

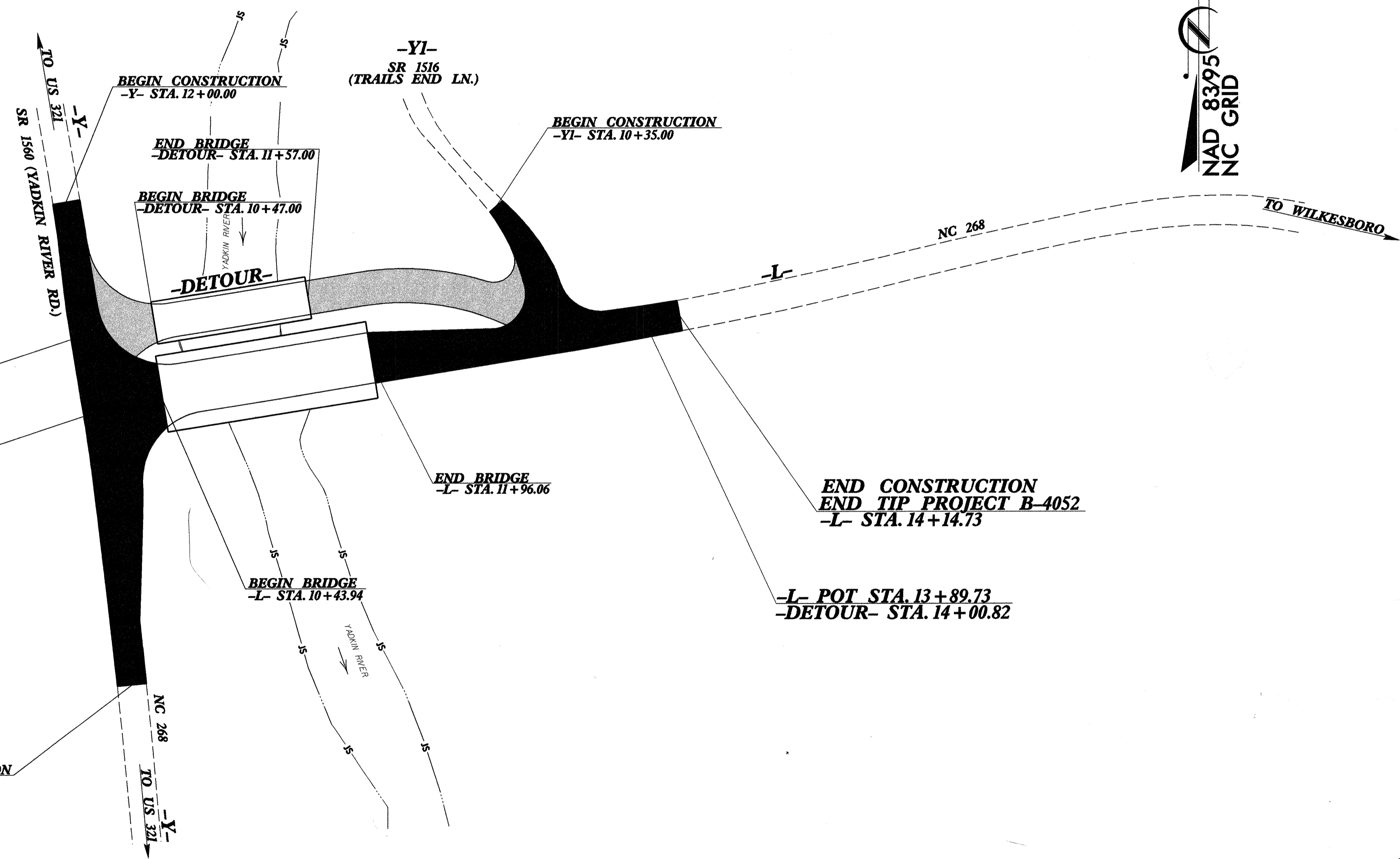
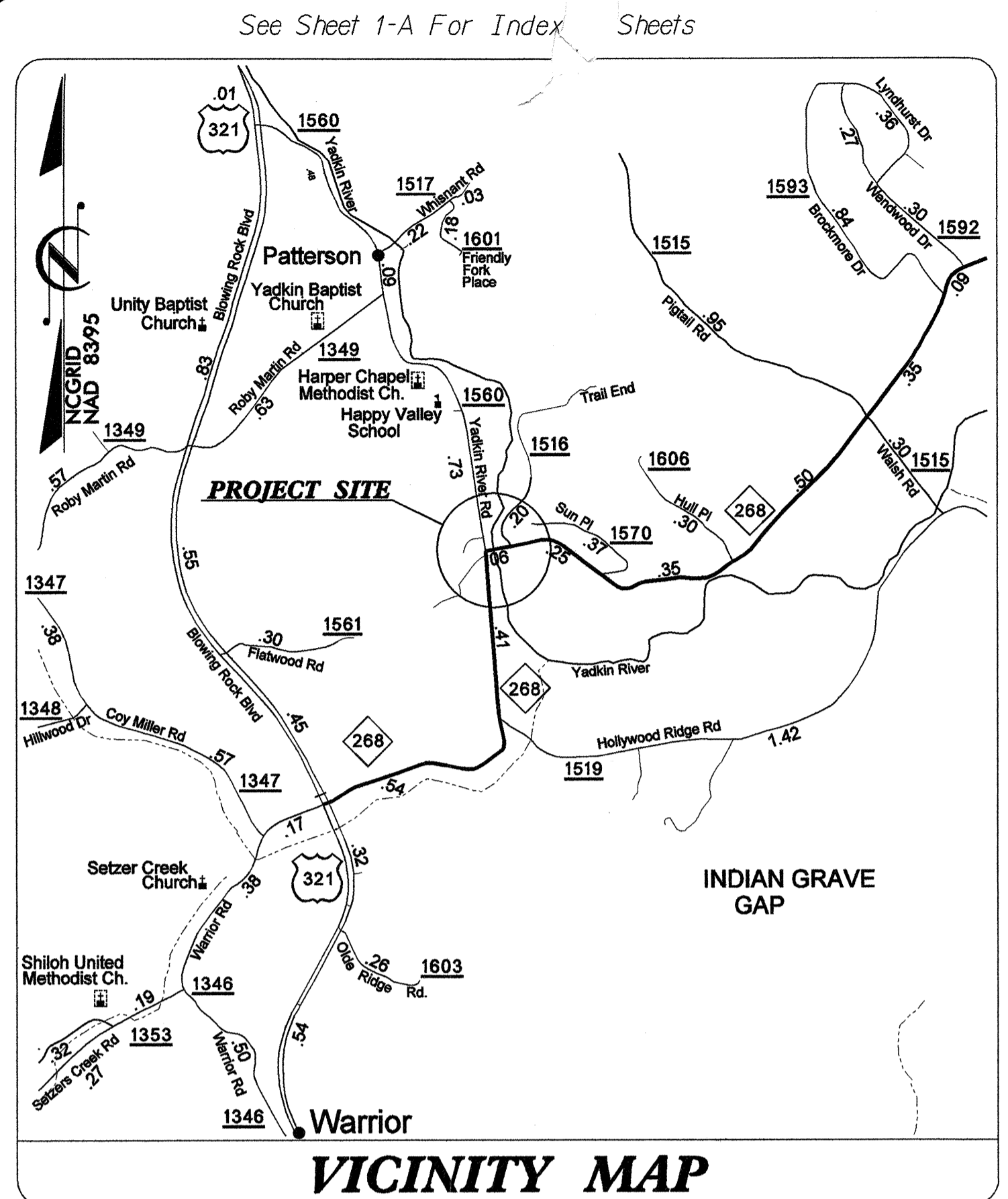
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4052	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33418.1.1	BRSTP-0268(9)	PE	
33418.2.1	BRSTP-0268(9)	UTIL. & RW	
33418.3.1	BRSTP-0268(9)	CONST	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CALDWELL COUNTY

LOCATION: BRIDGE NO. 7 OVER YADKIN RIVER ON NC 268

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURES



TIP PROJECT: B-4052

CONTRACT: C201837

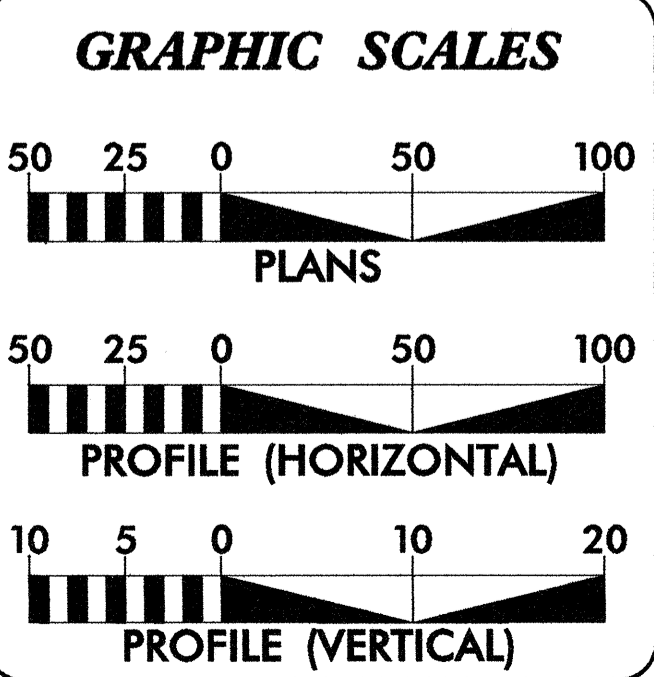
BEGIN CONSTRUCTION
BEGIN TIP PROJECT B-4052
-L- STA. 10+00.00
-Y- STA. 14+11.25

-Y- STA. 13+53.25
-DETOUR- STA. 10+00.00

-L- POT STA. 13+89.73
-DETOUR- STA. 14+00.82

NOTE: A DESIGN EXCEPTION IS REQUIRED FOR THE PROPOSED LANE WIDTH & SHOULDER WIDTH, AND HORIZONTAL CLEARANCE FOR -Y-.

END CONSTRUCTION
-Y- STA. 16+05.36



DESIGN DATA

ADT 2008 =	6,655
ADT 2028 =	10,830
DHV =	10%
D =	65%
T =	4% *
V =	40 MPH
* TTST 1%	DUAL 3%
CLASSIFICATION = MAJOR RURAL COLLECTOR	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4052	= 0.050 MILES
LENGTH STRUCTURE TIP PROJECT B-4052	= 0.029 MILES
TOTAL LENGTH TIP PROJECT B-4052	= 0.079 MILES

Prepared for the North Carolina Department of Transportation in the Office of:

WETHERILL ENGINEERING
559 JONES FRANKLIN ROAD
SUITE 164
RALEIGH, N.C. 27606
BUS: 919 851 8077
FAX: 919 851 8007

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: **EDWARD G. WETHERILL, PE**
PROJECT ENGINEER
APRIL 21, 2006

LETTING DATE: **BOB A. MAY, PE**
PROJECT DESIGN ENGINEER
MAY 20, 2008

NCDOT CONTACT: **B. DOUG TAYLOR, PE**
ROADWAY DESIGN PROJECT ENGINEER

HYDRAULICS ENGINEER

ROADWAY DESIGN ENGINEER

Professional Engineer Seal: W. Henry Wells, II, No. 09334

Professional Engineer Seal: Bob A. May, No. 21116

SIGNATURE: [Signature] 2/14/08

SIGNATURE: [Signature] 2-14-08

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

Professional Engineer Seal: State of North Carolina, Department of Transportation

STATE HIGHWAY DESIGN ENGINEER

4:08:55 PM P:\B-4052\Roadway\Proj\B4052_rdy_tsh.dgn 1/12/08

559 Jones Franklin Rd. Suite 164
Raleigh, N.C. 27606
Bus: 919 851 8077
Fax: 919 851 8107

TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

INDEX OF SHEETS

Sheet Number	Sheet
1	Title Sheet
1-A	Index of Sheets, General Notes and list of Standards
1-B	Conventional Symbols
1-C	Survey Control Sheets
2	Typical Sections, Pavement Schedule and Miscellaneous Details not covered by Roadway Standards
2-A	Detour Sheet
2-B	Anchorage for Frames - Brick/Concrete/Precast Concrete
2-C Thru 2-n	Temporary Shoring Details
3 Thru 3-B	Summary of Quantities, Summary of Drainage, Summary of Guardrail, Summary of Earthwork and Summary of Pavement Removal
4 Thru 6	Plan and Profile Sheets
TCP-1 Thru TCP-8	Traffic Control Plans
EC-1 Thru EC-6	Erosion Control Plans
RF-1	Reforestation Detail Sheet
SIGN-1 Thru SIGN-3	Signing Plans
UC-1 Thru UC-3	Utility Construction Plans
UO-1 Thru UO-2	Utilities by Others Plans
X-1A	Cross-Section Summary Sheet
X-1 Thru X-8	Cross-Sections
S-1 Thru S-28	Structure Plans

GENERAL NOTES

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

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

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

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

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

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

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.

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
Blue Ridge EMC - Power
AT&T North Carolina - Telephone
Caldwell County Water - Water
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.

LIST OF ROADWAY STANDARDS

2006 ROADWAY STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation - Method 'A'
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structure and Concrete Pad
838.21	Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.51	Reinforced Brick Endwall - for Single 54" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.29	Frames and Narrow Slot Flat Grates
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.02	Drop Inlet Installation in Expressway 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
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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2/17/2008

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	○
Property Corner	-----
Property Monument	□
Parcel/Sequence Number	(23)
Existing Fence Line	-----
Proposed Woven Wire Fence	-----
Proposed Chain Link Fence	-----
Proposed Barbed Wire Fence	-----
Existing Wetland Boundary	-----
Proposed Wetland Boundary	-----
Existing High Quality Wetland Boundary	-----
Existing Endangered Animal Boundary	-----
Existing Endangered Plant Boundary	-----

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	-----
River Basin Buffer	-----
Flow Arrow	-----
Disappearing Stream	-----
Spring	○
Swamp Marsh	-----
Proposed Lateral, Tail, Head Ditch	-----
False Sump	-----

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	□
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----
Proposed Slope Stakes Fill	-----
Proposed Wheel Chair Ramp	-----
Curb Cut for Future Wheel Chair Ramp	-----
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	-----
Pavement Removal	-----

VEGETATION:

Single Tree	○
Single Shrub	○
Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	-----

EXISTING STRUCTURES:

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

UTILITIES:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

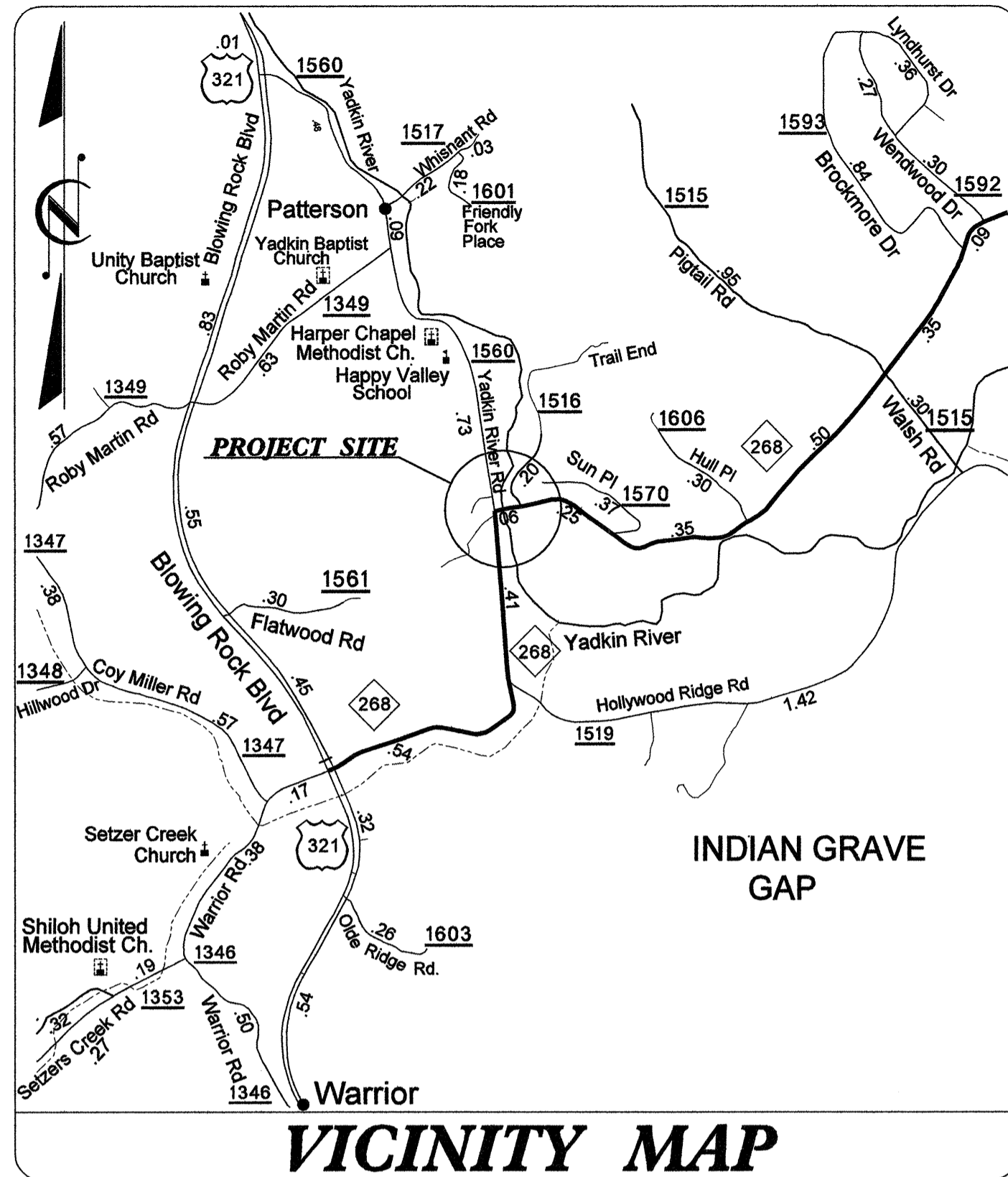
SANITARY SEWER:

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

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	□
Utility Unknown U/G Line	-----
U/G Tank; Water, Gas, Oil	□
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-4052



VICINITY MAP

**NCGS
HAPPY**
N = 826758.7370
E = 1242951.6480

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BL1	(BL-1)	825035.4461	1243149.4356	1220.35'	10+25.71	47.48' RT
BL2	(BL-2)	825106.7645	1243433.0463	1222.98'	13+17.08	22.57' RT
BL3	(BL-3)	825231.1061	1243952.1798	1224.64'	18+46.67	15.33' LT
BL4	(BL-4)	825087.8416	1244214.7187	1221.34'	OUTSIDE PROJECT LIMITS	

BY POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
BY5	(BY-5)	825525.2646	1243063.6573	1220.94'	OUTSIDE PROJECT LIMITS	
BY6	(BL-1)	825035.4461	1243149.4356	1220.35'	14+57.92	26.47' LT
BY7	(BY-7)	824465.5114	1243197.1389	1219.07'	OUTSIDE PROJECT LIMITS	

BY1 POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
BY18	(BY1-8)	825467.5552	1243331.5397	1218.65'	OUTSIDE PROJECT LIMITS	
BY19	(BL-2)	825106.7645	1243433.0463	1222.98'	OUTSIDE PROJECT LIMITS	

 BM #1 ELEVATION = 1212.45'
 N 824676. E 1243438.
 Y STATION 18+39 280' LEFT
 R/R SPIKE IN BASE OF A 10' POPLAR

BEGIN TIP PROJ B-4052
 -L- STA. 10+00.00
 N = 825078.1920
 E = 1243116.4467

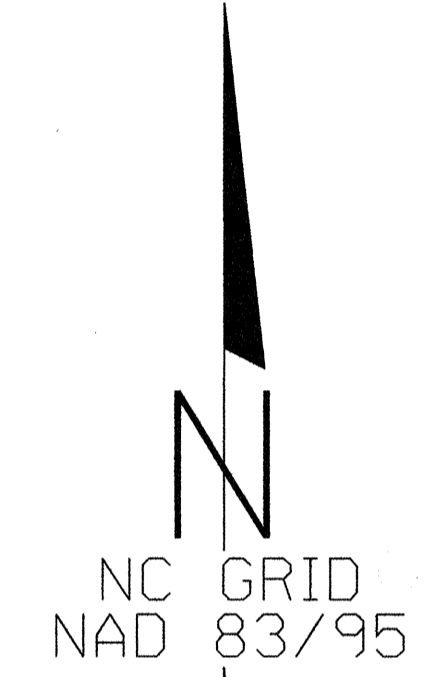
END TIP PROJ B-4052
 -L- STA. 14+14.73
 N = 825144.8643
 E = 1243525.7818

DATUM DESCRIPTION
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "HAPPY"
 WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF
 NORTHING: 826758.7370(ft) EASTING: 1242951.6480(ft)
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99990217
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "HAPPY" TO -L- STATION 10+00.00 IS
 S 5°36'02" E 1688.61
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

**NCGS
HAPPY AZIMUTH**
 N = 823821.7200
 E = 1243238.5390

- NOTES:**
- 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:
 B4052_LS_CONTROL_051013.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

NOTE: DRAWING NOT TO SCALE

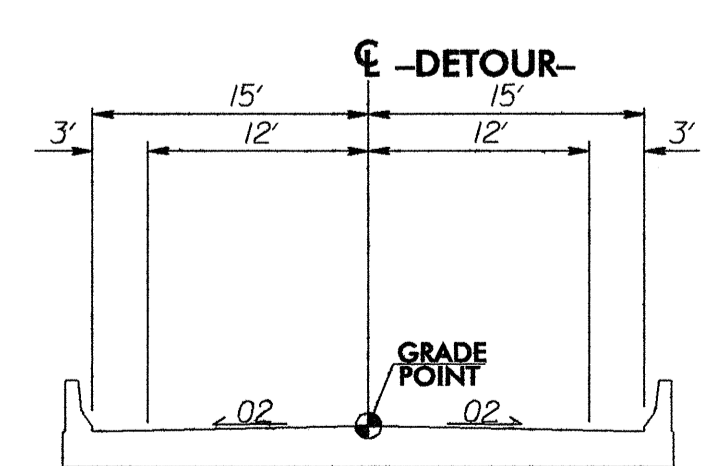
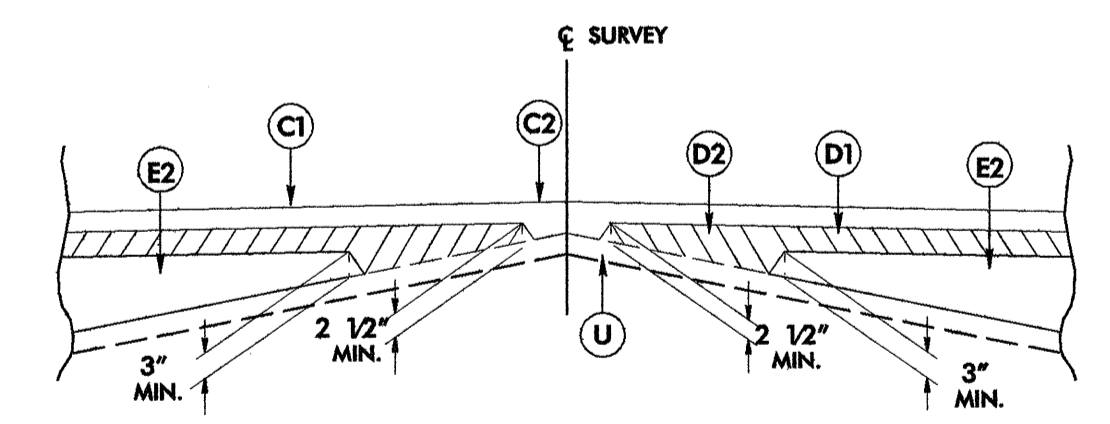


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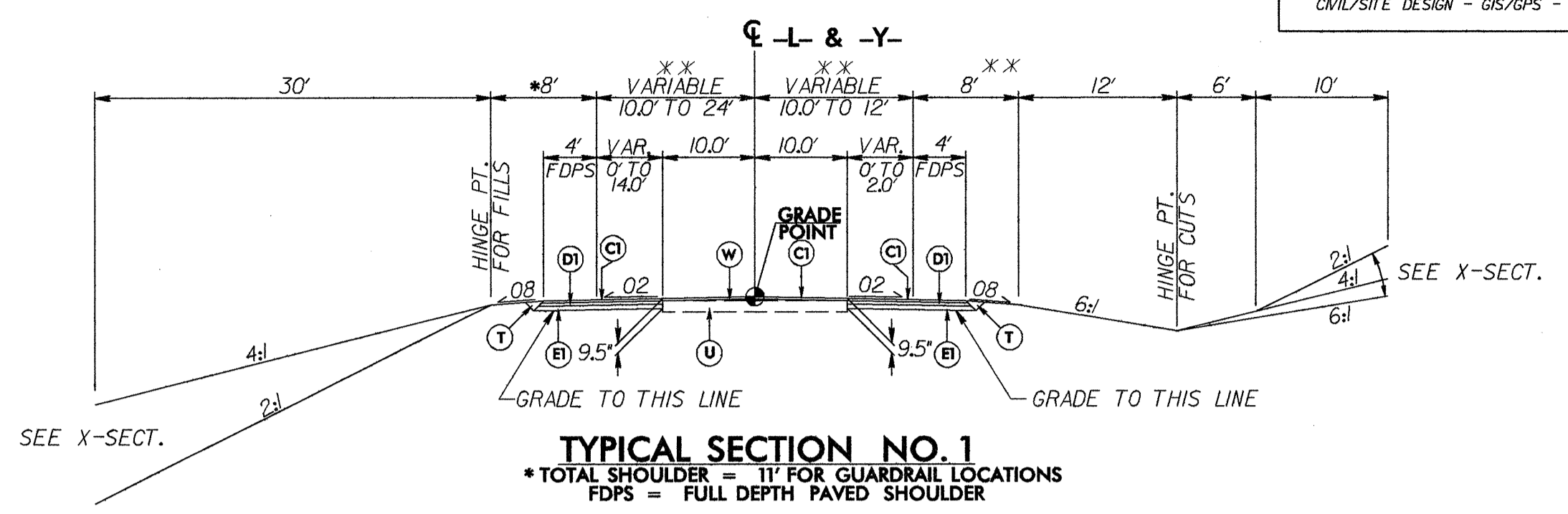
6/2/09

