

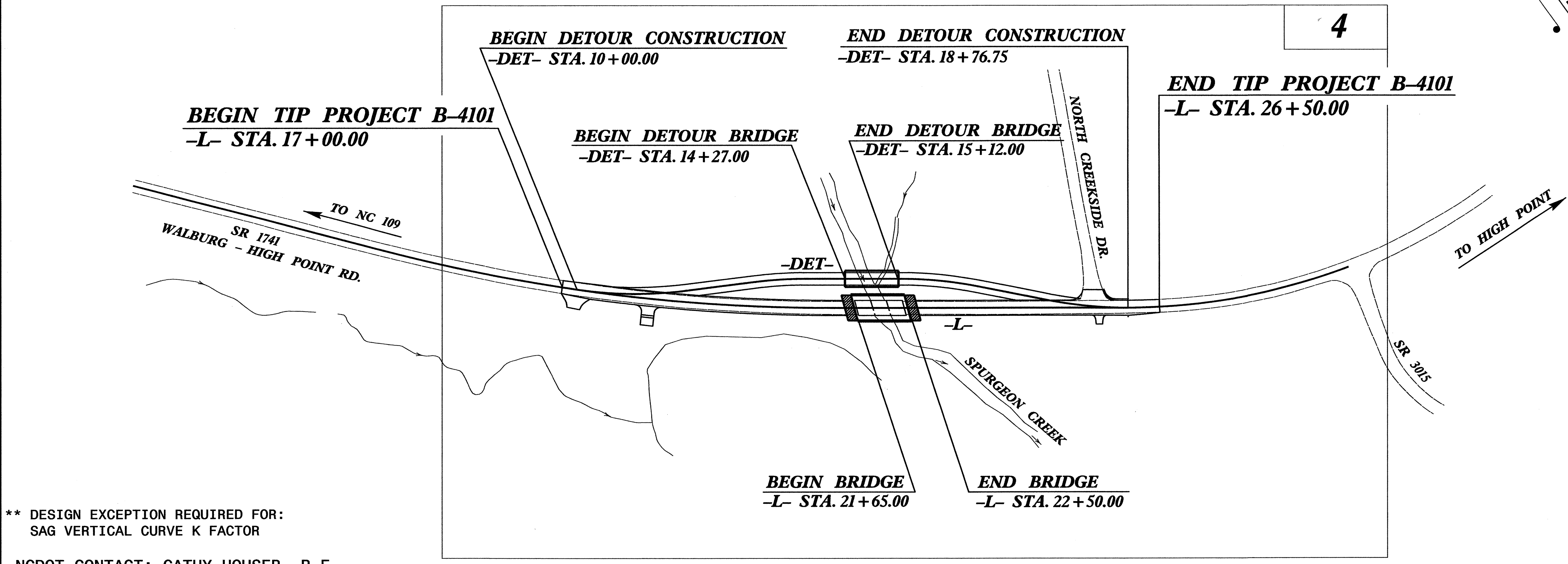
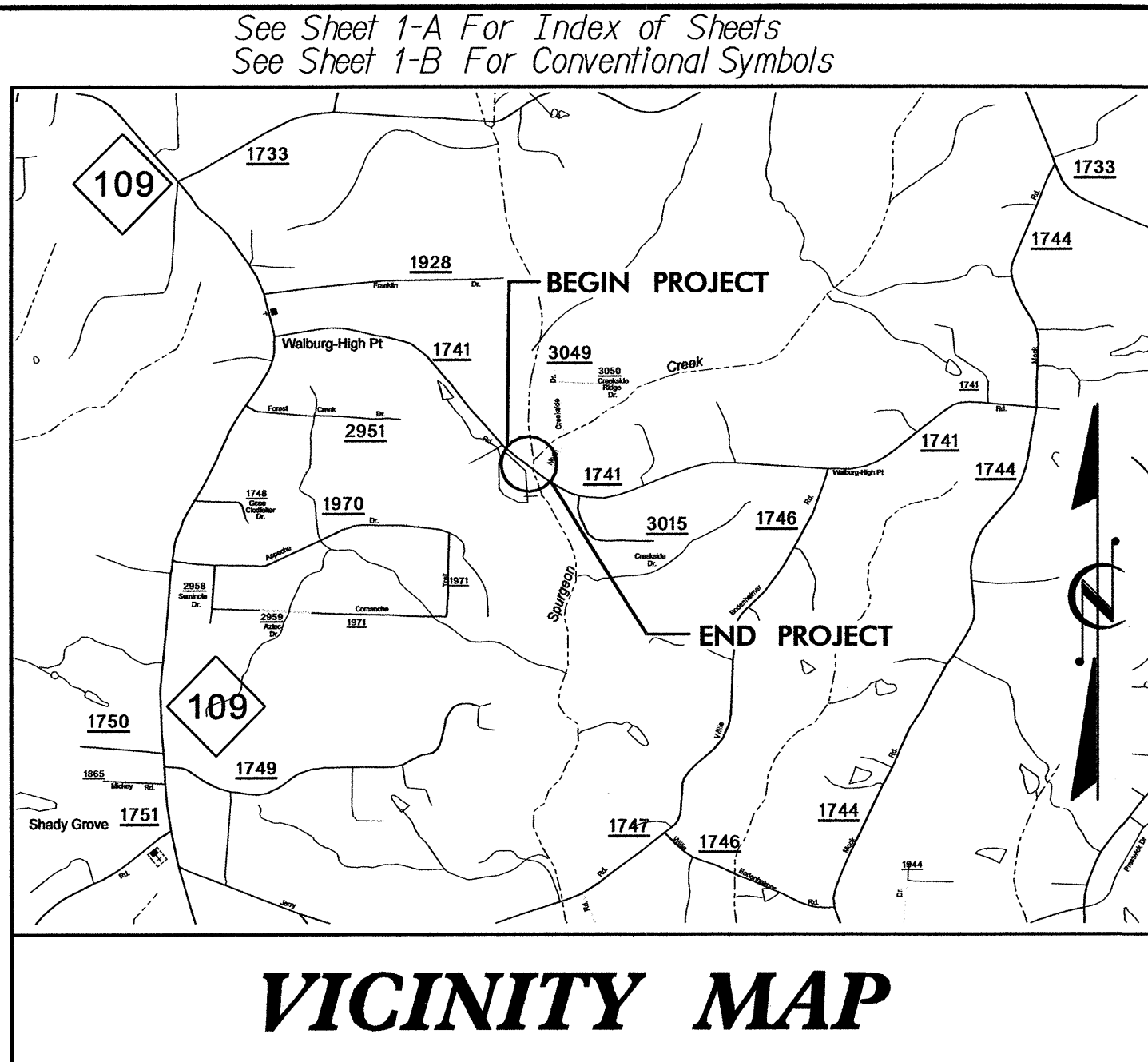
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4101	1	
WBS NO.	F.A. PROJ. NO.	DESCRIPTION	
33457.1.1	BRSTP-1741(3)	P.E.	
33457.2.1	BRSTP-1741(3)	R/W, UTIL	
33457.3.1	BRSTP-1741(3)	CONST	

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**DAVIDSON COUNTY**

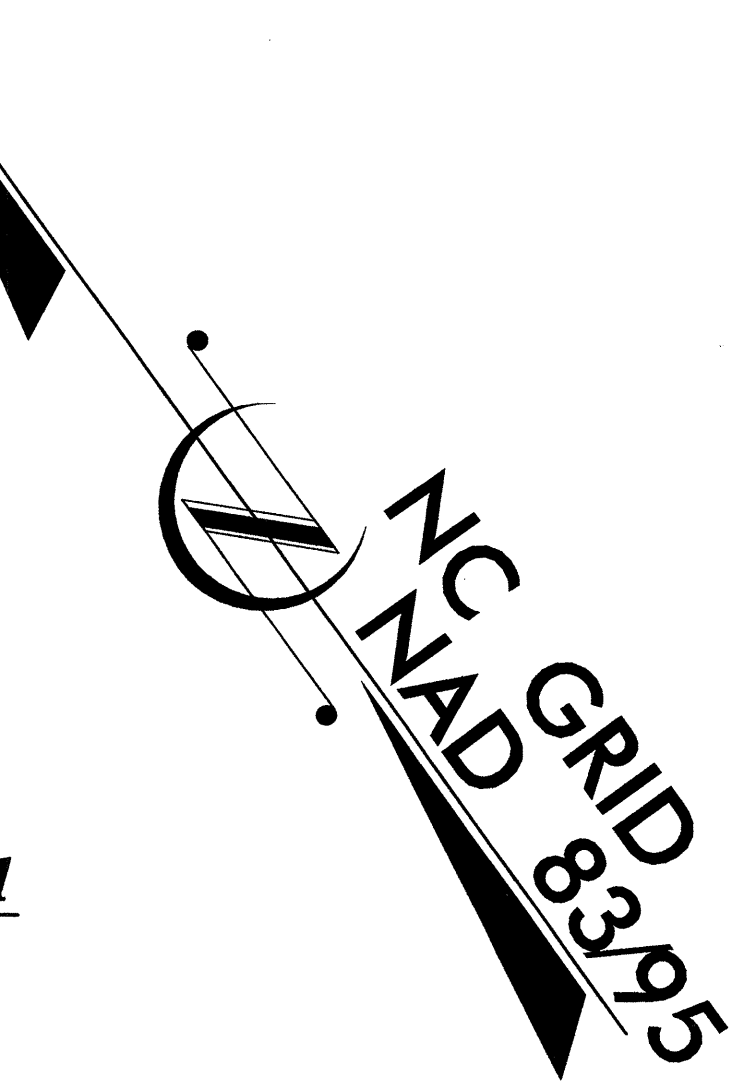
LOCATION: BRIDGE NO. 141 OVER SPURGEON CREEK ON SR 1741 (WALBURG-HIGH POINT RD.)

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURES



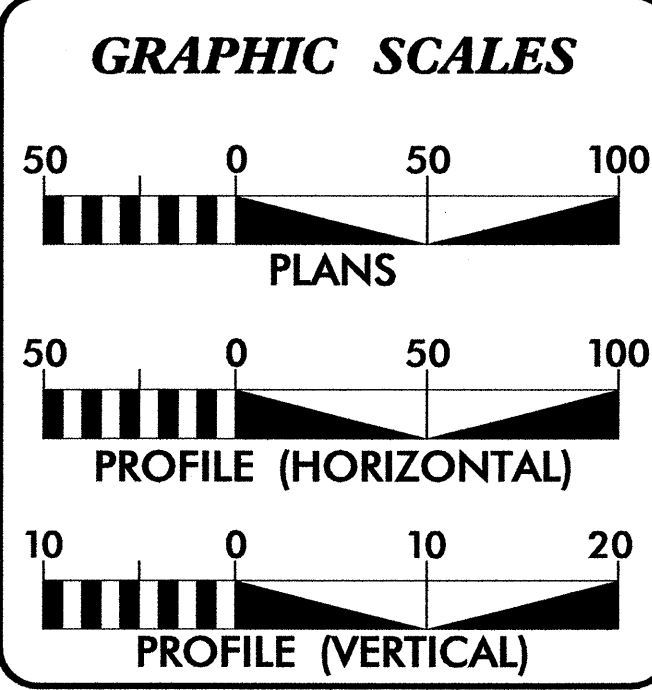
\*\* DESIGN EXCEPTION REQUIRED FOR:  
SAG VERTICAL CURVE K FACTOR

NCDOT CONTACT: CATHY HOUSER, P.E.  
ROADWAY DESIGN - ENGINEERING COORDINATION



TIP PROJECT: B-4101

CONTRACT: C201757



**DESIGN DATA**

ADT 2007 =	2,580
ADT 2027 =	4,380
DHV =	10 %
D =	55 %
T =	4 % *
** V =	60 MPH
* TTST 1%	DUAL 3%

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4101	=	0.164 MI.
LENGTH STRUCTURES TIP PROJECT B-4101	=	0.016 MI.
TOTAL LENGTH OF TIP PROJECT B-4101	=	0.180 MI.

Prepared in the Office of:  
**KO & ASSOCIATES, P.C.**  
Consulting Engineers  
1011 Schaub Dr. Suite 202 Raleigh, NC 27606  
(919) 851-8066

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
AUGUST 18, 2006

LETTING DATE:  
JANUARY 15, 2008

DAVID C. WALLER, PE  
PROJECT ENGINEER

STEPHEN R. WHITLEY, PE  
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

ROADWAY DESIGN ENGINEER

DAVID C. WALLER, PE  
SEAL 19732  
9-10-07

STEPHEN R. WHITLEY, PE  
SEAL 22606  
9-10-07

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

9/10/2007 R:\Roadway\Proj\4101\rdy-fsh.dgn Ko & Associates, P.C.

# INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	Title Sheet
1-A	Index of Sheets, General Notes and List of Standards
1-B	Conventional Symbols
1-C	Survey Control Sheet
2 thru 2-A	Typical Sections and Pavement Schedule
2-B	Temporary Detour Plan
2-C	Detail of Anchorage for Frames
2-D thru 2-O	Temporary Shoring Plans
3	Summary of Quantities
3-A	Earthwork Summary Sheet
3-B	Drainage Summary Sheet and Guardrail Summary Sheet
3-C	Pavement Removal Summary Sheet
4	Plan Sheet
5	Profile Sheet
TCP-1 thru TCP-10	Traffic Control Plans
PM-1	Pavement Marking Plans
EC-1 thru EC-6	Erosion Control Plans
UC-1 thru UC-2	Utility Construction Plans
UO-1 thru UO-2	Utility by Others
X-1	Cross-Section Summary Sheet
X-2 thru X-7	Cross-Sections
S-1 thru S-	Structure Plans

# GENERAL NOTES:

**GENERAL NOTES:**

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

**GRADING AND SURFACING OR RESURFACING AND WIDENING:**

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED 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 III.

**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.

**DRIVEWAYS:**

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3' RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

**STREET TURNOUT:**

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

**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:**

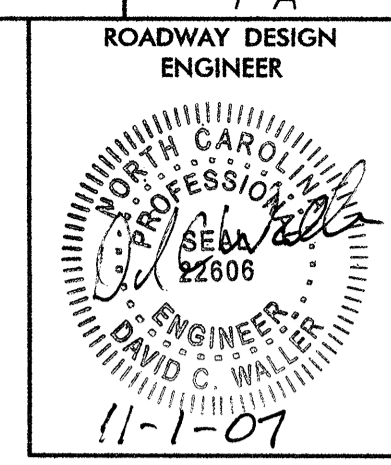
UTILITY OWNERS ON THIS PROJECT ARE AT&T, Lexcom, Energy United,  
City of Lexington Electric

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



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

### 2006 ROADWAY ENGLISH 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
<b>DIVISION 2 - EARTHWORK</b>	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superlevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
<b>DIVISION 3 - PIPE CULVERTS</b>	
300.01	Method of Pipe Installation - Method 'A'
310.10	Driveway Pipe Construction
<b>DIVISION 4 - MAJOR STRUCTURES</b>	
422.10	Reinforced Bridge Approach Fills
<b>DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</b>	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
<b>DIVISION 6 - ASPHALT BASES AND PAVEMENTS</b>	
654.01	Pavement Repairs
<b>DIVISION 8 - INCIDENTALS</b>	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
840.00	Concrete Base Pad for Drainage Structures
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drainage Installation in Shoulder Berm Gutter
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

Note: Not to Scale

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

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

3/15/06

BOUNDARIES AND PROPERTY:

Table listing symbols for 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, 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:

Table listing symbols for 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:

Table listing symbols for hydrology: Stream or Body of Water, Hydro, Pool or Reservoir, Jurisdictional Stream, Buffer Zone 1, Buffer Zone 2, Flow Arrow, Disappearing Stream, Spring, Wetland, Proposed Lateral, Tail, Head Ditch, False Sump.

RAILROADS:

Table listing symbols for railroads: Standard Gauge, RR Signal Milepost, Switch, RR Abandoned, RR Dismantled.

RIGHT OF WAY:

Table listing symbols for 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:

Table listing symbols for roads and related features: Existing Edge of Pavement, Existing Curb, Proposed Slope Stakes Cut, Proposed Slope Stakes Fill, Proposed Wheel Chair Ramp, Proposed Wheel Chair Ramp Curb Cut, Curb Cut for Future Wheel Chair Ramp, Existing Metal Guardrail, Proposed Guardrail, Existing Cable Guiderail, Proposed Cable Guiderail, Equality Symbol, Pavement Removal.

VEGETATION:

Table listing symbols for vegetation: Single Tree, Single Shrub, Hedge, Woods Line, Orchard, Vineyard.

EXISTING STRUCTURES:

Table listing symbols for existing structures: Bridge, Tunnel or Box Culvert, Bridge Wing Wall, Head Wall and End Wall, Head and End Wall, Pipe Culvert, Footbridge, Drainage Box: Catch Basin, DI or JB, Paved Ditch Gutter, Storm Sewer Manhole, Storm Sewer.

UTILITIES:

Table listing symbols for utilities: 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:

Table listing symbols for 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:

Table listing symbols for 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:

Table listing symbols for 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:

Table listing symbols for gas: Gas Valve, Gas Meter, Recorded U/G Gas Line, Designated U/G Gas Line (S.U.E.\*), Above Ground Gas Line.

SANITARY SEWER:

Table listing symbols for 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:

Table listing symbols for 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, End of Information.

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-4101	1C
Location and Surveys	

# SURVEY CONTROL SHEET B-4101

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3	BL-3	820428.6633	1668129.5006	825.05	10+20.88	27.28 RT
2	B4101-2	819880.3860	1668624.4100	788.27	17+57.67	15.97 RT
4	BL-4	819596.8734	1669028.1445	783.30	22+49.93	14.95 LT
5	BL-5	819406.6413	1669320.4399	797.04	25+98.26	31.85 LT
6	BL-6	819195.8057	1669669.4523	822.95	OUTSIDE PROJECT LIMITS	

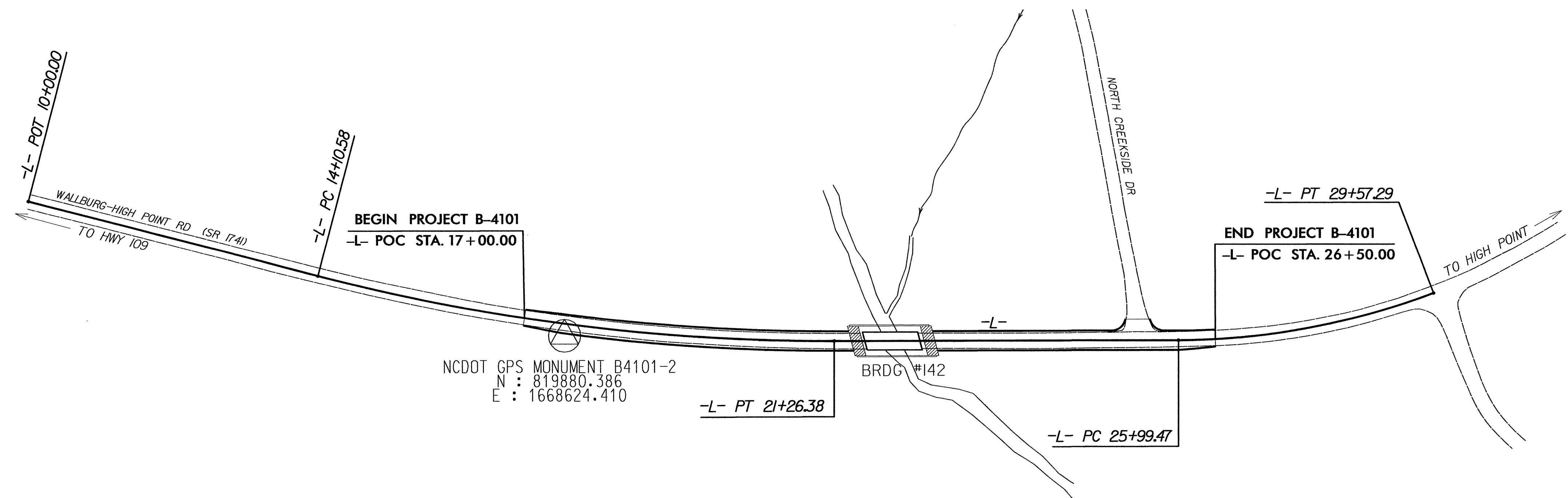
BY POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
7	BY-7	819740.2761	1669407.3228	792.60	24+73.37	353.20 LT
A5	BL-5	819406.6413	1669320.4399	797.04	25+98.26	31.85 LT

\*\*\*\*\*  
 BM #1 ELEVATION = 822.03  
 N 820372 E 1668131  
 L STATION 10+65 62 RIGHT  
 R/R SPIKE SET IN 26" OAK  
 \*\*\*\*\*

\*\*\*\*\*  
 BM #2 ELEVATION = 777.54  
 N 819785 E 1669040  
 L STATION 21+49 175 LEFT  
 R/R SPIKE SET IN 16" SWEET GUM  
 \*\*\*\*\*

\*\*\*\*\*  
 BM #3 ELEVATION = 834.40  
 N 819244 E 1669751  
 L STATION 29+57  
 N 82° 30' 21.5" E DIST 127.94  
 R/R SPIKE SET IN 36" DOUBLE SWEET GUM  
 \*\*\*\*\*

NCDOT GPS MONUMENT B4101-1  
 N : 820858.145  
 E : 1667834.866



### NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:  
[HTTP://WWW.NC.DOT.ORG/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.nc.dot.org/preconstruct/highway/location/project/)  
 THE FILES TO BE FOUND ARE AS FOLLOWS:  
[TIPB4101\\_LS\\_CONTROL\\_DATA.HTML](#)  
 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)  
 SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

**DATUM DESCRIPTION**  
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4101-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 820858.145(±) EASTING: 1667834.866(±) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99992227 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4101-1" TO -L- STATION 17+00.00 IS S 39°20'11.8" E 1197.41' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

B:\5\2007\N\p\B4101\1s-1c-051010.dgn

6/2/99

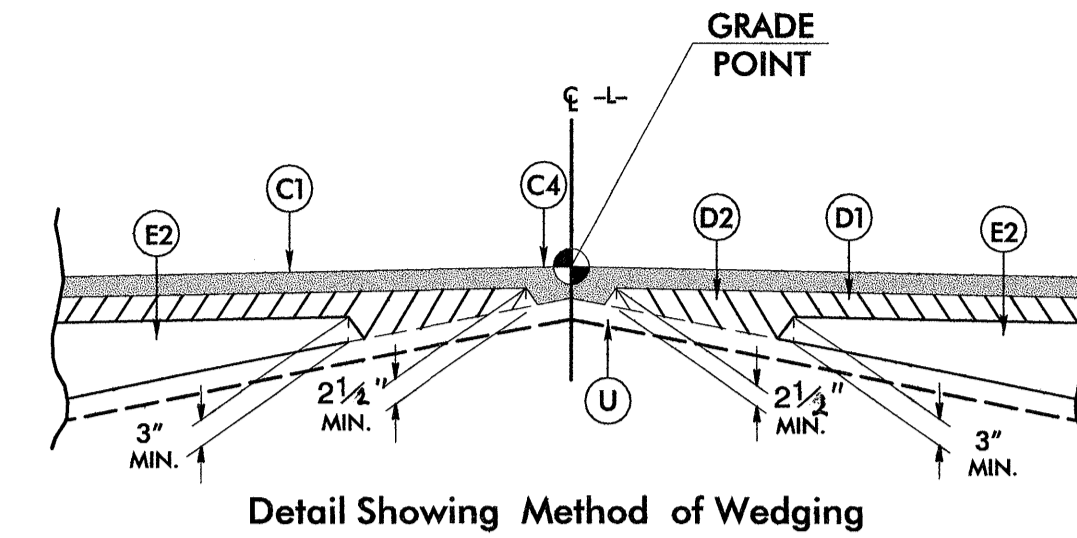
PAVEMENT SCHEDULE

C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD.	E2	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" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
C2	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J	PROP. 8" AGGREGATE BASE COURSE.
C3	PROP. APPROX. 4 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF THREE LAYERS.	P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.	T	EARTH MATERIAL.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
D2	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 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.	W	VARIABLE DEPTH ASPHALT PAVEMENT
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.		

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

**KO & ASSOCIATES, P.C.**  
 Consulting Engineers  
 1011 SCHUB DR., SUITE 202 RALEIGH, N.C. 27606  
 (919) 851-6066

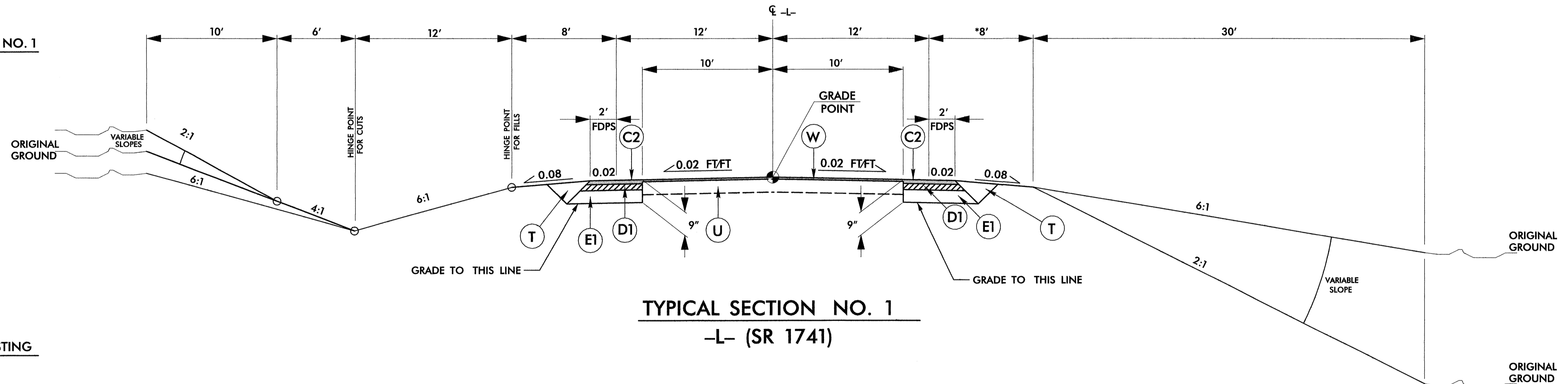
PROJECT REFERENCE NO. B-4101	SHEET NO. 2
ROADWAY DESIGN ENGINEER DAVID C. WALKER	PAVEMENT DESIGN ENGINEER CHI CHEN
10-09-07	11/6/07



\* ADD 5' WITH GUARDRAIL

TRANSITION FROM EXISTING TO T.S. NO.1  
 -L- STA. 17+00.00 TO 17+50.00

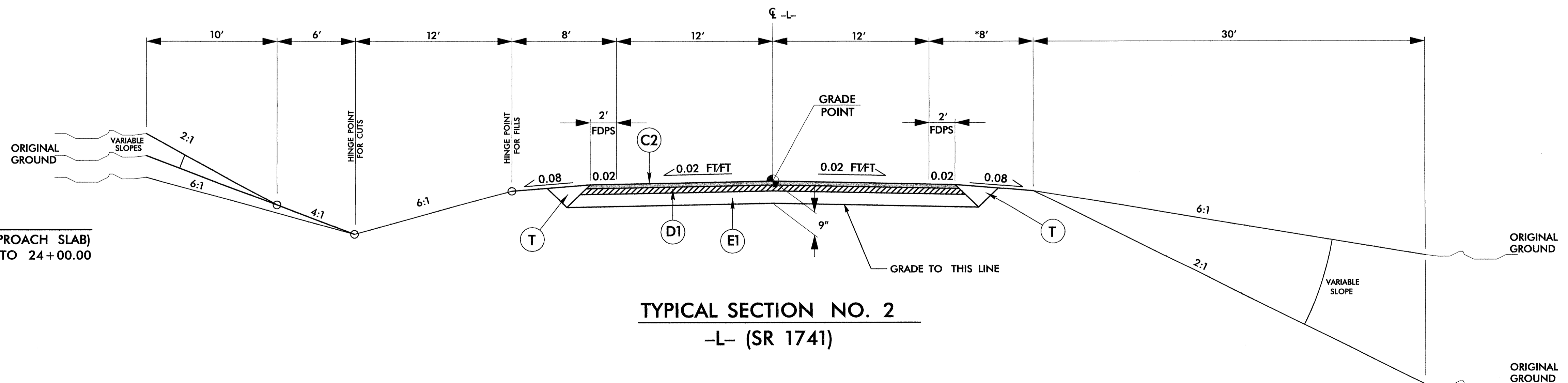
USE TYPICAL SECTION NO. 1  
 -L- STA. 17+50.00 TO 20+90.00  
 -L- STA. 24+00.00 TO 26+00.00



\* ADD 5' WITH GUARDRAIL

TRANSITION FROM T.S. NO. 1 TO EXISTING  
 -L- STA. 26+00.00 TO 26+50.00

USE TYPICAL SECTION NO. 2  
 -L- STA. 20+90.00 TO 21+51.04 (APPROACH SLAB)  
 -L- STA. 22+63.96 (APPROACH SLAB) TO 24+00.00



10/8/2007  
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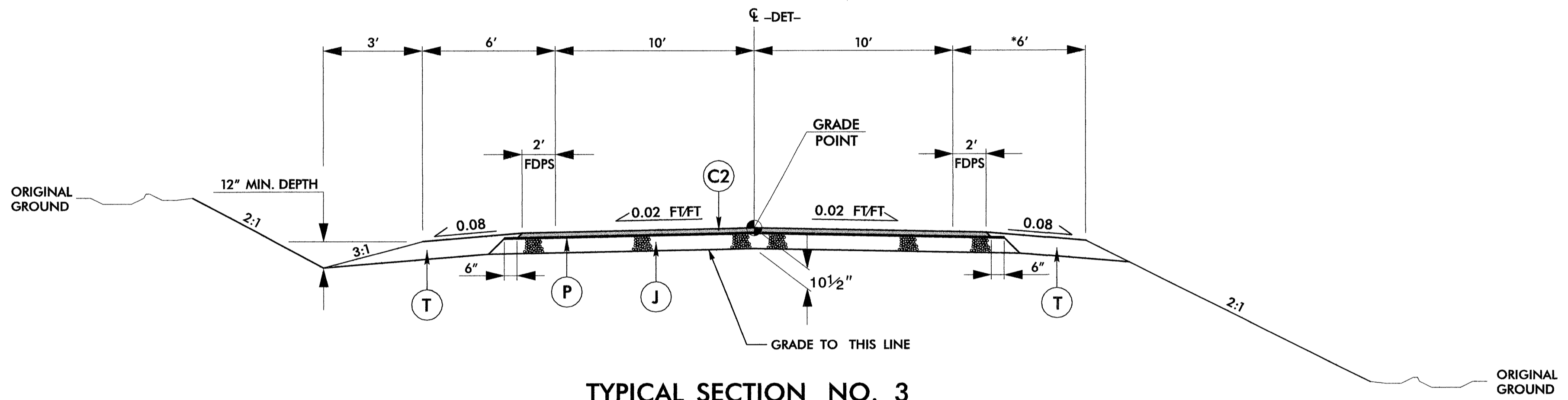
6/22/99

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD.	E2	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" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
C2	PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J	PROP. 8" AGGREGATE BASE COURSE.
C3	PROP. APPROX. 4 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF THREE LAYERS.	P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.	T	EARTH MATERIAL.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
D2	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 1/4" IN DEPTH OR GREATER THAN 4" IN DEPTH.	W	VARIABLE DEPTH ASPHALT PAVEMENT
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.	

