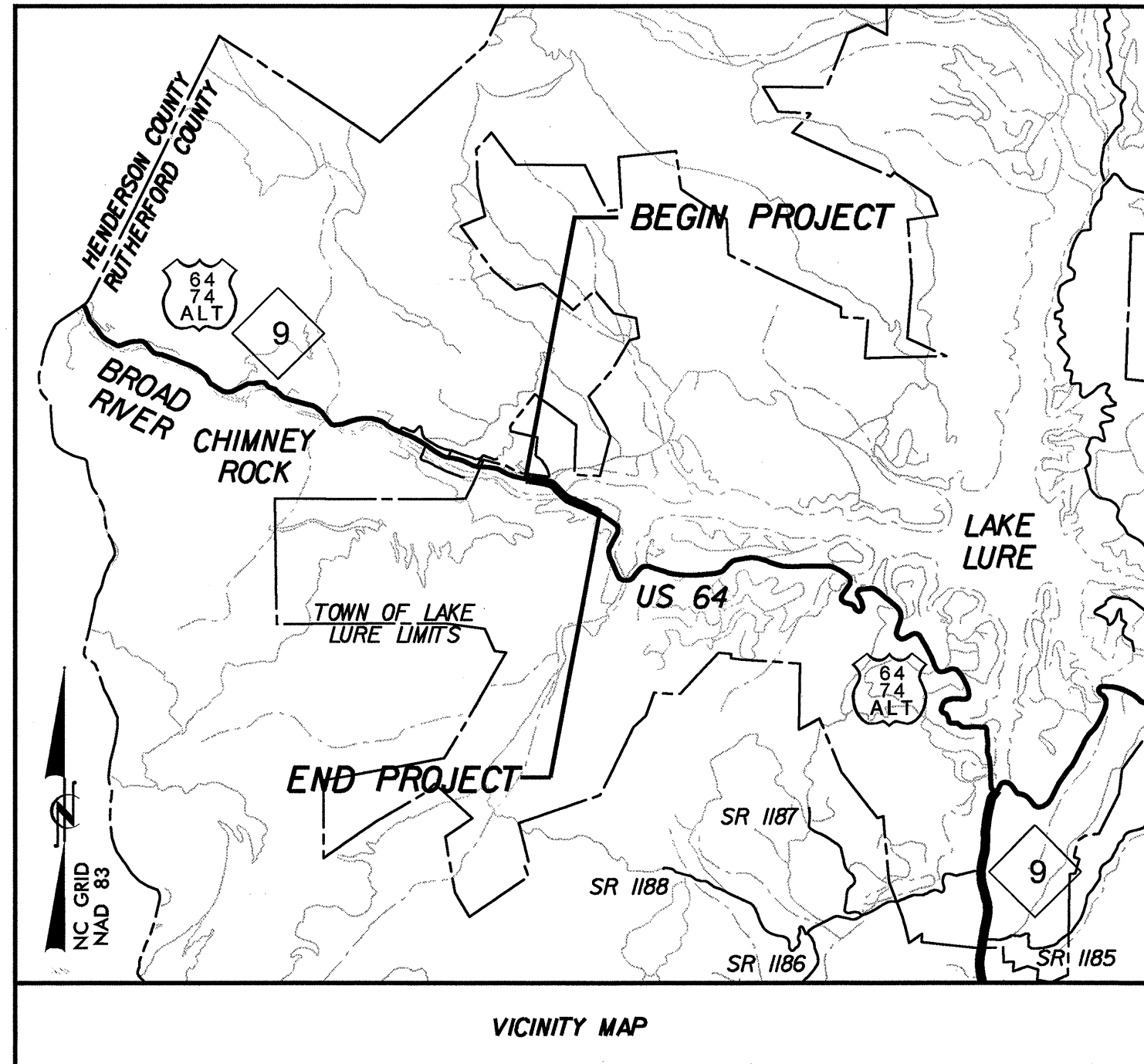


TIP PROJECT: B-4258

CONTRACT: C201927

SEE SHEET 1-A FOR INDEX OF SHEETS  
SEE SHEET 1-B FOR CONVENTIONAL PLAN SHEET SYMBOLS



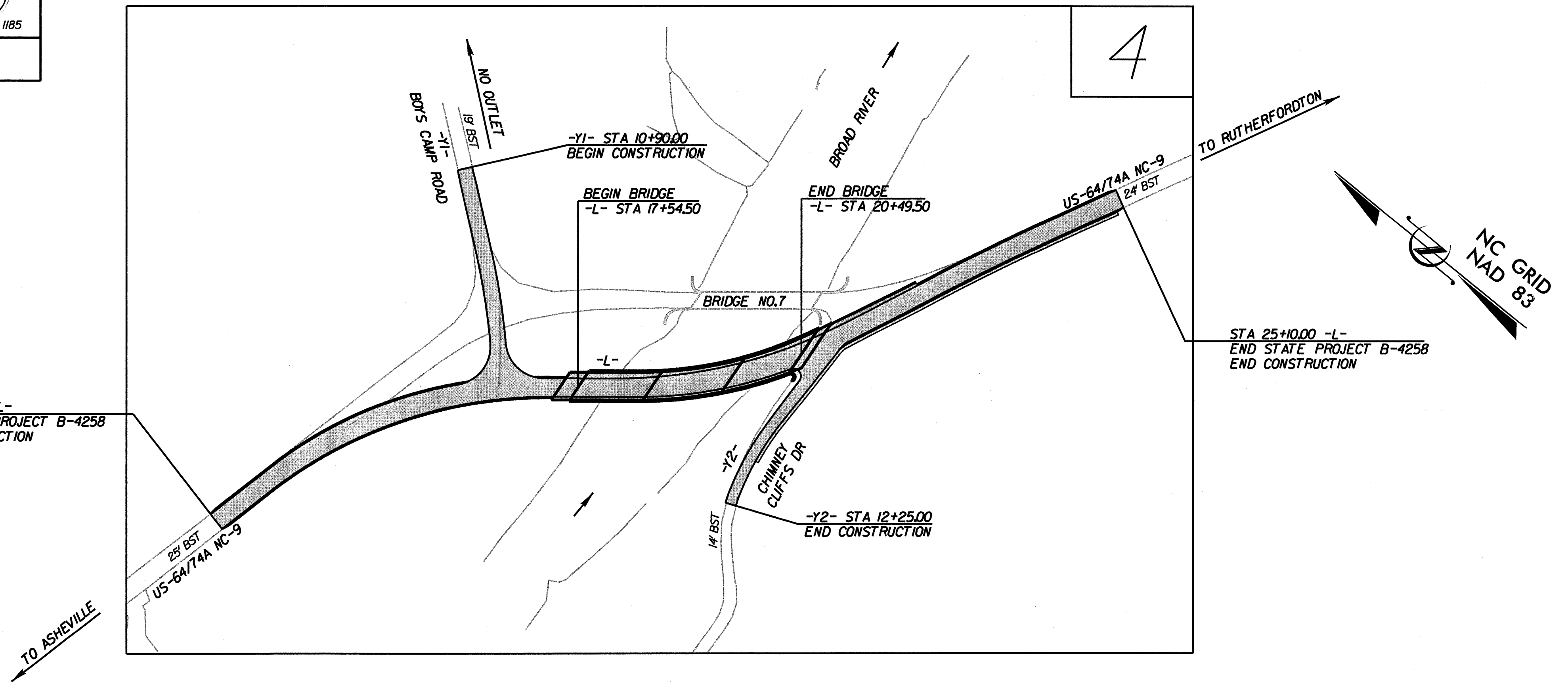
# STATE OF NORTH CAROLINA

## DIVISION OF HIGHWAYS

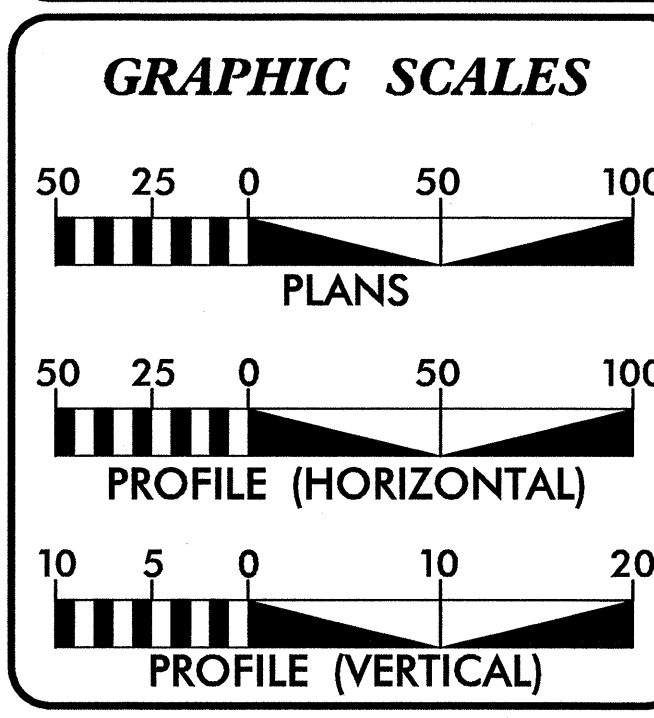
### RUTHERFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4258	1	
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
33600.1.1	BRSTP-0064(61)	P.E.	
33600.2.1	BRSTP-0064(61)	RIGHT-OF-WAY	
33600.2.1	BRSTP-0064(61)	UTILITY	
33600.3.1	BRSTP-0064(61)	CONSTRUCTION	

**LOCATION: BRIDGE NO. 7 OVER THE BROAD RIVER ON US-64**  
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE**



NCDOT CONTACT: B.D. TAYLOR, P.E.  
PROJECT ENGINEER  
ROADWAY DESIGN UNIT



**DESIGN DATA**

ADT 2007 = 4,300 VPD  
ADT 2030 = 6,300 VPD  
DHV = 9%  
D = 55%  
T = 5% \*  
V = 40 mph

FUNCTIONAL CLASSIFICATION:  
RURAL MINOR ARTERIAL  
\* (TTST 2% + DUAL 3%)

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT B-4258 = 0.185 MILE  
LENGTH OF STRUCTURE TIP PROJECT B-4258 = 0.056 MILE  
TOTAL LENGTH OF TIP PROJECT B-4258 = 0.241 MILE

PLANS PREPARED FOR THE NCDOT BY:

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: **SEPTEMBER 21, 2007**

LETTING DATE: **SEPTEMBER 16, 2008**

**Kimley-Horn and Associates, Inc.**  
Post Office Box 33048  
Raleigh, North Carolina 27636

**JEFFREY W. MOORE, PE**  
PROJECT ENGINEER

**J. JASON PACE, PE**  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

**ROADWAY DESIGN ENGINEER**

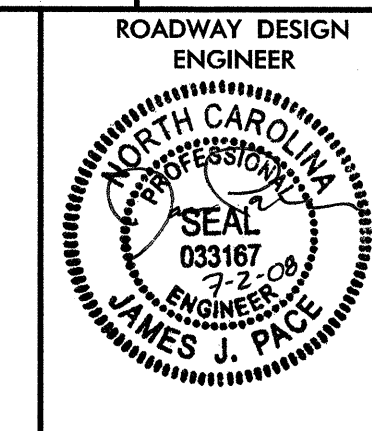
6-23-08  
P.E.

SEAL 026480

SEAL 033167  
JAMES J. PACE  
P.E.

**DIVISION OF HIGHWAYS**  
**STATE OF NORTH CAROLINA**

at miller  
P.E.  
STATE HIGHWAY DESIGN ENGINEER



EFF. 07-18-06  
REV. 01-02-07

33600.3.1 (B-4258)  
RUTHERFORD COUNTY

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEET
2 THRU 2-A	TYPICAL SECTIONS, PAVEMENT SCHEDULE, AND MISCELLANEOUS DETAILS
2-B	TEMPORARY GRAU TYPE B-77 SHOP CURVED DETAIL
2-C	ANCHORAGE FOR FRAMES
2-D THRU 2-O	TEMPORARY SHORING DETAILS
3	SUMMARY OF QUANTITIES
3-A	SUMMARY OF DRAINAGE QUANTITIES
3-B	SUMMARY OF GUARDRAIL, SUMMARY OF PAVEMENT REMOVAL, AND EARTHWORK SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TCP-1 THRU TCP-10	TRAFFIC CONTROL PLANS
PM-1 THRU PM-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
UC-1 THRU UC-2	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS SECTION SUMMARY SHEET
X-1 THRU X-16	CROSS SECTIONS
S-1 THRU S-40	STRUCTURE PLANS

GENERAL NOTES: 2006 SPECIFICATIONS  
EFFECTIVE: 07-18-06  
REVISED: 07-18-06

GRADE LINE:  
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR 'TEMPORARY SHORING' OR 'TEMPORARY SHORING-BARRIER SUPPORTED' DEPENDING UPON THE LOCATION OF THE SHORING.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

DUKE POWER, AT&T, NORTHLAND CABLE

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY CONTRACT.

2006 ROADWAY STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

STD. NO.	TITLE
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superlevation - Two Lane Pavement
300.01	Method of Pipe Installation - Method 'A'
310.10	Driveway Pipe Construction
422.10	Reinforced Bridge Approach Fills
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
654.01	Pavement Repairs
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structure and Concrete Pad
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.22	Frames and Wide Slot Sag Grates
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.02	Drop Inlet Installation in Expressway Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
850.01	Concrete Paved Ditches
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

**Note: Not to Scale**

\*S.U.E. = *Subsurface Utility Engineering*

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

**BOUNDARIES AND PROPERTY:**

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○
Property Corner	✕
Property Monument	□
Parcel/Sequence Number	⑫③
Existing Fence Line	-----
Proposed Woven Wire Fence	-----
Proposed Chain Link Fence	-----
Proposed Barbed Wire Fence	-----
Existing Wetland Boundary	-----
Proposed Wetland Boundary	-----
Existing Endangered Animal Boundary	-----
Existing Endangered Plant Boundary	-----

**BUILDINGS AND OTHER CULTURE:**

Gas Pump Vent or U/G Tank Cap	○
Sign	○
Well	○
Small Mine	✕
Foundation	□
Area Outline	□
Cemetery	+
Building	□
School	□
Church	□
Dam	□

**HYDROLOGY:**

Stream or Body of Water	-----
Hydro, Pool or Reservoir	□
Jurisdictional Stream	-----
Buffer Zone 1	-----
Buffer Zone 2	-----
Flow Arrow	-----
Disappearing Stream	-----
Spring	○
Swamp Marsh	-----
Proposed Lateral, Tail, Head Ditch	-----
False Sump	-----

**RAILROADS:**

Standard Gauge	-----
RR Signal Milepost	○
Switch	□
RR Abandoned	-----
RR Dismantled	-----

**RIGHT OF WAY:**

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite Marker	-----
Existing Control of Access	○
Proposed Control of Access	○
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Utility Easement	-----

**ROADS AND RELATED FEATURES:**

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----
Proposed Slope Stakes Fill	-----
Proposed Wheel Chair Ramp	-----
Curb Cut for Future Wheel Chair Ramp	-----
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	○
Pavement Removal	-----

**VEGETATION:**

Single Tree	○
Single Shrub	○
Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	-----

**EXISTING STRUCTURES:**

MAJOR:	
Bridge, Tunnel or Box Culvert	-----
Bridge Wing Wall, Head Wall and End Wall	-----
MINOR:	
Head and End Wall	-----
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	-----
Paved Ditch Gutter	-----
Storm Sewer Manhole	○
Storm Sewer	-----

**UTILITIES:**

POWER:	
Existing Power Pole	○
Proposed Power Pole	○
Existing Joint Use Pole	○
Proposed Joint Use Pole	○
Power Manhole	○
Power Line Tower	□
Power Transformer	□
U/G Power Cable Hand Hole	□
H-Frame Pole	○
Recorded U/G Power Line	-----
Designated U/G Power Line (S.U.E.*)	-----

**TELEPHONE:**

Existing Telephone Pole	○
Proposed Telephone Pole	○
Telephone Manhole	○
Telephone Booth	□
Telephone Pedestal	□
Telephone Cell Tower	□
U/G Telephone Cable Hand Hole	□
Recorded U/G Telephone Cable	-----
Designated U/G Telephone Cable (S.U.E.*)	-----
Recorded U/G Telephone Conduit	-----
Designated U/G Telephone Conduit (S.U.E.*)	-----
Recorded U/G Fiber Optics Cable	-----
Designated U/G Fiber Optics Cable (S.U.E.*)	-----

**WATER:**

Water Manhole	○
Water Meter	○
Water Valve	○
Water Hydrant	○
Recorded U/G Water Line	-----
Designated U/G Water Line (S.U.E.*)	-----
Above Ground Water Line	-----

**TV:**

TV Satellite Dish	○
TV Pedestal	□
TV Tower	○
U/G TV Cable Hand Hole	□
Recorded U/G TV Cable	-----
Designated U/G TV Cable (S.U.E.*)	-----
Recorded U/G Fiber Optic Cable	-----
Designated U/G Fiber Optic Cable (S.U.E.*)	-----

**GAS:**

Gas Valve	○
Gas Meter	○
Recorded U/G Gas Line	-----
Designated U/G Gas Line (S.U.E.*)	-----
Above Ground Gas Line	-----

**SANITARY SEWER:**

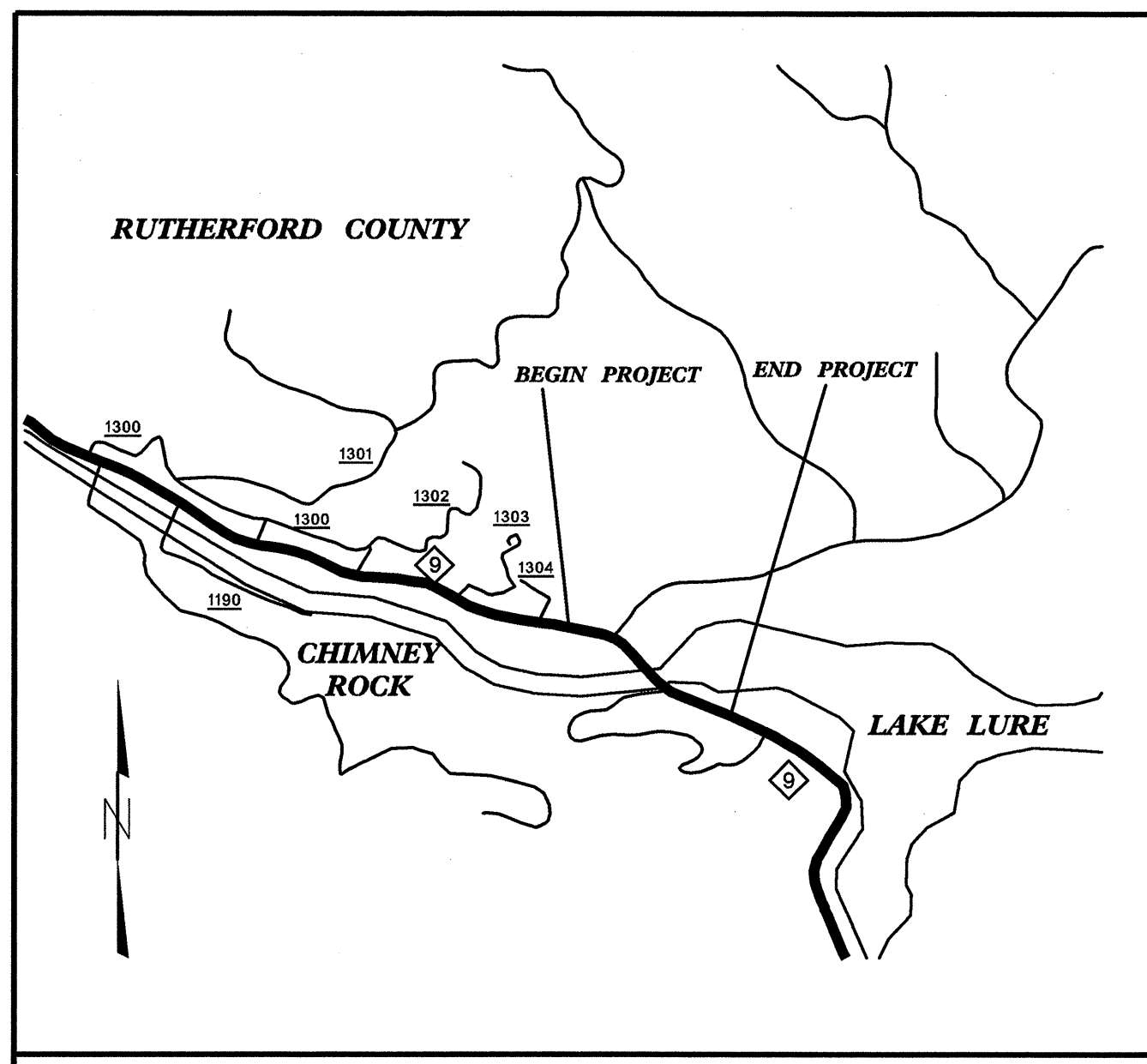
Sanitary Sewer Manhole	○
Sanitary Sewer Cleanout	○
U/G Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
Recorded SS Forced Main Line	-----
Designated SS Forced Main Line (S.U.E.*)	-----

**MISCELLANEOUS:**

Utility Pole	○
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	□
Utility Unknown U/G Line	-----
U/G Tank; Water, Gas, Oil	□
A/G Tank; Water, Gas, Oil	□
U/G Test Hole (S.U.E.*)	○
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

5/2/2008 R:\01036122\Roadway\Pro\N4258\_rdy.tshdgn

# SURVEY CONTROL SHEET B-4258



VICINITY MAP - NOT TO SCALE

**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4258-2" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 628846.9500(±) EASTING: 1037426.8100(±) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999824561 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4258-2" TO -L- STATION 10+00.00 IS N 64°20'39" W 1867.70' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3	BL-3	629657.4280	1035824.2210	1019.67	10+79.37	16.17 LT
2	BL-2	629565.0400	1036417.0680	1006.91	16+29.10	124.34 LT
1	BL-1	629205.3450	1036702.4210	1005.23	20+97.71	31.30 LT
GPS2	B4258-2	628846.9500	1037426.8100	998.74	OUTSIDE PROJECT LIMITS	
GPS1	B4258-1	628862.2320	1038094.4650	999.68	OUTSIDE PROJECT LIMITS	

BY1 POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
6	BY1-6	629852.9910	1036710.4640	1009.09	OUTSIDE PROJECT LIMITS	
EQ2	BL-2	629565.0400	1036417.0680	1006.91	12+53.75	28.28 RT

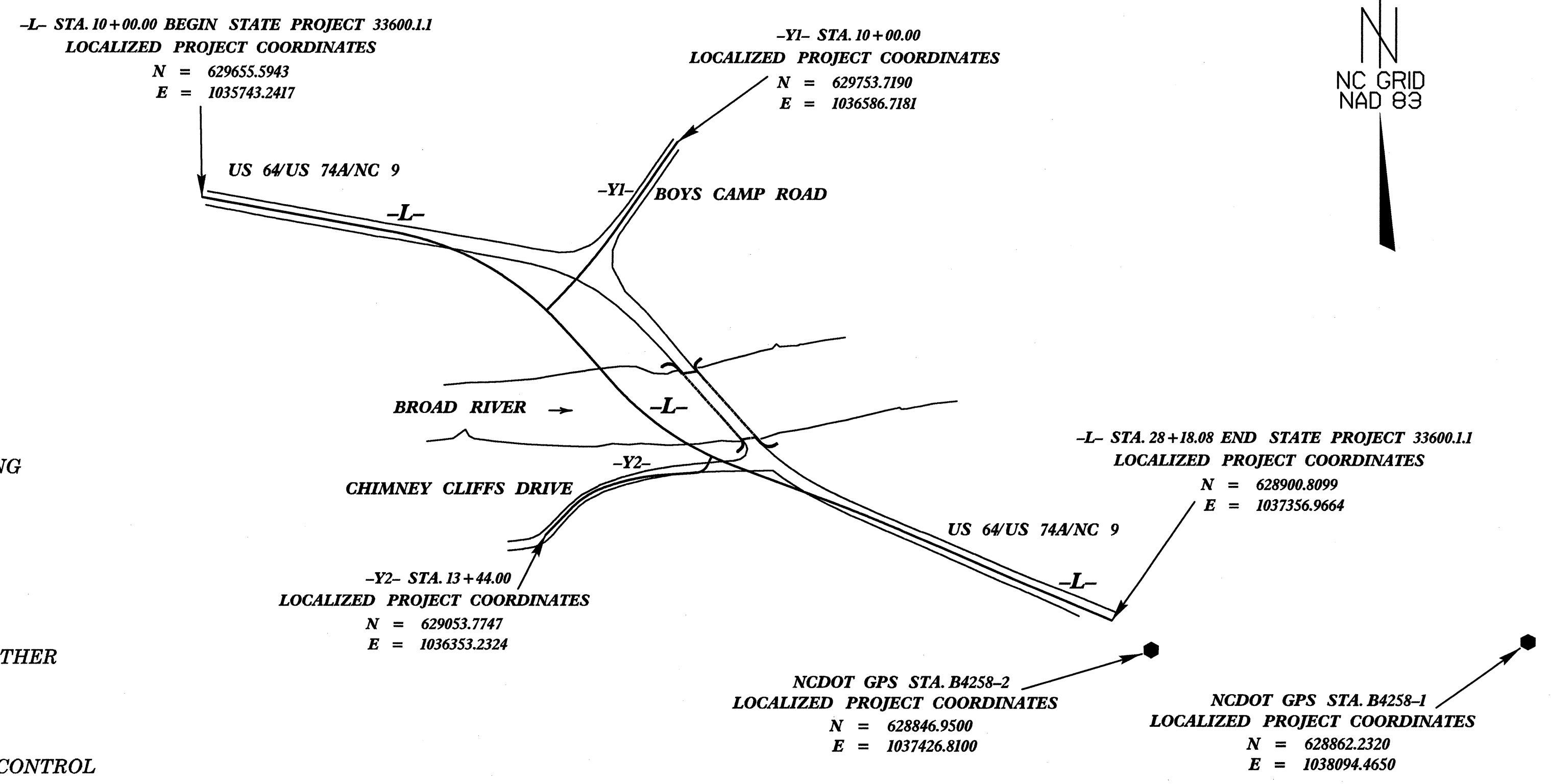
  

BY2 POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
EQ1	BL-1	629205.3450	1036702.4210	1005.23	OUTSIDE PROJECT LIMITS	
7	BY2-7	629078.8550	1036272.8250	1046.80	OUTSIDE PROJECT LIMITS	

```

*****
BM1      ELEVATION = 998.80
N 628971  E 1037391
L STATION 28+18
N 26° 17' 35.5" E DIST 77.75
RR SPIKE IN 24 INCH NEEDLE PINE
*****
BM2      ELEVATION = 1003.52
N 629439  E 1036403
L STATION 16+99 26 LEFT
RR SPIKE IN 42 INCH OAK
*****
BM3      ELEVATION = 1065.39
N 629847  E 1035622
L STATION 10+00
N 32° 13' 30.5" W DIST 226.61
RR SPIKE IN 36 INCH OAK
*****

```



**NOTES:**

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:  
[HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project/)  
  
THE FILES TO BE FOUND ARE AS FOLLOWS:  
B4258\_LS\_CONTROL\_060601.TXT  
  
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.  
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.  
NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)

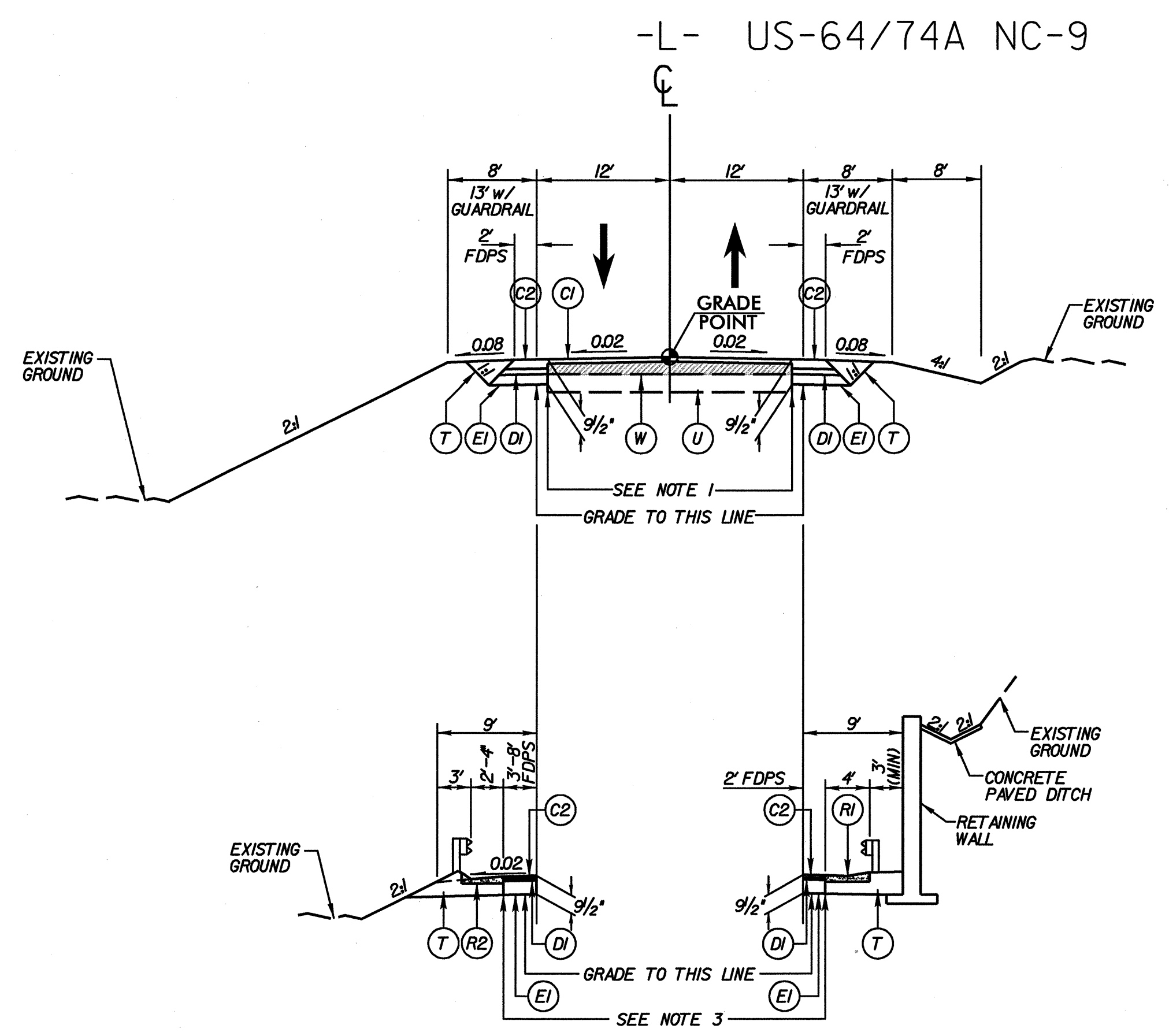
NOTE: DRAWING NOT TO SCALE

R:\01036122\Roadway\Proj\B4258-1\rdy\_1shdgn 5/2/2008

### PAVEMENT SCHEDULE

<b>C1</b>	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
<b>C2</b>	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
<b>C3</b>	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.5" IN DEPTH OR GREATER THAN 2" IN DEPTH.
<b>D1</b>	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
<b>D2</b>	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" DEPTH.
<b>E1</b>	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
<b>E2</b>	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5.5" DEPTH.
<b>RI</b>	PROPOSED 4" CONCRETE EXPRESSWAY GUTTER
<b>R2</b>	PROPOSED SHOULDER BERM GUTTER
<b>T</b>	EARTH MATERIAL
<b>U</b>	EXISTING PAVEMENT
<b>W</b>	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL W)

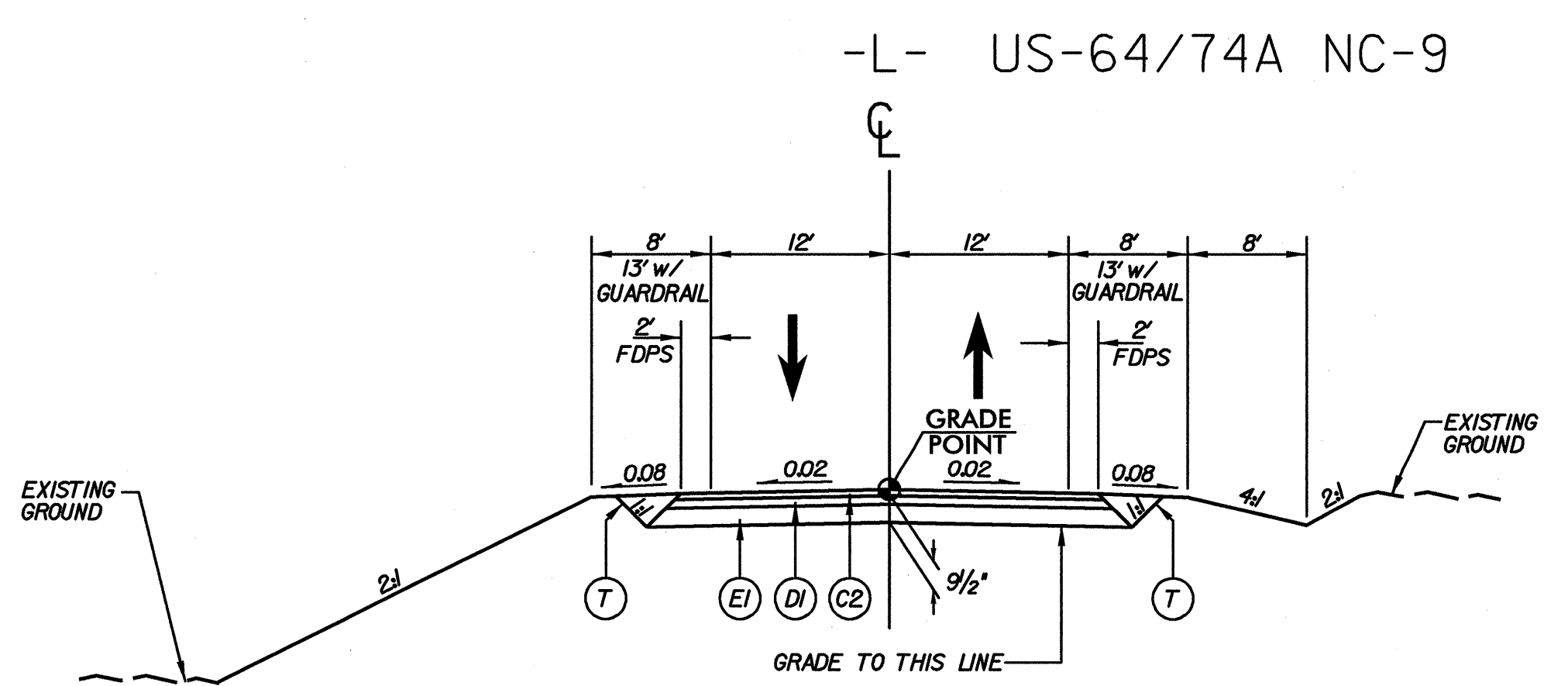
NOTE: PAVEMENT EDGE SLOPES ARE 1/4" UNLESS OTHERWISE INDICATED



### TYPICAL SECTION NO. 1

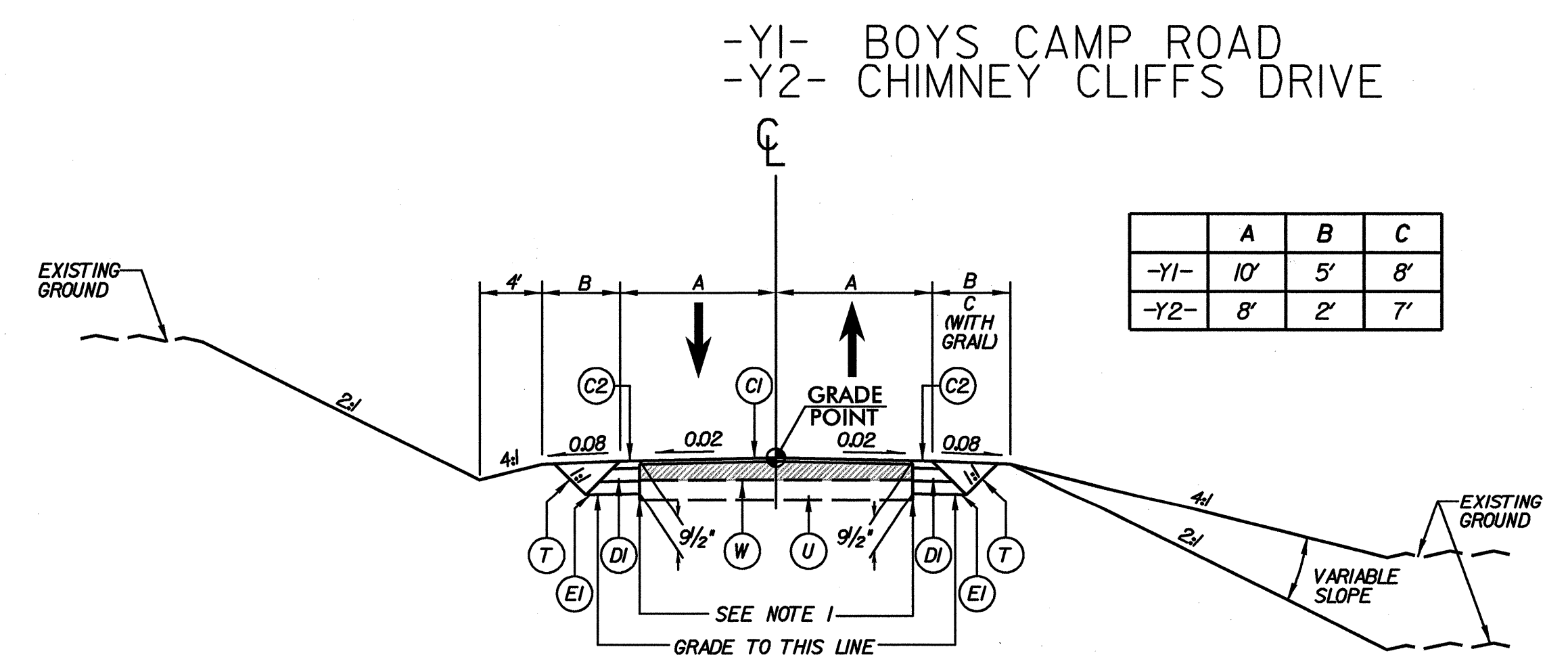
-L- STA 12+40.00 TO STA 14+52.00  
-L- STA 22+29.00 TO STA 25+10.00

- NOTES**
- 1: SAWCUT EXISTING PAVEMENT TO PROVIDE A MINIMUM OF 1' FULL DEPTH PAVEMENT.
  - 2: MILL AND RESURFACE (1.5" S9.5B) FROM -L- STA 24+16.00 TO STA 25+10.00.
  - 3: MATCH FACE OF EXPRESSWAY GUTTER WITH PAVEMENT.



