

CONTRACT: C202125 TIP PROJECT: B-4434
 09/08/09

See Sheet 1-A For Index of Sheets

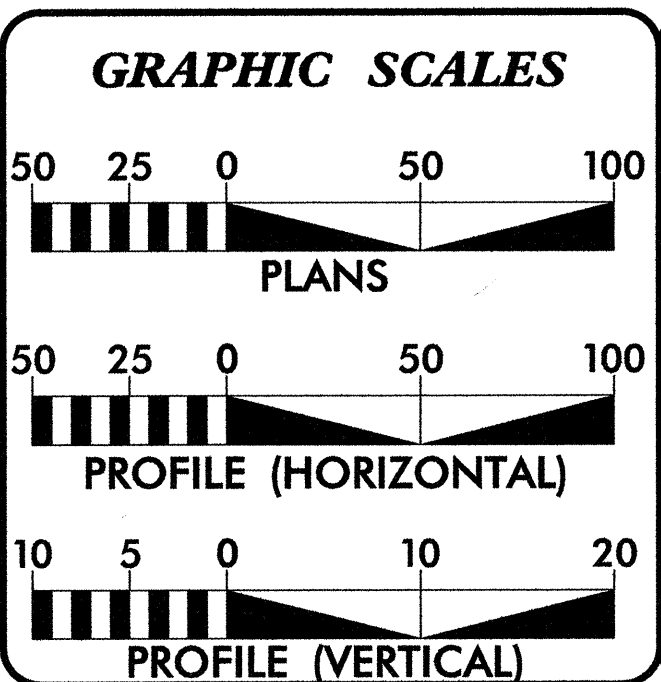
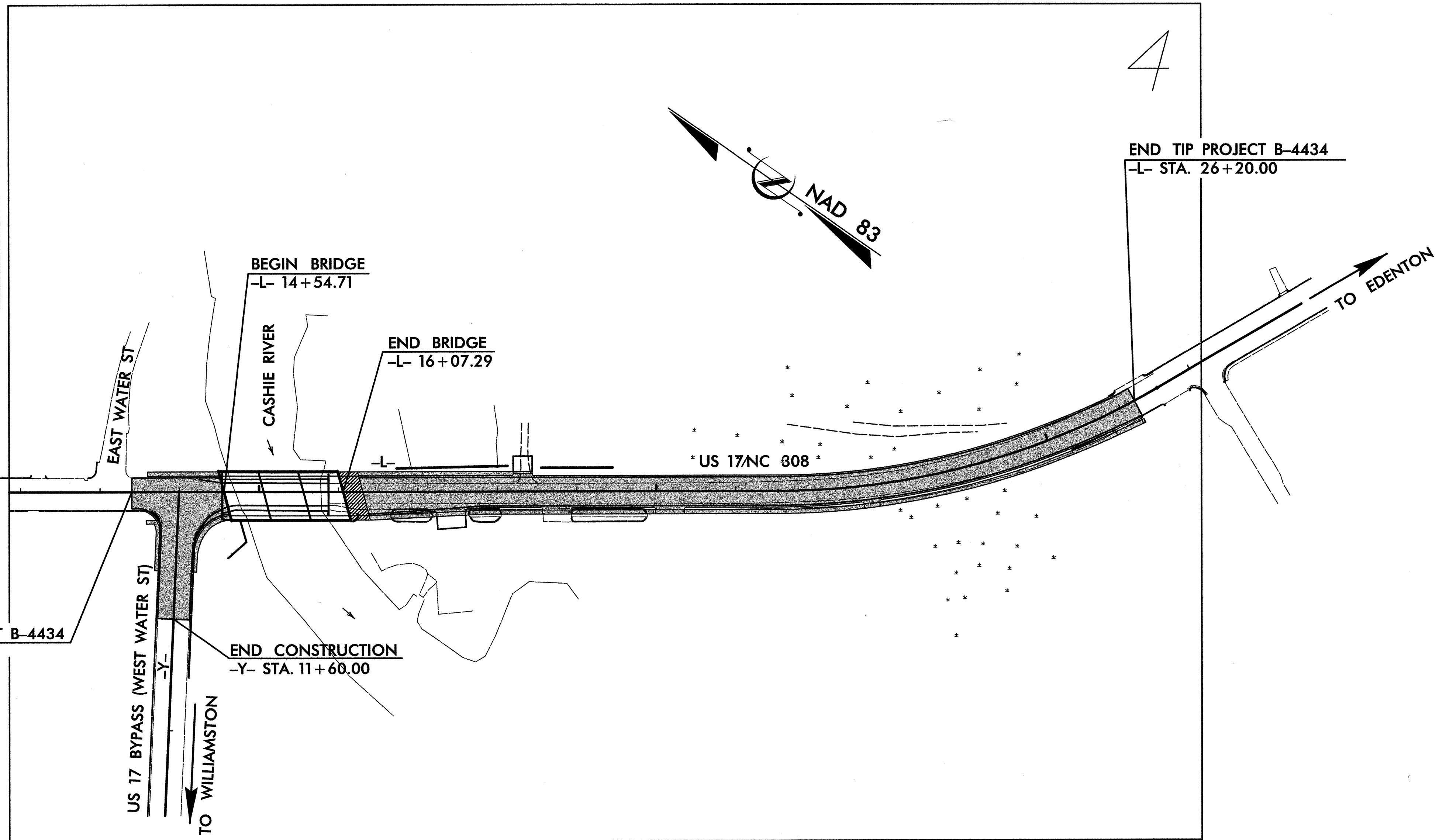
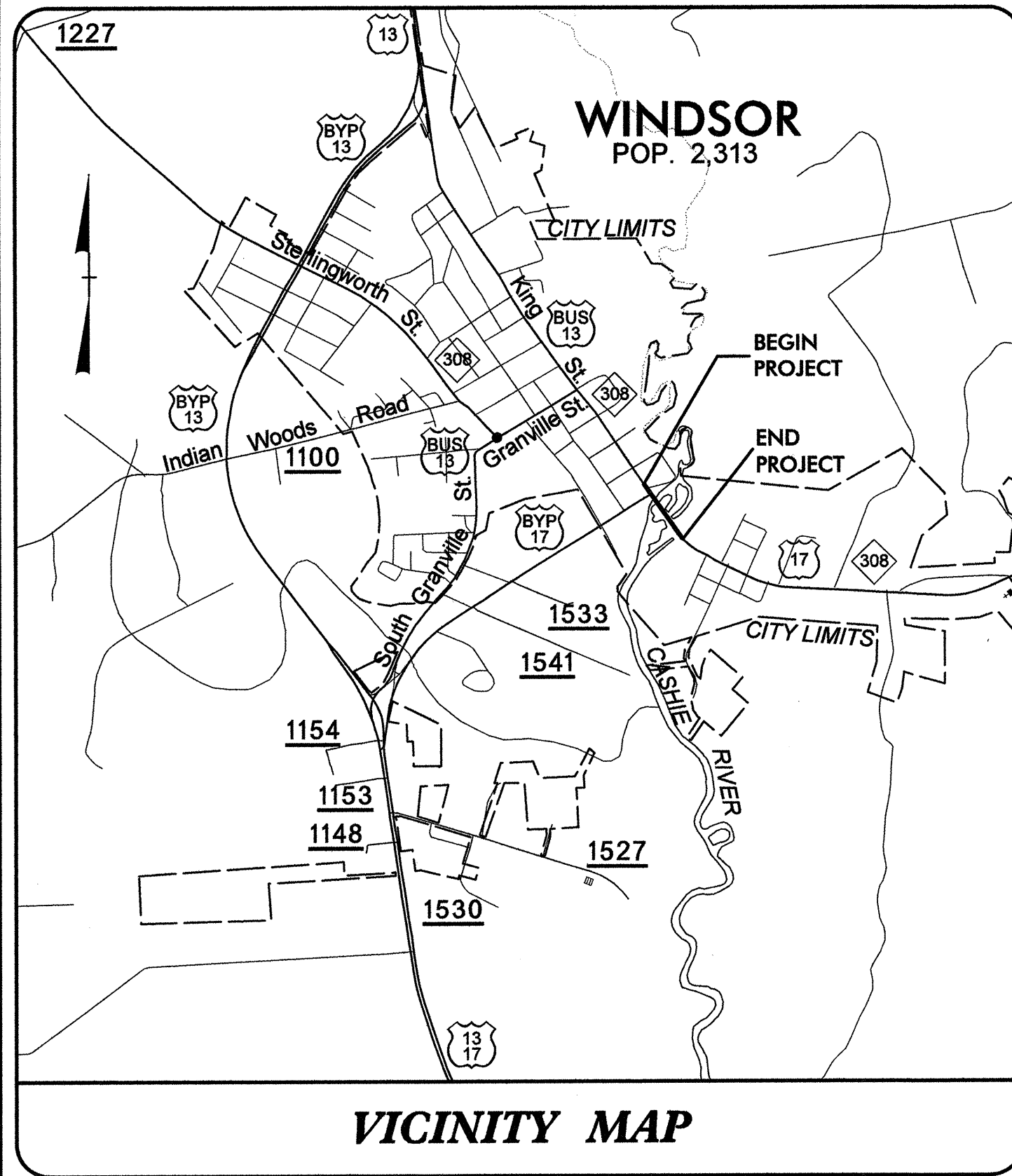
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

BERTIE COUNTY

LOCATION: BRIDGE NO. 14 OVER CASHIE RIVER ON US 17/NC 308

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4434	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33700.1.1	BRNHS-17(35)	PE	
33700.2.1	BRNHS-17(35)	R/W	
33700.3.1	BRNHS-17(35)	CONST.	



DESIGN DATA

ADT 2009 =	11,633
ADT 2029 =	9,717
DHV =	12 %
D =	60 %
T =	9 % *
V =	40 MPH
* (TTST 5% + DUAL 4%)	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4434 =	0.213 MILES
LENGTH STRUCTURE TIP PROJECT B-4434 =	0.029 MILES
TOTAL LENGTH TIP PROJECT B-4434 =	0.242 MILES

PLANS PREPARED BY:
 TGS ENGINEERS
 SUITE 141
 975 WALNUT STREET
 CARY, NC 27511
 PH (919) 319-8850

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
 JUNE 20, 2008

LETTING DATE:
 JUNE 16, 2009

NCDOT CONTACT:

PLANS PREPARED FOR:
 DIVISION OF HIGHWAYS
 1000 Birch Ridge Dr.
 Raleigh, NC 27610

CHARLES L. FLOWE, PE
 PROJECT ENGINEER

W. CRAIG PARKER, PE
 PROJECT DESIGN ENGINEER

B. DOUG TAYLOR, PE
 PROJECT ENGINEER - ROADWAY DESIGN

HYDRAULICS ENGINEER

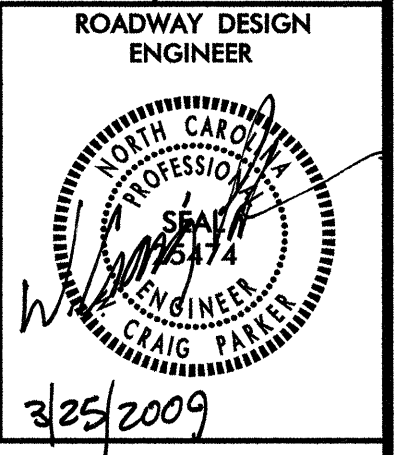
William J. Stepien
 SEAL 20754
 3/26/2009

ROADWAY DESIGN ENGINEER

W. Craig Parker
 SEAL 25474
 3/25/2009

**DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA**

Art McMillan
 P.E.
 STATE HIGHWAY DESIGN ENGINEER



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
GENERAL NOTES - CONT'D

INDEX OF SHEETS

STANDARD DRAWINGS

SHEET NO.	SHEET
1	Title Sheet
1-A	Index of Sheets, General Notes, and List of Standards
1-B	Conventional Symbols
1-C	Survey Control Sheet
2	Pavement Schedule, Typical Section for -L-, Sawcut Detail, Retaining Wall Insets, & Wedging Details
2A	Typical Section for -Y- and Bridge Typical Section
2B	Type III-Shop Curved Structure Anchor Unit
2-C	Standard Temporary Shoring
2-D	Standard Temporary Mechanically Stabilized Earth (MSE) Walls
2-E	Standard Temporary MSE Wall Reinforcement Tables
2-F	Temporary Fabric Wall
2-G	Hilfiker Temporary Wall
2-H	Sierrascape Temporary Wall
2-I thru 2-K	Retained Earth Temporary Wall
2-L thru 2-N	Terratrel Temporary Wall
3	Summary of Quantities
3A	Summary of Earthwork, Asphalt Pavement Removal, & Guardrail
3B	Summary of Drainage
4	Plan Sheet
5	Profile Sheet
TCP-1 thru TCP-8	Traffic Control Plans
PM-1 thru PM-2	Pavement Marking Plans
SD-1	Special Signs
EC-1 thru EC- 3	Erosion Control Plans
SIGN-1 thru SIGN-4	Signing Plans
SIG-1 thru SIG-11	Signalization Plans
UC-1 thru UC-7	Utility Construction Plans
UO-1 thru UO-2	Utilities By Others Plans
X-SUM	Earthwork Volume Summaries
X-1 thru X-8	Cross Sections
S-1 thru S-39	Structure Plans
W-1 thru W-2	Retaining Wall Plans

GENERAL NOTES

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

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

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

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

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' RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

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

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

TEMPORARY SHORING:
SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

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: TOWN OF WINDSOR (POWER), TOWN OF WINDSOR (WATER/SEWER), & EMBARQ (TELEPHONE)

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 OTHERS.

WHEELCHAIR RAMPS:
WHEELCHAIR RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. THE CONSTRUCTION OF ALL WHEELCHAIR RAMPS SHALL BE IN ACCORDANCE WITH STD. NO. 848.05

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	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation - Method 'A'
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structure and Concrete Pad
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
848.05	Wheelchair Ramp - Curb Cut
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

3/15/06

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	EDM
Parcel/Sequence Number	(123)
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	○
Well	○
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	▭
False Sump	▭

RAILROADS:

Standard Gauge	_____
RR Signal Milepost	○
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-
Proposed Temporary Utility Easement	-TUE-
Proposed Permanent Easement with Iron Pin and Cap Marker	◆

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
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	-S-

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	PH
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	PH
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	-W-
Designated U/G Water Line (S.U.E.*)	-W--
Above Ground Water Line	-A/G Water-

TV:

TV Satellite Dish	⊕
TV Pedestal	⊕
TV Tower	⊗
U/G TV Cable Hand Hole	PH
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	-U/L-
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.
Temporary Shoring	_____

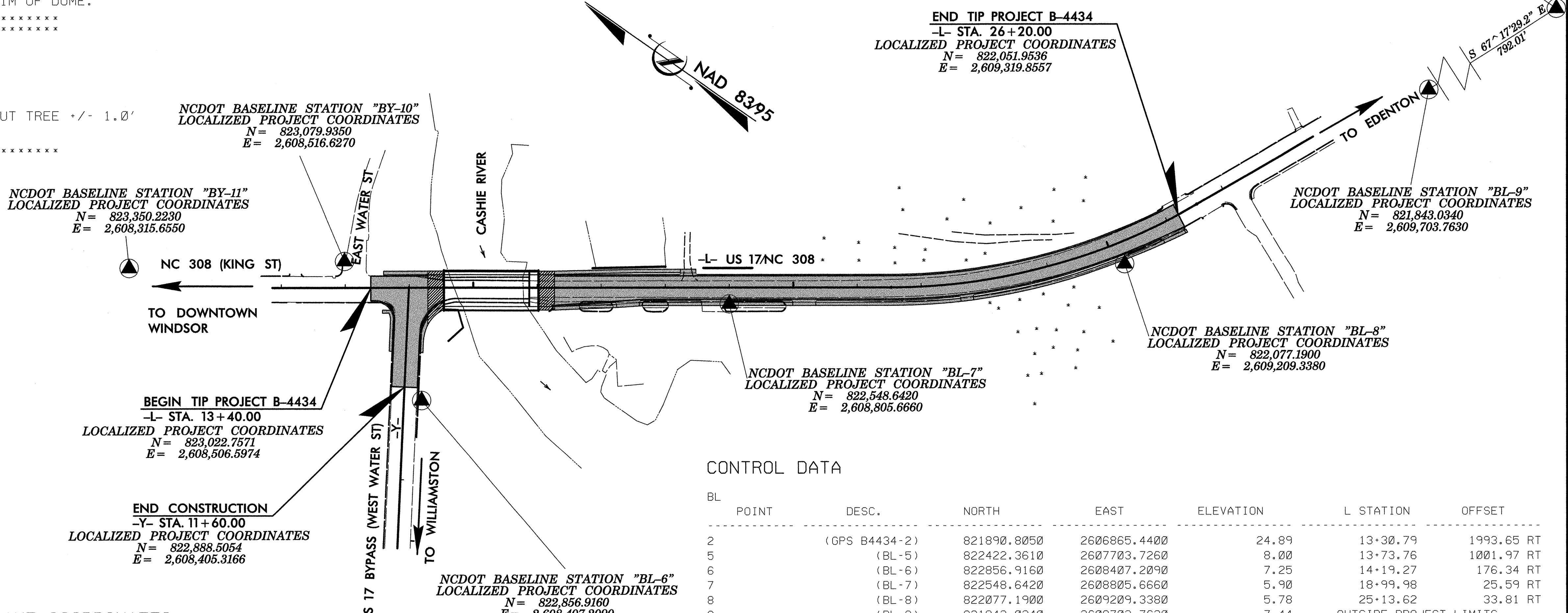
BENCHMARK DATA

 20 ELEVATION = 13.11
 N 823350 E 2608229
 L STATION 10+00
 N 59° 58' 18.8" W DIST 95.71
 NUT ON FIRE HYDRANT PAINTED WHITE AND LOCATED
 BETWEEN "CHATT" AND "ANOOGA" ON RIM OF DOME.

 21 ELEVATION = 3.45
 N 822783 E 2608947
 L STATION 17+88 225 LEFT
 R/R SPIKE SET IN BASE OF 16" WALNUT TREE +/- 1.0'
 OFF OF THE GROUND.

SURVEY CONTROL SHEET B-4434

NCDOT BASELINE STATION "GPS B4434-3"
 LOCALIZED PROJECT COORDINATES
 N= 821,537.2850
 E= 2,610,434.3730



CONTROL DATA

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
	2	(GPS B4434-2)	821890.8050	2606865.4400	24.89	13+30.79	1993.65 RT
	5	(BL-5)	822422.3610	2607703.7260	8.00	13+73.76	1001.97 RT
	6	(BL-6)	822856.9160	2608407.2090	7.25	14+19.27	176.34 RT
	7	(BL-7)	822548.6420	2608805.6660	5.90	18+99.98	25.59 RT
	8	(BL-8)	822077.1900	2609209.3380	5.78	25+13.62	33.81 RT
	9	(BL-9)	821843.0340	2609703.7630	7.44	OUTSIDE PROJECT LIMITS	
	3	(GPS B4434-3)	821537.2850	2610434.3730	8.96	OUTSIDE PROJECT LIMITS	

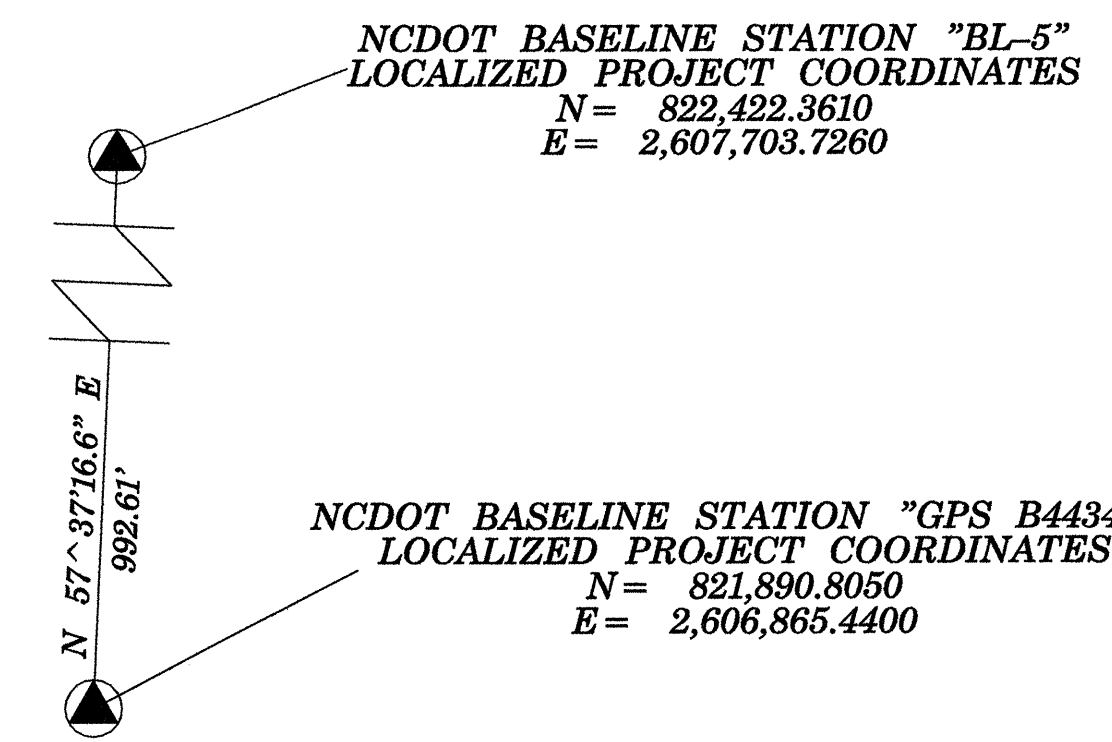
BY	POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
	11	(BY-11)	823350.2230	2608315.6550	10.90	OUTSIDE PROJECT LIMITS	
	10	(BY-10)	823079.9350	2608516.6270	7.22	OUTSIDE PROJECT LIMITS	
	6	(BL-6)	822856.9160	2608407.2090	7.25	OUTSIDE PROJECT LIMITS	

GPS NETWORK - STATE PLANE COORDINATES

POINT	NORTH	EAST	ELEVATION
WINDSOR 2	829259.4242	2598544.6225	58.03
LUMBER			35.91
GROVE	727655.8183	2592420.2482	36.67
WALNUT RESET	820650.2747	2680073.2521	19.89

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS B4434-3" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 821537.285(ft) EASTING: 2610434.373(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99996160 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BY-10" TO -L- STATION 13+40 IS S 9°56'56" W 58.05 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88



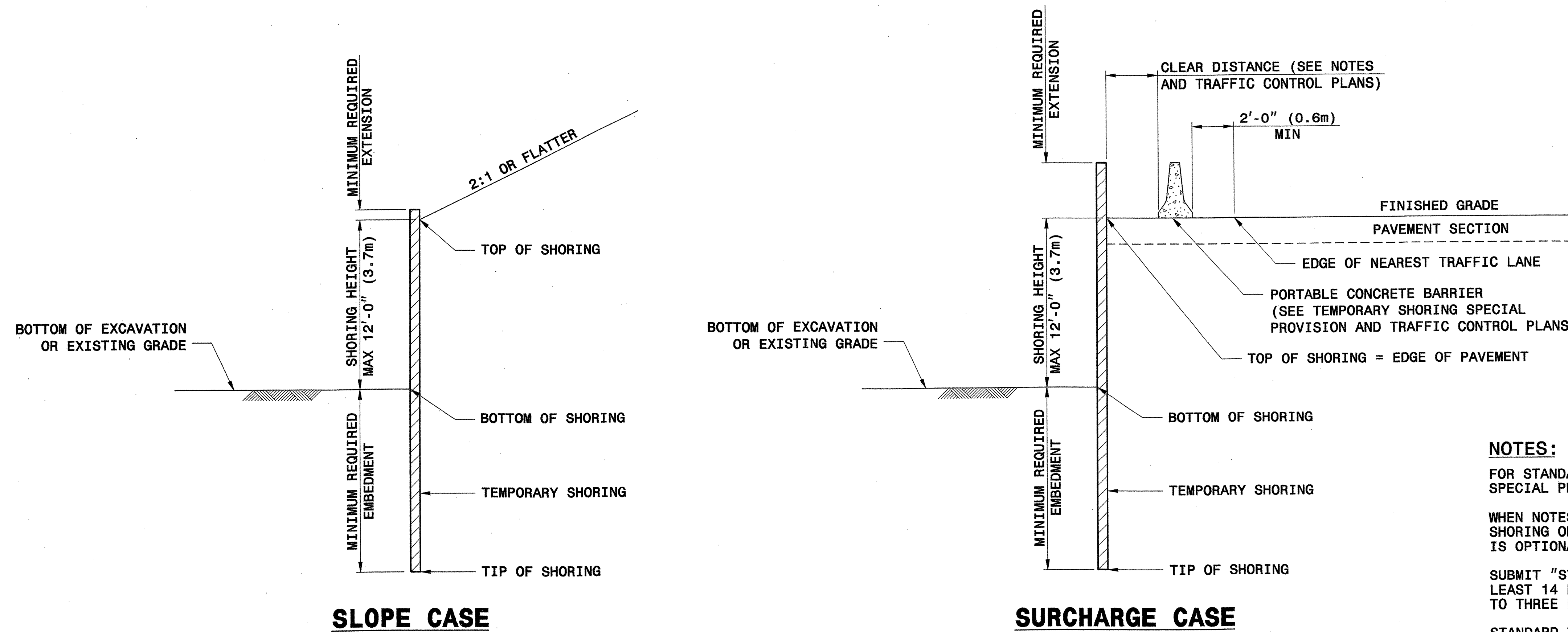
NOTES:

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING [HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project) FILE: b4434_ls_control_060719.txt
- SITE CALIBRATION PARAMETERS HAVE NOT BEEN DETERMINED 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 UTILIZING GLOBAL POSITIONING SYSTEM. NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION.

