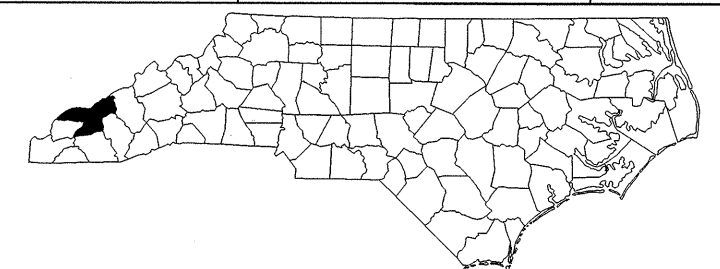


STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4286	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33625.1.1	BRNHF-19(7)	P.E.	
33625.2.1	BRNHF-19(7)	RW, UTIL.	
33625.3.1	BRNHF-19(7)	CONST.	



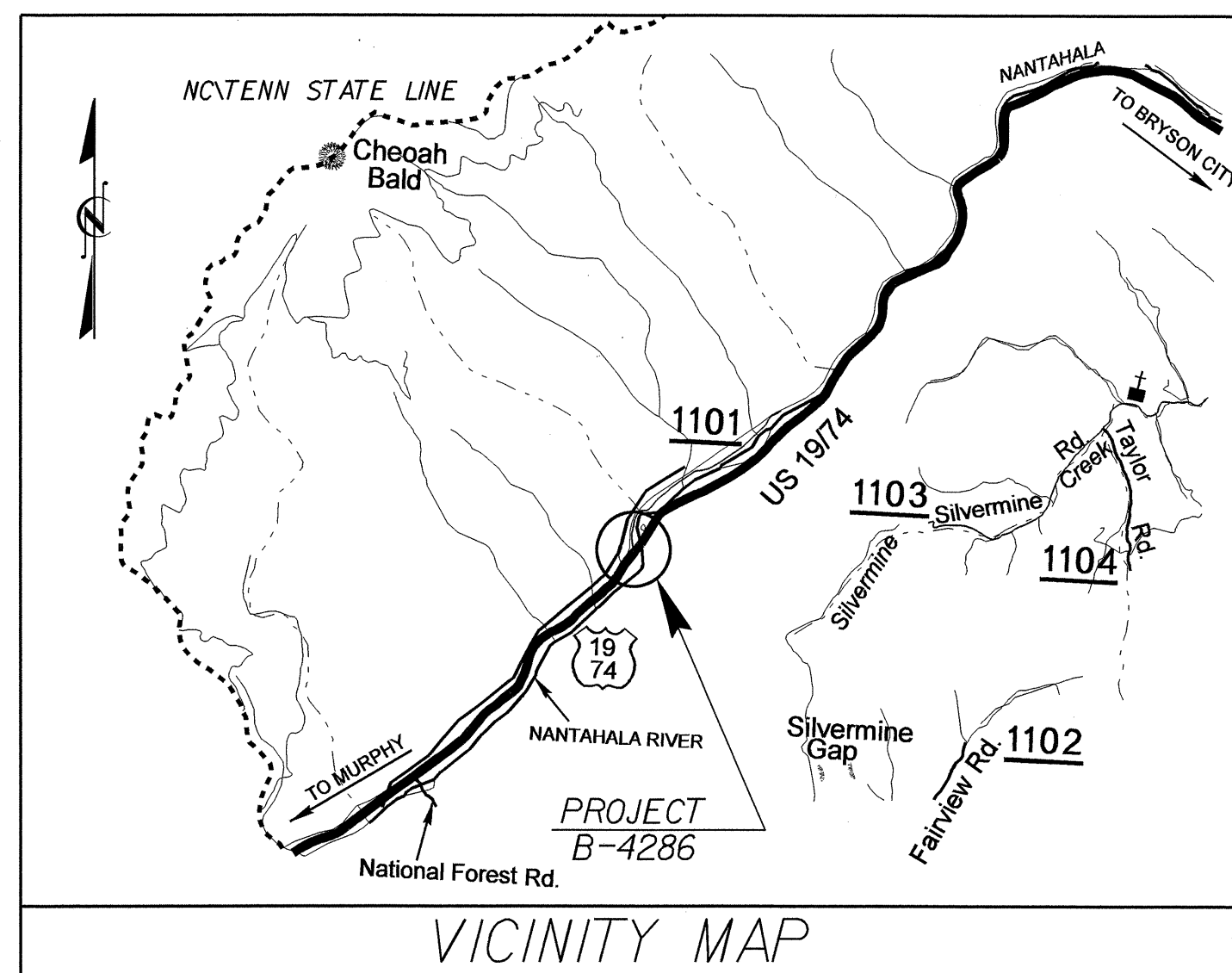
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# SWAIN COUNTY

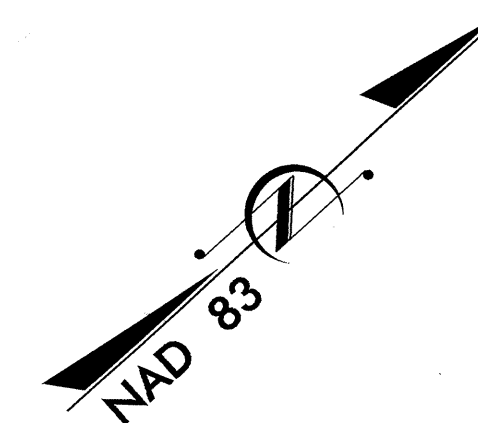
LOCATION: BRIDGE NO. 3 ON US 1974 OVER THE  
NANTHALA RIVER

TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND  
STRUCTURE

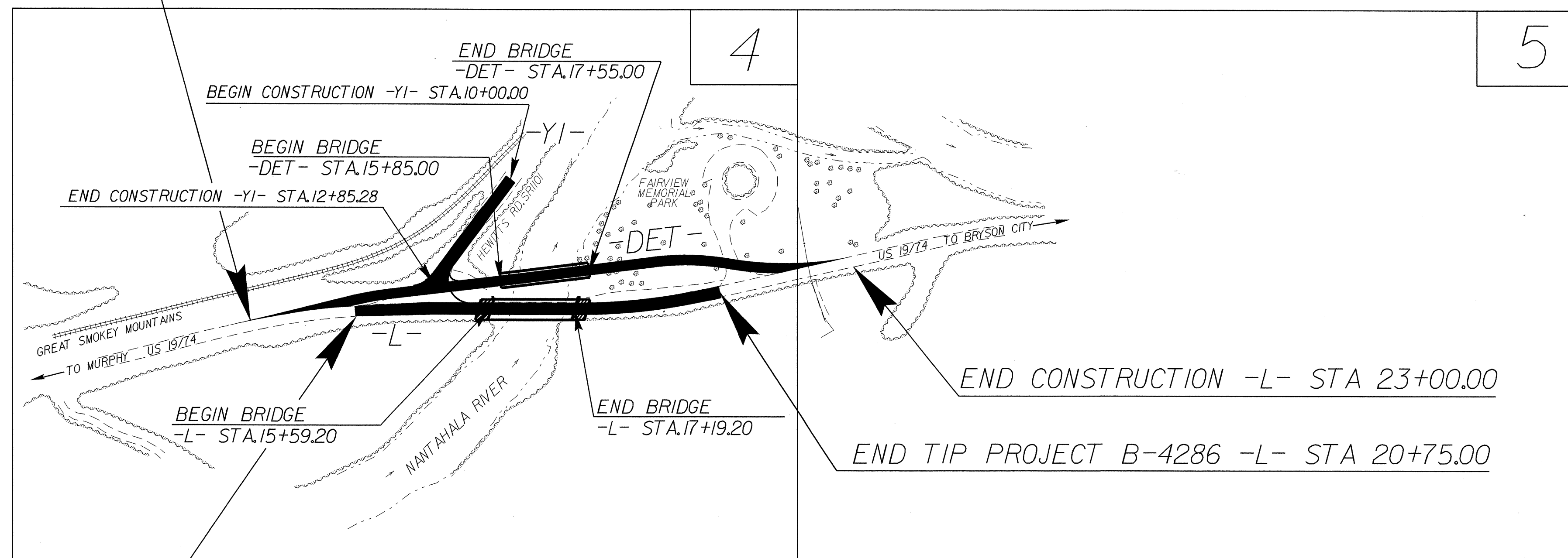
See Sheet 1-A For Index of Sheets



VICINITY MAP



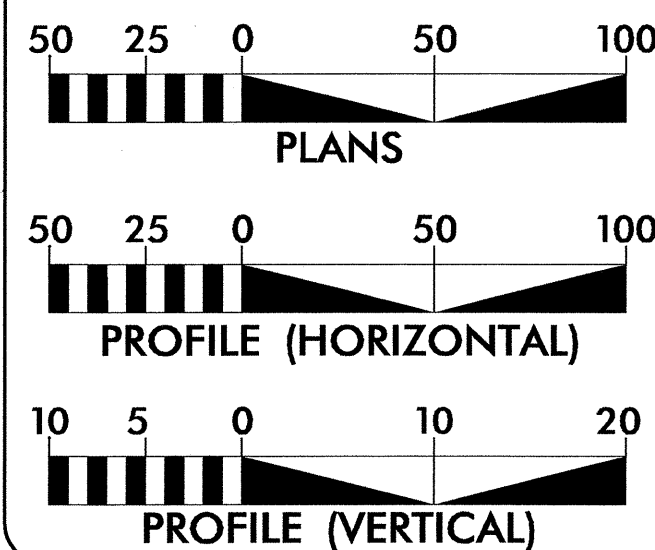
BEGIN CONSTRUCTION -L- STA. 11+00.00



BEGIN TIP PROJECT B-4286 -L- STA 13+00.00

END TIP PROJECT B-4286 -L- STA 20+75.00

GRAPHIC SCALES



DESIGN DATA

ADT 2010 = 5,900  
ADT 2035 = 12,567  
DHV = 10 %  
D = 60 %  
T = 13 % \*  
V = 50 MPH  
FUNC CLASS = ARTERIAL  
\* TTST 8% DUAL 5%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4286 = 0.117 MILES  
LENGTH OF STRUCTURE TIP PROJECT B-4286 = 0.030 MILES  
TOTAL LENGTH OF TIP PROJECT B-4286 = 0.147 MILES

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

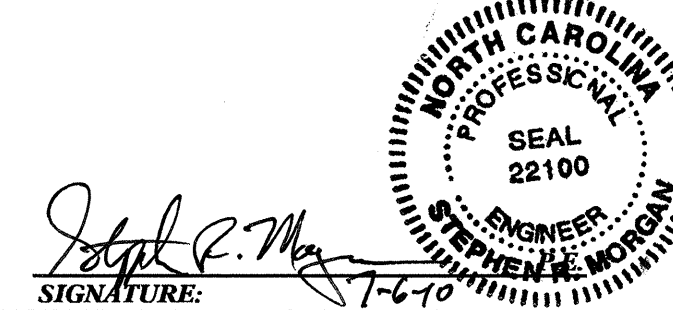
RIGHT OF WAY DATE:  
SEPTEMBER 02, 2009

LETTING DATE:  
DECEMBER 21, 2010

G.E. BREW, PE  
PROJECT ENGINEER

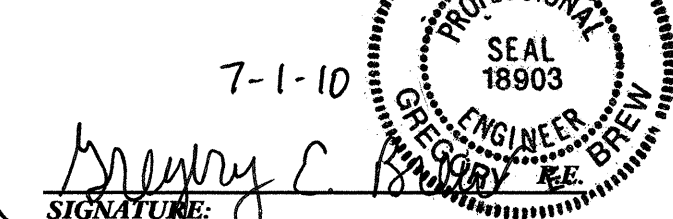
E. MORRISON  
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER



SIGNATURE: *G.E. Brew*

ROADWAY DESIGN ENGINEER



SIGNATURE: *E. Morrison*

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

*art millan*

STATE DESIGN ENGINEER  
DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

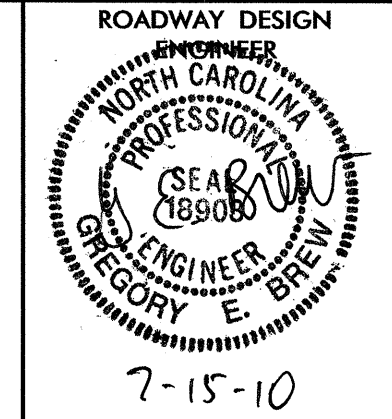
APPROVED  
DIVISION ADMINISTRATOR

DATE

TIP PROJECT: B-4286

CONTRACT: C202554

22-JUN-2010 10:54  
RA: R0000000\PROJ\B4286\_rdy.tsh.dgn  
\$\$\$\$\$USERNAME\$\$\$\$\$



Index of Sheets

Sheet No.	Sheet 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	Pavement Schedule, Detail for Method of Wedging, and Typical Sections
2-B	Detail of Expressway Gutter
2-C thru 2-N	Temporary Shoring, MSE and Temporary Wall Details
2-O	Detail of Modified Concrete Flume
2-P thru 2-O	Pipe Installation Details
3	Summary of Quantities
3-A thru 3-B	Summary of Earthwork, Summary of Removal of Existing Asphalt Pavement and Guardrail Summary
3-C	Parcel Index Sheet
4 thru 5	Plan Sheets
6 thru 7	Profile Sheets
TCP-1 thru TCP-6	Traffic Control Plans
PMP-1 thru PMP -2	Pavement Marking Plans
EC-1 thru EC-11	Erosion Control Plans
SIGN-1 thru SIGN-3	Signing Plans
UD-1 thru UD-2	Utilities by Others
RF-1 thru RF-2	Reforestation Detail Sheet
X-1A	Cross-Section Summary Sheet
X-1 thru X-10	Cross Sections
S-1 thru S-41	Structure Plans

GENERAL NOTES: 2006 SPECIFICATIONS  
EFFECTIVE: 07-18-06  
REVISED: 07-30-08

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 11.

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".

SUBSURFACE PLANS:  
NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

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 Energy  
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

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
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method 11
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Super-elevation - Two Lane Pavement
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Super-elevated Curve - Method 1
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & 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
876.03	Drainage Ditches with Class 'A' Rip Rap

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

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

\*S.U.E = SUBSURFACE UTILITY ENGINEER

CONVENTIONAL SYMBOLS

ROADS & RELATED ITEMS

Table listing symbols for roads and related items: Edge of Pavement, Curb, Prop. Slope Stakes Cut, Prop. Slope Stakes Fill, Prop. Woven Wire Fence, Prop. Chain Link Fence, Prop. Barbed Wire Fence, Prop. Wheelchair Ramp, Curb Cut for Future Wheelchair Ramp, Exist. Guardrail, Prop. Guardrail, Equality Symbol, Pavement Removal.

RIGHT OF WAY

Table listing symbols for right of way: Baseline Control Point, Existing Right of Way Marker, Exist. Right of Way Line w/Marker, Prop. Right of Way Line with Proposed RW Marker (Iron Pin & Cap), Prop. Right of Way Line with Proposed (Concrete or Granite) RW Marker, Exist. Control of Access Line, Prop. Control of Access Line, Exist. Easement Line, Prop. Temp. Construction Easement Line, Prop. Temp. Drainage Easement Line, Prop. Perm. Drainage Easement Line.

HYDROLOGY

Table listing symbols for hydrology: Stream or Body of Water, River Basin Buffer, Flow Arrow, Disappearing Stream, Spring, Swamp Marsh, Shoreline, Falls, Rapids, Prop Lateral, Tail, Head Ditches.

STRUCTURES

Table listing symbols for structures: MAJOR Bridge, Tunnel, or Box Culvert, Bridge Wing Wall, Head Wall and End Wall.

Table listing symbols for minor structures: MINOR Head & End Wall, Pipe Culvert, Footbridge, Drainage Boxes, Paved Ditch Gutter.

UTILITIES

Table listing symbols for utilities: Exist. Pole, Exist. Power Pole, Prop. Power Pole, Exist. Telephone Pole, Prop. Telephone Pole, Exist. Joint Use Pole, Prop. Joint Use Pole, Telephone Pedestal, UG Telephone Cable Hand Hold, Cable TV Pedestal, UG TV Cable Hand Hold, UG Power Cable Hand Hold, Hydrant, Satellite Dish, Exist. Water Valve, Sewer Clean Out, Power Manhole, Telephone Booth, Cellular Telephone Tower, Water Manhole, Light Pole, H-Frame Pole, Power Line Tower, Pole with Base, Gas Valve, Gas Meter, Telephone Manhole, Power Transformer, Sanitary Sewer Manhole, Storm Sewer Manhole, Tank; Water, Gas, Oil, Water Tank With Legs, Traffic Signal Junction Box, Fiber Optic Splice Box, Television or Radio Tower, Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement.

Table listing symbols for utilities (continued): Recorded Water Line, Designated Water Line (S.U.E.\*), Sanitary Sewer, Recorded Sanitary Sewer Force Main, Designated Sanitary Sewer Force Main(S.U.E.\*), Recorded Gas Line, Designated Gas Line (S.U.E.\*), Storm Sewer, Recorded Power Line, Designated Power Line (S.U.E.\*), Recorded Telephone Cable, Designated Telephone Cable (S.U.E.\*), Recorded U/G Telephone Conduit, Designated U/G Telephone Conduit (S.U.E.\*), Unknown Utility (S.U.E.\*), Recorded Television Cable, Designated Television Cable (S.U.E.\*), Recorded Fiber Optics Cable, Designated Fiber Optics Cable (S.U.E.\*), Exist. Water Meter, U/G Test Hole (S.U.E.\*), Abandoned According to U/G Record, End of Information.

BOUNDARIES & PROPERTIES

Table listing symbols for boundaries and properties: State Line, County Line, Township Line, City Line, Reservation Line, Property Line, Property Line Symbol, Exist. Iron Pin, Property Corner, Property Monument, Property Number, Parcel Number, Fence Line, Existing Wetland Boundaries, High Quality Wetland Boundary, Medium Quality Wetland Boundaries, Low Quality Wetland Boundaries, Proposed Wetland Boundaries, Existing Endangered Animal Boundaries, Existing Endangered Plant Boundaries.

BUILDINGS & OTHER CULTURE

Table listing symbols for buildings and other culture: Buildings, Foundations, Area Outline, Gate, Gas Pump Vent or U/G Tank Cap, Church, School, Park, Cemetery, Dam, Sign, Well, Small Mine, Swimming Pool.

TOPOGRAPHY

Table listing symbols for topography: Loose Surface, Hard Surface, Change in Road Surface, Curb, Right of Way Symbol, Guard Post, Paved Walk, Bridge, Box Culvert or Tunnel, Ferry, Culvert, Footbridge, Trail, Footpath, Light House.

VEGETATION

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

RAILROADS

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

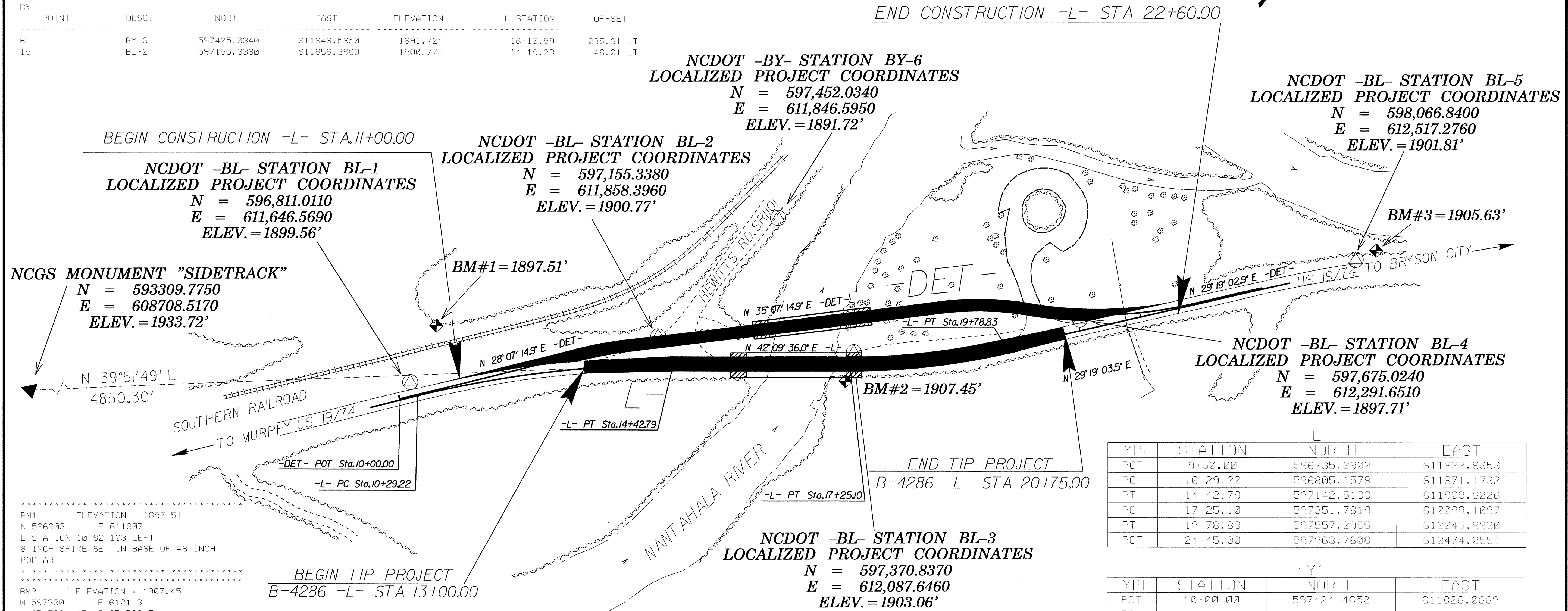


# SURVEY CONTROL SHEET B-4286

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL-1	596811.0110	611646.5690	1899.56'	10+22.78	24.46 LT
2	BL-2	597155.3380	611858.3960	1900.77'	14+19.23	46.01 LT
3	BL-3	597370.8370	612087.6460	1903.06'	17+32.34	20.52 LT
4	BL-4	597675.0240	612291.6510	1897.71'	21+03.83	17.84 LT
5	BL-5	598066.8400	612517.2760	1901.81'	OUTSIDE PROJECT LIMITS	

BY POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
6	BY-6	597425.0340	611846.5950	1891.72'	16+10.59	235.61 LT
15	BL-2	597155.3380	611858.3960	1900.77'	14+19.23	46.01 LT



**NCGS MONUMENT "SIDETRACK"**  
 N = 593309.7750  
 E = 608708.5170  
 ELEV. = 1933.72'

**NCDOT -BL- STATION BL-1 LOCALIZED PROJECT COORDINATES**  
 N = 596,811.0110  
 E = 611,646.5690  
 ELEV. = 1899.56'

**NCDOT -BL- STATION BL-2 LOCALIZED PROJECT COORDINATES**  
 N = 597,155.3380  
 E = 611,858.3960  
 ELEV. = 1900.77'

**NCDOT -BY- STATION BY-6 LOCALIZED PROJECT COORDINATES**  
 N = 597,452.0340  
 E = 611,846.5950  
 ELEV. = 1891.72'

**NCDOT -BL- STATION BL-5 LOCALIZED PROJECT COORDINATES**  
 N = 598,066.8400  
 E = 612,517.2760  
 ELEV. = 1901.81'

**NCDOT -BL- STATION BL-4 LOCALIZED PROJECT COORDINATES**  
 N = 597,675.0240  
 E = 612,291.6510  
 ELEV. = 1897.71'

**NCDOT -BL- STATION BL-3 LOCALIZED PROJECT COORDINATES**  
 N = 597,370.8370  
 E = 612,087.6460  
 ELEV. = 1903.06'

\*\*\*\*\*  
 BM1 ELEVATION = 1897.51  
 N 596903 E 611607  
 L STATION 10+82 103 LEFT  
 8 INCH SPIKE SET IN BASE OF 48 INCH POPLAR  
 \*\*\*\*\*  
 BM2 ELEVATION = 1907.45  
 N 597330 E 612113  
 L STATION 17+19 25 RIGHT  
 8 INCH SPIKE SET IN BASE OF 10 INCH WHITE PINE  
 \*\*\*\*\*  
 BM3 ELEVATION = 1905.63  
 N 598101 E 612528  
 L STATION 24+45  
 N 21° 31' 27.9" E DIST 147.76  
 8 INCH SPIKE SET IN BASE OF 24 INCH POPLAR  
 \*\*\*\*\*

BEGIN TIP PROJECT  
 B-4286 -L- STA 13+00.00

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	13+00.00	28.00	597015.7657	611839.6372
L	13+00.00	-50.00	597063.0445	611777.6019
L	13+00.00	-32.00	597052.1337	611791.9181
L	15+58.00	50.00	597194.3520	612023.0126
L	15+80.00	28.00	597225.4262	612021.4713
L	13+00.00	34.00	597012.1274	611844.4109
L	14+07.00	37.00	597091.4798	611912.8288
L	14+37.00	-99.00	597204.4068	611831.1259

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	10+00.00	22.80	597420.0466	611803.6992
Y1	10+00.00	10.00	597422.5272	611816.2565
Y1	10+72.00	22.80	597349.4124	611817.6568

TYPE	STATION	NORTH	EAST
POT	9+50.00	596735.2902	611633.8353
PC	10+29.22	596805.1578	611671.1732
PT	14+42.79	597142.5133	611908.6226
PC	17+25.10	597351.7819	612098.1097
PT	19+78.83	597557.2955	612245.9930
POT	24+45.00	597963.7608	612474.2551

TYPE	STATION	NORTH	EAST
POT	10+00.00	597424.4652	611826.0669
PC	12+20.24	597208.3967	611868.7505
PT	12+70.16	597165.6936	611892.9180
POT	12+97.36	597147.4370	611913.0808

**NOTES:**

1. 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:  
 B4286\_LS\_CONTROL\_070920.TXT

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

© INDICATES BASELINE CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

NOTE: DRAWING NOT TO SCALE

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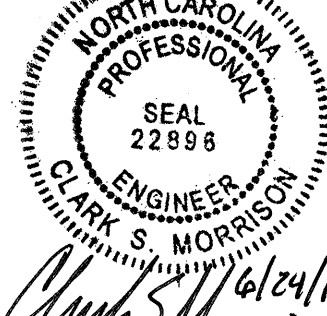


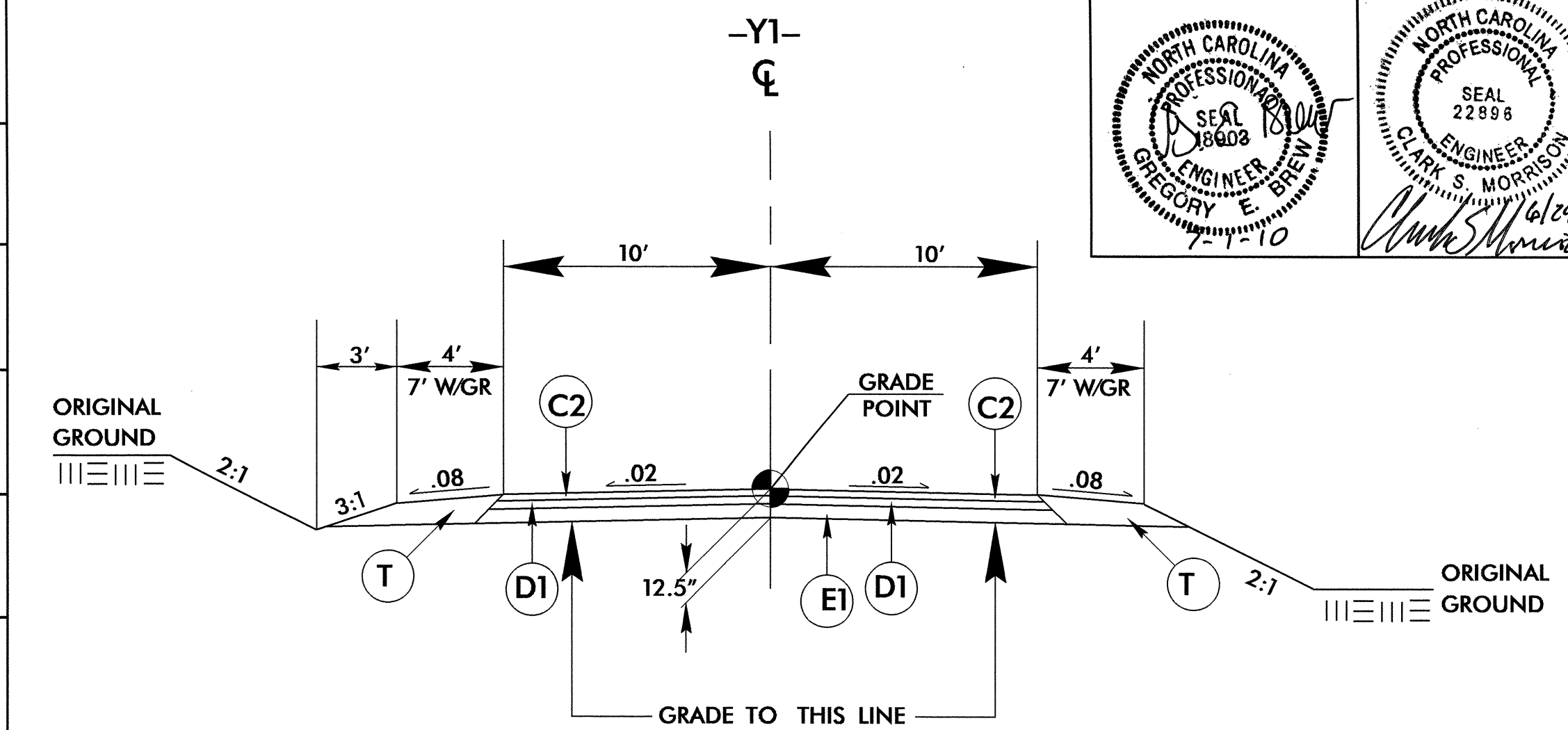
6/2/99

# FINAL PAVEMENT SCHEDULE

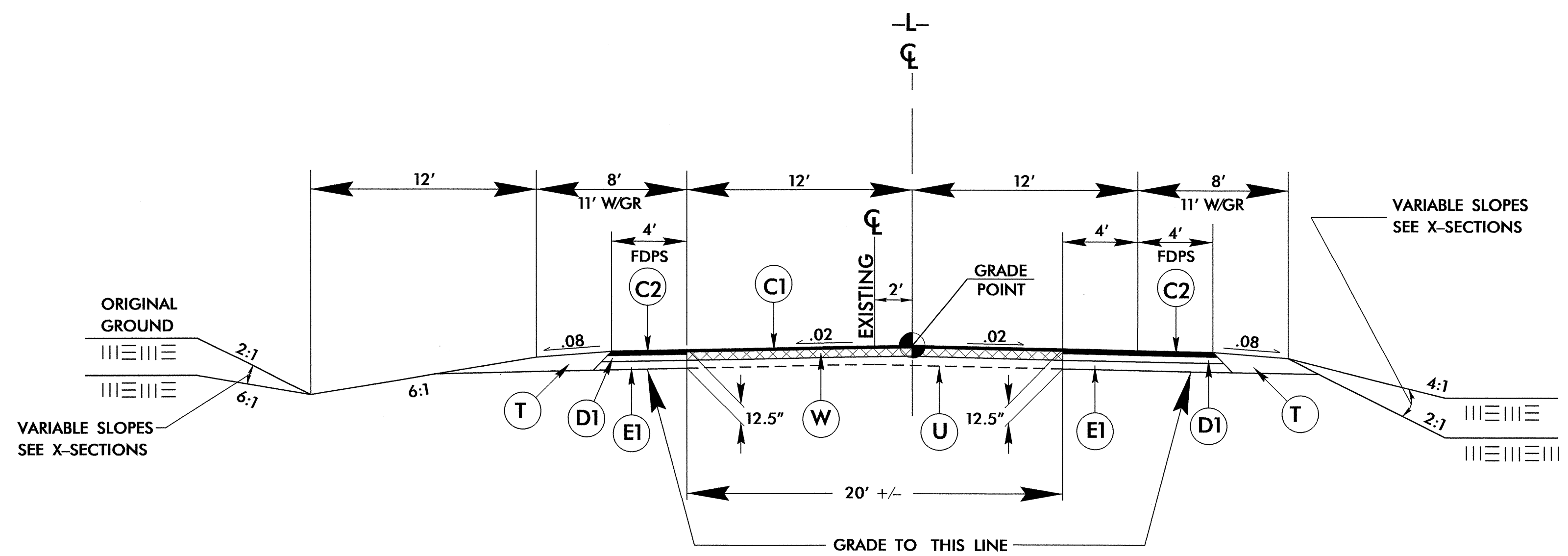
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.	E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	J1	PROP. 10" AGGREGATE BASE COURSE.
C3	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 TO EXCEED 1 1/2" IN DEPTH.	P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL.
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.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 5.5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL SHEET No. 2A)