### TYPICAL SECTION NO. 2

-L- STA 14+52.00 TO STA 17+54.50 (BEGIN BRIDGE)  
-L- STA 20+49.50 (END BRIDGE) TO STA 22+29.00



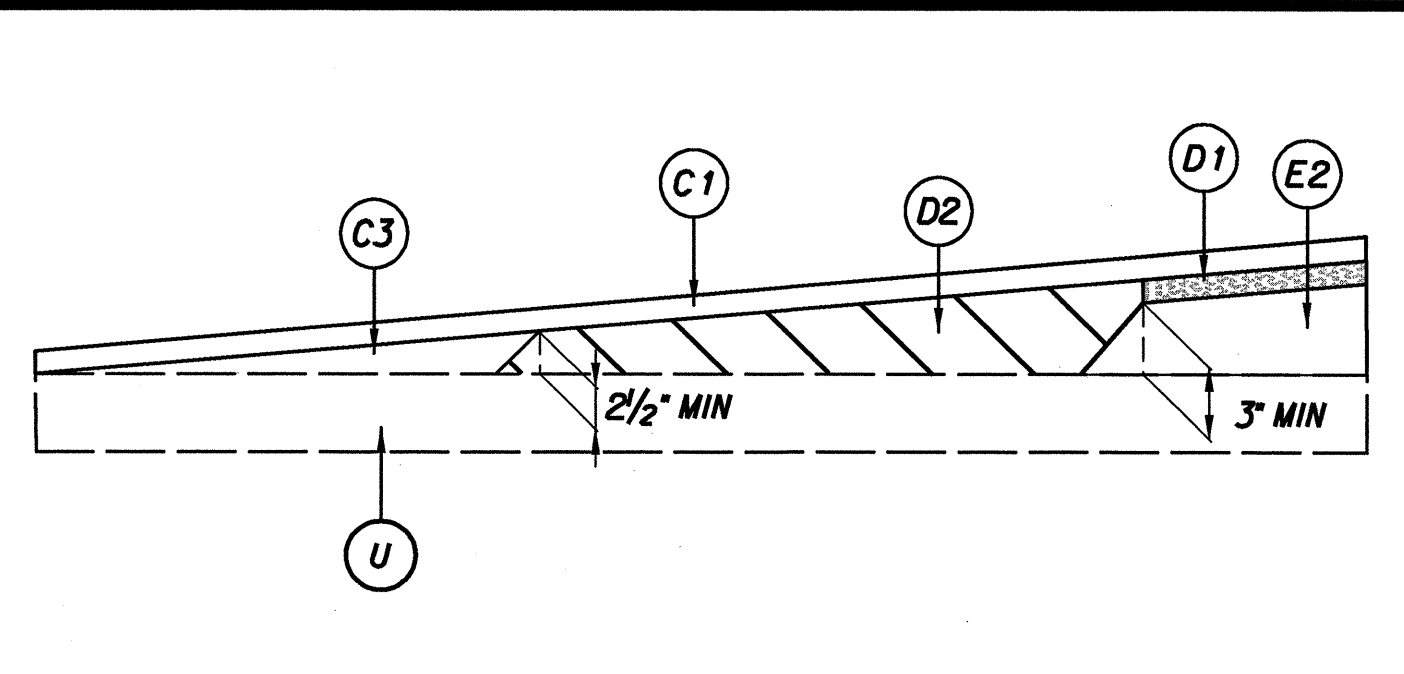
### TYPICAL SECTION NO. 3

-Y1- STA 10+90.00 TO STA 12+09.00  
-Y2- STA 11+93.00 TO STA 12+25.00

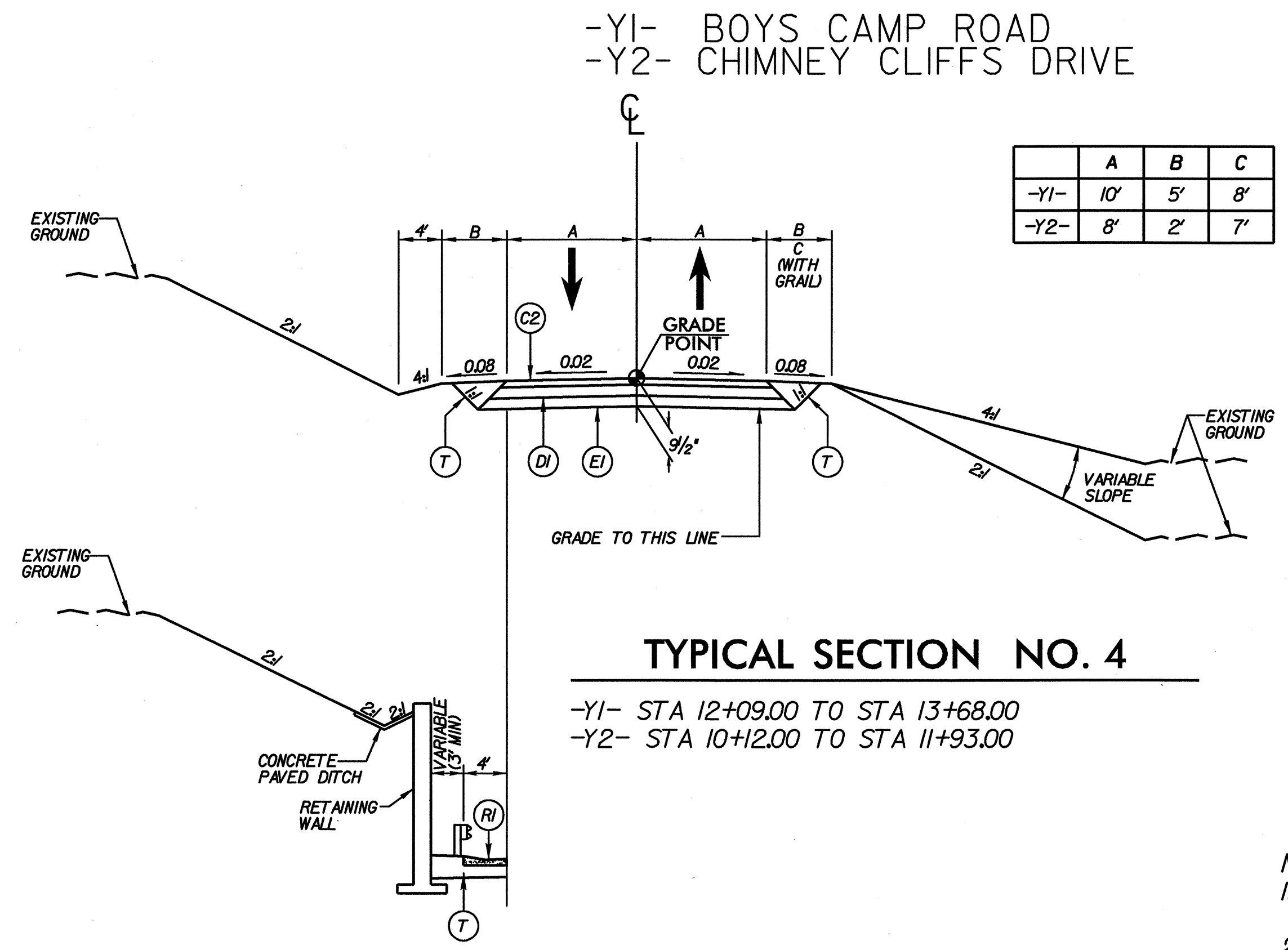
Kimley-Horn  
and Associates, Inc.

**PAVEMENT SCHEDULE**

C1	1.5' S9.5B
C2	3' S9.5B
C3	VARIABLE S9.5B
D1	2.5' I19.0B
D2	VARIABLE I19.0B
E1	4' B25.0B
E2	VARIABLE B25.0B
R1	PROPOSED 4' CONCRETE EXPRESSWAY GUTTER
R2	PROPOSED SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL W)



**WEDGING DETAIL FOR RESURFACING**



**TYPICAL SECTION NO. 4**

-Y1- STA 12+09.00 TO STA 13+68.00  
-Y2- STA 10+12.00 TO STA 11+93.00

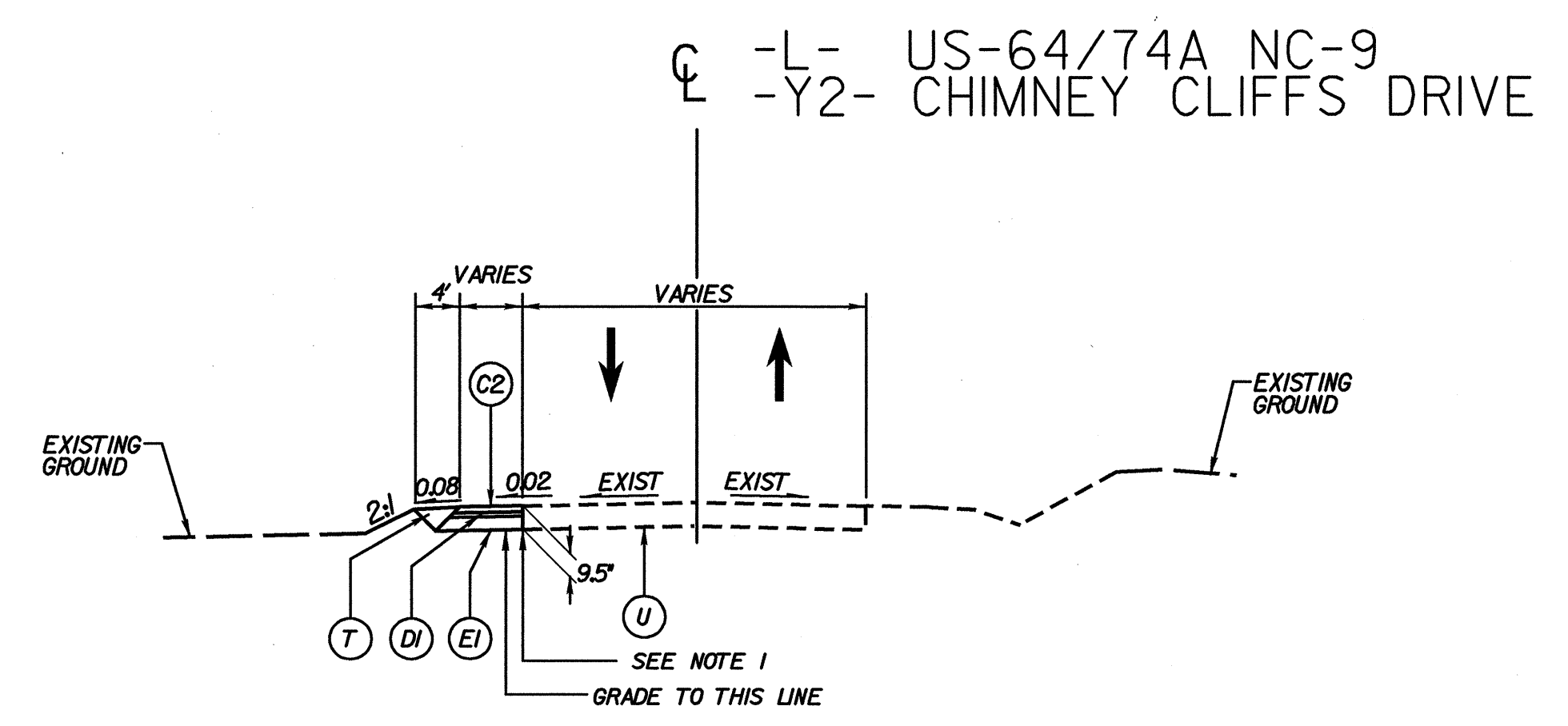
**NOTES**  
1: SAWCUT EXISTING PAVEMENT TO PROVIDE A MINIMUM OF 1' FULL DEPTH PAVEMENT.  
2: MILL AND RESURFACE (1.5' S9.5B) FROM  
-Y1- STA 10+90.00 TO STA 11+06.00.



**TYPICAL SECTION NO. 4A**

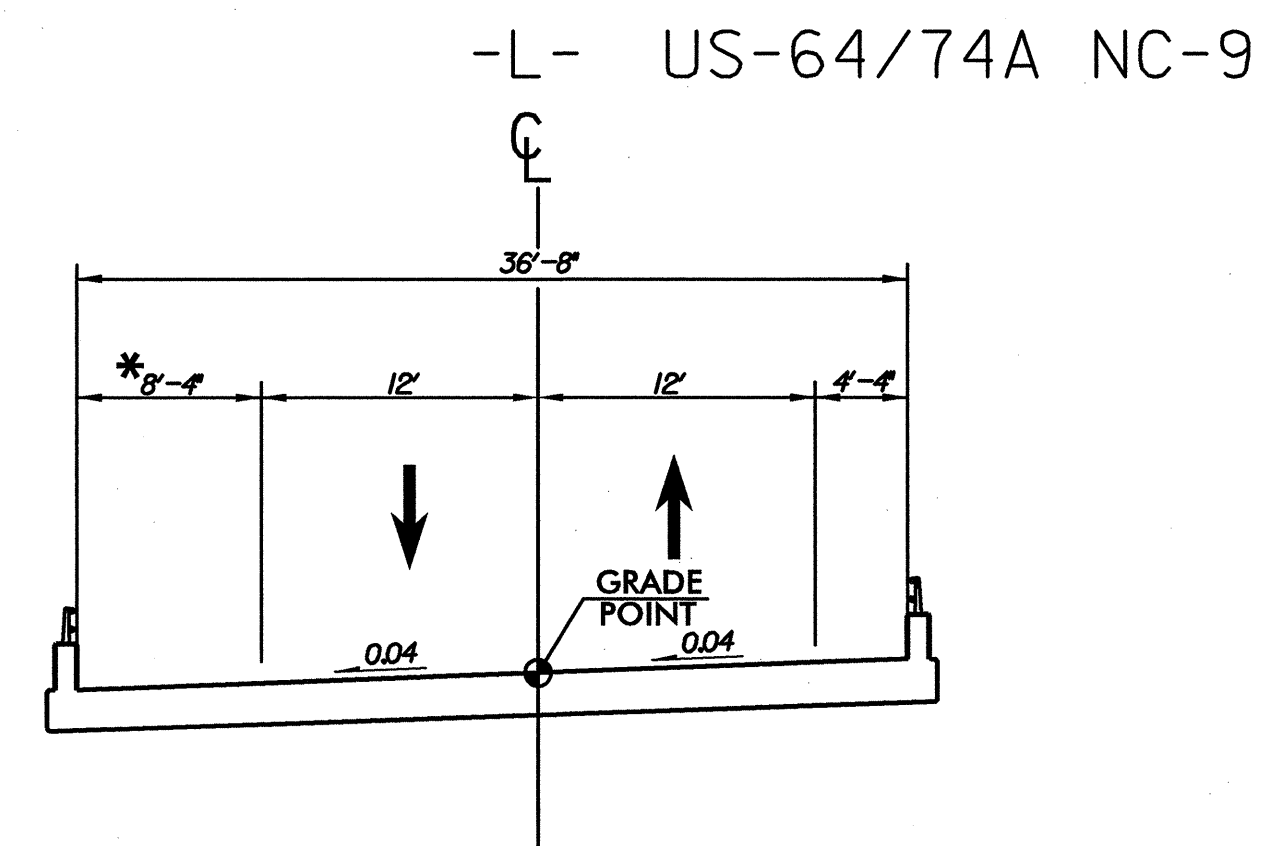
-Y2- STA 10+20.66 TO STA 11+60.00 LT

**TEMPORARY WIDENING**



**TYPICAL SECTION NO. 5**

-L- STA 21+21 TO STA 25+10 LT  
-Y2- STA 9+50 TO STA 12+50 RT

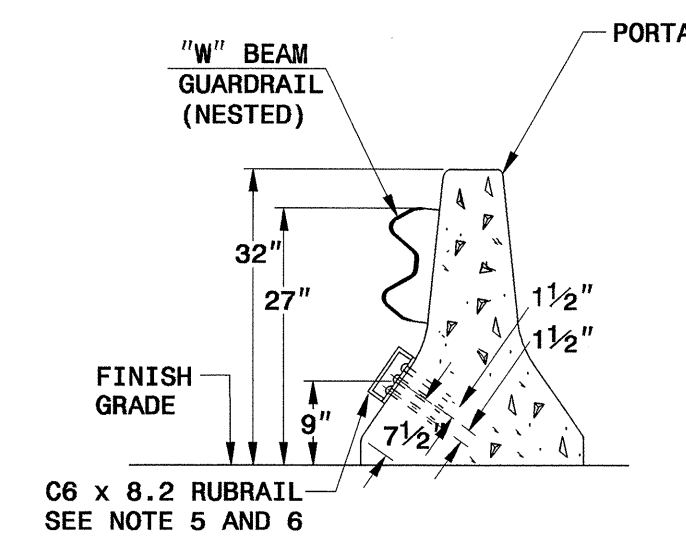


**BRIDGE TYPICAL SECTION NO. 1**

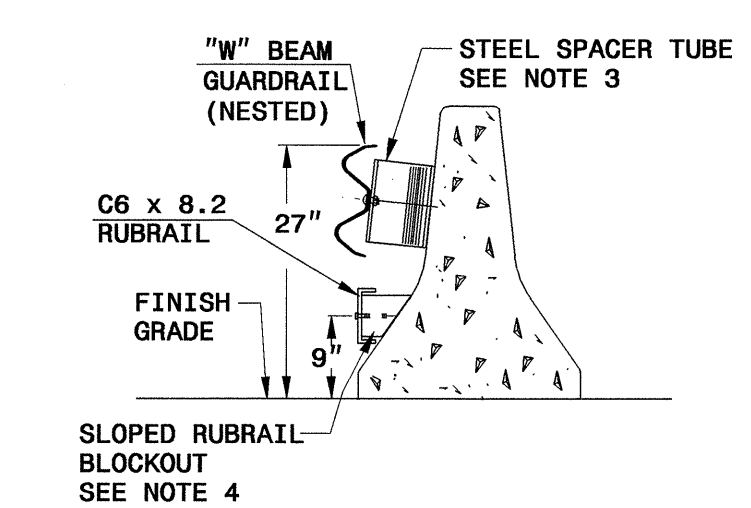
**DESIGN DATA**

- ADT 2007 = 4,300 VPD
- ADT 2030 = 6,300 VPD
- DHV = 9%
- D = 55%
- T = 5%
- TTST = 2%
- DUAL = 3%
- V = 40 mph

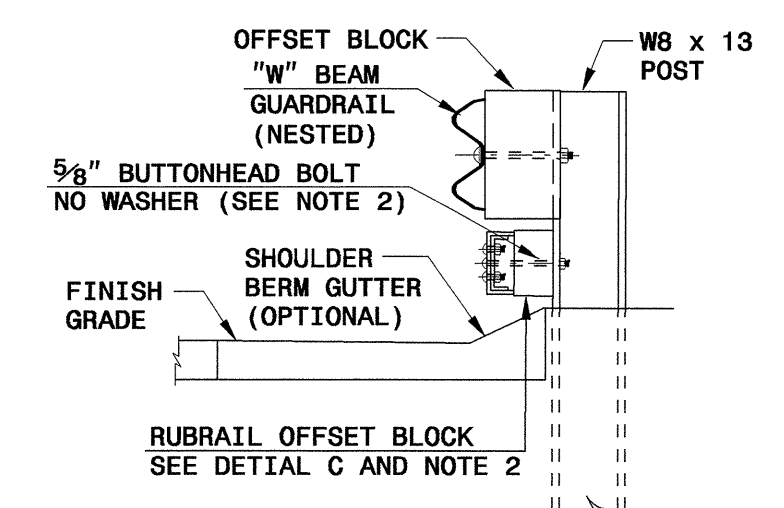
\* 8'-4" SHOULDER WIDTH REQUIRED FOR HYDRAULIC SPREAD



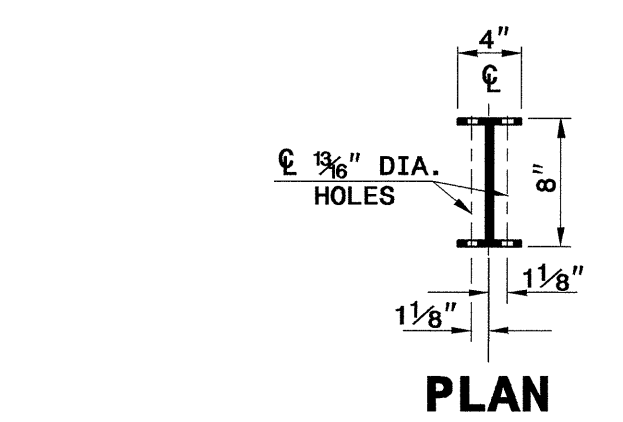
**SECTION A-A**



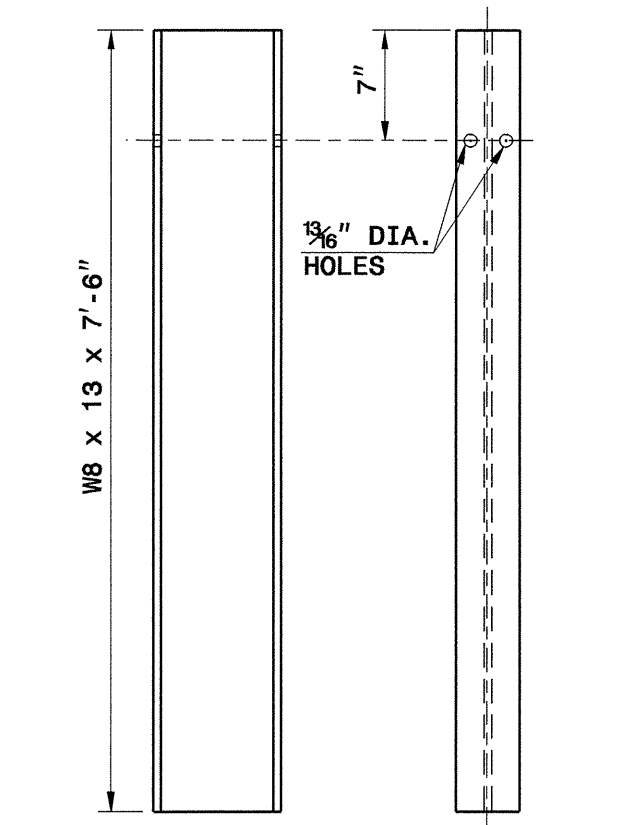
**SECTION B-B**



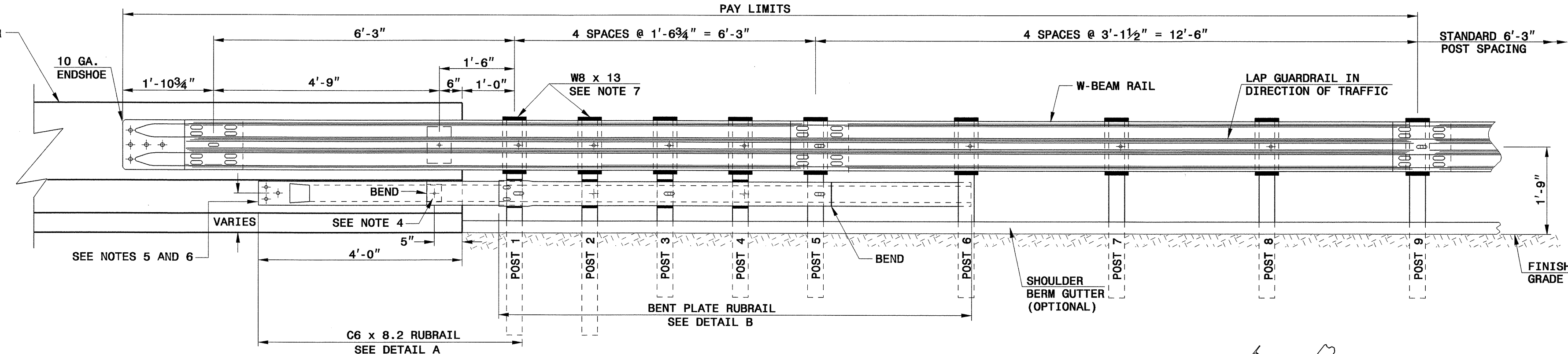
**SECTION C-C**



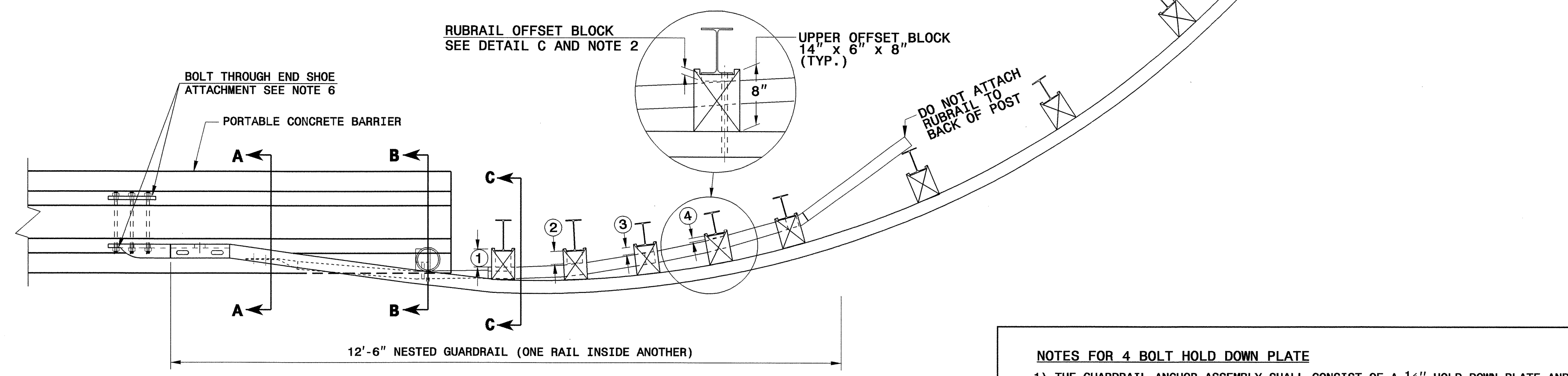
**PLAN**



**DETAIL F**  
"W8 X 13 X 7'-6".  
**STEEL POST**



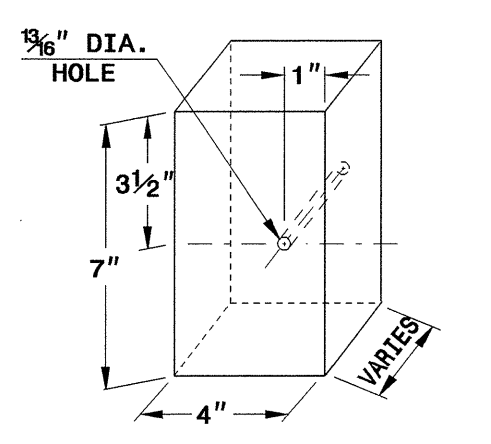
**ELEVATION**



**PLAN**

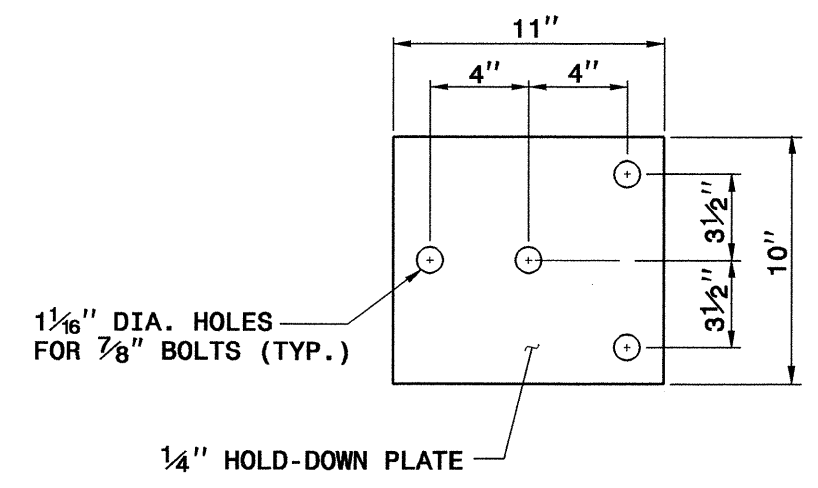
RUBRAIL BLOCKS 7" HIGH x 4" WIDE		
POST	THICKNESS	BOLT LENGTH
①	4 1/4"	9"
②	3 1/4"	5" *
③	2"	6"
④	1"	3" *

**DETAIL C**  
**RUBRAIL BLOCKOUT**

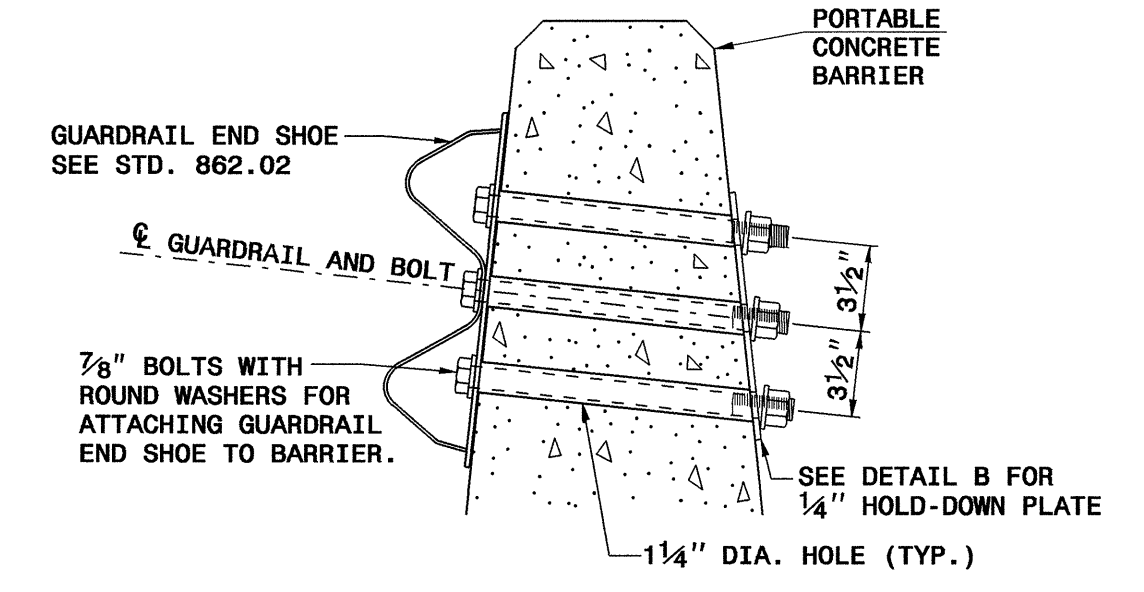


- GENERAL NOTES:**
- POSTS 1 THROUGH 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER BLOCKOUTS AND/OR RUBRAIL.
  - RUBRAIL BLOCKOUTS LOCATED ON POSTS 1 THROUGH 4 ARE OFFSET DRILLED AND SECURED WITH 5/8" BUTTONHEAD BOLTS (SEE CHART FOR BOLT LENGTHS). SECURE BLOCKS ONLY TO POSTS 2 AND 4. SECURE RUBRAIL AND BLOCKOUTS TO POSTS 1 AND 3. RUBRAIL IS SECURED TO POST 5 WITH A 5/8" x 4 1/2" BUTTONHEAD BOLT. RUBRAIL IS FLARED TO BACK OF POST 6 AND NOT SECURED.
  - STEEL SPACER TUBE IS A SCHEDULE 40 GALVANIZED PIPE 6" INSIDE DIAMETER x 9" LONG. ATTACH TUBE TO GUARDRAIL ONLY WITH 5/8" x 1 1/4" LONG BUTTONHEAD BOLT AND RECTANGULAR PLATE WASHER.
  - SEE DETAIL D FOR SLOPED RUBRAIL BLOCKOUT. BLOCKOUT IS ATTACHED TO RAIL ELEMENT ONLY. USE 3/8" x 3" LAG BOLT WITH FLAT WASHER.
  - SHOP FABRICATE THE C6 x 8.2 RUBRAIL END TO BE CONSISTENT WITH THE SLOPE OF THE JERSEY SHAPE AND ATTACH FLUSH WITH THE SLOPED TOE OF THE BARRIER OR BRIDGE RAIL.
  - ANCHORAGE:
    - AT PORTABLE CONCRETE BARRIER, ANCHOR RUBRAIL USING THREE 5/8" x 6" CHEMICALLY ANCHORED BOLTS WITH WASHERS.
    - AT PORTABLE CONCRETE BARRIER, ANCHOR THE W-BEAM END SHOE USING A 4 BOLT HOLD-DOWN PLATE AS SHOWN. INSTALL THE W-BEAM END SHOE BEHIND THE NESTED W-BEAM ELEMENTS.
  - POSTS 1 AND 2 ARE W8 x 13, 7'-6" LONG. ALL OTHER POSTS IN THE ANCHOR UNIT ARE W6 x 8.5.

