

09/08/99

See Sheet 1-A For Index of Sheets

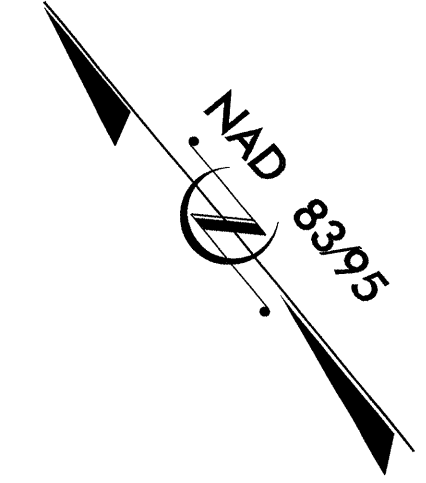
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4499	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
33732.1.1	BRZ-1792(2)	P.E.	
33732.2.1	BRZ-1792(2)	R/W, UTIL.	
33732.3.1	BRZ-1792(2)	CONST.	

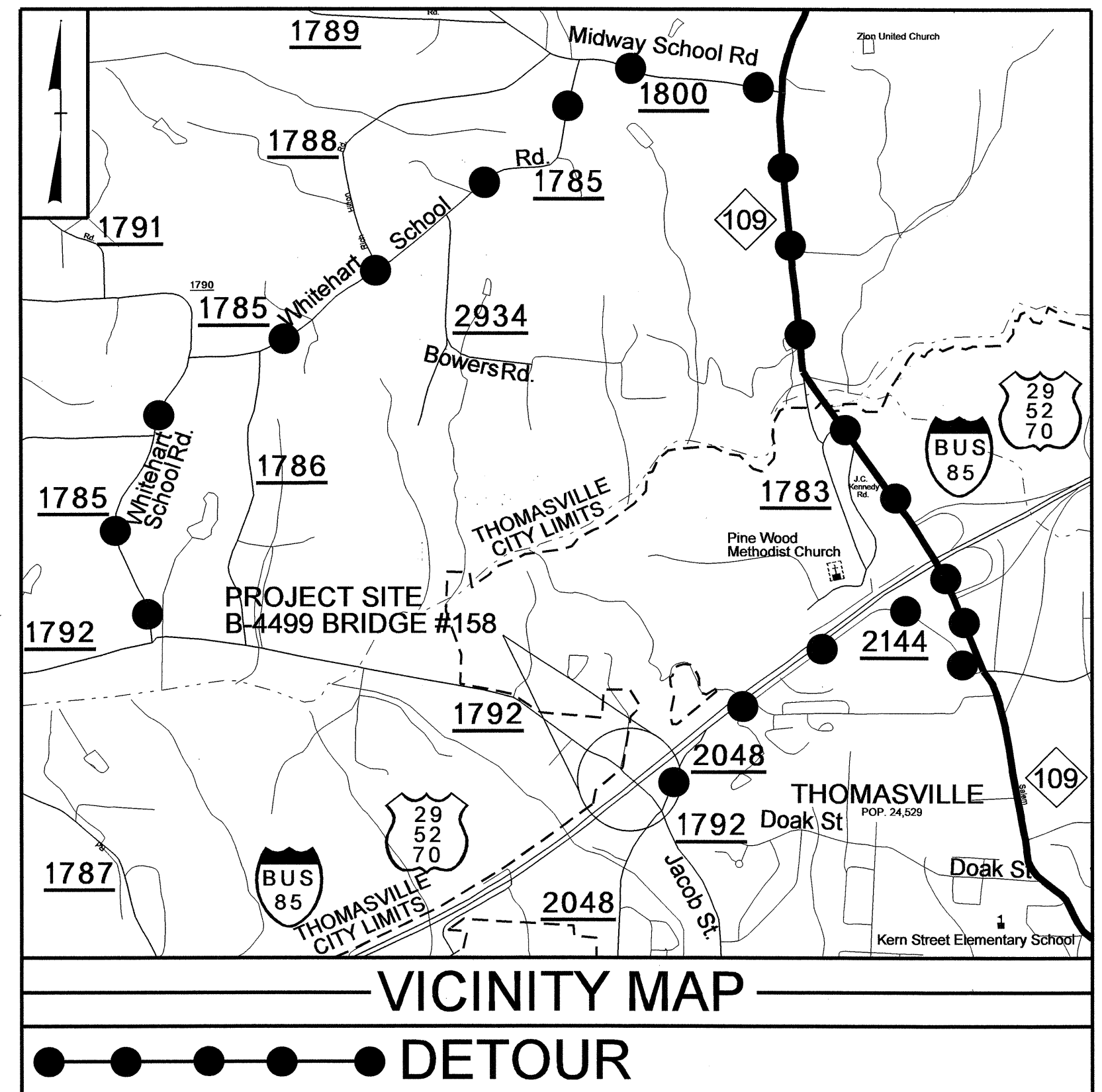
DAVIDSON COUNTY

**LOCATION: BRIDGE NO 158 OVER US. 29/70 I-85 BUSINESS
ON SR 1792 (MARTIN LUTHER KING, Jr. DRIVE.)**

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE



TIP PROJECT: B-4499

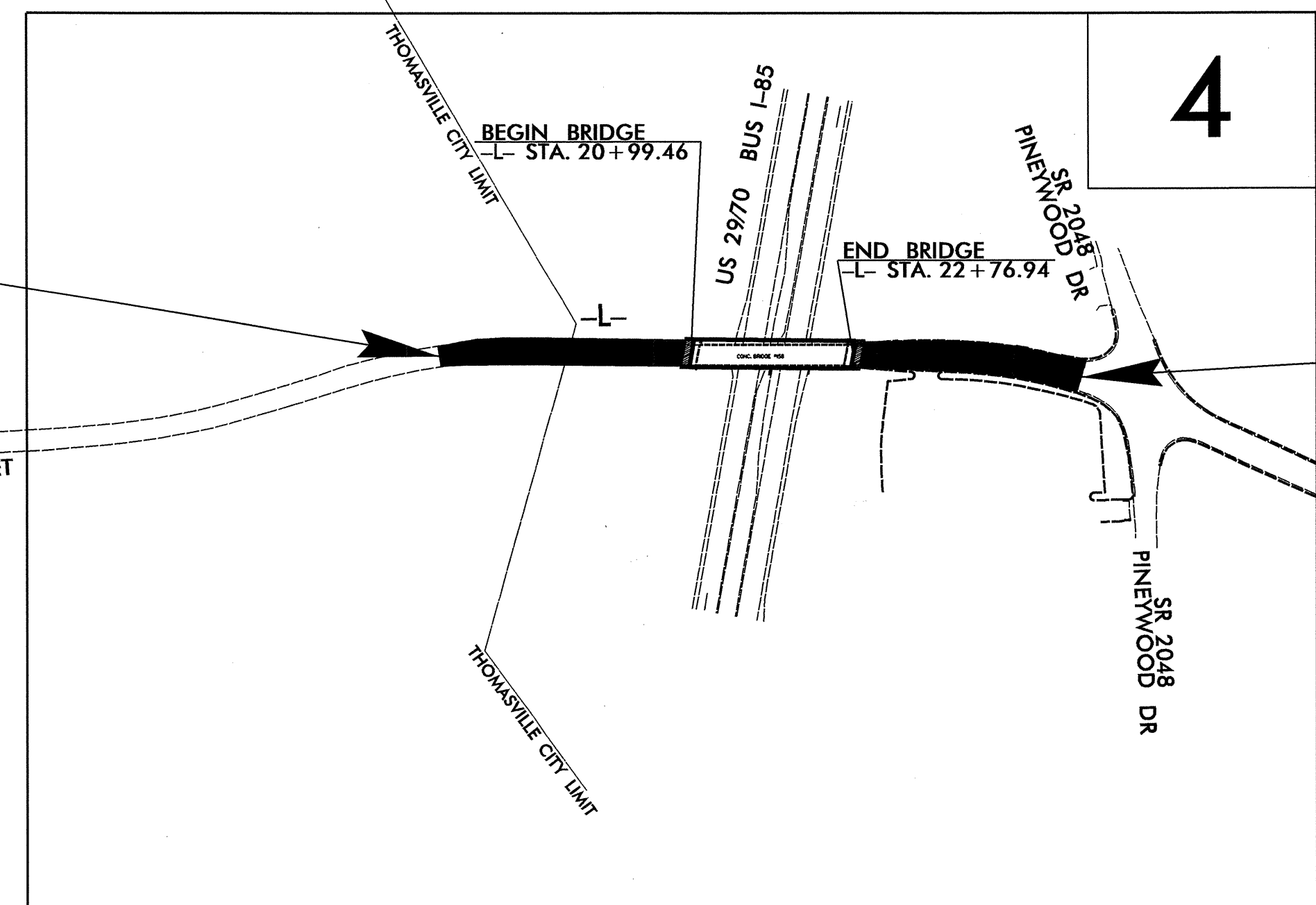


VICINITY MAP

DETOUR

**BEGIN TIP PROJECT B-4499
-L- STA. 18 + 00.00**

**TO OLD GREENSBORO ROAD
SR 1792 / JACOB STREET**

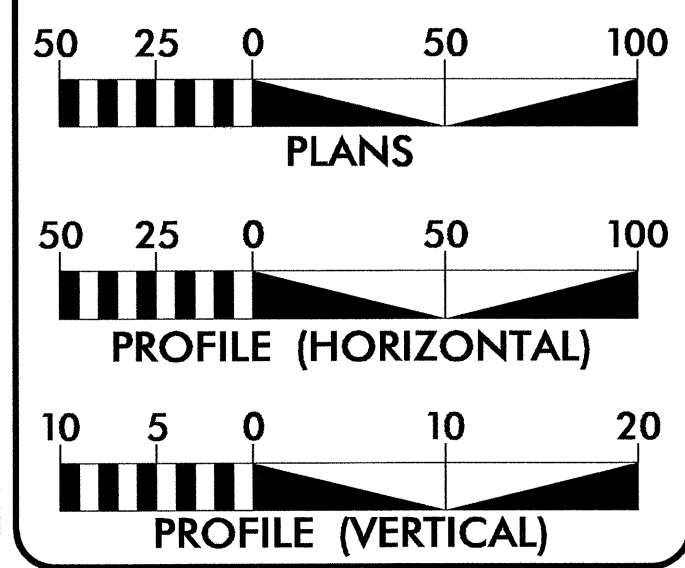


**END TIP PROJECT B-4499
-L- STA. 25 + 50.00**

**S.R. 1792 / MARTIN LUTHER KING JR. DRIVE
TO THOMASVILLE / LEXINGTON AVENUE**

STATEWIDE TIER DESIGN GUIDELINES WERE USED ON THIS PROJECT
A PORTION OF THIS PROJECT IS WITHIN THE CITY LIMITS OF THOMASVILLE
CONTROL OF ACCESS: PARTIAL CONTROL ON US 29/70 BUS I-85, NO CONTROL ON SR 1792 / JACOB STREET.

GRAPHIC SCALES



DESIGN DATA

ADT 2011 = 2790 VPD
 ADT 2030 = 4400 VPD
 DHV = 60 %
 D = 11 %
 T = 6 % *
 V = 40 MPH
 * TTST 2% DUAL 4%
 FUNC. CLASS : COLLECTOR

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4499 = 0.108 miles
 LENGTH OF STRUCTURE TIP PROJECT B-4499 = 0.034 miles
 TOTAL LENGTH OF TIP PROJECT B-4499 = 0.142 miles

Prepared in the Office of: DIVISION OF HIGHWAYS

1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JULY 14, 2009

LETTING DATE:
AUGUST 16, 2011

JIMMY GOODNIGHT, PE
PROJECT ENGINEER

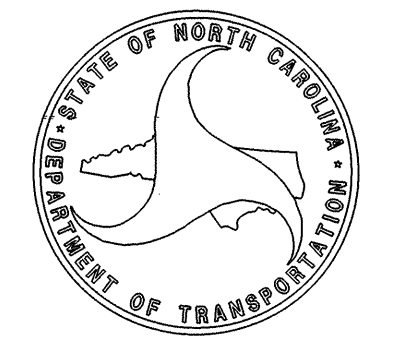
MARK HUSSEY
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

Professional Engineer Seal for James Goodnight, No. 14493, State of North Carolina, expires 5/31/11.

Professional Engineer Seal for James S. Goodnight, No. 14493, State of North Carolina, expires 5-27-2011.

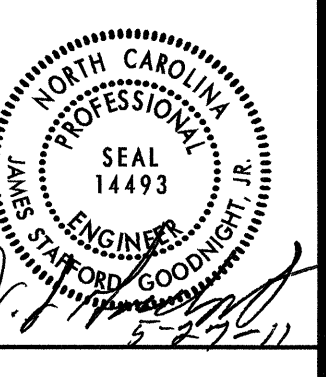
DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA



Art McMiller
STATE HIGHWAY DESIGN ENGINEER

26-MAY-2011 07:35
P:\Roadway\Proj\B4499_rdy_tsh.dgn
\$\$\$\$\$USERNAME\$\$\$\$\$

ROADWAY DESIGN ENGINEER



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
	DIVISION 2 - EARTHWORK
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - 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 Superelevated Curve - Method I
	DIVISION 6 - ASPHALT BASES AND PAVEMENTS
654.01	PAVEMENT REPAIRS
	DIVISION 8 - INCIDENTALS
806.01	CONCRETE RIGHT OF WAY MARKER
806.02	GRANITE RIGHT OF WAY MARKER
840.00	Concrete Base Pad for Drainage Structures
840.01	BRICK CATCH BASIN - 12" THRU 48" PIPE
840.02	Concrete CATCH BASIN - 12" THRU 48" PIPE
840.03	Frames, Grates, and Hood for use on Standard Catch Basin
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
857.01	Precast Reinforced Concrete Barrier
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

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 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.

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

DRIVEWAYS:
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3' RADIUS OR RADIUS AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS 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 POWER, TIME WARNER CABLE, NORTH STAR TELEPHONE, NORTH STATE TELEPHONE

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 CONTRACT.

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEETS
2-2A	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2B	DETAIL, PAVEMENT LIMITS UNDER STRUCTURE
2C	DETAIL, ANCHORAGE OF FRAMES
2D-2E	DETAIL, METHOD OF PIPE INSTALLATION
2-F THRU 2-O	DETAIL, TEMPORARY SHORING
3	SUMMARY OF QUANTITIES
3A	SUMMARY OF DRAINAGE QUANTITIES SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-6A	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-4	SIGNING PLANS
SD-1	SPECIAL SIGN DESIGN PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1 THRU X-8	CROSS-SECTIONS
S-1 THRU S-32	STRUCTURE PLANS

B/17-99

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

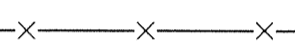









Note: Not to Scale

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS






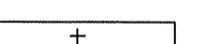





***S.U.E. = Subsurface Utility Engineering**

CONVENTIONAL PLAN SHEET SYMBOLS

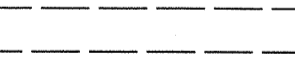







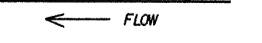

BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin	_____ 
Property Corner	_____ 
Property Monument	_____ 
Parcel/Sequence Number	_____ 
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	_____ 
Known Soil Contamination: Boundary or Site	_____ 
Potential Soil Contamination: Boundary or Site	_____ 

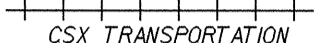




BUILDINGS AND OTHER CULTURE:

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

















HYDROLOGY:

Stream or Body of Water	_____
Hydro, Pool or Reservoir	_____ 
Jurisdictional Stream	_____ 
Buffer Zone 1	_____ 
Buffer Zone 2	_____ 
Flow Arrow	_____ 
Disappearing Stream	_____ 
Spring	_____ 
Wetland	_____ 
Proposed Lateral, Tail, Head Ditch	_____ 
False Sump	_____ 







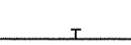
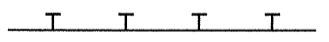
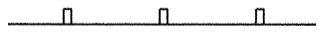
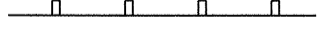



RAILROADS:

Standard Gauge	_____ 
RR Signal Milepost	_____ 
Switch	_____ 
RR Abandoned	_____ 
RR Dismantled	_____ 





RIGHT OF WAY:

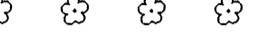
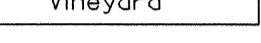
Baseline Control Point	_____ 
Existing Right of Way Marker	_____ 
Existing Right of Way Line	_____ 
Proposed Right of Way Line	_____ 
Proposed Right of Way Line with Iron Pin and Cap Marker	_____ 
Proposed Right of Way Line with Concrete or Granite Marker	_____ 
Existing Control of Access	_____ 
Proposed Control of Access	_____ 
Existing Easement Line	_____ 
Proposed Temporary Construction Easement	_____ 
Proposed Temporary Drainage Easement	_____ 
Proposed Permanent Drainage Easement	_____ 
Proposed Permanent Drainage / Utility Easement	_____ 
Proposed Permanent Utility Easement	_____ 
Proposed Temporary Utility Easement	_____ 
Proposed Aerial Utility Easement	_____ 

ROADS AND RELATED FEATURES:

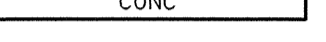
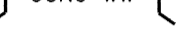
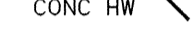






Proposed Permanent Easement with Iron Pin and Cap Marker	_____ 
Existing Edge of Pavement	_____ 
Existing Curb	_____ 
Proposed Slope Stakes Cut	_____ 
Proposed Slope Stakes Fill	_____ 
Proposed Curb Ramp	_____ 
Curb Cut Future Ramp	_____ 
Existing Metal Guardrail	_____ 
Proposed Guardrail	_____ 
Existing Cable Guiderail	_____ 
Proposed Cable Guiderail	_____ 
Equality Symbol	_____ 
Pavement Removal	_____ 

VEGETATION:












Single Tree	_____ 
Single Shrub	_____ 
Hedge	_____ 
Woods Line	_____ 

Orchard	_____ 
Vineyard	_____ 














EXISTING STRUCTURES:

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








UTILITIES:

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









TELEPHONE:

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






WATER:

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







TV:

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













GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

Utility Pole	_____ 
Utility Pole with Base	_____ 
Utility Located Object	_____ 
Utility Traffic Signal Box	_____ 
Utility Unknown U/G Line	_____ 
U/G Tank; Water, Gas, Oil	_____ 
Underground Storage Tank, Approx. Loc.	_____ 
A/G Tank; Water, Gas, Oil	_____ 
Geoenvironmental Boring	_____ 
U/G Test Hole (S.U.E.*)	_____ 
Abandoned According to Utility Records	_____ 
End of Information	_____ 

04/16/11

6/2/99

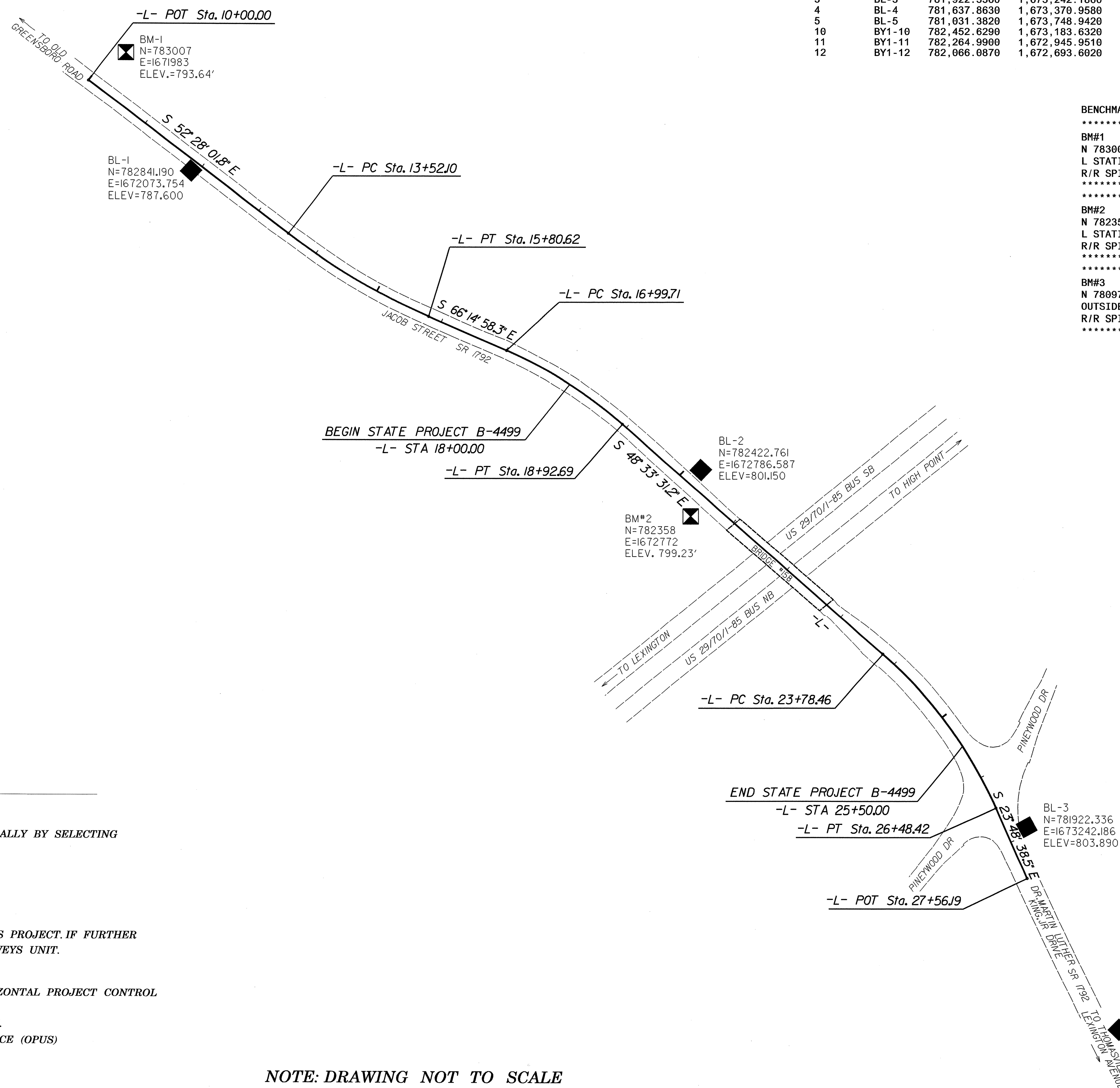
B4499-2
 N=783314.640
 E=1671451.650
 ELEV=775.840

SURVEY CONTROL SHEET B-4499

PROJECT REFERENCE NO.	SHEET NO.
B-4499	I-C
Location and Surveys	



POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
B4499-1	GPS-1	783,575.0210	1,670,162.5421	714.73	OUTSIDE PROJECT LIMITS	
B4499-2	GPS-2	783,314.6400	1,671,451.6500	775.84	OUTSIDE PROJECT LIMITS	
1	BL-1	782,841.1900	1,672,073.7540	787.60	11+90.92	13.73 RT
2	BL-2	782,422.7610	1,672,786.5870	801.15	20+16.81	24.97 LT
3	BL-3	781,922.3360	1,673,242.1860	803.89	26+89.65	28.67 LT
4	BL-4	781,637.8630	1,673,370.9580	811.17	OUTSIDE PROJECT LIMITS	
5	BL-5	781,031.3820	1,673,748.9420	810.30	OUTSIDE PROJECT LIMITS	
10	BY1-10	782,452.6290	1,673,183.6320	765.22	22+94.68	310.15 LT
11	BY1-11	782,264.9900	1,672,945.9510	772.86	22+40.69	12.18 LT
12	BY1-12	782,066.0870	1,672,693.6020	771.69	21+83.17	303.95 RT



BENCHMARKS:

.....

BM#1 ELEVATION = 793.64'
 N 783007 E 1671983
 L STATION 10+18 63 LEFT
 R/R SPIKE IN POWER POLE

BM#2 ELEVATION = 799.23'
 N 782358 E 1672772
 L STATION 20+49 33 RIGHT
 R/R SPIKE IN POWER POLE

BM#3 ELEVATION = 809.61'
 N 780970 E 1673727
 OUTSIDE PROJECT LIMITS
 R/R SPIKE IN POWER POLE

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4499-1"

WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 783575.021(ft) EASTING: 1670162.542(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99990684

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4499-1" TO -L- STATION 10+00 IS
 S 71°03'50" E 1,869.344'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:
 B4499_LS_CONTROL_081112.TXT
- SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- ⊙ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
 NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING USER SERVICE (OPUS)

NOTE: DRAWING NOT TO SCALE

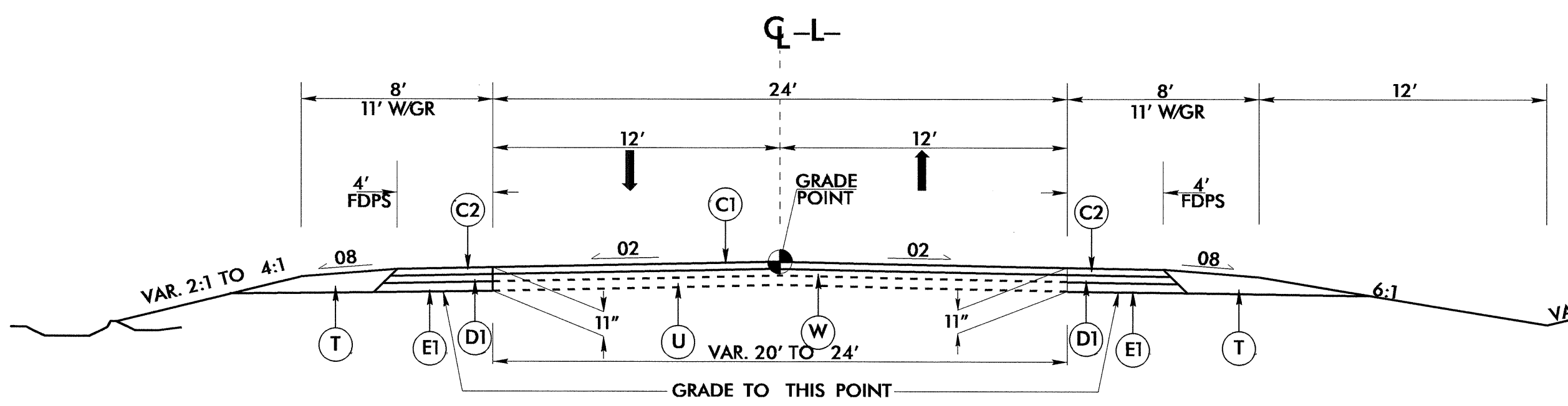
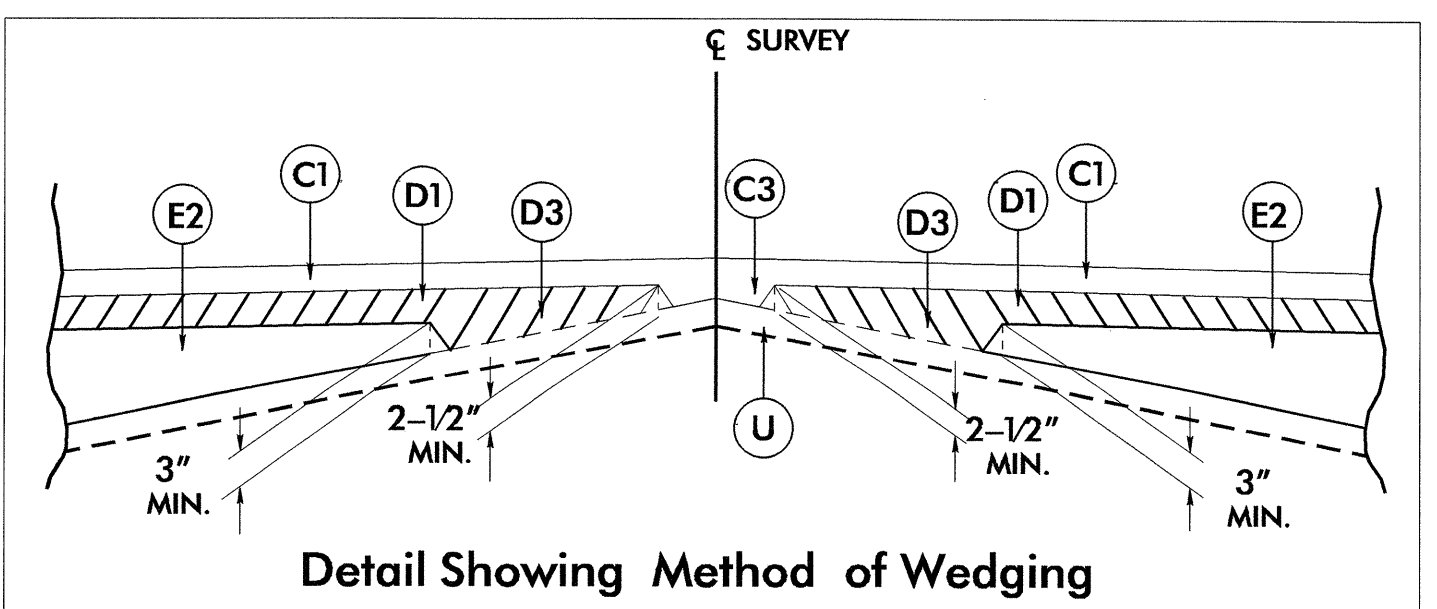
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 \$\$\$\$LISEFRM\$\$\$

6/2/99

PROJECT REFERENCE NO. B-4499	SHEET NO. 2
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 14493 J. B. [Signature]	PAVEMENT DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 22896 CLARK S. MORRISON

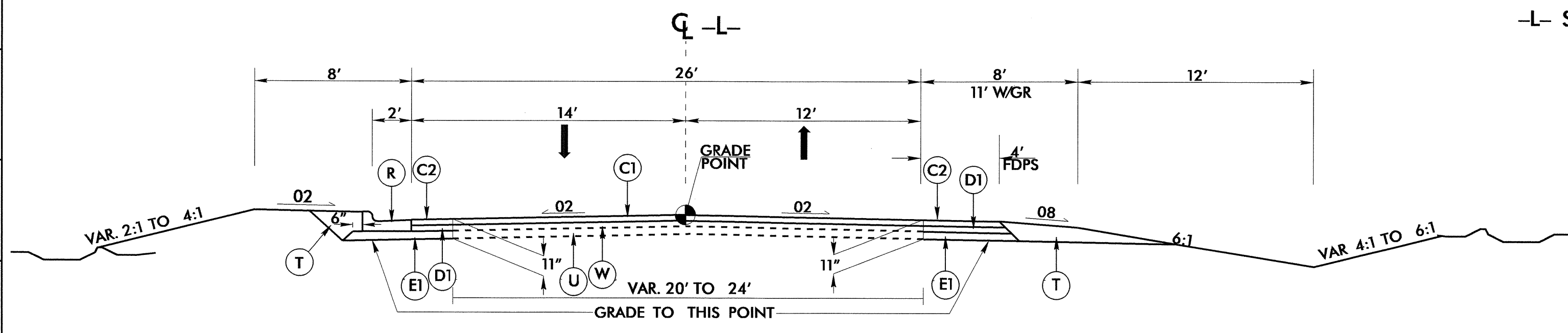
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1-1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE 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 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. APPROX. 2-1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D3	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.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 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.
R	2'-6" CONCRETE CURB AND GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT

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



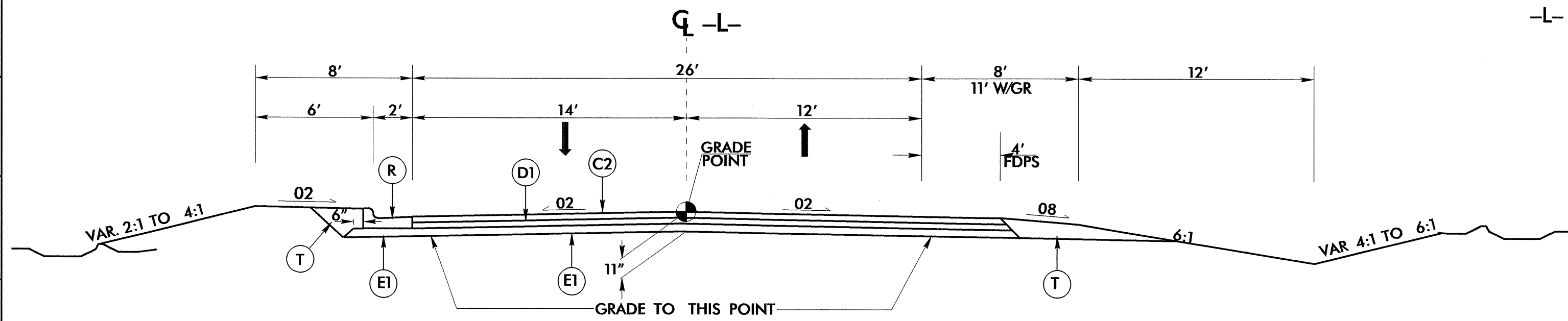
TYPICAL SECTION NO. 1

TYPICAL SECTION NO. 1
-L- STA. 18+00.00 TO 19+70.00



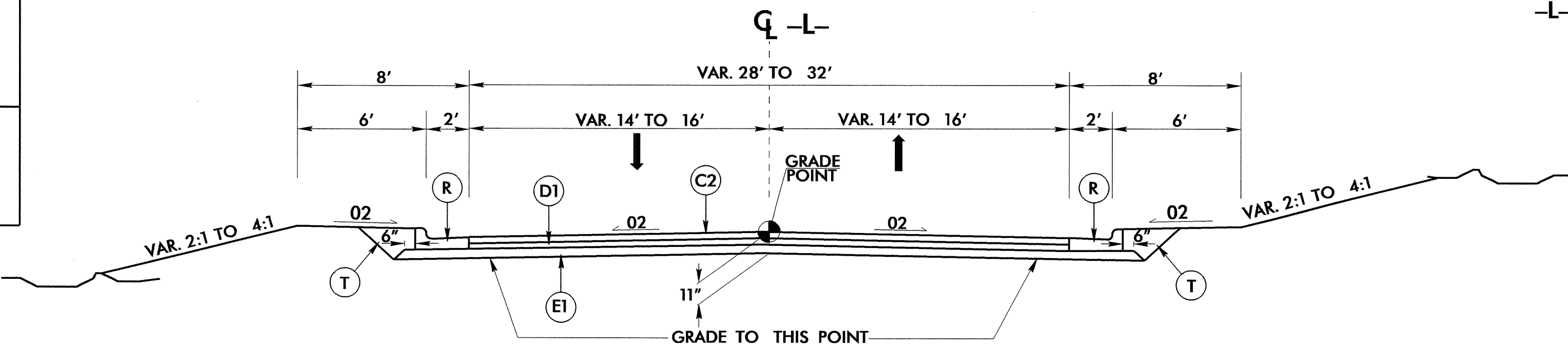
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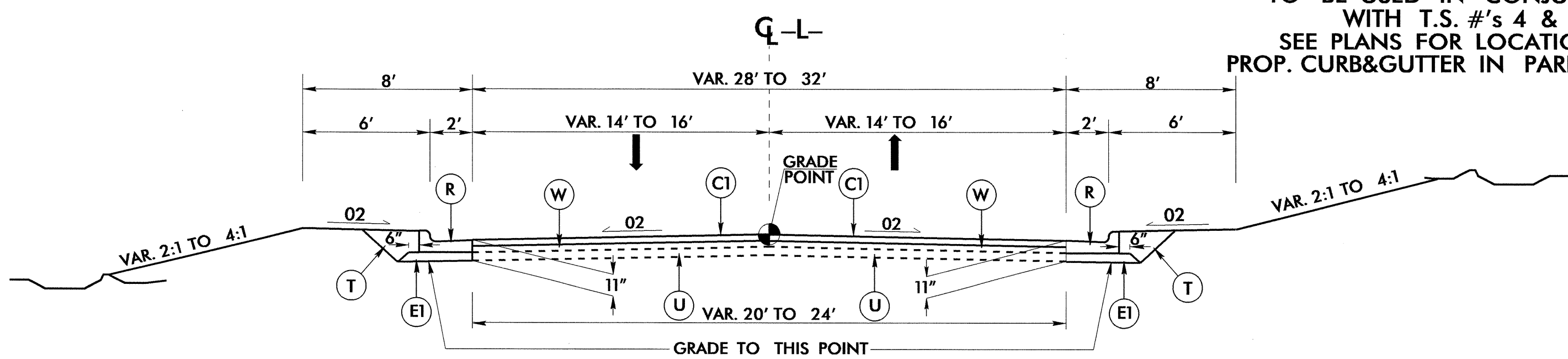
TYPICAL SECTION NO. 3

TYPICAL SECTION NO. 3
-L- STA. 20+25.00 TO BEG. BRIDGE 20+99.46

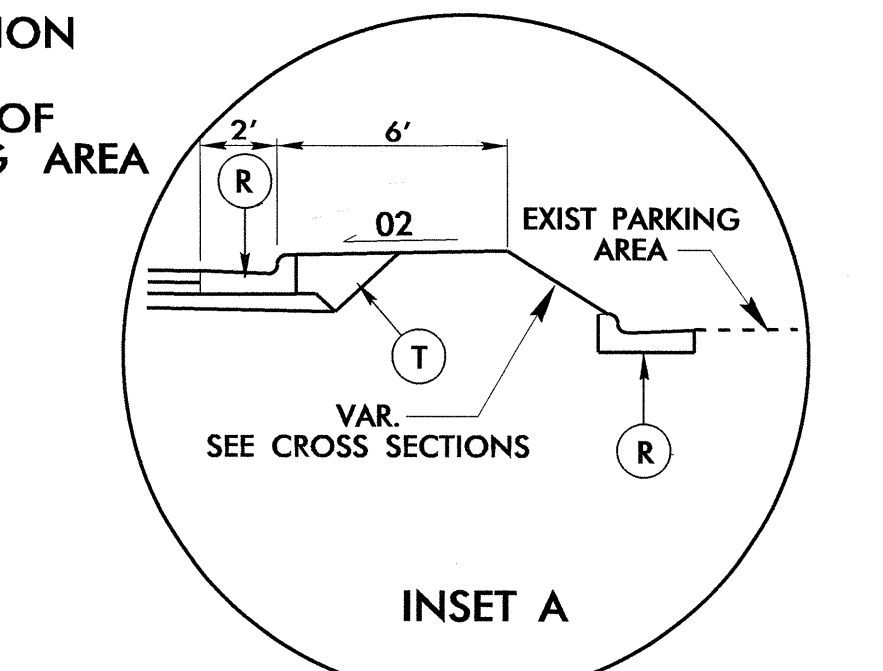


TYPICAL SECTION NO. 4

TYPICAL SECTION NO. 4
-L- END BRIDGE STA. 22+76.94 TO 24+50.00



TYPICAL SECTION NO. 5



TYPICAL SECTION NO. 5
-L- STA. 24+50.00 TO 25+50.00

INSET A
TO BE USED IN CONJUNCTION
WITH T.S. #'s 4 & 5
SEE PLANS FOR LOCATION OF
PROP. CURB&GUTTER IN PARKING AREA

15-MAY-2011 13:45 \\b4499_rdu_tup.dgn

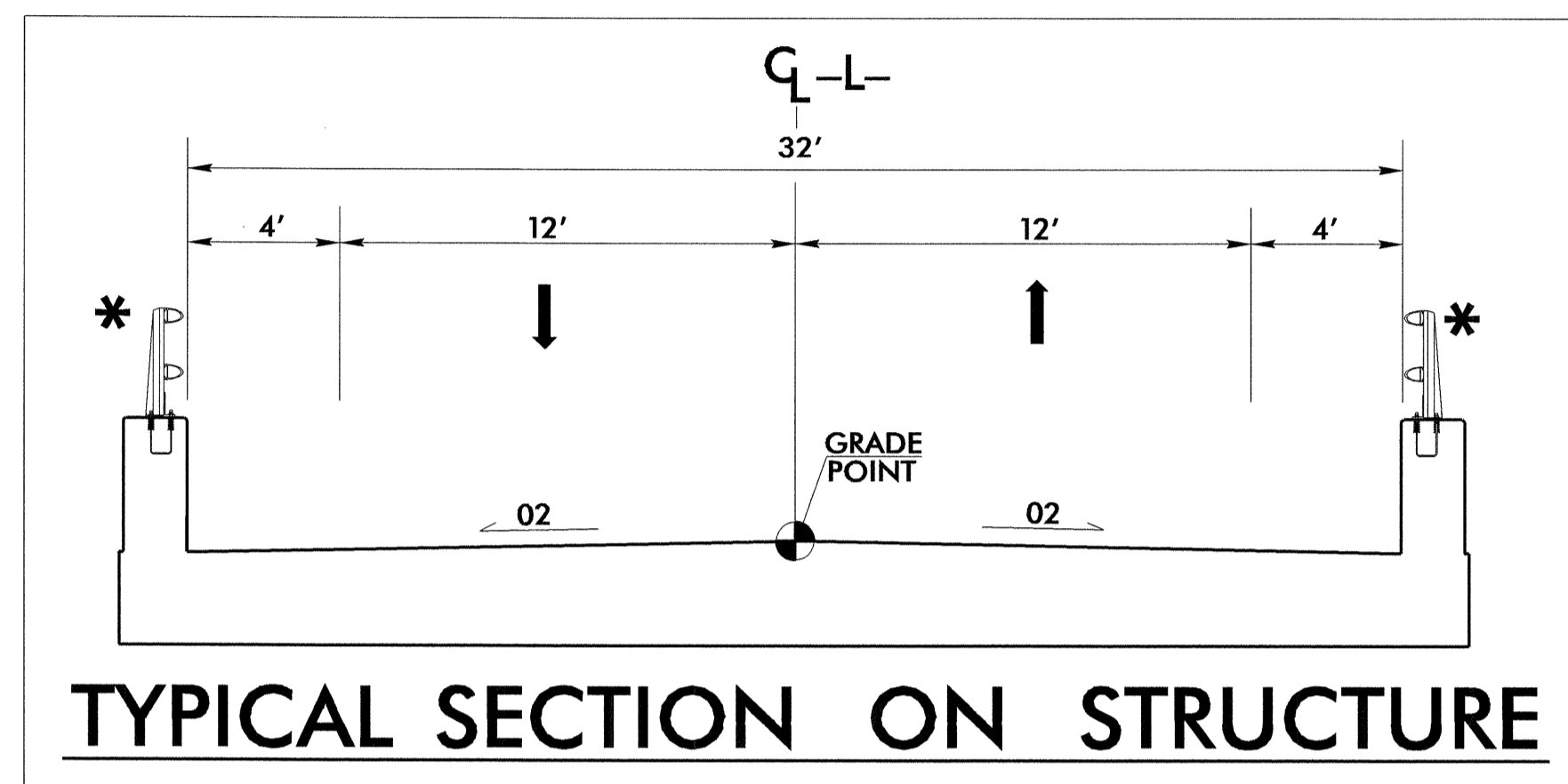
6/2/99

PAVEMENT SCHEDULE	
C1	1½", TYPE S9.5B
C2	3", TYPE S9.5B
C3	VAR. DEPTH, TYPE S9.5B
D1	4", TYPE I19.0B
D2	2½", TYPE I19.0B
D3	VAR. DEPTH, TYPE I19.0B
E1	4", TYPE B25.0B
E2	VAR. DEPTH, TYPE B25.0B
R	2'-6" CONCRETE CURB AND GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT

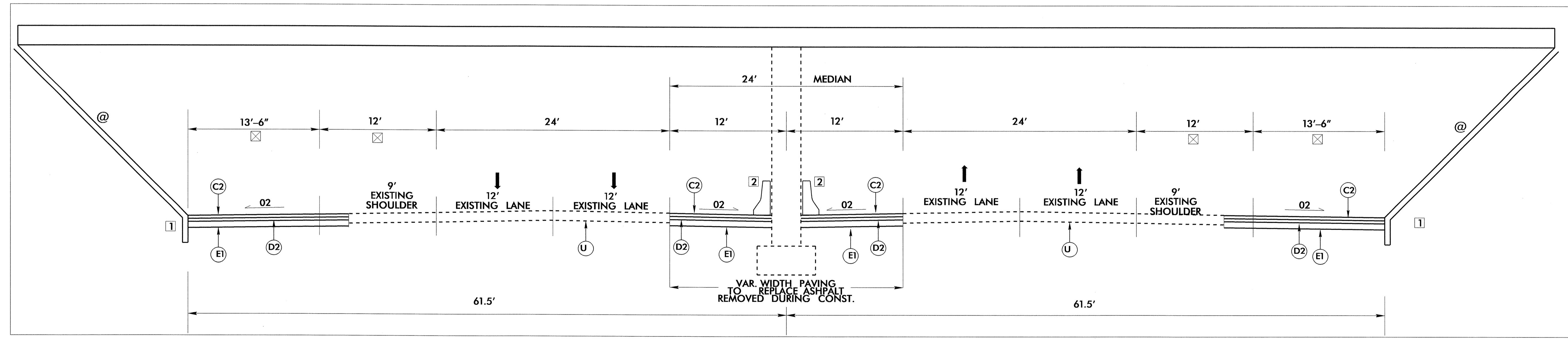
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

PROJECT REFERENCE NO. B-4499	SHEET NO. 2 A
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 14493 STAFFORD GOODWIGHT, JR. 5-20-11	PAVEMENT DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 22886 CLARK S. MORRISON 3/17/11

- MINIMUM VERTICAL CLEARANCE 16.5'
- * BICYCLE SAFE RAILS REQUIRED
- @ SLOPES DETERMINED BY GEOTECHNICAL UNIT
- 1 SEE STD. 610.02
- 2 SEE STD. 857.01
- ☒ PROPOSED FUTURE WIDENING R2808

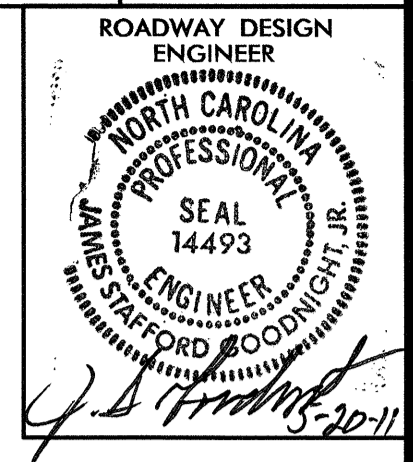


TYPICAL SECTION ON STRUCTURE



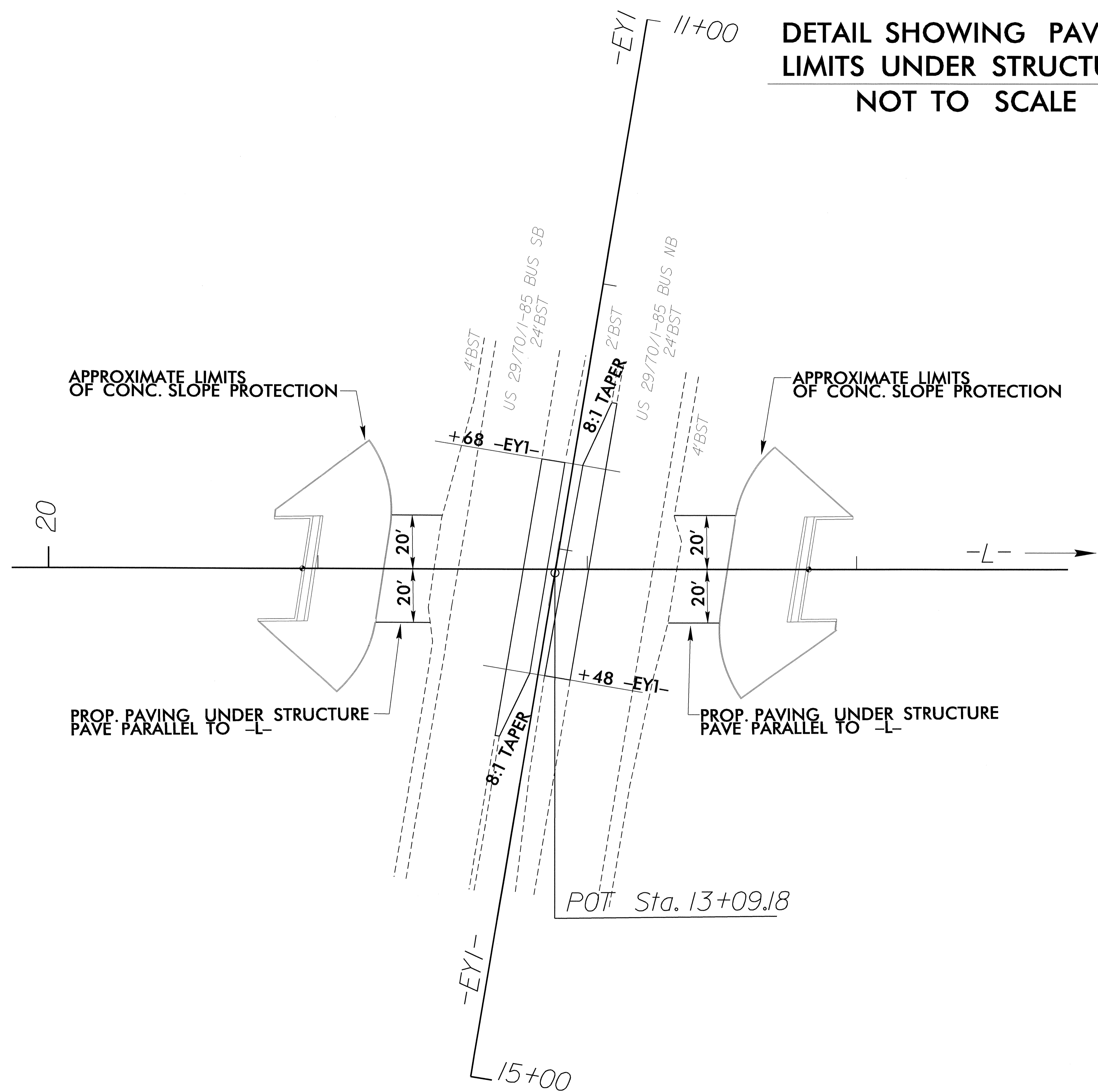
TYPICAL SECTION UNDER STRUCTURE
US 29/70/BUS. I-85

16-MAY-2011 09:53
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DETAIL SHOWING PAVING LIMITS UNDER STRUCTURE

NOT TO SCALE

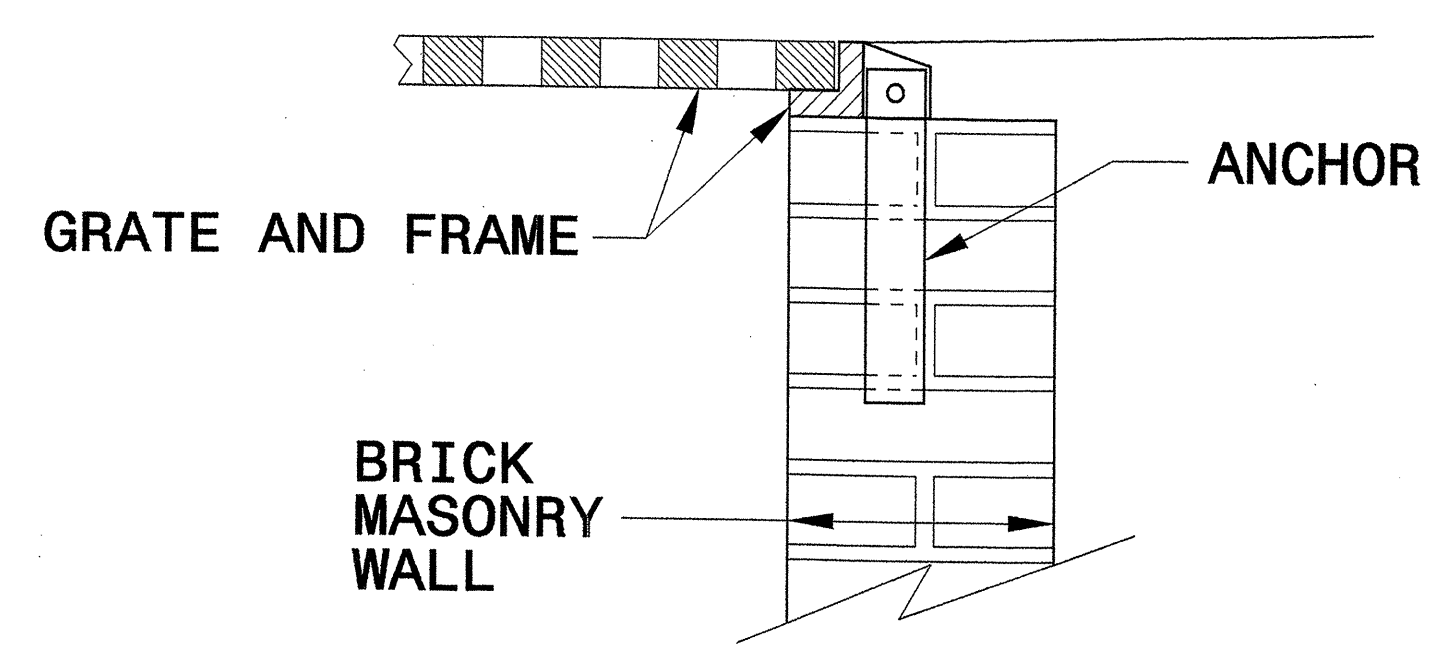


6/22/99
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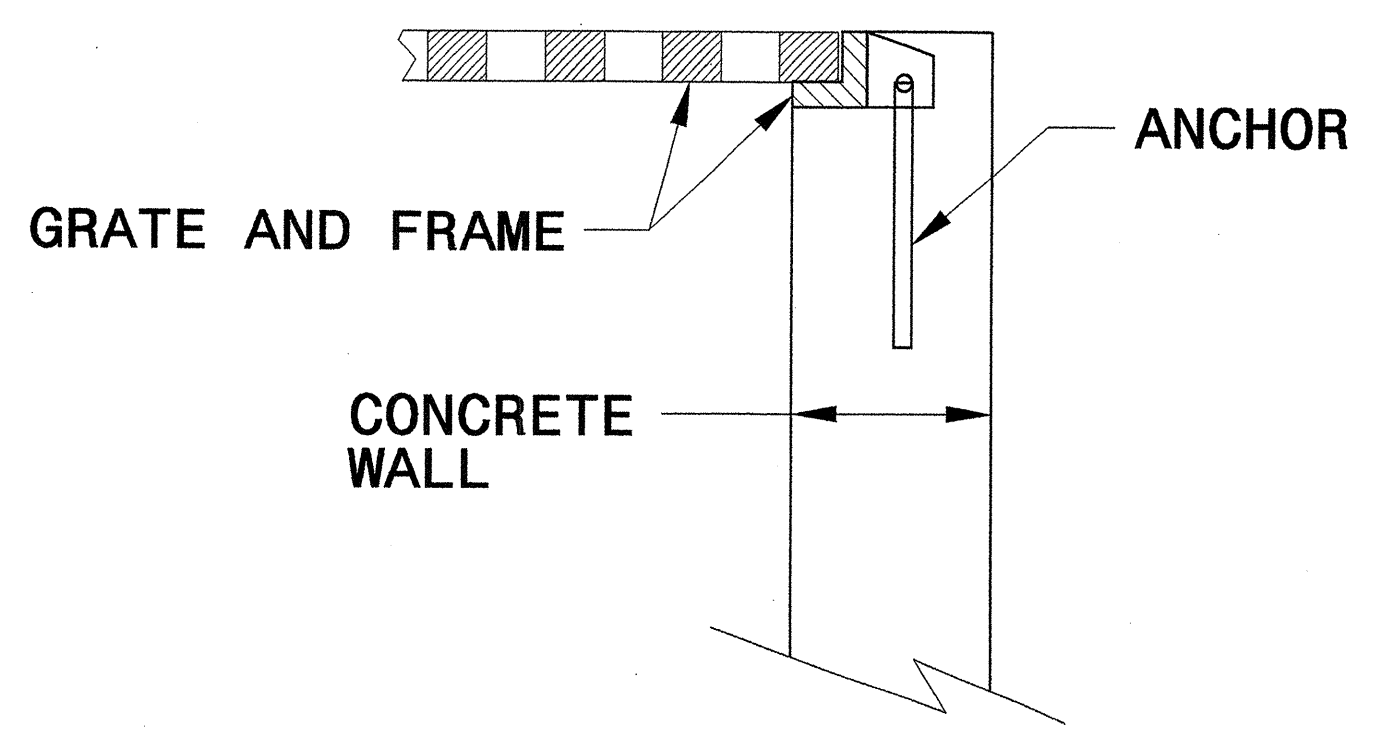
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

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

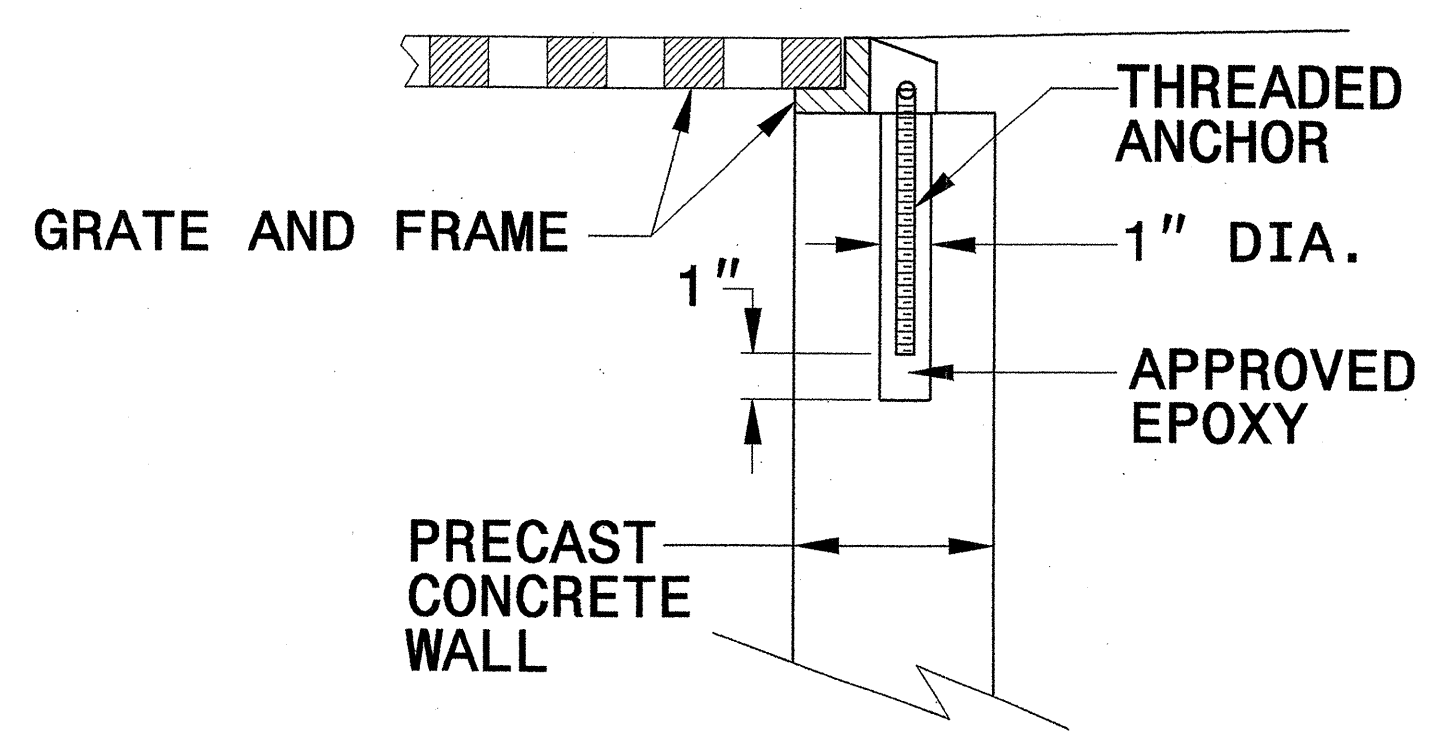
SHEET 1 OF 1 840D25



BRICK MASONRY CONSTRUCTION



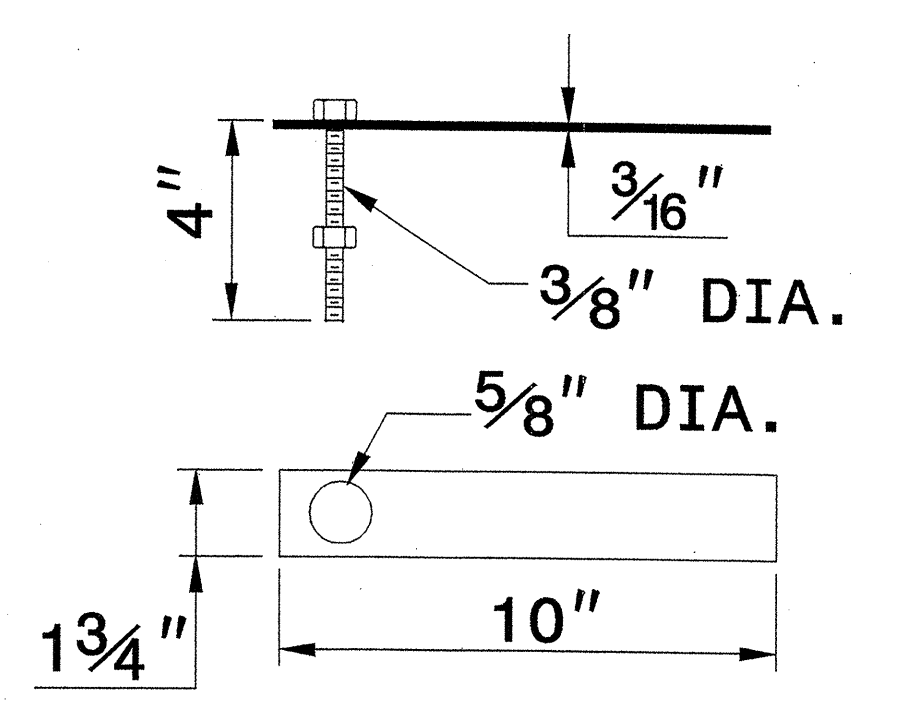
CONCRETE CONSTRUCTION



PRECAST CONCRETE CONSTRUCTION

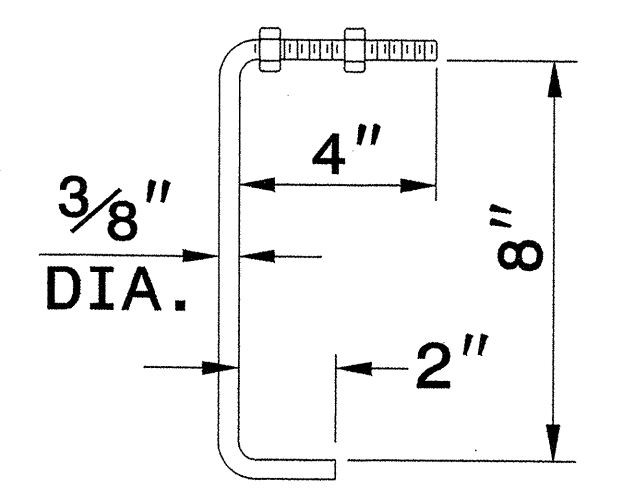
DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