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE  
NOTE: FDPS = FULL DEPTH PAVED SHOULDER

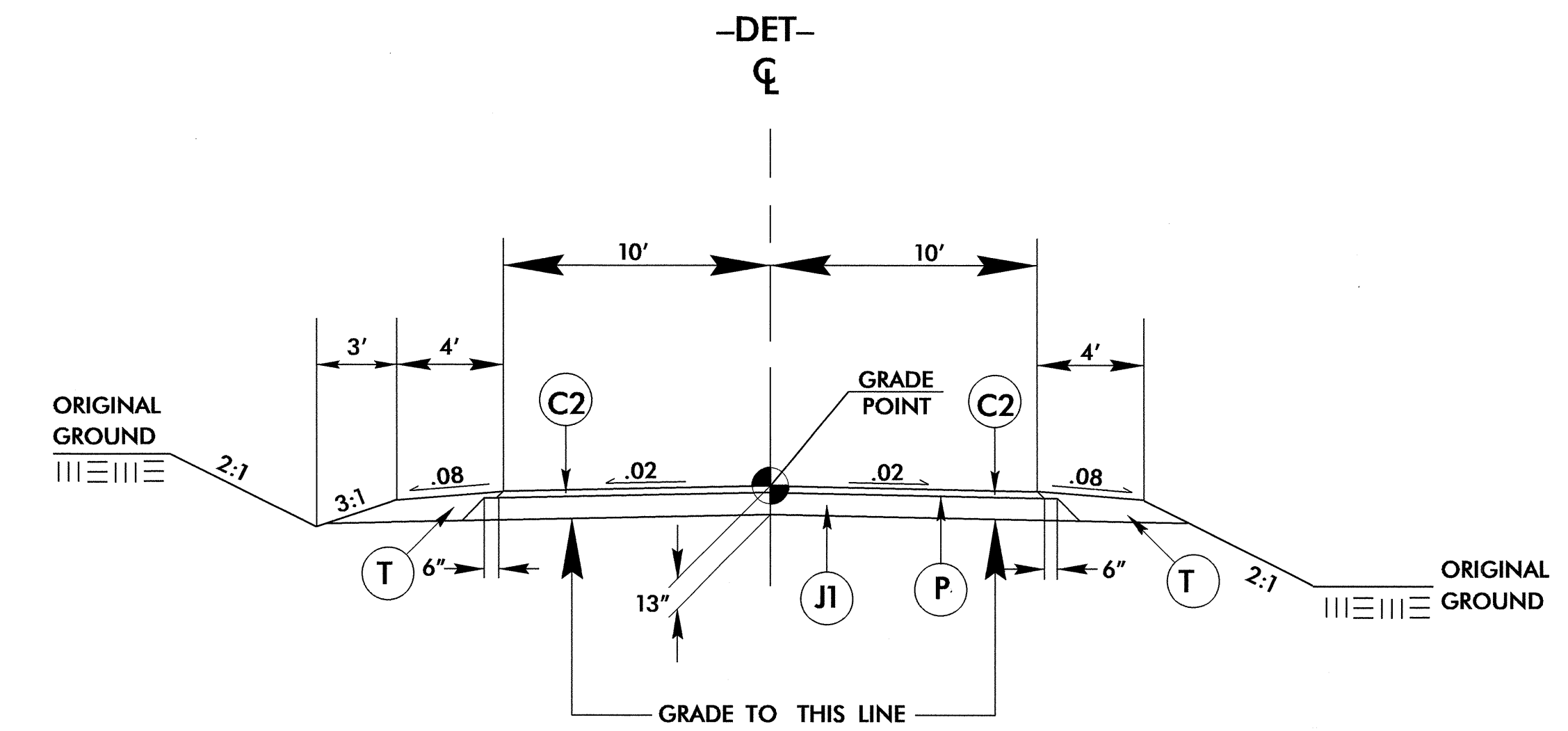
PROJECT REFERENCE NO. B-4286	SHEET NO. 2
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 



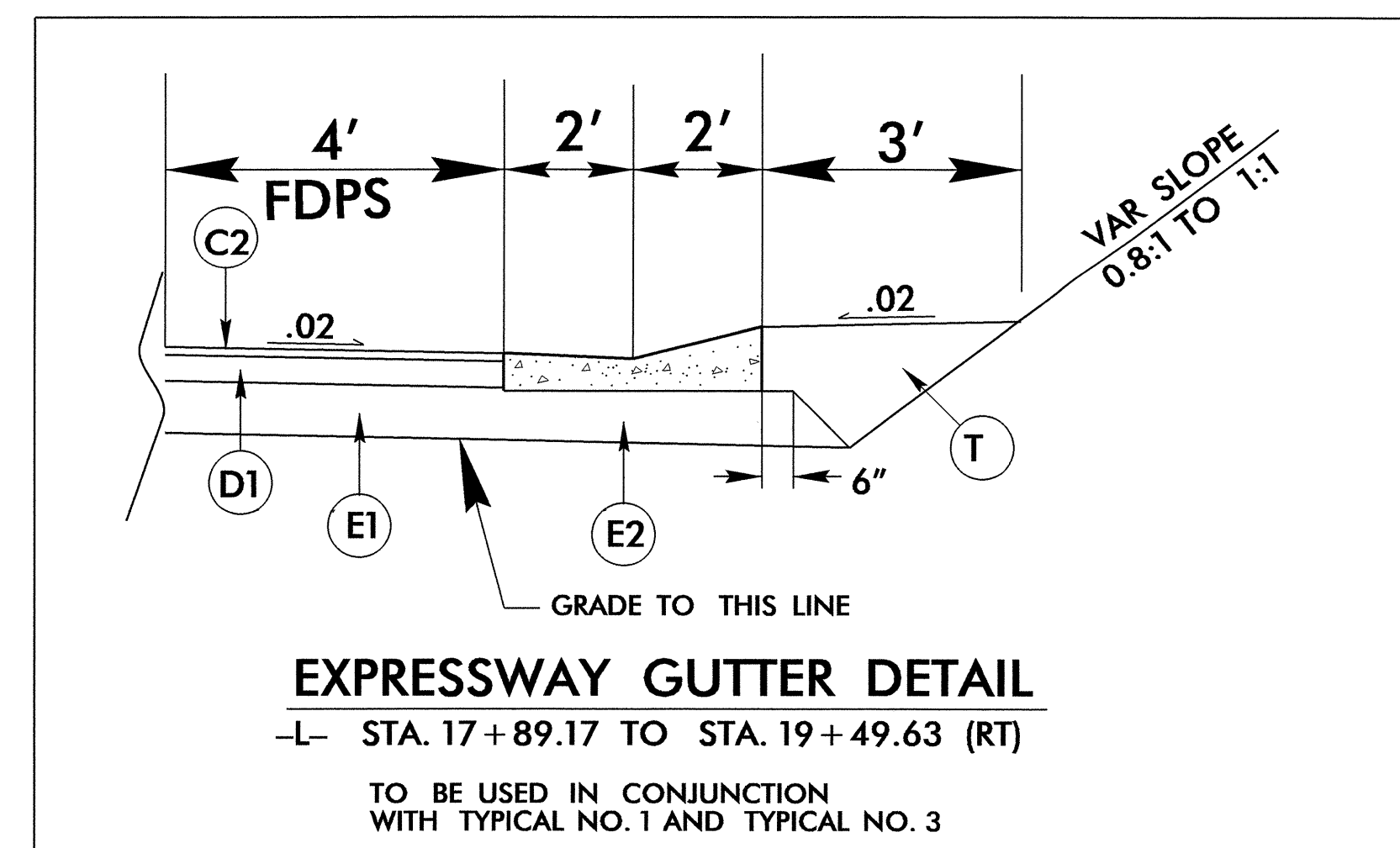
**TYPICAL SECTION NO. 4**  
-Y1- STA. 10+00.00 TO STA. 12+85.36



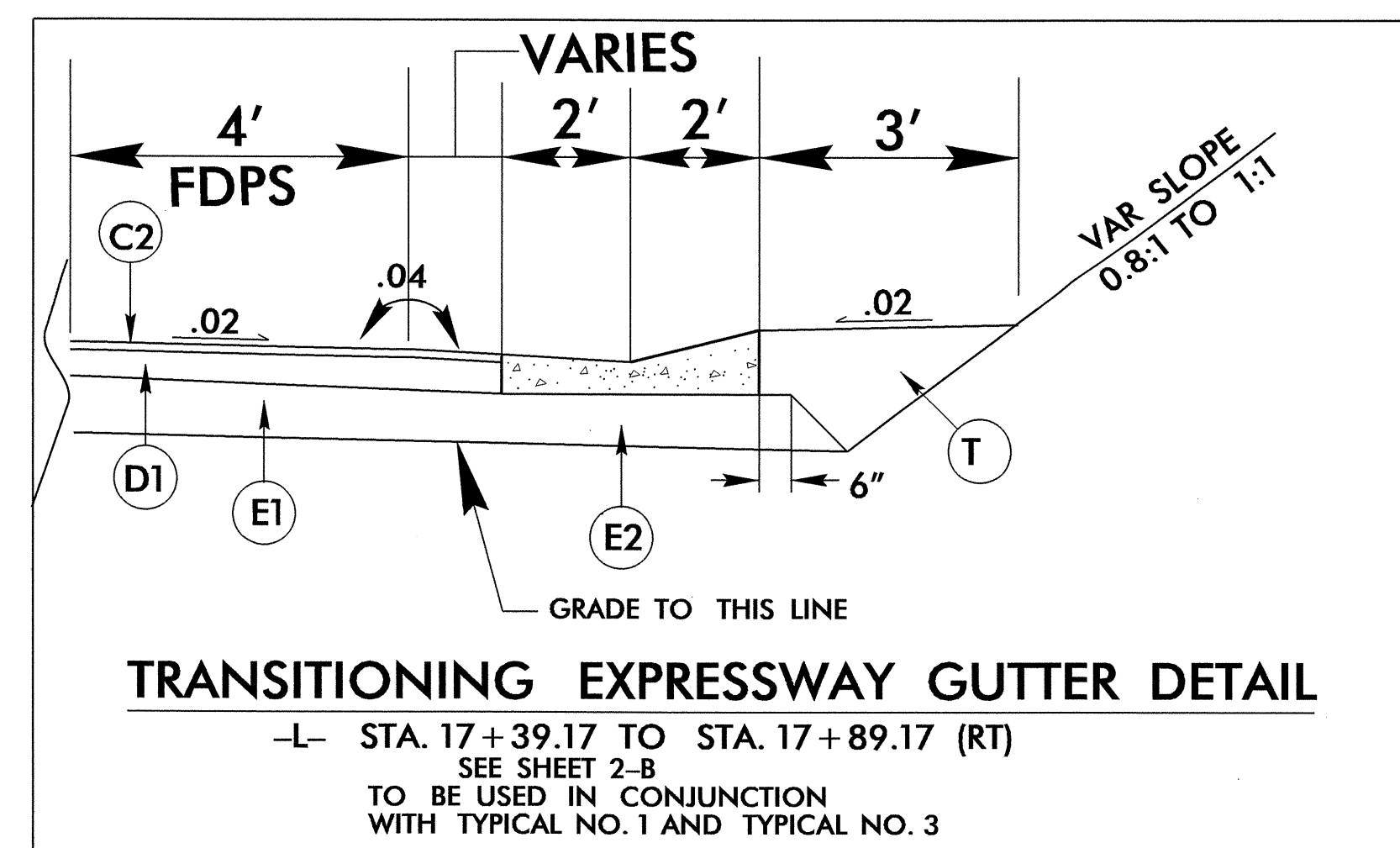
**TYPICAL SECTION NO. 1**  
-L- STA. 13+00.00 TO STA. 15+10.00  
-L- STA. 17+70.00 TO STA. 20+75.00



**TYPICAL SECTION NO. 2**  
TRANSITION FROM EXISTING TO T.S. NO. 2: -DET- 11+00.00 TO 12+90.00  
  
USE TYPICAL SECTION NO. 2 AS FOLLOWS  
-DET- 12+90.00 TO 15+85.00 (BEGIN BRIDGE)  
-DET- 17+55.00 (END BRIDGE) TO 21+61.38  
  
TRANSITION FROM T.S. NO. 2 TO EXISTING: -DET- 21+61.38 TO 22+60.00



**EXPRESSWAY GUTTER DETAIL**  
-L- STA. 17+89.17 TO STA. 19+49.63 (RT)  
TO BE USED IN CONJUNCTION WITH TYPICAL NO. 1 AND TYPICAL NO. 3



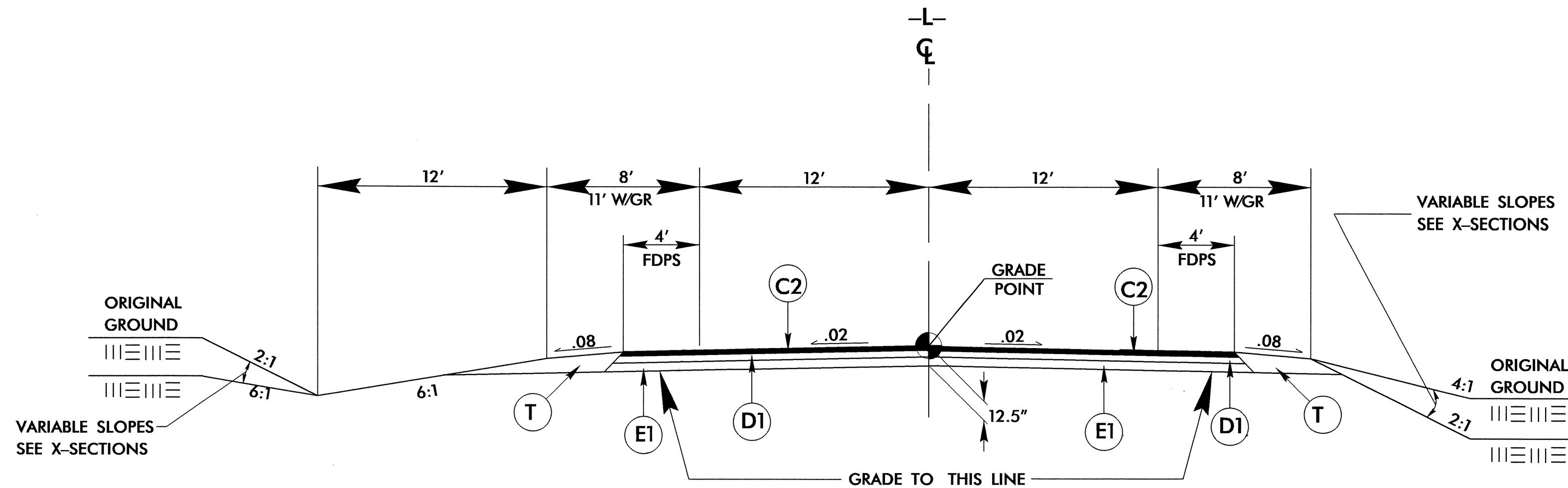
**TRANSITIONING EXPRESSWAY GUTTER DETAIL**  
-L- STA. 17+39.17 TO STA. 17+89.17 (RT)  
SEE SHEET 2-B  
TO BE USED IN CONJUNCTION WITH TYPICAL NO. 1 AND TYPICAL NO. 3

21-JUN-2010 14:22  
R:\Roadway\Projects\B4286.rdy\_ttyp.dgn  
\$\$\$\$\$USERNAME\$\$\$\$\$

6/2/99

FINAL PAVEMENT DESIGN	
C1	1.5" TYPE S9.5B,
C2	3" TYPE S9.5B,
C3	VAR. DEPTH TYPE S9.5B,
D1	4" TYPE I19.0B
D2	VAR. DEPTH TYPE I19.0B
E1	5.5" TYPE B25.0B,
E2	VAR. DEPTH TYPE B25.0B
J1	10" ABC
P	PRIME COAT
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	WEDGING

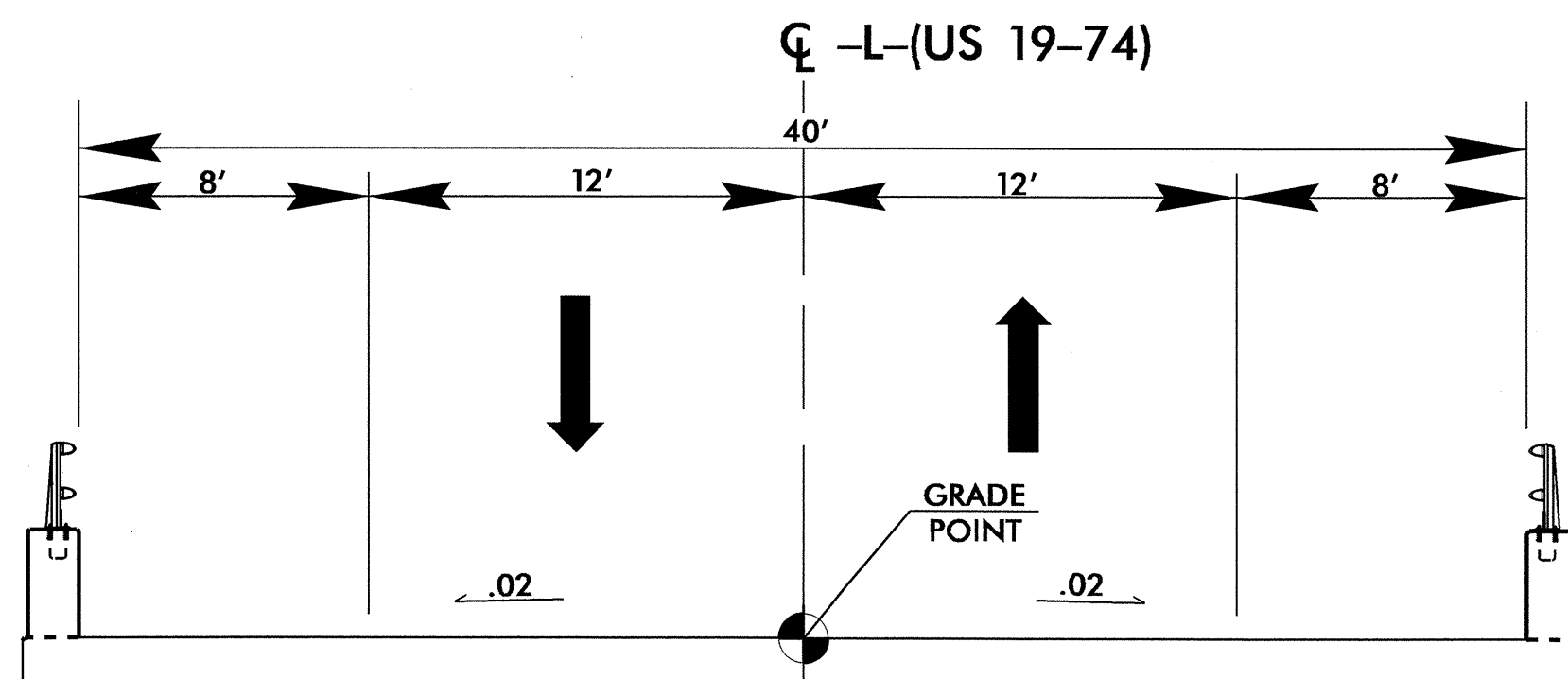
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE  
NOTE: FDPS = FULL DEPTH PAVED SHOULDER



**TYPICAL SECTION NO. 3**

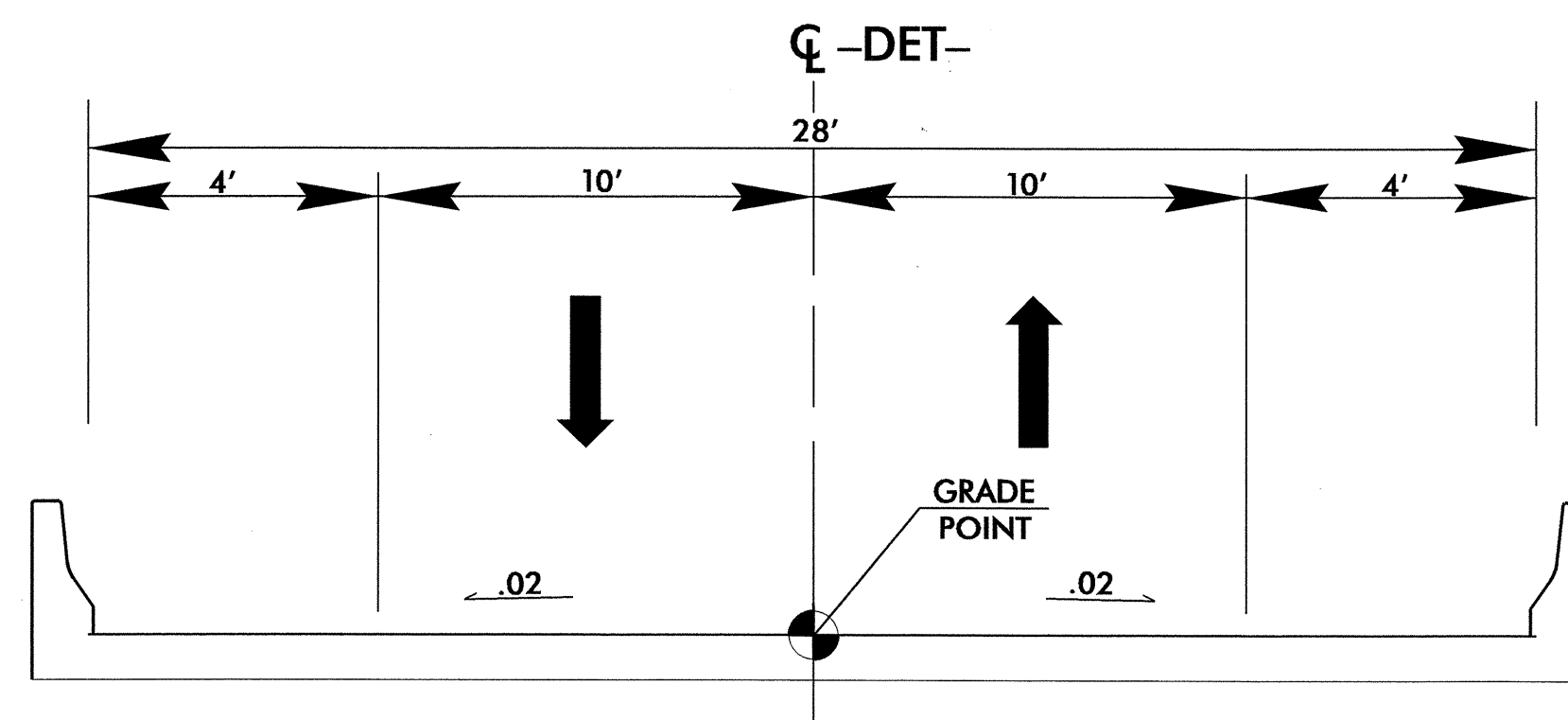
USE TYPICAL SECTION NO. 3 AS FOLLOWS

- L- STA. 15+10.00 TO STA. 15+59.20 (BEGIN BRIDGE)
- L- STA. 17+19.20 (END BRIDGE) TO STA. 17+70.00



**TYPICAL SECTION ON STRUCTURE**

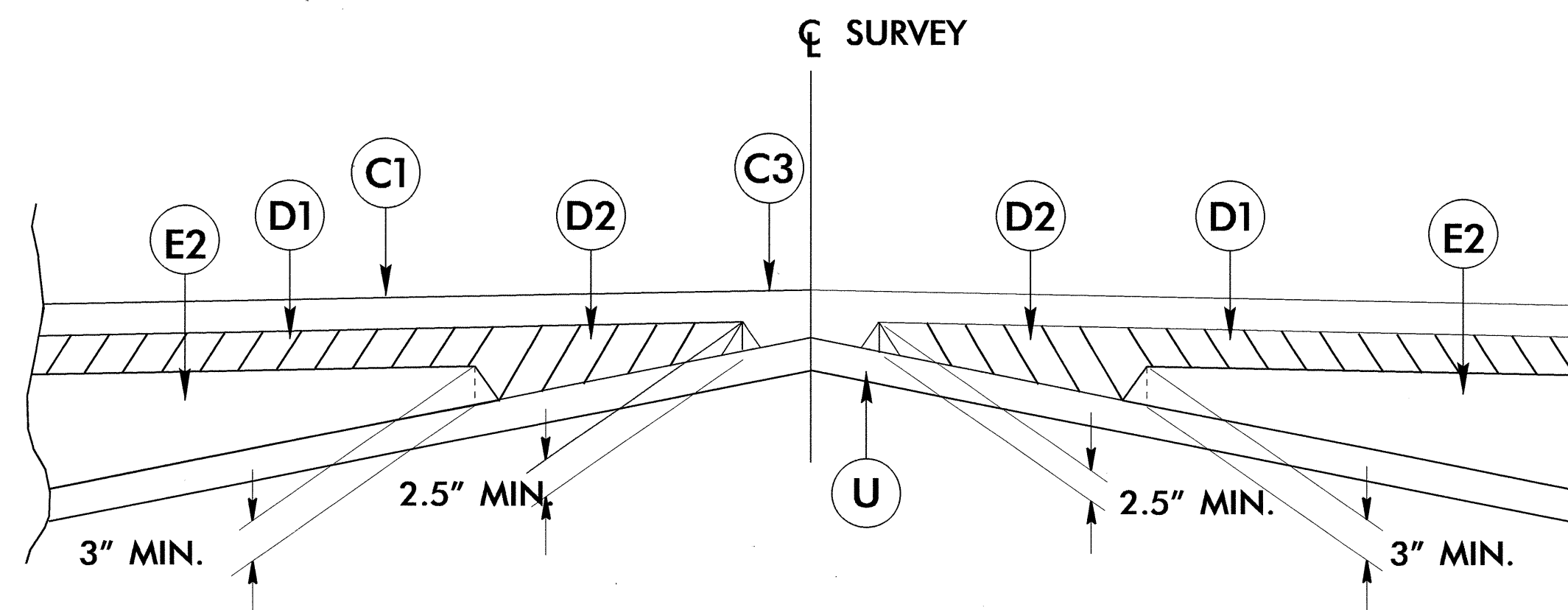
-L- STA. 15+59.20 (BEGIN BRIDGE) TO -L- STA. 17+19.20 (END BRIDGE)



**TYPICAL SECTION ON STRUCTURE**

-DET- STA. 15+85.00 (BEGIN BRIDGE) TO -DET- 17+55.00 (END BRIDGE)

SPECIAL RAIL WITH SIMULATED STONE FACE AS NEGOTIATED W/USFS

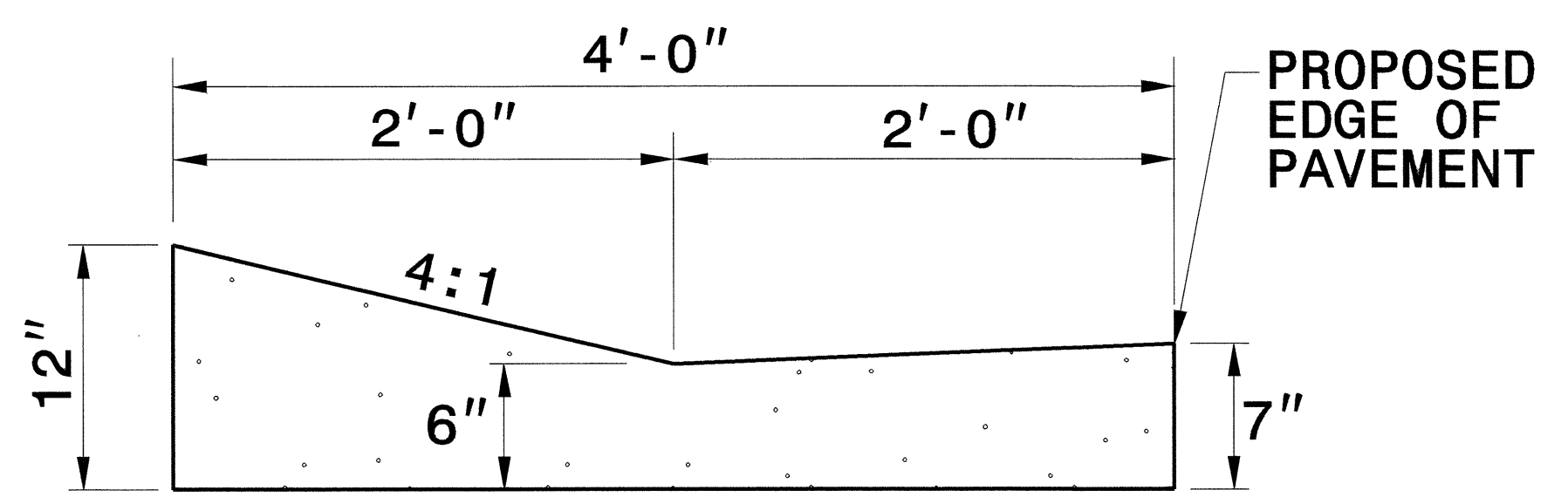


**Detail Showing Method of Wedging**

PROJECT REFERENCE NO. B-4286	SHEET NO. 2-A
ROADWAY DESIGN ENGINEER GREGORY E. GREGORY SEAL 18903 7-1-10	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON SEAL 22886

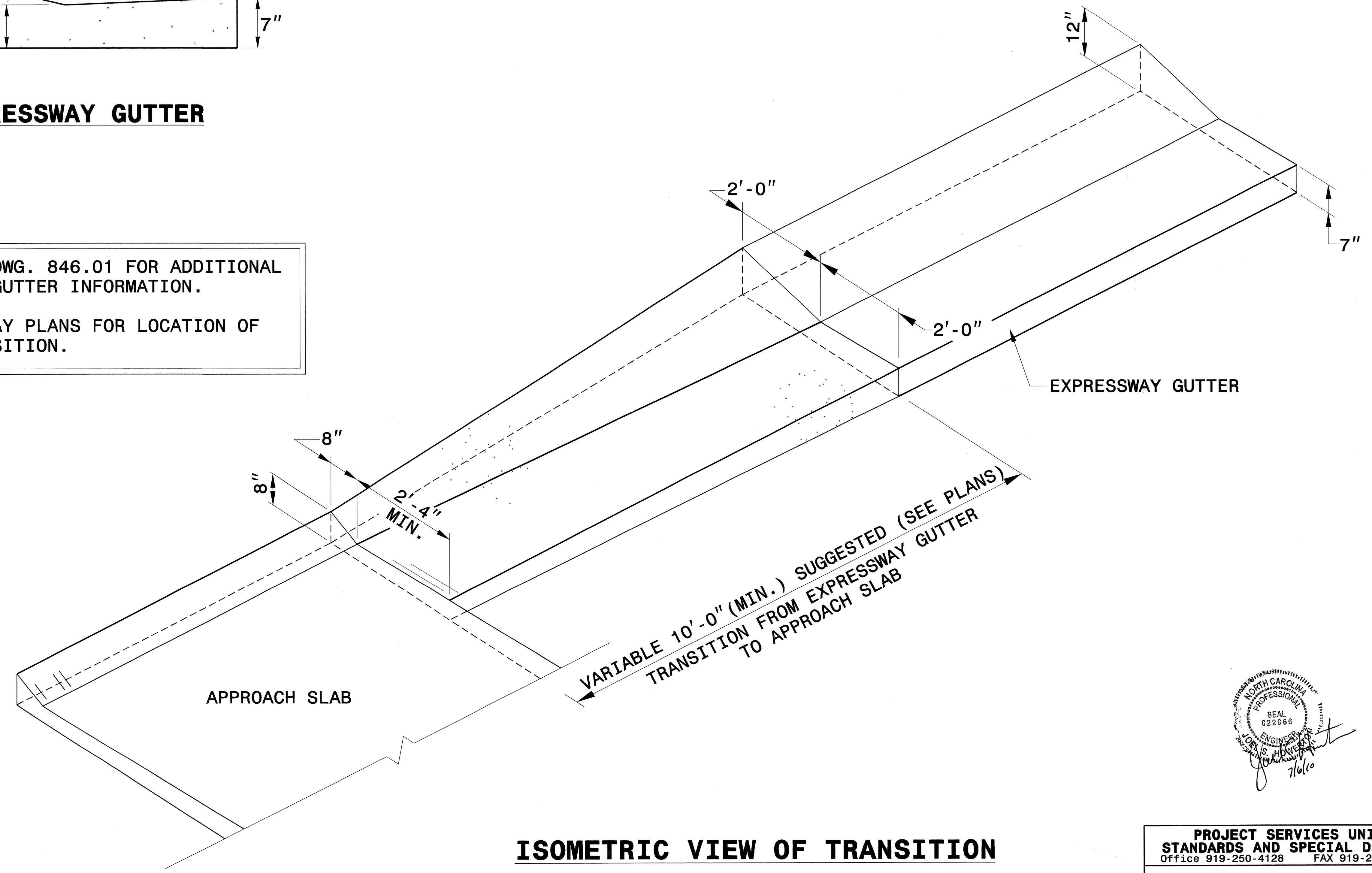
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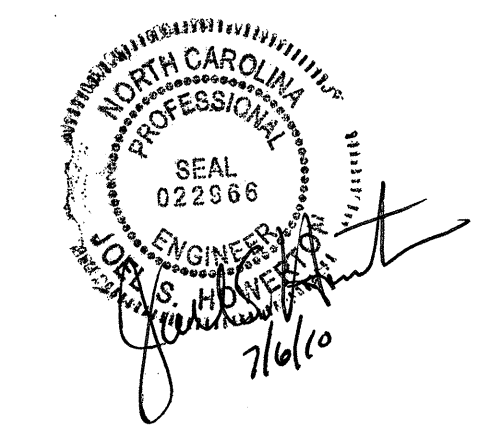


**EXPRESSWAY GUTTER**

NOTE: SEE STD. DWG. 846.01 FOR ADDITIONAL CURB AND GUTTER INFORMATION.  
SEE ROADWAY PLANS FOR LOCATION OF CURB TRANSITION.