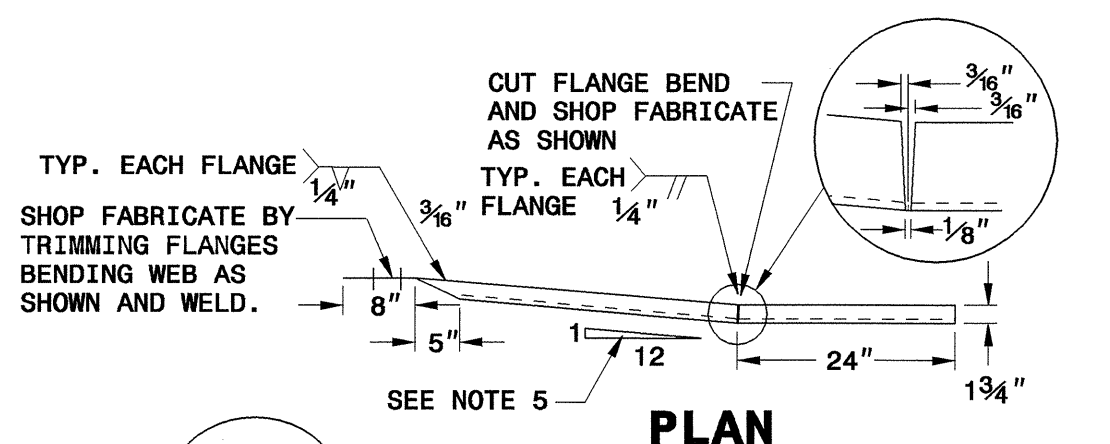
- NOTES FOR 4 BOLT HOLD DOWN PLATE**
- THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 4 - 7/8" DIA. BOLTS WITH NUTS AND WASHERS.
  - THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.
  - AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL. THE 1 1/4" DIA. HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



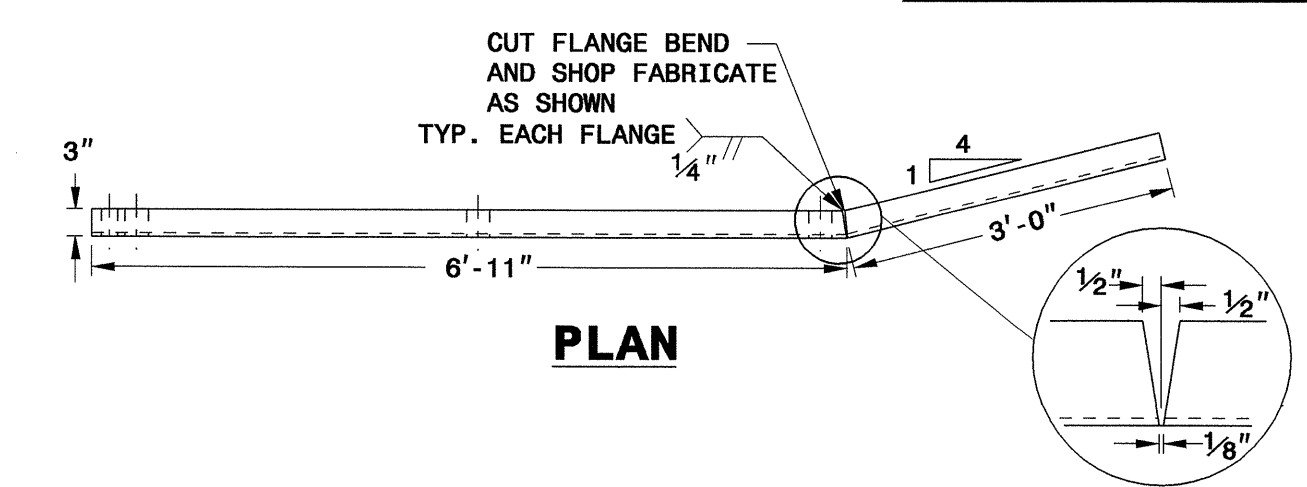
**4 BOLT HOLD DOWN PLATE**



**PART SECTION**  
**OF BARRIER OR RAIL**  
**THRU END SHOE SECTION AND**  
**4 BOLT HOLD DOWN PLATE**

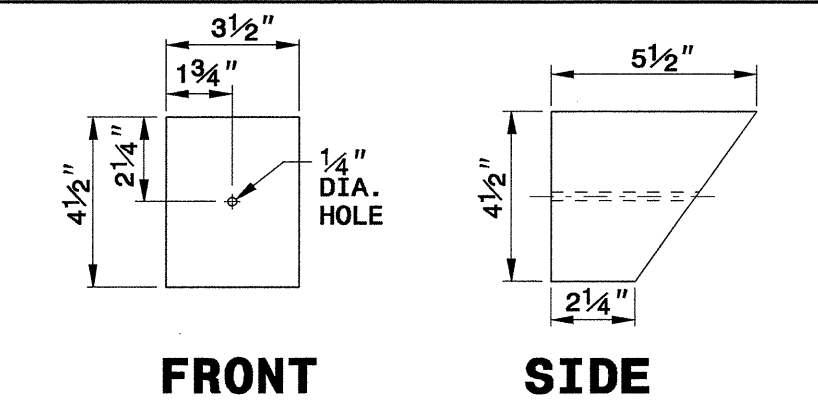


**DETAIL A**  
**C6 x 8.2 RUBRAIL**



**DETAIL B**  
**BENT PLATE RUBRAIL**

**DETAIL E**  
**LAG BOLT**

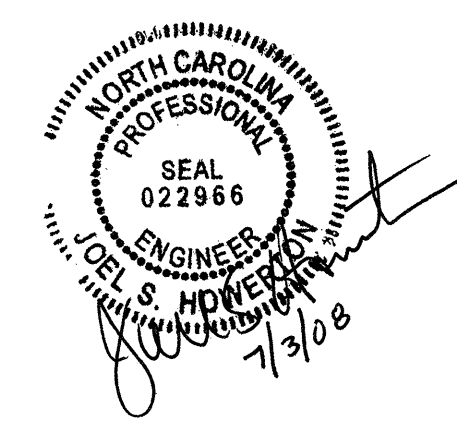


**DETAIL D**  
**SLOPED RUBRAIL BLOCKOUT**

**PROJECT SERVICES UNIT**  
**STANDARDS AND SPECIAL DESIGN**  
Office 919-250-4128 FAX 919-250-4119

**TEMPORARY GUARDRAIL ANCHOR**  
**UNIT TYPE B-77 SHOP CURVED**

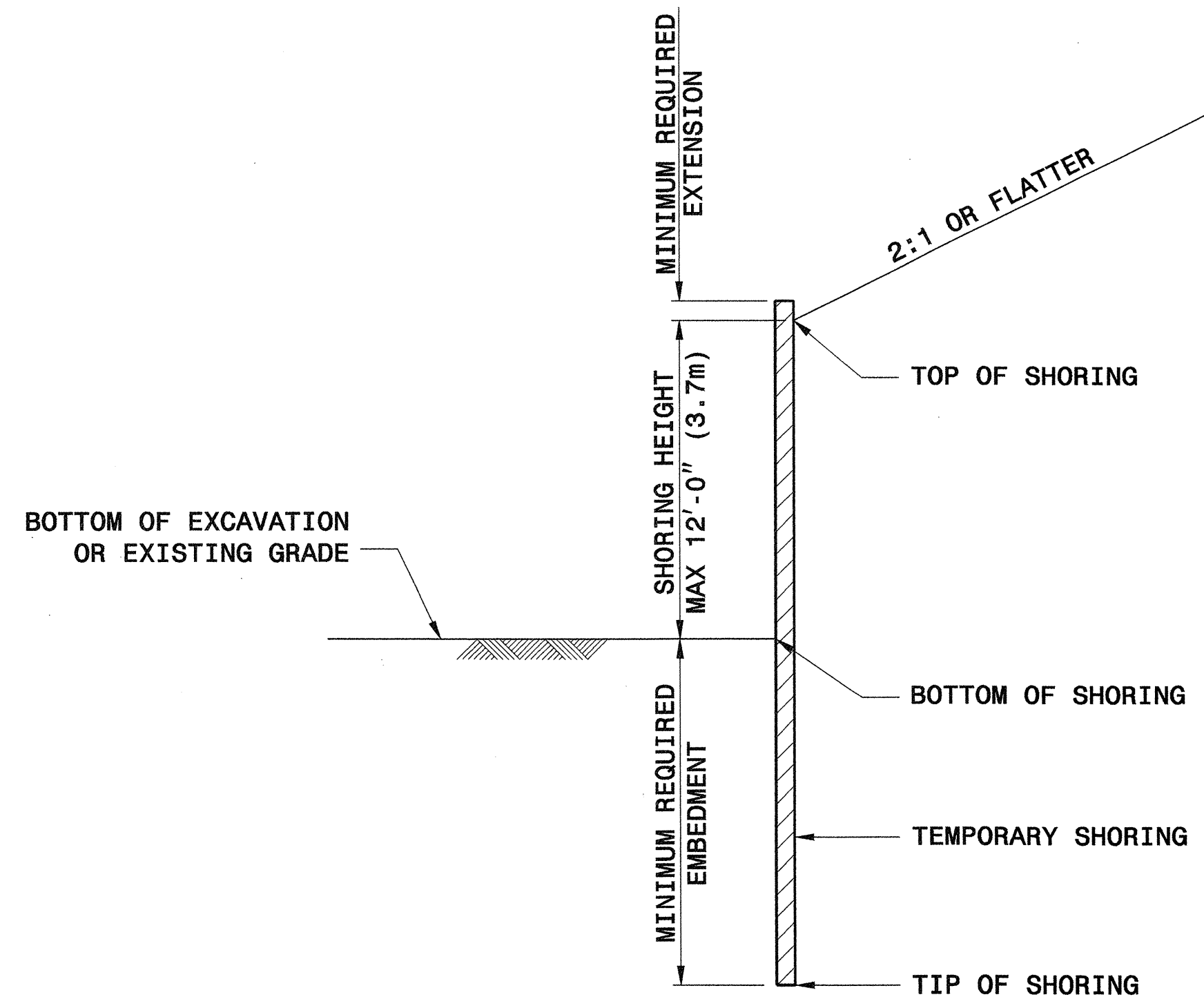
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MODIFIED BY: E.E. WARD DATE: 07-14-05  
CHECKED BY: J.E. HUNT DATE: 6/25/08  
FILE SPEC.: J.E. HUNT



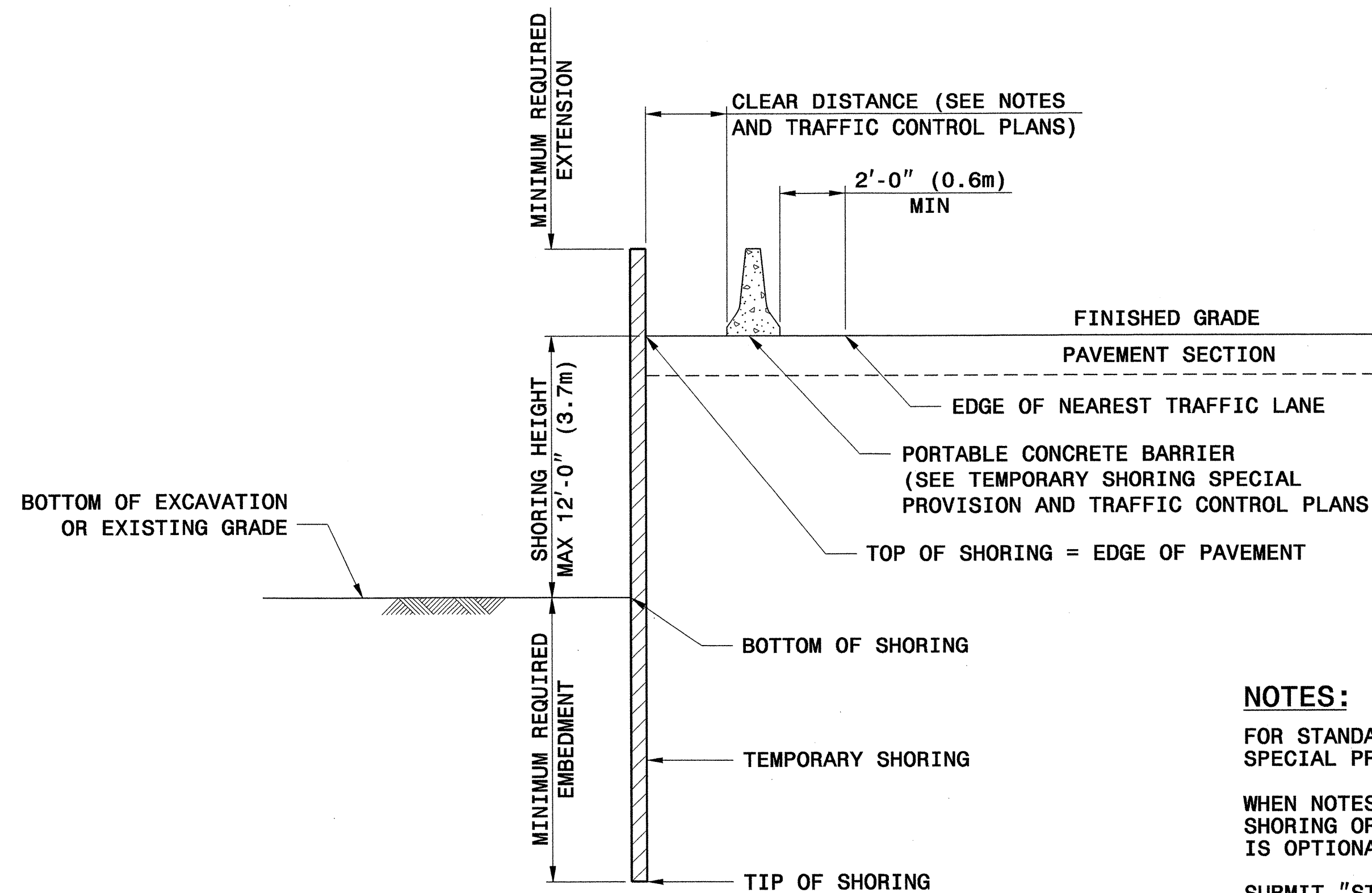
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**SLOPE CASE**



**SURCHARGE CASE**

**NOTES:**

FOR STANDARD TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.

WHEN NOTES ON PLANS DO NOT PROHIBIT STANDARD TEMPORARY SHORING OR STANDARD SHORING, STANDARD TEMPORARY SHORING IS OPTIONAL.

SUBMIT "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 14 DAYS BEFORE BEGINNING SHORING CONSTRUCTION. UP TO THREE LOCATIONS MAY BE INCLUDED ON EACH SELECTION FORM.

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING CONDITIONS:

- 1) MAXIMUM SHORING HEIGHT IS 12'-0" (3.7m).
- 2) TRAFFIC SURCHARGE IS 240 PSF (11.5 KPA) MAXIMUM OR BACKSLOPE IS 2:1 (H:V) OR FLATTER.
- 3) BOTTOM OF EXCAVATION OR EXISTING GRADE IN FRONT OF SHORING IS 6:1 (H:V) SLOPE OR FLATTER.
- 4) H PILE SPACING IS 6'-0" (1.8m).
- 5) H PILE EMBEDMENT DEPTHS ARE FOR DRIVEN PILES.
- 6) TIMBER LAGGING IS A MINIMUM OF 3" (75mm) THICK.

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:

TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/M<sup>3</sup>)  
 FRICTION ANGLE = 30 DEGREES  
 COHESION = 0 PSF (0 KPA)  
 GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF SHORING.

DO NOT USE STANDARD TEMPORARY SHORING WHEN THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE THE BOTTOM OF SHORING.

DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT WITHIN THE EMBEDMENT DEPTH.

VERIFY GROUNDWATER ELEVATION BEFORE BEGINNING SHORING CONSTRUCTION.

IF THE CLEAR DISTANCE AVAILABLE IS LESS THAN THE MINIMUM REQUIRED IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS, SET THE BARRIER AGAINST THE TRAFFIC SIDE OF THE SHORING AND USE THE "SURCHARGE CASE WITH TRAFFIC IMPACT".

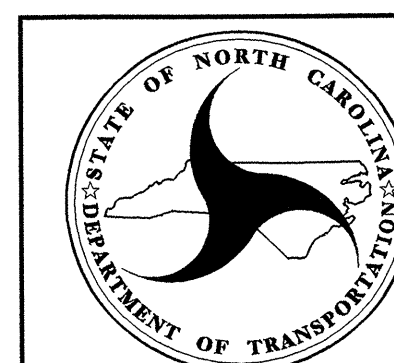
AT THE CONTRACTOR'S OPTION, H PILE EMBEDMENT DEPTHS FOR PILES SET IN DRILLED HOLES MAY BE REDUCED BY 25%. FOR PILE EXCAVATION, SEE TEMPORARY SHORING SPECIAL PROVISION.

CONTROL DRAINAGE DURING CONSTRUCTION IN THE VICINITY OF THE SHORING. COLLECT AND DIRECT RUNOFF AWAY FROM SHORING.

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

GROUNDWATER CONDITION	SHORING HEIGHT FT (m)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H PILES WITH TIMBER LAGGING			SHEET PILES		H PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN <sup>3</sup> /FT (cm <sup>3</sup> /m)	MINIMUM REQUIRED EMBEDMENT FT (m)			MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN <sup>3</sup> /FT (cm <sup>3</sup> /m)	MINIMUM REQUIRED EMBEDMENT FT (m)		
		HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)				HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)	
GROUNDWATER ELEVATION BELOW TIP OF SHORING	< 6 (1.8)	7.5 (2.3)	3.0 (161)	8.0 (2.4)	8.0 (2.4)	8.0 (2.4)	11.0 (3.4)	10.0 (538)	9.5 (2.9)	9.5 (2.9)	9.5 (2.9)
	7 (2.1)	8.5 (2.6)	4.5 (242)	9.5 (2.9)	9.5 (2.9)	9.5 (2.9)	12.0 (3.7)	12.0 (645)	10.5 (3.2)	10.5 (3.2)	10.5 (3.2)
	8 (2.4)	10.0 (3.0)	6.5 (349)	10.5 (3.2)	10.5 (3.2)	10.5 (3.2)	12.5 (3.8)	14.0 (753)	11.5 (3.5)	11.5 (3.5)	11.5 (3.5)
	9 (2.7)	11.0 (3.4)	9.5 (511)	--	12.0 (3.7)	12.0 (3.7)	13.5 (4.1)	16.5 (887)	--	12.5 (3.8)	12.5 (3.8)
	10 (3.0)	12.5 (3.8)	13.0 (699)	--	--	13.5 (4.1)	14.0 (4.3)	19.5 (1048)	--	13.5 (4.1)	13.5 (4.1)
	11 (3.4)	13.5 (4.1)	17.0 (914)	--	--	14.5 (4.4)	15.0 (4.6)	22.5 (1210)	--	--	14.5 (4.4)
	12 (3.7)	15.0 (4.6)	21.5 (1156)	--	--	16.0 (4.9)	16.0 (4.9)	25.5 (1371)	--	--	15.5 (4.7)
GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND TIP OF SHORING	< 6 (1.8)	11.5 (3.5)	4.5 (242)	11.5 (3.5)	11.5 (3.5)	11.5 (3.5)	16.0 (4.9)	12.0 (645)	13.0 (4.0)	13.0 (4.0)	13.0 (4.0)
	7 (2.1)	13.0 (4.0)	7.0 (376)	13.0 (4.0)	13.0 (4.0)	13.0 (4.0)	17.0 (5.2)	14.5 (780)	14.5 (4.4)	14.5 (4.4)	14.5 (4.4)
	8 (2.4)	15.0 (4.6)	10.0 (538)	--	15.0 (4.6)	15.0 (4.6)	18.0 (5.5)	17.0 (914)	--	15.5 (4.7)	15.5 (4.7)
	9 (2.7)	17.0 (5.2)	14.0 (753)	--	17.0 (5.2)	17.0 (5.2)	19.0 (5.8)	20.0 (1075)	--	17.0 (5.2)	17.0 (5.2)
	10 (3.0)	18.5 (5.6)	19.5 (1048)	--	--	18.5 (5.6)	20.0 (6.1)	23.5 (1263)	--	--	18.5 (5.6)
	11 (3.4)	20.5 (6.3)	26.0 (1398)	--	--	--	21.0 (6.4)	28.0 (1505)	--	--	20.0 (6.1)
	12 (3.7)	22.5 (6.9)	33.0 (1774)	--	--	--	22.0 (6.7)	33.0 (1774)	--	--	21.5 (6.6)

NOTE: MINIMUM REQUIRED EXTENSION IS 6" (150mm) FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" (800 mm) FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".



**GEOTECHNICAL ENGINEERING UNIT**  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD DRAWING NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 2-20-07

# STANDARD TEMPORARY MSE WALL OPTIONS

PROJECT REFERENCE NO. SHEET

B-4258

2-E

GEOTECHNICAL ENGINEER

ENGINEER



Sutta Hadden 3/29/07  
SIGNATURE DATE

TEMPORARY MSE WALL OPTION	VENDOR	CONTACT INFORMATION	REINFORCEMENT TYPE	SHEETS
TEMPORARY FABRIC WALL	N/A	N/A	POLYESTER OR POLYPROPYLENE FABRIC	3
HILFIKER TEMPORARY WALL	HILFIKER RETAINING WALLS	1902 HILFIKER LANE, EUREKA, CA 95503-5711 707-443-5093 WWW.HILFIKER.COM	WELDED WIRE MAT	4
SIERRASCAPE TEMPORARY WALL	TENSAR EARTH TECHNOLOGIES, INC	5883 GLENRIDGE DRIVE, SUITE 200 ATLANTA, GA 30328-5363 404-250-1290 WWW.TENSARCORP.COM	GEOGRID	5
RETAINED EARTH TEMPORARY WALL	THE REINFORCED EARTH COMPANY	8614 WESTWOOD CENTER DRIVE, SUITE 1100 VIENNA, VA 22182-2233 703-749-4325 WWW.REINFORCEDEARTH.COM	WELDED WIRE MESH	6-8
TERRATREL TEMPORARY WALL	THE REINFORCED EARTH COMPANY	8614 WESTWOOD CENTER DRIVE, SUITE 1100 VIENNA, VA 22182-2233 703-749-4325 WWW.REINFORCEDEARTH.COM	RIBBED STEEL STRIPS	9-11

FOR STANDARD TEMPORARY MSE WALLS, SEE TEMPORARY SHORING SPECIAL PROVISION.  
WHEN NOTES ON PLANS DO NOT PROHIBIT TEMPORARY MSE WALLS OR STANDARD SHORING, STANDARD TEMPORARY MSE WALLS ARE OPTIONAL.

WHEN NOTES ON PLANS REQUIRE TEMPORARY MSE WALLS, USE STANDARD TEMPORARY MSE WALLS OR CONTRACTOR DESIGNED TEMPORARY MSE WALLS.

WHEN THE ALIGNMENT OF STANDARD TEMPORARY MSE WALLS RESULTS IN AN INTERIOR ANGLE LESS THAN 90 DEGREES, SUBMIT AN ACUTE CORNER DETAIL FOR THE SPECIFIC SITUATION IN ACCORDANCE WITH THE WALL VENDOR RECOMMENDATIONS. ALSO, SUBMIT A "STANDARD TEMPORARY MSE WALL SELECTION FORM" FOR EACH TEMPORARY MSE WALL LOCATION. SUBMIT THESE ITEMS AT LEAST 14 DAYS BEFORE BEGINNING WALL CONSTRUCTION.

- STANDARD TEMPORARY MSE WALLS ARE BASED ON THE FOLLOWING CONDITIONS:
- 1) MAXIMUM WALL HEIGHT IS 28'-0" (8.5m).
  - 2) TRAFFIC SURCHARGE IS 240 PSF (11.5 KPA) MAXIMUM OR BACKSLOPE IS 2:1 (H:V) OR FLATTER.
  - 3) EXISTING OR FINISHED GRADE IN FRONT OF WALL IS 6:1 (H:V) SLOPE OR FLATTER.
  - 4) THE GRADE OF THE TOP OF WALL IS LESS THAN 4% FOR RETAINED EARTH AND TERRATREL TEMPORARY WALLS.
  - 5) DESIGN SERVICE LIFE IS 3 YEARS.
  - 6) MATERIAL IN REINFORCED ZONE IS SHORING BACKFILL.
  - 7) MAXIMUM APPLIED BEARING PRESSURE IS 1 TSF (100 KPA) FOR WALL HEIGHTS UP TO 8'-0" (2.4m), 2 TSF (195 KPA) FOR WALL HEIGHTS BETWEEN 8'-0" AND 18'-0" (2.4m AND 5.5m) AND 3 TSF (290 KPA) FOR WALL HEIGHTS OVER 18'-0" (5.5m).

STANDARD TEMPORARY MSE WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/M<sup>3</sup>)  
FRICTION ANGLE = 30 DEGREES  
COHESION = 0 PSF (0 KPA)  
GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF REINFORCED ZONE.

DO NOT USE STANDARD TEMPORARY MSE WALLS WHEN THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT BELOW THE BOTTOM OF REINFORCED ZONE.

CONTROL DRAINAGE DURING CONSTRUCTION IN THE VICINITY OF STANDARD TEMPORARY MSE WALLS. COLLECT AND DIRECT RUNOFF AWAY FROM WALLS AND SHORING BACKFILL.

- EXCAVATE AS NECESSARY FOR STANDARD TEMPORARY MSE WALLS IN ACCORDANCE WITH THE FOLLOWING FOR THE WALL OPTION CHOSEN:
- 1) MINIMUM EMBEDMENT OF 18" (450mm) UNLESS WALL BEARS ON ROCK, CONCRETE OR PAVEMENT AS DETERMINED BY THE ENGINEER
  - 2) VERTICAL STEPS IN INCREMENTS EQUAL TO THE VERTICAL REINFORCEMENT SPACING
  - 3) WITH THE EXCEPTION OF EITHER THE FIRST OR LAST SECTION OF WALL, HORIZONTAL SECTION LENGTHS IN INCREMENTS EQUAL TO THE FOLLOWING:

STANDARD TEMPORARY MSE WALL OPTION	INCREMENT
TEMPORARY FABRIC WALL	9'-0" (2.7m) MIN (VARIES)
HILFIKER TEMPORARY WALL	10'-0" (3.0m) MIN (VARIES)
SIERRASCAPE TEMPORARY WALL	18'-7 1/4" (5.7m)
RETAINED EARTH TEMPORARY WALL	24'-0" (7.3m)
TERRATREL TEMPORARY WALL	19'-8" (6.0m)

DO NOT PLACE SHORING BACKFILL OR FIRST REINFORCEMENT LAYER UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND FOUNDATION MATERIAL.

IF APPLICABLE, INSTALL FOUNDATIONS LOCATED WITHIN THE REINFORCED ZONE BEFORE BEGINNING WALL CONSTRUCTION UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

ERECT AND MAINTAIN FACINGS AND FORMS AS SHOWN ON THE STANDARD TEMPORARY MSE WALL DETAILS. STAGGER VERTICAL JOINTS OF FACINGS AND FORMS TO CREATE A RUNNING BOND WHEN POSSIBLE UNLESS SHOWN OTHERWISE ON THESE DETAILS.

PLACE FACINGS AND FORMS AS NEAR TO VERTICAL AS POSSIBLE WITH NO NEGATIVE BATTER. CONSTRUCT STANDARD TEMPORARY MSE WALLS WITH A VERTICAL AND HORIZONTAL TOLERANCE OF 3" (75mm) WHEN MEASURED WITH A 10'-0" (3m) STRAIGHT EDGE AND AN OVERALL VERTICAL PLUMBNESS (BATTER) AND HORIZONTAL ALIGNMENT OF LESS THAN 6" (150mm).

PLACE REINFORCEMENT AT LOCATIONS AND ELEVATIONS SHOWN ON THE STANDARD TEMPORARY MSE WALL DETAILS AND IN SLIGHT TENSION FREE OF KINKS, FOLDS, WRINKLES OR CREASES.

DO NOT SPLICE REINFORCEMENT IN THE REINFORCEMENT DIRECTION (RD), I.E., PARALLEL TO THE WALL FACE. SEAMS ARE ALLOWED IN THE CROSS-REINFORCEMENT DIRECTION (CRD).

CONTACT THE ENGINEER WHEN EXISTING OR FUTURE STRUCTURES SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT. TO AVOID STRUCTURES, DELFECT, SKEW AND MODIFY REINFORCEMENT.

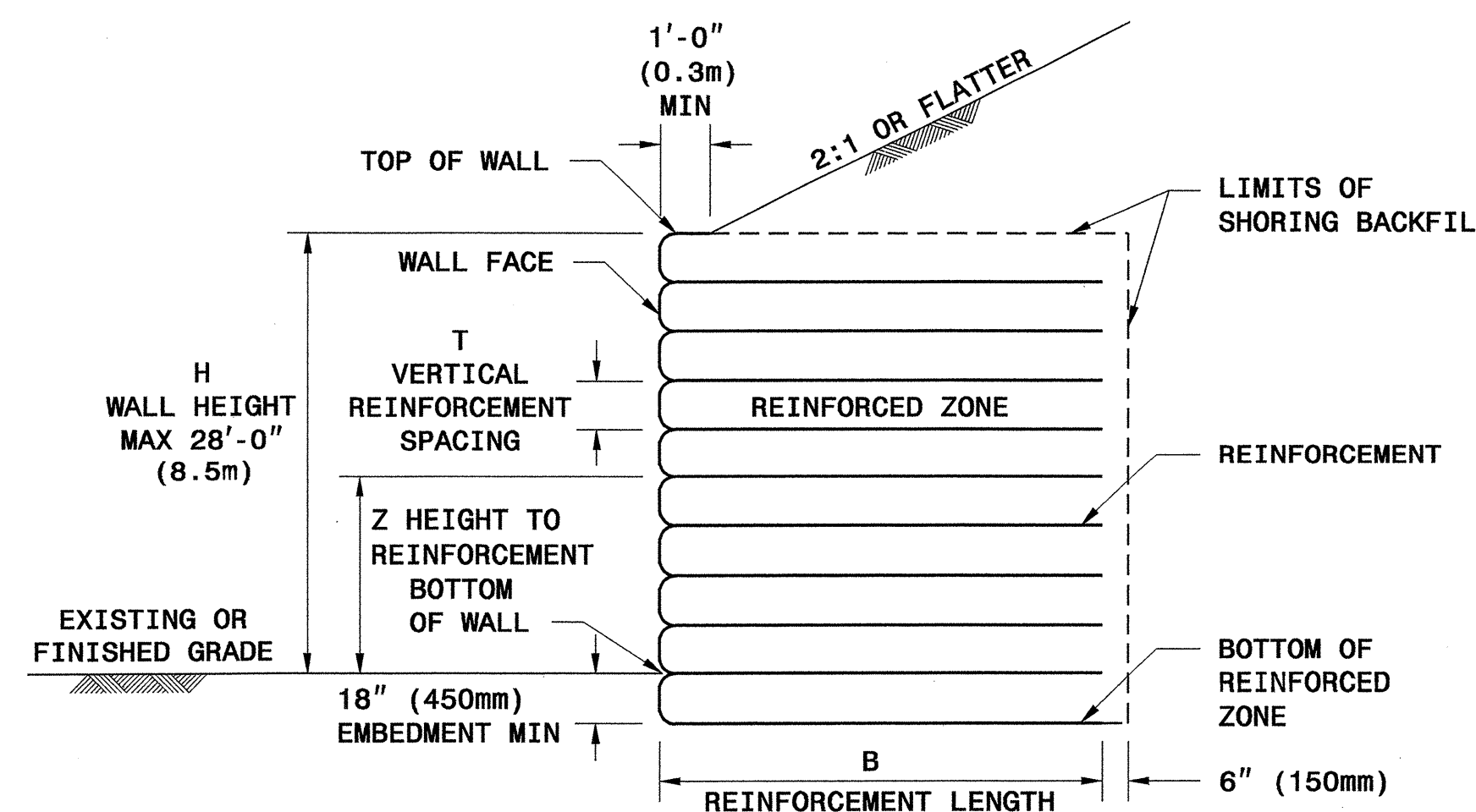
PLACE SHORING BACKFILL IN 8" TO 10" (200mm TO 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

DO NOT DAMAGE REINFORCEMENT WHEN PLACING AND COMPACTING SHORING BACKFILL. DO NOT OPERATE HEAVY EQUIPMENT ON REINFORCEMENT UNTIL IT IS COVERED WITH AT LEAST 10" (250mm) OF SHORING BACKFILL. DO NOT USE SHEEPSFOOT, GRID ROLLERS OR OTHER TYPES OF COMPACTION EQUIPMENT WITH FEET.

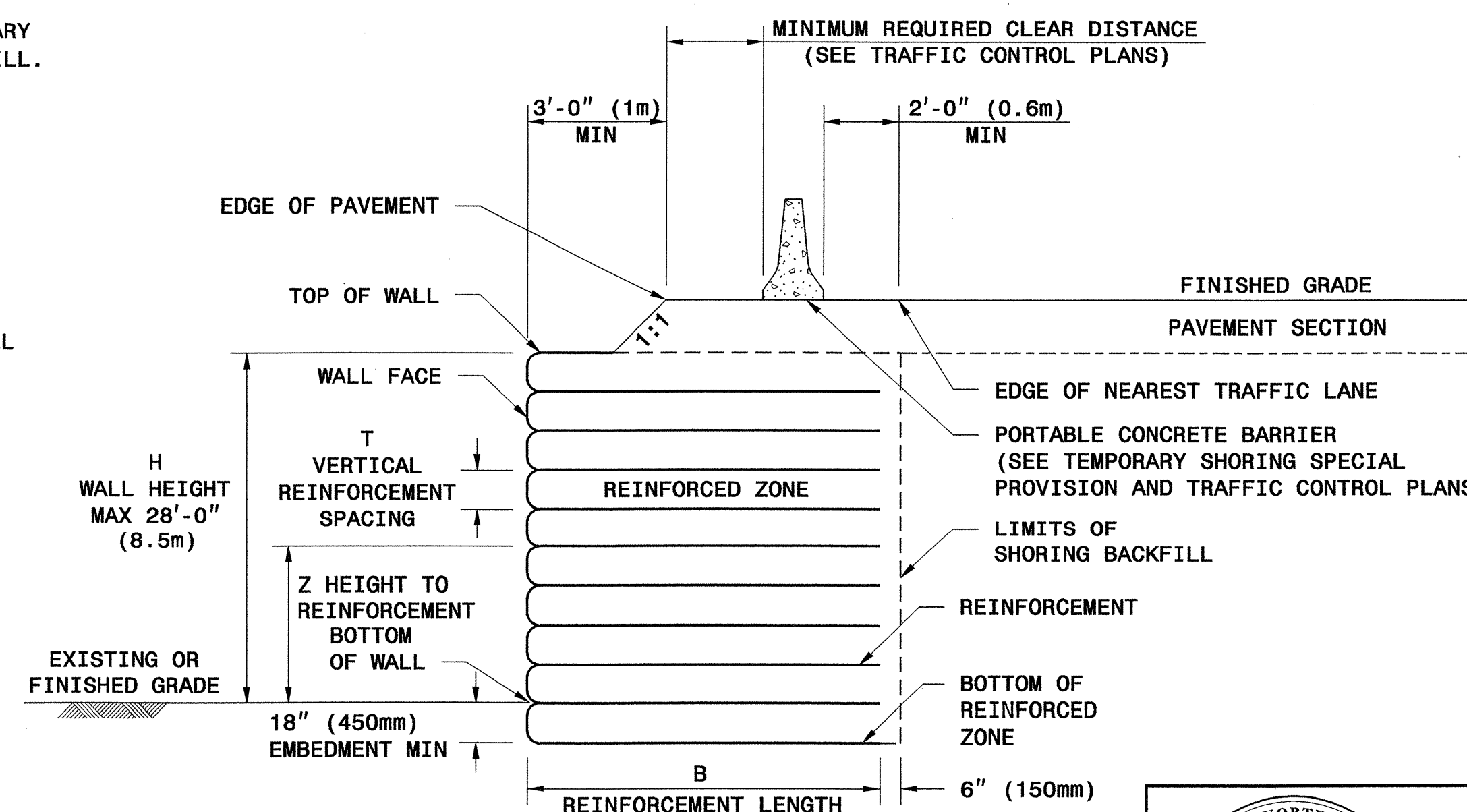
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm AND 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

BENCH STANDARD TEMPORARY MSE WALLS INTO THE SIDES OF EXCAVATIONS WHERE APPLICABLE.