NOTE: DRAWING NOT TO SCALE



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



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.

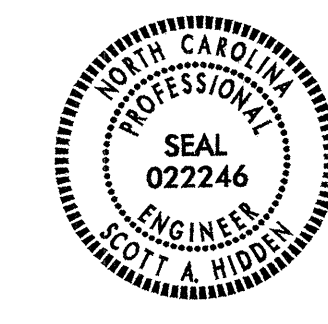
GROUNDWATER CONDITION	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT						SURCHARGE CASE WITH TRAFFIC IMPACT				
	SHORING HEIGHT FT (m)	SHEET PILES		H PILES WITH TIMBER LAGGING			SHEET PILES		H PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN ³ /FT (cm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

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

GEOTECHNICAL ENGINEERING UNIT
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DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.01
STANDARD TEMPORARY SHORING
DATE: 2-20-07

STANDARD TEMPORARY MSE WALL OPTIONS



Scott A. Hadden 3/29/07
SIGNATURE DATE

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

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

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

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

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

STANDARD TEMPORARY MSE WALLS ARE BASED ON THE FOLLOWING CONDITIONS:

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

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

- TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/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
- 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.

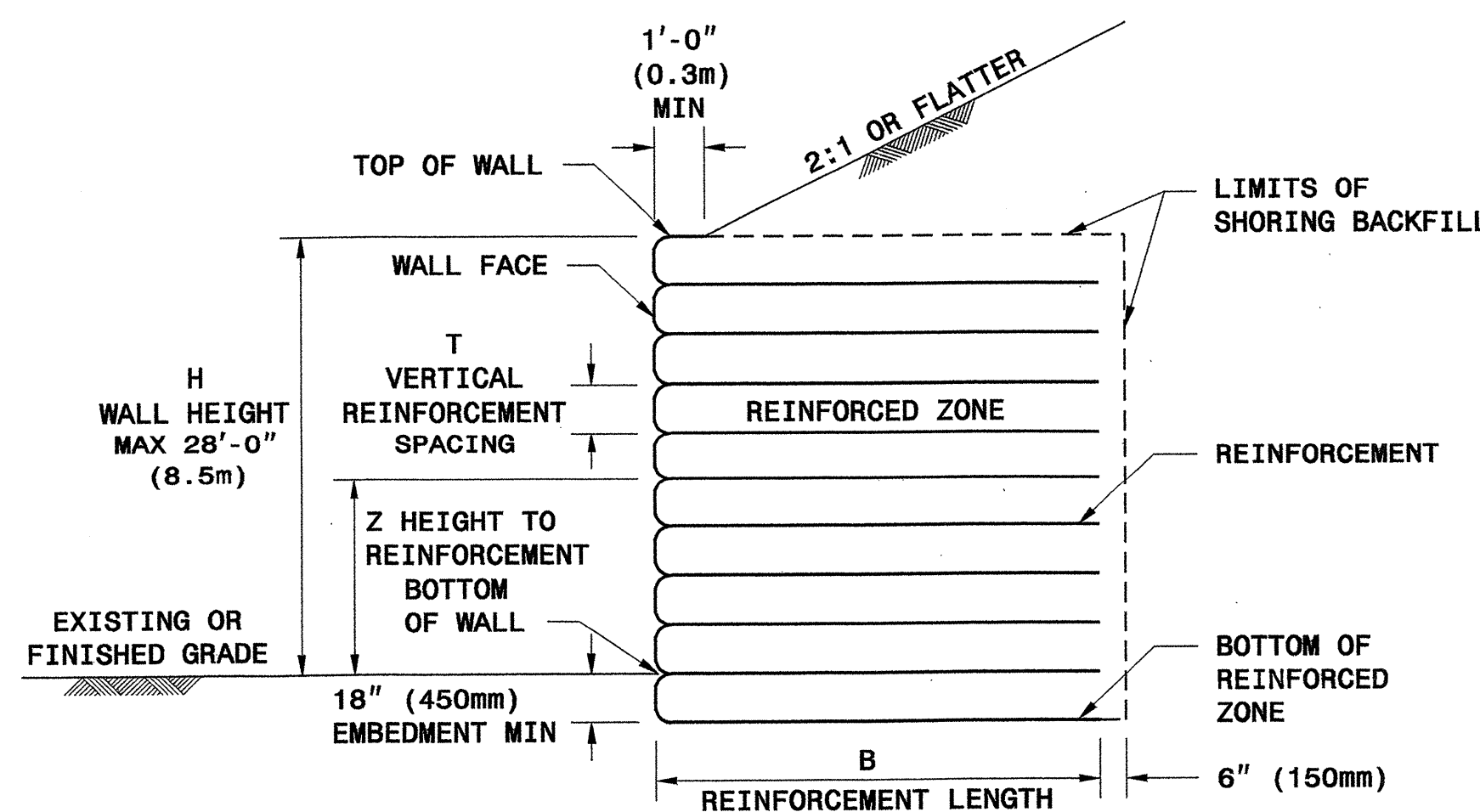
PLACE SHORING BACKFILL IN 8" TO 10" (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

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.

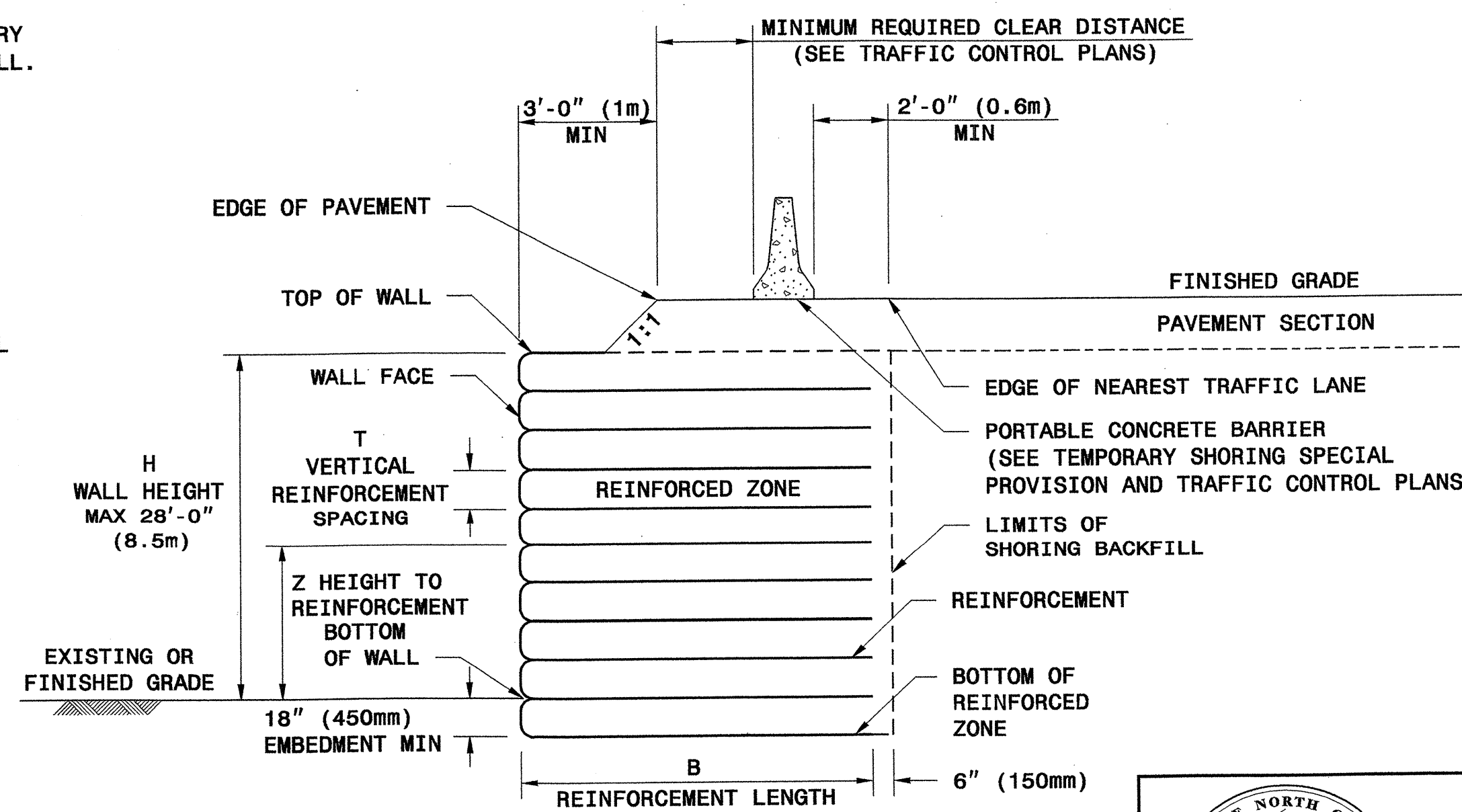
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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

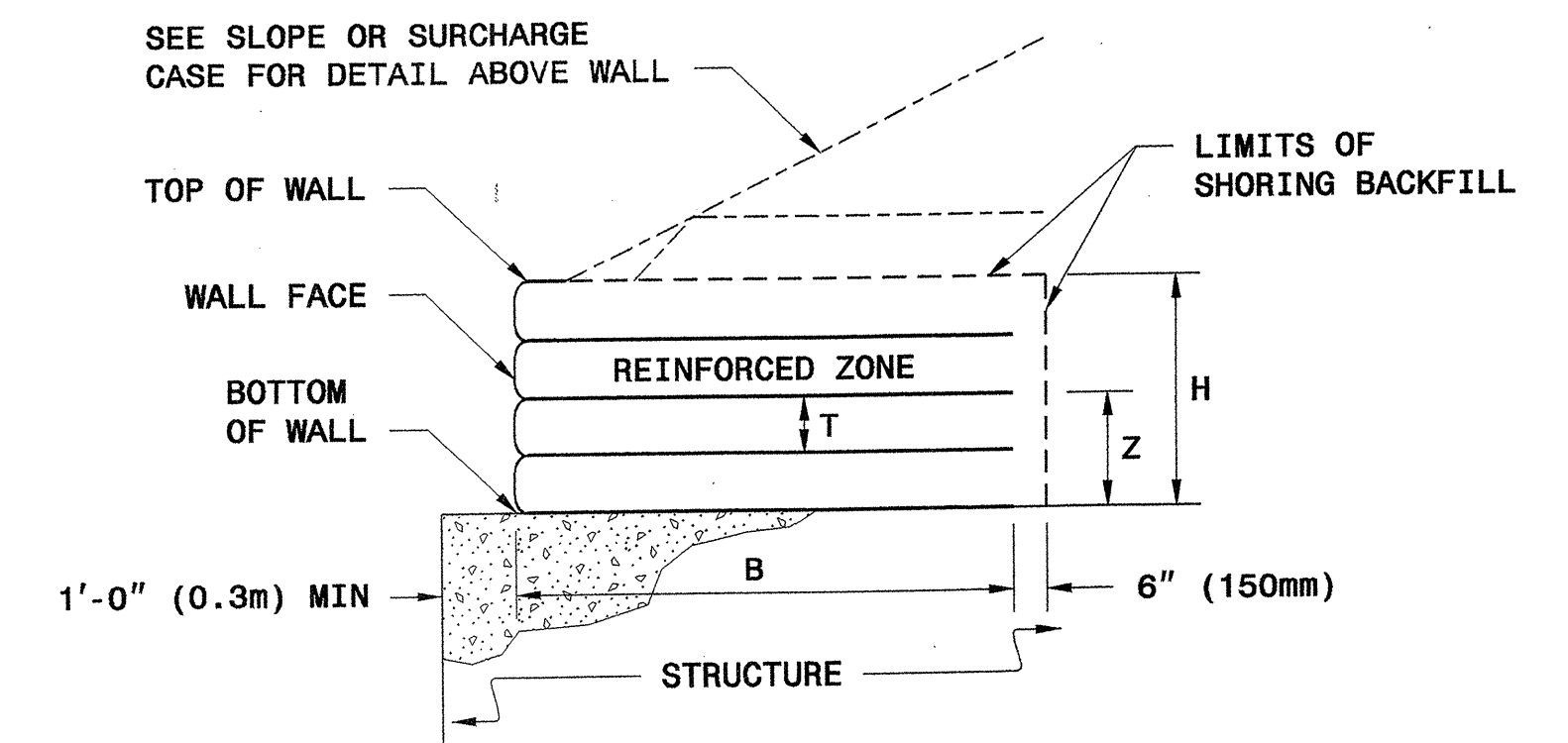
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



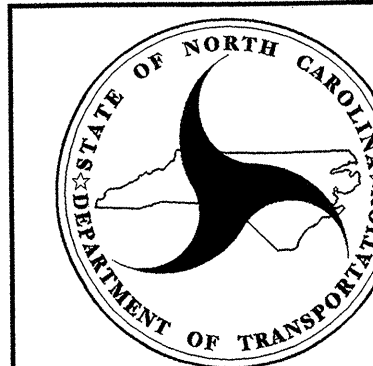
SLOPE CASE



SURCHARGE CASE



TEMPORARY MSE WALL ON STRUCTURE



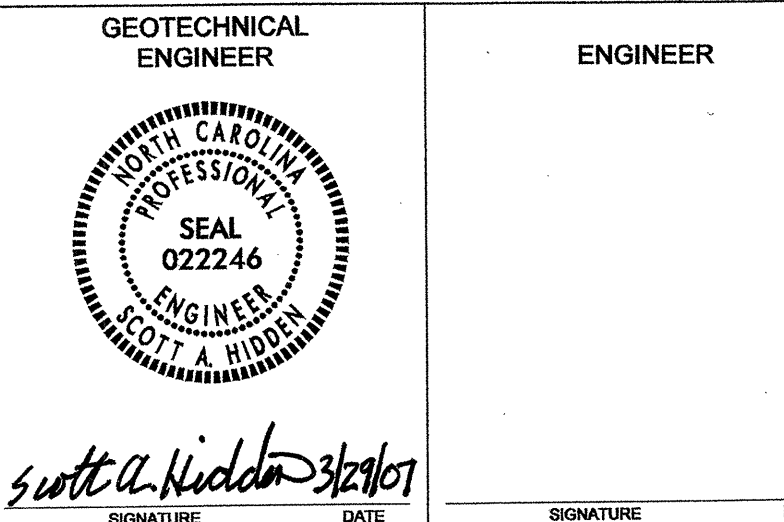
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RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS

SHEET 1 OF 11

DATE: 2-20-07



HOW TO USE THIS SHEET:

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

MINIMUM REQUIRED REINFORCEMENT LENGTH B (FT)

(FOR ALL WALL OPTIONS)

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

TERRATREL TEMPORARY WALL (STRIPS PER LEVEL PER PANEL)

H (FT)		4 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)	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	

SLOPE AND SURCHARGE CASES

Z (FT-INCHES)

SIERRASCAPE TEMPORARY WALL (GEOGRID TYPE)

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

H (FT)		4 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)	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	

SLOPE CASE

Z (FT)

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)	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	

SURCHARGE CASE

Z (FT)

HILFIKER TEMPORARY WALL (WELDED WIRE MAT TYPE)

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

H (FT)		4 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)	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	

SLOPE CASE

Z (FT)

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)	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	

SURCHARGE CASE

Z (FT)

RETAINED EARTH TEMPORARY WALL (WELDED WIRE MESH TYPE)

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

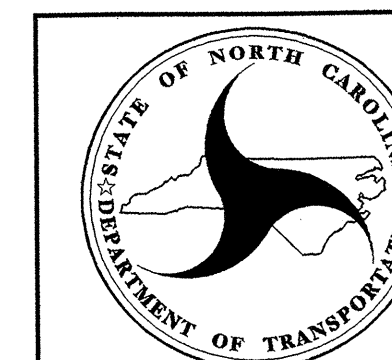
H (FT)		4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28
Z (FT)	27 - 6												3X1
	26 - 10												3X1
	25 - 2												3X1
	23 - 6												3X1
	21 - 10												3X1
	20 - 2												3X1
	18 - 6												3X1
	16 - 10												3X1
	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	

SLOPE AND SURCHARGE CASES

Z (FT-INCHES)

NOTES FOR HILFIKER TEMPORARY WALL

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



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STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

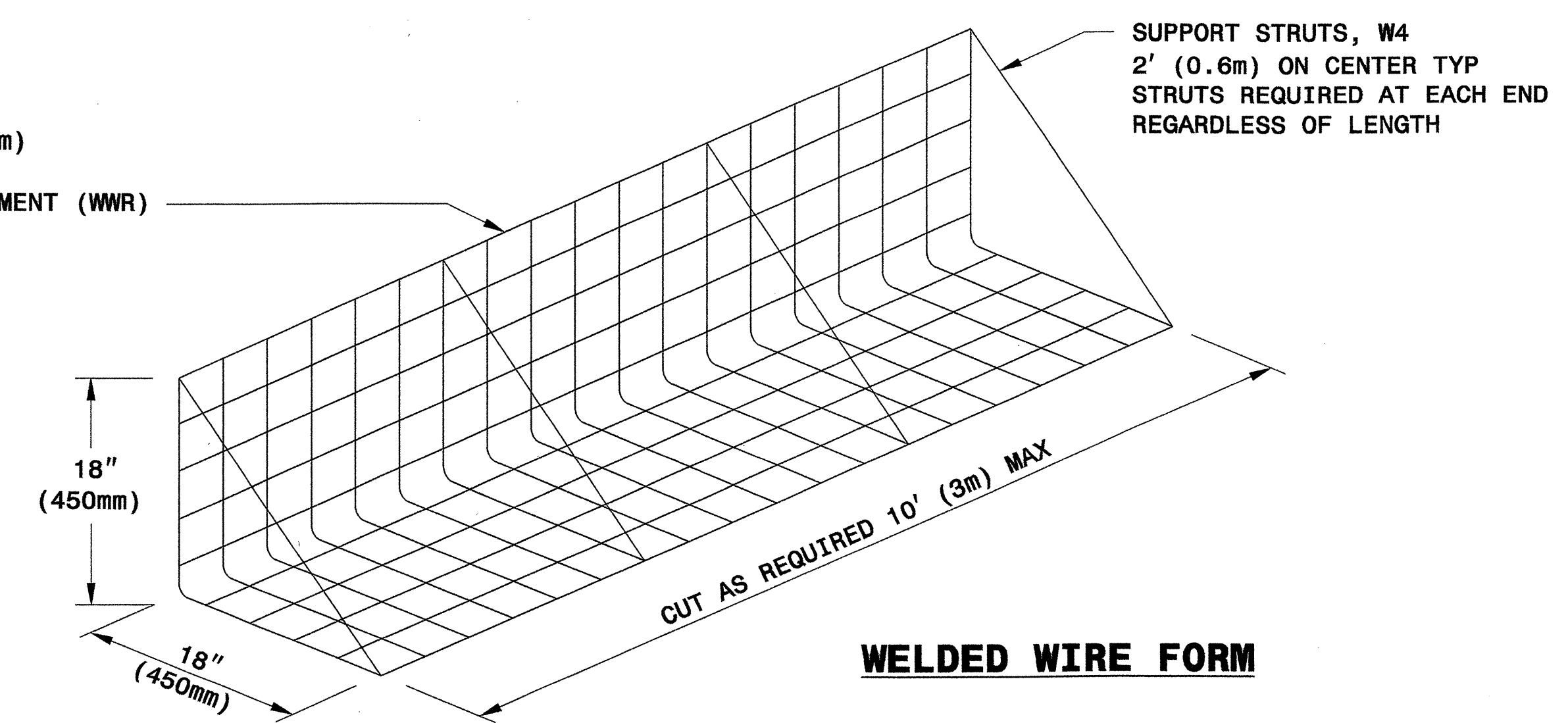
SHEET 2 OF 11

DATE: 2-20-07

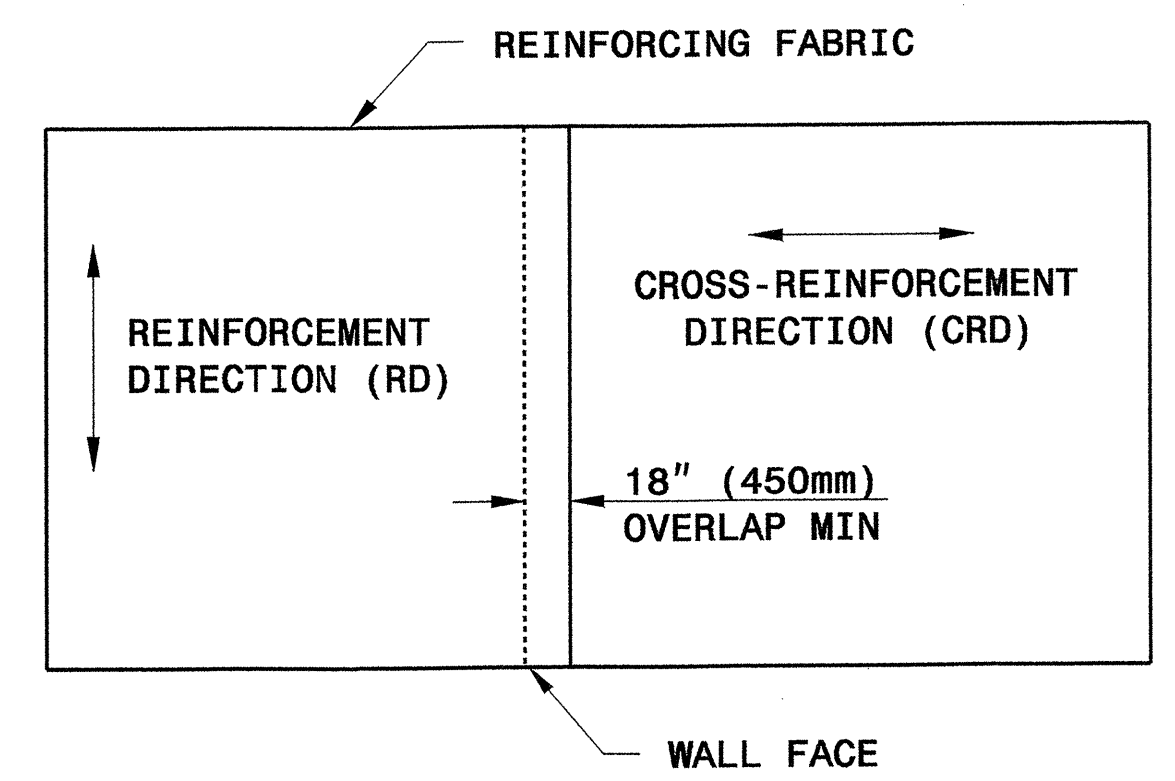


Scott A. Hadden 3/29/07
SIGNATURE DATE

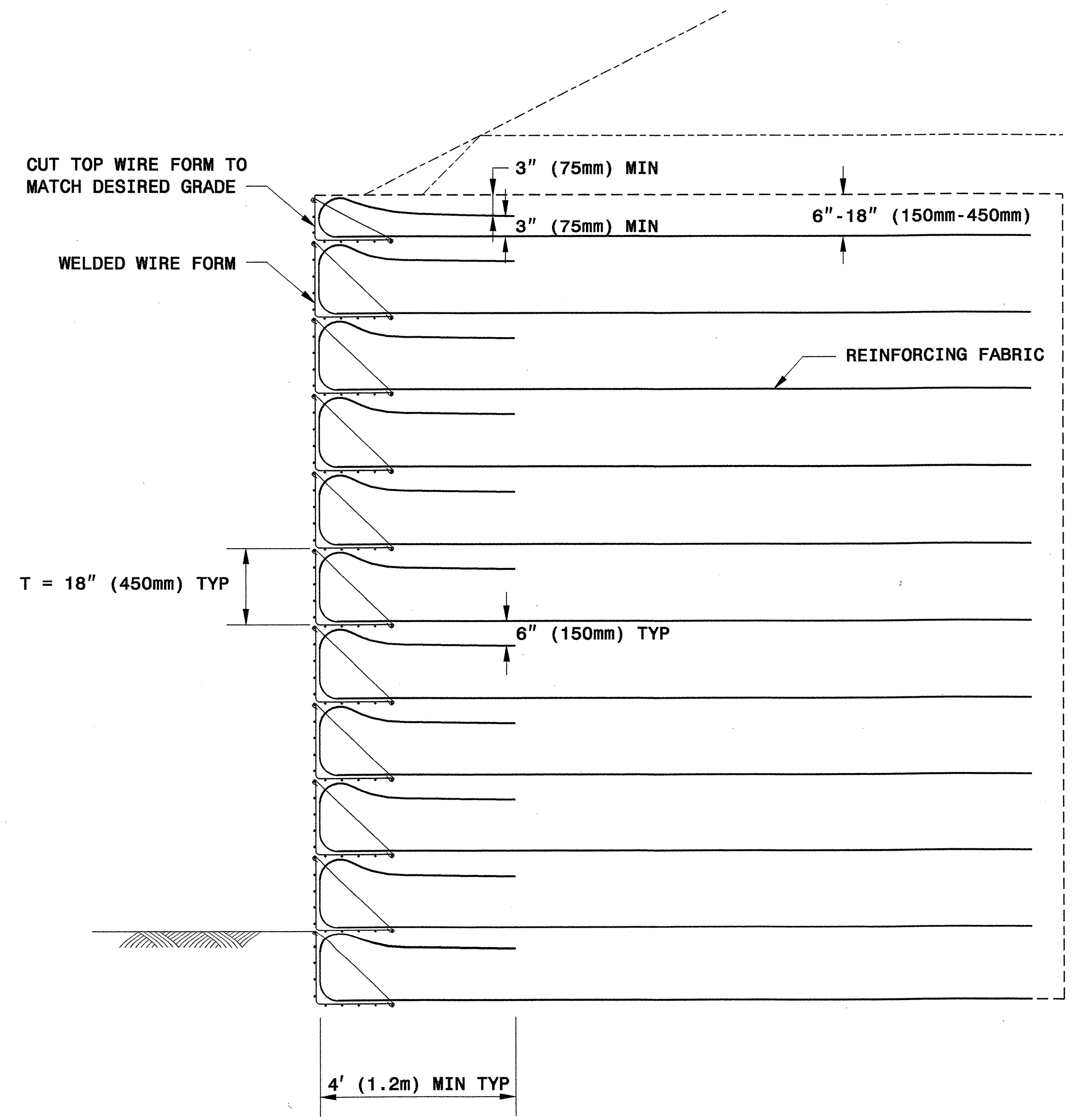
4" X 4" (102mm X 102mm)
W4 X W4 (MW26 X MW26)
WELDED WIRE REINFORCEMENT (WWR)