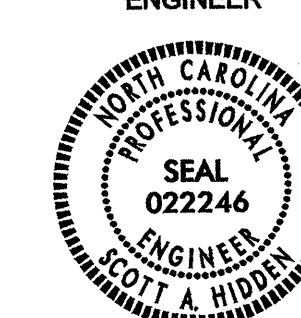


**ISOMETRIC VIEW OF TRANSITION**

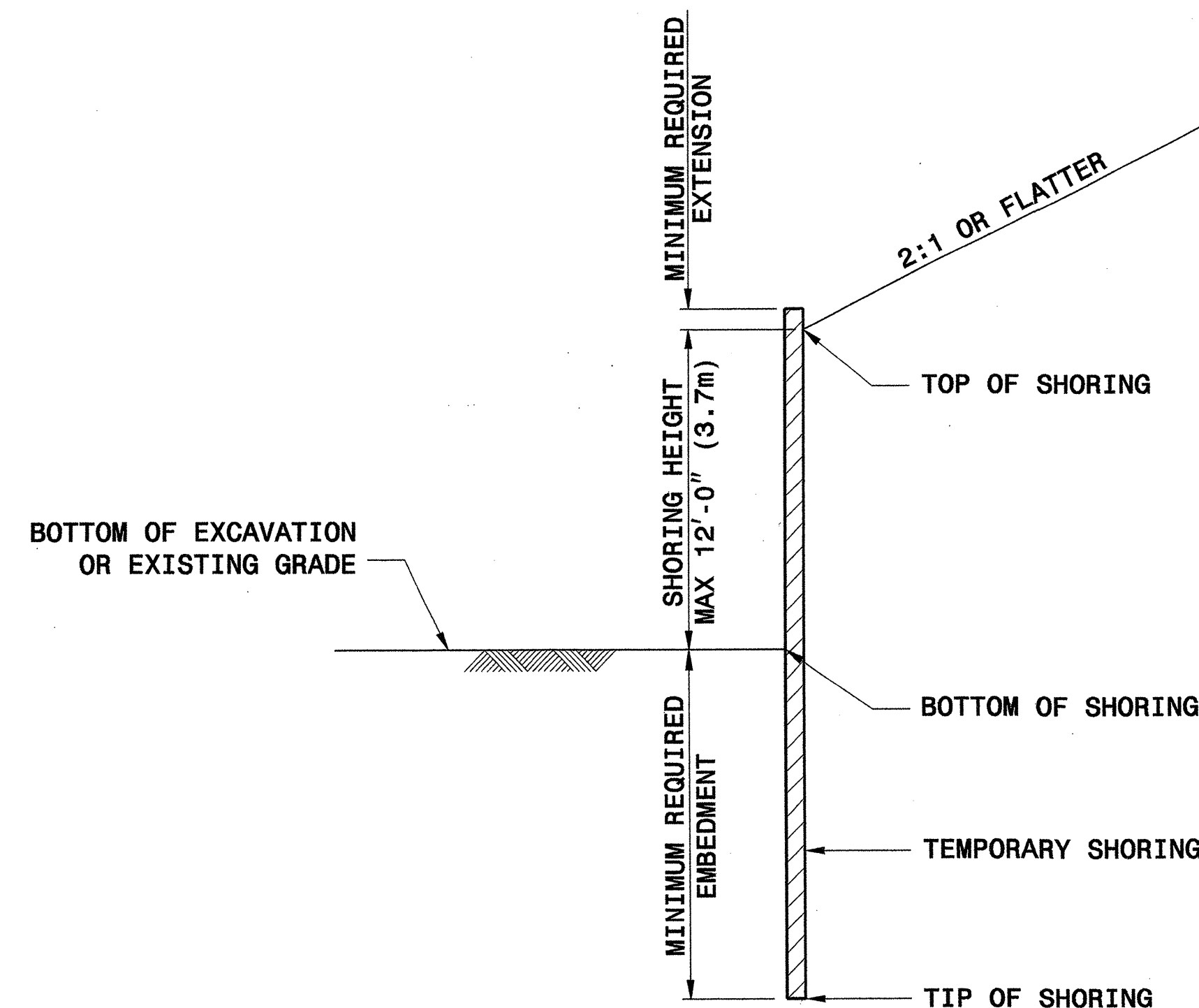


<b>PROJECT SERVICES UNIT STANDARDS AND SPECIAL DESIGN</b>	
Office 919-250-4128 FAX 919-250-4119	
<b>DETAIL OF EXPRESSWAY GUTTER TRANSITION TO APPROACH SLAB</b>	
ORIGINAL BY: rnbritt	DATE: 04-08-08
CHECKED BY: <i>[Signature]</i>	DATE: 1/25/10
FILE SPEC.: @details/nbritt/english/misc/curbgutter_trans.dgn	

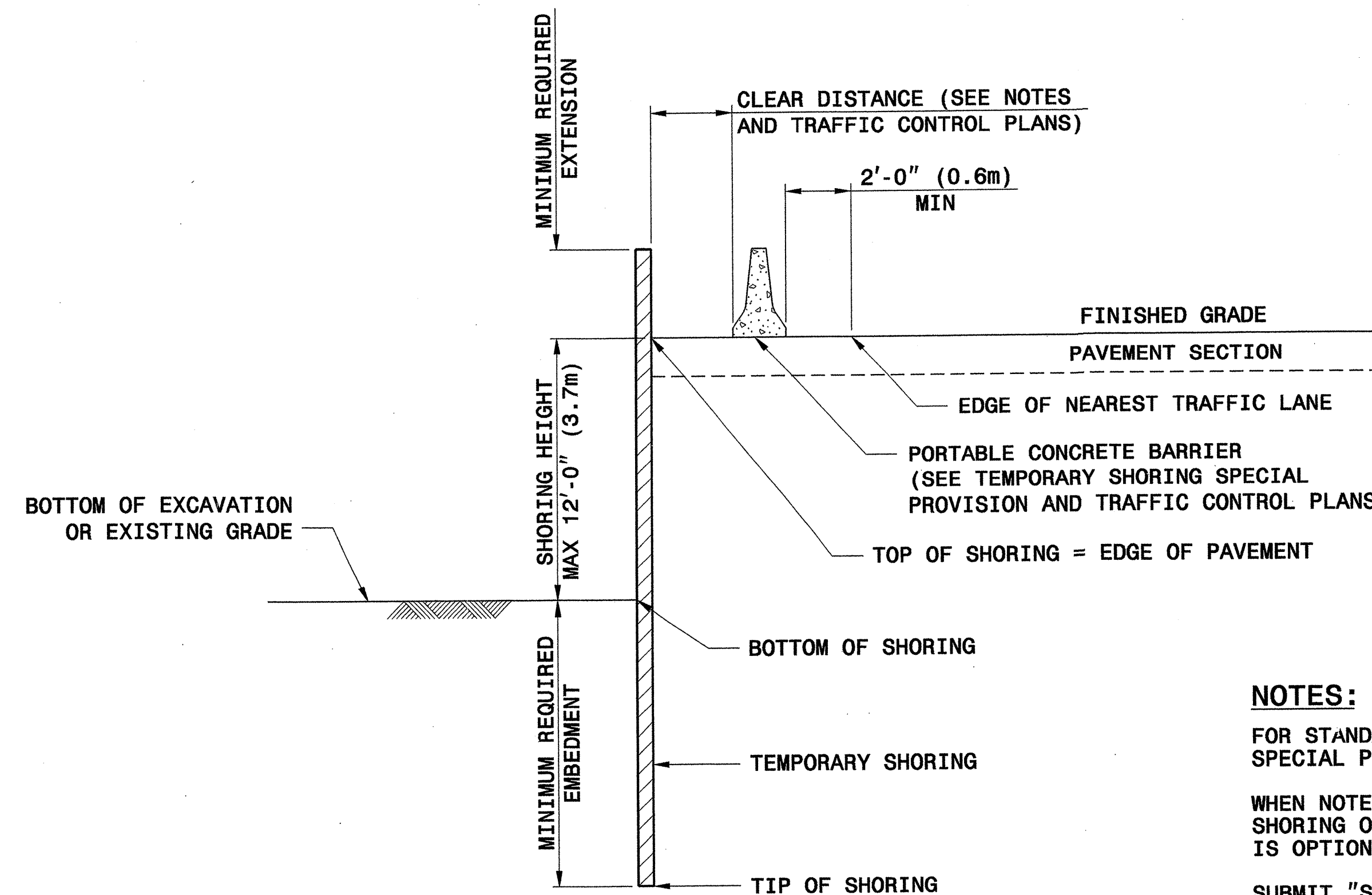
21-JAN-2010 13:25  
 s:\contracts\corp\529675\special\_details\nbritt\english\misc\expressway to shoulder berm transition.dgn  
 J:\power-ton AT P3237501



Scott A. Shadden 3/29/07  
SIGNATURE 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".

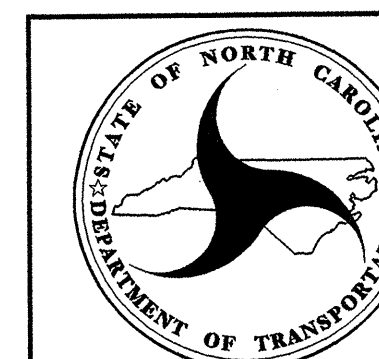
AT THE CONTRACTOR'S OPTION, H PILE EMBEDMENT DEPTHS FOR PILES SET IN DRILLED HOLES MAY BE REDUCED BY 25%. FOR PILE EXCAVATION, SEE TEMPORARY SHORING SPECIAL PROVISION.

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			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

<b>PROJECT REFERENCE NO.</b>		<b>SHEET</b>
B-4286		2-D
GEOTECHNICAL ENGINEER   S. A. Hildner 3/29/07 <small>SIGNATURE DATE</small>	ENGINEER   <small>SIGNATURE DATE</small>	

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.

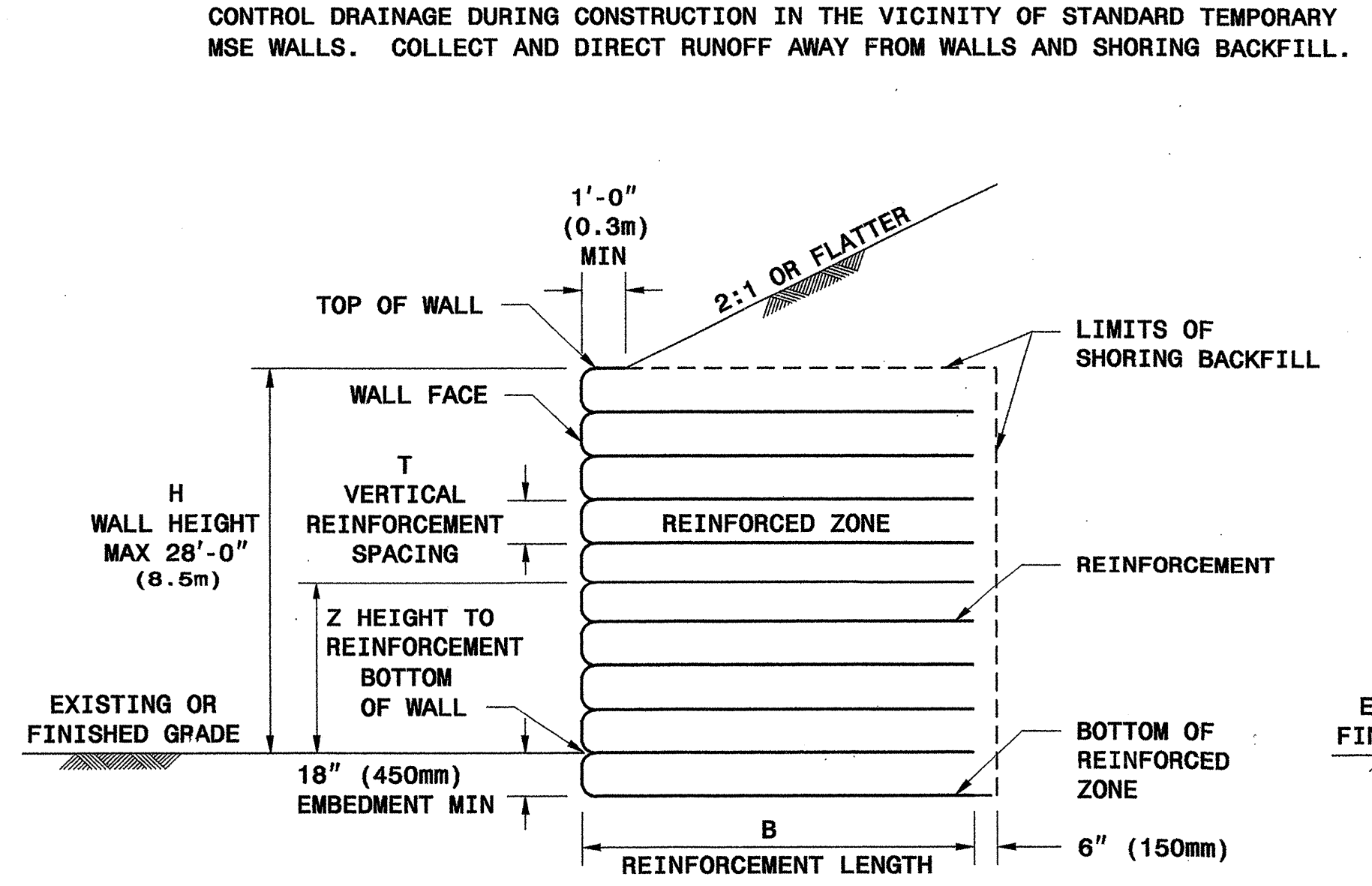
PLACE SHORING BACKFILL IN 8" TO 10" (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

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.

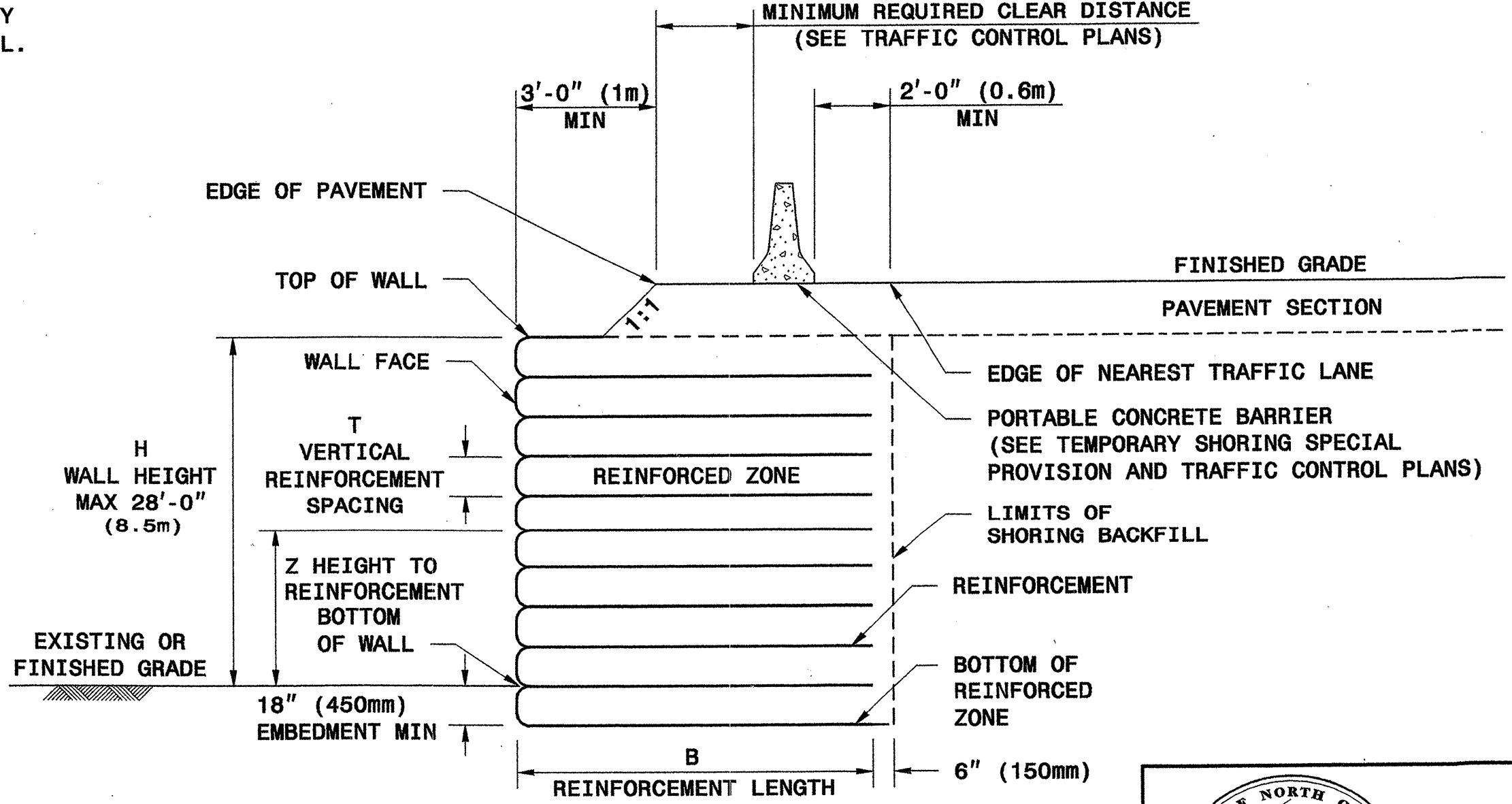
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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

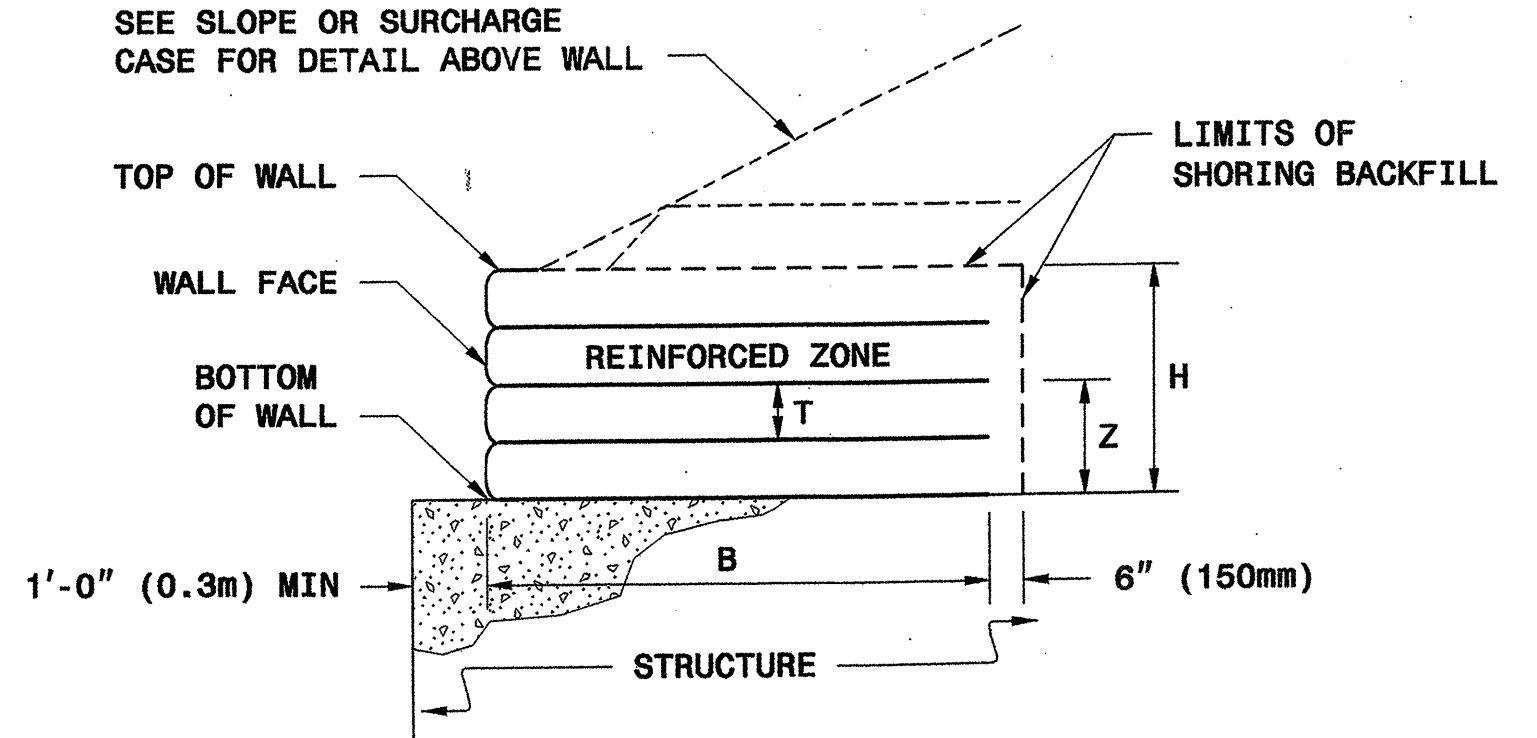
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.




**SLOPE CASE**



**SURCHARGE CASE**



**TEMPORARY MSE WALL ON STRUCTURE**

	<b>GEOTECHNICAL ENGINEERING UNIT</b>	<b>STANDARD DRAWING NO. 1801.02</b>
	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH	<b>STANDARD TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS</b>
		SHEET 1 OF 11      DATE: 2-20-07



GEOTECHNICAL ENGINEER ENGINEER

Scott A. Shidden 3/21/07

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)

WALL HEIGHT H (FT)	<8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28
SLOPE CASE	8	11	13	14	16	18	20	22	24	25	27
SURCHARGE CASE	8	9	11	12	14	15	16	18	19	21	22

TERRATREL TEMPORARY WALL (STRIPS PER LEVEL PER PANEL)

H (FT)	<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28
SLOPE AND SURCHARGE CASES													
Z (FT-INCHES)													

SIERRASCAPE TEMPORARY WALL (GEOGRID TYPE)

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

H (FT)	<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28
SLOPE CASE													
Z (FT)													

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

H (FT)	<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28
SLOPE CASE													
Z (FT)													

RETAINED EARTH TEMPORARY WALL (WELDED WIRE MESH TYPE)

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

H (FT)	<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28
SLOPE AND SURCHARGE CASES													
Z (FT-INCHES)													

NOTES FOR HILFIKER TEMPORARY WALL

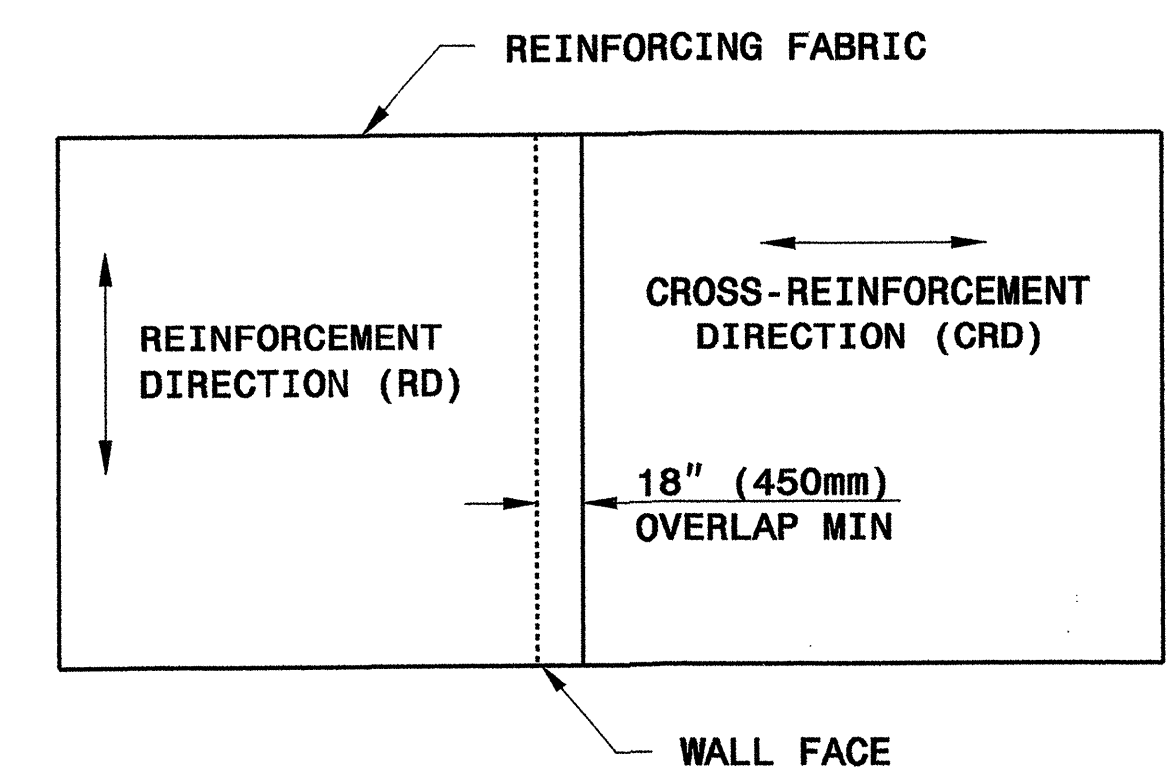
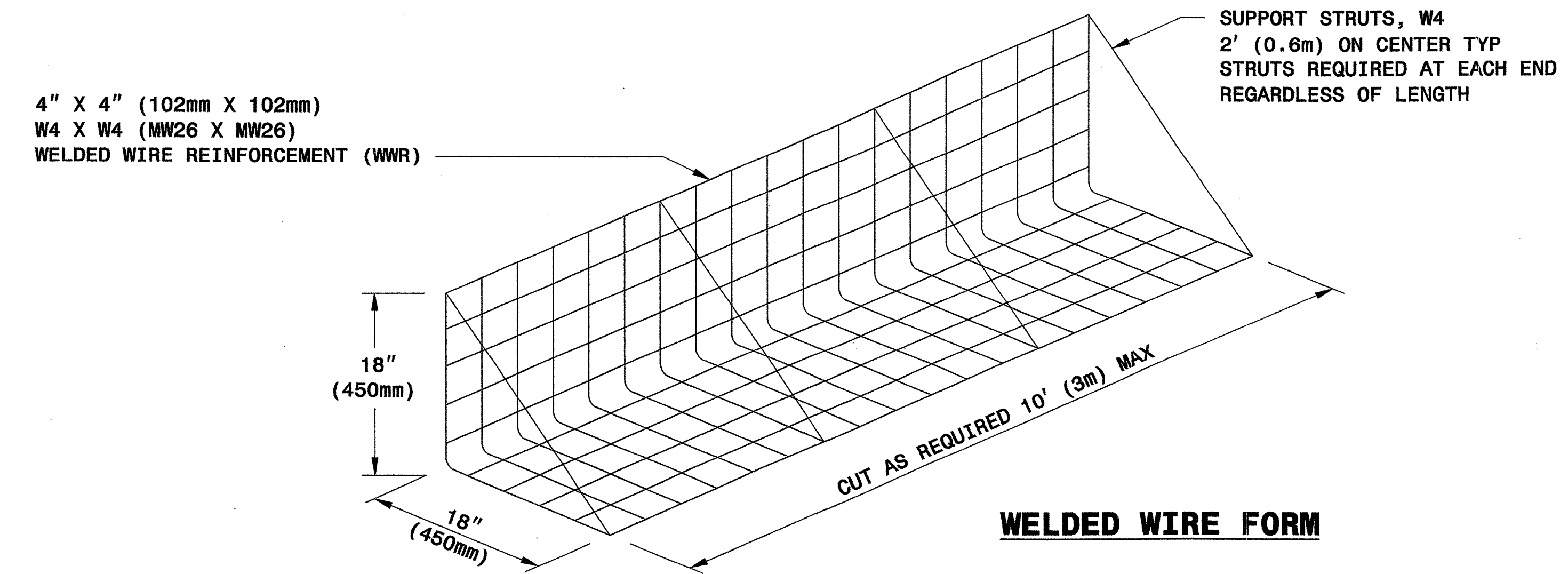
- 1) CAP MAT AT TOP OF WALL IS NOT INCLUDED IN TABLES.
- 2) REINFORCEMENT IS NOT REQUIRED AT 1' LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 24'.
- 3) REINFORCEMENT IS NOT REQUIRED AT 3' LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 26'.
- 4) REINFORCEMENT IS NOT REQUIRED AT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

GEOTECHNICAL ENGINEERING UNIT  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

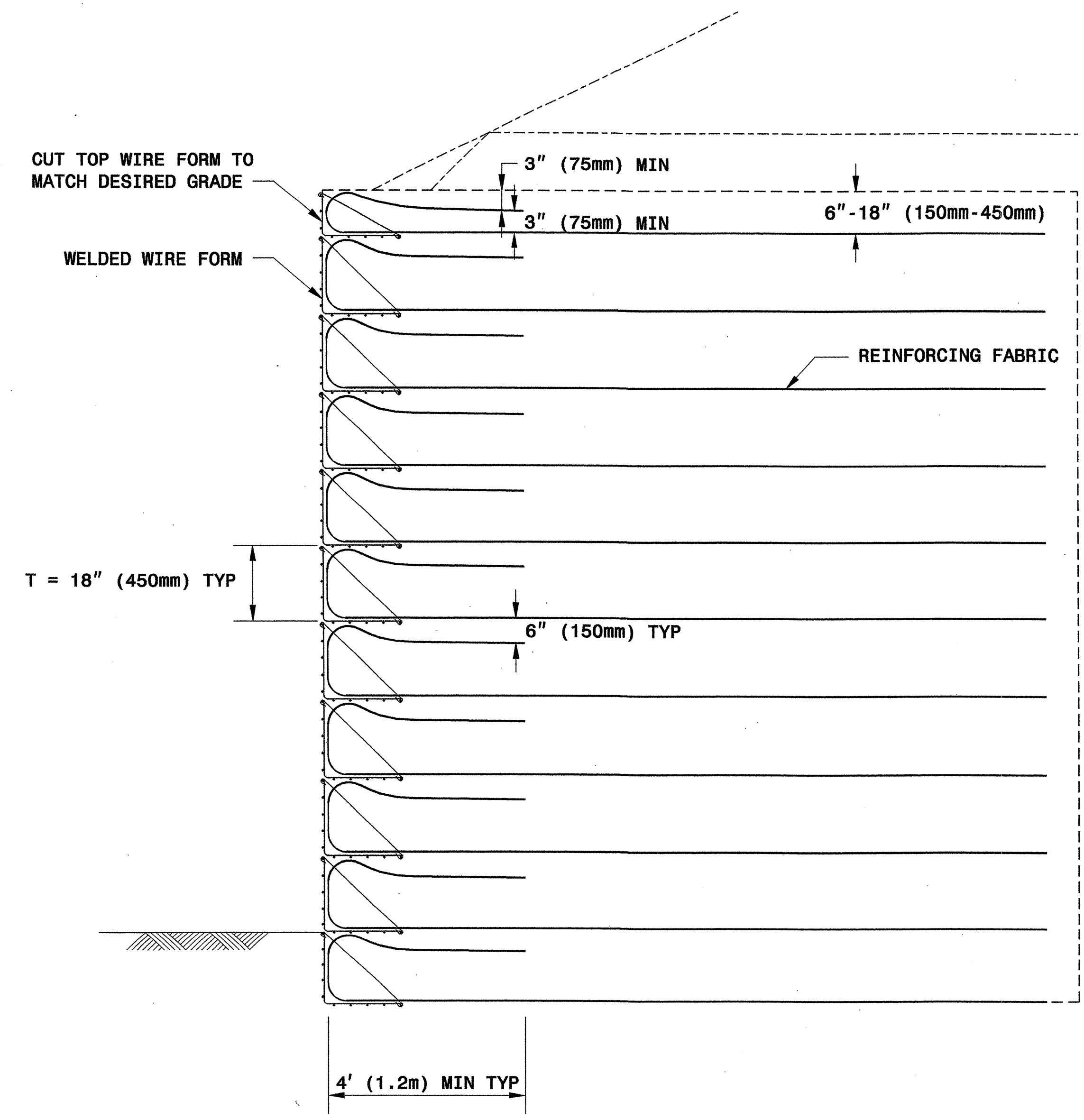
STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS





**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

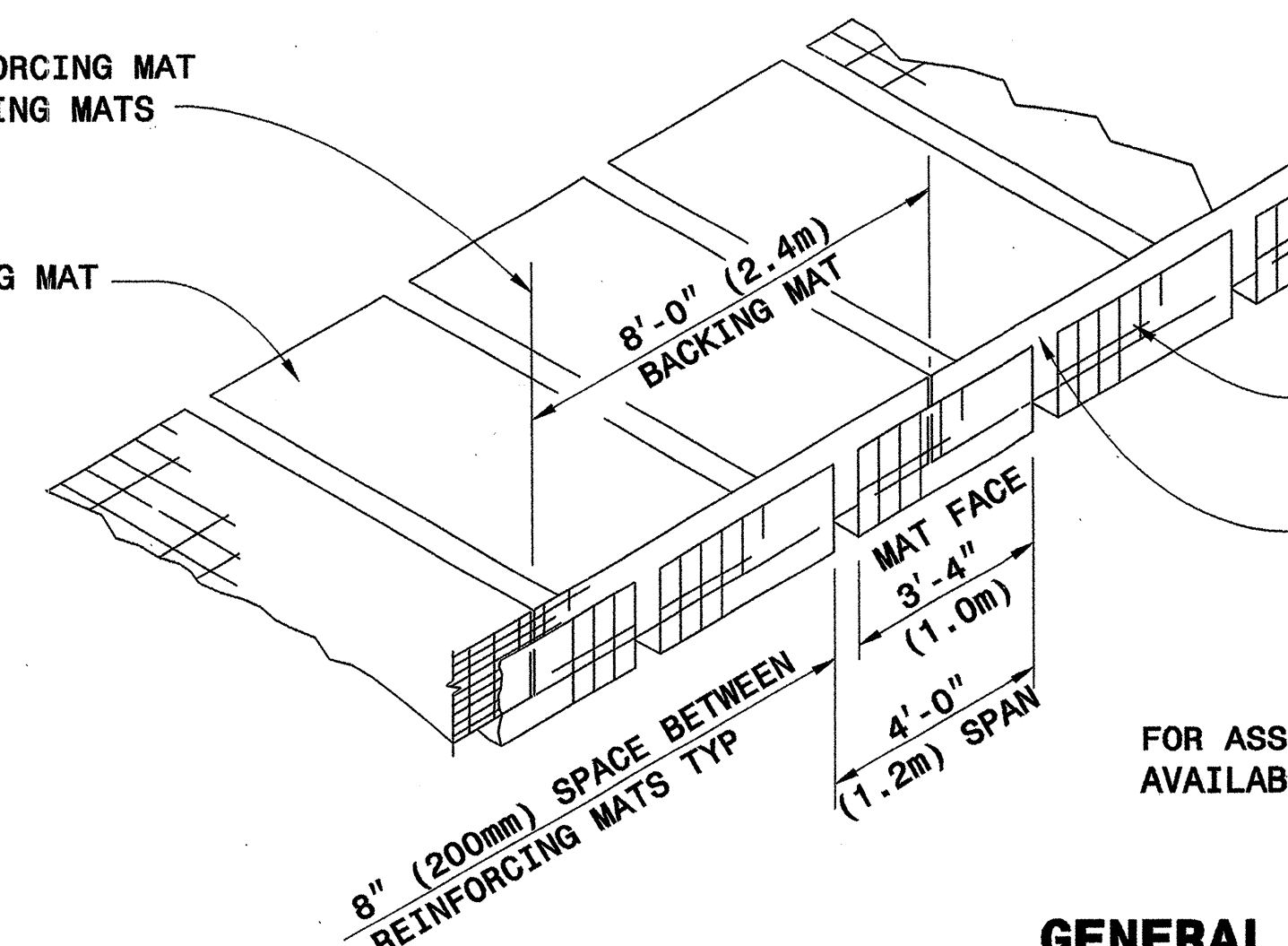


Scott A. Hadden 3/29/07  
SIGNATURE DATE

SIGNATURE DATE

CENTERLINE OF REINFORCING MAT  
FACE = EDGE OF BACKING MATS

REINFORCING MAT

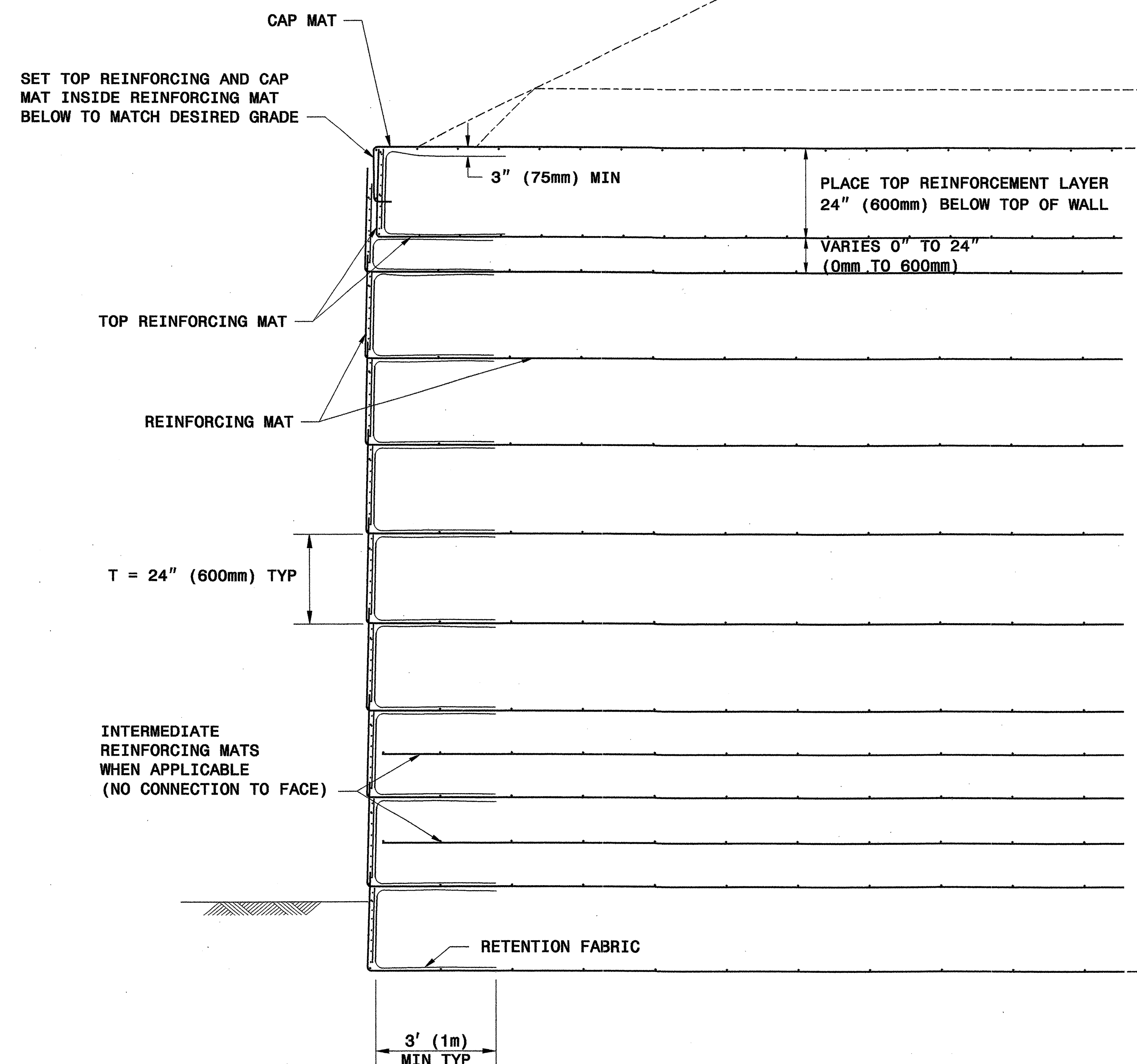


WALL FACE

BACKING MAT

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

**GENERAL ASSEMBLY DETAIL**



SET TOP REINFORCING AND CAP MAT INSIDE REINFORCING MAT BELOW TO MATCH DESIRED GRADE

CAP MAT

3" (75mm) MIN

PLACE TOP REINFORCEMENT LAYER 24" (600mm) BELOW TOP OF WALL

VARIES 0" TO 24" (0mm TO 600mm)

TOP REINFORCING MAT

REINFORCING MAT

T = 24" (600mm) TYP

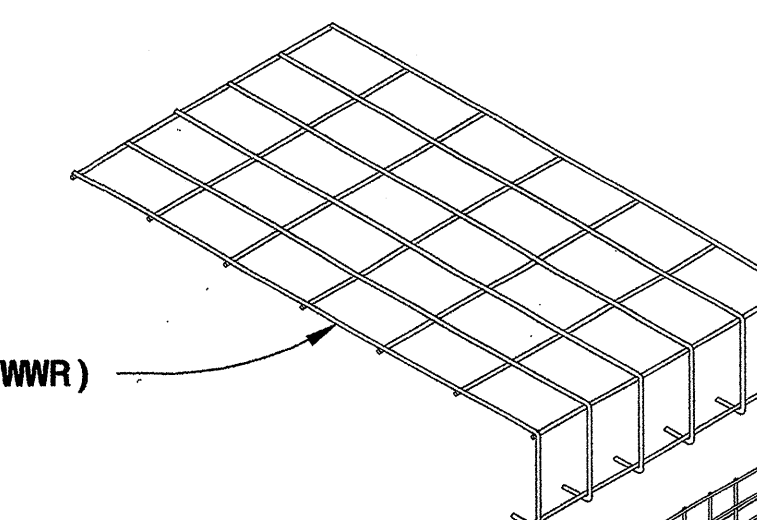
INTERMEDIATE REINFORCING MATS WHEN APPLICABLE (NO CONNECTION TO FACE)

RETENTION FABRIC

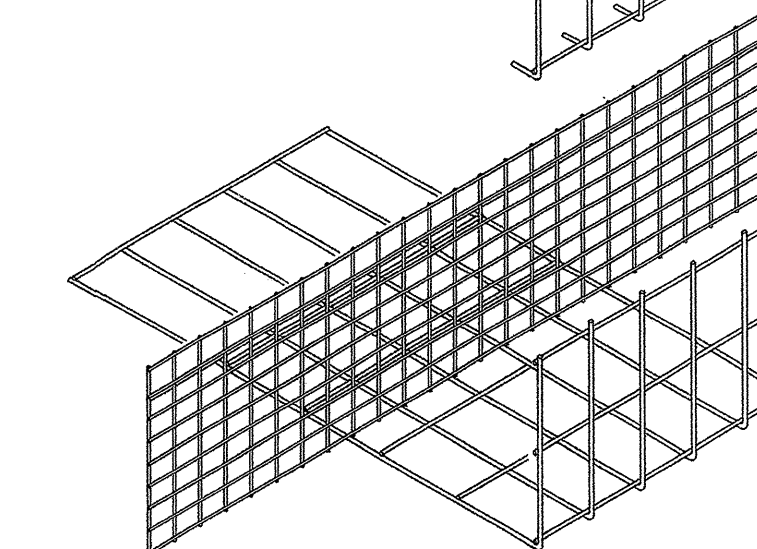
3' (1m) MIN TYP

**TYPICAL SECTION**

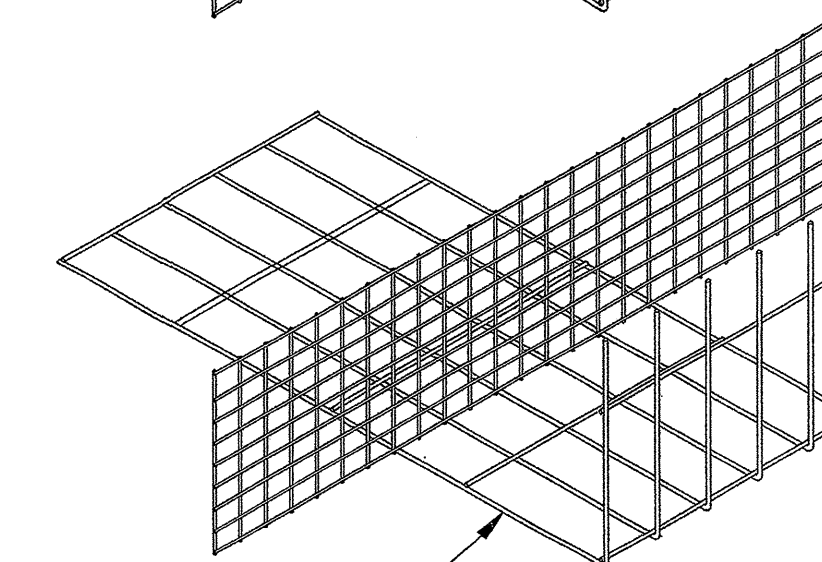
8" X 12" (203mm X 305mm)  
W4.5 X W3.5 (MW29 X MW23)  
CAP MAT  
WELDED WIRE REINFORCEMENT (WWR)



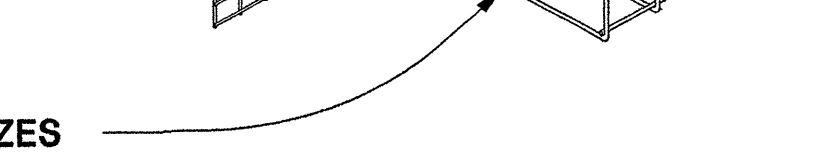
8" X 12" (203mm X 305mm)  
W4.5 X W3.5 (MW29 X MW23) WWR  
TOP REINFORCING MAT (NO PRONGS)



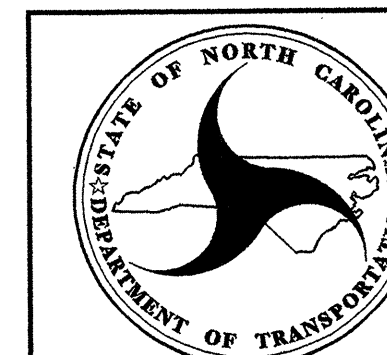
4" X 3" (102mm X 76mm)  
W5 X W2.5 (MW32 X MW16) WWR  
BACKING MAT  
8' (2.4m) WIDE



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



**WALL COMPONENTS**

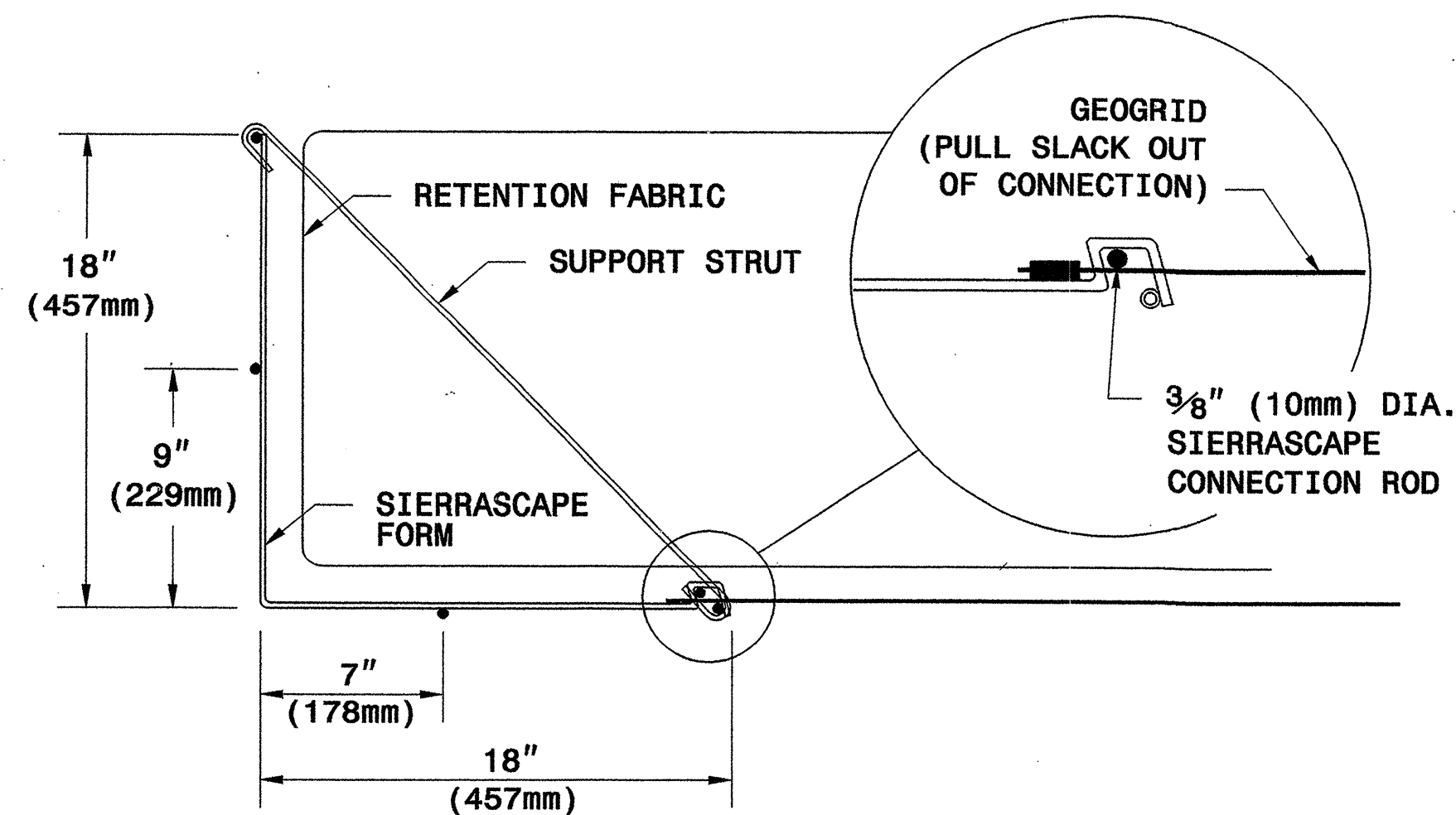






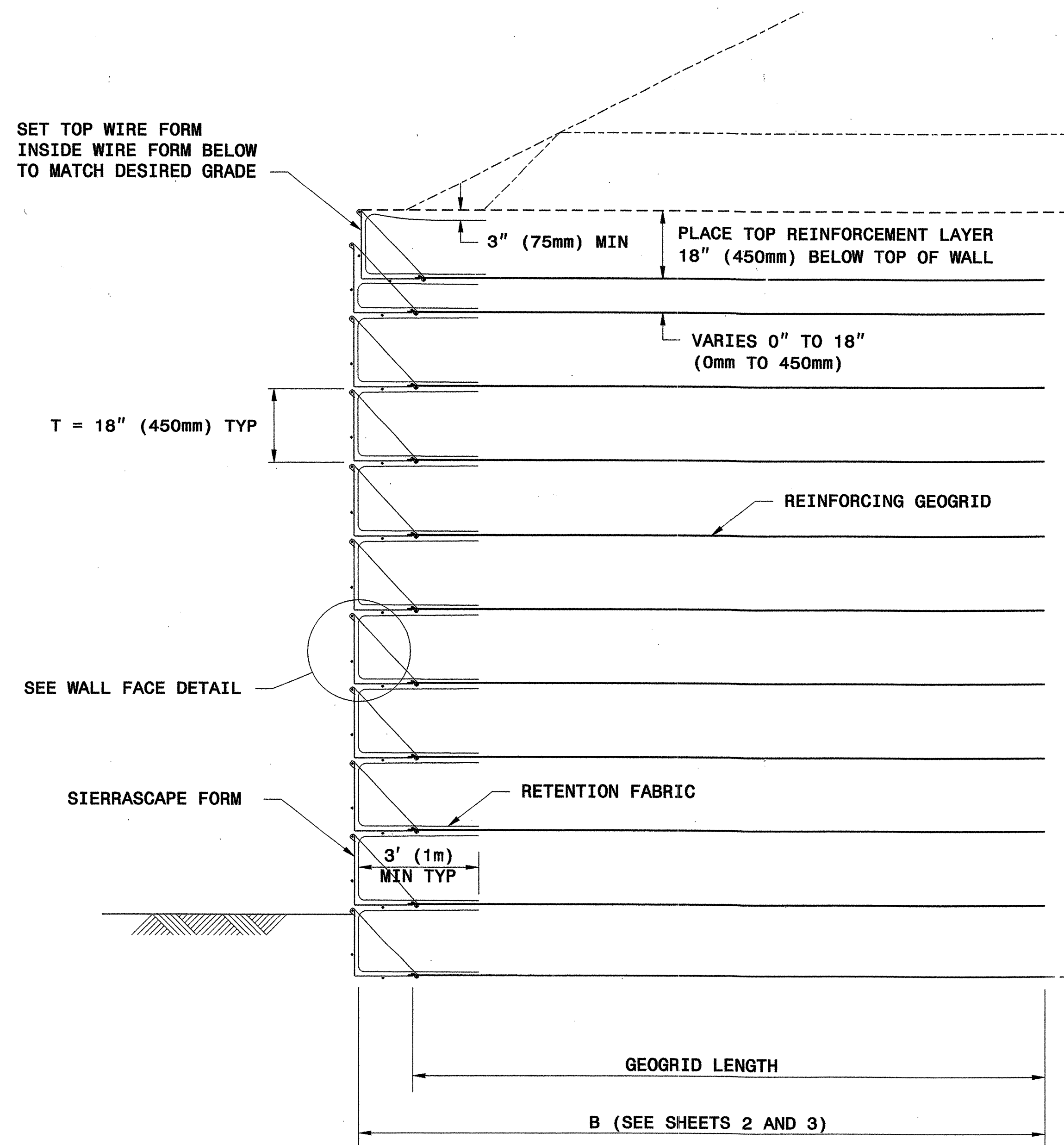
Scott A. Shidden 3/29/07  
SIGNATURE DATE

SIGNATURE DATE

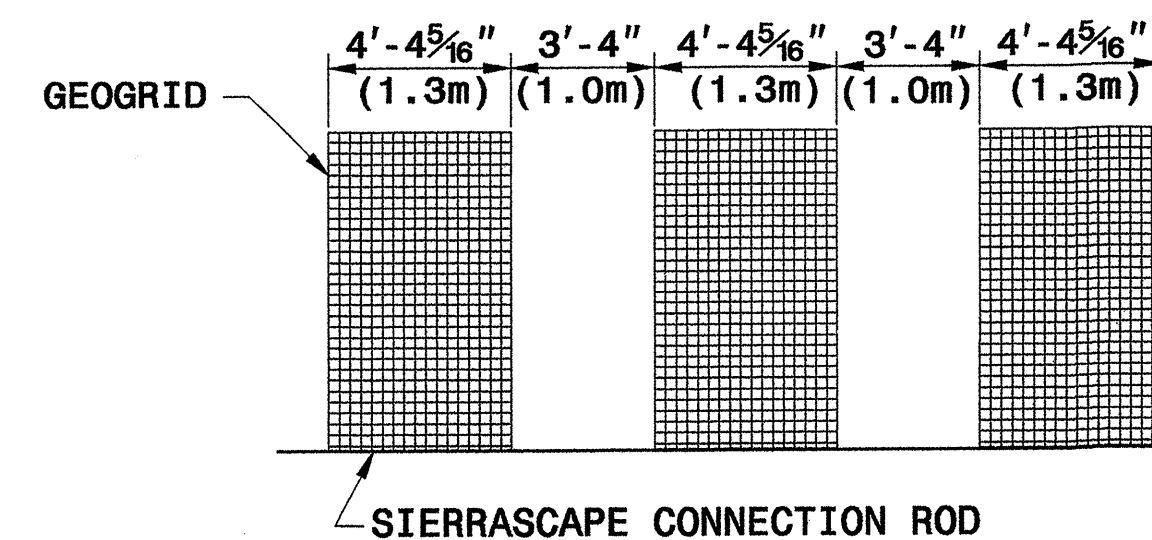


**WALL FACE DETAIL**

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

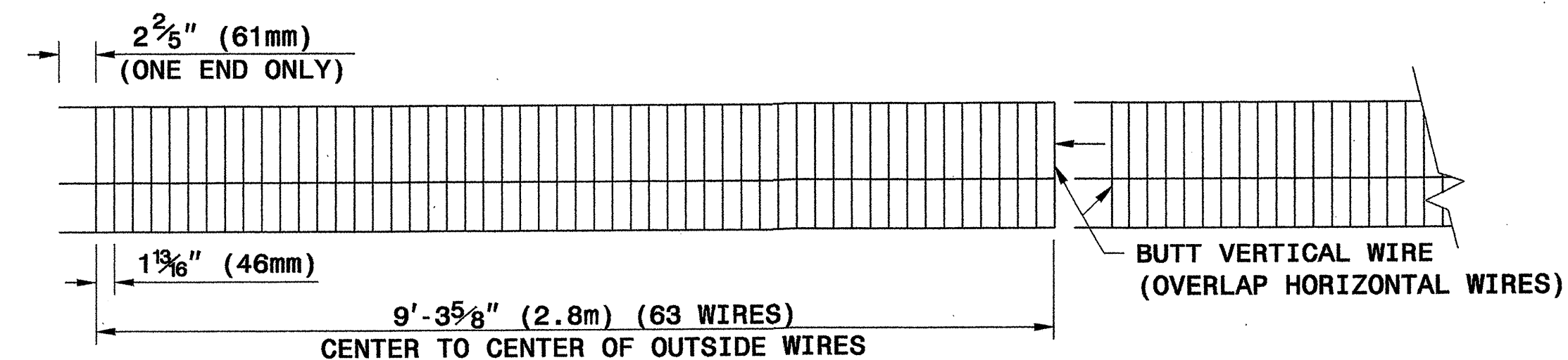


**TYPICAL SECTION**

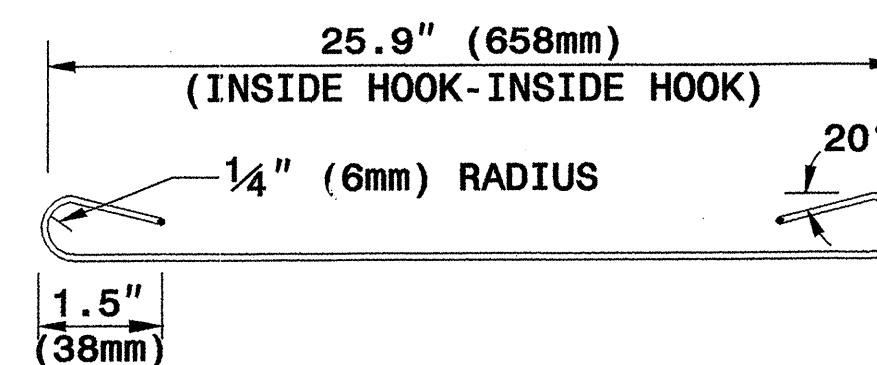


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

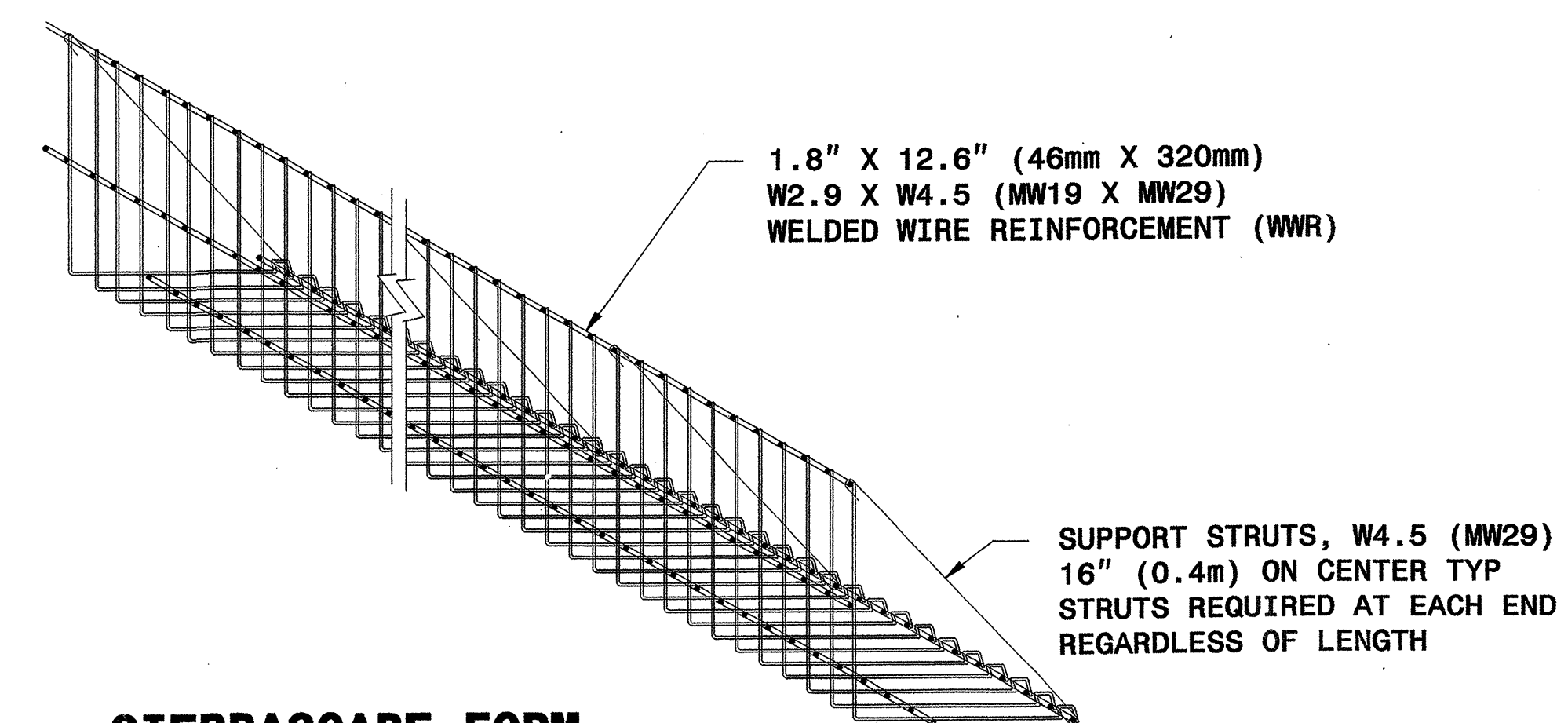
**TYPICAL GEOGRID COVERAGE**



**ELEVATION VIEW**

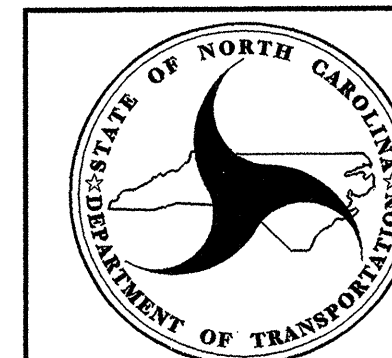
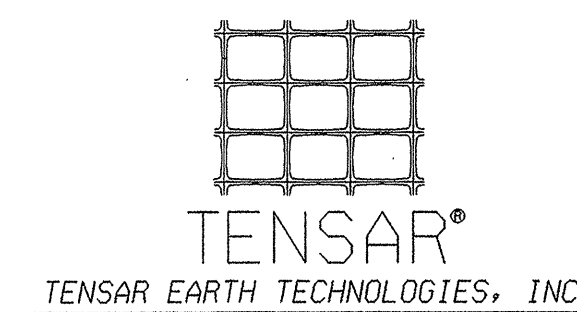