PAVEMENT SCHEDULE	
A	CONCRETE WEARING SURFACE (STRUCTURE PAY ITEM)
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
C3	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
R	CONCRETE EXPRESSWAY GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT

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



TYPICAL SECTION NO. 6
 USE TYPICAL SECTION NO. 6 AS FOLLOWS:
 -DETOUR- STA.10+47.00 (BEGIN BRIDGE) TO -DETOUR- STA.11+57.00 (END BRIDGE)



TYPICAL SECTION NO. 1
 * TOTAL SHOULDER = 11' FOR GUARDRAIL LOCATIONS
 FDEPS = FULL DEPTH PAVED SHOULDER

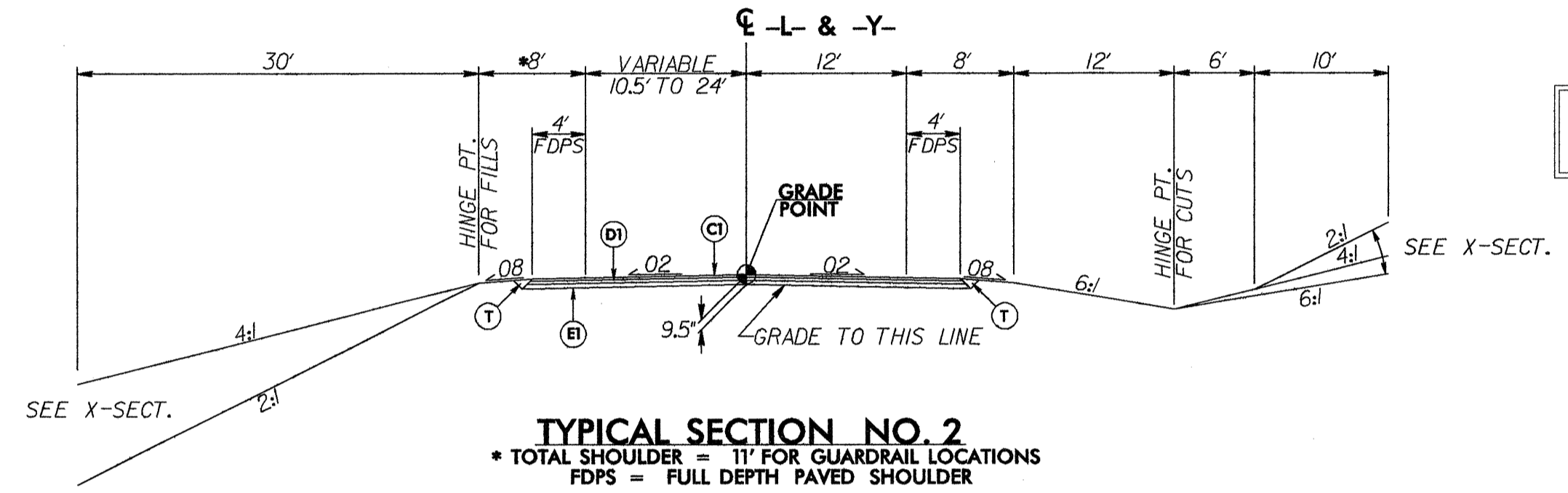
USE TYPICAL SECTION NO.1 AS FOLLOWS:
 -L- STA.10+25.00 TO -L- STA.10+25.00
 -L- STA.12+25.00 TO -L- STA.13+89.73
 -Y- STA.12+87.25 TO -Y- STA.15+80.36

TRANSITION FROM EXISTING TO TYPICAL SECTION NO.1
 -Y- STA.12+00.00 TO -Y- STA.12+87.25

TRANSITION FROM TYPICAL SECTION NO.1 TO EXISTING
 -L- STA.13+89.73 TO -L- STA.14+4.73
 -Y- STA.15+80.36 TO -Y- STA.16+05.36

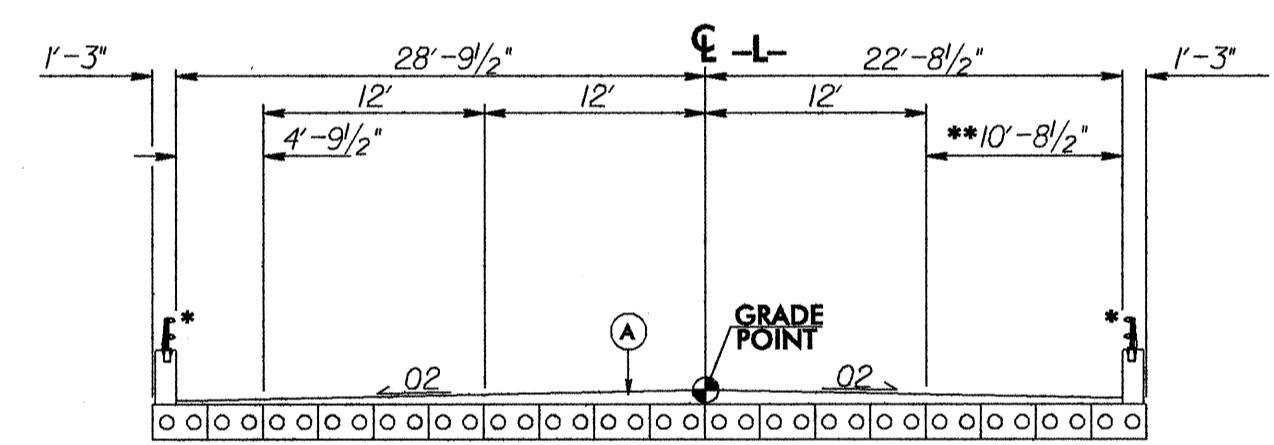
NOTE: FEATHER PROPOSED 4' PAVED SHOULDER TO EXISTING BST IN PARKING AREA.
 -L- STA.13+13.00 TO -L- STA.14+4.73 RT.

** NOTE: A DESIGN EXCEPTION IS REQUIRED FOR THE PROPOSED LANE WIDTH, SHOULDER WIDTH, AND HORIZONTAL CLEARANCE FOR -Y-.



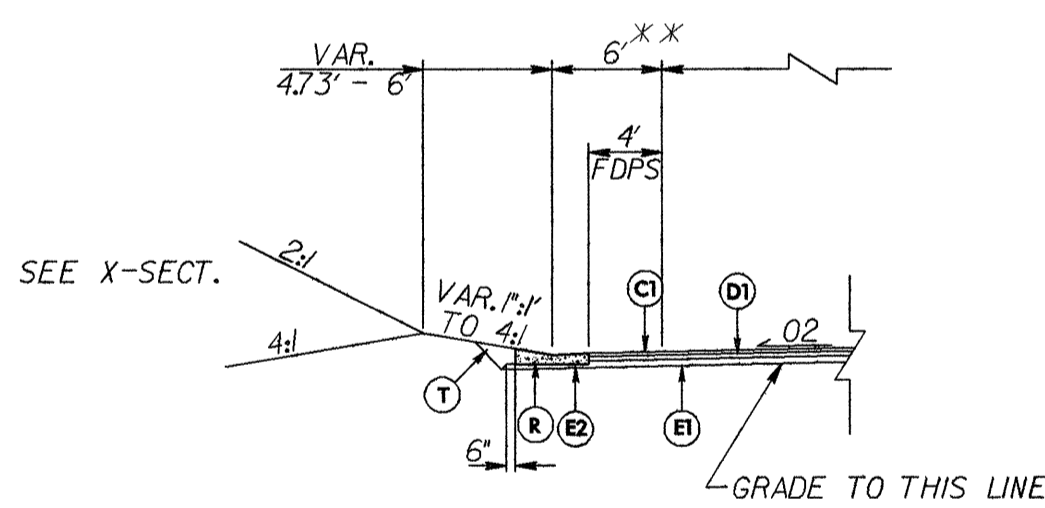
TYPICAL SECTION NO. 2
 * TOTAL SHOULDER = 11' FOR GUARDRAIL LOCATIONS
 FDEPS = FULL DEPTH PAVED SHOULDER

USE TYPICAL SECTION NO.2 AS FOLLOWS:
 -L- STA.10+25.00 TO -L- STA.10+43.94 (BEGIN BRIDGE)
 -L- STA.11+96.06 (END BRIDGE) TO -L- STA.12+25.00



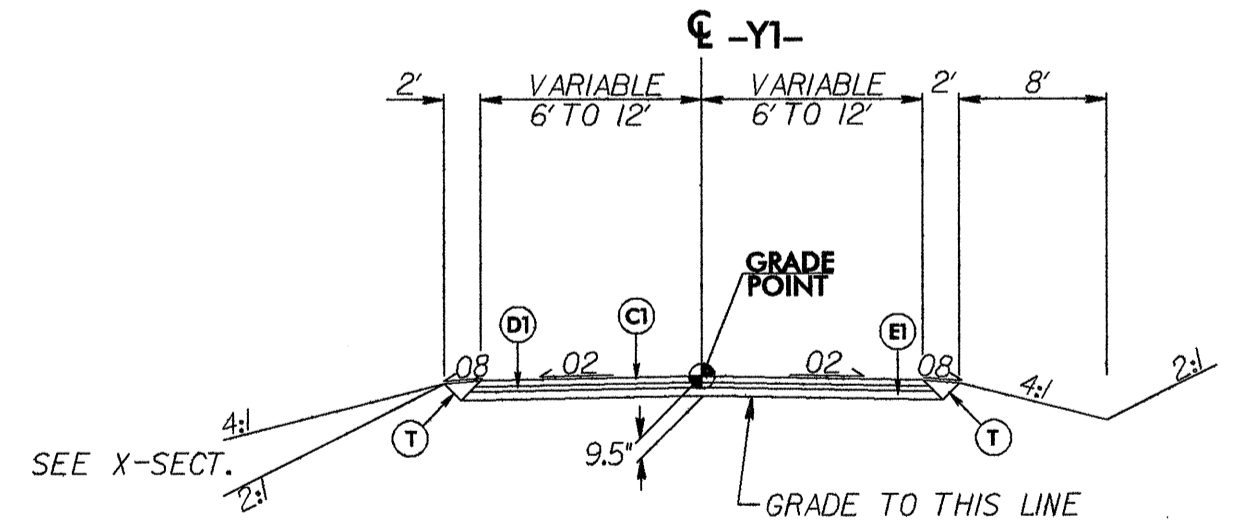
TYPICAL SECTION NO. 3
 * BICYCLE SAFE RAIL
 ** TURNING MOVEMENT ACCOMMODATING WB-50

USE TYPICAL SECTION NO.3 AS FOLLOWS:
 -L- STA.10+43.94 (BEGIN BRIDGE) TO -L- STA.11+96.06 (END BRIDGE)



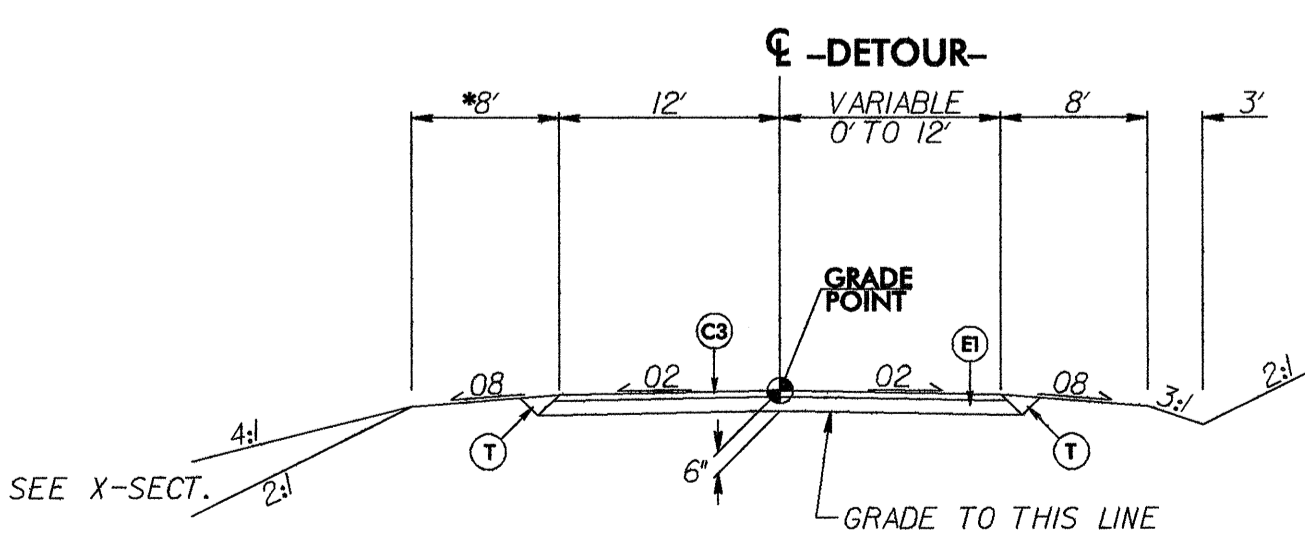
PARTIAL TYPICAL SECTION NO. 1A
 USE IN CONJUNCTION WITH TYPICAL SECTION NO.1
 FDEPS = FULL DEPTH PAVED SHOULDER

USE PARTIAL TYPICAL SECTION NO.1A AS FOLLOWS:
 -Y- STA.12+87.25 TO -Y- STA.15+75.00



TYPICAL SECTION NO. 4
 NOTE: TOTAL SHOULDER = 7' FOR GUARDRAIL LOCATIONS

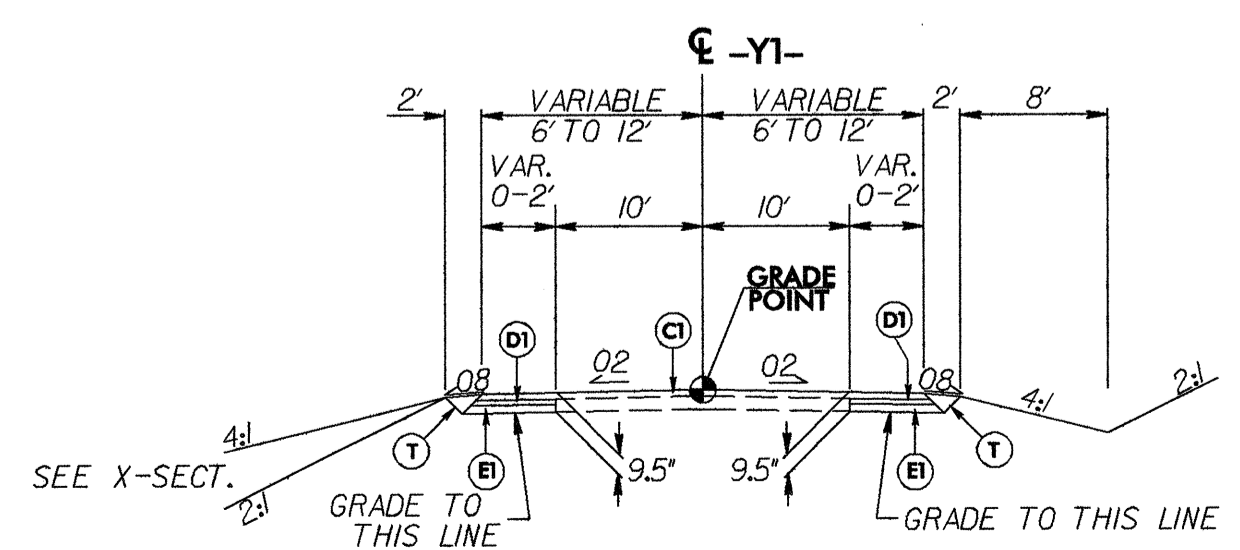
USE TYPICAL SECTION NO.4 AS FOLLOWS:
 -Y1- STA.10+35.00 TO -Y1- STA.10+90.69



TYPICAL SECTION NO. 6
 NOTE: TOTAL SHOULDER = 10' FOR GUARDRAIL LOCATIONS

USE TYPICAL SECTION NO.6 AS FOLLOWS:
 -DETOUR- STA.10+10.00 TO -DETOUR- STA.10+47.00 (BEGIN BRIDGE)
 -DETOUR- STA.11+57.00 (END BRIDGE) TO -DETOUR- STA.13+33.82

TRANSITION FROM TYPICAL SECTION NO.6 TO EXISTING
 -DETOUR- STA.13+32.82 TO -DETOUR- STA.13+89.73




TYPICAL SECTION NO. 5
 NOTE: TOTAL SHOULDER = 7' FOR GUARDRAIL LOCATIONS

USE TYPICAL SECTION NO.5 AS FOLLOWS:
 -Y1- STA.10+90.69 TO -Y1- STA.11+25.14

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 2/18/2008

8/17/99

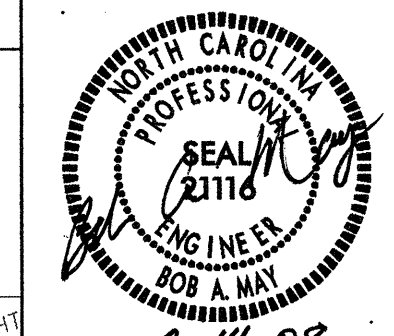
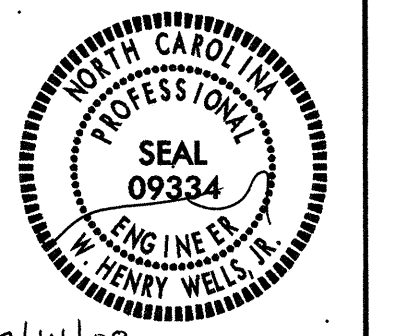
24	MELVIN W. GREENE DB 687 PG 923
5	ELEANOR M. CURTIS DB 632 PG 298 TAX MAP
8	HAPPY VALLEY RURITAN CLUB DB 868 PG 912



TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

SUNGATE DESIGN GROUP, P.A.

915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL 919 859-2243 FAX 919 859-6258

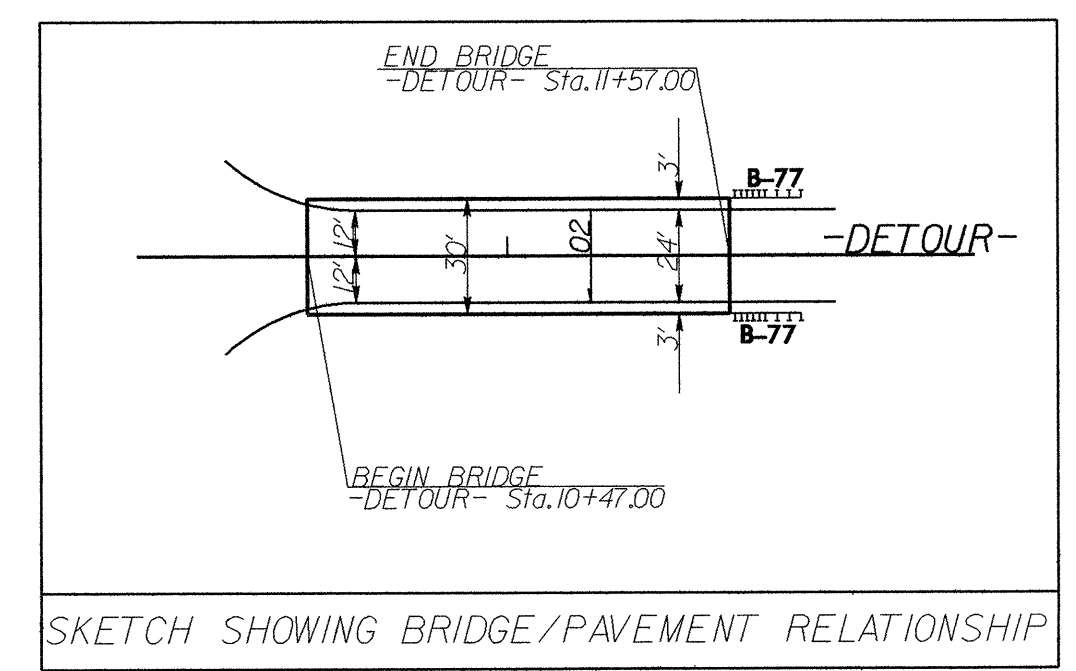
PROJECT REFERENCE NO. B-4052	SHEET NO. 2-A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 2-14-08	 2/14/08

-DETOUR-

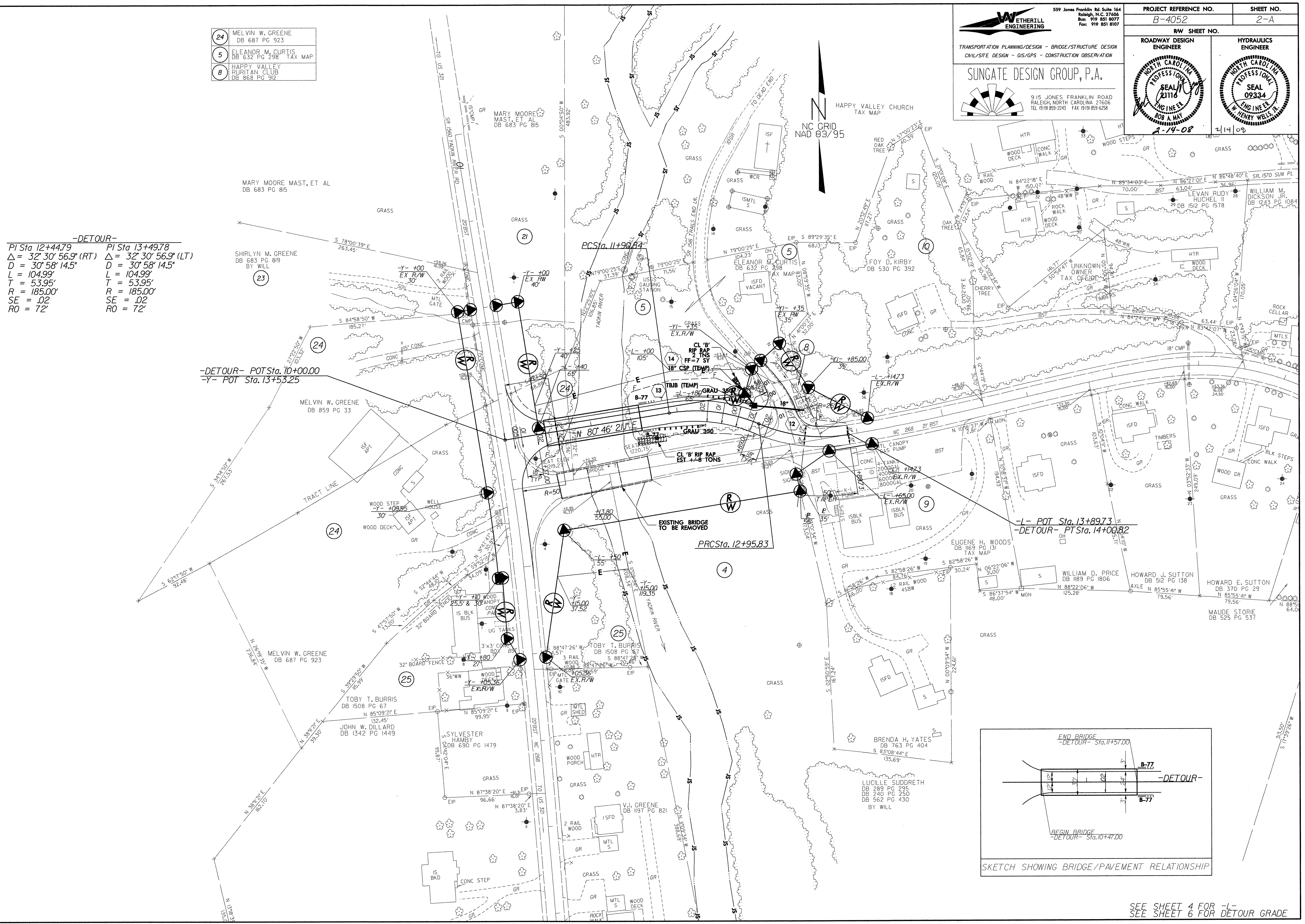
PI Sta 12+44.79	PI Sta 13+49.78
$\Delta = 32' 30" 56.9" (RT)$	$\Delta = 32' 30" 56.9" (LT)$
$D = 30' 58" 14.5"$	$D = 30' 58" 14.5"$
$L = 104.99'$	$L = 104.99'$
$T = 53.95'$	$T = 53.95'$
$R = 185.00'$	$R = 185.00'$
$SE = .02$	$SE = .02$
$RO = 72'$	$RO = 72'$

