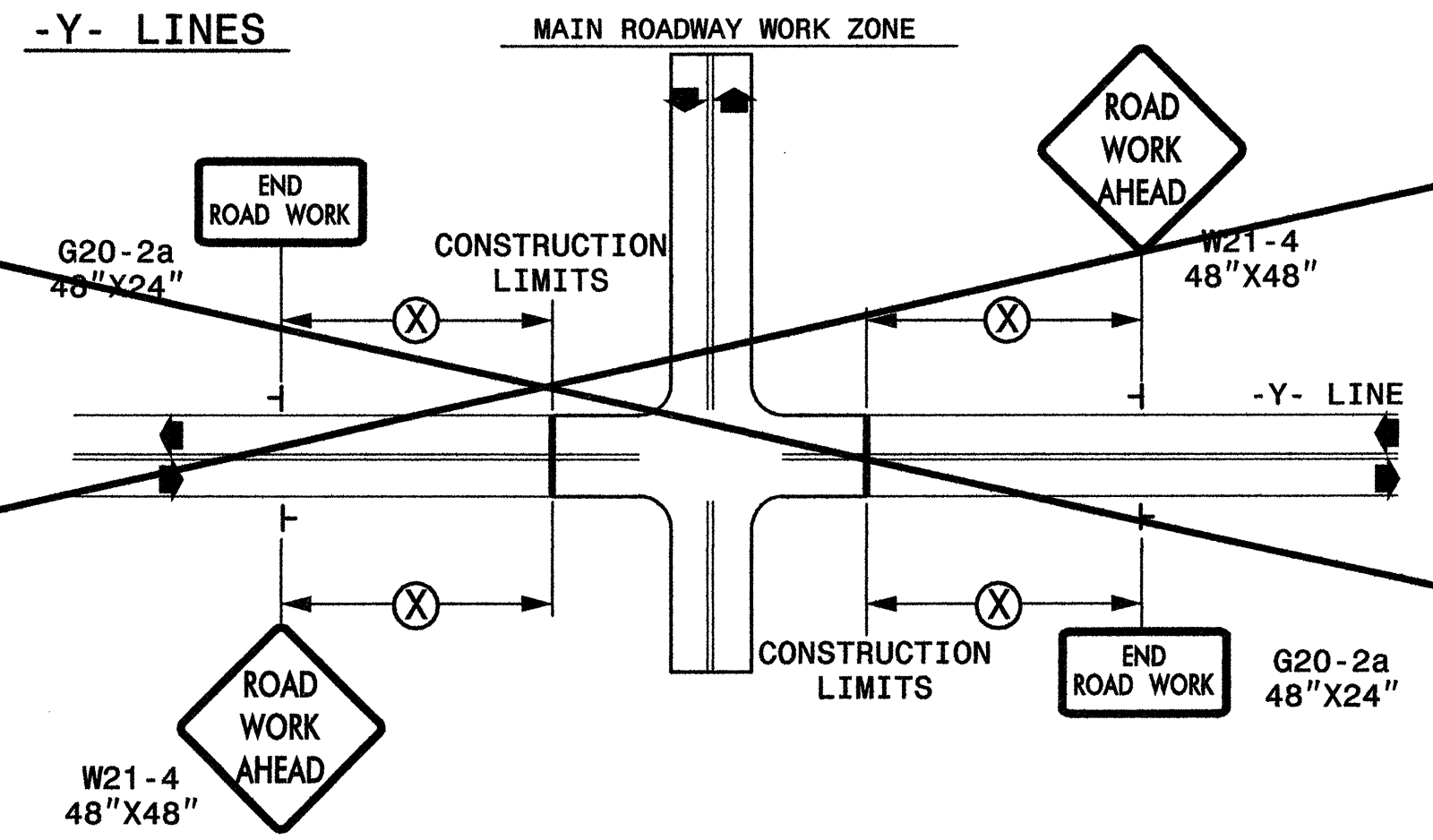
Plans prepared by:  
**KO & ASSOCIATES, P.C.**  
 Consulting Engineers  
 101 SCHAUB DR., SUITE #202  
 RALEIGH, N.C. 27606  
 For Division of Highways