**SUPPORT STRUT**



**SIERRASCAPE FORM**

**WALL COMPONENTS**



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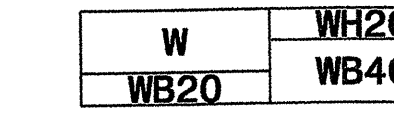
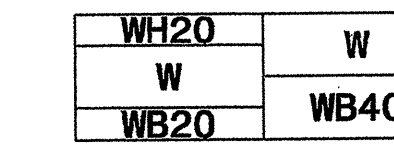
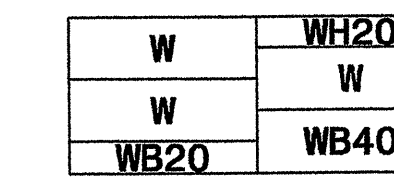
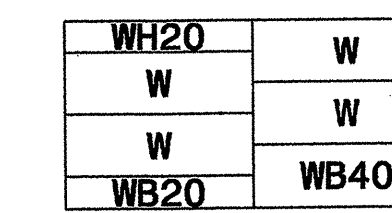
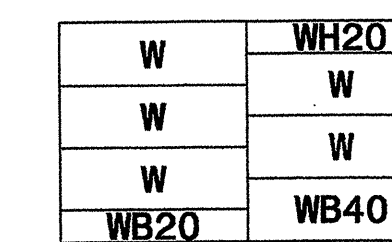
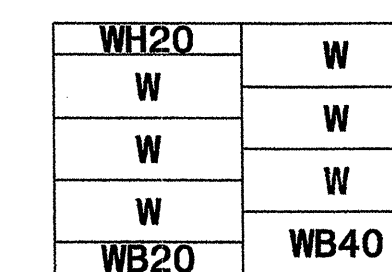
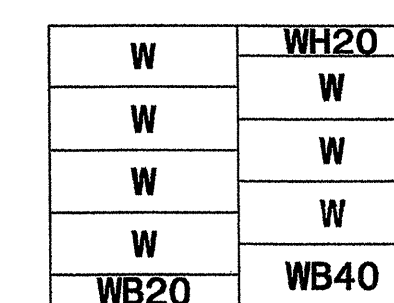
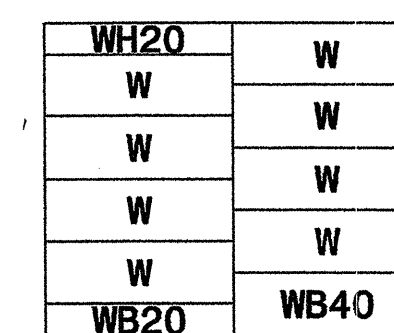
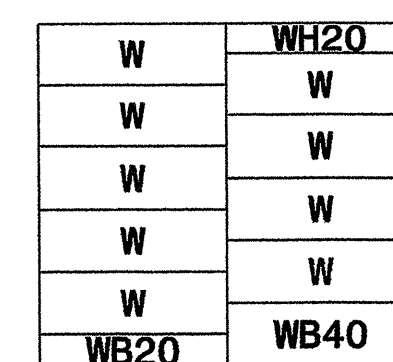
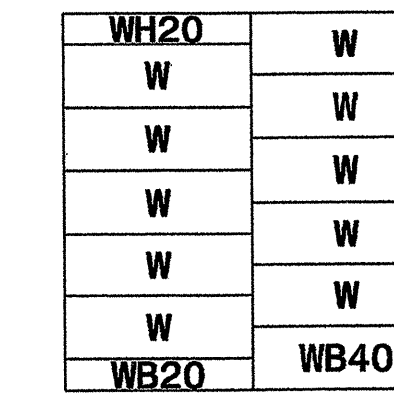
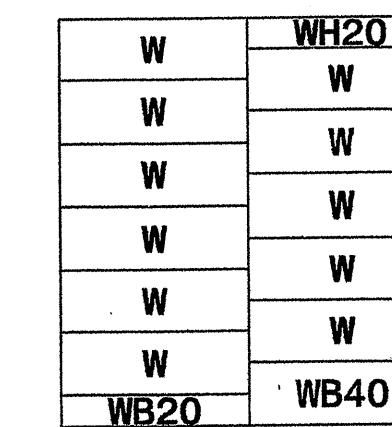
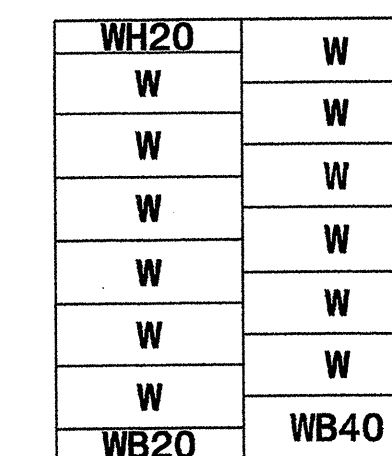
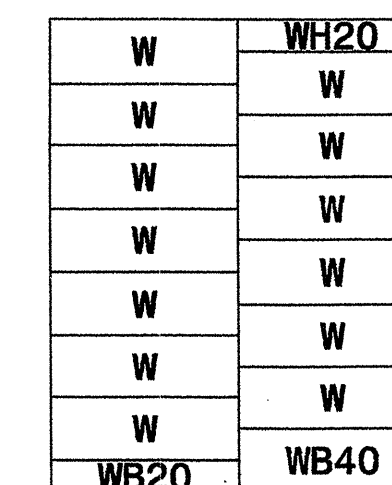
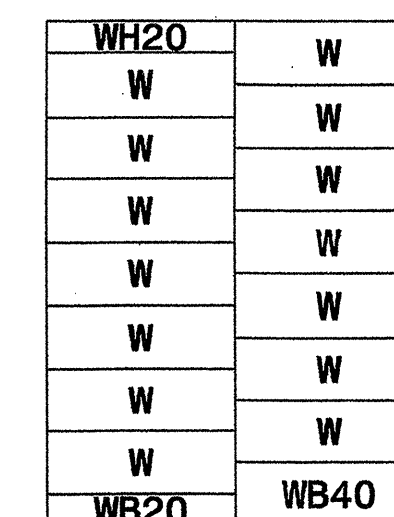
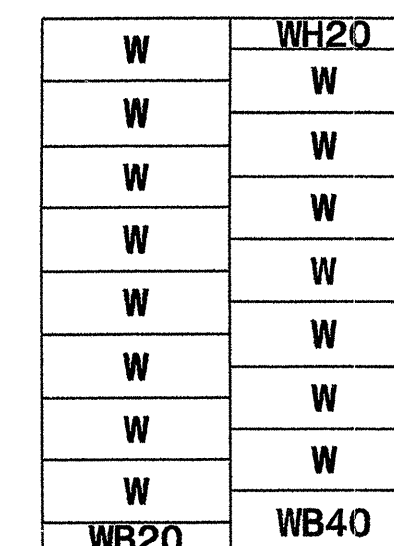
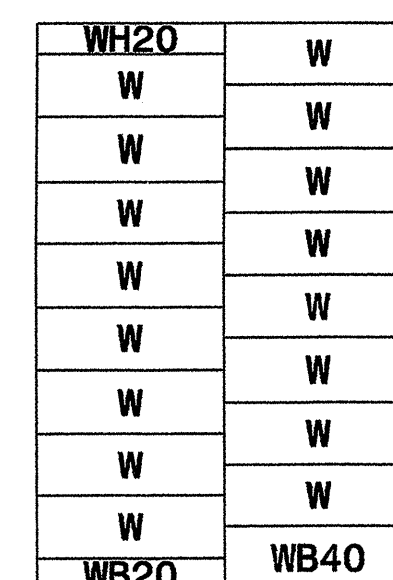
**SIERRASCAPE TEMPORARY WALL**



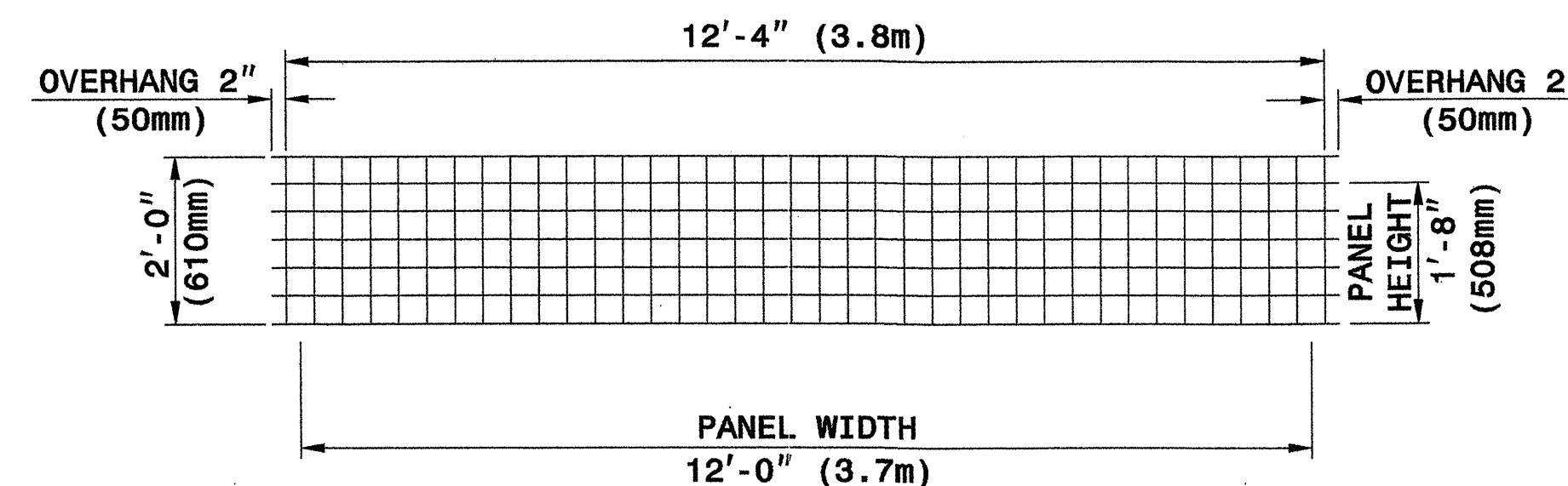
*Scott A. Hidden* 3/29/07  
SIGNATURE DATE

**PANEL LAYOUTS**

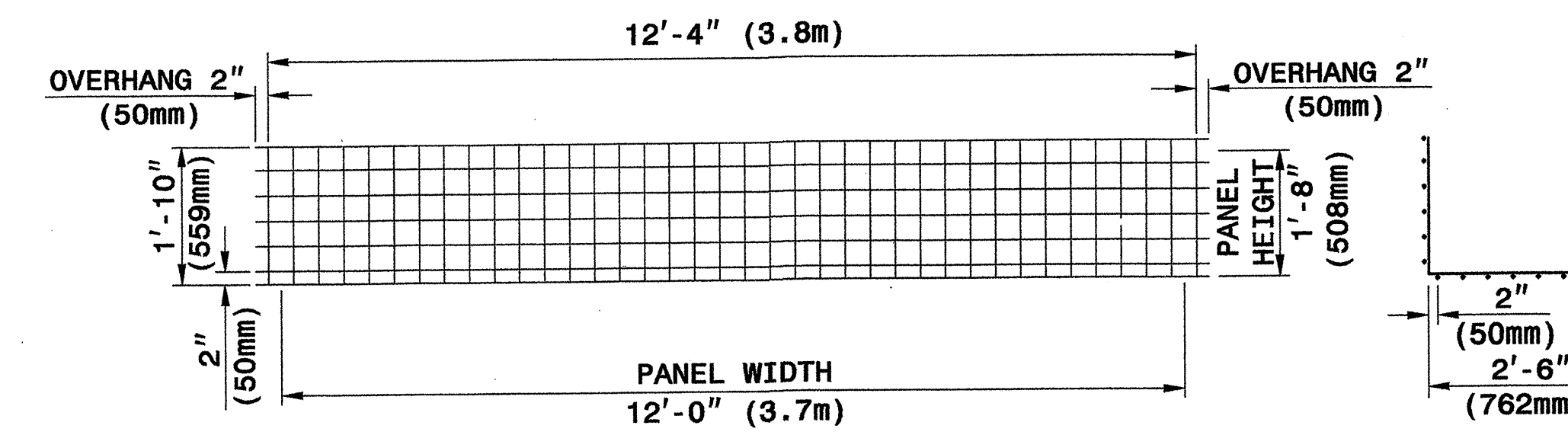
H - WALL HEIGHT  
(FEET-INCHES)  
(METER)



(FEET-INCHES)  
(METER)

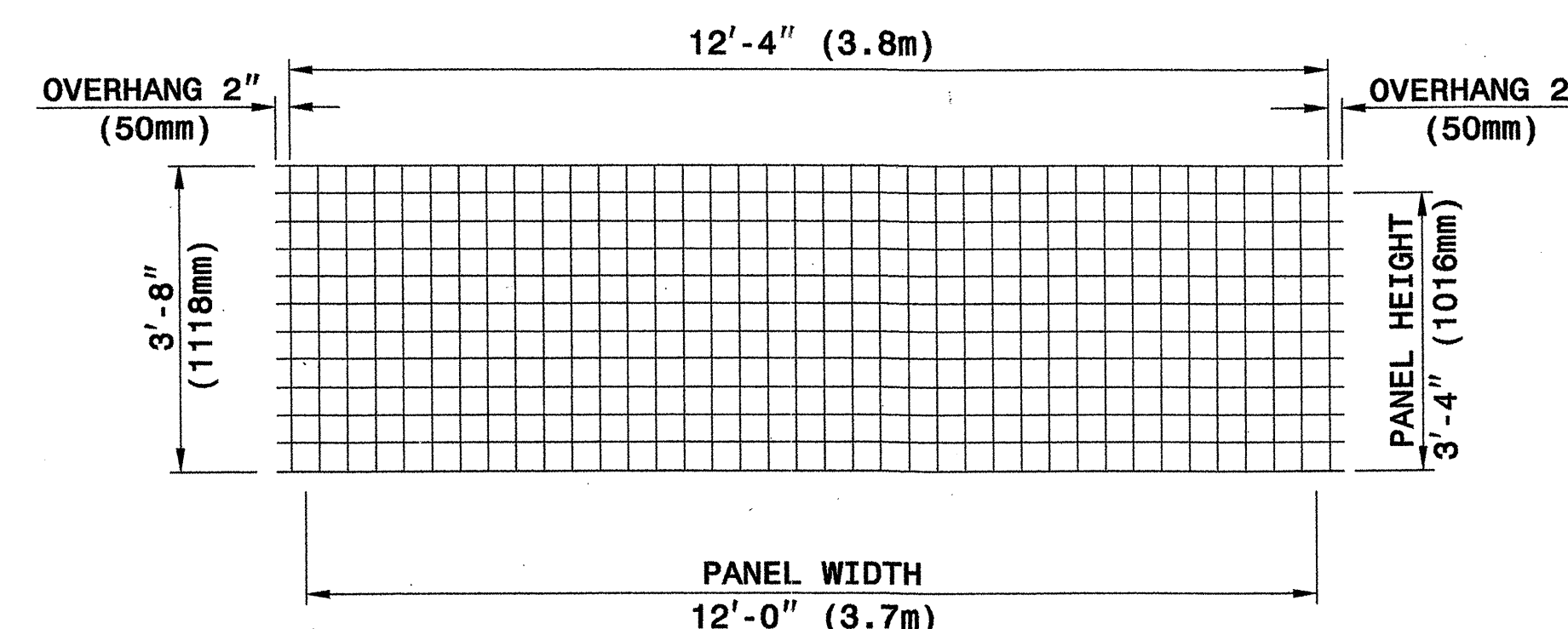


**TYPE WH20**

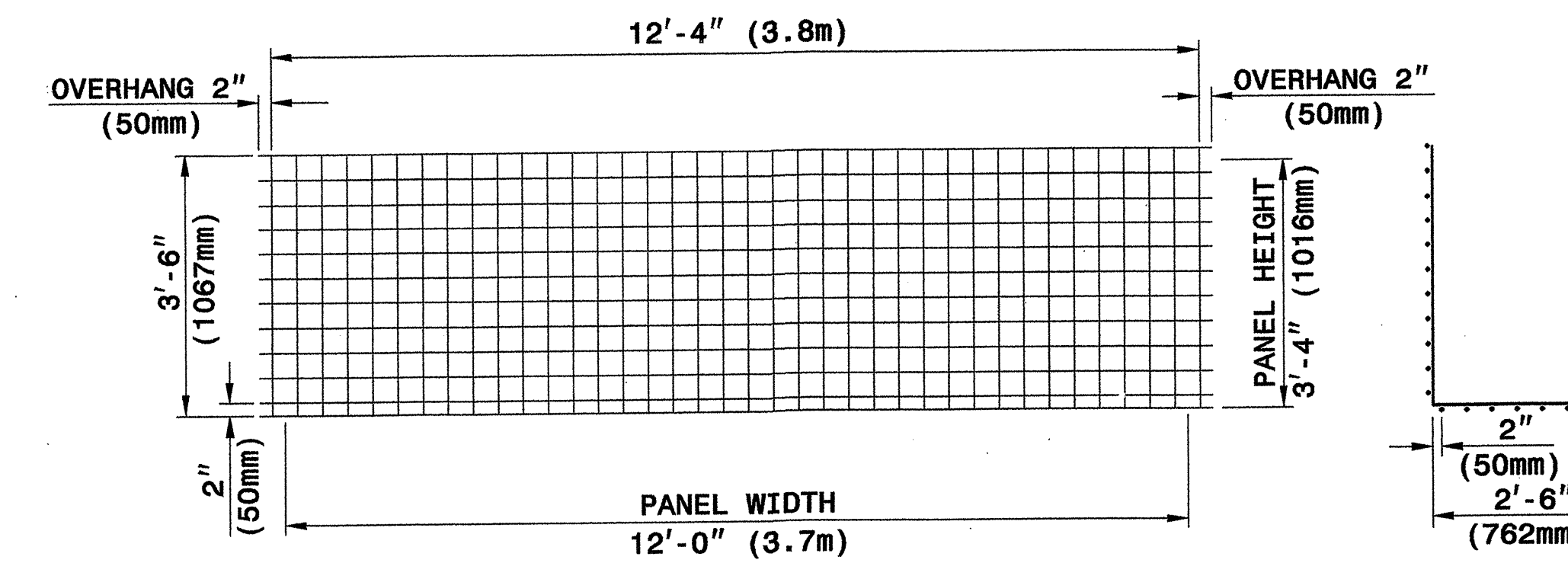


**TYPE WB20**

**SECTION**



**TYPE W**



**TYPE WB40**

**SECTION**

**WELDED WIRE FACINGS**

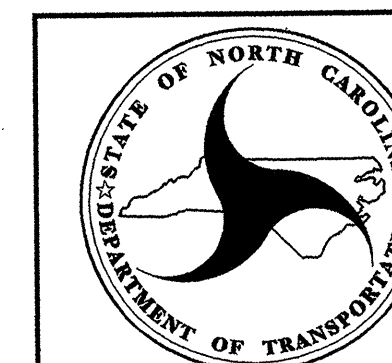
**WELDED WIRE FORMS**

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

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



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RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH  
TEMPORARY WALL

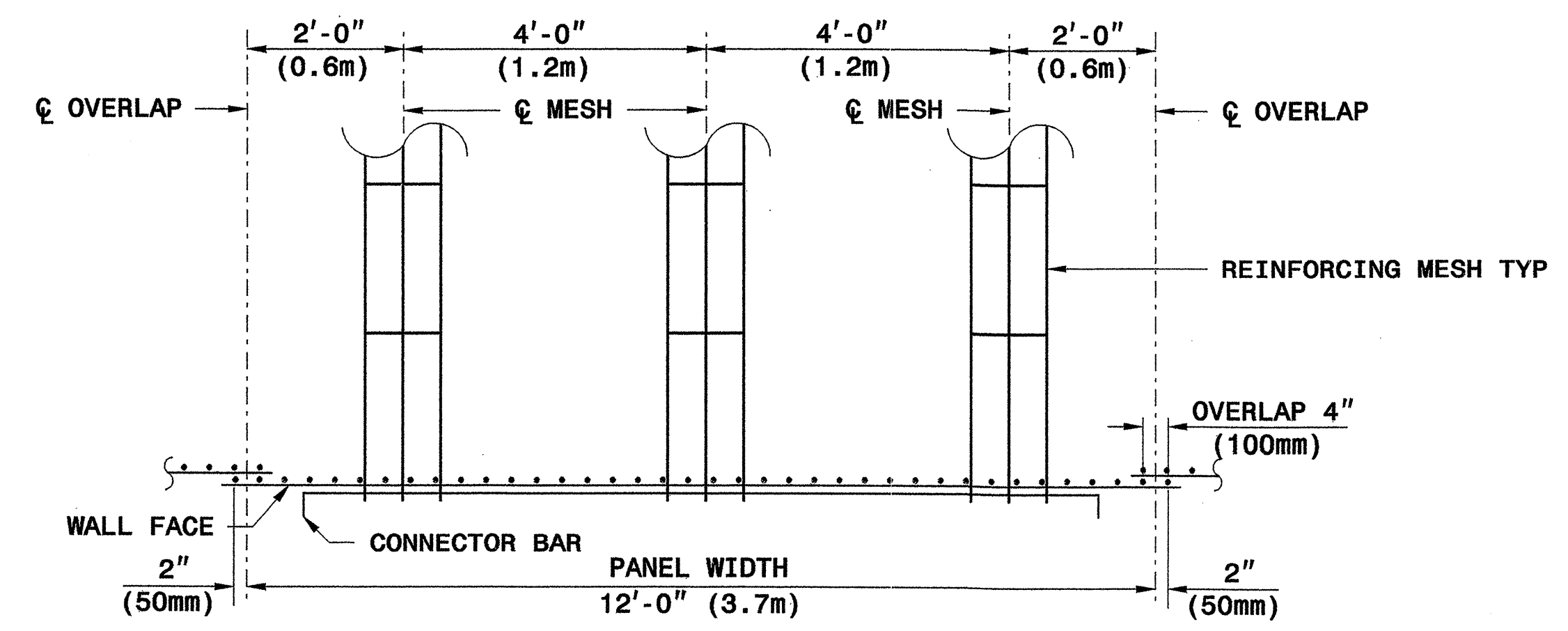
SHEET 6 OF 11

DATE: 12-19-06

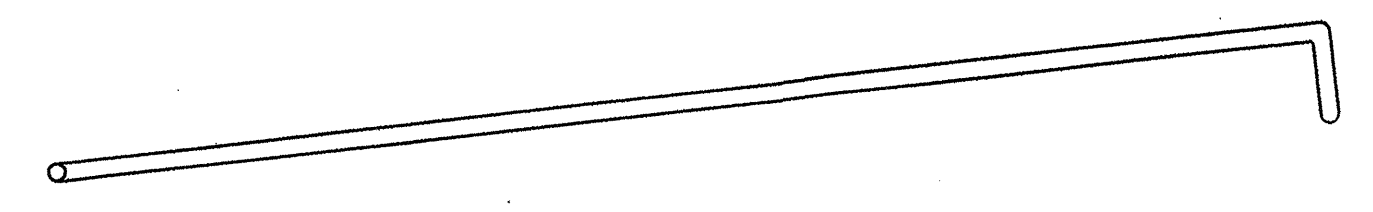




Signature: Scott A. Hadden, Date: 3/29/07



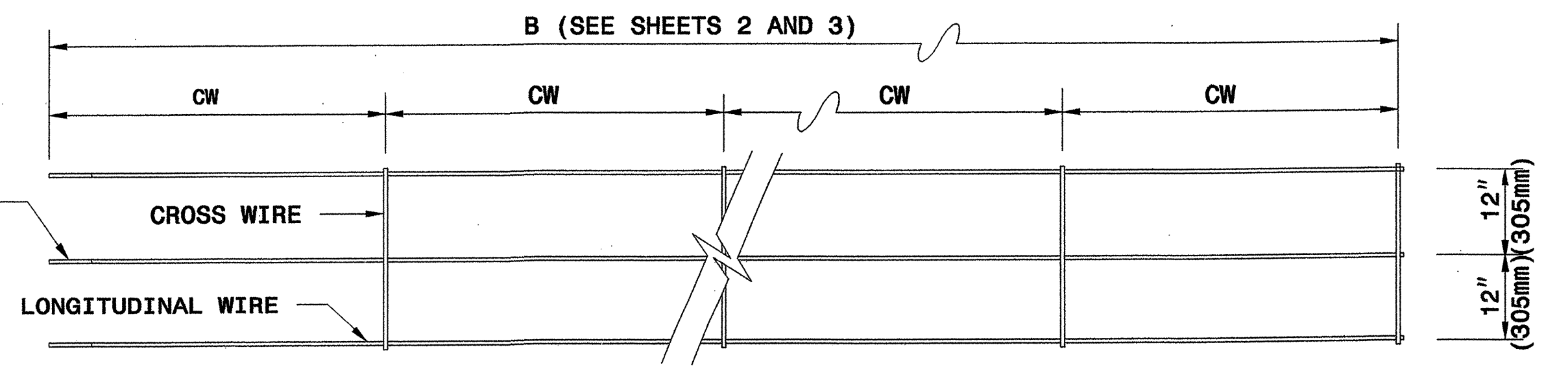
**REINFORCING MESH PLACEMENT DETAIL  
(PLAN VIEW)**



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

**CONNECTOR BAR**

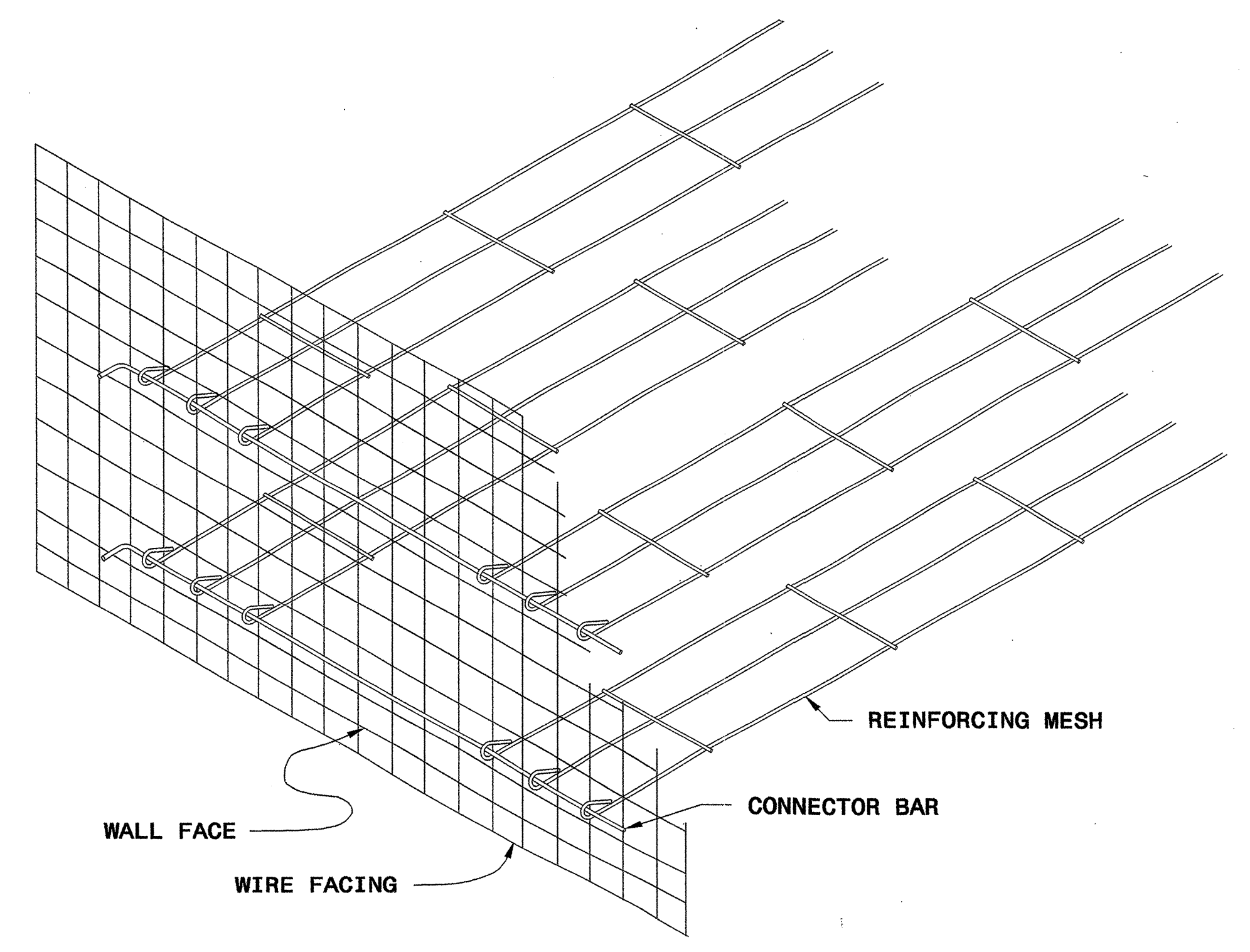
LOOPEd END OF MESH  
(SEE REINFORCING MESH LOOP DETAIL)



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

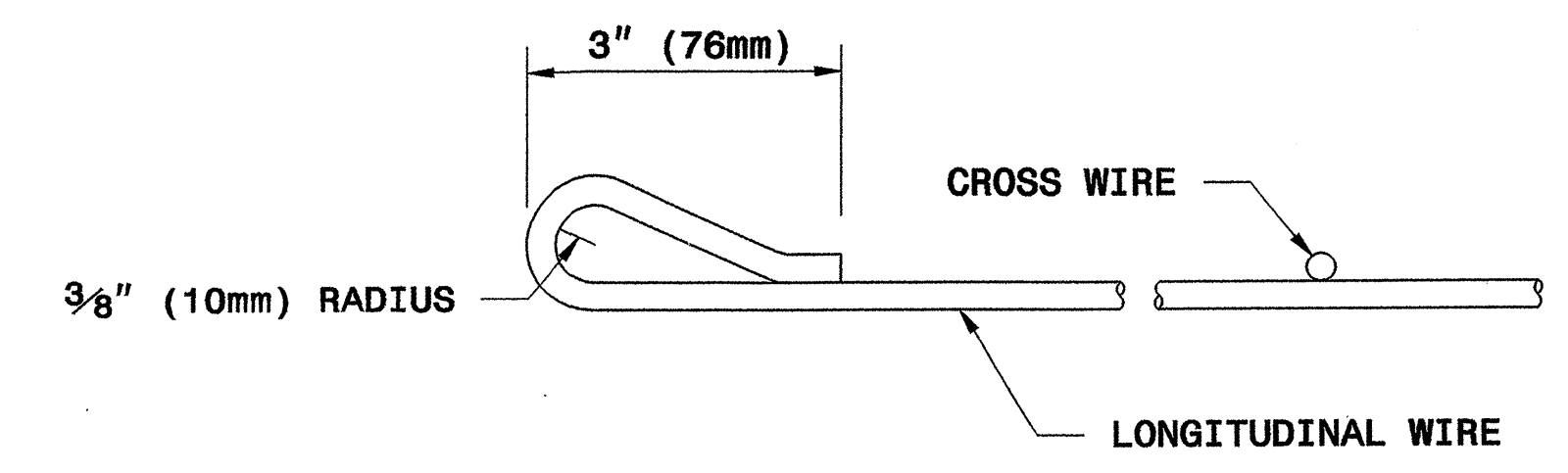
**3W8 X W8 X 2.0' (3MW52 X MW52 X 610mm)**  
 NO. OF LONGITUDINAL WIRES  
 GAUGE OF LONGITUDINAL WIRES  
 GAUGE OF CROSS WIRES  
 SPACING OF CROSS WIRES IN FT (mm), CW

**REINFORCING MESH DESIGNATION**

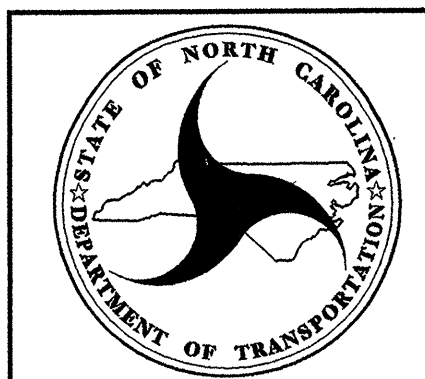


**GENERAL ASSEMBLY DETAIL**

**REINFORCING MESH**



**REINFORCING MESH LOOP DETAIL**



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STANDARD DRAWING NO. 1801.02