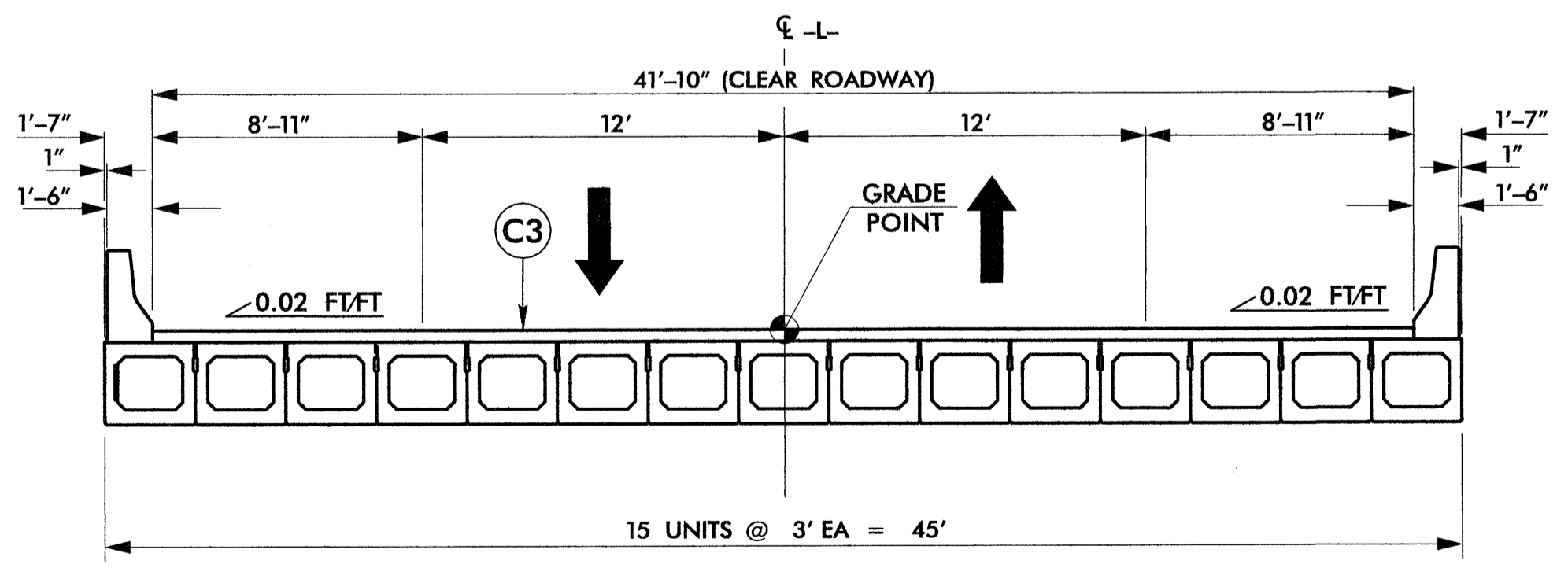
**KO & ASSOCIATES, P.C.**  
**Consulting Engineers**  
 1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606  
 (919) 851-6066

PROJECT REFERENCE NO. B-4101	SHEET NO. 2-A
ROADWAY DESIGN ENGINEER DAVID C. WALKER 10-09-07	PAVEMENT DESIGN ENGINEER CHI CHEN 11/6/07



TYPICAL SECTION NO. 3  
 -DET- (TEMP. DETOUR)

USE TYPICAL SECTION NO. 3  
 -DET- STA. 11+35.00 TO 14+27.00 (BRIDGE)  
 -DET- STA. 15+12.00 (BRIDGE) TO 17+60.00



TYPICAL SECTION NO. 4  
 -L- (SR 1741)

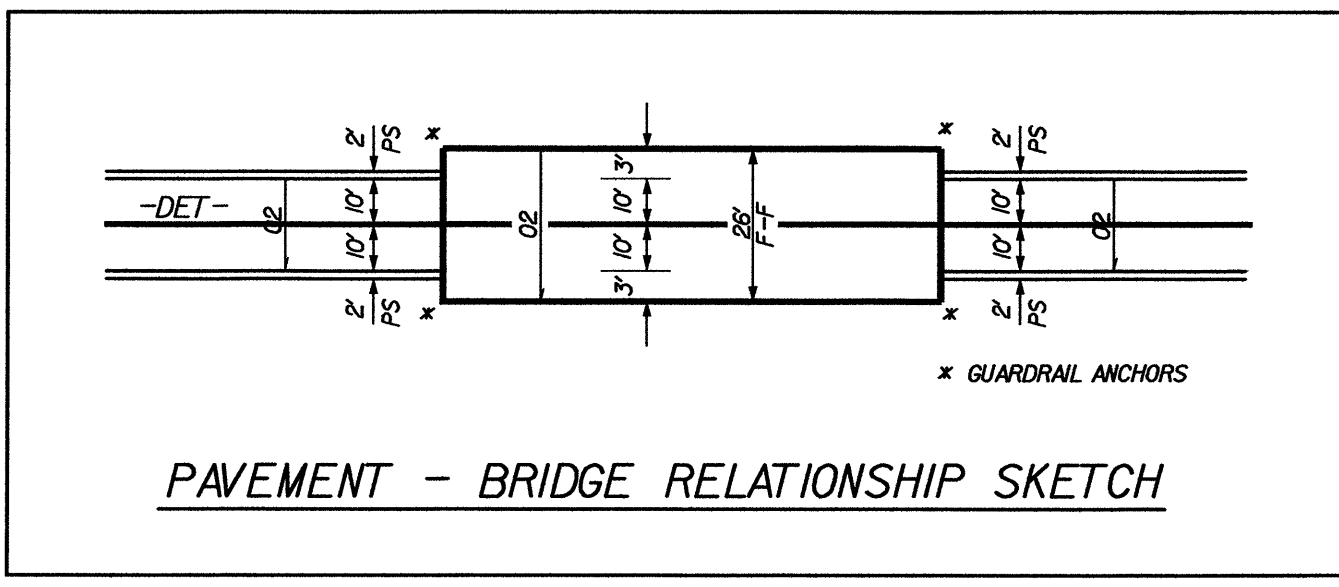
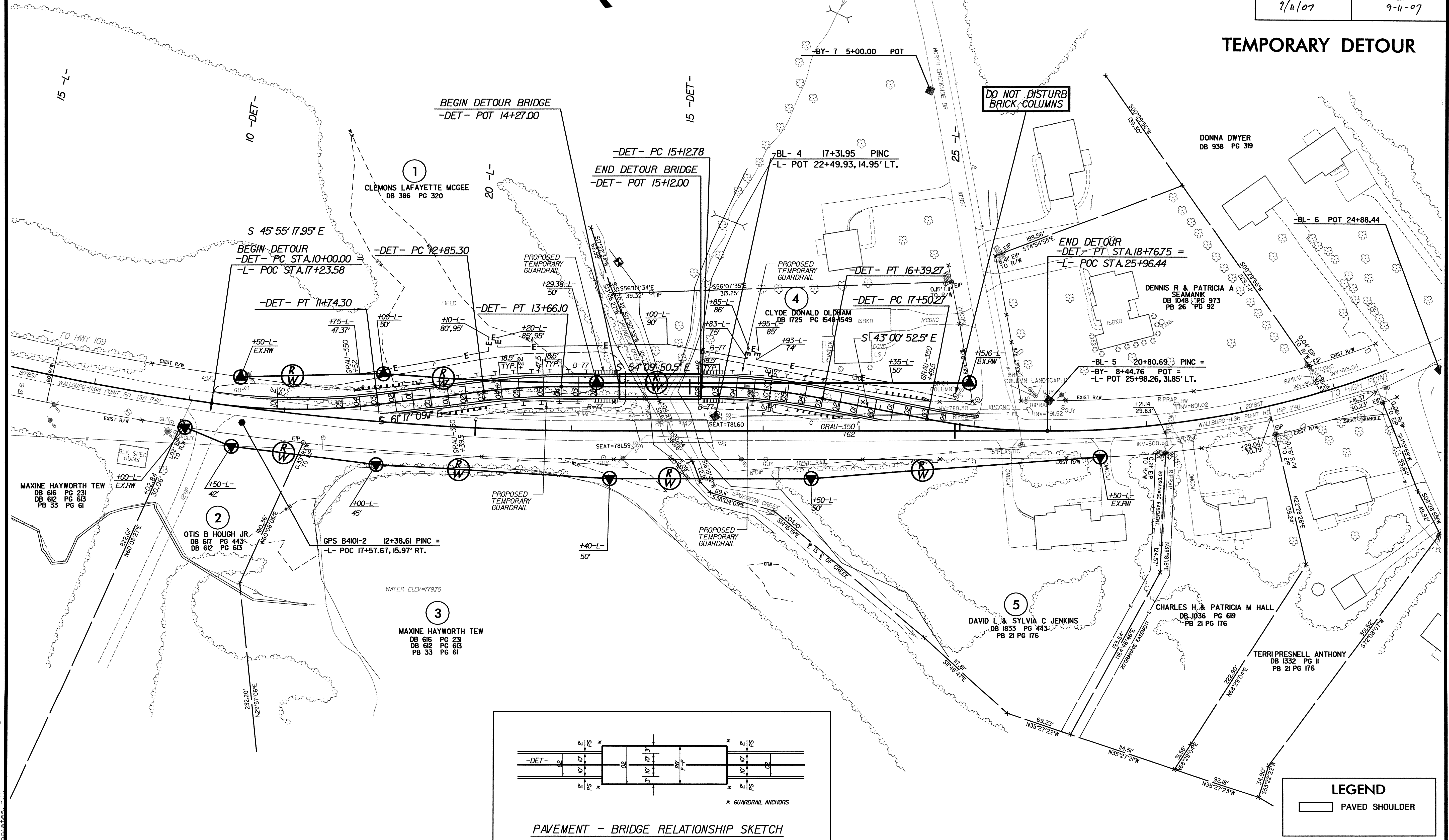
USE TYPICAL SECTION NO. 4  
 -L- STA. 21+65.00 TO 22+50.00

10/9/2007  
 C:\Roadway\Proj\1011\1011\_rdy.typ.dgn

**DETOUR**

PI Sta 10+87.68 Δ = 15° 21' 51.0" (LT) D = 8' 48' 53.0" L = 174.30' T = 87.68' R = 650.00'	PI Sta 13+25.75 Δ = 7° 07' 18.5" (RT) D = 8' 48' 53.0" L = 80.79' T = 40.45' R = 650.00'	PI Sta 15+76.22 Δ = 11° 08' 58.0" (RT) D = 8' 48' 53.0" L = 126.49' T = 63.44' R = 650.00'	PI Sta 18+13.71 Δ = 11° 08' 58.0" (LT) D = 8' 48' 53.0" L = 126.49' T = 63.44' R = 650.00'
---	---	---	---

**TEMPORARY DETOUR**



**LEGEND**

PAVED SHOULDER

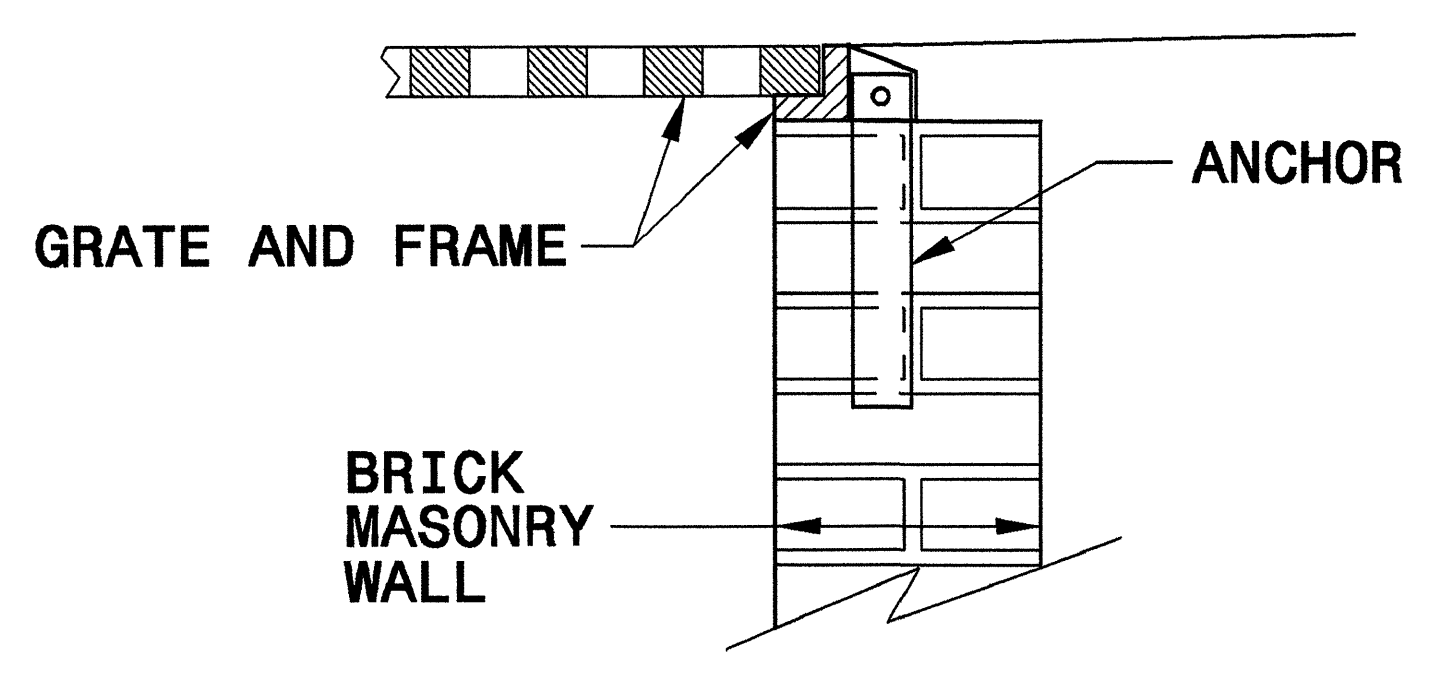
FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-5  
 FOR -DET- PROFILE, SEE SHEET NO. 5  
 FOR -L- PLAN, SEE SHEET NO. 4

8/17/09  
 8/11/2007  
 C:\Users\pco\OneDrive\Projects\B4101\rdw\psh.DET.dgn

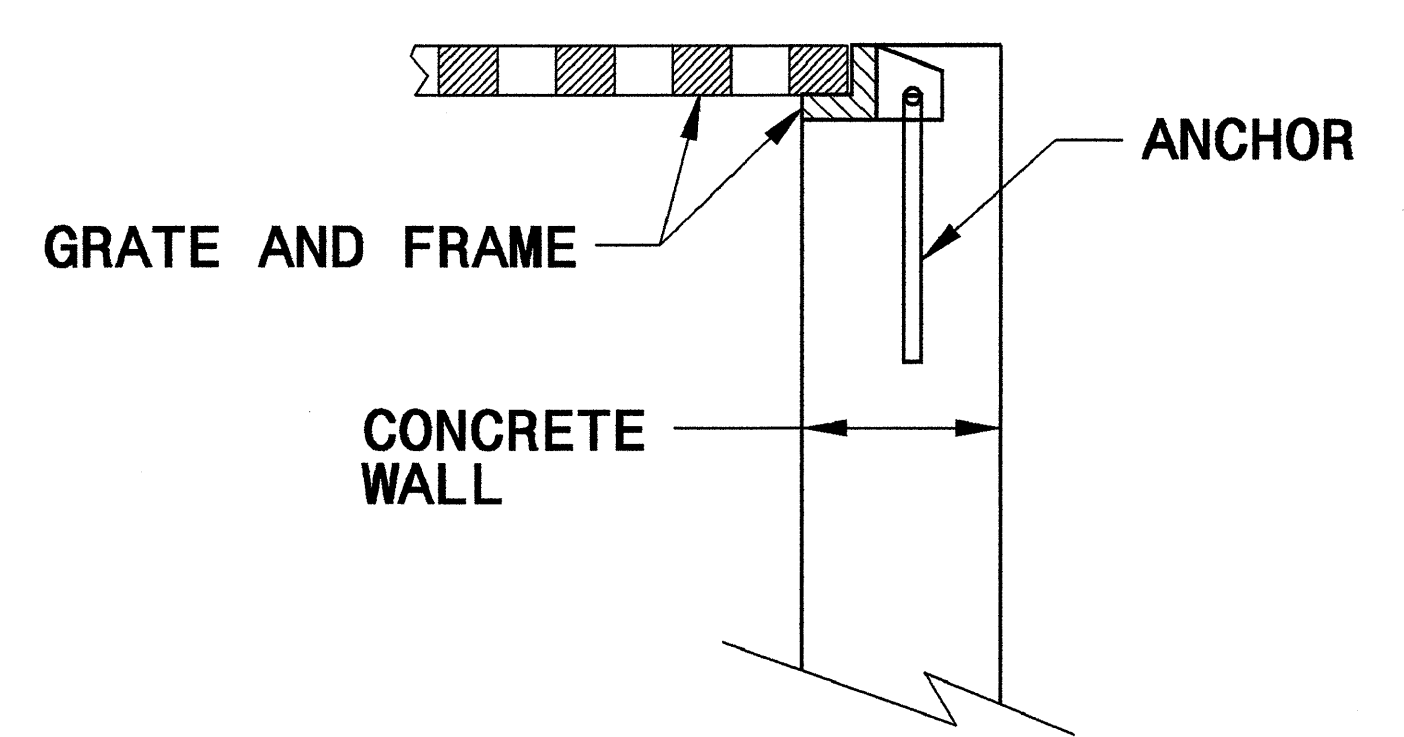
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR  
**ANCHORAGE FOR FRAMES**  
BRICK/CONCRETE/PRECAST CONCRETE

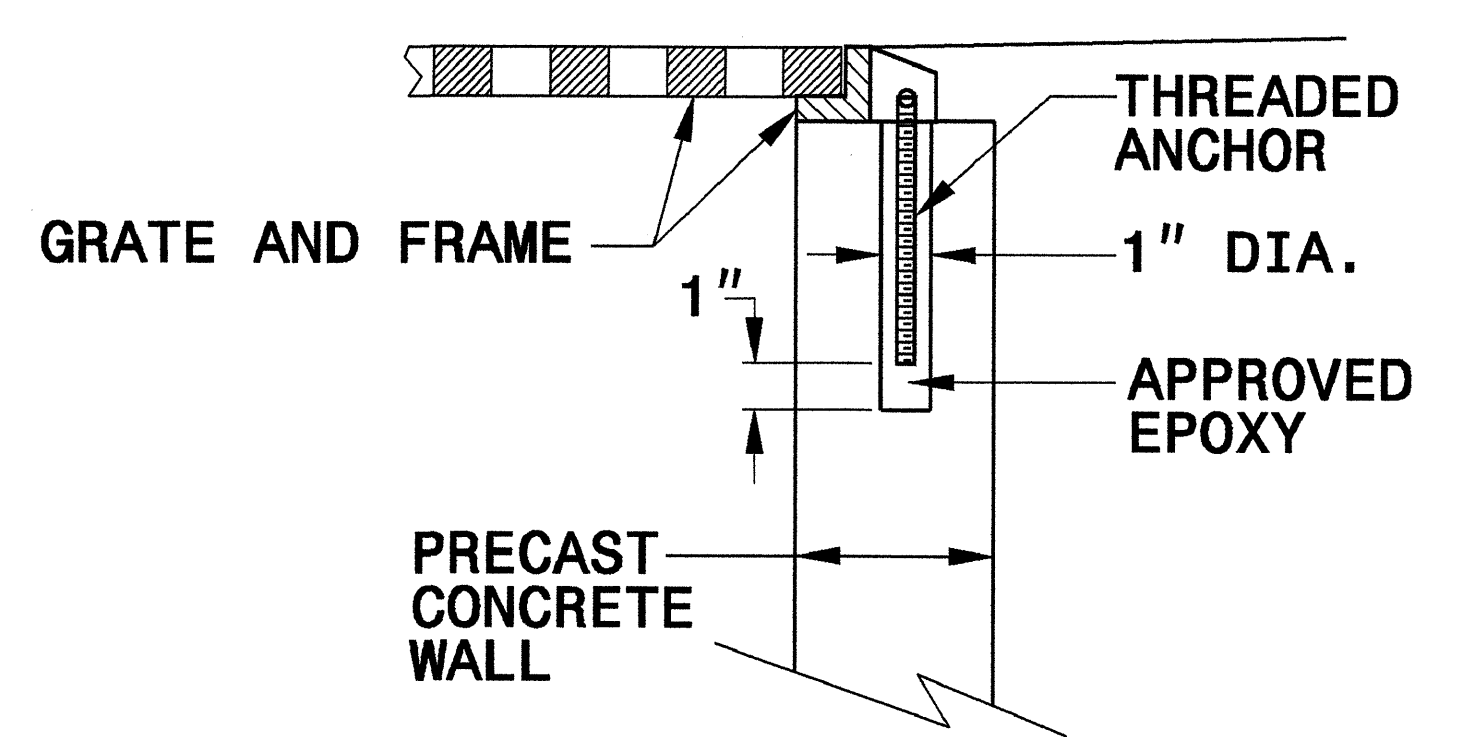
SHEET 1 OF 1  
**840D25**



**BRICK MASONRY CONSTRUCTION**



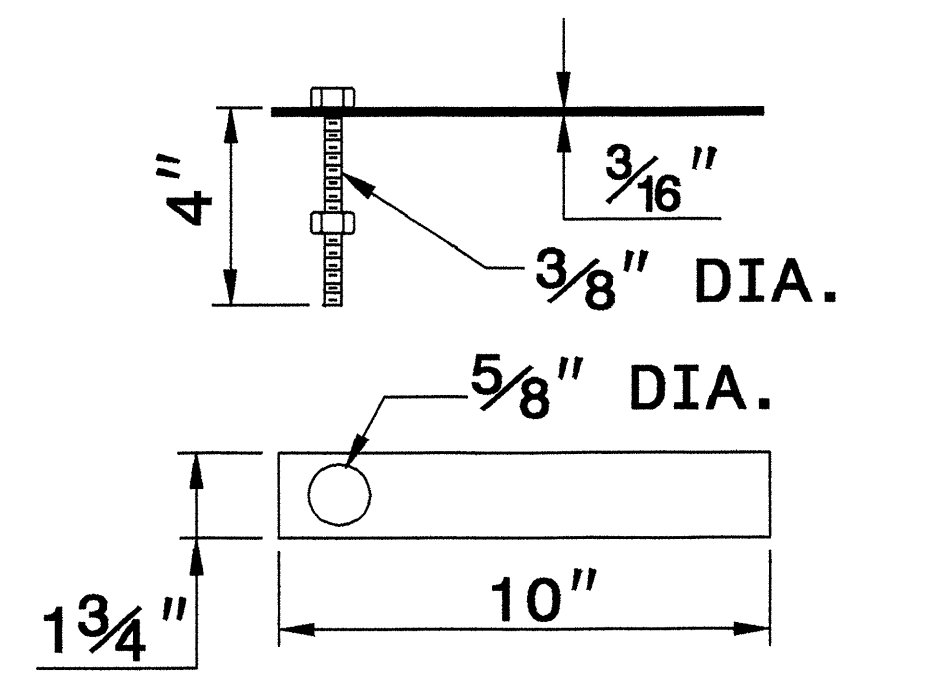
**CONCRETE CONSTRUCTION**



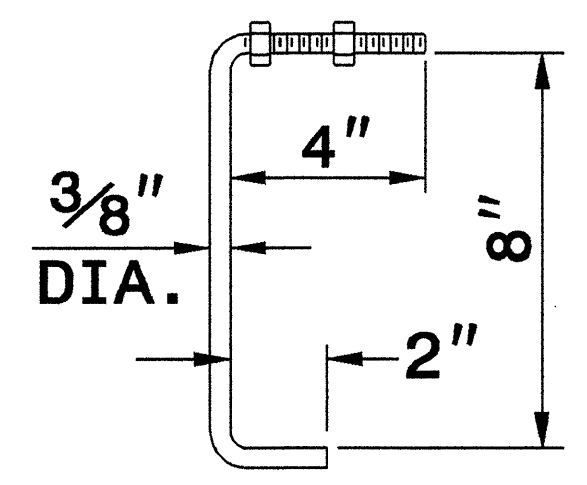
**PRECAST CONCRETE CONSTRUCTION**

**DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET**

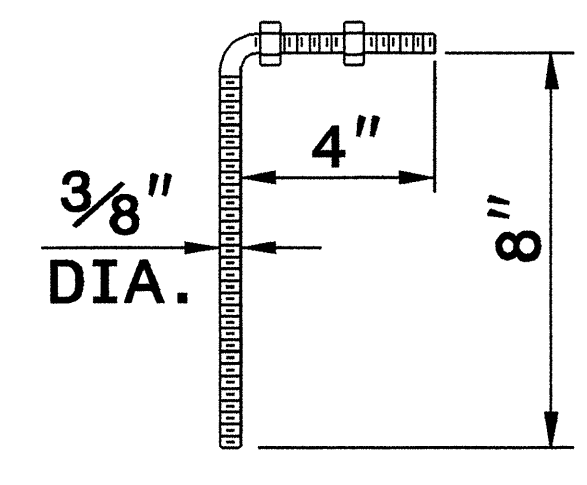
NOTE:  
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



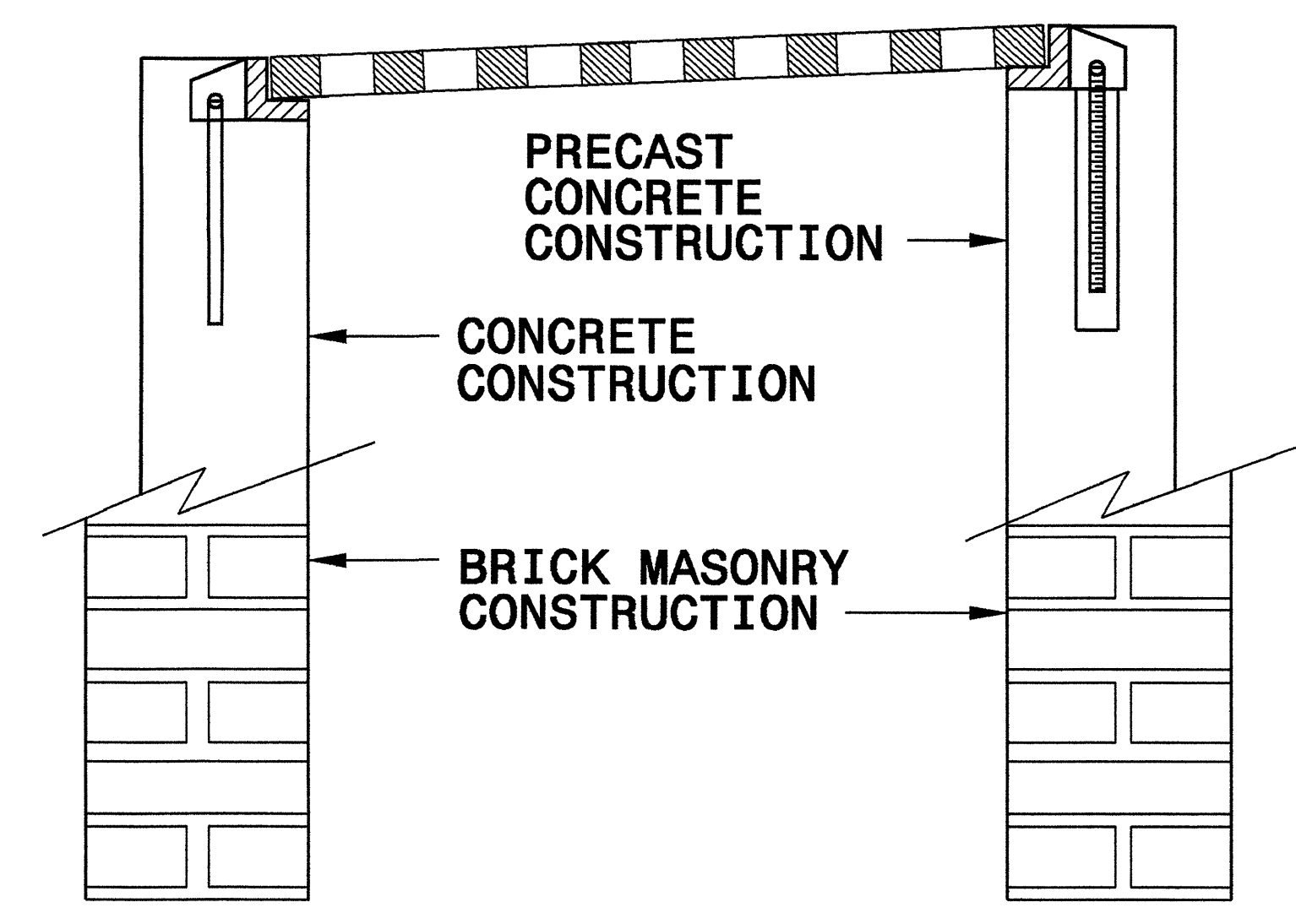
**MASONRY ANCHOR**  
3/8" DIA. BOLT WITH PLATE



