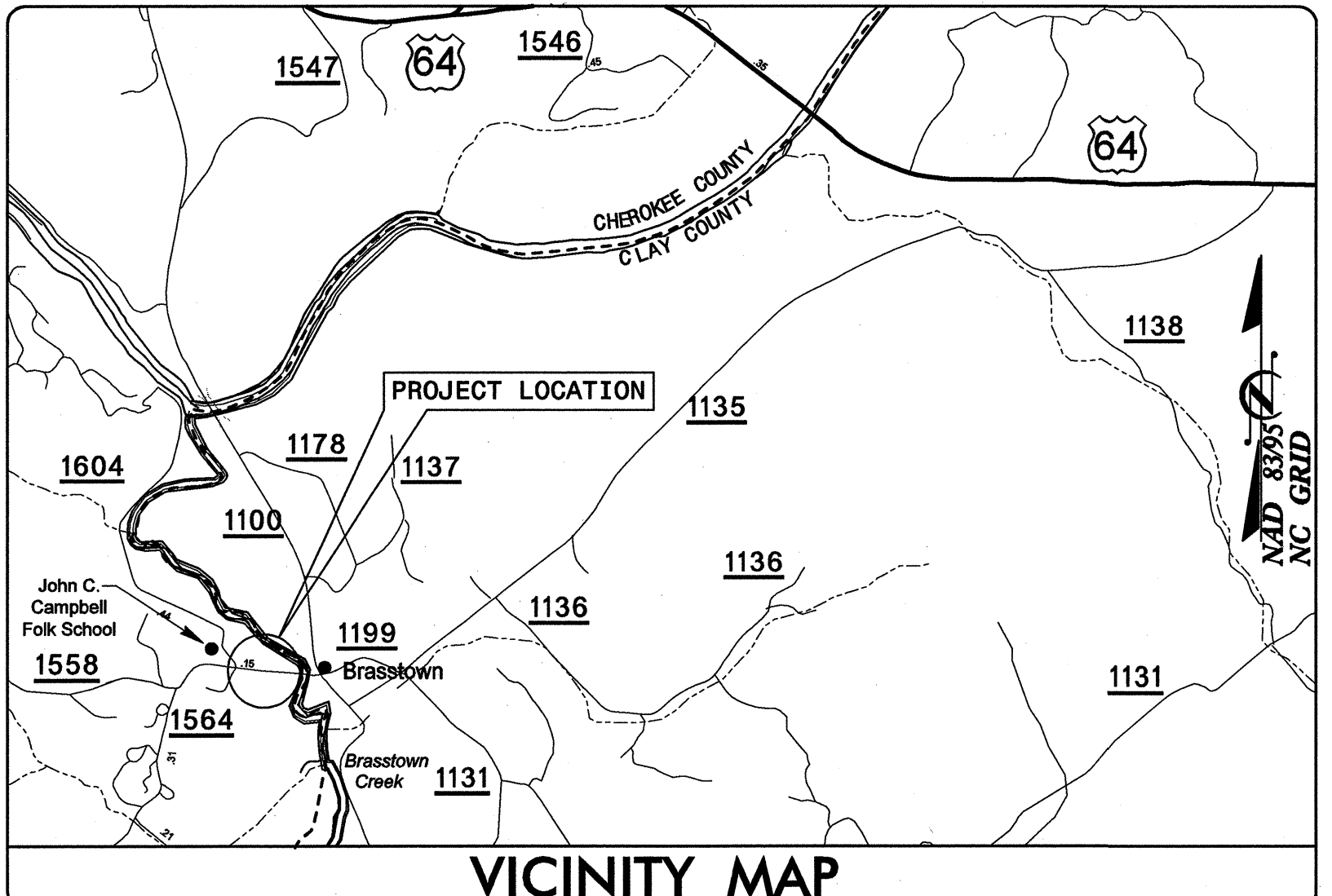


09/08/09

TIP PROJECT: B-4072

CONTRACT: C202159

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Plan Sheet Symbols



VICINITY MAP

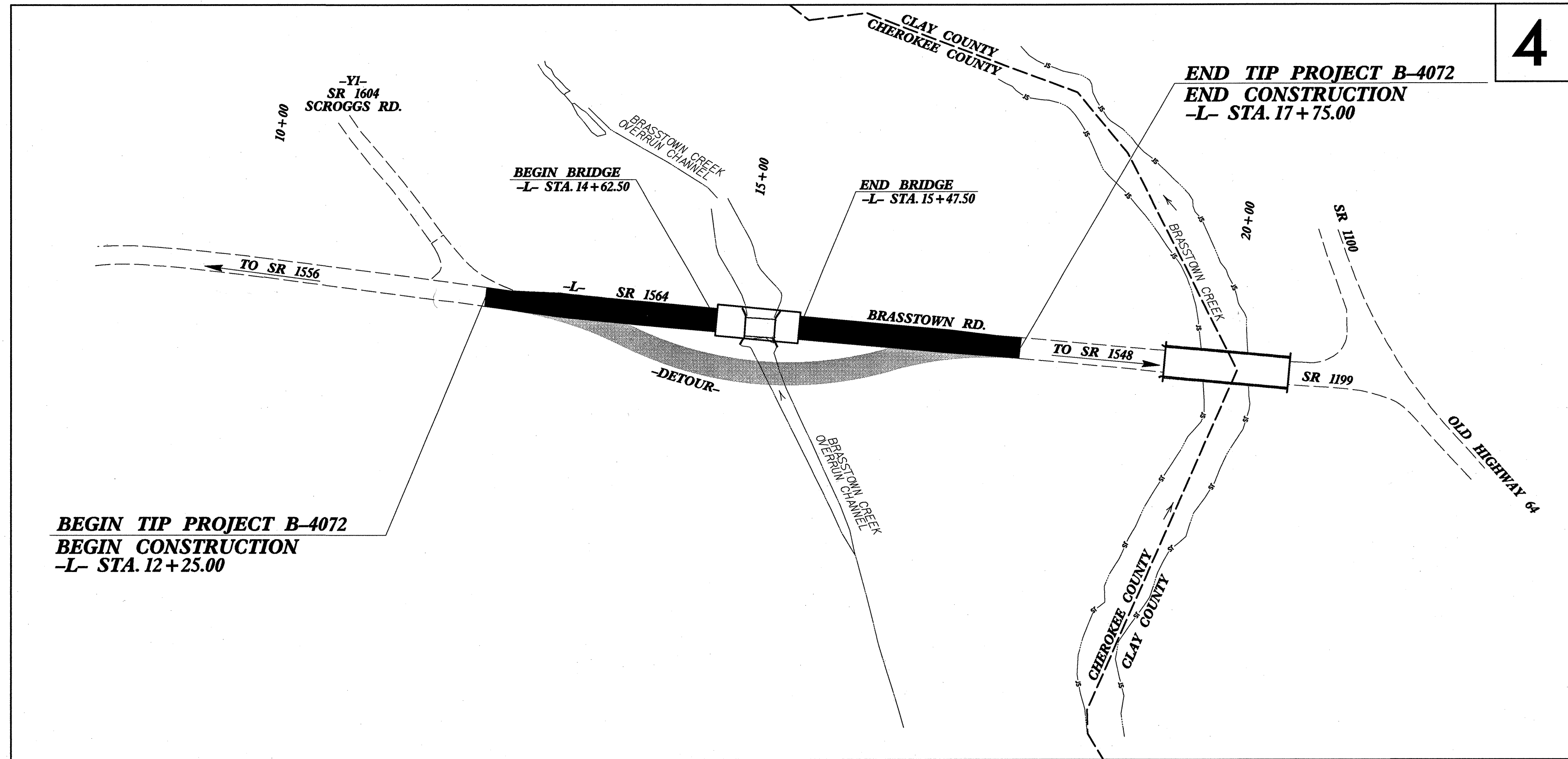
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CHEROKEE COUNTY

LOCATION: BRIDGE NO. 98 OVER BRASSTOWN CREEK OVERRUN
ON SR 1564 (BRASSTOWN RD.)