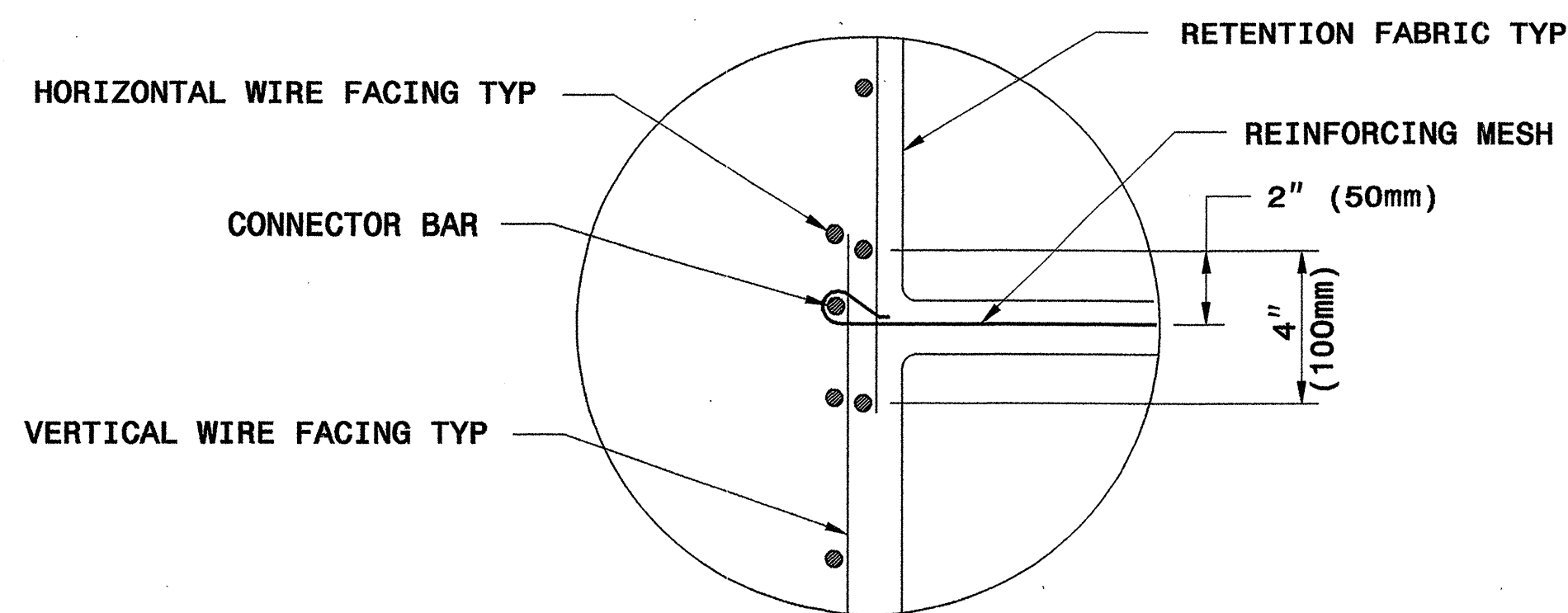
**RETAINED EARTH  
TEMPORARY WALL**



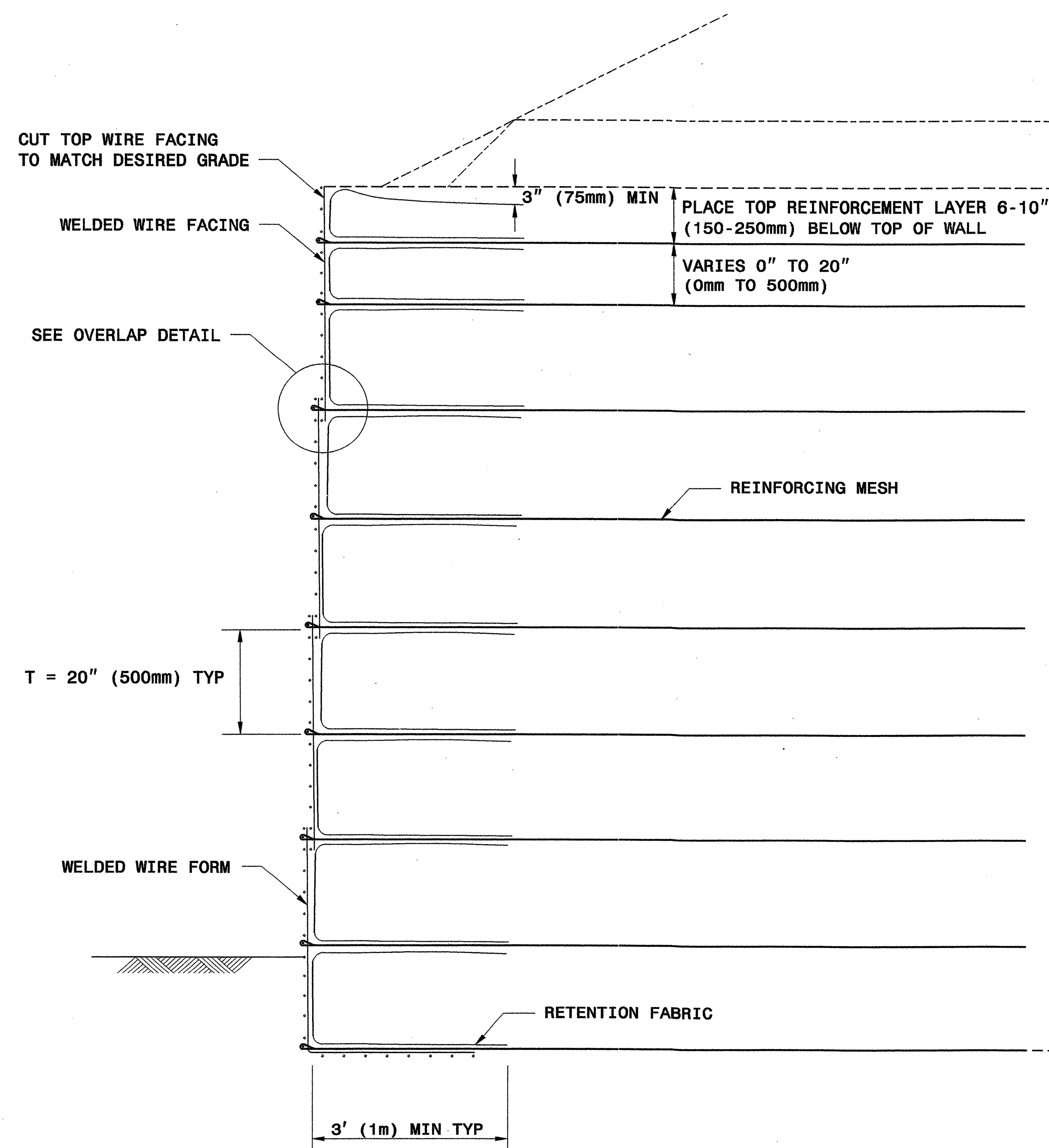


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SIGNATURE DATE

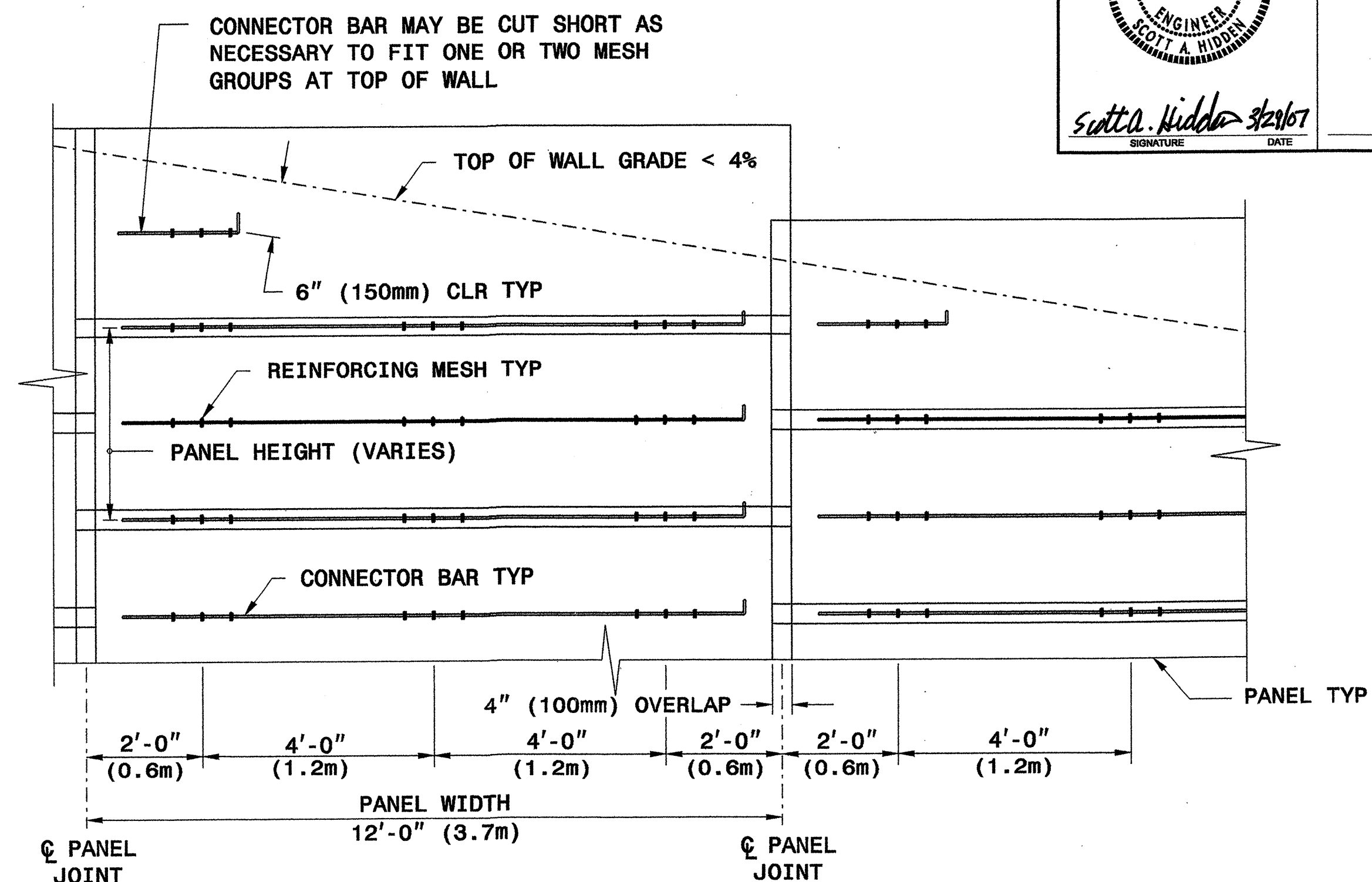
SIGNATURE DATE



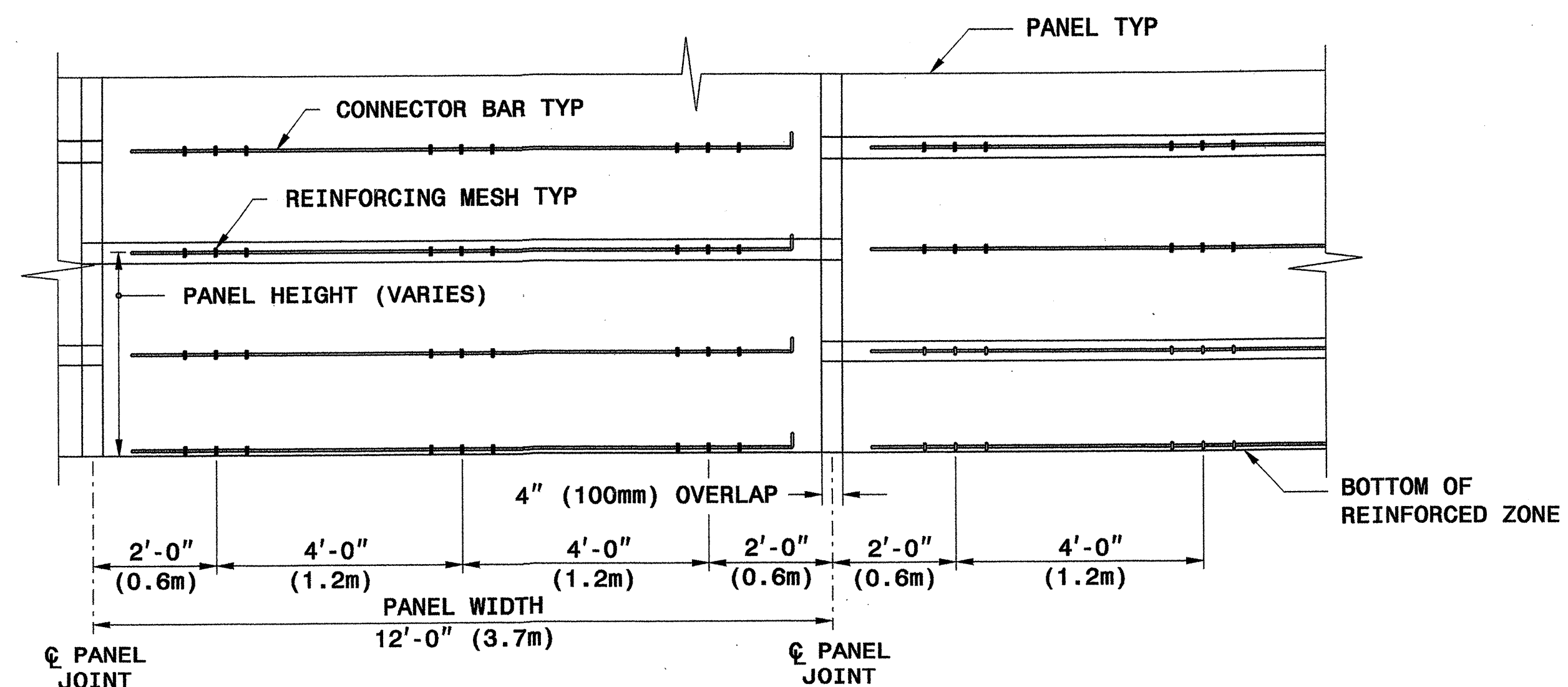
**OVERLAP DETAIL**



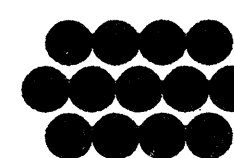
**TYPICAL SECTION**



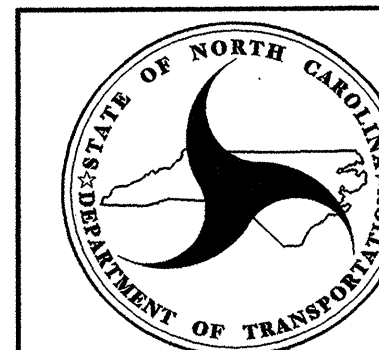
**TYPICAL ELEVATION @ TOP OF WALL  
(WIRES NOT SHOWN FOR CLARITY)**



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



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STATE OF NORTH CAROLINA  
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RALEIGH

STANDARD DRAWING NO. 1801.02

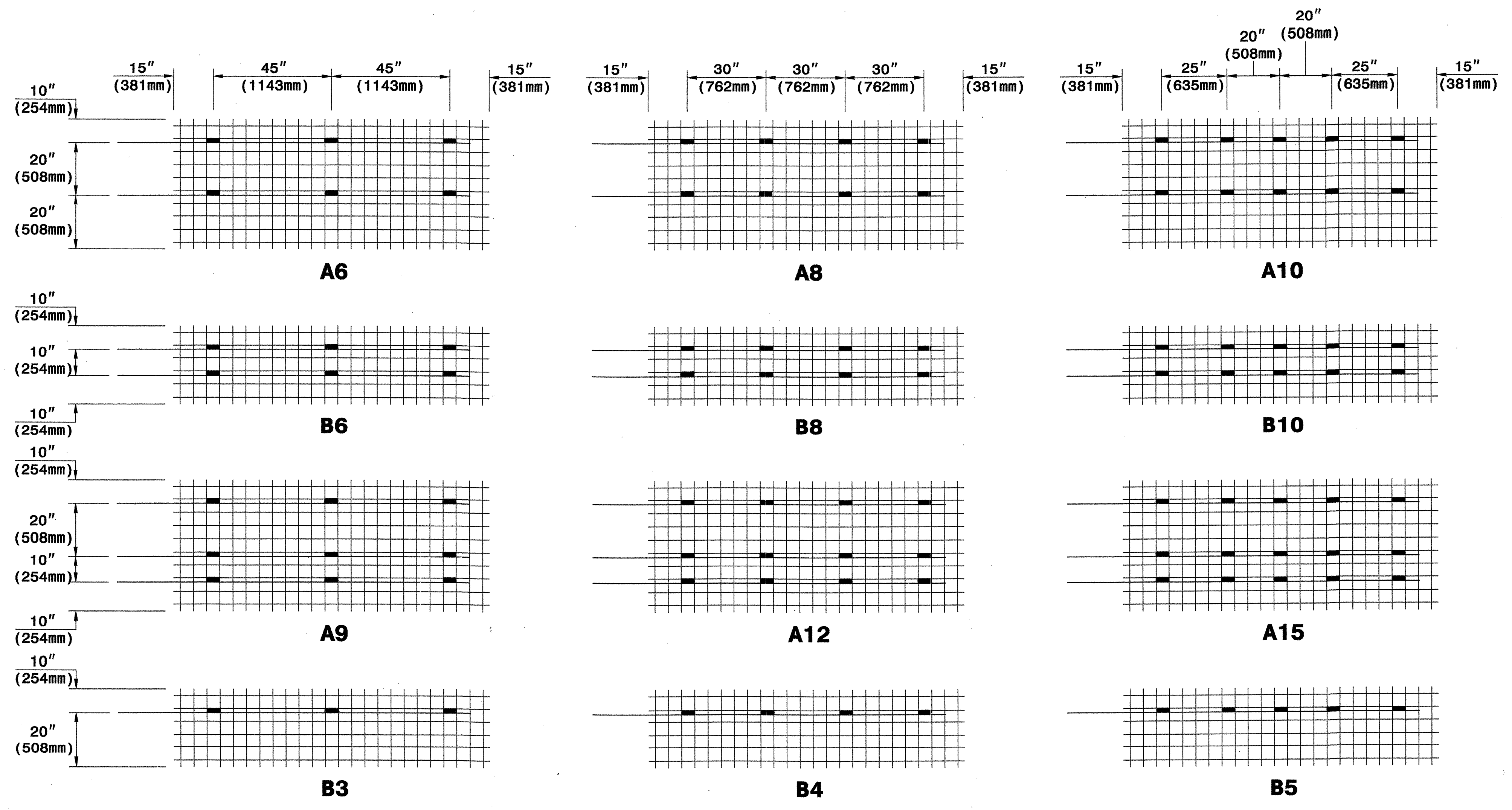
RETAINED EARTH  
TEMPORARY WALL

SHEET 8 OF 11

DATE: 12-19-06

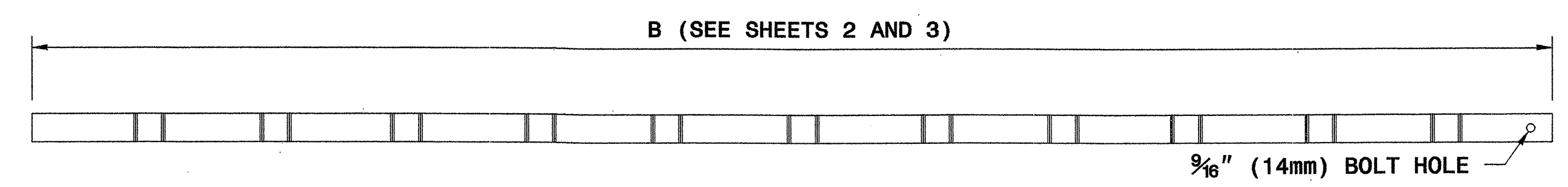




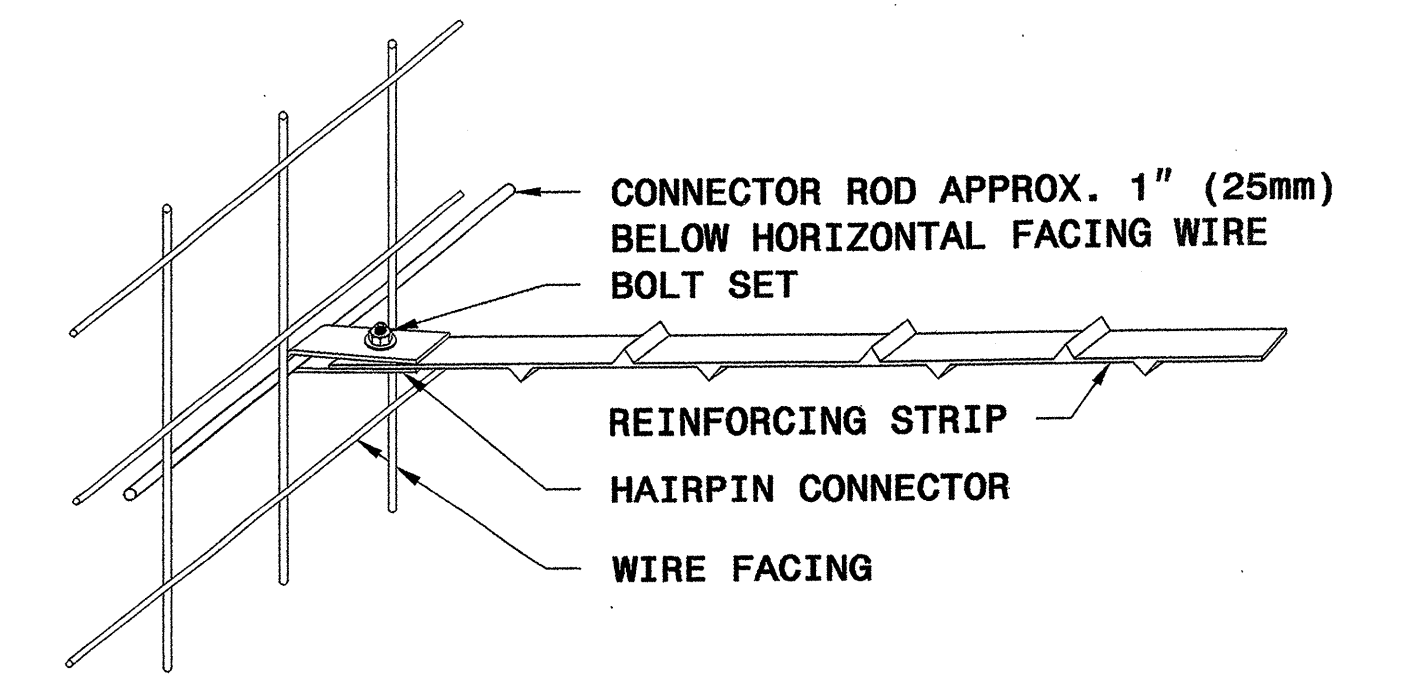


**KEY: A8**  
 NUMBER OF REINFORCING STRIPS  
 PANEL TYPE

**CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS**



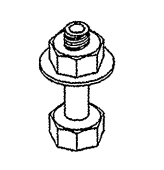
**REINFORCING STRIP - 2" X 5/32" (50mm X 4mm)**



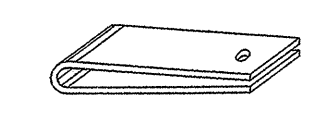
**STRIP TO FACING CONNECTION**



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



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



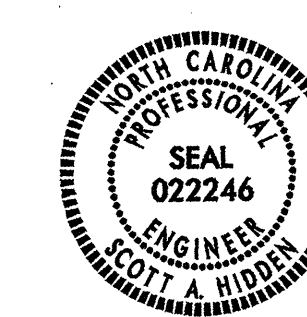
**HAIRPIN CONNECTOR**

**WALL COMPONENTS**



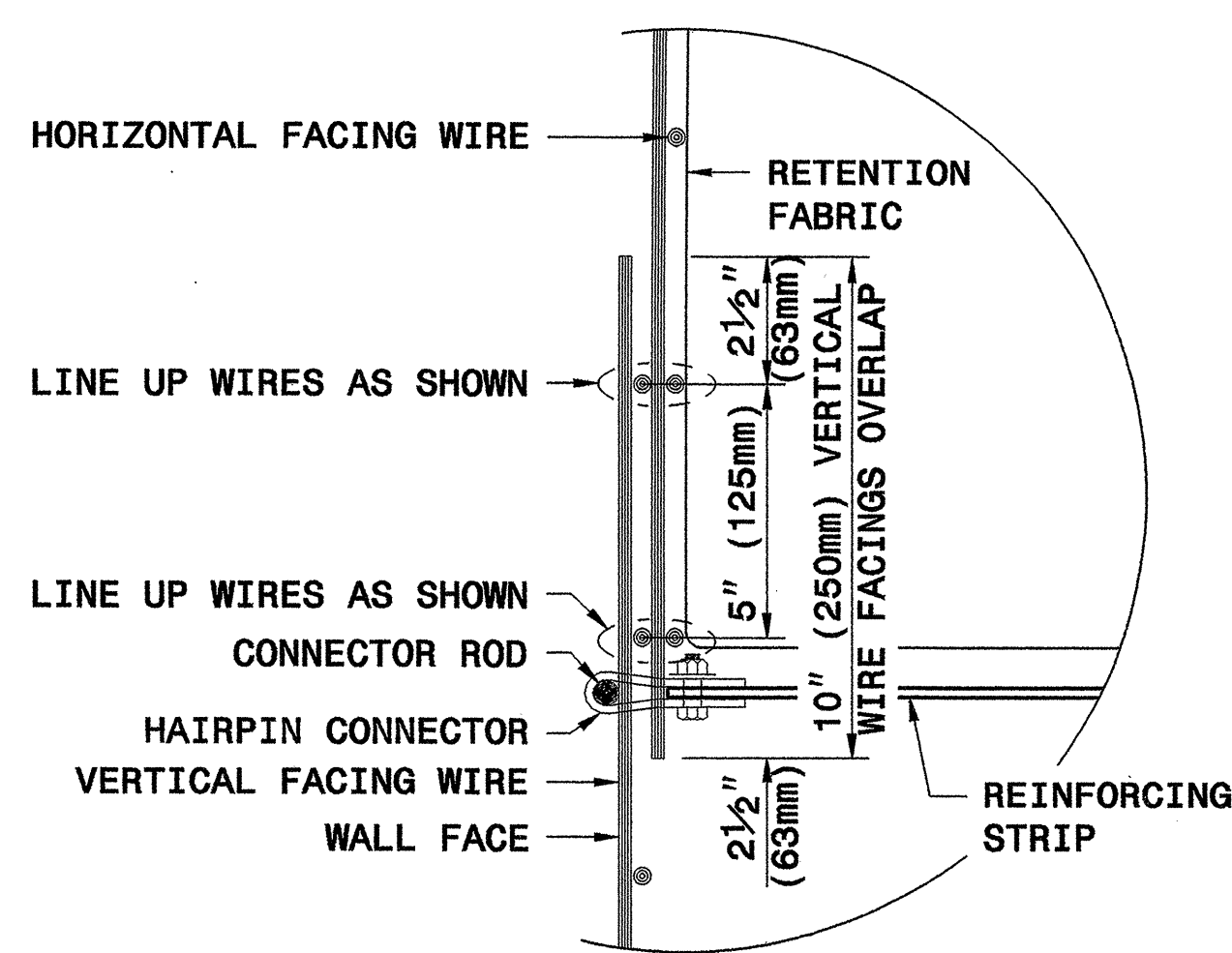
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 RALEIGH

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



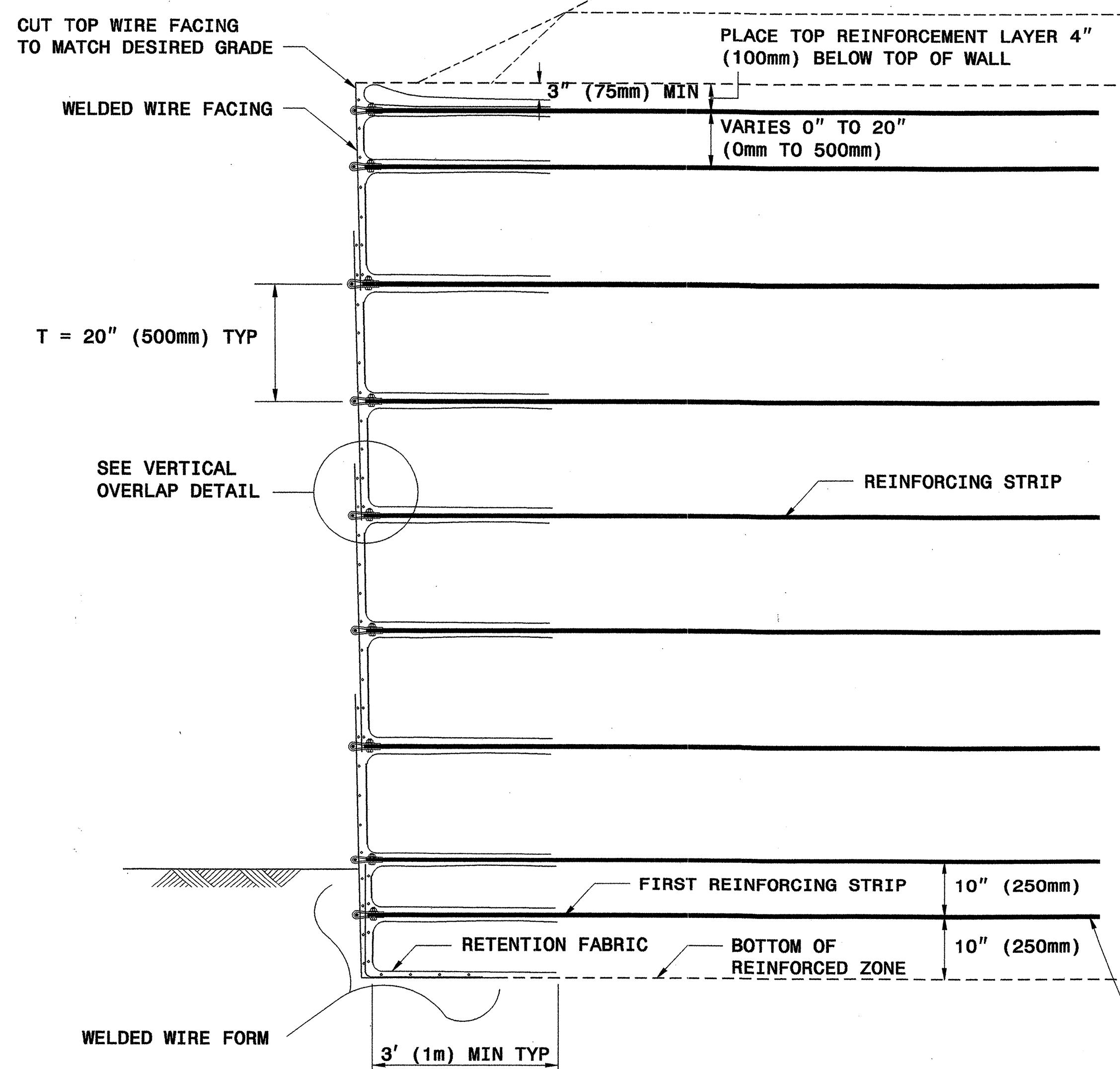
Surt A. Hadden

SIGNATURE DATE



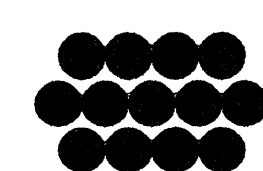
OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