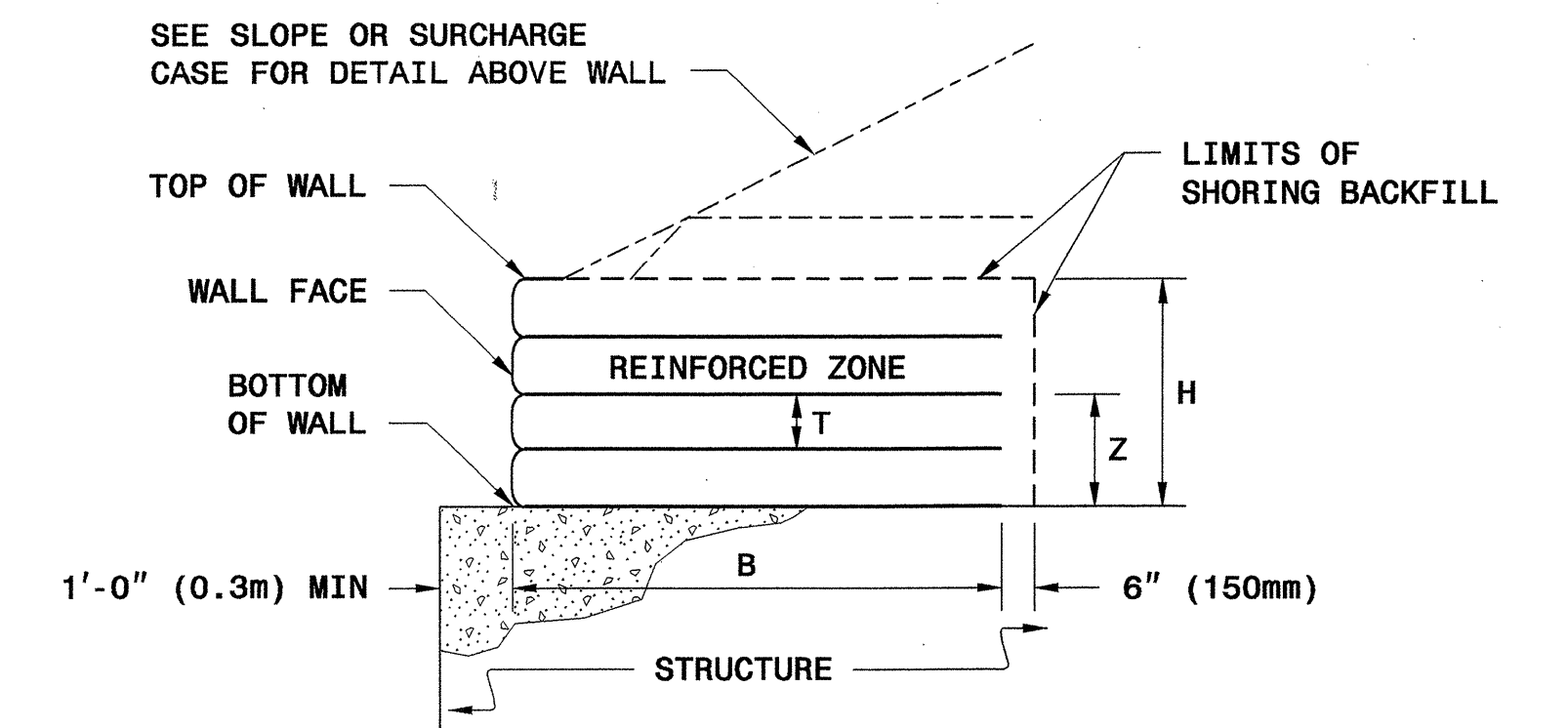
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



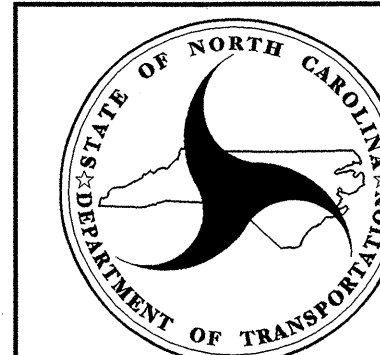
**SLOPE CASE**



**SURCHARGE CASE**



**TEMPORARY MSE WALL ON STRUCTURE**



**GEOTECHNICAL ENGINEERING UNIT**  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS

SHEET 1 OF 11 DATE: 2-20-07

GEOTECHNICAL ENGINEER

ENGINEER



Signature and Date of Scott A. Shidden

HOW TO USE THIS SHEET:

- FOR ALL WALL OPTIONS, DETERMINE MINIMUM REQUIRED REINFORCEMENT LENGTH (B) FROM TABLE AT RIGHT BASED ON WALL HEIGHT (H) AND SLOPE OR SURCHARGE CASE
- FOR STANDARD TEMPORARY FABRIC WALL, SEE SHEET 3 FOR FABRIC STRENGTH REQUIREMENTS BASED ON WALL HEIGHT (H)
- FOR ALL OTHER WALL OPTIONS, DETERMINE REINFORCEMENT TYPE FROM TABLES BELOW FOR EACH HEIGHT TO REINFORCEMENT (Z) BASED ON WALL HEIGHT (H) AND SLOPE OR SURCHARGE CASE

MINIMUM REQUIRED REINFORCEMENT LENGTH B (FT)

(FOR ALL WALL OPTIONS)

Table with columns: WALL HEIGHT H (FT), SLOPE CASE, SURCHARGE CASE and rows for wall heights 8, 10, 12, 14, 16, 18, 20, 22, 24, 26.

TERRATREL TEMPORARY WALL (STRIPS PER LEVEL PER PANEL)

Table showing reinforcement length B (FT) vs. Wall Height H (FT) for Terratrel Temporary Wall under Slope and Surcharge Cases.

SIERRASCAPE TEMPORARY WALL (GEOGRID TYPE)

11 = UX1100MSE 16 = UX1600MSE
14 = UX1400MSE 17 = UX1700MSE
15 = UX1500MSE

Table showing reinforcement length B (FT) vs. Wall Height H (FT) for Sierrascape Temporary Wall under Slope Case.

Table showing reinforcement length B (FT) vs. Wall Height H (FT) for Sierrascape Temporary Wall under Surcharge Case.

HILFIKER TEMPORARY WALL (WELDED WIRE MAT TYPE)

4.5 = W4.5 x W3.5
7.0 = W7.0 x W3.5
9.5 = W9.5 x W4.0

Table showing reinforcement length B (FT) vs. Wall Height H (FT) for HilfiKER Temporary Wall under Slope Case.

Table showing reinforcement length B (FT) vs. Wall Height H (FT) for HilfiKER Temporary Wall under Surcharge Case.

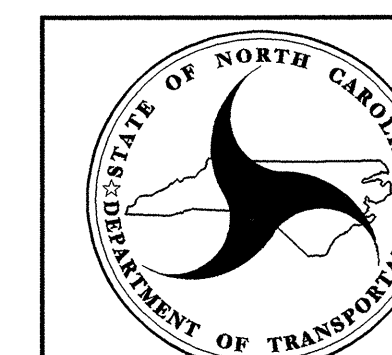
RETAINED EARTH TEMPORARY WALL (WELDED WIRE MESH TYPE)

3X1 = 3W8 x W8 x 1.0'
3X2 = 3W8 x W8 x 2.0'

Table showing reinforcement length B (FT) vs. Wall Height H (FT) for Retained Earth Temporary Wall under Slope and Surcharge Cases.

NOTES FOR HILFIKER TEMPORARY WALL

- 1) CAP MAT AT TOP OF WALL IS NOT INCLUDED IN TABLES.
2) REINFORCEMENT IS NOT REQUIRED AT 1' LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 24'.
3) REINFORCEMENT IS NOT REQUIRED AT 3' LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 26'.
4) REINFORCEMENT IS NOT REQUIRED AT 1' LEVEL FOR SURCHARGE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 26'.



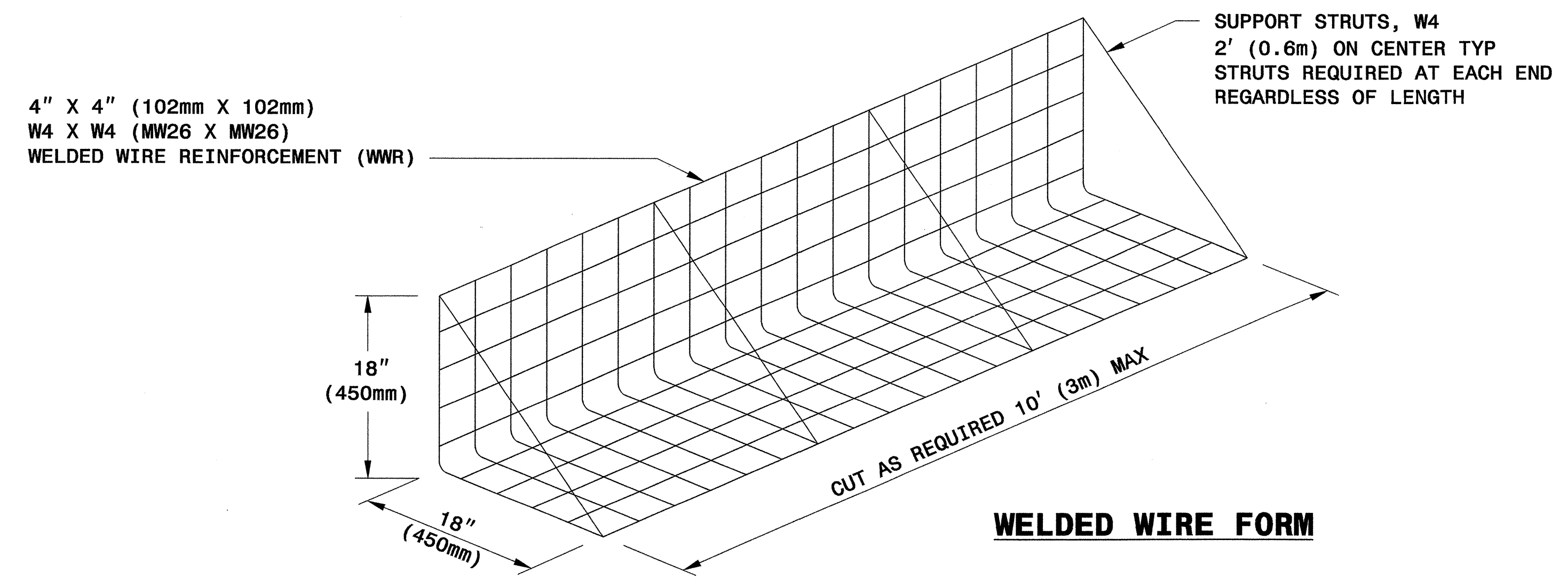
GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

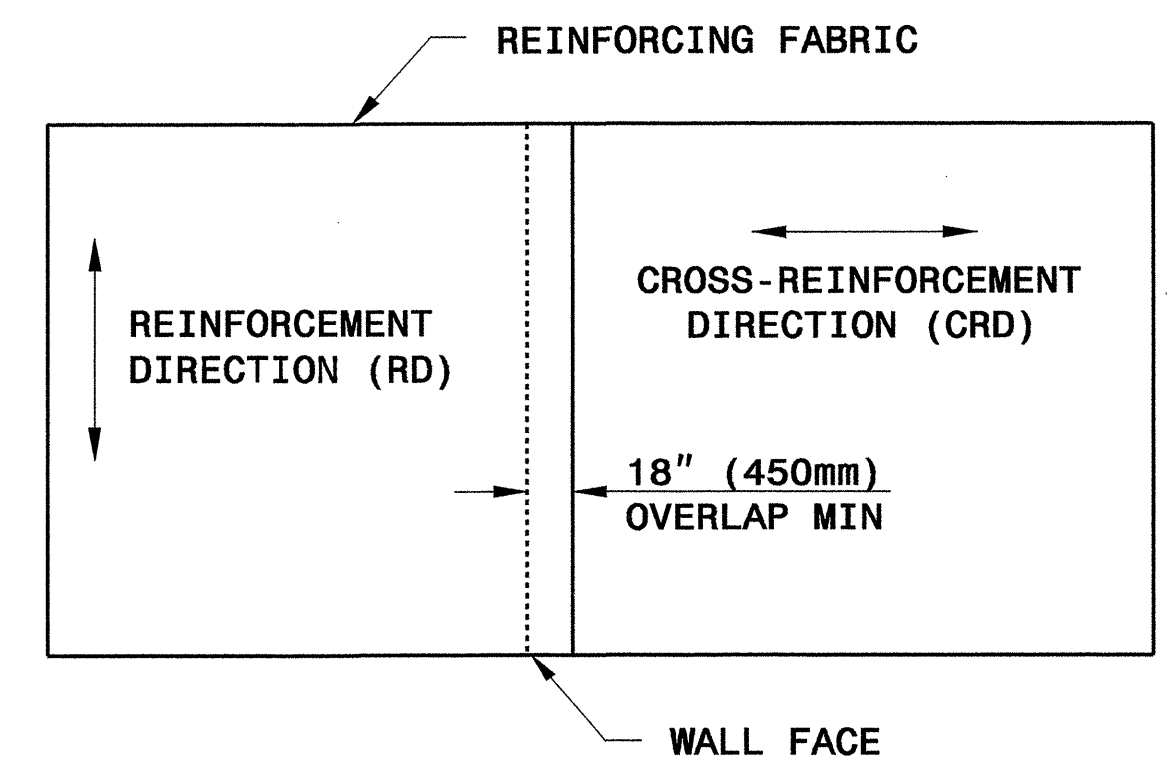
STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

SHEET 2 OF 11

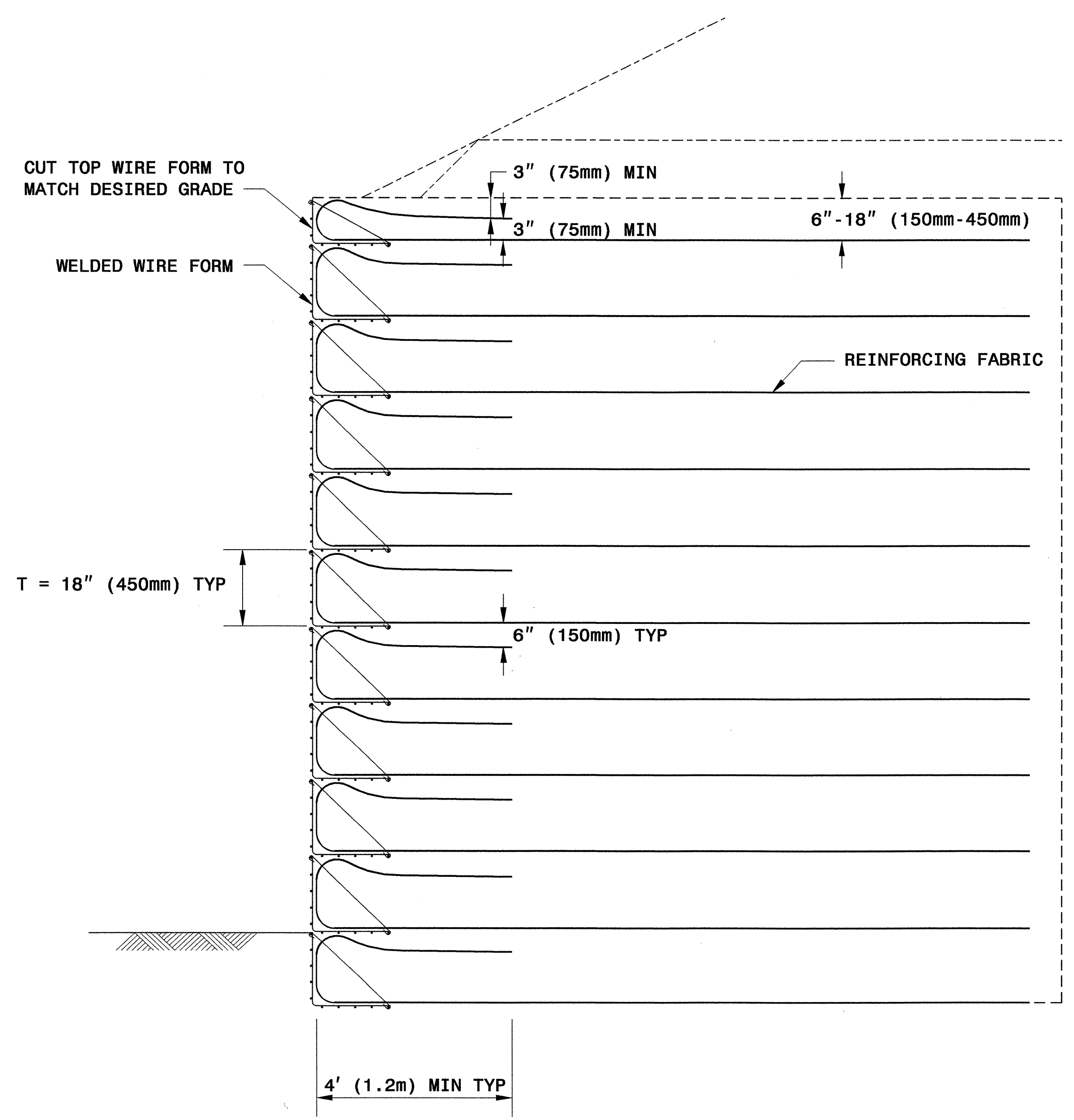
DATE: 2-20-07



**WELDED WIRE FORM**



**PLAN VIEW OF FABRIC OVERLAP**



**TYPICAL SECTION**

**MINIMUM REQUIRED REINFORCING FABRIC STRENGTH FOR RD\*  
(SLOPE AND SURCHARGE CASES)**

WALL HEIGHT H FEET (M)	POLYESTER WIDE WIDTH TENSILE STRENGTH @ ULTIMATE LB/INCH (KN/M)	POLYPROPYLENE WIDE WIDTH TENSILE STRENGTH @ ULTIMATE LB/INCH (KN/M)
4 (1.2)	200 (35)	200 (35)
6 (1.8)	200 (35)	200 (35)
8 (2.4)	200 (35)	200 (35)
10 (3.0)	200 (35)	230 (40)
12 (3.7)	220 (39)	264 (46)
14 (4.3)	248 (43)	297 (52)
16 (4.9)	276 (48)	330 (58)
18 (5.5)	304 (53)	364 (64)
20 (6.1)	332 (58)	397 (70)
22 (6.7)	359 (63)	431 (76)
24 (7.3)	387 (68)	464 (81)
26 (7.9)	415 (73)	497 (87)
28 (8.5)	443 (78)	531 (93)

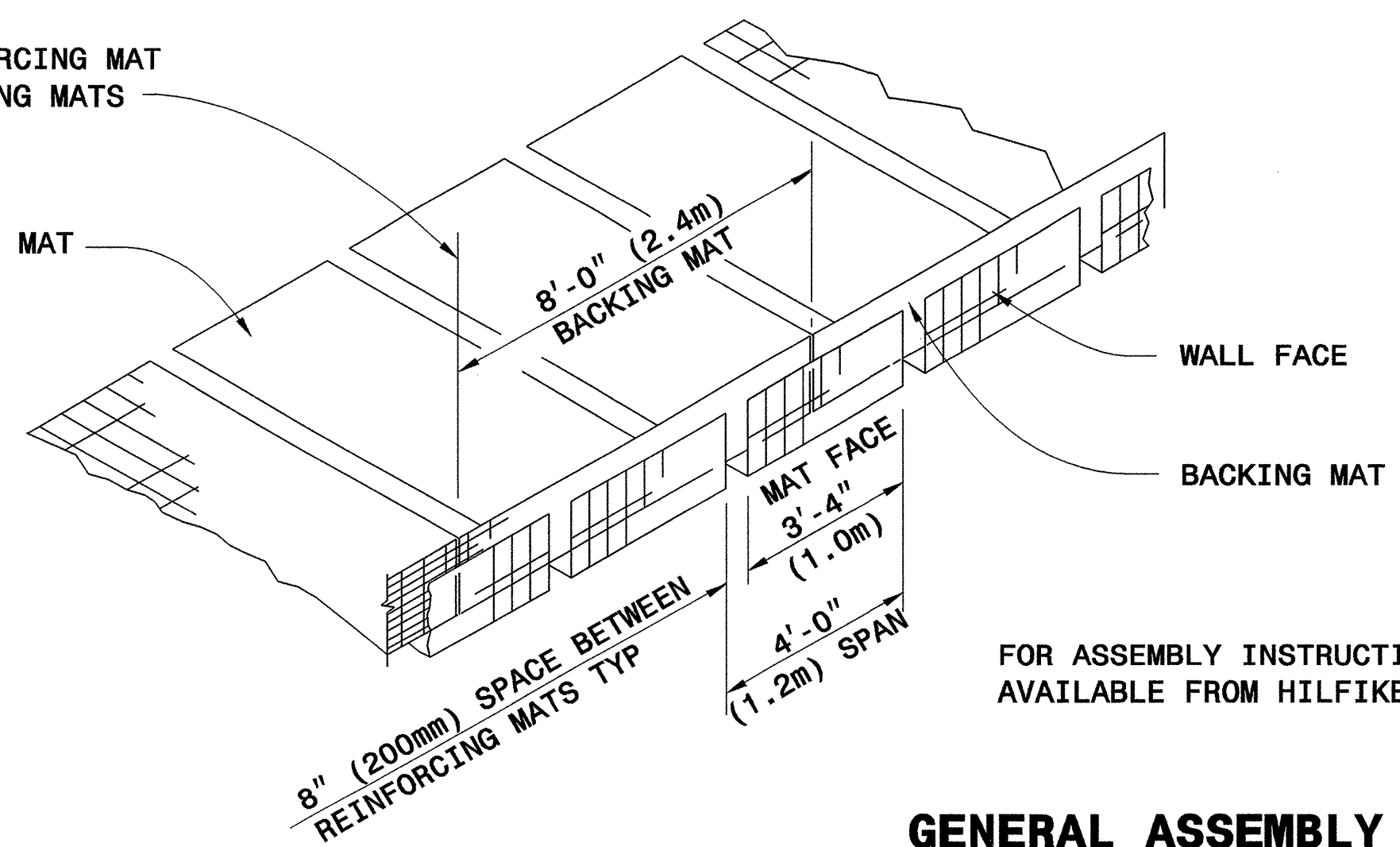
\*RD = REINFORCEMENT DIRECTION



Signature: Scott A. Hilden 3/29/07  
 DATE: DATE  
 SIGNATURE: SIGNATURE DATE: DATE

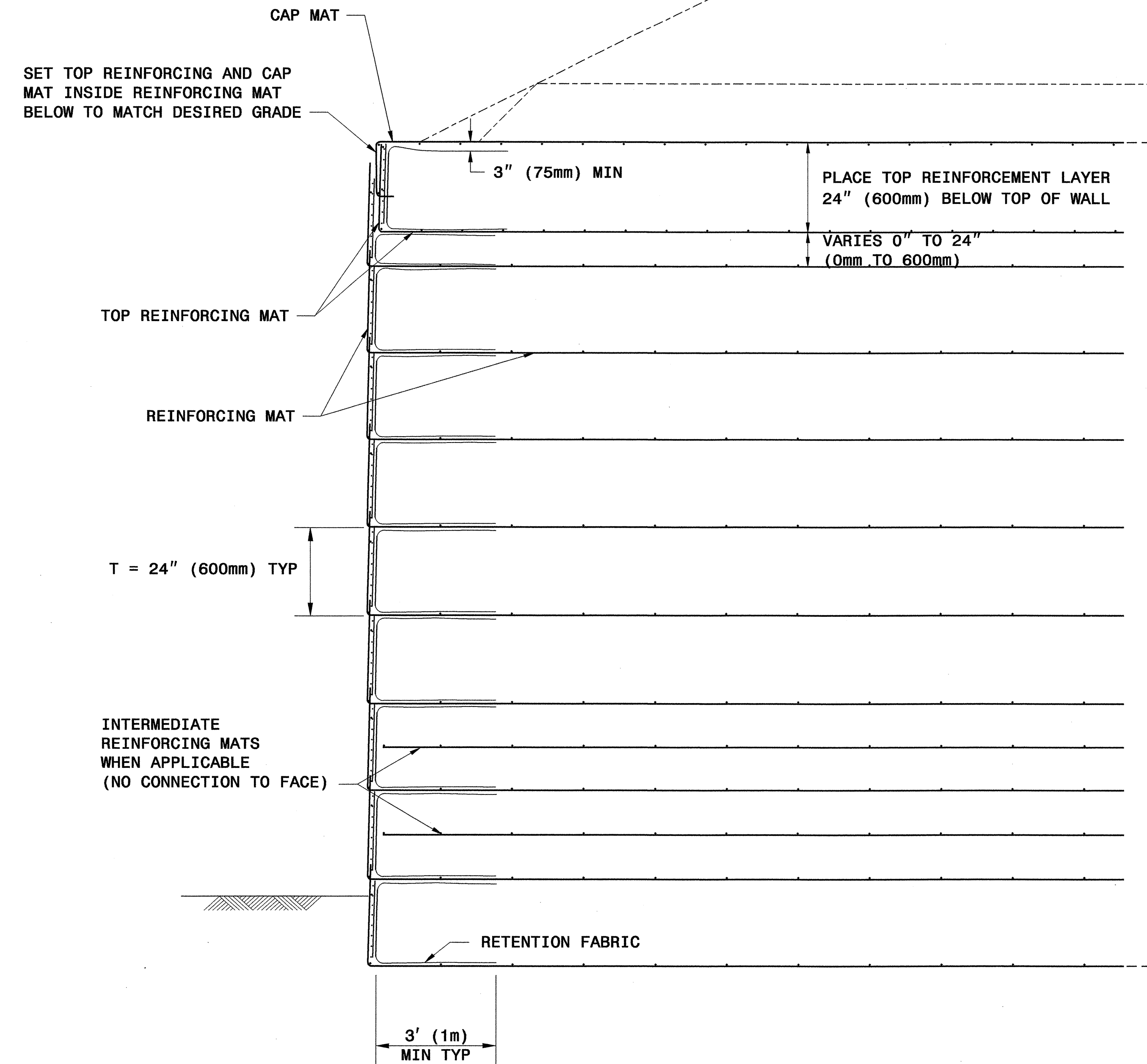
CENTERLINE OF REINFORCING MAT  
 FACE = EDGE OF BACKING MATS

REINFORCING MAT



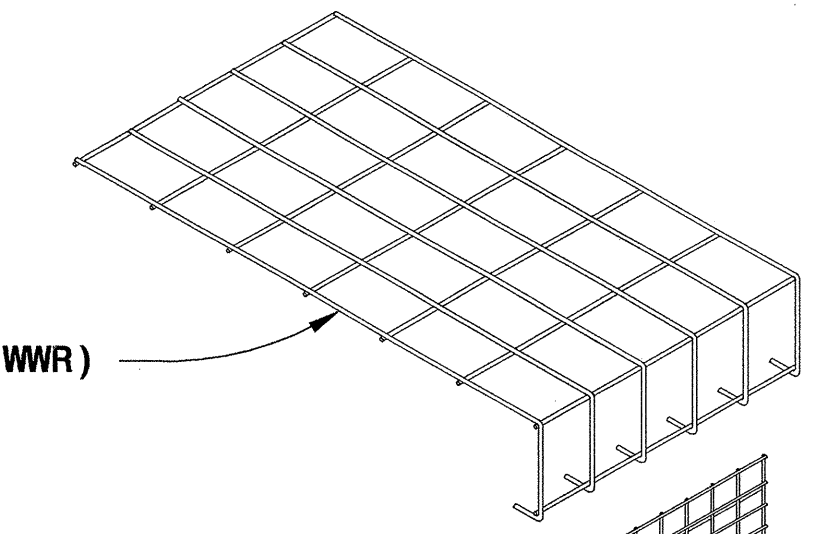
FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE  
 AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

**GENERAL ASSEMBLY DETAIL**

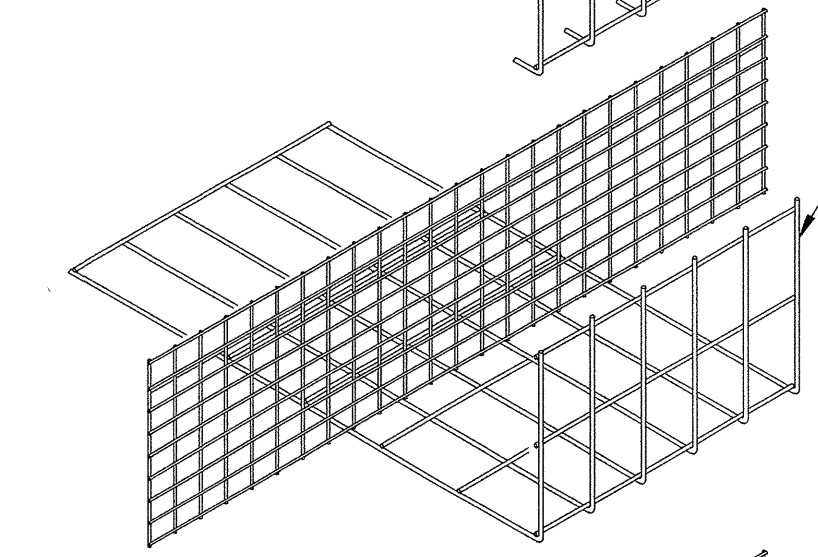


**TYPICAL SECTION**

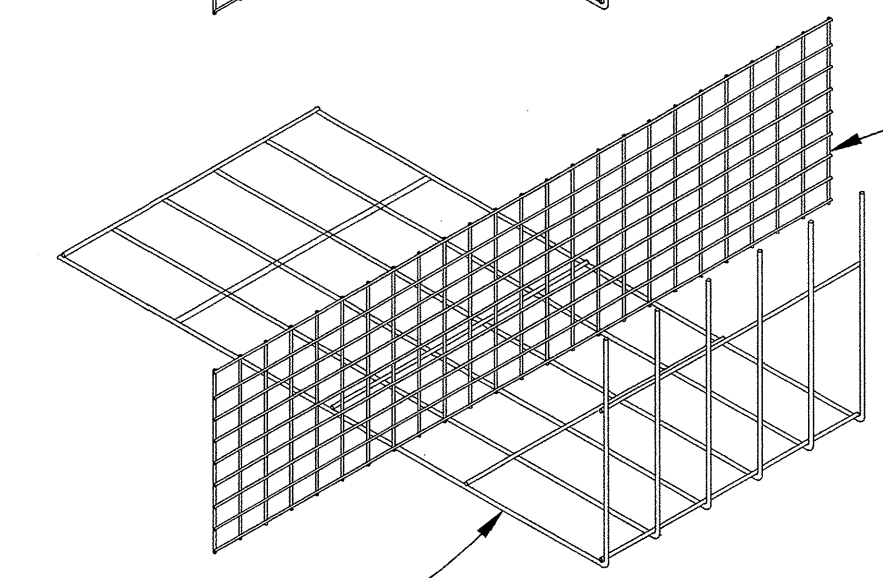
8" X 12" (203mm X 305mm)  
 W4.5 X W3.5 (MW29 X MW23)  
 CAP MAT  
 WELDED WIRE REINFORCEMENT (WWR)



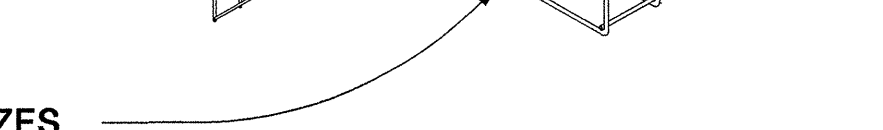
8" X 12" (203mm X 305mm)  
 W4.5 X W3.5 (MW29 X MW23) WWR  
 TOP REINFORCING MAT (NO PRONGS)