-DETOUR- POT Sta. 10+00.00
-Y- POT Sta. 13+53.25

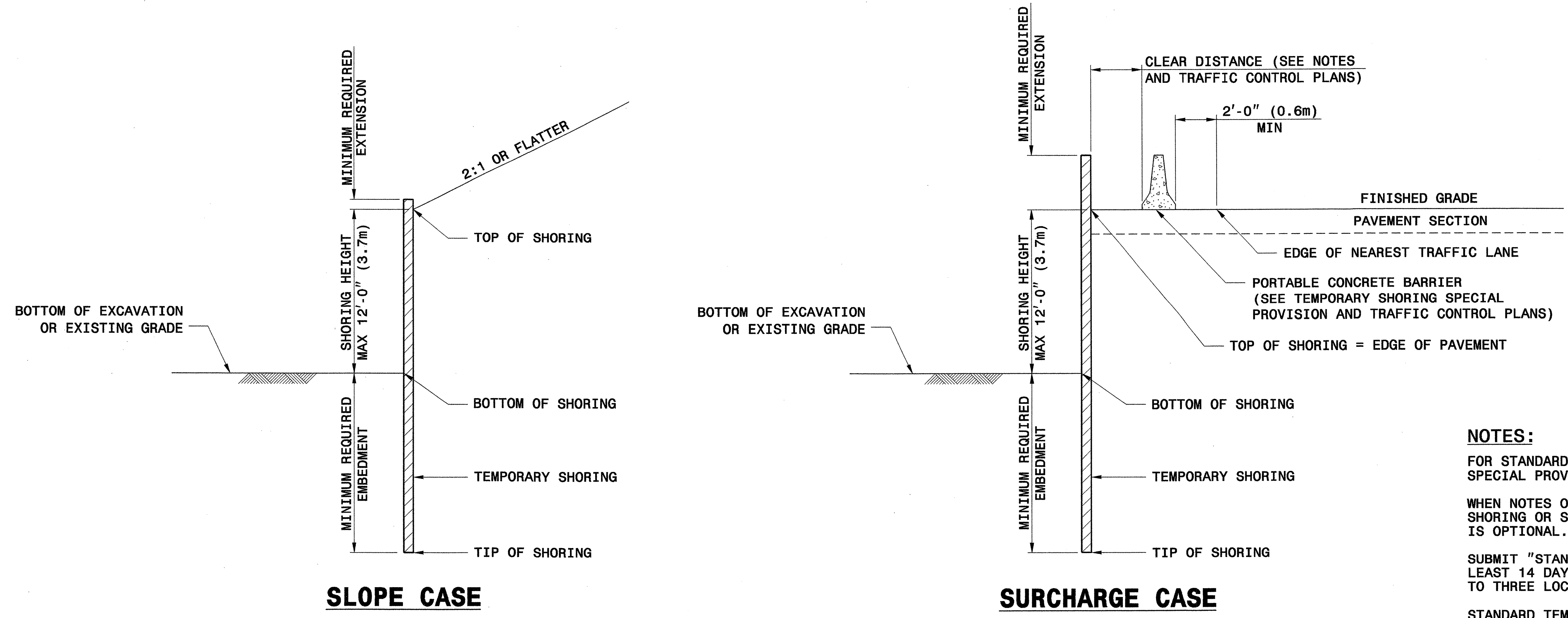
-L- POT Sta. 13+89.73
-DETOUR- PT Sta. 14+00.82



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 2/14/2008
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SEE SHEET 4 FOR -L-
SEE SHEET 6 FOR DETOUR GRADE



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)	MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN ³ /FT (cm ³ /m)	H PILES WITH TIMBER LAGGING			MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN ³ /FT (cm ³ /m)	H PILES WITH TIMBER LAGGING			
				HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)			HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)	
GROUNDWATER ELEVATION BELOW TIP OF SHORING	< 6 (1.8)	7.5 (2.3)	3.0 (161)	8.0 (2.4)	8.0 (2.4)	8.0 (2.4)	11.0 (3.4)	10.0 (538)	9.5 (2.9)	9.5 (2.9)	9.5 (2.9)	
	7 (2.1)	8.5 (2.6)	4.5 (242)	9.5 (2.9)	9.5 (2.9)	9.5 (2.9)	12.0 (3.7)	12.0 (645)	10.5 (3.2)	10.5 (3.2)	10.5 (3.2)	
	8 (2.4)	10.0 (3.0)	6.5 (349)	10.5 (3.2)	10.5 (3.2)	10.5 (3.2)	12.5 (3.8)	14.0 (753)	11.5 (3.5)	11.5 (3.5)	11.5 (3.5)	
	9 (2.7)	11.0 (3.4)	9.5 (511)	--	12.0 (3.7)	12.0 (3.7)	13.5 (4.1)	16.5 (887)	--	12.5 (3.8)	12.5 (3.8)	
	10 (3.0)	12.5 (3.8)	13.0 (699)	--	--	13.5 (4.1)	14.0 (4.3)	19.5 (1048)	--	13.5 (4.1)	13.5 (4.1)	
	11 (3.4)	13.5 (4.1)	17.0 (914)	--	--	14.5 (4.4)	15.0 (4.6)	22.5 (1210)	--	--	14.5 (4.4)	
	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".

STANDARD TEMPORARY MSE WALL OPTIONS

PROJECT REFERENCE NO. B-4052		SHEET 2-D
GEOTECHNICAL ENGINEER 		ENGINEER
Scott A. Shidden 2/29/07 SIGNATURE DATE		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 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, DELFECT, SKEW AND MODIFY REINFORCEMENT.

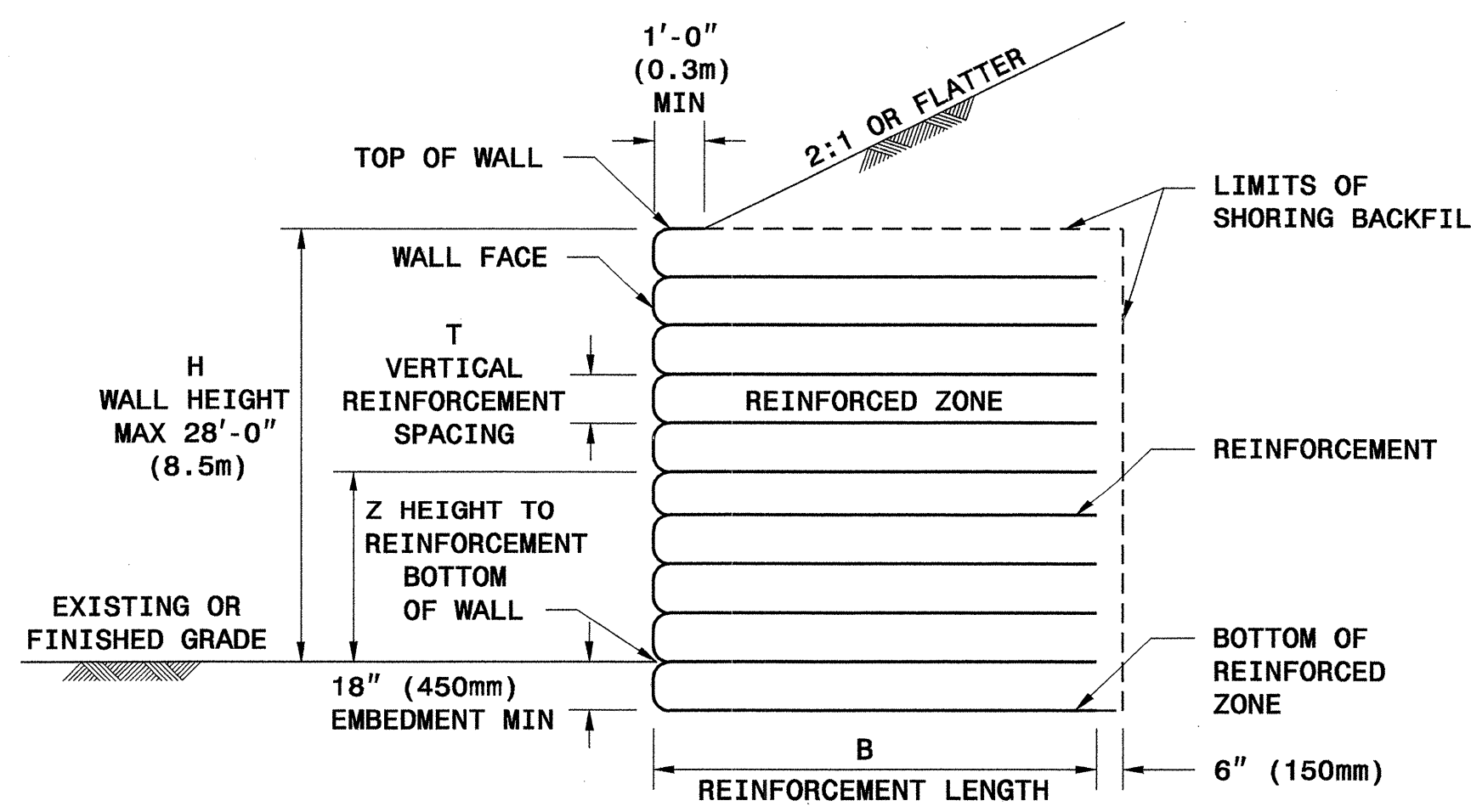
PLACE SHORING BACKFILL IN 8" TO 10" (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

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

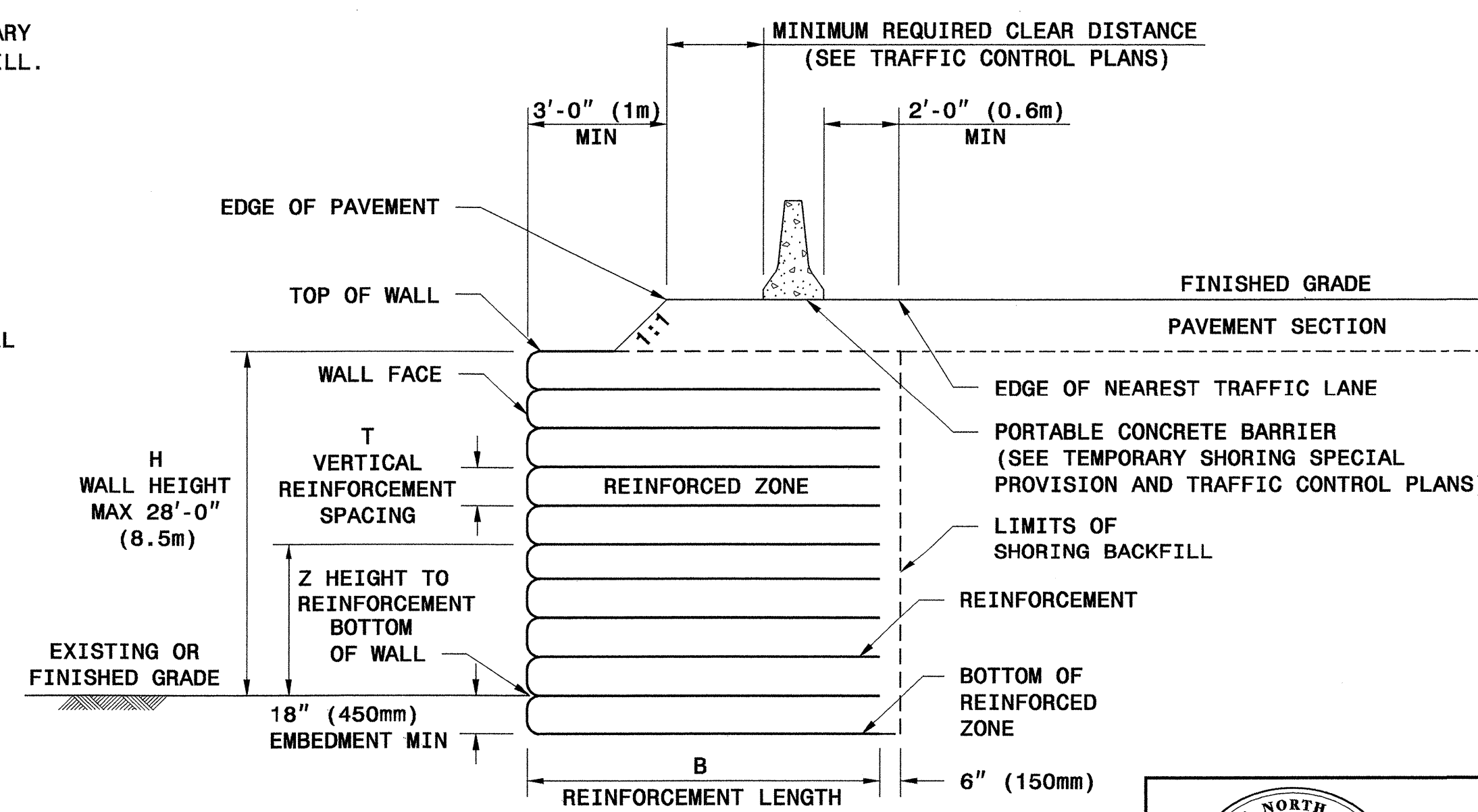
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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

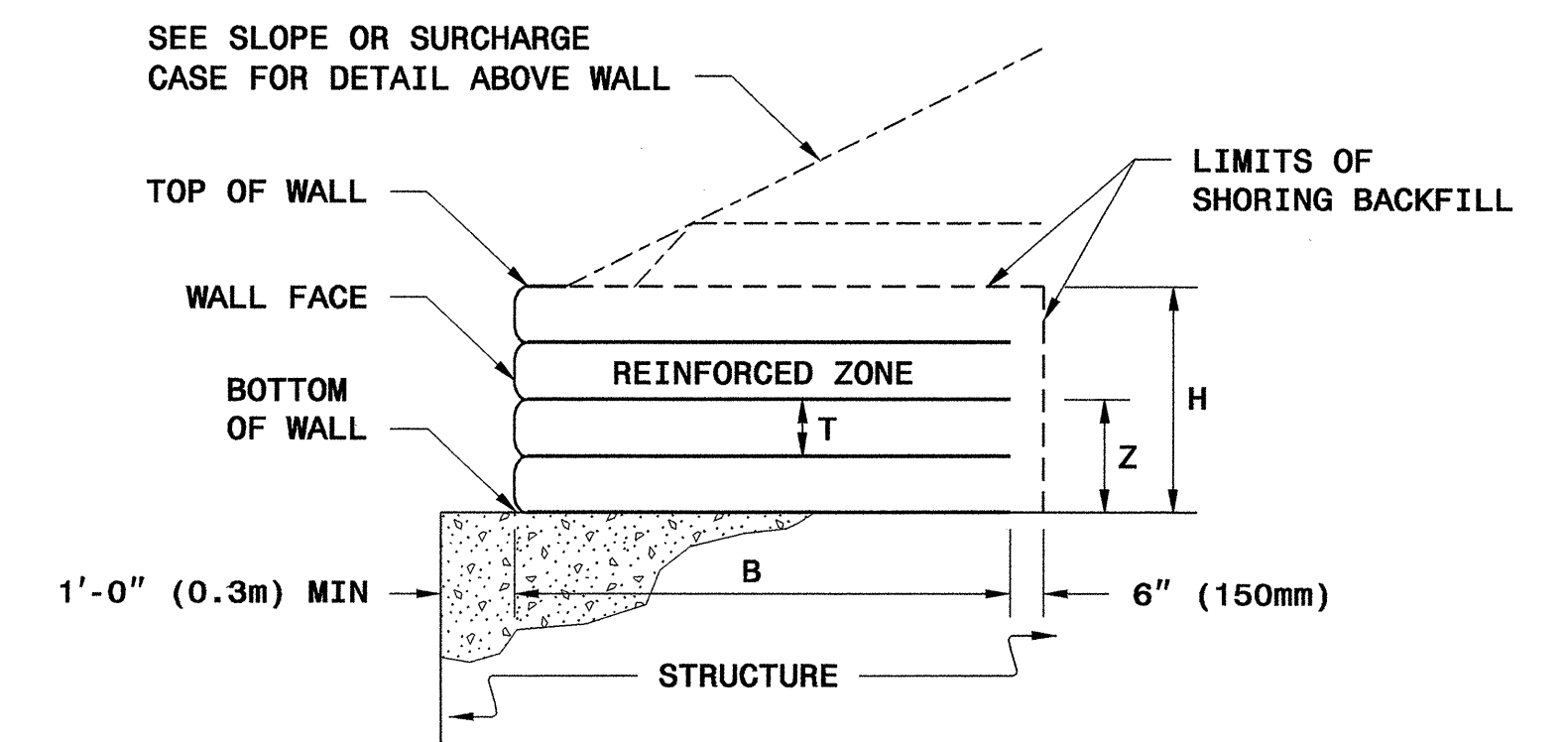
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.




SLOPE CASE



SURCHARGE CASE



TEMPORARY MSE WALL ON STRUCTURE


GEOTECHNICAL ENGINEERING UNIT
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS

SHEET 1 OF 11 DATE: 2-20-07

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

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

HILFIKER TEMPORARY WALL (WELDED WIRE MAT TYPE)

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

H (FT)		4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28
SLOPE CASE	26												4.5
	24												4.5
	22												4.5
	20												4.5
	18												4.5
	16												4.5
	14												4.5
	12												4.5
	10												4.5
	8												4.5
	6												4.5
	4												4.5
3												4.5	
2												4.5	
1												4.5	
0												4.5	
-1.5												4.5	

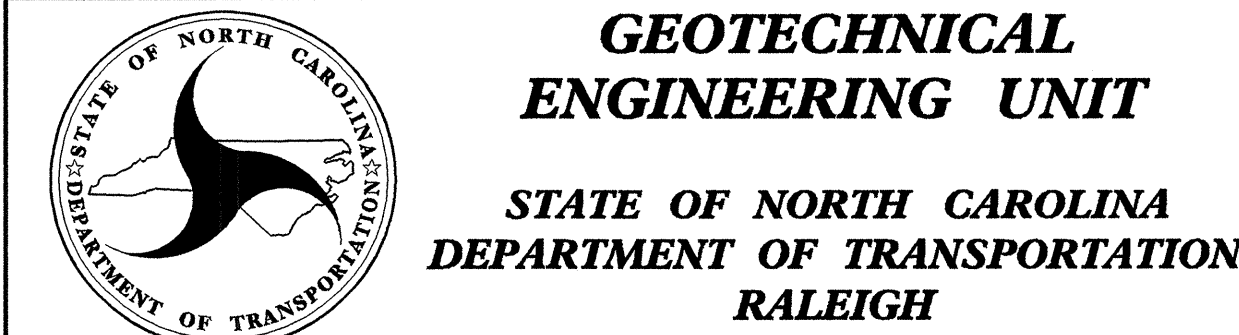
RETAINED EARTH TEMPORARY WALL (WELDED WIRE MESH TYPE)

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

NOTES FOR HILFIKER TEMPORARY WALL

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



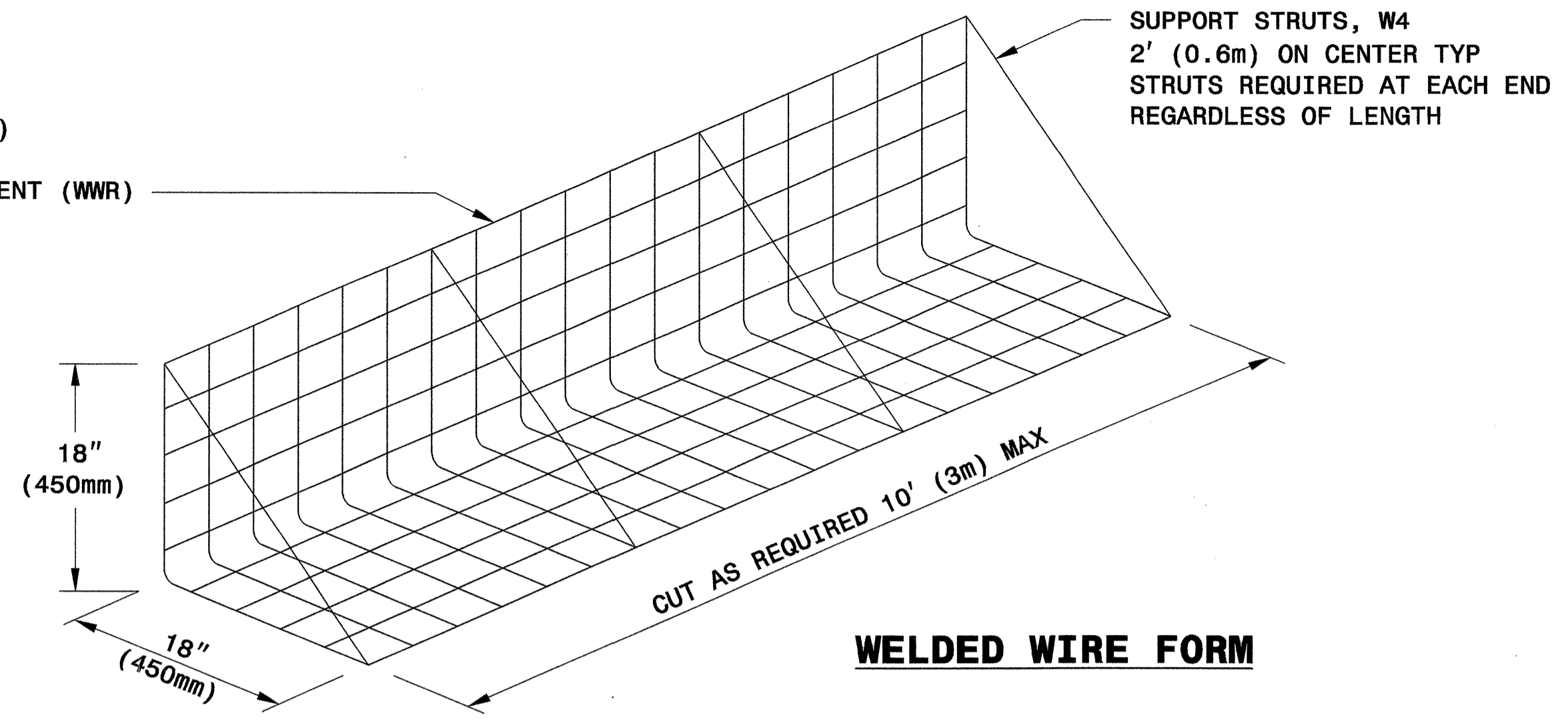
STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

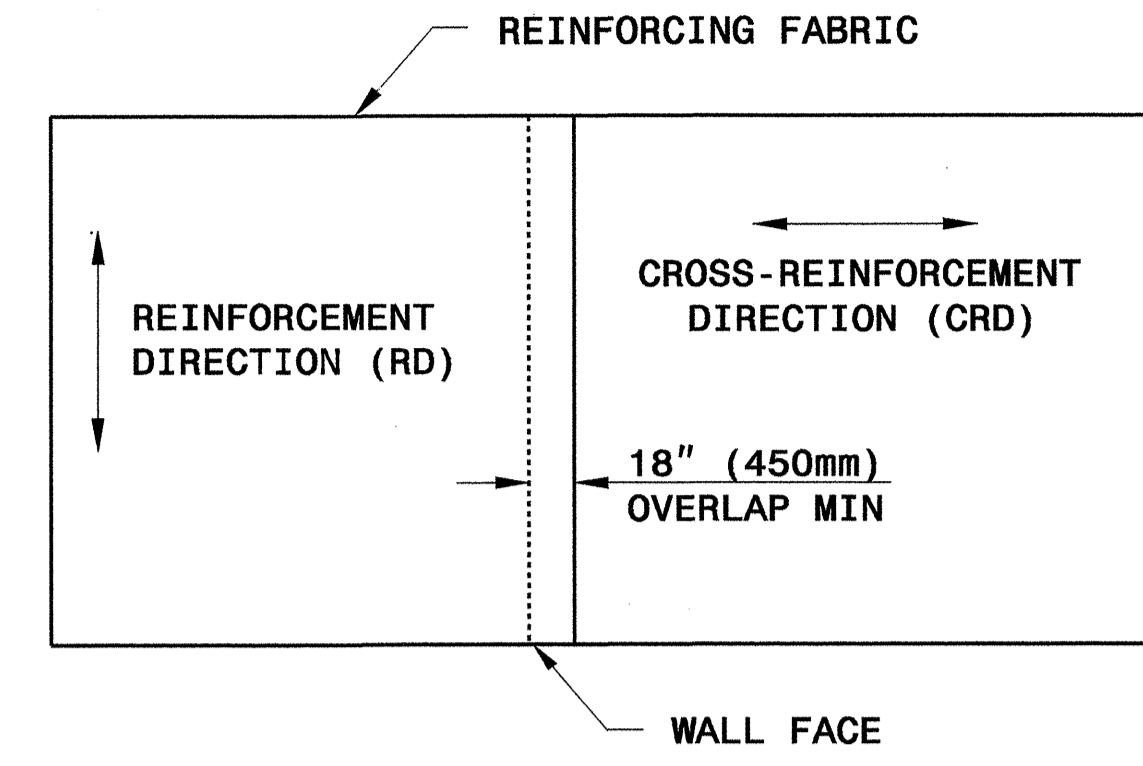


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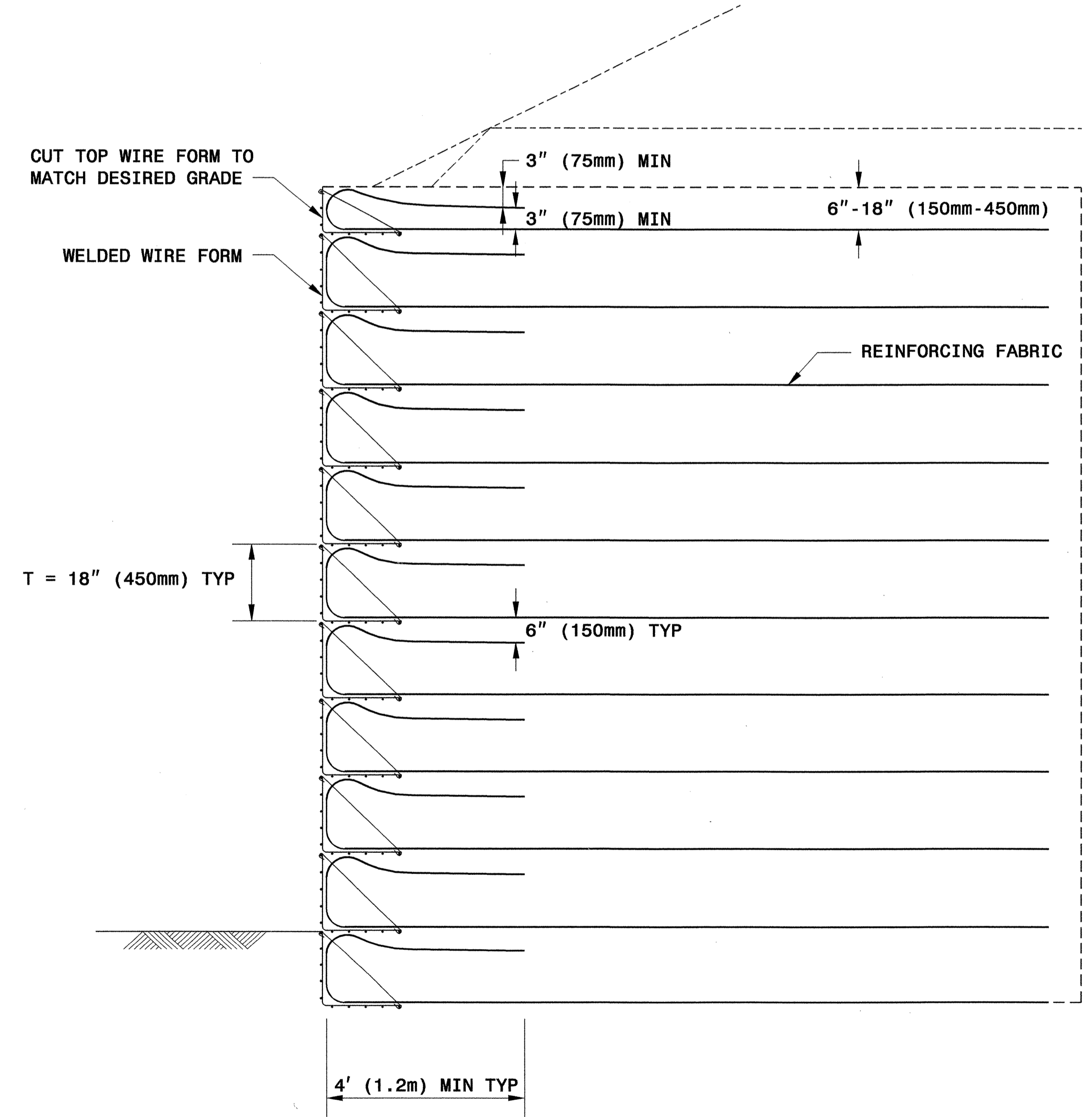
4" X 4" (102mm X 102mm)
W4 X W4 (MW26 X MW26)
WELDED WIRE REINFORCEMENT (WWR)