**VERTICAL OVERLAP DETAIL**

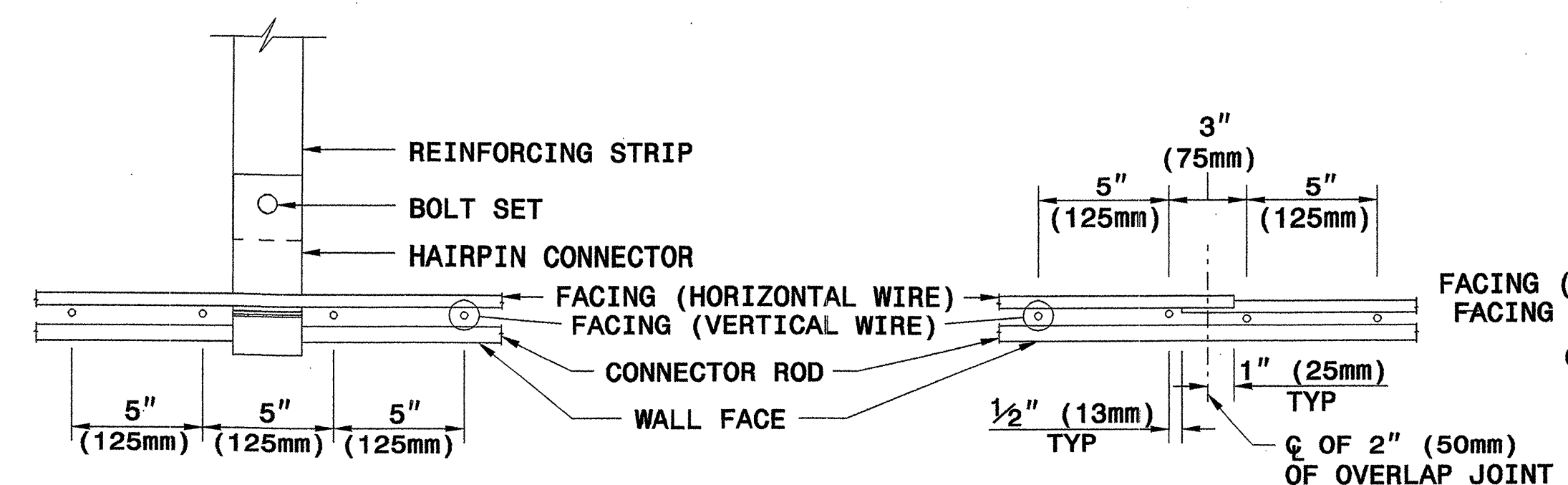


**TYPICAL SECTION**

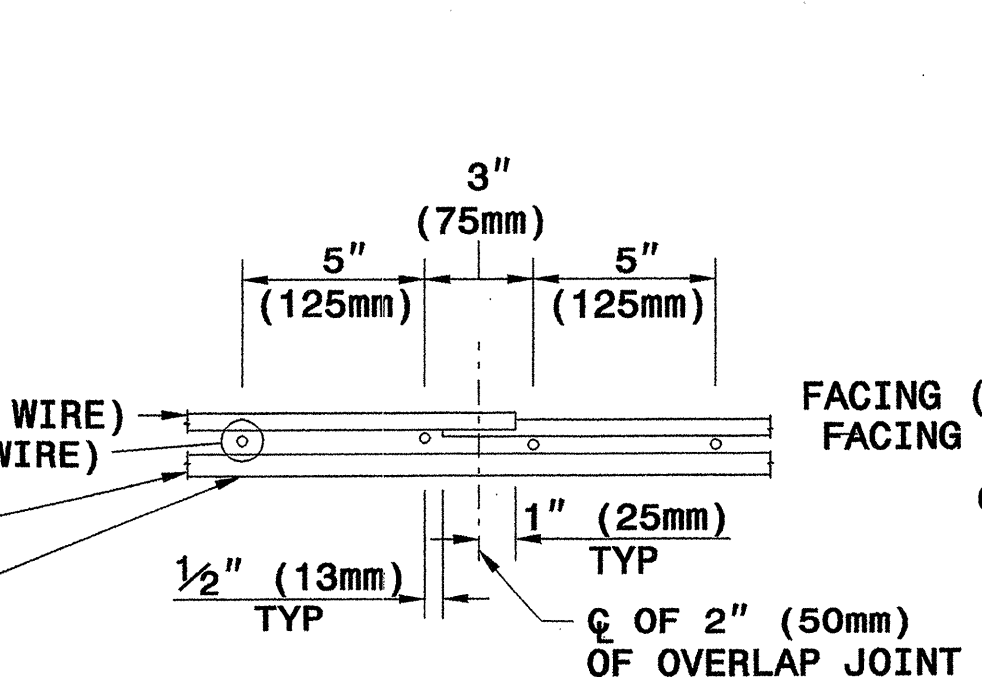
PLACE LOWEST REINFORCING STRIP 10" (250mm) FROM BOTTOM OF REINFORCED ZONE



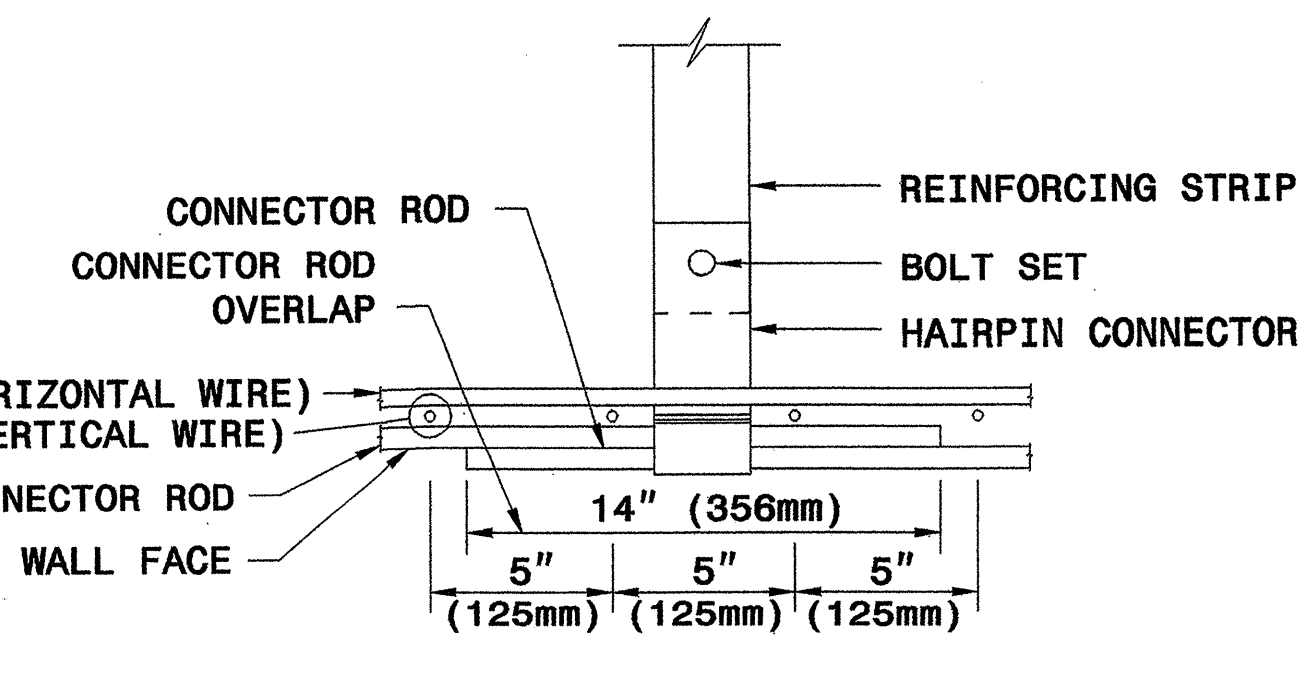
The Reinforced Earth Company



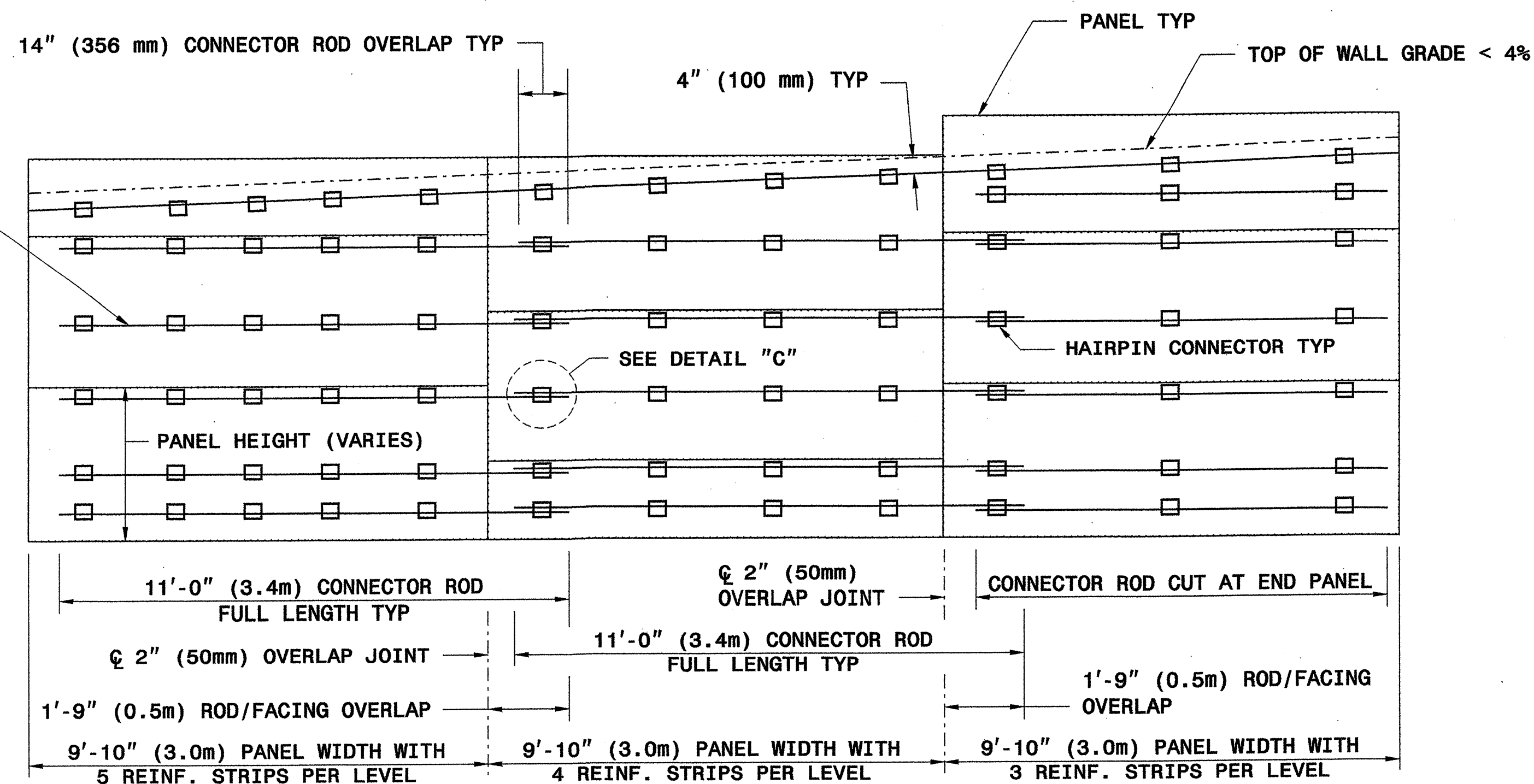
**PLAN DETAIL 'A' STRIP CONNECTION**



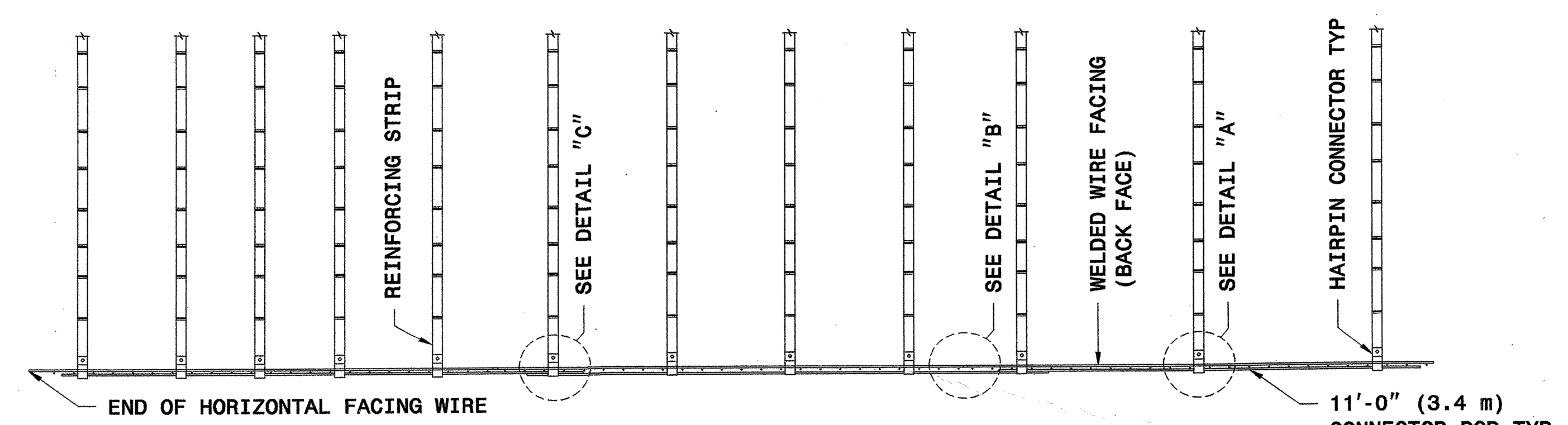
**PLAN DETAIL 'B' HORIZONTAL OVERLAP DETAIL**



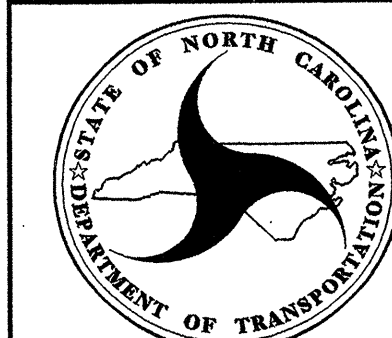
**PLAN DETAIL 'C' STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL**



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



**TYPICAL PLAN**



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RALEIGH

STANDARD DRAWING NO. 1801.02

**TERRATREL TEMPORARY WALL**

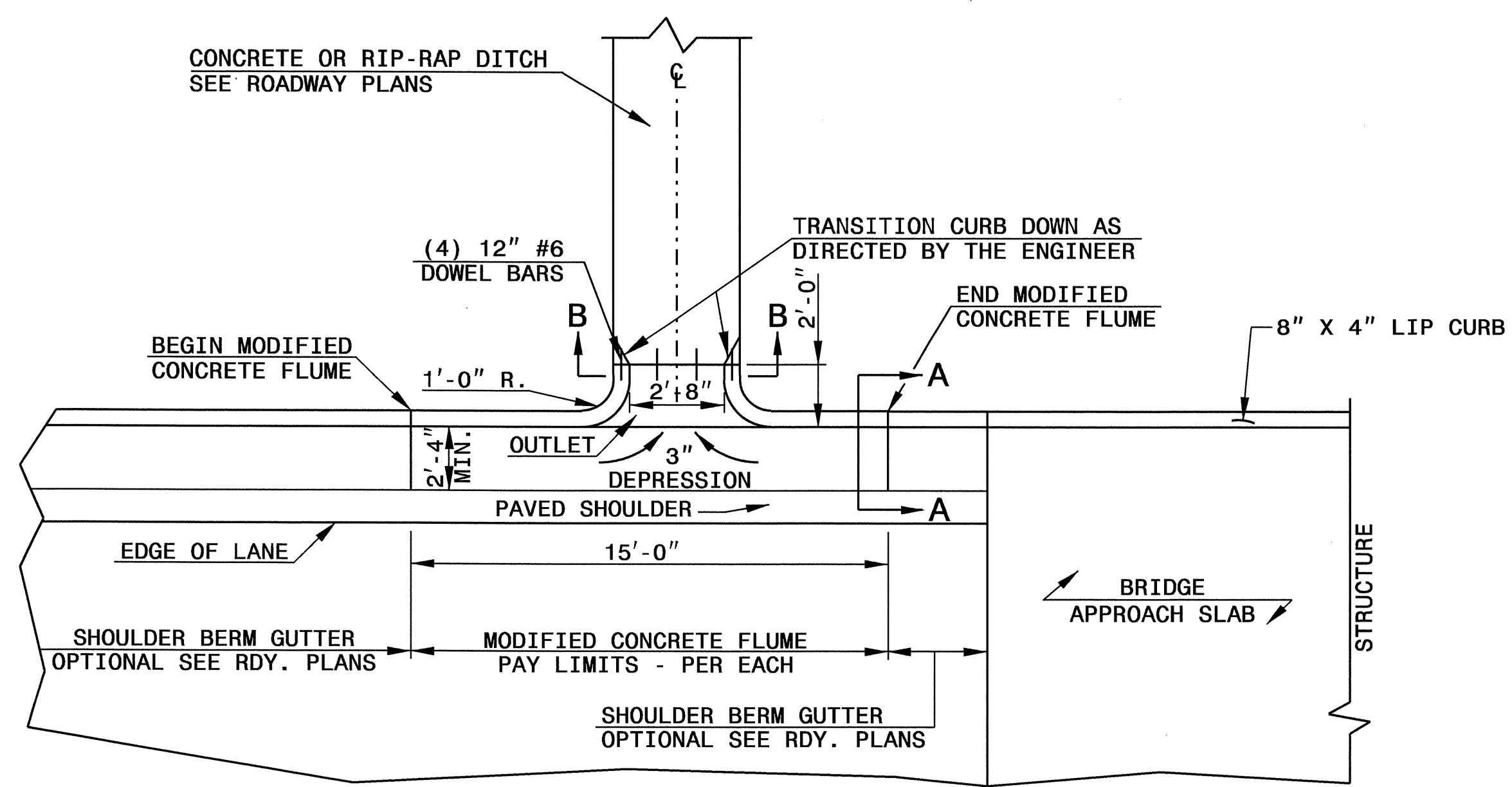


STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

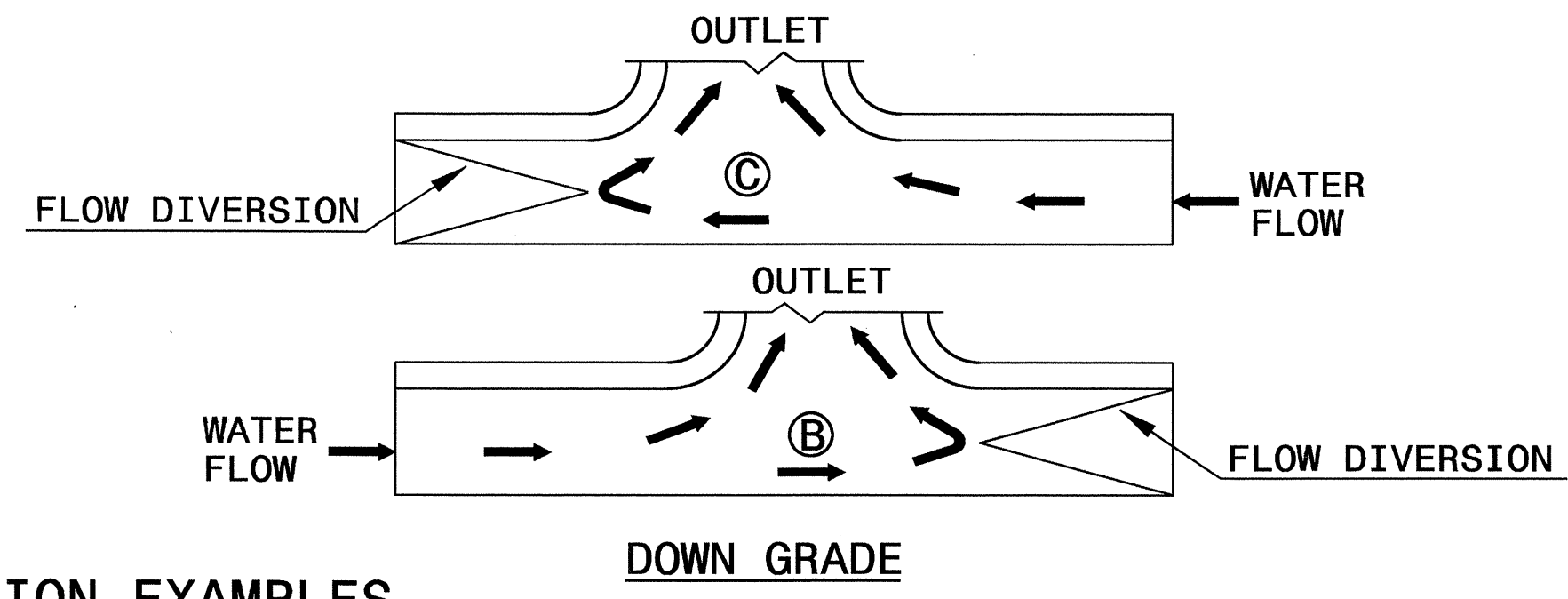
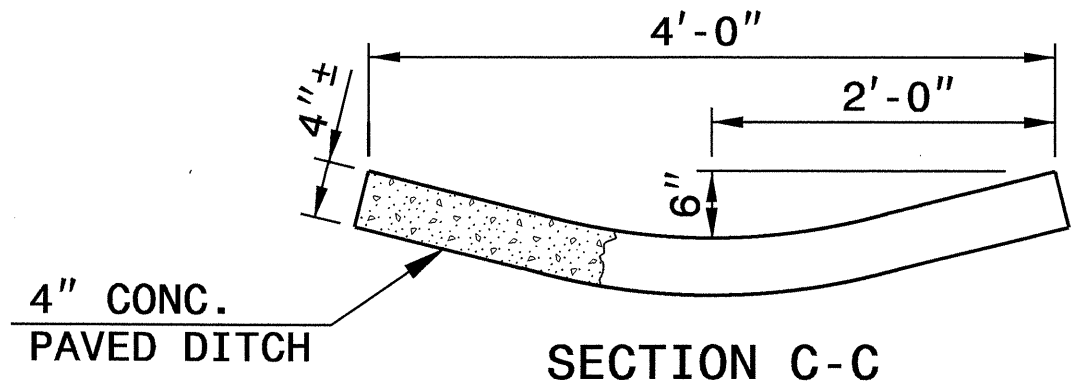
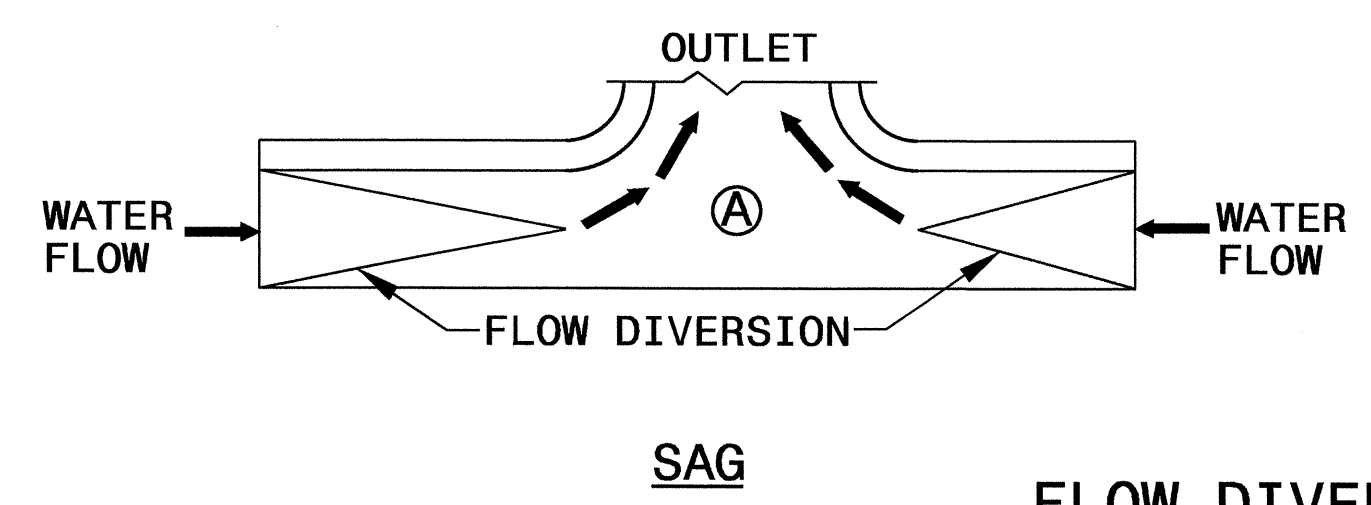
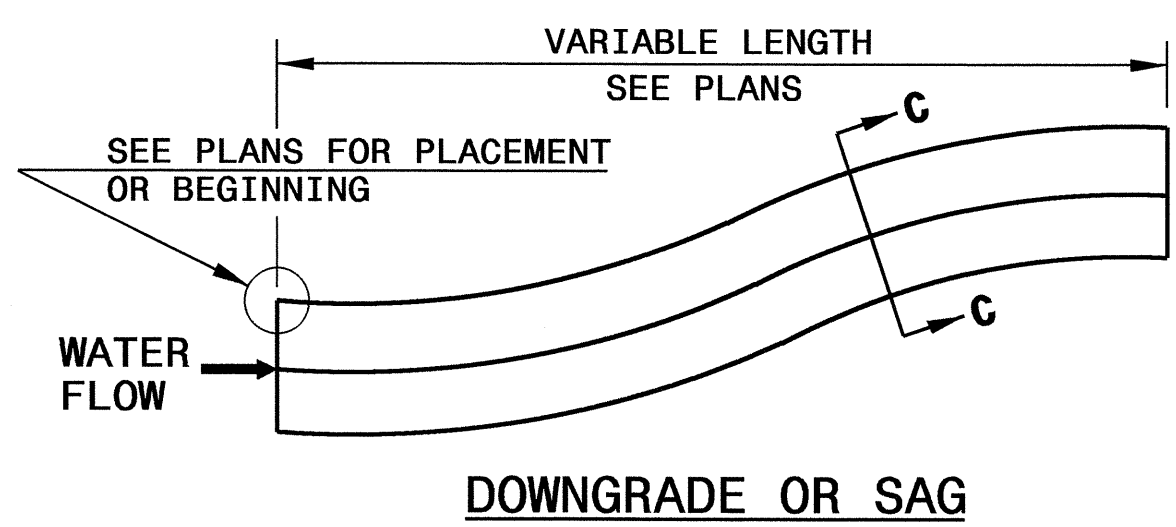
ENGLISH DETAIL DRAWING FOR  
**MODIFIED CONCRETE FLUME**  
WITH CONCRETE OR RIP-RAP DITCH

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

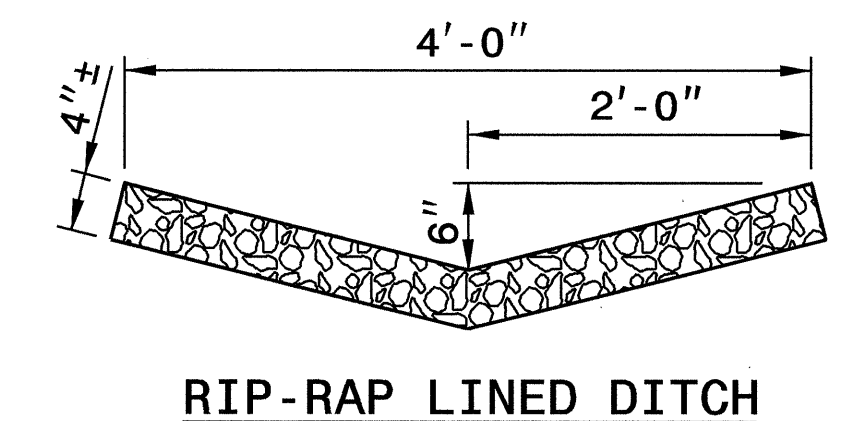
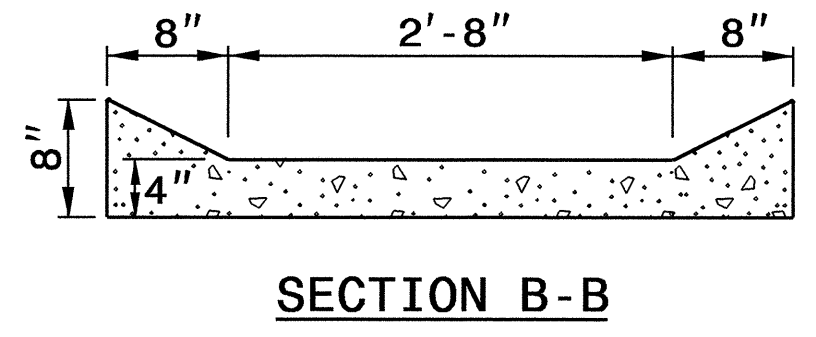
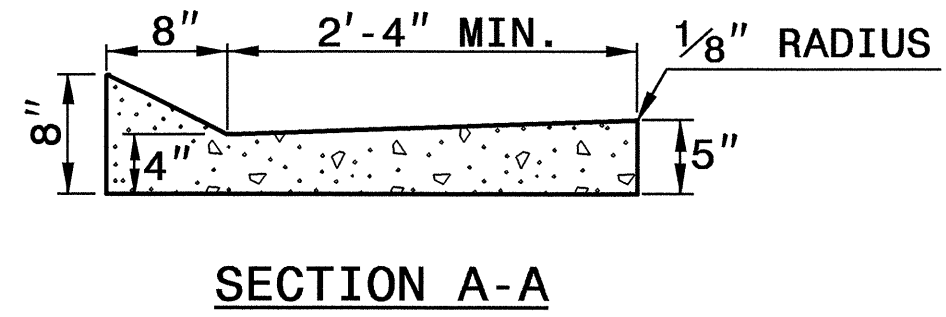
ENGLISH DETAIL DRAWING FOR  
**MODIFIED CONCRETE FLUME**  
WITH CONCRETE OR RIP-RAP DITCH



PLAN VIEW



FLOW DIVERSION EXAMPLES

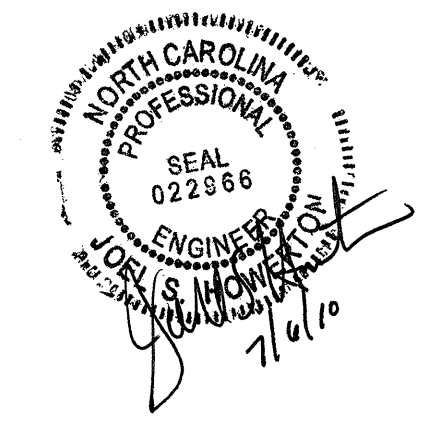


- NOTES:
- CONSTRUCT MODIFIED CONCRETE FLUME AND SHOULDER BERM GUTTER IN ACCORDANCE WITH THIS DETAIL.
  - CONSTRUCT CONCRETE DITCH IN ACCORDANCE WITH STD. DWG. NO. 850.01.
  - CONSTRUCT RIP RAP LINED DITCH IN ACCORDANCE WITH THIS DETAIL, IF CALLED FOR IN PLANS.
  - CONCRETE OR RIP RAP LINED DITCH SHALL BE THE TYPE AND LENGTH SPECIFIED BY THE ROADWAY PLANS. THE DITCH SHALL TERMINATE AS SHOWN ON THE PLANS. IF NO TERMINATION IS INDICATED PLACE RIP-RAP AT THE END OF THE DITCH AS INDICATED BY STD. DWG. 876.02 FOR AN 18" PIPE. TRANSITIONS FROM THE DITCH TO TERMINATION SHALL BE AS DIRECTED BY THE ENGINEER.
  - MODIFICATIONS SHALL BE AS DICTATED BY SITE CONDITIONS AND DIRECTED BY THE ENGINEER.

SHEET 1 OF 1  
MODFLMDTCH

SHEET 1 OF 1  
MODFLMDTCH

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USER:RWARD



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

**SEE PLATE FOR TITLE**

ORIGINAL BY: E.E. Ward DATE: Apr. 2002  
MODIFIED BY: E.E. Ward DATE: July 2004  
CHECKED BY: DATE:  
FILE SPEC.:





**FLEXIBLE PIPE**

Round Corrugated Steel Pipe 2 2/3 x 1/2 corrugation **					
Diameter (inches)	Minimum cover (inches)	Maximum cover (Ga)	Maximum Height of Cover (feet)		
			16	14	12
12	12	204	256	10	8
15	12	162	204	10	8
18	12	135	169	239	
21	12	115	145	204	
24	12	100	126	178	
30	12	79	100	142	
36	12	65	83	117	152
42	12	55	70	100	130
48	12	48	61	87	113
54	12	48	54	77	100
60	12	48	54	69	90
66	12	48	54	69	81
72	12	48	54	69	74
78	12	48	54	69	69
84	12	48	54	69	69

Round Corrugated Aluminum Pipe 2 2/3 x 1/2 corrugation **					
Diameter (inches)	Minimum cover (inches)	Maximum cover (Ga)	Maximum Height of Cover (feet)		
			16	14	12
12	12	123	155	218	281
15	12	98	123	174	224
18	12	81	102	144	187
21	12	69	87	123	160
24	12	60	76	108	139
27	12	67	95	123	151
30	12	60	85	111	136
36	12	50	71	92	113
42	12	60	78	96	113
48	12	52	68	84	84
54	12	46	50	74	74
60	12	50	50	50	62
66	12	50	50	50	51
72	12	50	50	50	41

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

7-06

**ENGLISH DETAIL DRAWING FOR  
 METHOD OF PIPE INSTALLATION**

FILL HEIGHT TABLES

SHEET 3 OF 3  
**300D01**

**ENGLISH DETAIL DRAWING FOR  
 METHOD OF PIPE INSTALLATION**

FILL HEIGHT TABLES

SHEET 3 OF 3  
**300D01**

\*\* FOR DIFFERENT CORRUGATIONS AND ARCH PIPES REFER TO ROADWAY DESIGN MANUAL OR MANUFACTURERS SPECIFICATION.