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



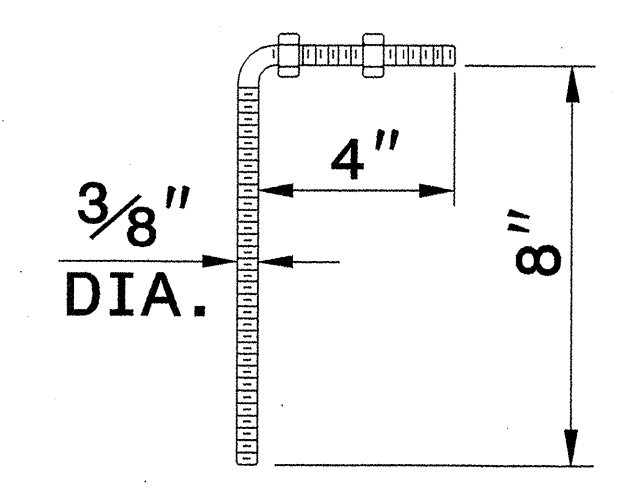
MASONRY ANCHOR

3/8" DIA. BOLT WITH PLATE



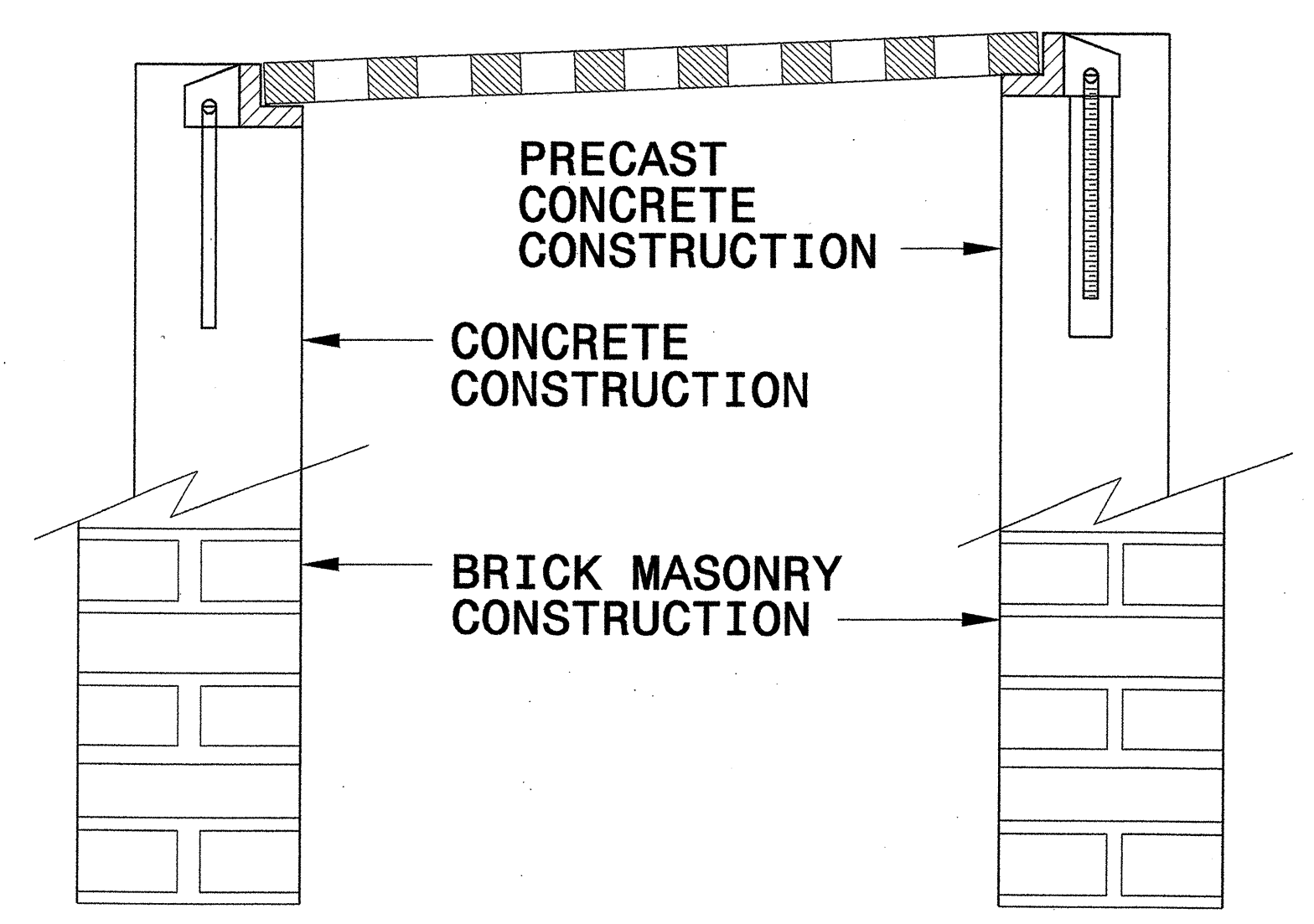
CONCRETE ANCHOR

3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR

3/8" DIA. BENT BAR

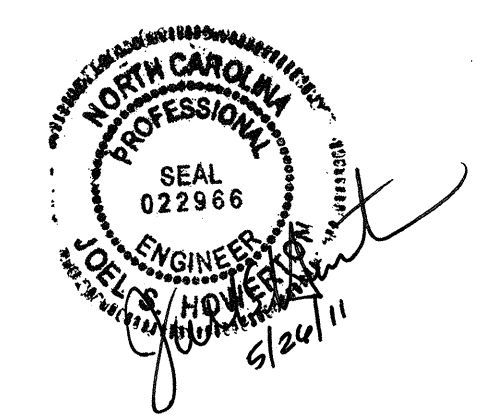


FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

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



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: J. S. Howerton DATE: 4/13/08
FILE SPEC.: J

30-JUL-2009 08:49
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 JHowerton

5/14/99

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

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

FLEXIBLE PIPE

Round Corrugated Steel Pipe
 2 2/3 x 1/2 corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)				
		16 (Ga)	14	12	10	8
12	12	204	256			
15	12	162	204			
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	160
48	12	48	61	87	113	139
54	12		54	77	100	123
60	12			69	90	111
66	12				81	100
72	12				74	91
78	12					81
84	12					69

Round Corrugated Aluminum Pipe
 2 2/3 x 1/2 corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)				
		16 (Ga)	14	12	10	8
12	12	123	155	218	281	344
15	12	98	123	174	224	275
18	12	81	102	144	187	228
21	12	69	87	123	160	195
24	12	60	76	108	139	171
27	12		67	95	123	151
30	12		60	85	111	136
36	12		50	71	92	113
42	12			60	78	96
48	12			52	68	84
54	12			46	58	74
60	12				50	62
66	12					51
72	12					41

** 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

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

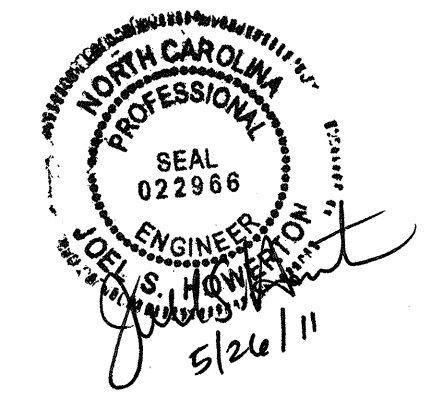
ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

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

SEE PLATE FOR TITLE

ORIGINAL BY: K Kempf DATE: 5-15-09
 MODIFIED BY: DATE:
 CHECKED BY: DATE: 7/30/09
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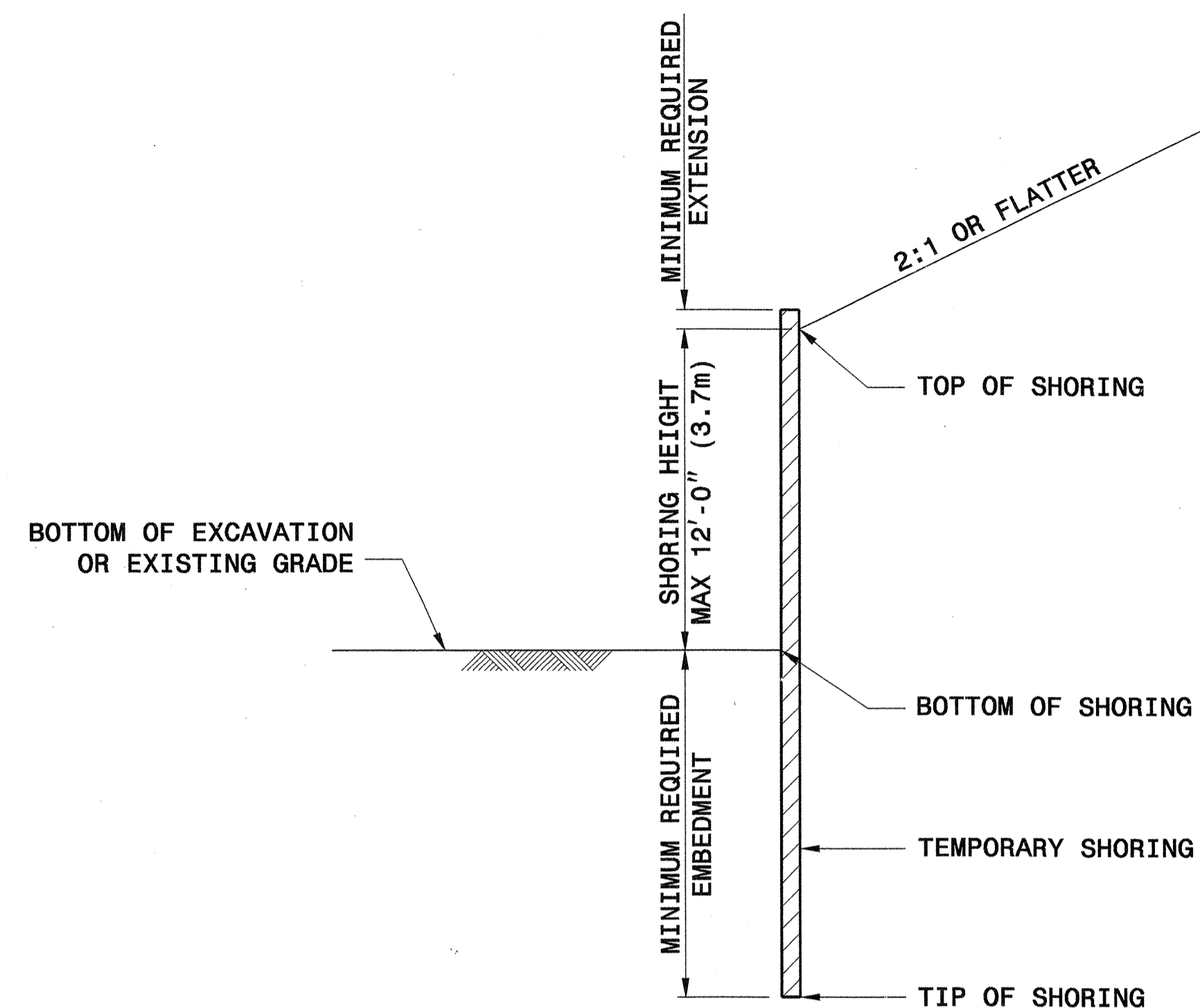


GEOTECHNICAL ENGINEER

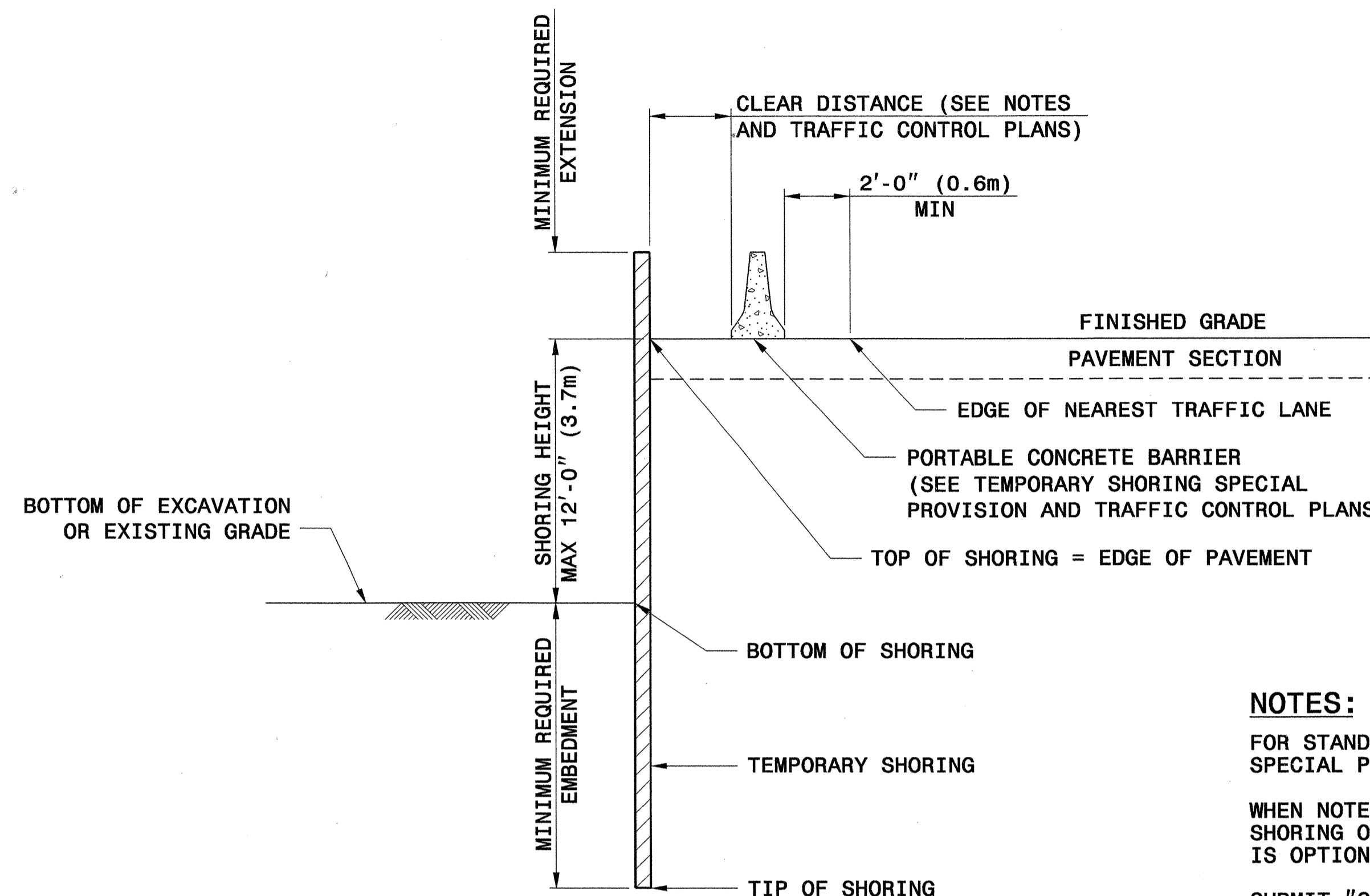
ENGINEER



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



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/M³)
 FRICTION ANGLE = 30 DEGREES
 COHESION = 0 PSF (0 KPA)
 GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF SHORING.

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

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

VERIFY GROUNDWATER ELEVATION BEFORE BEGINNING SHORING CONSTRUCTION.

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

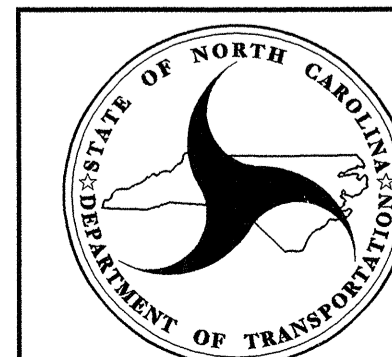
AT THE CONTRACTOR'S OPTION, H PILE EMBEDMENT DEPTHS FOR PILES SET IN DRILLED HOLES MAY BE REDUCED BY 25%. FOR PILE EXCAVATION, SEE TEMPORARY SHORING SPECIAL PROVISION.

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

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

GROUNDWATER CONDITION	SHORING HEIGHT FT (m)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN ³ /FT (cm ³ /m)	H PILES WITH TIMBER LAGGING			MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN ³ /FT (cm ³ /m)	H PILES WITH TIMBER LAGGING		
				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)
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

GEOLOGICAL
ENGINEER

ENGINEER

NORTH CAROLINA
PROFESSIONAL
SEAL
022246
ENGINEER
SCOTT A. HIDDEN

Signature: *Scott A. Hidden* 3/29/07
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/M³)
 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 WITH THE EXCEPTION OF EITHER THE FIRST OR LAST SECTION OF WALL, HORIZONTAL SECTION LENGTHS IN INCREMENTS EQUAL TO THE FOLLOWING:

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

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

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

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

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

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

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

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

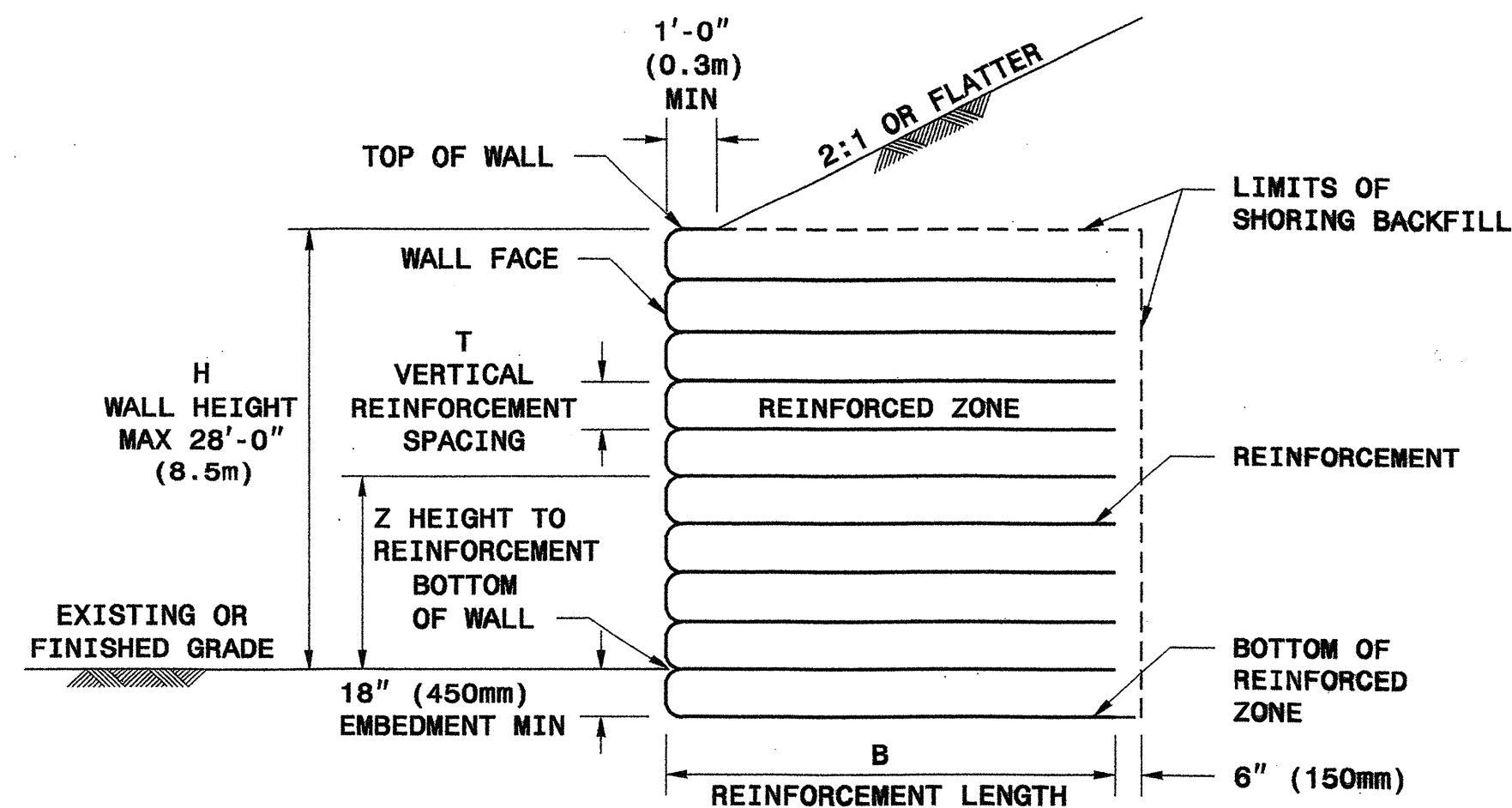
PLACE SHORING BACKFILL IN 8" TO 10" (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

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

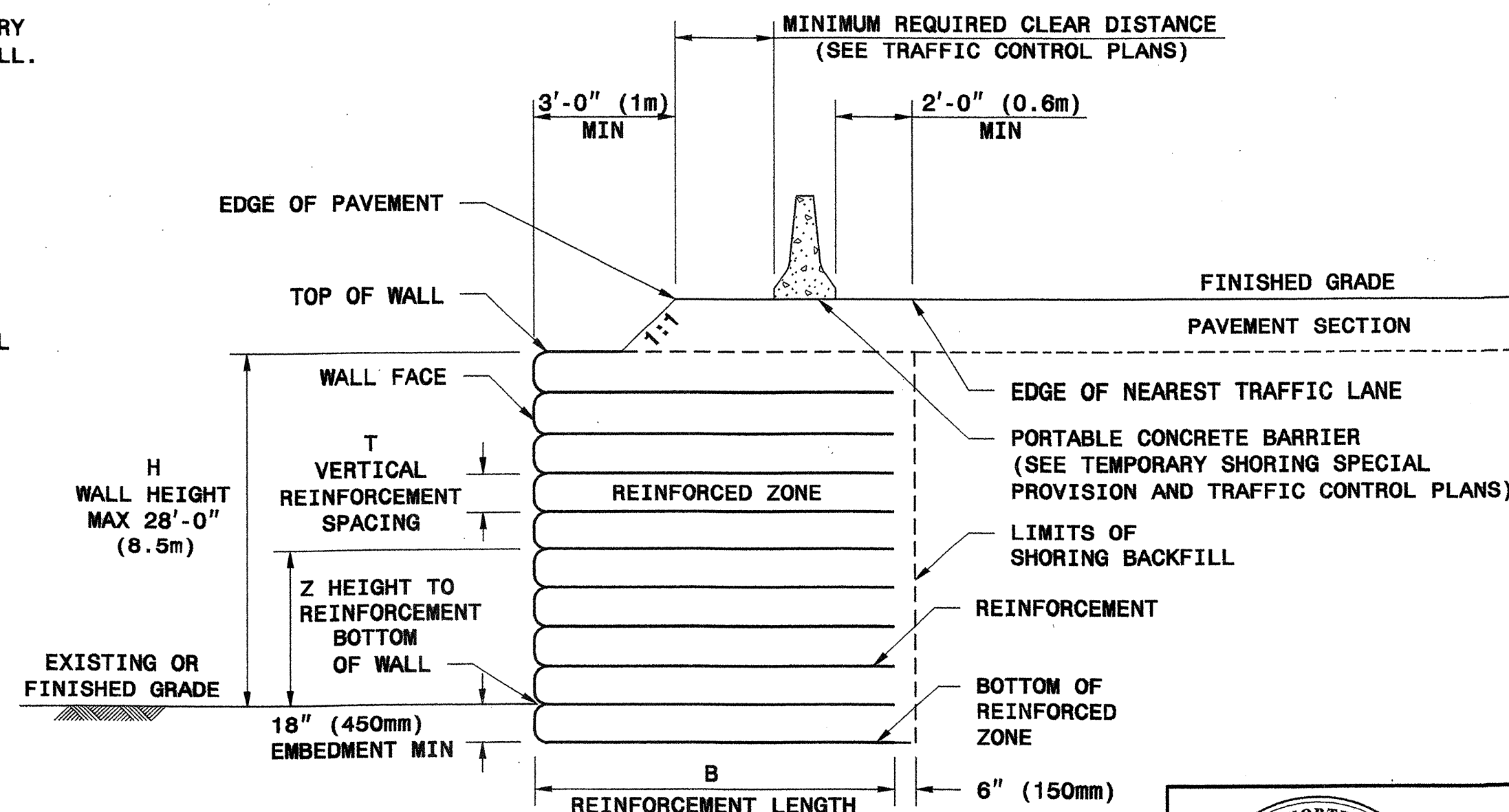
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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

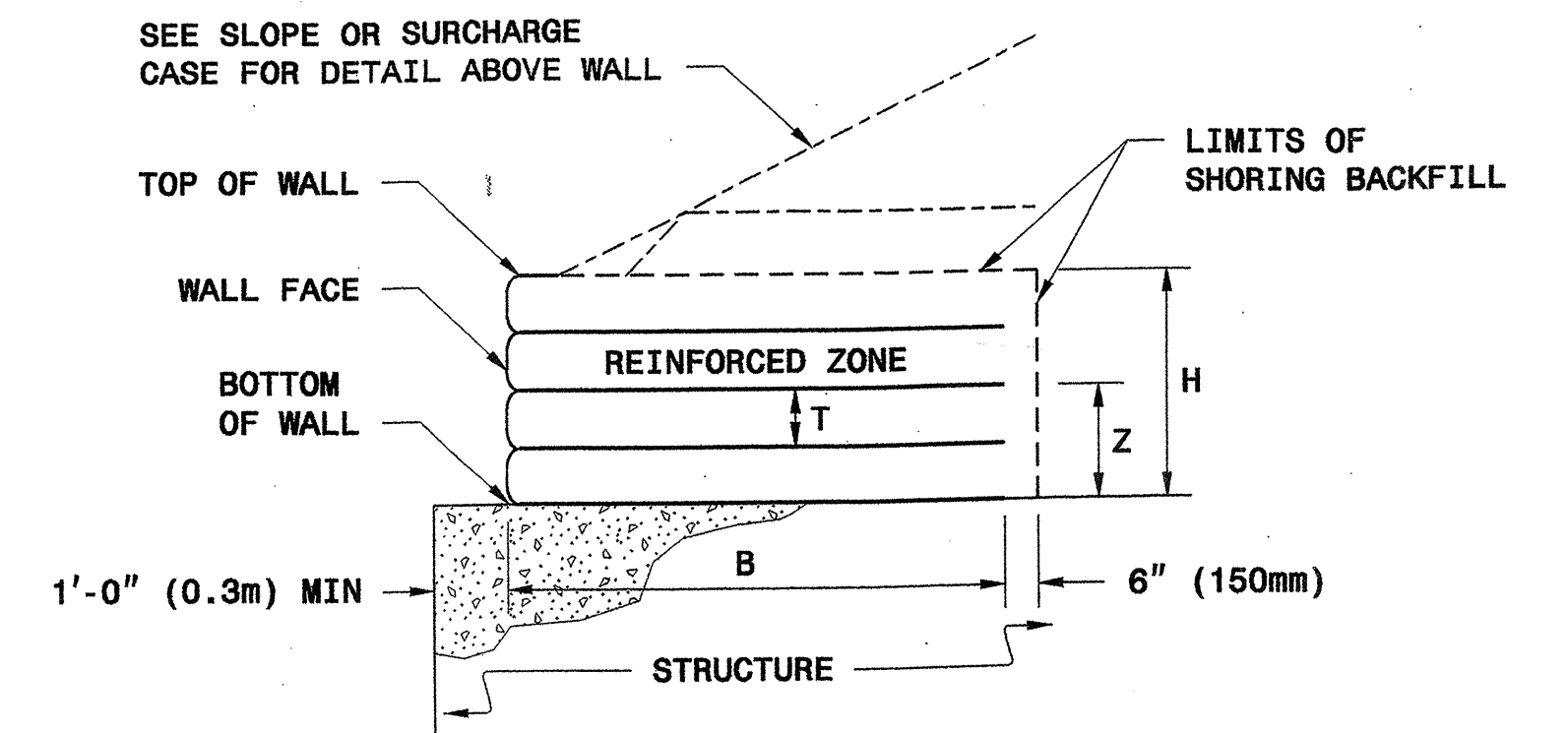
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



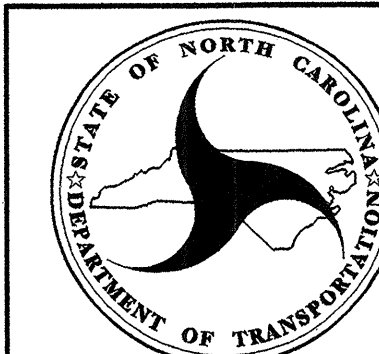
SLOPE CASE



SURCHARGE CASE



TEMPORARY MSE WALL ON STRUCTURE



**GEOTECHNICAL
ENGINEERING UNIT**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

**STANDARD TEMPORARY
MECHANICALLY STABILIZED
EARTH (MSE) WALLS**

SHEET 1 OF 11 DATE: 2-20-07



Scott A. Hadden 3/21/07
SIGNATURE DATE

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)													
	27 - 8													3
	26 - 10													3
	25 - 2													3
	23 - 6													3
	21 - 10													3
	20 - 2													3
	18 - 6													3
	16 - 10													3
	15 - 2													3
	13 - 6													3
	11 - 10													3
	10 - 2													3
8 - 6													3	
6 - 10													3	
5 - 2													3	
3 - 6													3	
1 - 10													3	
0 - 2													3	
0 - 8													3	

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)													
	26.5													11
	25.5													11
	24													11
	22.5													11
	21													11
	19.5													11
	18													11
	16.5													11
	15													11
	13.5													11
	12													11
	10.5													11
9													11	
7.5													11	
6													11	
4.5													11	
3													11	
1.5													11	
0													11	
-1.5													11	

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)													
	26													4.5
	24													4.5
	22													4.5
	20													4.5
	18													4.5
	16													4.5
	14													4.5
	12													4.5
	10													4.5
	8													4.5
	6													4.5
	4													4.5
3													4.5	
2													4.5	
1													4.5	
0													4.5	
-1.5													4.5	

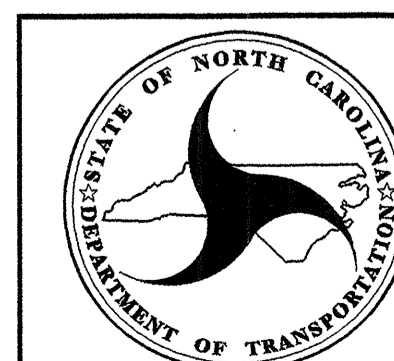
RETAINED EARTH TEMPORARY WALL (WELDED WIRE MESH TYPE)

3X1 = 3WB x WB x 1.0'
3X2 = 3WB x WB 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)													
	27 - 6													3X1
	26 - 10													3X1
	25 - 2													3X1
	23 - 6													3X1
	21 - 10													3X1
	20 - 2													3X1
	18 - 6													3X1
	16 - 10													3X1
	15 - 2													3X1
	13 - 6													3X1
	11 - 10													3X1
	10 - 2													3X1
8 - 6													3X1	
6 - 10													3X1	
5 - 2													3X1	
3 - 6													3X1	
1 - 10													3X1	
0 - 2													3X1	
-1 - 6													3X1	

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'.