WELDED WIRE FORM



PLAN VIEW OF FABRIC OVERLAP

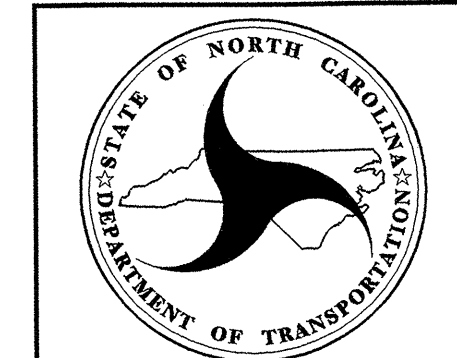


TYPICAL SECTION

**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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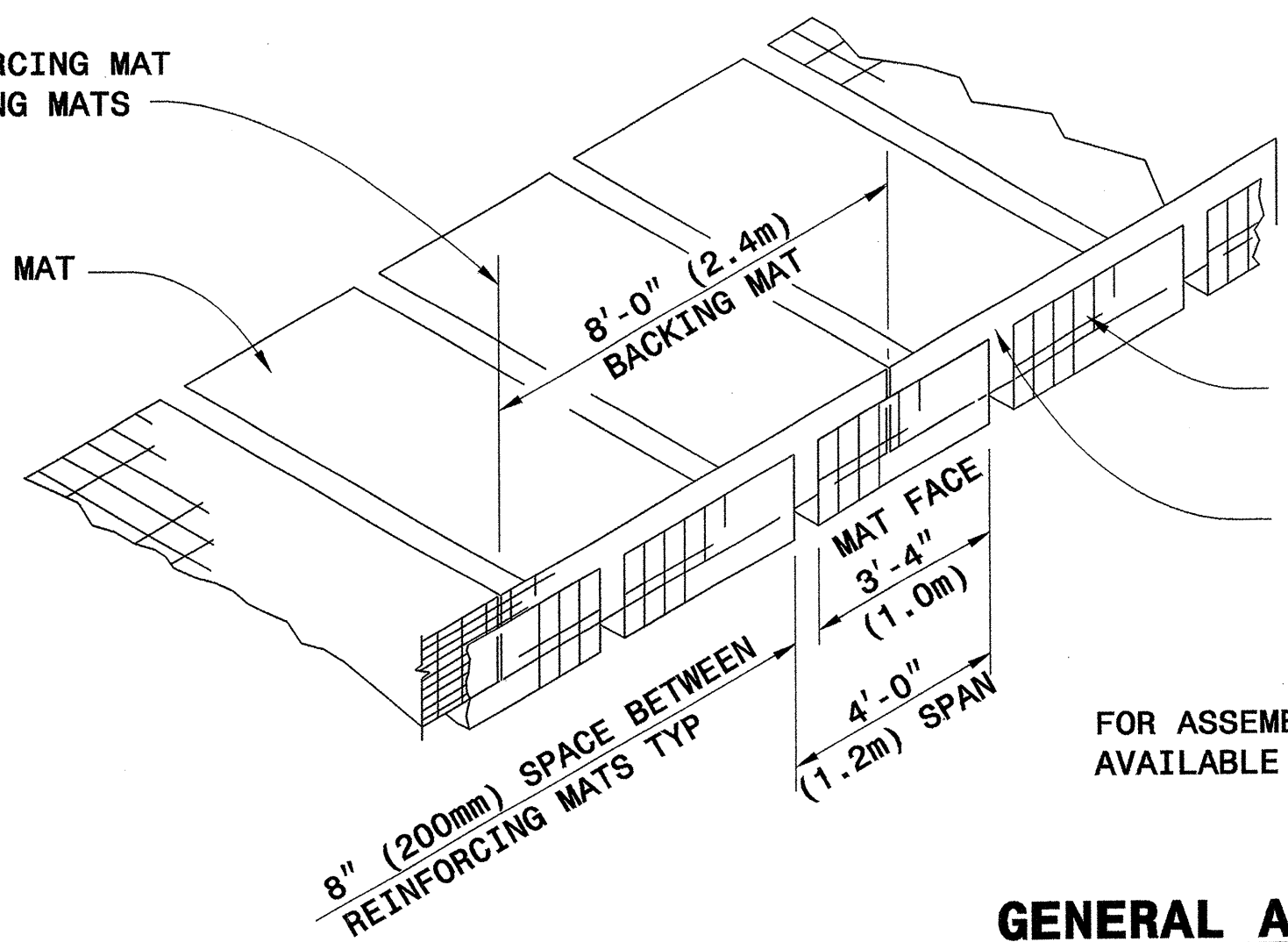
STANDARD DRAWING NO. 1801.02

TEMPORARY FABRIC WALL

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

CENTERLINE OF REINFORCING MAT
FACE = EDGE OF BACKING MATS

REINFORCING MAT

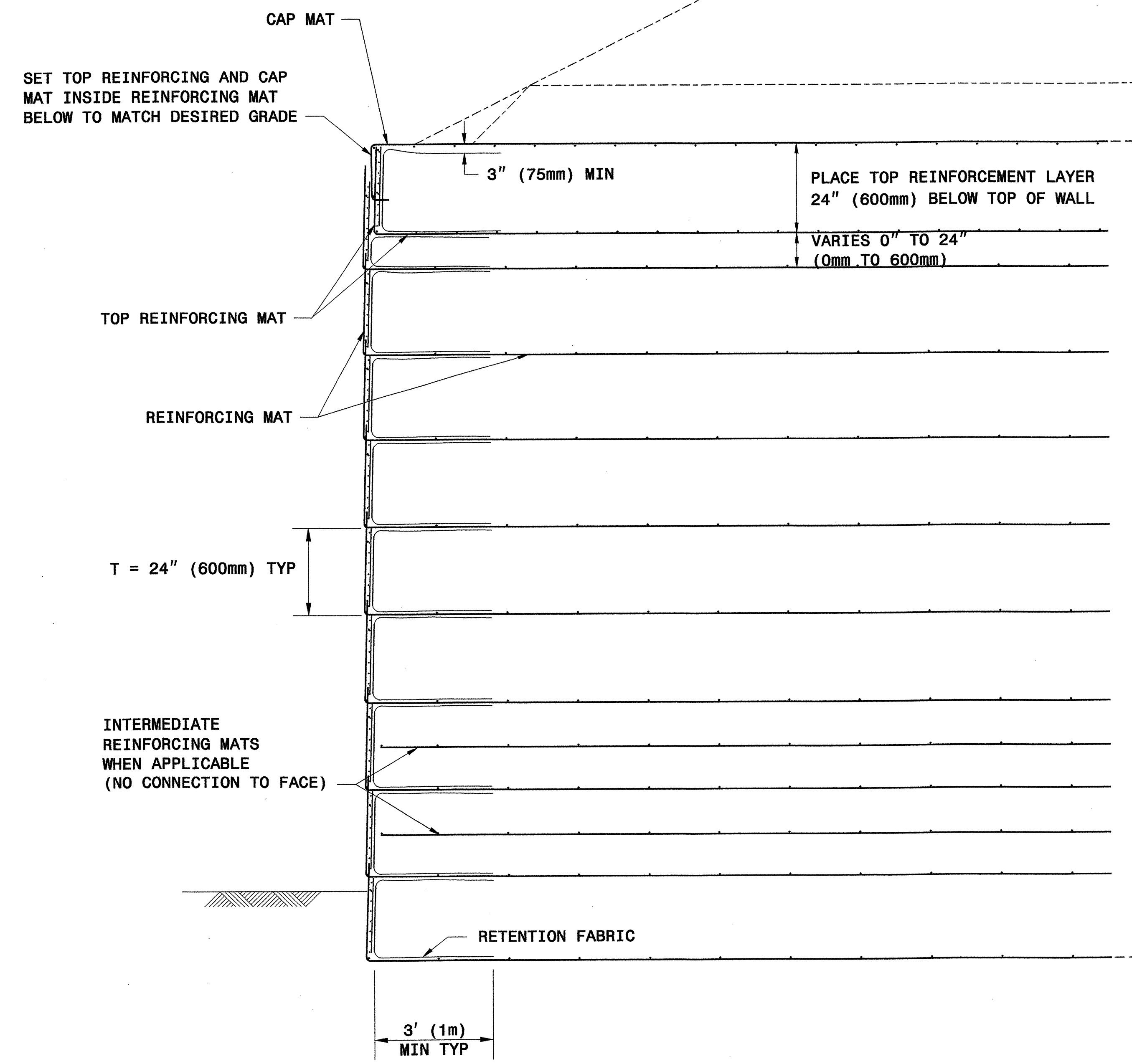


WALL FACE

BACKING MAT

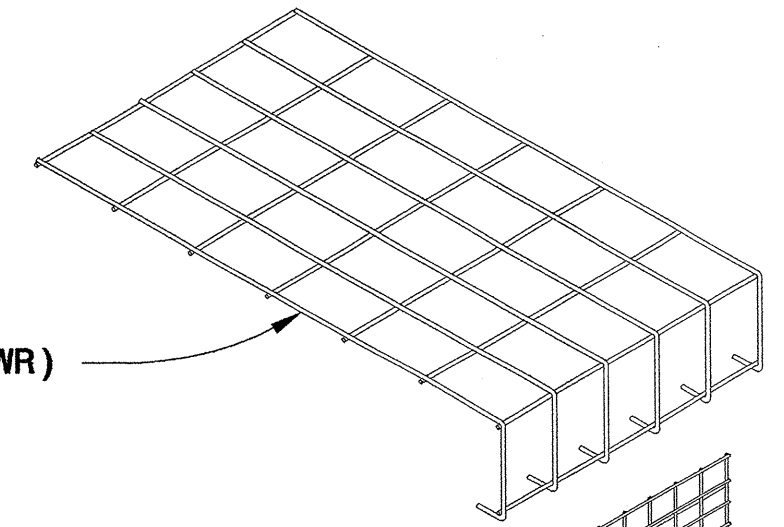
FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE
AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

GENERAL ASSEMBLY DETAIL

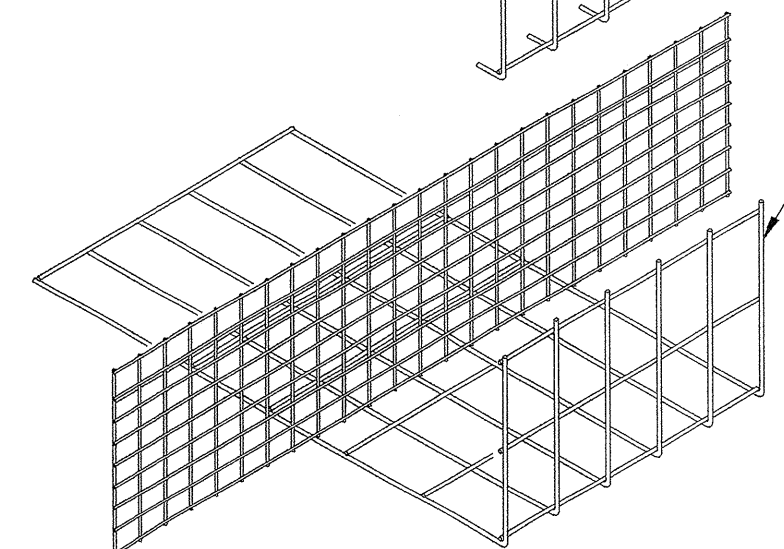


TYPICAL SECTION

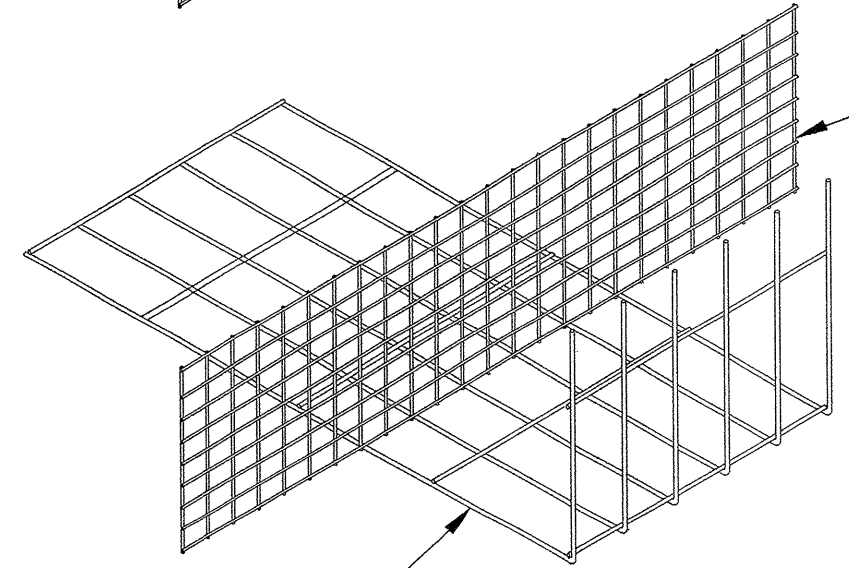
8" X 12" (203mm X 305mm)
W4.5 X W3.5 (MW29 X MW23)
CAP MAT
WELDED WIRE REINFORCEMENT (WWR)



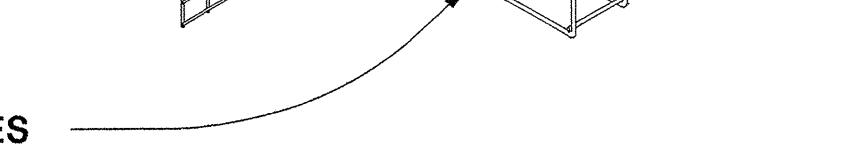
8" X 12" (203mm X 305mm)
W4.5 X W3.5 (MW29 X MW23) WWR
TOP REINFORCING MAT (NO PRONGS)



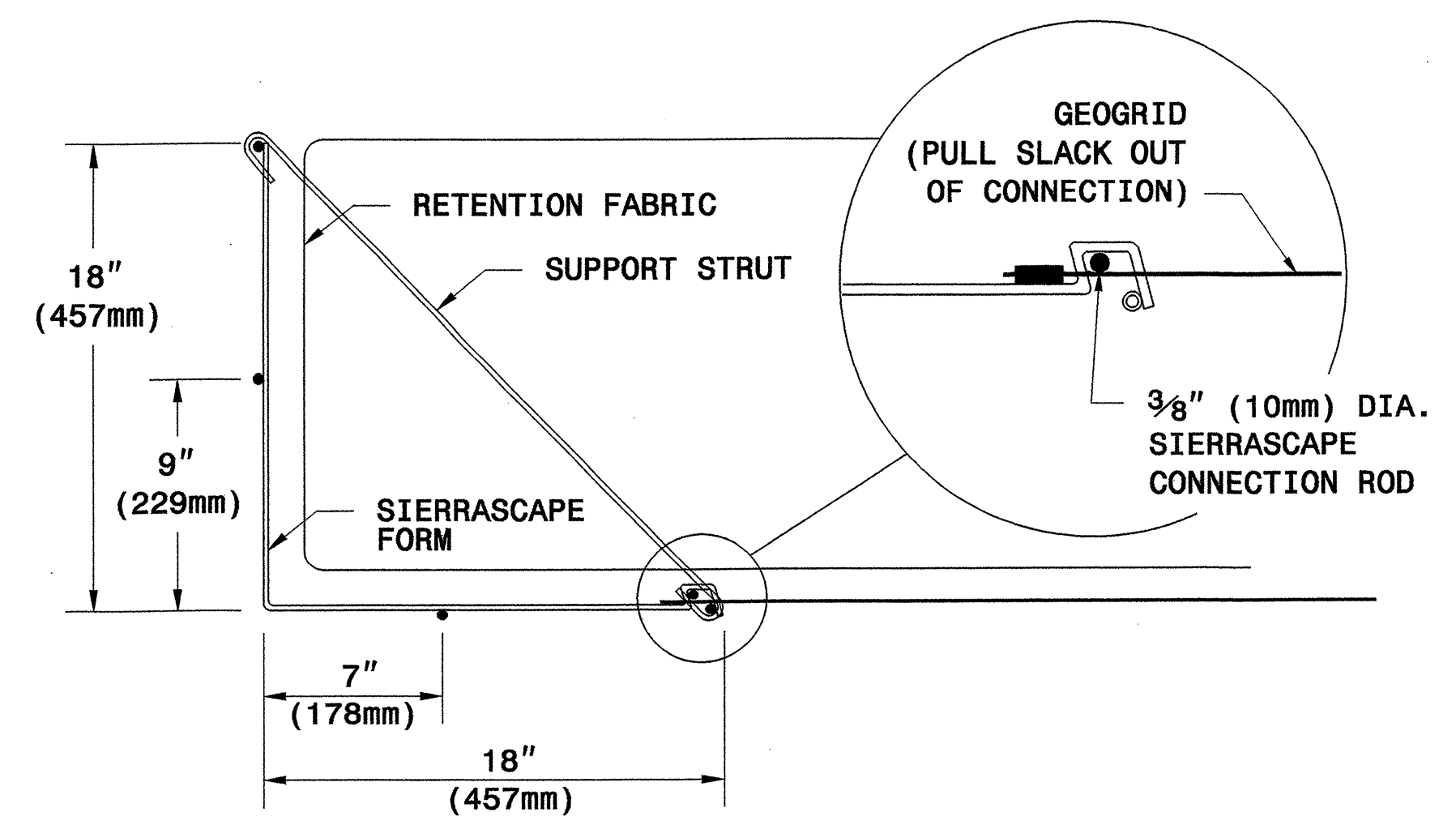
4" X 3" (102mm X 76mm)
W5 X W2.5 (MW32 X MW16) WWR
BACKING MAT
8' (2.4m) WIDE



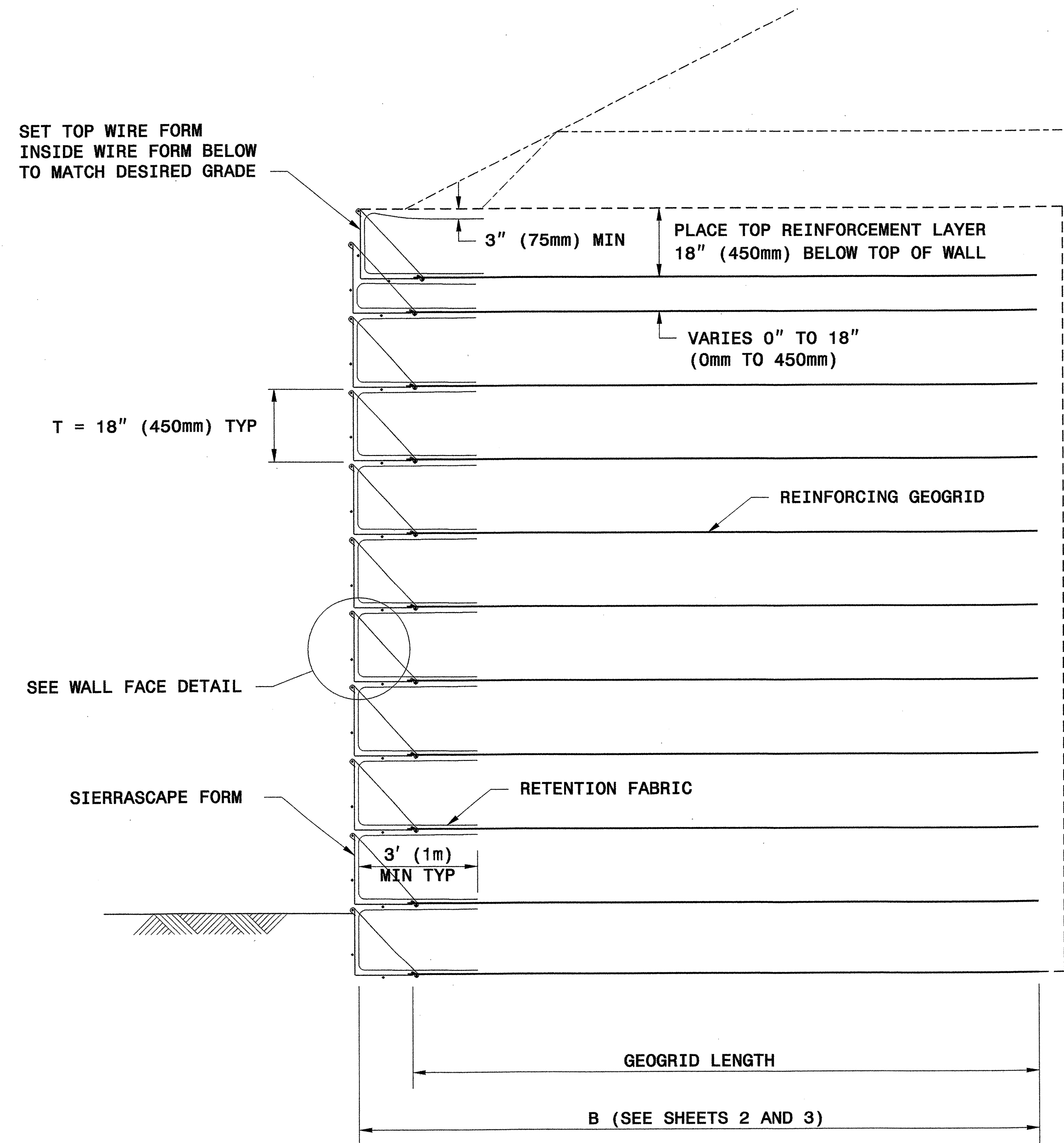
8" X 21" (203mm X 533mm)
REINFORCING MAT
SEE SHEETS 2 AND 3 FOR GAUGE SIZES



