

See Sheet 1-A For Index of Sheets  
See Sheet 1-B For Symbology

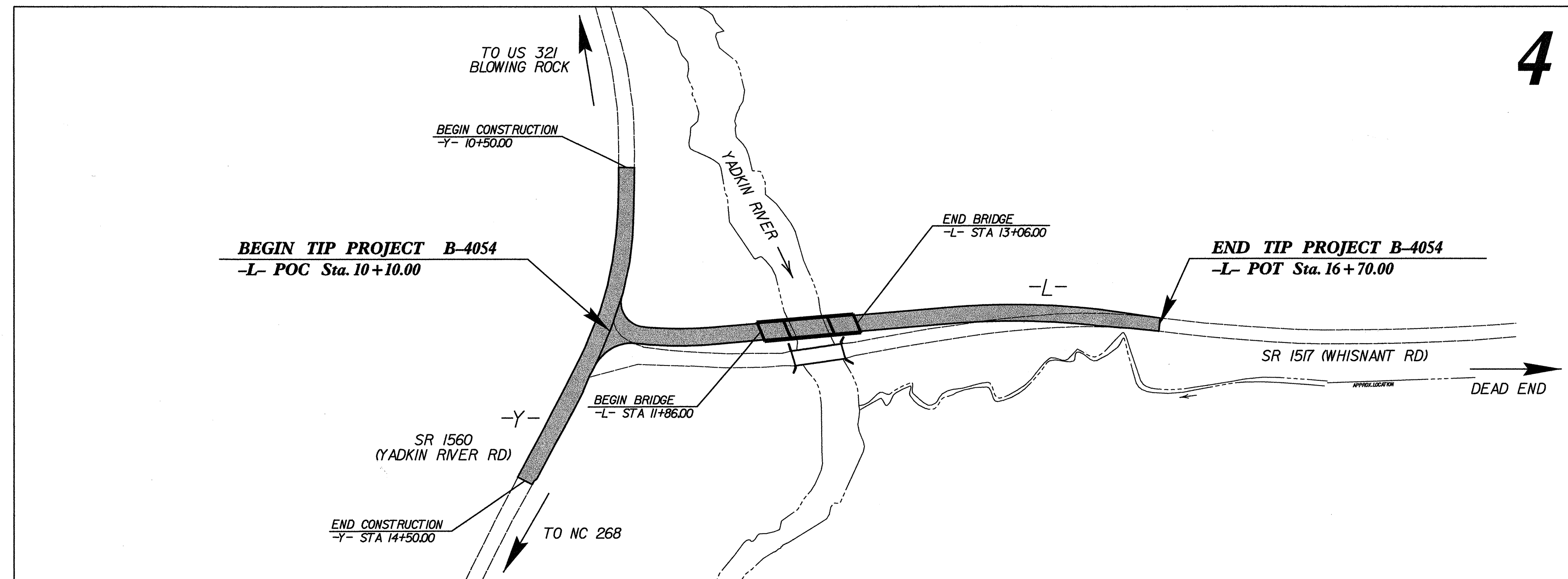
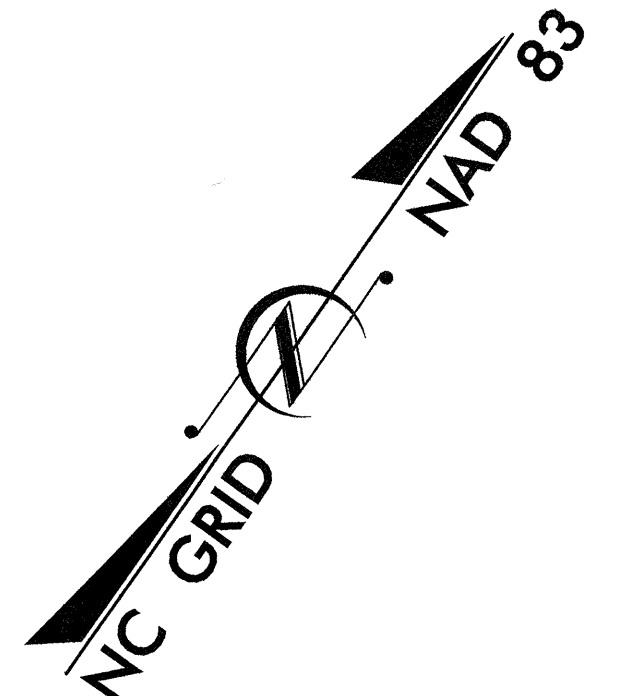
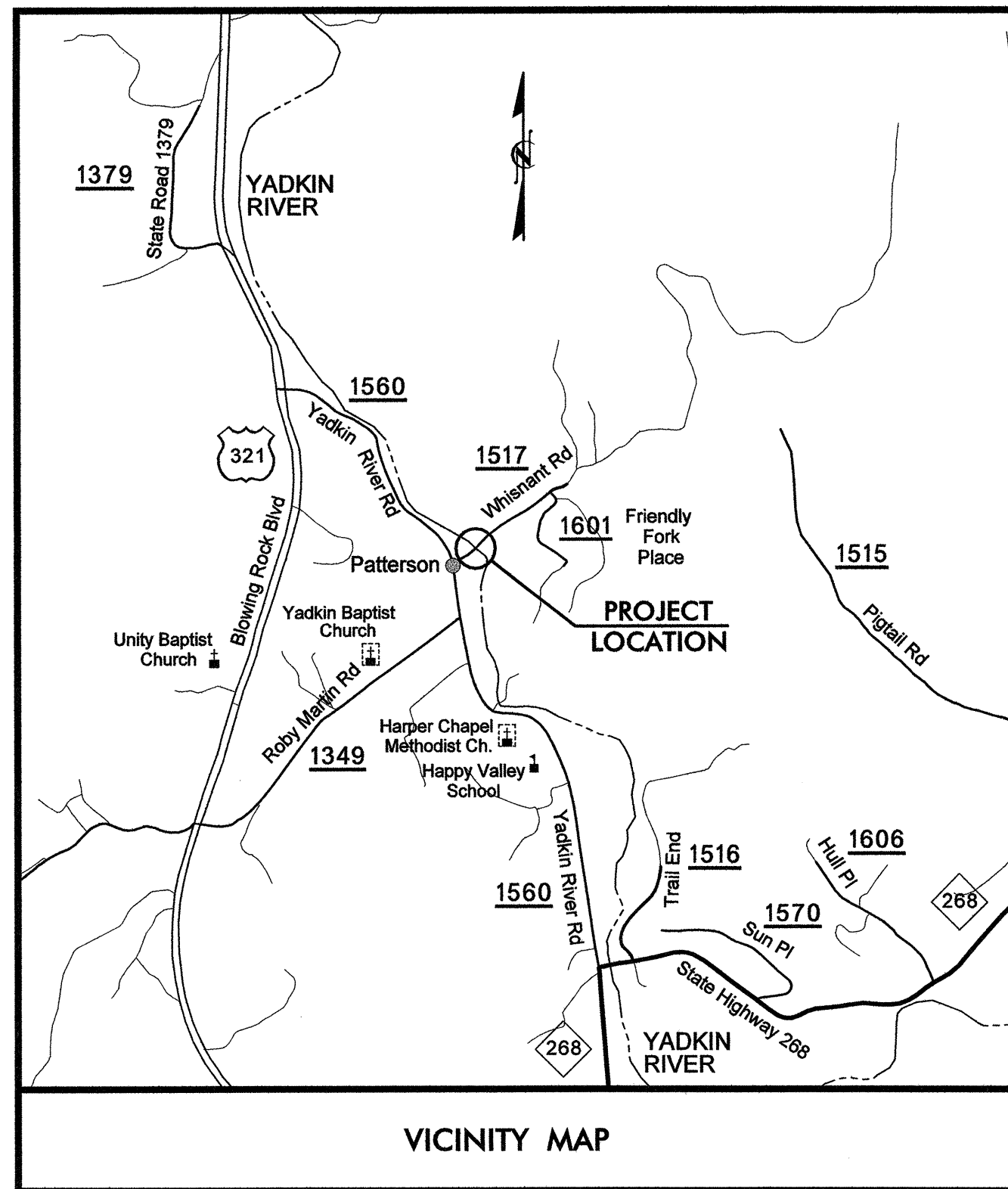
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**CALDWELL COUNTY**

**LOCATION: BRIDGE NO. 334 OVER YADKIN RIVER  
ON SR 1517 (WHISNANT ROAD)**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4054	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33419.1.1	BRZ-1517(3)	PE	
33419.2.1	BRZ-1517(3)	R/W, UTILITIES	
33419.3.1	BRZ-1517(3)	CONST.	

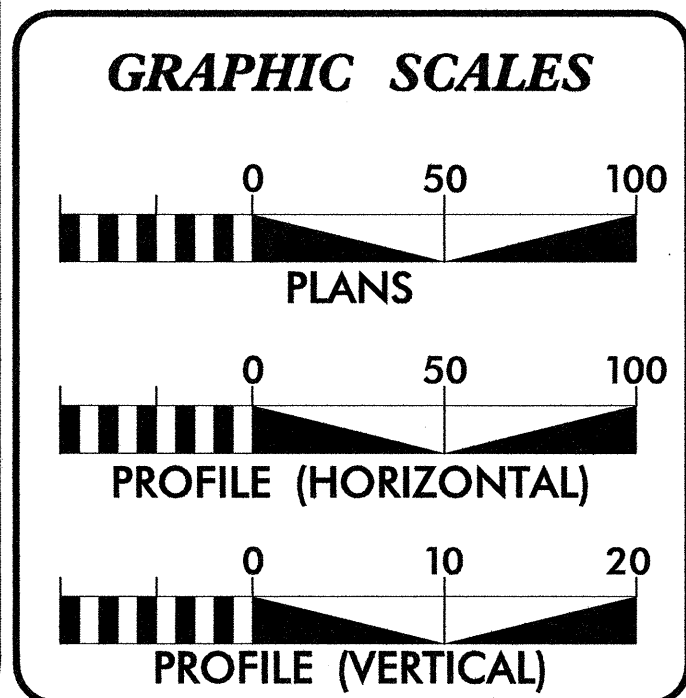


4

**NCDOT CONTACT:**  
MR. DOUG TAYLOR, PE - ENGINEERING  
COORDINATION SECTION ENGINEER  
ROADWAY DESIGN UNIT

TIP PROJECT: B-4054

CONTRACT: C201733



**DESIGN DATA**

ADT 2007 =	266
ADT 2027 =	526
DHV =	9 %
D =	60 %
T =	3 %*
V =	30 MPH **
* (1% TTST + 2% DUAL)	
FUNCT CLASS =	RURAL LOCAL

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4054	=	0.102 mile
LENGTH STRUCTURES TIP PROJECT B-4054	=	0.023 mile
TOTAL LENGTH TIP PROJECT B-4054	=	0.125 mile

\*\* DESIGN EXCEPTION REQUIRED FOR  
60 MPH DESIGN SPEED.

Prepared For:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., Raleigh NC, 27610  
By:  
MA ENGINEERING CONSULTANTS, INC.  
598 E. CHATHAM STREET, SUITE 137  
CARY, NORTH CAROLINA 27511  
(919) 270-0220

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
AUGUST 7, 2006

LETTING DATE:  
JANUARY 15, 2008

**BURKE EVANS, PE**  
PROJECT ENGINEER

**K.S. HUTCHENS**  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

*Roger S. Weadon* 9/24/07  
SIGNATURE: P.E.

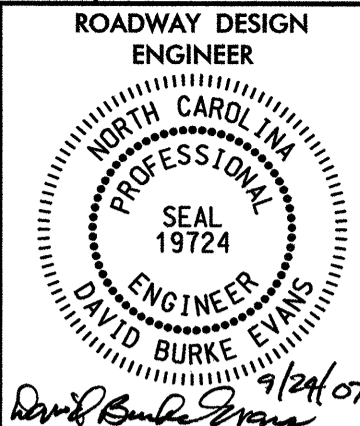

**ROADWAY DESIGN ENGINEER**

*David Burke Evans* 9-24-07  
SIGNATURE: P.E.

**DIVISION OF HIGHWAYS**  
STATE OF NORTH CAROLINA

*David Burke Evans* P.E.  
STATE HIGHWAY DESIGN ENGINEER

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PROJECT REFERENCE NO. B-4054	SHEET NO. 1-A
ROADWAY DESIGN ENGINEER 	
	

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

UNDERDRAINS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

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:

- AT&T - Telephone
- Omni Supply, Inc. - Water & Effluent sewer system
- Blue Ridge Electric Membership Corp. - Electric
- Charter Communications - Cable TV

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

RIGHT-OF-WAY MARKERS:

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

2006 ROADWAY STANDARD DRAWINGS

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

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

STD. NO.	TITLE
<b>DIVISION 2 - EARTHWORK</b>	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
<b>DIVISION 3 - PIPE CULVERTS</b>	
300.01	Method of Pipe Installation - Method 'A'
310.10	Driveway Pipe Construction
<b>DIVISION 4 - MAJOR STRUCTURES</b>	
422.10	Reinforced Bridge Approach Fills
<b>DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</b>	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
<b>DIVISION 8 - INCIDENTALS</b>	
806.01	Concrete Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
840.00	Concrete Base Pad for Drainage Structures
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.25	Anchorage for Frames - Brick or Concrete (Beg. January 2007 Let Use Detail in Lieu of Standard)
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
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.02	Woven Wire Fence - with Wood Post
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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 SHEET
2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2-A	DETAIL OF ANCHORAGE FOR FRAMES - BRICK OR CONCRETE
2-B THRU 2-L	DETAIL OF TEMPORARY SHORING
2M	DETAIL OF CONTAMINATED SOIL CONTAINMENT
3	SUMMARY OF QUANTITIES
3-A	SUMMARIES OF EARTHWORK, PAVEMENT REMOVAL, DRAINAGE, AND GUARDRAIL
4	PLAN AND PROFILE SHEET
TCP-1 THRU TCP-6	TRAFFIC CONTROL PLANS
PM-1	PAVEMENT MARKING PLAN
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
UC-1 THRU UC-3	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1	CROSS-SECTION SUMMARY
X-2 THRU X-7	CROSS-SECTIONS
S-1 THRU S-28	STRUCTURE PLANS

Note: Not to Scale

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

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

**BOUNDARIES AND PROPERTY:**

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	②③
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	----- WLB
Proposed Wetland Boundary	----- WLB
Existing Endangered Animal Boundary	----- EAB
Existing Endangered Plant Boundary	----- EPB

**BUILDINGS AND OTHER CULTURE:**

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

**HYDROLOGY:**

Stream or Body of Water	-----
Hydro, Pool or Reservoir	-----
Jurisdictional Stream	----- JS
Buffer Zone 1	----- BZ 1
Buffer Zone 2	----- BZ 2
Flow Arrow	←
Disappearing Stream	-----
Spring	○
Wetland	-----
Proposed Lateral, Tail, Head Ditch	----- FLD
False Sump	▽

**RAILROADS:**

Standard Gauge	-----
RR Signal Milepost	○ CSX TRANSPORTATION MILEPOST 35
Switch	□ 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	----- E
Proposed Temporary Construction Easement	----- E
Proposed Temporary Drainage Easement	----- TDE
Proposed Permanent Drainage Easement	----- PDE
Proposed Permanent Utility Easement	----- PUE

**ROADS AND RELATED FEATURES:**

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	----- C
Proposed Slope Stakes Fill	----- F
Proposed Wheel Chair Ramp	----- WCR
Proposed Wheel Chair Ramp Curb Cut	----- WCC
Curb Cut for Future Wheel Chair Ramp	----- CCFR
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	----- Vineyard

**EXISTING STRUCTURES:**

MAJOR:	
Bridge, Tunnel or Box Culvert	----- CONC
Bridge Wing Wall, Head Wall and End Wall	----- CONC WW
MINOR:	
Head and End Wall	----- CONC HW
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	□ CB
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	----- P
Designated U/G Power Line (S.U.E.*)	----- P

**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	----- T
Designated U/G Telephone Cable (S.U.E.*)	----- T
Recorded U/G Telephone Conduit	----- TC
Designated U/G Telephone Conduit (S.U.E.*)	----- TC
Recorded U/G Fiber Optics Cable	----- T FO
Designated U/G Fiber Optics Cable (S.U.E.*)	----- T FO

**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	----- A/G Water

**TV:**

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

**GAS:**

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

**SANITARY SEWER:**

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

**MISCELLANEOUS:**

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

# SURVEY CONTROL SHEET B-4054

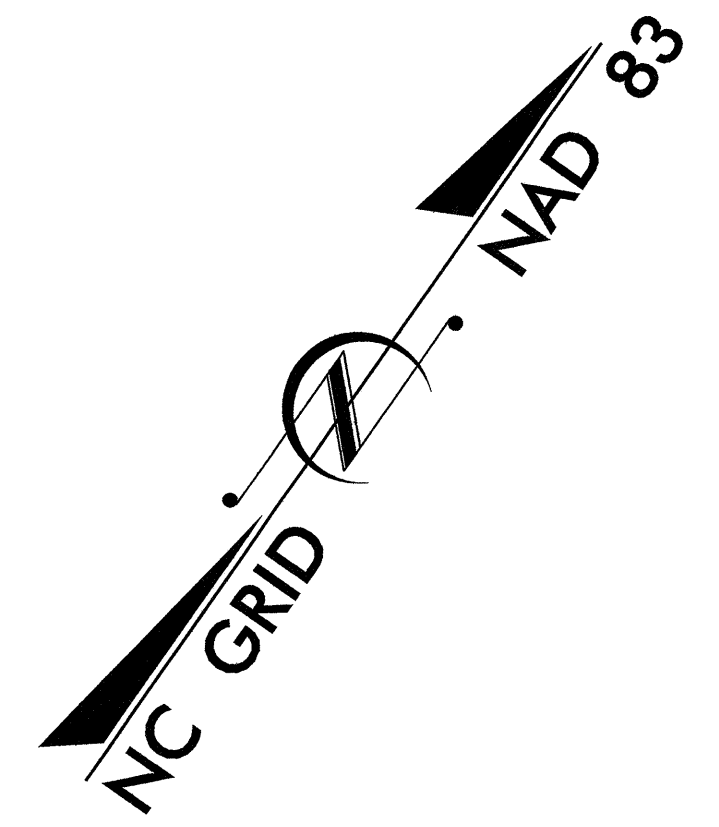
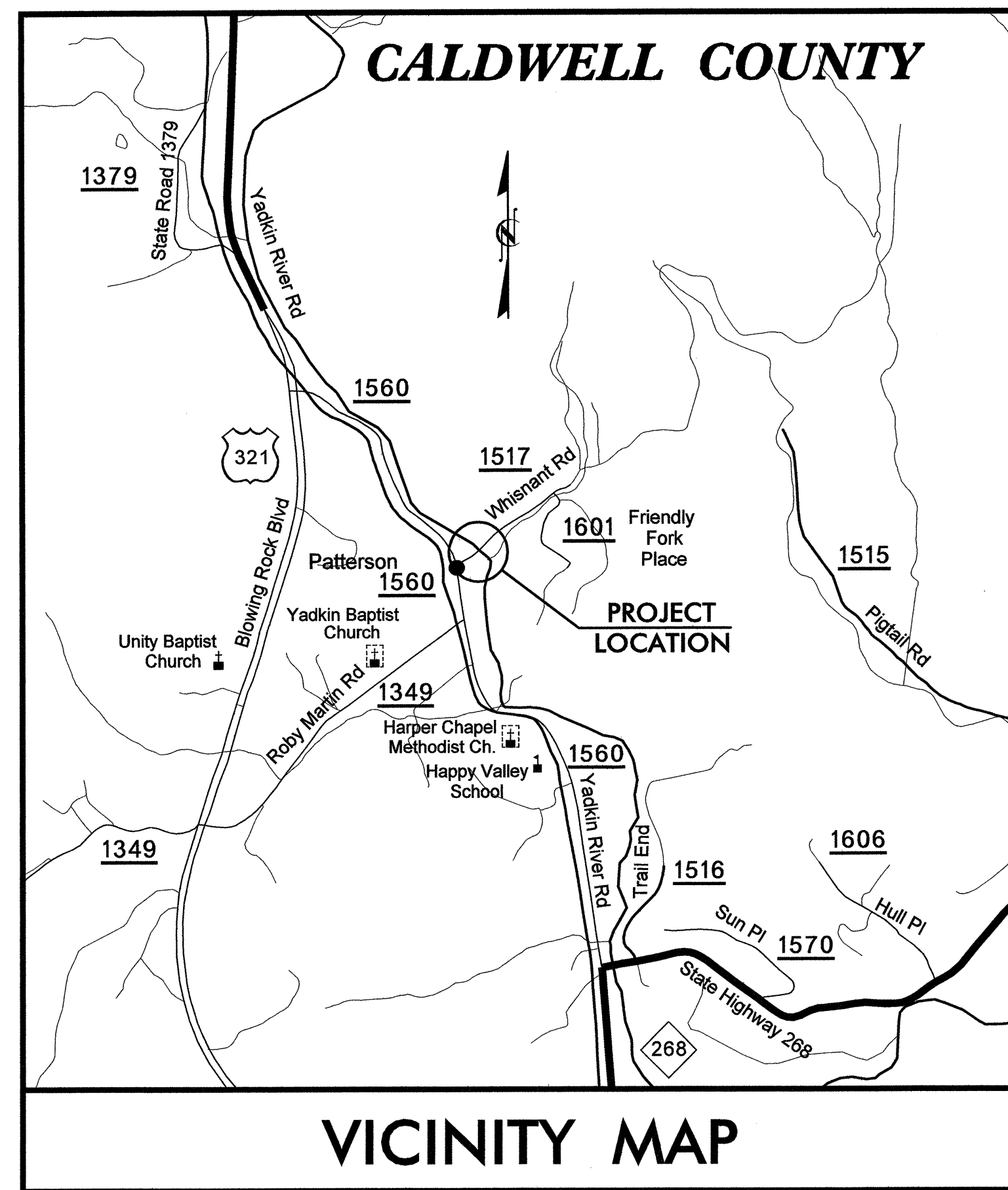
BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	(BL-1)	828910.0130	1241717.5170	1254.84'	OUTSIDE PROJECT LIMITS	
4054	(B4054-1)	829105.9270	1241990.5630	1243.18'	13+14.32	17.53 RT
2	(BL-2)	829236.4360	1242128.6300	1252.43'	15+04.24	1.61 RT
3	(BL-3)	829377.6770	1242349.7000	1264.60'	17+66.59	11.74 LT

BY POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
4	(BY-4)	828563.3910	1241759.9950	1249.15	OUTSIDE PROJECT LIMITS	
10	(BL-1)	828910.0130	1241717.5170	1254.84	12+68.38	14.48 RT
5	(BY-5)	829226.1870	1241560.7320	1270.79	OUTSIDE PROJECT LIMITS	

\*\*\*\*\*

TBM #1	ELEVATION - 1266.58	TBM #2	ELEVATION - 1290.50
N 828835	E 1241651	N 829608	E 1242697
-Y- STATION 13+34	90' RIGHT	OUTSIDE PROJECT LIMITS	
RAILROAD SPIKE IN 15" OAK		RAILROAD SPIKE IN 24" OAK	

\*\*\*\*\*



BEGIN CONSTRUCTION  
-Y- POT 10+50.00  
N = 829108.9877  
E = 1241641.1615

BEGIN STATE PROJECT B-4054  
-L- POC Sta. 10+10.00  
N = 828937.4849  
E = 1241736.5455

END CONSTRUCTION  
-Y- POT STA 14+50.00  
N = 828732.6376  
E = 1241756.1670

END STATE PROJECT B-4054  
-L- POT Sta. 16+70.00  
N = 829320.9204  
E = 1242271.0028

NC DOT GPS STATION B4054-2  
LOCALIZED PROJECT COORDINATES  
N = 829551.373  
E = 1242640.817

NC DOT GPS STATION B4054-1  
LOCALIZED PROJECT COORDINATES  
N = 829105.9270  
E = 1241990.5630

## DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4054-1" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 829106.029(±) EASTING: 1241990.295(±) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99990296 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4054-1" TO -L- STATION 10+10.00 IS S 56°24'26" W 304.62 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 29

NOTE: DRAWING NOT TO SCALE

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:  
B4054\_LS\_CONTROL\_060727.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 EXISTING HARN MONUMENTATION

\*B4054-1 WAS REPLACED BY NCDOT DUE TO MONUMENT DISTURBANCE AND DOES NOT REFLECT THE SAME COORDINATE VALUES AS SHOWN IN THE DATUM DESCRIPTION.