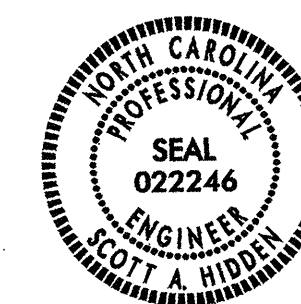
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RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

SHEET 2 OF 11

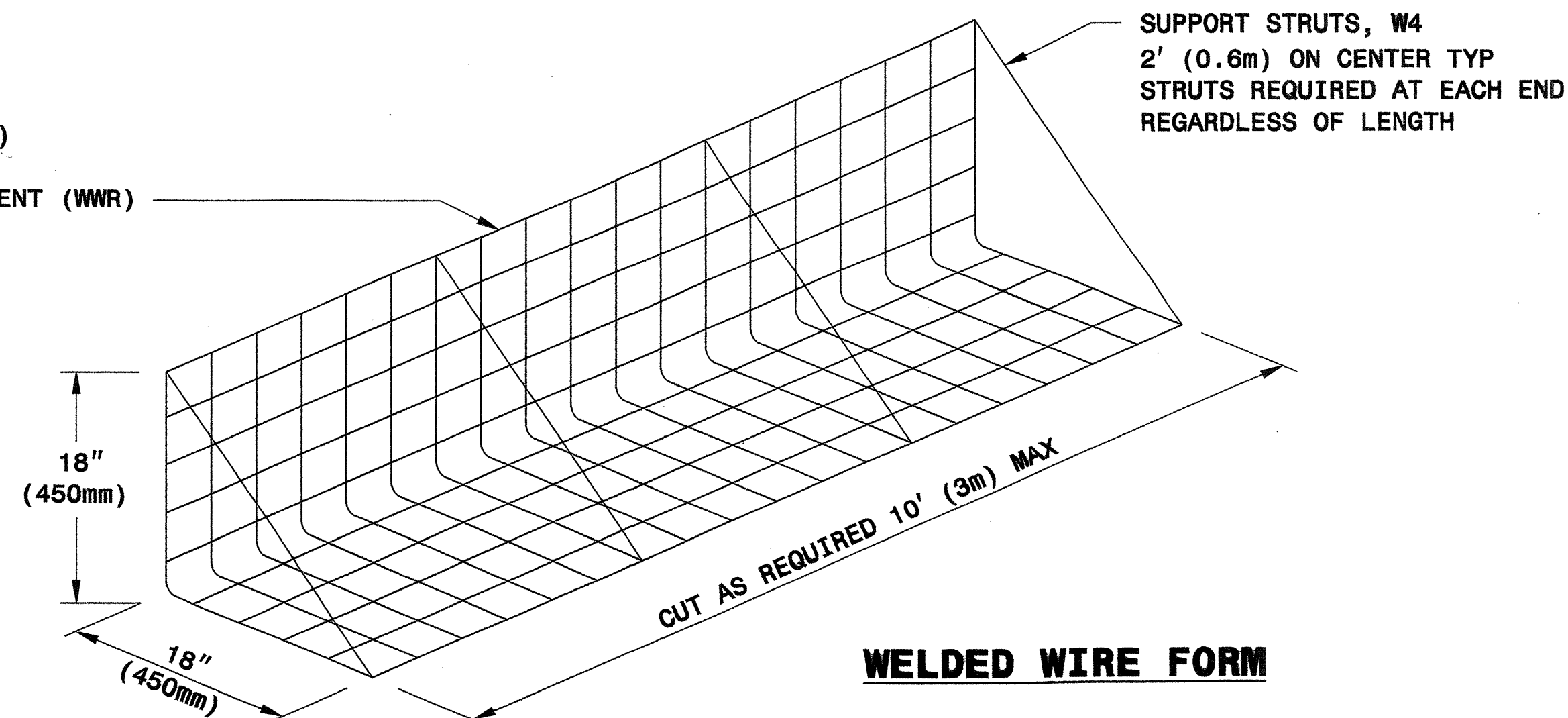
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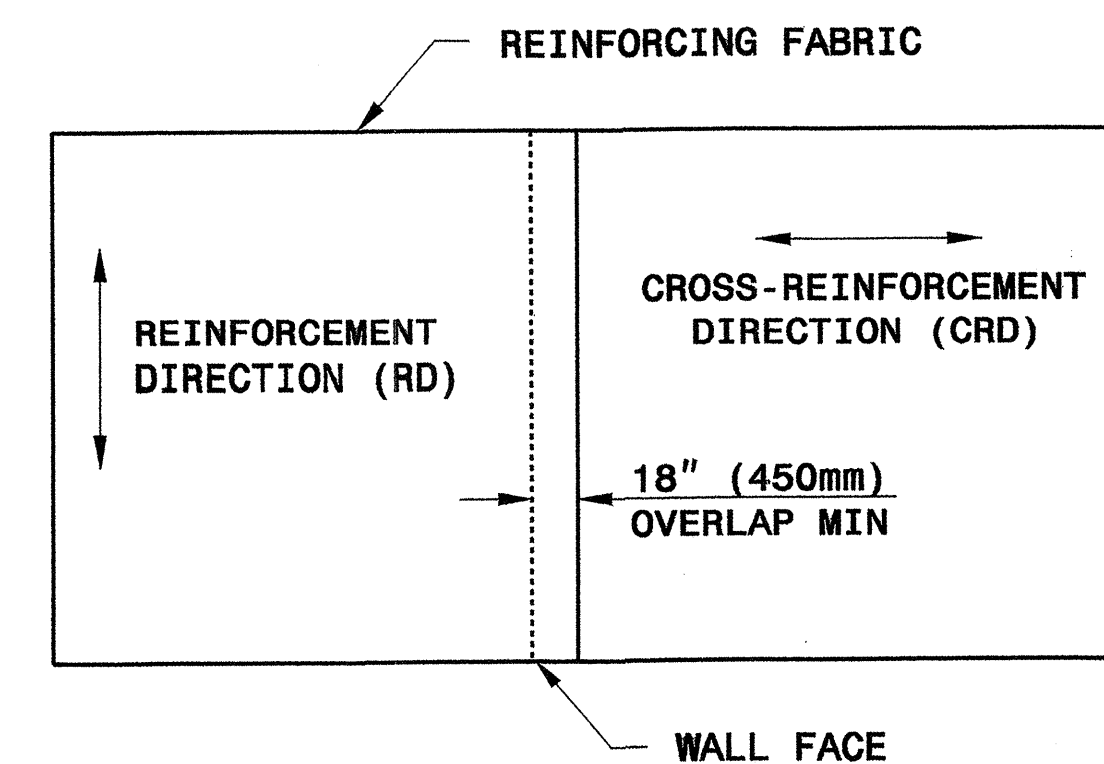
Scott A. Hadden 3/29/07
SIGNATURE DATE

SIGNATURE DATE

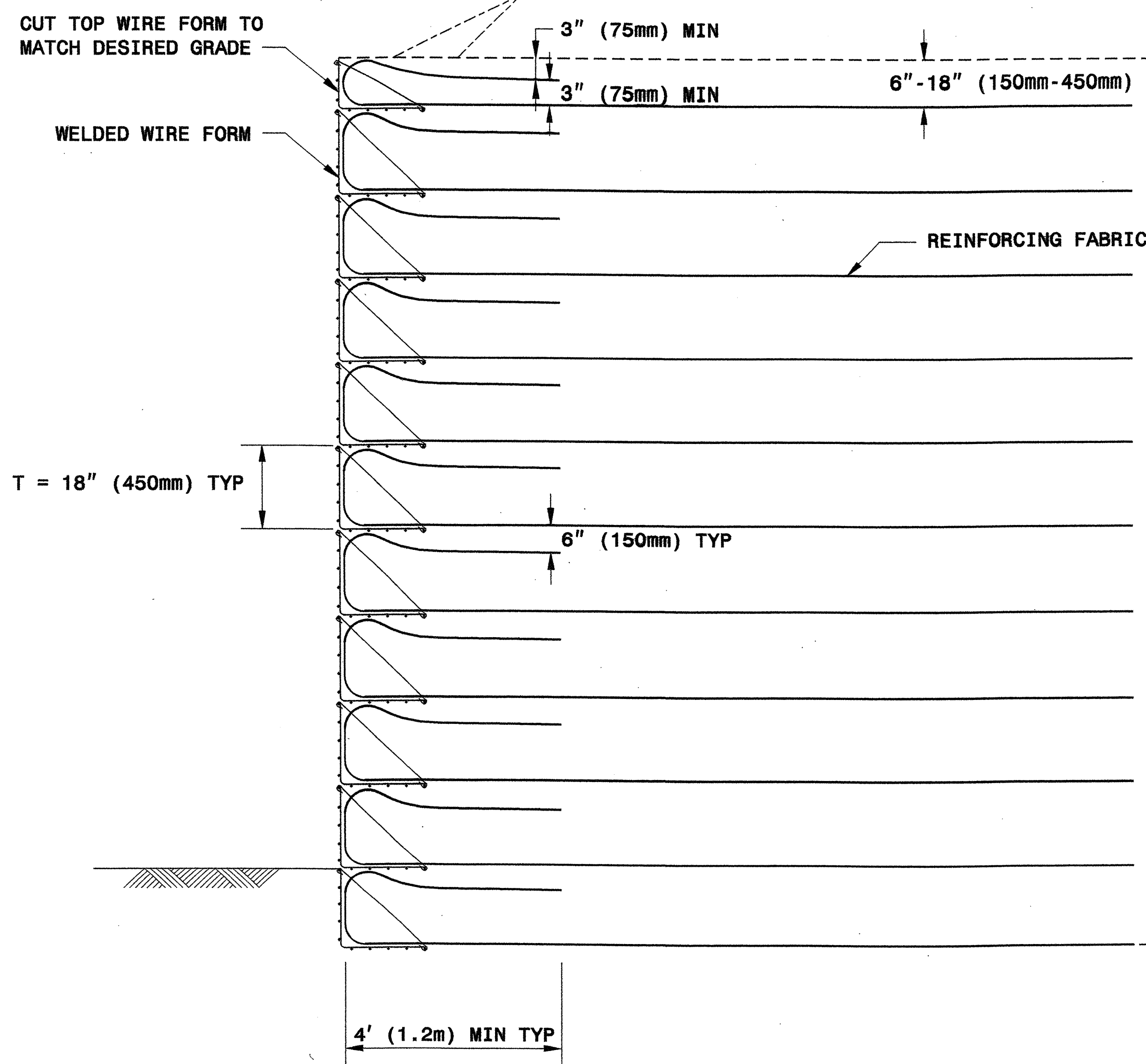
4" X 4" (102mm X 102mm)
W4 X W4 (MW26 X MW26)
WELDED WIRE REINFORCEMENT (WWR)



WELDED WIRE FORM



PLAN VIEW OF FABRIC OVERLAP

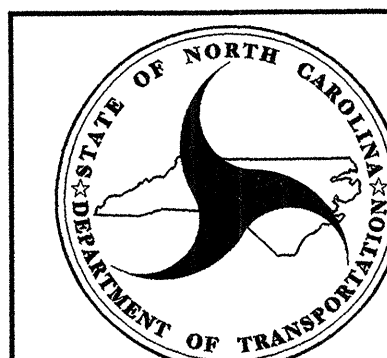


TYPICAL SECTION

**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



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RALEIGH

STANDARD DRAWING NO. 1801.02

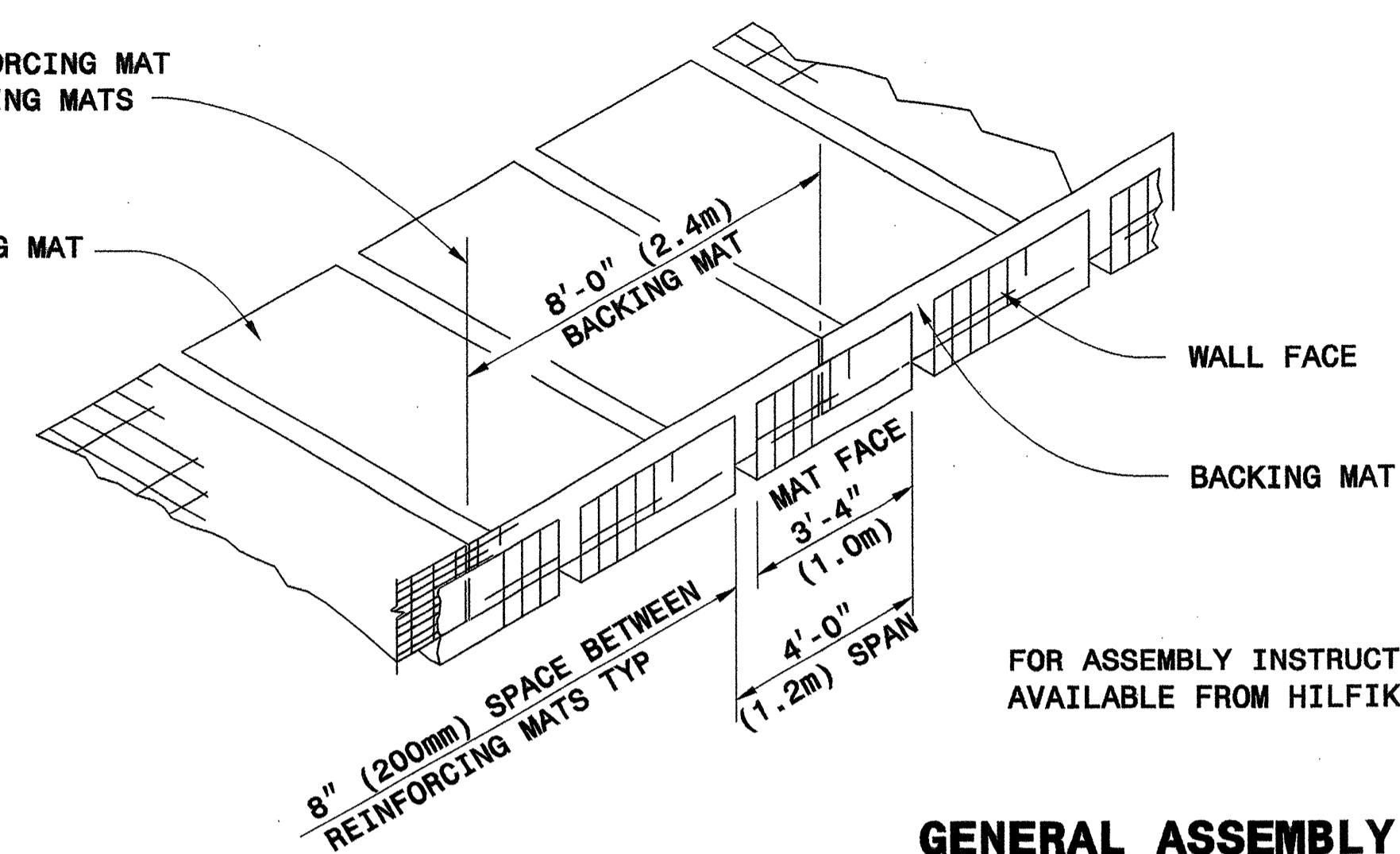
TEMPORARY FABRIC WALL

SHEET 3 OF 11

DATE: 12-19-06

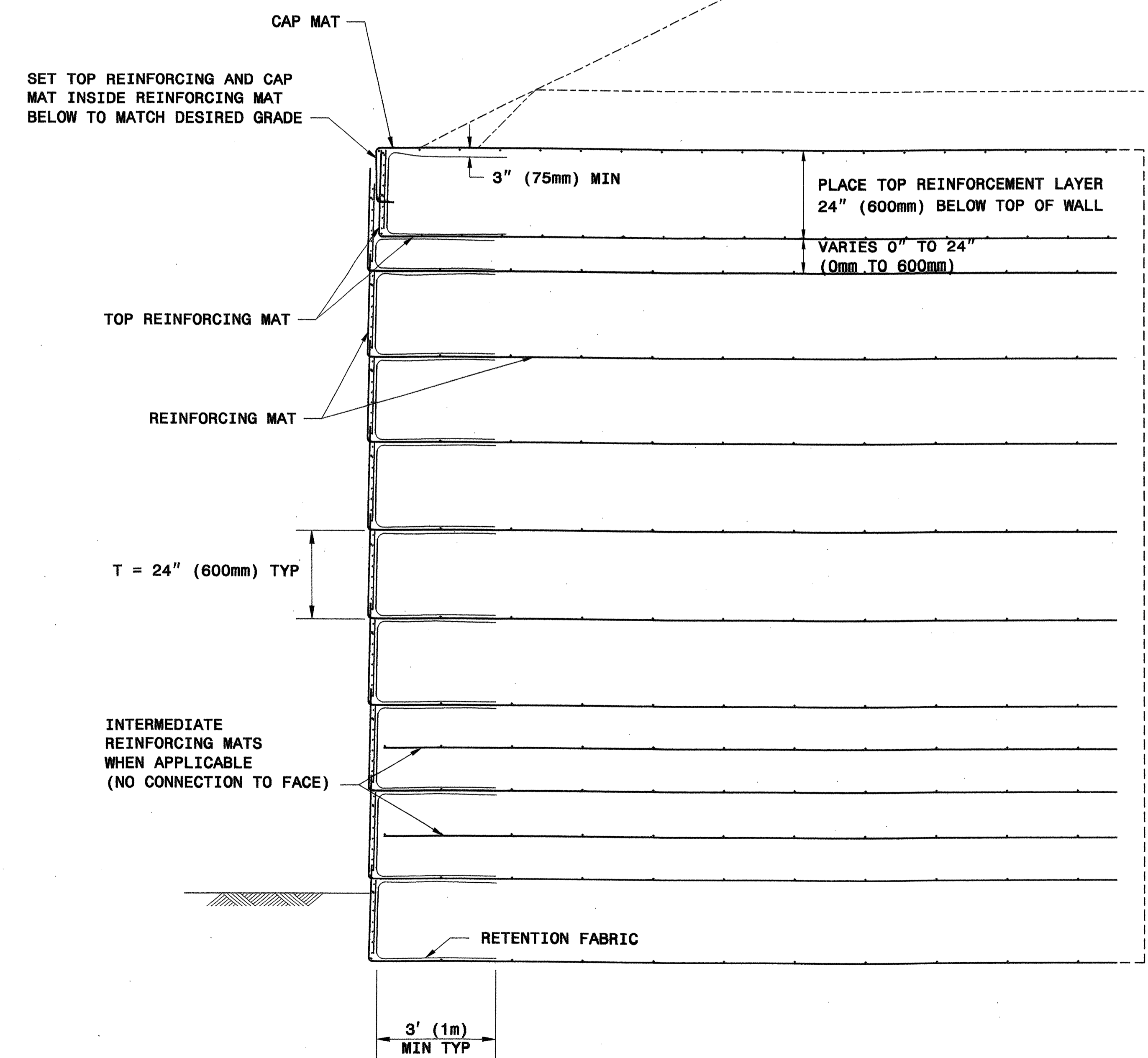
CENTERLINE OF REINFORCING MAT
FACE = EDGE OF BACKING MATS

REINFORCING MAT



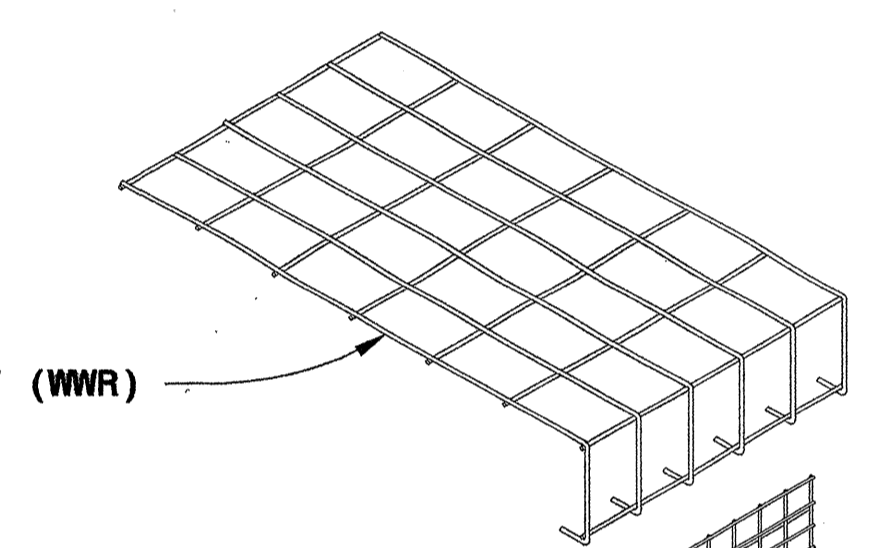
FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

GENERAL ASSEMBLY DETAIL

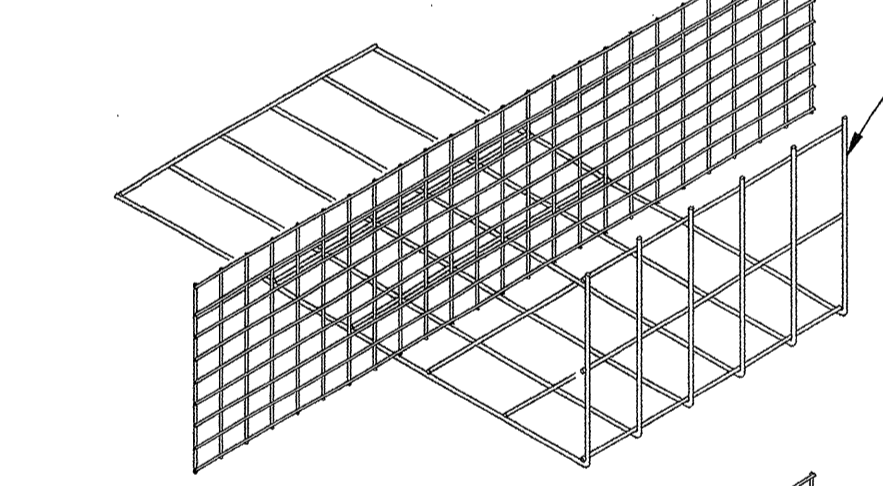


TYPICAL SECTION

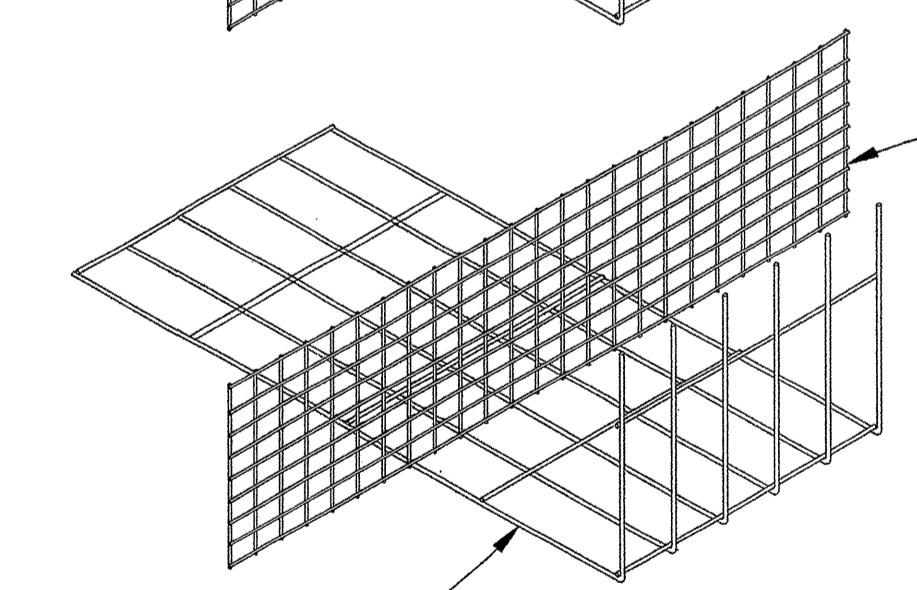
8" X 12" (203mm X 305mm)
W4.5 X W3.5 (MW29 X MW23)
CAP MAT
WELDED WIRE REINFORCEMENT (WWR)



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

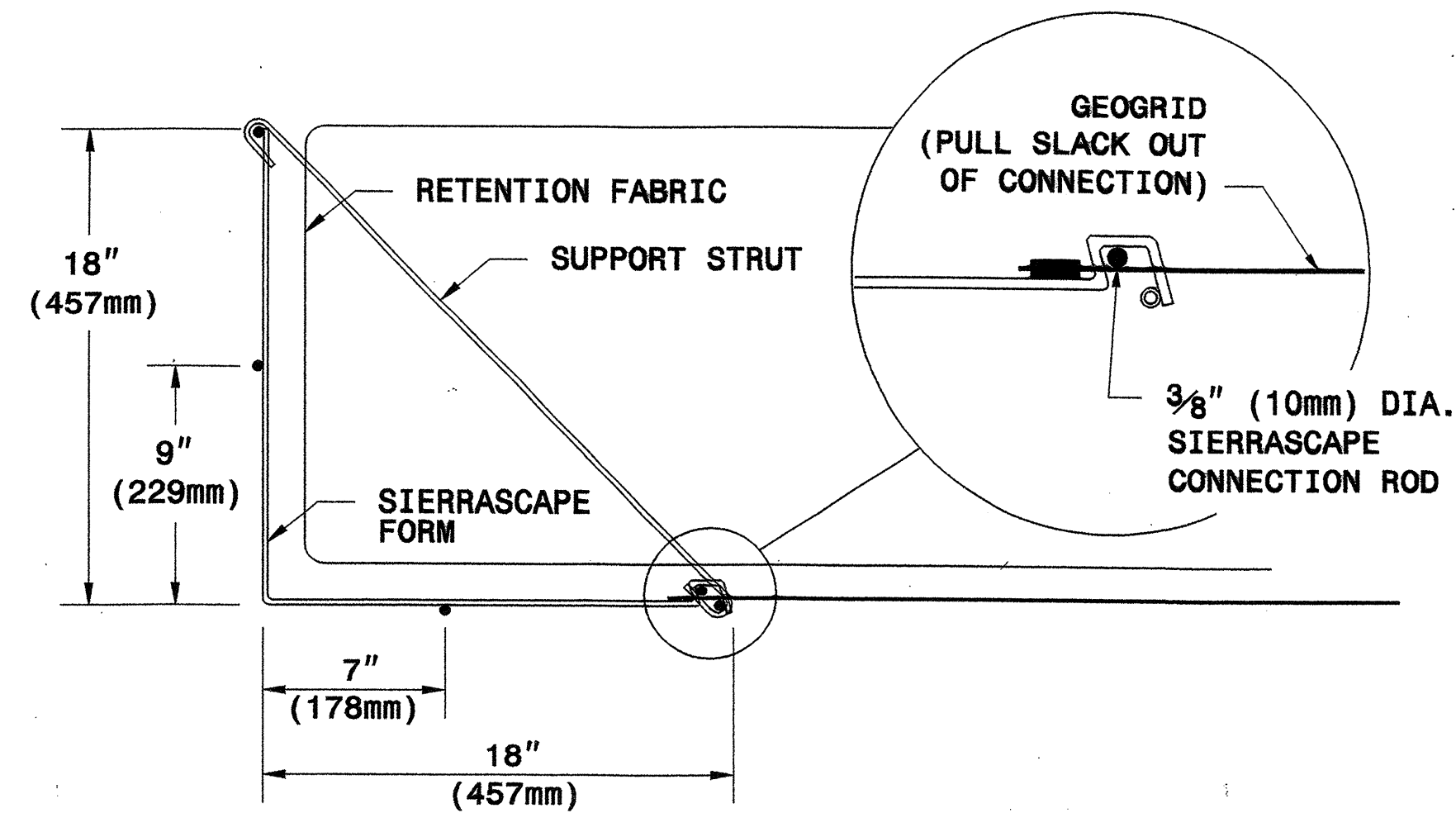


4" X 3" (102mm X 76mm)
W5 X W2.5 (MW32 X MW16) WWR
BACKING MAT
8' (2.4m) WIDE



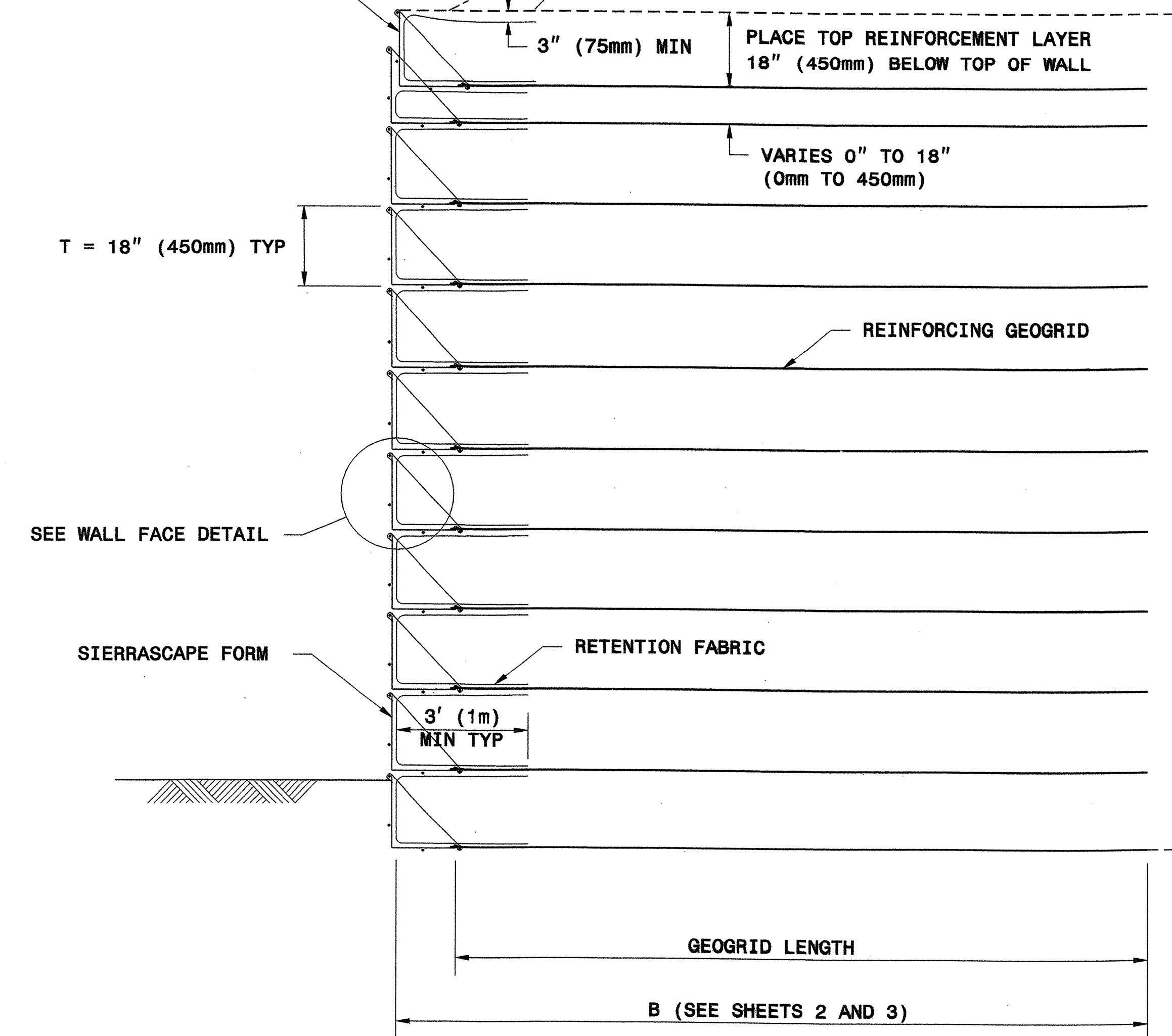
8" X 21" (203mm X 533mm)
REINFORCING MAT
SEE SHEETS 2 AND 3 FOR GAUGE SIZES