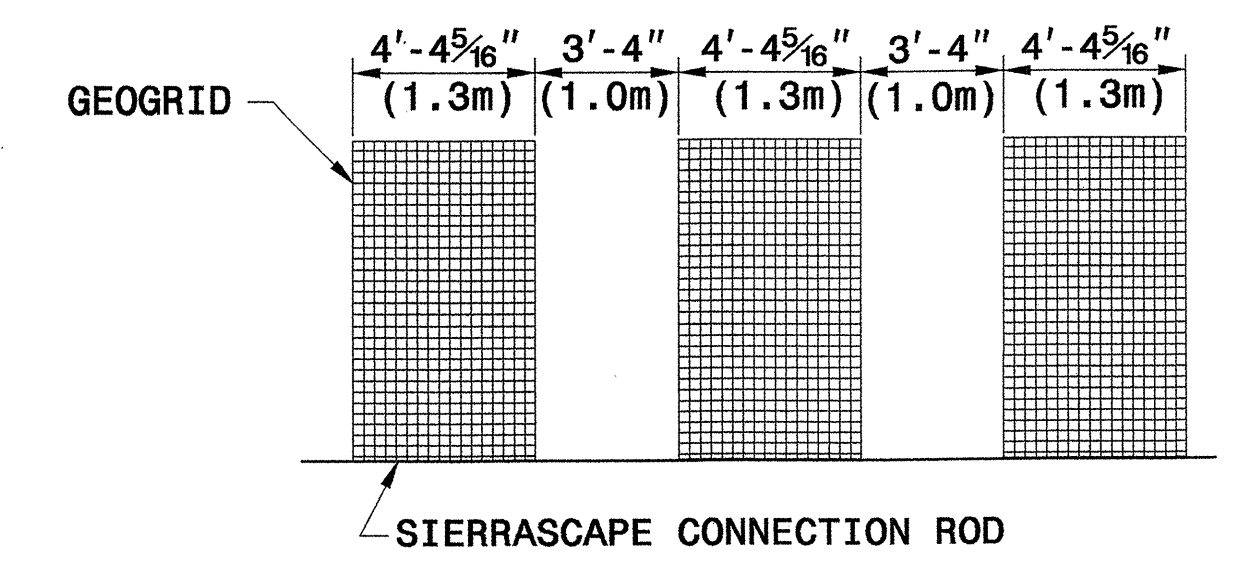
WALL COMPONENTS



WALL FACE DETAIL

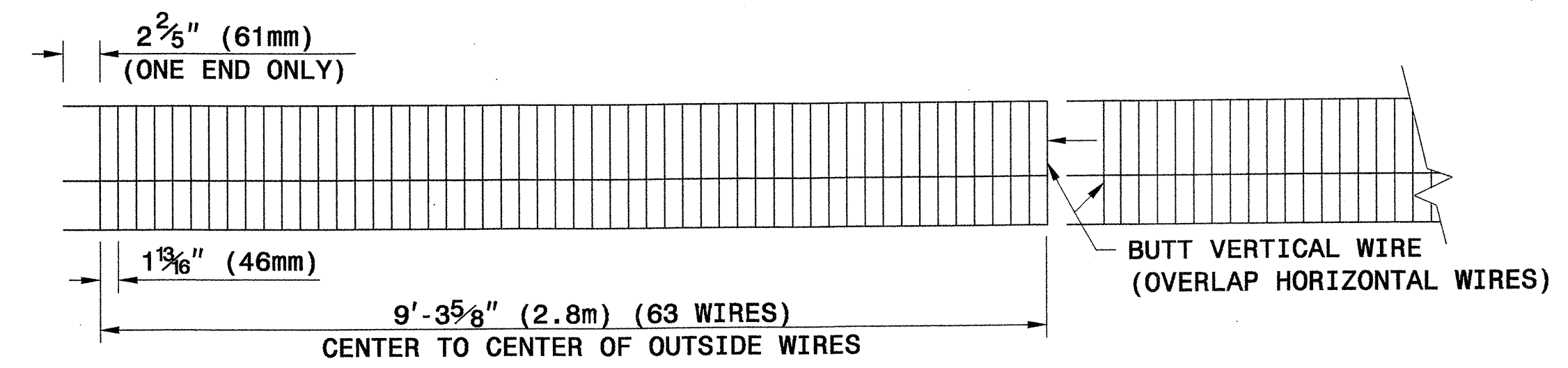


TYPICAL SECTION

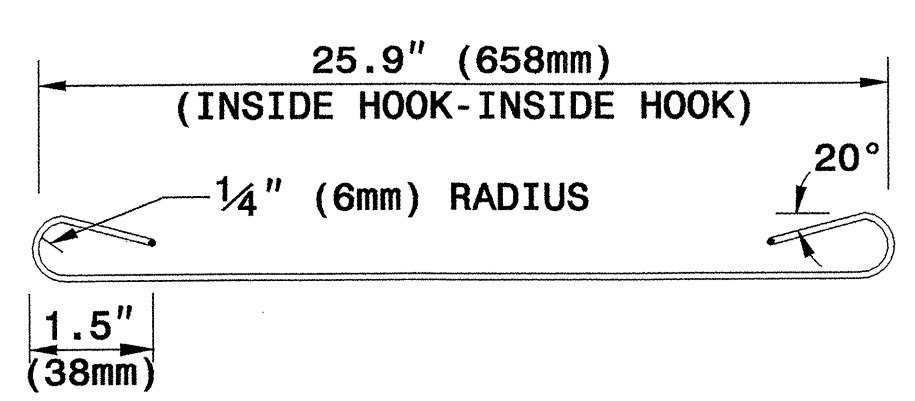


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

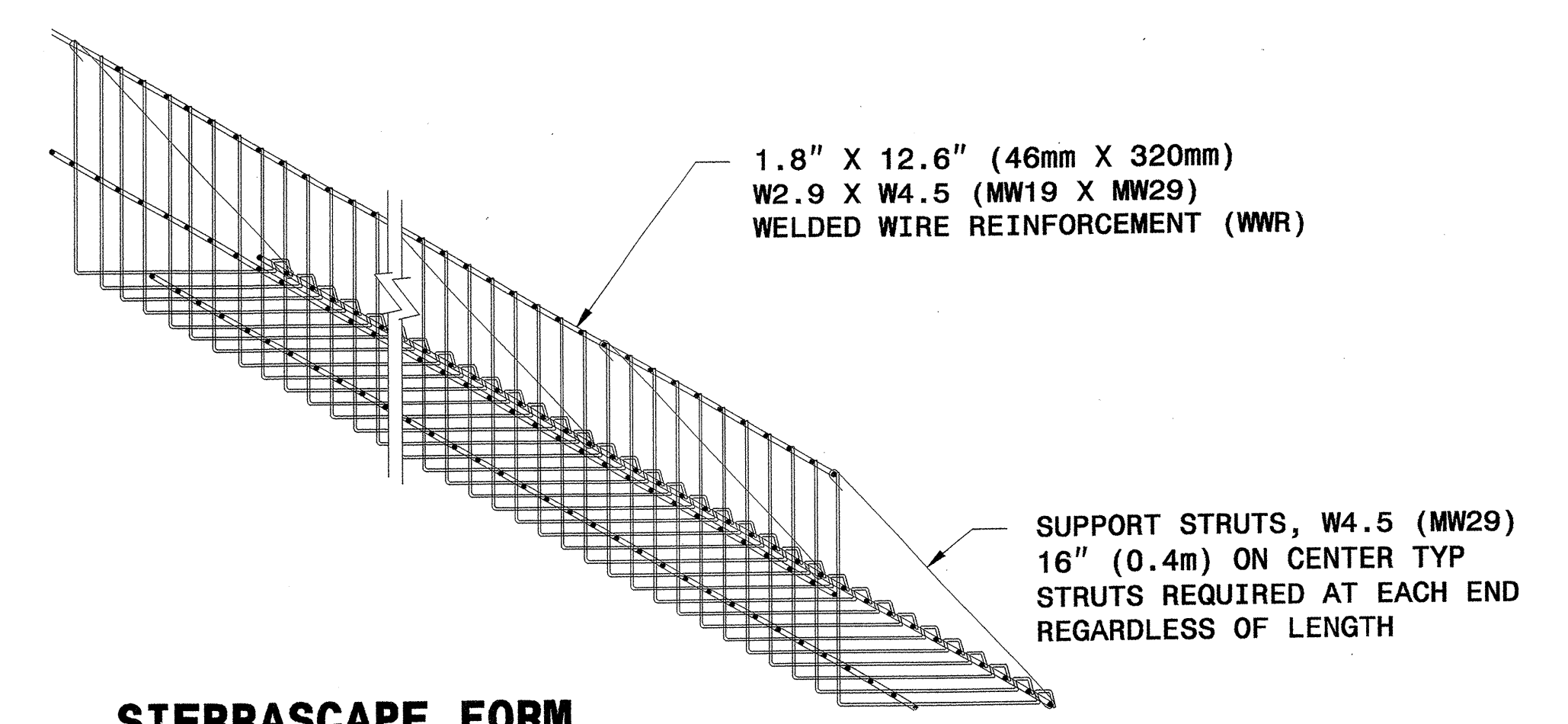
TYPICAL GEOGRID COVERAGE



ELEVATION VIEW

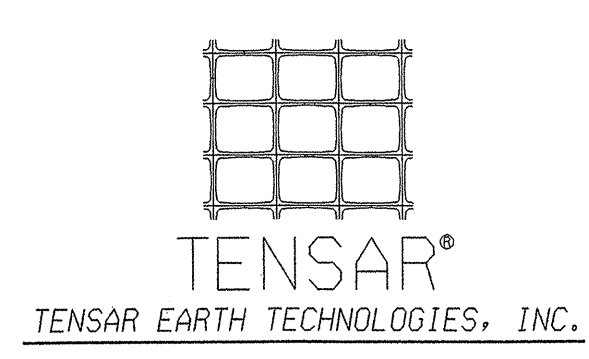


SUPPORT STRUT



SIERRASCAPE FORM

WALL COMPONENTS



GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD DRAWING NO. 1801.02

SIERRASCAPE TEMPORARY WALL

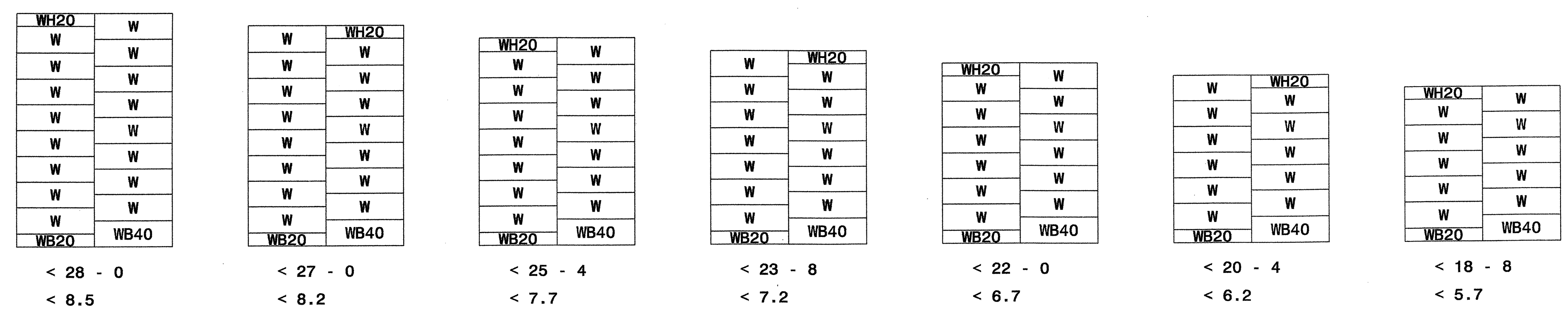
SHEET 5 OF 11 DATE: 12-19-06

GEOTECHNICAL ENGINEER ENGINEER

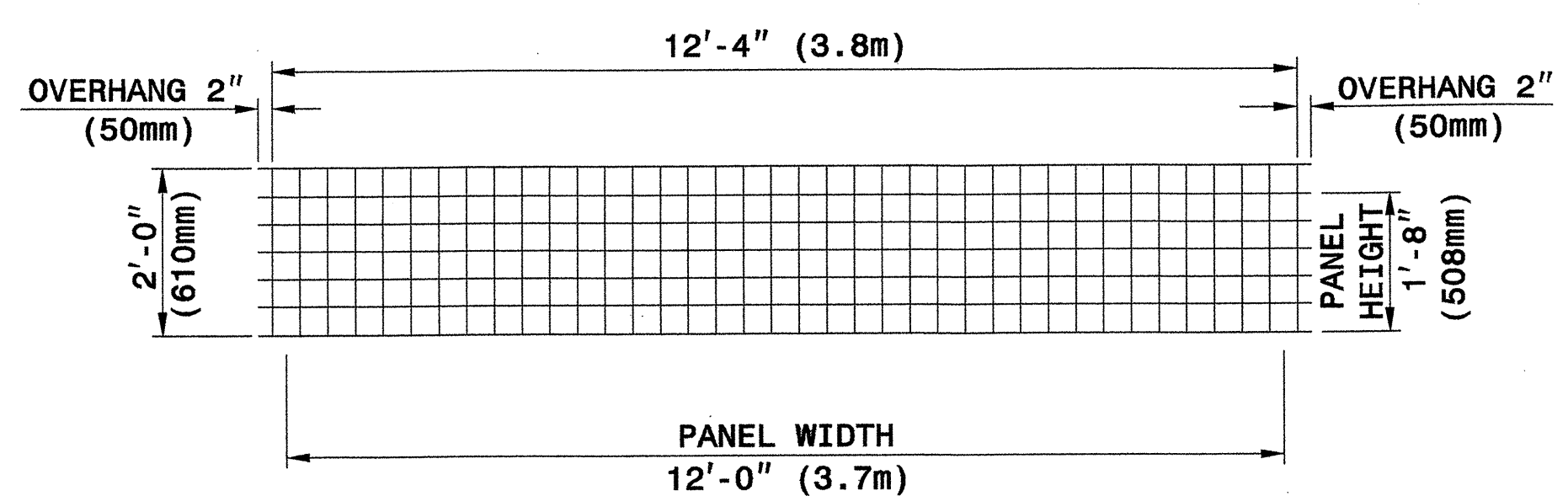
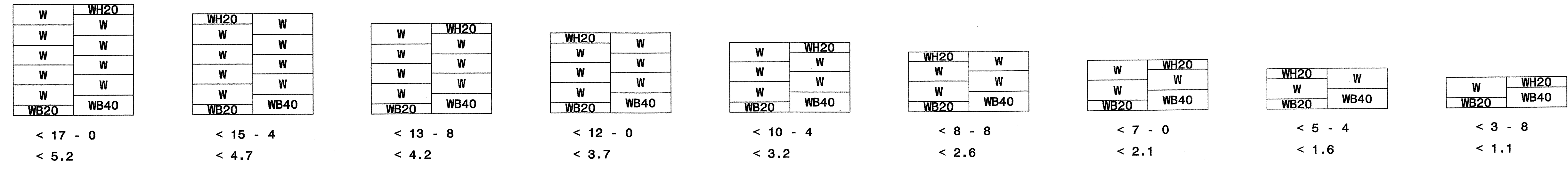
Scott A. Hidden 3/29/07

PANEL LAYOUTS

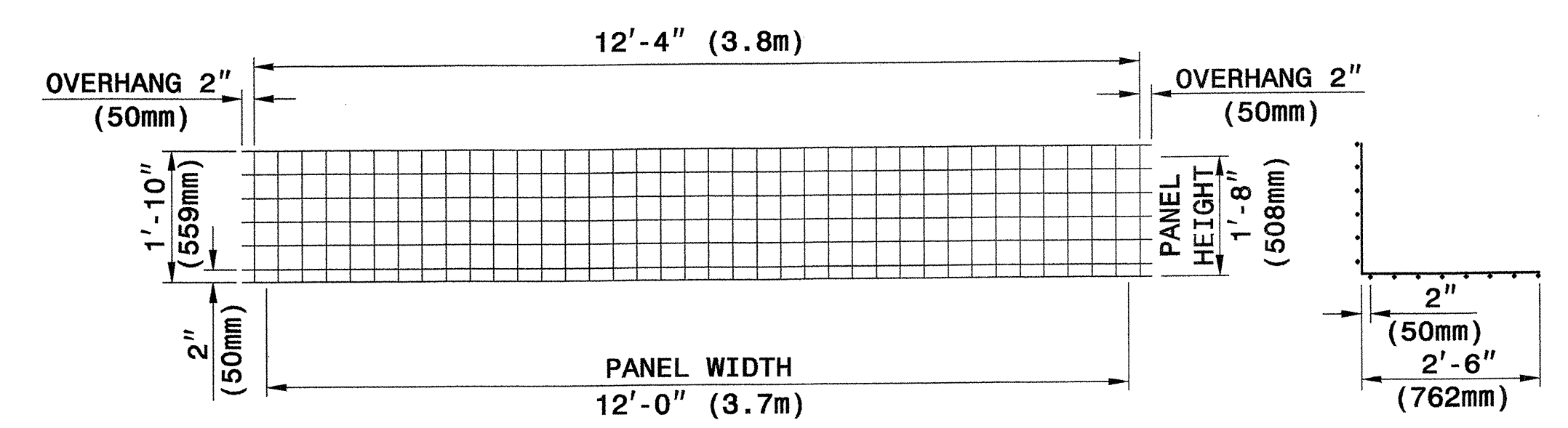
H - WALL HEIGHT
(FEET-INCHES)
(METER)



(FEET-INCHES)
(METER)

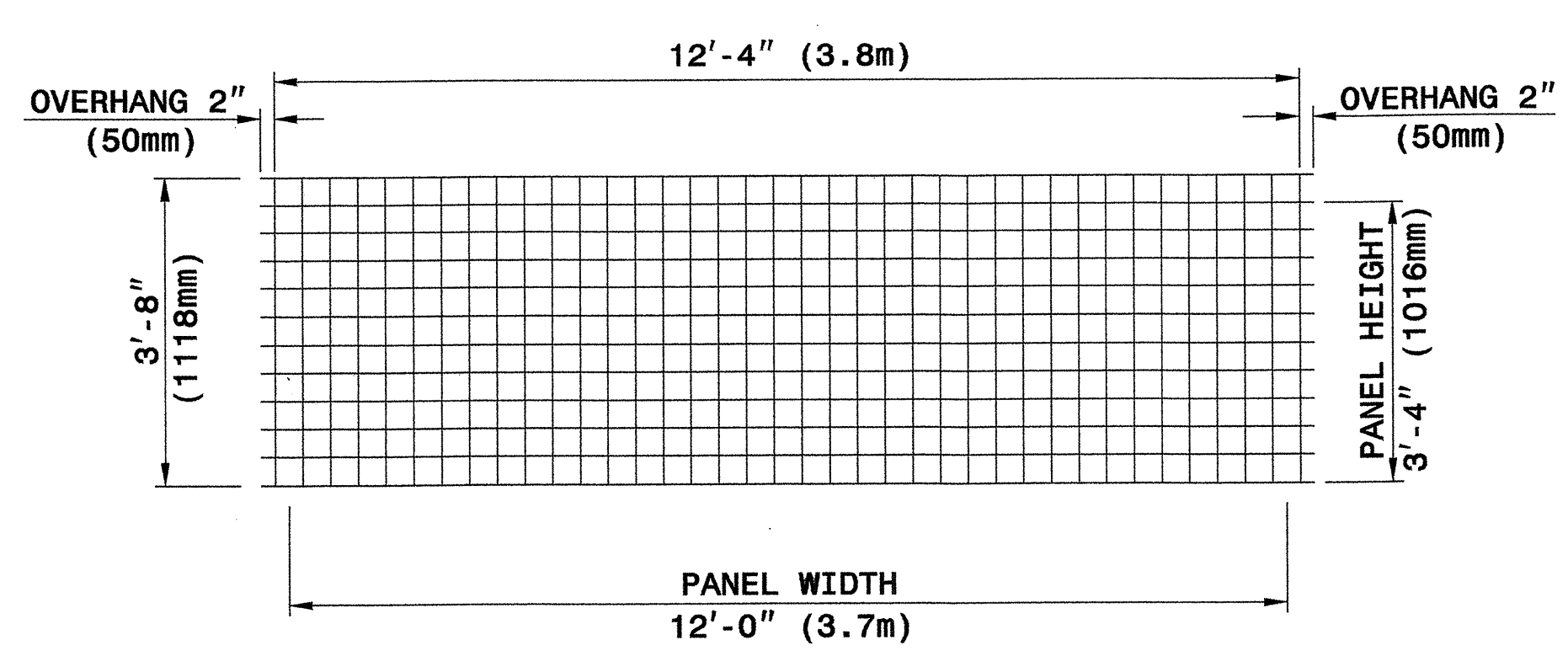


TYPE WH20

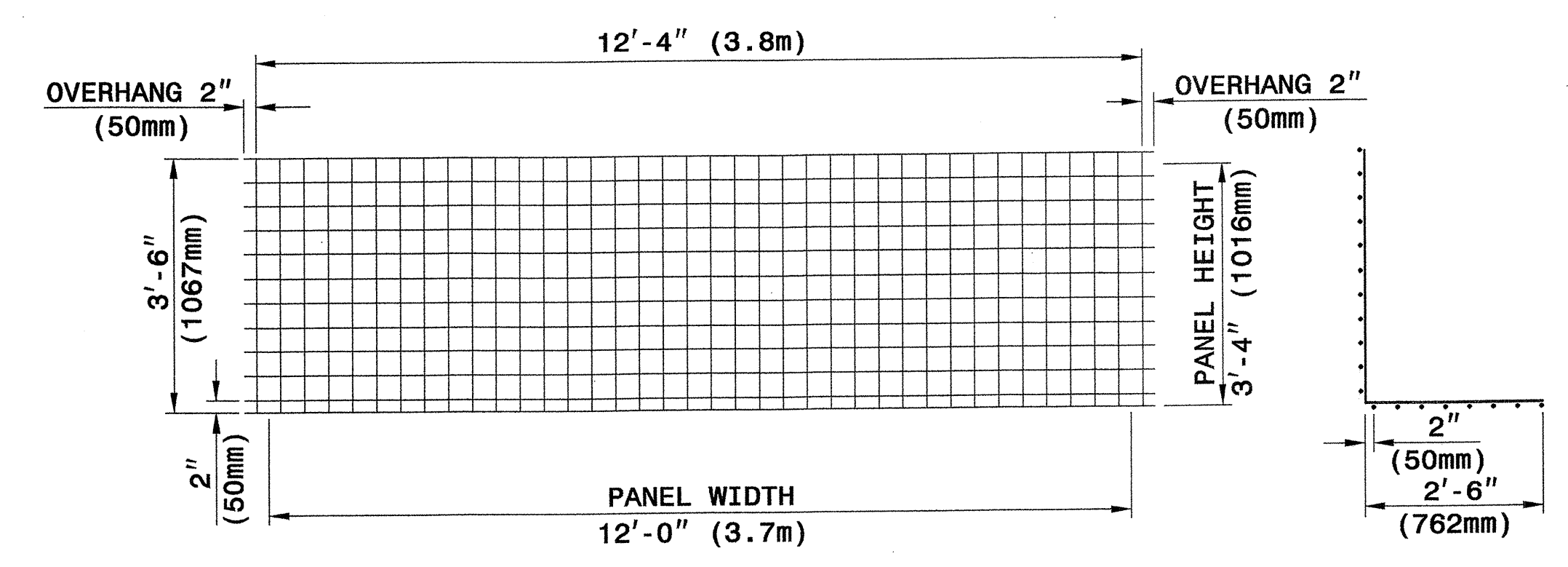


TYPE WB20

SECTION



TYPE W



TYPE WB40

SECTION

WELDED WIRE FACINGS

WELDED WIRE FORMS


PANEL TYPES (WELDED WIRE FACINGS AND FORMS)

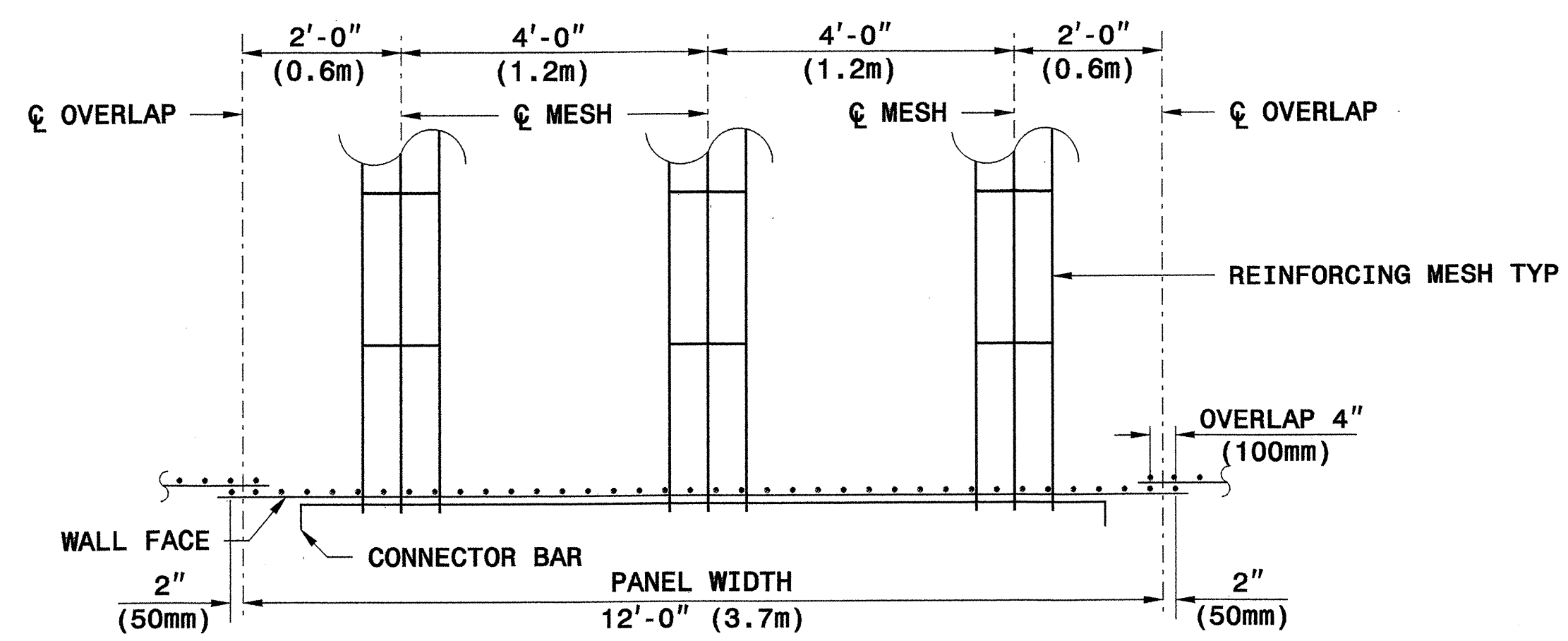
4" X 4" (100mm X 100mm), W8 X W8 (MW52 X MW52) WELDED WIRE REINFORCEMENT (WWR)



GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

GEOTECHNICAL ENGINEER  SEAL 022246 ENGINEER SCOTT A. SHIDDEN	ENGINEER SIGNATURE DATE SIGNATURE DATE
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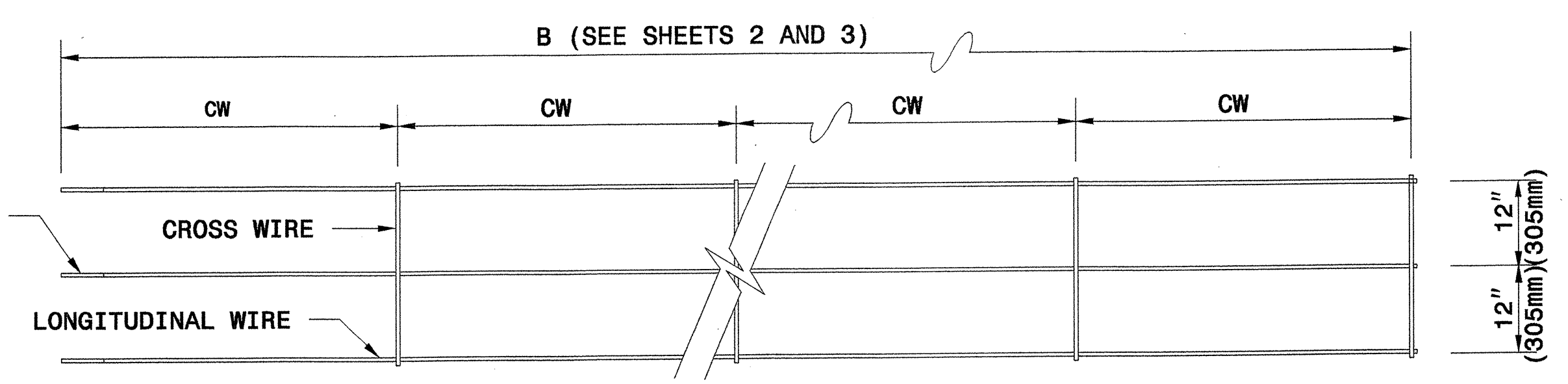


REINFORCING MESH PLACEMENT DETAIL (PLAN VIEW)



1/2" (13mm) DIA. BAR

CONNECTOR BAR

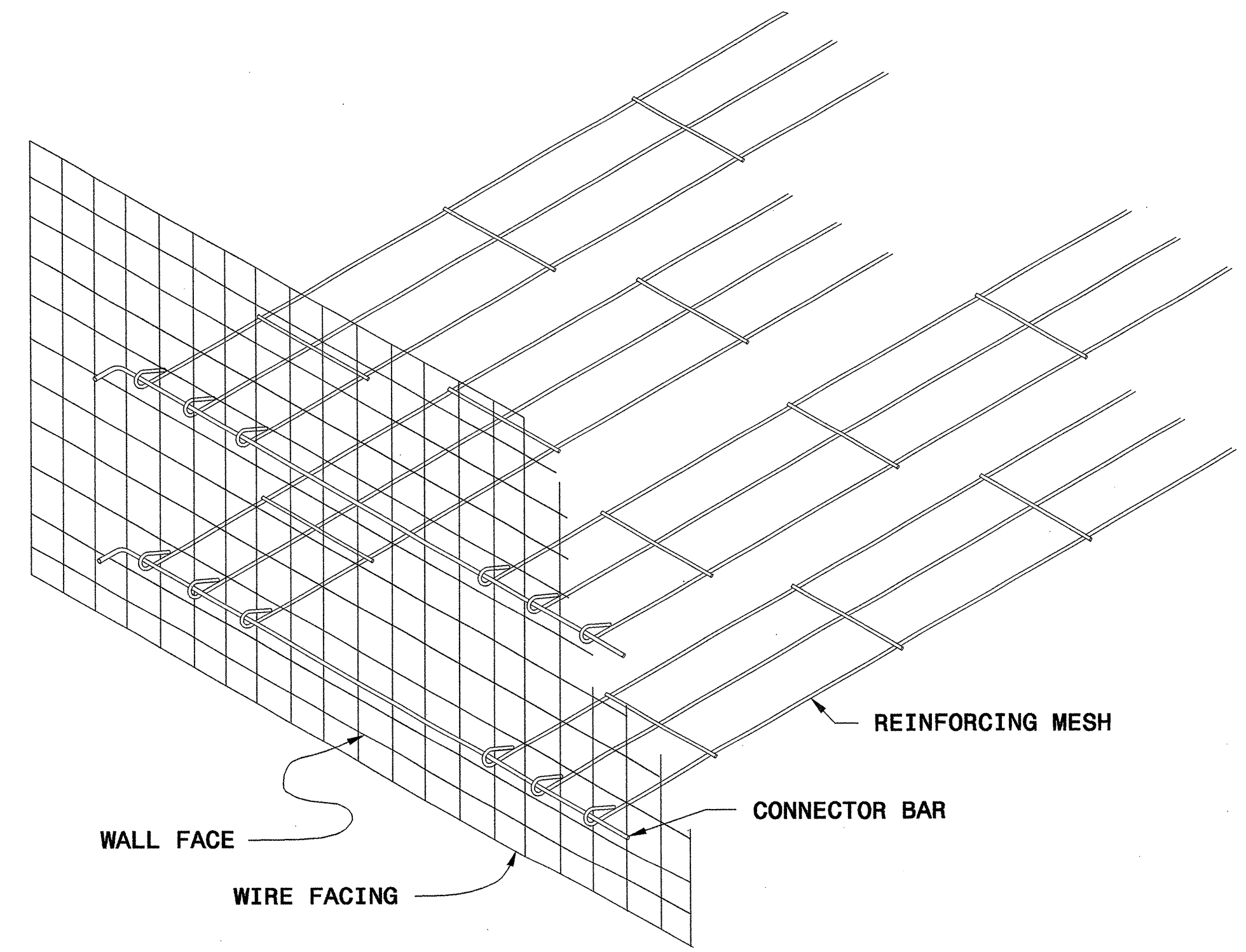


LOOPEd END OF MESH (SEE REINFORCING MESH LOOP DETAIL)

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

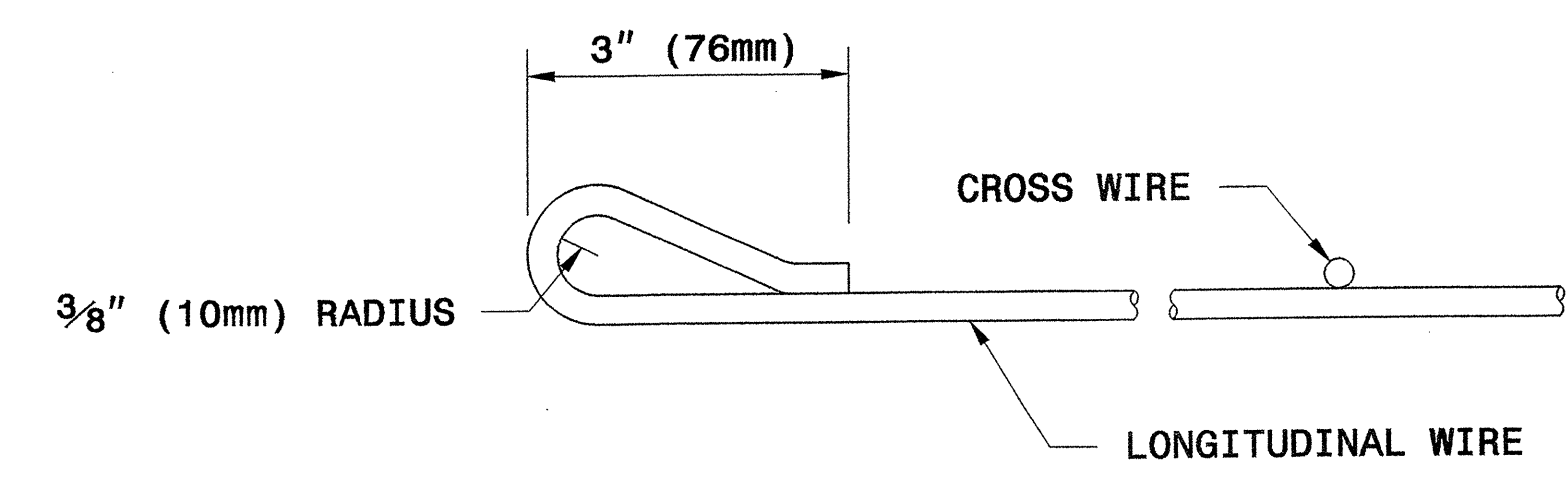
3W8 X W8 x 2.0' (3MW52 X MW52 X 610mm)
 NO. OF LONGITUDINAL WIRES
 GAUGE OF LONGITUDINAL WIRES
 GAUGE OF CROSS WIRES
 SPACING OF CROSS WIRES IN FT (mm), CW

REINFORCING MESH DESIGNATION



GENERAL ASSEMBLY DETAIL

REINFORCING MESH



REINFORCING MESH LOOP DETAIL



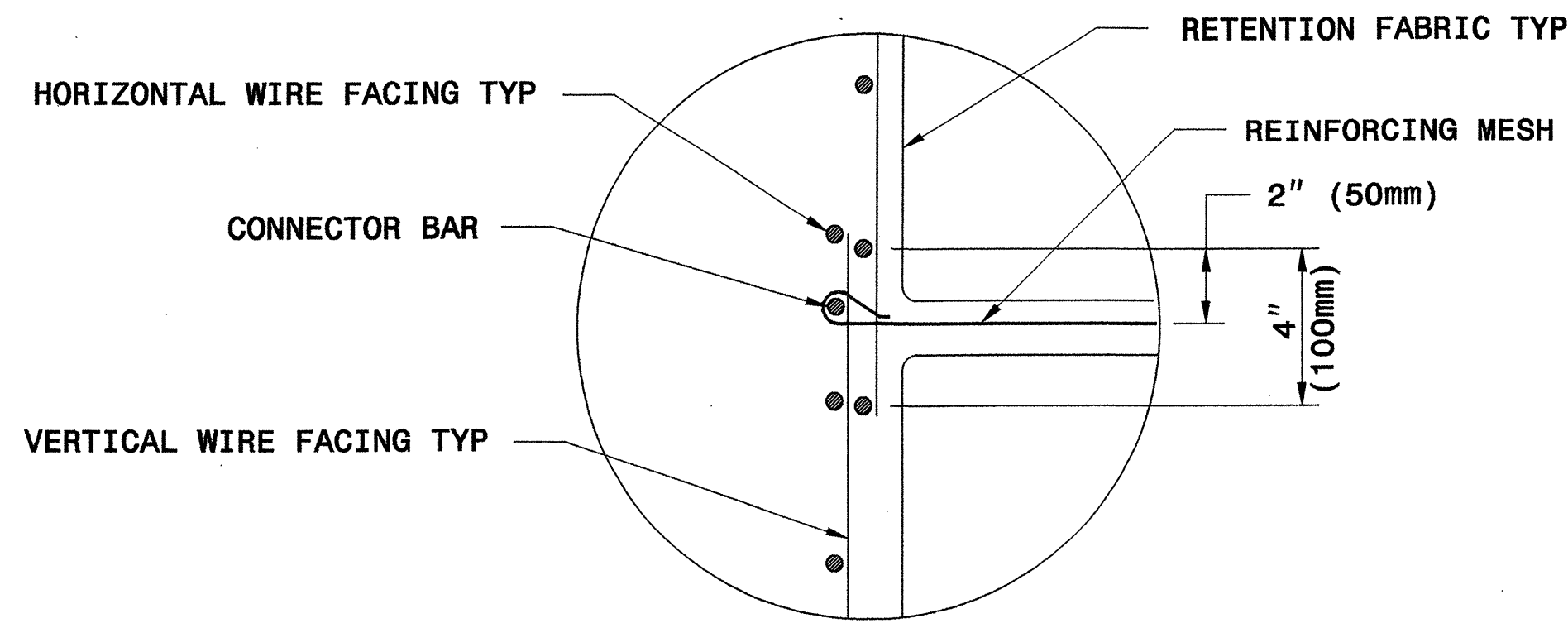
GEOTECHNICAL ENGINEERING UNIT
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD DRAWING NO. 1801.02
RETAINED EARTH TEMPORARY WALL
 SHEET 7 OF 11 DATE: 12-19-06

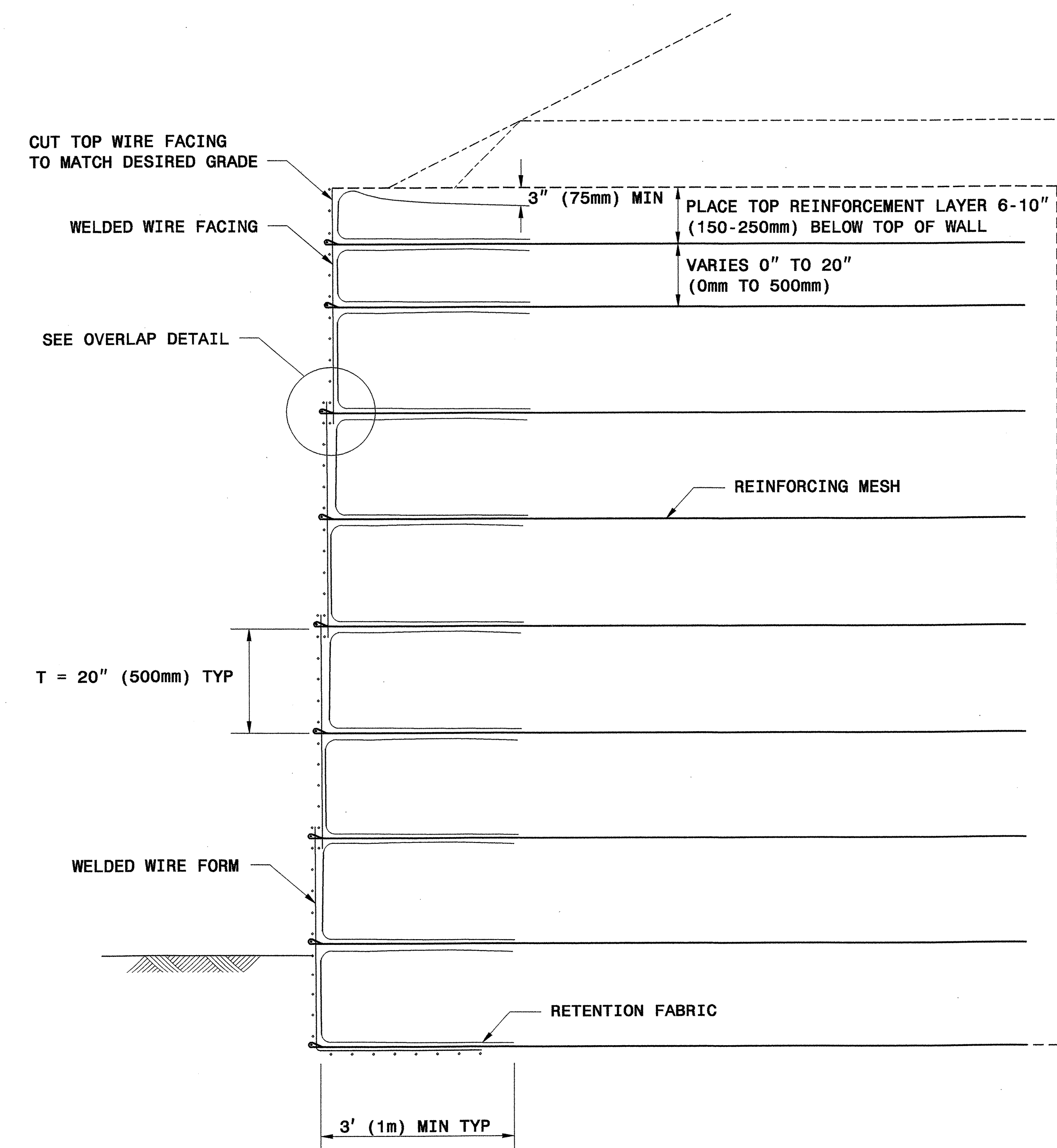
GEOTECHNICAL ENGINEER ENGINEER



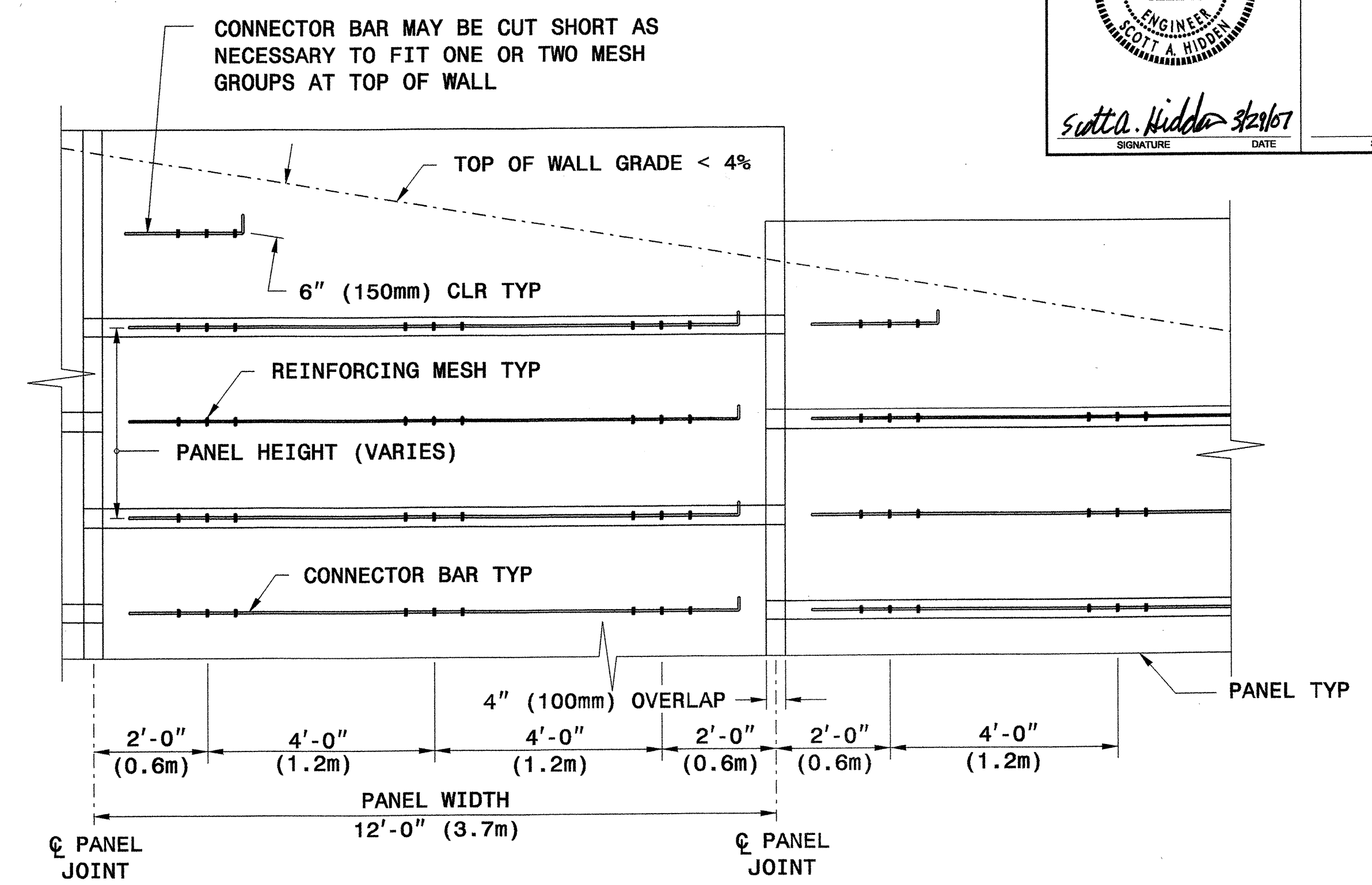
Signature: *Scott A. Hadden* 3/21/07
 SIGNATURE DATE