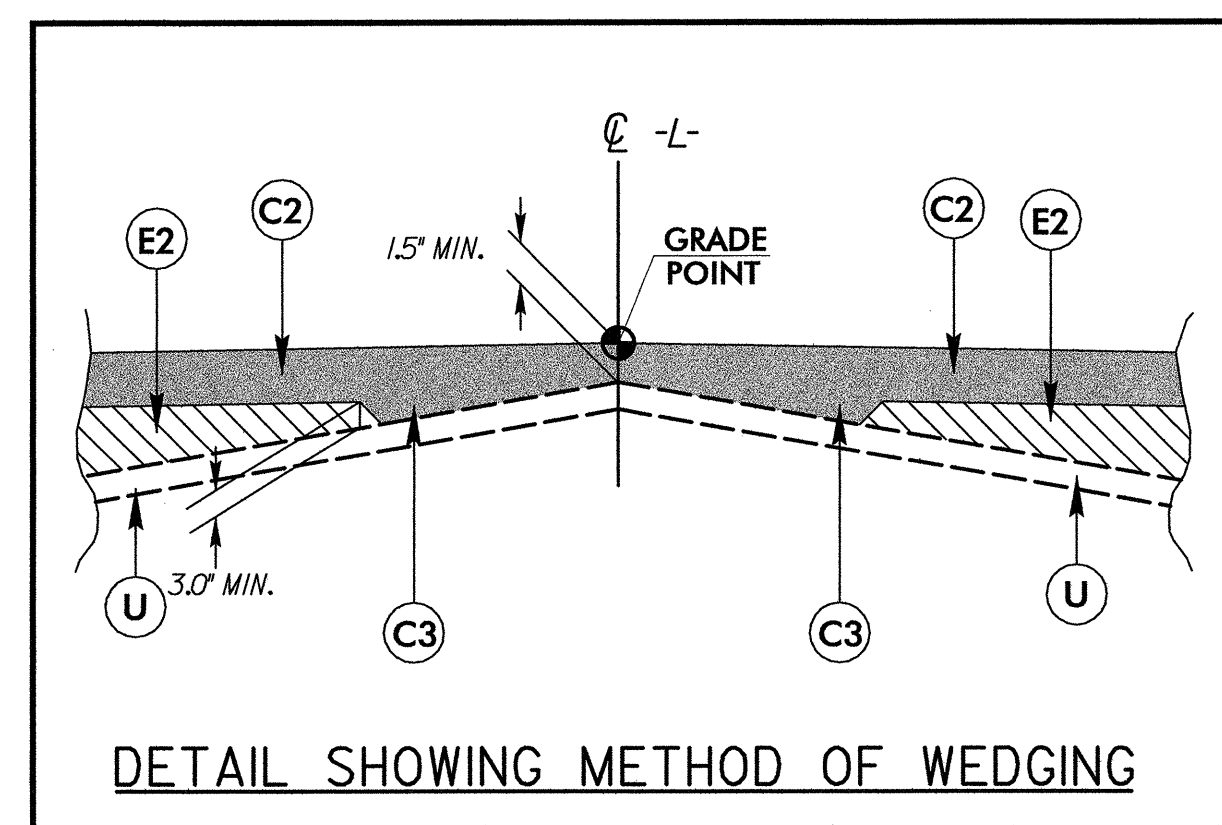
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B-2/05

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS PER SQUARE YARD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS PER SQUARE YARD IN EACH OF TWO LAYERS.
C3	PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1.0" OR GREATER THAN 1.5" IN DEPTH.
E1	PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS PER SQUARE YARD.
E2	PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3.0" OR GREATER THAN 5.5" IN DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL THIS SHEET)

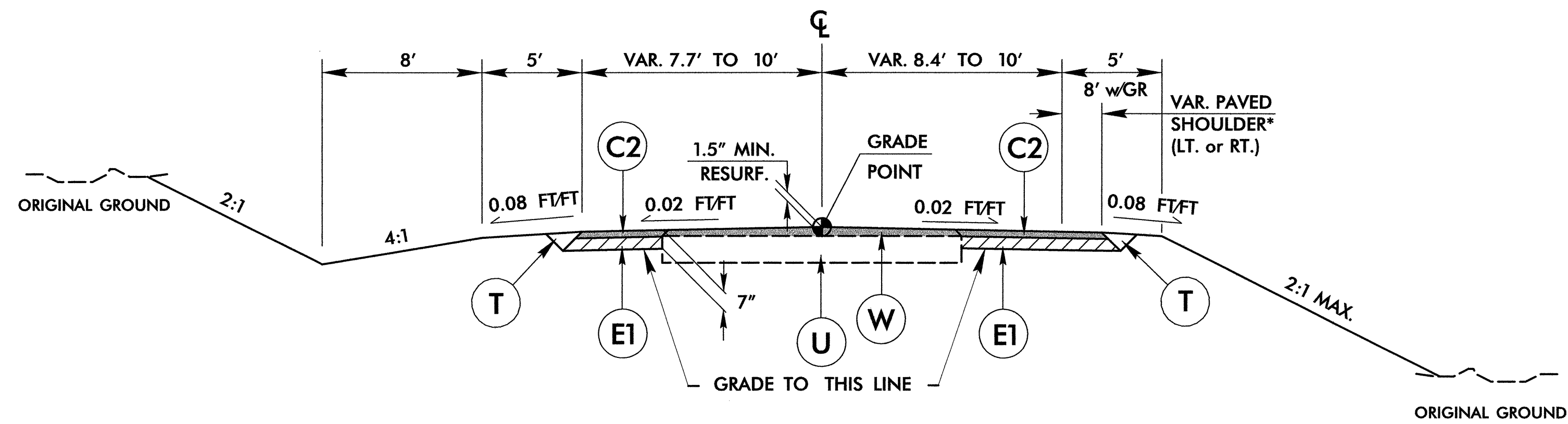
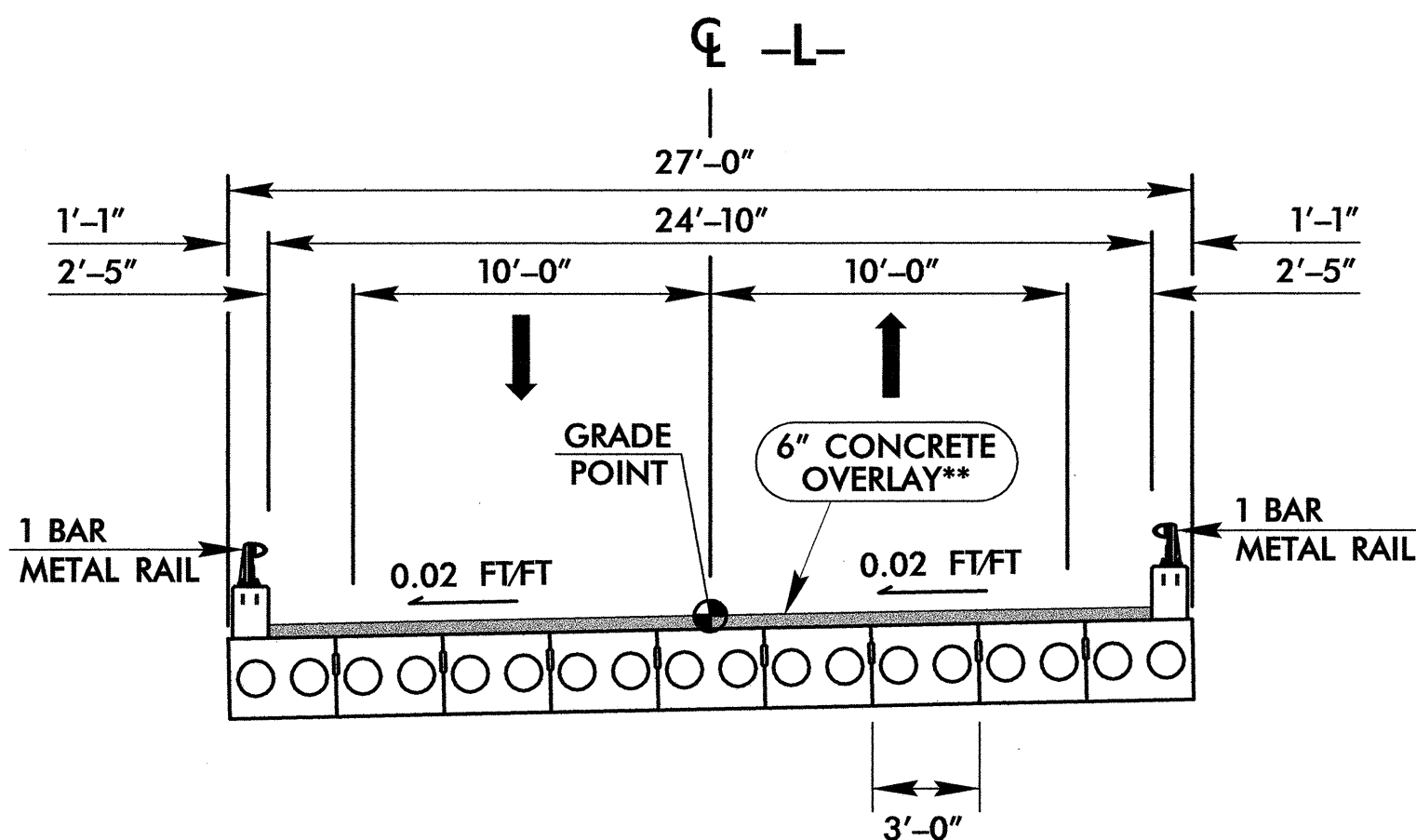
PAVEMENT EDGE SLOPES AND TRENCH SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



### TYPICAL SECTION ON STRUCTURE

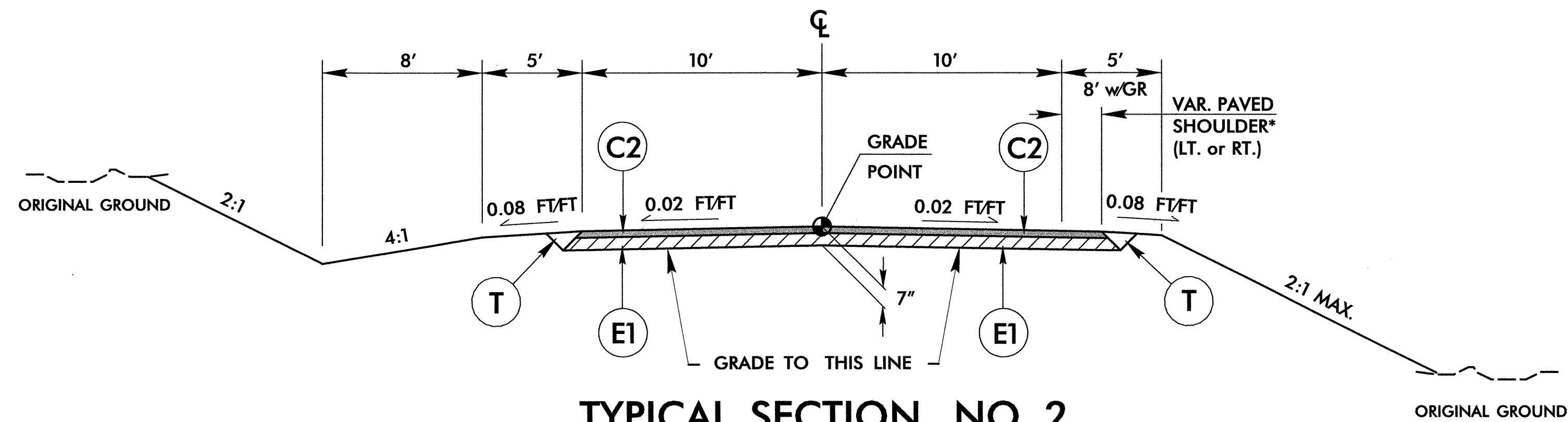
FROM -L- STA. 11+86.00 TO STA. 13+06.00

\*\* - STRUCTURE PAY ITEM



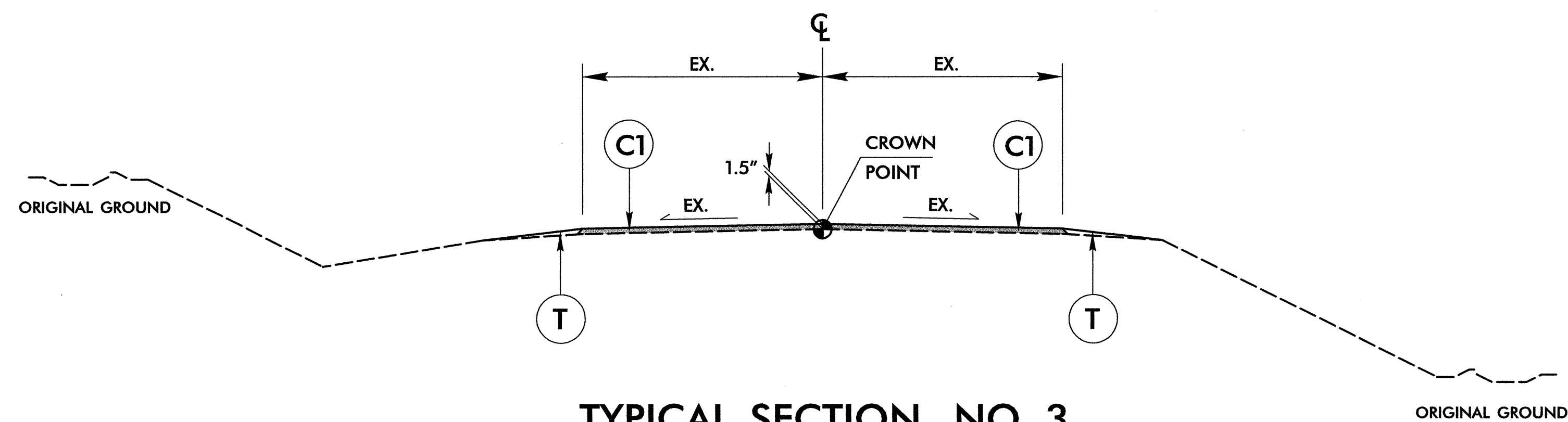
### TYPICAL SECTION NO. 1

FROM -L- STA. 10+10.00 TO STA. 10+41.20  
 FROM -L- STA. 14+52.00 TO STA. 16+25.00  
 FROM -L- STA. 16+25.00 TO STA. 16+70.00 (WIDEN & RESURFACE ONLY)



### TYPICAL SECTION NO. 2

FROM -L- STA. 10+41.20 TO STA. 11+86.00 (BEGIN BRIDGE)  
 FROM -L- STA. 13+06.00 (END BRIDGE) TO STA. 14+52.00



### TYPICAL SECTION NO. 3

FROM -Y- STA. 10+50.00 TO STA. 14+50.00 (RESURFACE ONLY)

PROJECT REFERENCE NO. B-4054	SHEET NO. 2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER DAVID BURKE EVANS SEAL 19724 9/20/07	PAVEMENT DESIGN ENGINEER CLARK S. MORRISON SEAL 22896 9/20/07
598 East Chatham Street Suite 137 Cary, NC 27511 Phone: 919.297.0220 Fax: 919.297.0221	

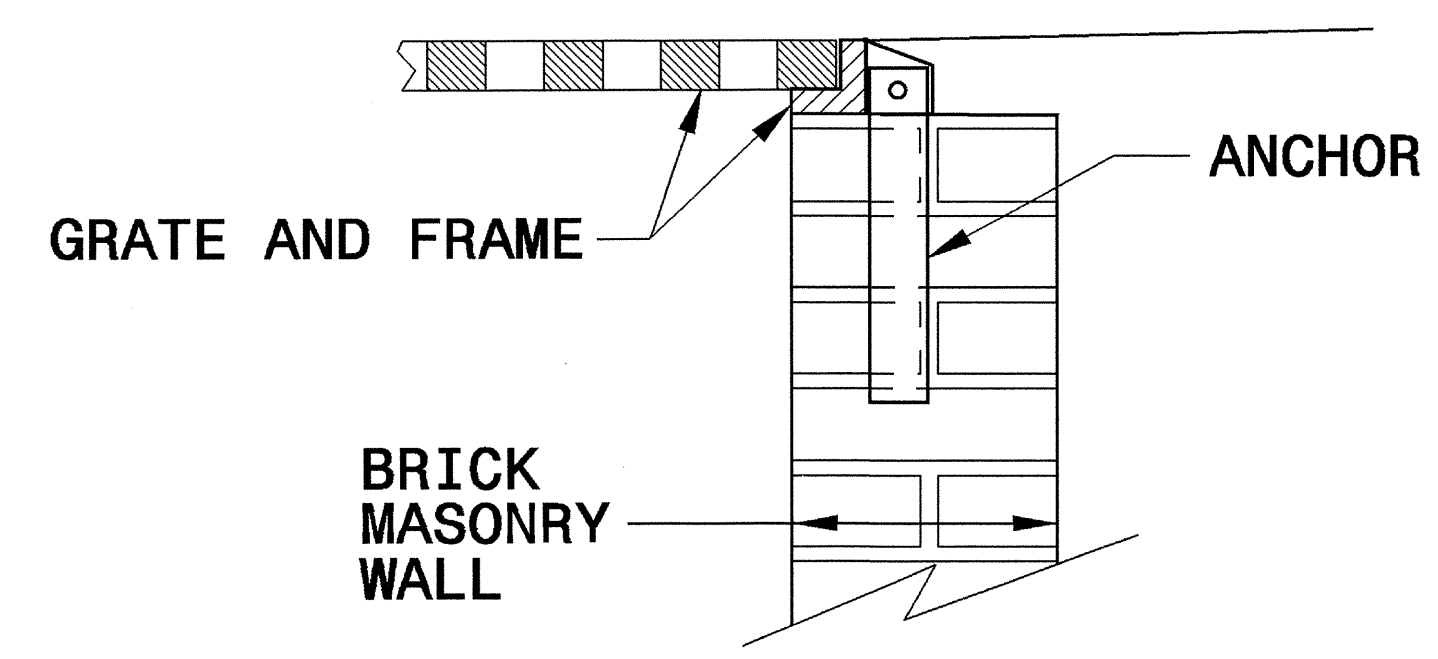
\* - REFER TO PLAN SHEET FOR PAVED SHOULDER LOCATIONS AND WIDTHS.

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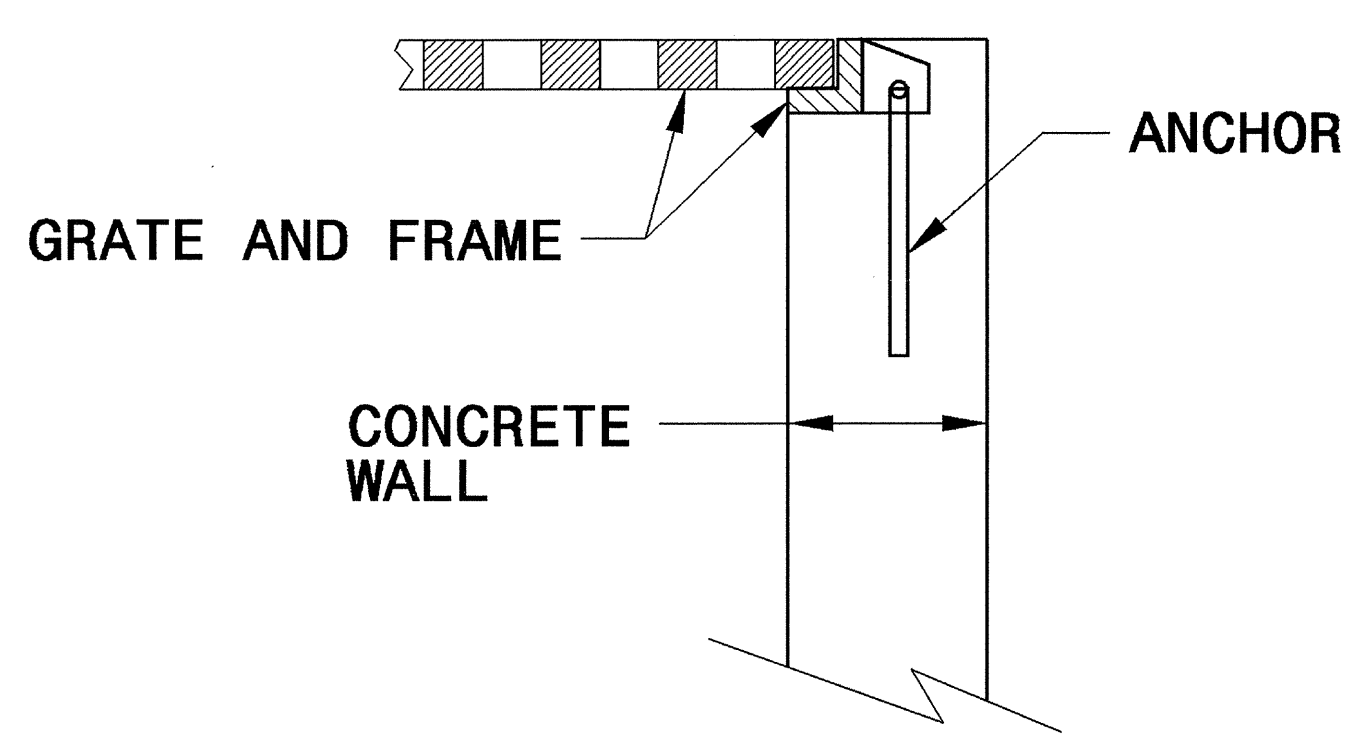
STATE OF  
NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

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

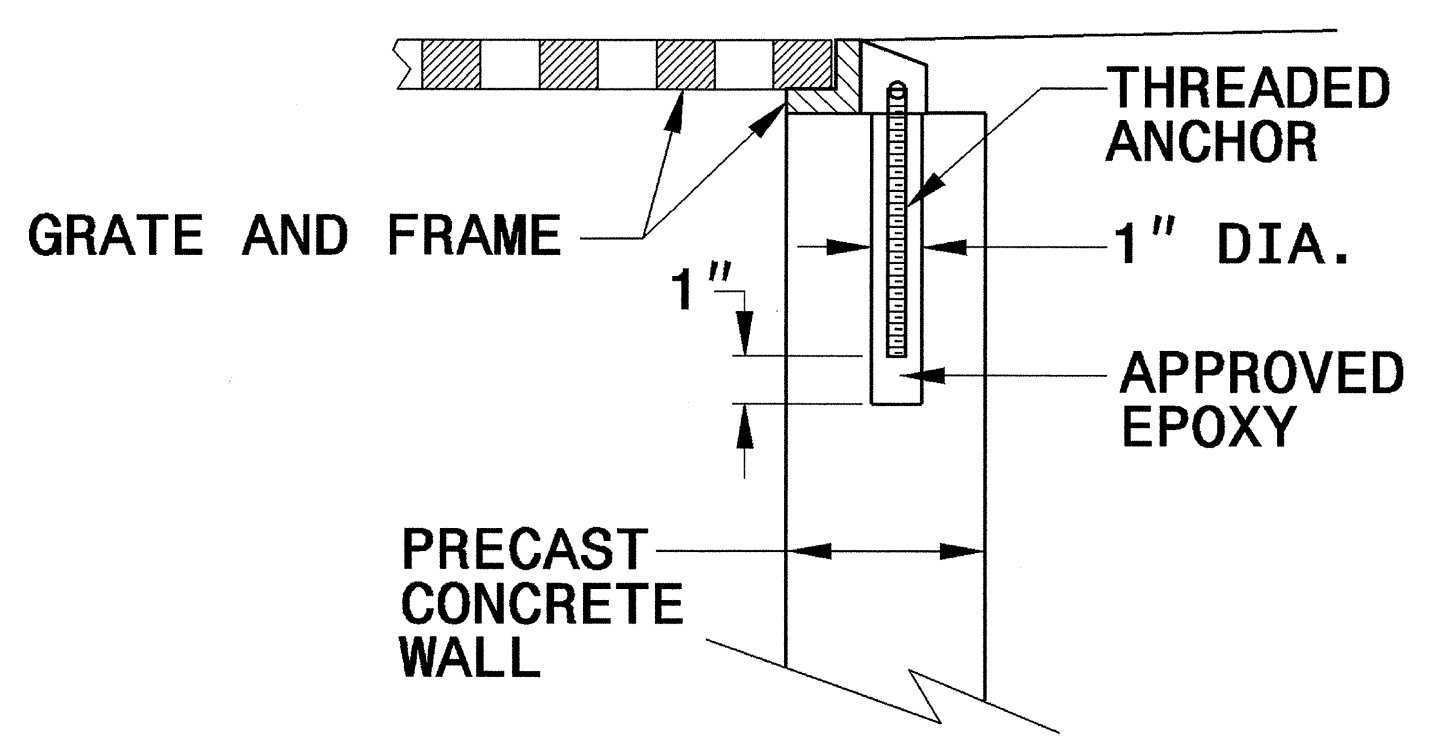
SHEET 1 OF 1  
**840D25**



**BRICK MASONRY  
CONSTRUCTION**



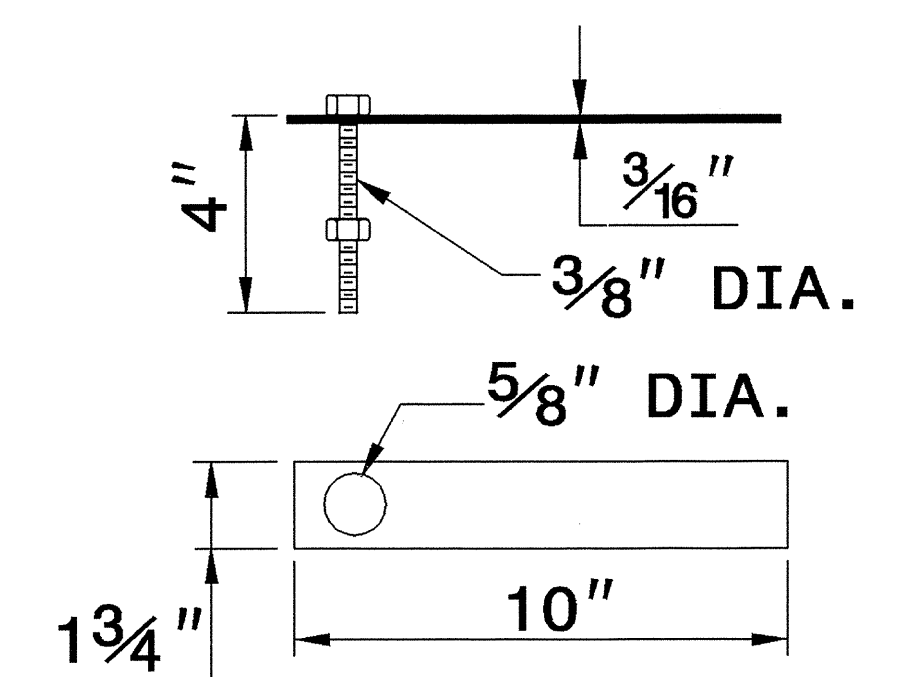
**CONCRETE  
CONSTRUCTION**



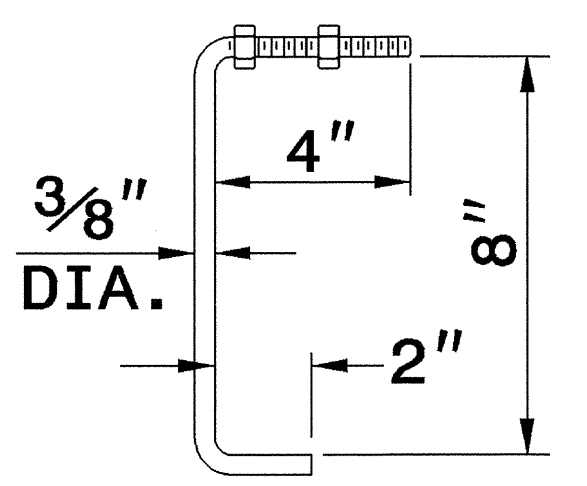
**PRECAST CONCRETE  
CONSTRUCTION**

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

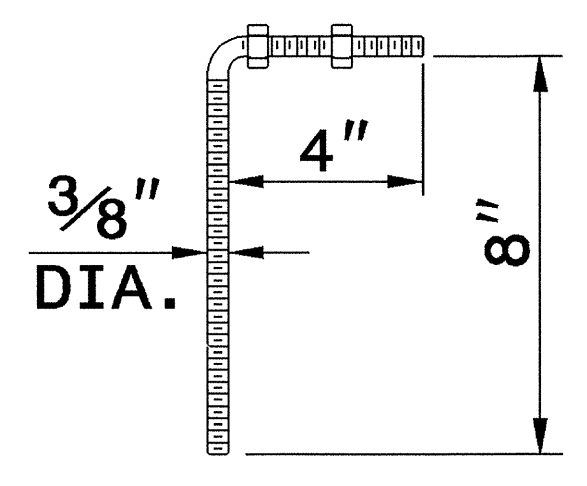
NOTE:  
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL  
OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



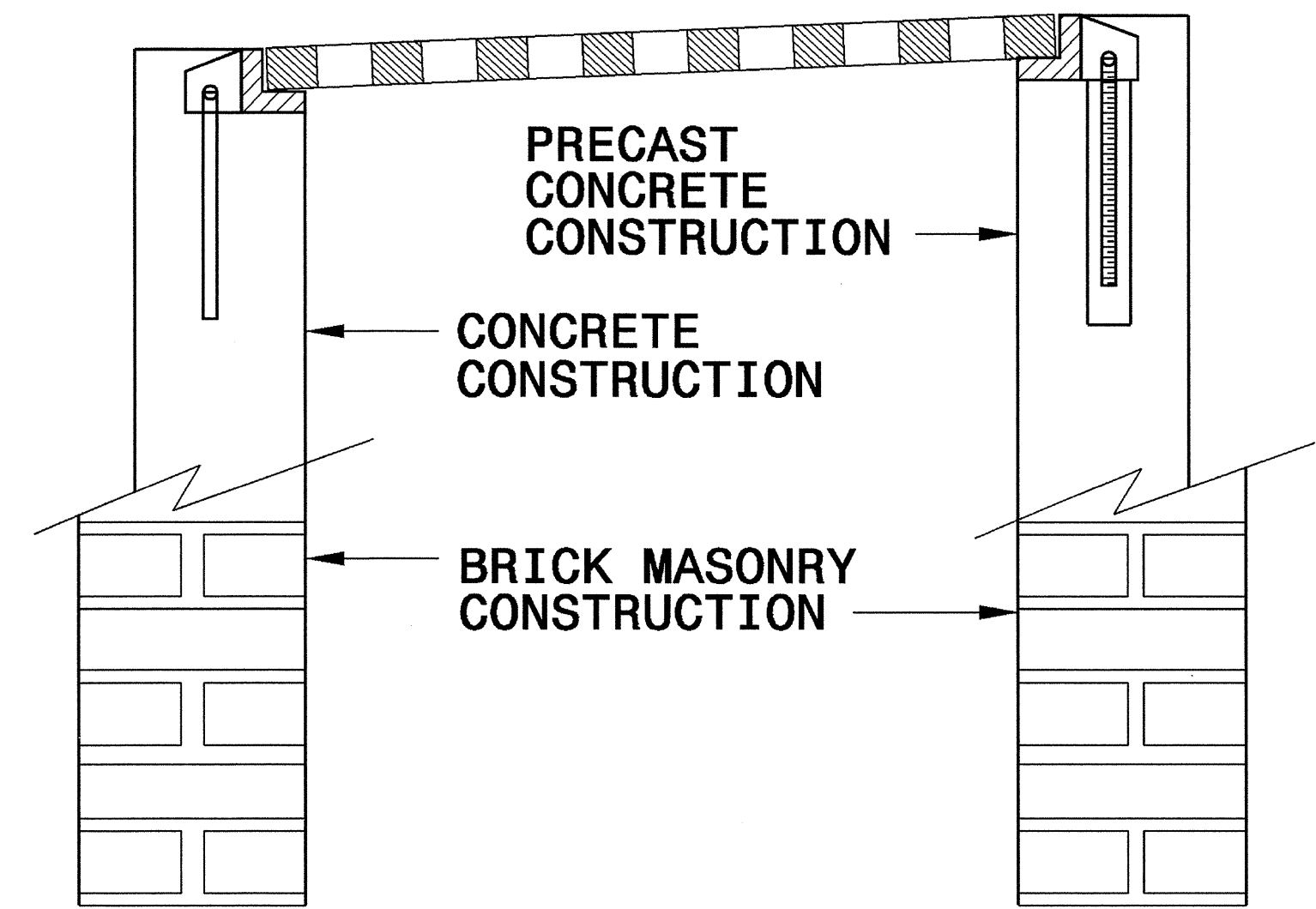
**MASONRY ANCHOR**  
3/8" DIA. BOLT WITH PLATE



**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**

27-SEP-2006 08:59 S:\Contracts\Special Details\ericward\stds\06\stds to Special Details\84025 Anchorage for Frames\0840d25.dgn ericward AT P5222293


NORTH CAROLINA  
PROFESSIONAL  
SEAL  
022966  
ENGINEER  
JOEL S. HOWERY  
9/26/07

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

**SEE PLATE FOR TITLE**

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

# STANDARD TEMPORARY MSE WALL OPTIONS

<b>PROJECT REFERENCE NO.</b> B-405A		<b>SHEET</b> 2-B
GEOTECHNICAL ENGINEER	ENGINEER	
		
Scott A. Shidden SIGNATURE		DATE

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

FOR STANDARD TEMPORARY MSE WALLS, SEE TEMPORARY SHORING SPECIAL PROVISION.