4" X 3" (102mm X 76mm)  
 W5 X W2.5 (MW32 X MW16) WWR  
 BACKING MAT  
 8' (2.4m) WIDE



8" X 21" (203mm X 533mm)  
 REINFORCING MAT  
 SEE SHEETS 2 AND 3 FOR GAUGE SIZES



**WALL COMPONENTS**



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 RALEIGH

STANDARD DRAWING NO. 1801.02  
**HILFIKER TEMPORARY WALL**  
 SHEET 4 OF 11 DATE: 12-19-06

GEOTECHNICAL ENGINEER

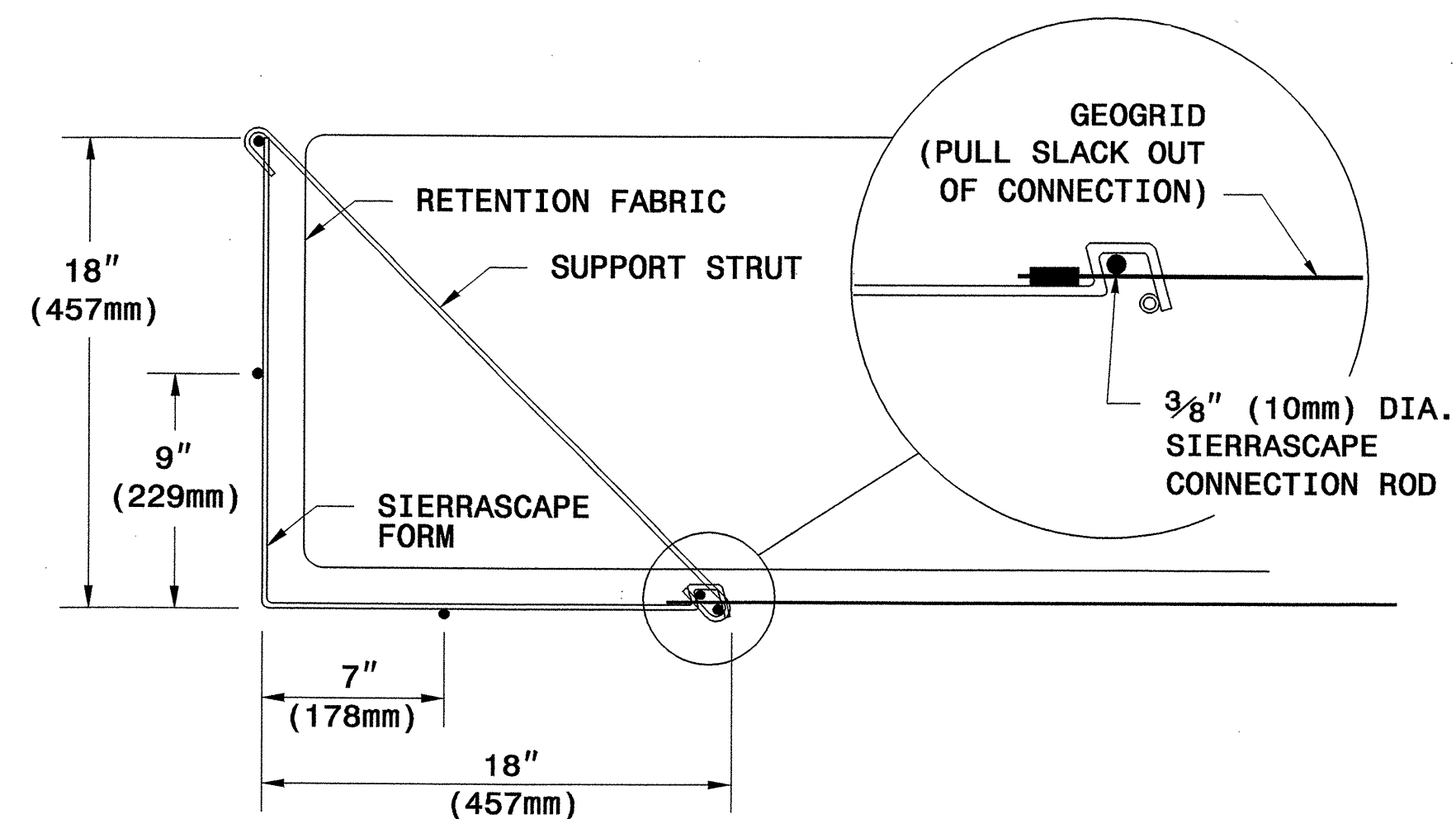
ENGINEER



Scott A. Hadden 3/29/07

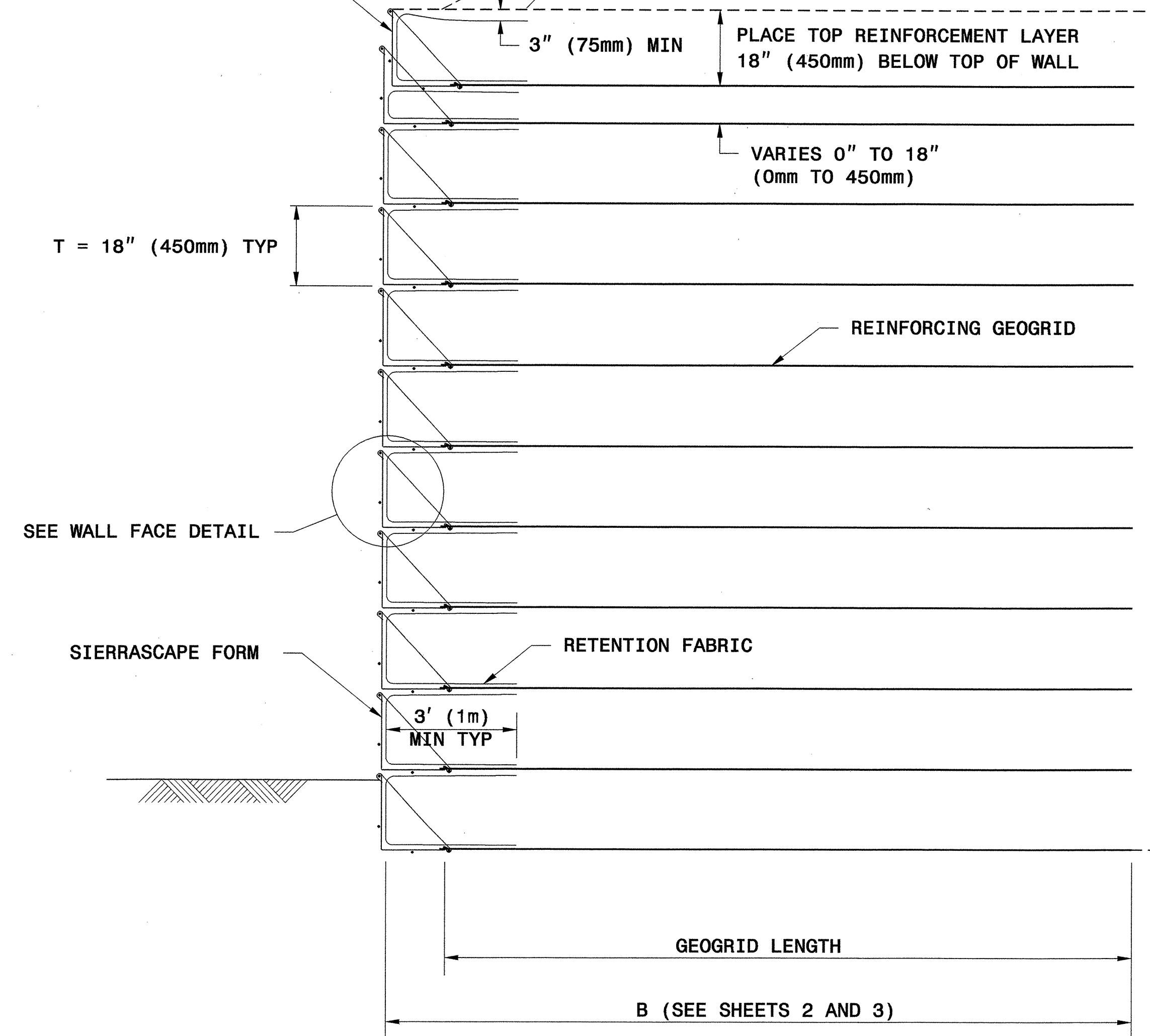
SIGNATURE DATE

SIGNATURE DATE

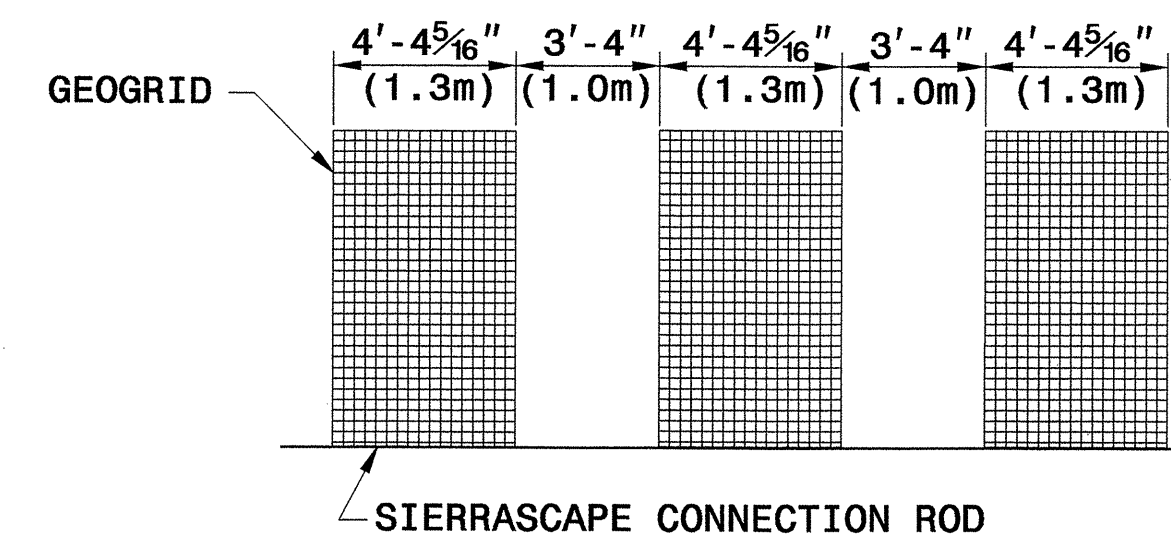


**WALL FACE DETAIL**

SET TOP WIRE FORM INSIDE WIRE FORM BELOW TO MATCH DESIRED GRADE

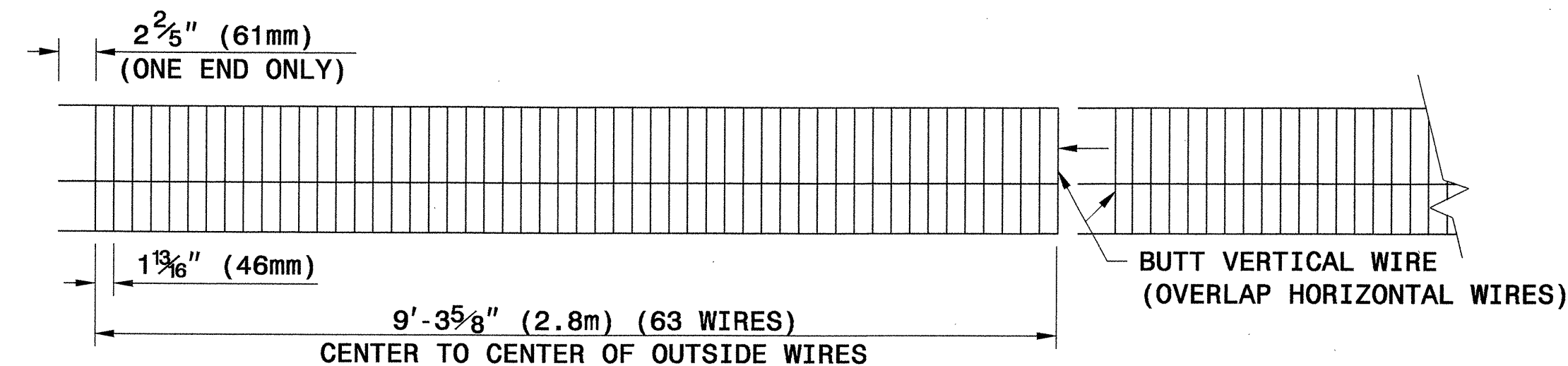


**TYPICAL SECTION**

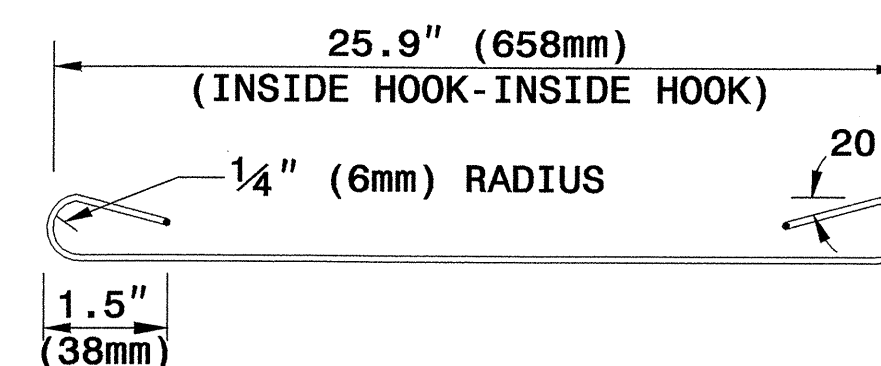


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

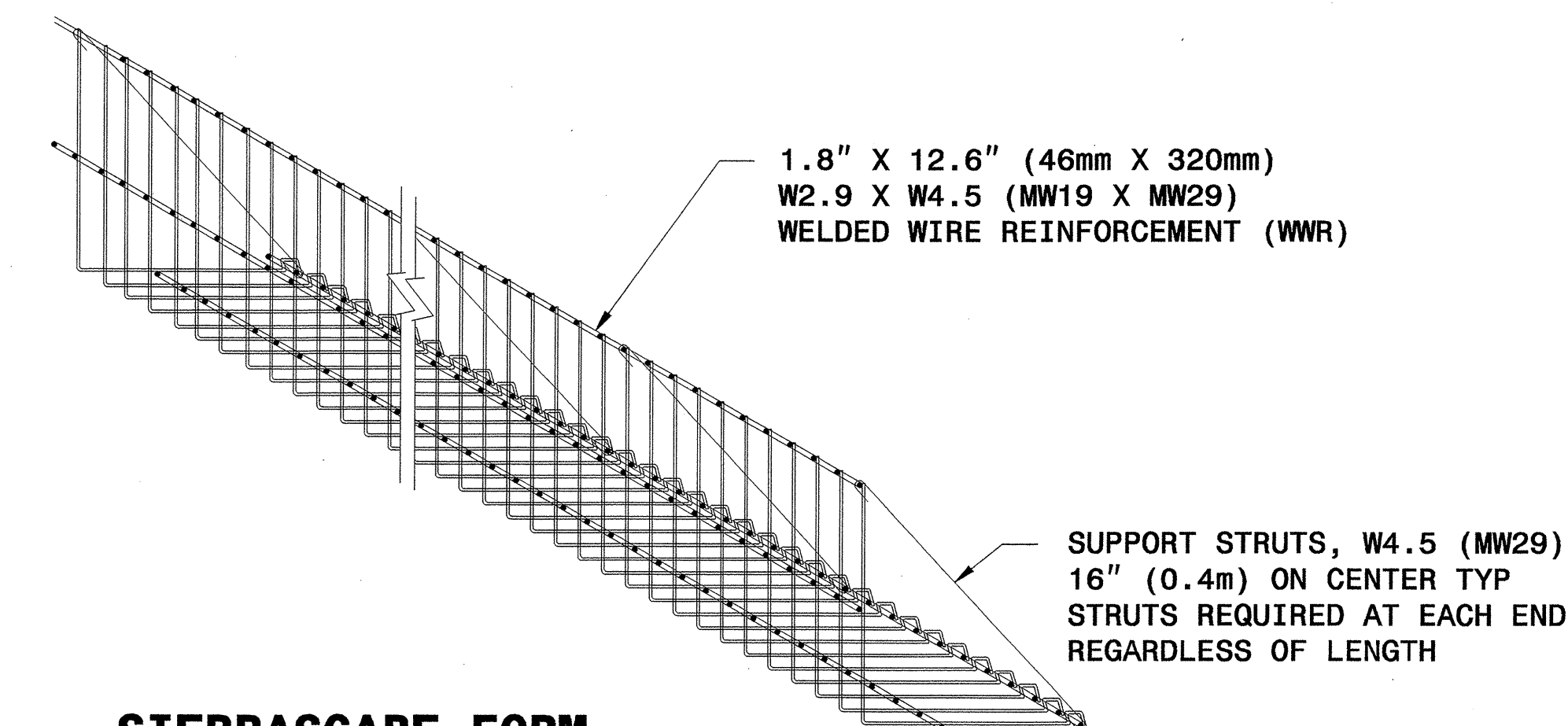
**TYPICAL GEOGRID COVERAGE**



**ELEVATION VIEW**

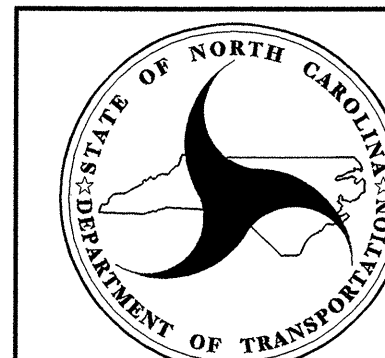
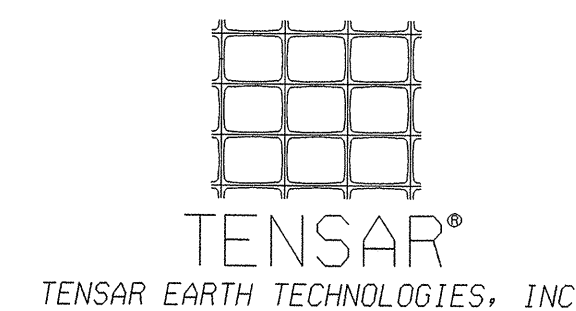


**SUPPORT STRUT**



**SIERRASCAPE FORM**

**WALL COMPONENTS**



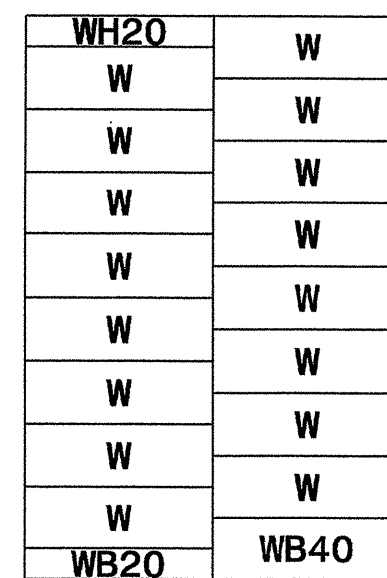
**GEOTECHNICAL ENGINEERING UNIT**  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD DRAWING NO. 1801.02

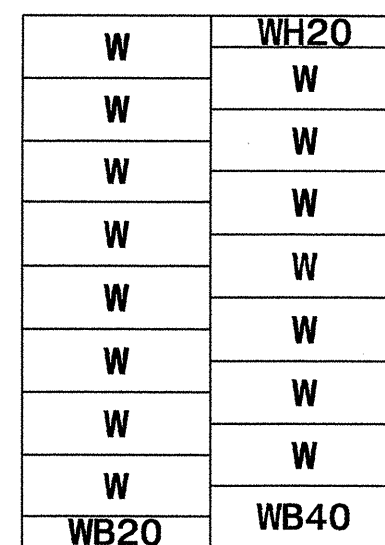
**SIERRASCAPE TEMPORARY WALL**

**PANEL LAYOUTS**

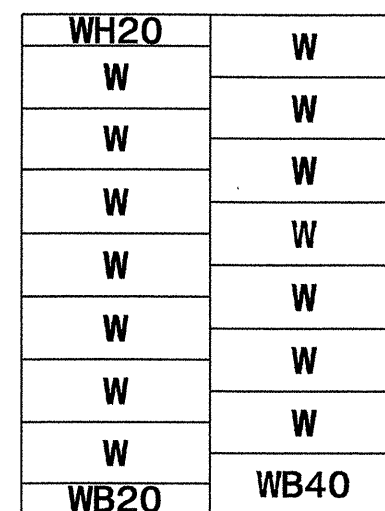
H - WALL HEIGHT  
(FEET-INCHES)  
(METER)



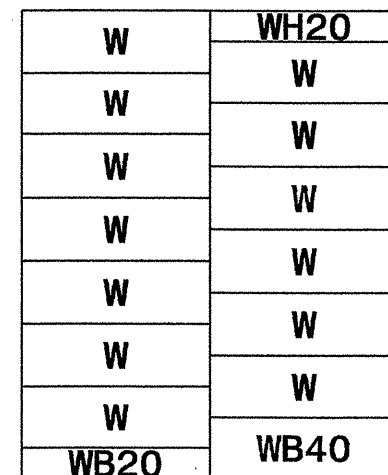
< 28 - 0  
< 8.5



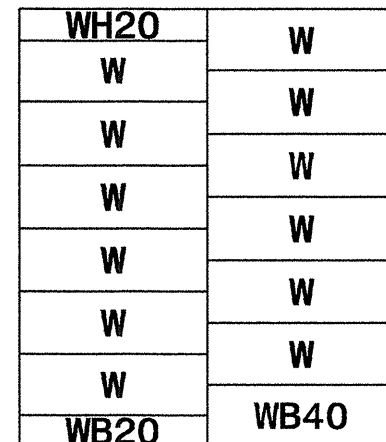
< 27 - 0  
< 8.2



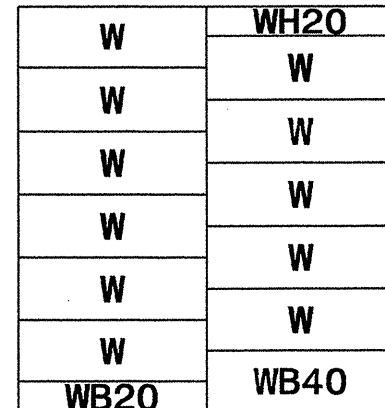
< 25 - 4  
< 7.7



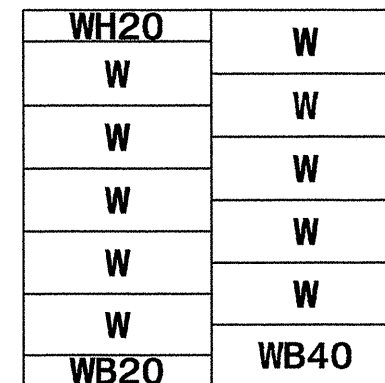
< 23 - 8  
< 7.2



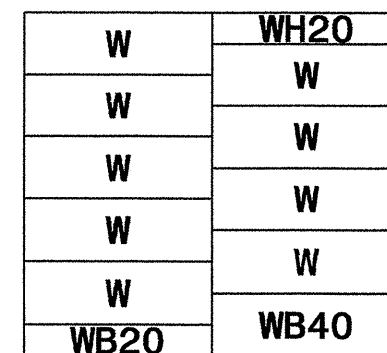
< 22 - 0  
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< 20 - 4  
< 6.2

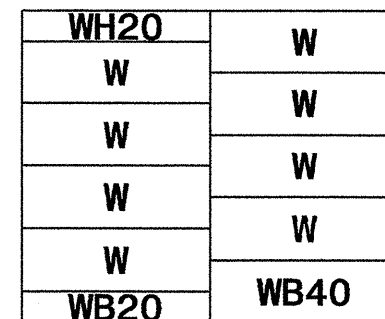


< 18 - 8  
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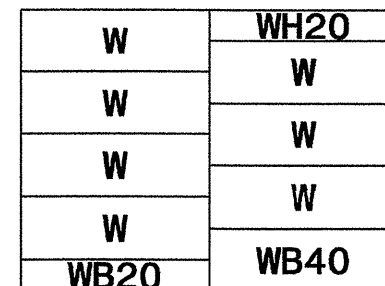


(FEET-INCHES)  
(METER)

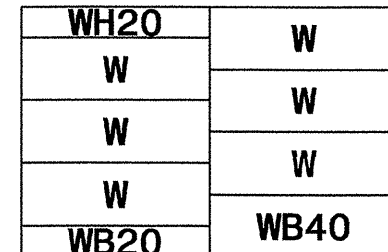
< 17 - 0  
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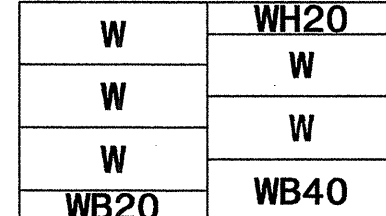
< 15 - 4  
< 4.7



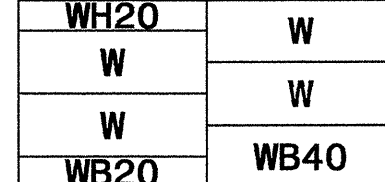
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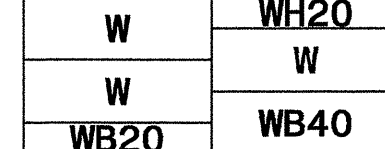
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< 3.7



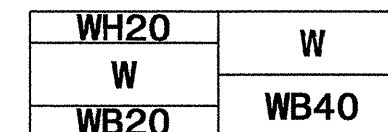
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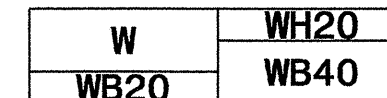
< 8 - 8  
< 2.6



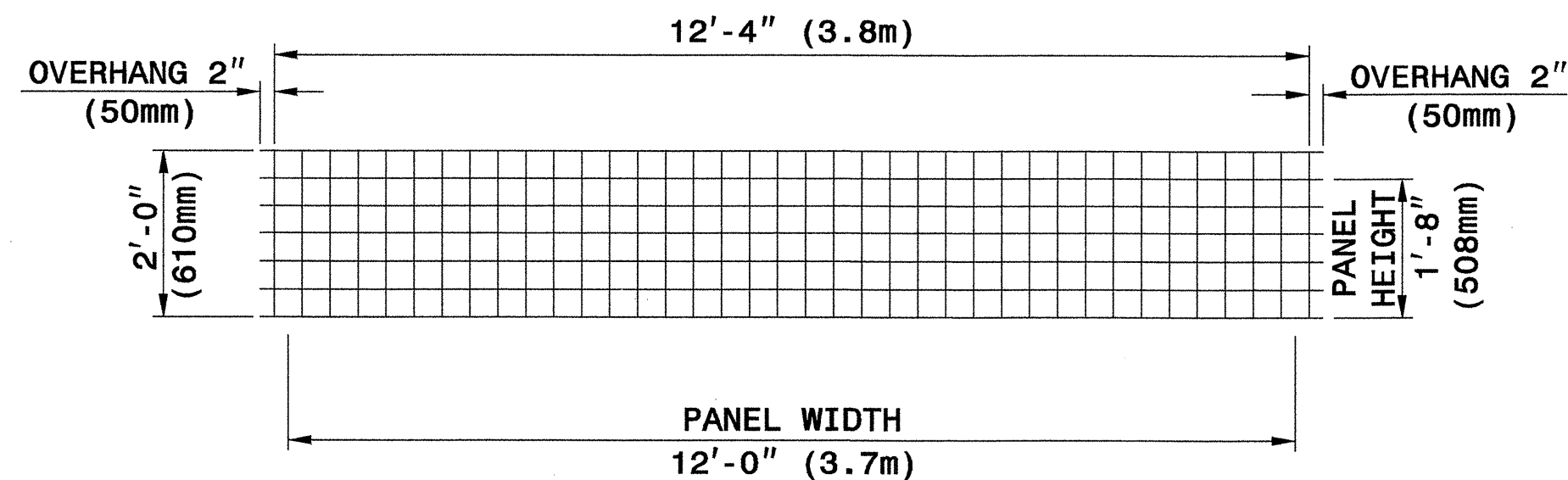
< 7 - 0  
< 2.1



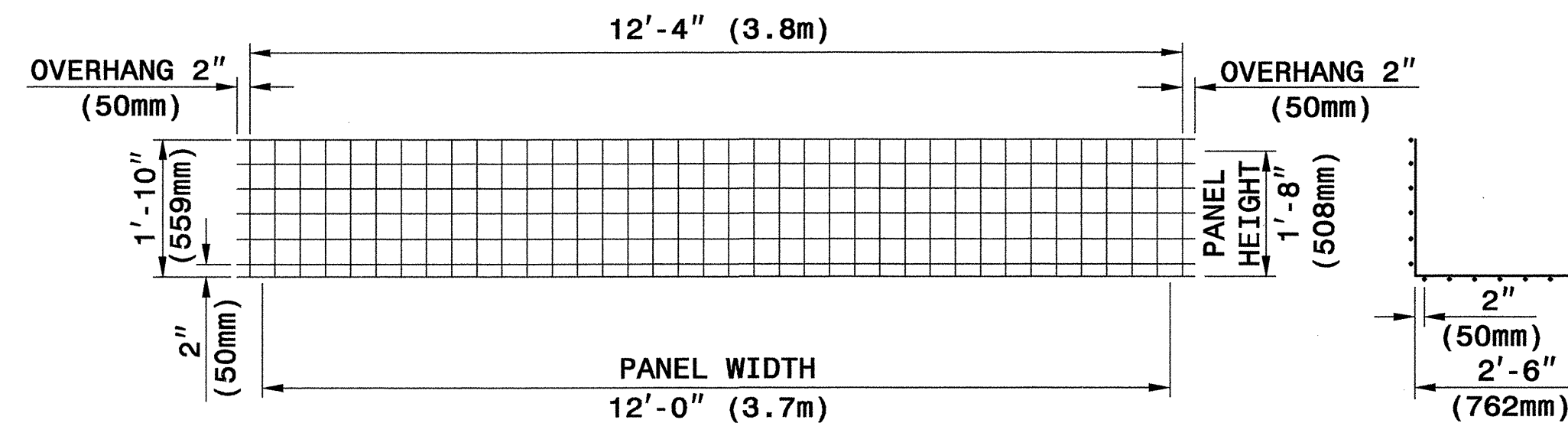
< 5 - 4  
< 1.6



< 3 - 8  
< 1.1

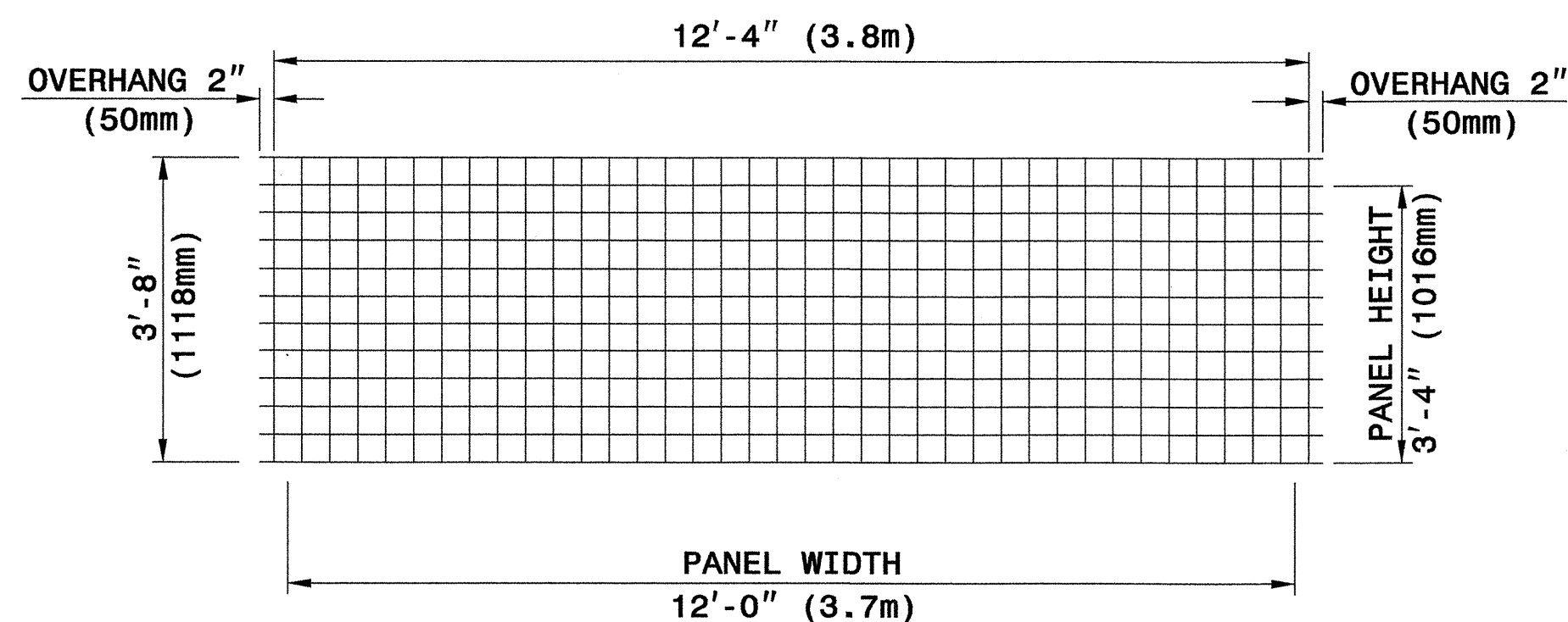


**TYPE WH20**

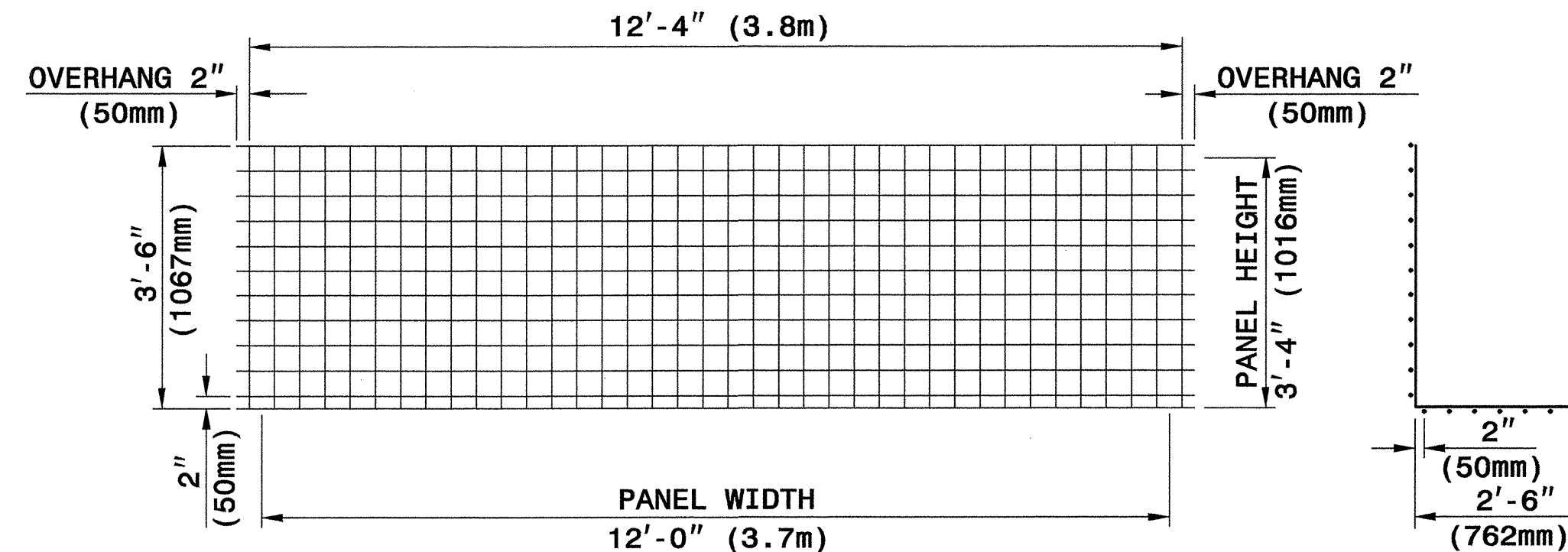


**TYPE WB20**

**SECTION**



**TYPE W**



**TYPE WB40**

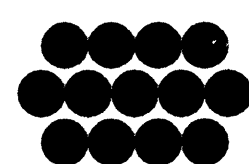
**SECTION**

**WELDED WIRE FACINGS**

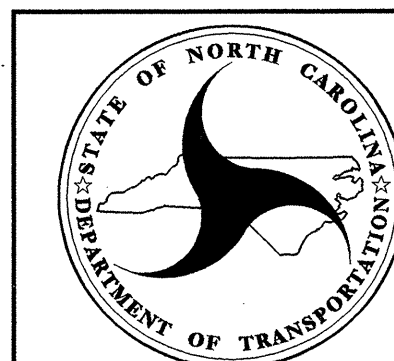
**WELDED WIRE FORMS**

**PANEL TYPES (WELDED WIRE FACINGS AND FORMS)**

4" X 4" (100mm X 100mm), W8 X W8 (MW52 X MW52) WELDED WIRE REINFORCEMENT (WWR)



The Reinforced Earth Company



**GEOTECHNICAL ENGINEERING UNIT**

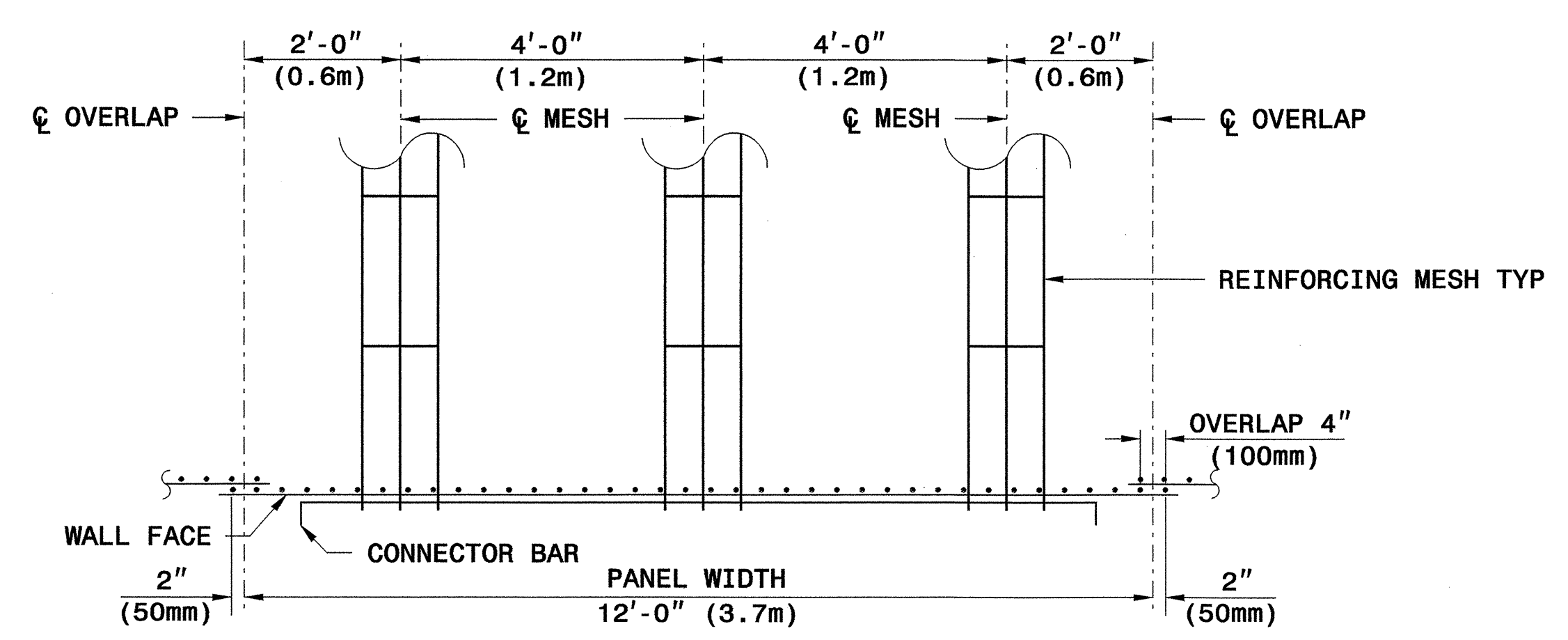
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD DRAWING NO. 1801.02