WALL COMPONENTS

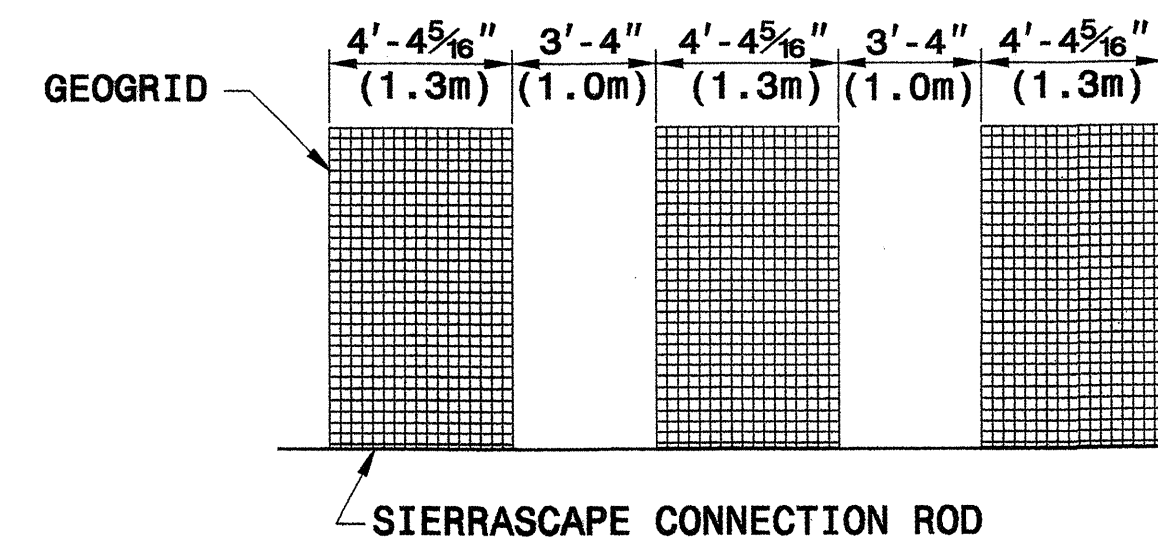


WALL FACE DETAIL

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

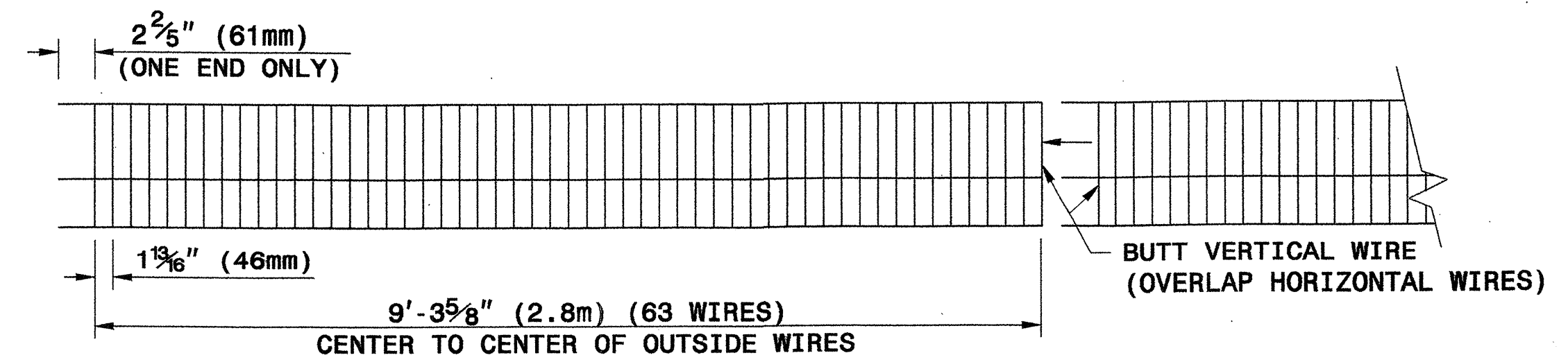


TYPICAL SECTION

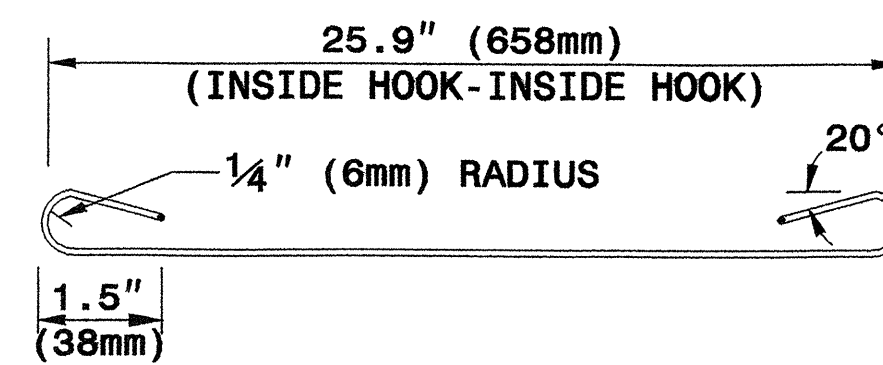


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

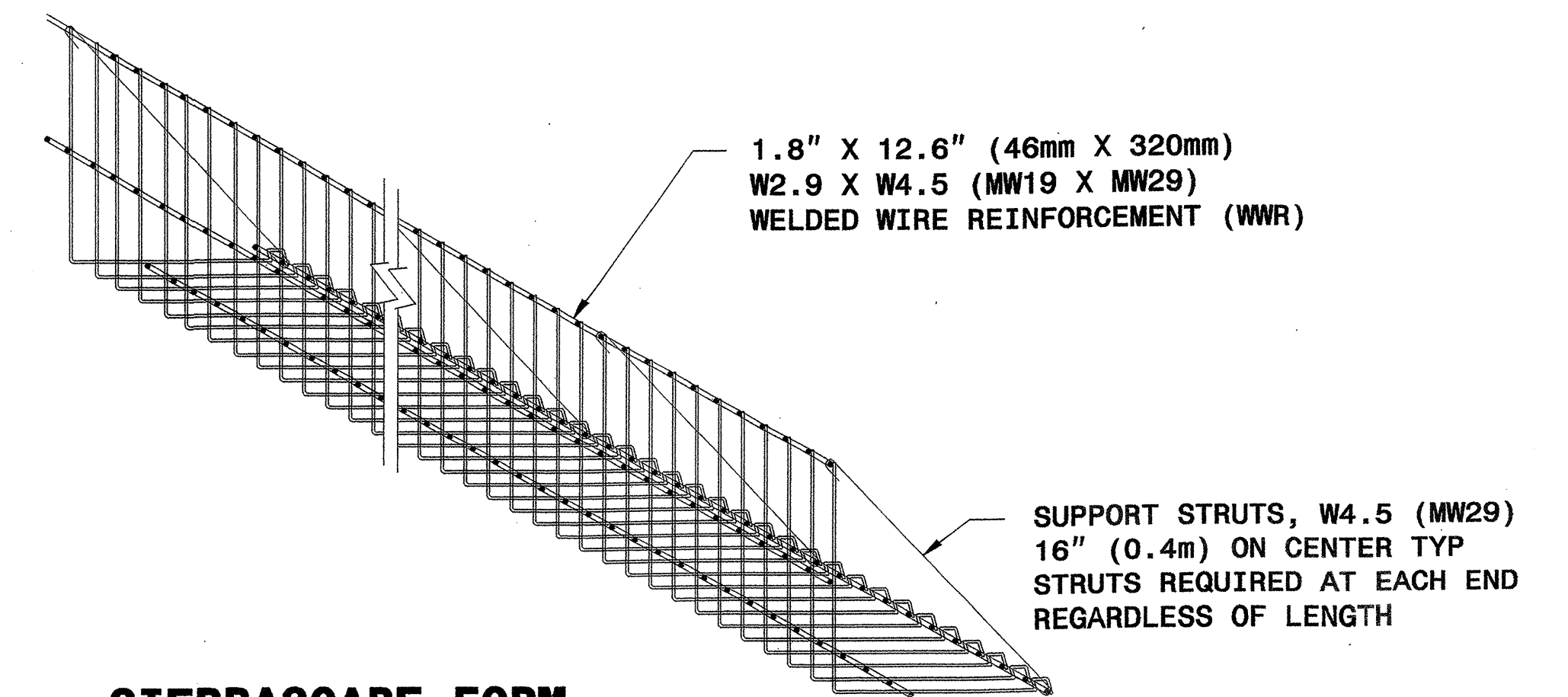
TYPICAL GEOGRID COVERAGE



ELEVATION VIEW

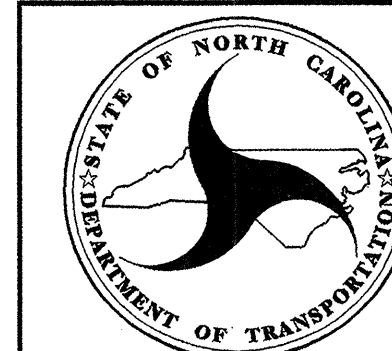
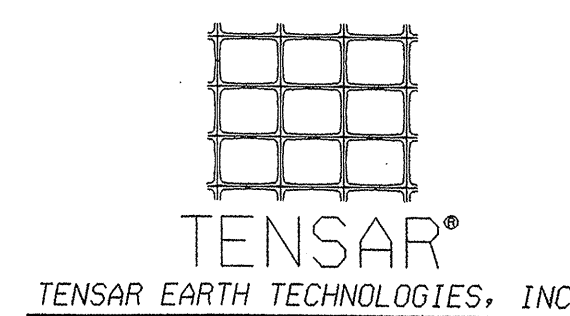


SUPPORT STRUT



SIERRASCAPE FORM

WALL COMPONENTS



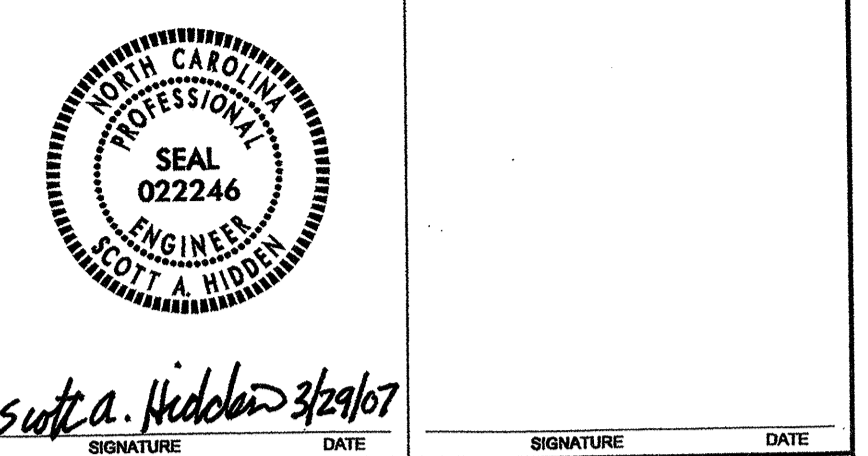
GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

SIERRASCAPE TEMPORARY WALL

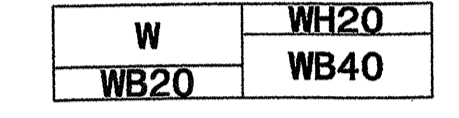
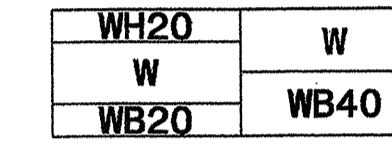
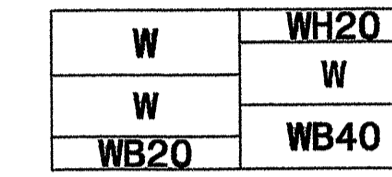
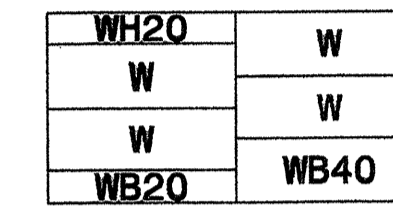
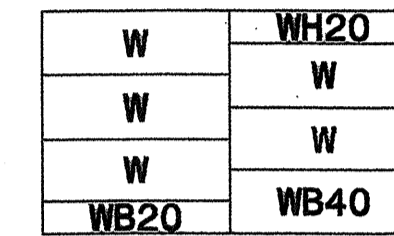
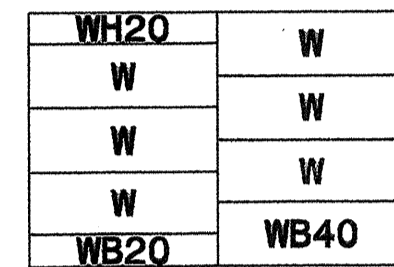
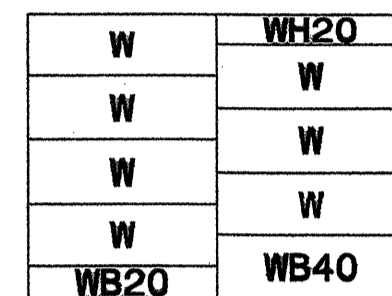
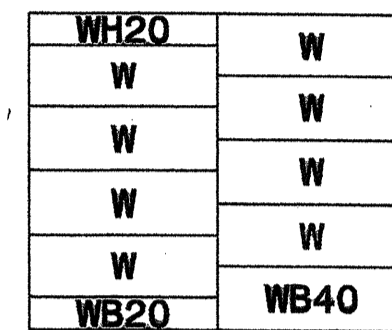
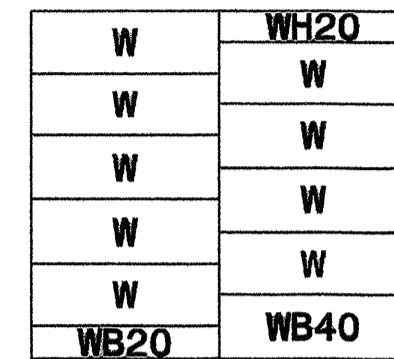
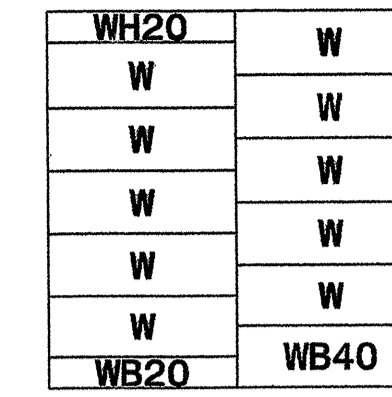
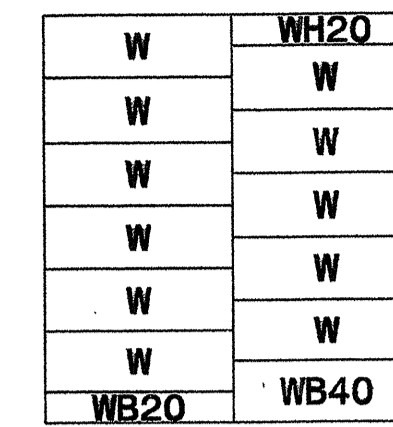
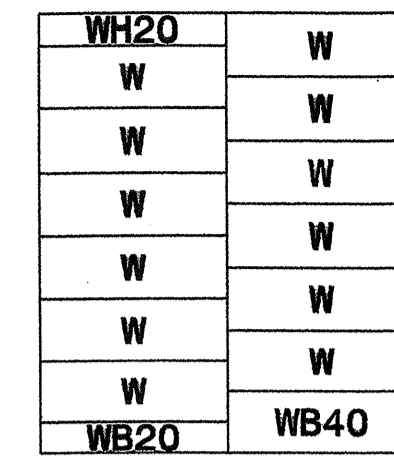
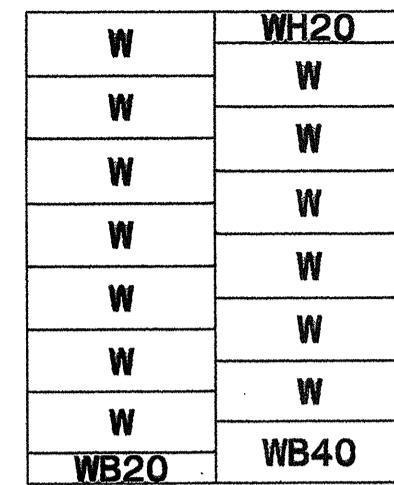
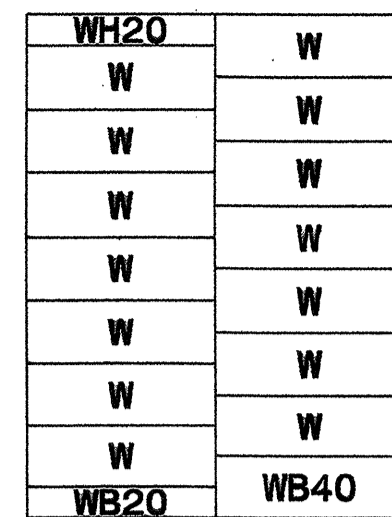
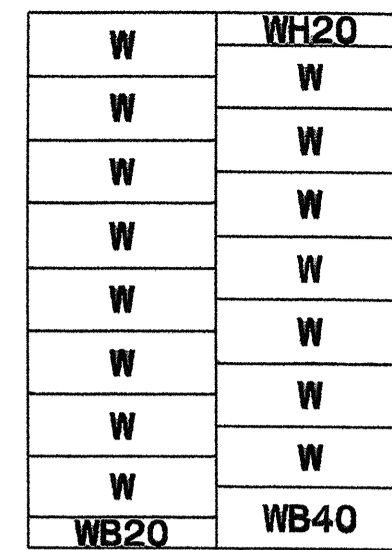
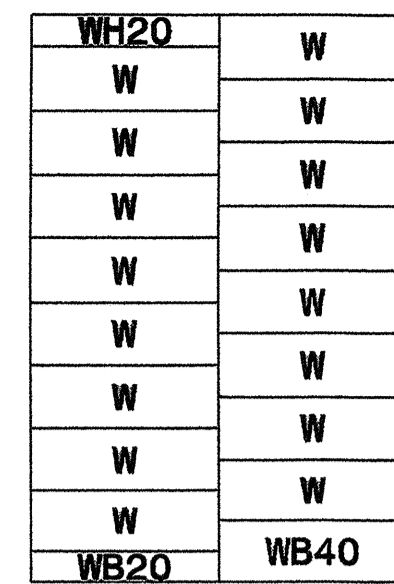
SHEET 5 OF 11

DATE: 12-19-06

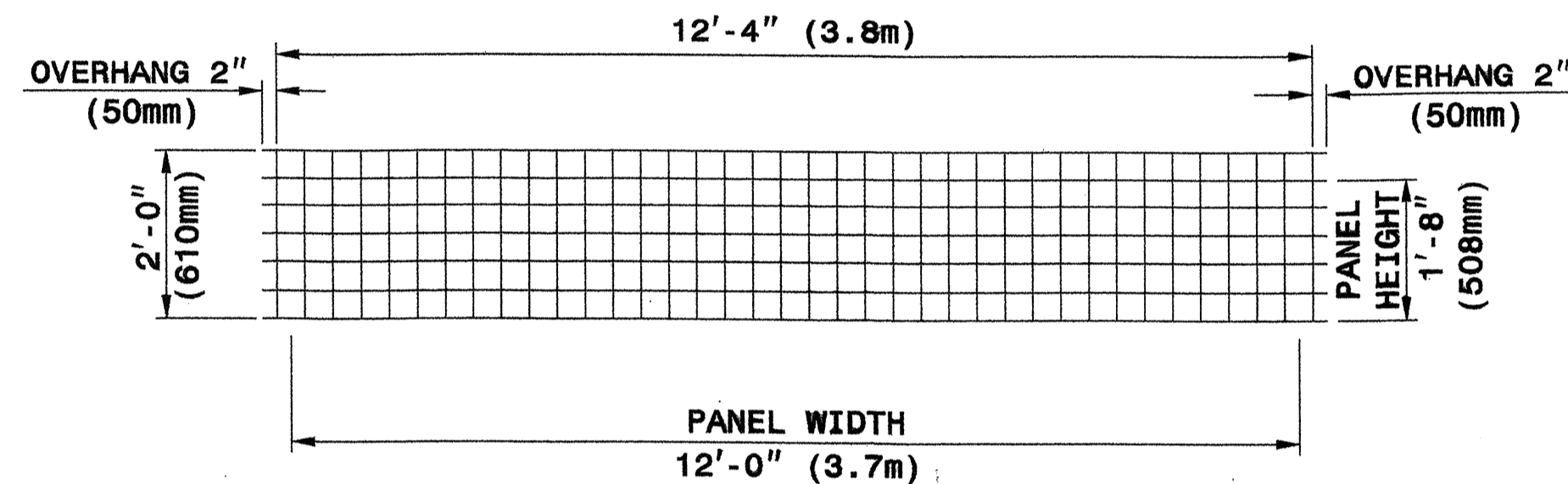


PANEL LAYOUTS

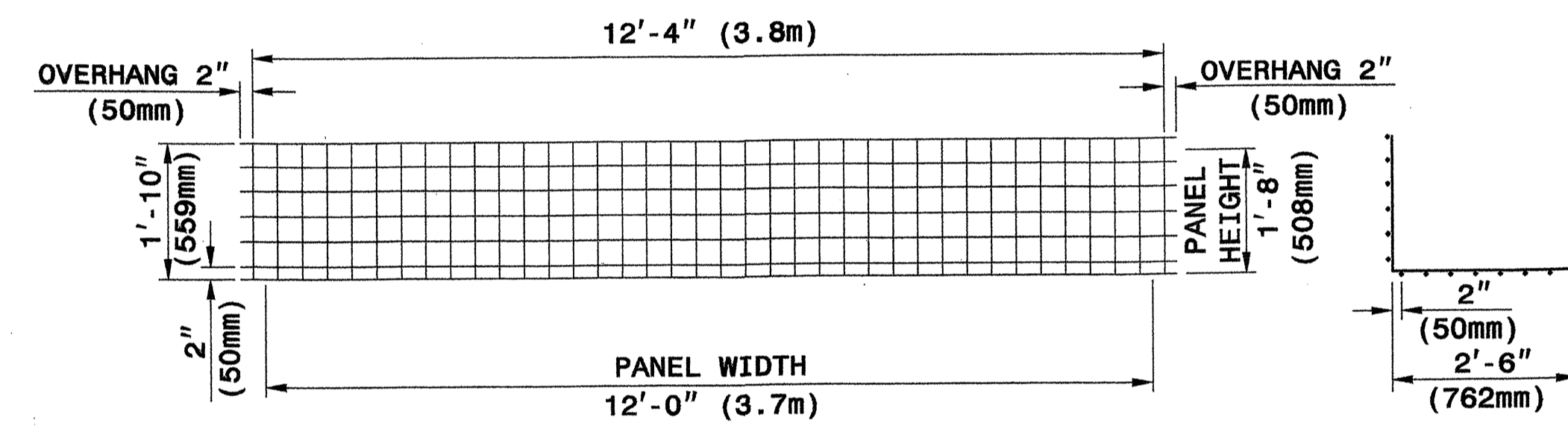
H - WALL HEIGHT
(FEET-INCHES)
(METER)



(FEET-INCHES)
(METER)

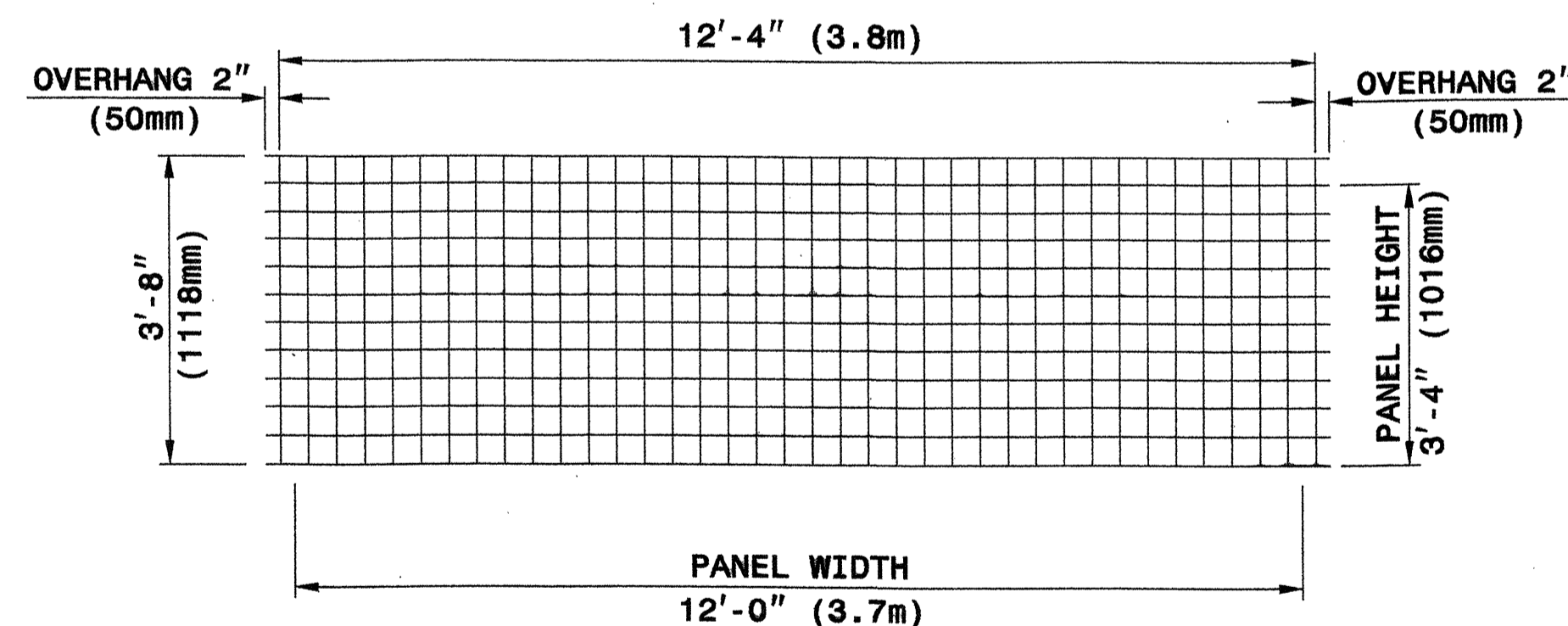


TYPE WH20

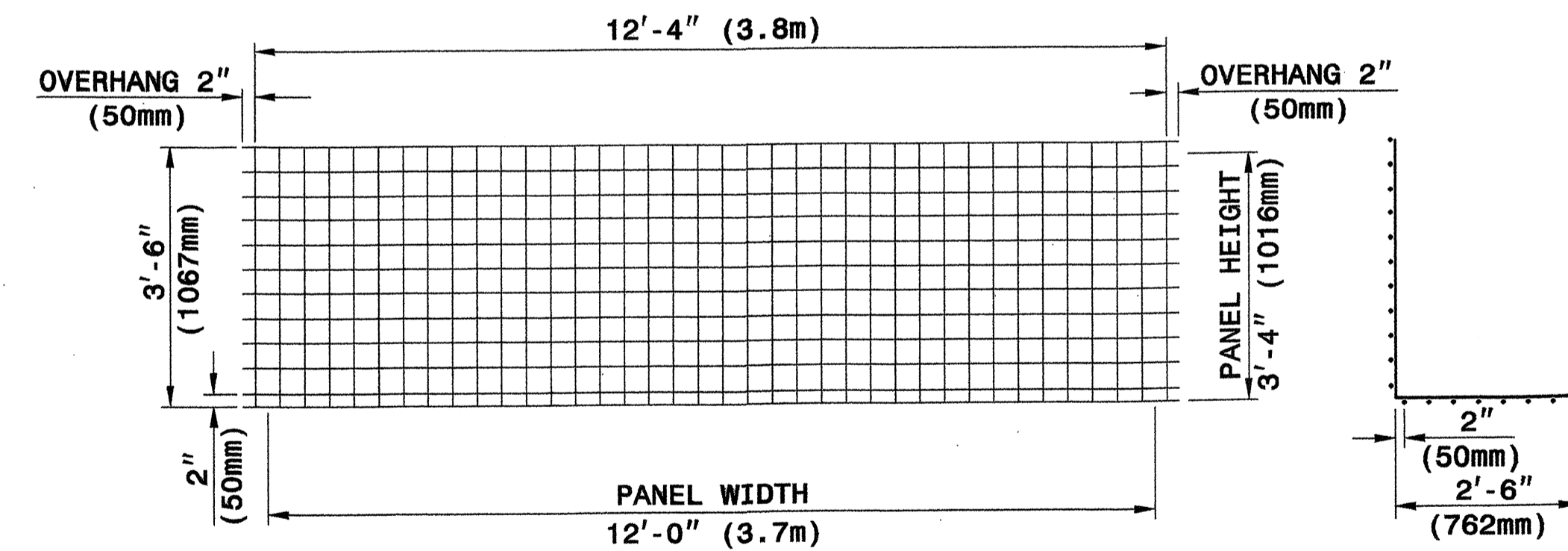


TYPE WB20

SECTION



TYPE W



TYPE WB40

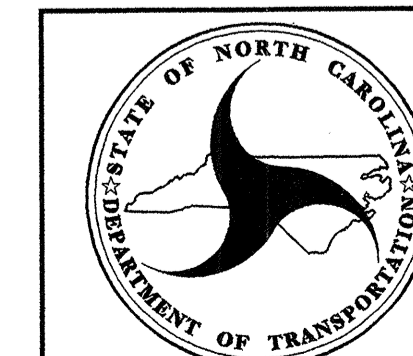
SECTION

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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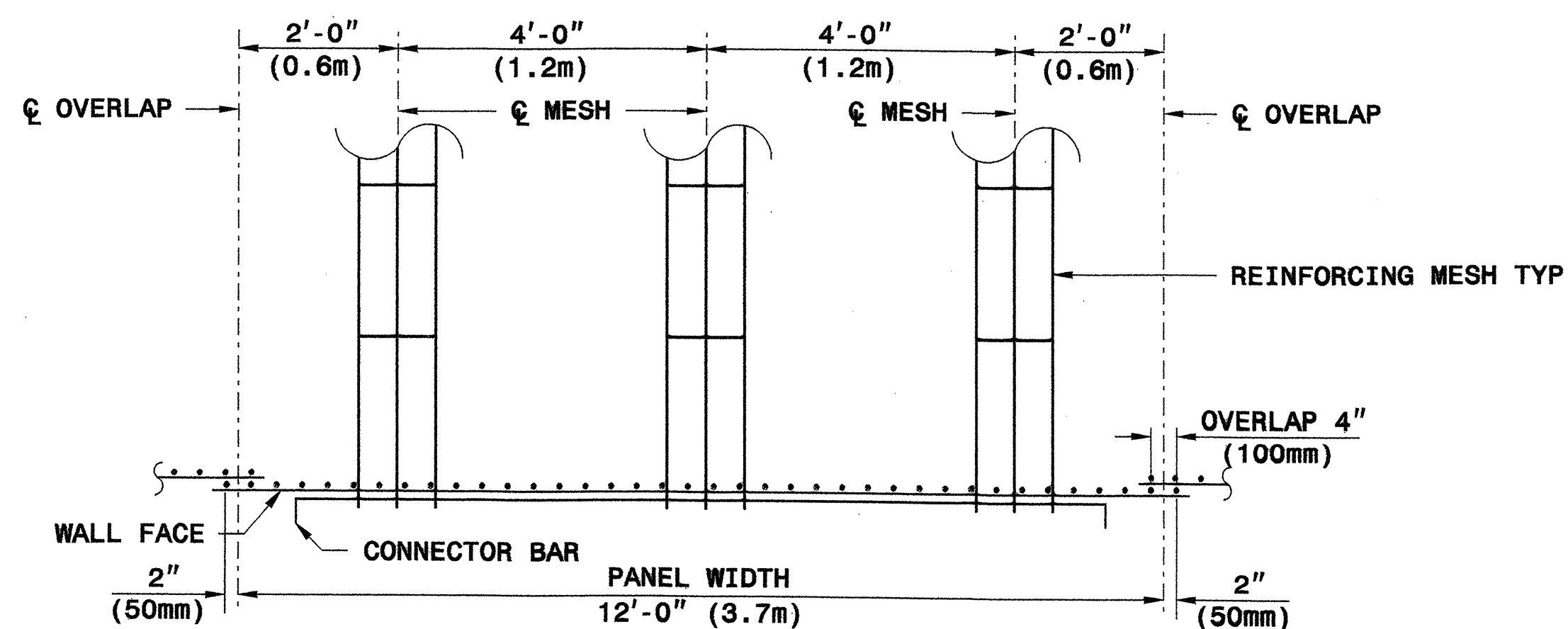
RETAINED EARTH
TEMPORARY WALL