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

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

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

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

STANDARD TEMPORARY MSE WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:

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

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

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

- EXCAVATE AS NECESSARY FOR STANDARD TEMPORARY MSE WALLS IN ACCORDANCE WITH THE FOLLOWING FOR THE WALL OPTION CHOSEN:
- 1) MINIMUM EMBEDMENT OF 18" (450mm) UNLESS WALL BEARS ON ROCK, CONCRETE OR PAVEMENT AS DETERMINED BY THE ENGINEER
  - 2) VERTICAL STEPS IN INCREMENT 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, DEFLECT, SKEW AND MODIFY REINFORCEMENT.

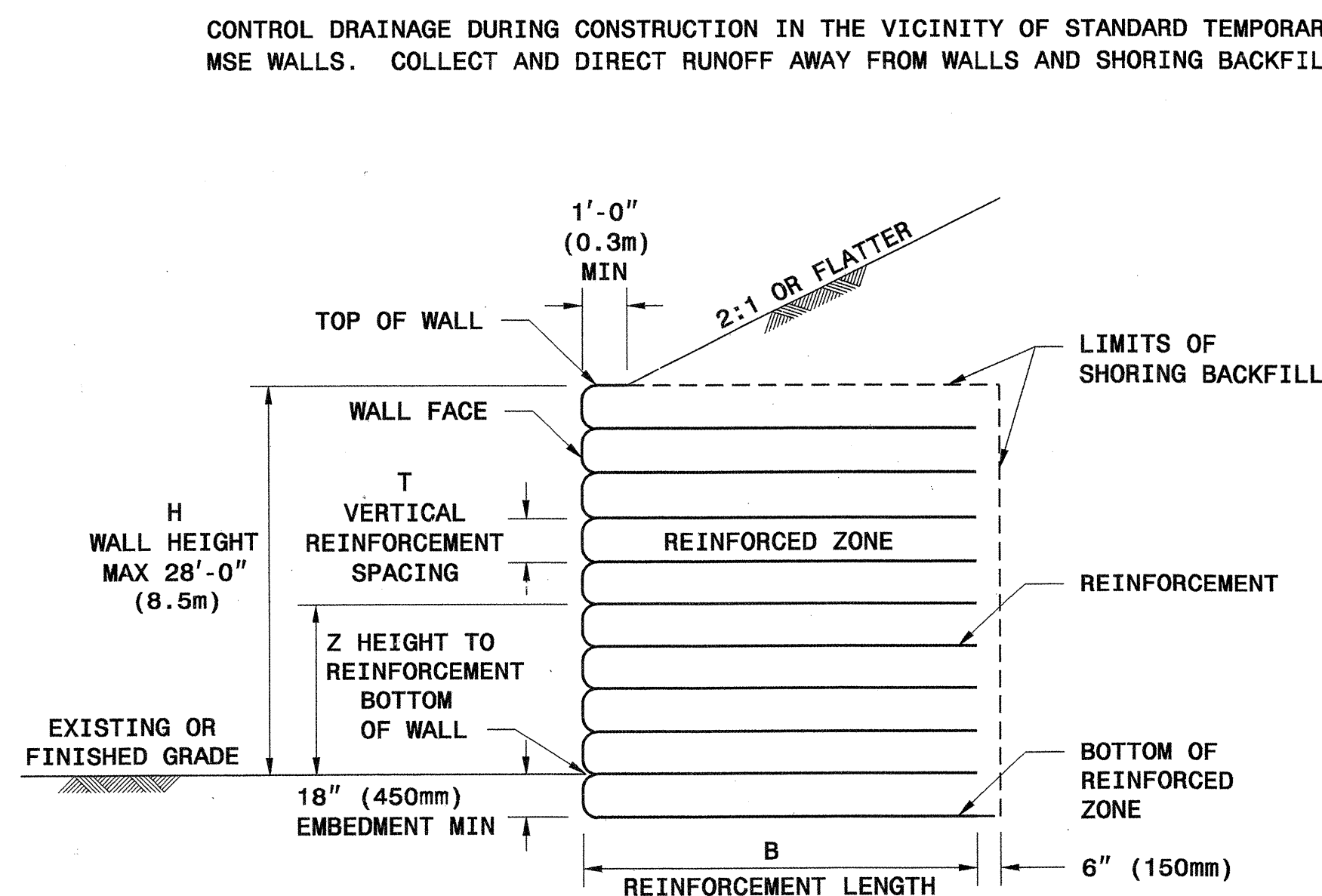
PLACE SHORING BACKFILL IN 8" TO 10" (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

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

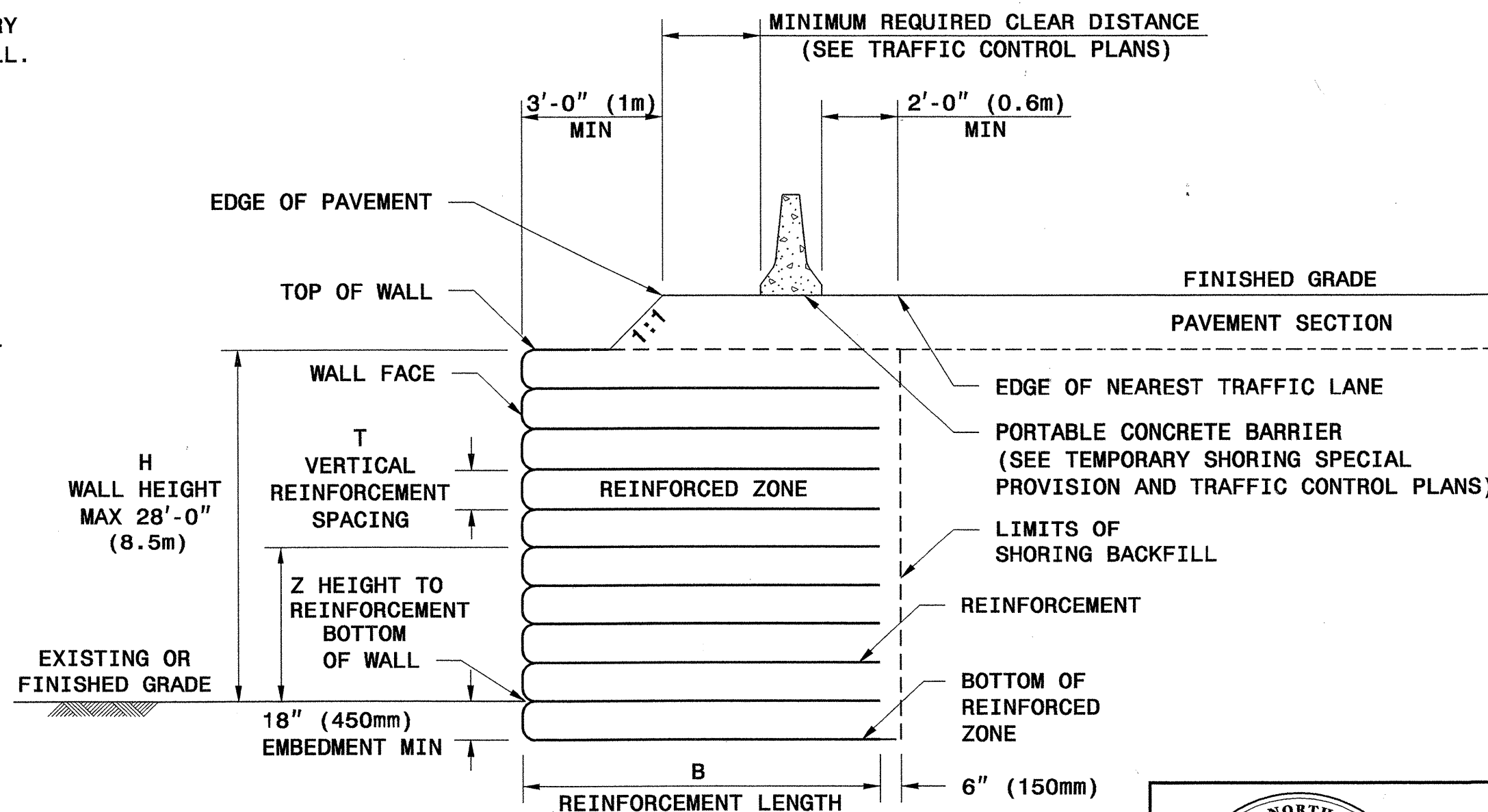
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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

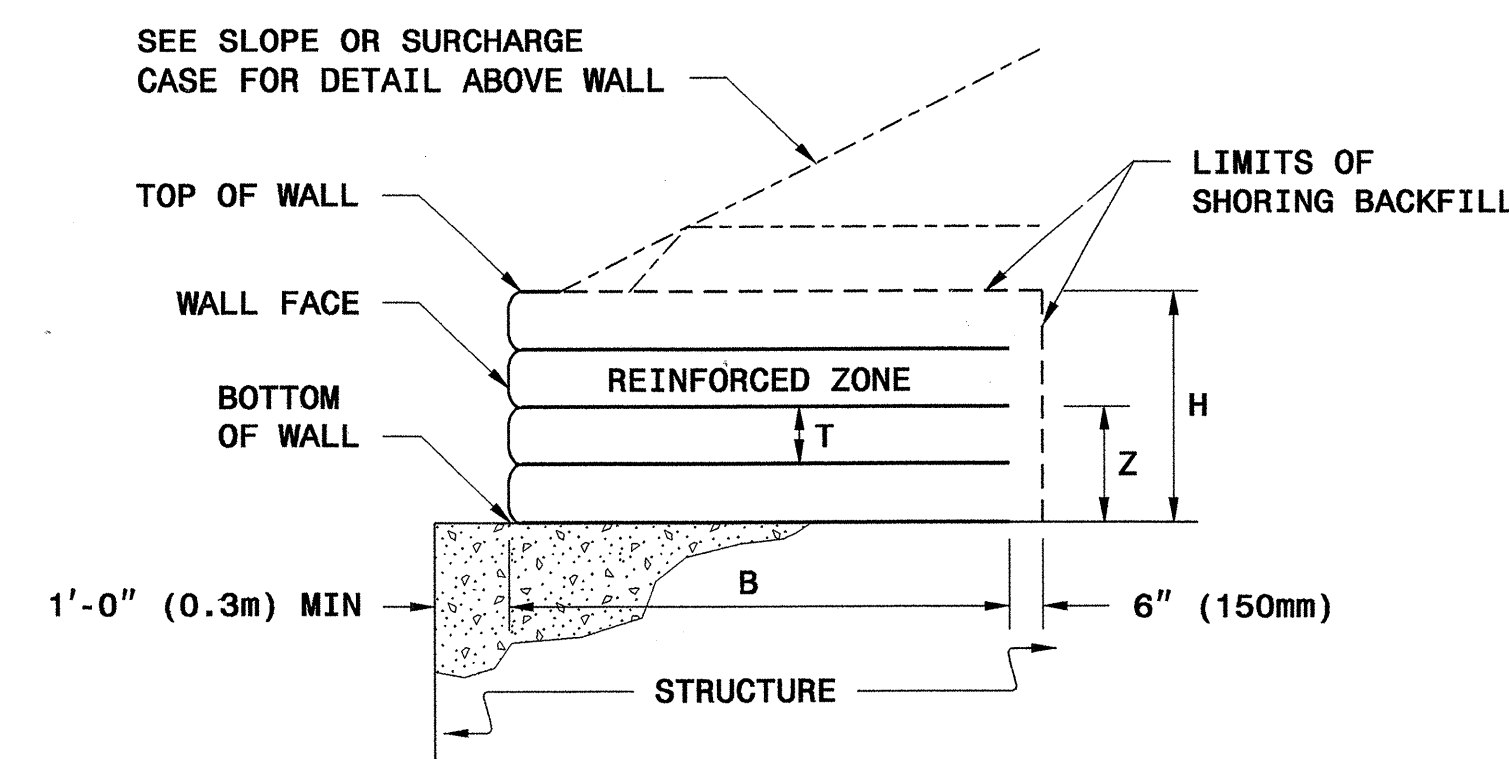
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



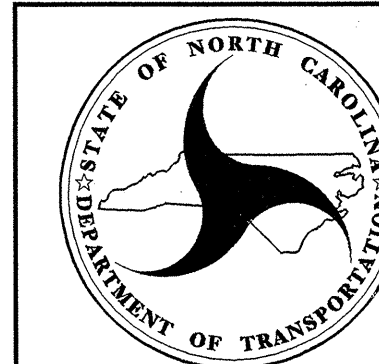
**SLOPE CASE**



**SURCHARGE CASE**



**TEMPORARY MSE WALL ON STRUCTURE**



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

STANDARD DRAWING NO. 1801.02

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

SHEET 1 OF 11      DATE: 2-20-07

GEOTECHNICAL ENGINEER ENGINEER

Scott A. Shidden 3/29/07

# 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

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

TERRATREL TEMPORARY WALL (STRIPS PER LEVEL PER PANEL)

H (FT)		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	Z (FT-INCHES)
SLOPE AND SURCHARGE CASES		3	3	3	3	3	3	3	3	3	3	3	3	27 - 8
		3	3	3	3	3	3	3	3	3	3	3	3	26 - 10
		3	3	3	3	3	3	3	3	3	3	3	3	25 - 2
		3	3	3	3	3	3	3	3	3	3	3	3	23 - 6
		3	3	3	3	3	3	3	3	3	3	3	3	21 - 10
		3	3	3	3	3	3	3	3	3	3	3	3	20 - 2
		3	3	3	3	3	3	3	3	3	3	3	3	18 - 6
		3	3	3	3	3	3	3	3	3	3	3	3	16 - 10
		3	3	3	3	3	3	3	3	3	3	3	3	15 - 2
		4	4	4	4	4	4	4	4	4	4	4	4	13 - 6
		4	4	4	4	4	4	4	4	4	4	4	4	11 - 10
		5	5	5	5	5	5	5	5	5	5	5	5	10 - 2
		5	5	5	5	5	5	5	5	5	5	5	5	8 - 6
		5	5	5	5	5	5	5	5	5	5	5	5	6 - 10
		5	5	5	5	5	5	5	5	5	5	5	5	5 - 2
		5	5	5	5	5	5	5	5	5	5	5	5	3 - 6
		5	5	5	5	5	5	5	5	5	5	5	5	1 - 10
		5	5	5	5	5	5	5	5	5	5	5	5	0 - 2
		5	5	5	5	5	5	5	5	5	5	5	5	-0 - 8

SIERRASCAPE TEMPORARY WALL (GEOGRID TYPE)

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

H (FT)		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	Z (FT)
SLOPE CASE		11	11	11	11	11	11	11	11	11	11	11	11	26.5
		11	11	11	11	11	11	11	11	11	11	11	11	25.5
		11	11	11	11	11	11	11	11	11	11	11	11	24
		11	11	11	11	11	11	11	11	11	11	11	11	22.5
		11	11	11	11	11	11	11	11	11	11	11	11	21
		11	11	11	11	11	11	11	11	11	11	11	11	19.5
		11	11	11	11	11	11	11	11	11	11	11	11	18
		11	11	11	11	11	11	11	11	11	11	11	11	16.5
		11	11	11	11	11	11	11	11	11	11	11	11	15
		11	11	11	11	11	11	11	11	11	11	11	11	13.5
		11	11	11	11	11	11	11	11	11	11	11	11	12
		11	11	11	11	11	11	11	11	11	11	11	11	10.5
		11	11	11	11	11	11	11	11	11	11	11	11	9
		11	11	11	11	11	11	11	11	11	11	11	11	7.5
		11	11	11	11	11	11	11	11	11	11	11	11	6
		11	11	11	11	11	11	11	11	11	11	11	11	4.5
		11	11	11	11	11	11	11	11	11	11	11	11	3
		11	11	11	11	11	11	11	11	11	11	11	11	1.5
		11	11	11	11	11	11	11	11	11	11	11	11	0
		11	11	11	11	11	11	11	11	11	11	11	11	-1.5

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 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	Z (FT)
SLOPE CASE		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	26
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	24
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	22
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	20
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	18
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	16
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	14
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	12
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	10
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	8
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	6
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	2
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	0
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	1
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	0
		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	-1.5

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 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	Z (FT-INCHES)
SLOPE AND SURCHARGE CASES		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	27 - 6
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	26 - 10
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	25 - 2
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	23 - 6
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	21 - 10
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	20 - 2
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	18 - 6
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	16 - 10
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	15 - 2
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	13 - 6
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	11 - 10
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	10 - 2
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	8 - 6
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	6 - 10
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	5 - 2
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3 - 6
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	1 - 10
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	0 - 2
		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	-1 - 6

NOTES FOR HILFIKER TEMPORARY WALL

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

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

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

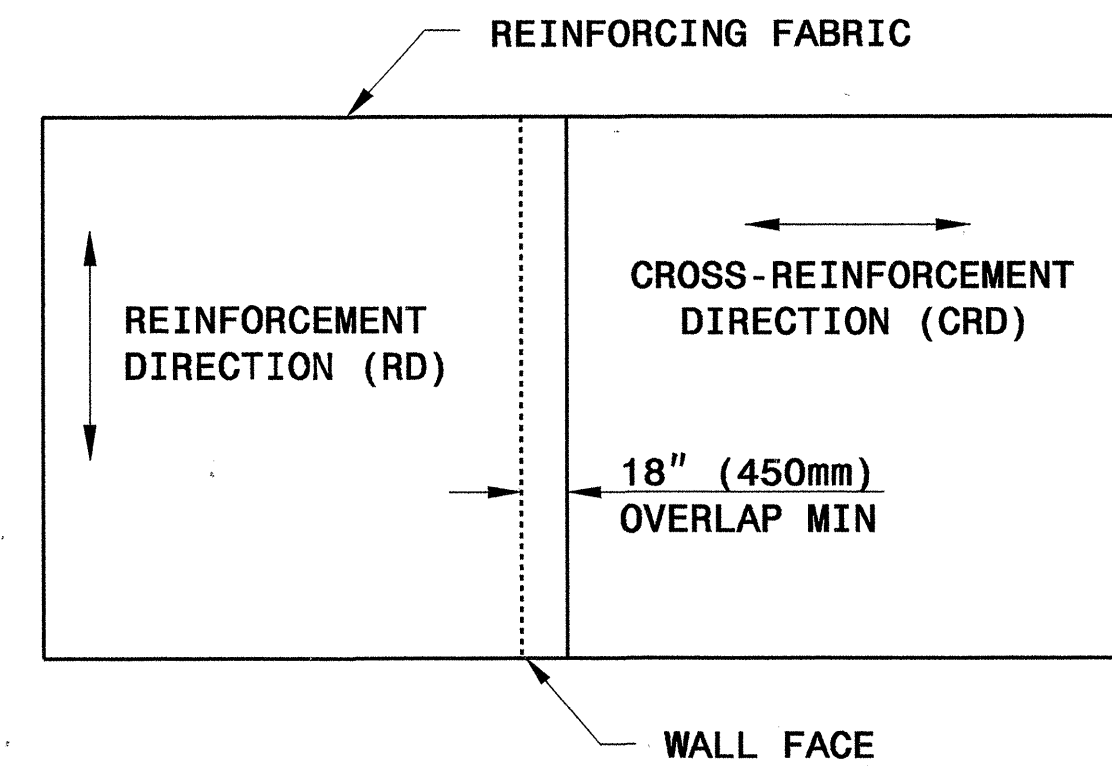
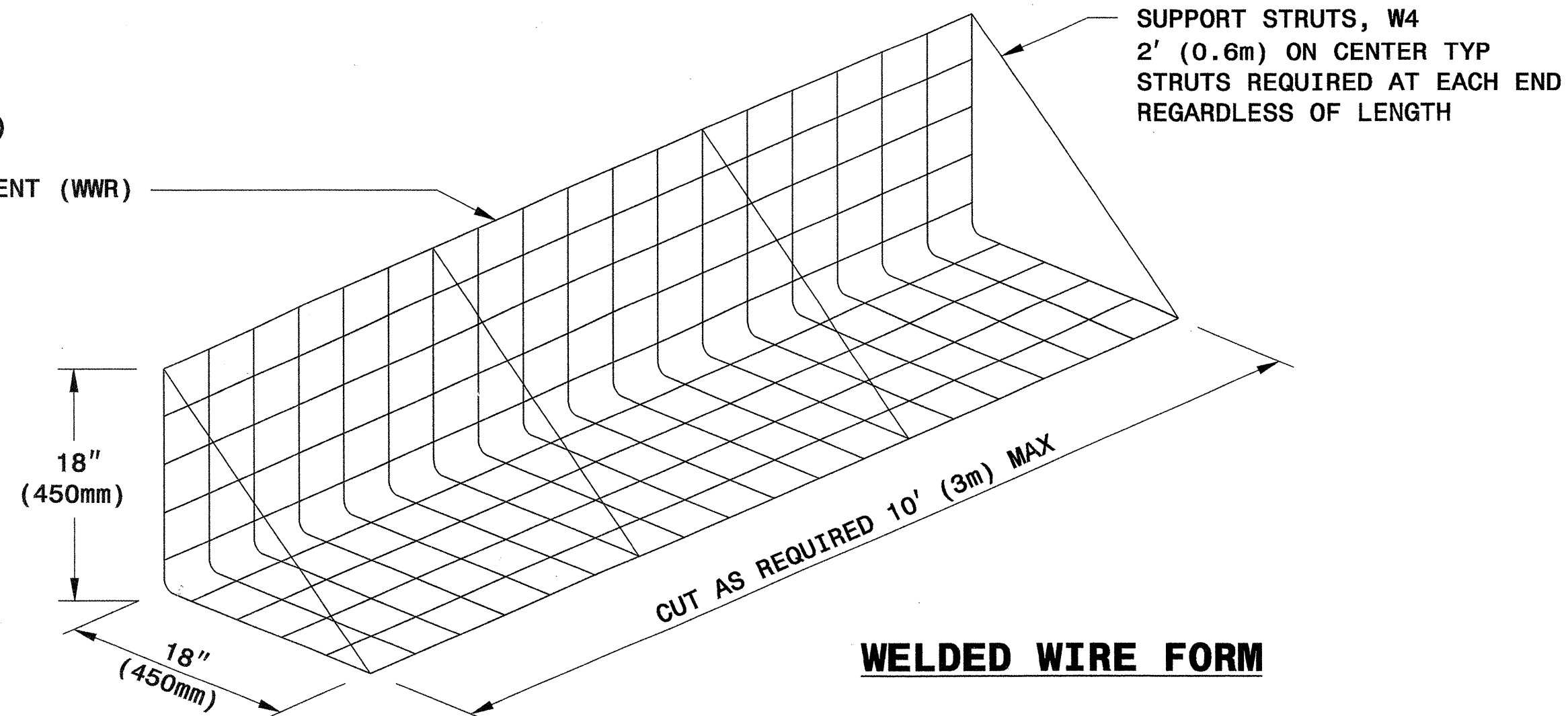
SHEET 2 OF 11 DATE: 2-20-07



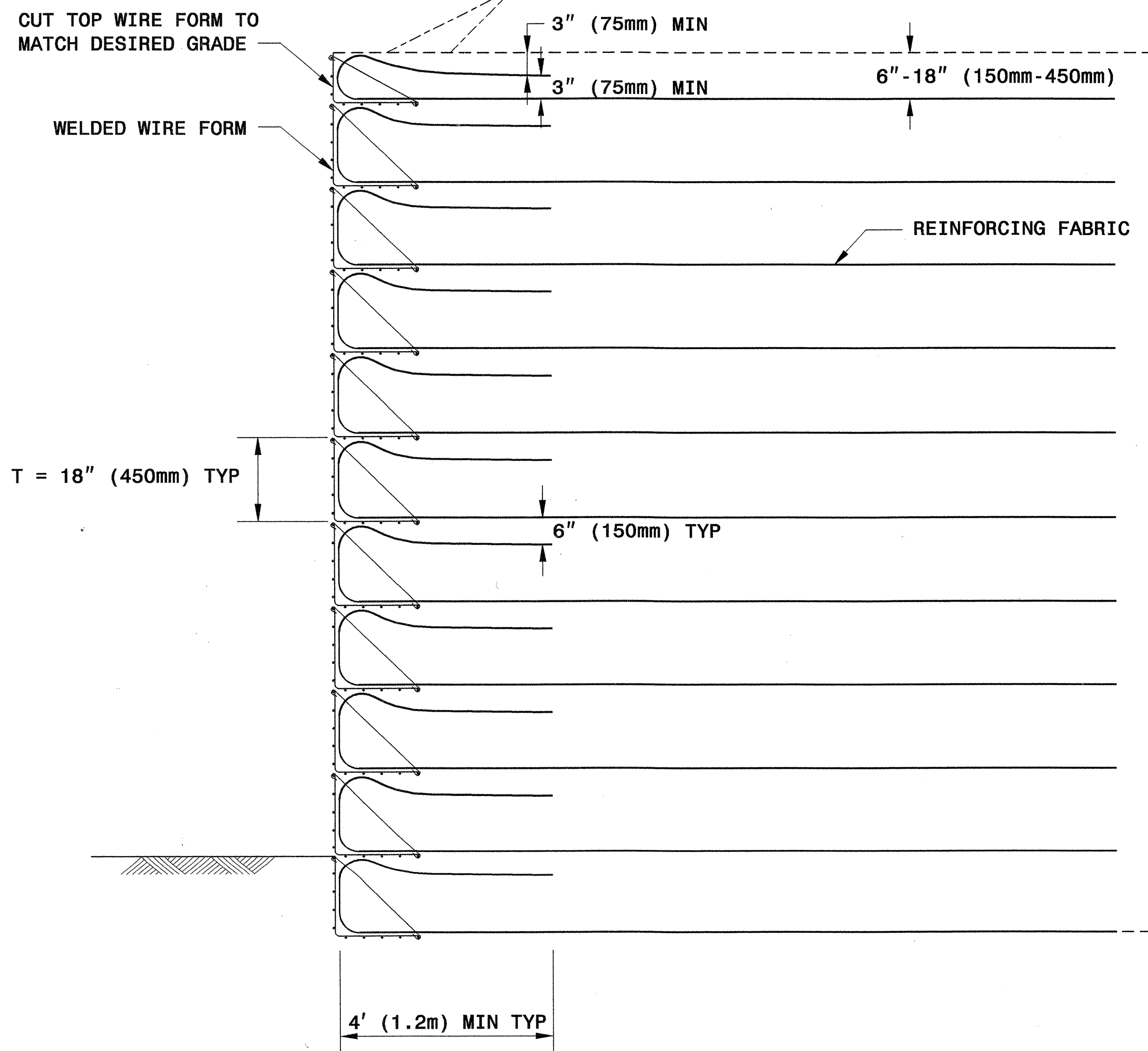


Signature: *Scott A. Hadden* 3/29/07  
 DATE: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