WELDED WIRE FORM



PLAN VIEW OF FABRIC OVERLAP

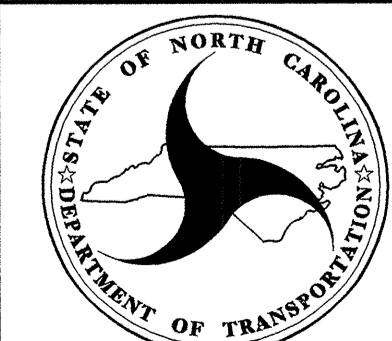


TYPICAL SECTION

**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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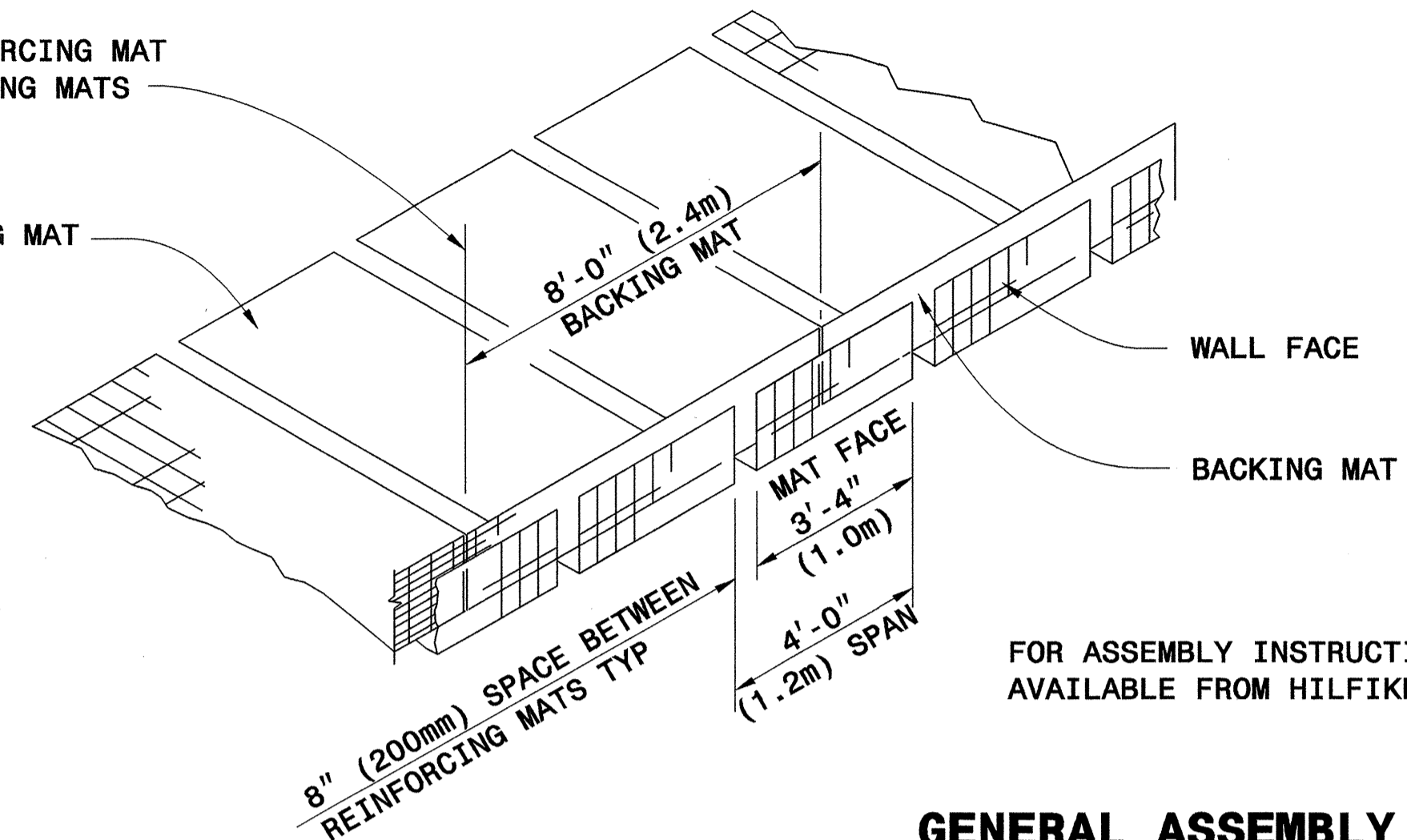
TEMPORARY FABRIC WALL



Signature: *Scott A. Hilden* 3/29/07
 DATE: _____
 SIGNATURE DATE SIGNATURE DATE

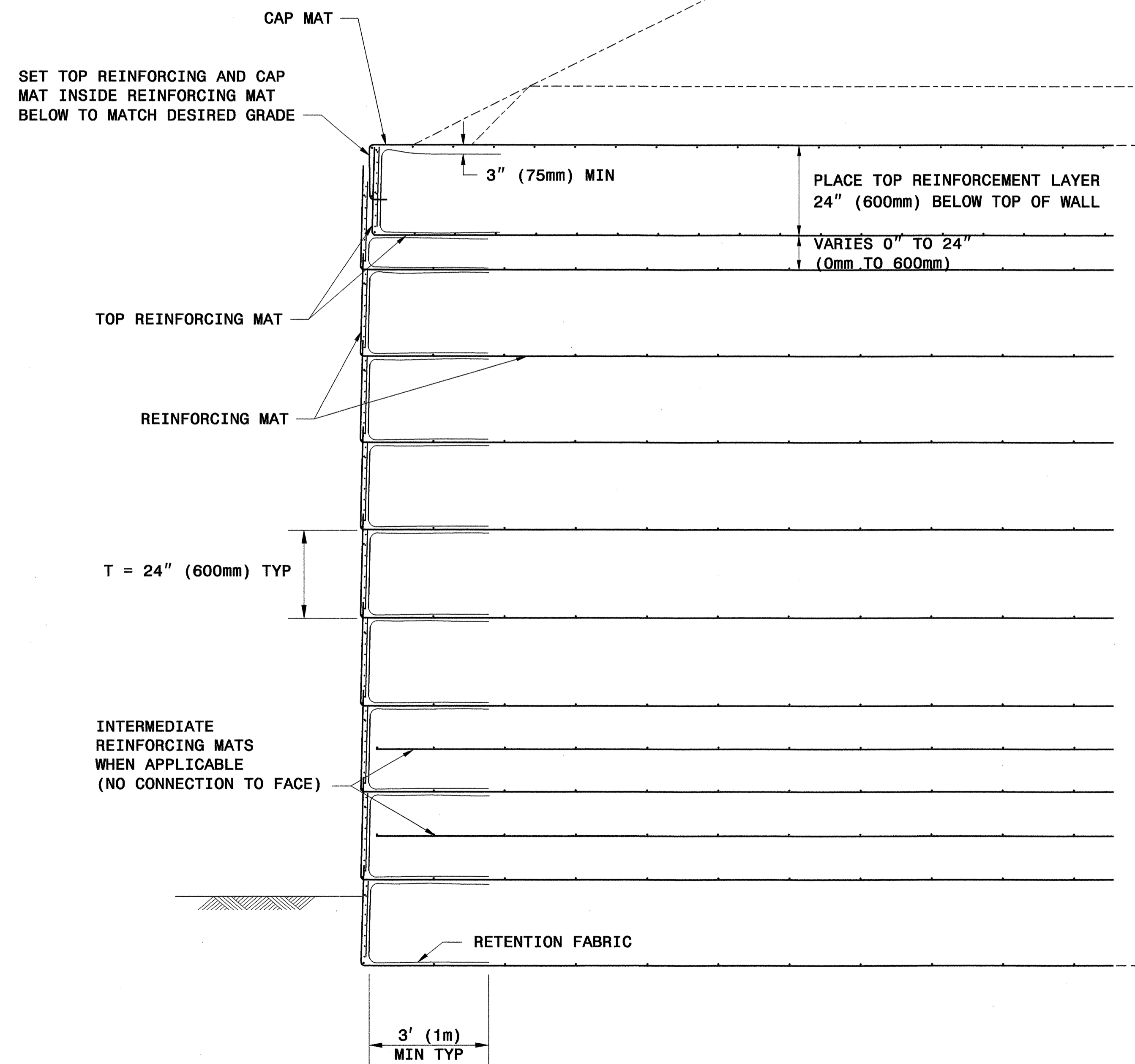
CENTERLINE OF REINFORCING MAT
 FACE = EDGE OF BACKING MATS

REINFORCING MAT



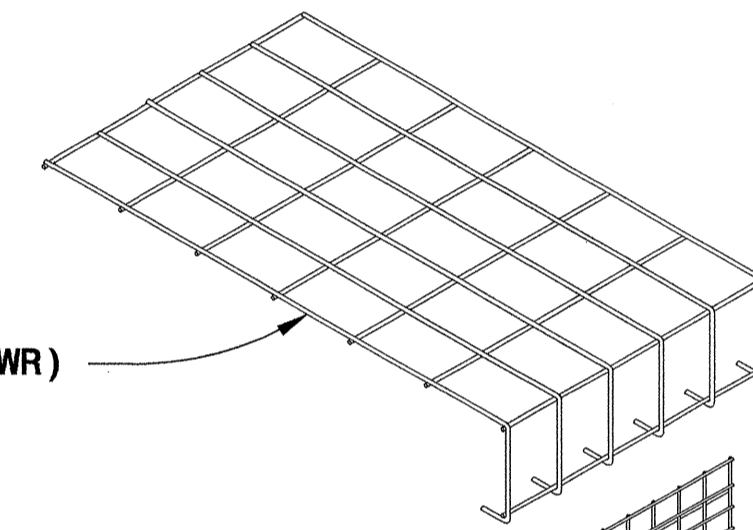
FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE
 AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

GENERAL ASSEMBLY DETAIL

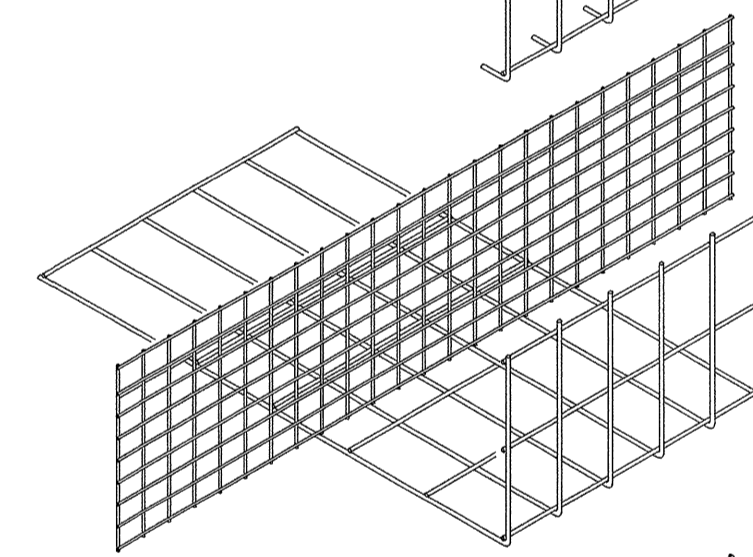


TYPICAL SECTION

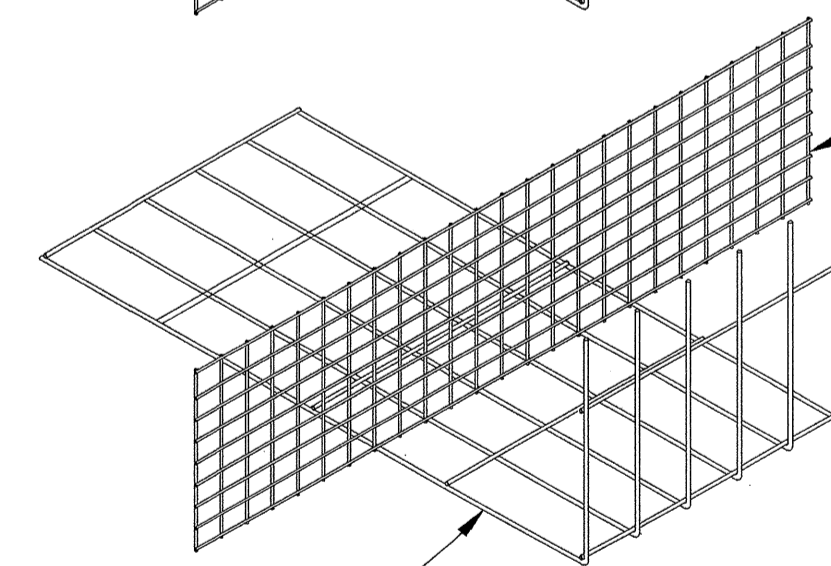
8" X 12" (203mm X 305mm)
 W4.5 X W3.5 (MW29 X MW23)
 CAP MAT
 WELDED WIRE REINFORCEMENT (WWR)



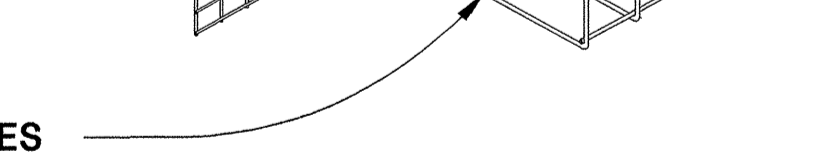
8" X 12" (203mm X 305mm)
 W4.5 X W3.5 (MW29 X MW23) WWR
 TOP REINFORCING MAT (NO PRONGS)



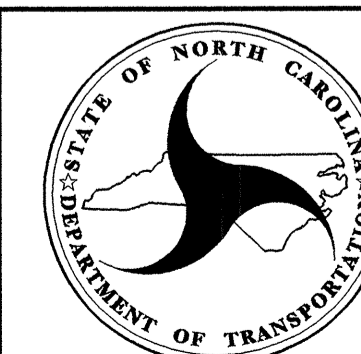
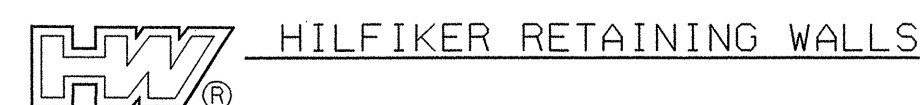
4" X 3" (102mm X 76mm)
 W5 X W2.5 (MW32 X MW16) WWR
 BACKING MAT
 8' (2.4m) WIDE



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



WALL COMPONENTS



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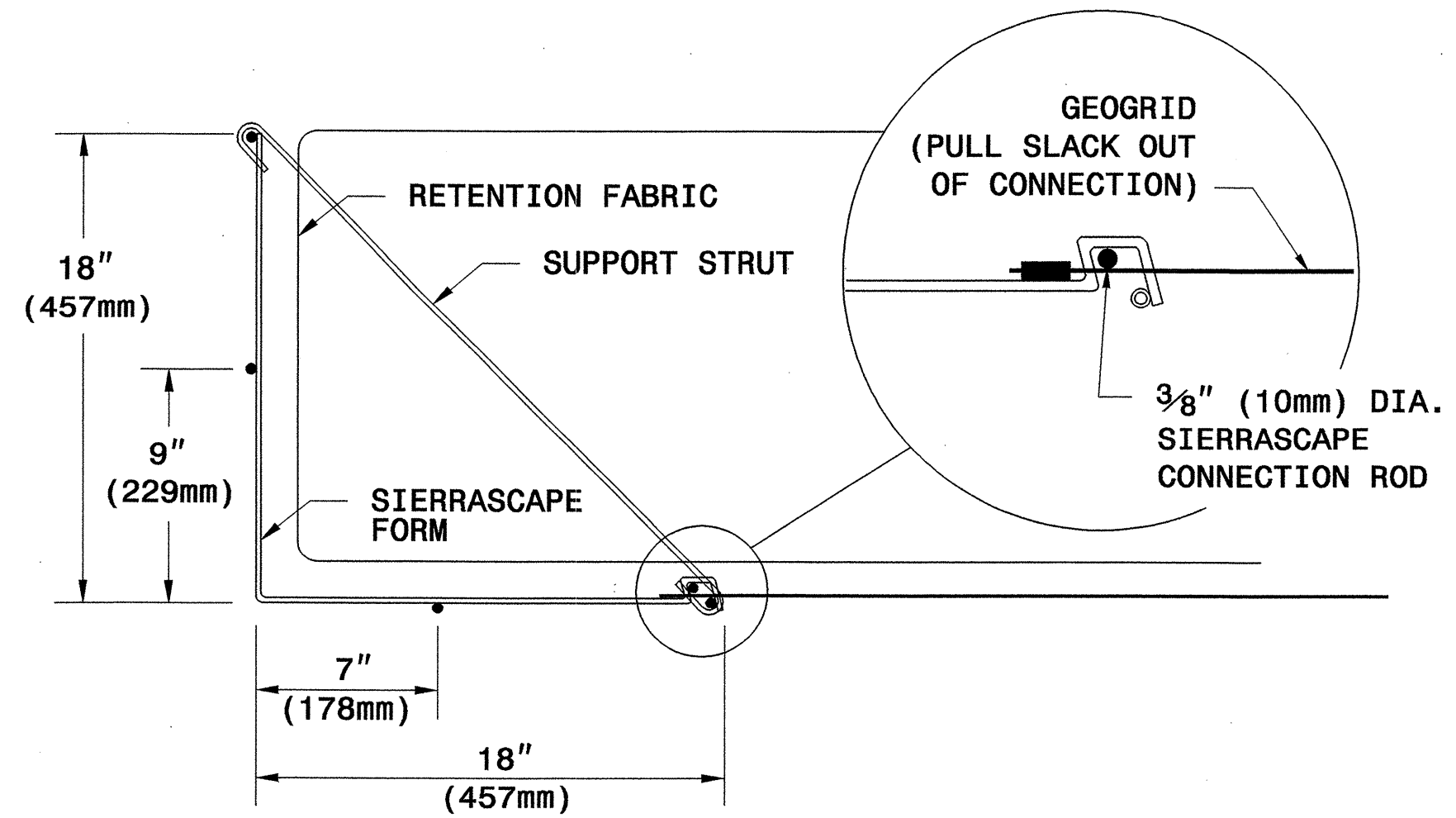
STANDARD DRAWING NO. 1801.02

HILFIKER TEMPORARY WALL

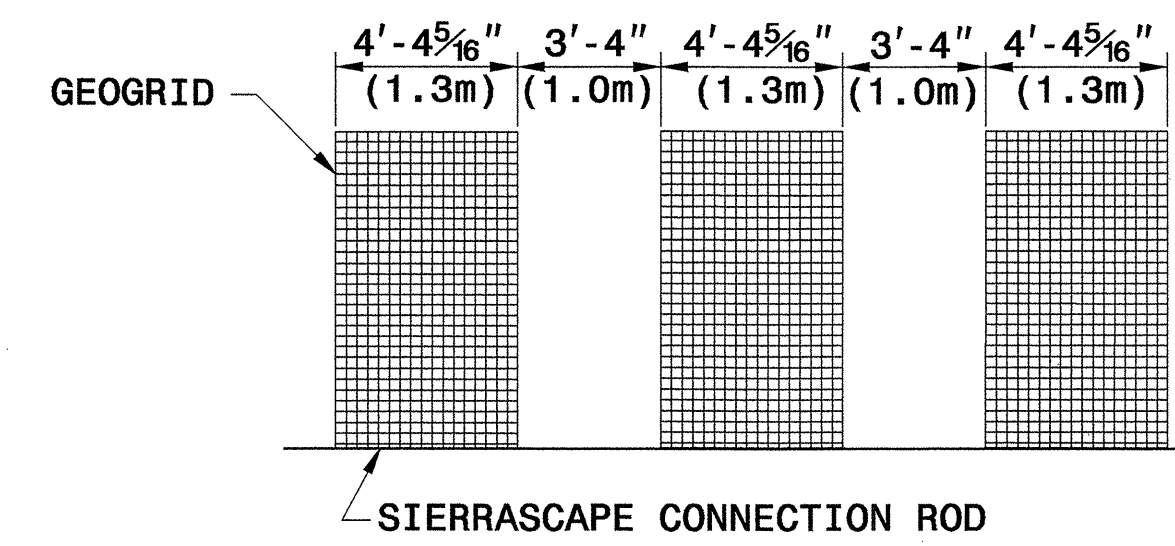


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SIGNATURE DATE



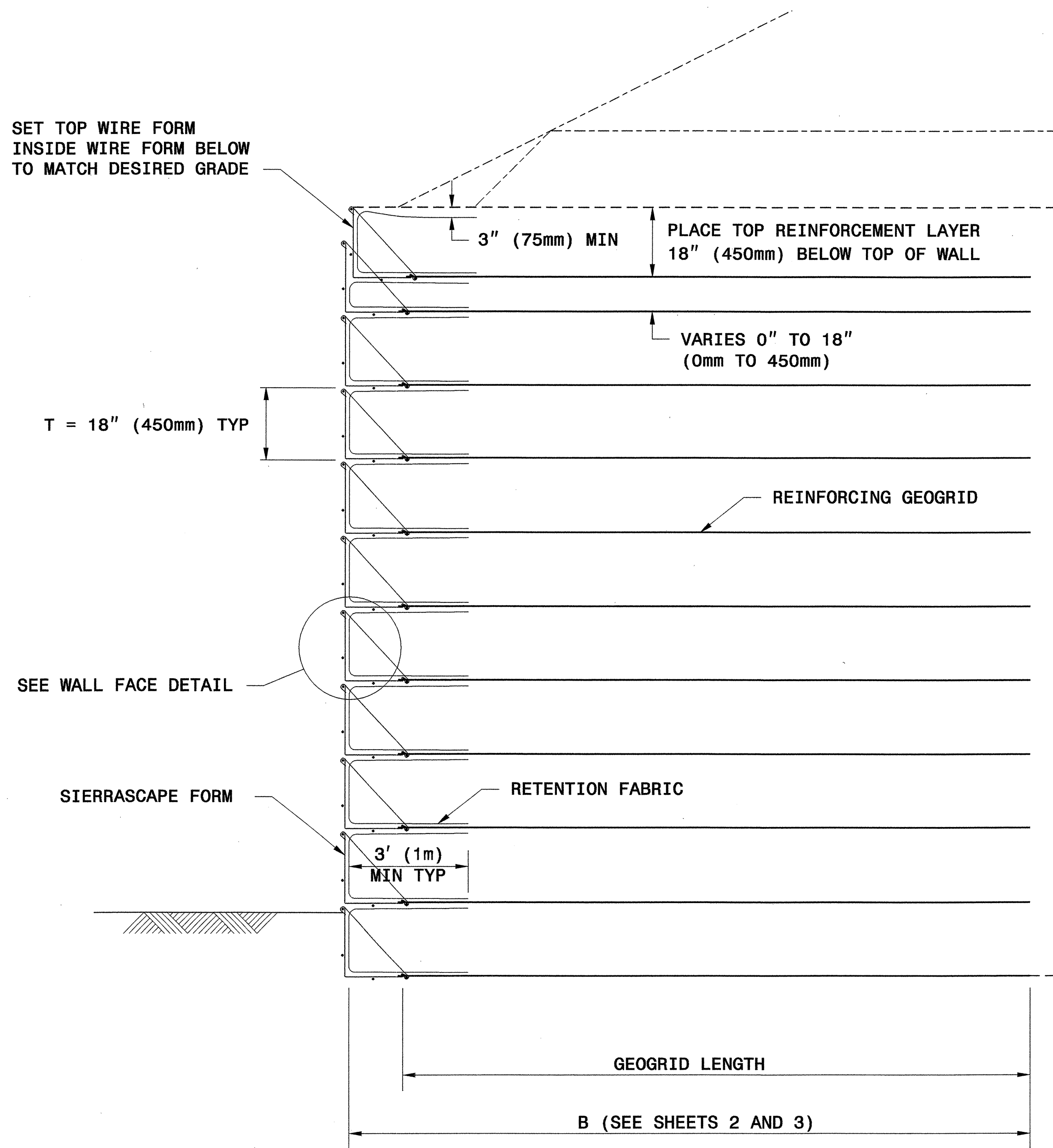
WALL FACE DETAIL



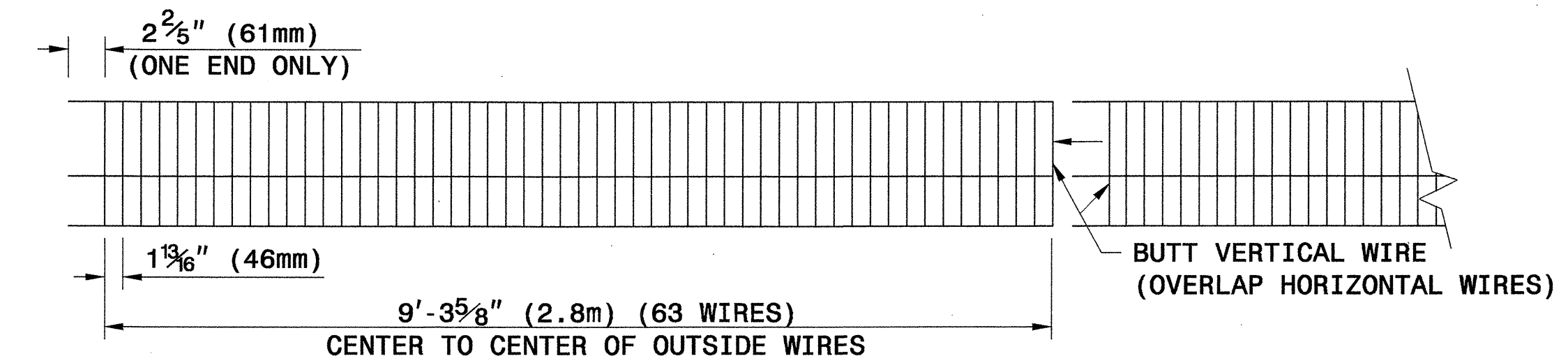
PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