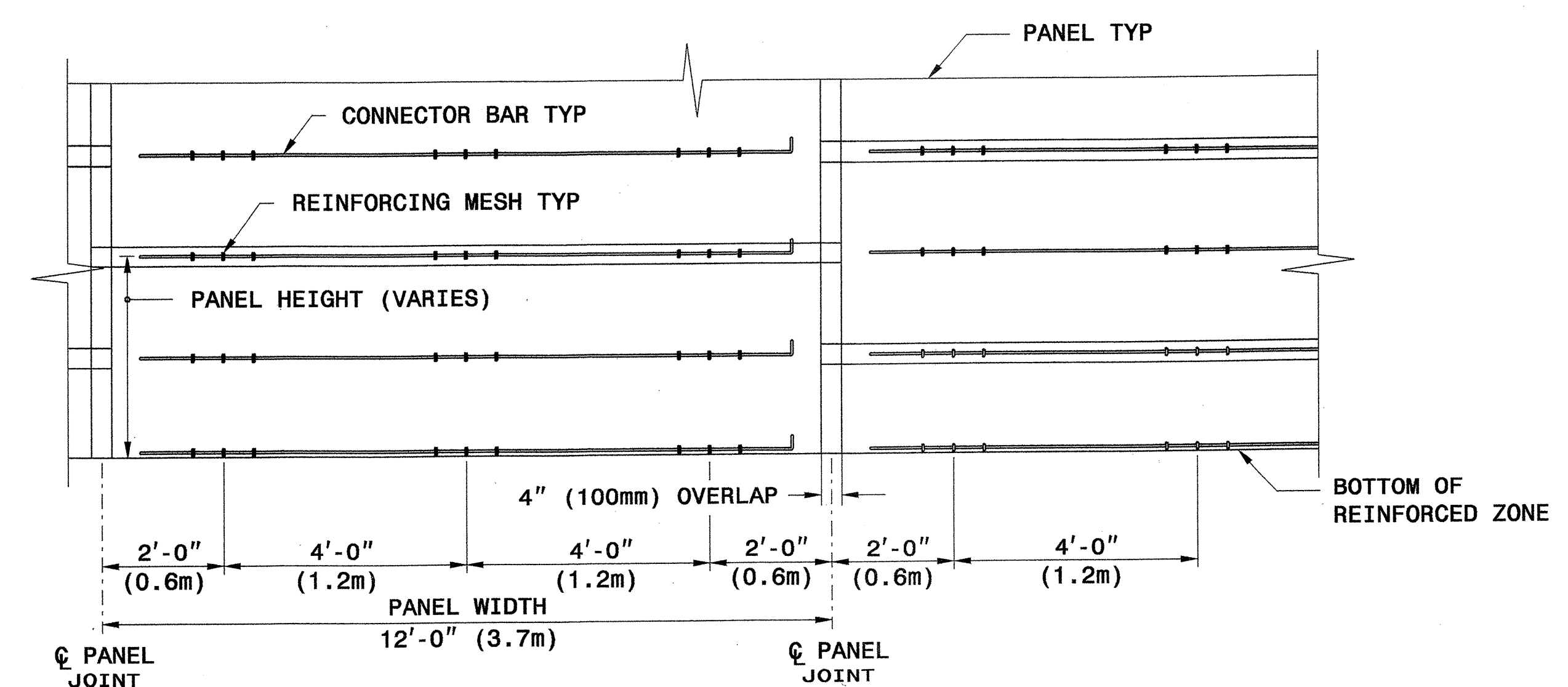
OVERLAP DETAIL



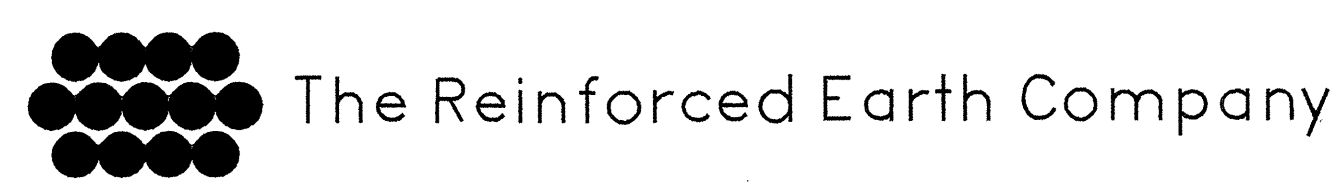
TYPICAL SECTION



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



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



GEOTECHNICAL ENGINEERING UNIT
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD DRAWING NO. 1801.02

**RETAINED EARTH
 TEMPORARY WALL**

221427 3/29/2007 std no 1801 shidden GE-Oce34bond

GEOTECHNICAL ENGINEER

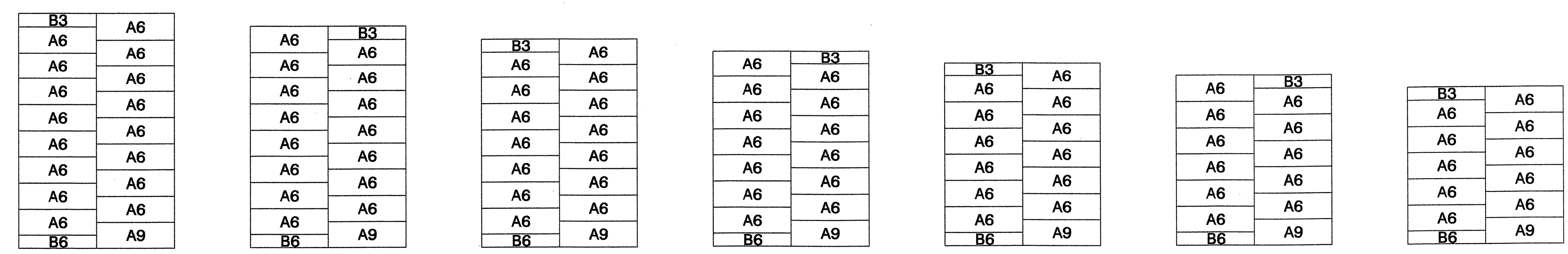
ENGINEER

Scott A. Hadden

SIGNATURE DATE SIGNATURE DATE

PANEL LAYOUTS

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



< 28 - 0
< 8.5

< 27 - 8
< 8.4

< 26 - 0
< 7.9

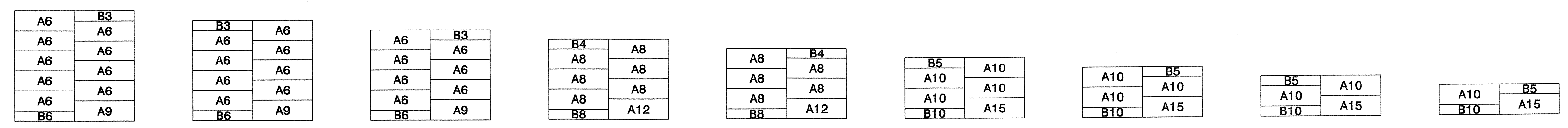
< 24 - 4
< 7.4

< 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

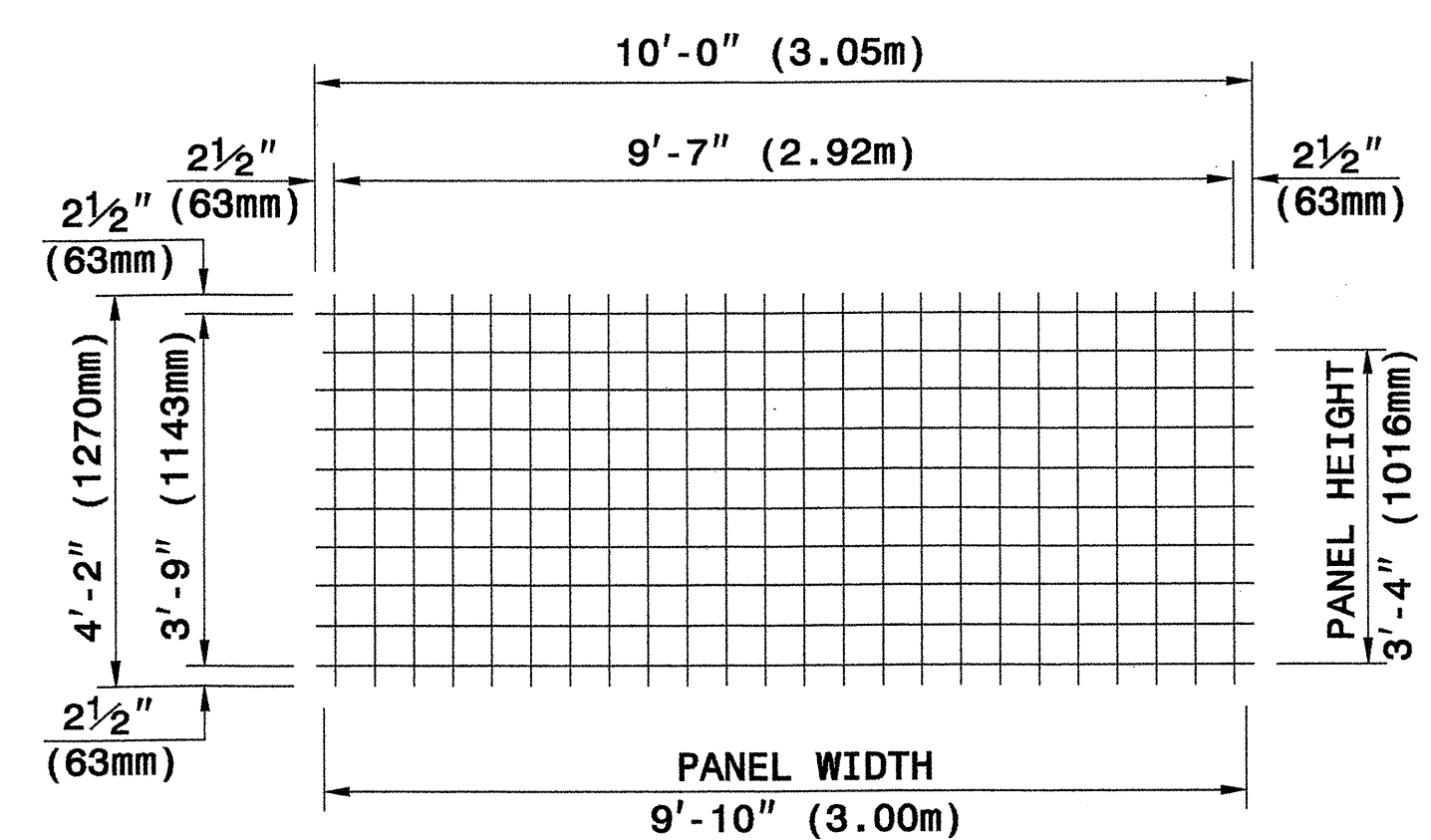
< 11 - 0
< 3.4

< 9 - 4
< 2.8

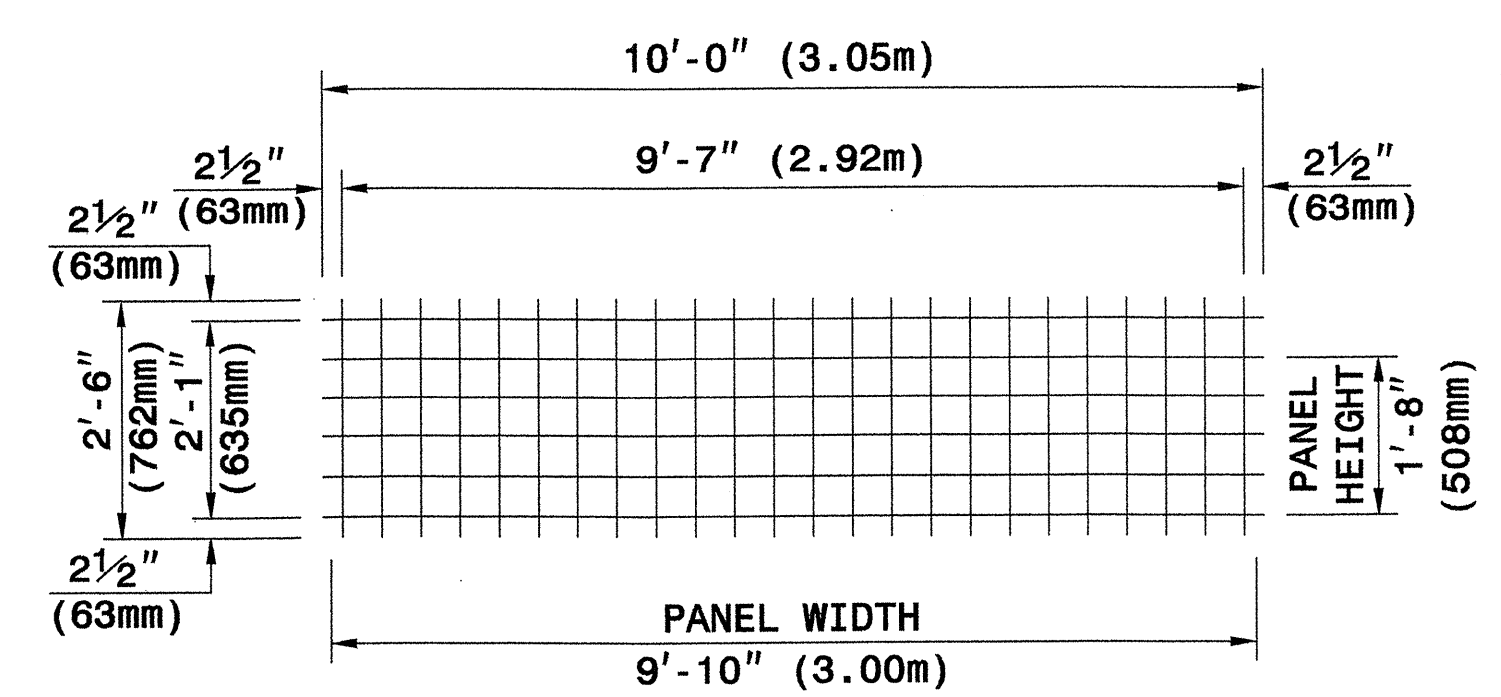
< 7 - 8
< 2.3

< 6 - 0
< 1.8

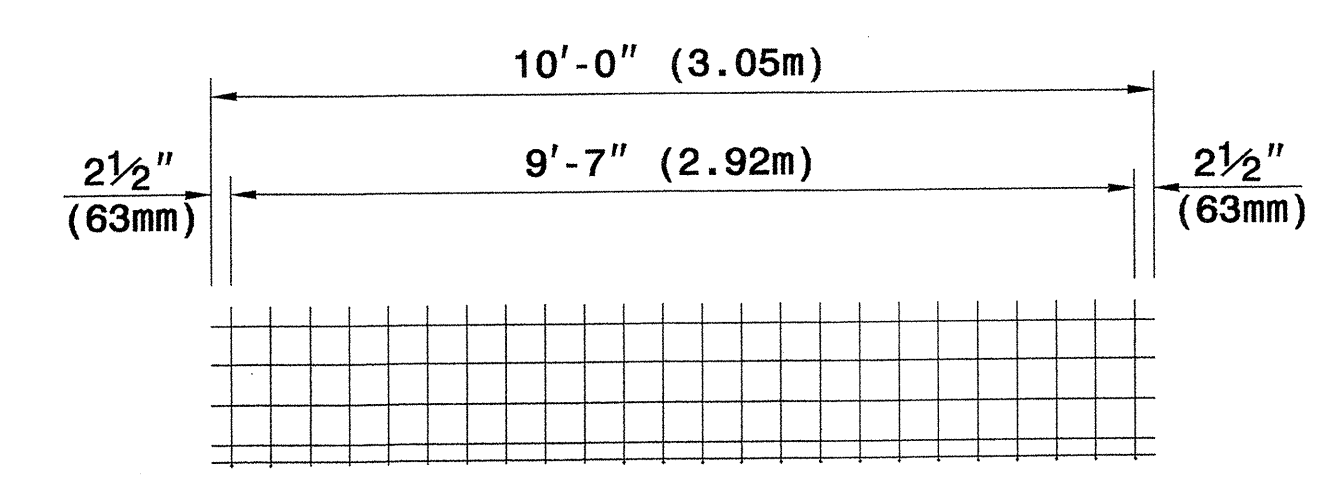
< 4 - 4
< 1.3



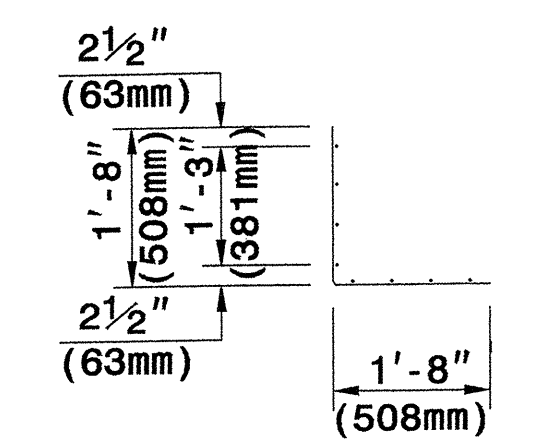
TYPE A



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)



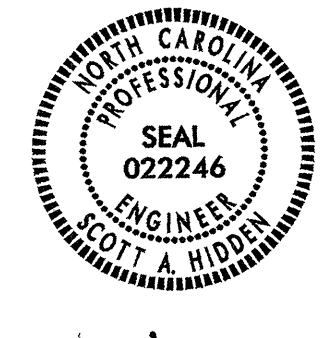
GEOTECHNICAL ENGINEERING UNIT

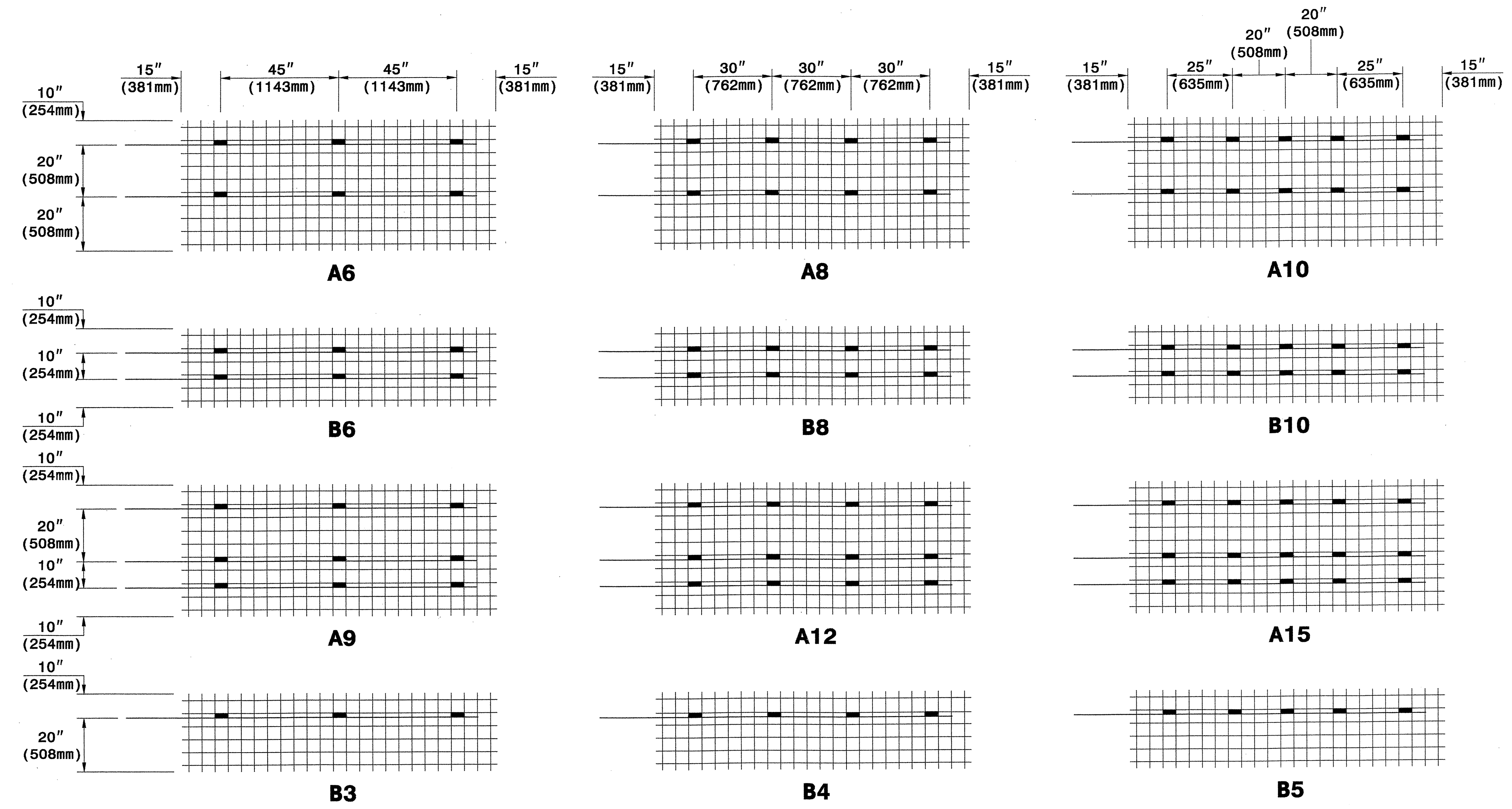
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL
TEMPORARY WALL

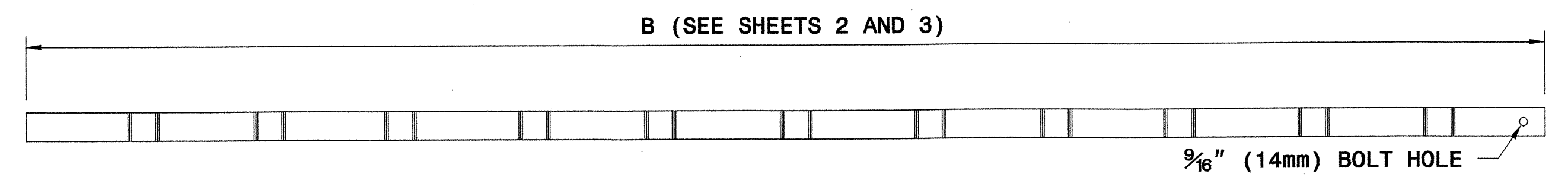
SHEET 9 OF 11 DATE: 12-19-06

GEOTECHNICAL ENGINEER  Scott A. Niddler 3/24/07 SIGNATURE DATE	ENGINEER SIGNATURE DATE
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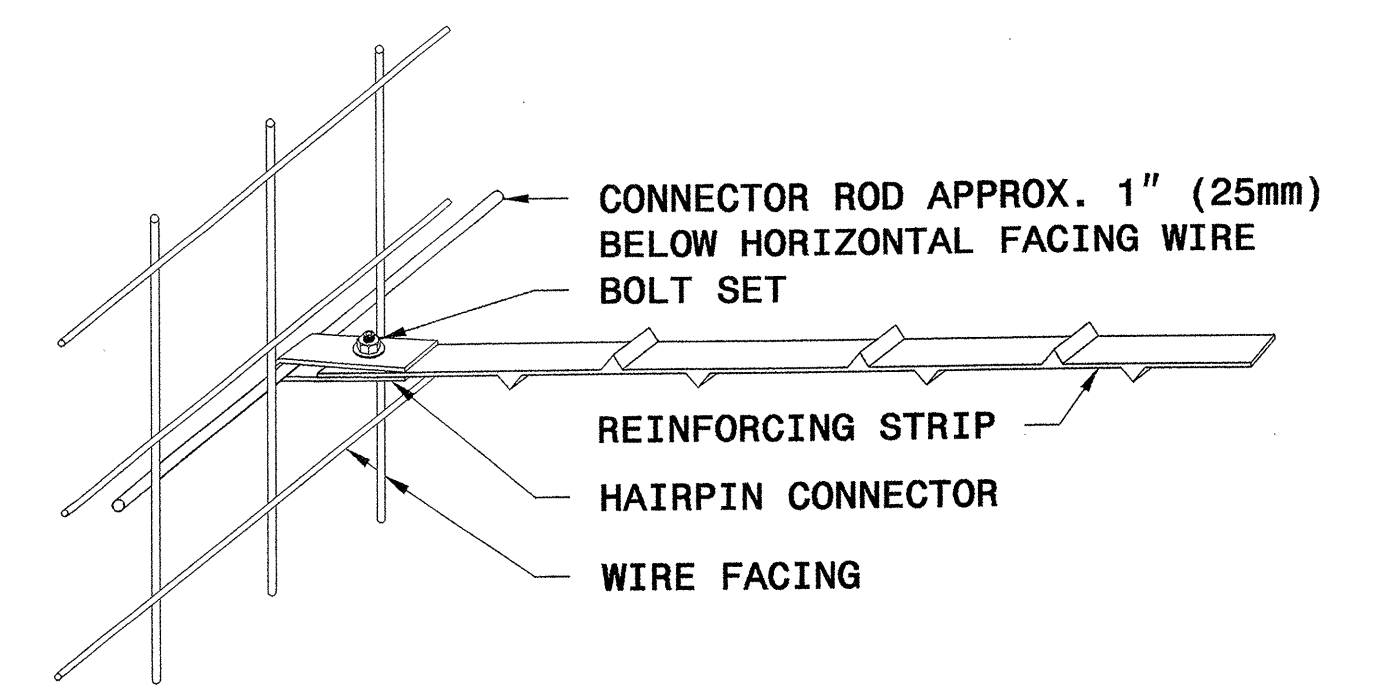


KEY: A8
 NUMBER OF REINFORCING STRIPS
 PANEL TYPE

CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



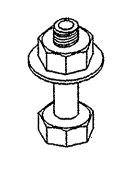
REINFORCING STRIP - 2" X 5/32" (50mm X 4mm)