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



PLAN VIEW OF FABRIC OVERLAP

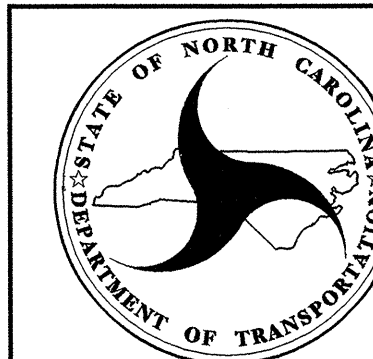


TYPICAL SECTION

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

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

\*RD = REINFORCEMENT DIRECTION



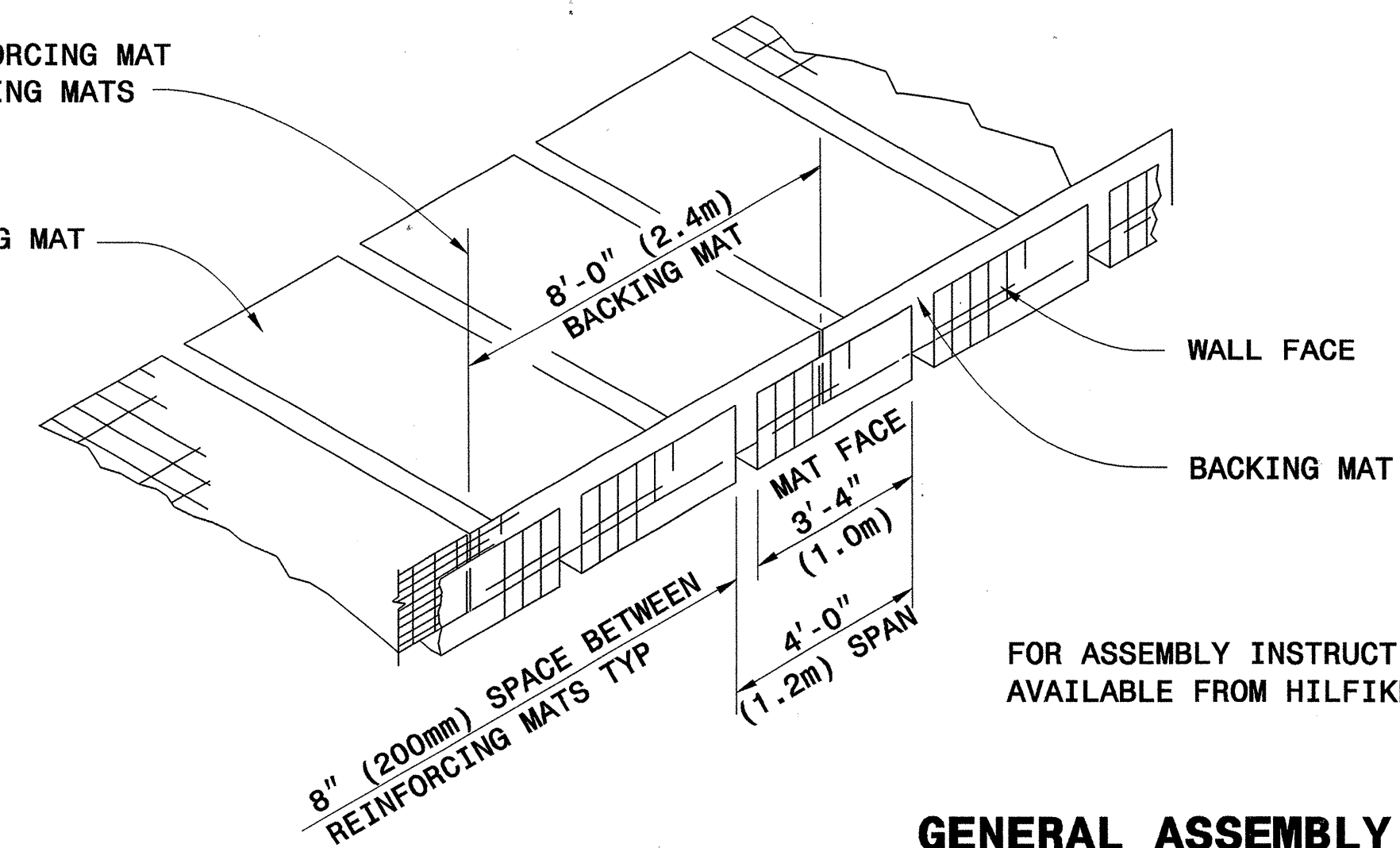
**GEOTECHNICAL ENGINEERING UNIT**  
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 RALEIGH

STANDARD DRAWING NO. 1801.02

TEMPORARY FABRIC WALL

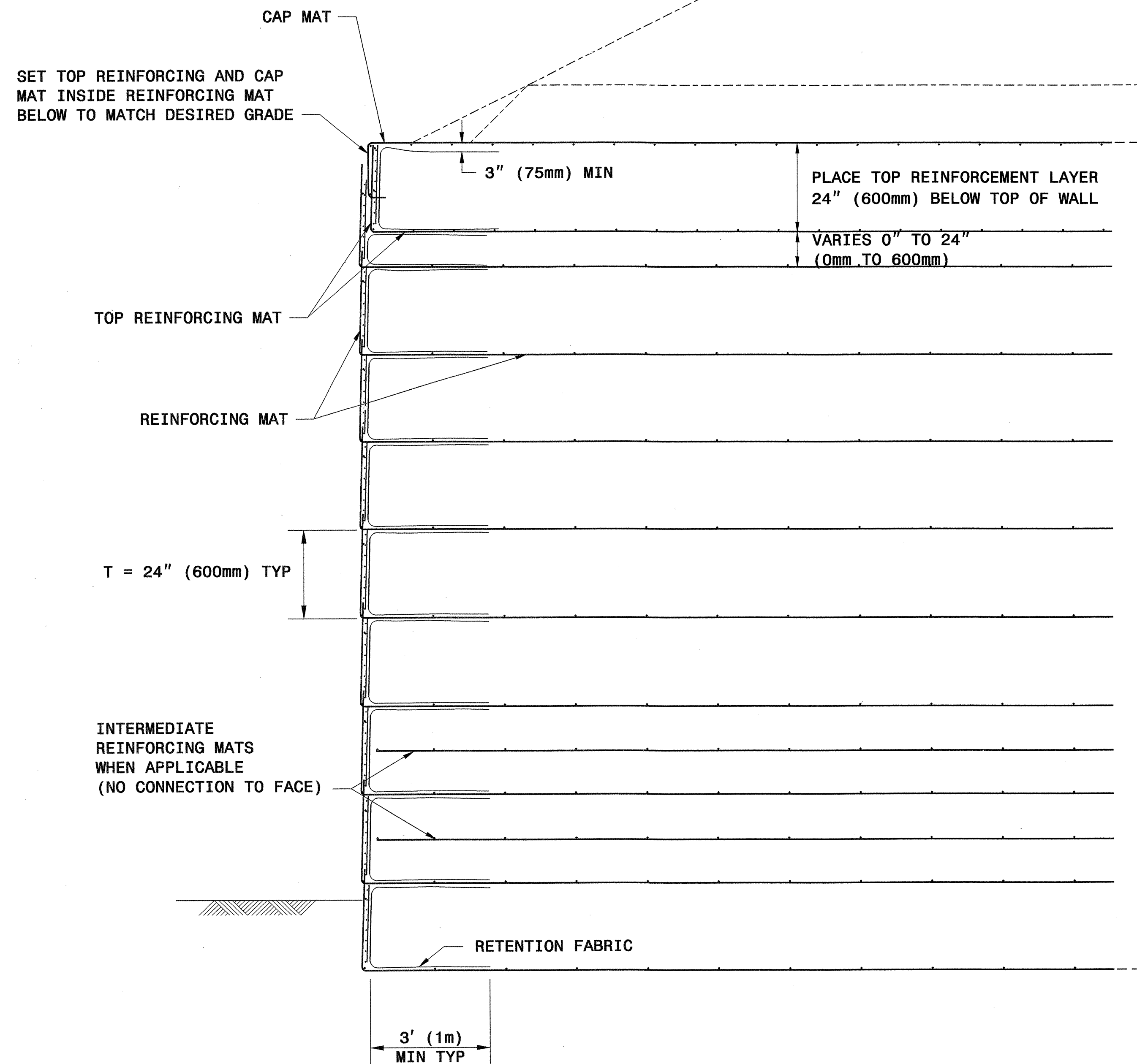
CENTERLINE OF REINFORCING MAT  
FACE = EDGE OF BACKING MATS

REINFORCING MAT



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

**GENERAL ASSEMBLY DETAIL**



**TYPICAL SECTION**

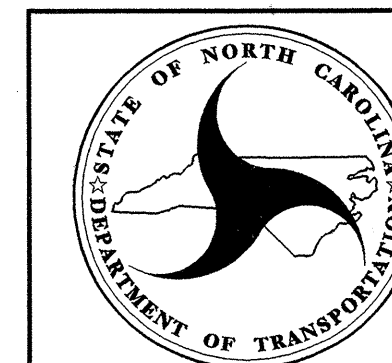
8" X 12" (203mm X 305mm)  
W4.5 X W3.5 (MW29 X MW23)  
CAP MAT  
WELDED WIRE REINFORCEMENT (WWR)

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

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

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

**WALL COMPONENTS**



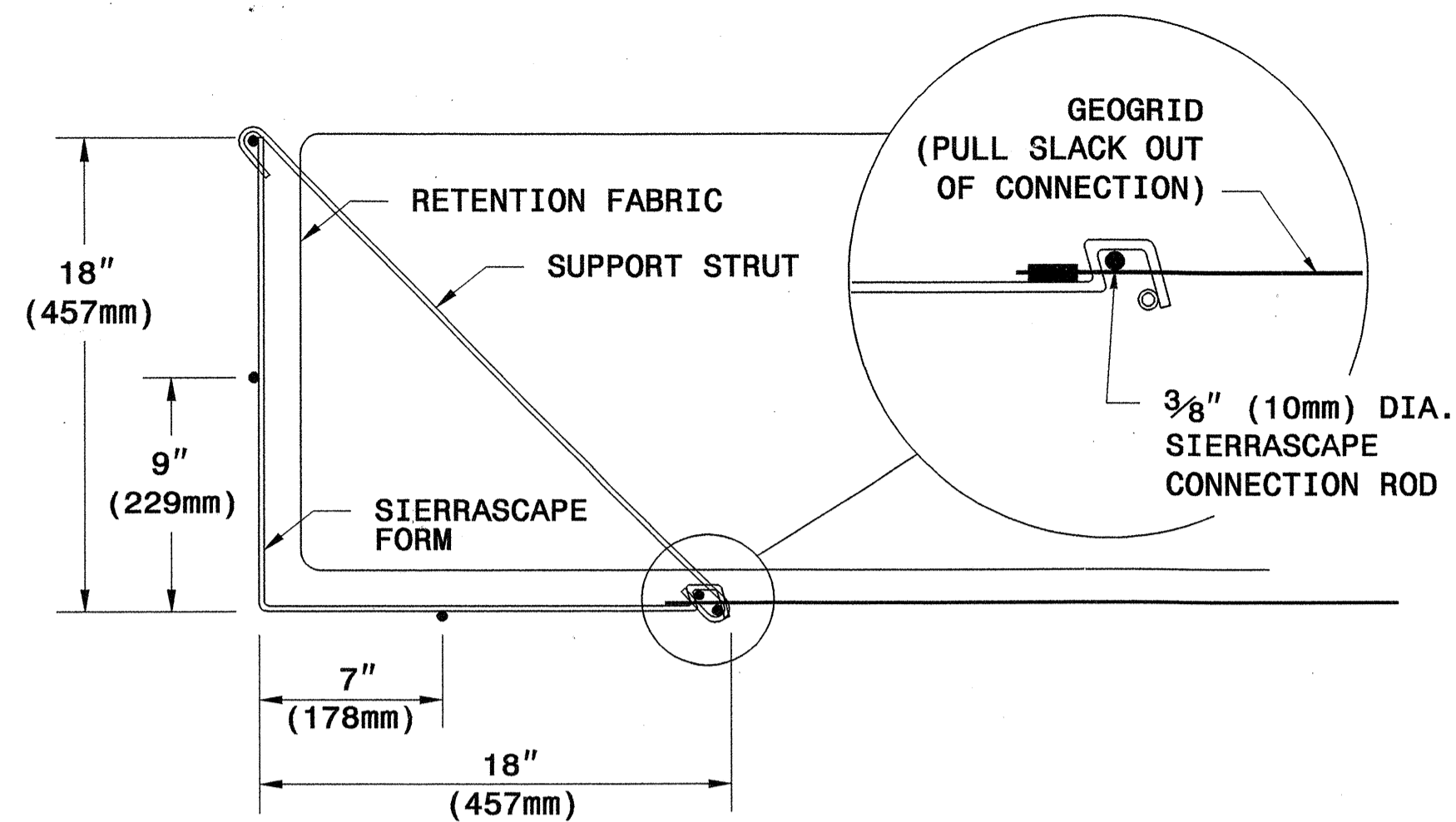
GEOTECHNICAL ENGINEER

ENGINEER



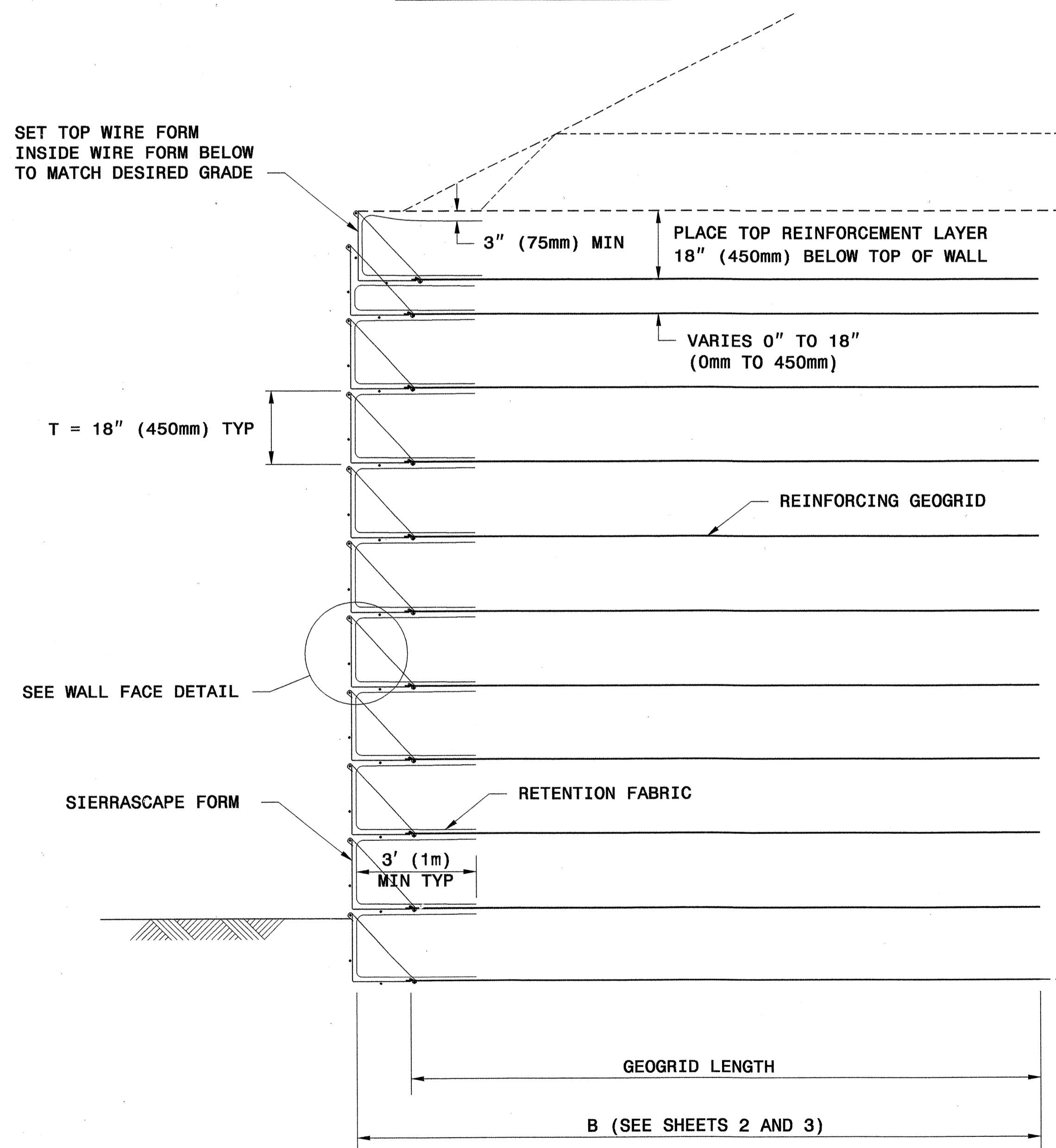
Scott A. Hadden 5/29/07  
SIGNATURE DATE

SIGNATURE DATE

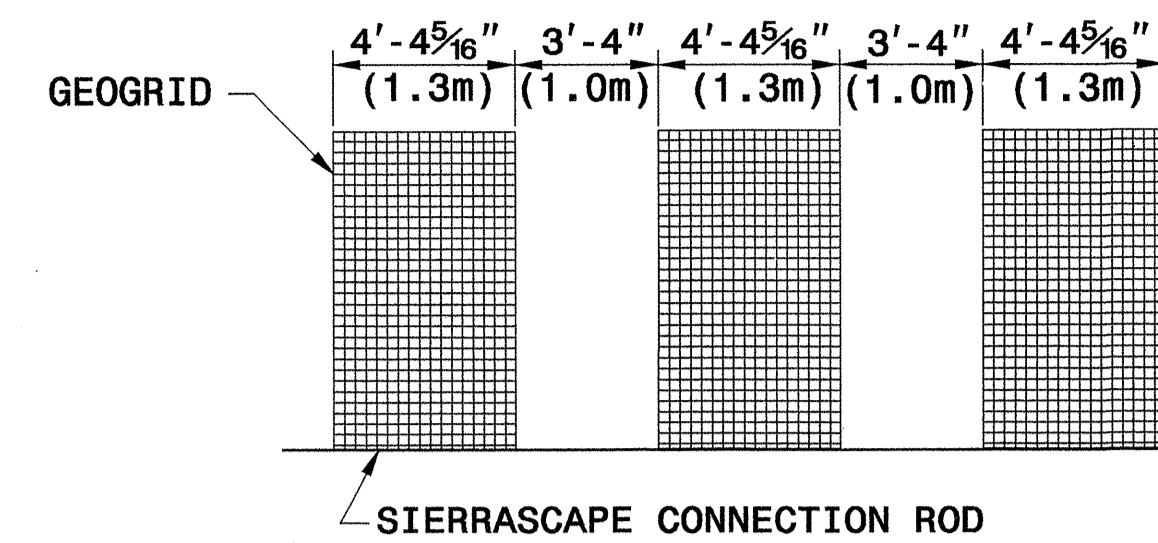


**WALL FACE DETAIL**

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

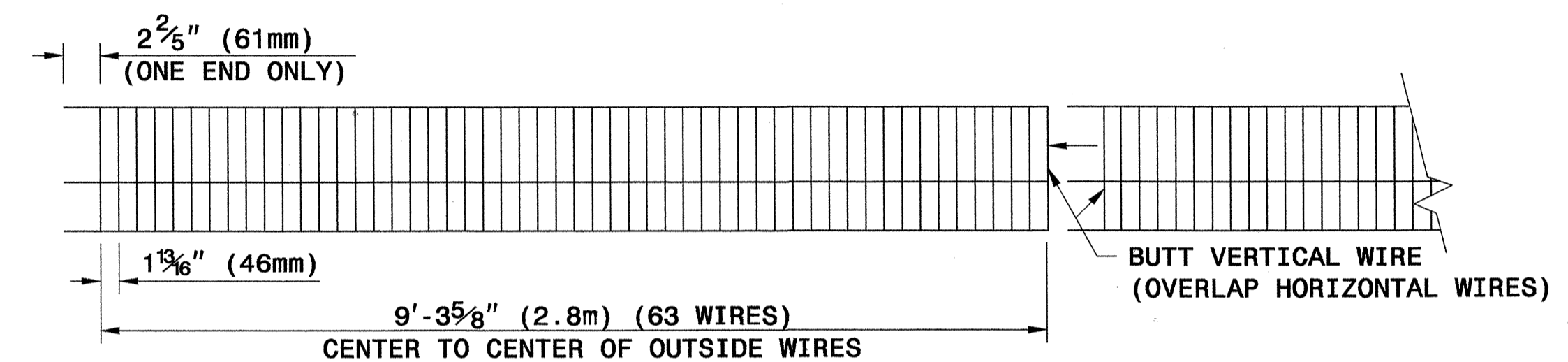


**TYPICAL SECTION**

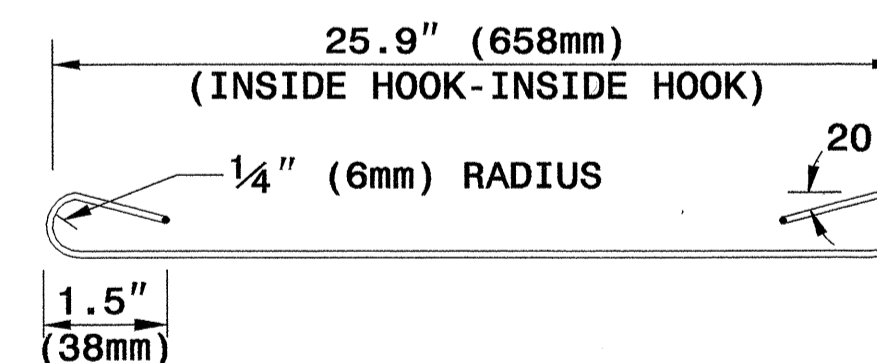


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

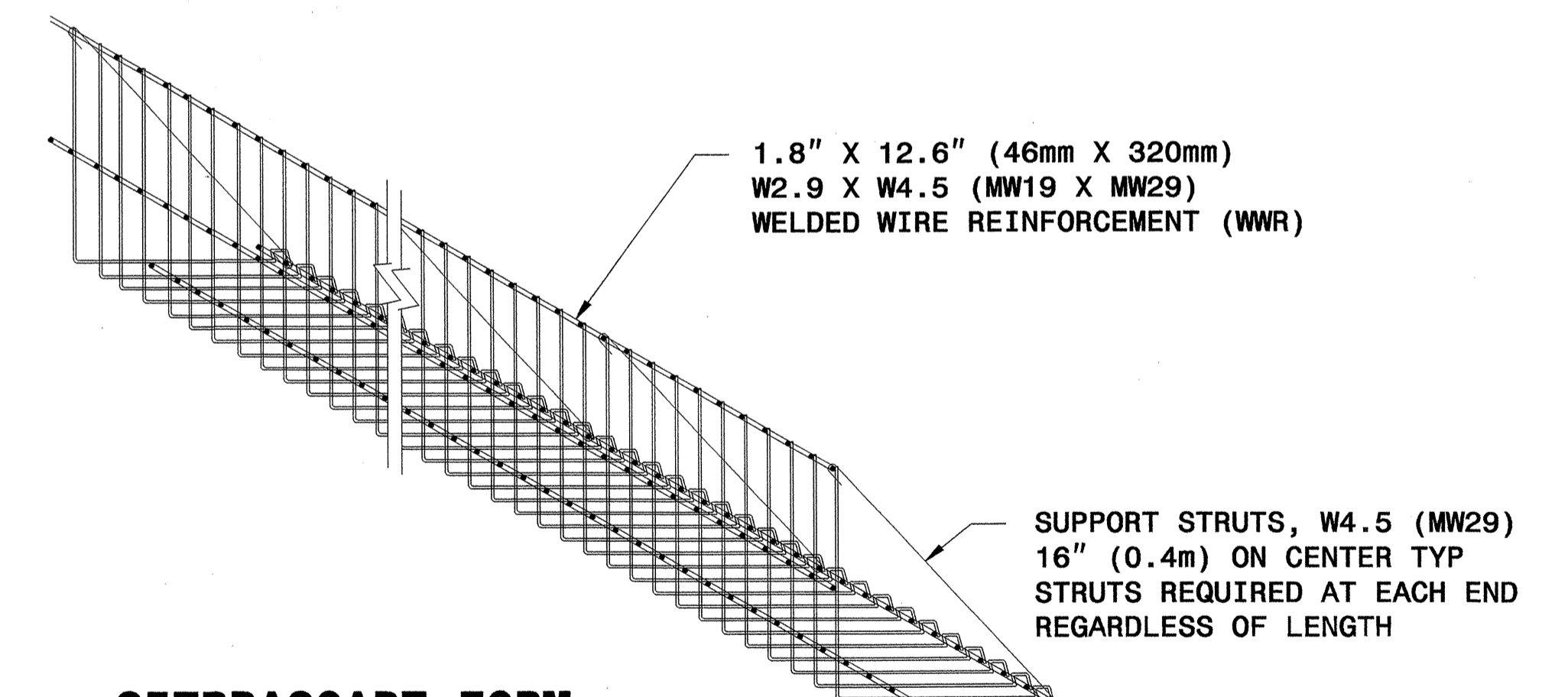
**TYPICAL GEOGRID COVERAGE**



**ELEVATION VIEW**

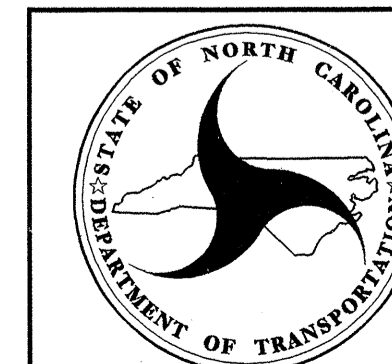
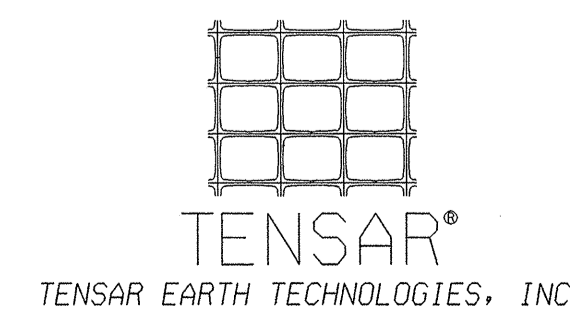


**SUPPORT STRUT**



**SIERRASCAPE FORM**

**WALL COMPONENTS**



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SIERRASCAPE  
TEMPORARY WALL