TYPICAL GEOGRID COVERAGE

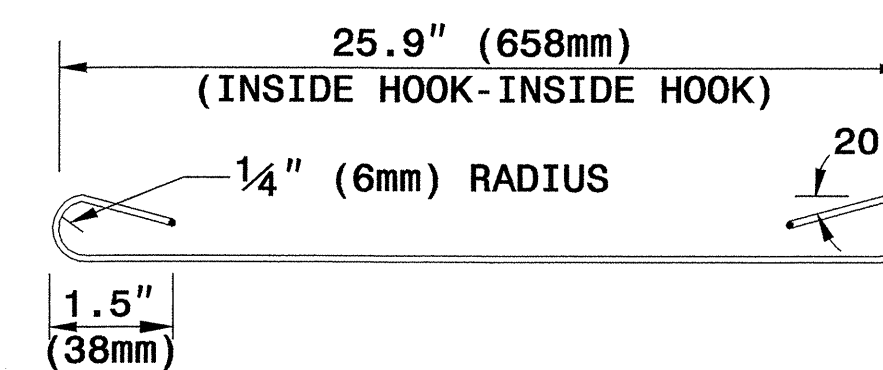
SET TOP WIRE FORM INSIDE WIRE FORM BELOW TO MATCH DESIRED GRADE



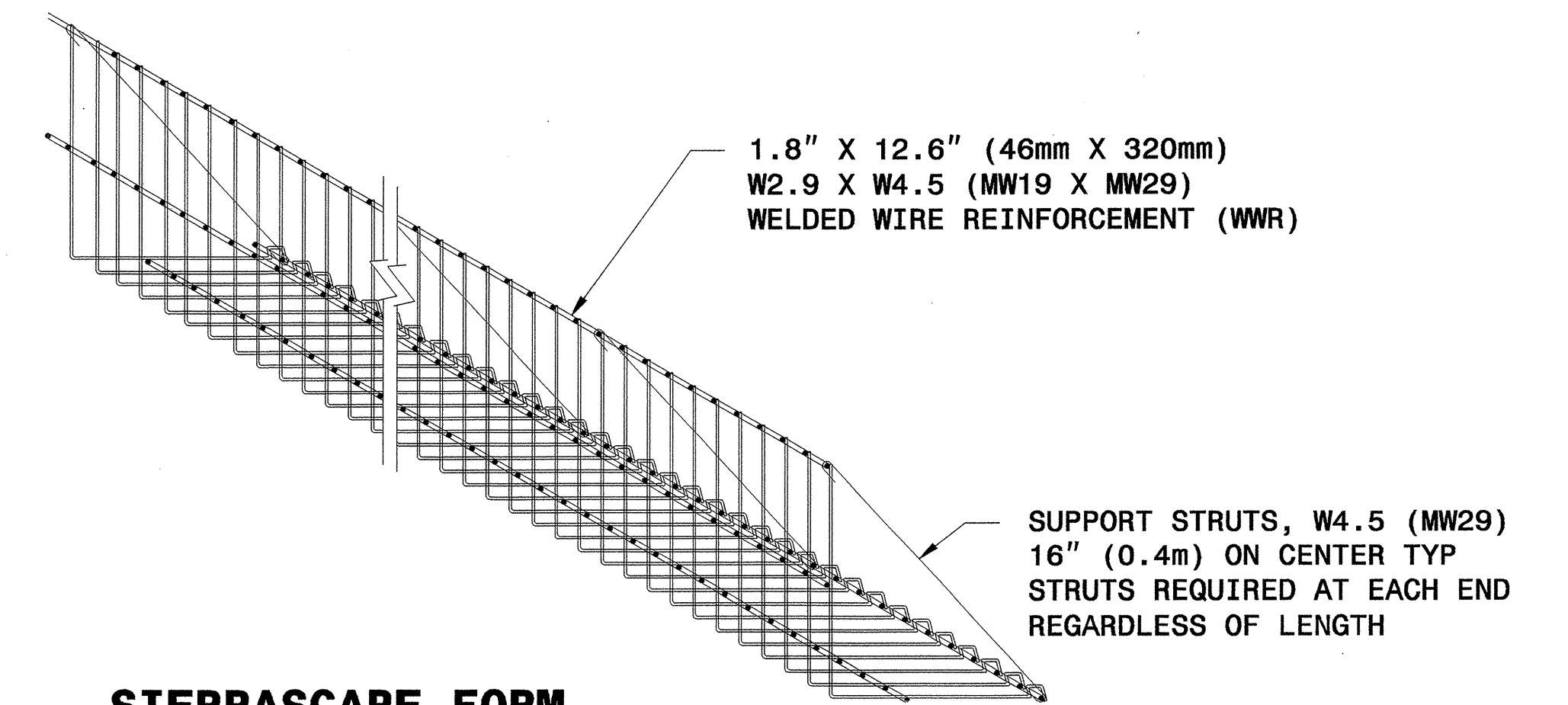
TYPICAL SECTION



ELEVATION VIEW

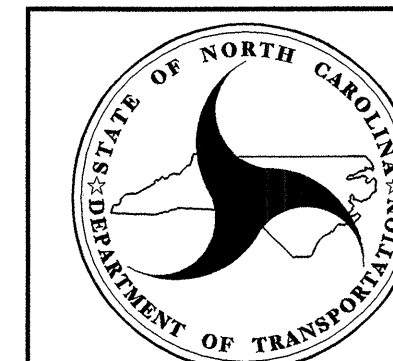
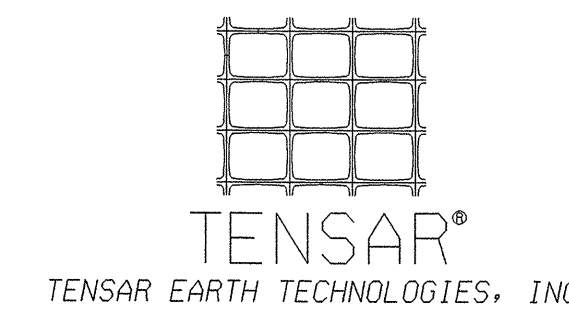


SUPPORT STRUT



SIERRASCAPE FORM

WALL COMPONENTS



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STANDARD DRAWING NO. 1801.02

SIERRASCAPE TEMPORARY WALL

GEOTECHNICAL ENGINEER ENGINEER

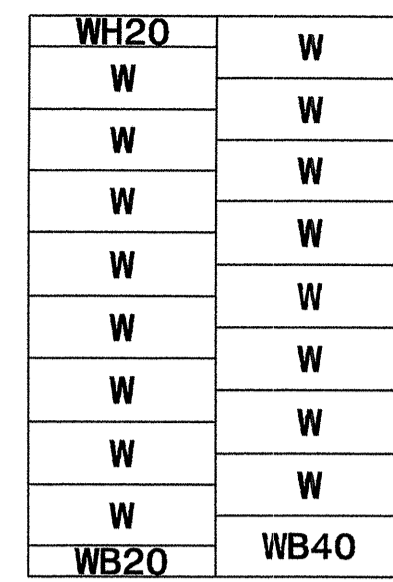


S. A. Hadden 3/29/07

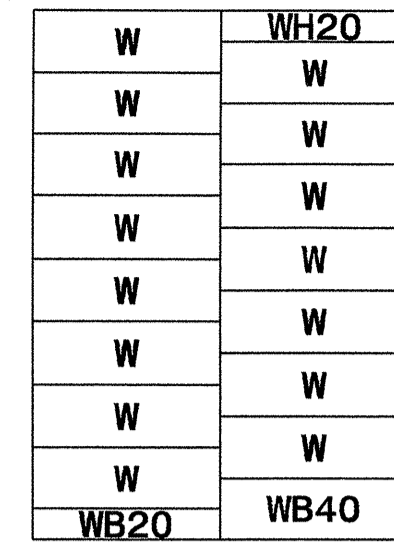
PANEL LAYOUTS

H - WALL HEIGHT

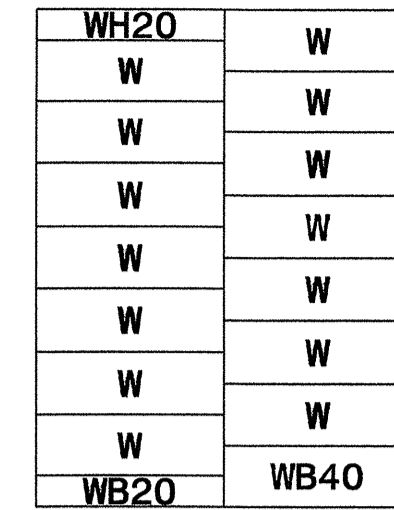
(FEET-INCHES)
(METER)



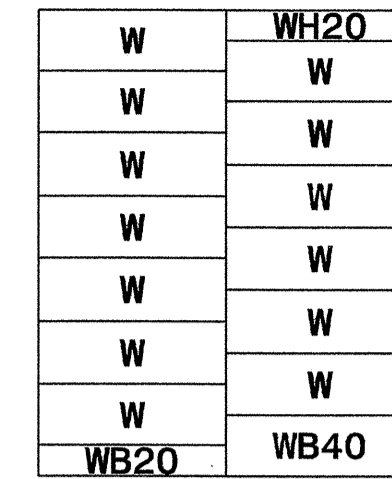
< 28 - 0
< 8.5



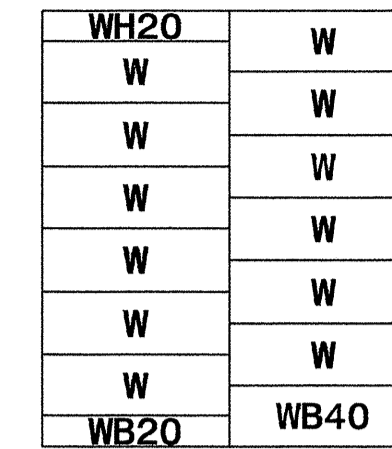
< 27 - 0
< 8.2



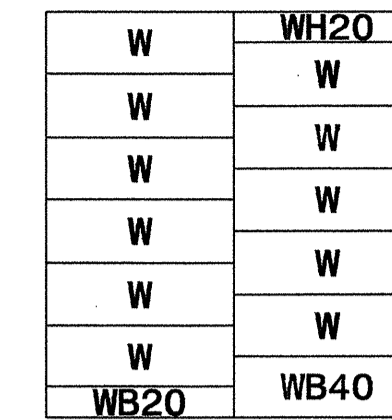
< 25 - 4
< 7.7



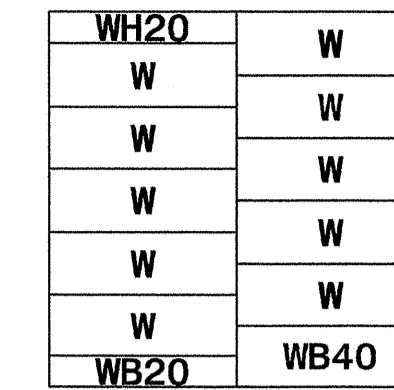
< 23 - 8
< 7.2



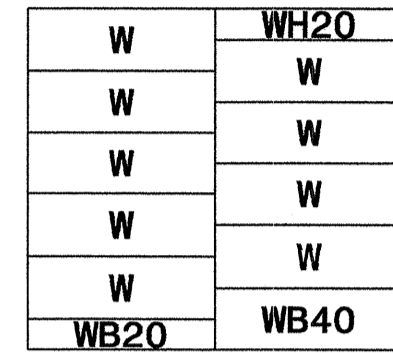
< 22 - 0
< 6.7



< 20 - 4
< 6.2

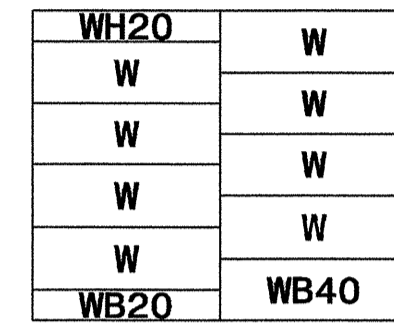


< 18 - 8
< 5.7

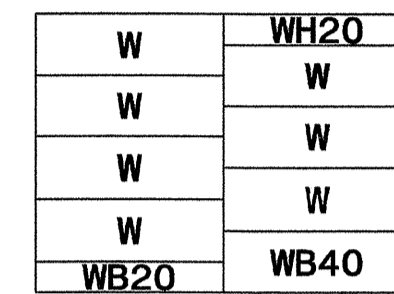


(FEET-INCHES)
(METER)

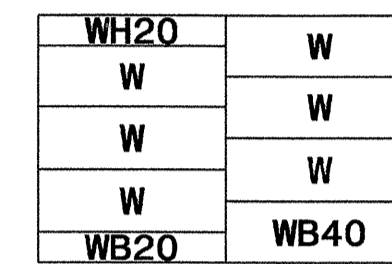
< 17 - 0
< 5.2



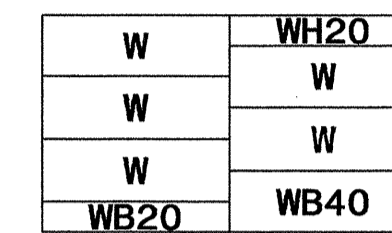
< 15 - 4
< 4.7



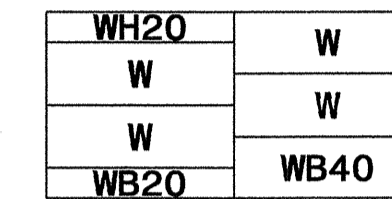
< 13 - 8
< 4.2



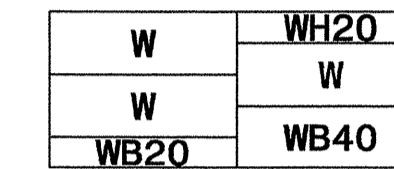
< 12 - 0
< 3.7



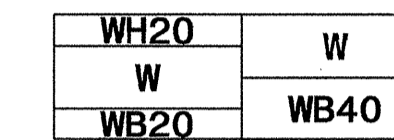
< 10 - 4
< 3.2



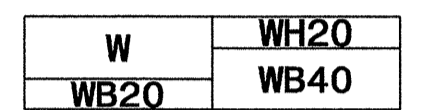
< 8 - 8
< 2.6



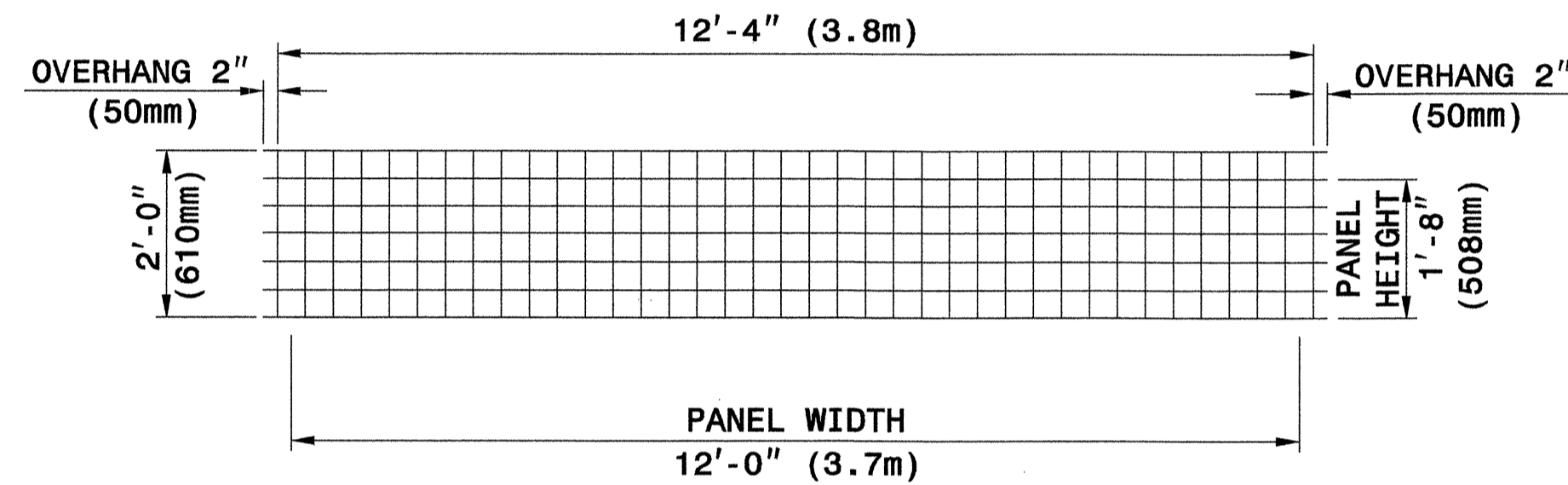
< 7 - 0
< 2.1



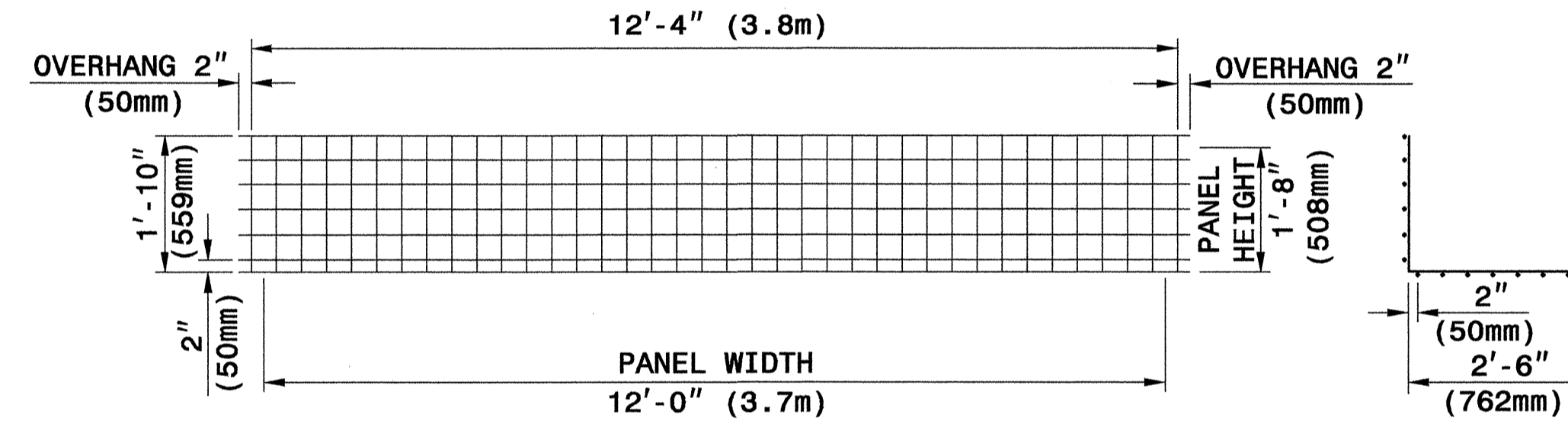
< 5 - 4
< 1.6



< 3 - 8
< 1.1

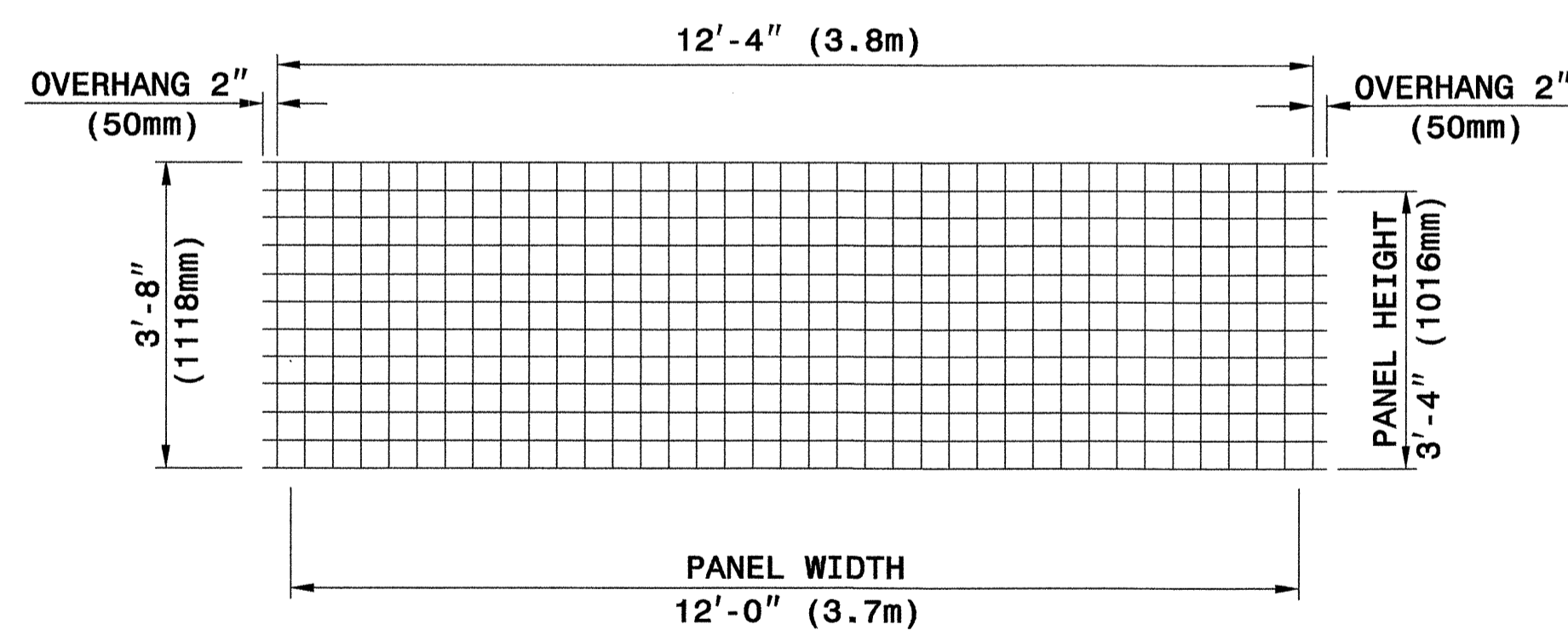


TYPE WH20

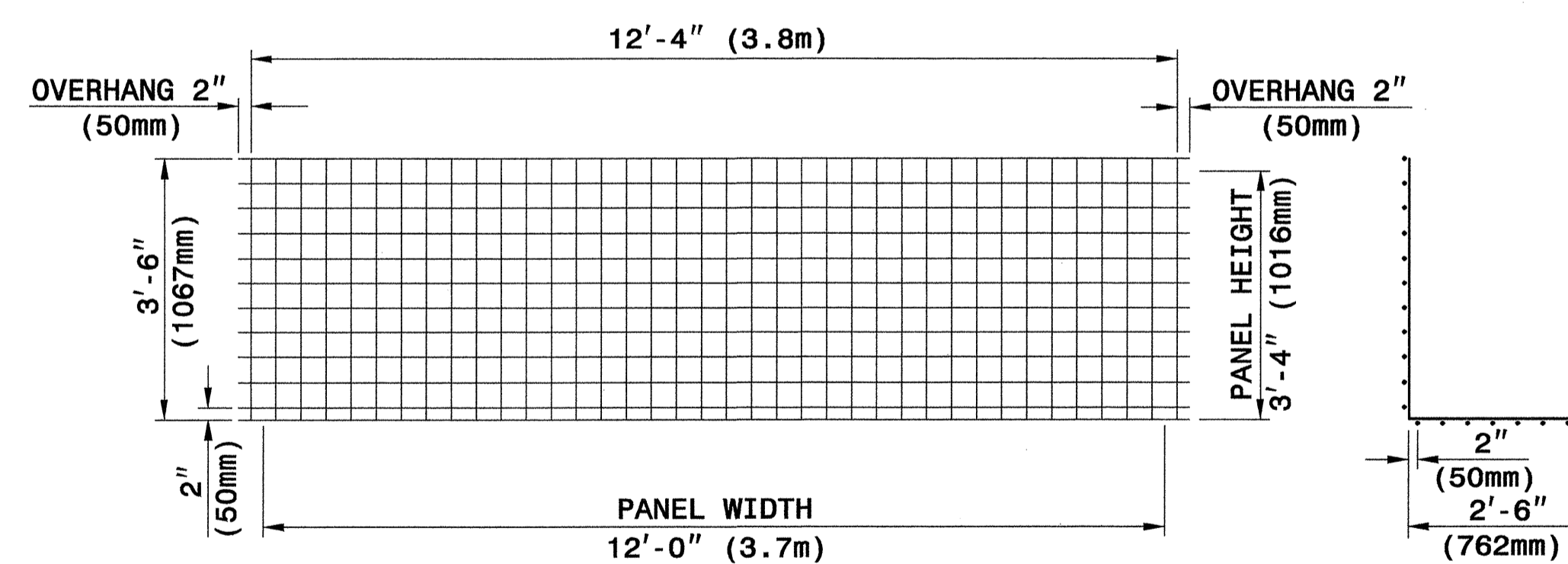


TYPE WB20

SECTION



TYPE W



TYPE WB40

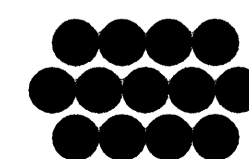
SECTION

WELDED WIRE FACINGS

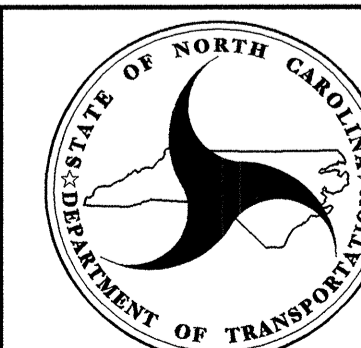
WELDED WIRE FORMS

PANEL TYPES (WELDED WIRE FACINGS AND FORMS)