**CONCRETE ANCHOR**  
3/8" DIA. BENT BAR



**PRECAST CONCRETE ANCHOR**  
3/8" DIA. BENT BAR



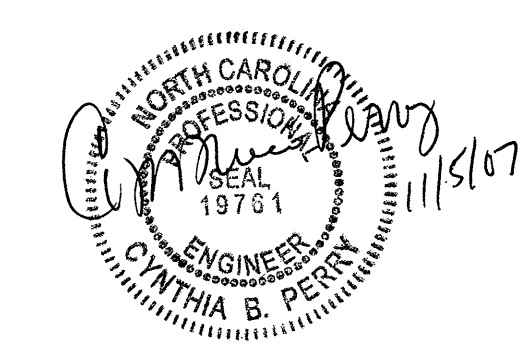
**FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS**

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RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR  
**ANCHORAGE FOR FRAMES**  
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1  
**840D25**

Z:\SEP-2006\_08:59  
S:\Contractors\Centr\9519\Special Details\eroward\stds\06\Std to Special Details\840D25 Anchorage for Frames\0840d25.dgn  
eroward AT 15222293



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

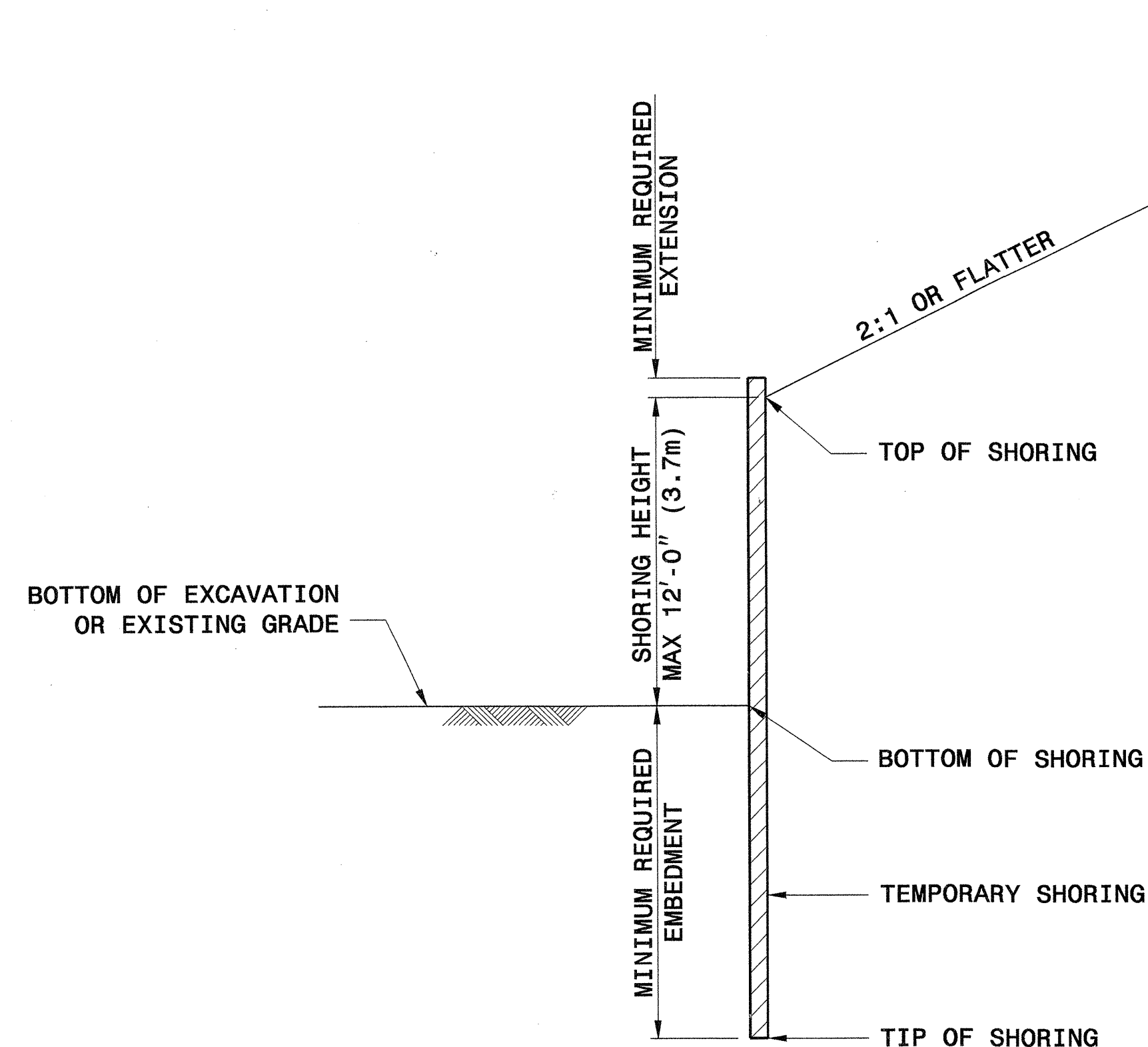
**SEE PLATE FOR TITLE**

ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06  
 MODIFIED BY: E.E. WARD DATE: 9/25/06  
 CHECKED BY: DATE: \_\_\_\_\_  
 FILE SPEC.: \_\_\_\_\_

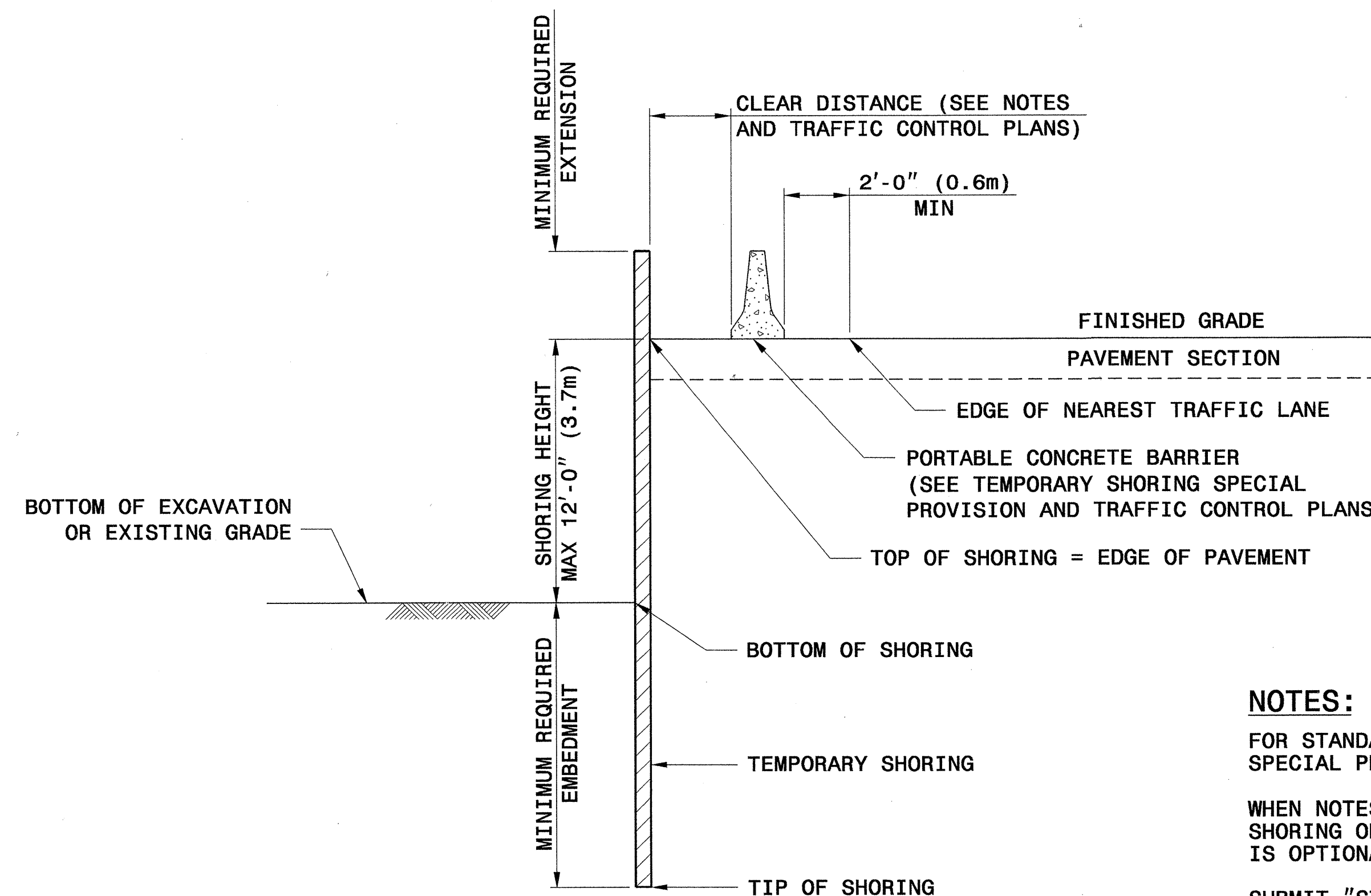




Signature: Scott A. Hadden 3/29/07  
DATE



**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".

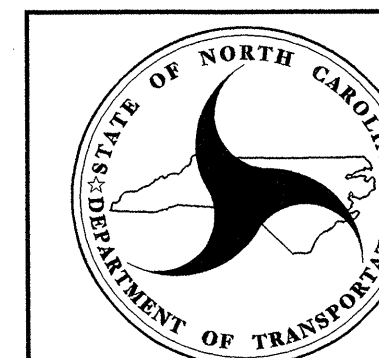
AT THE CONTRACTOR'S OPTION, H PILE EMBEDMENT DEPTHS FOR PILES SET IN DRILLED HOLES MAY BE REDUCED BY 25%. FOR PILE EXCAVATION, SEE TEMPORARY SHORING SPECIAL PROVISION.

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	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT						SURCHARGE CASE WITH TRAFFIC IMPACT				
	SHORING HEIGHT FT (m)	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)	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

<b>PROJECT REFERENCE NO.</b> B-4101		<b>SHEET</b> 2-E
GEOTECHNICAL ENGINEER  Scott A. Shidden	ENGINEER _____ 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:

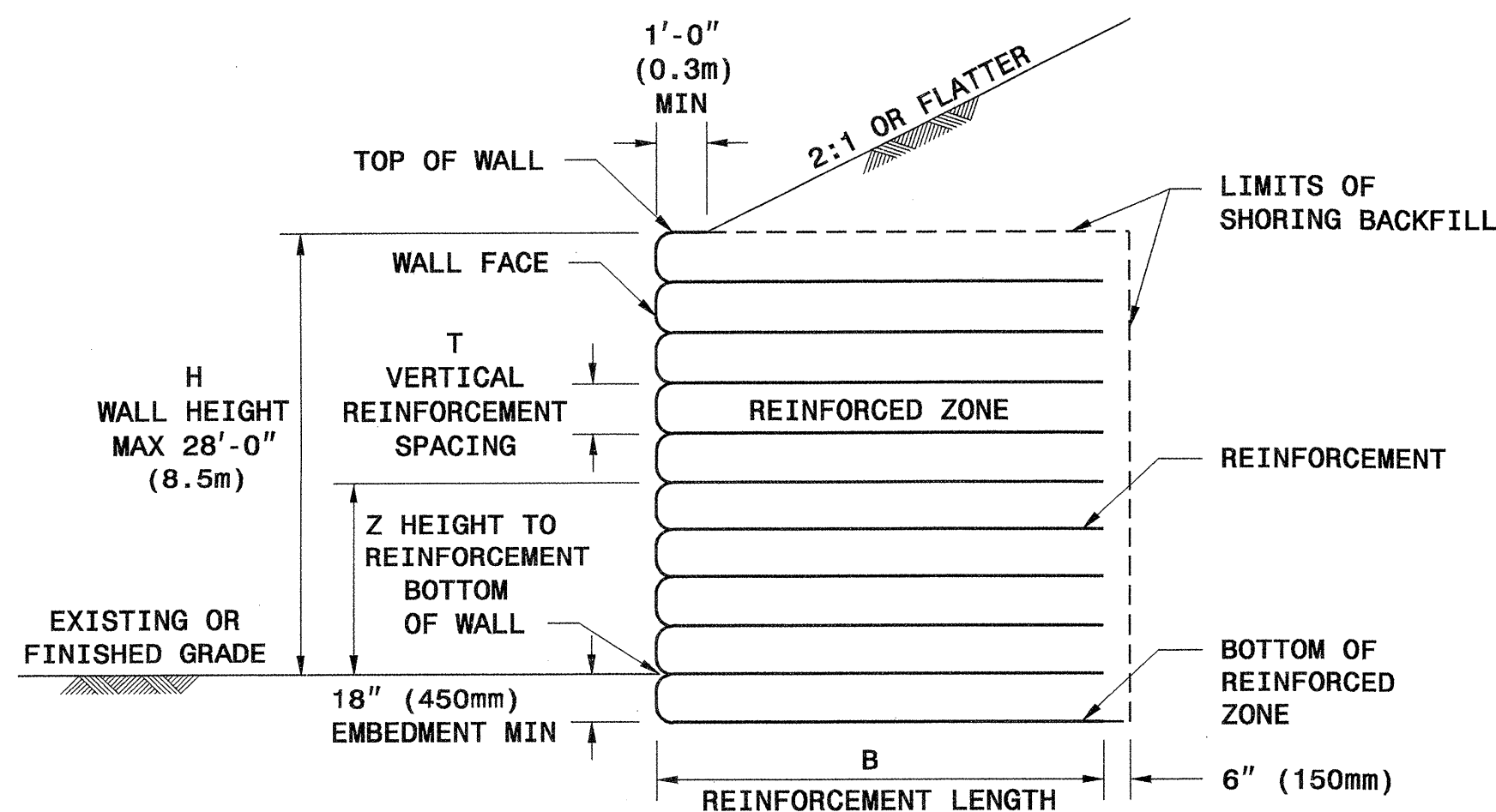
- 1) MAXIMUM WALL HEIGHT IS 28'-0" (8.5m).
- 2) TRAFFIC SURCHARGE IS 240 PSF (11.5 KPA) MAXIMUM OR BACKSLOPE IS 2:1 (H:V) OR FLATTER.
- 3) EXISTING OR FINISHED GRADE IN FRONT OF WALL IS 6:1 (H:V) SLOPE OR FLATTER.
- 4) THE GRADE OF THE TOP OF WALL IS LESS THAN 4% FOR RETAINED EARTH AND TERRATREL TEMPORARY 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:

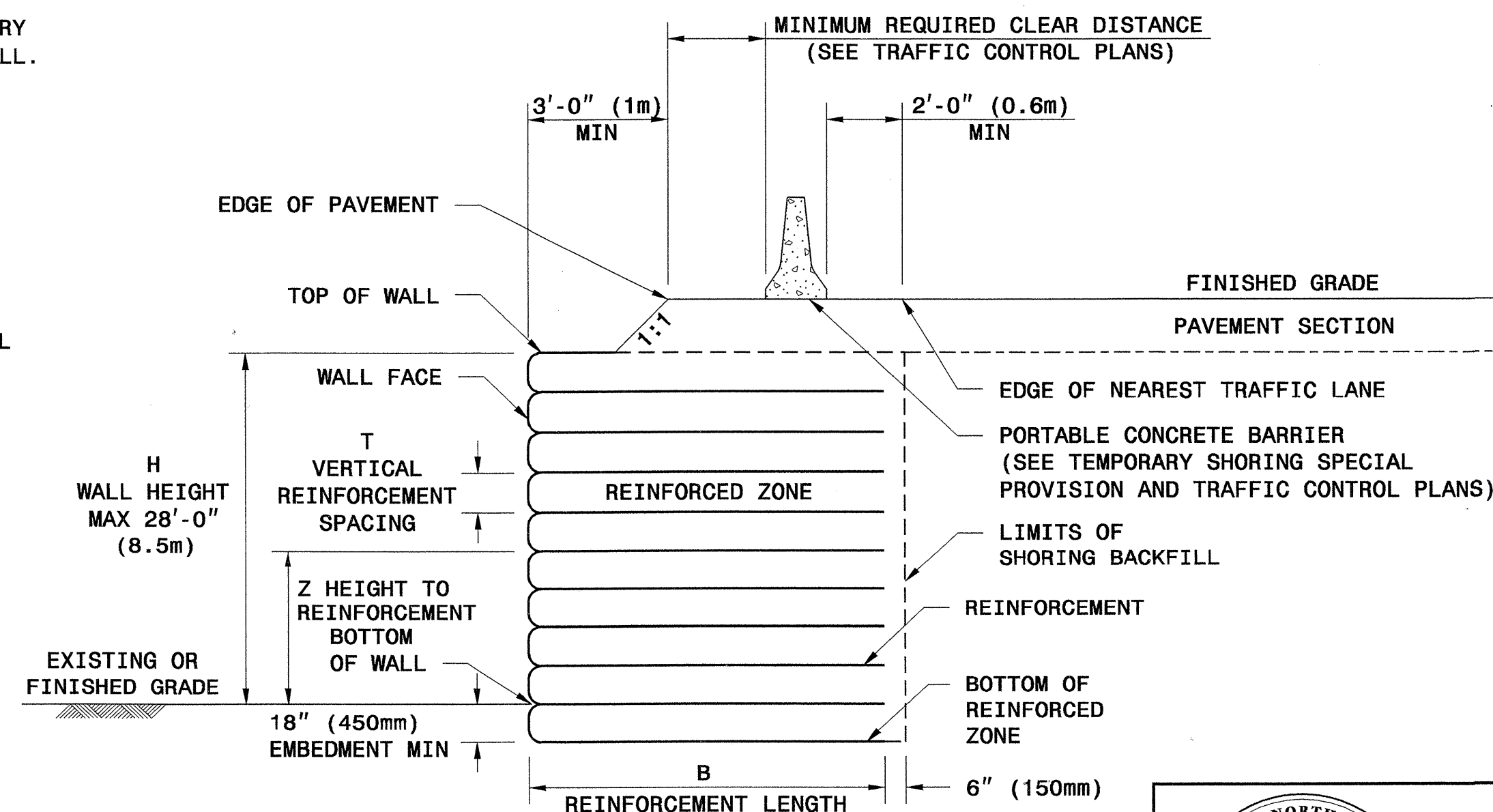
- TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/M<sup>3</sup>)
- FRICTION ANGLE = 30 DEGREES
- COHESION = 0 PSF (0 KPA)
- GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF REINFORCED ZONE.

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.



**SLOPE CASE**



**SURCHARGE CASE**

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, DEFLECT, SKEW AND MODIFY REINFORCEMENT.

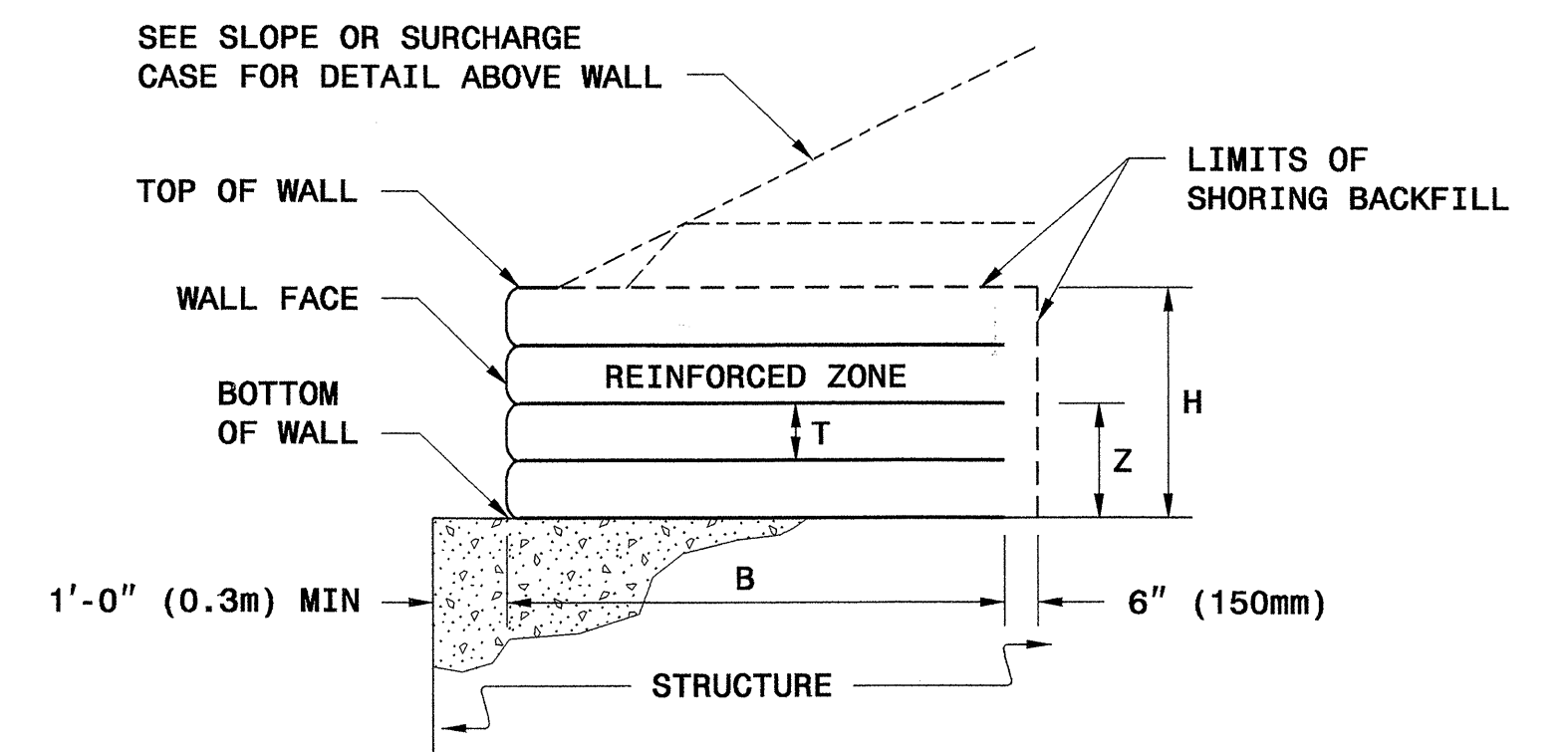
PLACE SHORING BACKFILL IN 8" TO 10" (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

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.

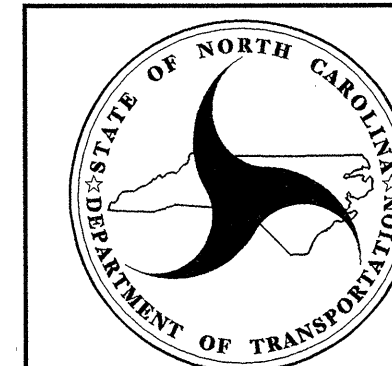
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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.



**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**

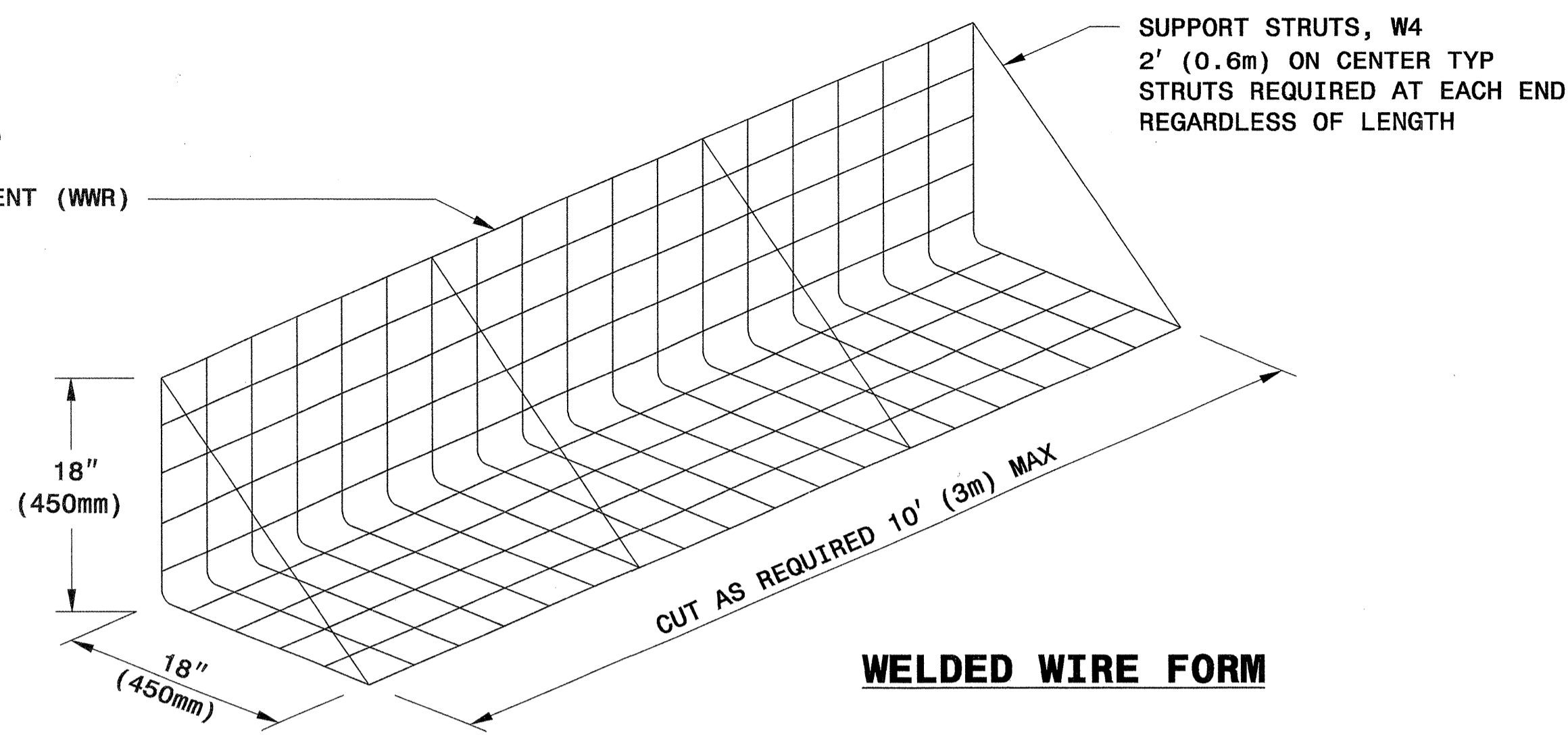
SHEET 1 OF 11      DATE: 2-20-07



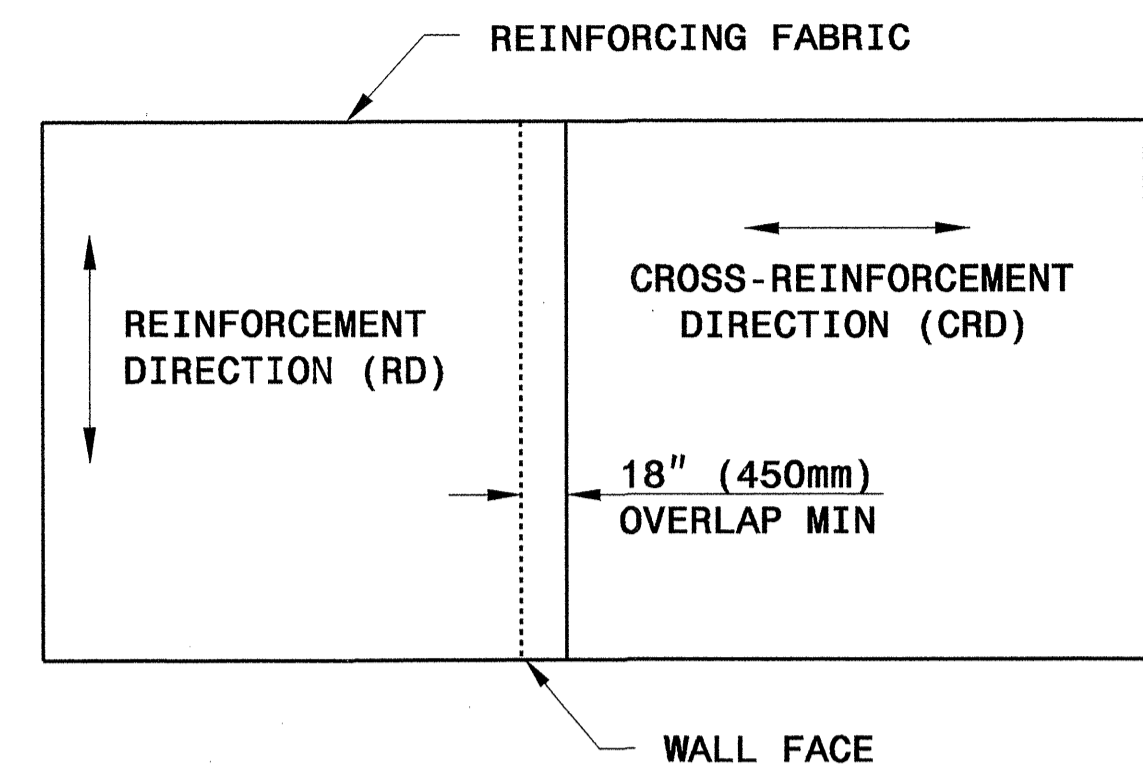


Signature: *Scott A. Hadden* 3/29/07  
 DATE: 3/29/07

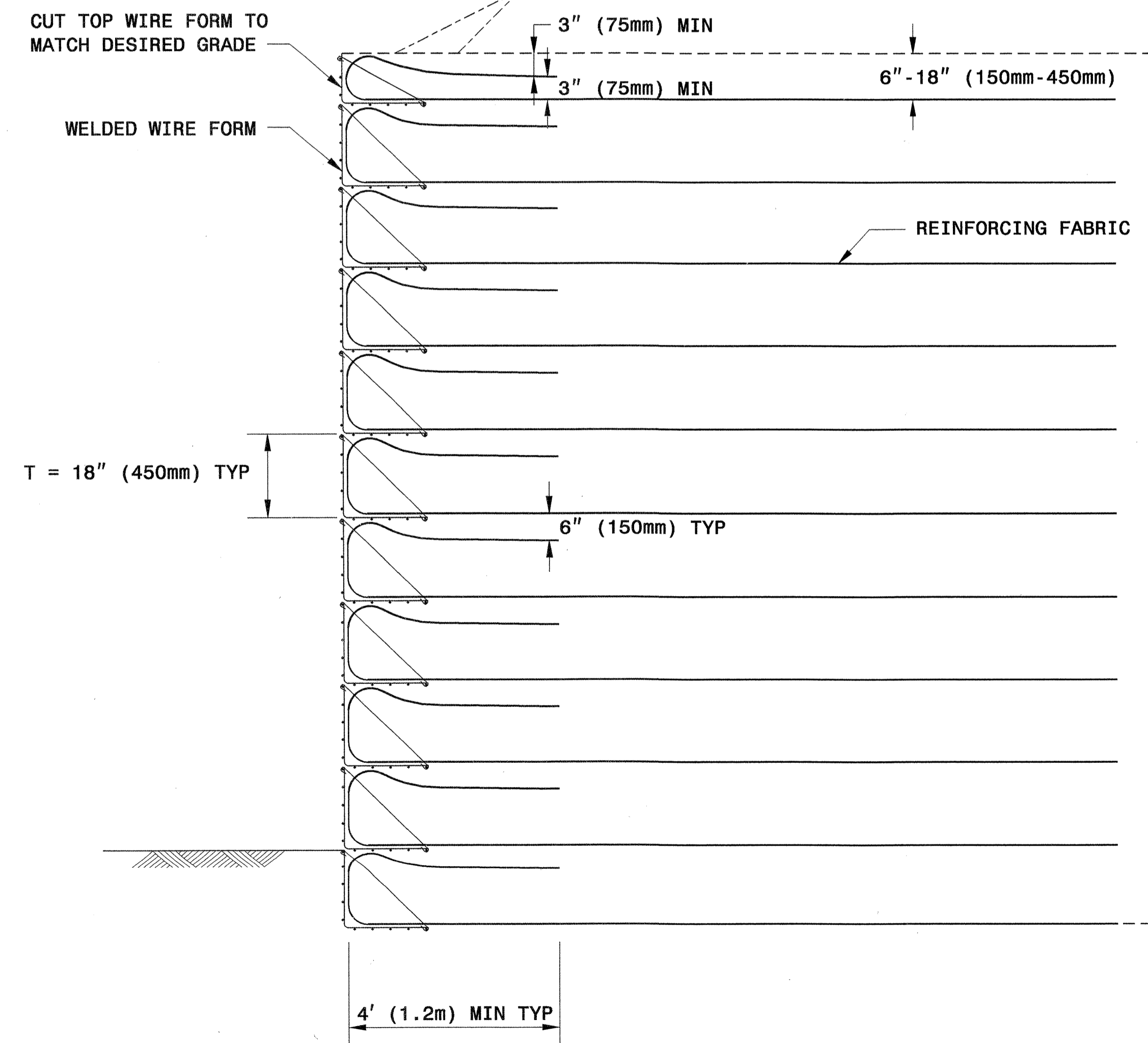
4" X 4" (102mm X 102mm)  
 W4 X W4 (MW26 X MW26)  
 WELDED WIRE REINFORCEMENT (WWR)