SHEET 5 OF 11

DATE: 12-19-06

GEOTECHNICAL ENGINEER

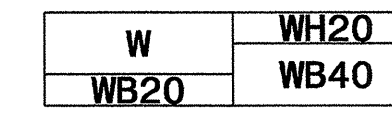
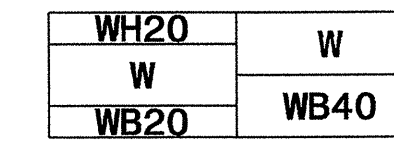
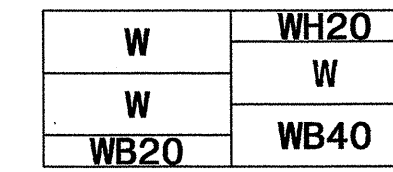
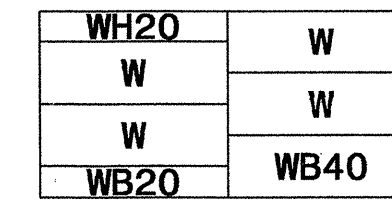
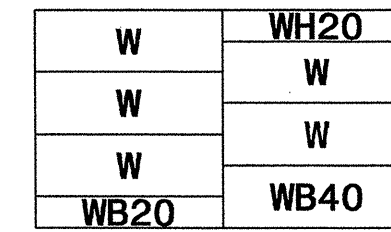
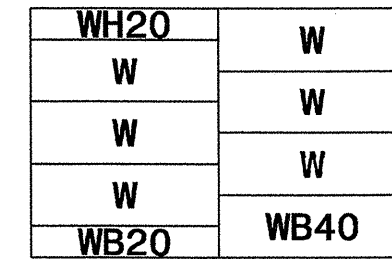
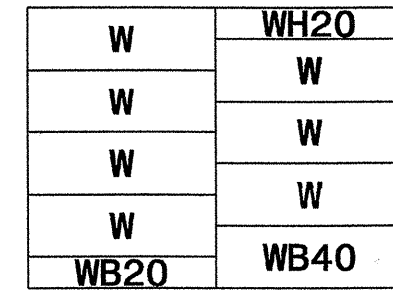
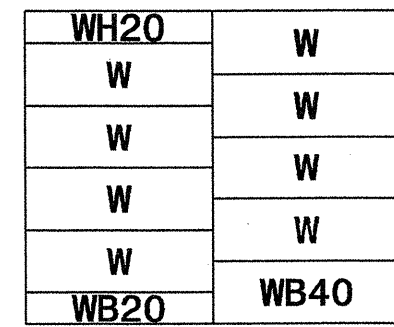
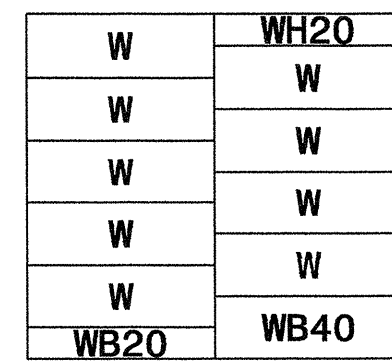
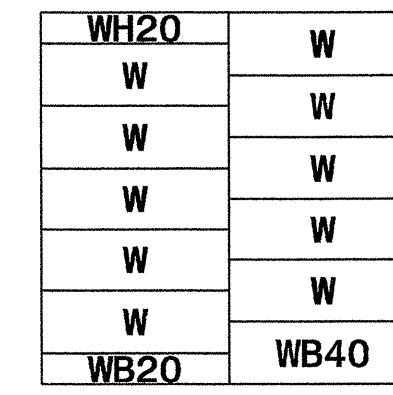
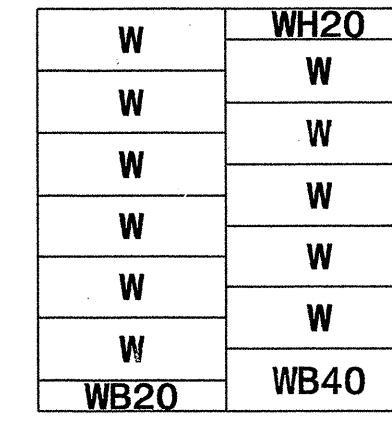
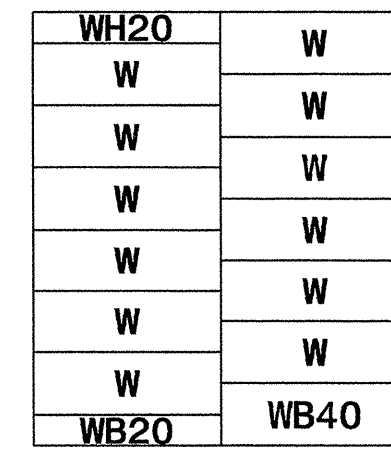
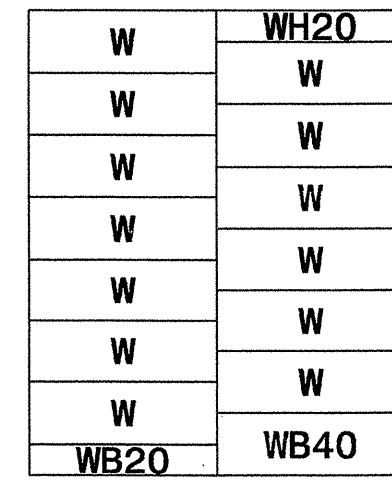
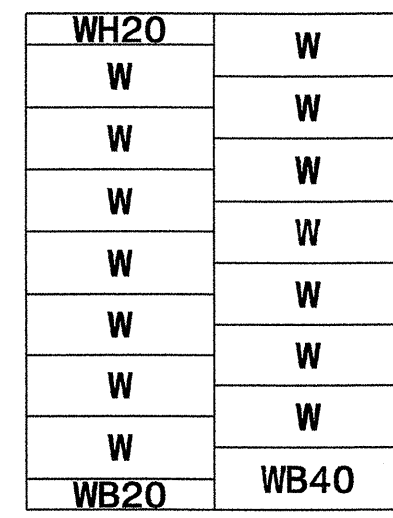
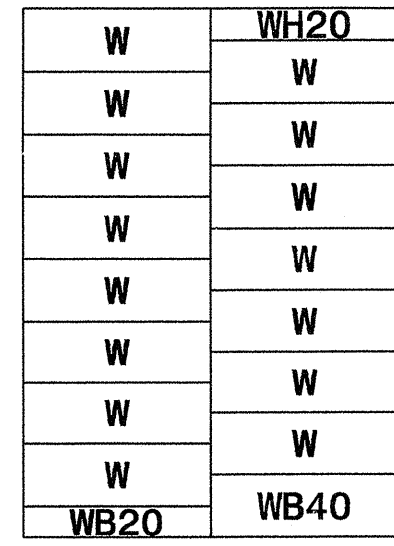
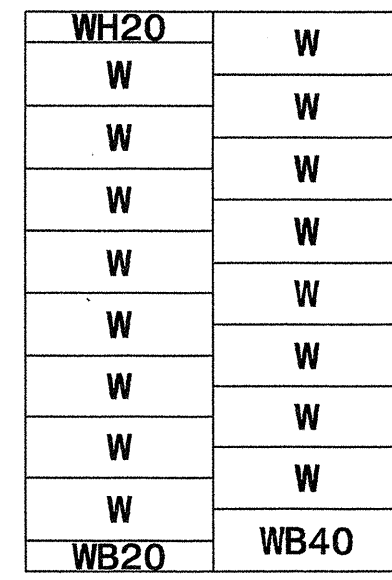
ENGINEER



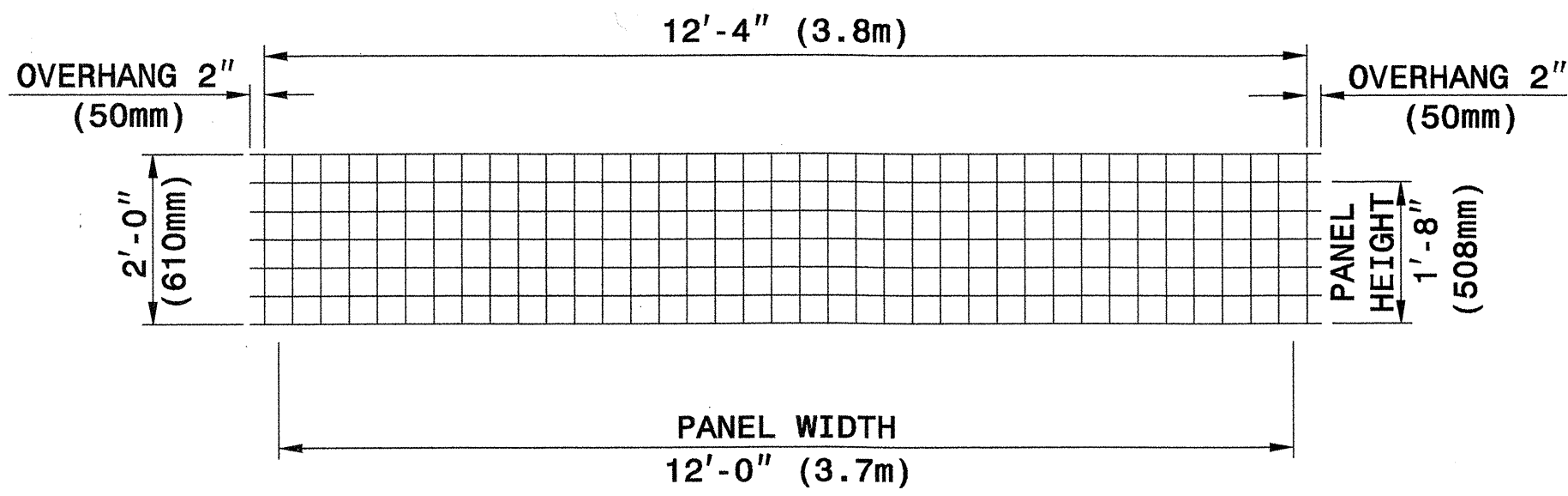
Scott A. Hadden 3/29/07

**PANEL LAYOUTS**

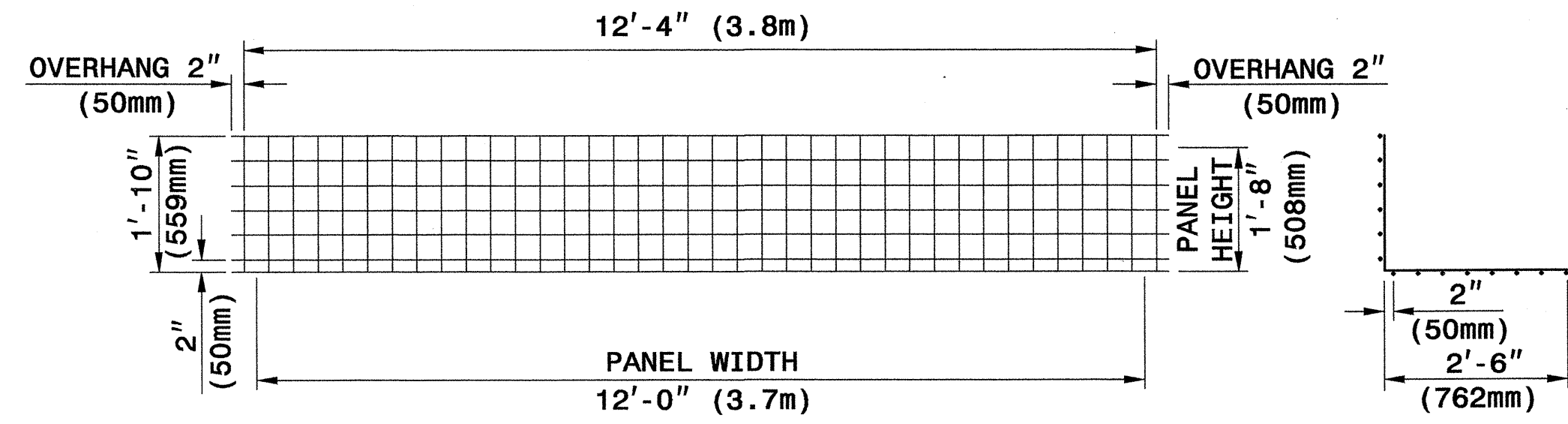
H - WALL HEIGHT  
(FEET-INCHES)  
(METER)



(FEET-INCHES)  
(METER)

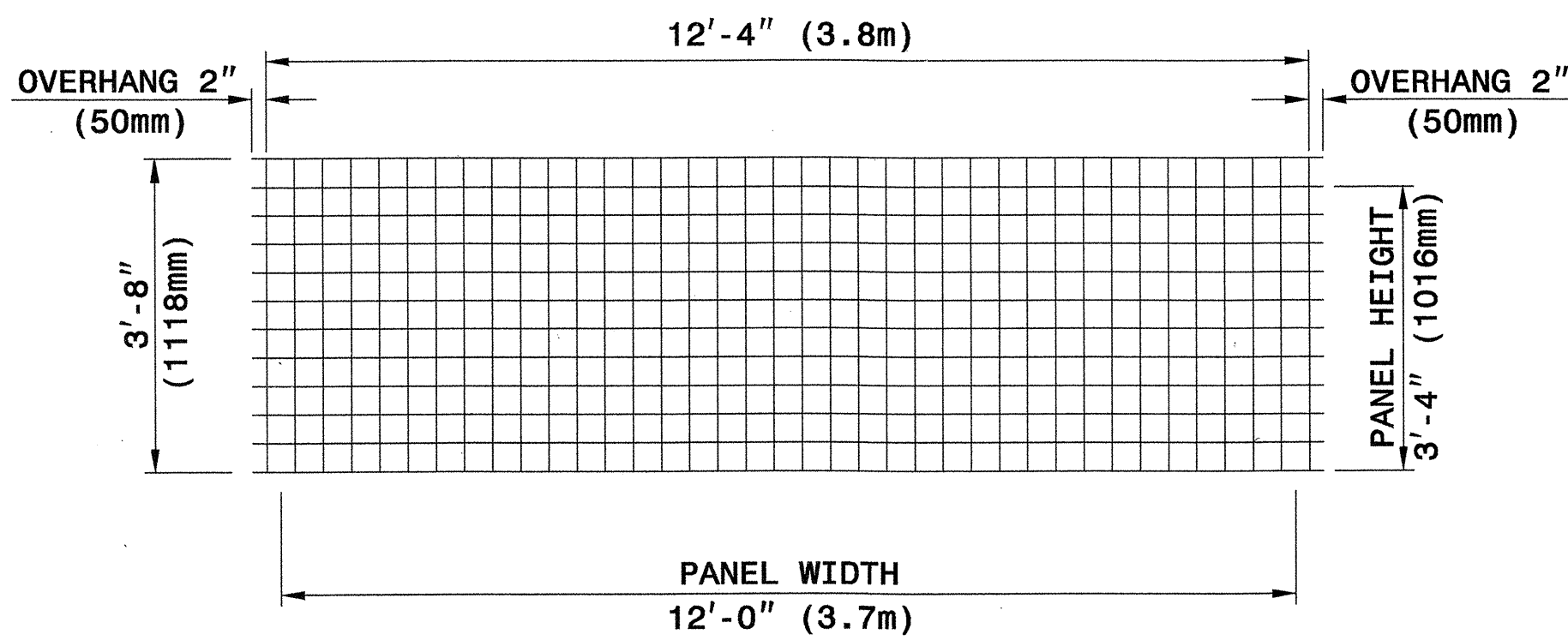


**TYPE WH20**

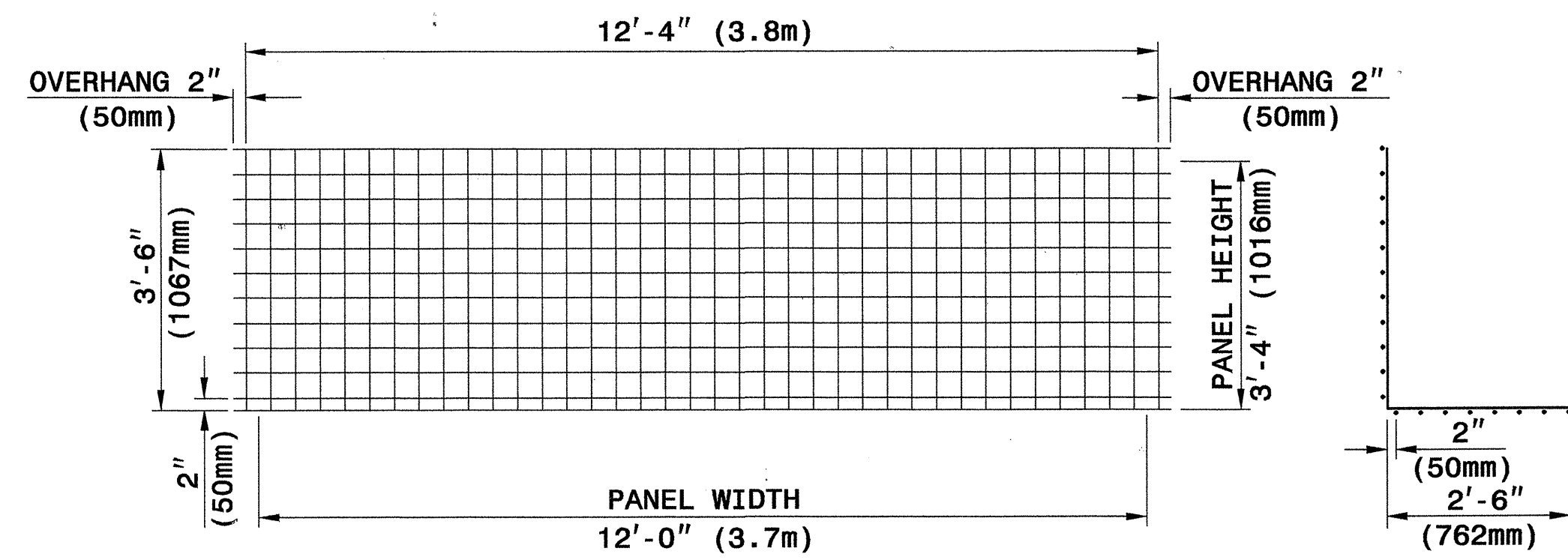


**TYPE WB20**

**SECTION**



**TYPE W**



**TYPE WB40**

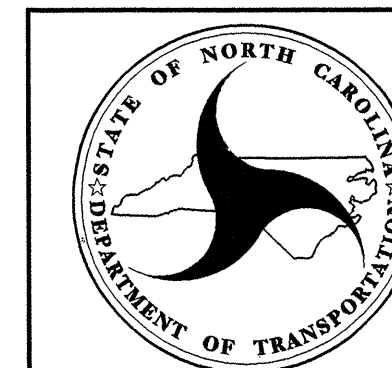
**SECTION**

**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)

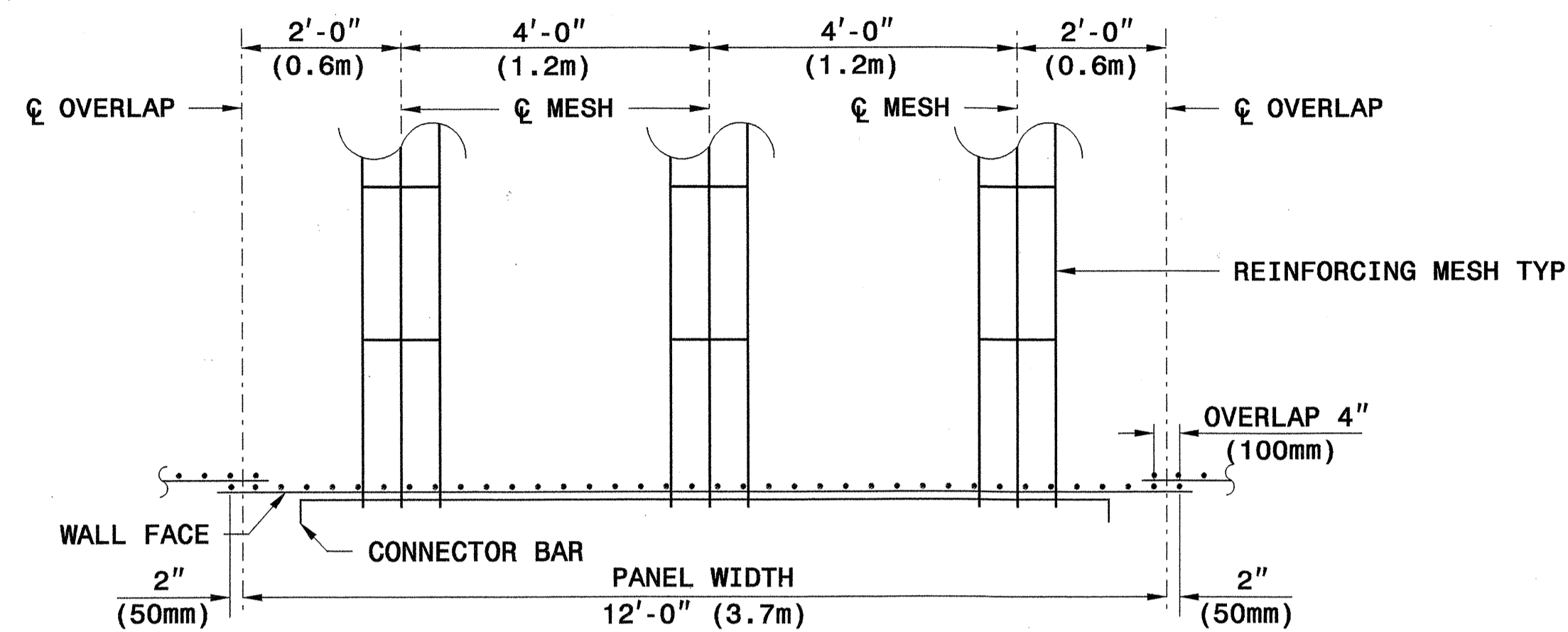


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STANDARD DRAWING NO. 1801.02

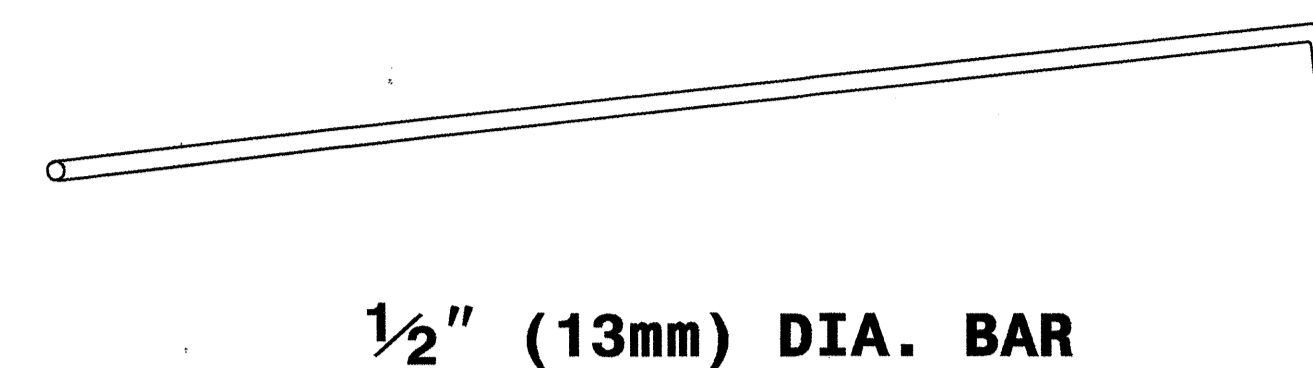
RETAINED EARTH  
TEMPORARY WALL

<b>PROJECT REFERENCE NO.</b>		<b>SHEET</b>	
B-4054		2-H	
GEOTECHNICAL ENGINEER		ENGINEER	
			
Signature: <i>Scott A. Shidden</i>		DATE: 3/29/07	

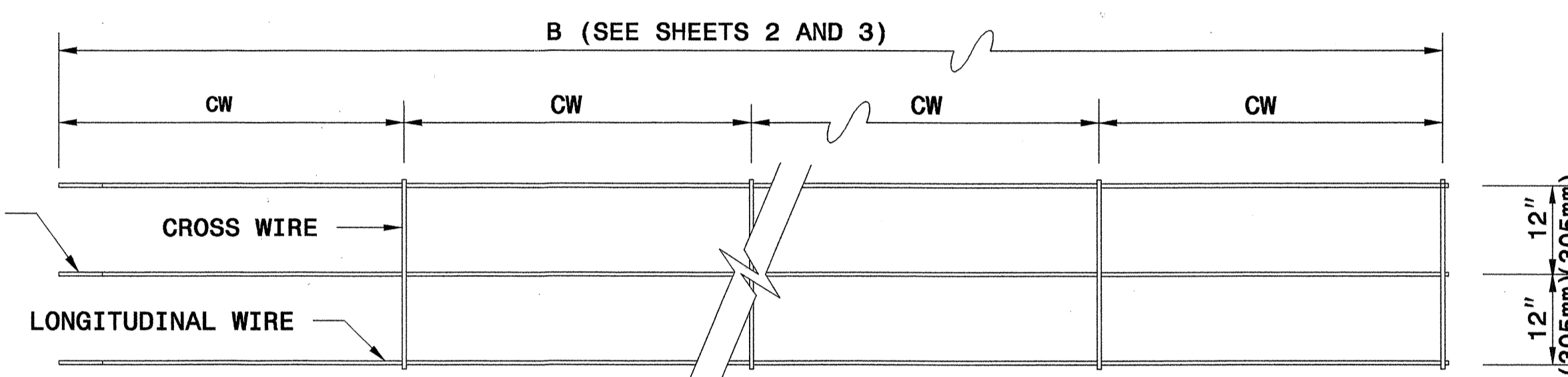


**REINFORCING MESH PLACEMENT DETAIL  
(PLAN VIEW)**

LOOPED END OF MESH  
(SEE REINFORCING MESH LOOP DETAIL)

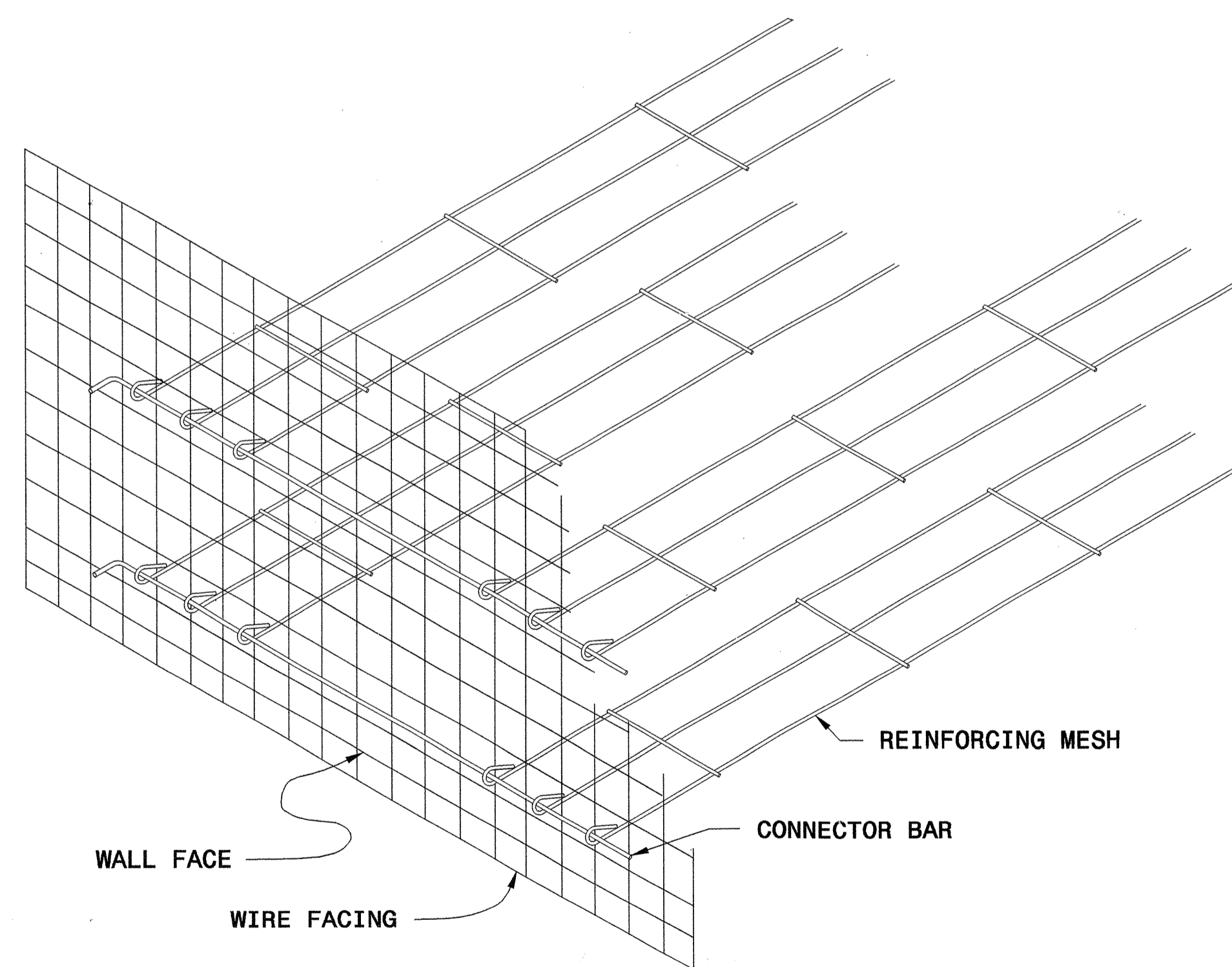


**CONNECTOR BAR**

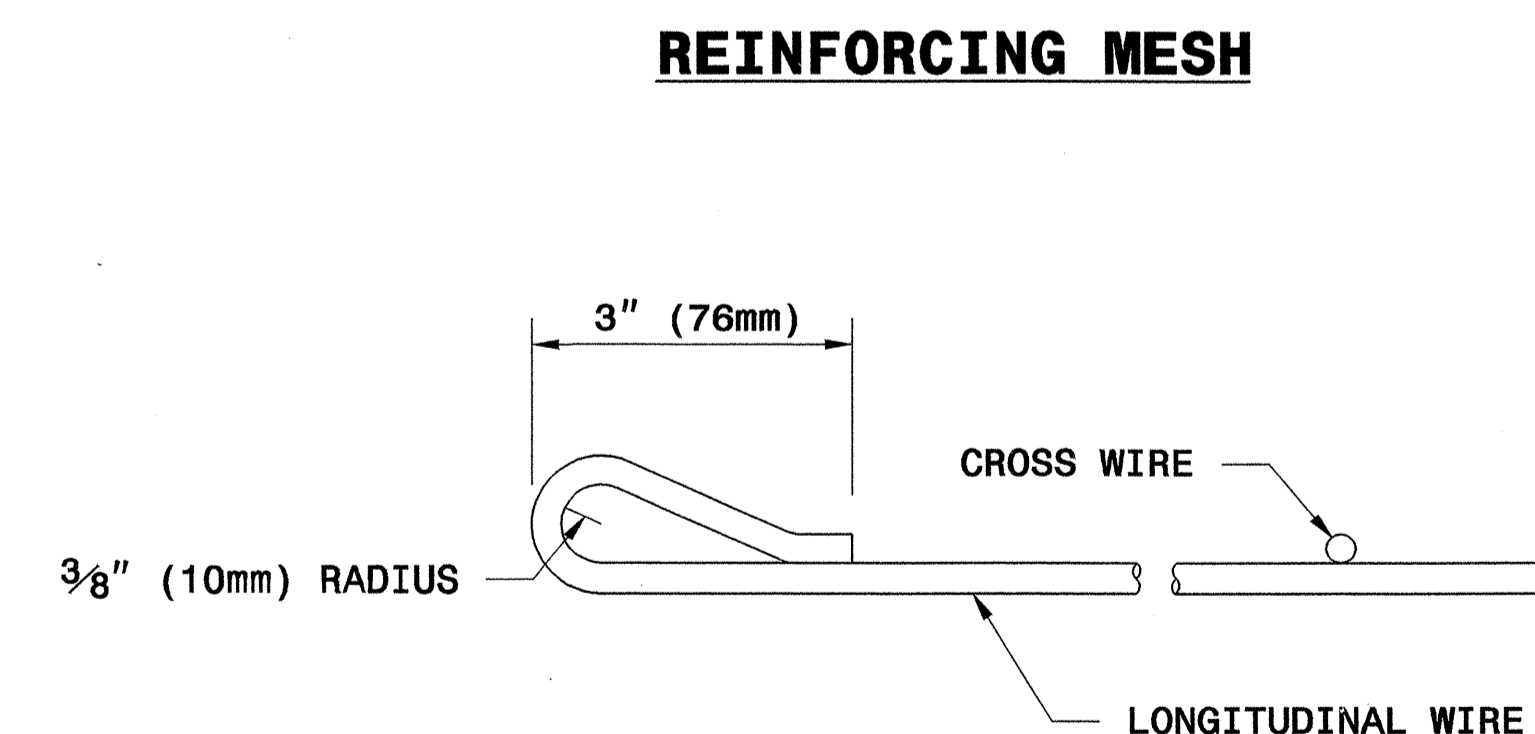


**3W8 X W8 x 2.0' (3MW52 X MW52 X 610mm)**  
 NO. OF LONGITUDINAL WIRES  
 GAUGE OF LONGITUDINAL WIRES  
 GAUGE OF CROSS WIRES  
 SPACING OF CROSS WIRES IN FT (mm), CW