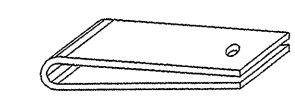
STRIP TO FACING CONNECTION



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

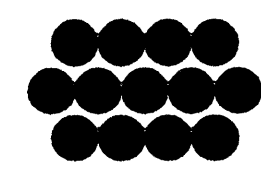


1/2" (13mm) BOLT WITH NUT AND WASHER
BOLT SET

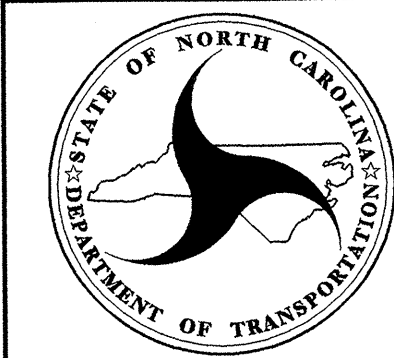


HAIRPIN CONNECTOR

WALL COMPONENTS



The Reinforced Earth Company



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

STANDARD DRAWING NO. 1801.02

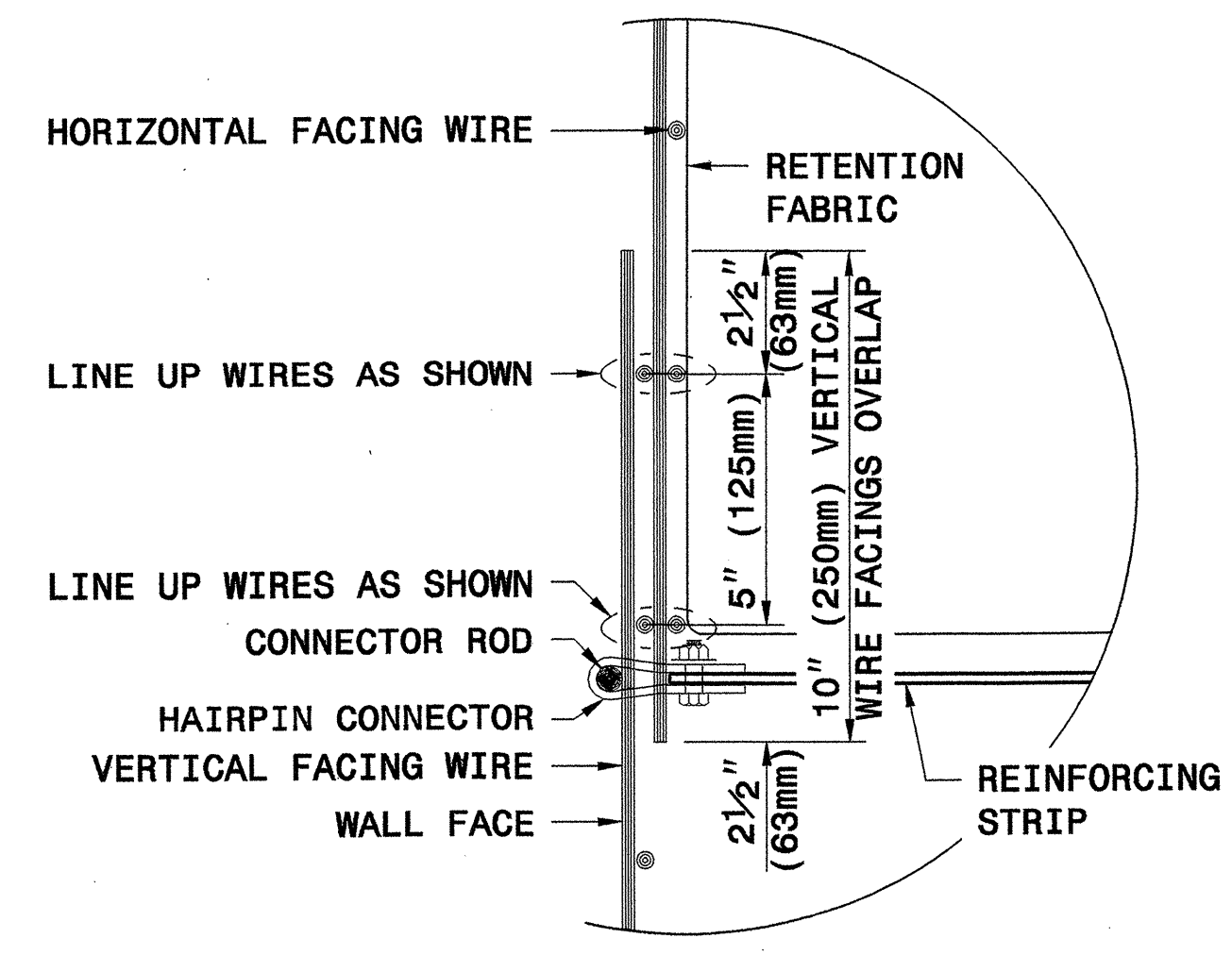
TERRATREL
 TEMPORARY WALL

SHEET 10 OF 11 DATE: 12-19-06

GEOTECHNICAL ENGINEER ENGINEER

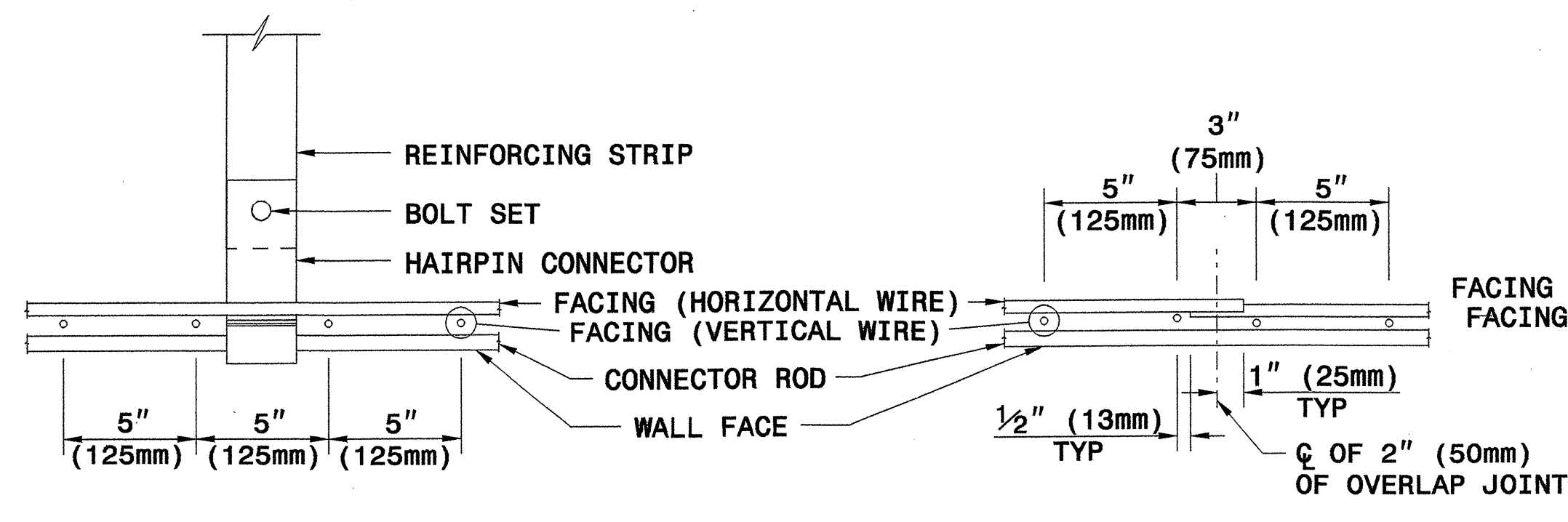
SEAL 022246
NORTH CAROLINA PROFESSIONAL ENGINEER
NOT A HIDDEN

S. A. Hadden 1/1/07
SIGNATURE DATE SIGNATURE DATE

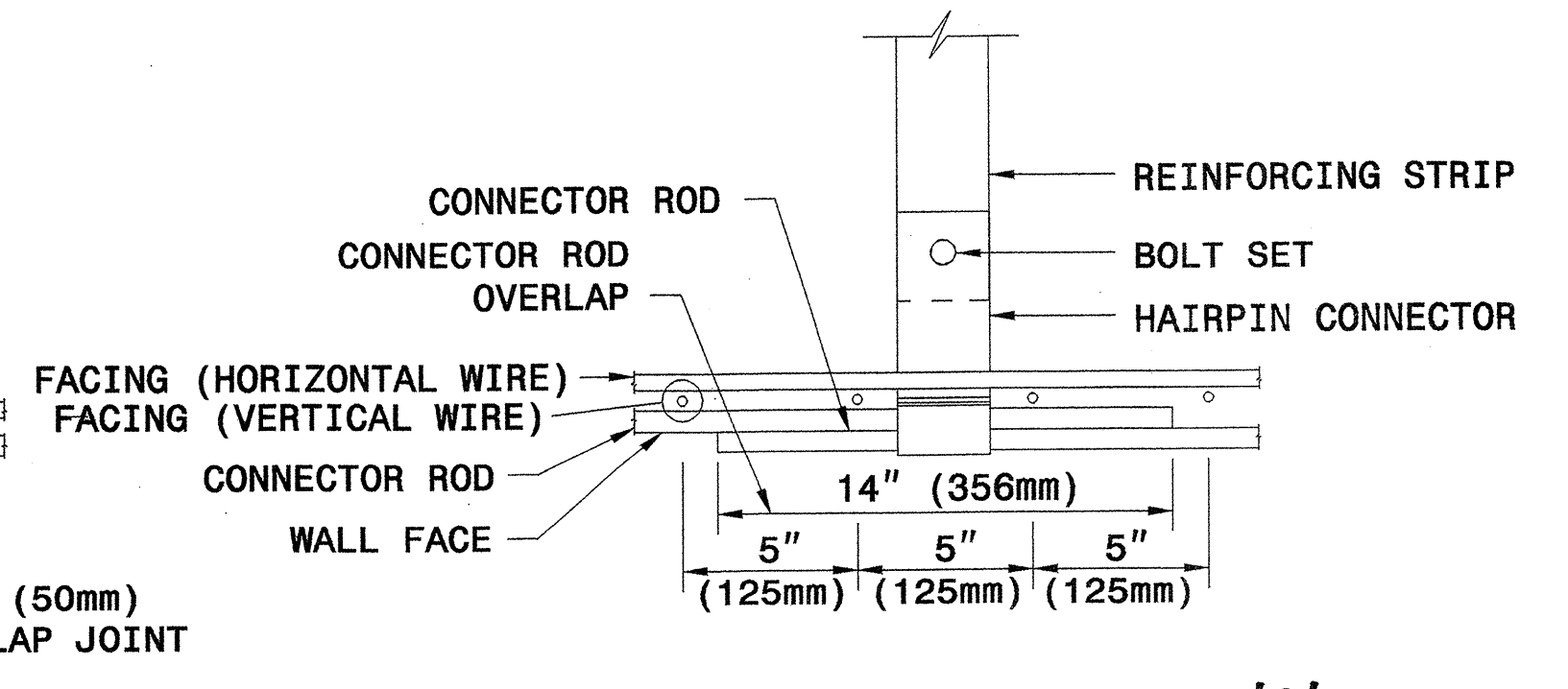


OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

VERTICAL OVERLAP DETAIL

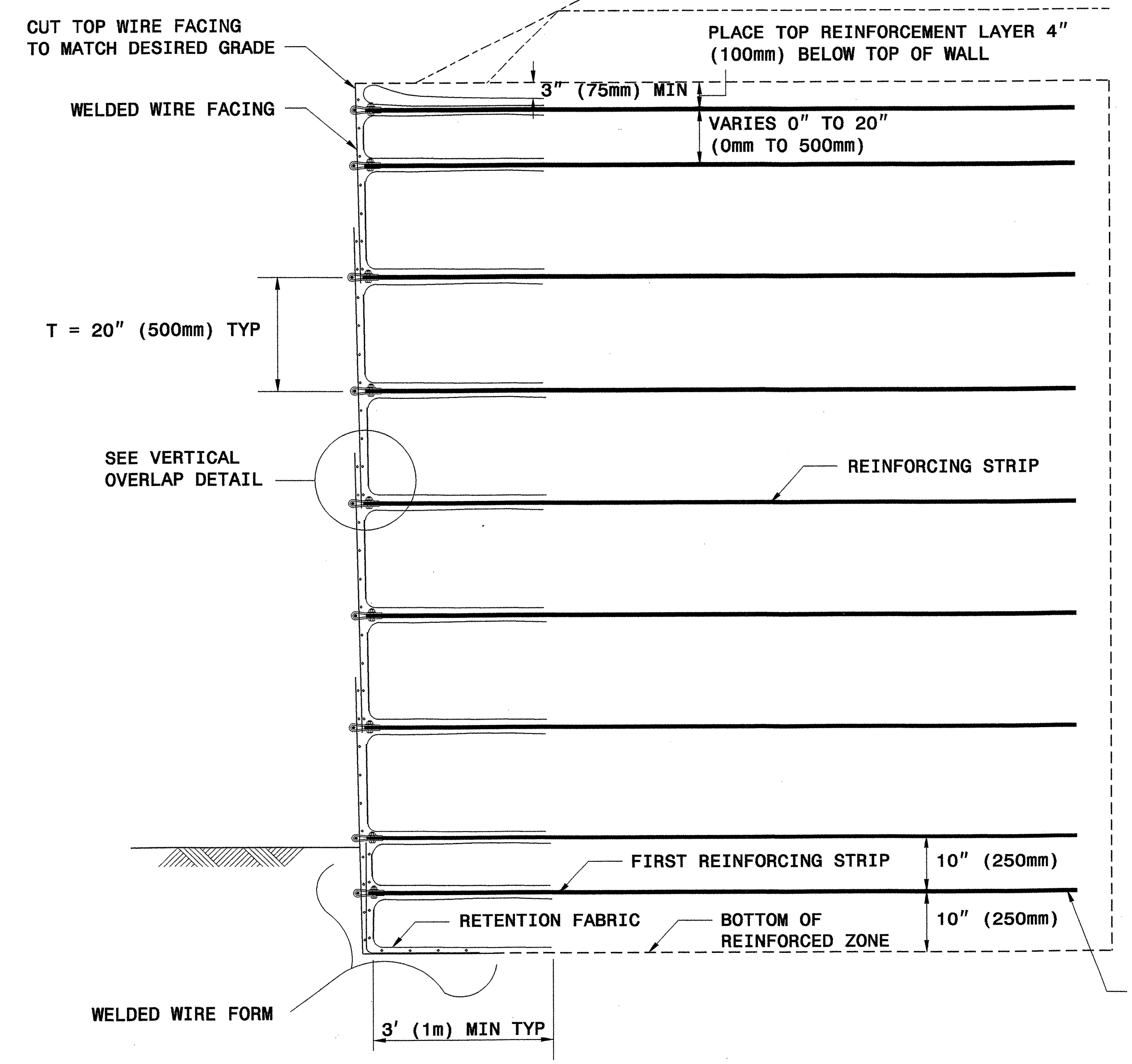


PLAN DETAIL 'A' STRIP CONNECTION



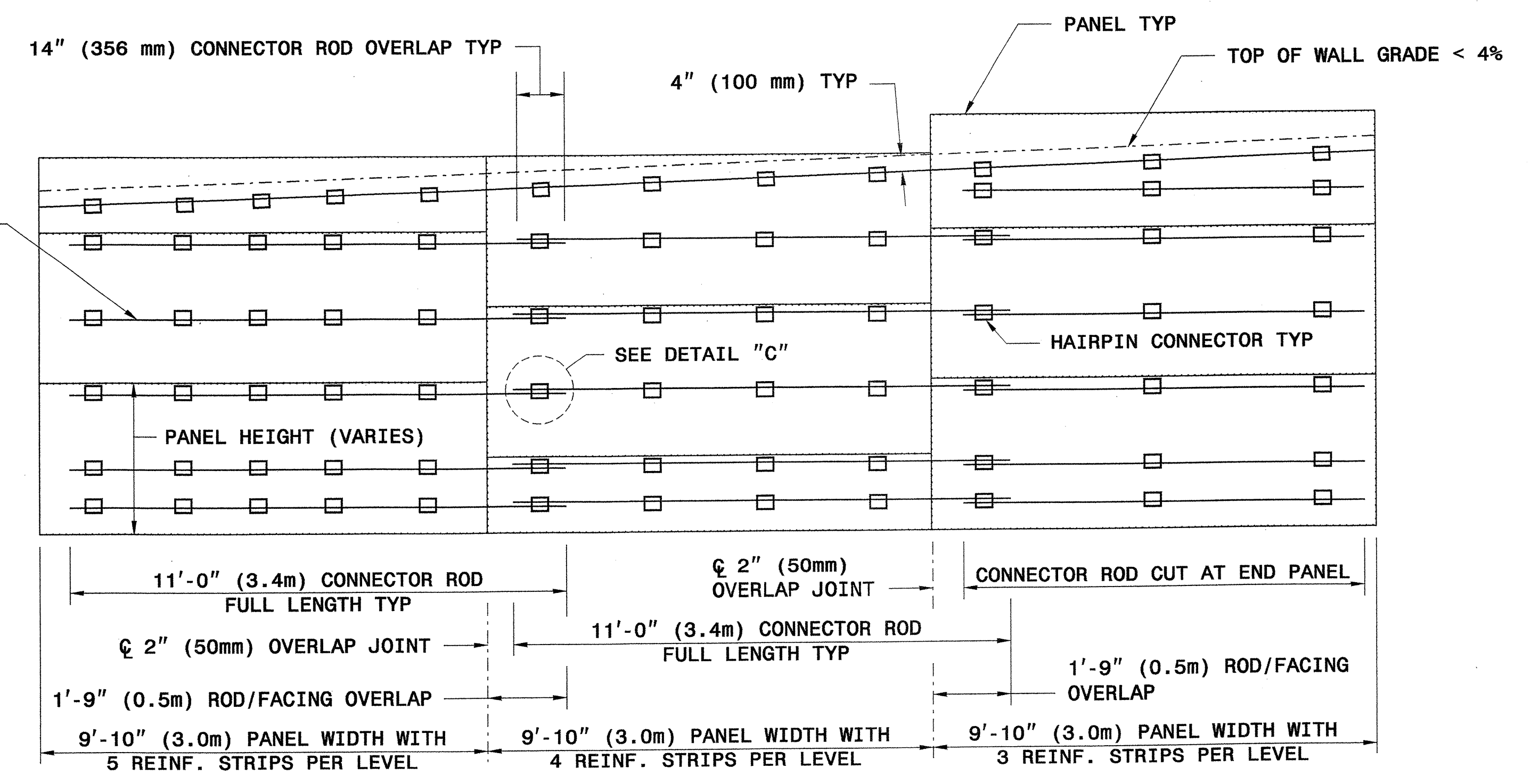
PLAN DETAIL 'B' HORIZONTAL OVERLAP DETAIL

PLAN DETAIL 'C' STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL

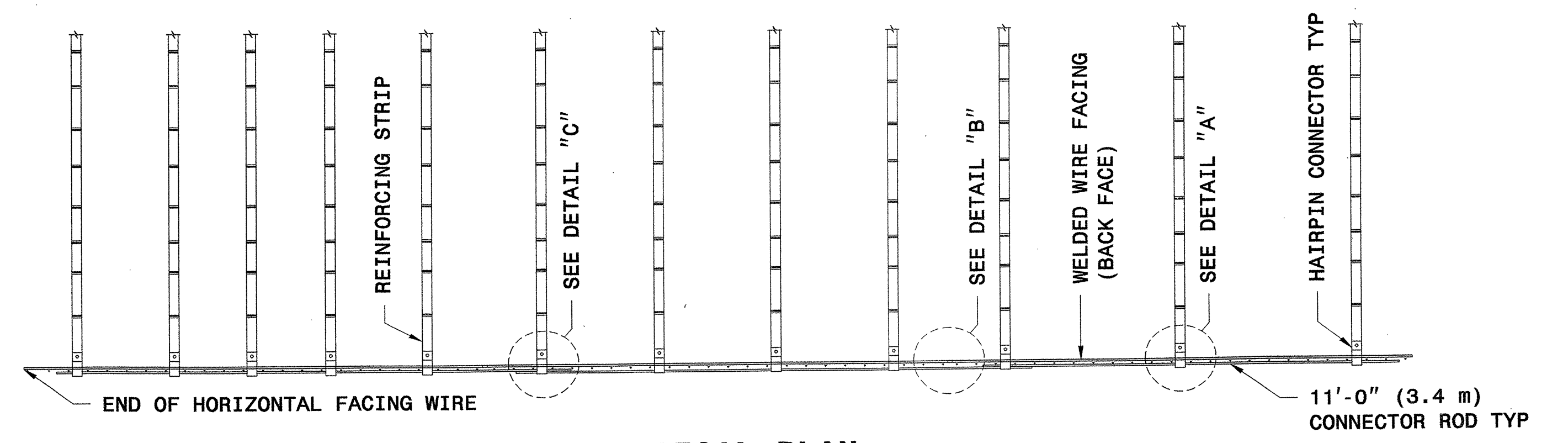


TYPICAL SECTION

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



TYPICAL ELEVATION (WIRES NOT SHOWN FOR CLARITY)



TYPICAL PLAN



GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

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

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202125

ItemNumber	Sec #	Quantity	Unit	Description
000100000-N	800	Lump Sum		MOBILIZATION
000100000-E	200	Lump Sum		CLEARING & GRUBBING .. ACRE(S)
000800000-E	200	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
002200000-E	225	330	CY	UNCLASSIFIED EXCAVATION
002900000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (15+31)
003600000-E	225	300	CY	UNDERCUT EXCAVATION
010600000-E	230	3,500	CY	BORROW EXCAVATION
013400000-E	240	130	CY	DRAINAGE DITCH EXCAVATION
015600000-E	250	1,660	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT
019500000-E	265	500	CY	SELECT GRANULAR MATERIAL
019600000-E	270	500	SY	FABRIC FOR SOIL STABILIZATION
019900000-E	SP	485	SF	TEMPORARY SHORING
031800000-E	300	97	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
036600000-E	310	484	LF	15" RC PIPE CULVERTS, CLASS III
037200000-E	310	404	LF	18" RC PIPE CULVERTS, CLASS III
037800000-E	310	24	LF	24" RC PIPE CULVERTS, CLASS III
099500000-E	340	336	LF	PIPE REMOVAL
101100000-N	500	Lump Sum		FINE GRADING
122000000-E	545	8	TON	INCIDENTAL STONE BASE
148900000-E	610	470	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
149800000-E	610	690	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
151900000-E	610	810	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
156000000-E	620	102	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
169300000-E	654	178	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
202200000-E	815	22.4	CY	SUBDRAIN EXCAVATION
203300000-E	815	16.8	CY	SUBDRAIN FINE AGGREGATE
204400000-E	815	100	LF	6" PERFORATED SUBDRAIN PIPE
205500000-E	815	3	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	18	EA	MASONRY DRAINAGE STRUCTURES
230800000-E	840	1.15	LF	MASONRY DRAINAGE STRUCTURES
237400000-N	840	8	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
237400000-N	840	4	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
237400000-N	840	5	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
239600000-N	840	1	EA	FRAME WITH COVER, STD 840.54
254900000-E	846	2,010	LF	2'-6" CONCRETE CURB & GUTTER
259100000-E	848	670	SY	4" CONCRETE SIDEWALK
260500000-N	848	5	EA	CONCRETE WHEELCHAIR RAMPS
261200000-E	848	270	SY	6" CONCRETE DRIVEWAY
273800000-E	SP	60	SY	GENERIC PAVING ITEM BRICK PAVR SIDEWALK
303000000-E	862	462.5	LF	STEEL BM GUARDRAIL
304500000-E	862	75	LF	STEEL BM GUARDRAIL, SHOP CURVED
315000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
316500000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** (350 TL-2)
318000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** (III SHOP-CURVED)
319500000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1

SUMMARY OF QUANTITIES

321000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
321500000-N	862	3	EA	GUARDRAIL ANCHOR UNITS, TYPE III
327000000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
364900000-E	876	11	TON	RIP RAP, CLASS B
365600000-E	876	288	SY	FILTER FABRIC FOR DRAINAGE
408200000-E	903	281	LF	SUPPORTS, WOOD
410200000-N	904	5	EA	SIGN ERECTION, TYPE E
410800000-N	904	2	EA	SIGN ERECTION, TYPE F
411610000-N	904	8	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (D)
411610000-N	904	2	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)
414100000-N	907	7	EA	DISPOSAL OF SUPPORT, WOOD
415500000-N	907	3	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
415800000-N	907	2	EA	DISPOSAL OF SIGN SYSTEM, WOOD
440000000-E	1110	569	SF	WORK ZONE SIGNS (STATIONARY)
440500000-E	1110	96	SF	WORK ZONE SIGNS (PORTABLE)
441000000-E	1110	24	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
443000000-N	1130	50	EA	DRUMS
443500000-N	1135	20	EA	CONES
444500000-E	1145	120	LF	BARRICADES (TYPE III)
445000000-N	1150	480	HR	FLAGGER
446500000-N	1160	2	EA	TEMPORARY CRASH CUSHIONS
447000000-N	1160	2	EA	RESET TEMPORARY CRASH CUSHIONS
448500000-E	1170	195	LF	PORTABLE CONCRETE BARRIER
449000000-E	1170	330	LF	PORTABLE CONCRETE BARRIER (ANCHORED)
451600000-N	1180	25	EA	SKINNY DRUM
465000000-N	1251	22	EA	TEMPORARY RAISED PAVEMENT MARKERS
471000000-E	1205	110	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
481000000-E	1205	8,035	LF	PAINT PAVEMENT MARKING LINES (4")
481500000-E	1205	45	LF	PAINT PAVEMENT MARKING LINES (6")
482000000-E	1205	370	LF	PAINT PAVEMENT MARKING LINES (8")
483500000-E	1205	165	LF	PAINT PAVEMENT MARKING LINES (24")
484500000-N	1205	25	EA	PAINT PAVEMENT MARKING SYMBOL
486000000-E	1205	320	LF	REMOVAL OF PAVEMENT MARKING LINES (8")
490000000-N	1251	30	EA	PERMANENT RAISED PAVEMENT MARKERS
569150000-E	1520	376	LF	12" SANITARY GRAVITY SEWER
570950000-E	1520	290	LF	10" FORCE MAIN SEWER
577500000-E	1525	2	EA	4' DIA UTILITY MANHOLE
577600000-E	1525	2	EA	5' DIA UTILITY MANHOLE
578100000-E	1525	7	LF	UTILITY MANHOLE WALL, 4' DIA
578200000-E	1525	16	LF	UTILITY MANHOLE WALL, 5' DIA
580000000-E	1530	86	LF	ABANDON 6" UTILITY PIPE
580100000-E	1530	645	LF	ABANDON 8" UTILITY PIPE
580400000-E	1530	936	LF	ABANDON 12" UTILITY PIPE
581600000-N	1530	2	EA	ABANDON UTILITY MANHOLE
587160000-E	1550	54	LF	TRENCHLESS INSTALLATION OF 10" IN SOIL
587161000-E	1550	6	LF	TRENCHLESS INSTALLATION OF 10" NOT IN SOIL
587170000-E	1550	120	LF	TRENCHLESS INSTALLATION OF 12" IN SOIL
587171000-E	1550	12	LF	TRENCHLESS INSTALLATION OF 12" NOT IN SOIL
588200000-N	SP	1	EA	GENERIC UTILITY ITEM ABANDON PUMP STATION