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



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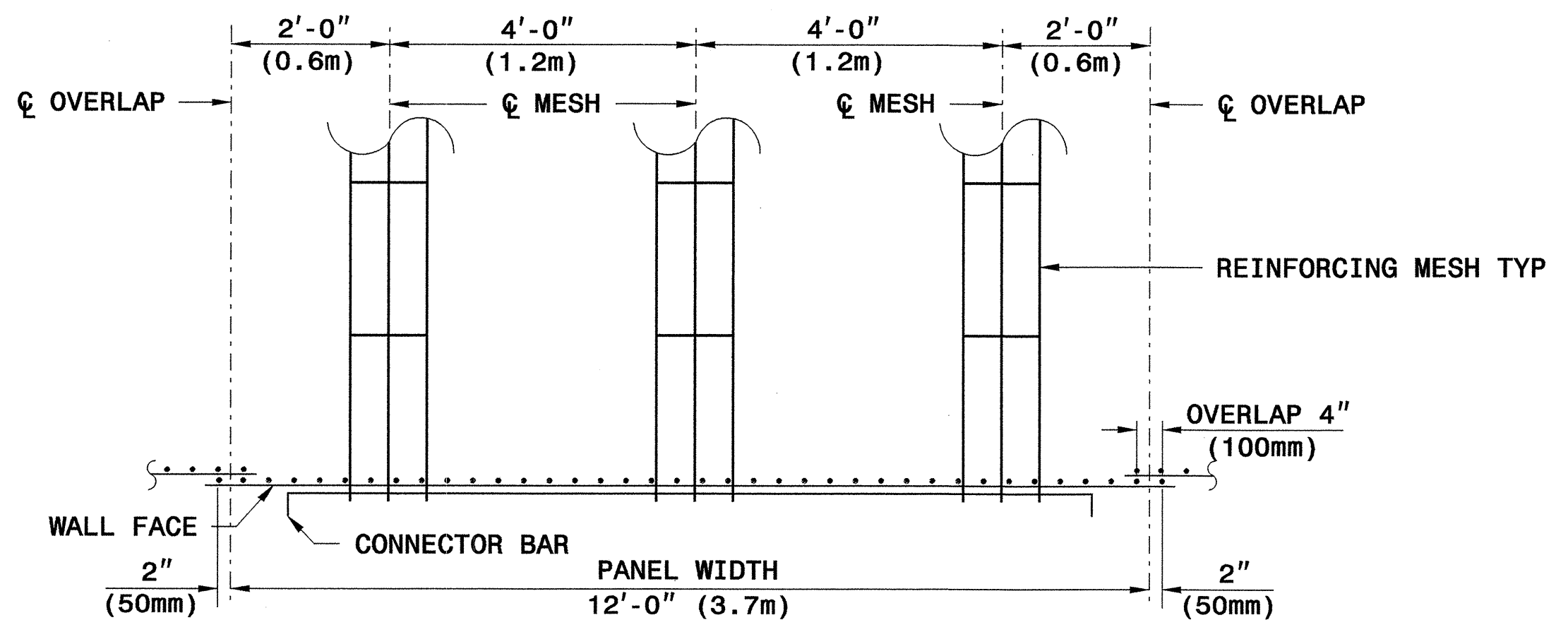
STATE OF NORTH CAROLINA
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RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH
TEMPORARY WALL

SHEET 6 OF 11

DATE: 12-19-06



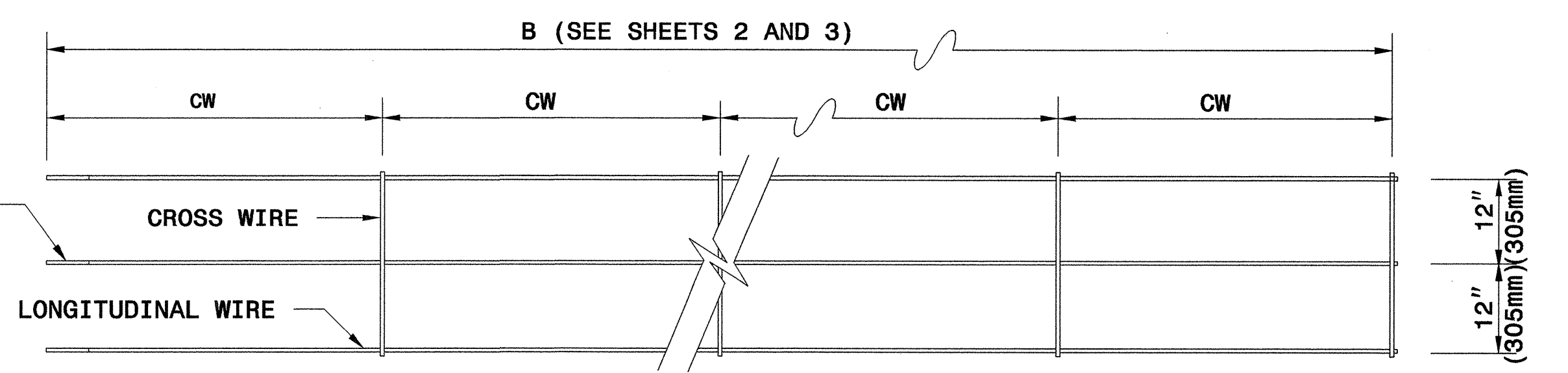
**REINFORCING MESH PLACEMENT DETAIL
(PLAN VIEW)**



1/2" (13mm) DIA. BAR

CONNECTOR BAR

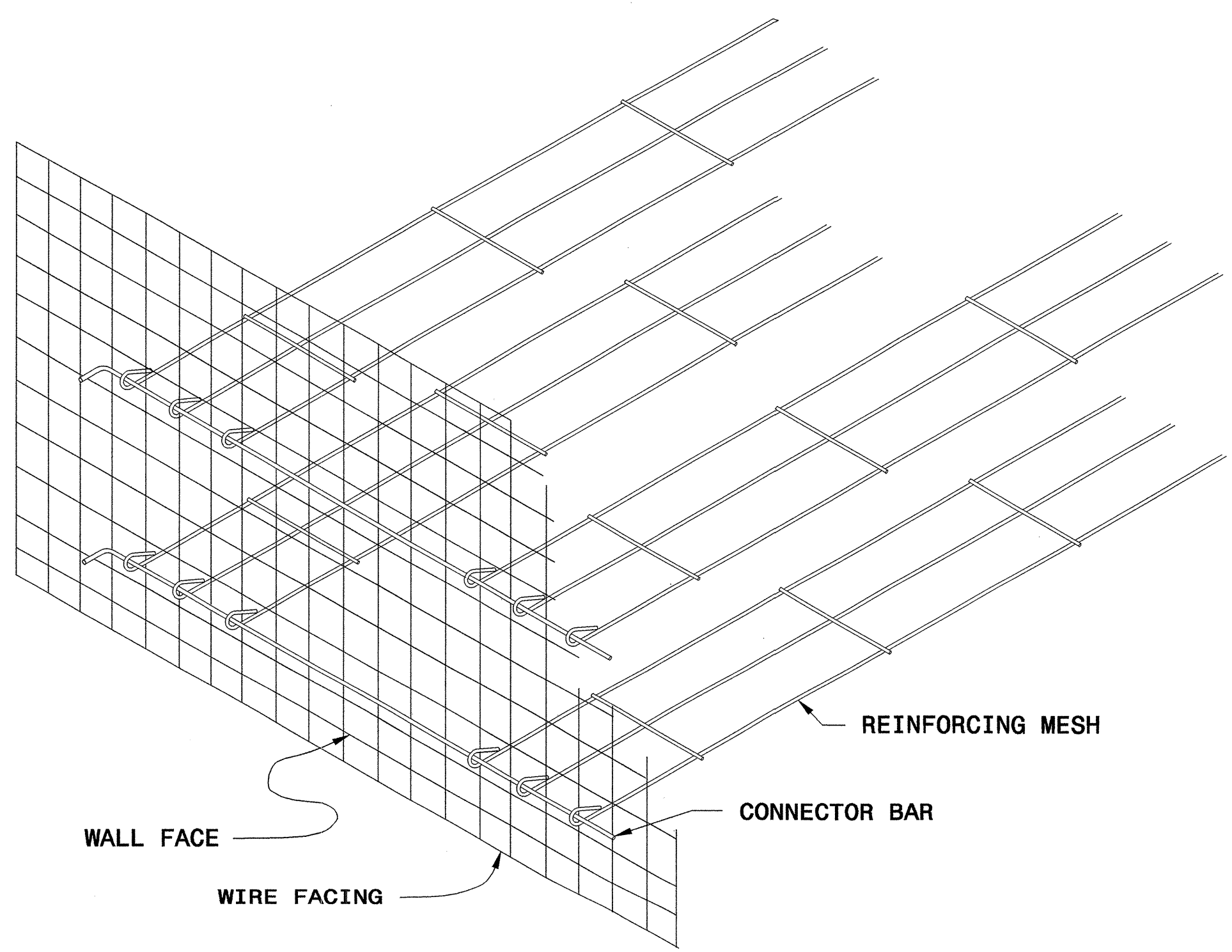
LOOPED END OF MESH
(SEE REINFORCING MESH LOOP DETAIL)



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

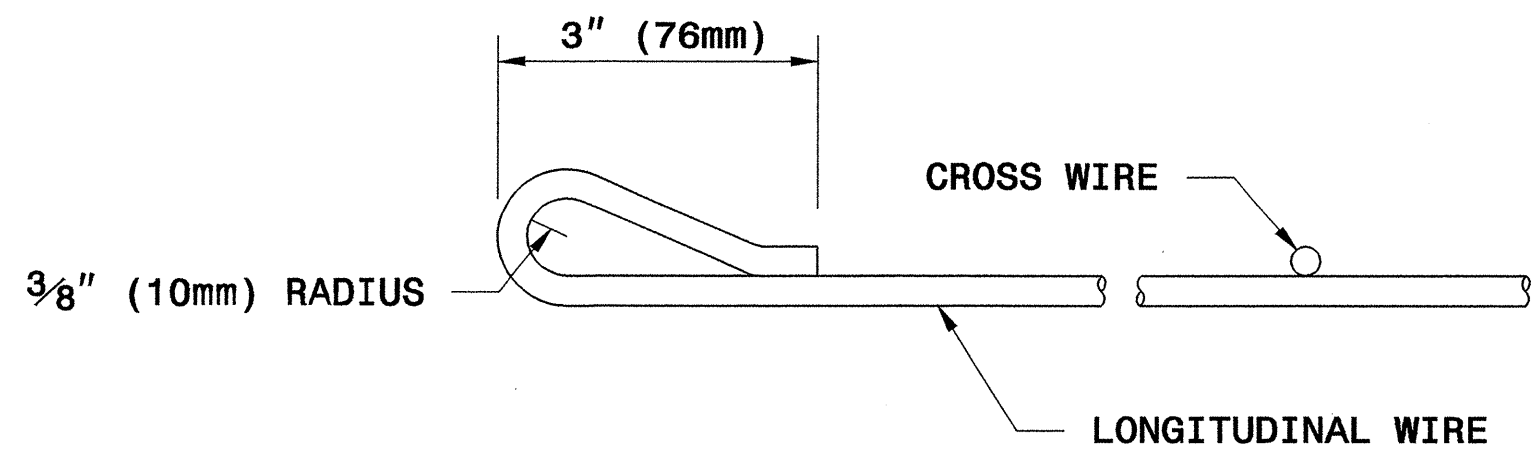
3W8 X W8 x 2.0' (3MW52 X MW52 X 610mm)
 NO. OF LONGITUDINAL WIRES
 GAUGE OF LONGITUDINAL WIRES
 GAUGE OF CROSS WIRES
 SPACING OF CROSS WIRES IN FT (mm), CW

REINFORCING MESH DESIGNATION



GENERAL ASSEMBLY DETAIL

REINFORCING MESH



REINFORCING MESH LOOP DETAIL



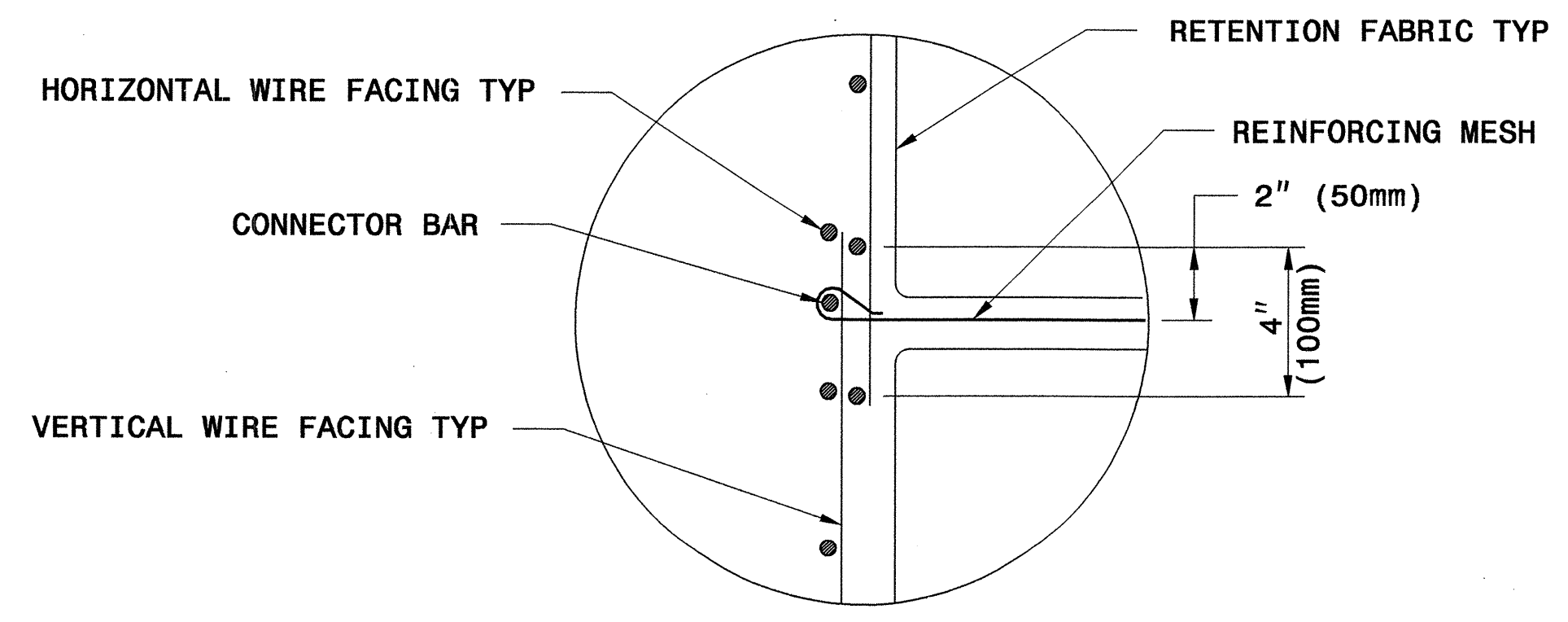
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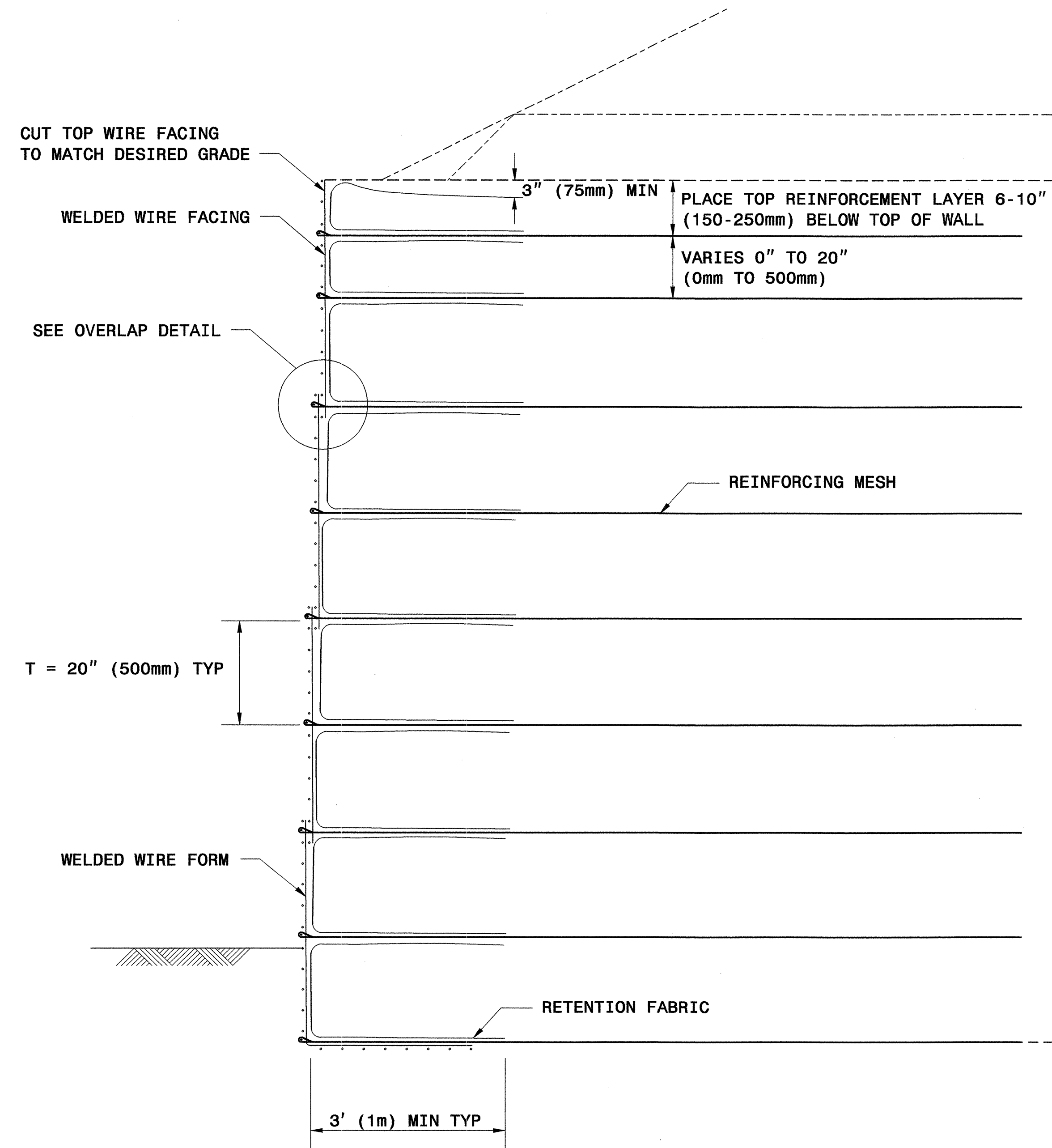
**RETAINED EARTH
TEMPORARY WALL**