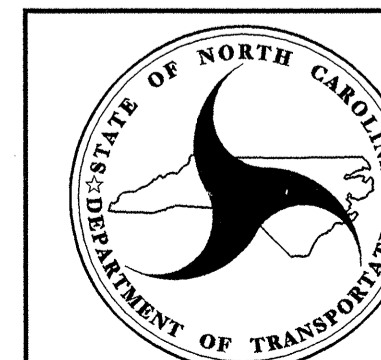
**REINFORCING MESH DESIGNATION**



**GENERAL ASSEMBLY DETAIL**



**REINFORCING MESH LOOP DETAIL**

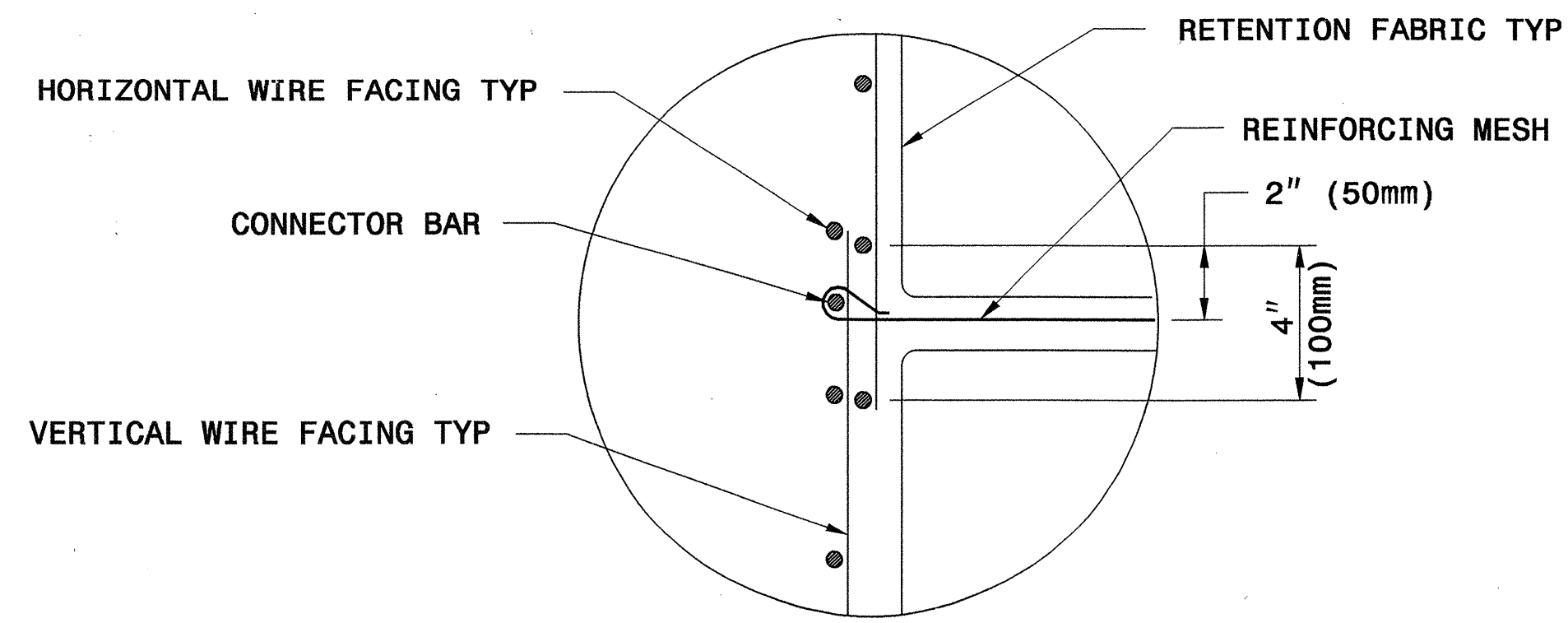


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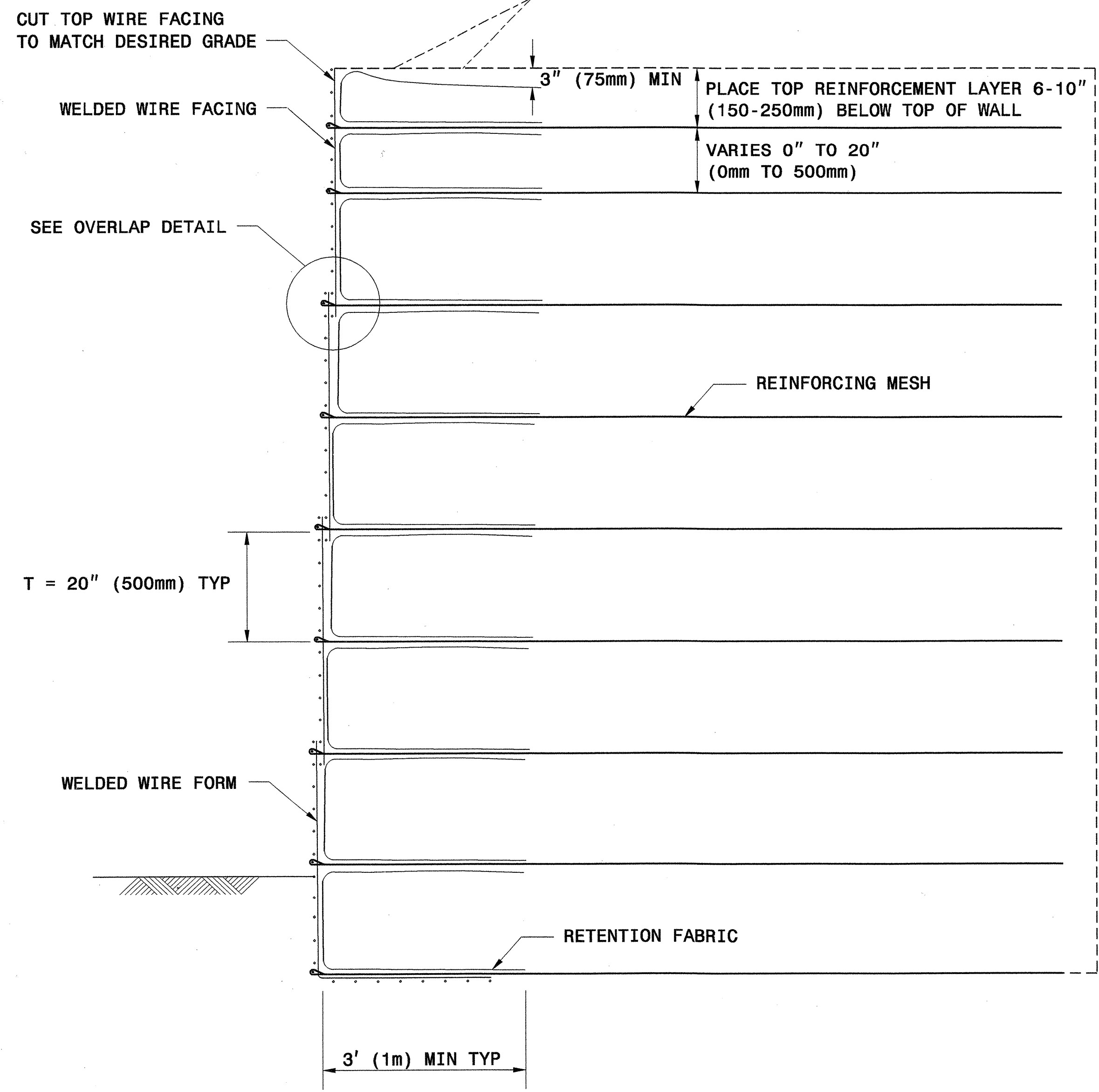
STANDARD DRAWING NO. 1801.02

RETAINED EARTH  
 TEMPORARY WALL

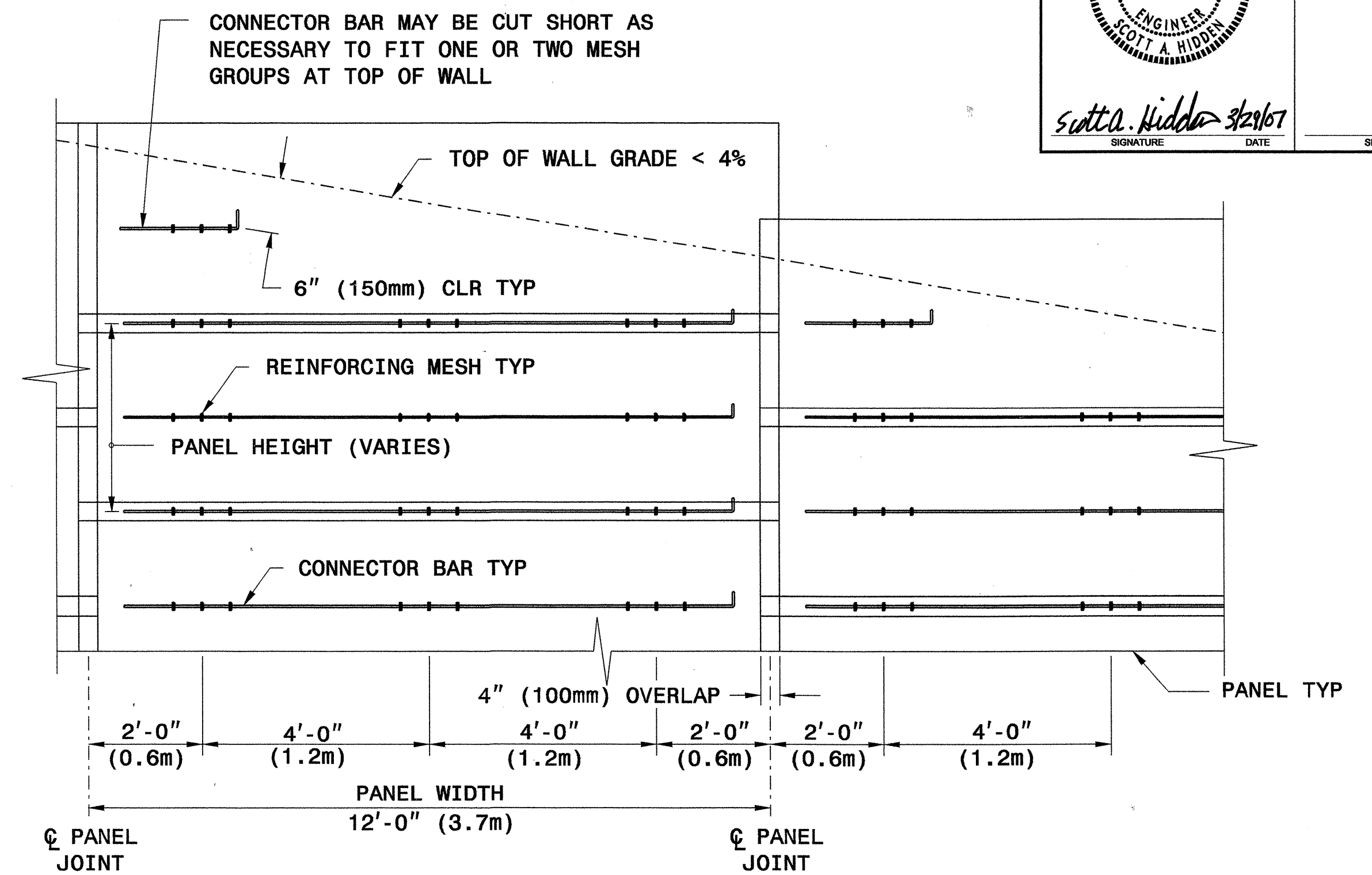
SHEET 7 OF 11 DATE: 12-19-06



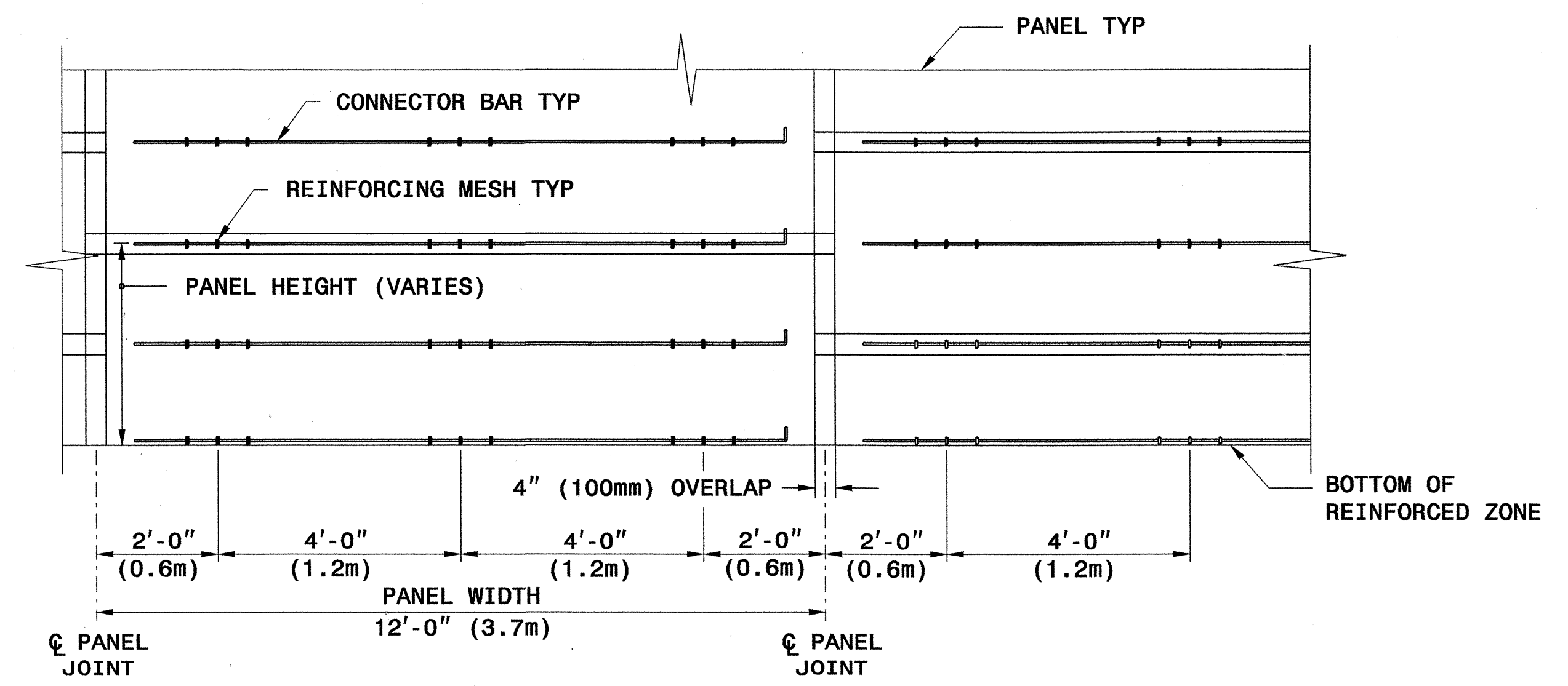
**OVERLAP DETAIL**



**TYPICAL SECTION**



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



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

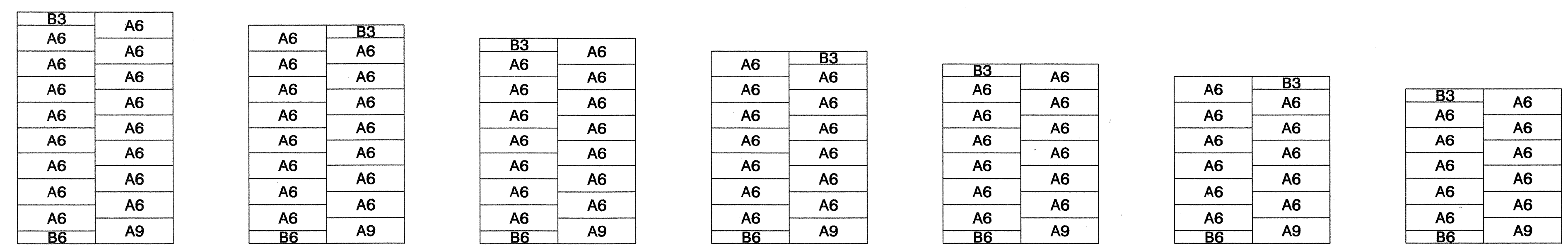


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RALEIGH

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

**PANEL LAYOUTS**

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



< 28 - 0  
< 8.5

< 27 - 8  
< 8.4

< 26 - 0  
< 7.9

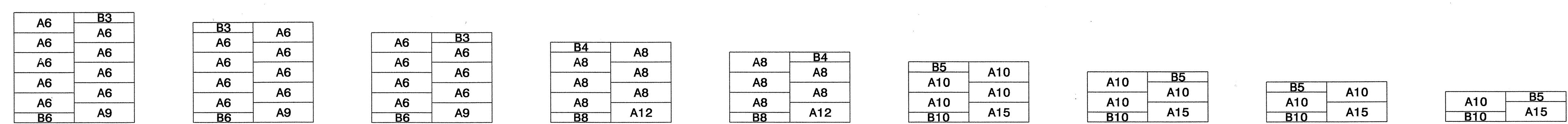
< 24 - 4  
< 7.4

< 22 - 8  
< 6.9

< 21 - 0  
< 6.4

< 19 - 4  
< 5.9

(FEET - INCHES)  
(METER)