ItemNumber	Sec #	Quantity	Unit	Description
600000000-E	1605	3,200	LF	TEMPORARY SILT FENCE
600600000-E	1610	150	TON	STONE FOR EROSION CONTROL, CLASS A
600900000-E	1610	100	TON	STONE FOR EROSION CONTROL, CLASS B
601200000-E	1610	250	TON	SEDIMENT CONTROL STONE
601500000-E	1615	2.5	ACR	TEMPORARY MULCHING
601800000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING
602100000-E	1620	0.25	TON	FERTILIZER FOR TEMPORARY SEEDING
602400000-E	1622	350	LF	TEMPORARY SLOPE DRAINS
602700000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
602900000-E	SP	2,400	LF	SAFETY FENCE
603000000-E	1630	55	CY	SILT EXCAVATION
603600000-E	1631	400	SY	MATTING FOR EROSION CONTROL
604200000-E	1632	600	LF	1/4" HARDWARE CLOTH
604800000-E	SP	200	SY	FLOATING TURBIDITY CURTAIN
608400000-E	1660	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	1.25	TON	FERTILIZER TOPDRESSING
611400000-N	SP	5	HR	SPECIALIZED HAND MOWING
611700000-N	SP	12	EA	RESPONSE FOR EROSION CONTROL
706000000-E	1705	1,520	LF	SIGNAL CABLE
712000000-E	1705	9	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
713200000-E	1705	1	EA	VEHICLE SIGNAL HEAD (12", 4 SECTION)
714400000-E	1705	3	EA	VEHICLE SIGNAL HEAD (12", 5 SECTION)
726400000-E	1710	650	LF	MESSANGER CABLE (3/8")
730000000-E	1715	180	LF	UNPAVED TRENCHING (***** (1, 2"))
732400000-N	1716	2	EA	JUNCTION BOX (STANDARD SIZE)
736000000-N	1720	3	EA	WOOD POLE
737200000-N	1721	4	EA	GUY ASSEMBLY
740800000-E	1722	1	EA	1" RISER WITH WEATHERHEAD
742000000-E	1722	5	EA	2" RISER WITH WEATHERHEAD
744400000-E	1725	1,520	LF	INDUCTIVE LOOP SAWCUT
745600000-E	1726	2,200	LF	LEAD-IN CABLE (***** (14-2))
768400000-N	1750	1	EA	SIGNAL CABINET FOUNDATION
775600000-N	1751	1	EA	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)
778000000-N	1751	5	EA	DETECTOR CARD (TYPE 2070L)
790100000-N	1753	1	EA	CABINET BASE EXTENDER

COMPUTED BY: WCP DATE: 02-26-09
 CHECKED BY: JLT DATE: 3-19-09

PROJECT NO. B-4434
 SHEET NO. 3-A

**STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS**

SUMMARY OF EARTHWORK

LINE	Station	Station	Uncl. Excav.	Undercut Excav.	Embank. +%	Borrow	Waste
-L-	13+40.00	14+54.71	28		34	6	0
-Y-	10+20.02	11+00.00	33		25	0	8
BRIDGE							
-L-	16+07.29	26+20.00	250		3,415	3,165	
PROJECT TOTAL			311		3,474	3,171	8
Earth Waste to replace Borrow						-8	-8
PROJECT TOTAL			311		3,474	3,163	0
Est. 5% to replace Topsoil on Borrow Pits						158	
GRAND TOTAL			311		3,474	3,321	0
Contingency Undercut				300			
SAY:			330	300		3,500	

**SUMMARY OF EXISTING ASPHALT
 PAVEMENT REMOVAL**

LINE	Station	Station	LOC LT/RT/CL	AREA	
				SF	YD ²
-L-	13+40.00	13+61.45	RT	49.18	5.46
-L-	13+60.00	14+10.56	LT	55.45	6.16
-Y-	10+44.11	11+00.00	RT	55.37	6.15
-Y-	10+67.57	11+00.00	LT	29.34	3.26
-L-	14+29.09	14+53.48	CL	948.36	105.37
-L-	15+87.83	16+27.00	CL	990.75	110.08
-L-	15+94.50	26+20.00	RT	12,364.90	1,373.88
-L-	25+39.98	26+00.00	LT	85.26	9.47
TOTAL:					1,620
SAY:					1,660

Pavement Structure Volume: 300 Cu. Yd.

DDE: 130 Cu. Yd.

Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Unit.

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

GUARDRAIL SUMMARY

LINE	BEG. STA.	END STA.	LOC.	LENGTH			WARRANT POINT		"N" DIST FROM E.O.L.	TOTAL BERM WIDTH	FLARE LENGTH		W		ANCHORS					IMP. ATTN. TYPE 350			REMOVE EXISTING GRDRAIL	REMARKS			
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPR. END	TRAIL. END			APPR. END	TRAIL. END	APPR. END	TRAIL. END	350 TL-2	350	CAT-1	AT-1	III	TYPE III Shop Curved	EA	G			NG		
-L-	13+91.63	14+47.88	LT	62.5				BRIDGE	7.5'	10'	25'		0.5'	1													
-Y/-L-	11+06+/-	14+64.07	LT/RT		87.5			BRIDGE	8.14'	10'								1								*SHOP CURVED TYPE III ANCHOR (SEE SHT. 2-C)	
-L-	16+16.65	17+10.40	RT	100.0				BRIDGE	7.5'	10'	75'		1.5'		1												
-L-	16+00.46	18+06.71	LT	212.5				BRIDGE	7.5'	10'	25'		0.5'	1													NOTE: UTILIZE 3'-1 1/2" POST SPACING FOR THIS LINE
-L-	18+59.00	21+40.25	LT	287.5				19+36+/-	2'	10'	50'		1'		1	1											
SUB-TOTALS:				662.50	87.5										2	2	1	1	3	1							
LESS ANCHOR DEDUCTIONS																											
TYPE 350					2@50 ft																						
TYPE 350 TL-2					2@25 ft																						
TYPE AT-1					1@6.25 ft																						
TYPE III					3@18.75 ft																						
TYPE III-SHP CRVD					1@18.75 ft																						
CAT-1					1@6.25'																						
ANCHOR TOTALS					212.5	25																					
GRAND TOTALS					450	62.5									2	2	1	1	3	1							
SAY					462.5	75																					

ADDITIONAL GUARDRAIL POSTS = 5 EA

8/17/09

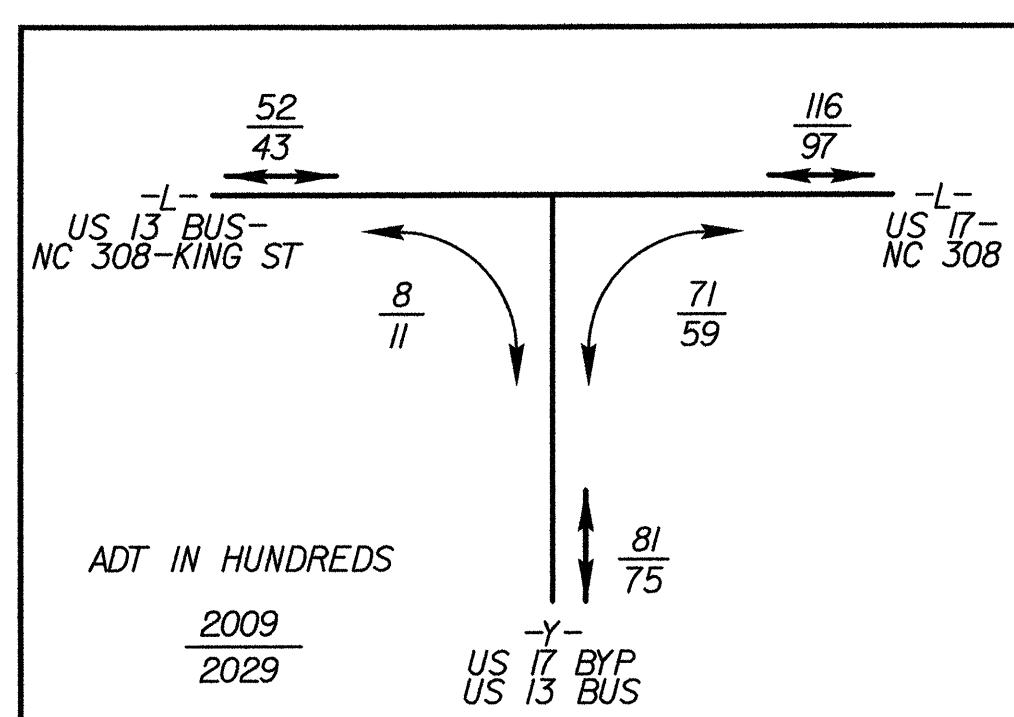
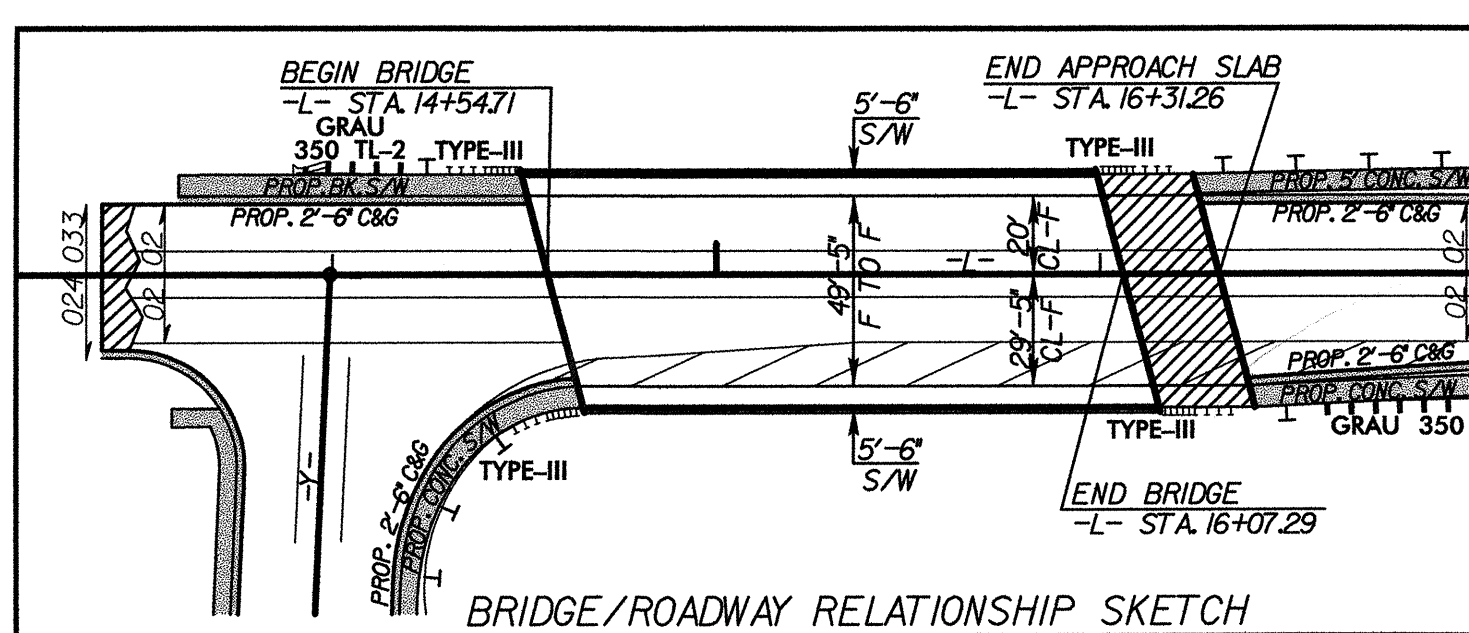
TGS ENGINEERS
SUITE 141
975 WALNUT STREET
CARY, NC 27511
PH (919) 319-8850

PROJECT REFERENCE NO. B-4434
SHEET NO. 4

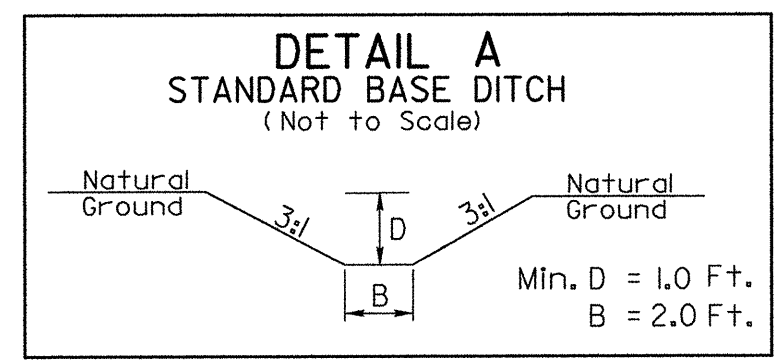
RW SHEET NO.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER
NO. 25474
4/29/09

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER
NO. 12300
4/29/09



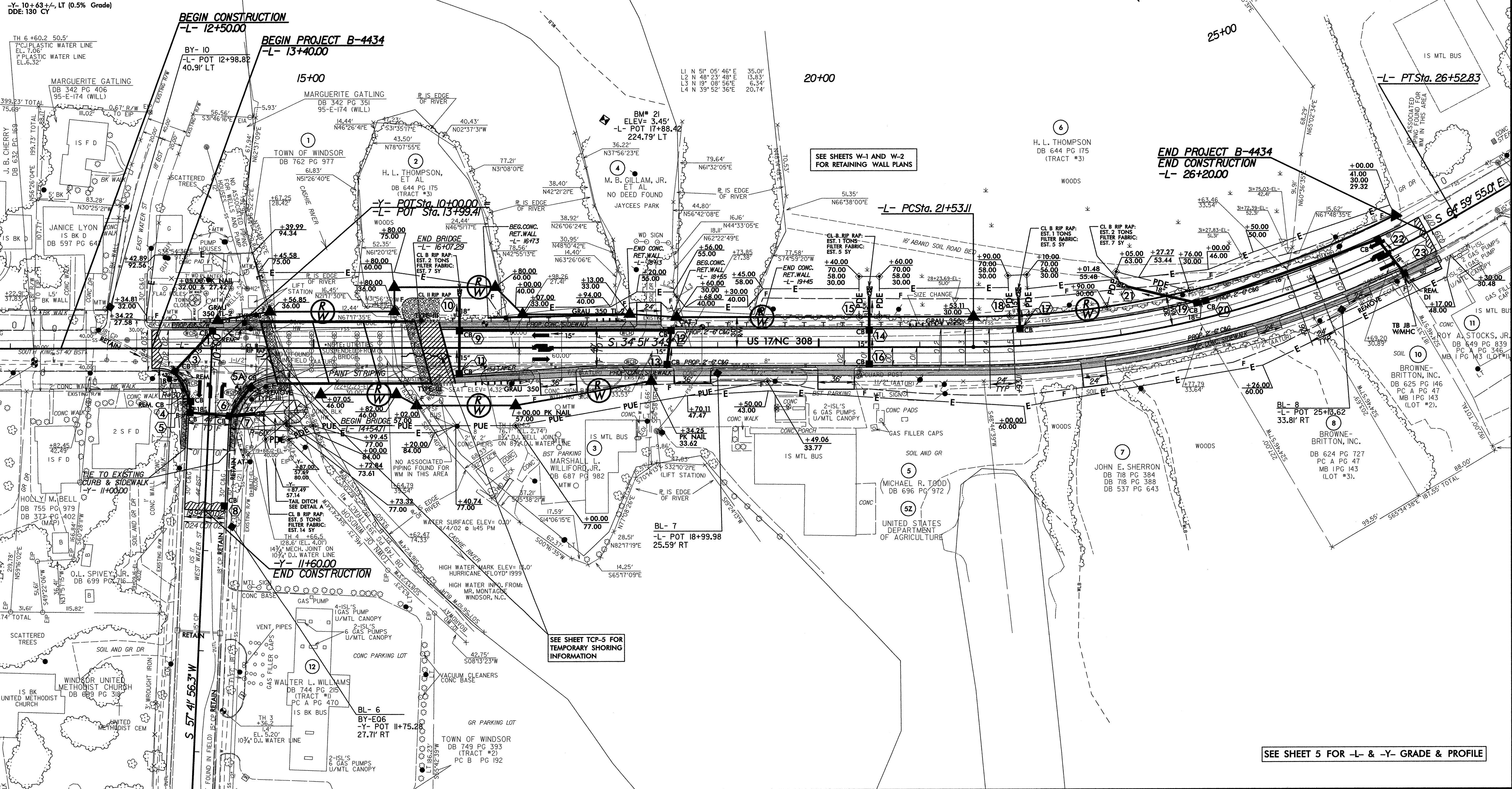
-L-
PI Sta 24+08.89
 $\Delta = 30' 08" 20.1" (LT)$
 $D = 6' 01" 52.1"$
 $L = 499.72'$
 $T = 255.79'$
 $R = 950.00'$
 $SE = 0.05$
 $Vd = 40 \text{ mph}$



NOTE: ALL PIPES ARE RC CLASS III, UNLESS OTHERWISE INDICATED ON PLANS.

SEE SHEETS S-1 THRU S-39 FOR STRUCTURES PLANS.

REVISIONS



PLASTIC WATER LINE
EL. 7.06'
PLASTIC WATER LINE
EL. 6.32'

MARGUERITE GATLING
DB 342 PG 406
95-E-174 (WILL)

JANICE LYON
IS BK D
DB 597 PG 64

HOLLY M. BELL
DB 755 PG 979
DB 377 PG 402

O.L. SPIVEY, JR.
DB 699 PG 1016

WINDSOR UNITED METHODIST CHURCH
DB 689 PG 318

WINDSOR UNITED METHODIST CEM.

WALTER L. WILLIAMS
DB 744 PG 215
(TRACT #1)
PC A PG 470

IS BK BUS

2-1/2" ISL'S
6" GAS PUMPS
U/MTL CANOPY

TH 3
EL. 5.20'
10 3/4" D.I. WATER LINE

4-1/2" ISL'S
1" GAS PUMP
U/MTL CANOPY

2-1/2" ISL'S
6" GAS PUMPS
U/MTL CANOPY

VENT PIPES

GAS FILLER CAPS

CONC. PARKING LOT

YACUUM CLEANERS
CONC. BASE

GR PARKING LOT

TOWN OF WINDSOR
DB 749 PG 393
(TRACT #2)
PC B PG 192

BL- 6
BY-EQ6
-Y- POT 11+75.28
27.71' RT

BL- 7
-L- POT 18+99.98
25.59' RT

BL- 8
-L- POT 25+16.62
33.81' RT

BL- 9
-L- POT 12+98.82
40.91' LT

BL- 10
-L- POT 13+99.41

BL- 11
-L- POT 14+54.71

BL- 12
-L- POT 15+00.00

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-L- POT 389+07.29

BL- 387
-L- POT 390+07.29

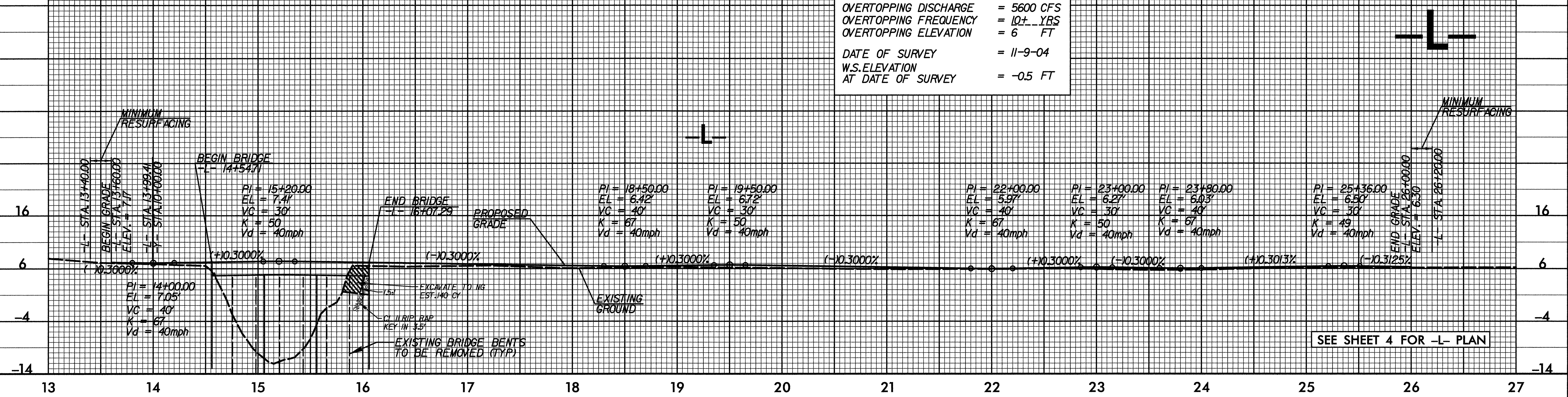
BM#20 ELEV. = 13.11
 N 823349.6 E 2608229.4
 -BY- STATION 4+49.00, 69.6' RT
 NUT ON FIRE HYDRANT PAINTED WHITE AND LOCATED BETWEEN "CHATT" AND "ANOOGA" ON RIM OF DOME.

BM #21 ELEV. = 3.45
 N 822783.3 E 2608947.4
 -BL- STATION 27+92.00, 272.3' LT
 RR SPIKE SET IN BASE OF 16" WALNUT TREE +/- 1.0' OFF OF THE GROUND.

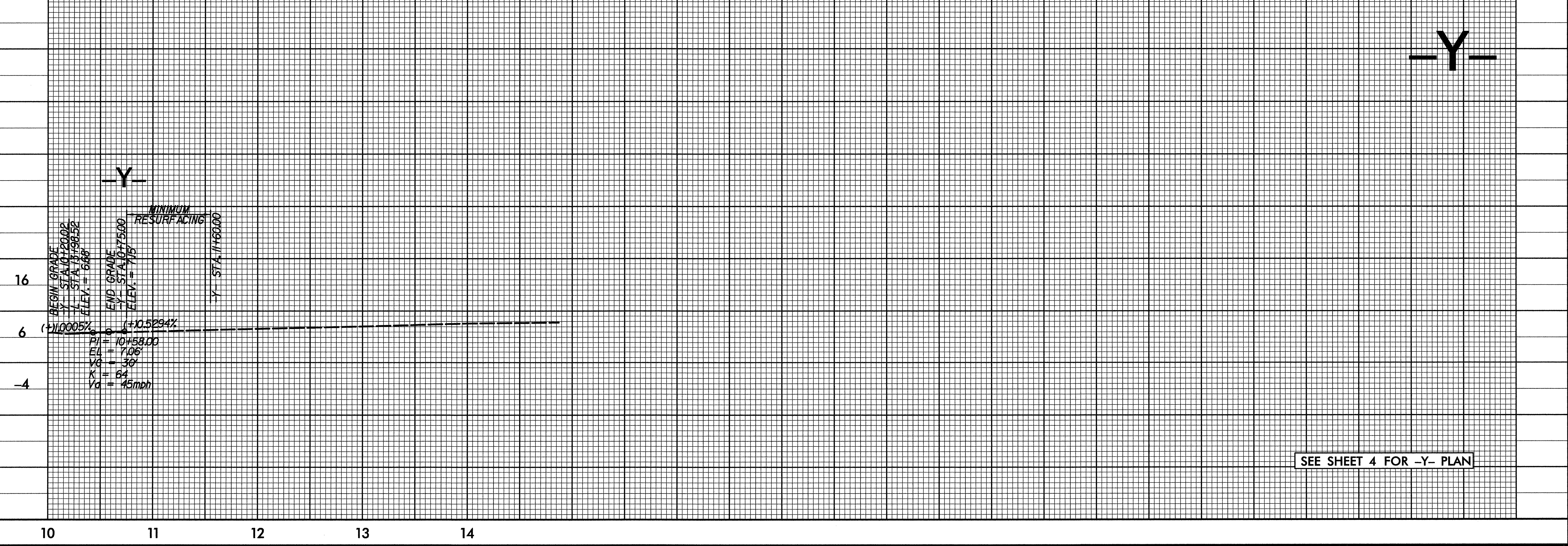
BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 7900 CFS
 DESIGN FREQUENCY = 50 YRS
 DESIGN HW ELEVATION = 8.3 FT
 BASE DISCHARGE = 9800 CFS
 BASE FREQUENCY = 100 YRS
 BASE HW ELEVATION = 9.4 FT
 OVERTOPPING DISCHARGE = 5600 CFS
 OVERTOPPING FREQUENCY = 10+ YRS
 OVERTOPPING ELEVATION = 6 FT

DATE OF SURVEY = 11-9-04
 W.S.ELEVATION AT DATE OF SURVEY = -0.5 FT



SEE SHEET 4 FOR -L- PLAN



SEE SHEET 4 FOR -Y- PLAN