SHEET 6 OF 11 DATE: 12-19-06

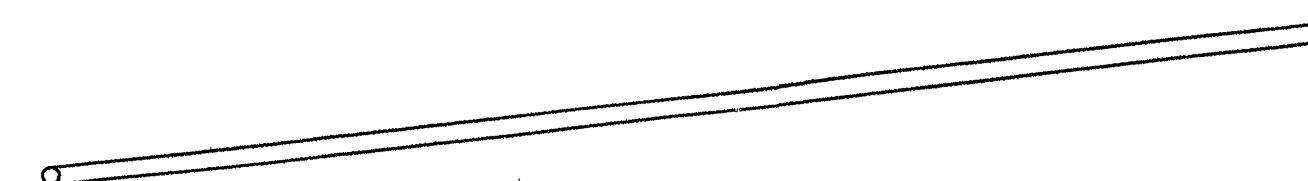


Scott A. Hadden 3/29/07
SIGNATURE DATE

SIGNATURE DATE



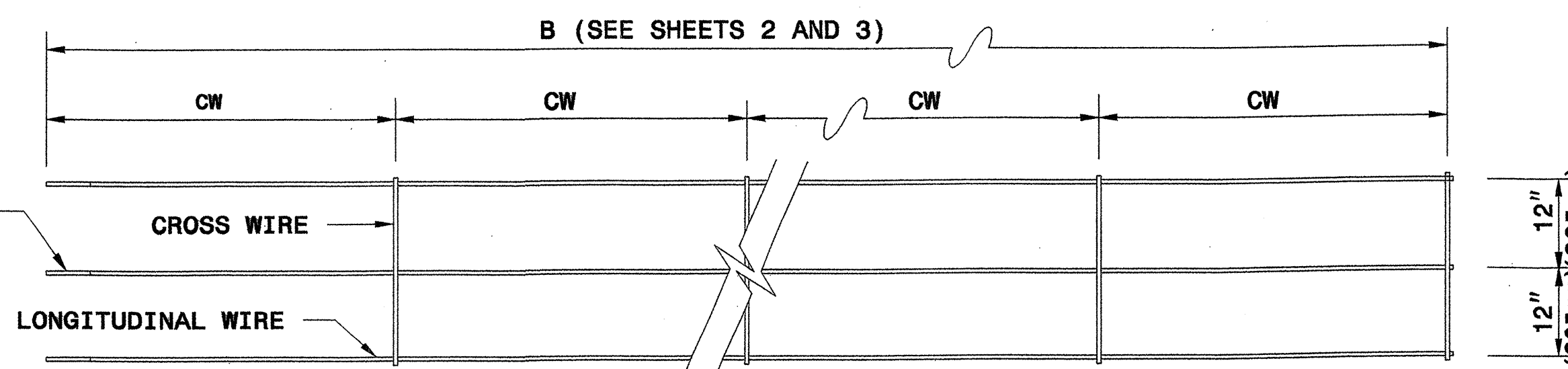
**REINFORCING MESH PLACEMENT DETAIL
(PLAN VIEW)**



1/2" (13mm) DIA. BAR

CONNECTOR BAR

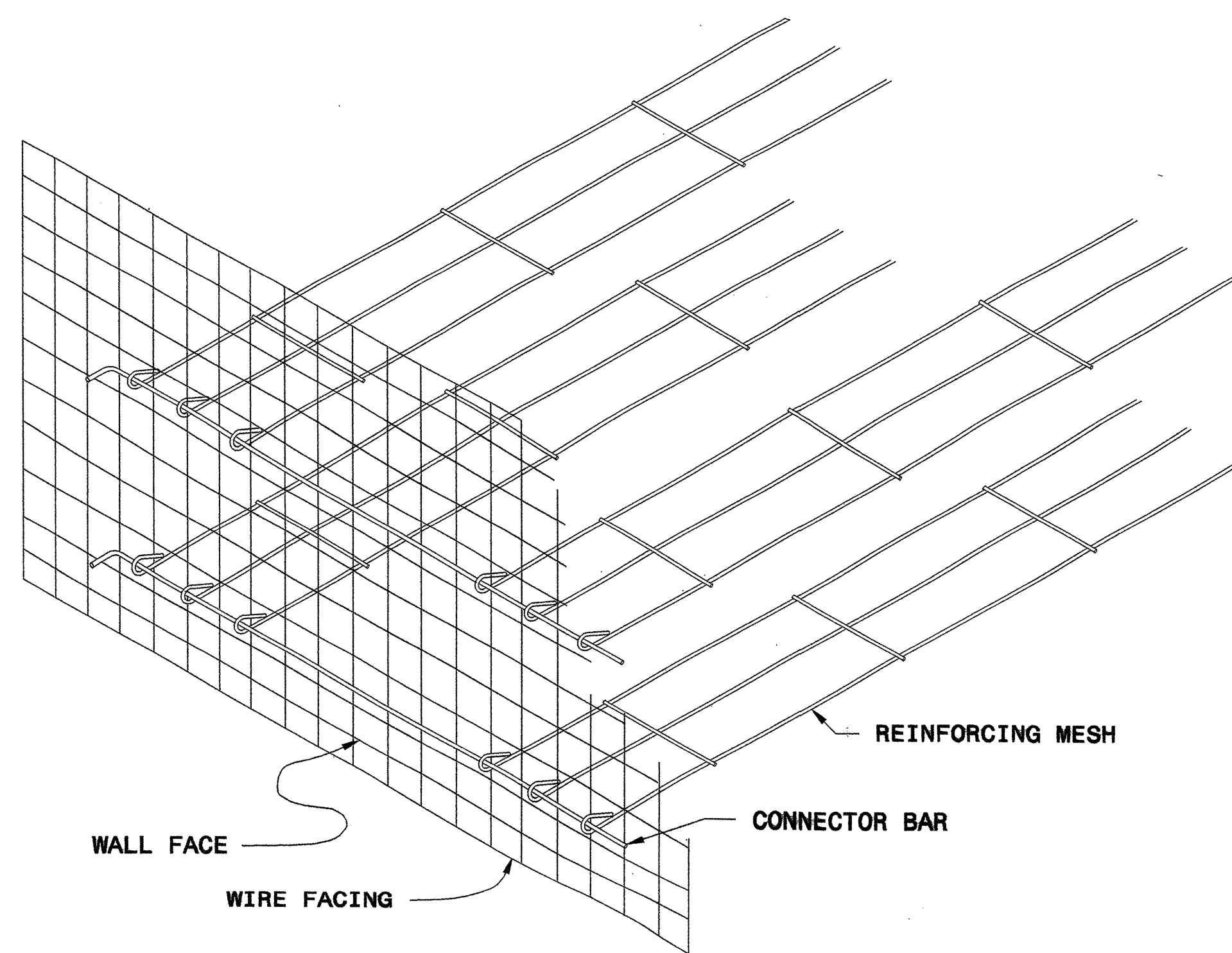
LOOPEd END OF MESH
(SEE REINFORCING MESH LOOP DETAIL)



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

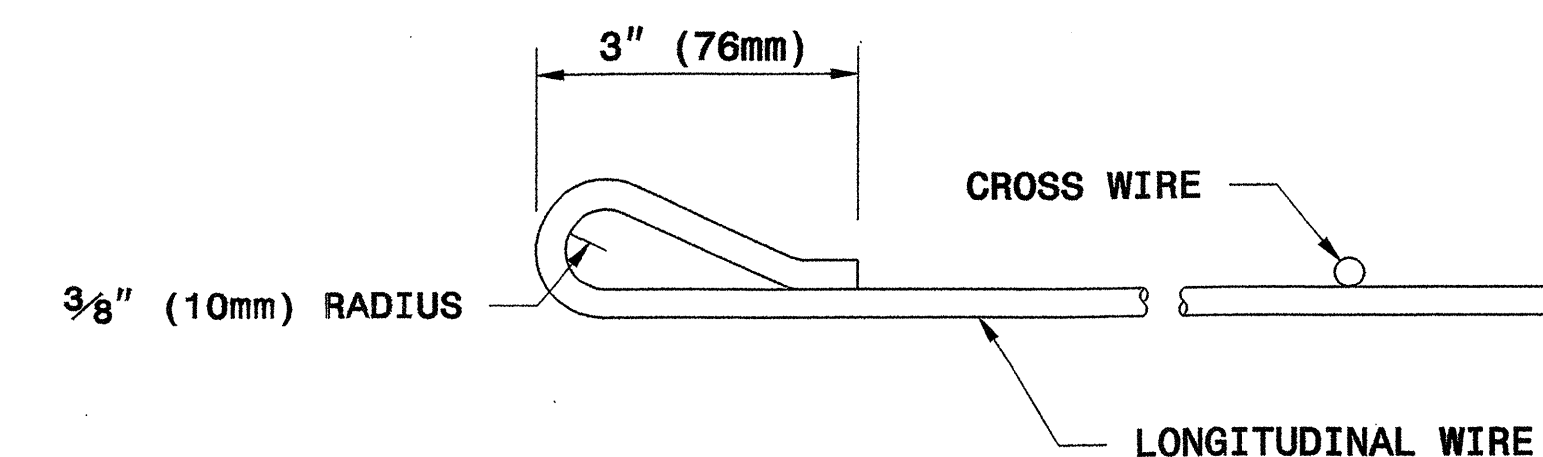
3W8 X W8 X 2.0' (3MW52 X MW52 X 610mm)
 NO. OF LONGITUDINAL WIRES
 GAUGE OF LONGITUDINAL WIRES
 GAUGE OF CROSS WIRES
 SPACING OF CROSS WIRES IN FT (mm), CW

REINFORCING MESH DESIGNATION



GENERAL ASSEMBLY DETAIL

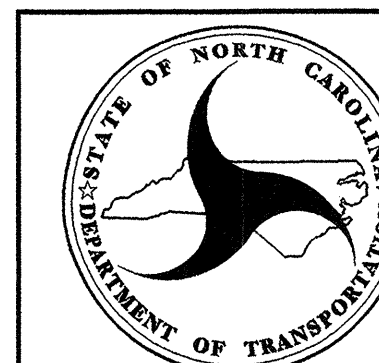
REINFORCING MESH



REINFORCING MESH LOOP DETAIL



The Reinforced Earth Company



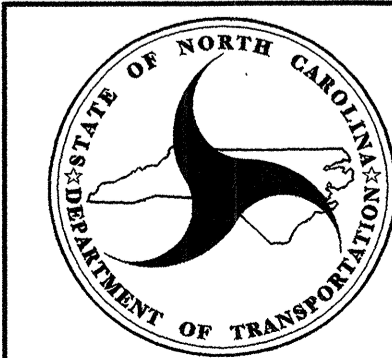
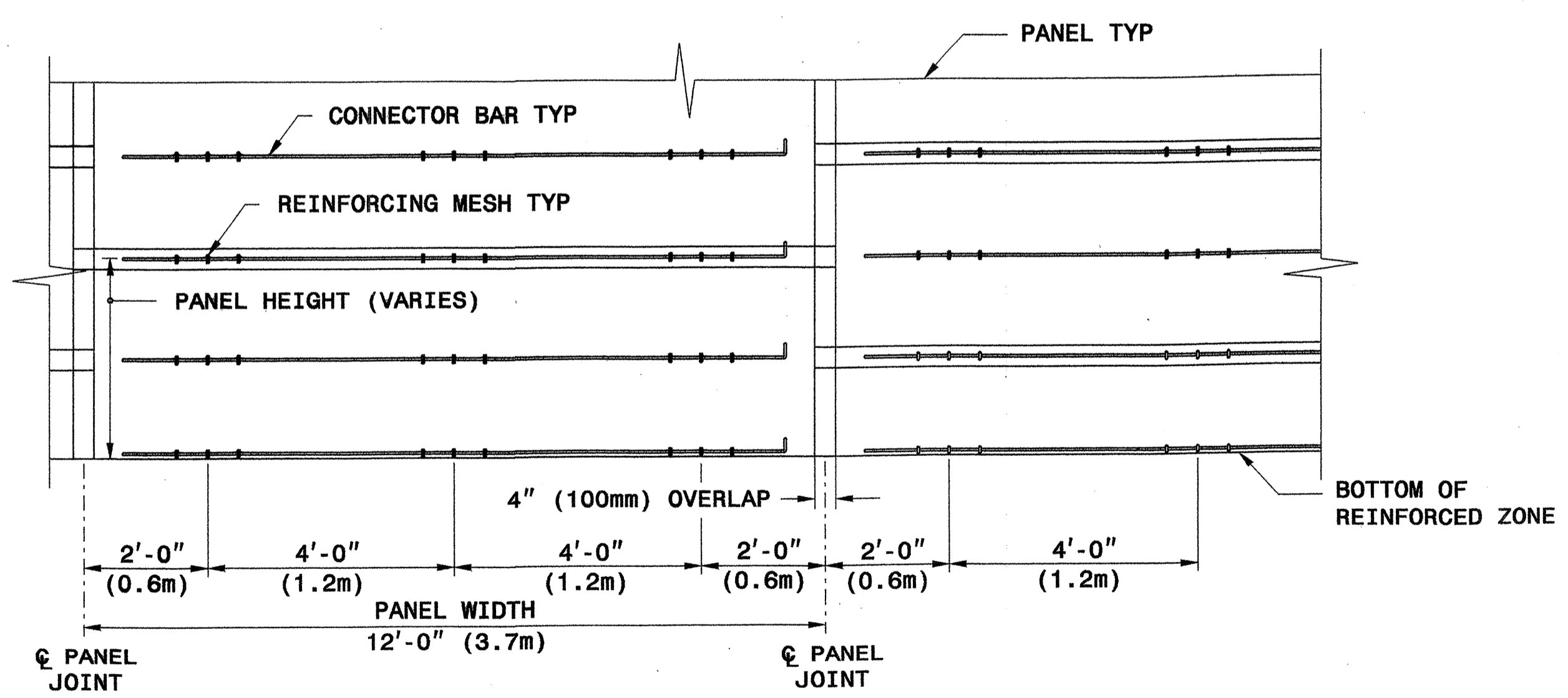
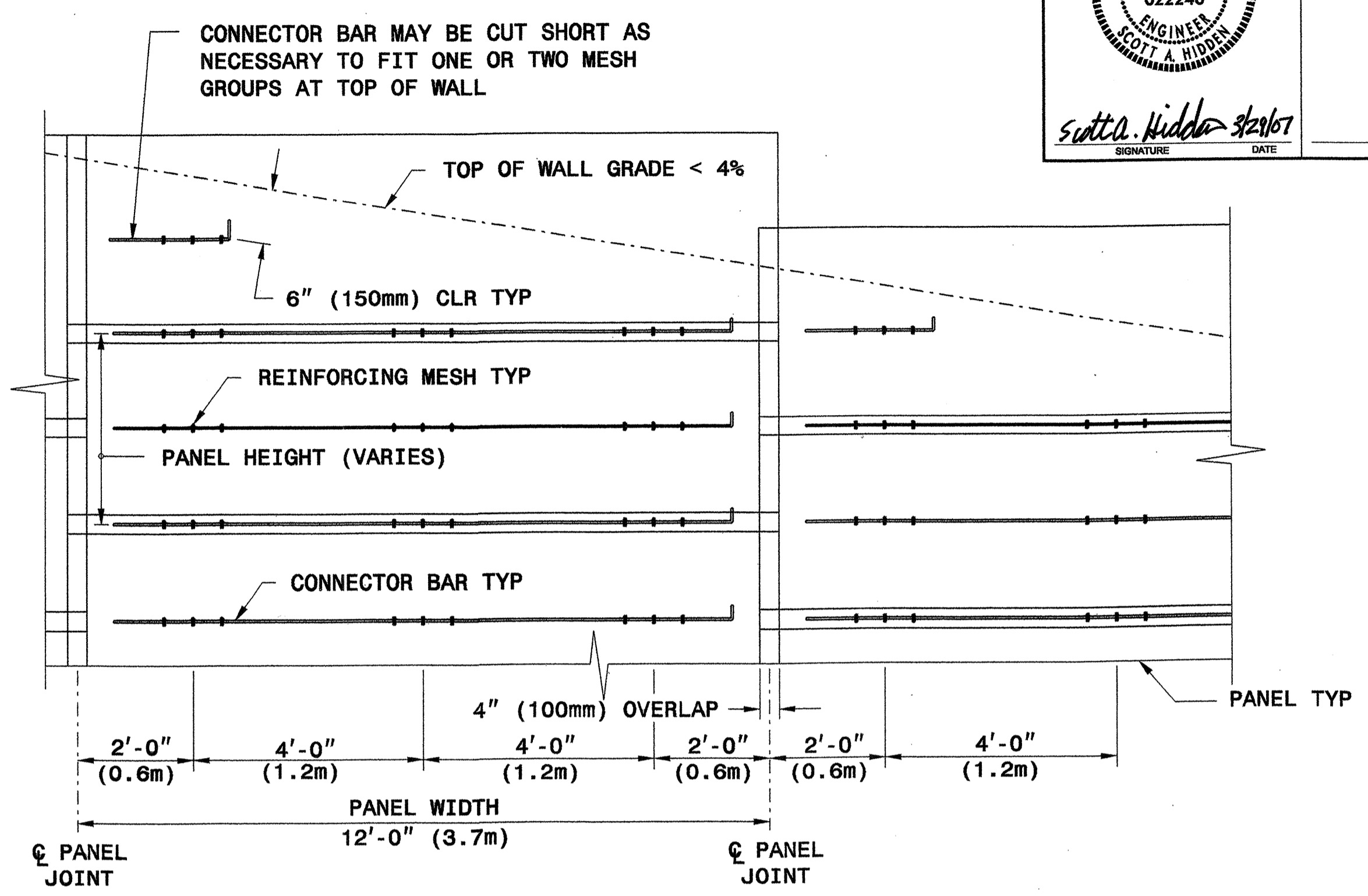
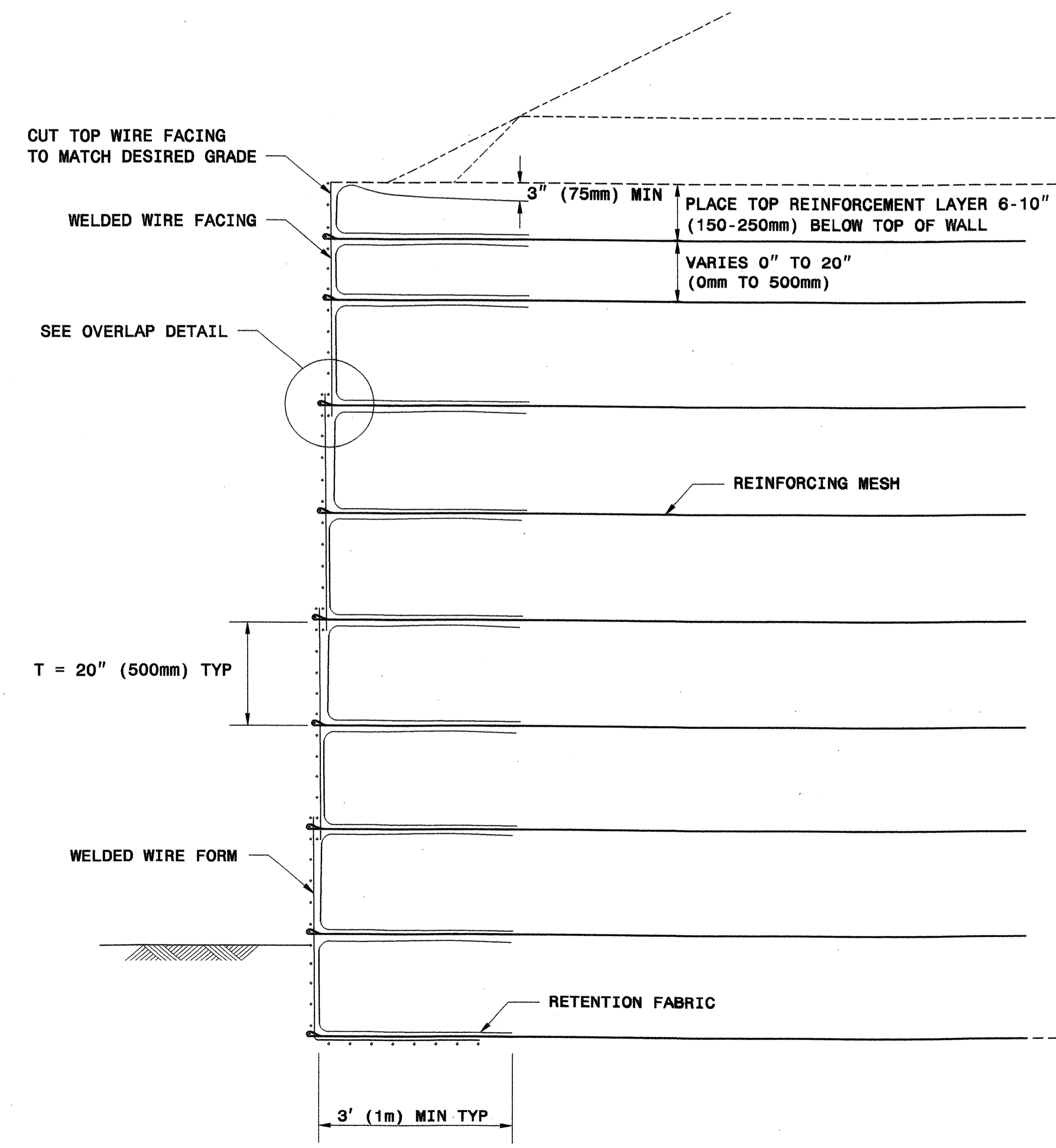
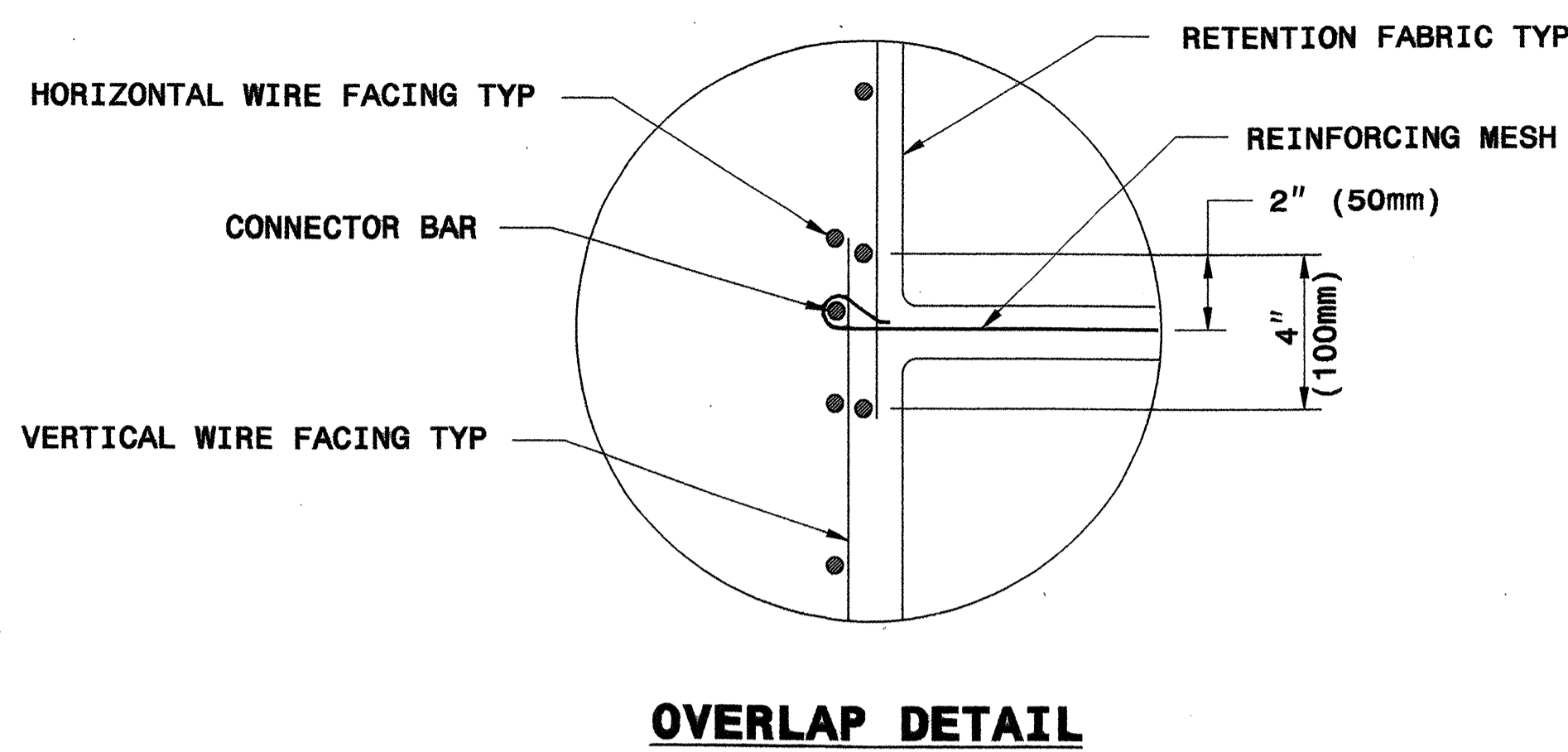
GEOTECHNICAL ENGINEERING UNIT
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 RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH
 TEMPORARY WALL

SHEET 7 OF 11

DATE: 12-19-06



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DEPARTMENT OF TRANSPORTATION
RALEIGH

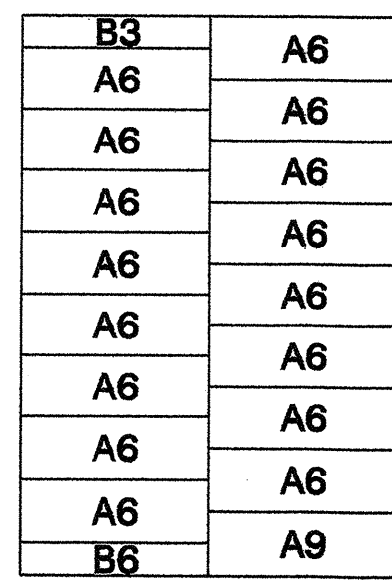
STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

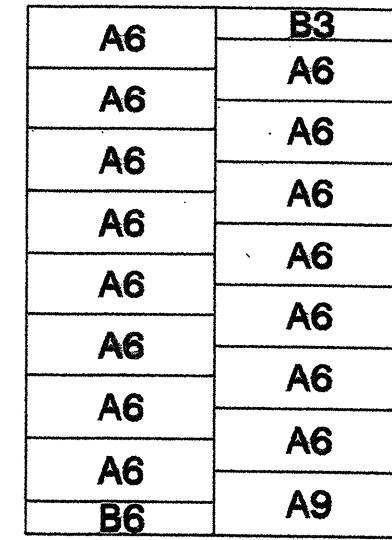
SHEET 8 OF 11 DATE: 12-19-06

PANEL LAYOUTS

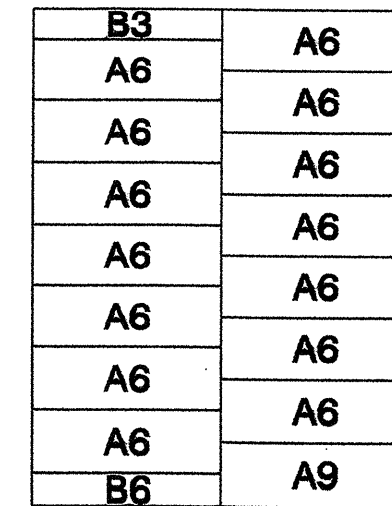
H - WALL HEIGHT
 (FEET-INCHES)
 (METER)