< 17 - 8  
< 5.4

< 16 - 0  
< 4.9

< 14 - 4  
< 4.4

< 12 - 8  
< 3.9

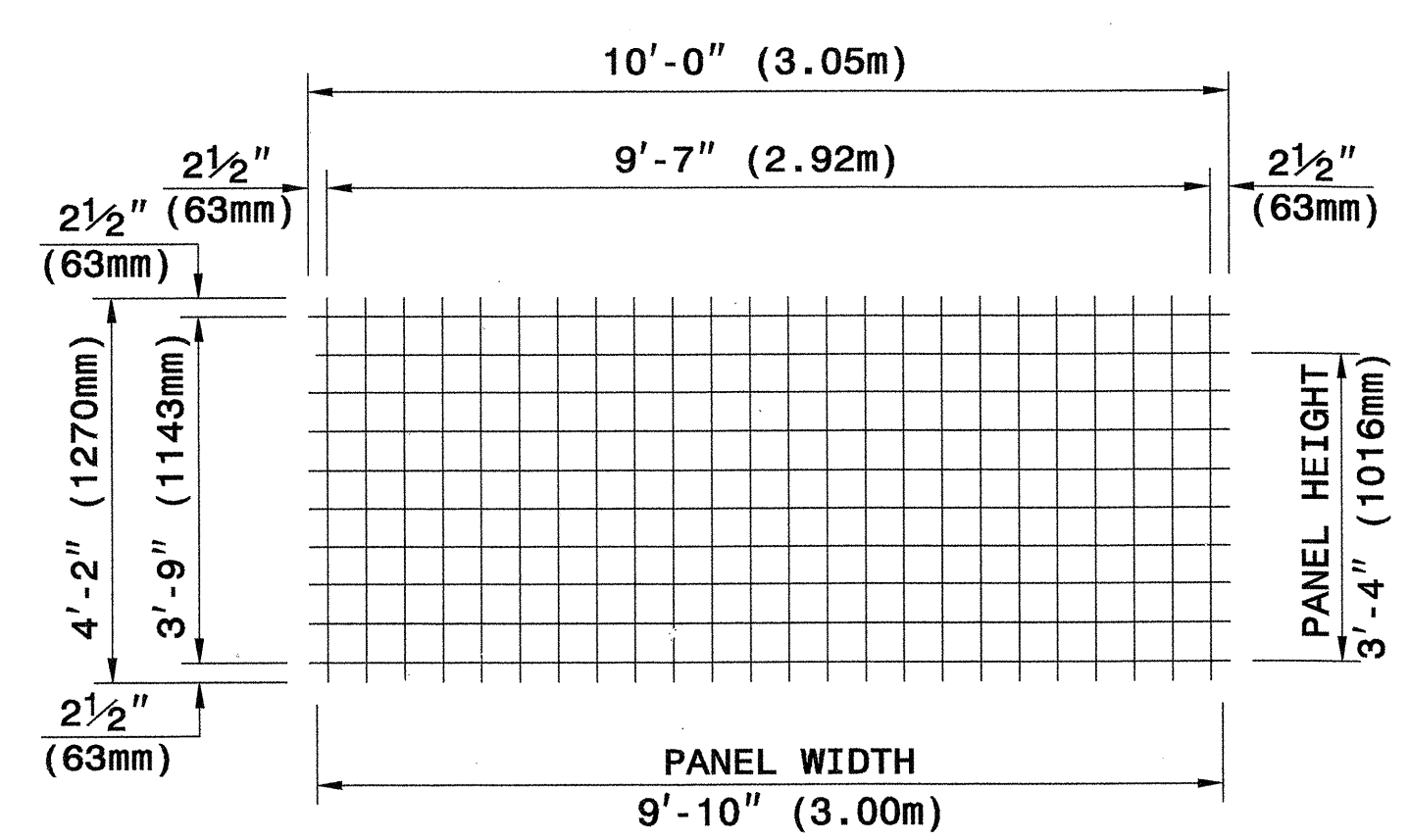
< 11 - 0  
< 3.4

< 9 - 4  
< 2.8

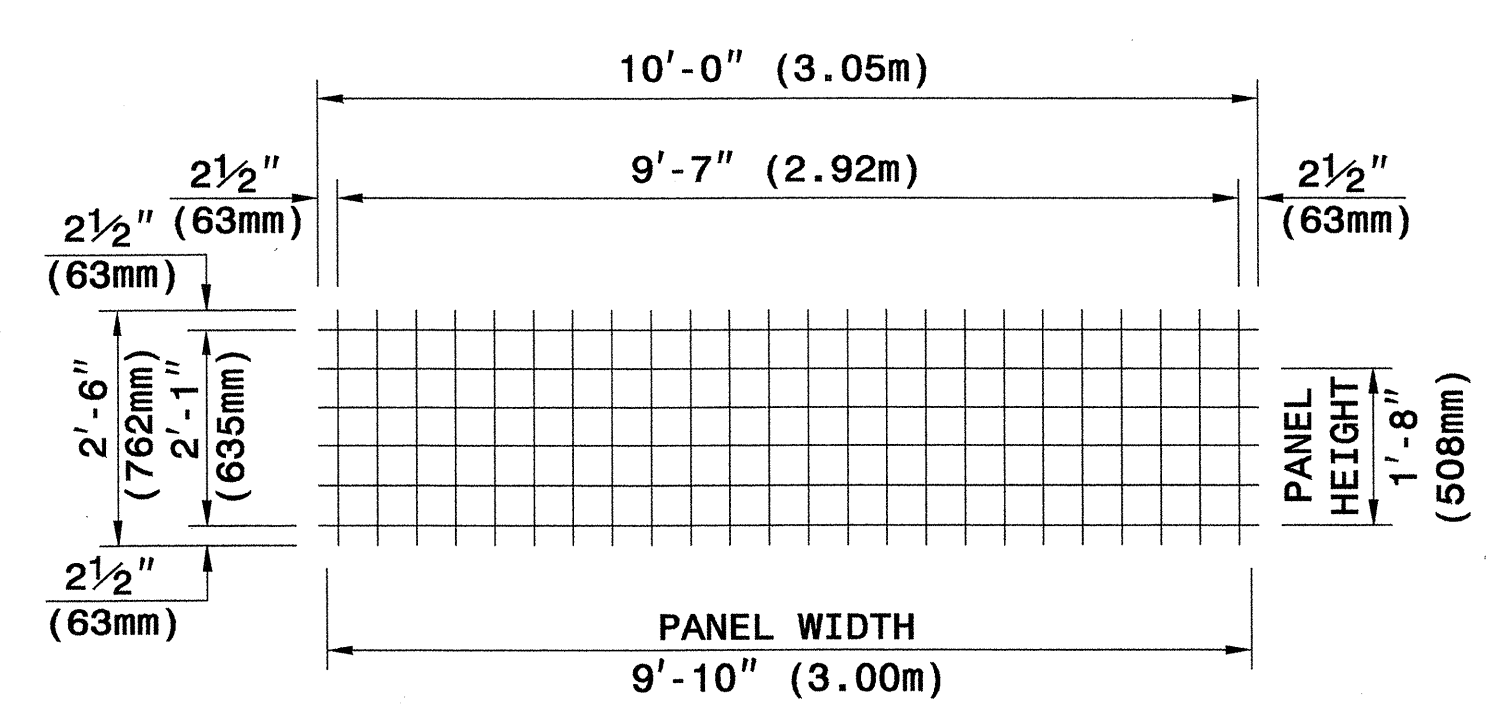
< 7 - 8  
< 2.3

< 6 - 0  
< 1.8

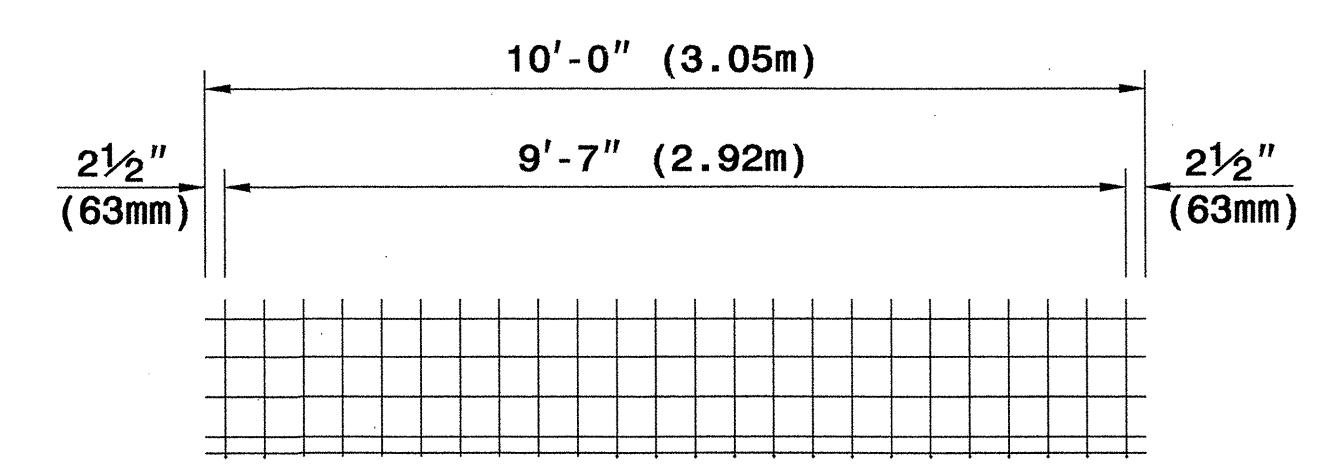
< 4 - 4  
< 1.3



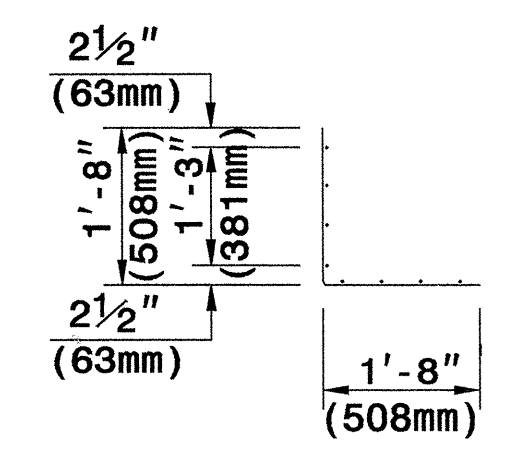
**TYPE A**



**TYPE B**



**WELDED WIRE FORM**



**SECTION**

**WELDED WIRE FACINGS**


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

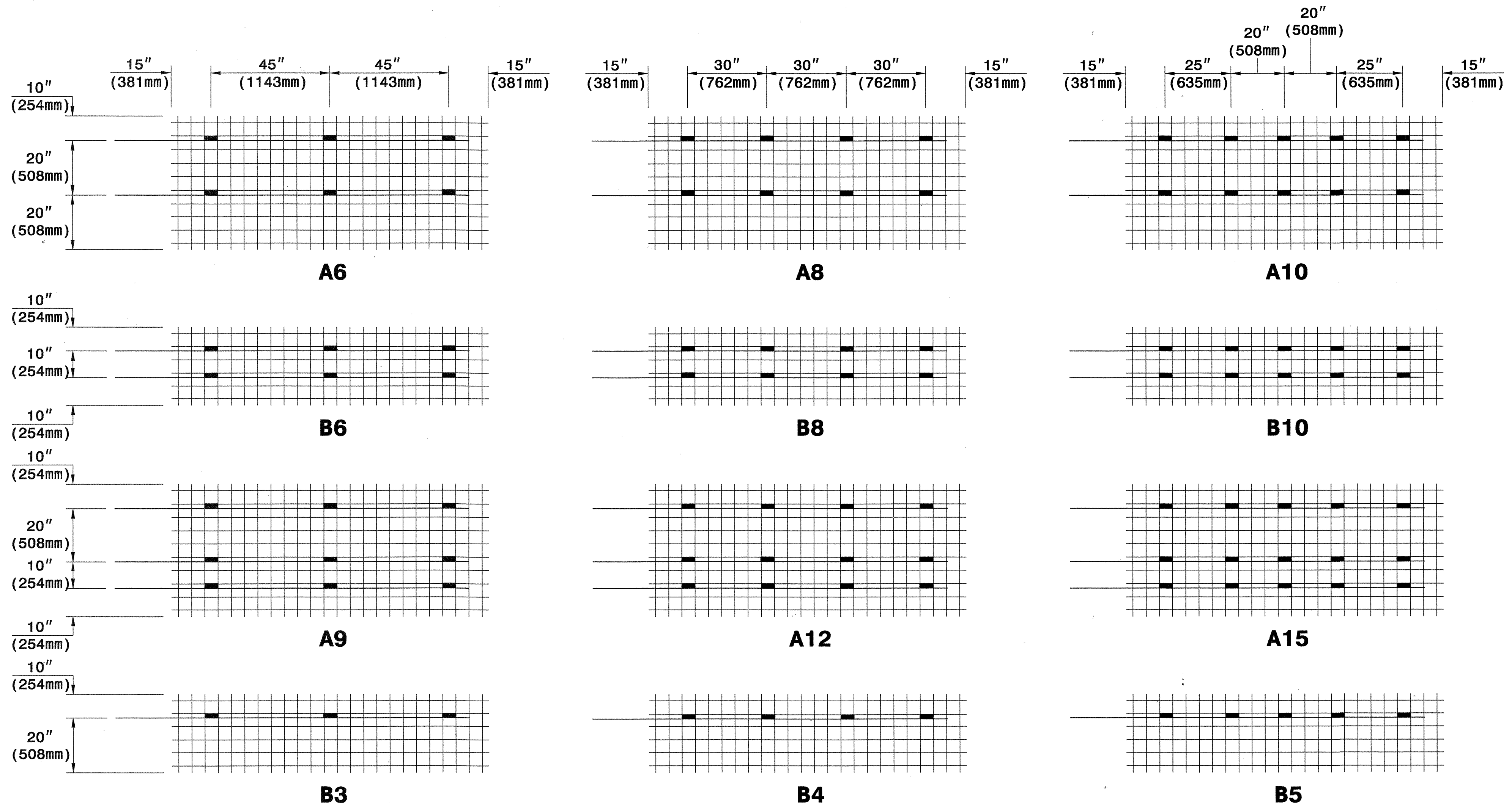
5" X 5" (125mm X 125mm), W5 X W5 (MW32 X MW32) WELDED WIRE REINFORCEMENT (WWR)



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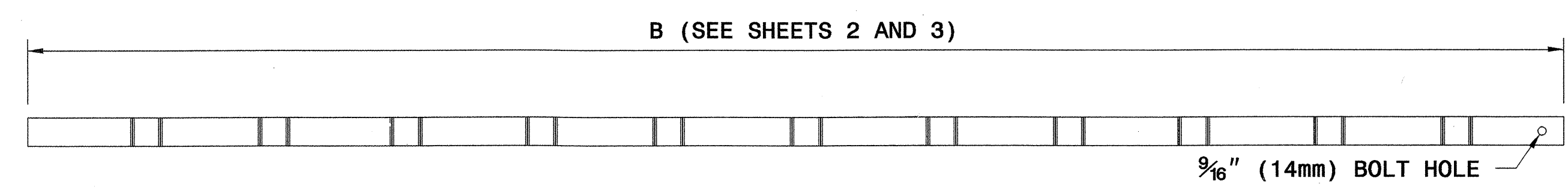
STANDARD DRAWING NO. 1801.02  
**TERRATREL TEMPORARY WALL**  
 SHEET 9 OF 11 DATE: 12-19-06

GEOTECHNICAL ENGINEER  Scott A. Hadden 3/2/07 SIGNATURE DATE	ENGINEER SIGNATURE DATE
--	----------------------------

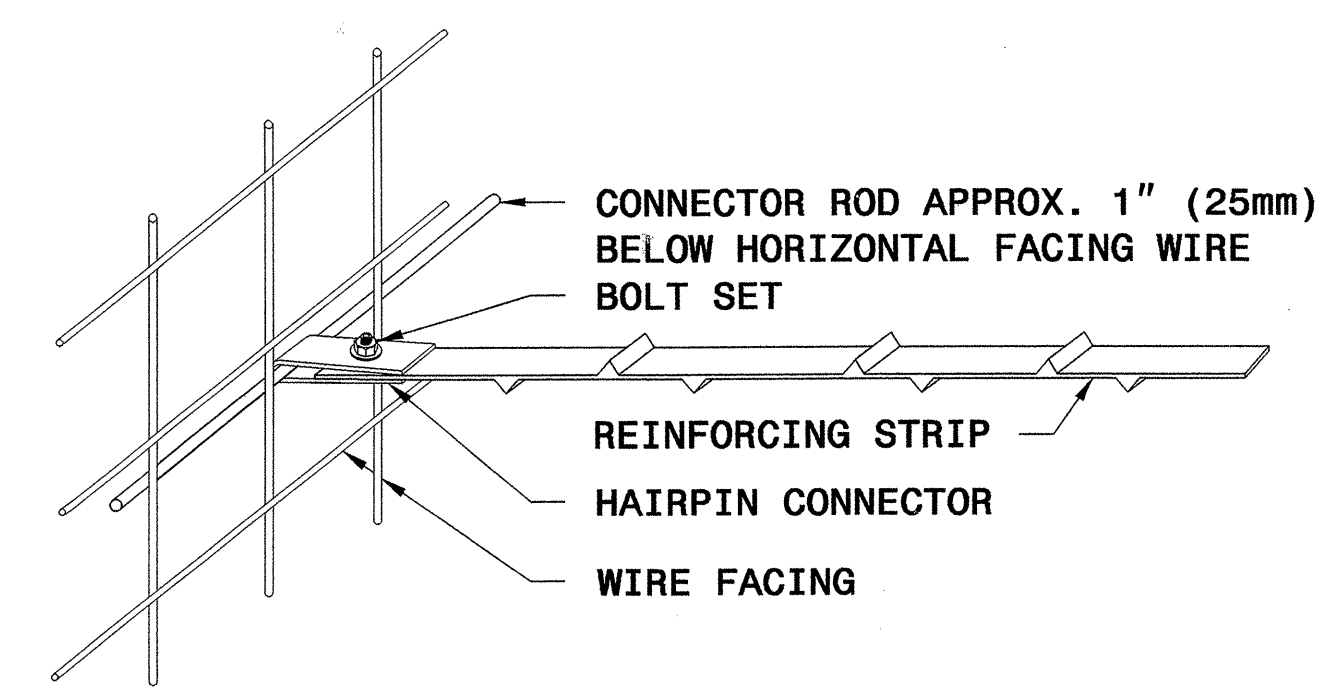


KEY: A8  
 NUMBER OF REINFORCING STRIPS  
 PANEL TYPE

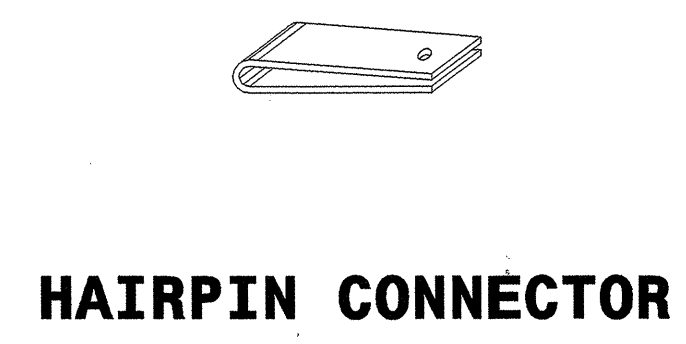
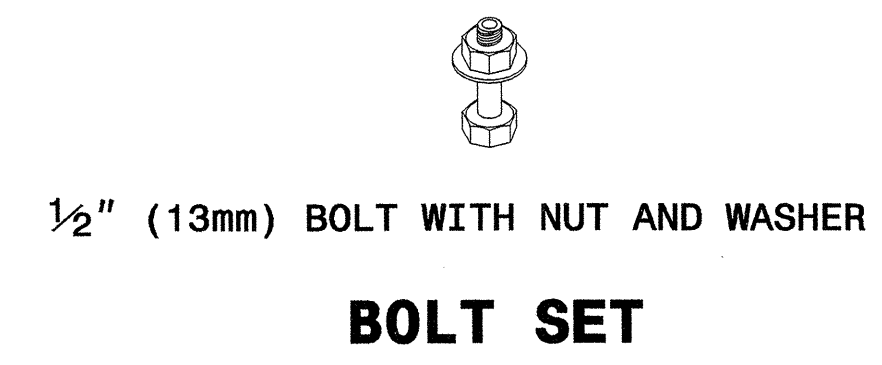
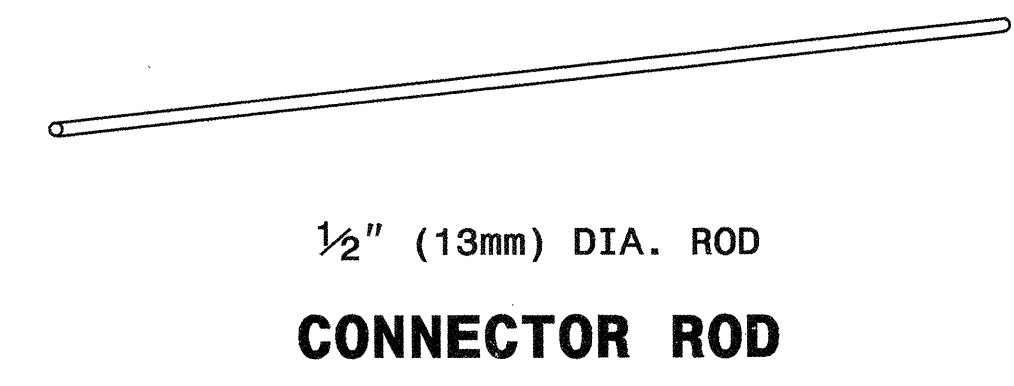
**CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS**



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

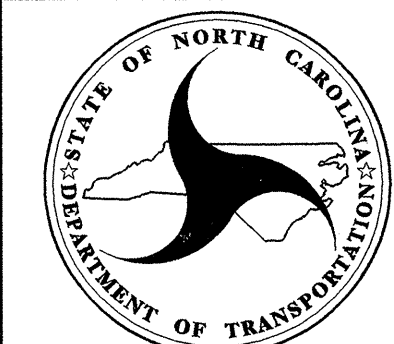


**STRIP TO FACING CONNECTION**



**WALL COMPONENTS**



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

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

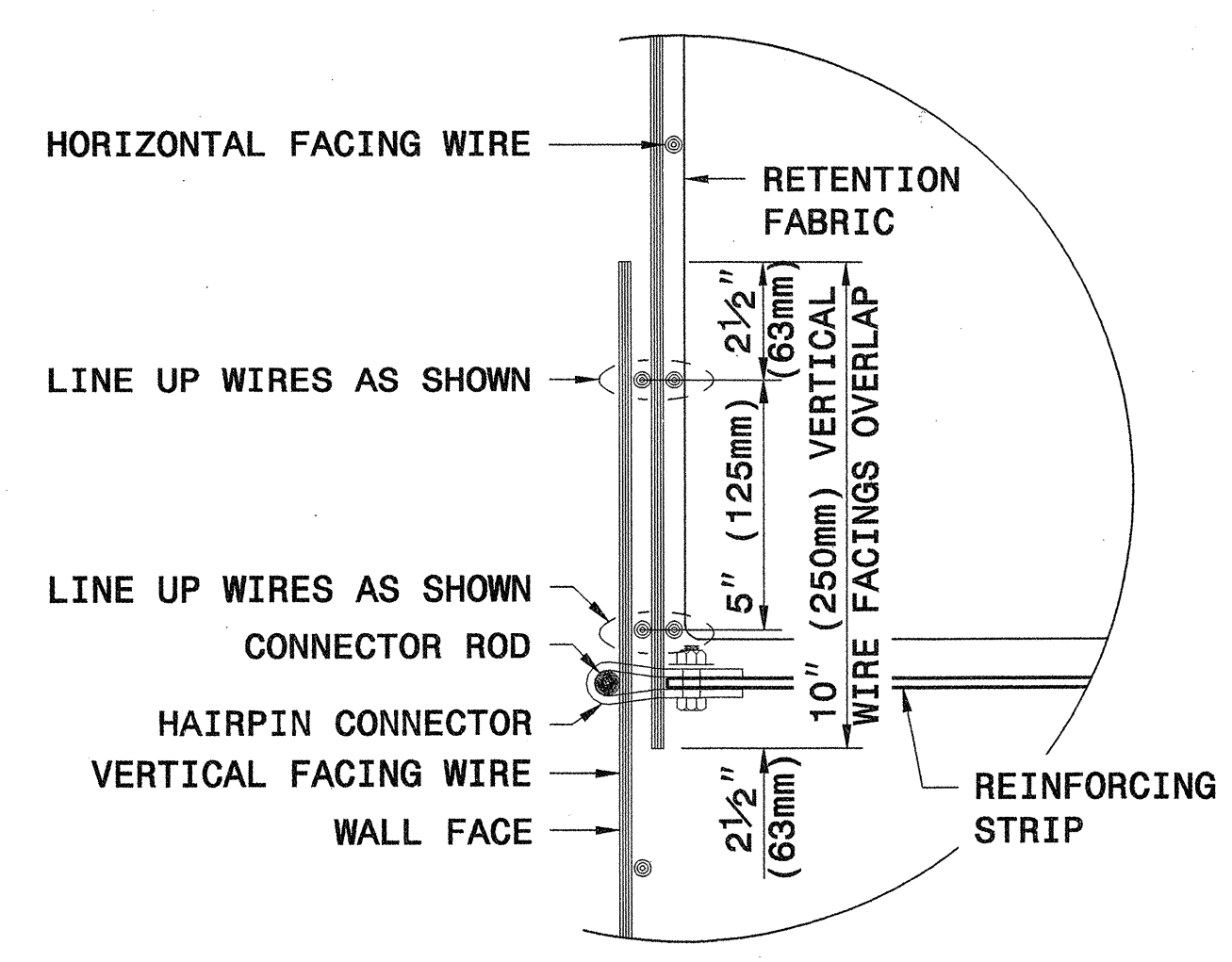


GEOTECHNICAL ENGINEER ENGINEER

SEAL 022246

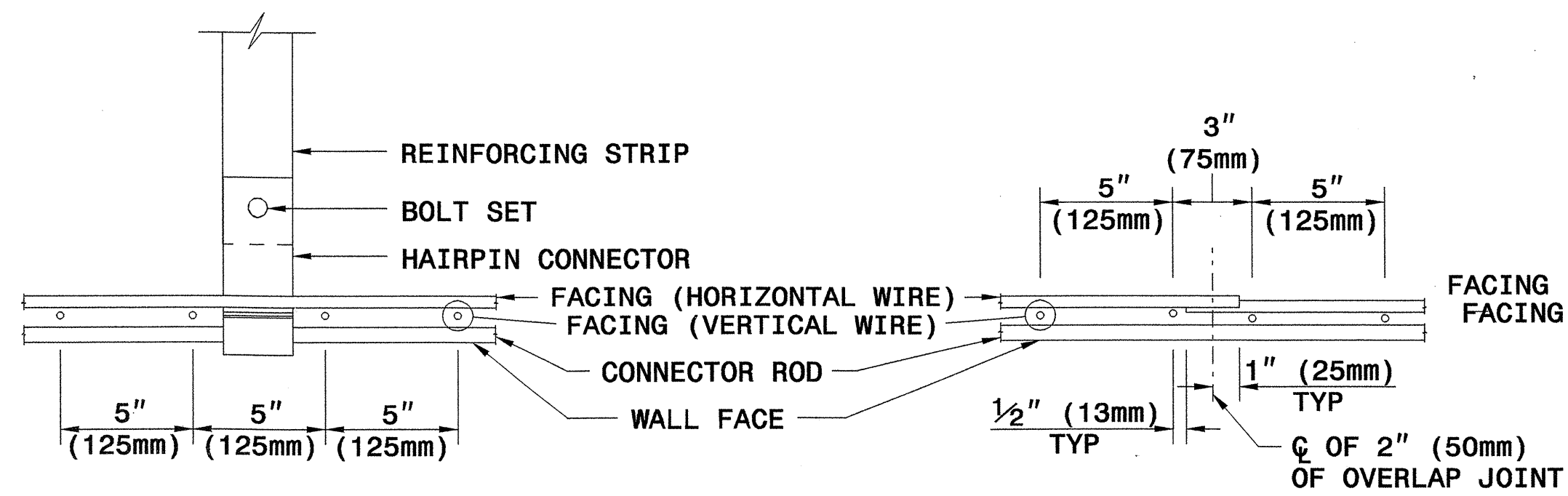
SCOTT A. HIDDEN

DATE SIGNATURE DATE

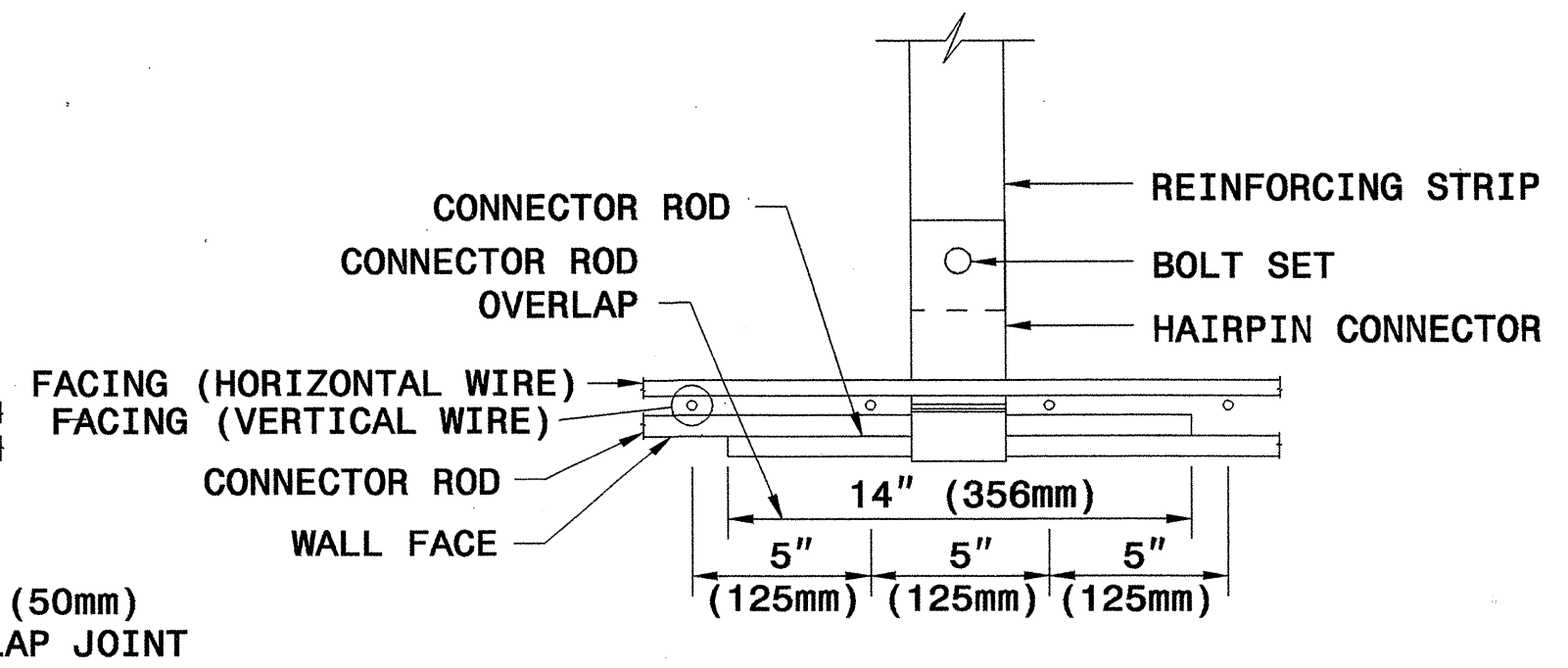


OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

**VERTICAL OVERLAP DETAIL**

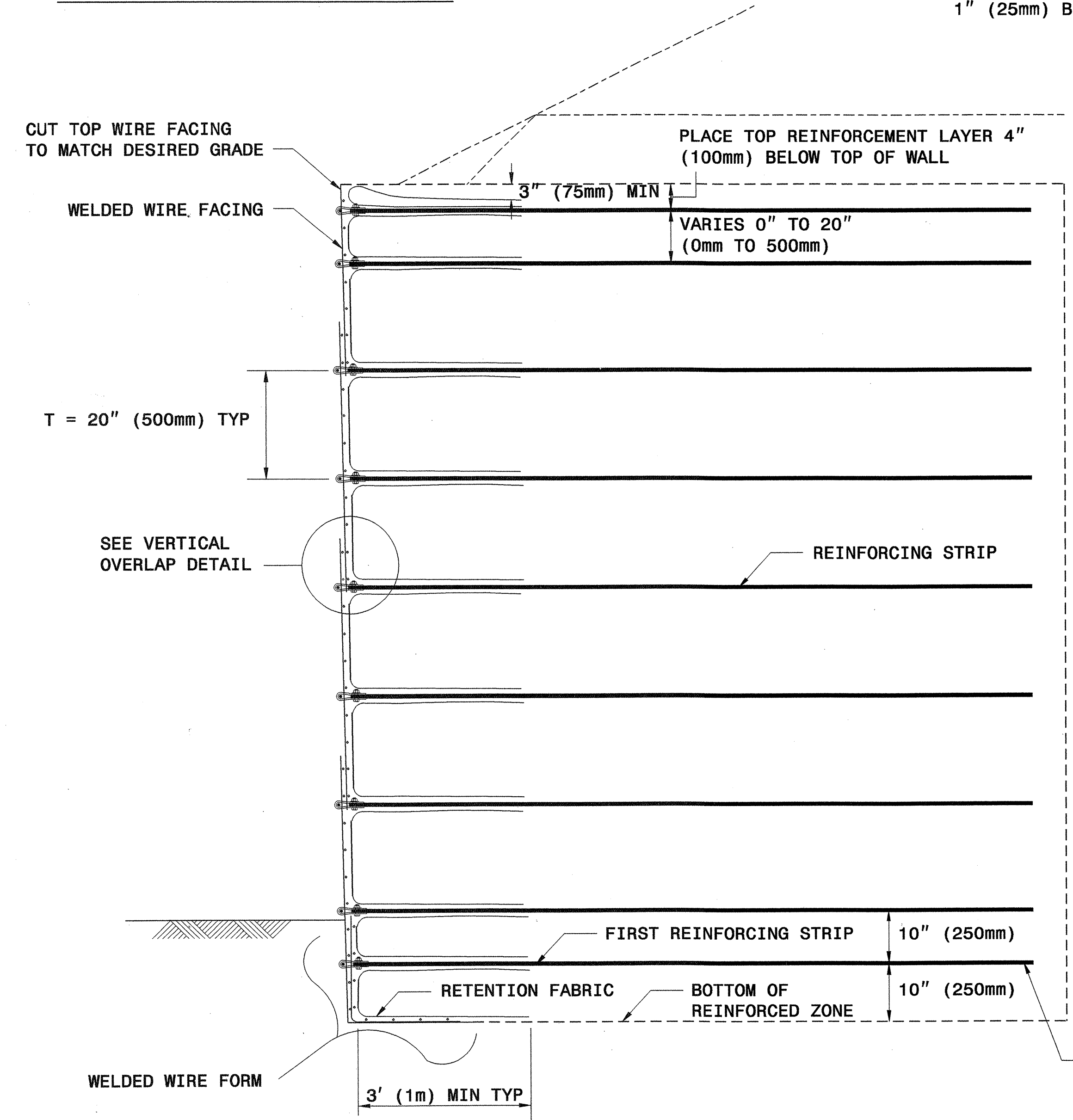


**PLAN DETAIL 'A' STRIP CONNECTION**

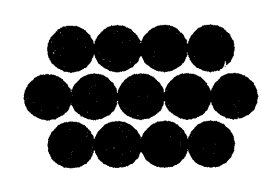


**PLAN DETAIL 'B' HORIZONTAL OVERLAP DETAIL**

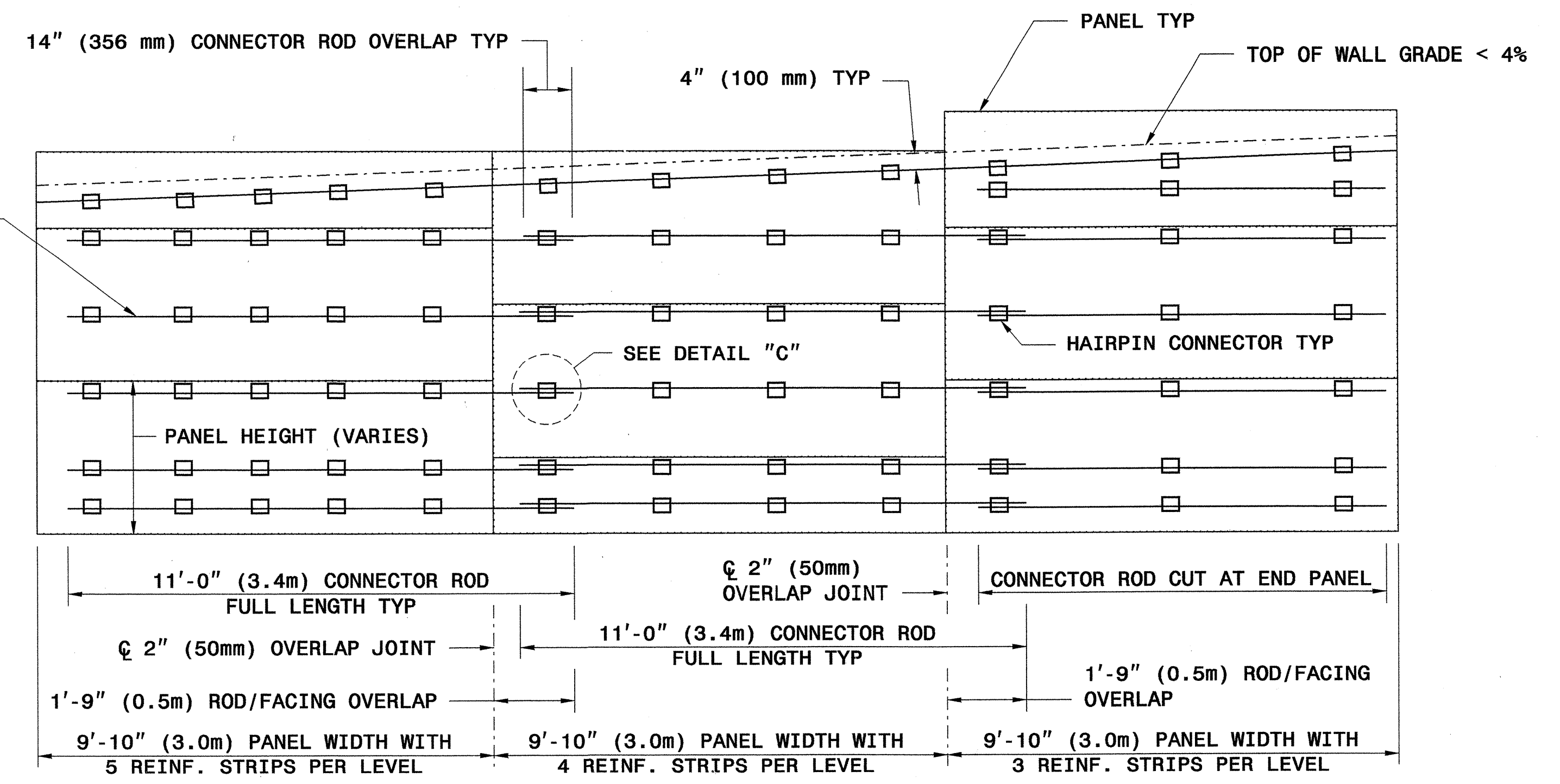
**PLAN DETAIL 'C' STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL**