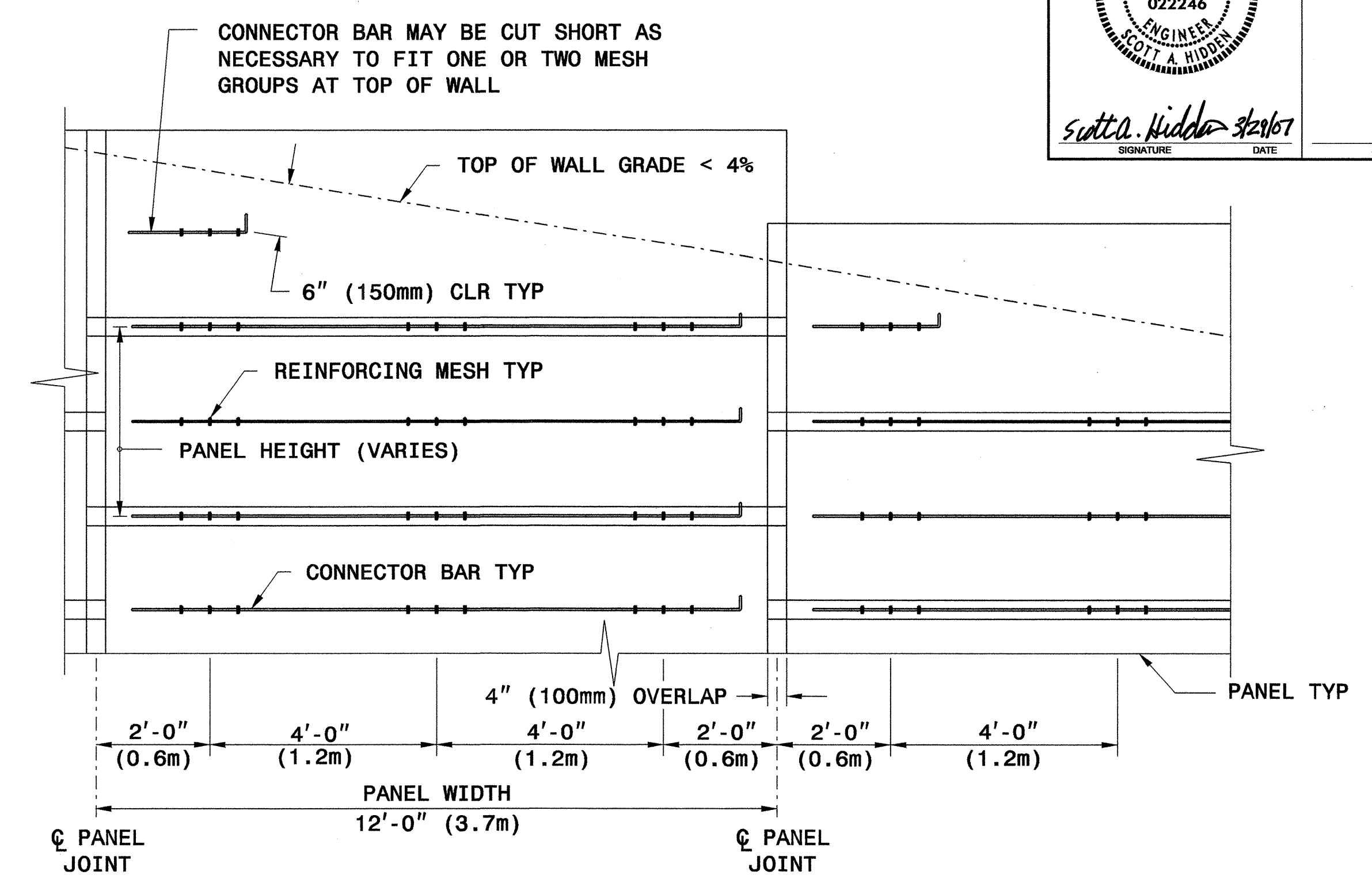
Scott A. Hadden 3/21/07
SIGNATURE DATE



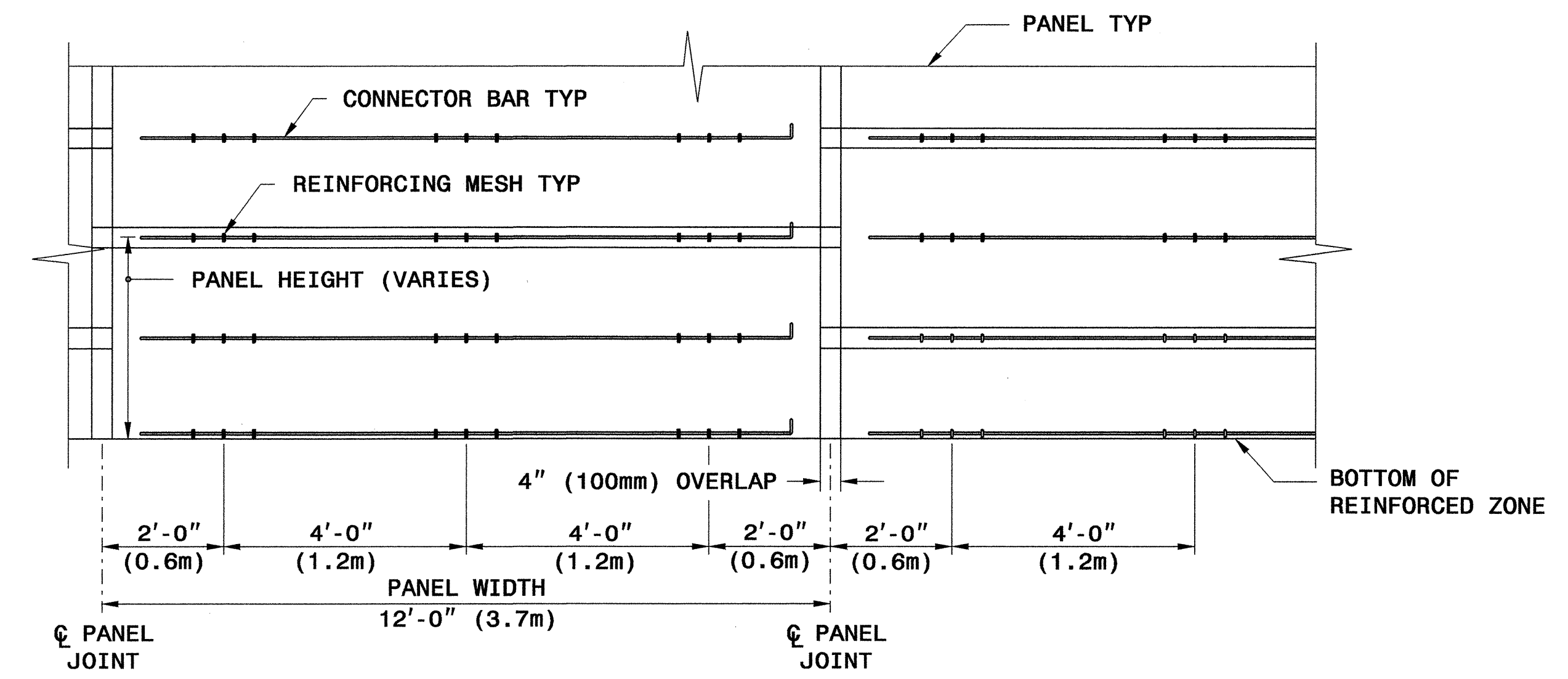
OVERLAP DETAIL



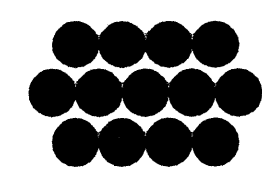
TYPICAL SECTION



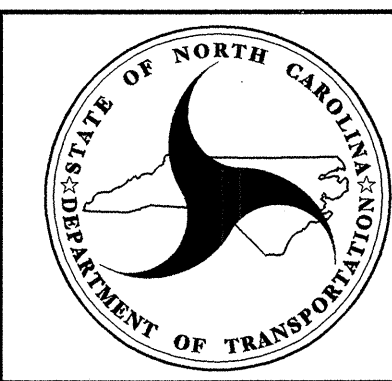
**TYPICAL ELEVATION @ TOP OF WALL
(WIRES NOT SHOWN FOR CLARITY)**



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



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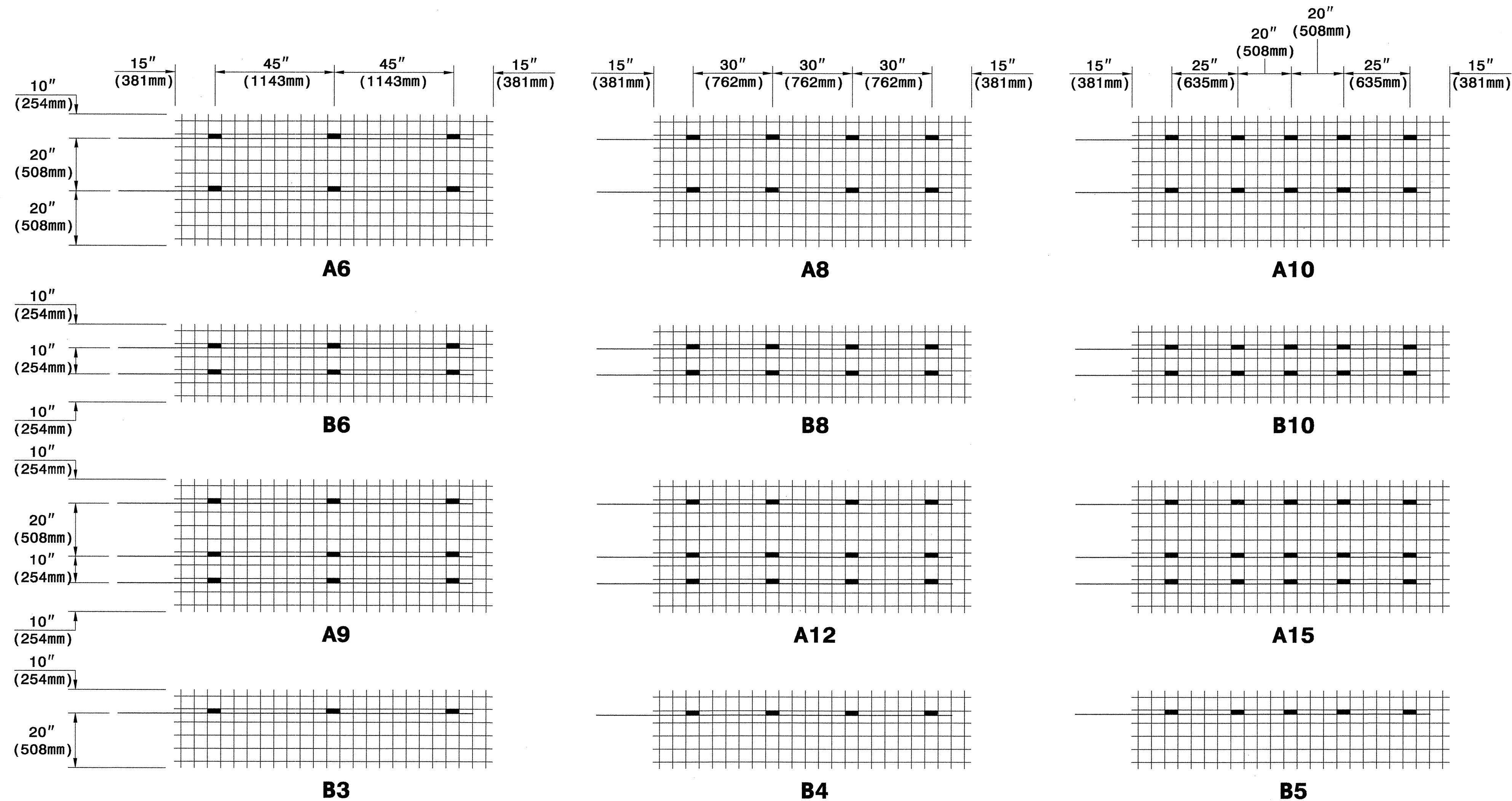
GEOTECHNICAL ENGINEERING UNIT
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RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH
TEMPORARY WALL

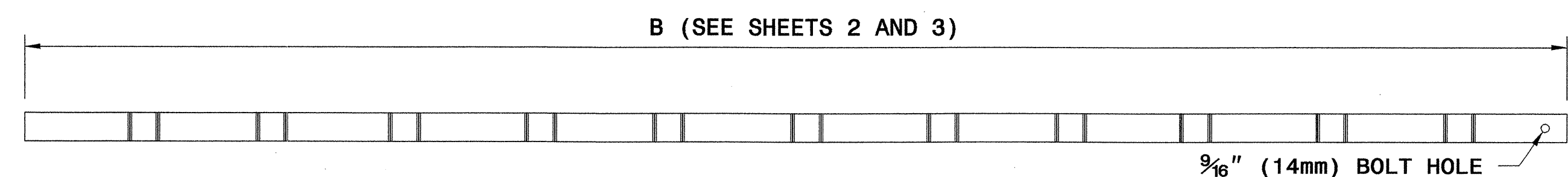


Scott A. Niddes 3/24/07

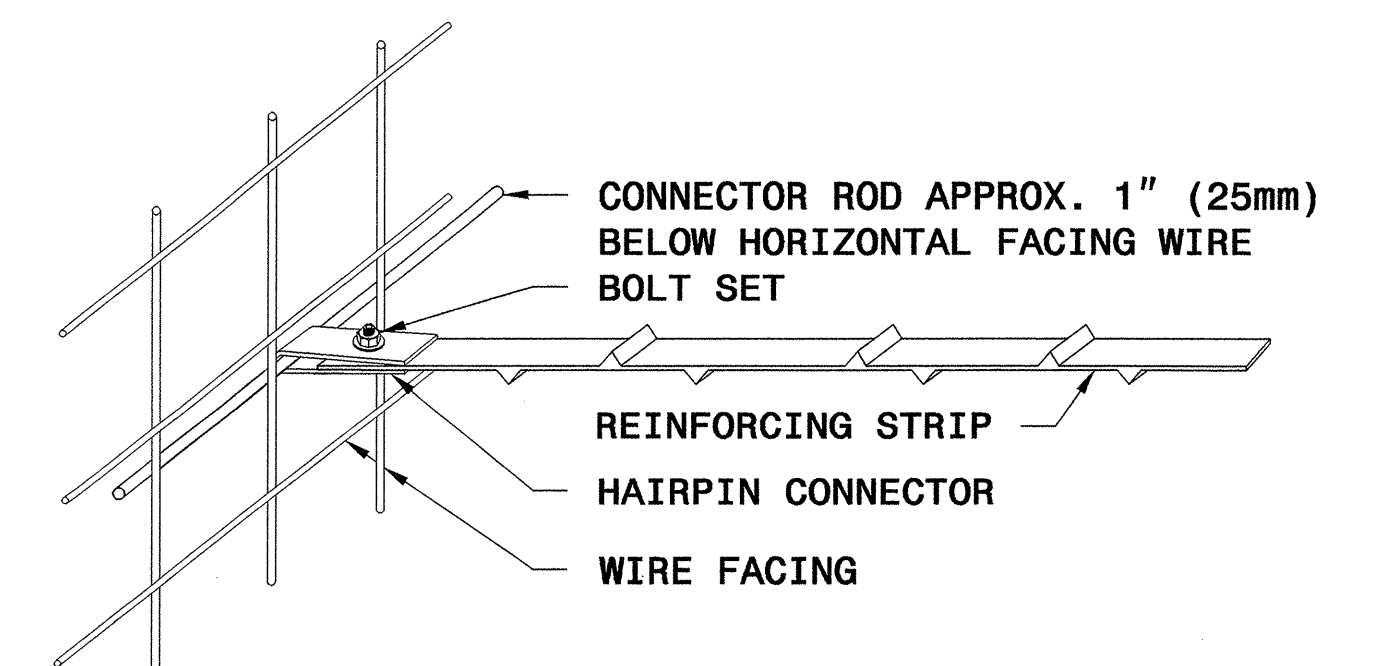


KEY: A8
 NUMBER OF REINFORCING STRIPS
 PANEL TYPE

CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



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

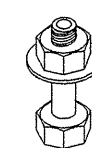


STRIP TO FACING CONNECTION



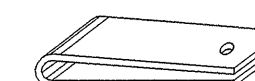
1/2" (13mm) DIA. ROD

CONNECTOR ROD



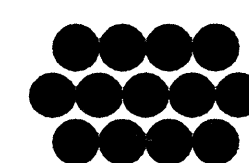
1/2" (13mm) BOLT WITH NUT AND WASHER

BOLT SET

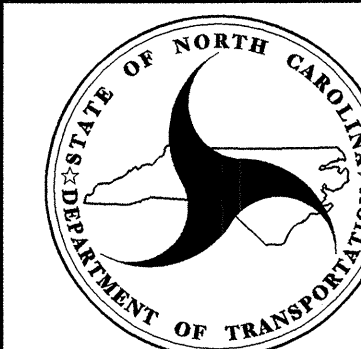


HAIRPIN CONNECTOR

WALL COMPONENTS



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STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