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

- CSP - AASHTO M36
- CAAP - AASHTO M196
- HDPE - AASHTO M294
- PVC - ASTM F949 or AASHTO M304

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

**RIGID PIPE**

- RCP - \* (Minimum fill) 1' for Class IV & CLASS V  
 2' for Class III & Class II
- \* (Maximum fill) 10' - Class II pipe  
 20' - Class III pipe  
 30' - Class IV pipe  
 40' - Class V pipe

(For fills > 40' & < 80' use LRFD Direct Design Method)

\* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

- RCP - AASHTO M170

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

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

**SEE PLATE FOR TITLE**

ORIGINAL BY: KKempf DATE: 5-15-09  
 MODIFIED BY: *Joel S. Howard* DATE: 7/30/09  
 CHECKED BY: *Joel S. Howard* DATE: 7/30/09  
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STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202554

ItemNumber	Sec #	Quantity	Unit	Description
000100000-N	800	Lump Sum		MOBILIZATION
000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
002900000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (16+39.20)
003800000-E	SP	260	CY	SHALLOW UNDERCUT
004300000-N	226	Lump Sum		GRADING
005000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
005700000-E	226	100	CY	UNDERCUT EXCAVATION
008000000-E	SP	100	TON	CLASS IV SUBGRADE STABILIZATION
019500000-E	SP	100	CY	SELECT GRANULAR MATERIAL
019600000-E	270	100	SY	FABRIC FOR SOIL STABILIZATION
019900000-E	SP	1,800	SF	TEMPORARY SHORING
031800000-E	SP	20	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
032000000-E	SP	40	SY	FOUNDATION CONDITIONING FABRIC
033200000-E	SP	36	LF	15" DRAINAGE PIPE
033530000-E	SP	44	LF	18" DRAINAGE PIPE
033540000-E	SP	20	LF	24" DRAINAGE PIPE
099500000-E	340	36	LF	PIPE REMOVAL
112100000-E	520	1,020	TON	AGGREGATE BASE COURSE
122000000-E	545	500	TON	INCIDENTAL STONE BASE
127500000-E	600	5,032	GAL	PRIME COAT
148900000-E	610	650	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
149800000-E	610	591	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE 119.0B
151900000-E	610	745	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
156000000-E	620	105	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
169300000-E	654	100	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
202200000-E	SP	25	CY	SUBDRAIN EXCAVATION
203300000-E	SP	20	CY	SUBDRAIN FINE AGGREGATE
204400000-E	SP	100	LF	6" PERFORATED SUBDRAIN PIPE
207000000-N	SP	1	EA	SUBDRAIN PIPE OUTLETS
207700000-E	SP	6	LF	6" OUTLET PIPE (SUBDRAINS)
225300000-E	840	1	CY	PIPE COLLARS
255600000-E	846	90	LF	SHOULDER BERM GUTTER
257000000-N	SP	4	EA	MODIFIED CONCRETE FLUME
257700000-E	846	211	LF	CONCRETE EXPRESSWAY GUTTER
261900000-E	850	22	SY	4" CONCRETE PAVED DITCH
334500000-E	864	350	LF	REMOVE & RESET EXISTING GUARDRAIL
336000000-E	863	490	LF	REMOVE EXISTING GUARDRAIL
338000000-E	862	150	LF	TEMPORARY STEEL BM GUARDRAIL
338700000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** TEMPORARY (CAT-1)
338700000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** TEMPORARY (III)
338910000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY
342000000-E	SP	362.5	LF	GENERIC GUARDRAIL ITEM WEATHERING STEEL BM GUARDRAIL WITH PAINTED LAPS
342000000-E	SP	175	LF	GENERIC GUARDRAIL ITEM WEATHERING STEEL BM GUARDRAIL WITH PAINTED LAPS, SHOP CURVED
343500000-N	SP	3	EA	GENERIC GUARDRAIL ITEM PAINTED GALVANIZED GUARDRAIL ANCHOR UNITS, TYPE 350
343500000-N	SP	1	EA	GENERIC GUARDRAIL ITEM PAINTED GALVANIZED GUARDRAIL ANCHOR UNITS, TYPE AT-1
343500000-N	SP	4	EA	GENERIC GUARDRAIL ITEM PAINTED GALVANIZED GUARDRAIL ANCHOR UNITS, TYPE III

ItemNumber	Sec #	Quantity	Unit	Description
357500000-E	SP	275	LF	GENERIC FENCING ITEM TEMPORARY 72" CHAIN LINK FENCE COMPLETE WITH POSTS
364200000-E	876	6	TON	RIP RAP, CLASS A
364900000-E	876	2	TON	RIP RAP, CLASS B
365600000-E	876	1,955	SY	FILTER FABRIC FOR DRAINAGE
407200000-E	903	28	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
408200000-E	903	13	LF	SUPPORTS, WOOD
410200000-N	904	2	EA	SIGN ERECTION, TYPE E
411610000-N	904	1	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)
414100000-N	907	1	EA	DISPOSAL OF SUPPORT, WOOD
415500000-N	907	2	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
440000000-E	1110	151	SF	WORK ZONE SIGNS (STATIONARY)
440500000-E	1110	144	SF	WORK ZONE SIGNS (PORTABLE)
441000000-E	1110	36	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
443000000-N	1130	34	EA	DRUMS
443500000-N	1135	34	EA	CONES
444500000-E	1145	64	LF	BARRICADES (TYPE III)
445000000-N	1150	4,800	HR	FLAGGER
448000000-N	1165	1	EA	TMA
451600000-N	1180	49	EA	SKINNY DRUM
465000000-N	1251	108	EA	TEMPORARY RAISED PAVEMENT MARKERS
481000000-E	1205	30,188	LF	PAINT PAVEMENT MARKING LINES (4")
483500000-E	1205	100	LF	PAINT PAVEMENT MARKING LINES (24")
485000000-E	1205	1,500	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
487000000-E	1205	20	LF	REMOVAL OF PAVEMENT MARKING LINES (24")

ItemNumber	Sec #	Quantity	Unit	Description
490500000-N	1253	9	EA	SNOWFLOWABLE PAVEMENT MARKERS
600000000-E	1605	3,000	LF	TEMPORARY SILT FENCE
600600000-E	1610	700	TON	STONE FOR EROSION CONTROL, CLASS A
600900000-E	1610	265	TON	STONE FOR EROSION CONTROL, CLASS B
601200000-E	1610	575	TON	SEDIMENT CONTROL STONE
601500000-E	1615	4	ACR	TEMPORARY MULCHING
601800000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
602100000-E	1620	1.5	TON	FERTILIZER FOR TEMPORARY SEEDING
602400000-E	1622	200	LF	TEMPORARY SLOPE DRAINS
602700000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
602900000-E	SP	850	LF	SAFETY FENCE
603000000-E	1630	710	CY	SILT EXCAVATION
603600000-E	1631	11,800	SY	MATting FOR EROSION CONTROL
603700000-E	SP	40	SY	COIR FIBER MAT
603800000-E	SP	100	SY	PERMANENT SOIL REINFORCEMENT MAT
604200000-E	1632	800	LF	1/4" HARDWARE CLOTH
607000000-N	SP	12	EA	SPECIAL STILLING BASINS
607101000-E	SP	325	LF	WATTLE
607102000-E	SP	125	LB	POLYACRYLAMIDE (PAM)
607103000-E	SP	165	LF	COIR FIBER BAFFLES
607105000-E	SP	3	EA	*** SKIMMER (1-1/2")
608400000-E	1660	3.5	ACR	SEEDING & MULCHING
608700000-E	1660	3	ACR	MOWING
609000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
609300000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
609600000-E	1662	75	LB	SEED FOR SUPPLEMENTAL SEEDING
610800000-E	1665	1.75	TON	FERTILIZER TOPDRESSING
611450000-N	SP	10	MHR	SPECIALIZED HAND MOWING
611700000-N	SP	27	EA	RESPONSE FOR EROSION CONTROL
612600000-E	SP	0.25	ACR	STREAMBANK REFORESTATION
614700000-E	SP	450	LF	GENERIC EROSION CONTROL ITEM TREE PROTECTION FENCE

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STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

## SUMMARY OF QUANTITIES

### SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
-L- STA.13+00.00 TO -L- STA.15+50.00	98		375	277	
-L- STA.17+50.00 TO -L- STA.20+00.00	623		0		623
-DET- STA.11+50.00 TO -DET- STA.15+50.00	103		1,605	1,502	
-DET- STA.17+50.00 TO -DET- STA.21+50.00	128		1,241	1,113	
-YI- STA.10+00.00 TO -YI- STA.12+25.00	85		628	543	
-L- STA.17+00.00 TO -L- STA.20+00.00 (EARTH BERM SEE EC PLANS)			29	29	
SUBTOTAL	1,037		3,878	3,464	623
LOSS DUE TO CLEARING AND GRUBBING	-370			370	
DETOUR REMOVAL	2,149				2,149
WASTE IN LIEU OF BORROW				-623	-623
PROJECT TOTAL	2,816		3,878	3,211	2,149
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				161	
GRAND TOTAL	2,816		3,878	3,371	2,149
SAY	2,820			3,375	
CONTINGENCY UNDERCUT = 100CY					
CONTINGENCY SHALLOW UNDERCUT = 260CY					
CONT. CLASSIV SUBGRADE STAB. = 100TON					

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, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

### SUMMARY OF ASPHALT PAVEMENT REMOVAL

STATION TO STATION	LOCATION	AREA SQ. YDS.
-L- 15+10.00 TO -L- 15+59.00	RT & LT	131.20
-L- 17+19.00 TO -L- 17+70.00	RT & LT	135.47
-DET- 11+00.00 TO 15+85.00	RT & LT	874.71
-DET- 17+55.00 TO 21+61.00	RT & LT	947.83
	TOTAL	2,089.21
	SAY	2,090.00

### SUMMARY OF EXPRESSWAY GUTTER

STATION TO STATION	LOCATION	AREA SQ. YDS.
-L- STA. 17+39.17 TO -L- STA. 19+49.63	RT	210.50'
	TOTAL	210.50'
	SAY	211.00'

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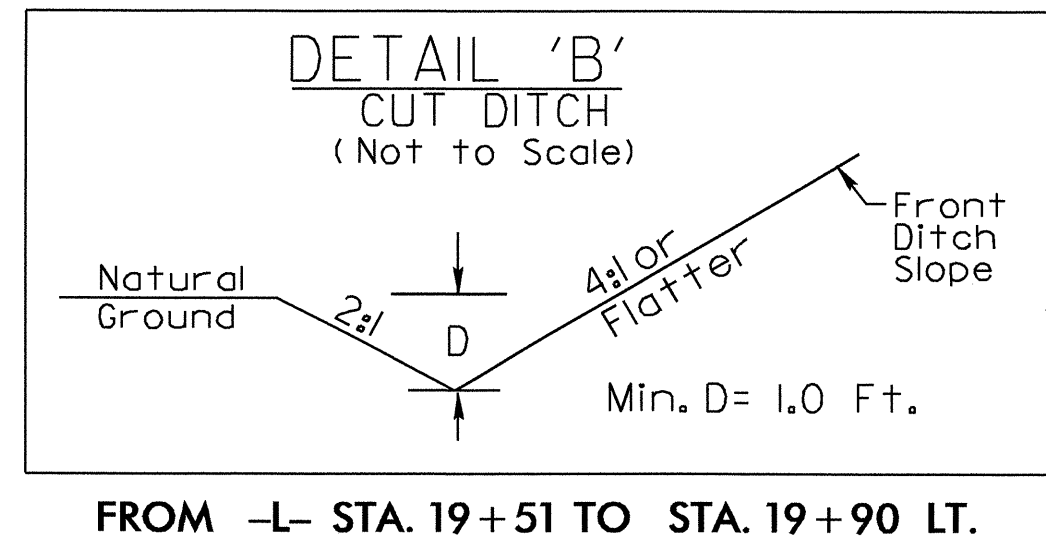
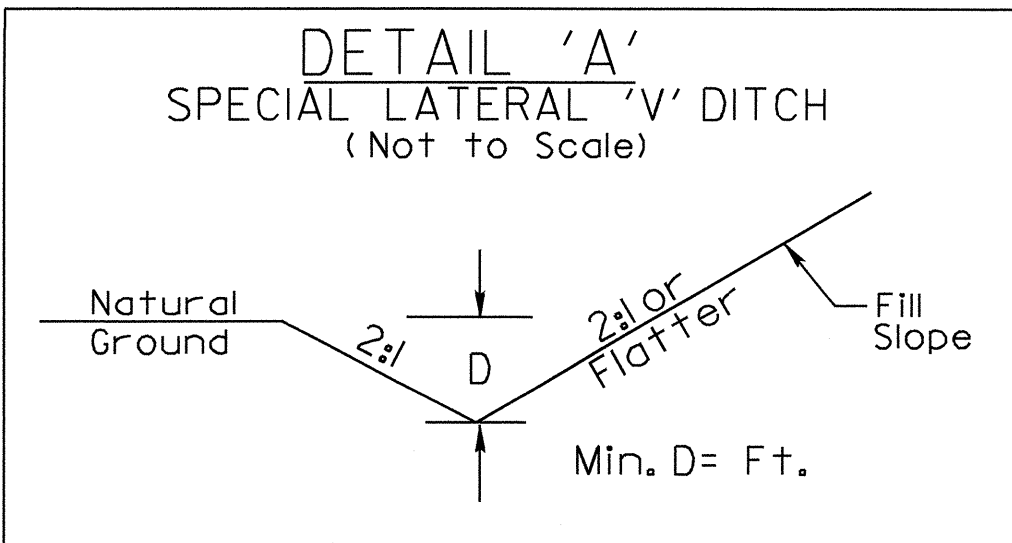




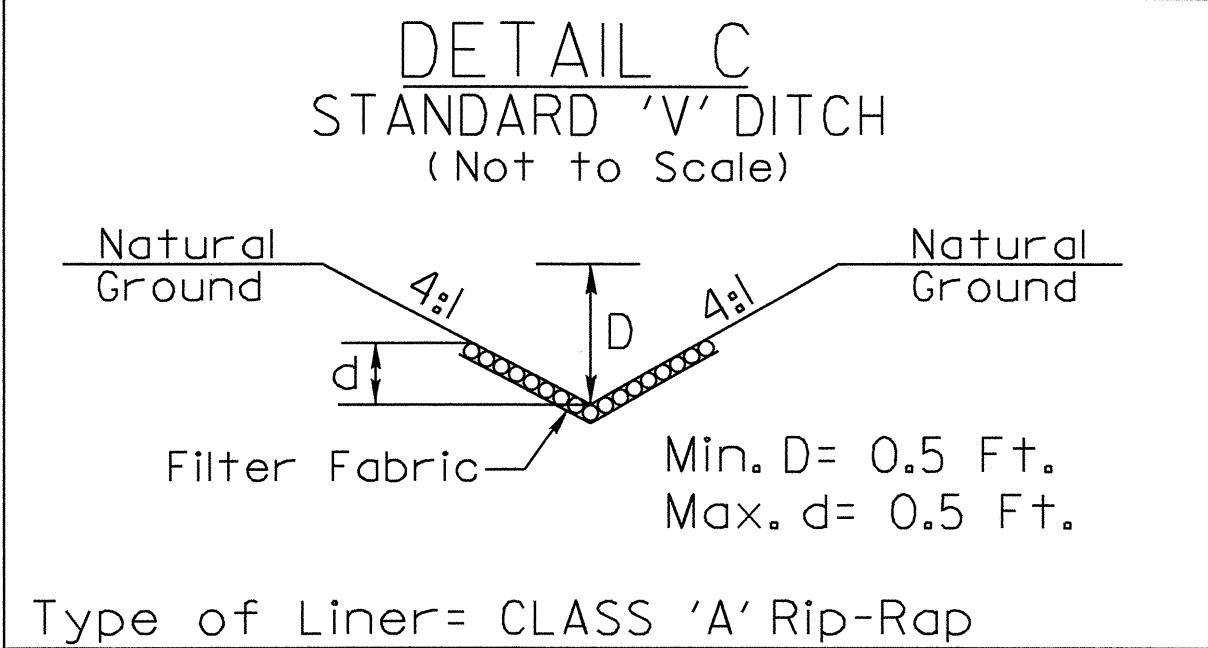
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REVISIONS

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FROM -L- STA. 17+57 TO STA. 19+92 RT.



Type of Liner= CLASS 'A' Rip-Rap

TYPICAL AT OUTLET OF EACH MODIFIED CONCRETE FLUME (MCF) EST. 1.5 TONS EACH EST. 5 SY FF EACH

-L-	-DET-
PI Sta 18+52.50	PI Sta 19+70.03
$\Delta = 12' 50" 31.2" (LT)$	$\Delta = 14' 11" 12.3" (RT)$
$D = 5' 03" 41.27"$	$D = 7' 50" 55.5"$
$L = 253.72'$	$L = 180.75'$
$T = 127.39'$	$T = 90.84'$
$R = 1,132.00'$	$R = 730.00'$

BEGIN STATE PROJECT B-4286  
-L- STA. 13+00.00

BEGIN CONSTRUCTION B-4286  
-L- STA. 11+00.00

-L- \*POT STA 10+21.30  
24.50' (LT)

-L- PC Sta. 10+29.22

-DET- POT Sta. 10+00.00

N 28° 07' 13.7" E -L-

N 28° 07' 14.9" E -DET-

N 28° 41' 00" E 46.39'

N 28° 14' 37" E

N 29° 48' 21" E 60.38'

N 73° 06' 07" W 53.88'

N 17° 15' 17.5" E 33.67'

N 42° 13' 52" E 26.98'

N 42° 13' 52" E 26.98'

N 57° 04' 00" W 34.52'

-DET- PC Sta. 12+90.00

11+00.00 43.00' (LT) 32.00'

13+00.00 32.00' (LT) 50.00' (LT)

14+07.00 37.00' (RT)

13+00.00 28.00' (RT) 34.00' (RT)

14+07.00 37.00' (RT)

-L- PT Sta. 14+42.79

BEGIN APPROACH SLAB  
-L- STA. 15+35.06

BEGIN BRIDGE  
-L- STA. 15+59.20

15+80.00 28.00'

15+58.00 50.00' (RT)

17+00.00 50.00' (RT)

17+00.00 50.00' (RT)

17+00.00 50.00' (RT)

-L- \*2 PINC STA 14+27.15  
24.50' (LT)

-DET- PT Sta. 13+79.19

-YI- PC Sta. 12+20.24

-YI- PT Sta. 12+70.16

-YI- POT Sta. 12+97.36

14+37.00 99.00' (LT)

15+40.00 100.00' (LT)

15+80.00 28.00'

15+58.00 50.00' (RT)

17+00.00 50.00' (RT)

17+00.00 50.00' (RT)

17+00.00 50.00' (RT)

17+00.00 50.00' (RT)

17+00.00 50.00' (RT)

-DET-	-L-	-YI-
PI Sta 13+34.65	PI Sta 12+37.05	PI Sta 12+46.09
$\Delta = 7' 00" 00.0" (RT)$	$\Delta = 14' 02" 16.80" (RT)$	$\Delta = 36' 39" 56.0" (LT)$
$D = 7' 50" 55.5"$	$D = 3' 23" 39.48"$	$D = 73' 27" 22.1"$
$L = 89.19'$	$L = 413.58'$	$L = 49.91'$
$T = 44.65'$	$T = 207.83'$	$T = 25.85'$
$R = 730.00'$	$R = 1688.00'$	$R = 78.00'$

THE UNITED STATES OF AMERICA  
U.S. FOREST SERVICE  
TRACT N-577  
D.B.99 PG.656  
D.B.99 PG.671

FOR PROFILES SEE SHEET 6 AND 7  
FOR STRUCTURES SEE SHEETS S-1 THRU S-41

BEGIN CONSTRUCTION  
-YI- STA. 10+00.00

BEGIN BRIDGE  
-DET- STA. 15+85.00

-L- STA 16+10.59 235.60' (LT)

-YI- STA 10+03.42 20.25' (LT)

END BRIDGE  
-DET- STA. 17+55.00

-DET- PC Sta. 18+79.19

-DET- PRC Sta. 20+23.18

GRADE -L- LINE  
DITCH TO DRAIN TO DRIVE PIPE AFTER  
REMOVAL OF TEMP.  
15" DRAINAGE PIPE

END TEMP. CHAIN LINK FENCE -L- STA. 20+17.00

END TEMP. CHAIN LINK FENCE -L- STA. 20+17.00

END PROPOSED EXPRESSWAY GUTTER -L- STA. 19+49.63

BEGIN PROPOSED EXPRESSWAY GUTTER -L- STA. 17+39.17

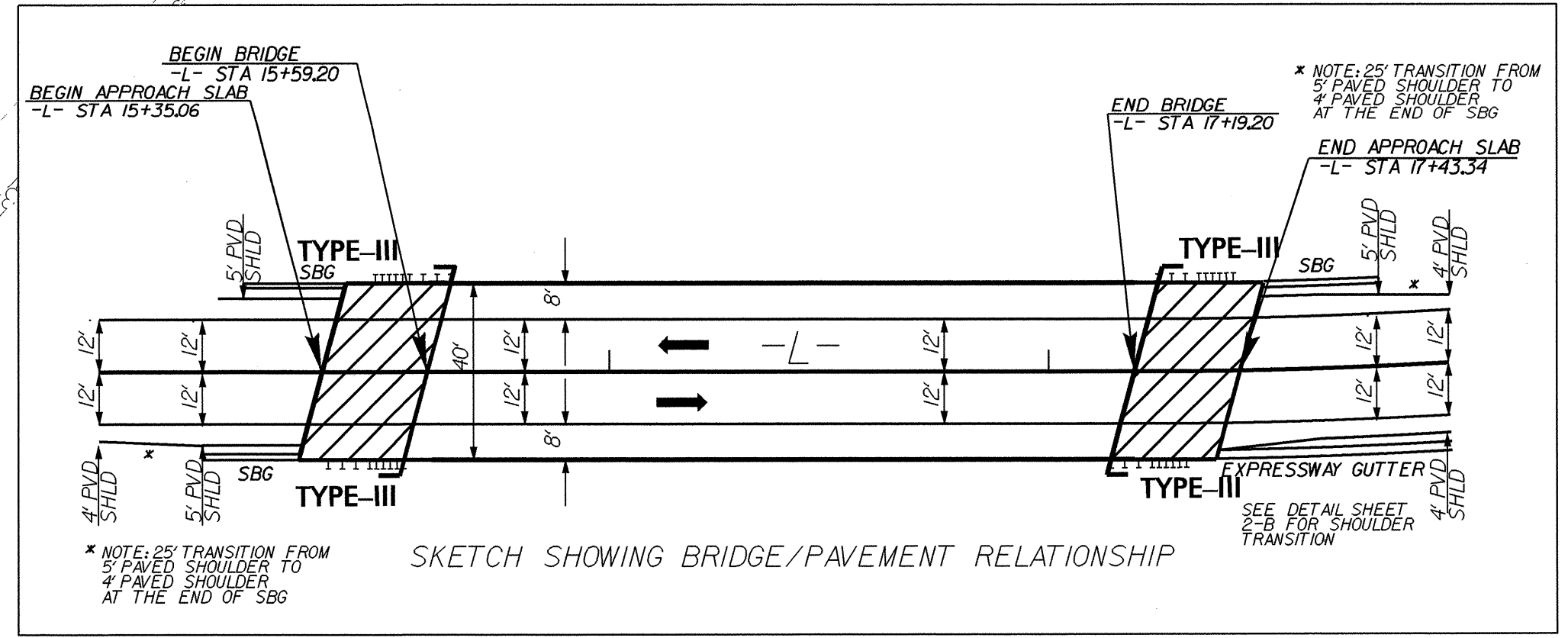
-L- PT Sta. 19+78.83

END APPROACH SLAB  
-L- STA. 17+43.34

-L- \*3 PINC STA 17+30.55  
20.60' (LT)

-L- PT Sta. 17+25.10

END BRIDGE  
-L- STA. 17+19.20



MATCH LINE -L- STA. 20+59.23 SEE SHEET NO. 5

PROJECT REFERENCE NO. B-4286	SHEET NO. 4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER GREGORY E. BRUNN NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22100 08/29/10	HYDRAULICS ENGINEER GREGORY E. BRUNN NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22100 08/29/10







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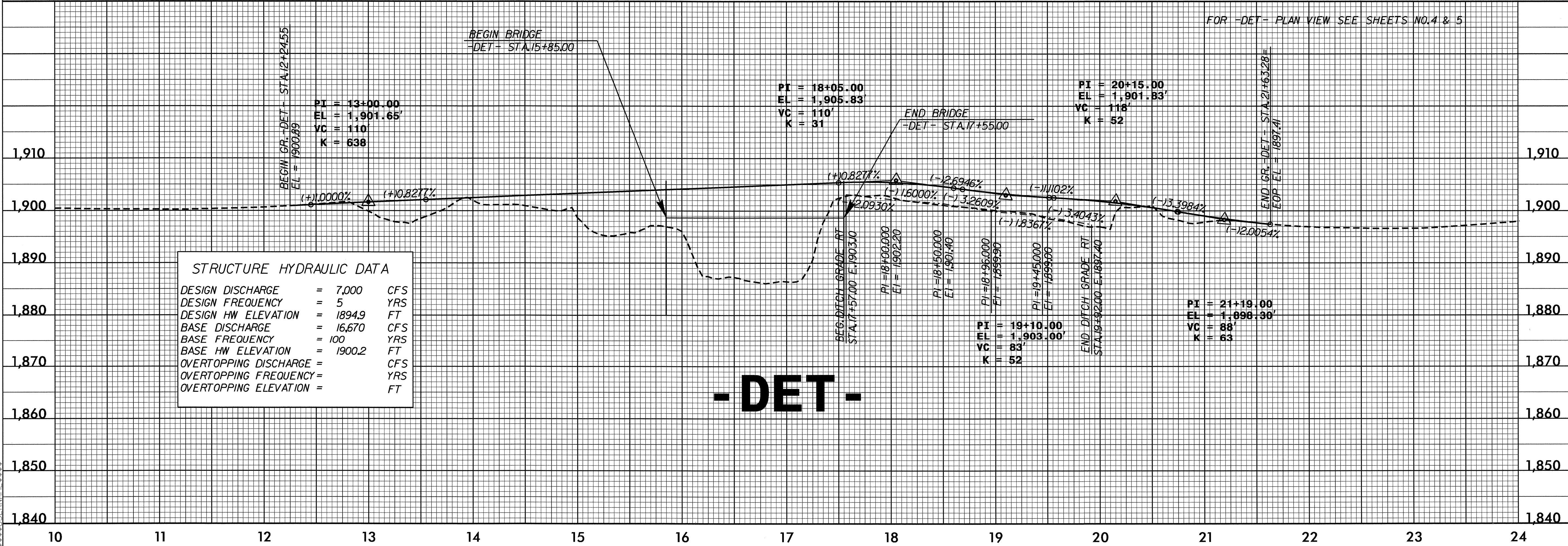
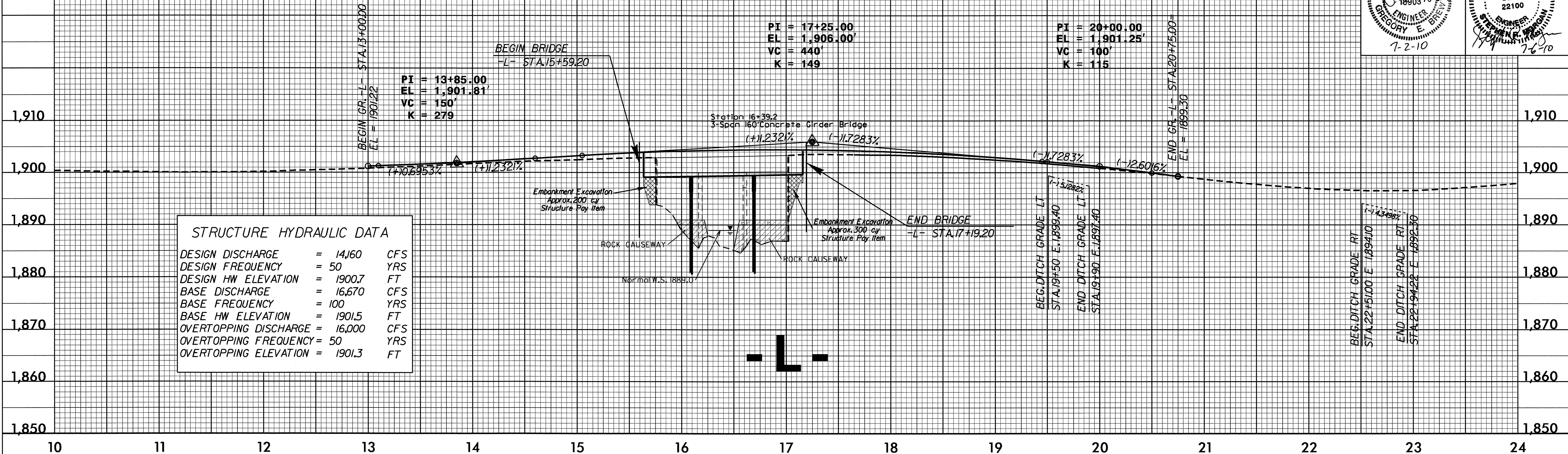
BM\*1 8" SPIKE IN BASE OF 48" POPLAR  
-BL- STA.5+57.73  
OFFSET 81.39' LT ELEV.= 1897.51'  
LOCATED N23°03'18"W 99.78' FROM (BL1)

BM\*2 8" SPIKE IN BASE OF 10" WHITE PINE  
-BL- STA.12+09.23  
OFFSET 46.87' RT ELEV.= 1907.45'  
LOCATED S31°33'59"E 47.86' FROM (BL3)

BM\*3 8" SPIKE IN BASE OF 24" POPLAR  
ELEV.= 1905.63'  
LOCATED N18°02'02"E 36.16' FROM (BL5)

FOR -L- PLAN VIEW SEE SHEETS NO.4 & 5  
FOR STRUCTURE SEE SHEET S-LTHRU S-4

PROJECT REFERENCE NO. B-4286	SHEET NO. 6
ROADWAY DESIGN ENGINEER SEAL 18903 GREGORY E. BRIDGES 1-2-10	HYDRAULICS ENGINEER SEAL 22100 STEPHEN E. BRIDGES 1-6-10



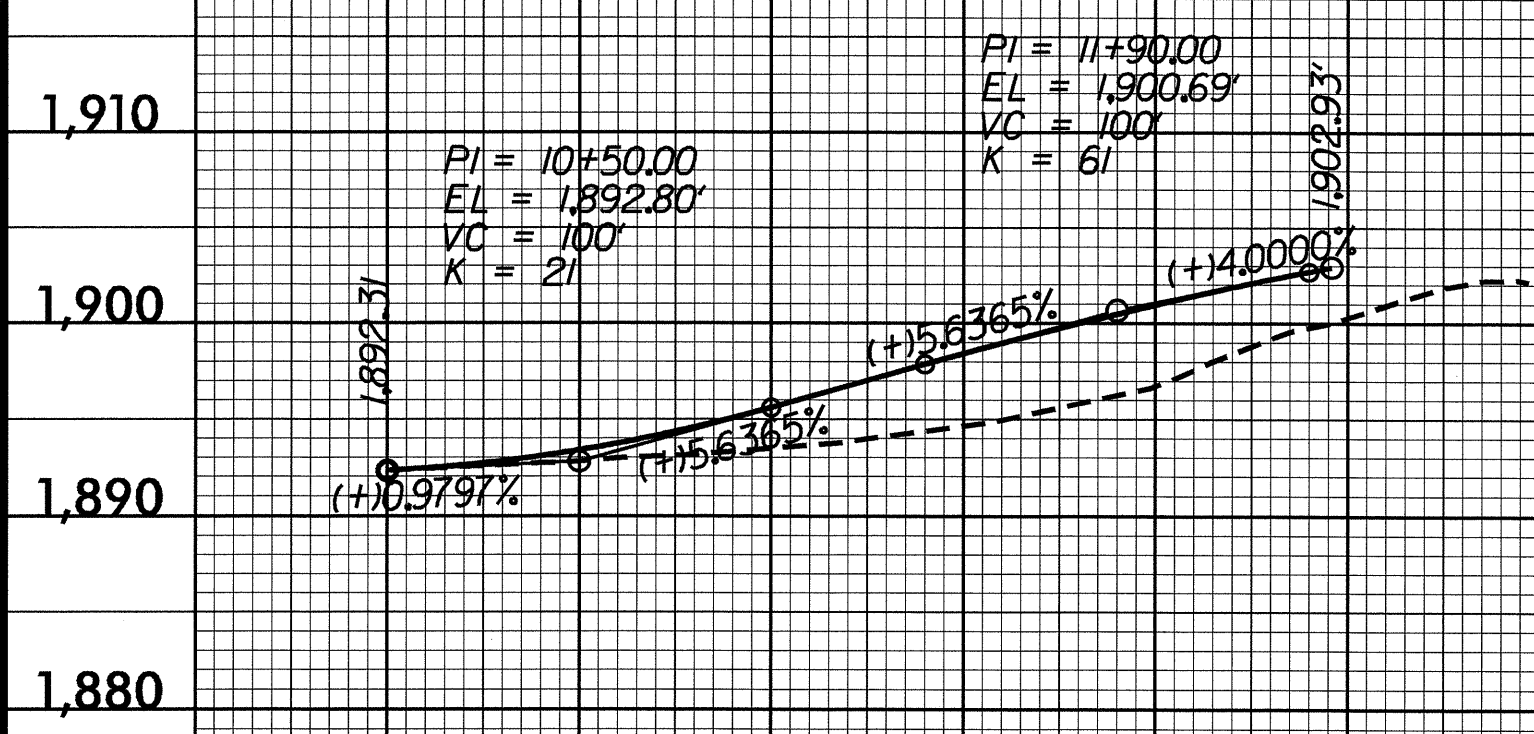
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PROJECT REFERENCE NO. B-4286	SHEET NO. 7
7-2-10	7-6-10

FOR Y1- PLAN VIEW SEE SHEETS NO.4



# -Y1 WITH DET-

10      11      12

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