**WELDED WIRE FORM**



**PLAN VIEW OF FABRIC OVERLAP**

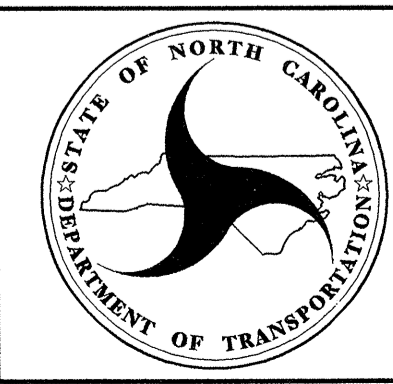


**TYPICAL SECTION**

**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



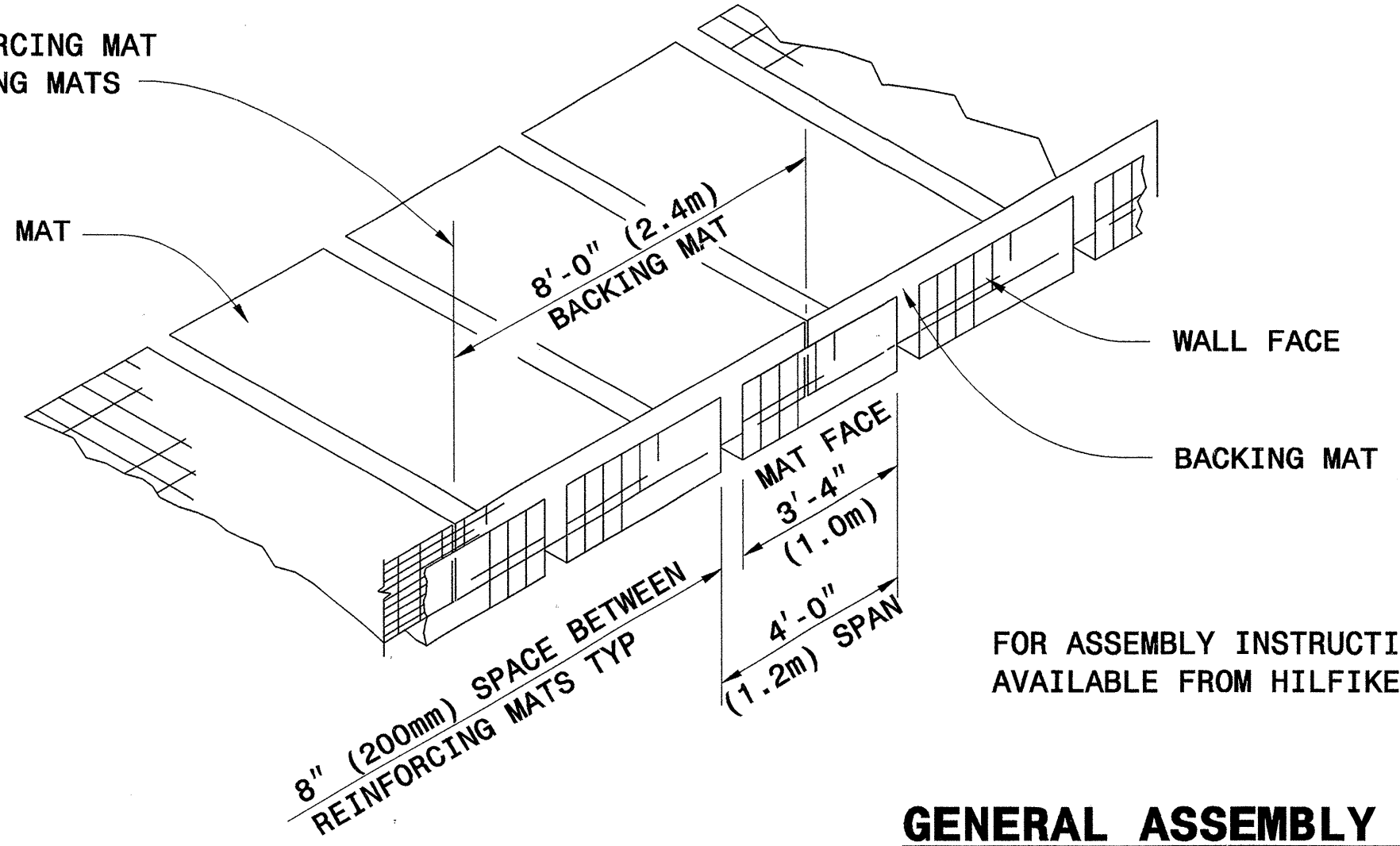
**GEOTECHNICAL ENGINEERING UNIT**  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD DRAWING NO. 1801.02

TEMPORARY FABRIC WALL

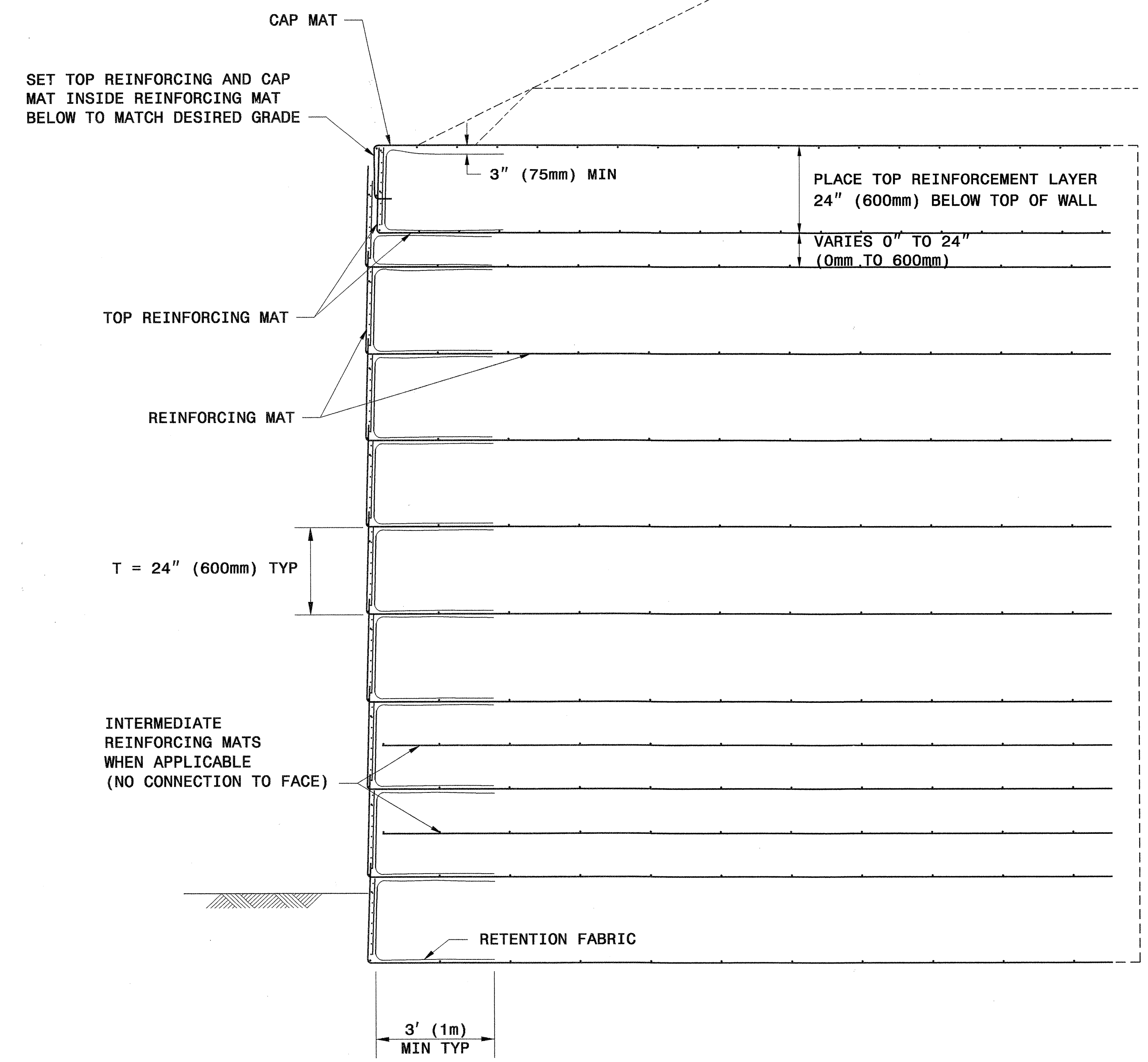
CENTERLINE OF REINFORCING MAT  
FACE = EDGE OF BACKING MATS

REINFORCING MAT



FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE  
AVAILABLE FROM HILFIKER WEBSITE AT [WWW.HILFIKER.COM/WWW](http://WWW.HILFIKER.COM/WWW)

**GENERAL ASSEMBLY DETAIL**



**TYPICAL SECTION**

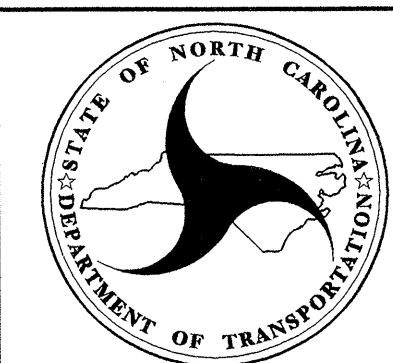
8" X 12" (203mm X 305mm)  
W4.5 X W3.5 (MW29 X MW23)  
CAP MAT  
WELDED WIRE REINFORCEMENT (WWR)

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

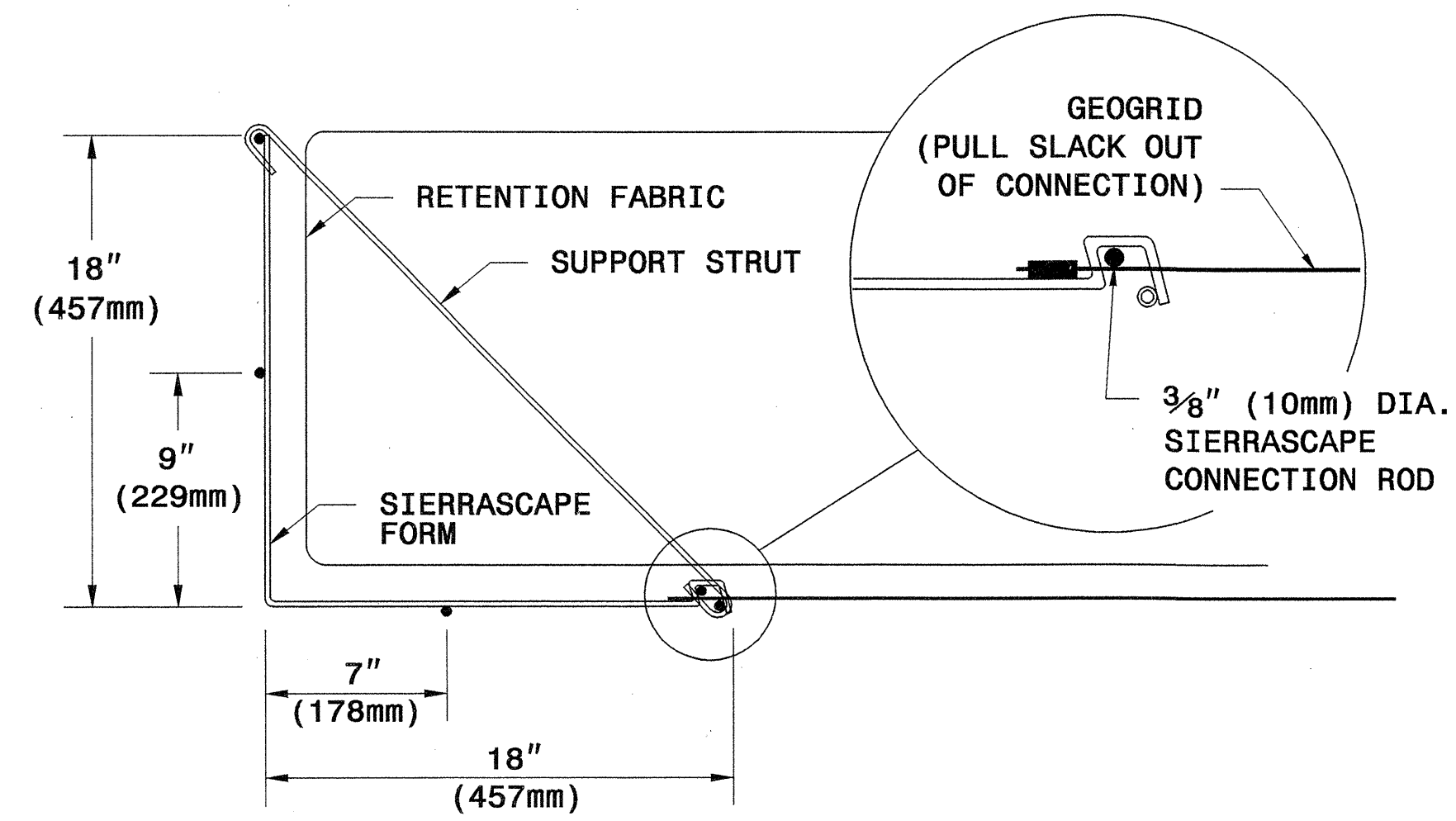
8" X 21" (203mm X 533mm)  
REINFORCING MAT  
SEE SHEETS 2 AND 3 FOR GAUGE SIZES

**WALL COMPONENTS**

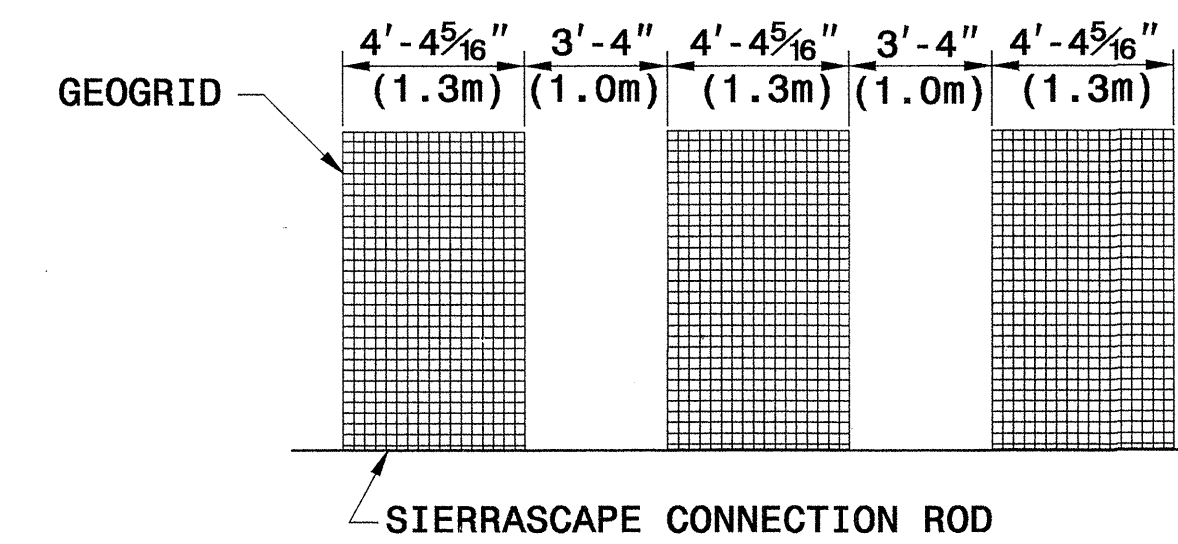




Signature: Scott A. Hadden 3/29/07  
 DATE: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_



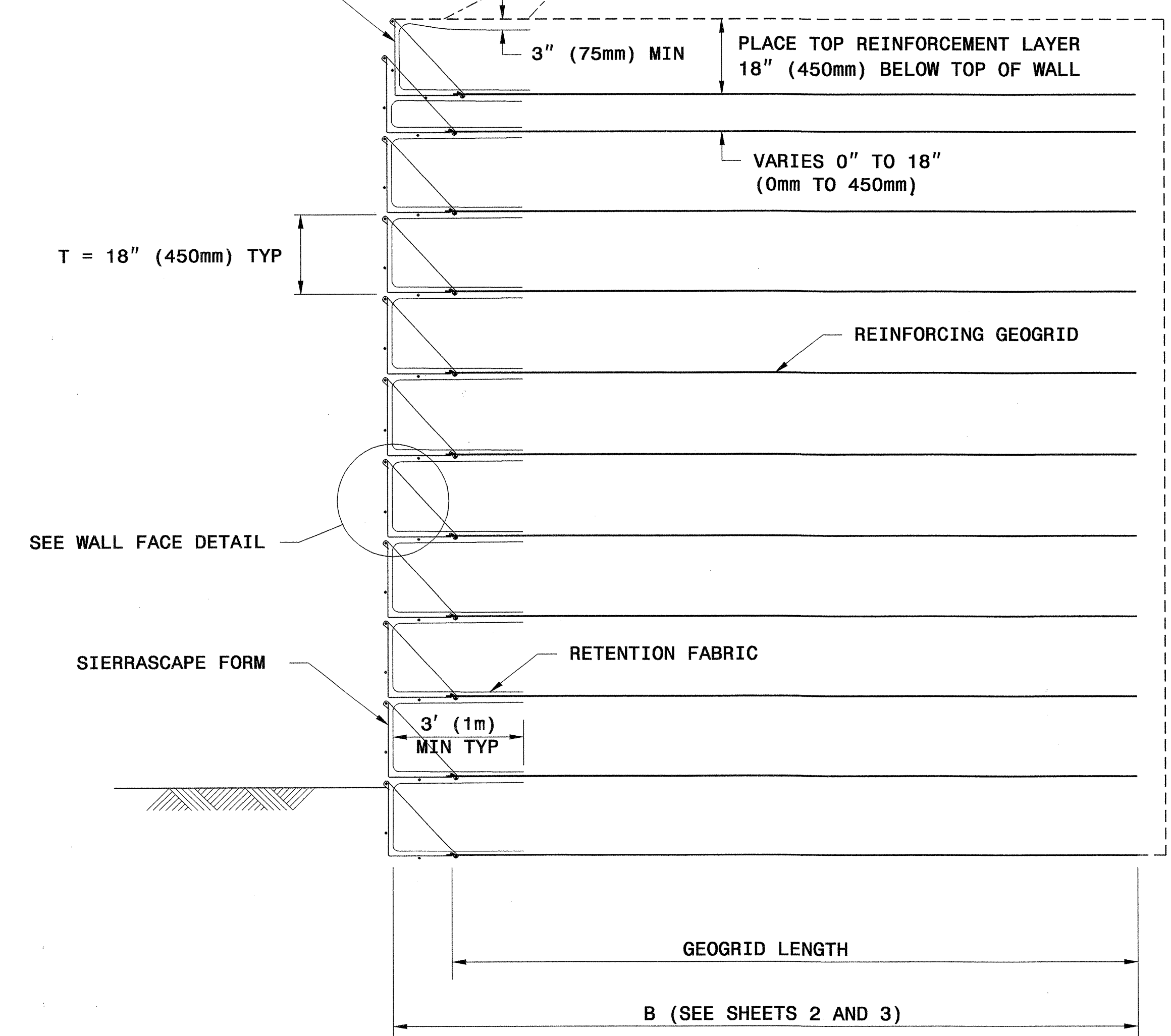
**WALL FACE DETAIL**



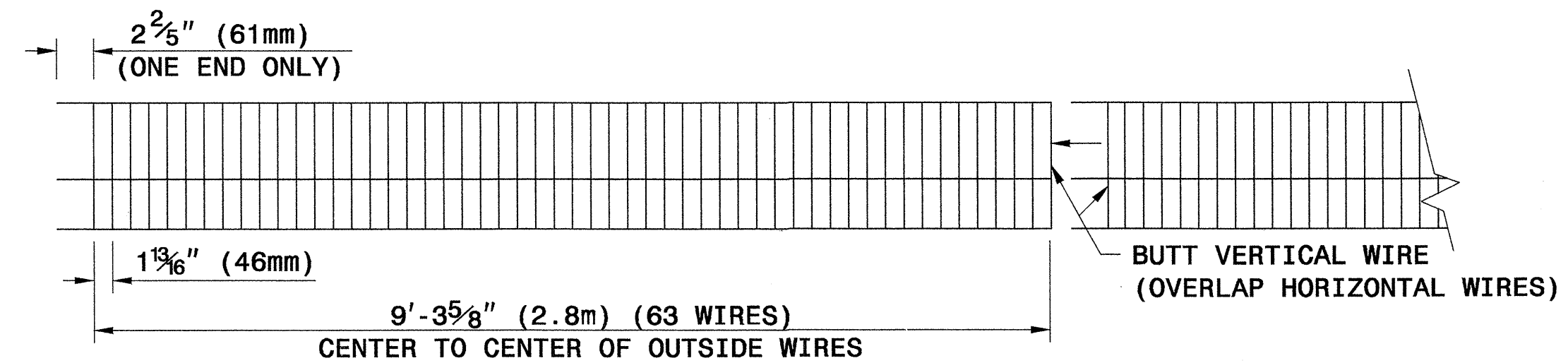
PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

**TYPICAL GEOGRID COVERAGE**

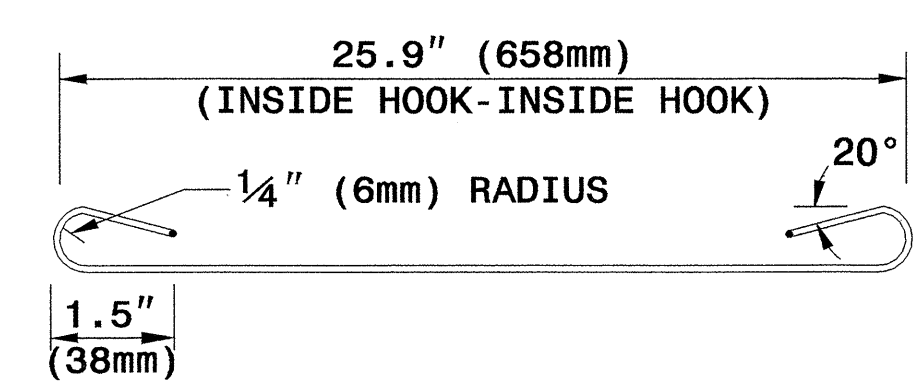
SET TOP WIRE FORM INSIDE WIRE FORM BELOW TO MATCH DESIRED GRADE



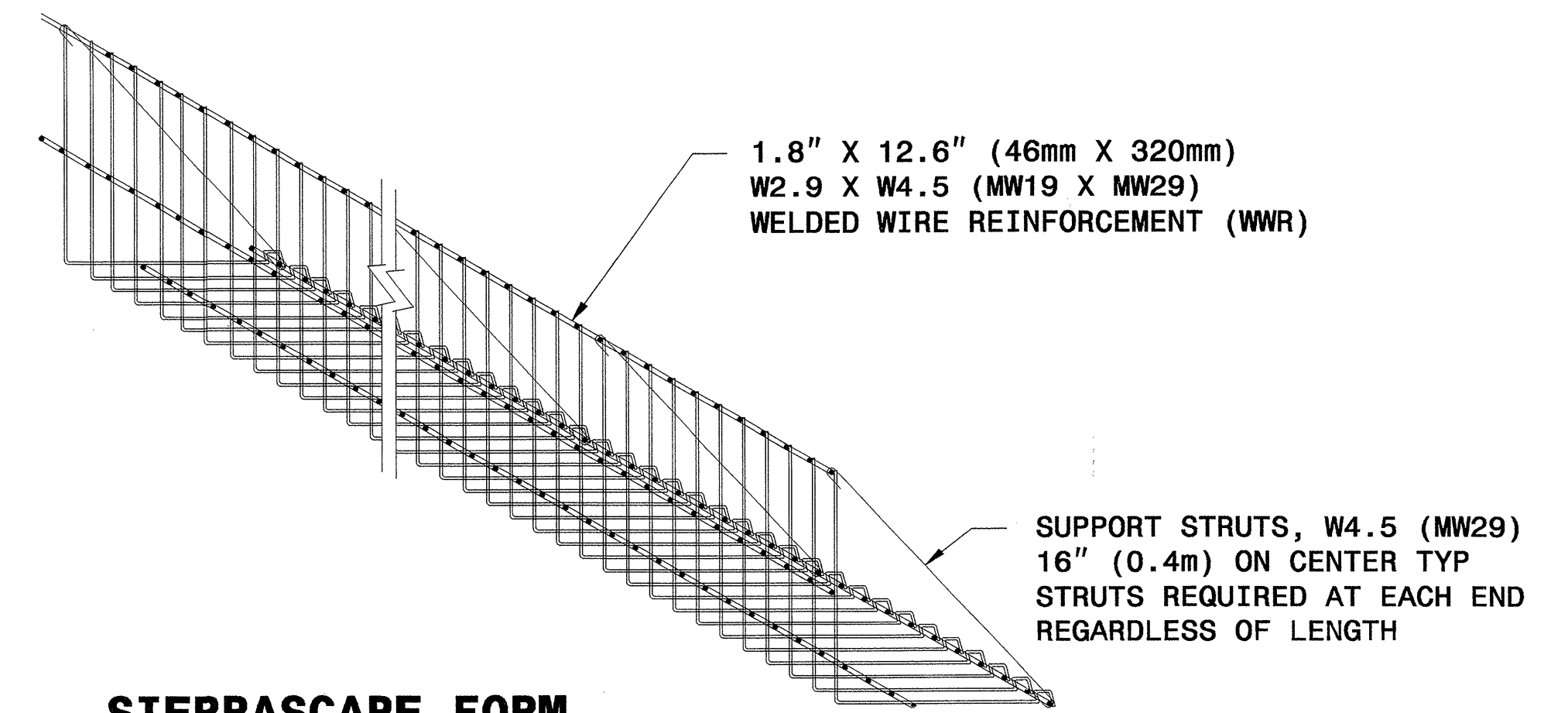
**TYPICAL SECTION**



**ELEVATION VIEW**

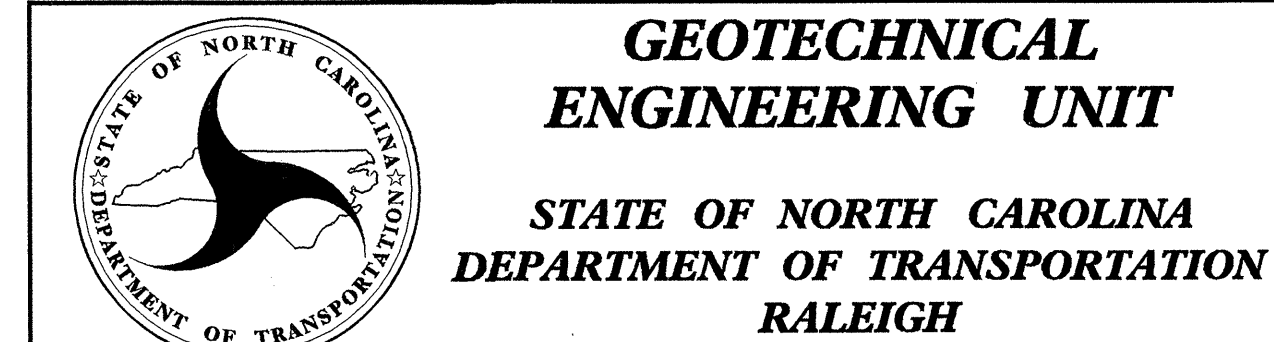
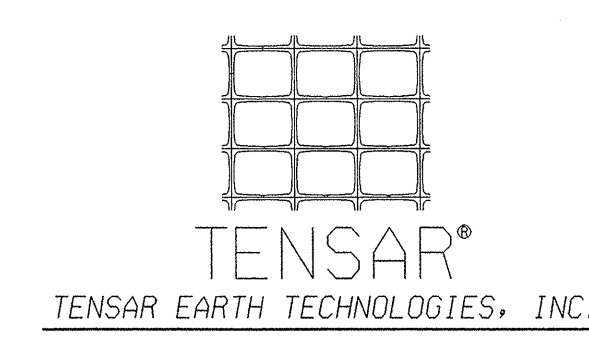