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



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**

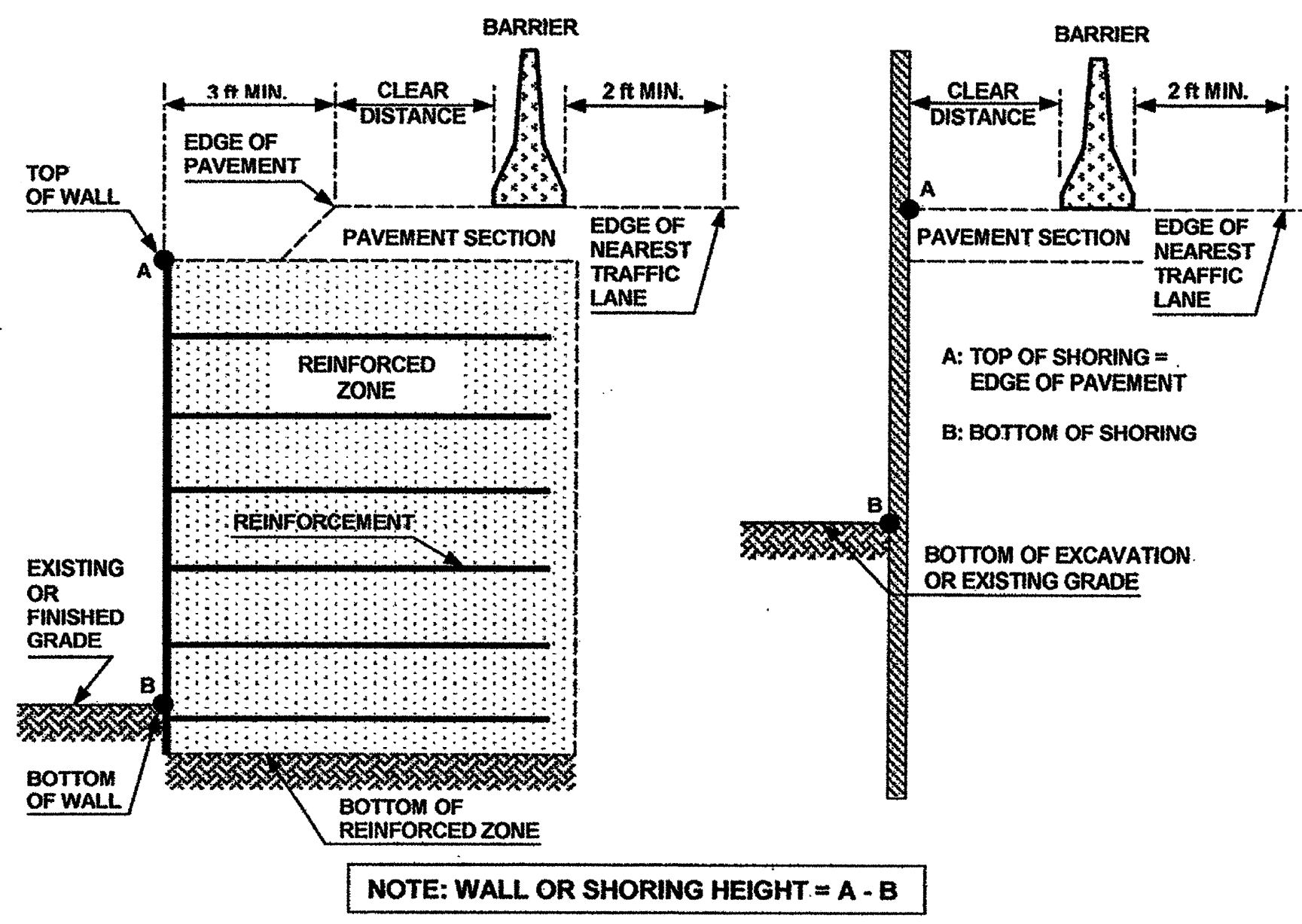
┆ STATIONARY SIGN

◀ DIRECTION OF TRAFFIC FLOW

SHEET 1 OF 1

APPROVED: <i>Michael T. Kierman</i> DATE: 9-19-07	DETAIL DRAWING FOR TWO-WAY UNDIVIDED AND URBAN FREEWAYS ADVANCED WORK ZONE WARNING SIGNS	
	SCALE: NONE	
	DATE: 9-07	
	DWG. BY: BLM	
	DESIGN BY: BLM	
REVIEWED BY: MTR	REVISIONS	