TYPE OF WORK: GRADING, PAVING, DRAINAGE & STRUCTURE

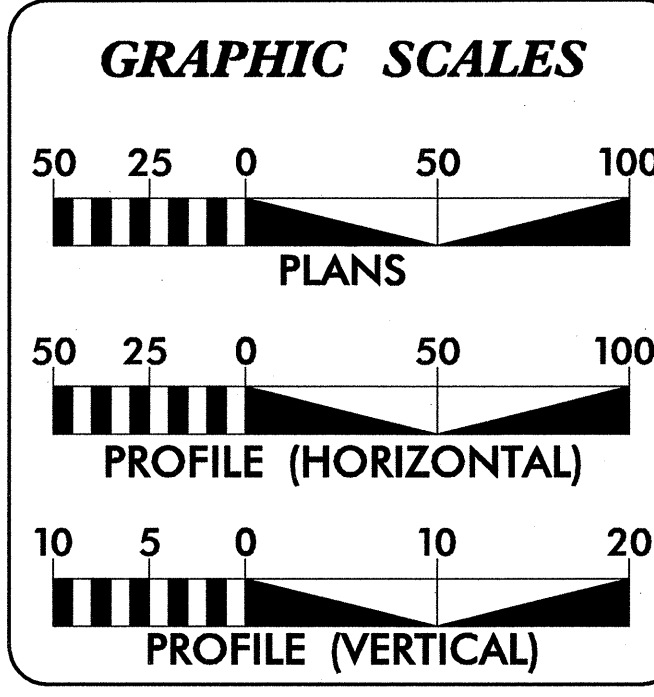
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4072	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33435.1.1	BRZ-1564(3)	PE	
33435.2.1	BRZ-1564(3)	R/W & UTIL.	
33435.3.1	BRZ-1564(3)	CONST.	



4

NAD 83/95
NC GRID

SUNGATE DESIGN GROUP, P.A.

 915 JONES FRANKLIN ROAD
 RALEIGH, NORTH CAROLINA 27606
 TEL 919 859-2243 FAX 919 859-6258
 License No. C-9850



DESIGN DATA

ADT 2009 = 2590
 ADT 2029 = 3980
 DHV = 10 %
 D = 60 %
 T = 5 % *
 V = 45 MPH
 * TTST 1% DUAL 4%
 CLASS. = RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4072 = 0.088 MILES
 LENGTH STRUCTURE TIP PROJECT B-4072 = 0.016 MILES
 TOTAL LENGTH TIP PROJECT B-4072 = 0.104 MILES

ETHERILL ENGINEERING
 Prepared for the North Carolina Department of Transportation in the Office of:
 559 JONES FRANKLIN ROAD
 SUITE 164
 Raleigh, N.C. 27606
 License No. F-0377
 Bus: 919 851 9077
 Fax: 919 851 8107

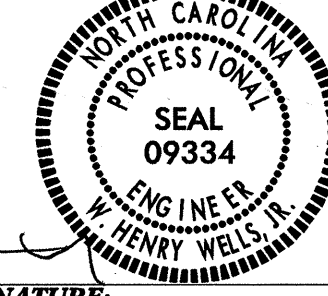
2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: EDWARD G. WETHERILL, PE
 PROJECT ENGINEER
 MAY 20, 2008

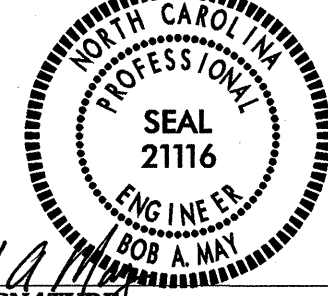
LETTING DATE: BOB A. MAY, PE
 PROJECT DESIGN ENGINEER
 DECEMBER 15, 2009

NCDOT CONTACT: DOUG TAYLOR, PE
 ROADWAY DESIGN PROJECT ENGINEER

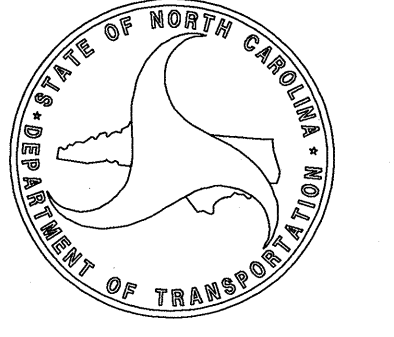
HYDRAULICS ENGINEER


 SIGNATURE: *Edward G. Wetherill*
 P.E. 9/17/09

ROADWAY DESIGN ENGINEER

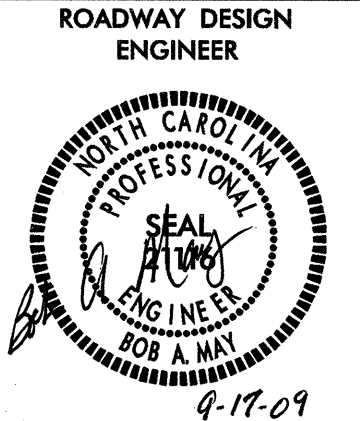
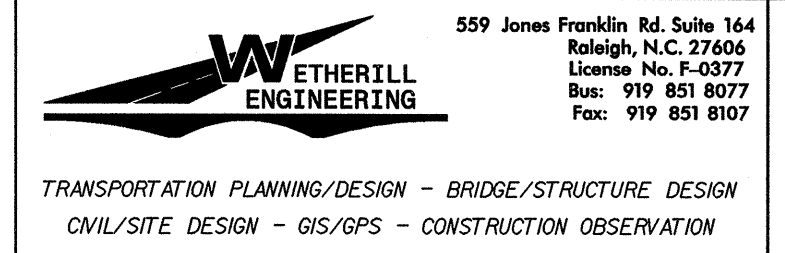

 SIGNATURE: *Bob A. May*
 P.E. 9-17-09

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA



Bob A. May P.E.
 STATE HIGHWAY DESIGN ENGINEER

9/17/2009 8:57:25 AM P:\B-4072\Roadway\Proj\B4072_Rdy_tsh.dgn



INDEX OF SHEETS

Sheet Number	Sheet
1	Title Sheet
1-A	Index of Sheets, Roadway Standards. General Notes
1-B	Conventional Symbols
1-C	Survey Control Sheet
2	Typical Sections, Pavement Schedule
2-A	Detour Plan Sheet
2-B	Anchorage for Frames Detail
2-C	Detail for Bridge Approach Fill - Subregional Tier
2-D	Standard Temporary Shoring
2-E	Standard Temporary Mechanically Stabilized Earth (MSE) Walls
2-F	Standard Temporary MSE Walls Reinforcement Tables-English Units
2-G	Temporary Fabric Wall
2-H	Hilfiker Temporary Wall
2-I	Sierrascap Temporary Wall
2-J Thru 2-L	Retained Earth Temporary Wall
2-M Thru 2-O	Terratrel Temporary Wall
2-P Thru 2-Q	Method of Pipe Installation
3	Summary of Quantities
3-A	Summary of Earthwork, Summary of Existing Asphalt Pavement Removal Shoulder Berm Gutter, and List of Temporary Pipes, Endwalls, etc., (for pipes 54" & Under)
3-B	List of Pipes, Endwalls, etc., (for pipes 48" & Under) Guardrail Summary and Temporary Guardrail Summary
4 Thru 5	Plan and Profile Sheets
TCP-1 Thru TCP-9	Traffic Control Plans
EC-1 Thru EC-6	Erosion Control Plans
RF-1	Reforestation Detail Sheet
X-1	Cross-Section Summary Sheet
X-2 Thru X-5	Cross-Sections
S-1 Thru S-19	Structure Plans

GENERAL NOTES

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

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

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

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

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

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

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

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

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

END BENTS:
THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE
Murphy Electric Power Board
Verizon
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

LIST OF ROADWAY STANDARDS

2006 ROADWAY ENGLISH STANDARD DRAWINGS

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

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

STD. NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superlevation - Two Lane Pavement
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
838.39	Reinforced Concrete Endwall - for Single 72" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.69	Reinforced Brick Endwall - for Single 72" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

3/15/06













Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering












STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

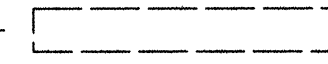

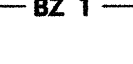




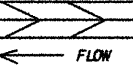


BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin	_____ 
Property Corner	_____ 
Property Monument	_____ 
Parcel/Sequence Number	_____ 
Existing Fence Line	_____ 
Proposed Woven Wire Fence	_____ 
Proposed Chain Link Fence	_____ 
Proposed Barbed Wire Fence	_____ 
Existing Wetland Boundary	_____ 
Proposed Wetland Boundary	_____ 
Existing Endangered Animal Boundary	_____ 
Existing Endangered Plant Boundary	_____ 

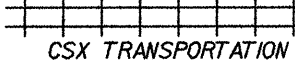

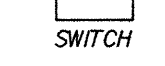


BUILDINGS AND OTHER CULTURE:

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





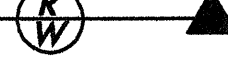










HYDROLOGY:

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


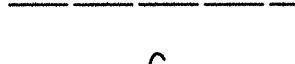


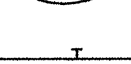
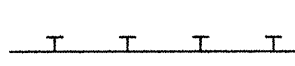
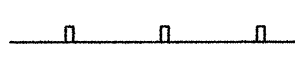
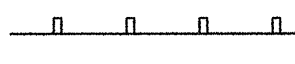



RAILROADS:

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



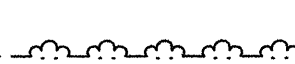

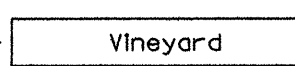

RIGHT OF WAY:

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

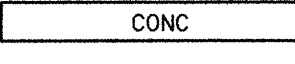
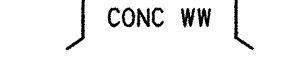
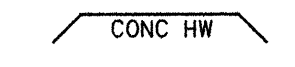



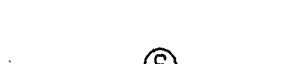


ROADS AND RELATED FEATURES:

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










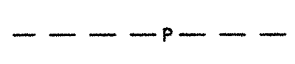

VEGETATION:

Single Tree	_____ 
Single Shrub	_____ 
Hedge	_____ 
Woods Line	_____ 
Orchard	_____ 
Vineyard	_____ 








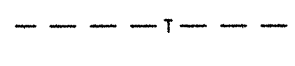
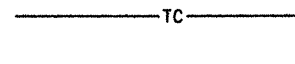
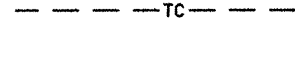


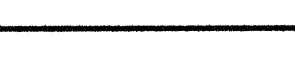
EXISTING STRUCTURES:

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	_____ 






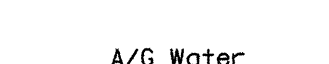

UTILITIES:

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.*)	_____ 





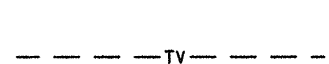
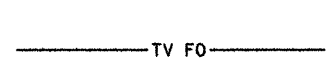
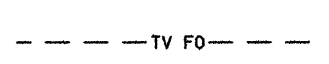

TELEPHONE:

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.*)	_____ 



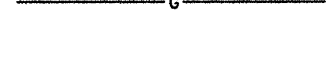
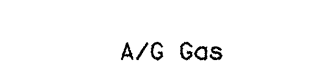

WATER:

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	_____ 



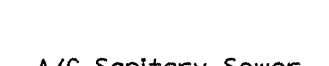



TV:

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.*)	_____ 






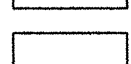




GAS:

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:

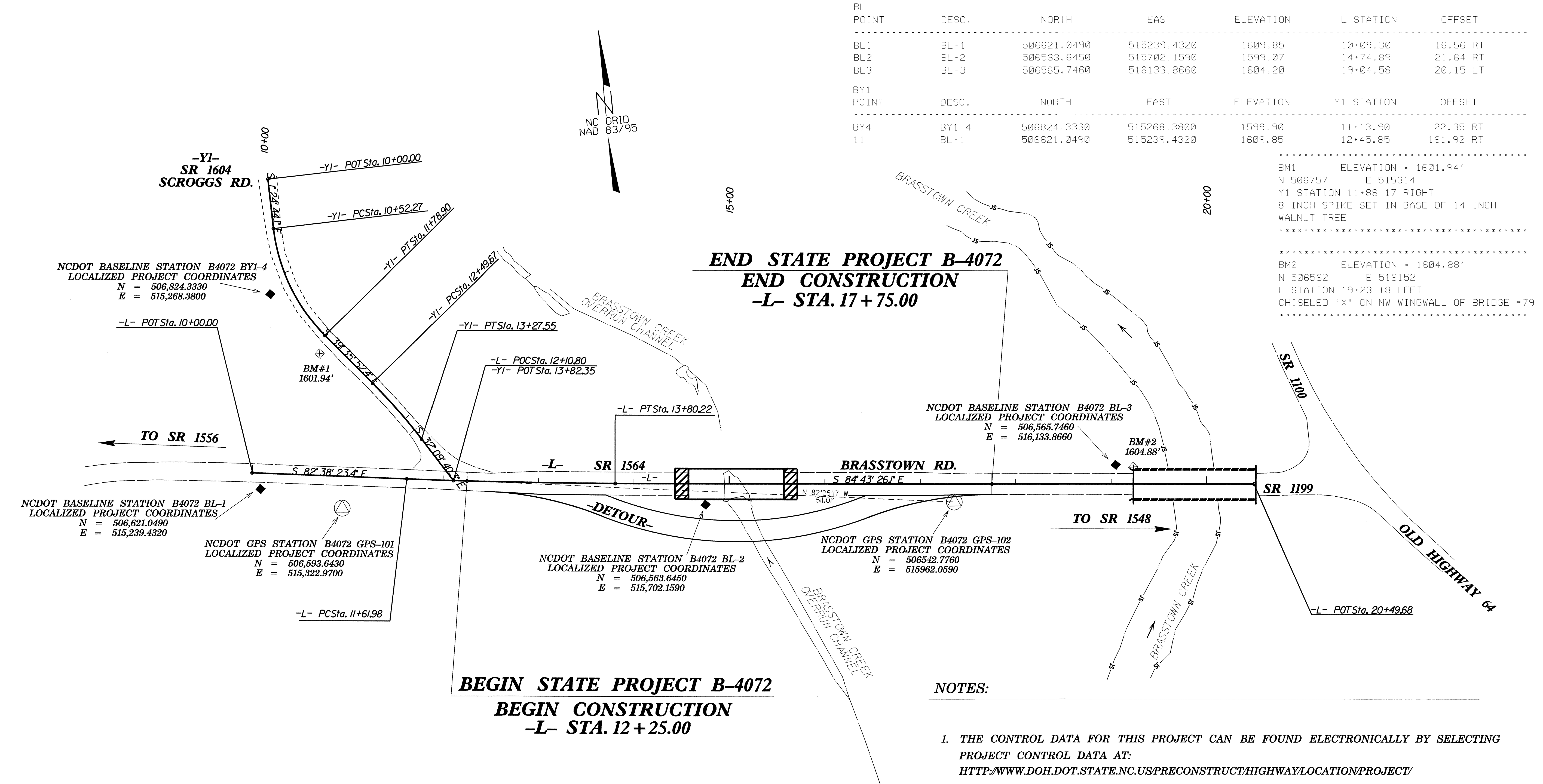
Utility Pole	_____ 
Utility Pole with Base	_____ 
Utility Located Object	_____ 
Utility Traffic Signal Box	_____ 
Utility Unknown U/G Line	_____ 
U/G Tank; Water, Gas, Oil	_____ 
A/G Tank; Water, Gas, Oil	_____ 
U/G Test Hole (S.U.E.*)	_____ 
Abandoned According to Utility Records	_____ 
End of Information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

SURVEY CONTROL SHEET B-4072

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BL1	BL-1	506621.0490	515239.4320	1609.85	10+09.30	16.56 RT
BL2	BL-2	506563.6450	515702.1590	1599.07	14+74.89	21.64 RT
BL3	BL-3	506565.7460	516133.8660	1604.20	19+04.58	20.15 LT
BY1 POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
BY4	BY1-4	506824.3330	515268.3800	1599.90	11+13.90	22.35 RT
11	BL-1	506621.0490	515239.4320	1609.85	12+45.85	161.92 RT

.....
 BM1 ELEVATION = 1601.94'
 N 506757 E 515314
 Y1 STATION 11+88 17 RIGHT
 8 INCH SPIKE SET IN BASE OF 14 INCH
 WALNUT TREE

 BM2 ELEVATION = 1604.88'
 N 506562 E 516152
 L STATION 19+23 18 LEFT
 CHISELED *X* ON NW WINGWALL OF BRIDGE *79



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4072 GPS-102" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 506,542.7760(++) EASTING: 515,962.0590(++) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999802740 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4072 GPS-102" TO -L- STATION 12+25.00 IS N 82°25'17" W 511.01' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

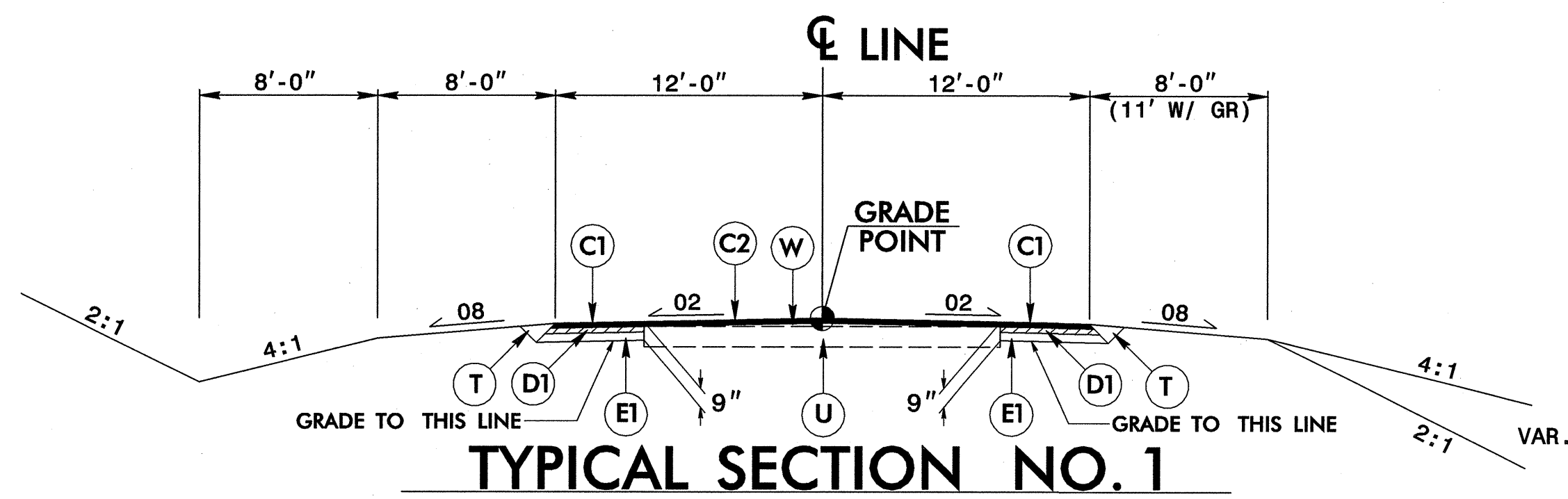
NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project/)
 THE FILE TO BE FOUND ARE AS FOLLOWS:
B4072_LS_CONTROL_071002.TXT

 SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- ⊕ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
 NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)

NOTE: DRAWING NOT TO SCALE

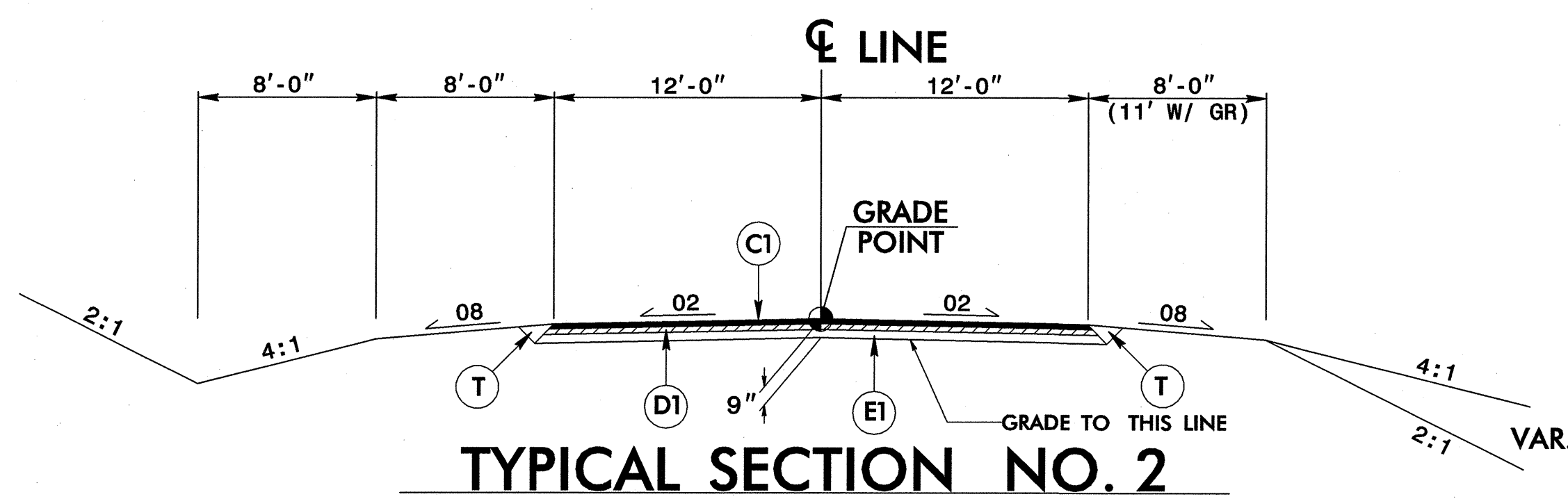
18-SEP-2009 10:00 \\dot\projects\projects\4072\roadway\proj\4072\roadway\proj\4072_1s_1c.dgn



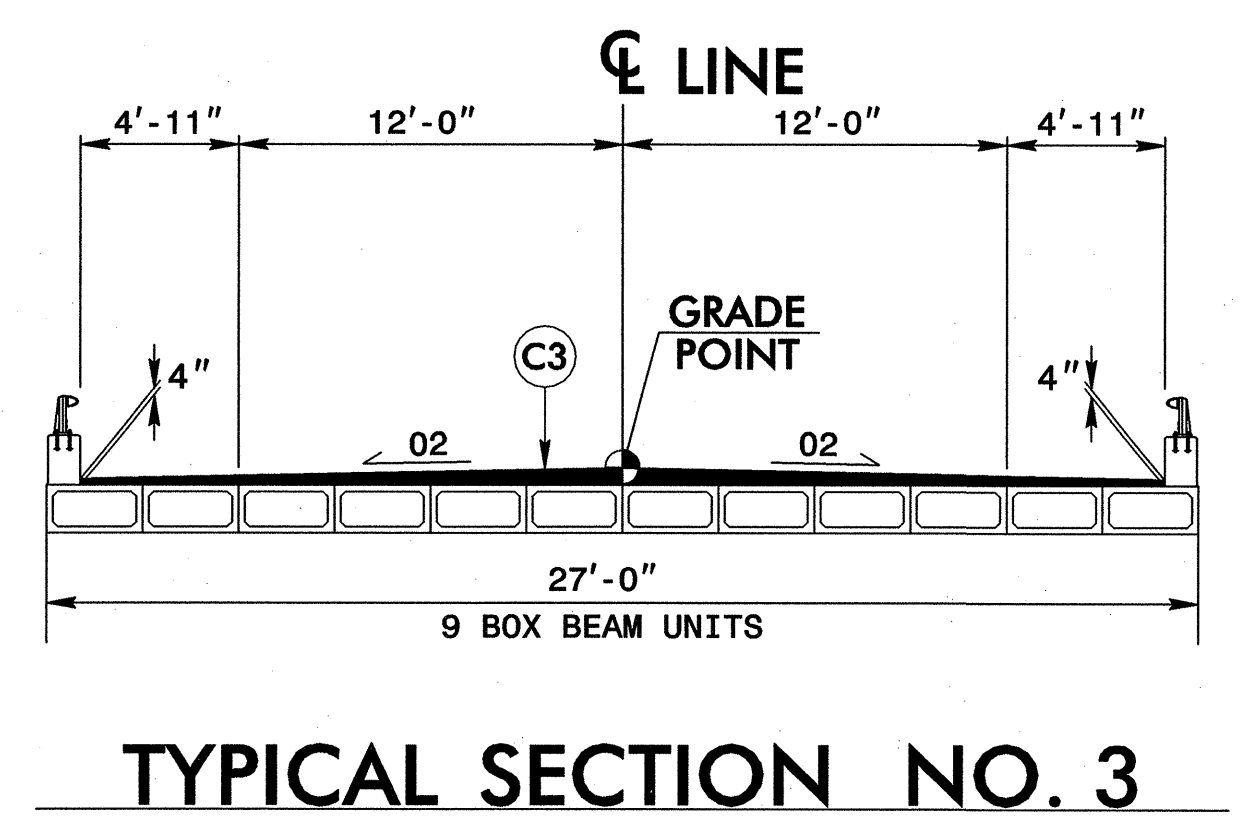
NOTE: TRANSITION FROM EXIST. PAVEMENT TO TYPICAL SECTION NO. 1
 -L- STA. 12+25.00 TO -L- STA. 12+50.00