**SUPPORT STRUT**



**SIERRASCAPE FORM**

**WALL COMPONENTS**

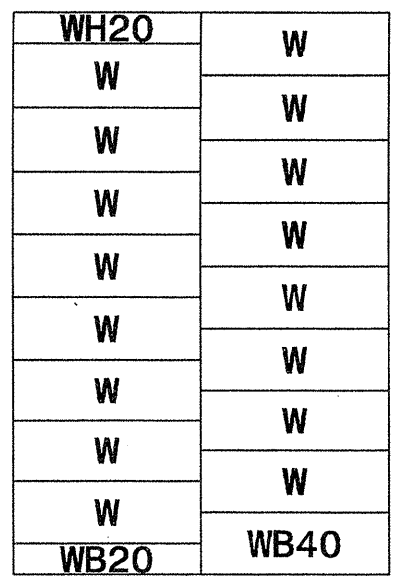
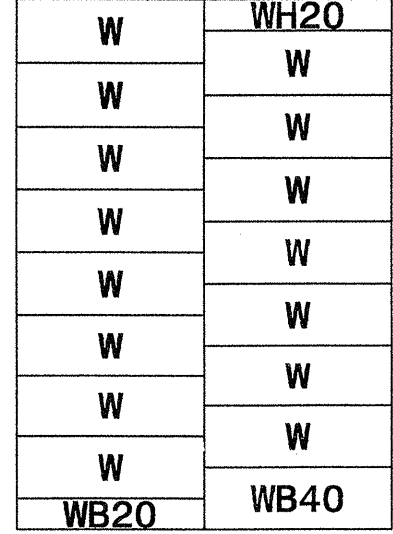
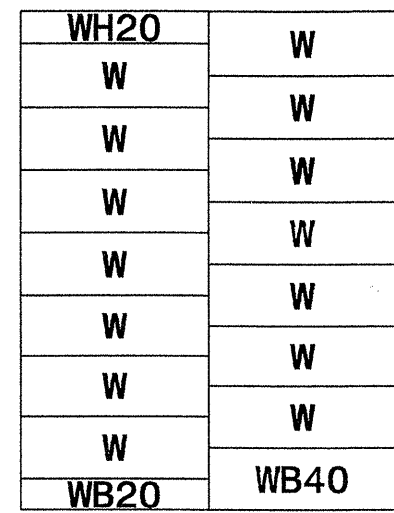
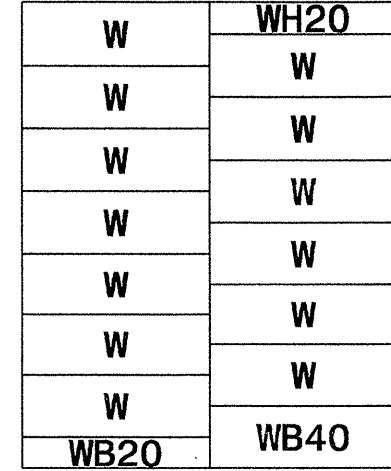
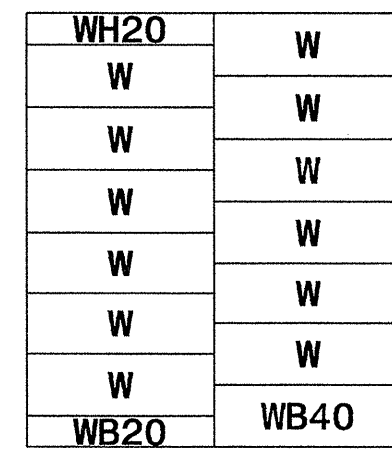
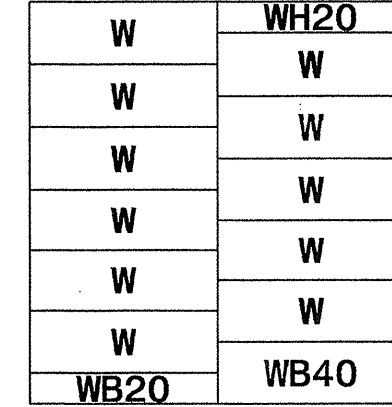
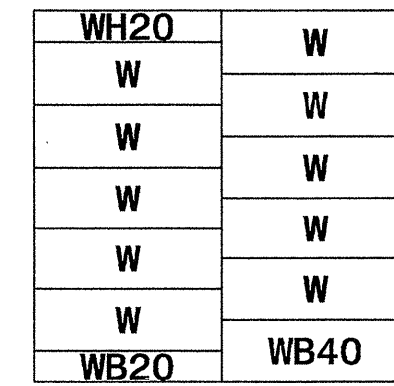
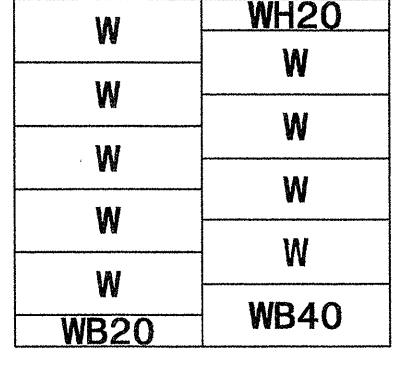
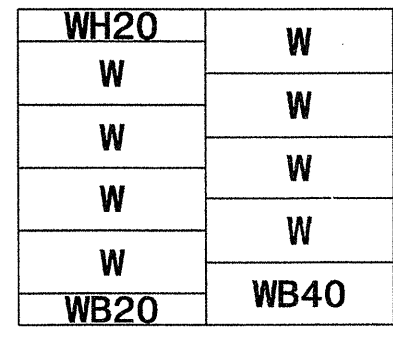
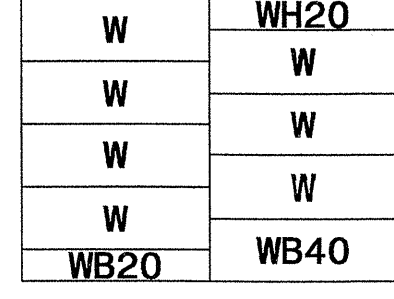
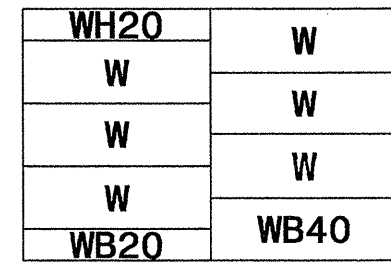
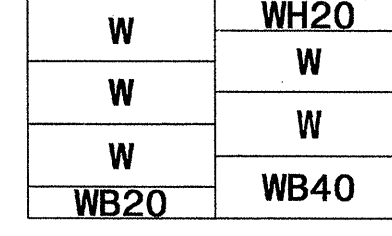
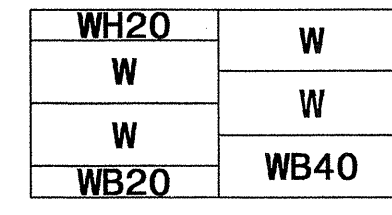
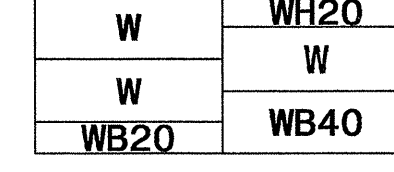
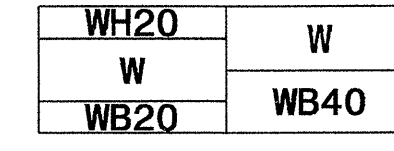
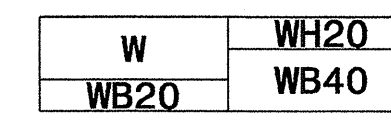


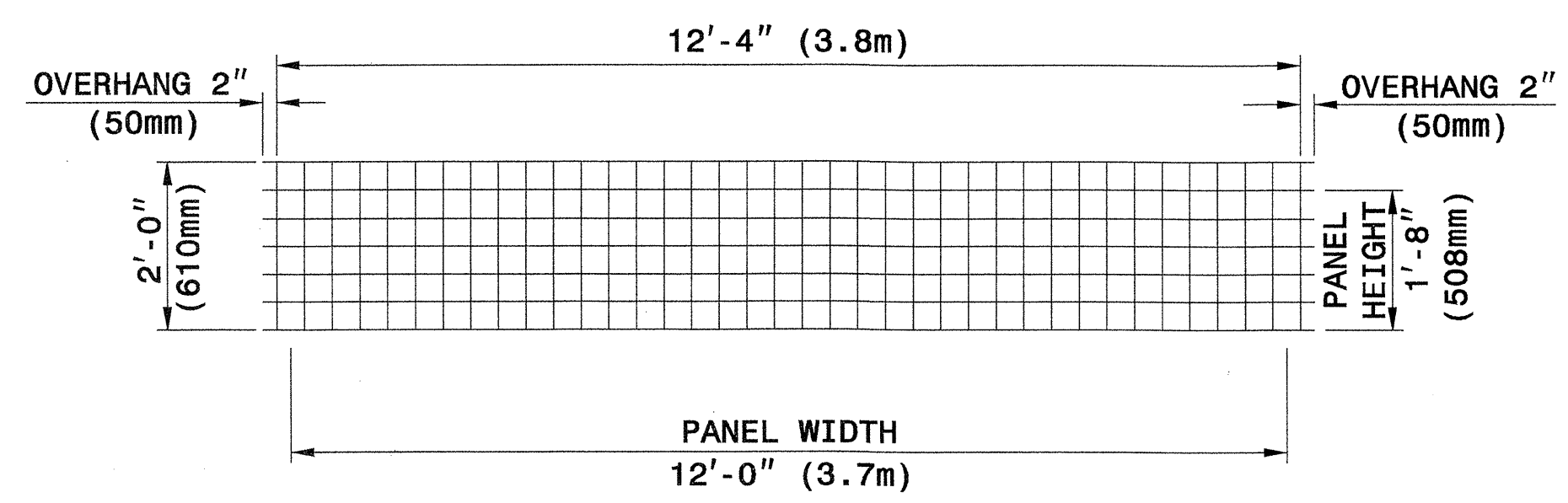
STANDARD DRAWING NO. 1801.02

SIERRASCAPE TEMPORARY WALL

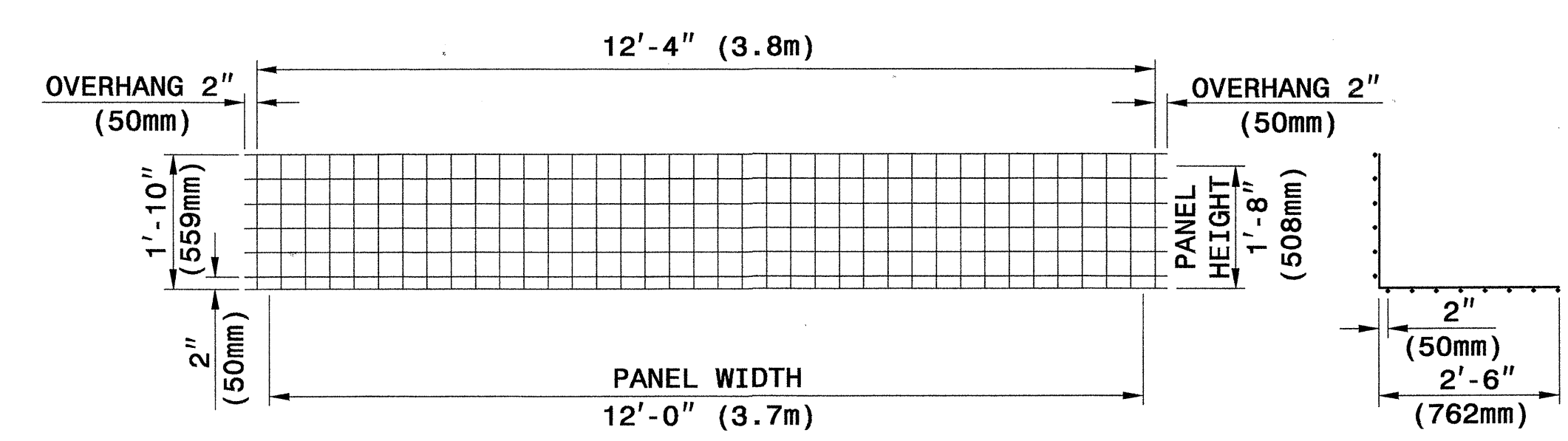
**PANEL LAYOUTS**

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

								
< 28 - 0 < 8.5	< 27 - 0 < 8.2	< 25 - 4 < 7.7	< 23 - 8 < 7.2	< 22 - 0 < 6.7	< 20 - 4 < 6.2	< 18 - 8 < 5.7		
								
< 17 - 0 < 5.2	< 15 - 4 < 4.7	< 13 - 8 < 4.2	< 12 - 0 < 3.7	< 10 - 4 < 3.2	< 8 - 8 < 2.6	< 7 - 0 < 2.1	< 5 - 4 < 1.6	< 3 - 8 < 1.1

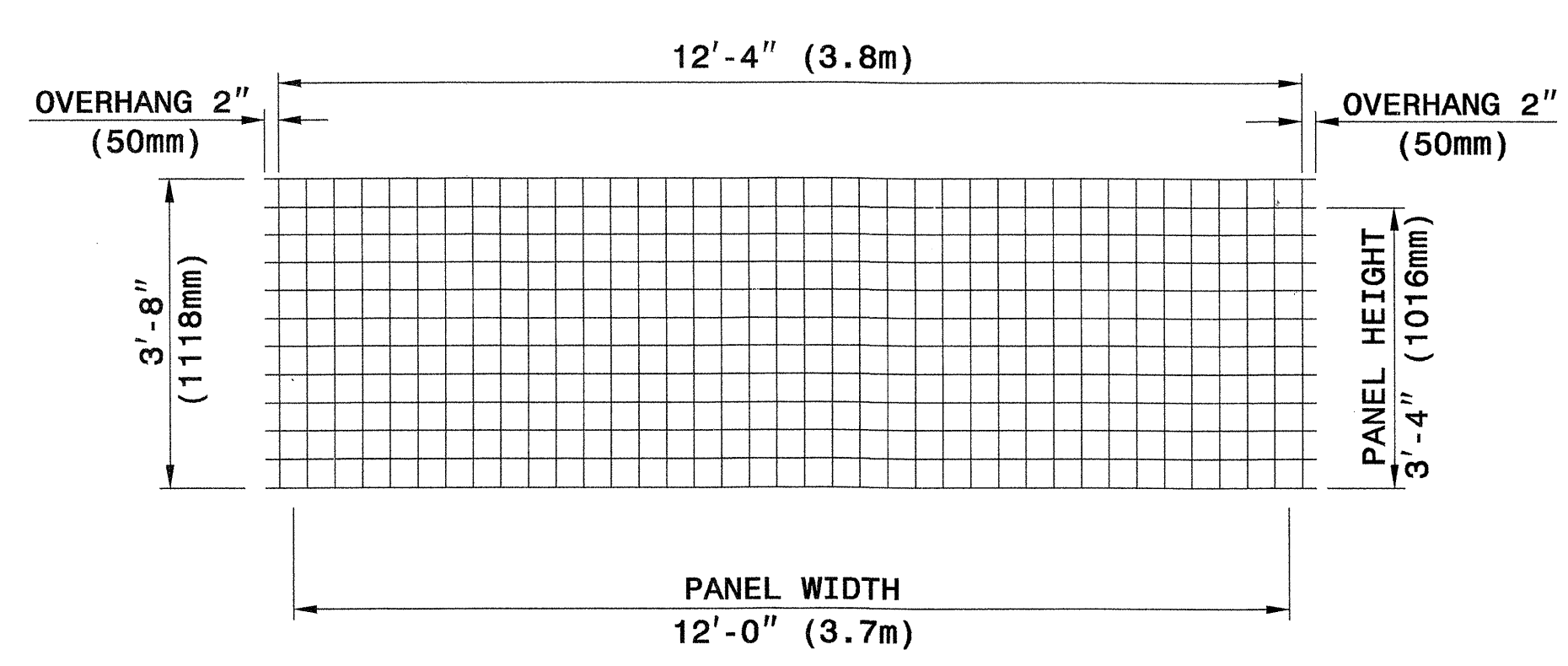


**TYPE WH20**

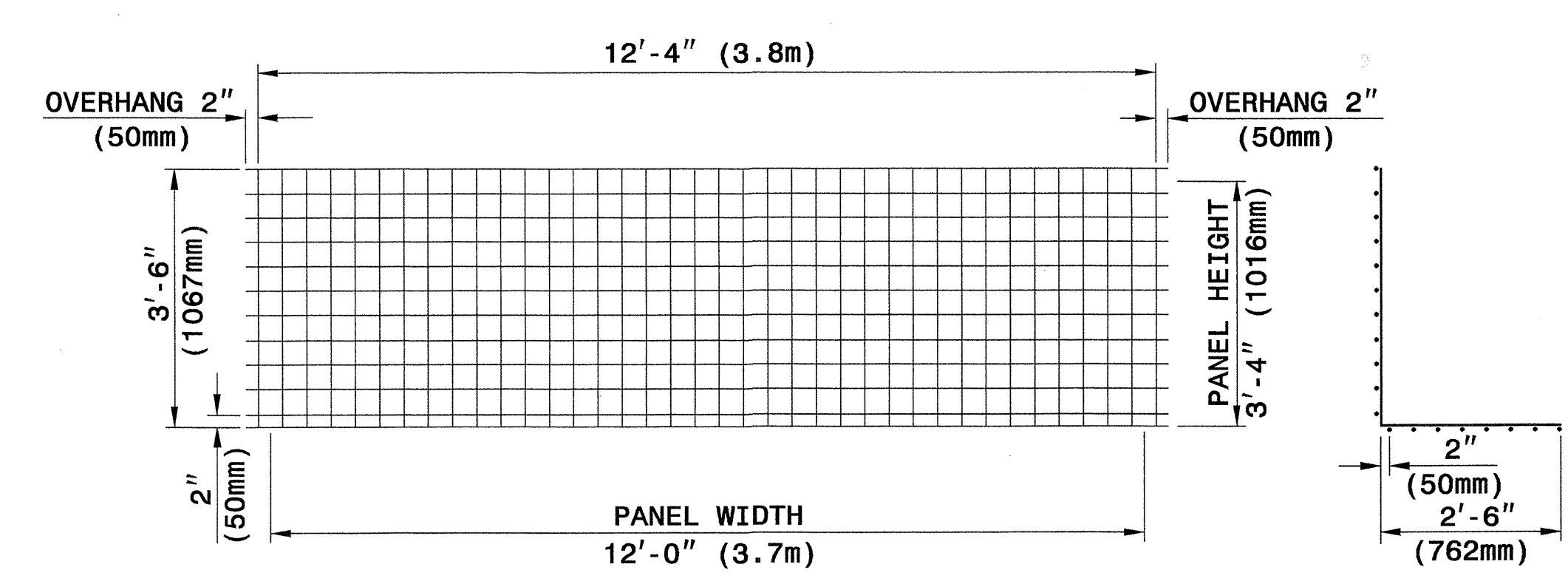


**TYPE WB20**

**SECTION**



**TYPE W**



**TYPE WB40**

**SECTION**

**WELDED WIRE FACINGS**

**WELDED WIRE FORMS**

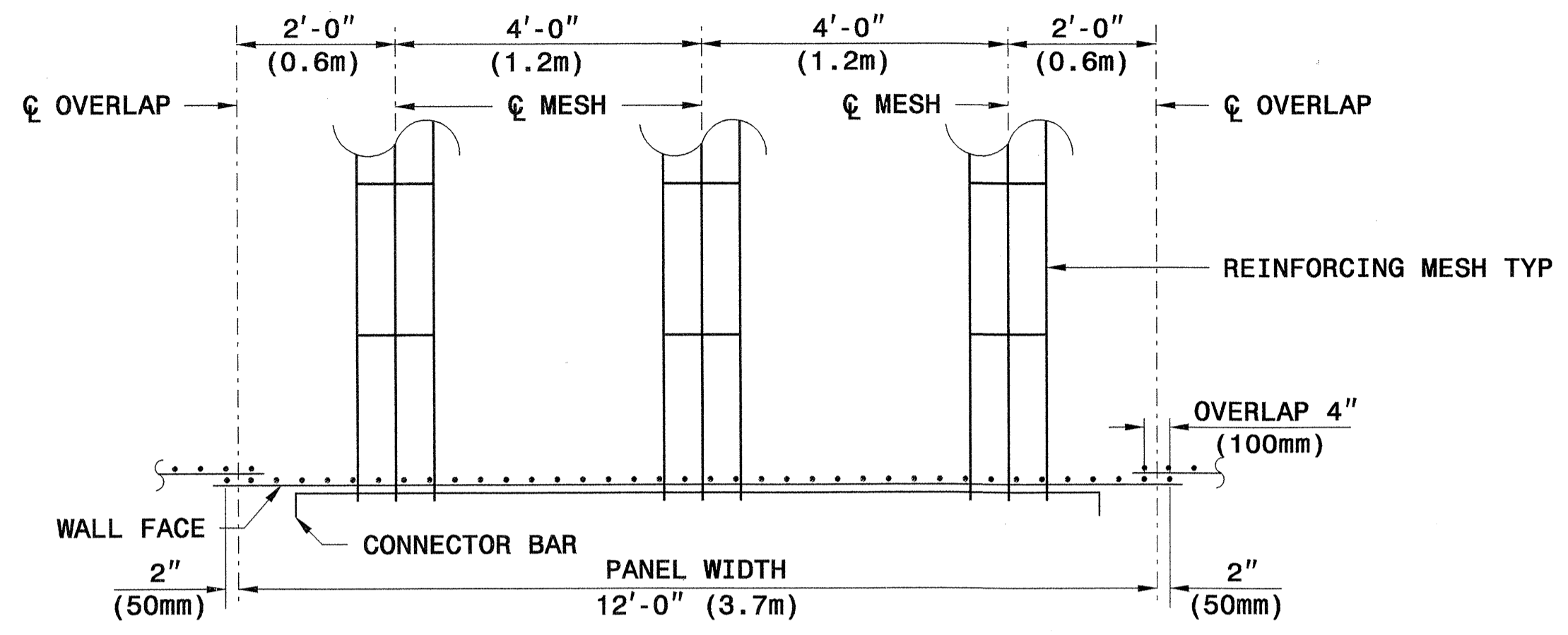
**PANEL TYPES (WELDED WIRE FACINGS AND FORMS)**

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

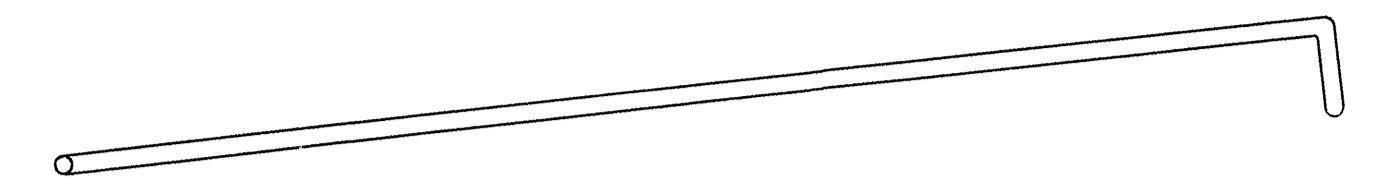


**GEOTECHNICAL ENGINEERING UNIT**  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**STANDARD DRAWING NO. 1801.02**  
**RETAINED EARTH TEMPORARY WALL**  
 SHEET 6 OF 11 DATE: 12-19-06

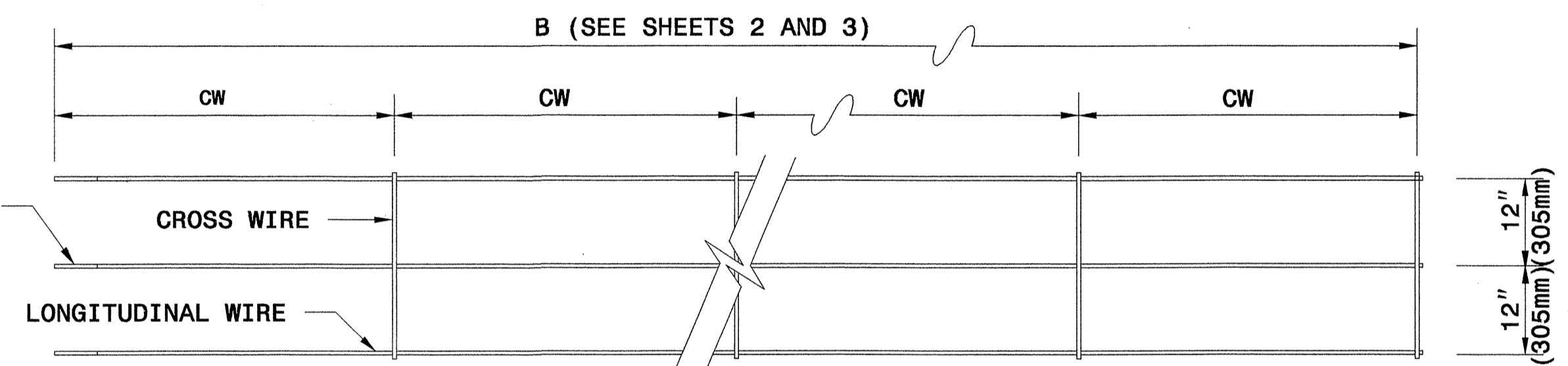


**REINFORCING MESH PLACEMENT DETAIL (PLAN VIEW)**



**CONNECTOR BAR**

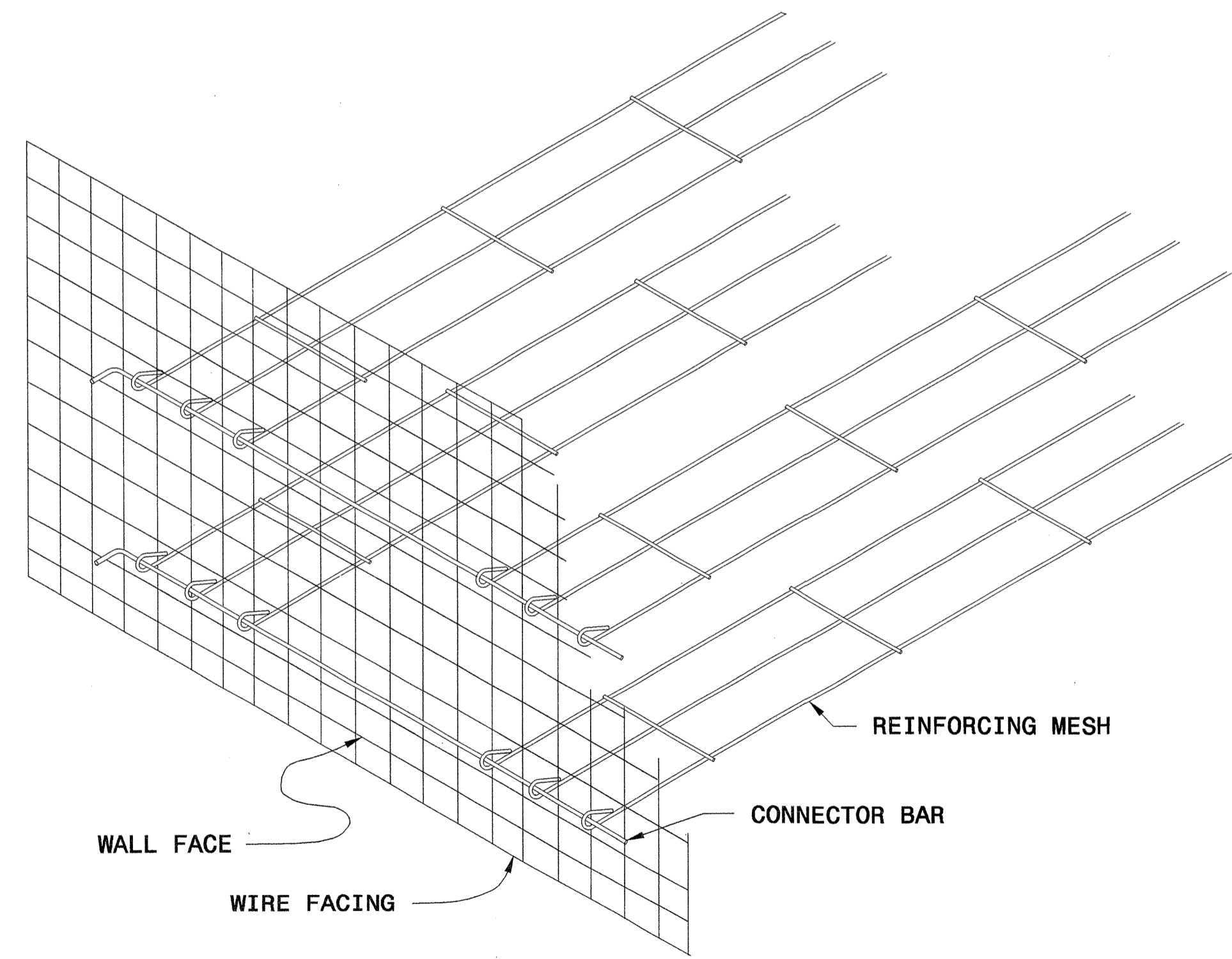
LOOPED END OF MESH (SEE REINFORCING MESH LOOP DETAIL)