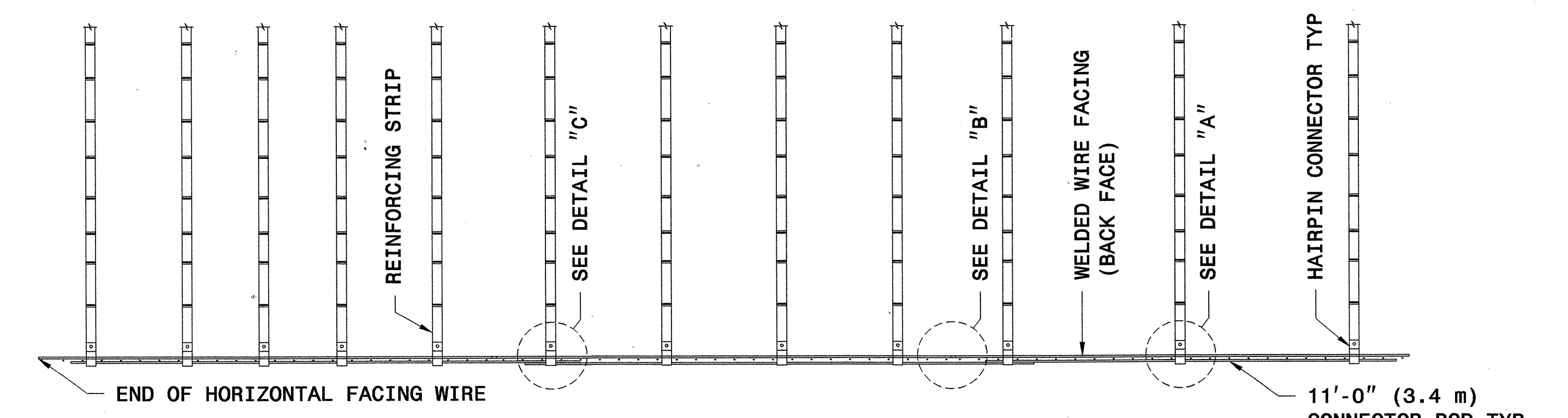
**TYPICAL SECTION**



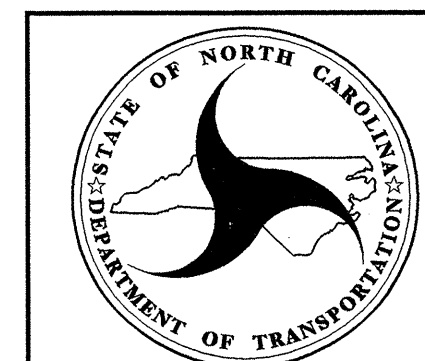
The Reinforced Earth Company



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



**TYPICAL PLAN**



**GEOTECHNICAL ENGINEERING UNIT**

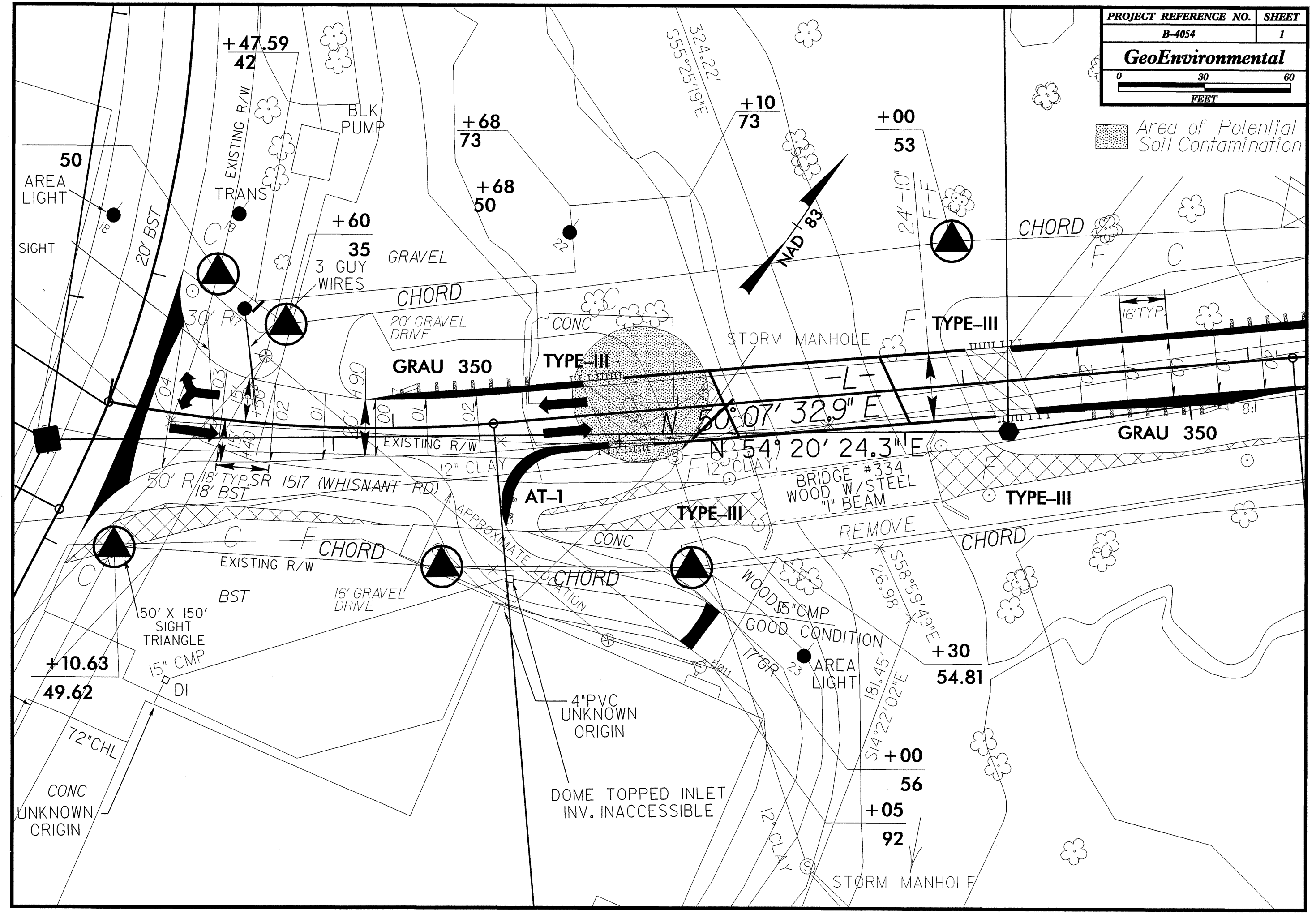
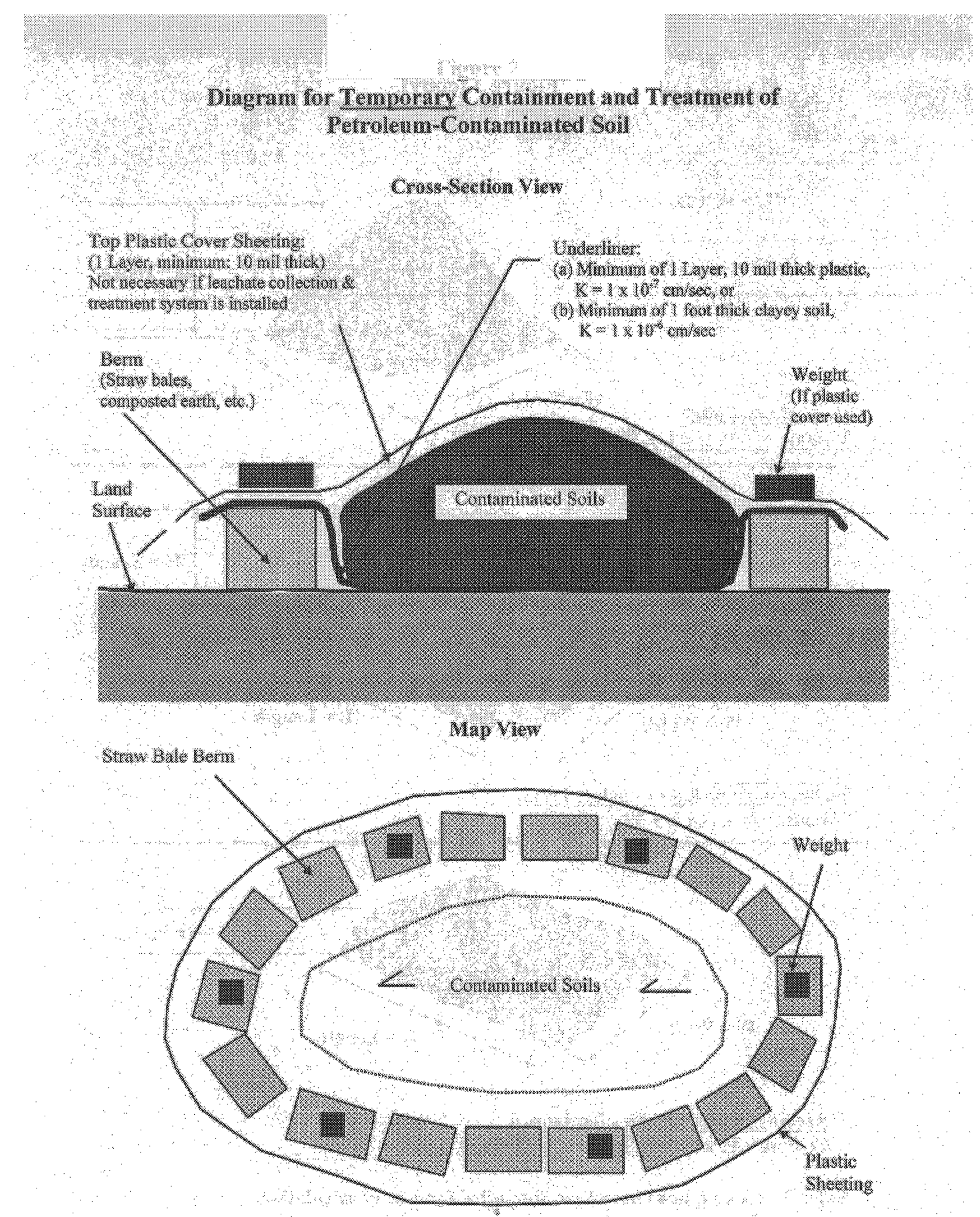
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

8/17/99

REVISIONS



25-OCT-2007 15:06  
F:\p\rd22290\proj\B4054 detail for geo cont soil.dgn  
BTKYLE

# STATE OF NORTH CAROLINA SUMMARY OF QUANTITIES

PROJECT REFERENCE No. B-4054	SHEET No. 3
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## STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201733

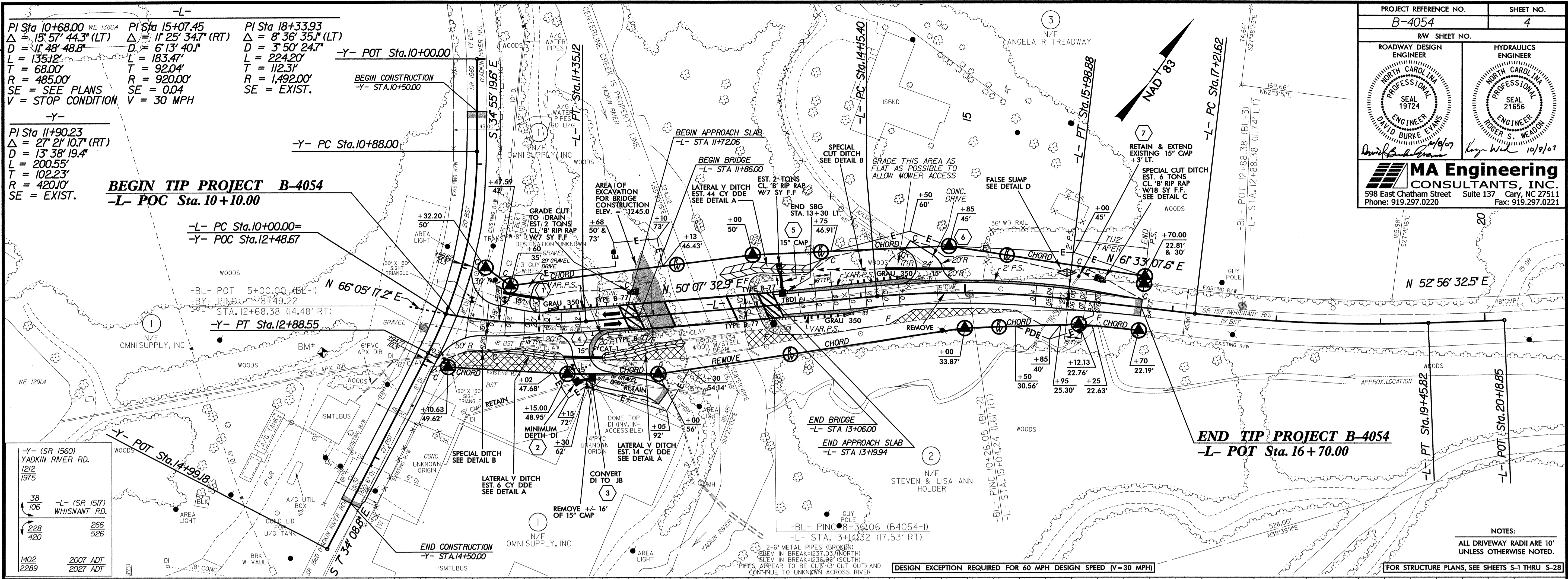
ItemNumber	Sec #	Quantity	Unit	Description
000100000-N	800	Lump Sum		MOBILIZATION
002900000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL STATION ***** (12+46.00)
004300000-N	226	Lump Sum		GRADING
005000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB- BING
005700000-E	226	1	CY	UNDERCUT EXCAVATION
008000000-E	SP	10	TON	CLASS IV SUBGRADE STABILIZA- TION
013400000-E	240	70	CY	DRAINAGE DITCH EXCAVATION
019500000-E	265	10	CY	SELECT GRANULAR MATERIAL
019600000-E	270	10	SY	FABRIC FOR SOIL STABILIZATION
019900000-E	SP	424	SF	TEMPORARY SHORING
023400000-E	SP	25	CY	GENERIC GRADING ITEM EXCAVATION & STOCKPILING OF CONTAMINATED SOIL
031800000-E	300	30	TON	FOUNDATION CONDITIONING MATE- RIAL, MINOR STRS
034300000-E	310	148	LF	15" SIDE DRAIN PIPE
070800000-E	310	28	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
080600000-E	310	2	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
099500000-E	340	40	LF	PIPE REMOVAL
122000000-E	545	100	TON	INCIDENTAL STONE BASE
148900000-E	610	279	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
152500000-E	610	315	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
156000000-E	620	35	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
200000000-N	806	12	EA	RIGHT OF WAY MARKERS
202200000-E	815	12	CY	SUBDRAIN EXCAVATION
203300000-E	815	9	CY	SUBDRAIN FINE AGGREGATE
204400000-E	815	50	LF	6" PERFORATED SUBDRAIN PIPE
205500000-E	815	2	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
206600000-N	815	1	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
207700000-E	815	6	LF	6" OUTLET PIPE (SUBDRAINS)
228600000-N	840	2	EA	MASONRY DRAINAGE STRUCTURES
236400000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.16
236700000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.29
255600000-E	846	14	LF	SHOULDER BERM GUTTER
261200000-E	848	100	SY	6" CONCRETE DRIVEWAY
290500000-N	859	1	EA	CONVERT EXISTING DROP INLET TO JUNCTION BOX
303000000-E	862	112.5	LF	STEEL BM GUARDRAIL
304500000-E	862	25	LF	STEEL BM GUARDRAIL, SHOP CURVED
315000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
321000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
327000000-N	SP	3	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
331700000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
350300000-E	866	200	LF	WOVEN WIRE FENCE, 47" FABRIC
350900000-E	866	15	EA	4" TIMBER FENCE POSTS, 7'-6" LONG
351500000-E	866	10	EA	5" TIMBER FENCE POSTS, 8'-0" LONG
364900000-E	876	20	TON	RIP RAP, CLASS B
365600000-E	876	415	SY	FILTER FABRIC FOR DRAINAGE
440000000-E	1110	160	SF	WORK ZONE SIGNS (STATIONARY)
440500000-E	1110	176	SF	WORK ZONE SIGNS (PORTABLE)
441000000-E	1110	20	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)

ItemNumber	Sec #	Quantity	Unit	Description
443000000-N	1130	45	EA	DRUMS
443500000-N	1135	21	EA	CONES
444500000-E	1145	32	LF	BARRICADES (TYPE III)
445000000-N	1150	1,920	HR	FLAGGER
446500000-N	1160	2	EA	TEMPORARY CRASH CUSHIONS
448000000-N	1165	1	EA	TMA
448500000-E	1170	200	LF	PORTABLE CONCRETE BARRIER
449500000-E	1170	60	LF	PORTABLE CONCRETE BARRIER (DRAINAGE)
451600000-N	1180	32	EA	SKINNY DRUM
465000000-N	1251	83	EA	TEMPORARY RAISED PAVEMENT MARKERS
477000000-E	1205	480	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)
481000000-E	1205	12,413	LF	PAINT PAVEMENT MARKING LINES (4")
483500000-E	1205	80	LF	PAINT PAVEMENT MARKING LINES (24")
532580000-E	1510	255	LF	8" WATER LINE
554600000-E	1515	1	EA	8" VALVE
569150000-E	1520	203	LF	12" SANITARY GRAVITY SEWER
577500000-E	1525	2	EA	4' DIA UTILITY MANHOLE
581600000-N	1530	1	EA	ABANDON UTILITY MANHOLE
588200000-N	SP	1	EA	GENERIC UTILITY ITEM VALVE POST INDICATOR
600000000-E	1605	700	LF	TEMPORARY SILT FENCE
600600000-E	1610	150	TON	STONE FOR EROSION CONTROL, CLASS A
600900000-E	1610	225	TON	STONE FOR EROSION CONTROL, CLASS B
601200000-E	1610	200	TON	SEDIMENT CONTROL STONE
601500000-E	1615	1.5	ACR	TEMPORARY MULCHING
601800000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING

ItemNumber	Sec #	Quantity	Unit	Description
602100000-E	1620	0.25	TON	FERTILIZER FOR TEMPORARY SEED- ING
602400000-E	1622	15	LF	TEMPORARY SLOPE DRAINS
602900000-E	SP	225	LF	SAFETY FENCE
603000000-E	1630	555	CY	SILT EXCAVATION
603600000-E	1631	1,200	SY	MATting FOR EROSION CONTROL
603700000-E	SP	20	SY	COIR FIBER MAT
604200000-E	1632	80	LF	1/4" HARDWARE CLOTH
607000000-N	SP	4	EA	SPECIAL STILLING BASINS
607103000-E	SP	55	LF	COIR FIBER BAFFLES
607105000-E	SP	2	EA	*** SKIMMER (1-1/2")
608400000-E	1660	1.5	ACR	SEEDING & MULCHING
608700000-E	1660	1	ACR	MOWING
609000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
609300000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
609600000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
610800000-E	1665	1	TON	FERTILIZER TOPDRESSING
611400000-N	SP	2	HR	SPECIALIZED HAND MOWING
611700000-N	SP	16	EA	RESPONSE FOR EROSION CONTROL
612300000-E	1670	0.15	ACR	REFORESTATION

***** BEGIN SCHEDULE AA ***** ***** (3 ALTERNATES) *****				
036600000-E AA1	310	16	LF	15" RC PIPE CULVERTS, CLASS III
*** OR ***				
053600000-E AA2	SP	16	LF	**** HDPE PIPE CULVERTS (15")
*** OR ***				
054000000-E AA3	SP	16	LF	**** ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, **** THICK (15", 0.064") 0.064"
***** END SCHEDULE AA *****				

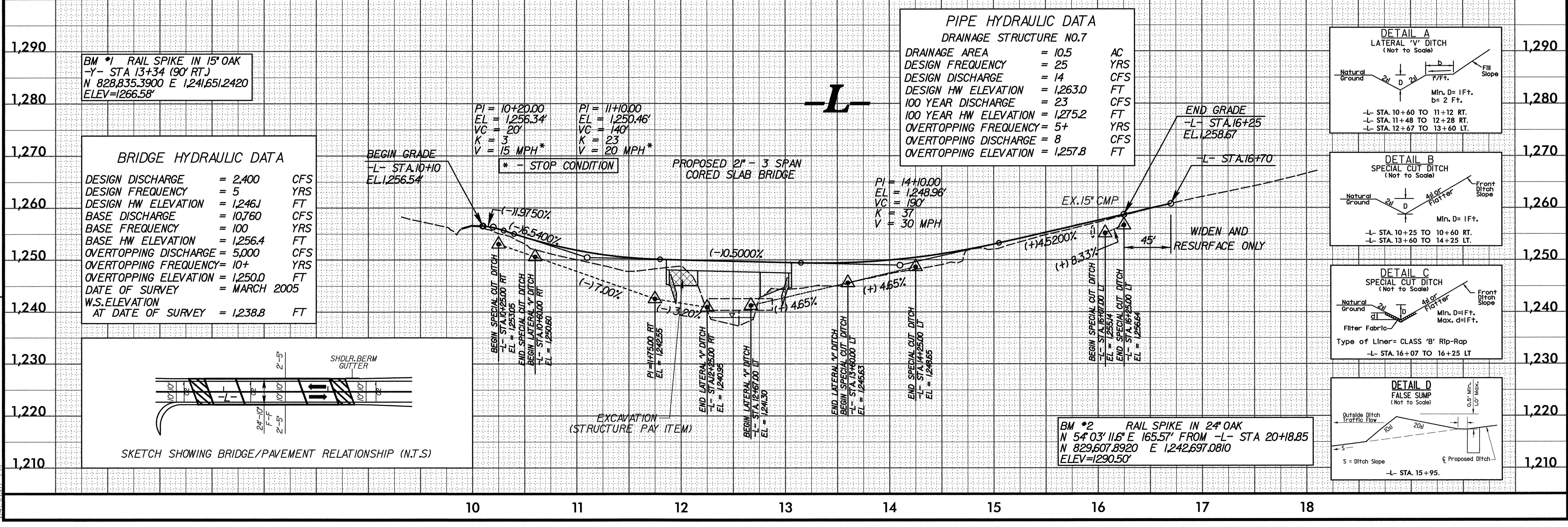




REVISIONS

1402	2007 ADT
2289	2021 ADT

NOTES:  
 ALL DRIVEWAY RADII ARE 10' UNLESS OTHERWISE NOTED.  
 FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-28

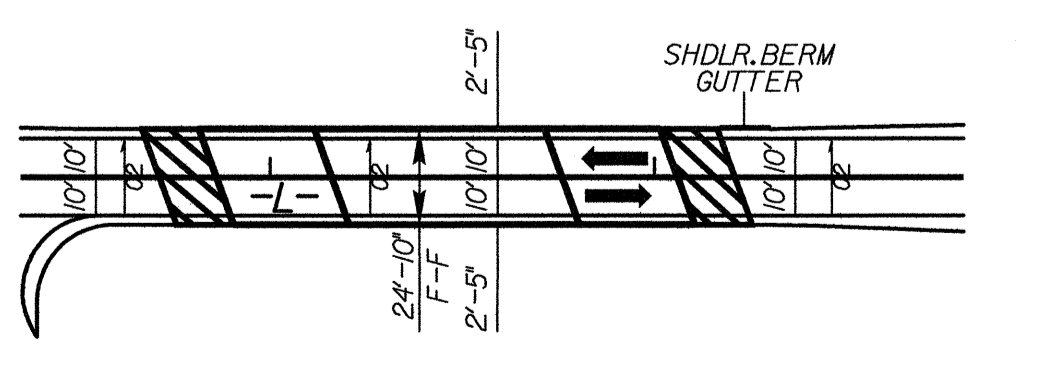


BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 2,400	CFS
DESIGN FREQUENCY	= 5	YRS
DESIGN HW ELEVATION	= 1,246.1	FT
BASE DISCHARGE	= 1,076.0	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1,256.4	FT
OVERTOPPING DISCHARGE	= 5,000	CFS
OVERTOPPING FREQUENCY	= 10+	YRS
OVERTOPPING ELEVATION	= 1,250.0	FT
DATE OF SURVEY	= MARCH 2005	
W.S. ELEVATION AT DATE OF SURVEY	= 1,238.8	FT

PIPE HYDRAULIC DATA  
 DRAINAGE STRUCTURE NO. 7

DRAINAGE AREA	= 10.5	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 14	CFS
DESIGN HW ELEVATION	= 1,263.0	FT
100 YEAR DISCHARGE	= 23	CFS
100 YEAR HW ELEVATION	= 1,275.2	FT
OVERTOPPING FREQUENCY	= 5+	YRS
OVERTOPPING DISCHARGE	= 8	CFS
OVERTOPPING ELEVATION	= 1,257.8	FT



10/02/2007  
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