9/17/2007  
 C:\TIP\Group45\B4101\ko\B4101\Traffic\TrafficControl\TCP\002\B4101\_TC\_Top9\_wzws.dgn  
 KO & Associates, P.C.



**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.
- 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:
 

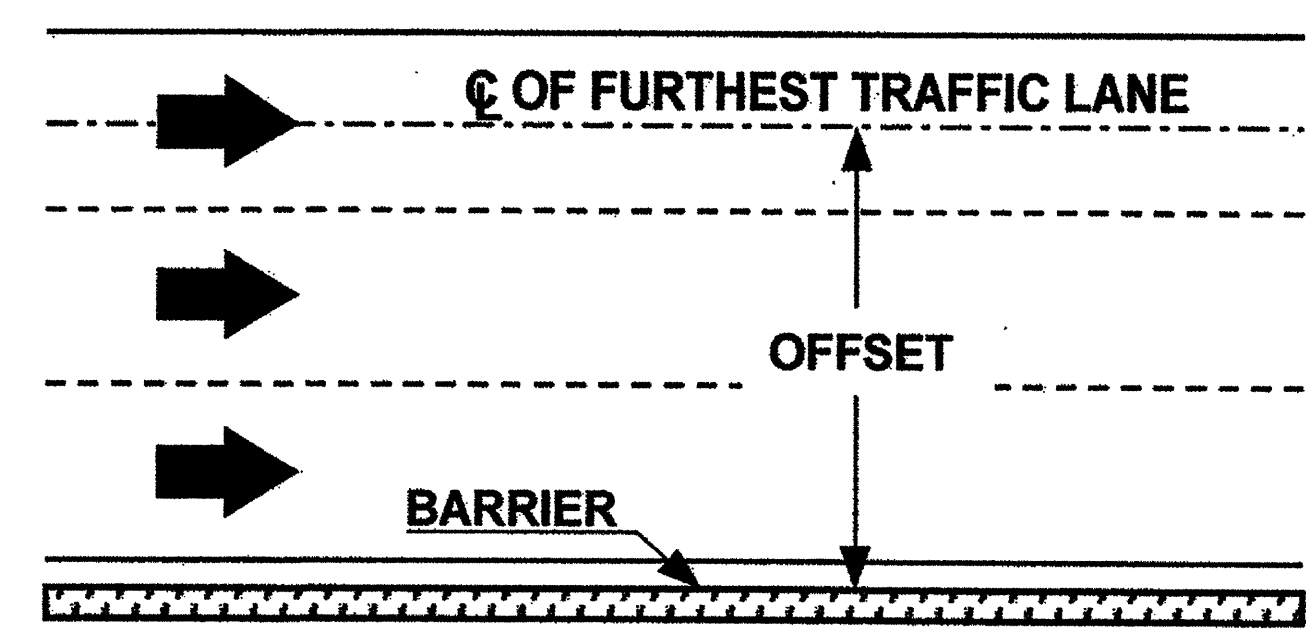
CLEAR DISTANCE - HORIZONTAL DISTANCE FROM THE BACK FACE OF THE BARRIER TO THE EDGE OF PAVEMENT FOR TEMPORARY MSE WALL OR TO THE FACE OF NON-ANCHORED TEMPORARY SHORING AS SHOWN IN FIGURE A.

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.
- 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: [HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/WZTC/DESRES/ENGLISH/DESRESENG.HTML](http://www.ncdot.org/doh/preconstruct/wztc/desres/english/desreseng.html)
- 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: [Signature] DATE: [Blank]

**PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS**

SCALE: NONE		REVISIONS
DATE: 3/07		
DESIGN BY: JI		
REVIEWED BY: JI		

March 2007

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