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

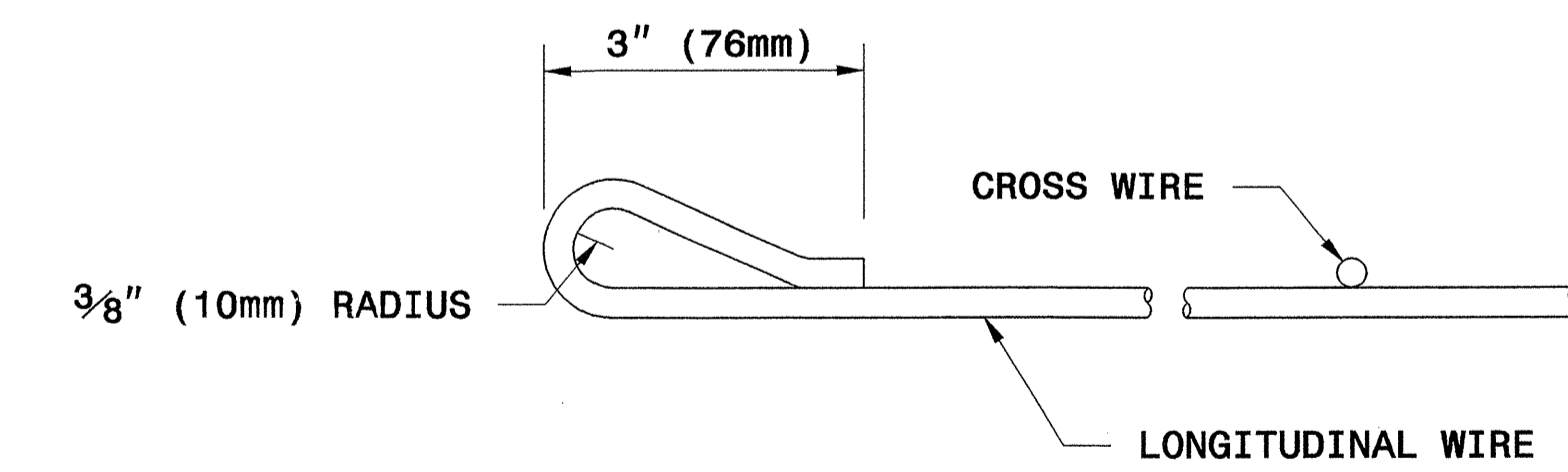
**3W8 X W8 x 2.0' (3MW52 X MW52 X 610mm)**  
 NO. OF LONGITUDINAL WIRES  
 GAUGE OF LONGITUDINAL WIRES  
 GAUGE OF CROSS WIRES  
 SPACING OF CROSS WIRES IN FT (mm), CW

**REINFORCING MESH DESIGNATION**



**GENERAL ASSEMBLY DETAIL**

**REINFORCING MESH**



**REINFORCING MESH LOOP DETAIL**



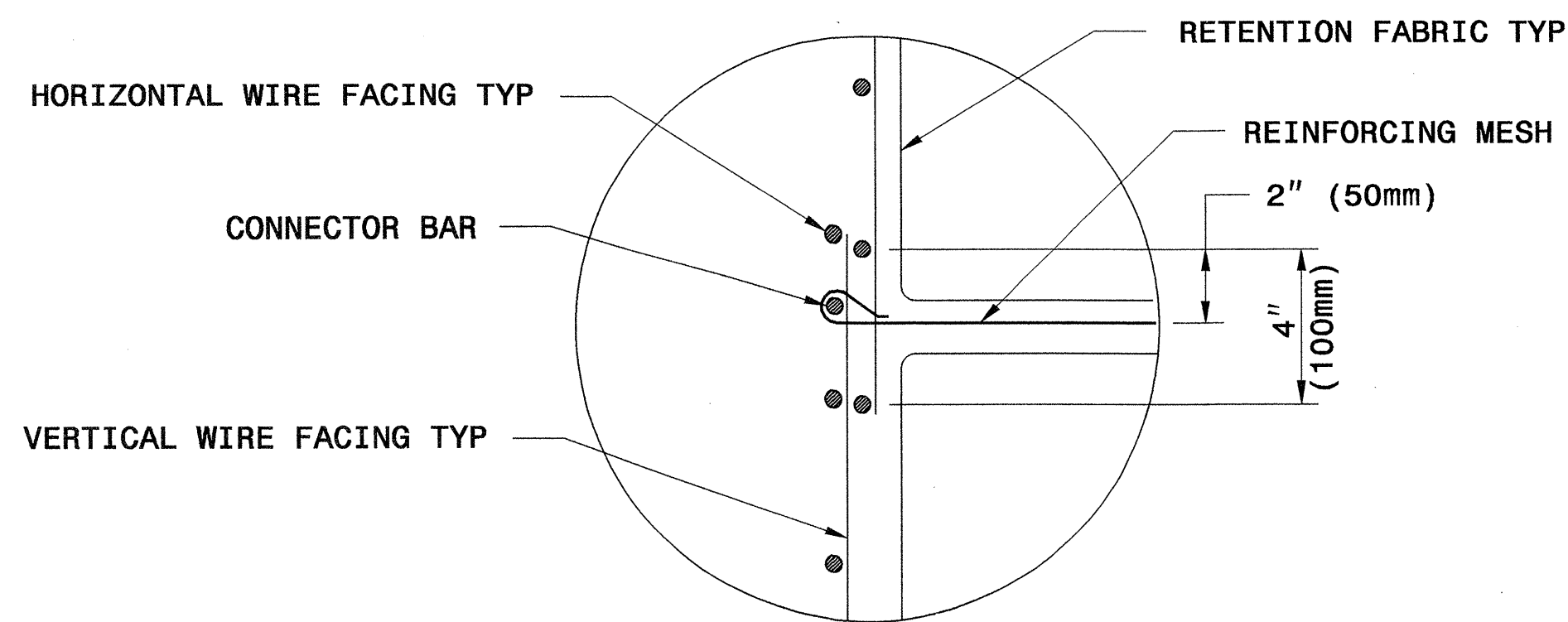


GEOTECHNICAL ENGINEER

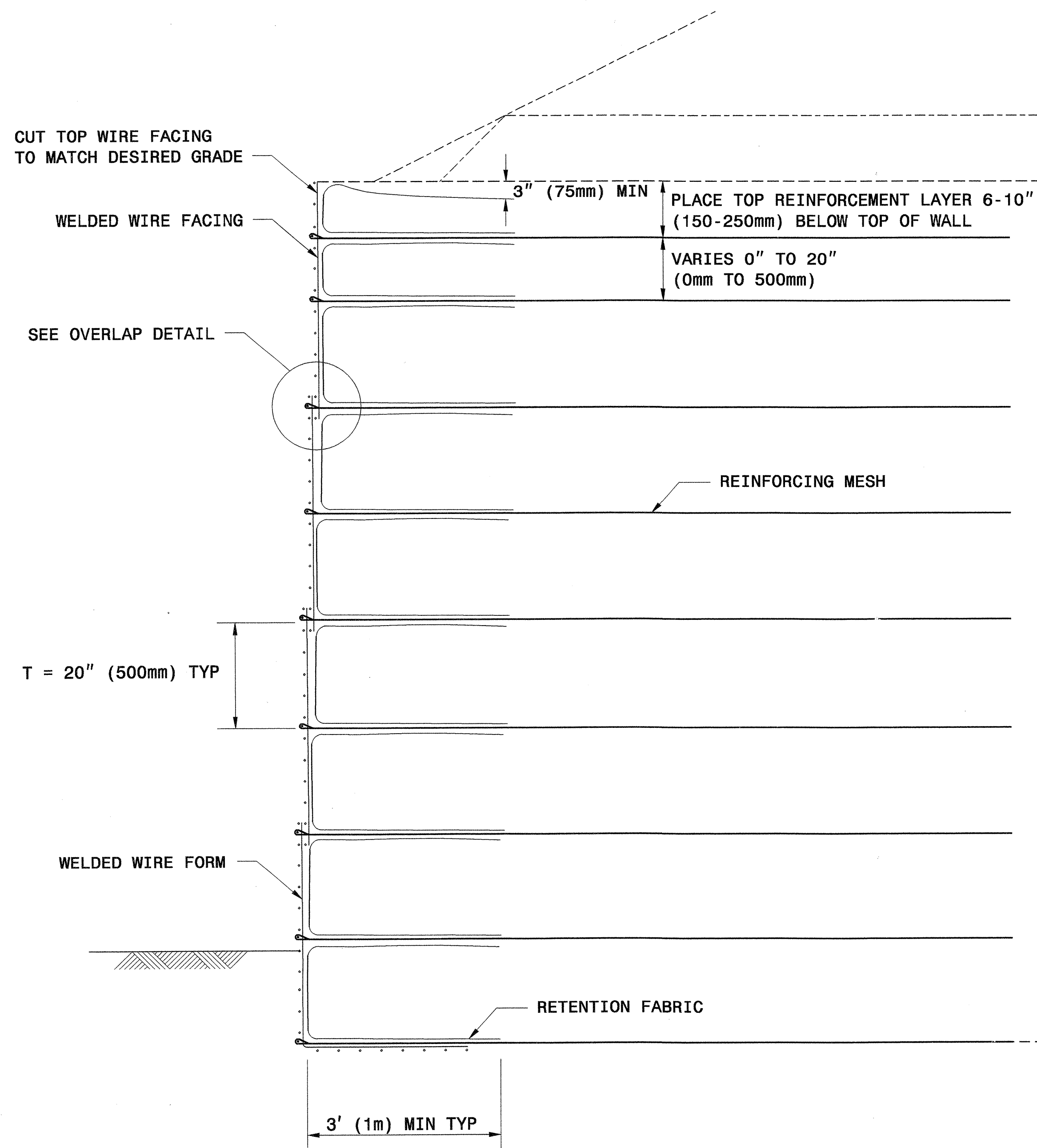
ENGINEER



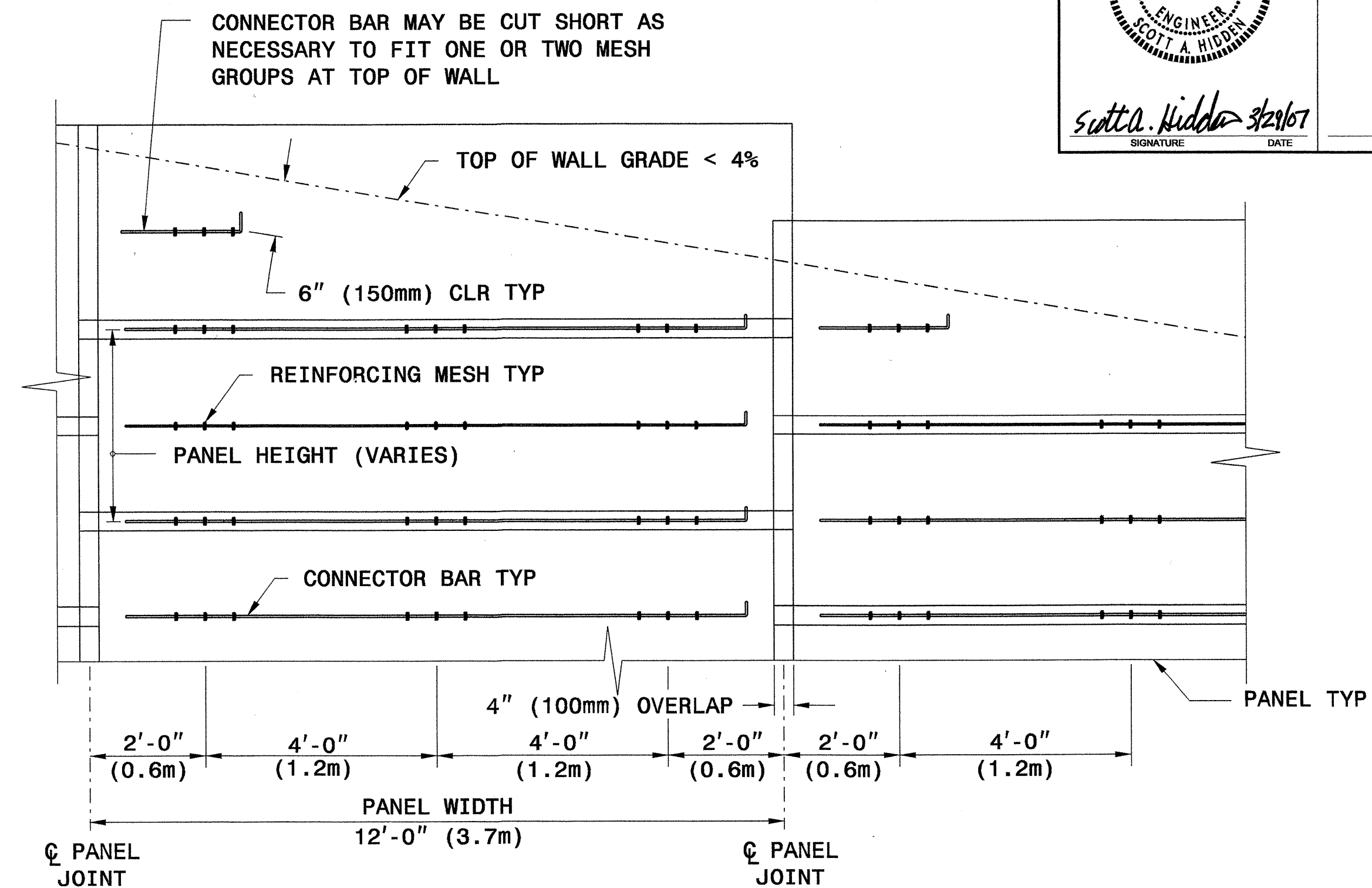
Signature: Scott A. Hadden  
Date: 3/29/07



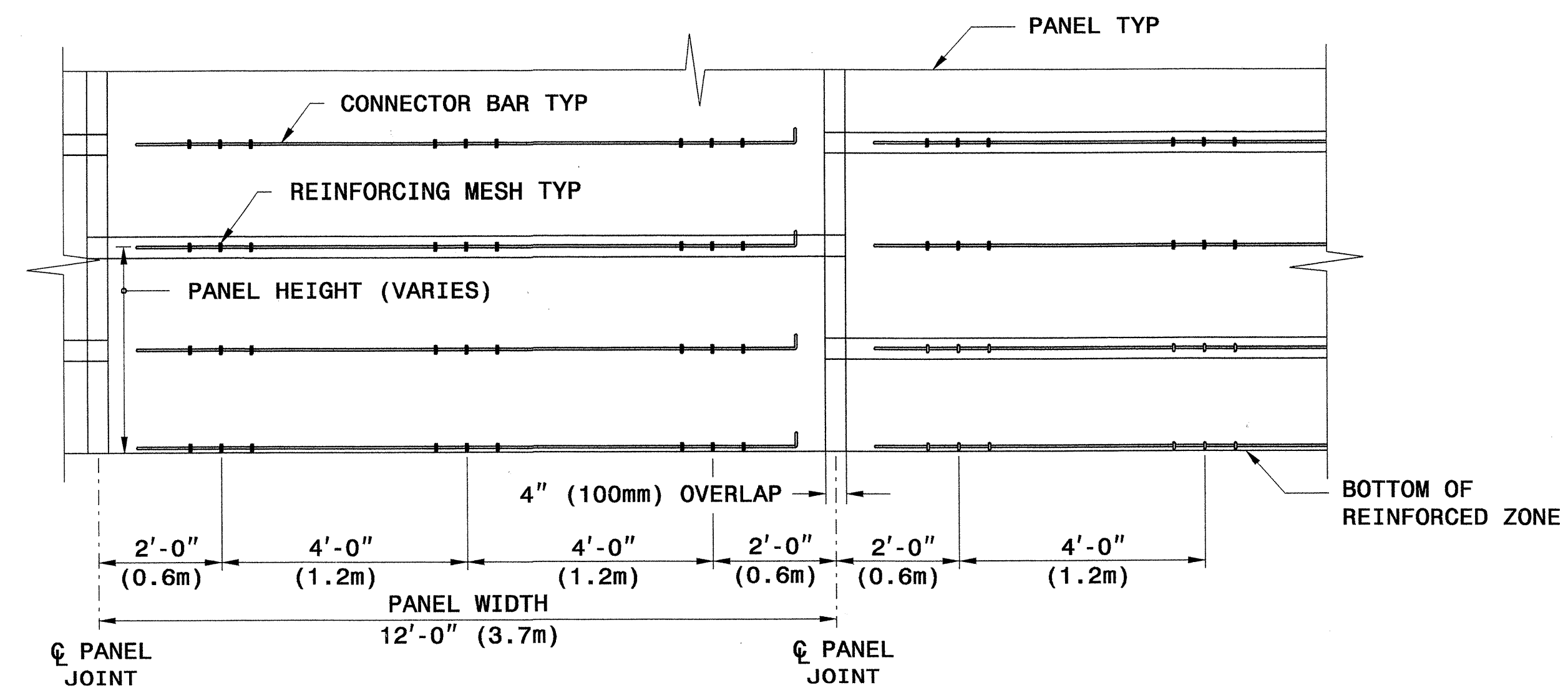
**OVERLAP DETAIL**



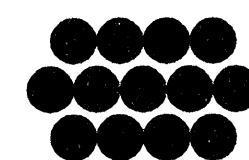
**TYPICAL SECTION**



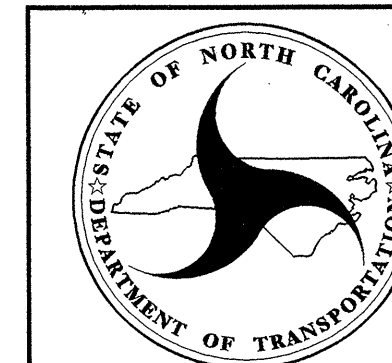
**TYPICAL ELEVATION @ TOP OF WALL  
(WIRES NOT SHOWN FOR CLARITY)**



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



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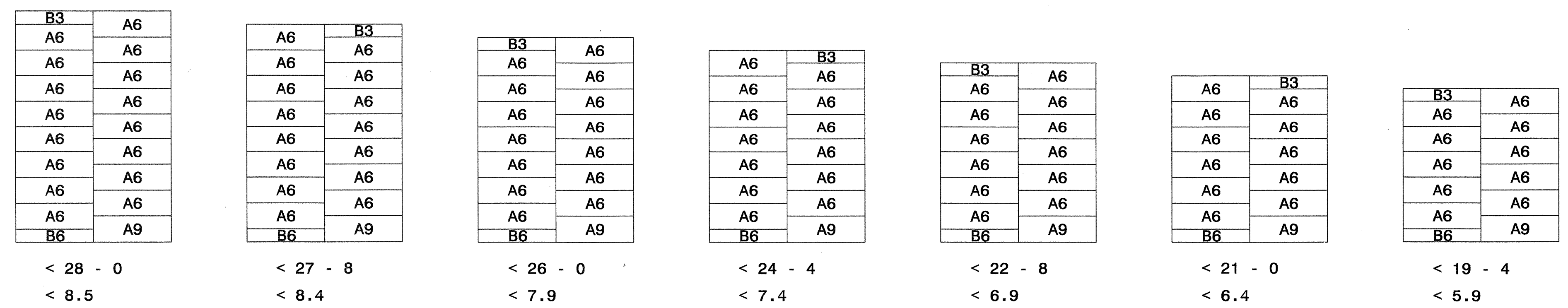
**GEOTECHNICAL ENGINEERING UNIT**  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD DRAWING NO. 1801.02

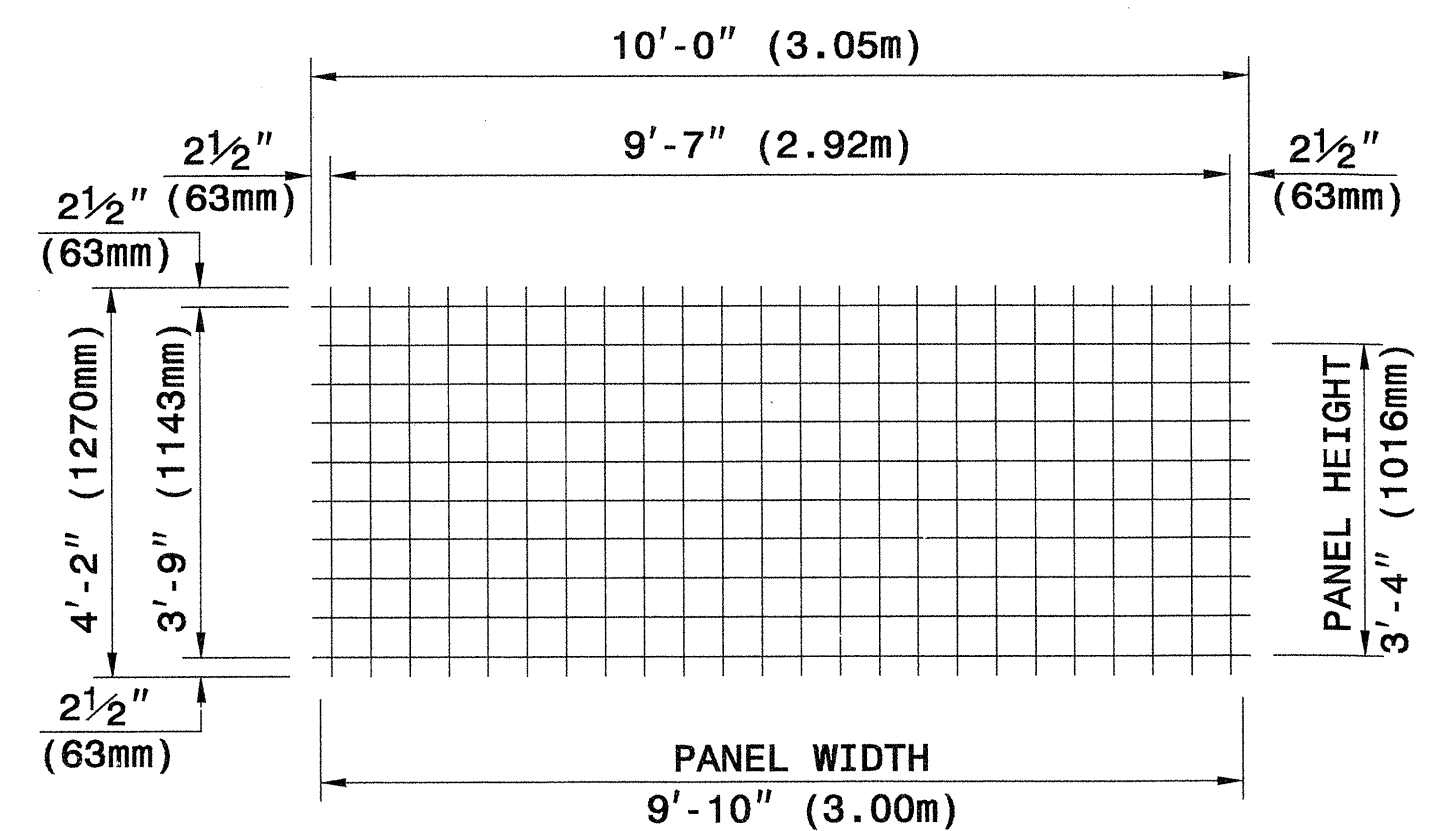
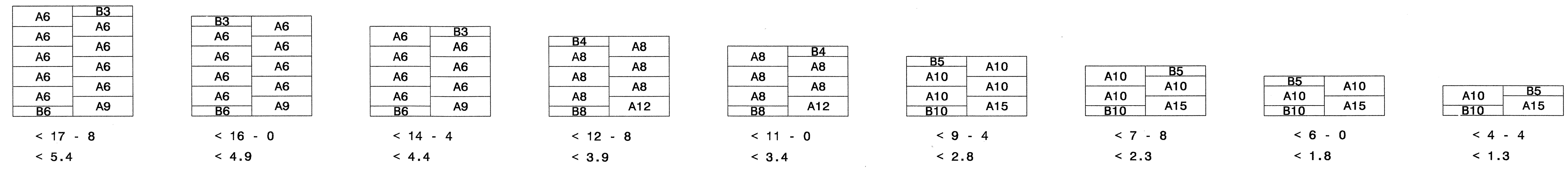
RETAINED EARTH  
TEMPORARY WALL

**PANEL LAYOUTS**

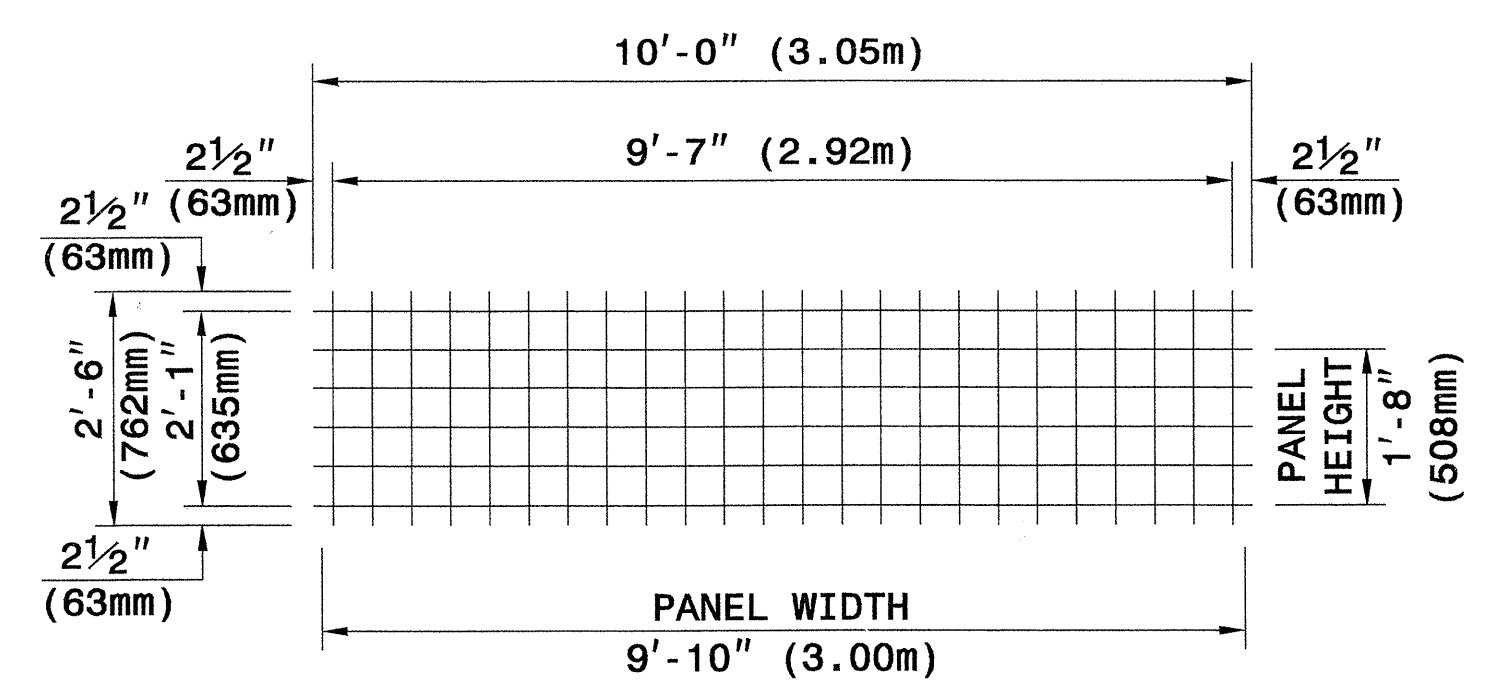
H - WALL HEIGHT  
(FEET-INCHES)  
(METER)