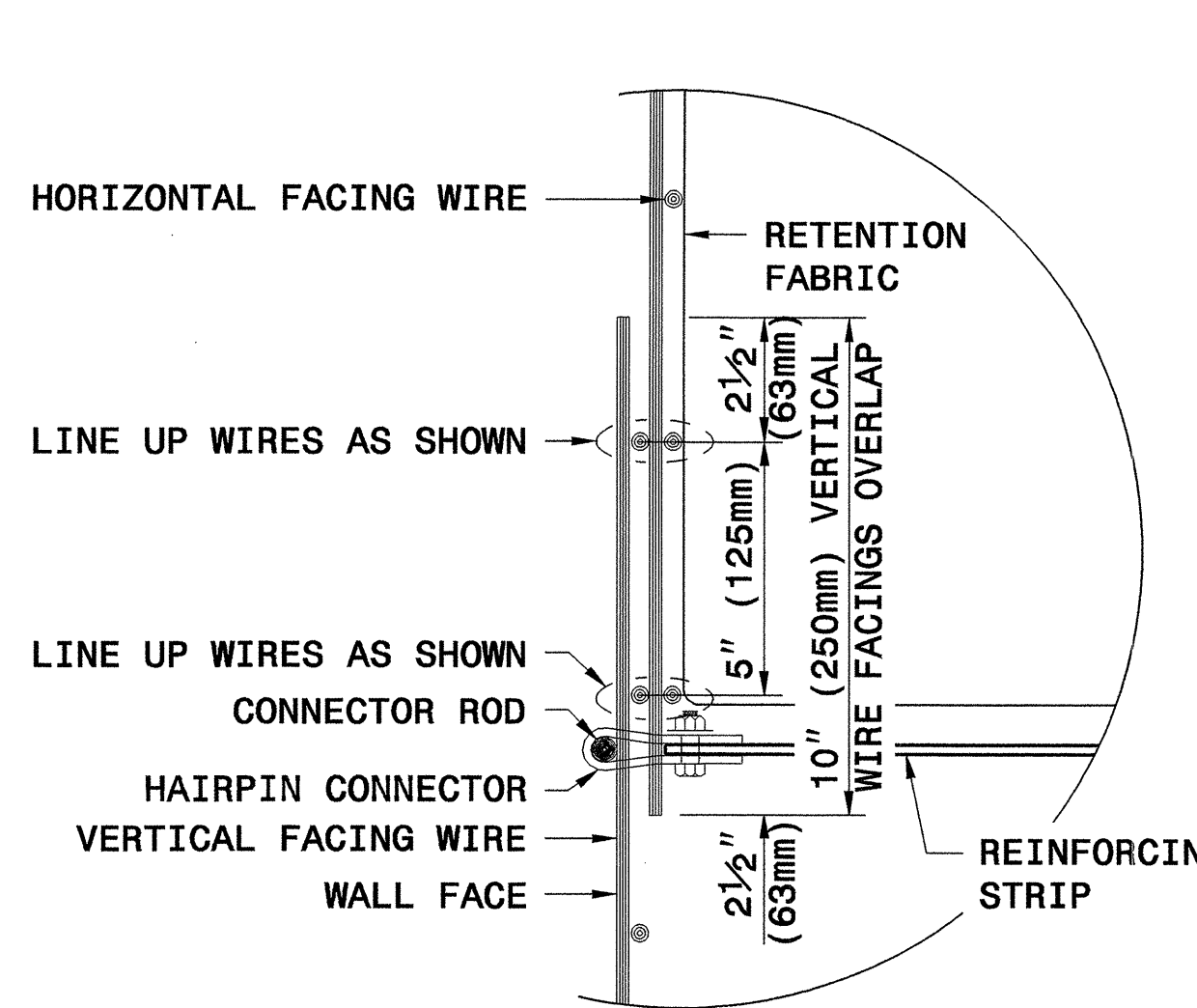
SHEET 10 OF 11

DATE: 12-19-06



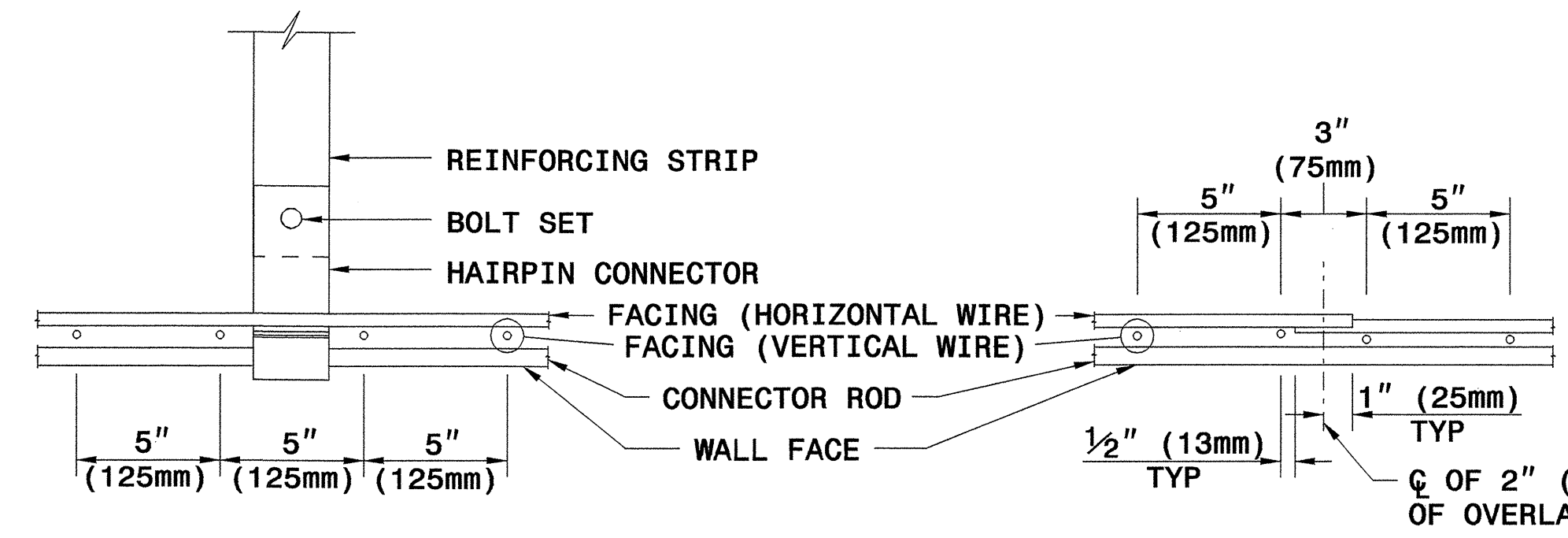
Scott A. Shidden
SIGNATURE DATE

SIGNATURE DATE

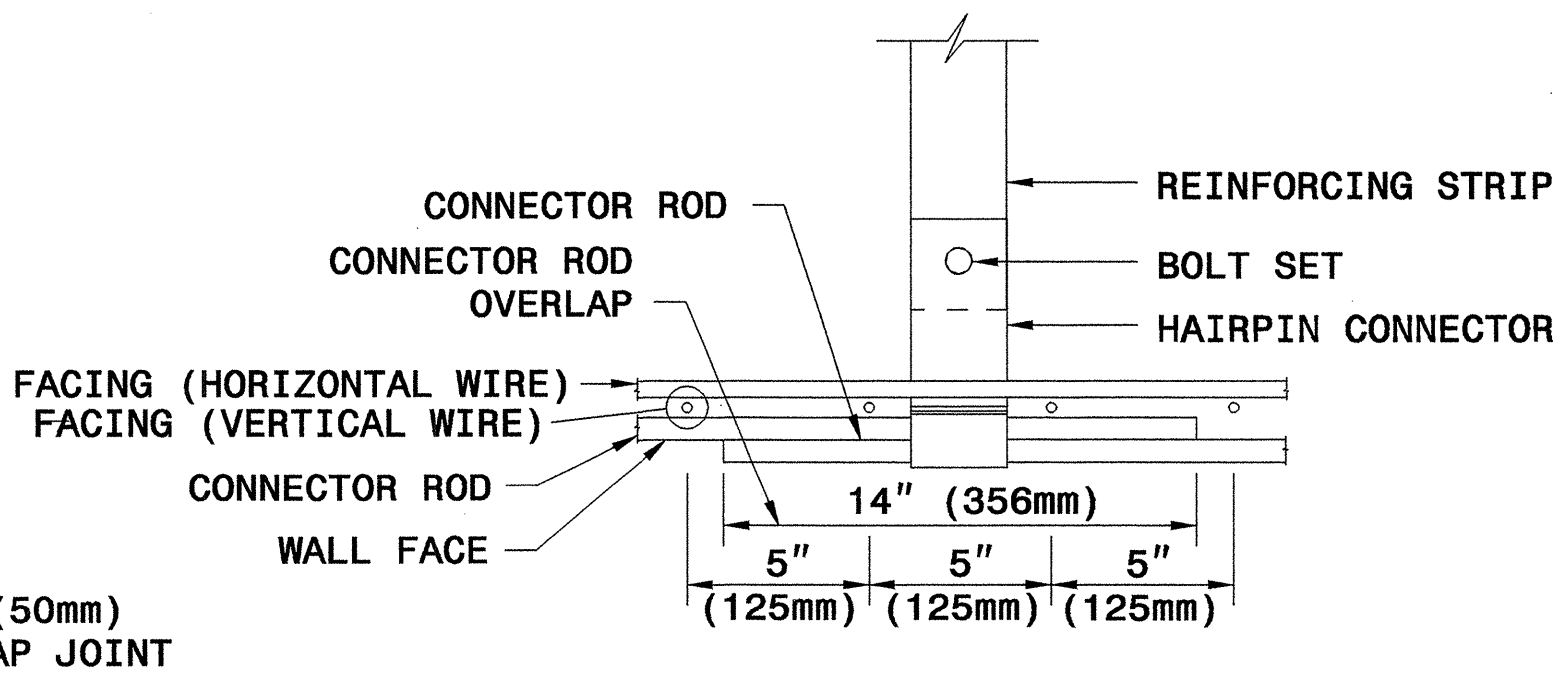


OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

VERTICAL OVERLAP DETAIL

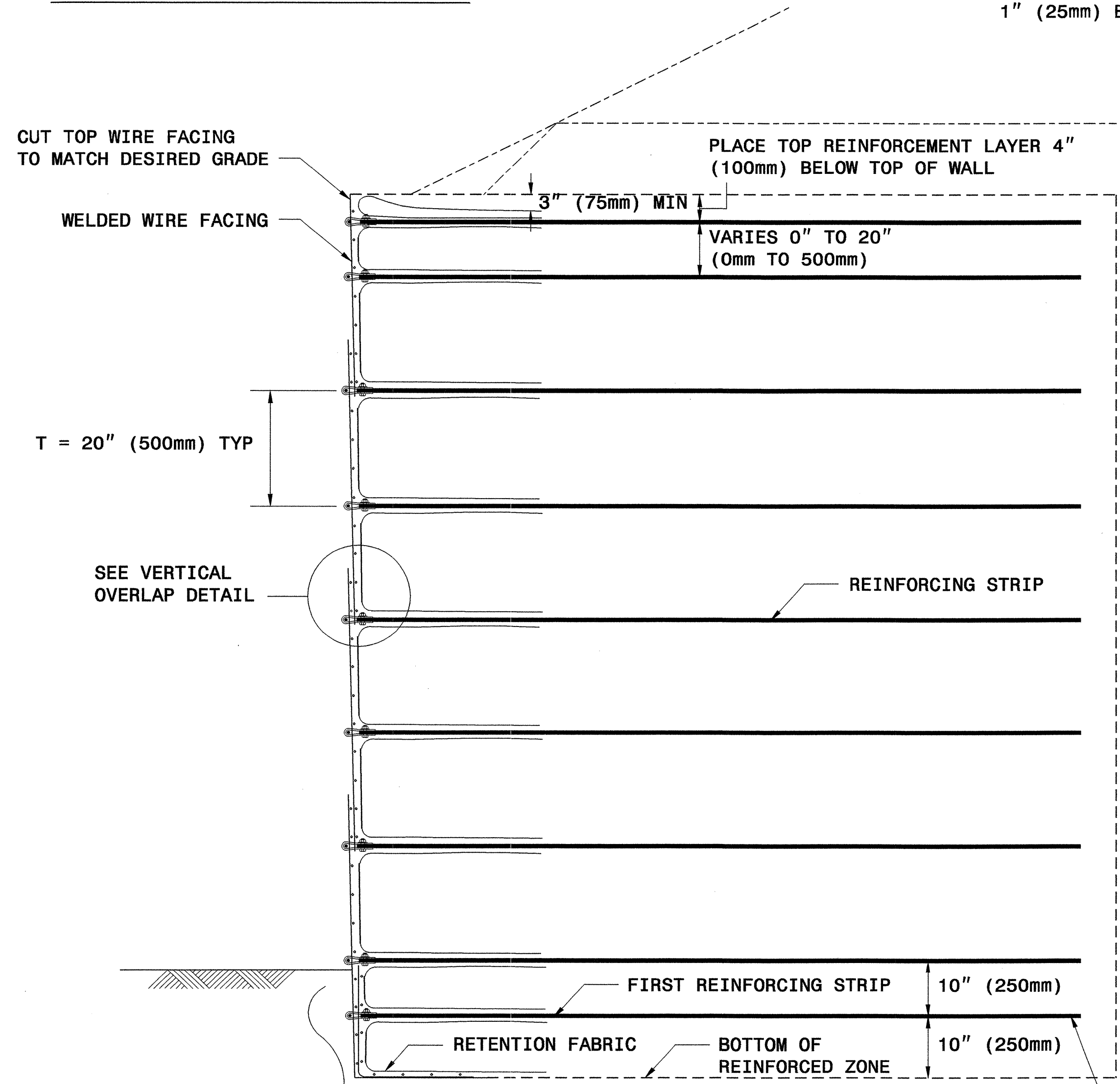


**PLAN DETAIL 'A'
STRIP CONNECTION**

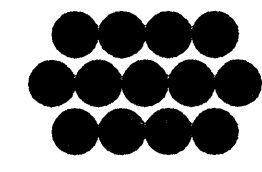


**PLAN DETAIL 'B'
HORIZONTAL OVERLAP DETAIL**

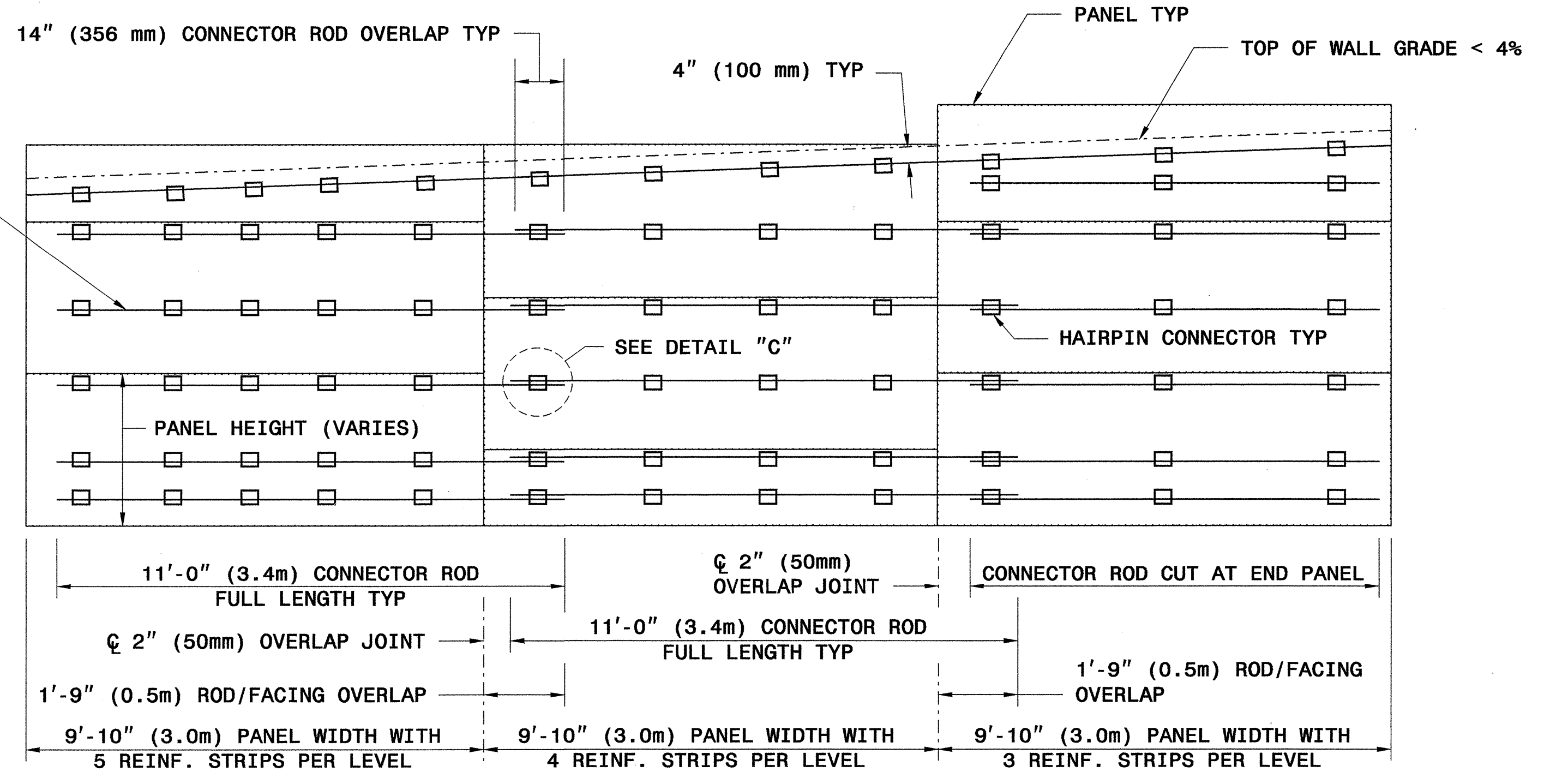
**PLAN DETAIL 'C'
STRIP CONNECTION WITH
HORIZONTAL OVERLAP DETAIL**



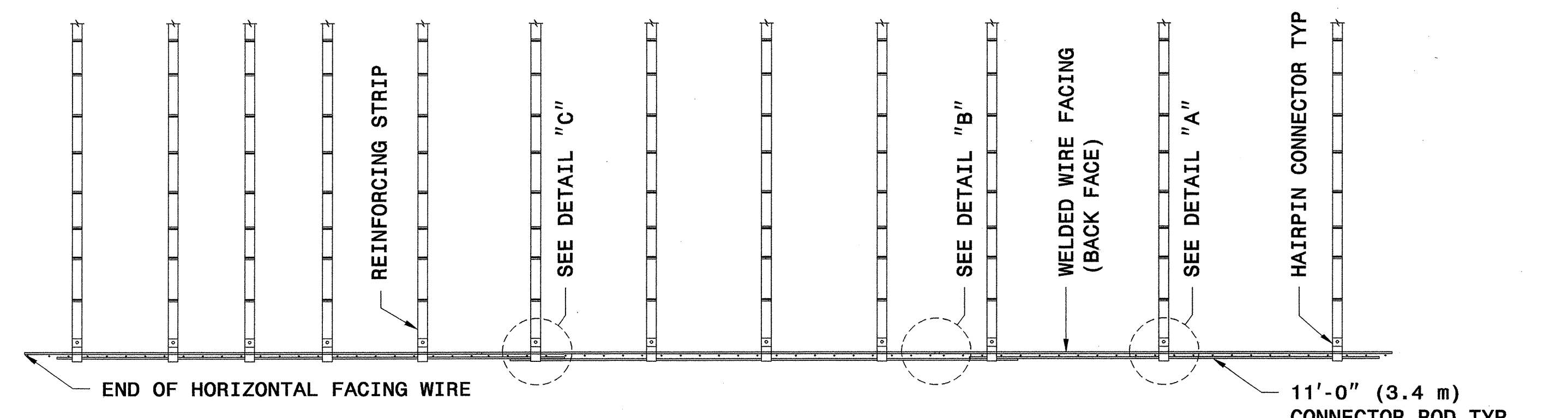
TYPICAL SECTION



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



TYPICAL PLAN



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RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL
TEMPORARY WALL

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
 ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201837

ItemNumber	Sec #	Quantity	Unit	Description
000100000-N	800	Lump Sum		MOBILIZATION
002900000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (11+20.00)
004300000-N	226	Lump Sum		GRADING
005000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
005700000-E	226	300	CY	UNDERCUT EXCAVATION
008000000-E	SP	600	TON	CLASS IV SUBGRADE STABILIZATION
019500000-E	265	500	CY	SELECT GRANULAR MATERIAL
019600000-E	270	500	SY	FABRIC FOR SOIL STABILIZATION
019900000-E	SP	206	SF	TEMPORARY SHORING
031800000-E	300	40	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
036600000-E	310	188	LF	15" RC PIPE CULVERTS, CLASS III
037200000-E	310	56	LF	18" RC PIPE CULVERTS, CLASS III
040800000-E	310	36	LF	54" RC PIPE CULVERTS, CLASS III
058800000-E	310	28	LF	18" CS PIPE CULVERTS, 0.064" THICK
070800000-E	310	40	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
080600000-E	310	4	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
099500000-E	340	28	LF	PIPE REMOVAL
122000000-E	545	100	TON	INCIDENTAL STONE BASE
148900000-E	610	430	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
149800000-E	610	220	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE 119.0B
151900000-E	610	540	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
156000000-E	620	62	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
169300000-E	654	20	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
200000000-N	806	22	EA	RIGHT OF WAY MARKERS
202200000-E	815	70	CY	SUBDRAIN EXCAVATION
203300000-E	815	55	CY	SUBDRAIN FINE AGGREGATE
204400000-E	815	300	LF	6" PERFORATED SUBDRAIN PIPE
205500000-E	815	9	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)
222000000-E	838	5	CY	REINFORCED ENDWALLS
228600000-N	840	6	EA	MASONRY DRAINAGE STRUCTURES
236700000-N	840	5	EA	FRAME WITH TWO GRATES, STD 840.29
257700000-E	846	300	LF	CONCRETE EXPRESSWAY GUTTER
303000000-E	862	62.5	LF	STEEL BM GUARDRAIL
304500000-E	862	25	LF	STEEL BM GUARDRAIL, SHOP CURVED
315000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
319500000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
321500000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE III
327000000-N	SP	1	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
338000000-E	862	62.5	LF	TEMPORARY STEEL BM GUARDRAIL
338700000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** TEMPORARY (B-77)
338910000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY
362800000-E	876	33	TON	RIP RAP, CLASS I
364900000-E	876	14	TON	RIP RAP, CLASS B
365600000-E	876	430	SY	FILTER FABRIC FOR DRAINAGE
365900000-N	SP	2	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON

ItemNumber	Sec #	Quantity	Unit	Description
402500000-E	901	17.5	SF	CONTRACTOR FURNISHED, TYPE *** SIGN (E)
402500000-E	901	46.94	SF	CONTRACTOR FURNISHED, TYPE *** SIGN (F)
407200000-E	903	130	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
410200000-N	904	3	EA	SIGN ERECTION, TYPE E
410800000-N	904	5	EA	SIGN ERECTION, TYPE F
415500000-N	907	11	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
440000000-E	1110	328	SF	WORK ZONE SIGNS (STATIONARY)
440500000-E	1110	112	SF	WORK ZONE SIGNS (PORTABLE)
441000000-E	1110	32	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
443000000-N	1130	54	EA	DRUMS
443500000-N	1135	54	EA	CONES
444500000-E	1145	48	LF	BARRICADES (TYPE III)
445500000-N	1150	190	MD	FLAGGER
446500000-N	1160	1	EA	TEMPORARY CRASH CUSHIONS
447000000-N	1160	2	EA	RESET TEMPORARY CRASH CUSHIONS
448000000-N	1165	1	EA	TMIA
465000000-N	1251	39	EA	TEMPORARY RAISED PAVEMENT MARKERS
477000000-E	1205	600	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4")
481000000-E	1205	7,151	LF	PAINT PAVEMENT MARKING LINES (4")
483500000-E	1205	68	LF	PAINT PAVEMENT MARKING LINES (24")
484700000-E	1205	3,581	LF	POLYUREA PAVEMENT MARKING LINES (4", *****) (STANDARD GLASS BEADS)
484714000-E	1205	42	LF	POLYUREA PAVEMENT MARKING LINES (24", *****) (STANDARD GLASS BEADS)

ItemNumber	Sec #	Quantity	Unit	Description
4847220000-N	1205	5	EA	POLYUREA PAVEMENT MARKING SYMBOL (***** (STANDARD GLASS BEADS)
485000000-E	1205	754	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
490500000-N	1253	23	EA	SNOWPLOWABLE PAVEMENT MARKERS
5325800000-E	1510	592	LF	8" WATER LINE
554600000-E	1515	4	EA	8" VALVE
560600000-E	1515	1	EA	2" BLOW OFF
564310000-E	1515	2	EA	3/4" WATER METER
567200000-N	1515	1	EA	RELOCATE FIRE HYDRANT
600000000-E	1605	980	LF	TEMPORARY SILT FENCE
600600000-E	1610	105	TON	STONE FOR EROSION CONTROL, CLASS A
600900000-E	1610	170	TON	STONE FOR EROSION CONTROL, CLASS B
601200000-E	1610	180	TON	SEDIMENT CONTROL STONE
601500000-E	1615	1	ACR	TEMPORARY MULCHING
601800000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING
602100000-E	1620	1.25	TON	FERTILIZER FOR TEMPORARY SEEDING
602400000-E	1622	65	LF	TEMPORARY SLOPE DRAINS
602700000-N	1622	2	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
602900000-E	SP	180	LF	SAFETY FENCE
603000000-E	1630	370	CY	SILT EXCAVATION
603600000-E	1631	550	SY	MATTING FOR EROSION CONTROL
603700000-E	SP	15	SY	COIR FIBER MAT
604200000-E	1632	100	LF	1/4" HARDWARE CLOTH
607000000-N	SP	4	EA	SPECIAL STILLING BASINS
607103000-E	SP	50	LF	COIR FIBER BAFFLES
607105000-E	SP	2	EA	** SKIMMER (1-1/2')
608400000-E	1660	2	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	12	EA	RESPONSE FOR EROSION CONTROL
612300000-E	1670	0.25	ACR	REFORESTATION

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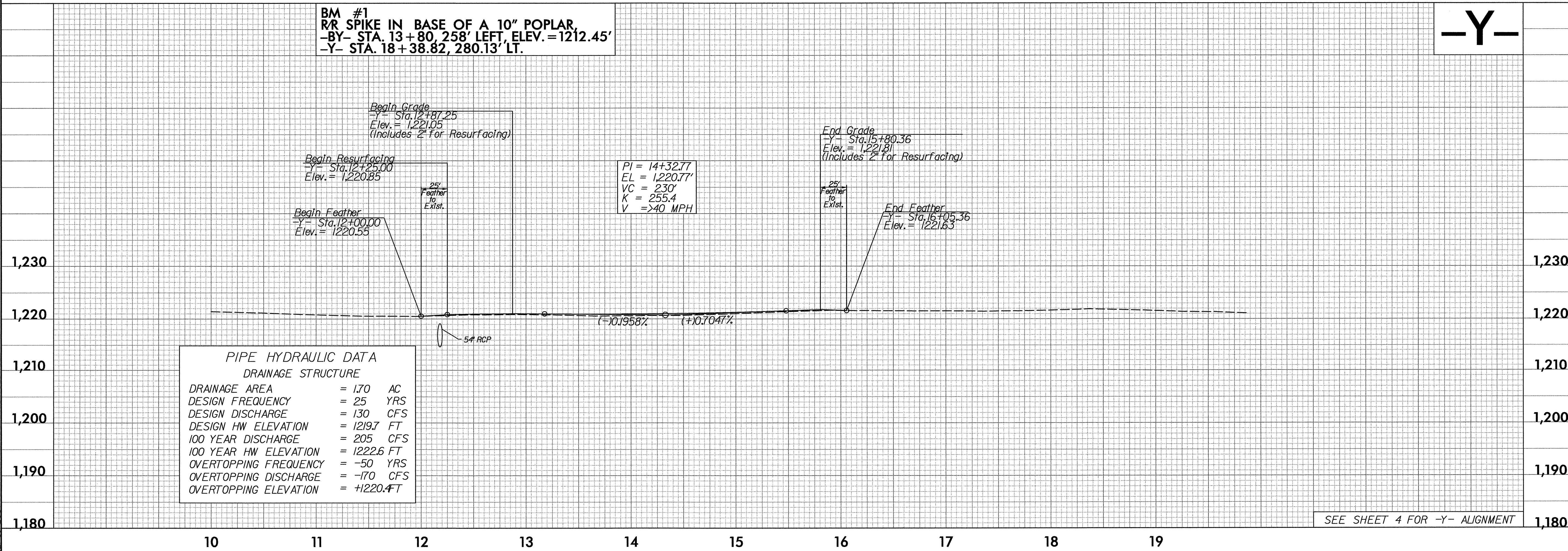
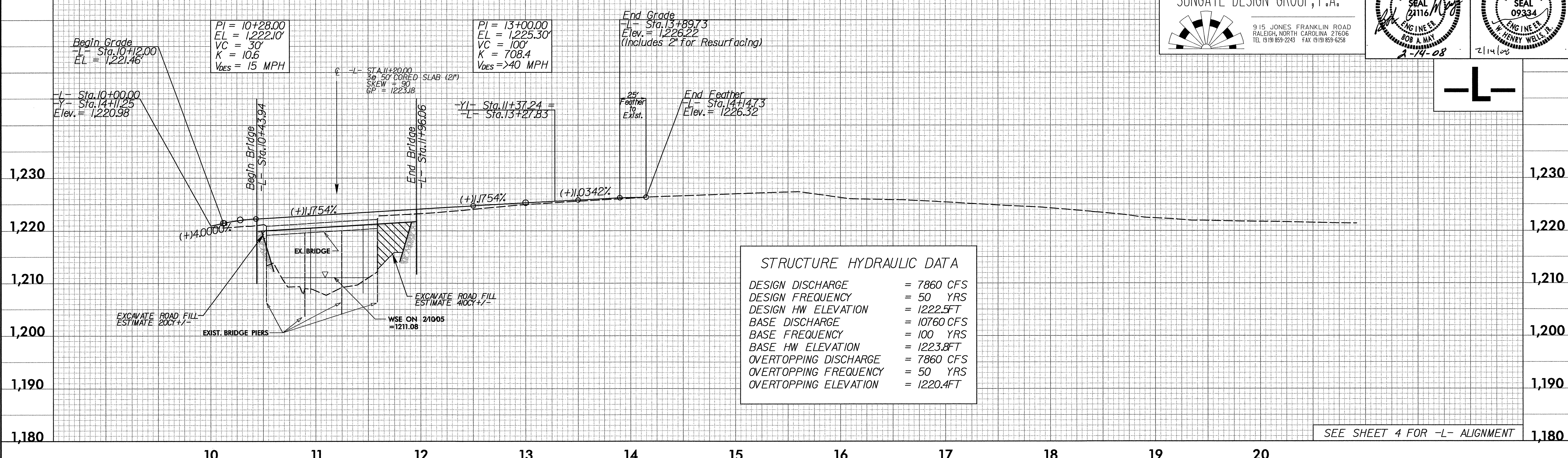
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TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION

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PROJECT REFERENCE NO. B-4052	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
2-14-08	2/14/08



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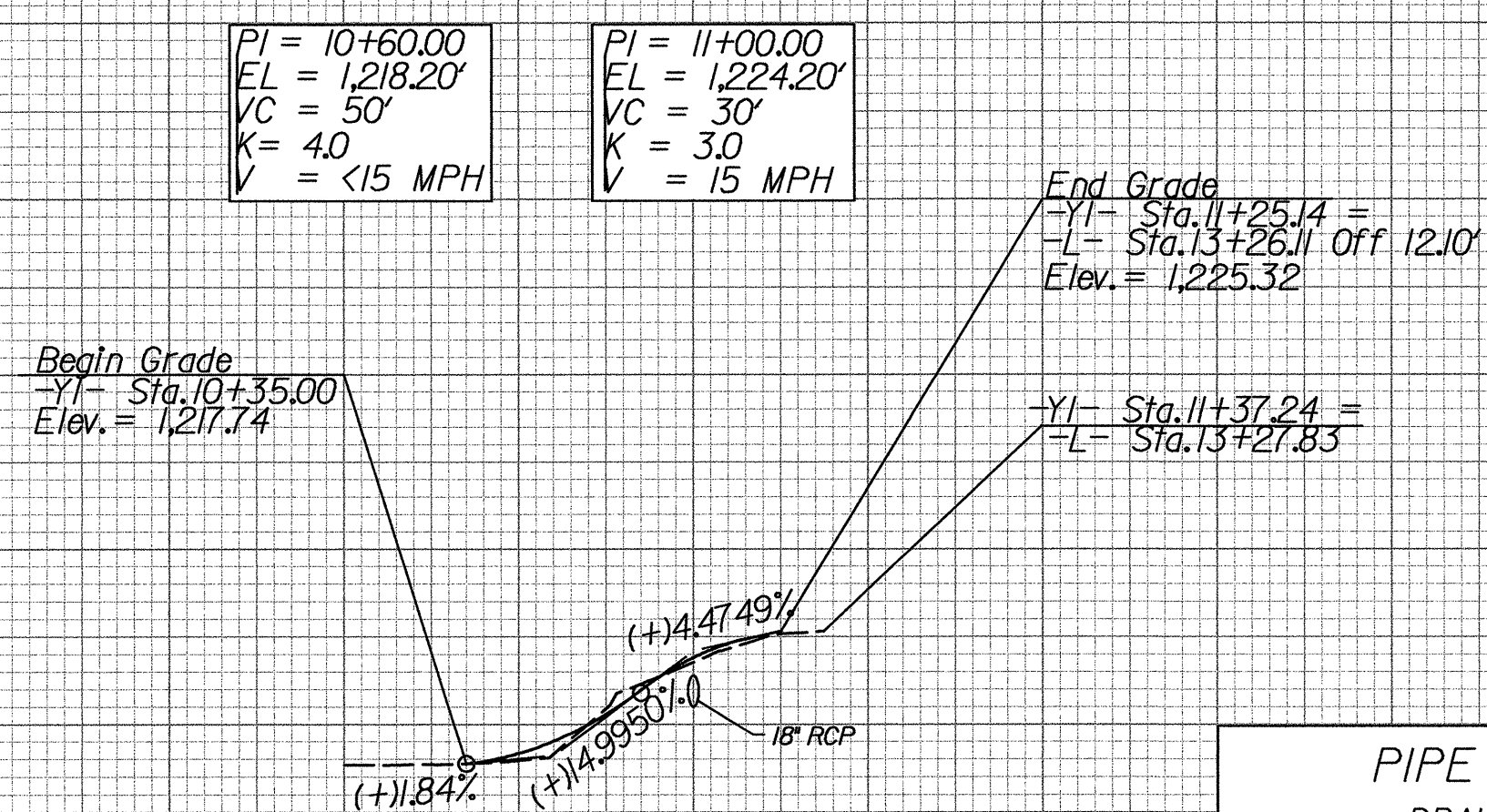
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PROJECT REFERENCE NO. B-4052	SHEET NO. 6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
2-14-08	2-14-08

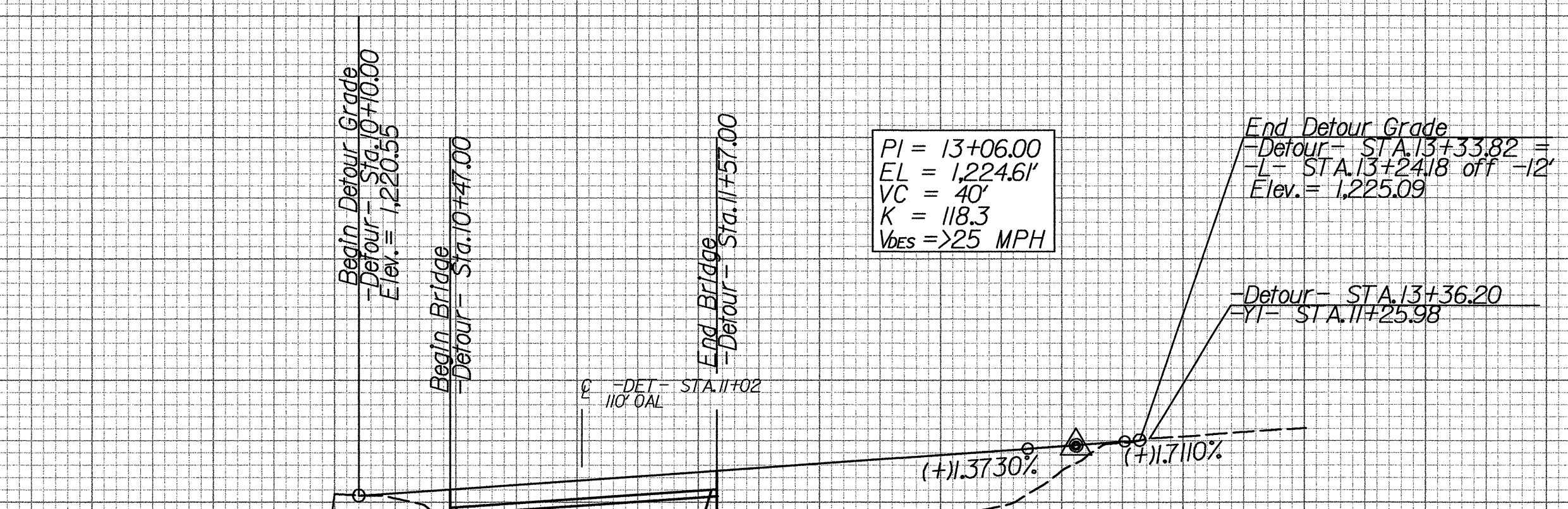
-Y1-



PIPE HYDRAULIC DATA	
DRAINAGE STRUCTURE	
DRAINAGE AREA	= 0.2 AC
DESIGN FREQUENCY	= 25 YRS
DESIGN DISCHARGE	= 2.9 CFS
DESIGN HW ELEVATION	= 1222.4 FT
100 YEAR DISCHARGE	= 3.5 CFS
100 YEAR HW ELEVATION	= 1222.5 FT
OVERTOPPING FREQUENCY	= +500 YRS
OVERTOPPING DISCHARGE	= +5.2 CFS
OVERTOPPING ELEVATION	= 1223.8 FT

SEE SHEET 4 FOR -Y1- ALIGNMENT

-DETOUR-



STRUCTURE HYDRAULIC DATA	
DESIGN DISCHARGE	= 2400 CFS
DESIGN FREQUENCY	= 5 YRS
DESIGN HW ELEVATION	= 1216.7 FT
BASE DISCHARGE	= CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= FT
OVERTOPPING DISCHARGE	= CFS
OVERTOPPING FREQUENCY	= YRS
OVERTOPPING ELEVATION	= FT

SEE SHEET 2-A FOR -DETOUR- ALIGNMENT

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