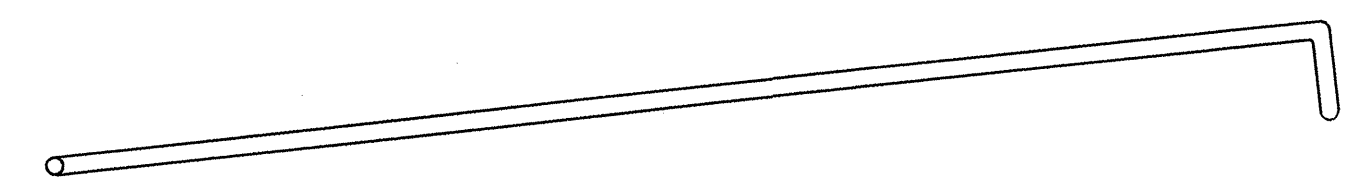
RETAINED EARTH  
TEMPORARY WALL

SHEET 6 OF 11

DATE: 12-19-06



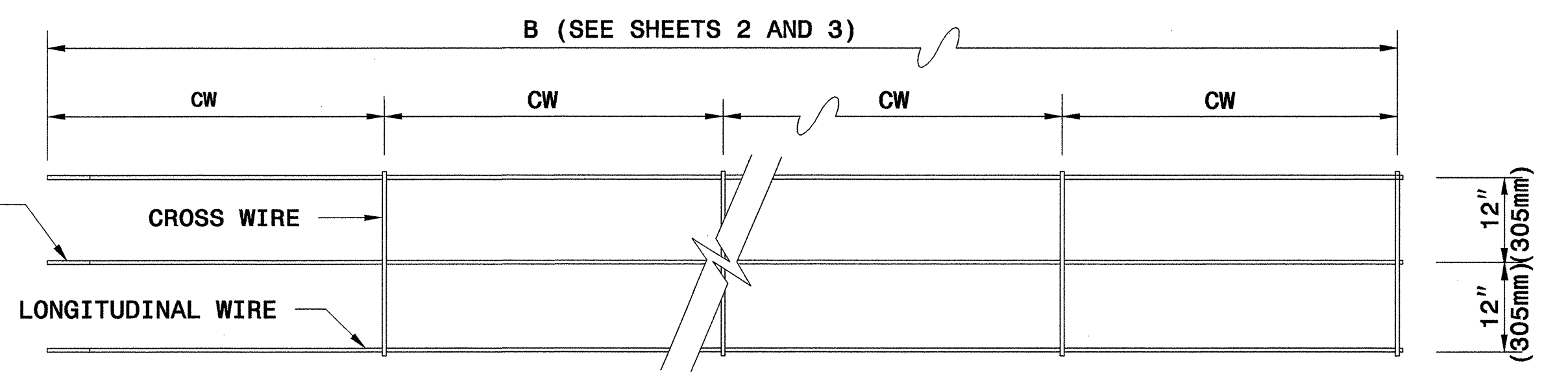
**REINFORCING MESH PLACEMENT DETAIL  
(PLAN VIEW)**



**1/2" (13mm) DIA. BAR**

**CONNECTOR BAR**

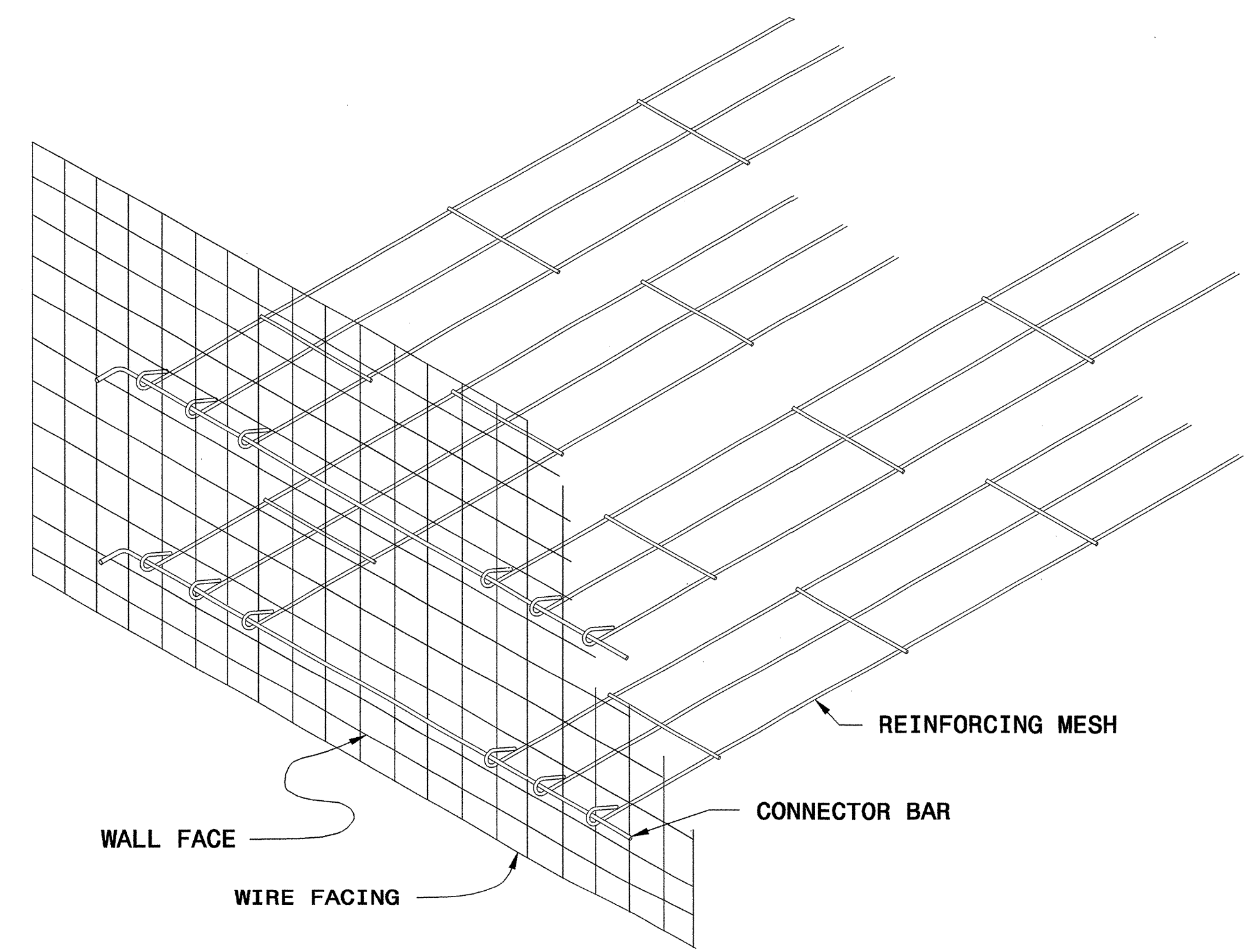
LOOPEd END OF MESH  
(SEE REINFORCING MESH LOOP DETAIL)



IF REINFORCEMENT LENGTH IS NOT AN INCREMENT OF 2'-0" (610mm) MAKE CW EQUAL TO 12" (305mm) AT THE END OF THE REINFORCING MESH OPPOSITE THE LOOPEd END

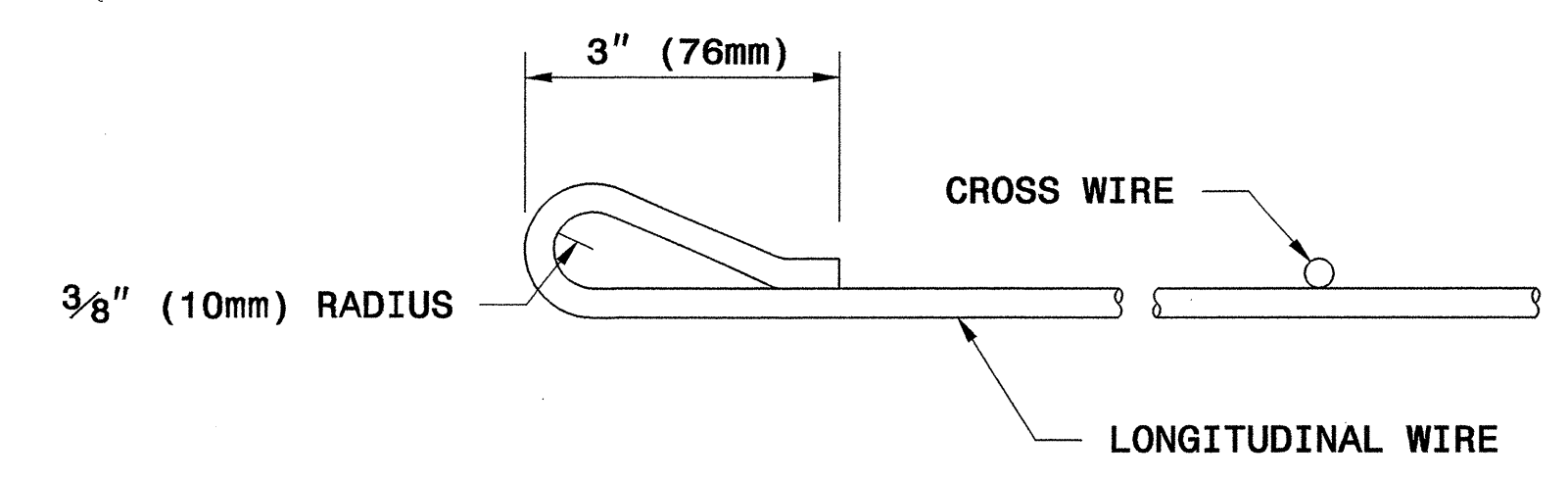
**3W8 X W8 x 2.0' (3MW52 X MW52 X 610mm)**  
 NO. OF LONGITUDINAL WIRES  
 GAUGE OF LONGITUDINAL WIRES  
 GAUGE OF CROSS WIRES  
 SPACING OF CROSS WIRES IN FT (mm), CW

**REINFORCING MESH DESIGNATION**



**GENERAL ASSEMBLY DETAIL**


**REINFORCING MESH**

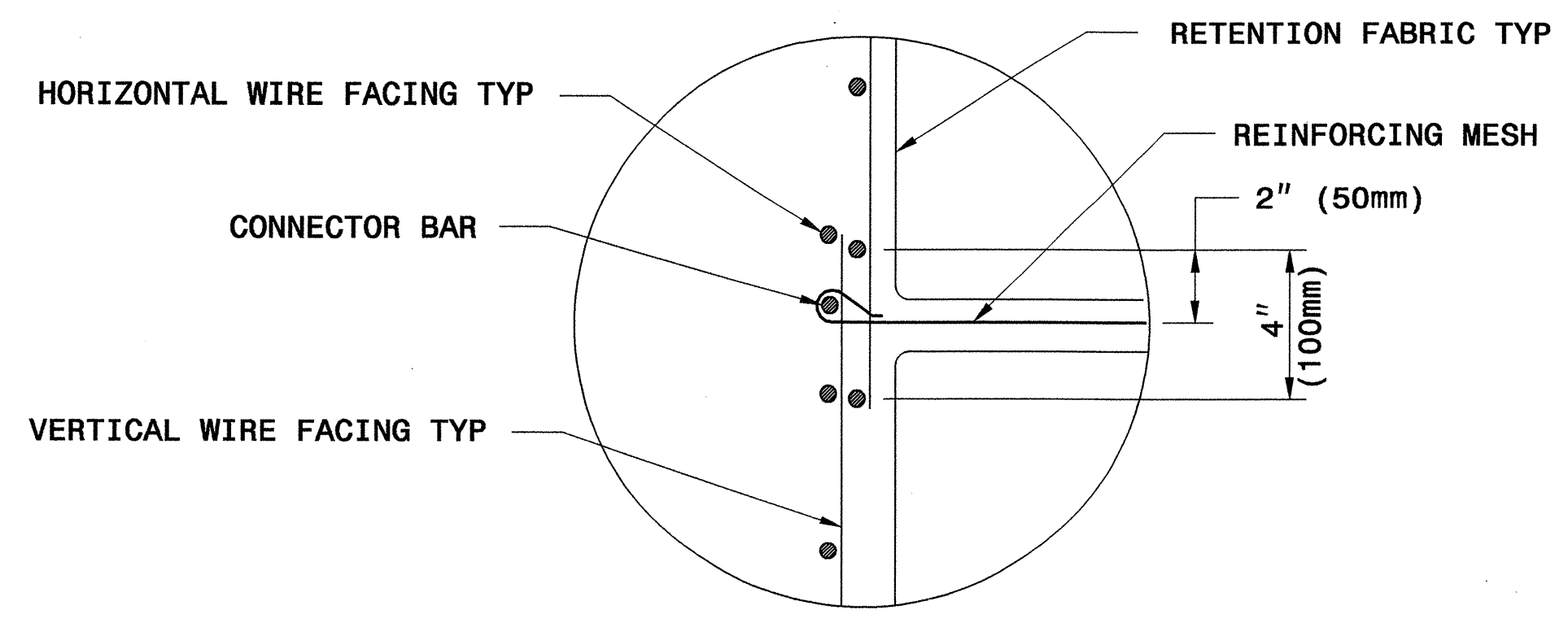


**REINFORCING MESH LOOP DETAIL**

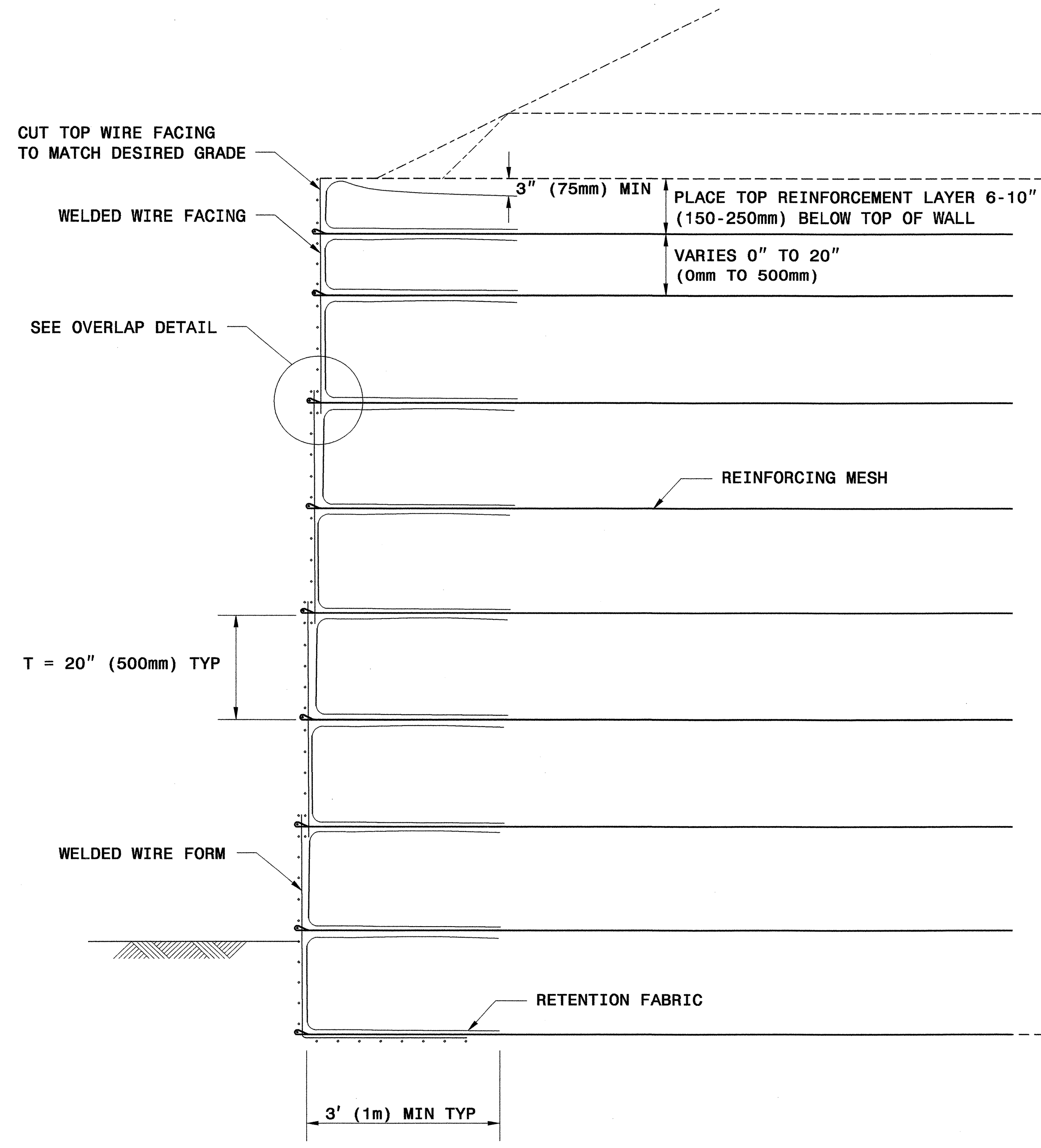




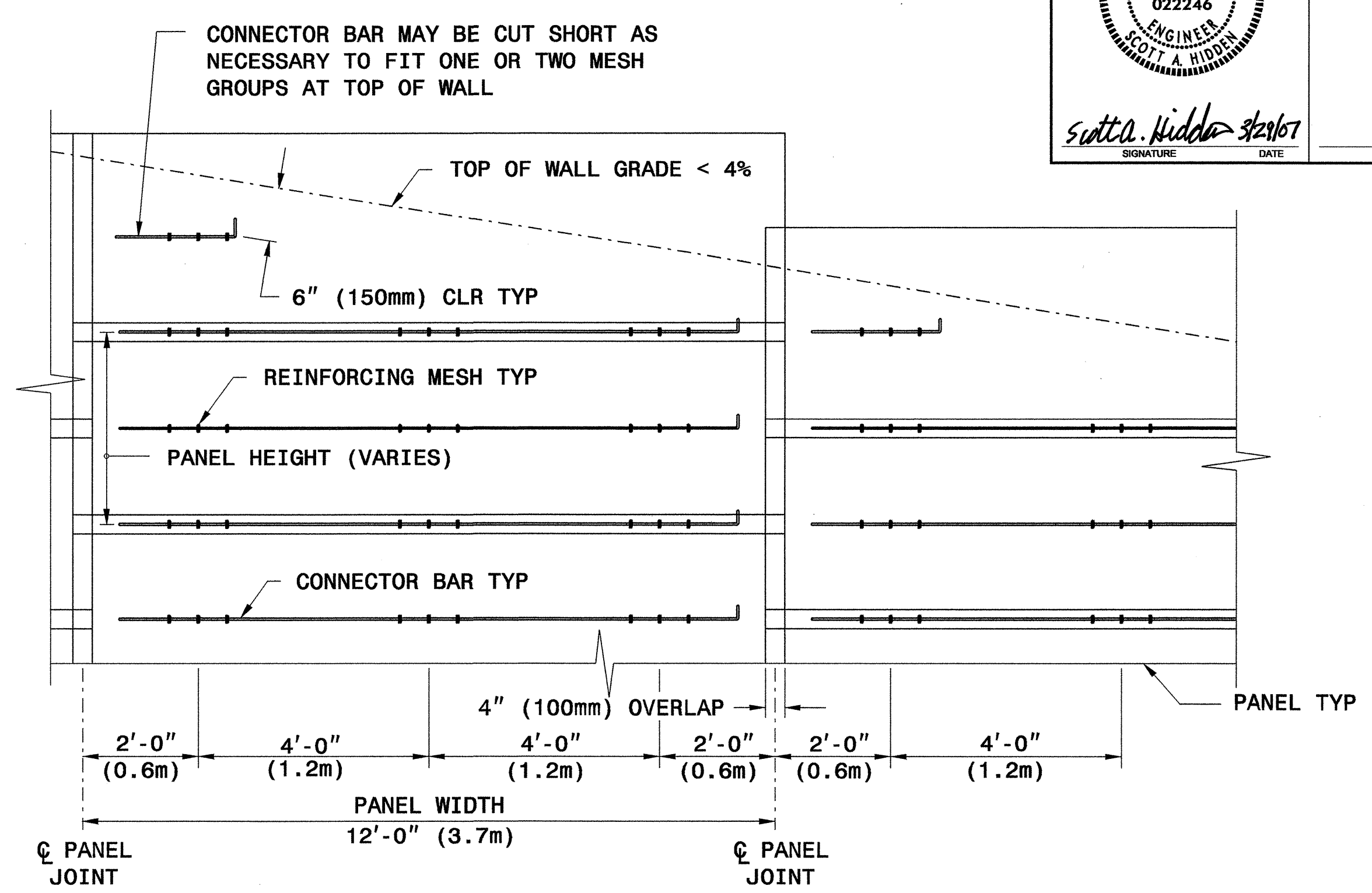
GEOTECHNICAL ENGINEER   Scott A. Hadden 3/29/07 SIGNATURE DATE	ENGINEER     SIGNATURE DATE
--	--



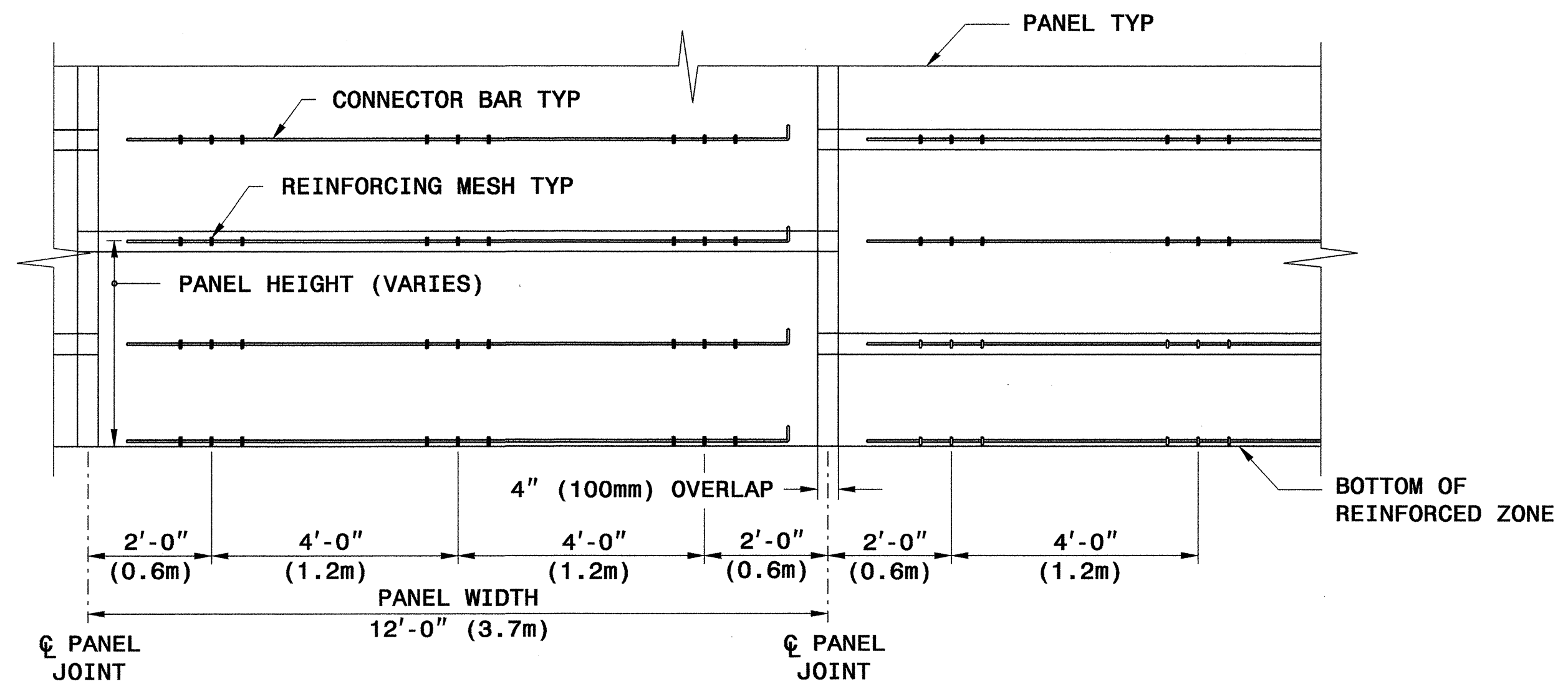
**OVERLAP DETAIL**



**TYPICAL SECTION**

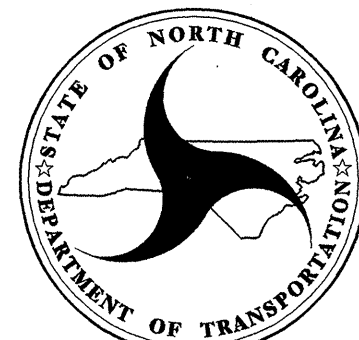


**TYPICAL ELEVATION @ TOP OF WALL  
(WIRES NOT SHOWN FOR CLARITY)**



**TYPICAL ELEVATION @ BOTTOM OF WALL  
(WIRES NOT SHOWN FOR CLARITY)**




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 RALEIGH

STANDARD DRAWING NO. 1801.02  
  
**RETAINED EARTH  
TEMPORARY WALL**  
  
 SHEET 8 OF 11      DATE: 12-19-06

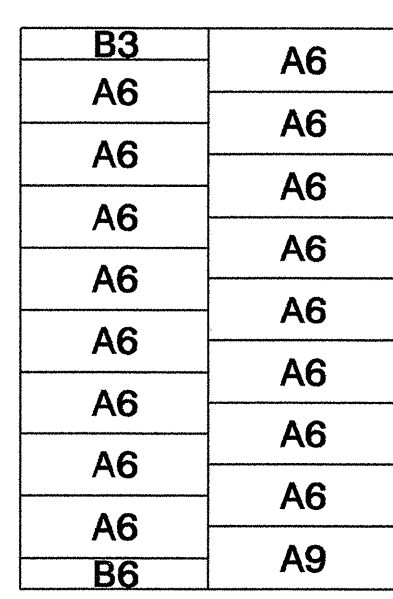
GEOTECHNICAL ENGINEER ENGINEER



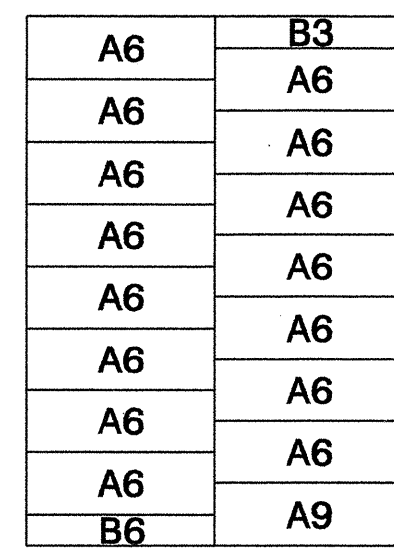
Scott A. Shidden  
SIGNATURE DATE

**PANEL LAYOUTS**

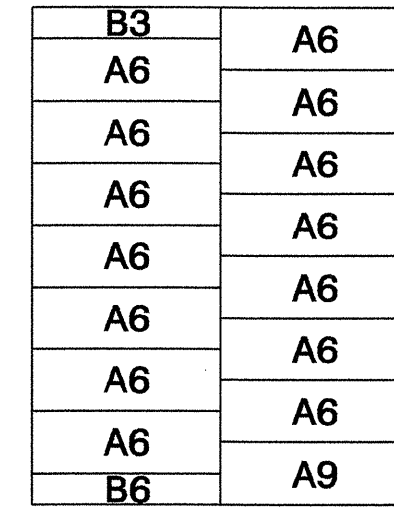
H - WALL HEIGHT  
(FEET-INCHES)  
(METER)



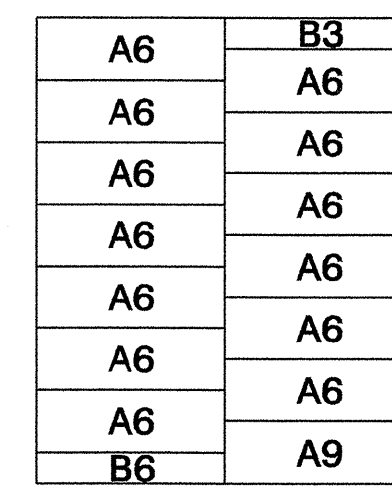
< 28 - 0  
< 8.5



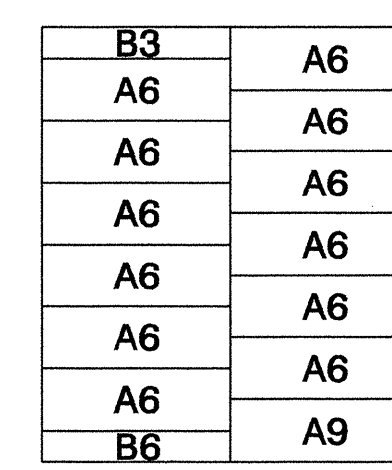
< 27 - 8  
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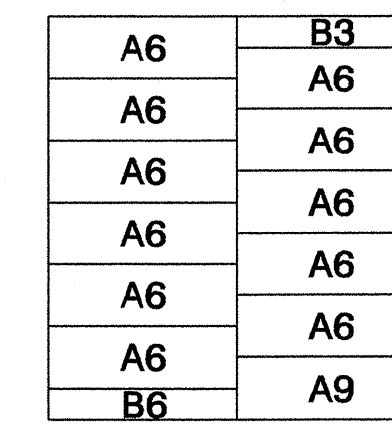
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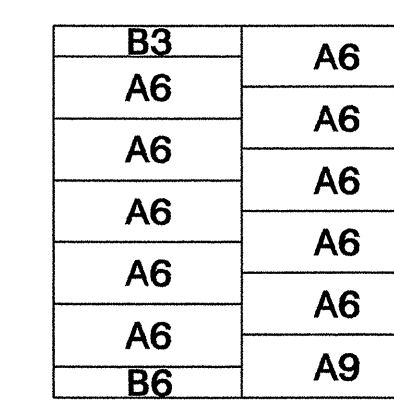
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< 7.4



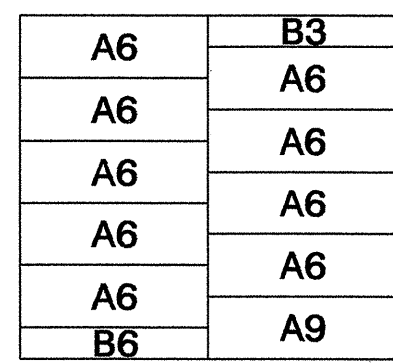
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< 6.9



< 21 - 0  
< 6.4

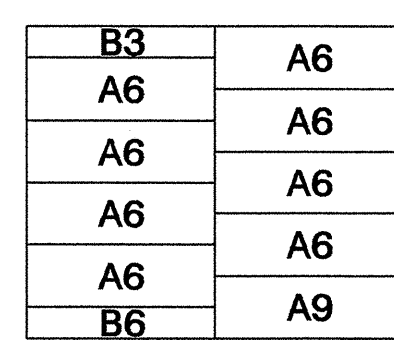


< 19 - 4  
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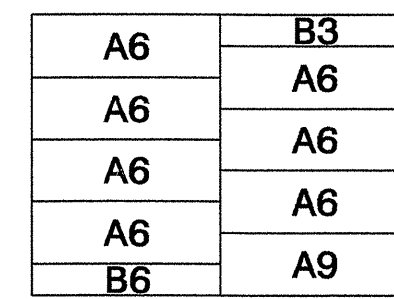


(FEET-INCHES)  
(METER)