NOTE: TRANSITION FROM TYPICAL SECTION NO. 1 TO EXIST. PAVEMENT
 -L- STA. 17+50.00 TO -L- STA. 17+75.00

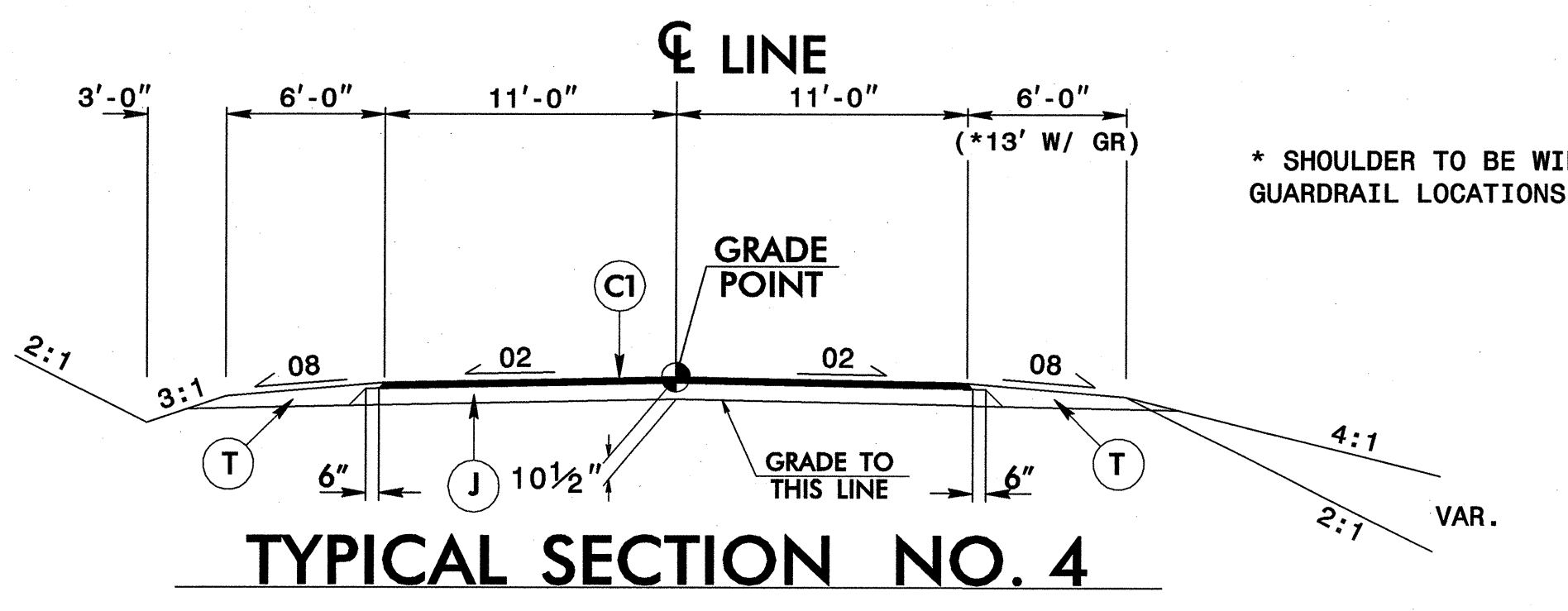
USE TYPICAL SECTION NO. 1
 -L- STA. 12+50.00 TO -L- STA. 14+35.00
 -L- STA. 15+75.00 TO -L- STA. 17+50.00



USE TYPICAL SECTION NO. 2
 -L- STA. 14+35.00 TO -L- STA. 14+62.50 (BEG. BRIDGE)
 -L- STA. 15+47.50 (END BRIDGE) TO -L- STA. 15+75.00



USE TYPICAL SECTION NO. 3
 -L- STA. 14+62.50 TO -L- STA. 15+47.50



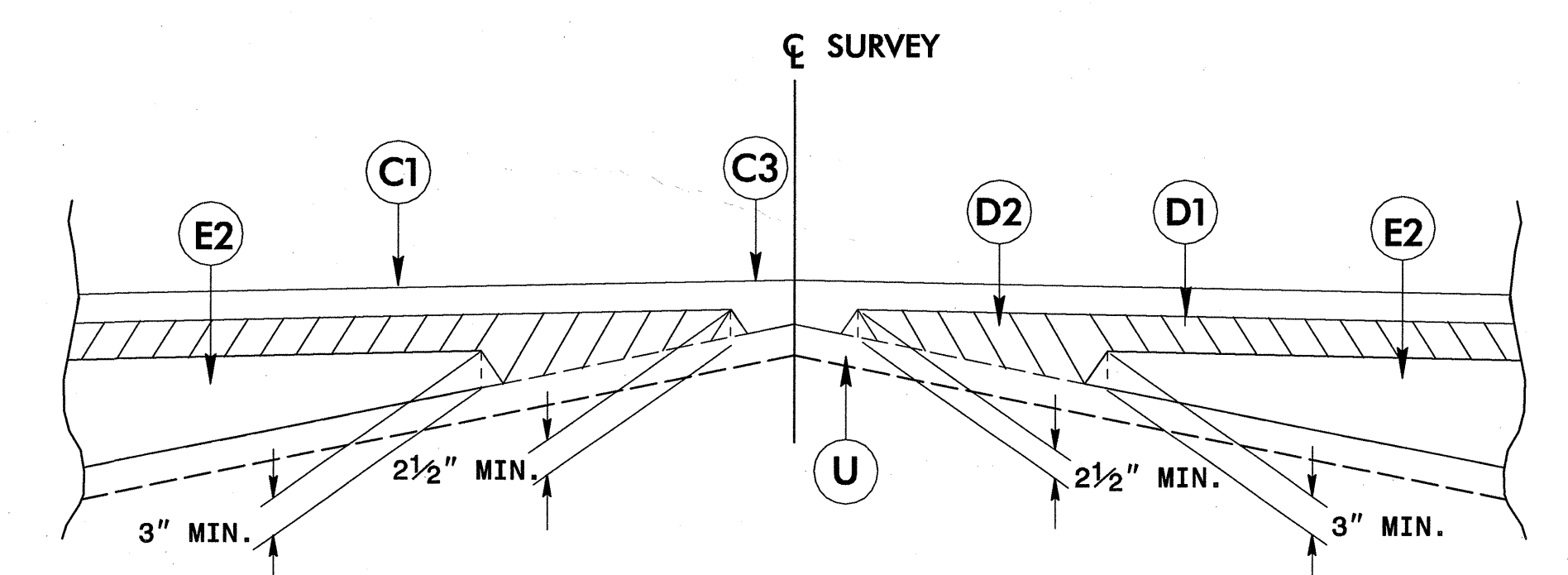
* SHOULDER TO BE WIDENED AN ADDITIONAL 5' IN GUARDRAIL LOCATIONS TO ACCOMMODATE PEDESTRIAN TRAFFIC

USE TYPICAL SECTION NO. 4
 -DETOUR- STA. 12+43.66 TO -DETOUR- STA. 17+86.68

PAVEMENT SCHEDULE
 (FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
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.
J	PROP. 8" AGGREGATE BASE COURSE.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

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



Detail Showing Method of Wedging

8/17/99

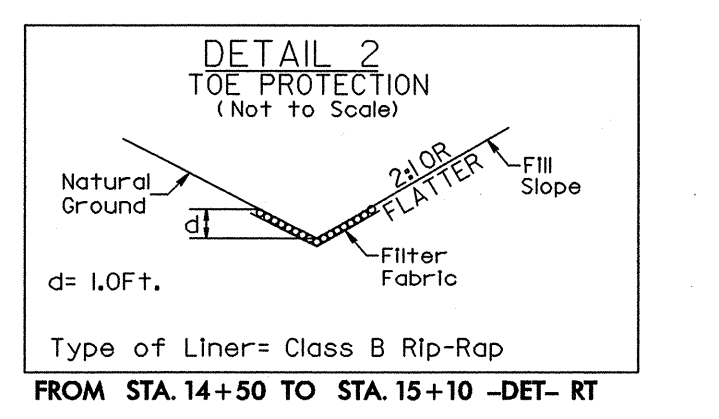
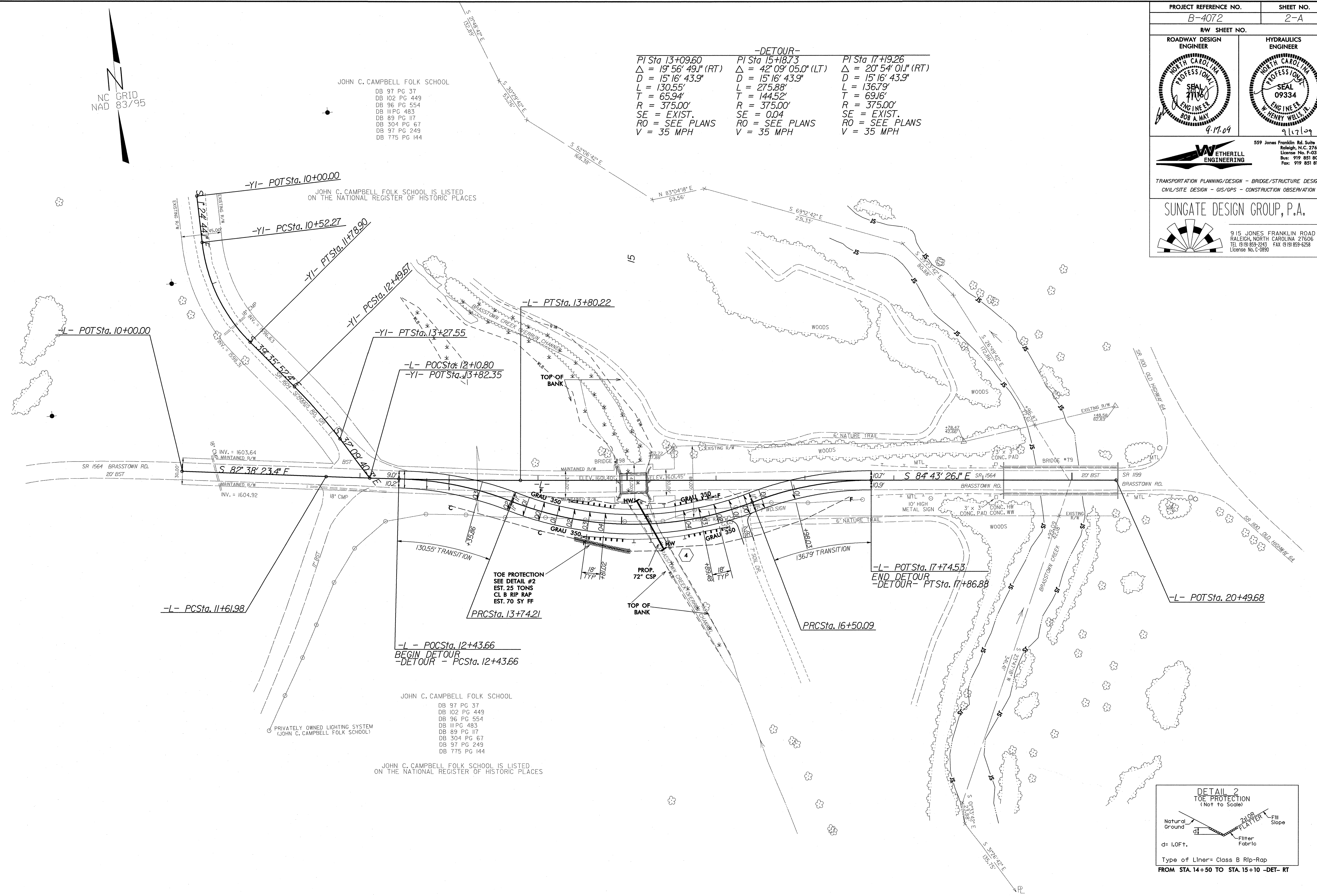