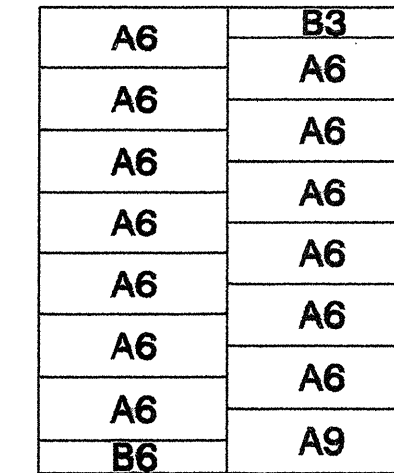
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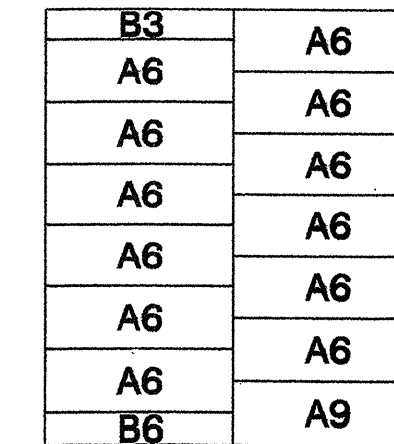
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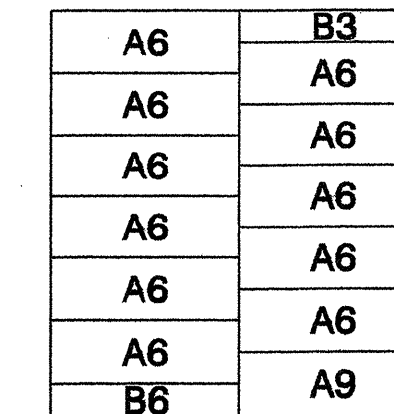
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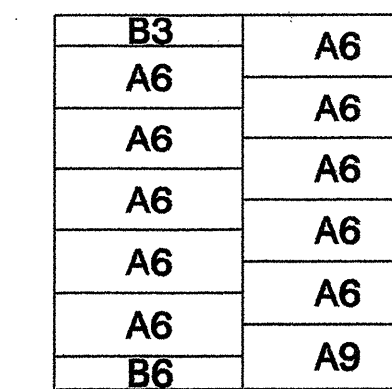
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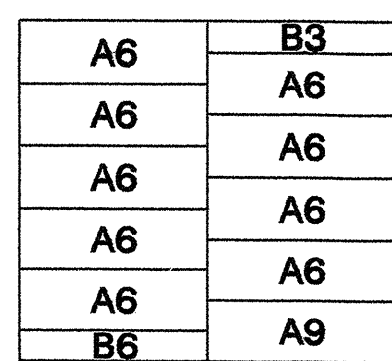
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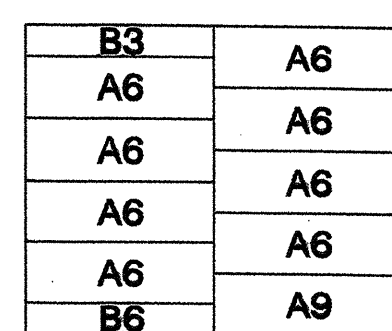
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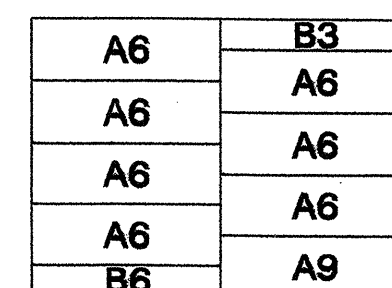
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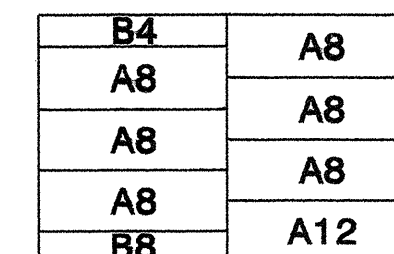
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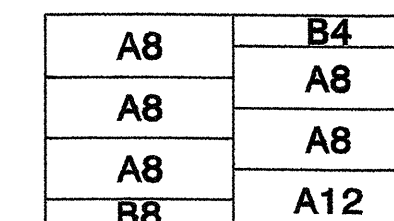
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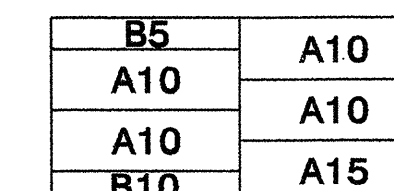
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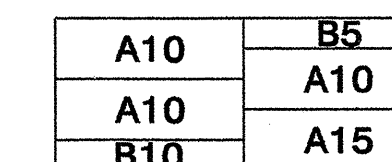
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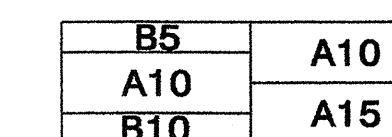
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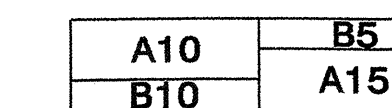
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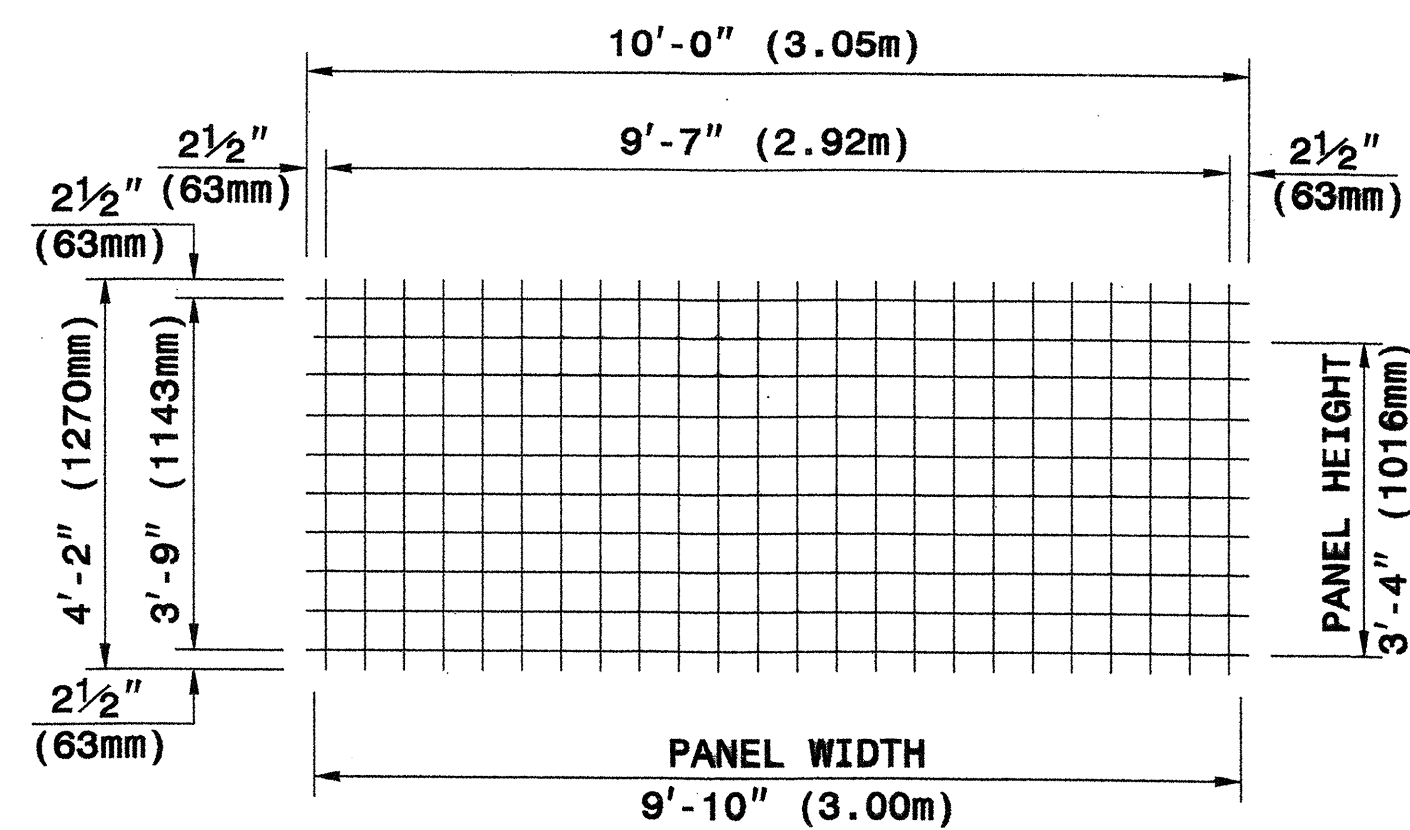
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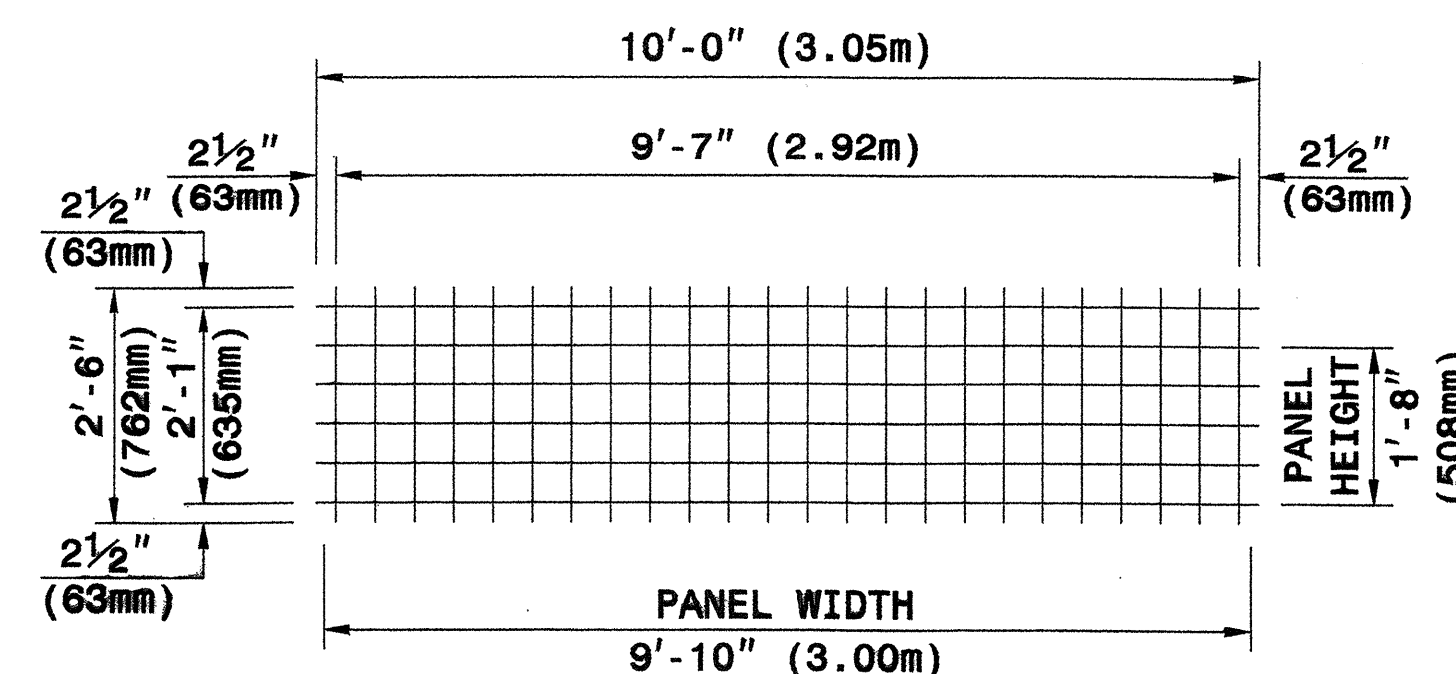
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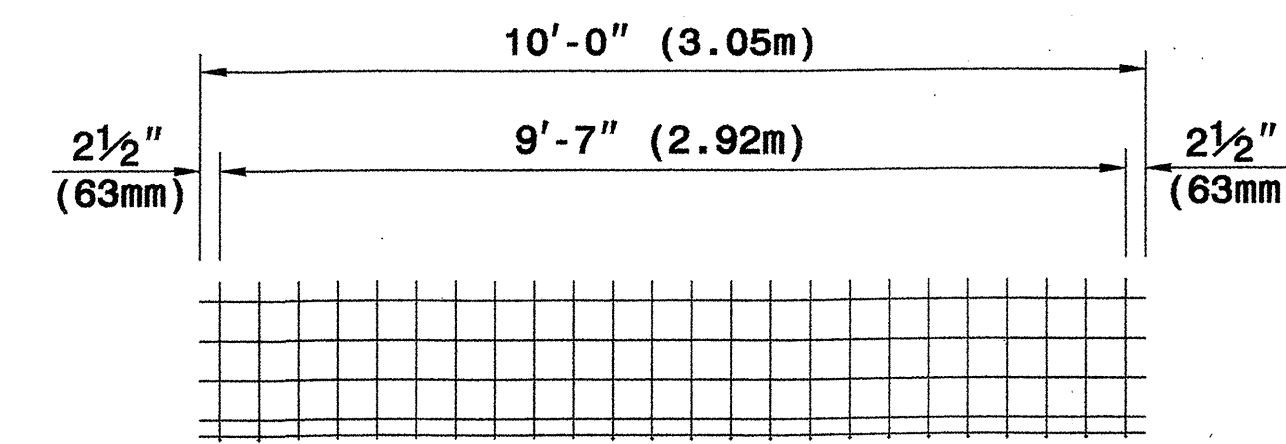
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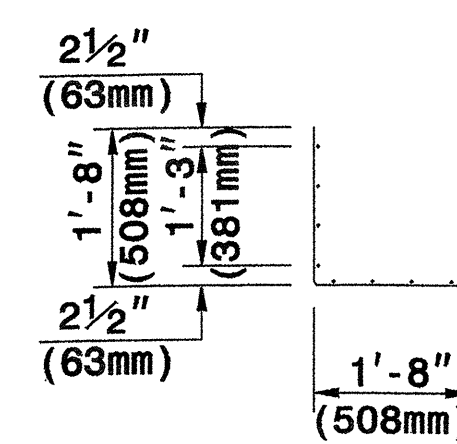
TYPE A



TYPE B



WELDED WIRE FORM



SECTION

WELDED WIRE FACINGS

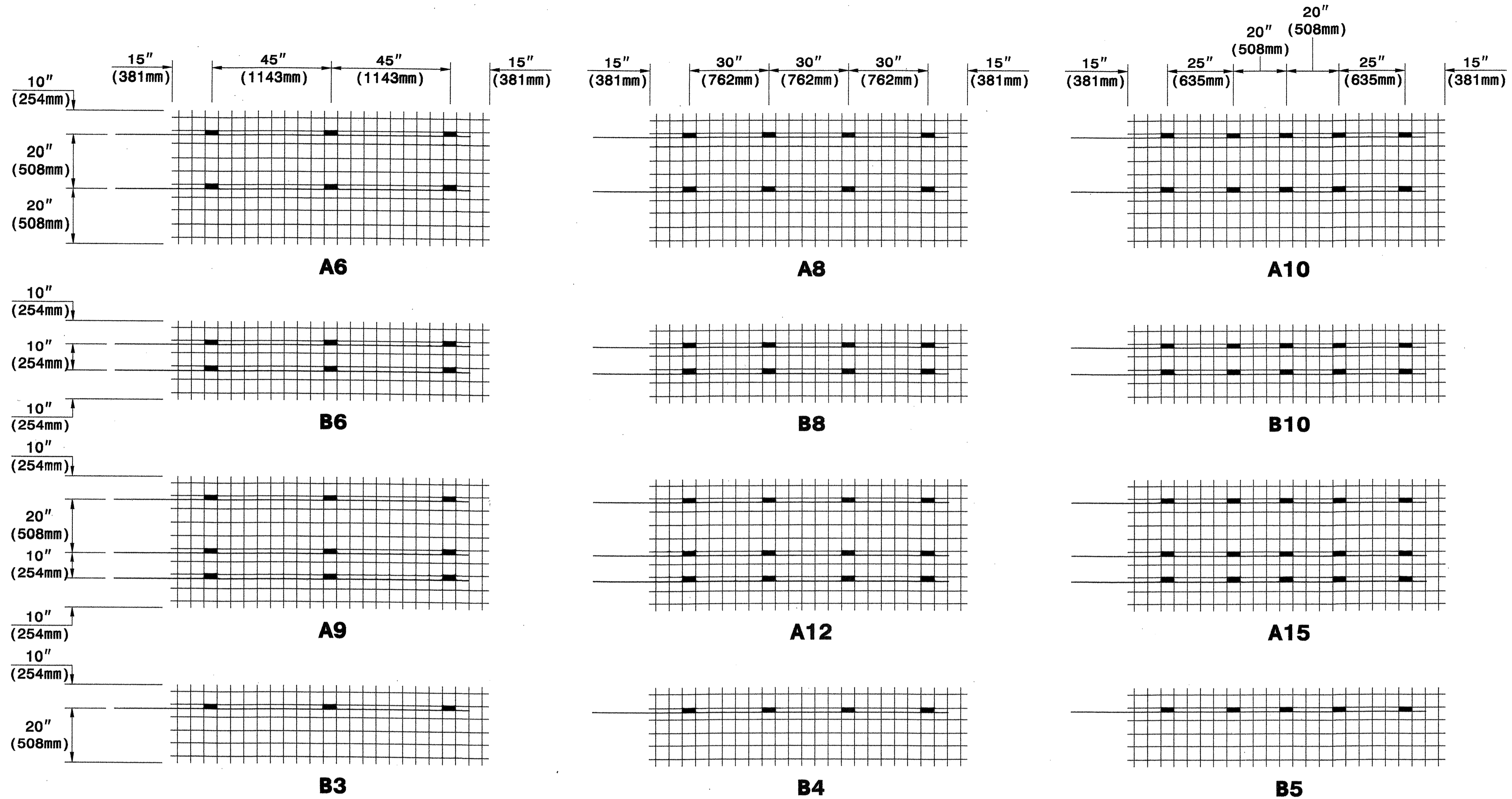
PANEL TYPES (WELDED WIRE FACINGS AND FORM)

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



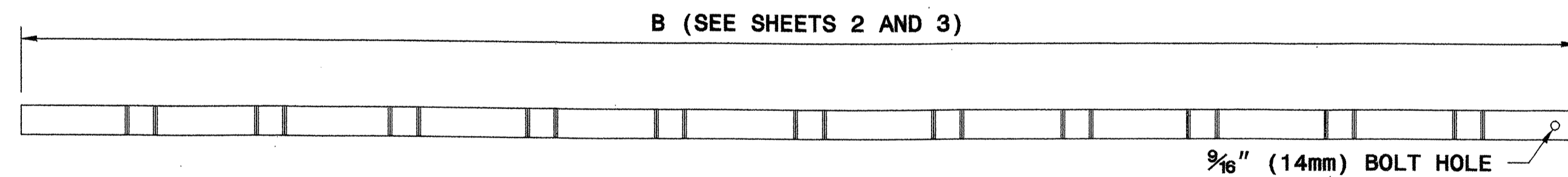
GEOTECHNICAL ENGINEERING UNIT
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

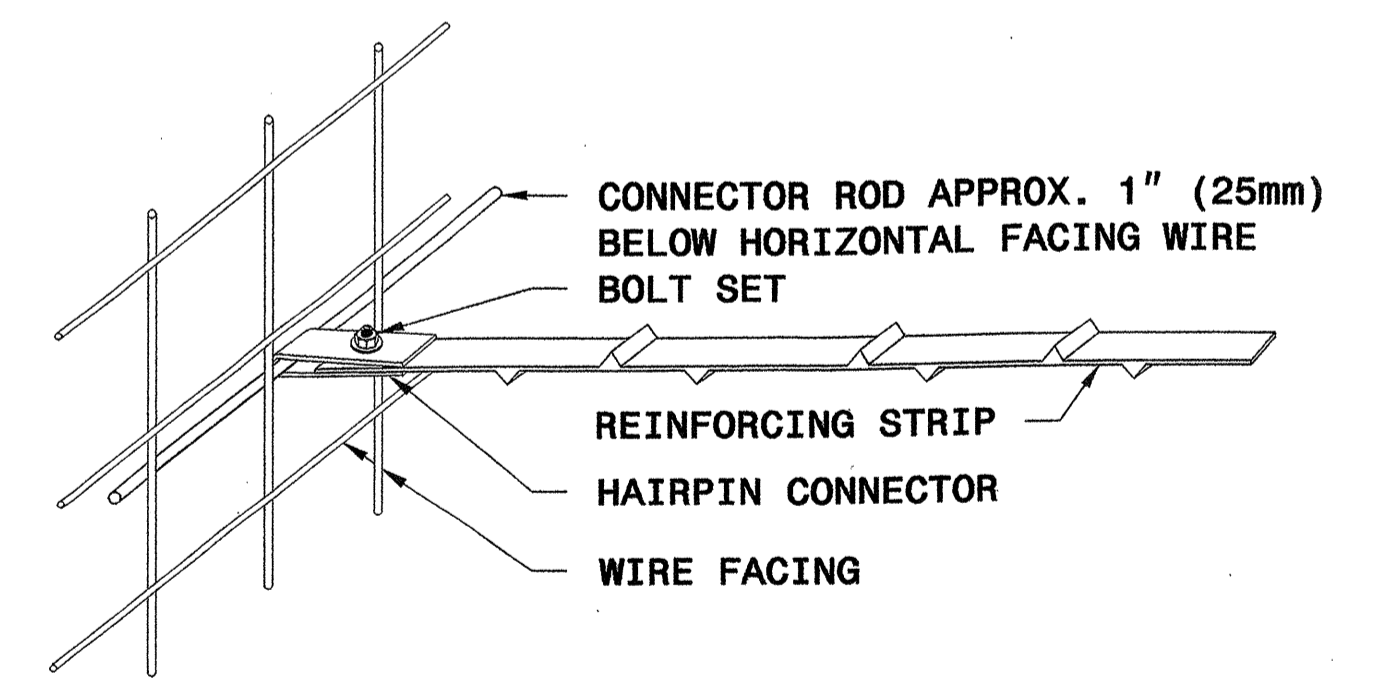


KEY: A8
 NUMBER OF REINFORCING STRIPS
 PANEL TYPE

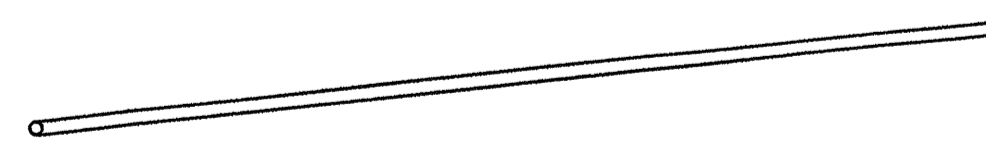
CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



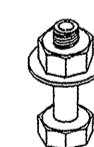
REINFORCING STRIP - 2" X 5/32" (50mm X 4mm)



STRIP TO FACING CONNECTION



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

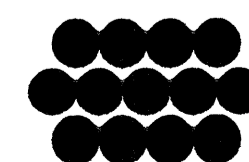


1/2" (13mm) BOLT WITH NUT AND WASHER
BOLT SET

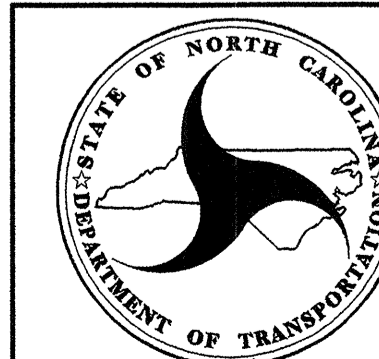


HAIRPIN CONNECTOR

WALL COMPONENTS



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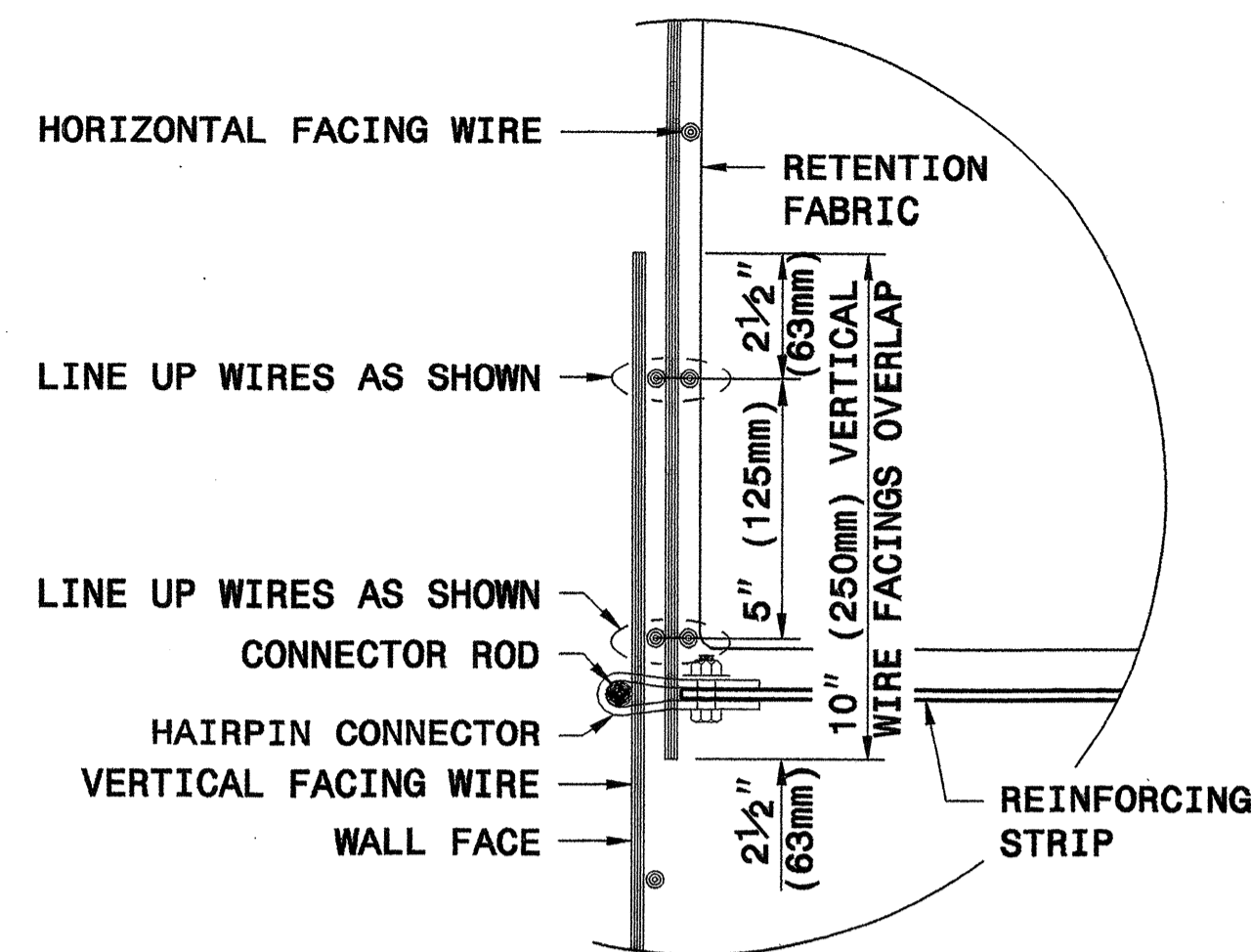
TERRATREL
 TEMPORARY WALL

SHEET 10 OF 11

DATE: 12-19-06

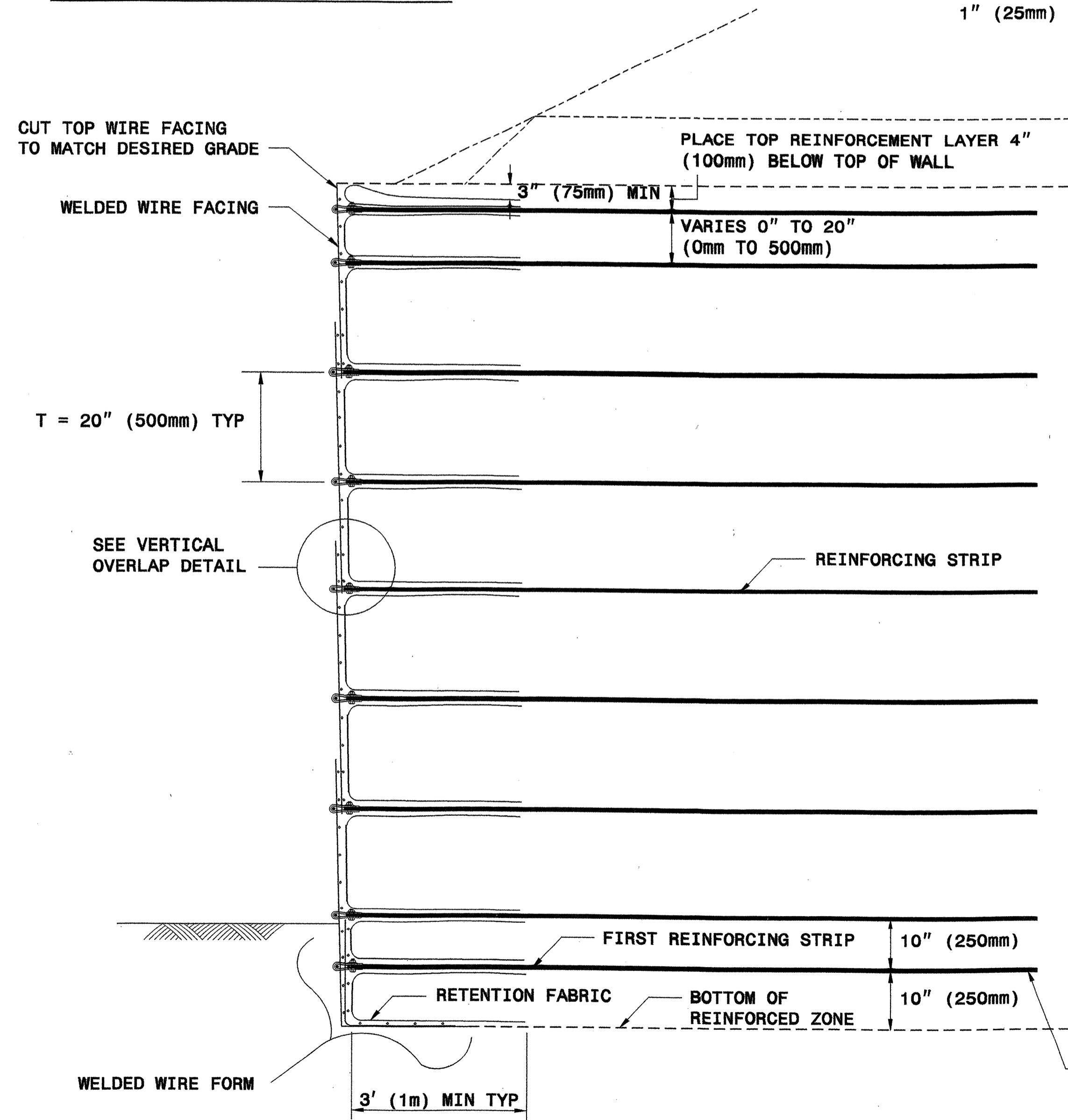


Signature: Scott A. Hadden, Date: _____



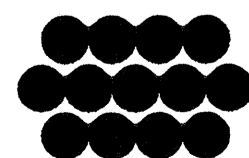
OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