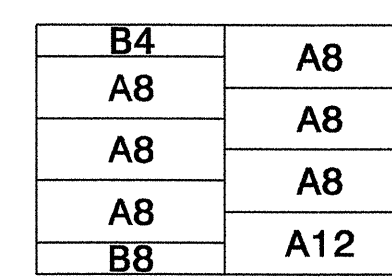
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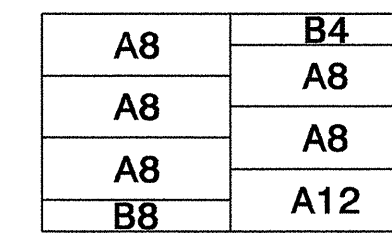
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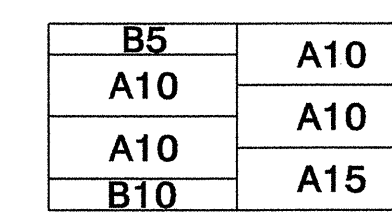
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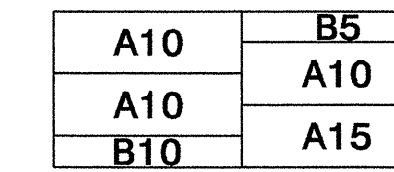
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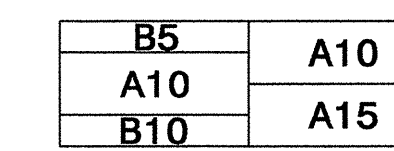
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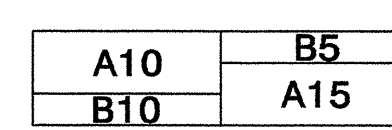
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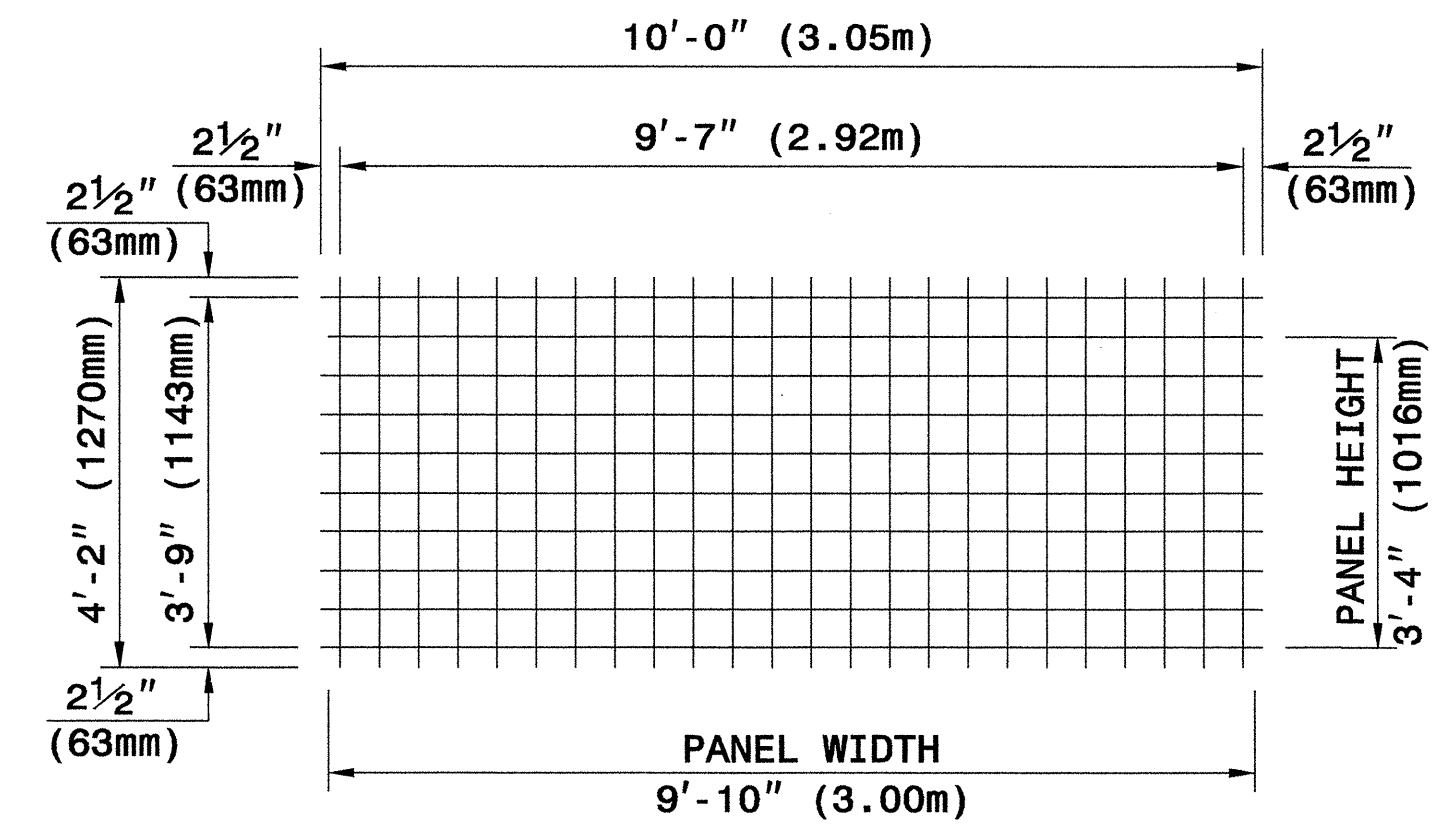
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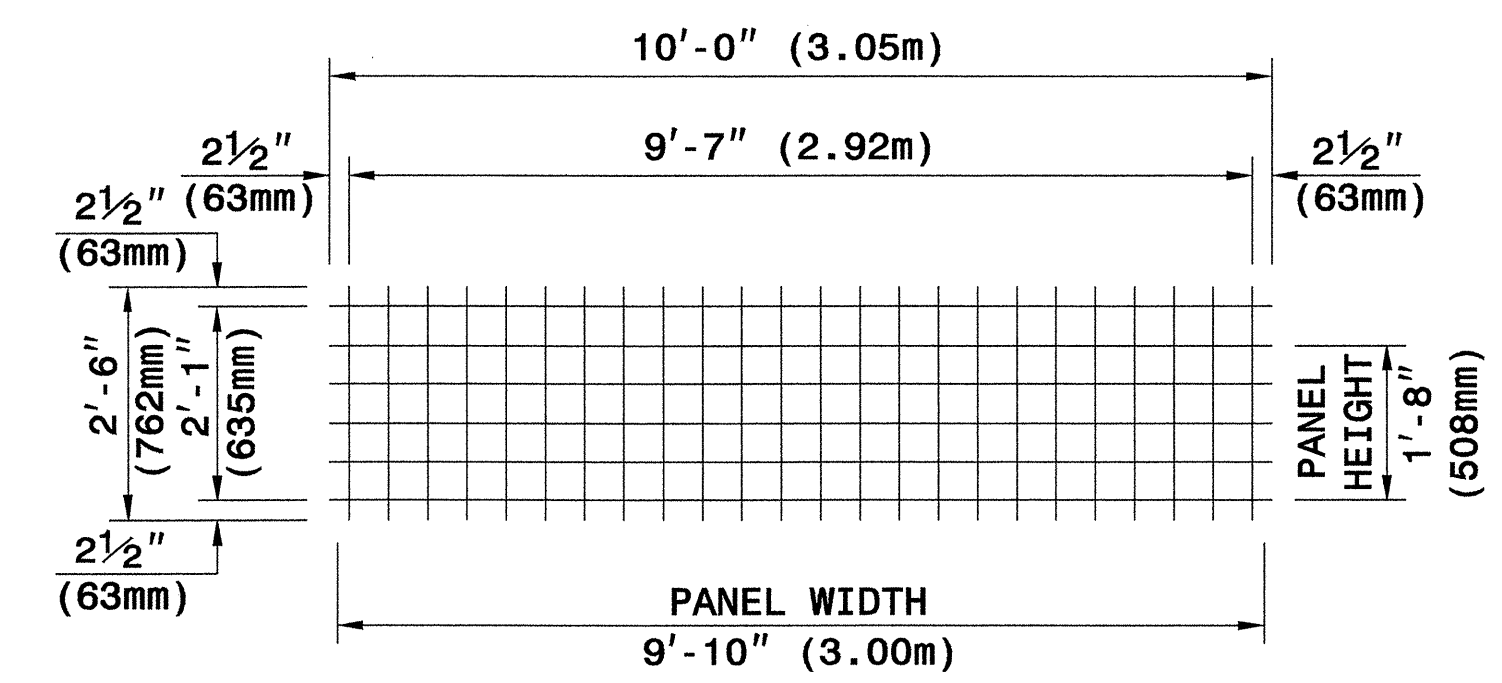
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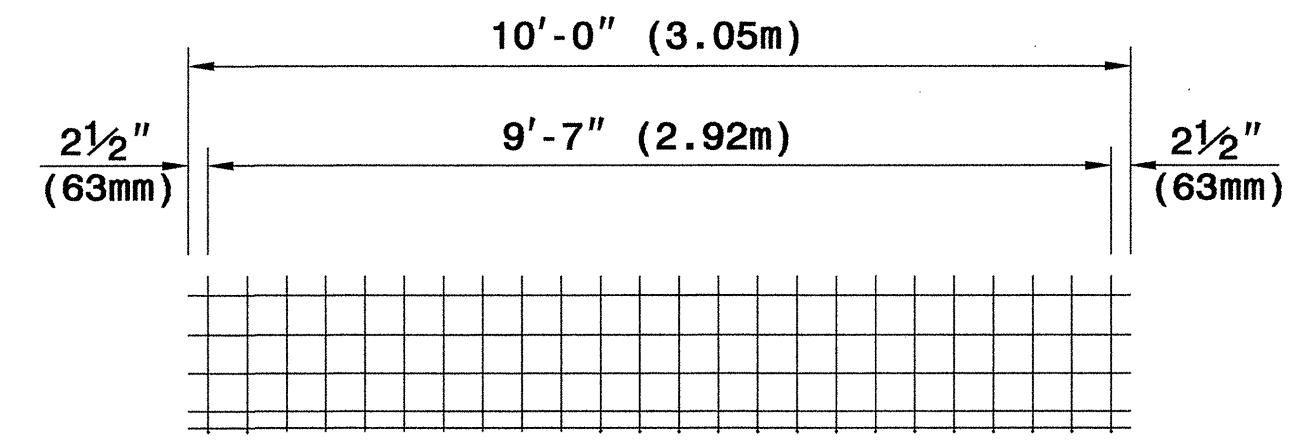
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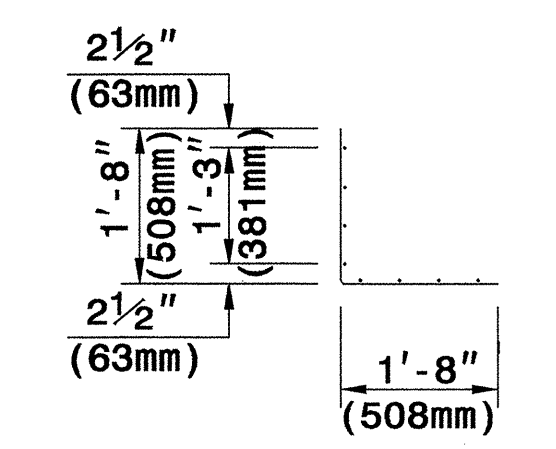
**TYPE A**



**TYPE B**



**WELDED WIRE FORM**



**SECTION**

**WELDED WIRE FACINGS**

**PANEL TYPES (WELDED WIRE FACINGS AND FORM)**

5" X 5" (125mm X 125mm), W5 X W5 (MW32 X MW32) WELDED WIRE REINFORCEMENT (WWR)



**GEOTECHNICAL ENGINEERING UNIT**  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD DRAWING NO. 1801.02

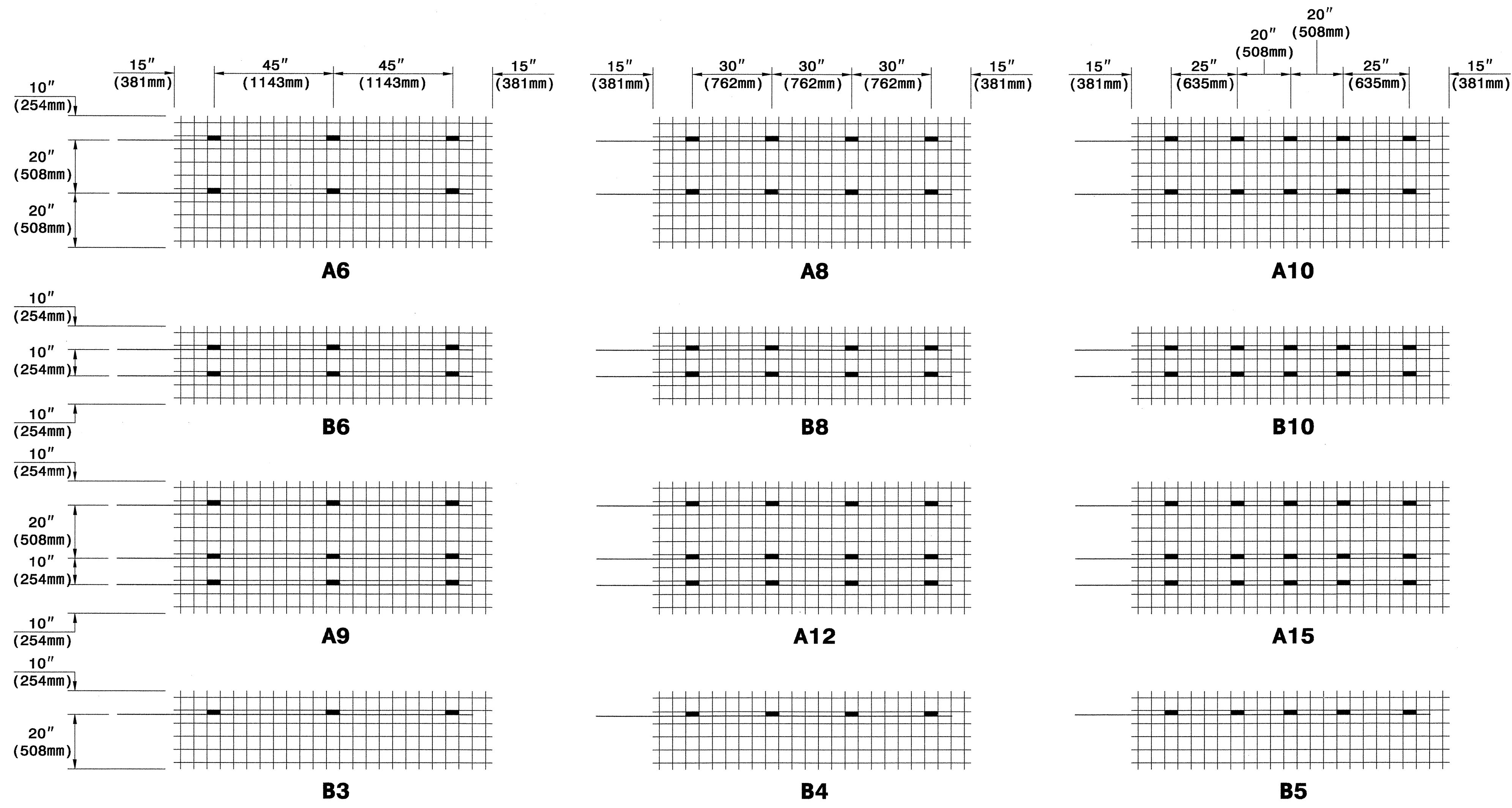
**TERRATREL  
TEMPORARY WALL**

EC221427 3/29/2007 std no 1801 shidden GE-Oce34bond

GEOTECHNICAL ENGINEER ENGINEER

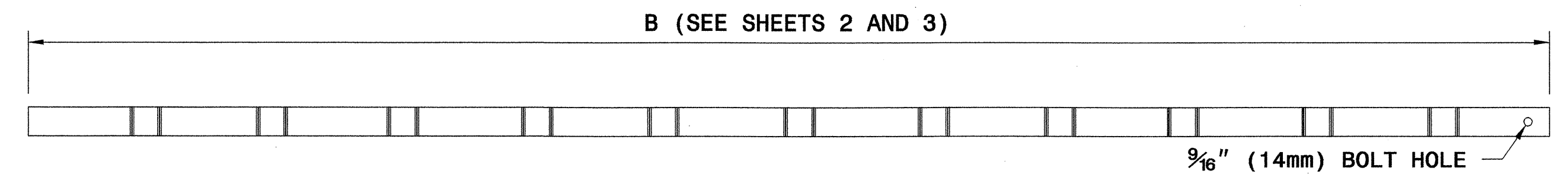


Scott A. Hadden 3/24/07  
SIGNATURE DATE

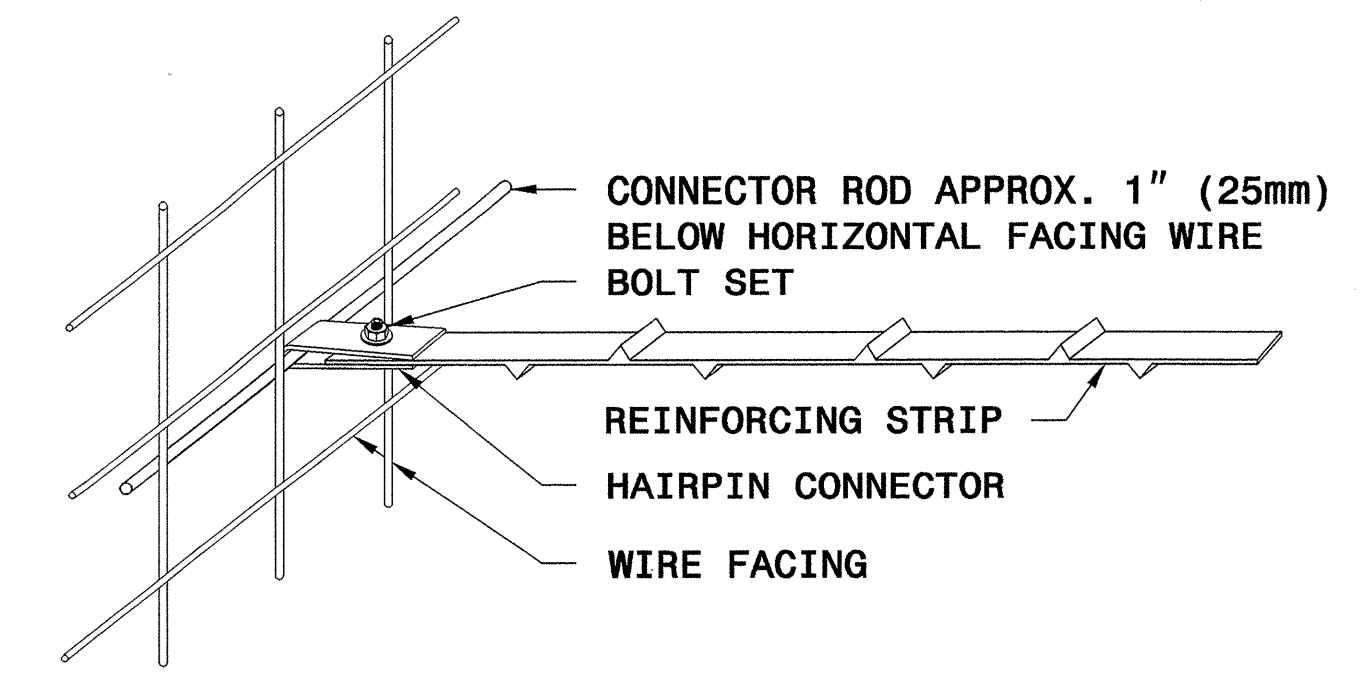


KEY: A8  
NUMBER OF REINFORCING STRIPS  
PANEL TYPE

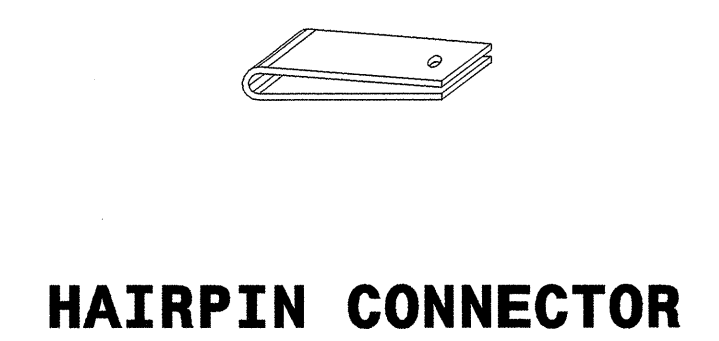
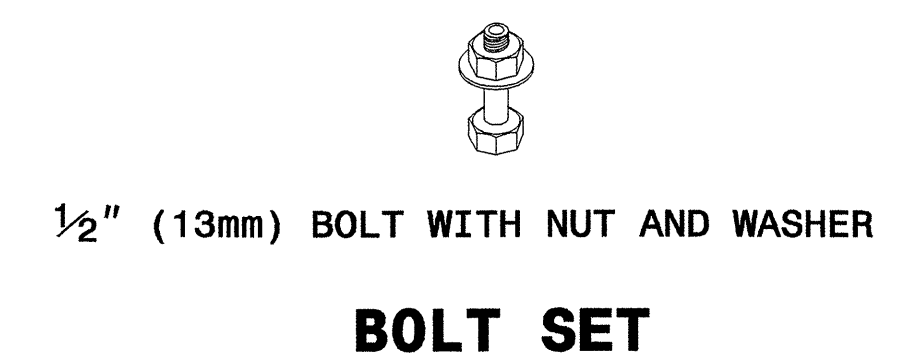
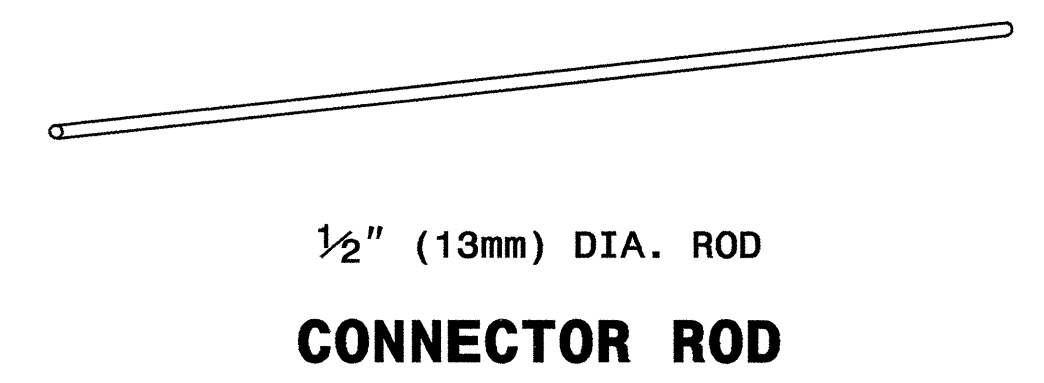
CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



REINFORCING STRIP - 2" X 5/32" (50mm X 4mm)



STRIP TO FACING CONNECTION



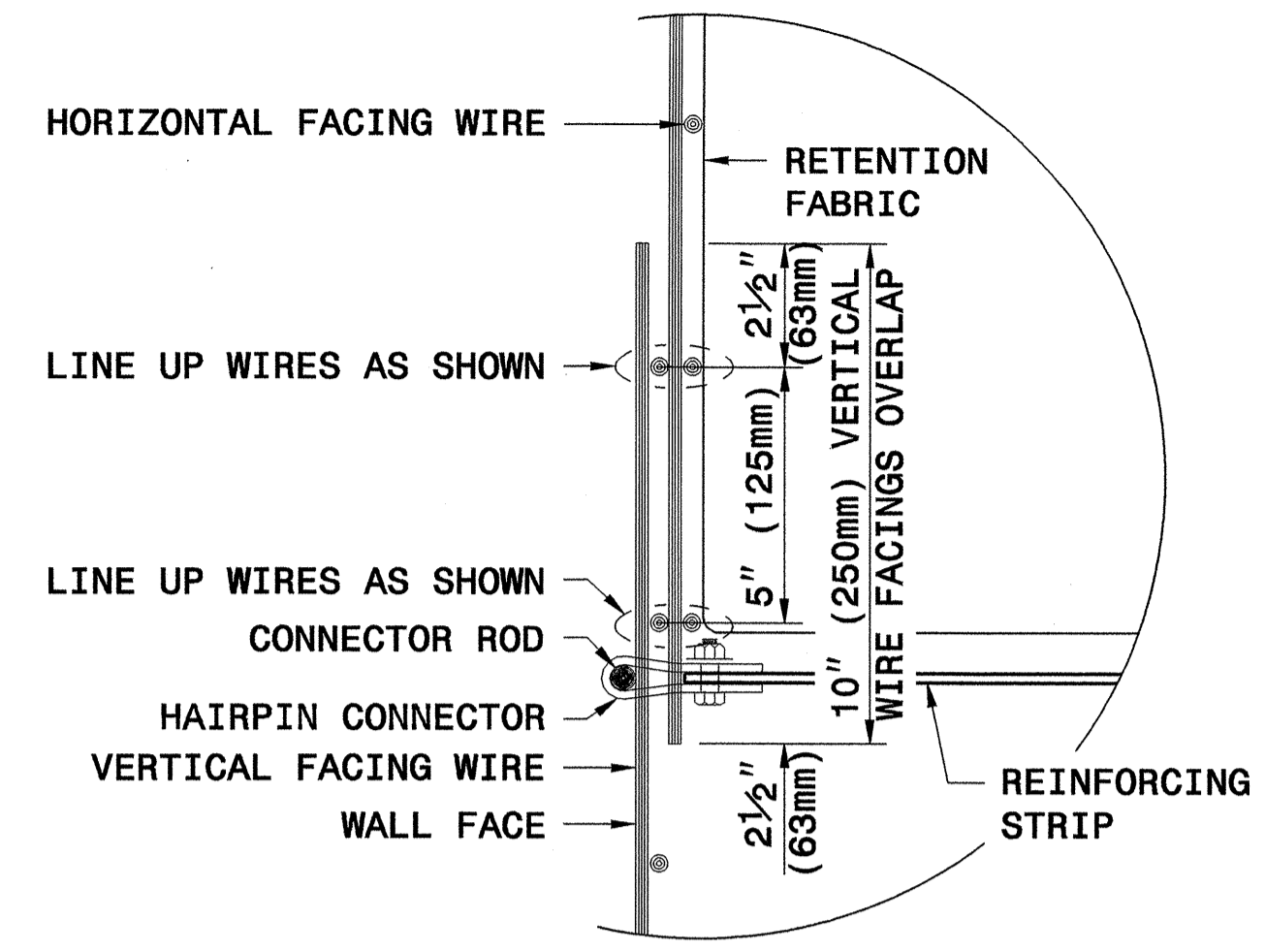
WALL COMPONENTS



GEOTECHNICAL ENGINEERING UNIT  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

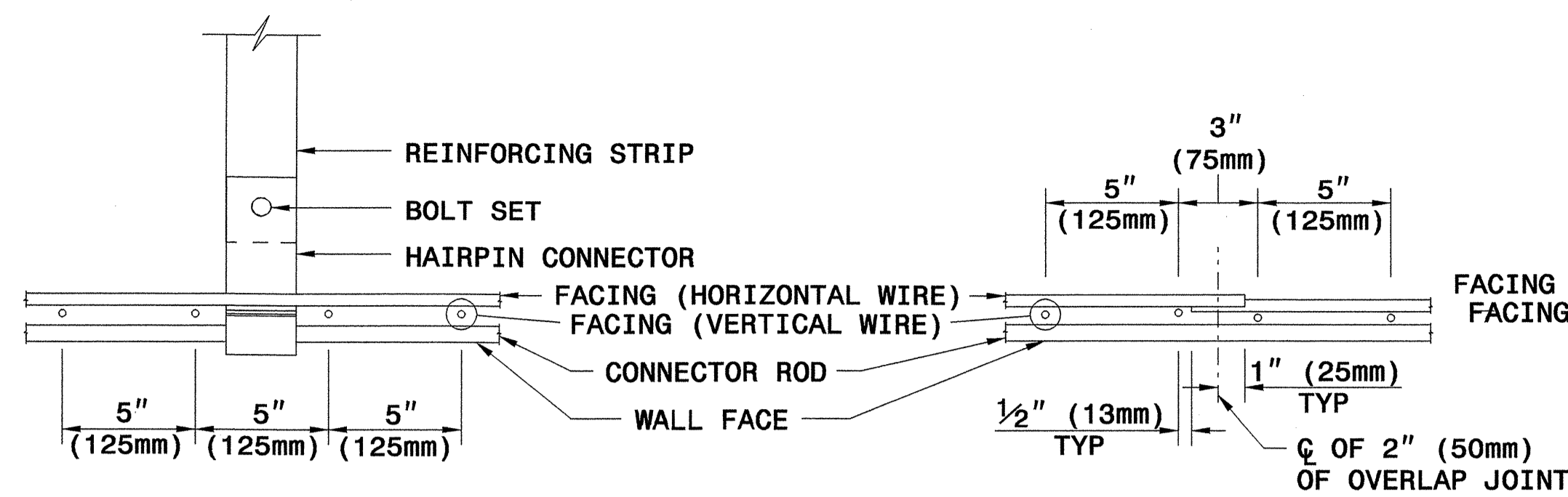
STANDARD DRAWING NO. 1801.02

TERRATREL  
TEMPORARY WALL



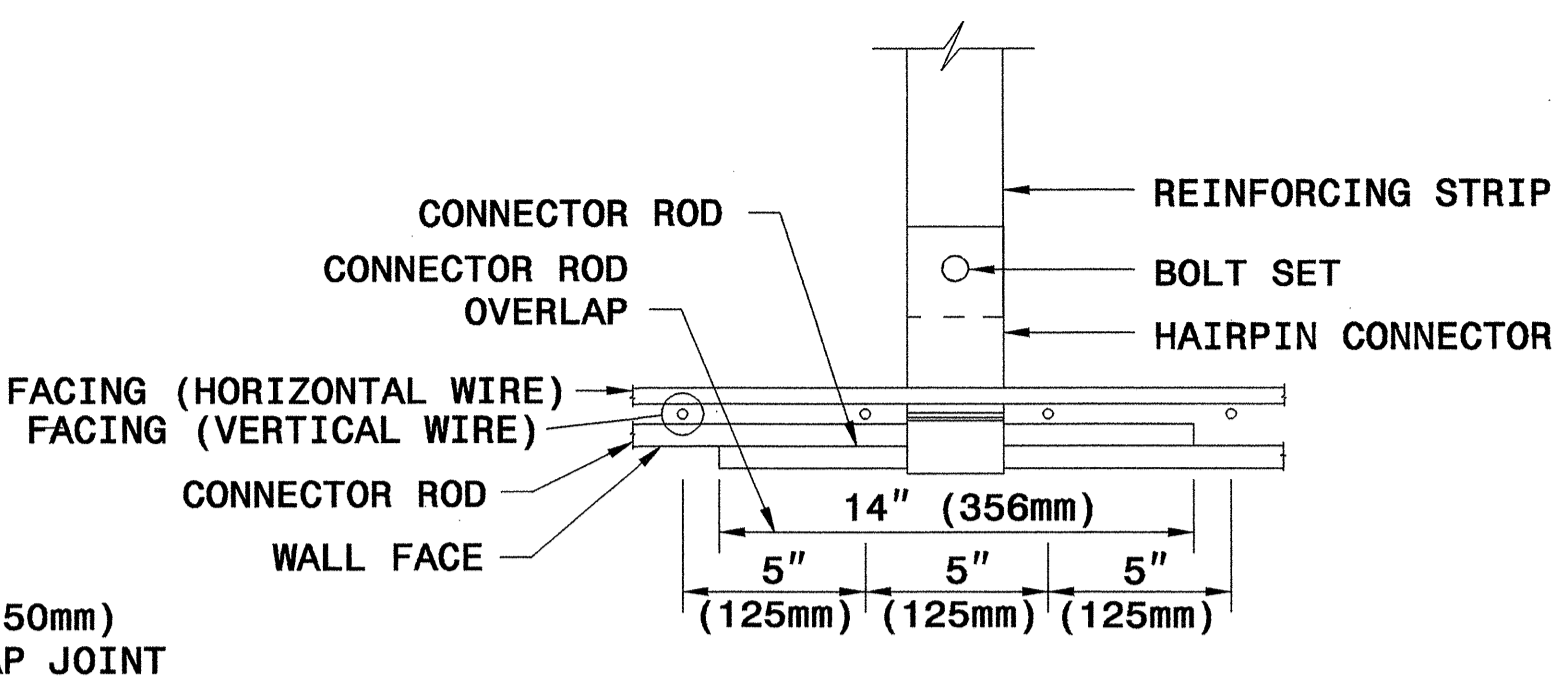
OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

**VERTICAL OVERLAP DETAIL**

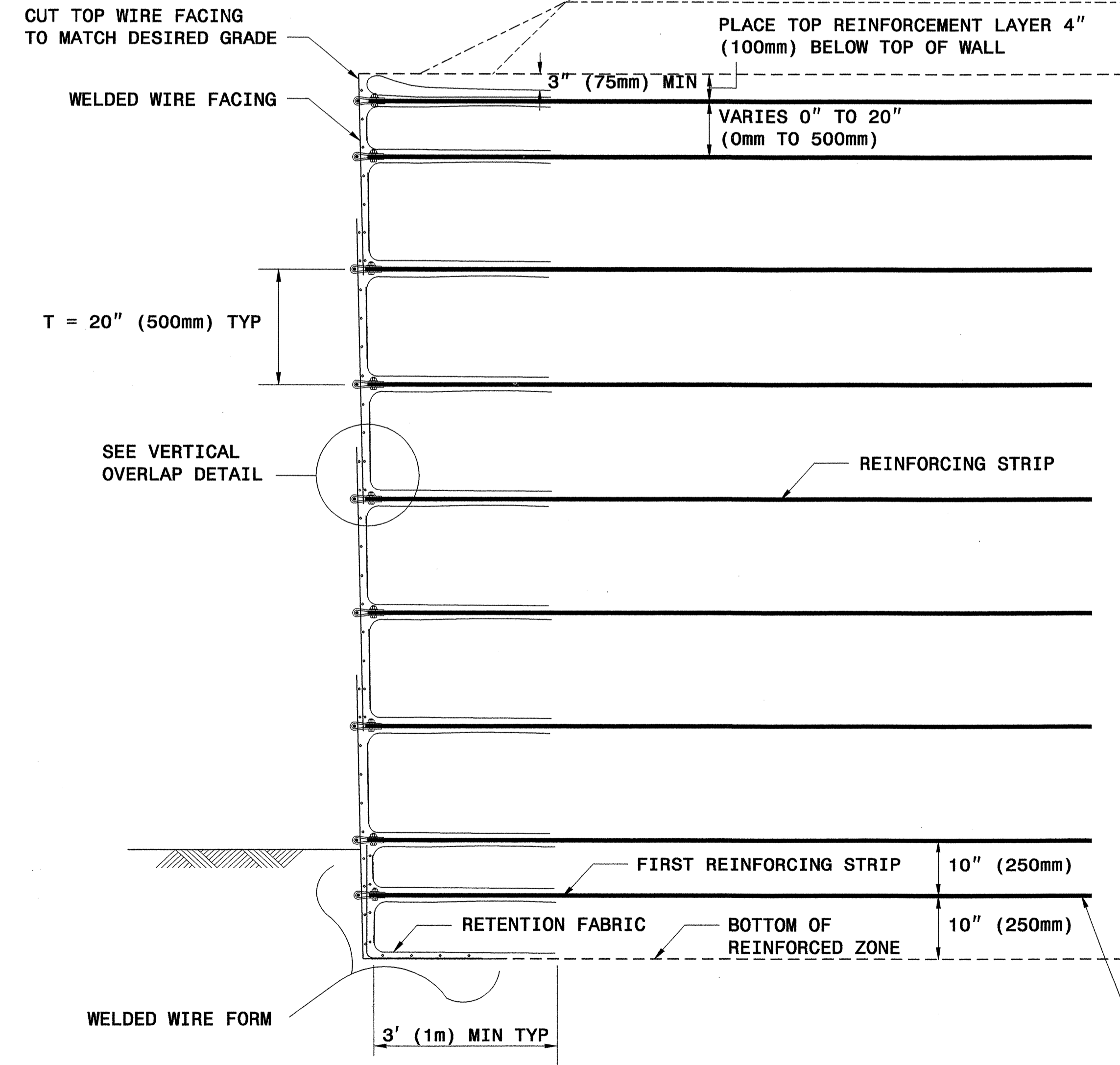


**PLAN DETAIL 'A'  
STRIP CONNECTION**

**PLAN DETAIL 'B'  
HORIZONTAL OVERLAP DETAIL**

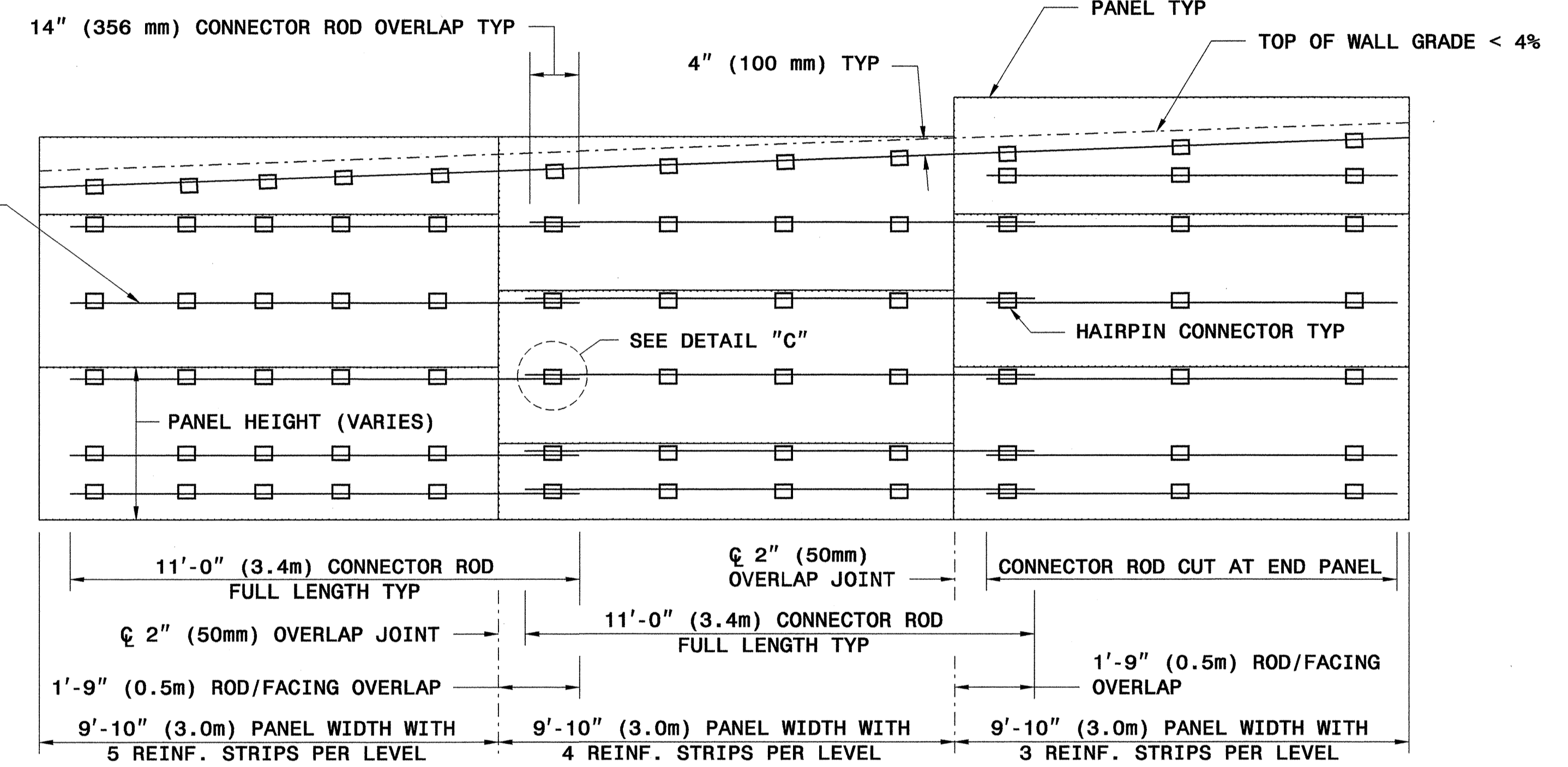


**PLAN DETAIL 'C'  
STRIP CONNECTION WITH  
HORIZONTAL OVERLAP DETAIL**

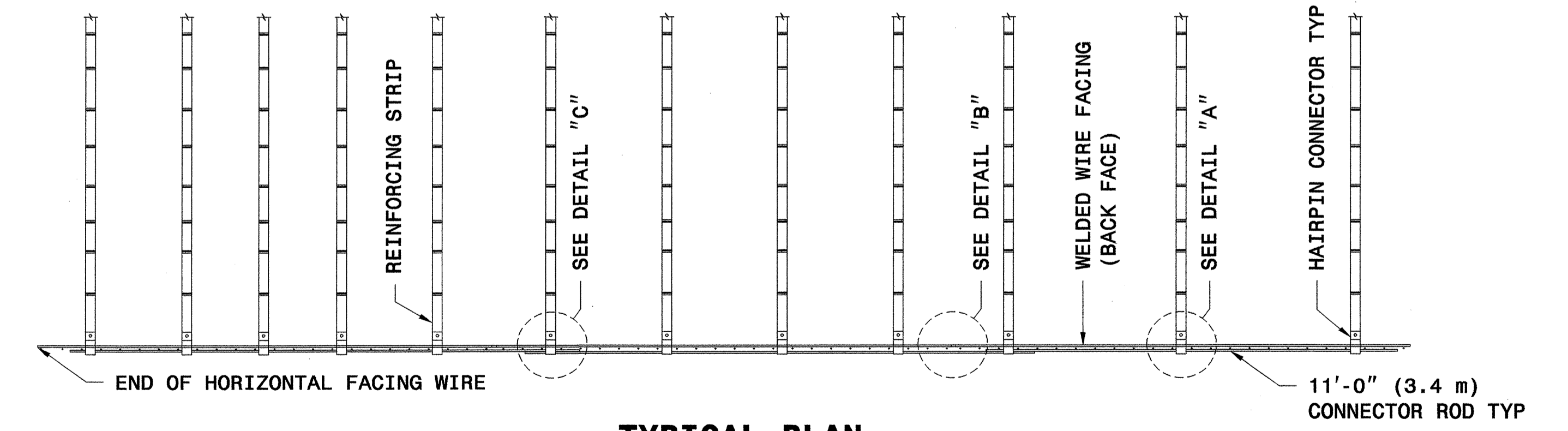


**TYPICAL SECTION**

PLACE LOWEST REINFORCING STRIP 10" (250mm) FROM BOTTOM OF REINFORCED ZONE



**TYPICAL ELEVATION  
(WIRES NOT SHOWN FOR CLARITY)**



**TYPICAL PLAN**



**GEOTECHNICAL ENGINEERING UNIT**  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**STANDARD DRAWING NO. 1801.02**  
**TERRATREL TEMPORARY WALL**  
SHEET 11 OF 11      DATE: 12-19-06