JOHN C. CAMPBELL FOLK SCHOOL
 DB 97 PG 37
 DB 102 PG 449
 DB 96 PG 554
 DB III PG 483
 DB 89 PG 117
 DB 304 PG 67
 DB 97 PG 249
 DB 775 PG 144

-DETOUR-

PI Sta 13+09.60	PI Sta 15+18.73	PI Sta 17+19.26
$\Delta = 19^\circ 56' 49.1''$ (RT)	$\Delta = 42^\circ 09' 05.0''$ (LT)	$\Delta = 20^\circ 54' 01.1''$ (RT)
D = 15' 16" 43.9"	D = 15' 16" 43.9"	D = 15' 16" 43.9"
L = 130.55'	L = 275.88'	L = 136.79'
T = 65.94'	T = 144.52'	T = 69.16'
R = 375.00'	R = 375.00'	R = 375.00'
SE = EXIST.	SE = 0.04	SE = EXIST.
RO = SEE PLANS	RO = SEE PLANS	RO = SEE PLANS
V = 35 MPH	V = 35 MPH	V = 35 MPH

PROJECT REFERENCE NO. B-4072	SHEET NO. 2-A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER
 559 Jones Franklin Rd. Suite 164 Raleigh, N.C. 27606 License No. E-0377 Bus: 919 851 8077 Fax: 919 851 8107	
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CML/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION	
SUNGATE DESIGN GROUP, P.A. 915 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606 TEL 919 859-2243 FAX 919 859-6293 License No. C-0890	



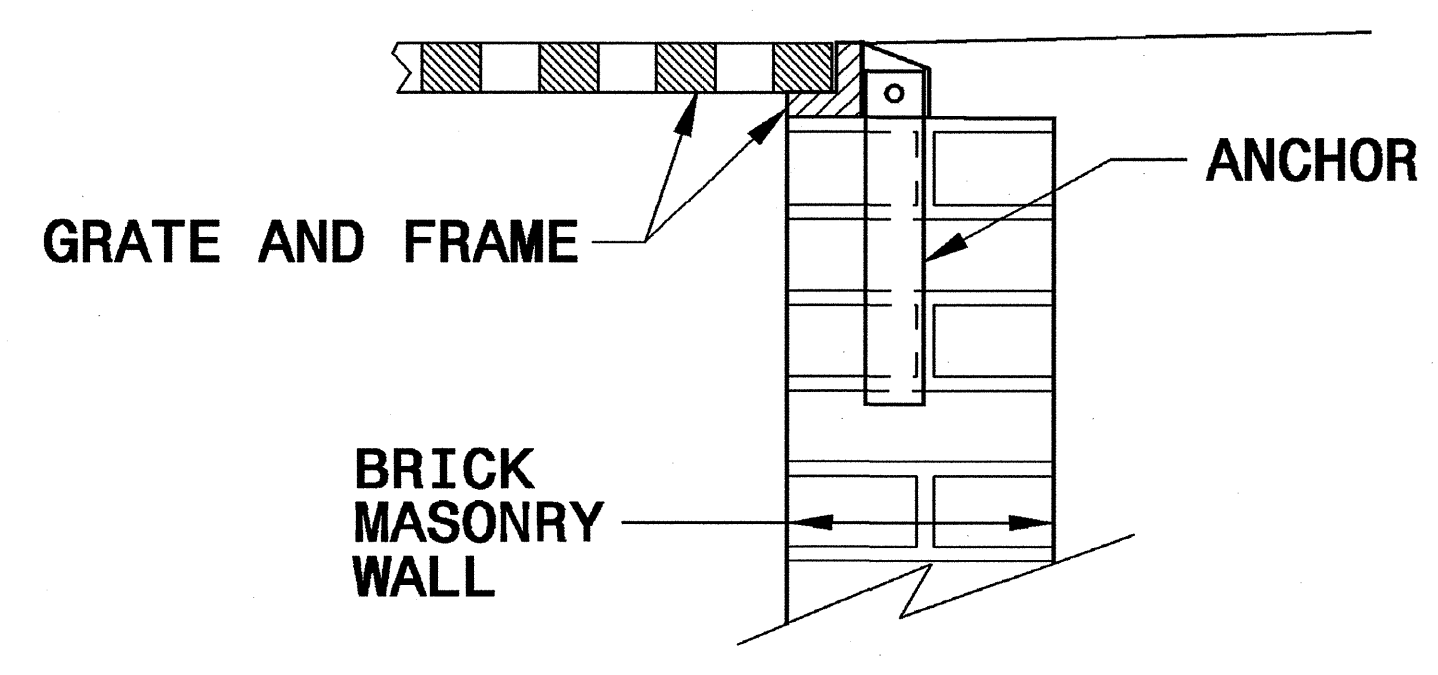
SEE SHEET 4 FOR -L- ALIGNMENT
 SEE SHEET 5 FOR PROFILE

8:42:25 AM Roadway\Proj\B4072.Rdy_detour_psh.dgn
 9/15/2006

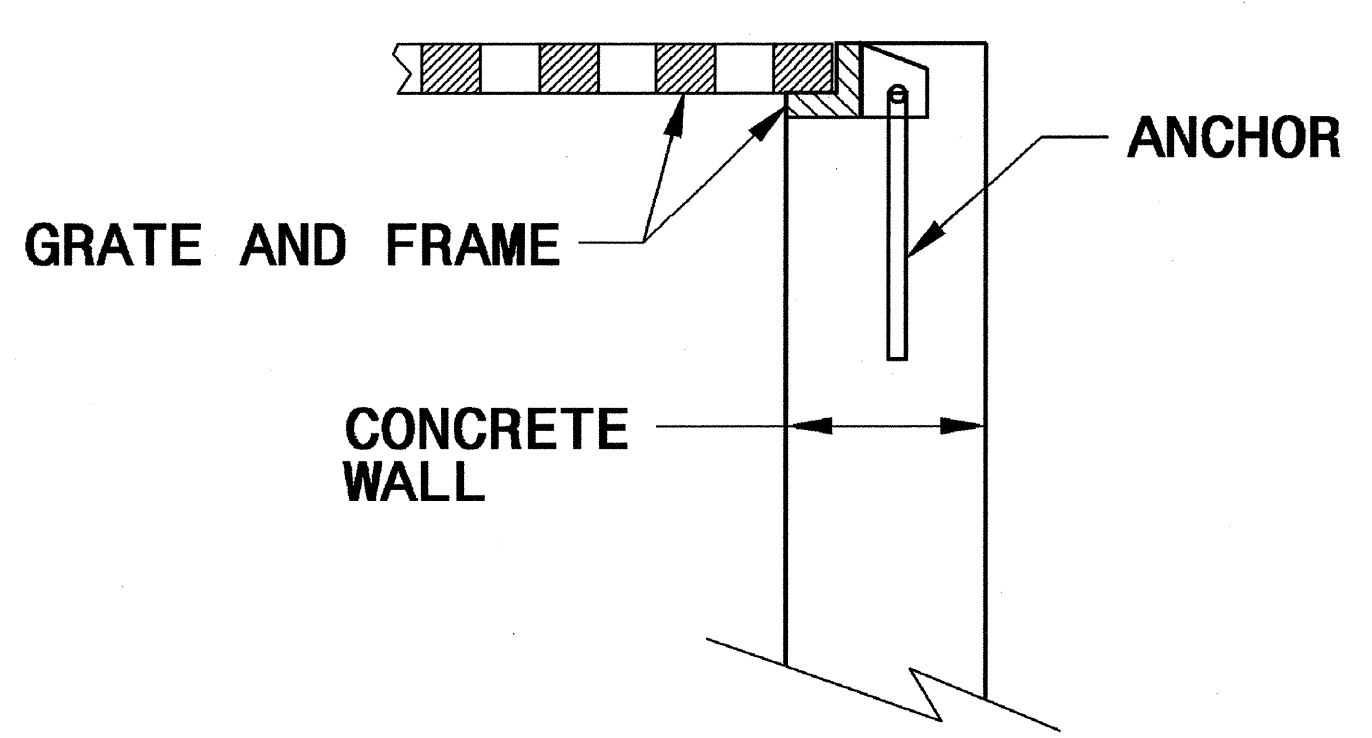
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