VERTICAL OVERLAP DETAIL

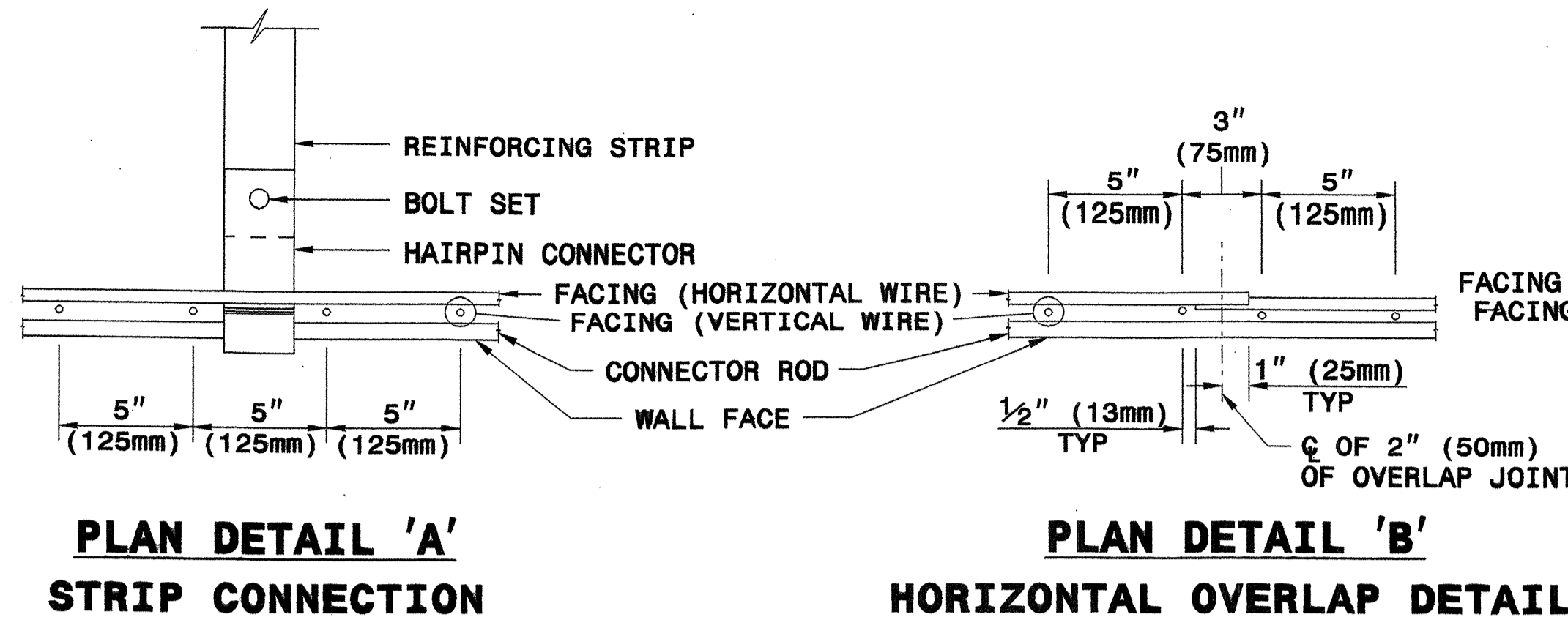


TYPICAL SECTION

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

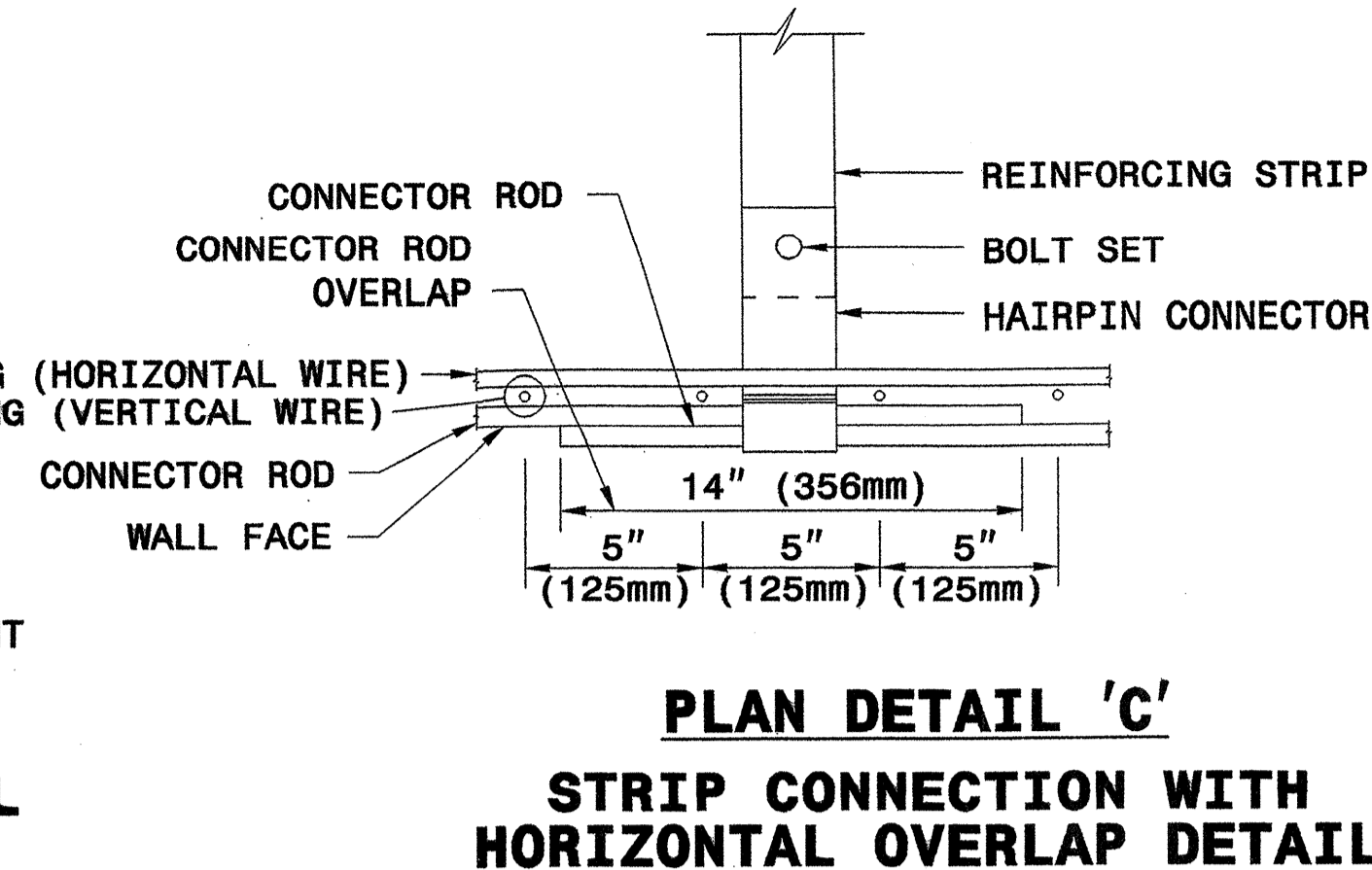


The Reinforced Earth Company

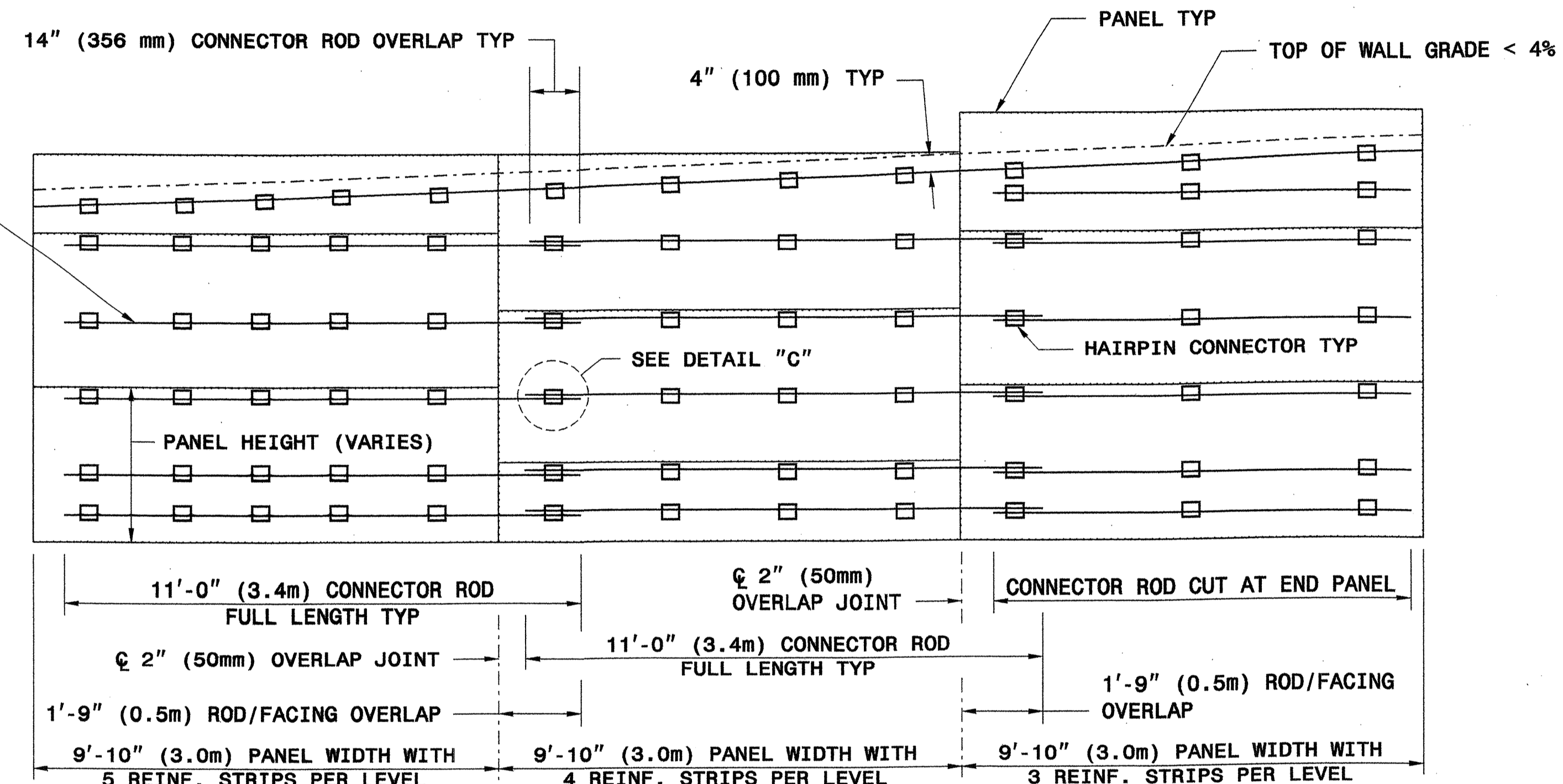


PLAN DETAIL 'A' STRIP CONNECTION

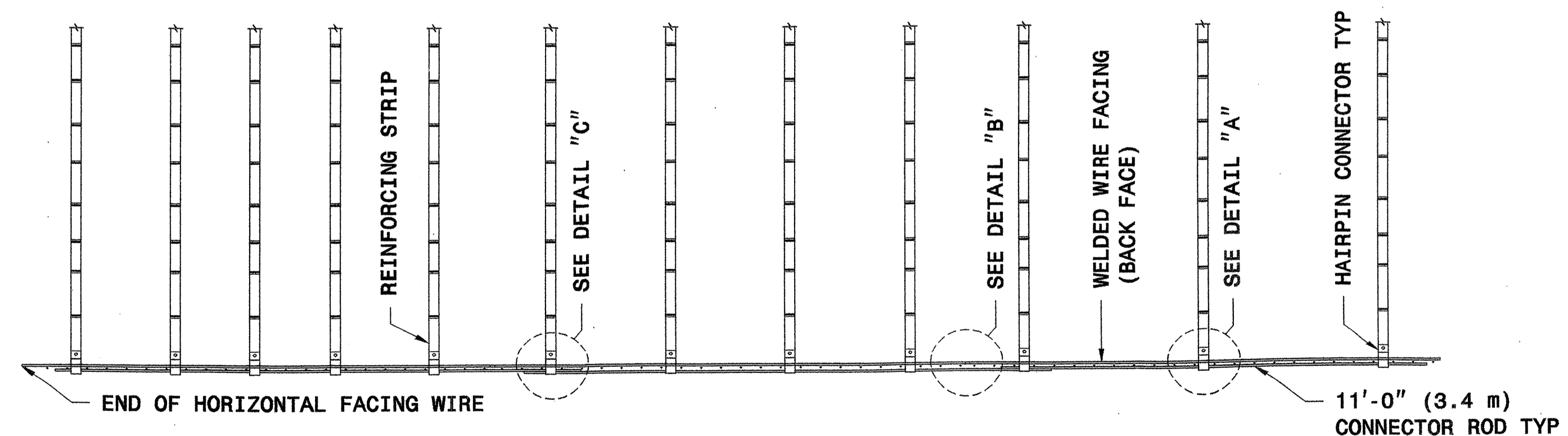
PLAN DETAIL 'B' HORIZONTAL OVERLAP DETAIL



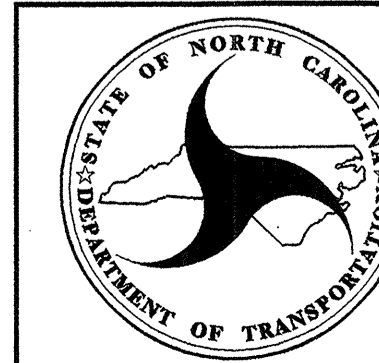
PLAN DETAIL 'C' STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL



TYPICAL ELEVATION (WIRES NOT SHOWN FOR CLARITY)



TYPICAL PLAN



GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL
TEMPORARY WALL

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
SUMMARY OF QUANTITIES

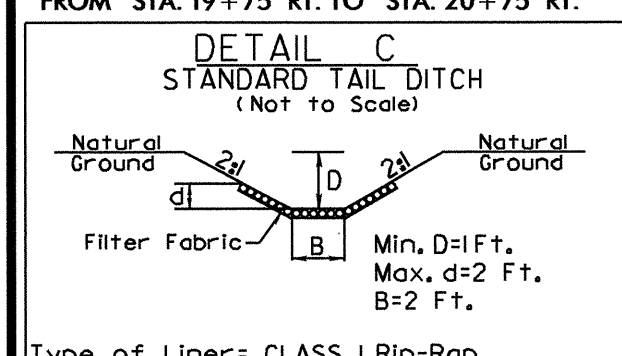
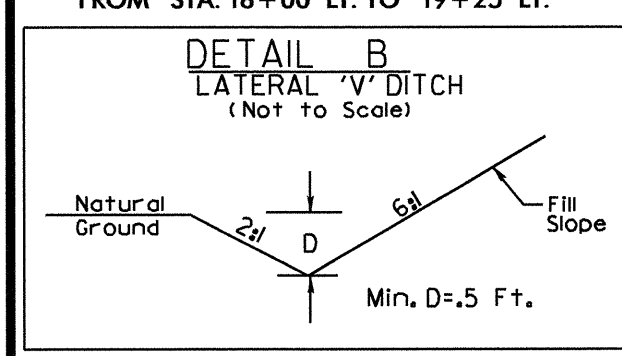
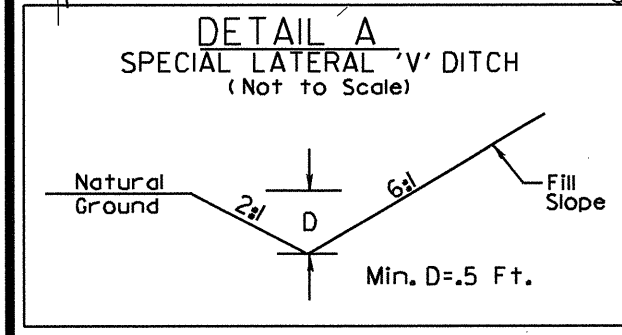
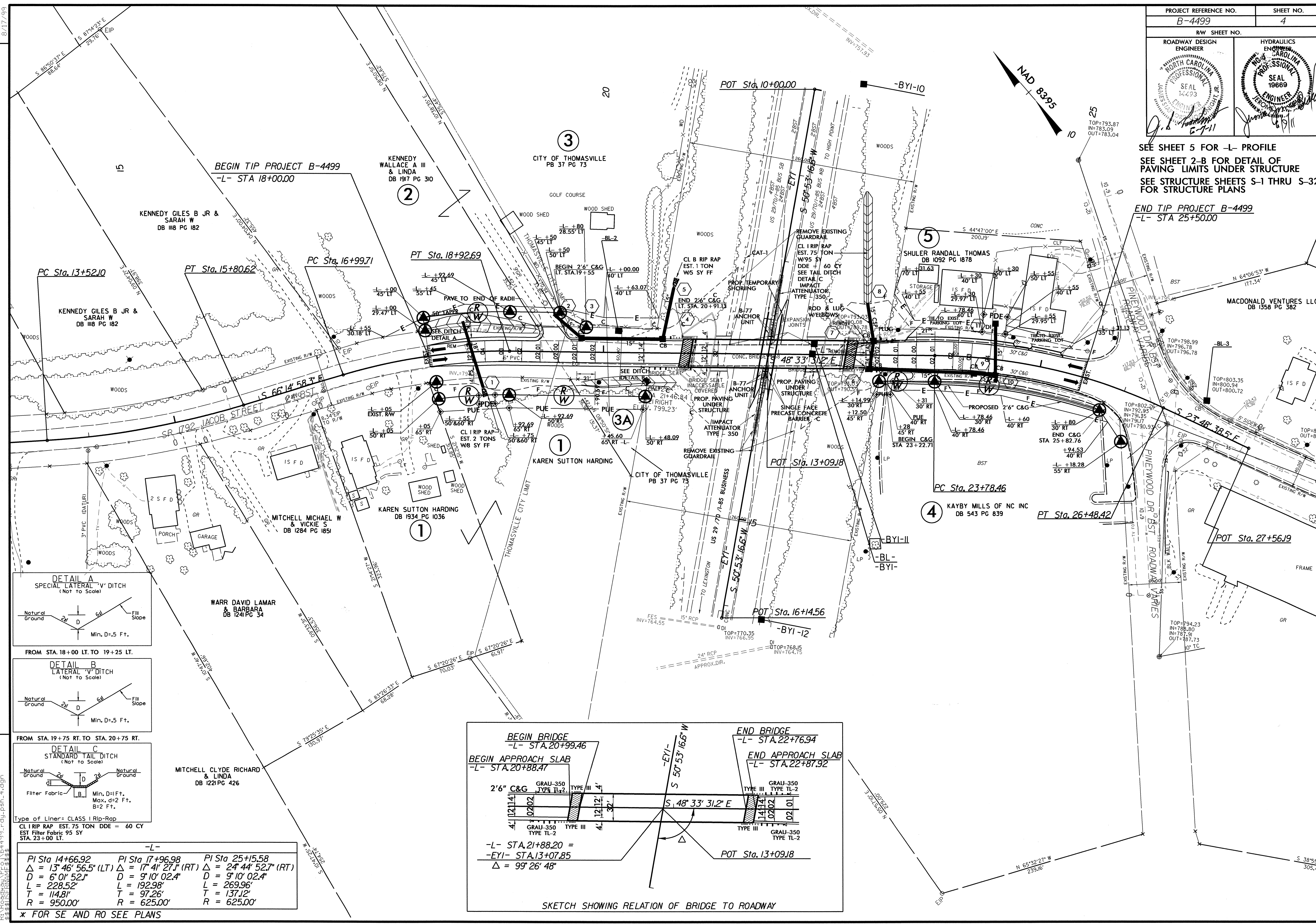
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202438																			
ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION	1575000000-E	SP	65	TON	ASPHALT BINDER FOR PLANT MIX	3317000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77	4900000000-N	1251	9	EA	PERMANENT RAISED PAVEMENT MARKERS
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING	1693000000-E	654	10	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR	3360000000-E	863	597	LF	REMOVE EXISTING GUARDRAIL	6000000000-E	1605	1,200	LF	TEMPORARY SILT FENCE
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (21+88.20)	2000000000-N	806	13	EA	RIGHT OF WAY MARKERS	3628000000-E	876	80	TON	RIP RAP, CLASS I	6006000000-E	1610	270	TON	STONE FOR EROSION CONTROL, CLASS A
0038000000-E	SP	175	CY	SHALLOW UNDERCUT	2022000000-E	SP	56	CY	SUBDRAIN EXCAVATION	3649000000-E	876	1	TON	RIP RAP, CLASS B	6009000000-E	1610	215	TON	STONE FOR EROSION CONTROL, CLASS B
0043000000-N	226	Lump Sum		GRADING	2033000000-E	SP	42	CY	SUBDRAIN FINE AGGREGATE	3656000000-E	876	590	SY	FILTER FABRIC FOR DRAINAGE	6012000000-E	1610	125	TON	SEDIMENT CONTROL STONE
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING	2044000000-E	SP	250	LF	6" PERFORATED SUBDRAIN PIPE	4072000000-E	903	75	LF	SUPPORTS, 3-LB STEEL U-CHANNEL	6015000000-E	1615	1.5	ACR	TEMPORARY MULCHING
0057000000-E	226	200	CY	UNDERCUT EXCAVATION	2077000000-E	SP	6	LF	6" OUTLET PIPE (SUBDRAINS)	4096000000-N	904	1	EA	SIGN ERECTION, TYPE D	6018000000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
0080000000-E	SP	350	TON	CLASS IV SUBGRADE STABILIZATION	2077000000-E	SP	6	LF	6" OUTLET PIPE (SUBDRAINS)	4102000000-N	904	4	EA	SIGN ERECTION, TYPE E	6021000000-E	1620	1.25	TON	FERTILIZER FOR TEMPORARY SEEDING
0134000000-E	240	60	CY	DRAINAGE DITCH EXCAVATION	2264000000-E	840	0.045	CY	PIPE PLUGS	4155000000-N	907	13	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	6024000000-E	1622	200	LF	TEMPORARY SLOPE DRAINS
0196000000-E	270	600	SY	FABRIC FOR SOIL STABILIZATION	2286000000-N	840	7	EA	MASONRY DRAINAGE STRUCTURES	4400000000-E	1110	355	SF	WORK ZONE SIGNS (STATIONARY)	6027000000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
0199000000-E	SP	1,100	SF	TEMPORARY SHORING	2308000000-E	840	0.86	LF	MASONRY DRAINAGE STRUCTURES	4405000000-E	1110	384	SF	WORK ZONE SIGNS (PORTABLE)	6029000000-E	SP	50	LF	SAFETY FENCE
0318000000-E	SP	60	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS	2355000000-N	840	1	EA	FRAME WITH GRATE, STD 840.29	4410000000-E	1110	47	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)	6030000000-E	1630	360	CY	SILT EXCAVATION
0320000000-E	SP	190	SY	FOUNDATION CONDITIONING FABRIC	2374000000-N	840	2	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	4415000000-N	1115	2	EA	FLASHING ARROW PANELS, TYPE C	6036000000-E	1631	2,500	SY	MATTING FOR EROSION CONTROL
0343000000-E	SP	236	LF	15" SIDE DRAIN PIPE	2374000000-N	840	1	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	4420000000-N	1120	2	EA	CHANGEABLE MESSAGE SIGN	6037000000-E	SP	10	SY	COIR FIBER MAT
0344000000-E	SP	104	LF	18" SIDE DRAIN PIPE	2374000000-N	840	3	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)	4430000000-N	1130	66	EA	DRUMS	6042000000-E	1632	300	LF	1/4" HARDWARE CLOTH
0366000000-E	SP	92	LF	15" RC PIPE CULVERTS, CLASS III	2549000000-E	846	760	LF	2'-6" CONCRETE CURB & GUTTER	4445000000-E	1145	112	LF	BARRICADES (TYPE III)	6071020000-E	SP	10	LB	POLYACRYLAMIDE (PAM)
0372000000-E	SP	80	LF	18" RC PIPE CULVERTS, CLASS III	2612000000-E	848	110	SY	6" CONCRETE DRIVEWAY	4465000000-N	1160	2	EA	TEMPORARY CRASH CUSHIONS	6071030000-E	SP	100	LF	COIR FIBER BAFFLE
0582000000-E	SP	44	LF	15" CS PIPE CULVERTS, 0.064" THICK	2724000000-E	857	84	LF	PRECAST REINFORCED CONCRETE BARRIER, SINGLE FACED	4470000000-N	1160	2	EA	RESET TEMPORARY CRASH CUSHIONS	6071050000-E	SP	1	EA	*** SKIMMER (1-1/2")
0636000000-E	SP	2	EA	*** CS PIPE ELBOWS, ***** THICK (15", 0.064")	3000000000-N	SP	2	EA	IMPACT ATTENUATOR UNIT, TYPE 350	4480000000-N	1165	2	EA	TMIA	6084000000-E	1660	1.5	ACR	SEEDING & MULCHING
0995000000-E	340	85	LF	PIPE REMOVAL	3030000000-E	862	250	LF	STEEL BM GUARDRAIL	4485000000-E	1170	470	LF	PORTABLE CONCRETE BARRIER	6087000000-E	1660	1.5	ACR	MOWING
1220000000-E	545	200	TON	INCIDENTAL STONE BASE	3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS	4500000000-E	1170	470	LF	RESET PORTABLE CONCRETE BARRIER	6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
1489000000-E	610	480	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B	3165000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** (350 TL-2)	4685000000-E	1205	847	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
1498000000-E	610	410	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B	3210000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1	4686000000-E	1205	1,124	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	6096000000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
1519000000-E	610	390	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	3215000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III	4770000000-E	1205	564	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (II)	6108000000-E	1665	1	TON	FERTILIZER TOPDRESSING
										4770000000-E	1205	1,892	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)	6114500000-N	SP	15	MHR	SPECIALIZED HAND MOWING
														6117000000-N	SP	25	EA	RESPONSE FOR EROSION CONTROL	

5/28/99

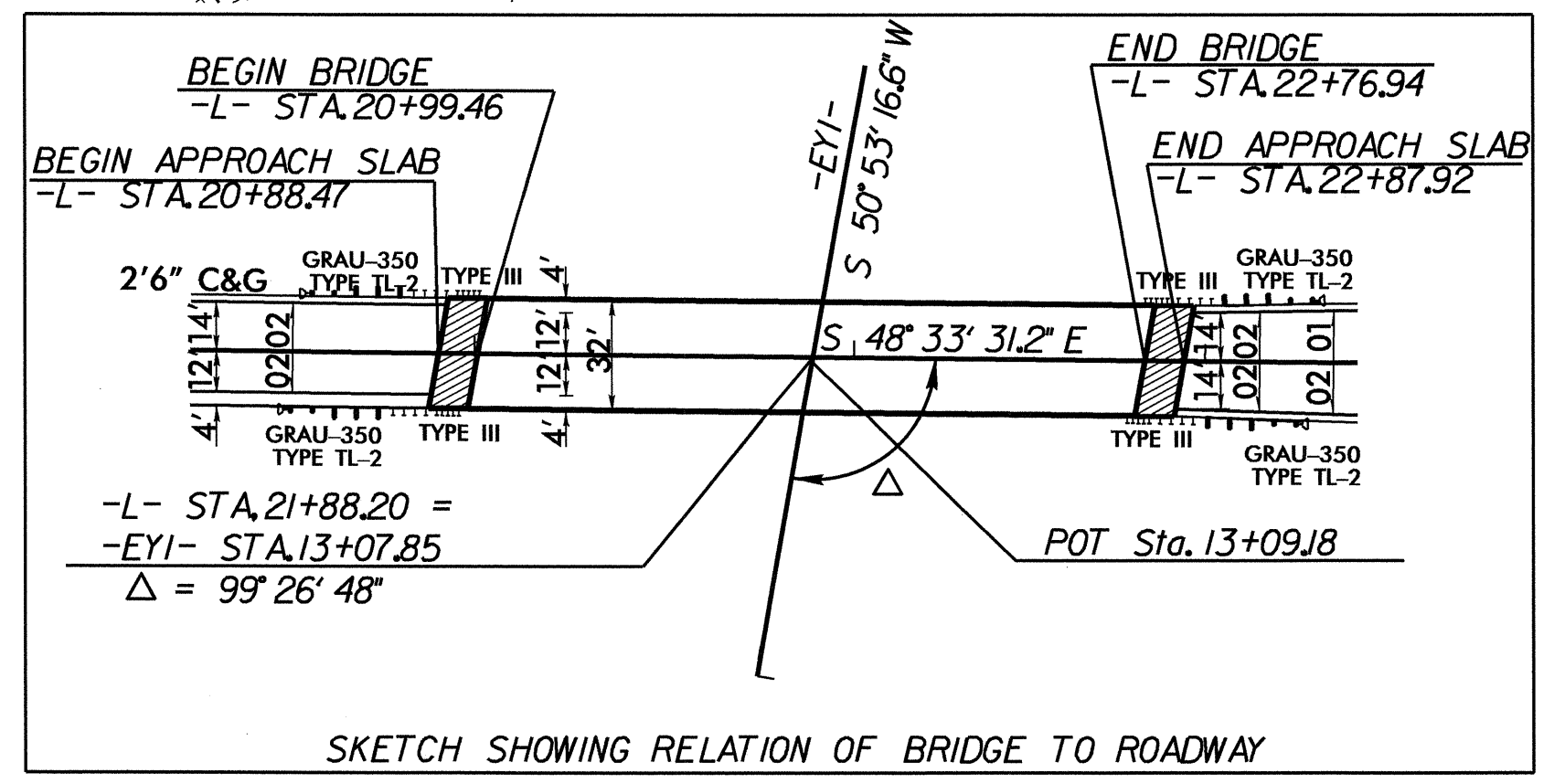
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SEE SHEET 5 FOR -L- PROFILE
 SEE SHEET 2-B FOR DETAIL OF PAVING LIMITS UNDER STRUCTURE
 SEE STRUCTURE SHEETS S-1 THRU S-32 FOR STRUCTURE PLANS

END TIP PROJECT B-4499
 -L- STA 25+50.00



PI Sta 14+66.92	PI Sta 17+96.98	PI Sta 25+15.58
$\Delta = 13^{\circ} 46' 56.5''$ (LT)	$\Delta = 17^{\circ} 41' 27.1''$ (RT)	$\Delta = 24^{\circ} 44' 52.7''$ (RT)
D = 6' 01' 52.1"	D = 9' 10' 02.4"	D = 9' 10' 02.4"
L = 228.52'	L = 192.98'	L = 269.96'
T = 114.81'	T = 97.26'	T = 137.12'
R = 950.00'	R = 625.00'	R = 625.00'

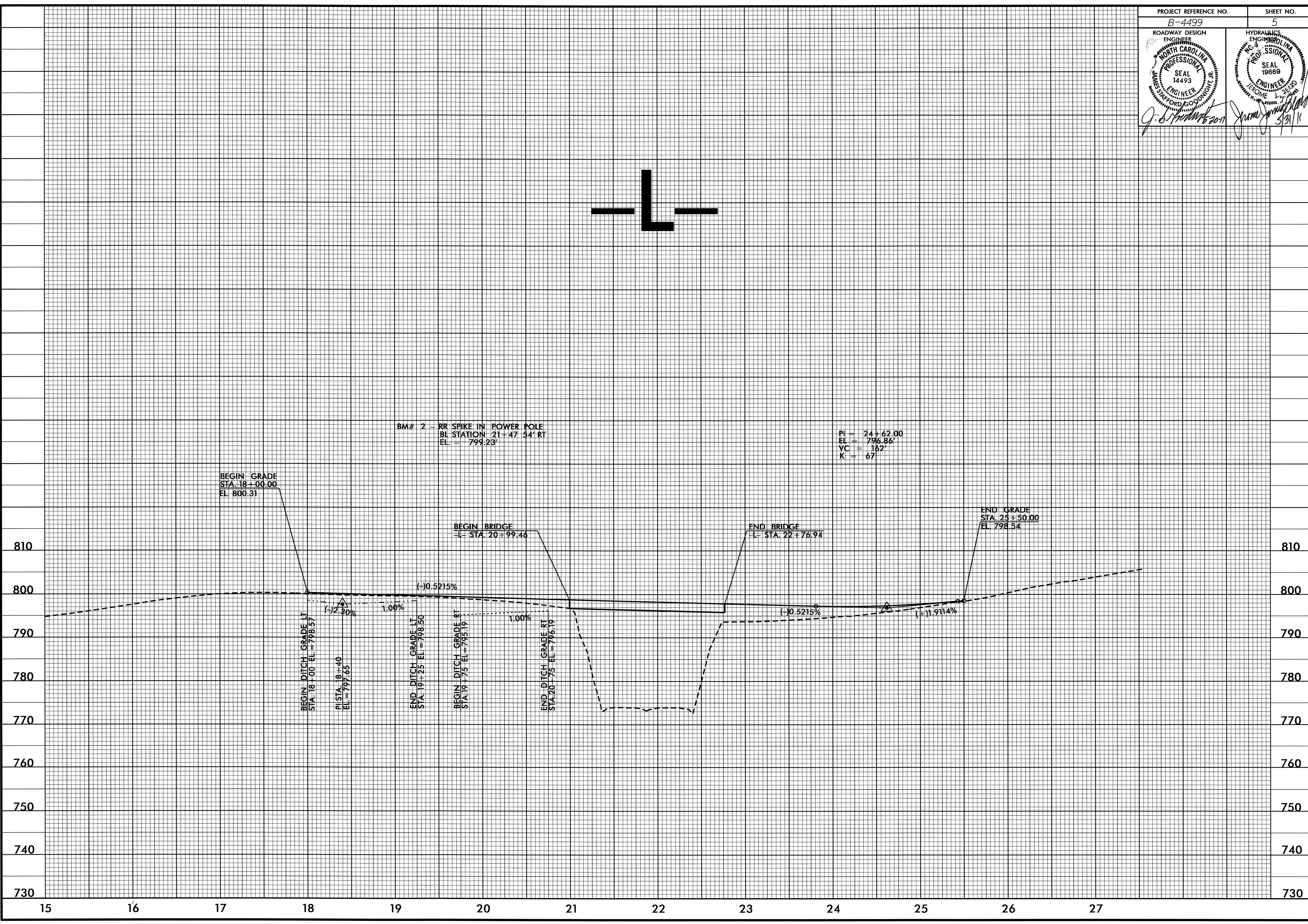


REVISIONS

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PROJECT REFERENCE NO. B-4499	SHEET NO. 5
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 14493 JAMES STAFFORD GOODRIGHT JR. 5/14/99	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 19669 JAMES STAFFORD GOODRIGHT JR. 5/14/99



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