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201927

ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION	3387000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** TEMPORARY (B-77 SHOP CURVED)	6070000000-N	SP	12	EA	SPECIAL STILLING BASINS
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (19+02.00)	3628000000-E	876	7	TON	RIP RAP, CLASS I	6071030000-E	SP	55	LF	COIR FIBER BAFFLES
0043000000-N	226	Lump Sum		GRADING	3649000000-E	876	50	TON	RIP RAP, CLASS B	6071050000-E	SP	1	EA	*** SKIMMER (1-1/2")
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING	3656000000-E	876	1,360	SY	FILTER FABRIC FOR DRAINAGE	6084000000-E	1660	2.5	ACR	SEEDING & MULCHING
0057000000-E	226	20	CY	UNDERCUT EXCAVATION	4400000000-E	1110	276	SF	WORK ZONE SIGNS (STATIONARY)	6087000000-E	1660	1	ACR	MOWING
0080000000-E	SP	150	TON	CLASS IV SUBGRADE STABILIZATION	4405000000-E	1110	192	SF	WORK ZONE SIGNS (PORTABLE)	6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
0134000000-E	240	30	CY	DRAINAGE DITCH EXCAVATION	4410000000-E	1110	56	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)	6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
0195000000-E	265	150	CY	SELECT GRANULAR MATERIAL	4430000000-N	1130	75	EA	DRUMS	6096000000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
0196000000-E	270	150	SY	FABRIC FOR SOIL STABILIZATION	4445000000-E	1145	120	LF	BARRICADES (TYPE III)	6108000000-E	1665	1.25	TON	FERTILIZER TOPDRESSING
0199000000-E	SP	375	SF	TEMPORARY SHORING	4455000000-N	1150	102	MD	FLAGGER	6114000000-N	SP	2.5	HR	SPECIALIZED HAND MOWING
0318000000-E	300	73	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS	4465000000-N	1160	3	EA	TEMPORARY CRASH CUSHIONS	6117000000-N	SP	12	EA	RESPONSE FOR EROSION CONTROL
0343000000-E	310	24	LF	15" SIDE DRAIN PIPE	4470000000-N	1160	3	EA	RESET TEMPORARY CRASH CUSHIONS					
0366000000-E	310	564	LF	15" RC PIPE CULVERTS, CLASS III	4480000000-N	1165	2	EA	TMA					
0372000000-E	310	52	LF	18" RC PIPE CULVERTS, CLASS III	4485000000-E	1170	225	LF	PORTABLE CONCRETE BARRIER					
0390000000-E	310	60	LF	36" RC PIPE CULVERTS, CLASS III	4490000000-E	1170	275	LF	PORTABLE CONCRETE BARRIER (ANCHORED)					
0708000000-E	310	12	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK	4500000000-E	1170	330	LF	RESET PORTABLE CONCRETE BARRIER					
0995000000-E	340	136	LF	PIPE REMOVAL	4650000000-N	1251	51	EA	TEMPORARY RAISED PAVEMENT MARKERS					
1220000000-E	545	25	TON	INCIDENTAL STONE BASE	4685000000-E	1205	2,806	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)					
1297000000-E	607	290	SY	MILLING ASPHALT PAVEMENT, **** DEPTH (1-1/2")	4686000000-E	1205	2,380	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)					
1489000000-E	610	750	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B	4710000000-E	1205	55	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)					
1498000000-E	610	470	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE 119.0B	4770000000-E	1205	1,177	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (III)					
1519000000-E	610	820	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	4770000000-E	1205	1,177	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)					
1560000000-E	620	105	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22	4810000000-E	1205	14,854	LF	PAINT PAVEMENT MARKING LINES (4")					
1693000000-E	654	20	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR	4835000000-E	1205	210	LF	PAINT PAVEMENT MARKING LINES (24")					
2000000000-N	806	34	EA	RIGHT OF WAY MARKERS	4850000000-E	1205	3,840	LF	REMOVAL OF PAVEMENT MARKING LINES (4")					
2022000000-E	815	23	CY	SUBDRAIN EXCAVATION	4870000000-E	1205	50	LF	REMOVAL OF PAVEMENT MARKING LINES (24")					
2033000000-E	815	17	CY	SUBDRAIN FINE AGGREGATE	4900000000-N	1251	5	EA	PERMANENT RAISED PAVEMENT MARKERS					
2044000000-E	815	100	LF	6" PERFORATED SUBDRAIN PIPE	4905000000-N	1253	20	EA	SNOWPLOWABLE PAVEMENT MARKERS					
2055000000-E	815	3	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS	5325600000-E	1510	190	LF	6" WATER LINE					
2066000000-N	815	1	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET	5540000000-E	1515	2	EA	6" VALVE					
2077000000-E	815	6	LF	6" OUTLET PIPE (SUBDRAINS)	5648000000-N	1515	1	EA	RELOCATE WATER METER					
2286000000-N	840	11	EA	MASONRY DRAINAGE STRUCTURES	5672000000-N	1515	2	EA	RELOCATE FIRE HYDRANT					
2308000000-E	840	10	LF	MASONRY DRAINAGE STRUCTURES	5900000000-E	SP	20	TON	GENERIC UTILITY ITEM FOUNDATION CONDITIONING MATERIAL					
2365000000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.22	6000000000-E	1605	800	LF	TEMPORARY SILT FENCE					
2367000000-N	840	8	EA	FRAME WITH TWO GRATES, STD 840.29	6006000000-E	1610	360	TON	STONE FOR EROSION CONTROL, CLASS A					
2396000000-N	840	1	EA	FRAME WITH COVER, STD 840.54	6009000000-E	1610	225	TON	STONE FOR EROSION CONTROL, CLASS B					
2556000000-E	846	115	LF	SHOULDER BERM GUTTER	6012000000-E	1610	485	TON	SEDIMENT CONTROL STONE					
2577000000-E	846	600	LF	CONCRETE EXPRESSWAY GUTTER	6015000000-E	1615	1.5	ACR	TEMPORARY MULCHING					
2619000000-E	850	260	SY	4" CONCRETE PAVED DITCH	6018000000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING					
3030000000-E	862	675	LF	STEEL BM GUARDRAIL	6021000000-E	1620	1.25	TON	FERTILIZER FOR TEMPORARY SEEDING					
3045000000-E	862	75	LF	STEEL BM GUARDRAIL, SHOP CURVED	6024000000-E	1622	100	LF	TEMPORARY SLOPE DRAINS					
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS	6027000000-N	1622	3	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS					
3195000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1	6029000000-E	SP	650	LF	SAFETY FENCE					
3215000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III	6030000000-E	1630	470	CY	SILT EXCAVATION					
3270000000-N	SP	5	EA	GUARDRAIL ANCHOR UNITS, TYPE 350	6036000000-E	1631	900	SY	MATting FOR EROSION CONTROL					
3360000000-E	863	155	LF	REMOVE EXISTING GUARDRAIL	6037000000-E	SP	10	SY	COIR FIBER MAT					
3382000000-E	862	62.5	LF	TEMPORARY STEEL BM GUARDRAIL (SHOP CURVED)	6038000000-E	SP	90	SY	PERMANENT SOIL REINFORCEMENT MAT					
					6042000000-E	1632	375	LF	1/4" HARDWARE CLOTH					

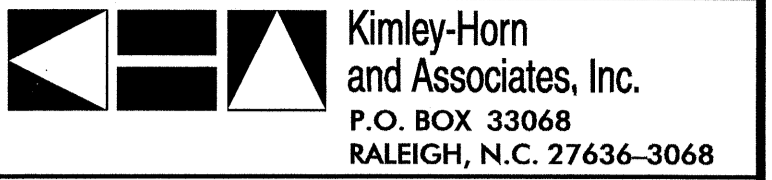
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5/2/2008



COMPUTED BY: J. PACE DATE: 2/26/08  
 CHECKED BY: J. MOORE DATE: 2/27/08

PROJECT REFERENCE NO. SHEET NO.  
 B-4258 3-B



STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.  
 TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.  
 FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.  
 W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.  
 G = GATING IMPACT ATTENUATOR TYPE 350  
 NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH		W		ANCHORS										IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	TEMP. SHOP CURVED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GRAU 350	M-350	TYPE III	CAT-1	TERM END SECTION	AT-1	TEMP. B-77 SHOP CURVED SECTION	NO.	PERMITTED	G	NG				
-L-	15+75.13	17+43.88	RT	168.75			17+43.88		10	13	50		1				1												103		
-L-	17+10.20	17+66.45	LT	62.50	50.00				10	13	6.25		1																		
-L-	20+97.50	25+10.00	RT	400.00	12.50				6	9	50						1														
-L-	20+79.34	22+48.09	LT	168.75			20+79.34		6	9	50		1				1														
-Y2-	10+48.00	11+79.25	RT	131.25			10+48.00		4	7	50		1				1													52	
-Y2-	10+16.00	10+51.00	LT	50.00					4	7							1														
-Y2-	9+50.00	10+00.00	LT			50.00															1										TEMPORARY SHOP CURVED; SEE TCP-6
			SUBTOTAL	981.25	62.5	50.00																									
			LESS ANCHOR DEDUCTIONS																												
	GRAU 350	5 @ 50.00'	=	-250.00'																											
	AT-1	1 @ 6.25'	=	-6.25'																											
	TYPE III	4 @ 18.75'	=	-75.00'																											
			TOTAL	650.00	62.5	50.00											5		4			1	1							155	
			SAY	675	75	62.5																18.75'									
			ADDITIONAL GUARDRAIL POSTS = 5 EA																												

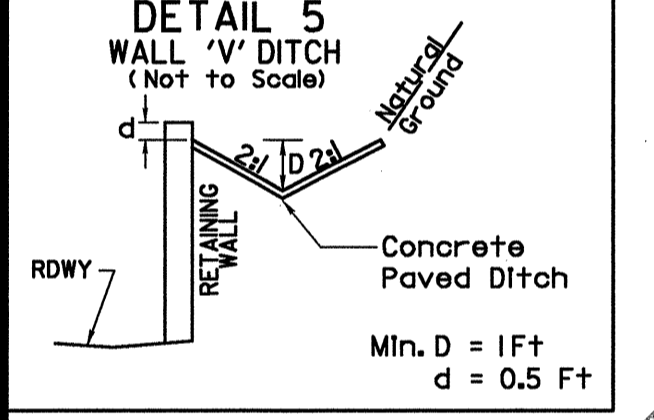
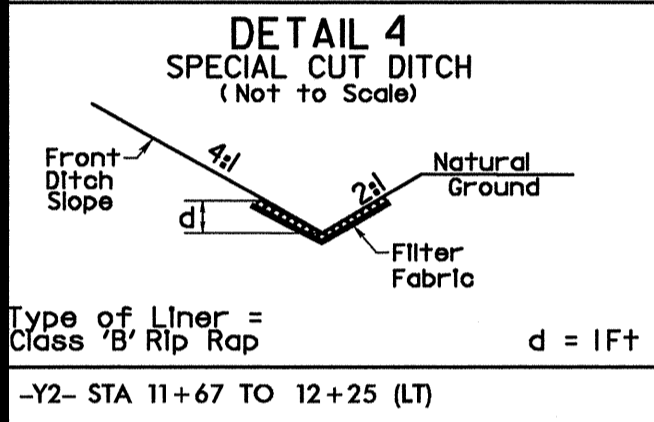
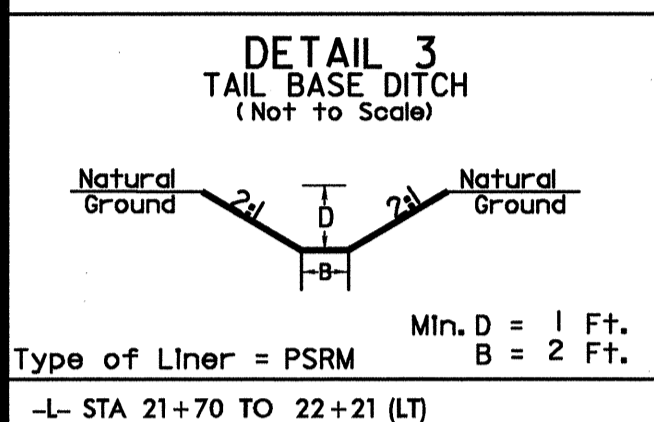
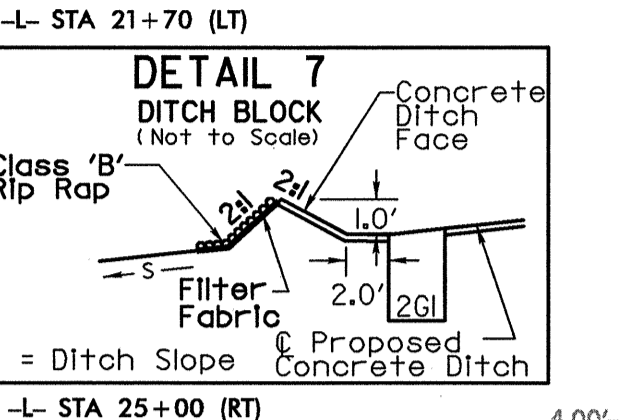
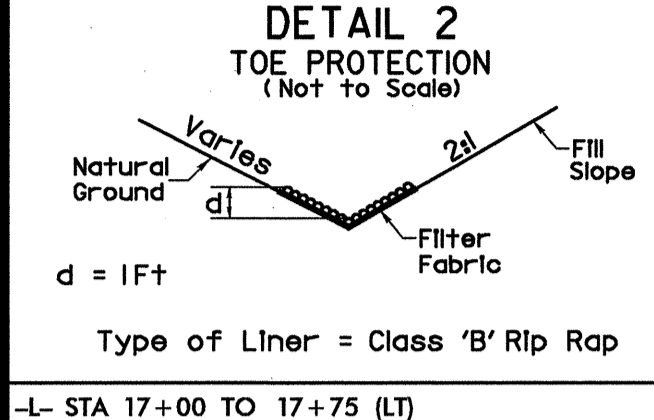
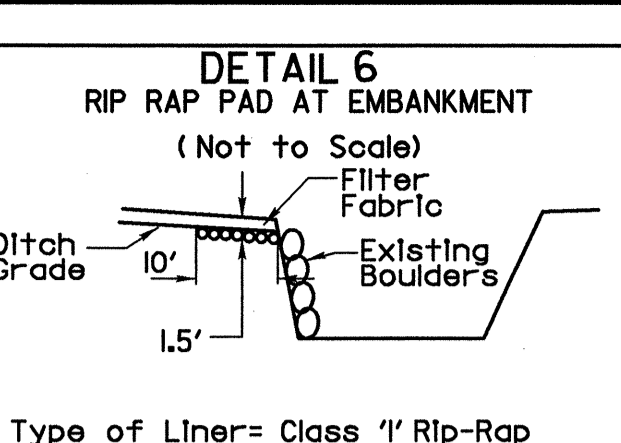
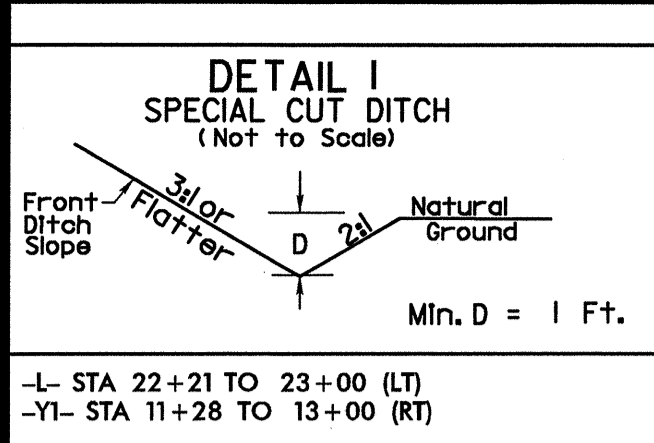
SUMMARY OF EARTHWORK  
 IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L- STA 12+40.00 TO STA 17+54.50	92	0	4310	4218	0
-Y1- STA 10+90.00 TO STA 13+68.00	51	0	578	527	0
-L- STA 20+49.50 TO STA 25+10.00	2191	0	1413	0	778
-Y2- STA 10+12.00 TO STA 12+25.00	928	0	782	0	146
TOTALS	3262	0	7083	4745	924
EST LOSS DUE TO CLEARING AND GRUBBING	-75			75	
EARTH WASTE TO REPLACE BORROW				-924	-924
PROJECT TOTALS	3187	0	7083	3896	0
EST. FOR REPLACING TOPSOIL ON BORROW PITS				195	
GRAND TOTALS	3187			4091	
SAY	3200			4100	
ESTIMATED UNDERCUT = 20 CY					
ESTIMATED DDE = 30 CY					

REMOVAL OF EXISTING ASPHALT PAVEMENT			
LINE	STATION TO	STATION	LOCATION SQ. YDS.
-L-	14+52	TO 19+26	LT/RT 1535
-L-	21+00	TO 22+29	LT/RT 350
-L-		TEMP WIDENING	LT 230
-Y2-		TEMP WIDENING	RT 230
-Y1-	12+09	TO 13+68	LT/RT 400
-Y2-	10+12	TO 11+93	LT/RT 530
TOTAL			3275
SAY			3300

NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING."  
 NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

\$DATE\$  
\$FILEL\$



**-L-**

PI Sta 15+24.10  
Δ = 37° 58' 50.4" (RT)  
D = 10' 42' 34.2"  
L = 354.64'  
T = 184.11'  
R = 535.00'  
SE = 0.04  
RO = 84.00'

PI Sta 19+63.63  
Δ = 27° 39' 19.6" (LT)  
D = 10' 42' 34.2"  
L = 258.23'  
T = 131.68'  
R = 535.00'  
SE = 0.04  
RO = 84.00'

PI Sta 23+39.47  
Δ = 2° 53' 59.1" (RT)  
D = 1' 54' 35.5"  
L = 151.83'  
T = 75.93'  
R = 3,000.00'  
SE = NC  
RO = NONE

PI Sta 12+67.03  
Δ = 8° 46' 18.3" (RT)  
D = 6' 21' 58.3"  
L = 137.79'  
T = 69.03'  
R = 900.00'  
SE = NC  
RO = NONE

**TRAFFIC DIAGRAM**

2007 ADT  
2030 ADT

-YI- BOYS CAMP ROAD

4300 6300	<100 <100	<100 <100	4300 6300
--------------	--------------	--------------	--------------

DHV = 9%  
DIR = 55%  
TTST = 2%  
DUAL = 3%

**TRAFFIC DIAGRAM**

2007 ADT  
2030 ADT

-Y2- CHIMNEY CLIFFS DRIVE

4300 6300	<100 <100	<100 <100	4300 6300
--------------	--------------	--------------	--------------

DHV = 9%  
DIR = 55%  
TTST = 2%  
DUAL = 3%

PROJECT REFERENCE NO. B-4258  
SHEET NO. 4

RW SHEET NO.

ROADWAY DESIGN ENGINEER  
HYDRAULICS ENGINEER

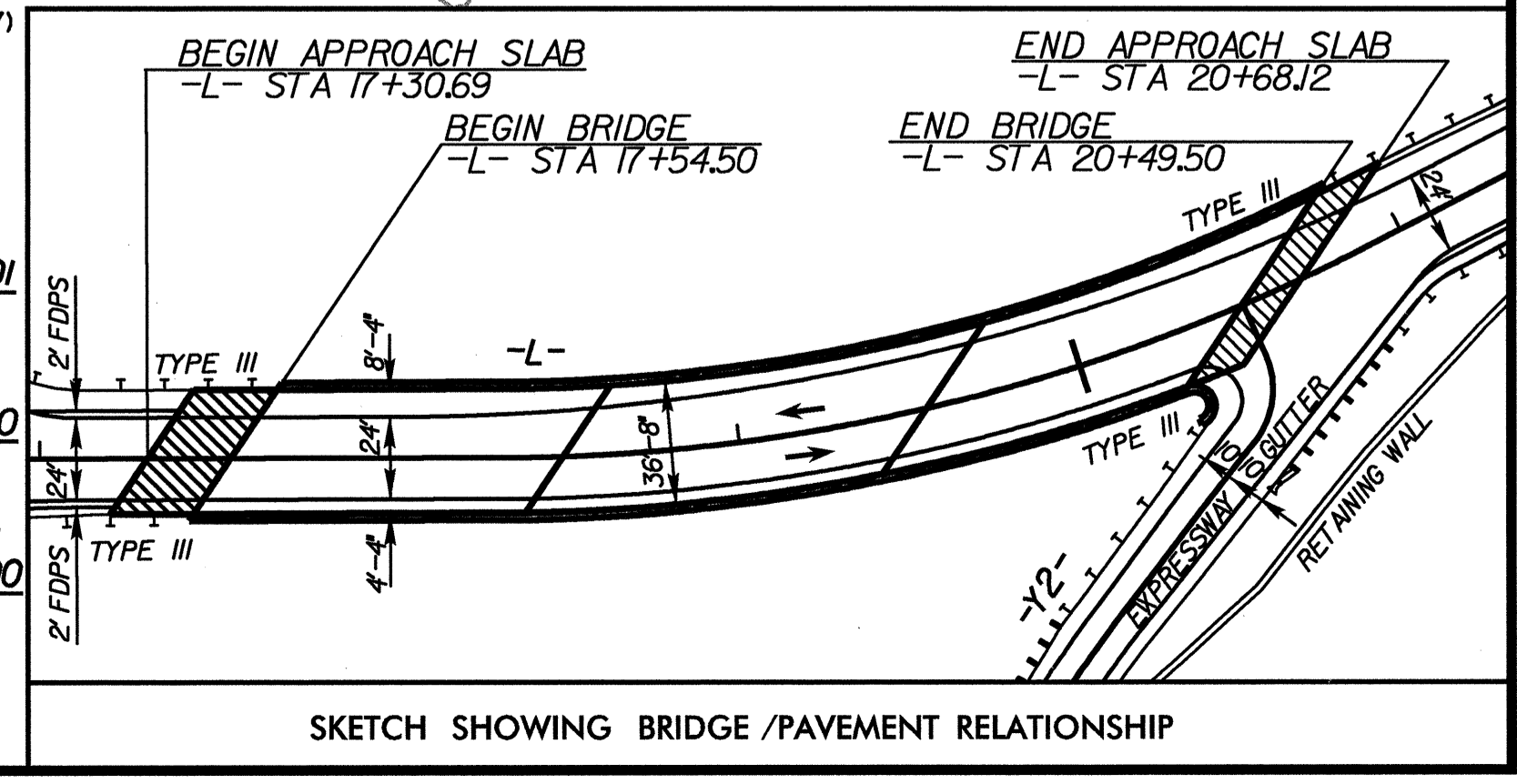
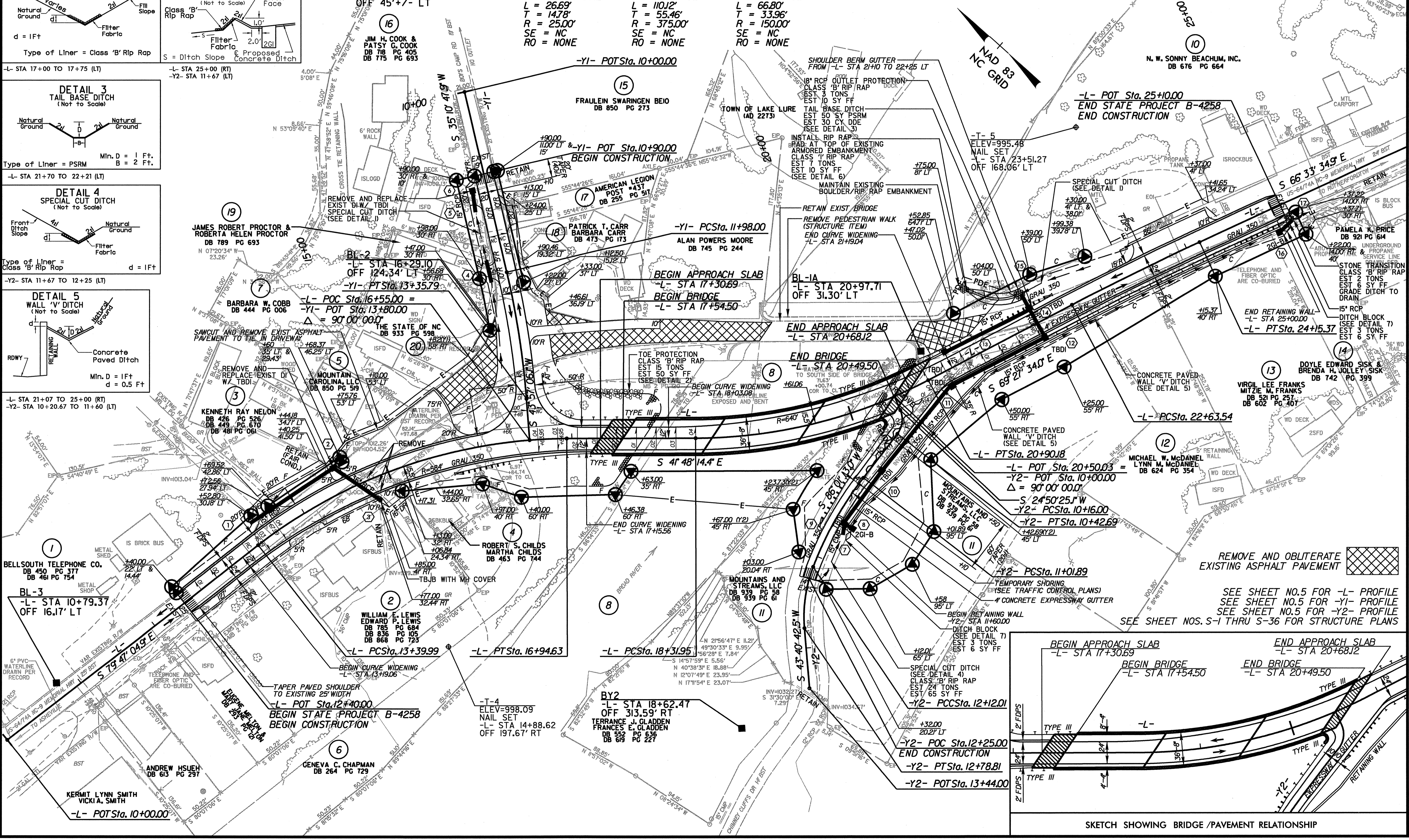
Kimley-Horn and Associates, Inc.  
P.O. BOX 33068  
RALEIGH, N.C. 27636-3068

RIGHT-OF-WAY REVISIONS

CONSTR. REV.

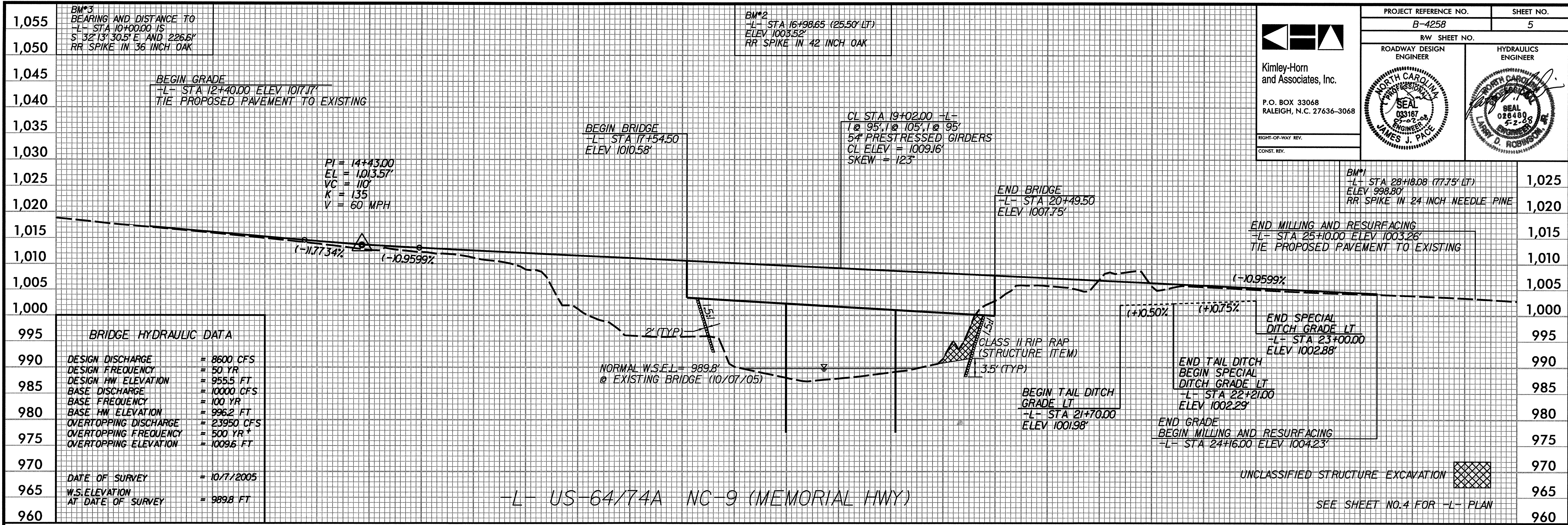
Professional Engineer Seal for James J. Packer, State of North Carolina, No. 028480, Exp. 7-1-05.

Professional Engineer Seal for D. Robinson, State of North Carolina, No. 028480, Exp. 7-1-05.



7/8/2008  
RR:01036122:Roadway\Proj\B-4258\_rdy\_05h.dgn





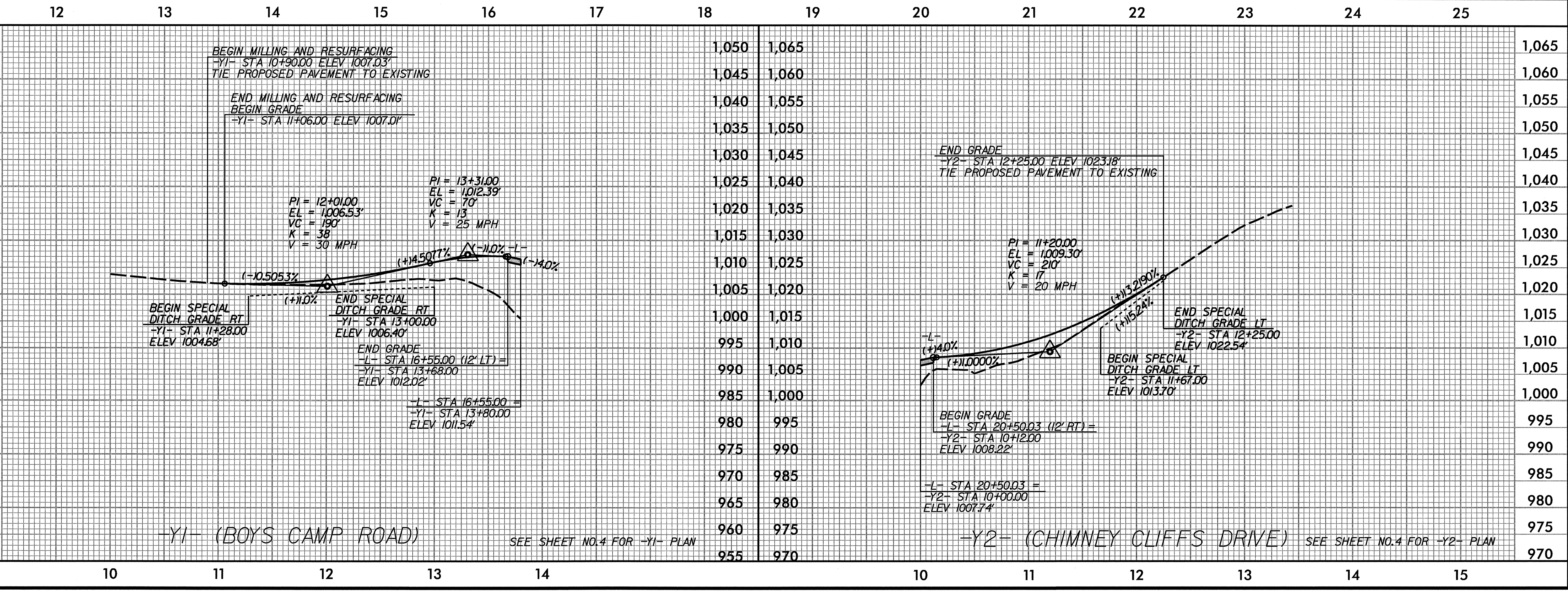
**BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE	= 8600 CFS
DESIGN FREQUENCY	= 50 YR
DESIGN HW ELEVATION	= 955.5 FT
BASE DISCHARGE	= 10000 CFS
BASE FREQUENCY	= 100 YR
BASE HW ELEVATION	= 996.2 FT
OVERTOPPING DISCHARGE	= 23950 CFS
OVERTOPPING FREQUENCY	= 500 YR*
OVERTOPPING ELEVATION	= 1009.6 FT
DATE OF SURVEY	= 10/7/2005
W.S. ELEVATION AT DATE OF SURVEY	= 989.8 FT

PROJECT REFERENCE NO. B-4258 SHEET NO. 5  
 RW SHEET NO.  
 ROADWAY DESIGN ENGINEER  
 HYDRAULICS ENGINEER  
 Kimley-Horn and Associates, Inc.  
 P.O. BOX 33068  
 RALEIGH, N.C. 27636-3068  
 RIGHT-OF-WAY REV.  
 CONST. REV.

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 JAMES J. PACE  
 03187  
 5-2-05

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 LAW D. ROBINSON  
 028480  
 5-2-05



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5/2/2008