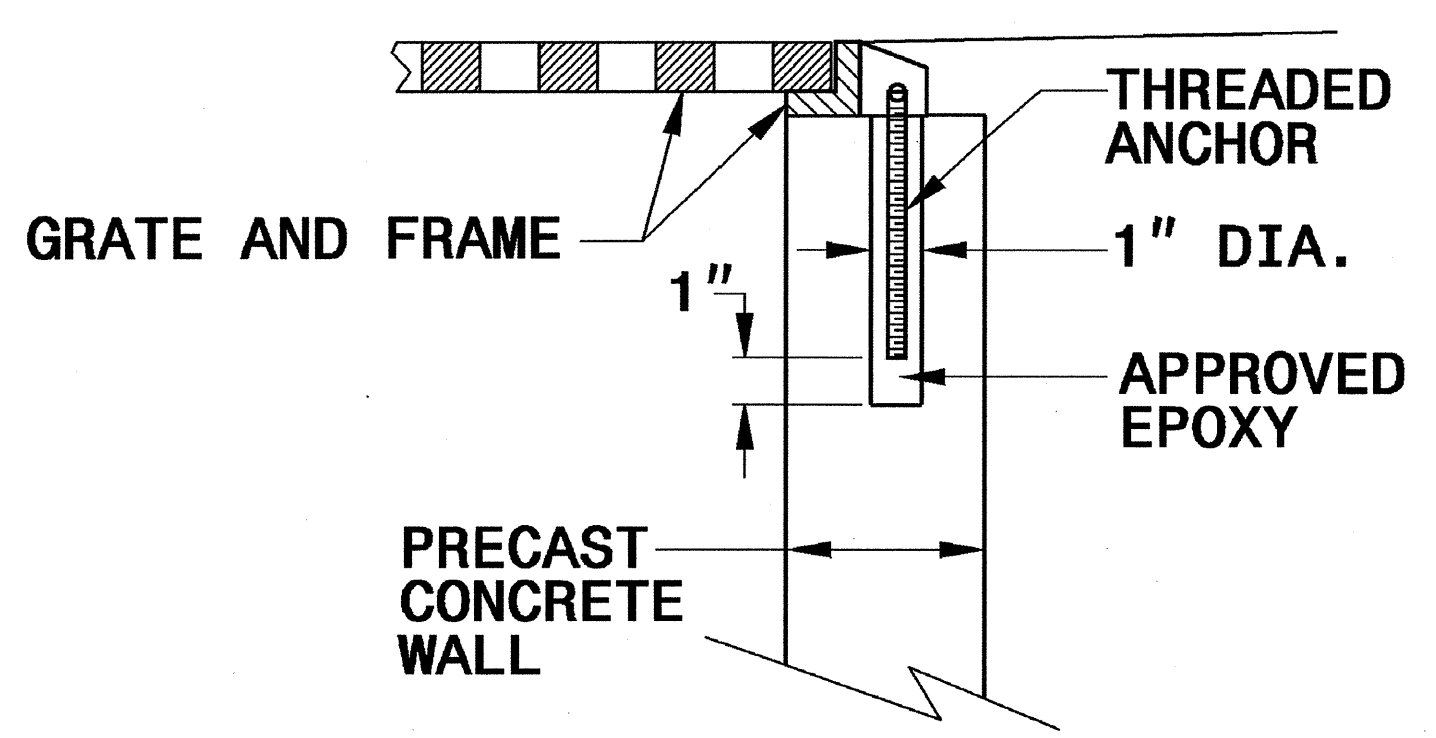
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



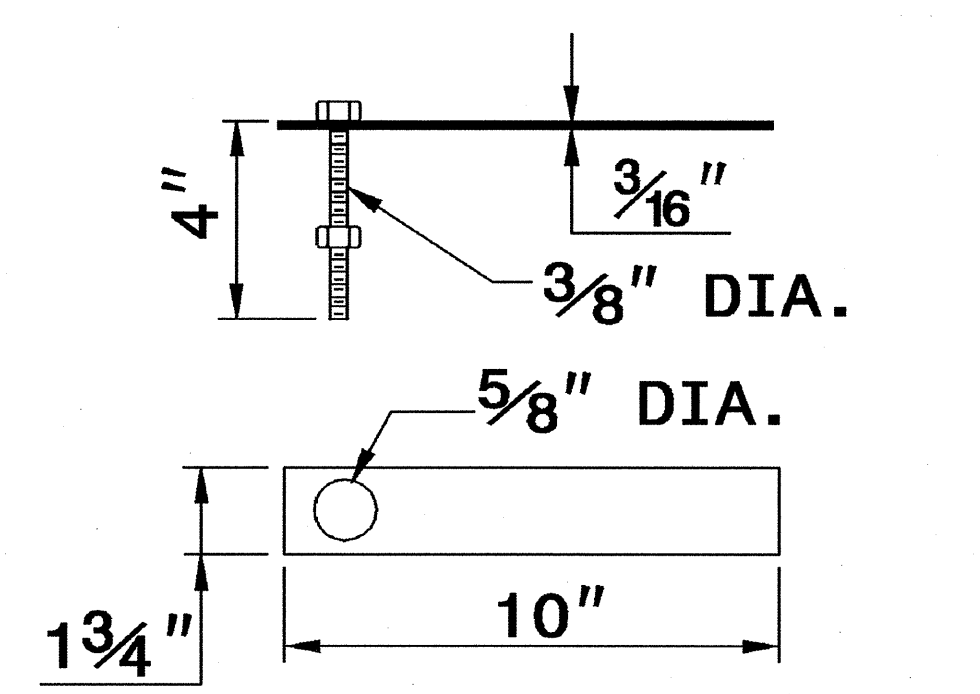
CONCRETE CONSTRUCTION



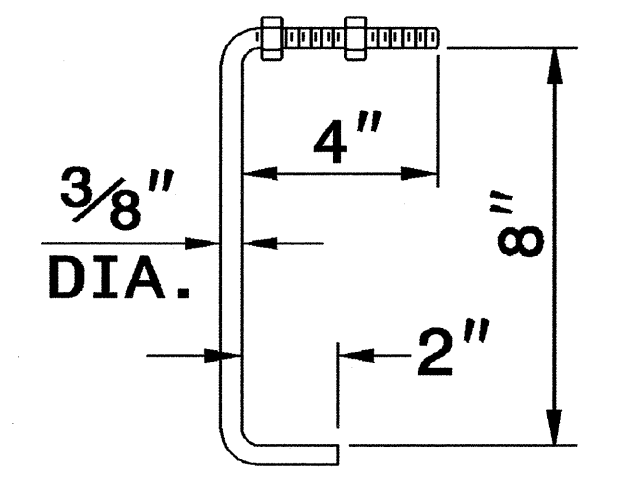
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

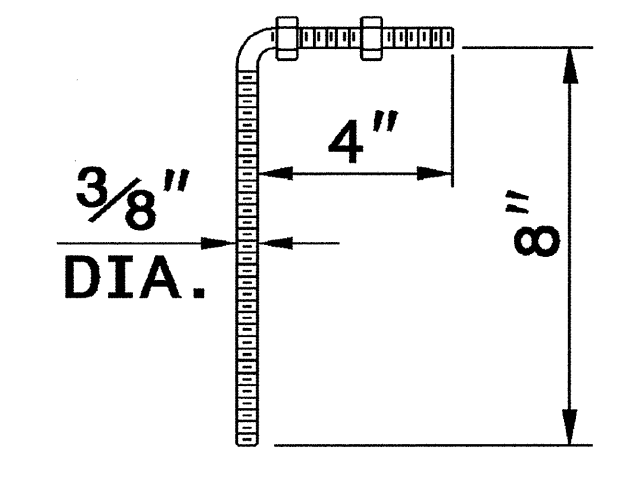
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