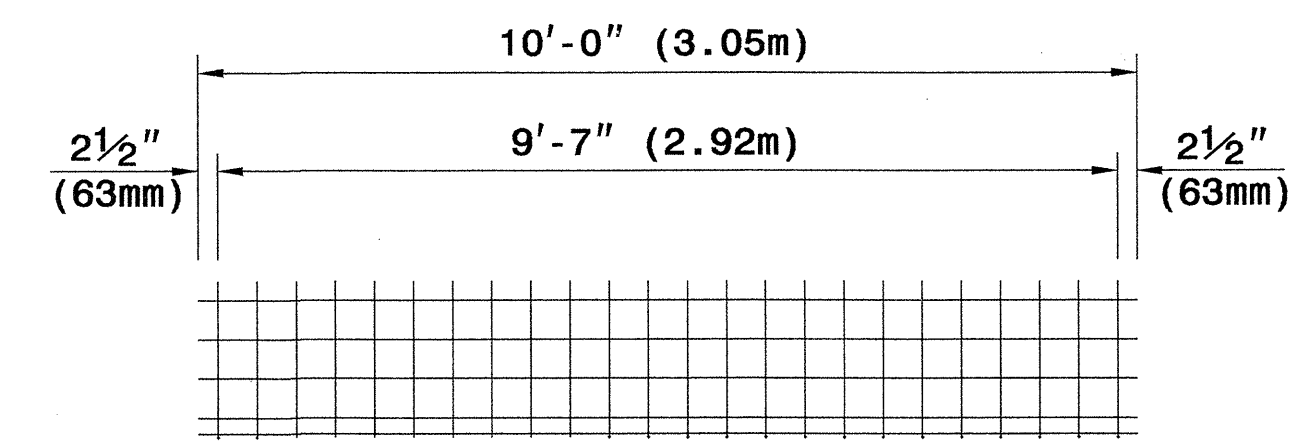
(FEET-INCHES)  
(METER)



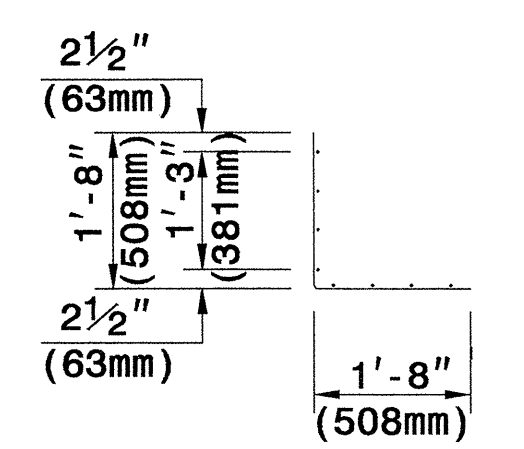
**TYPE A**



**TYPE B**



**WELDED WIRE FORM**



**SECTION**

**WELDED WIRE FACINGS**

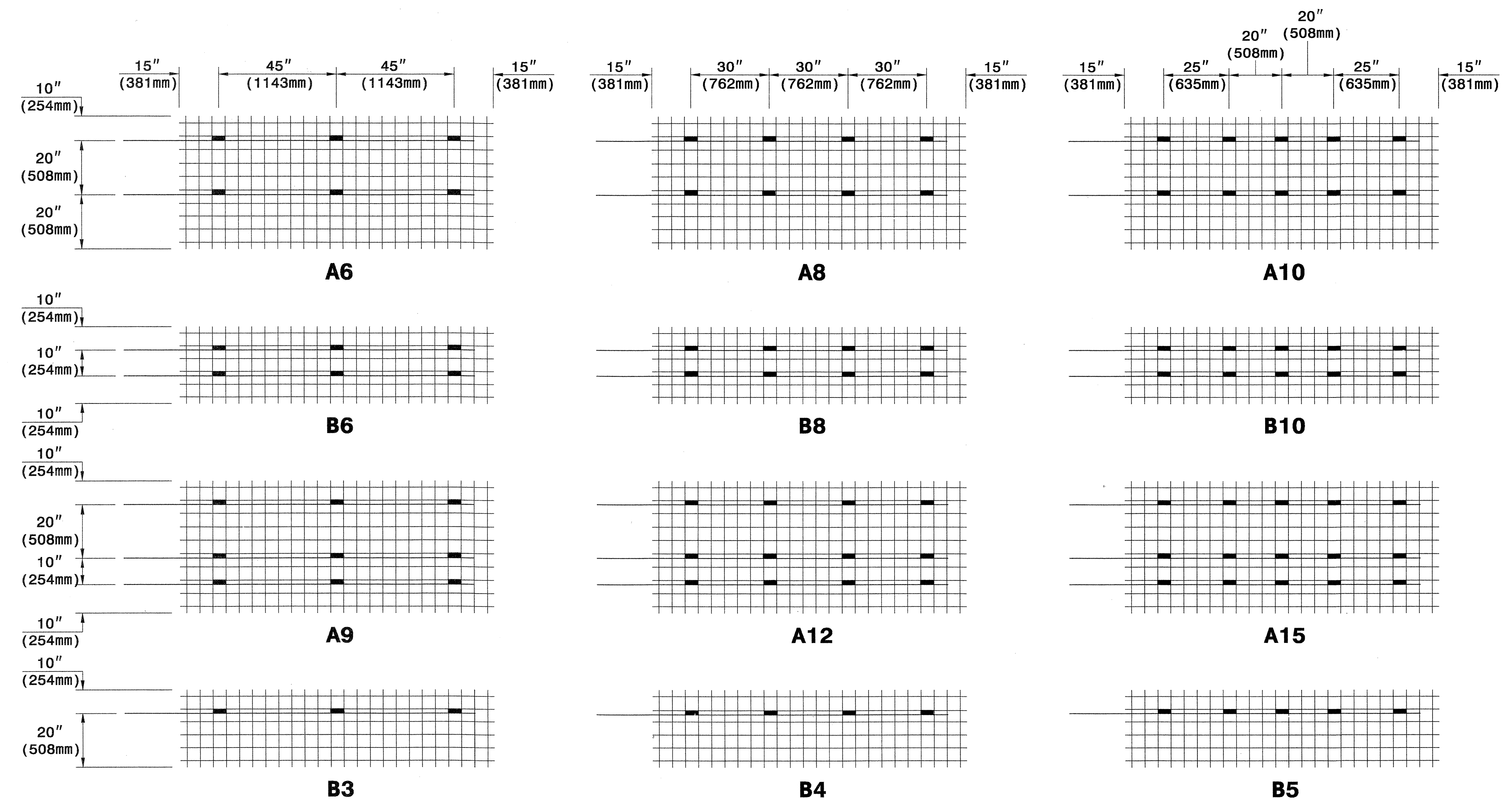
**PANEL TYPES (WELDED WIRE FACINGS AND FORM)**

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



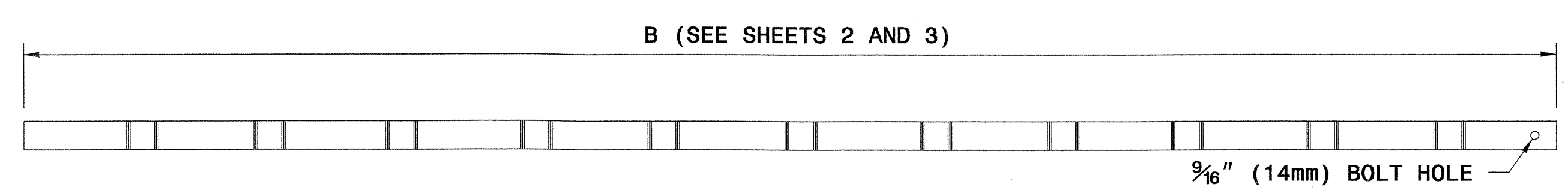
**GEOTECHNICAL ENGINEERING UNIT**  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD DRAWING NO. 1801.02  
**TERRATREL TEMPORARY WALL**  
SHEET 9 OF 11      DATE: 12-19-06

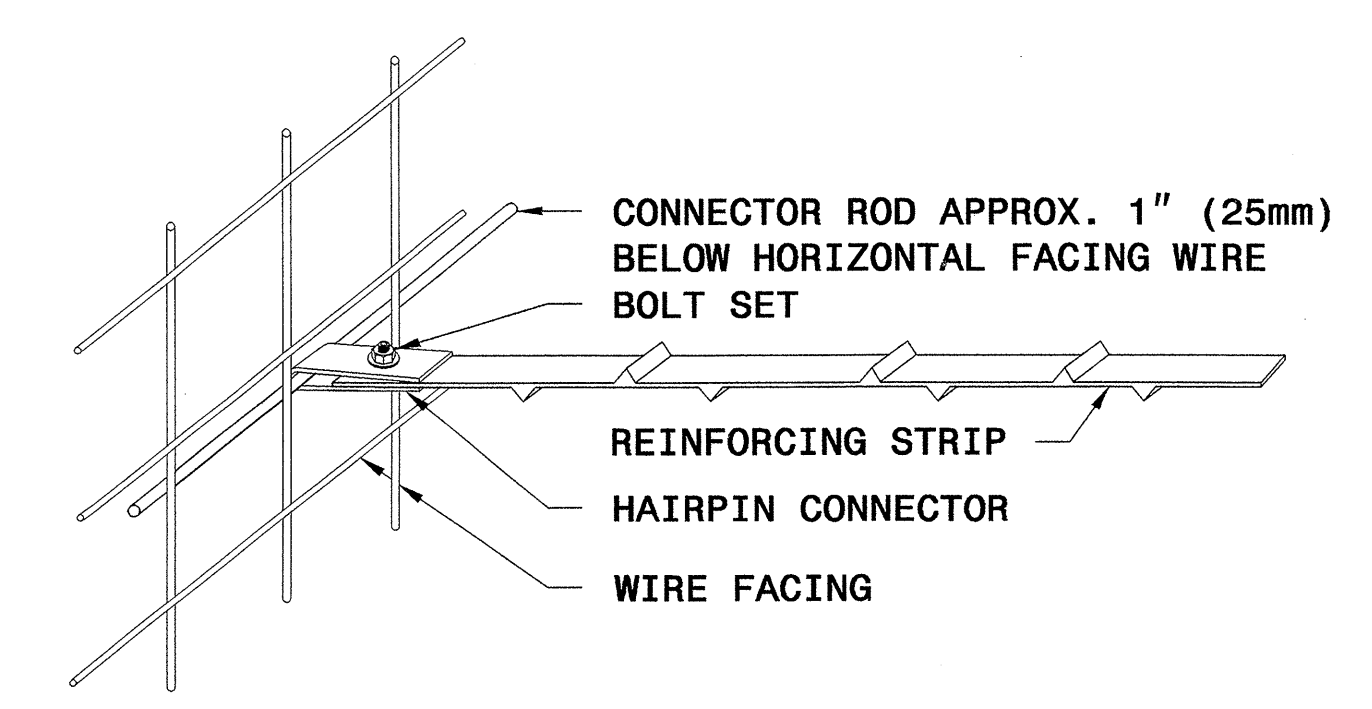


**KEY: A8**  
 NUMBER OF REINFORCING STRIPS  
 PANEL TYPE

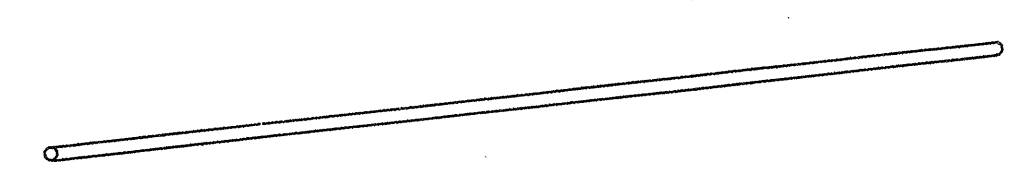
**CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS**



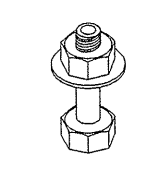
**REINFORCING STRIP - 2" X 5/32" (50mm X 4mm)**



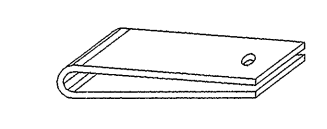
**STRIP TO FACING CONNECTION**



1/2" (13mm) DIA. ROD  
**CONNECTOR ROD**

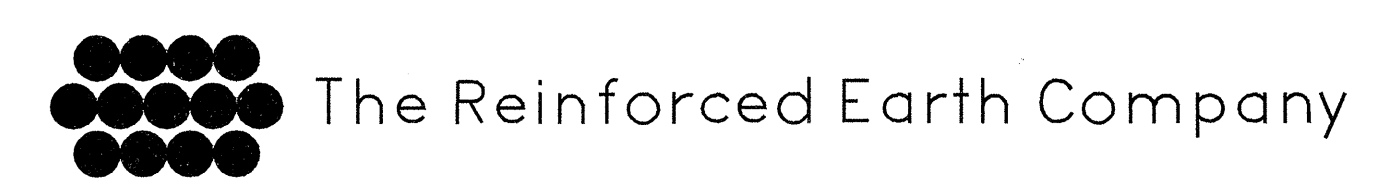


1/2" (13mm) BOLT WITH NUT AND WASHER  
**BOLT SET**



**HAIRPIN CONNECTOR**

**WALL COMPONENTS**



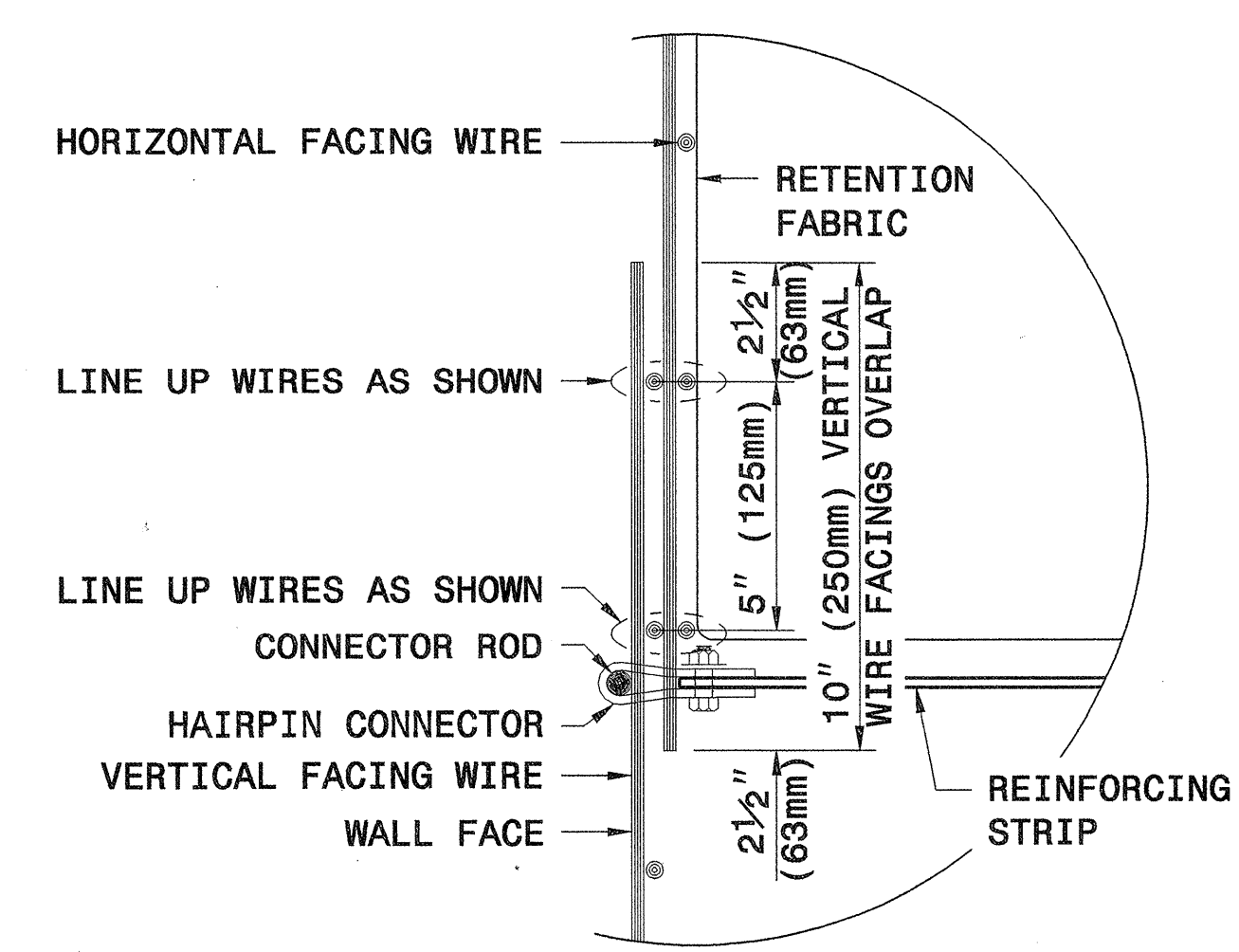
**GEOTECHNICAL ENGINEERING UNIT**  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD DRAWING NO. 1801.02  
**TERRATREL TEMPORARY WALL**  
 SHEET 10 OF 11 DATE: 12-19-06

GEOTECHNICAL ENGINEER ENGINEER

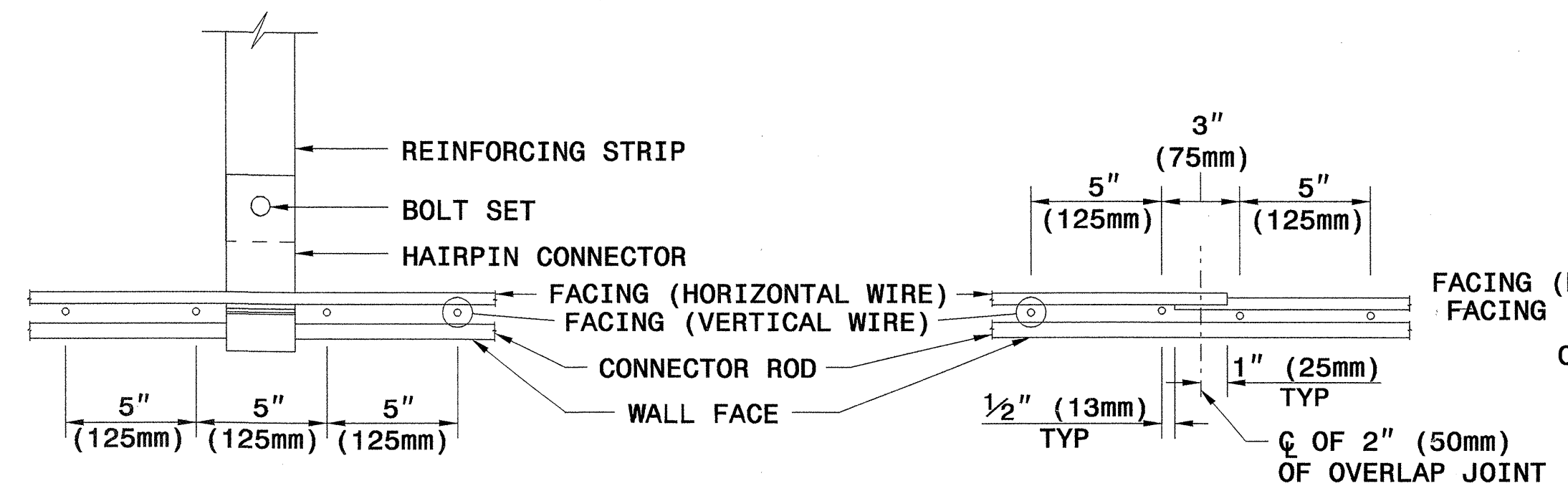
SEAL 022246  
SCOTT A. HIDDEN

Signature: *Scott A. Hidden* DATE: \_\_\_\_\_

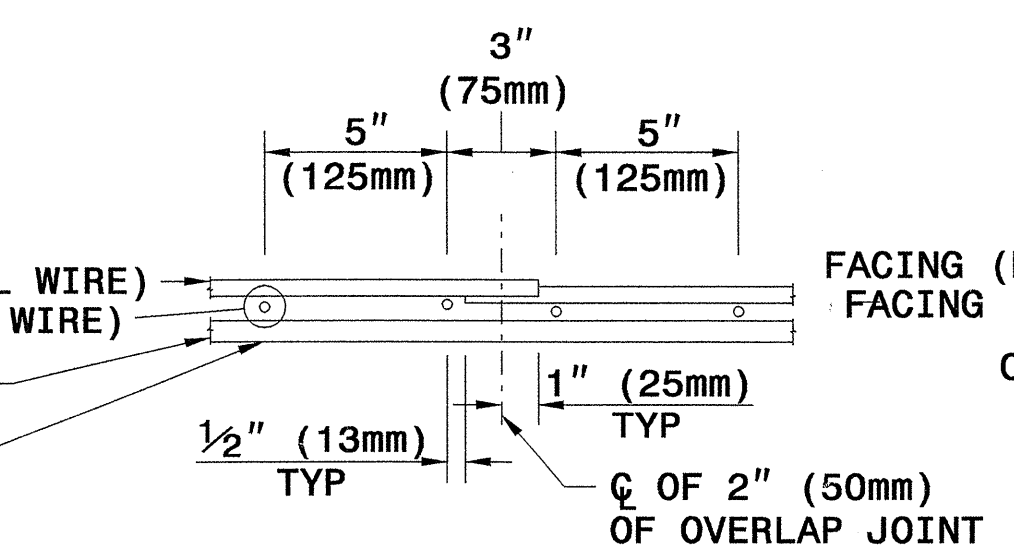


OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

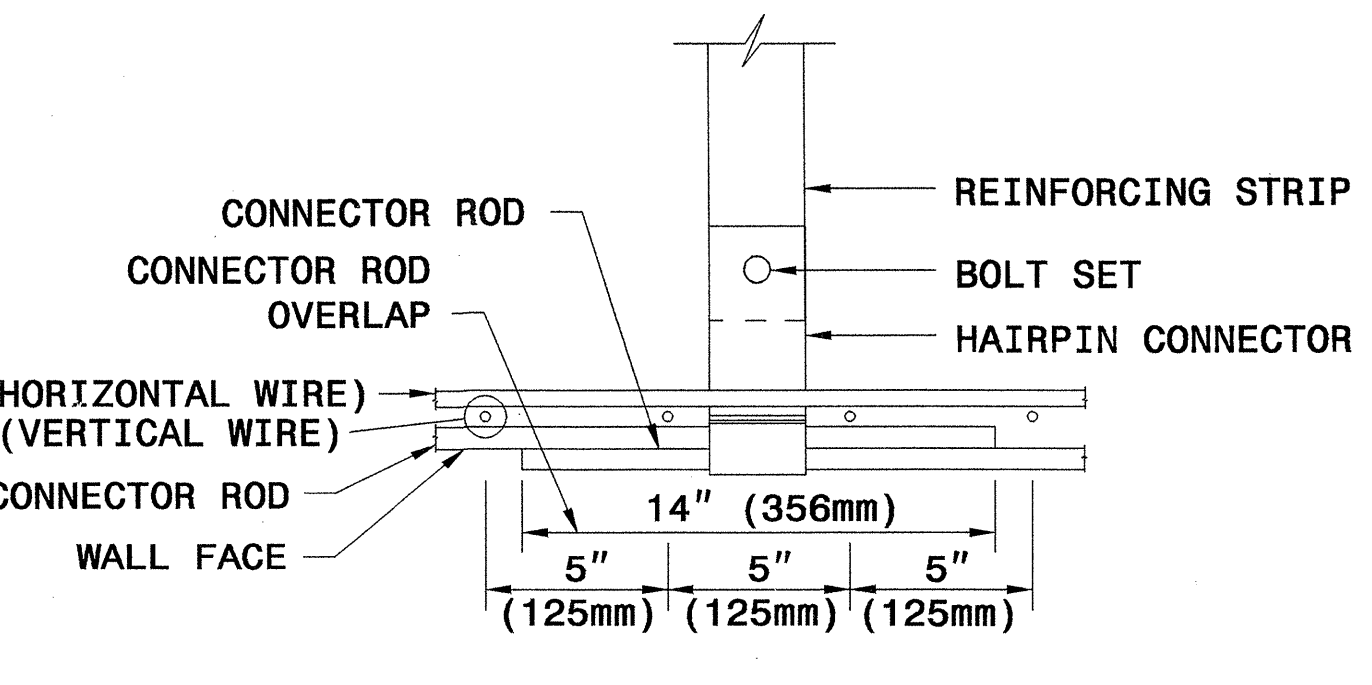
**VERTICAL OVERLAP DETAIL**



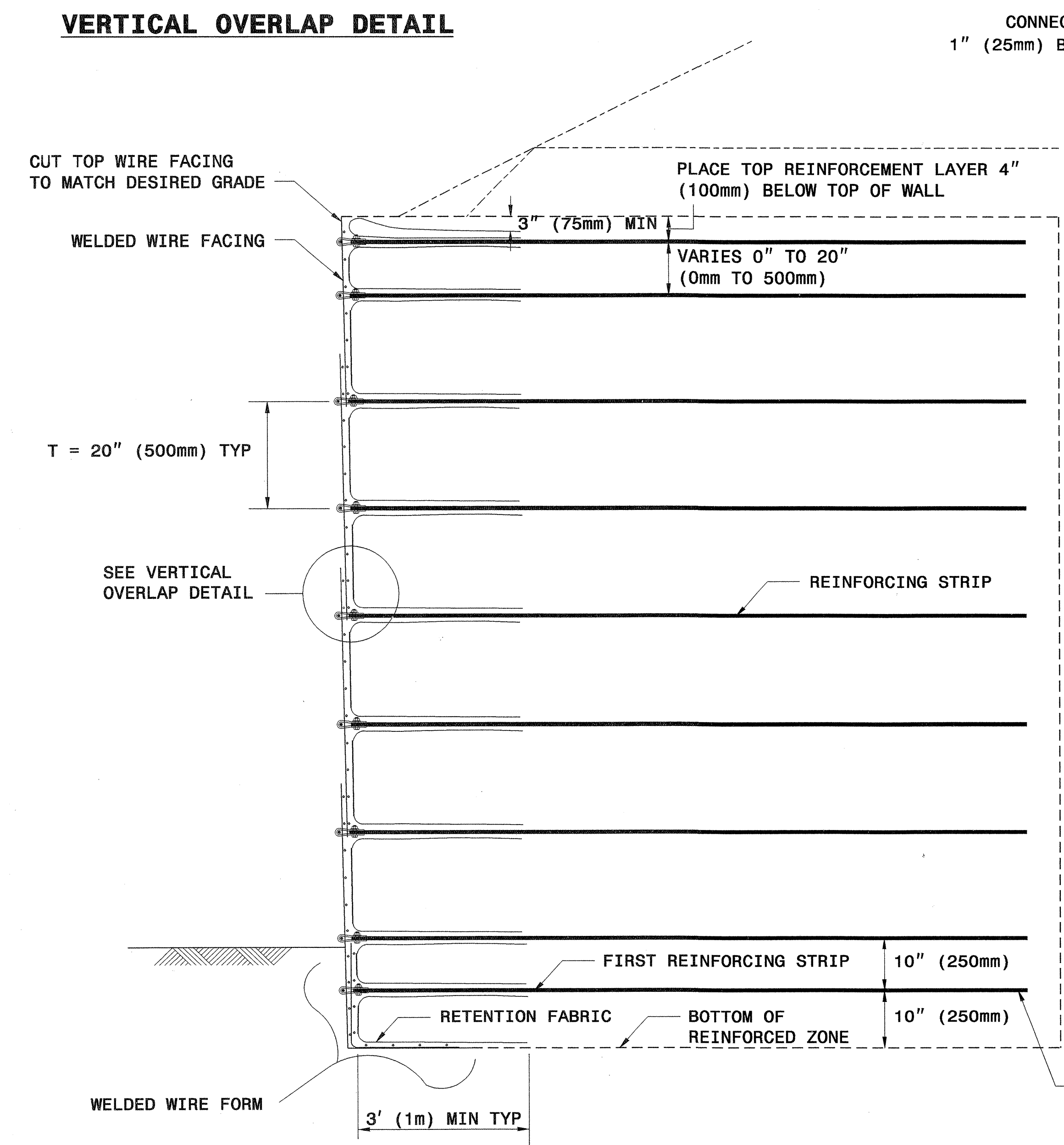
**PLAN DETAIL 'A' STRIP CONNECTION**



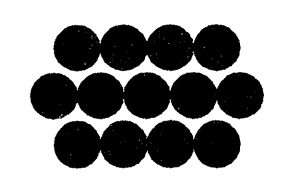
**PLAN DETAIL 'B' HORIZONTAL OVERLAP DETAIL**



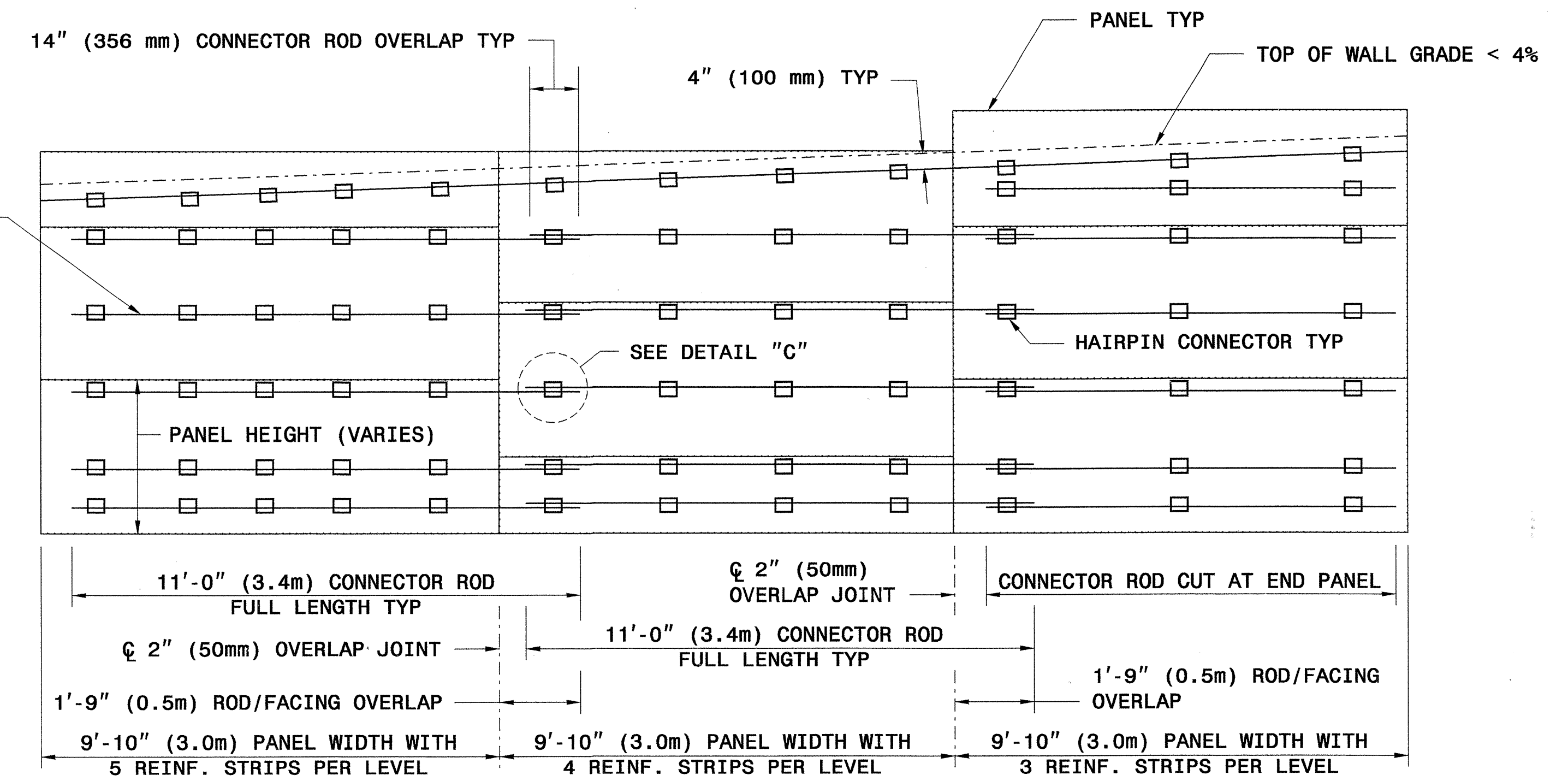
**PLAN DETAIL 'C' STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL**



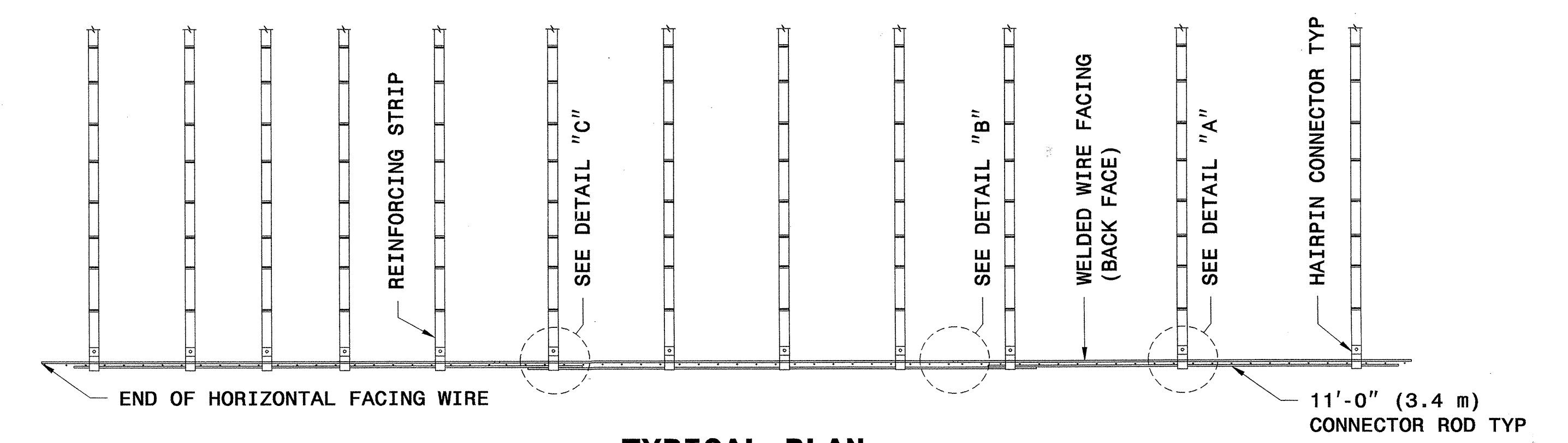
**TYPICAL SECTION**



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**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

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201757					ItemNumber	Sec #	Quantity	Unit	Description
000100000-N	800	Lump Sum		MOBILIZATION	444500000-E	1145	48	LF	BARRICADES (TYPE III)
000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING	445000000-N	1150	512	HR	FLAGGER
002900000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (22+07.50)	448000000-N	1165	1	EA	TMLA
004300000-N	226	Lump Sum		GRADING	465000000-N	1251	68	EA	TEMPORARY RAISED PAVEMENT MARKERS
005000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB- BING	481000000-E	1205	14,616	LF	PAINT PAVEMENT MARKING LINES (4")
005700000-E	226	1,000	CY	UNDERCUT EXCAVATION	484700000-E	1205	3,800	LF	POLYUREA PAVEMENT MARKING LINES (4", *****) (STANDARD GLASS BEADS)
008000000-E	SP	1,000	TON	CLASS IV SUBGRADE STABILIZA- TION	490000000-N	1251	12	EA	PERMANENT RAISED PAVEMENT MARKERS
013400000-E	240	30	CY	DRAINAGE DITCH EXCAVATION	532580000-E	1510	118	LF	8" WATER LINE
019500000-E	265	1,500	CY	SELECT GRANULAR MATERIAL	580100000-E	1530	146	LF	ABANDON 8" UTILITY PIPE
019600000-E	270	2,000	SY	FABRIC FOR SOIL STABILIZATION	600000000-E	1605	2,000	LF	TEMPORARY SILT FENCE
019900000-E	SP	200	SF	TEMPORARY SHORING	600600000-E	1610	150	TON	STONE FOR EROSION CONTROL, CLASS A
031800000-E	300	20	TON	FOUNDATION CONDITIONING MATE- RIAL, MINOR STRS	600900000-E	1610	210	TON	STONE FOR EROSION CONTROL, CLASS B
034300000-E	310	20	LF	15" SIDE DRAIN PIPE	601200000-E	1610	65	TON	SEDIMENT CONTROL STONE
037200000-E	310	76	LF	18" RC PIPE CULVERTS, CLASS III	601500000-E	1615	2.5	ACR	TEMPORARY MULCHING
070800000-E	310	64	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK	601800000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
080600000-E	310	4	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK	602100000-E	1620	0.5	TON	FERTILIZER FOR TEMPORARY SEED- ING
095000000-E	340	96	LF	PIPE REMOVAL	602400000-E	1622	100	LF	TEMPORARY SLOPE DRAINS
112100000-E	520	811	TON	AGGREGATE BASE COURSE	602700000-N	1622	3	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
122000000-E	545	20	TON	INCIDENTAL STONE BASE	602900000-E	SP	300	LF	SAFETY FENCE
127500000-E	600	630	GAL	PRIME COAT	603000000-E	1630	540	CY	SILT EXCAVATION
133000000-E	607	50	SY	INCIDENTAL MILLING	603600000-E	1631	900	SY	MATting FOR EROSION CONTROL
148900000-E	610	300	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B	603700000-E	SP	40	SY	COIR FIBER MAT
149800000-E	610	230	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE 119.0B	604200000-E	1632	25	LF	1/4" HARDWARE CLOTH
152500000-E	610	690	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A	6071030000-E	SP	125	LF	COIR FIBER BAFFLES
156000000-E	620	70	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22	6071050000-E	SP	5	EA	*** SKIMMER (1-1/2")
169300000-E	654	10	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR	608400000-E	1660	3	ACR	SEEDING & MULCHING
200000000-N	806	10	EA	RIGHT OF WAY MARKERS	608700000-E	1660	1.5	ACR	MOWING
228600000-N	840	1	EA	MASONRY DRAINAGE STRUCTURES	609000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
236700000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.29	609300000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
255600000-E	846	24	LF	SHOULDER BERM GUTTER	609600000-E	1662	75	LB	SEED FOR SUPPLEMENTAL SEEDING
261200000-E	848	10	SY	6" CONCRETE DRIVEWAY	610800000-E	1665	2.25	TON	FERTILIZER TOPDRESSING
303000000-E	862	875	LF	STEEL BM GUARDRAIL	611400000-N	SP	4.5	HR	SPECIALIZED HAND MOWING
315000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS	611700000-N	SP	12	EA	RESPONSE FOR EROSION CONTROL
327000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350					
331700000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77					
338000000-E	862	575	LF	TEMPORARY STEEL BM GUARDRAIL					
338700000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** TEMPORARY (B-77)					
338910000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY					
357400000-E	867	165	LF	GENERIC FENCING ITEM WOOD RAIL FENCE RESET					
362800000-E	876	10	TON	RIP RAP, CLASS I					
363500000-E	876	120	TON	RIP RAP, CLASS II					
364900000-E	876	5	TON	RIP RAP, CLASS B					
365600000-E	876	520	SY	FILTER FABRIC FOR DRAINAGE					
440000000-E	1110	160	SF	WORK ZONE SIGNS (STATIONARY)					
440500000-E	1110	112	SF	WORK ZONE SIGNS (PORTABLE)					
441000000-E	1110	52	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)					
442000000-N	1120	2	EA	CHANGEABLE MESSAGE SIGN					
443000000-N	1130	30	EA	DRUMS					
443500000-N	1135	30	EA	CONES					

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DIVISION OF HIGHWAYS  
 STATE OF NORTH CAROLINA

**SUMMARY OF EARTHWORK**  
 IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
<b>SUMMARY NO. 1</b>					
-L- 17+24 TO 21+50 LEFT (DETOUR)	27		2755	2728	
<b>TOTAL SUMMARY NO. 1</b>	27		2755	2728	
<b>SUMMARY NO. 2</b>					
-L- 22+35 TO 25+25 LEFT (DETOUR)	177		473	296	
<b>TOTAL SUMMARY NO. 2</b>	177		473	296	
<b>SUB-TOTAL SUMMARY NOS. 1 &amp; 2 (DETOUR)</b>	204		3228	3024	
EST. BORROW FOR SHOULDER CONST.			239	239	
<b>DETOUR TOTALS</b>	204		3467	3263	
<b>SUMMARY NO. 3</b>					
-L- 17+00 TO 21+00 LEFT	4		102	98	
<b>TOTAL SUMMARY NO. 3</b>	4		102	98	
<b>SUMMARY NO. 4</b>					
-L- 17+00 TO 21+00 RIGHT	16		757	741	
<b>TOTAL SUMMARY NO. 4</b>	16		757	741	
<b>SUMMARY NO. 5</b>					
-L- 21+00 TO 21+65 (BRIDGE)	0		320	320	
<b>TOTAL SUMMARY NO. 5</b>	0		320	320	
<b>SUMMARY NO. 6</b>					
-L- 22+50 (BRIDGE) TO 24+50	0		707	707	
<b>TOTAL SUMMARY NO. 6</b>	0		707	707	
<b>SUMMARY NO. 7</b>					
-L- 24+00 TO 26+50 LEFT	5		2	3	
<b>TOTAL SUMMARY NO. 7</b>	5		2	3	
<b>SUMMARY NO. 8</b>					
-L- 24+00 TO 26+50 RIGHT	14		183	169	
<b>TOTAL SUMMARY NO. 8</b>	14		183	169	
<b>SUB-TOTAL SUMMARY NOS. 3 THRU 8</b>	39		2071	2035	3
EST. BORROW IN LIEU OF WASTE				-3	
<b>-L- TOTALS</b>	39		2071	2032	0
<b>SUMMARY NO. 9</b>					
DETOUR REMOVAL (-L- 18+50 TO 21+50)	2181		0		2181
<b>TOTAL SUMMARY NO. 9</b>	2181		0		2181
<b>SUMMARY NO. 10</b>					
DETOUR REMOVAL (-L- 22+50 TO 25+50)	420		35		385
<b>TOTAL SUMMARY NO. 10</b>	420		35		385
<b>SUB-TOTAL SUMMARY NOS. 9 &amp; 10</b>	2601		35		2566
<b>DETOUR REMOVAL TOTALS</b>	2601		35		2566
<b>PROJECT TOTALS</b>	2844		5573	5560	2566
EST. 5% TO REPLACE TOPSOIL IN BORROW PITS				265	
<b>GRAND TOTAL</b>	2844		5573	5560	2566
<b>SAY</b>	2850			5600	2600

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.

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

ESTIMATED DRAINAGE DITCH EXCAVATION = 30 CY  
 ESTIMATED UNDERCUT EXCAVATION = 1000 CY  
 SELECT GRANULAR MATERIAL = 1500 CY  
 CL IV SUBGRADE STABILIZATION = 1000 TONS

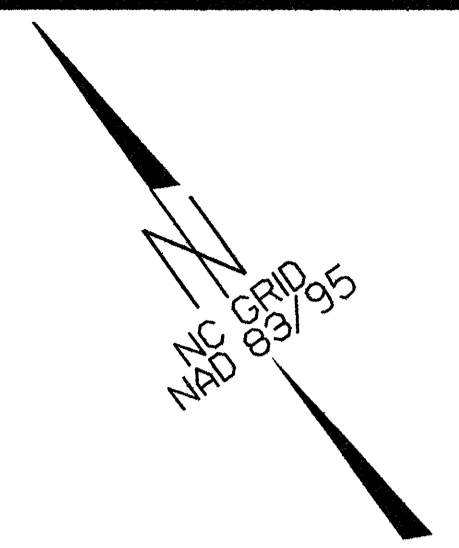
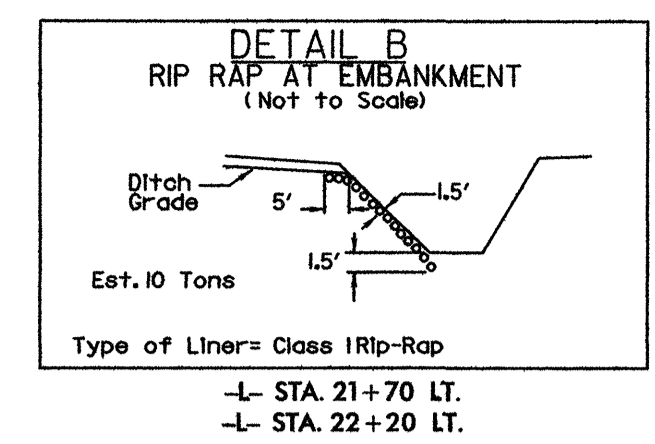
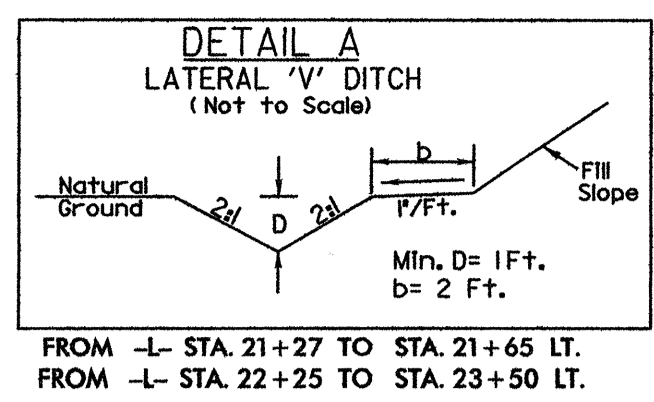


## SUMMARY OF PAVEMENT REMOVAL

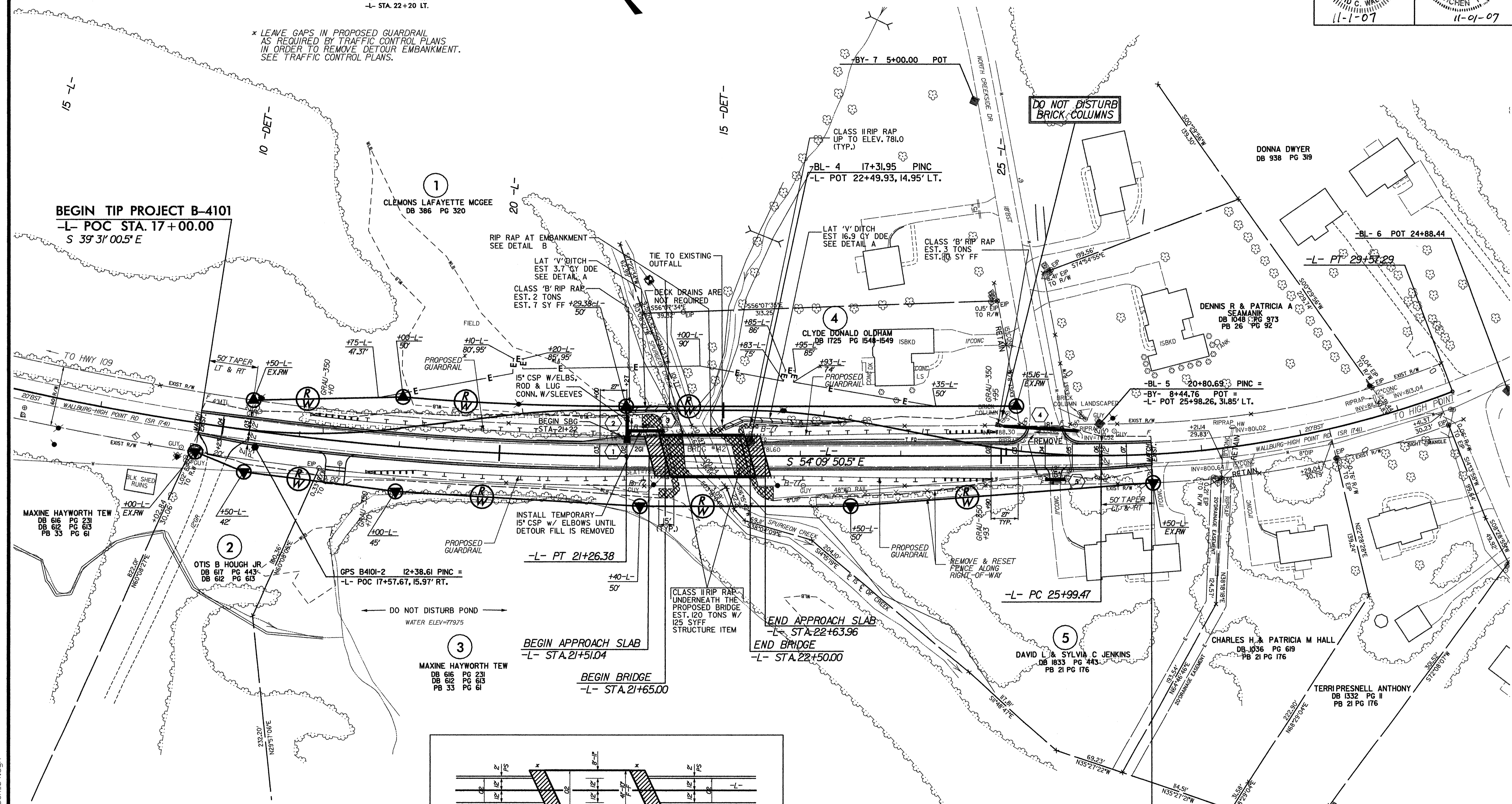
SURVEY LINE	STATION TO STATION	LOCATION	ASPHALT REMOVAL (SY)
-L-	20+90 TO 21+68	CL	173.3
-L-	22+44 TO 24+00	CL	346.7
-DET-	10+65 TO 12+15	LT	174.0
-DET-	12+15 TO 14+27	CL	565.3
-DET-	15+12 TO 16+79	CL	445.3
-DET-	16+79 TO	LT	167.2
TOTAL			1871.8
SAY			1880



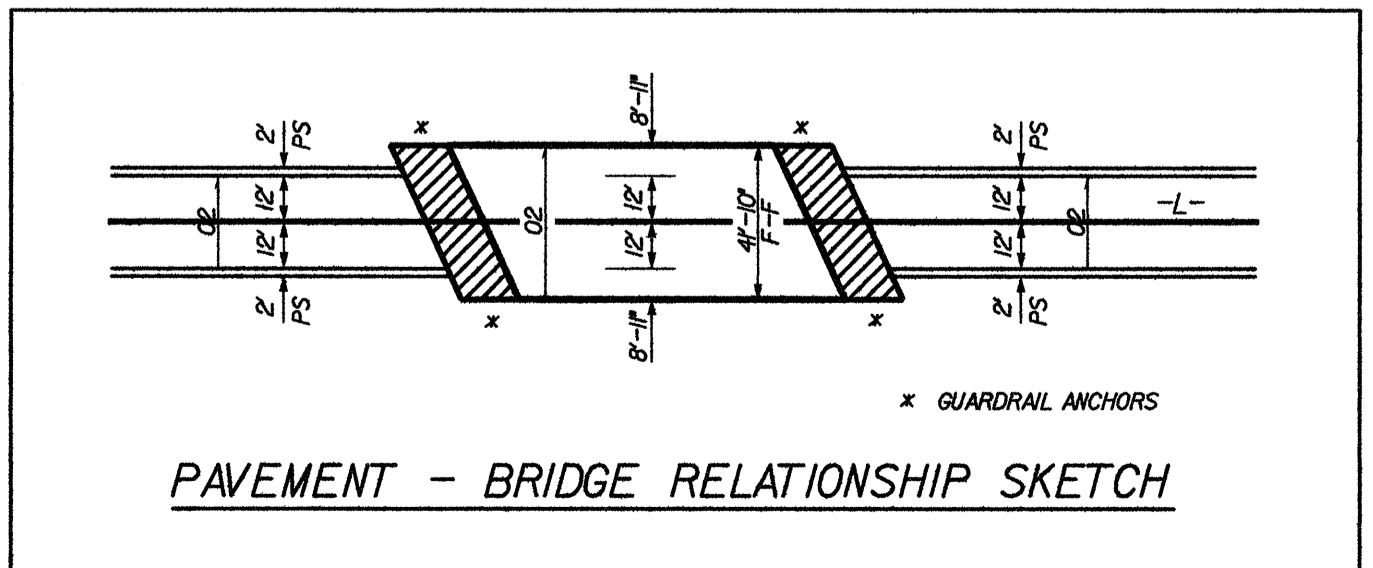
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\* LEAVE GAPS IN PROPOSED GUARDRAIL AS REQUIRED BY TRAFFIC CONTROL PLANS IN ORDER TO REMOVE DETOUR EMBANKMENT. SEE TRAFFIC CONTROL PLANS.



PI Sta 17+70.44	PI Sta 27+80.37
Δ = 14° 38' 50.1" (LT)	Δ = 20° 48' 50.3" (LT)
D = 2' 02" 46.6"	D = 5' 49" 00.6"
L = 715.80'	L = 357.82'
T = 359.86'	T = 180.91'
R = 2,800.00'	R = 985.00'
SE = 0.030	SE = EXIST
RO = 81'	



**LEGEND**

	PAVED SHOULDER
	APPROACH SLAB

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-4  
 FOR -L- PROFILE, SEE SHEET NO. 5  
 FOR DETOUR, SEE SHEET NO. 2-B

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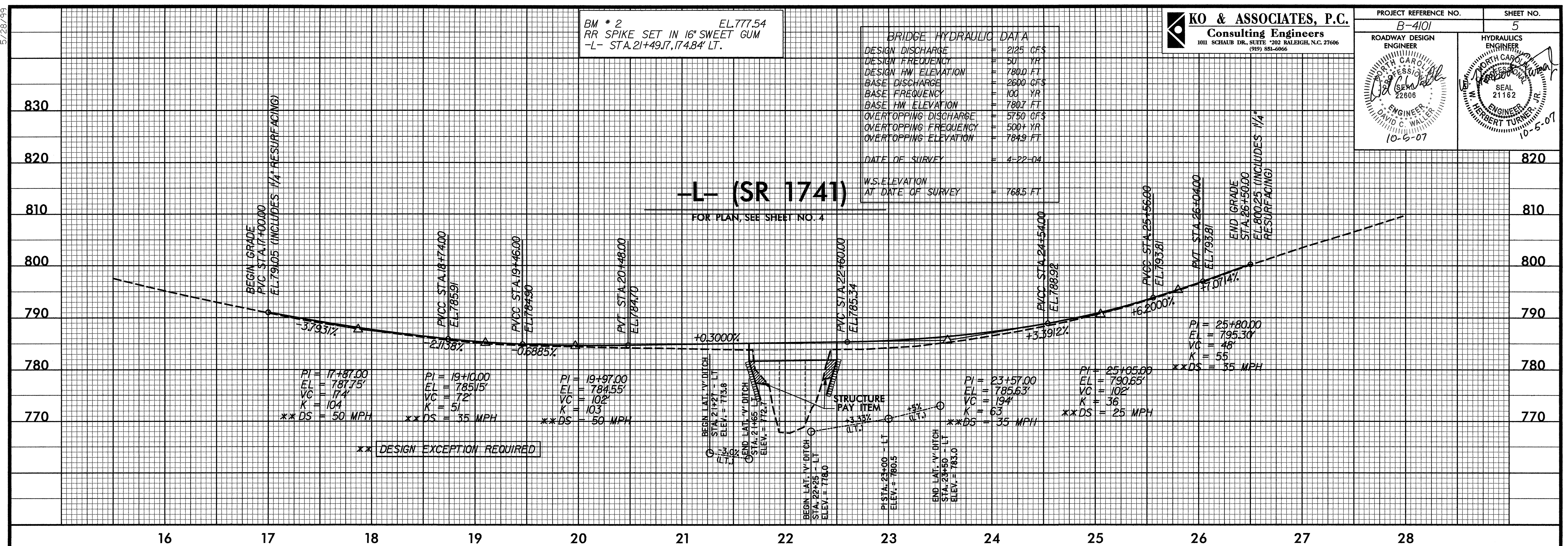
BM \* 2 EL.777.54  
RR SPIKE SET IN 16' SWEET GUM  
-L- STA.21+49.17, 174.84' LT.

**KO & ASSOCIATES, P.C.**  
Consulting Engineers  
1011 SCHAUB DR., SUITE 202 RALEIGH, N.C. 27606  
(919) 881-6066

PROJECT REFERENCE NO. <b>B-4101</b>	SHEET NO. <b>5</b>
ROADWAY DESIGN ENGINEER <i>[Signature]</i>	HYDRAULICS ENGINEER <i>[Signature]</i>
SEAL 22606	SEAL 21162
10-6-07	10-5-07

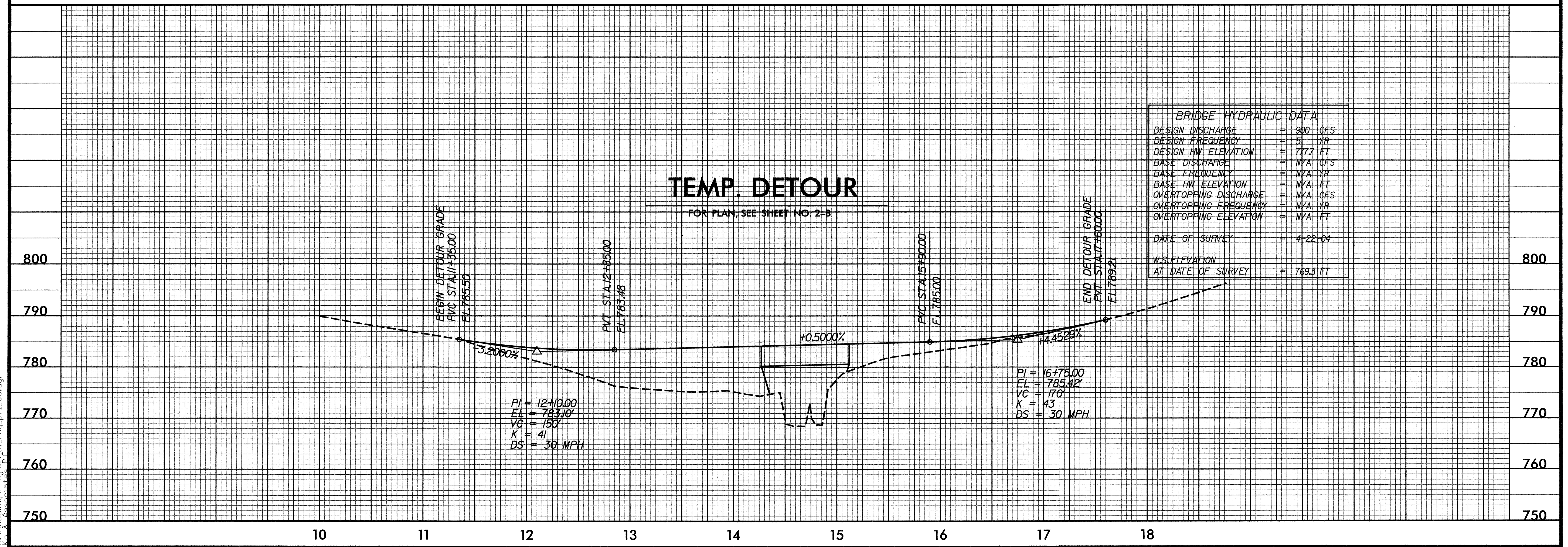
**BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE	= 2125 CFS
DESIGN FREQUENCY	= 50 YR
DESIGN HW ELEVATION	= 780.0 FT
BASE DISCHARGE	= 2600 CFS
BASE FREQUENCY	= 100 YR
BASE HW ELEVATION	= 780.7 FT
OVERTOPPING DISCHARGE	= 5750 CFS
OVERTOPPING FREQUENCY	= 500 YR
OVERTOPPING ELEVATION	= 784.9 FT
DATE OF SURVEY	= 4-22-04
W.S. ELEVATION AT DATE OF SURVEY	= 768.5 FT



**BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE	= 900 CFS
DESIGN FREQUENCY	= 5 YR
DESIGN HW ELEVATION	= 777.7 FT
BASE DISCHARGE	= N/A CFS
BASE FREQUENCY	= N/A YR
BASE HW ELEVATION	= N/A FT
OVERTOPPING DISCHARGE	= N/A CFS
OVERTOPPING FREQUENCY	= N/A YR
OVERTOPPING ELEVATION	= N/A FT
DATE OF SURVEY	= 4-22-04
W.S. ELEVATION AT DATE OF SURVEY	= 769.3 FT



10/5/2007  
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