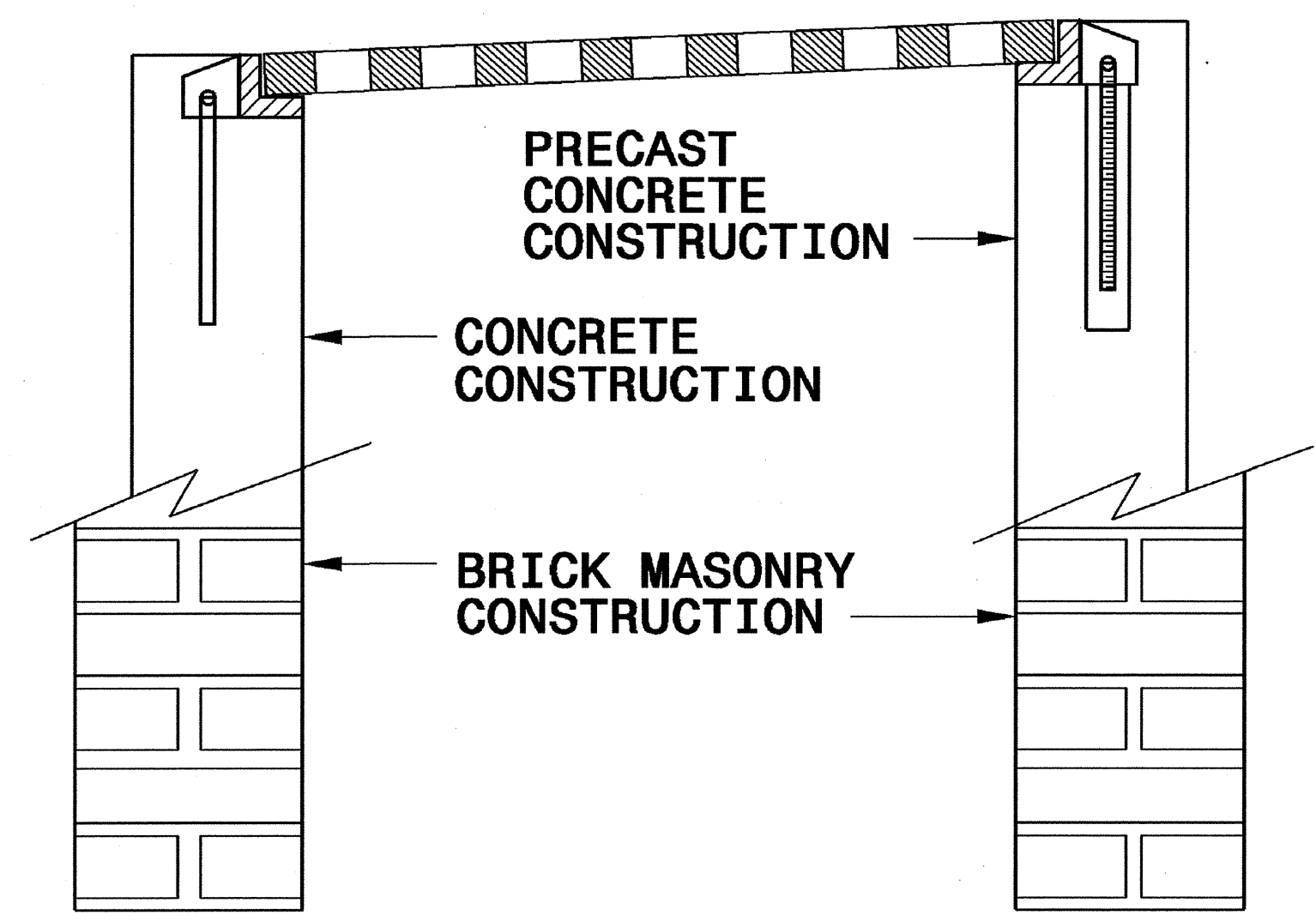
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



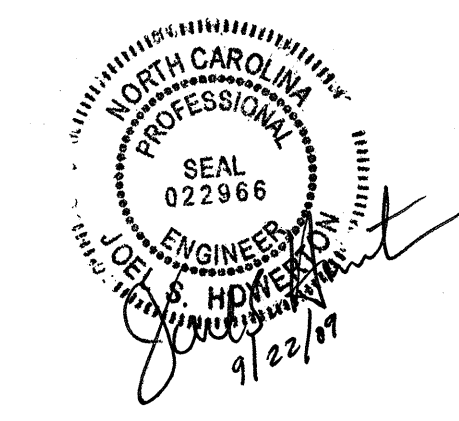
FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

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

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

SHEET 1 OF 1
840D25

27-SEP-2006 08:59
S:\Contracts\90379533\Special Details\viewer\stds\06\stds to Special Details\84025 Anchorage for Frames\0840d25.dgn
Reviewed: PJ 9/22/06



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

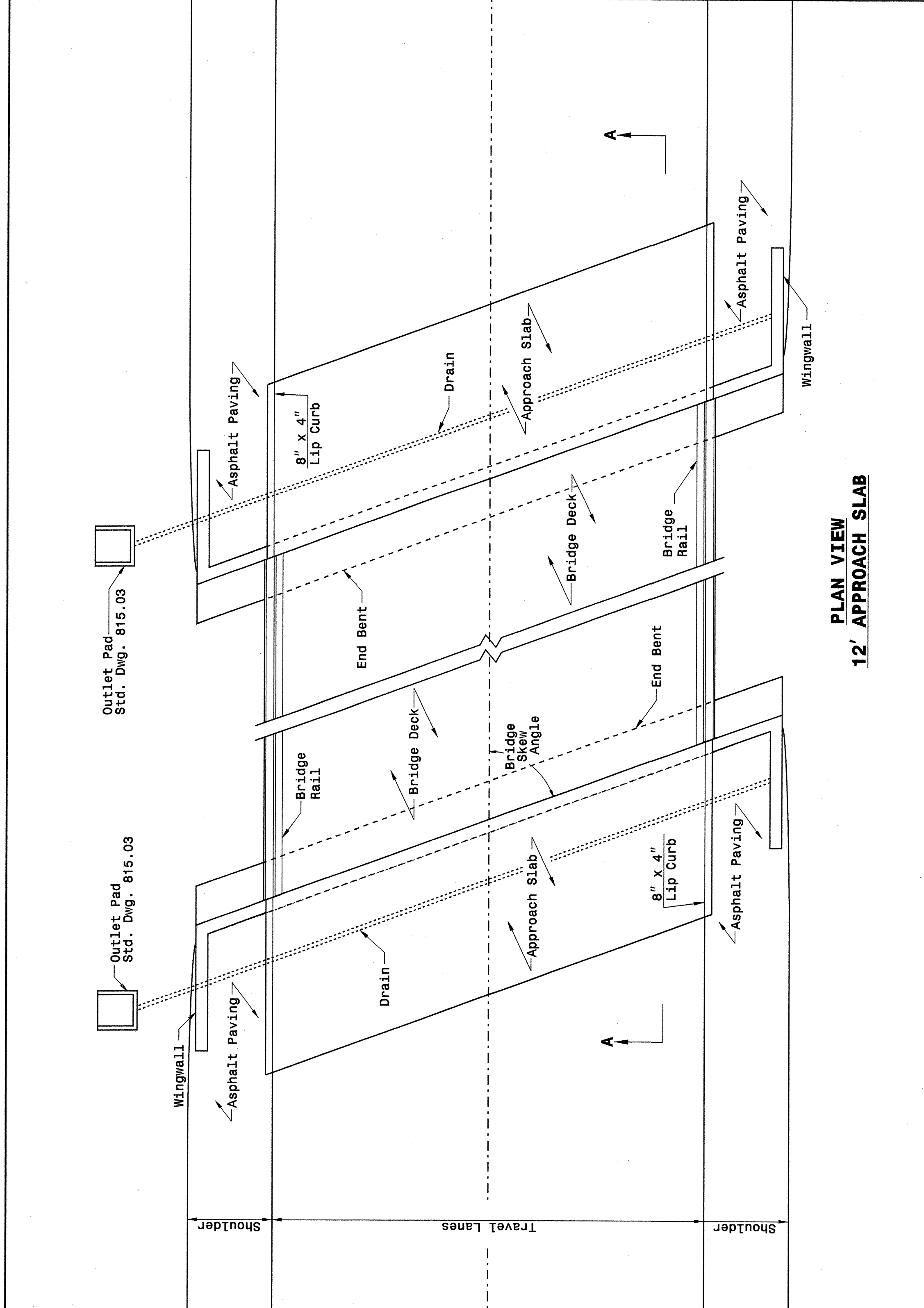
SEE PLATE FOR TITLE

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

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

ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

SHEET 1 OF 2
422D11



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

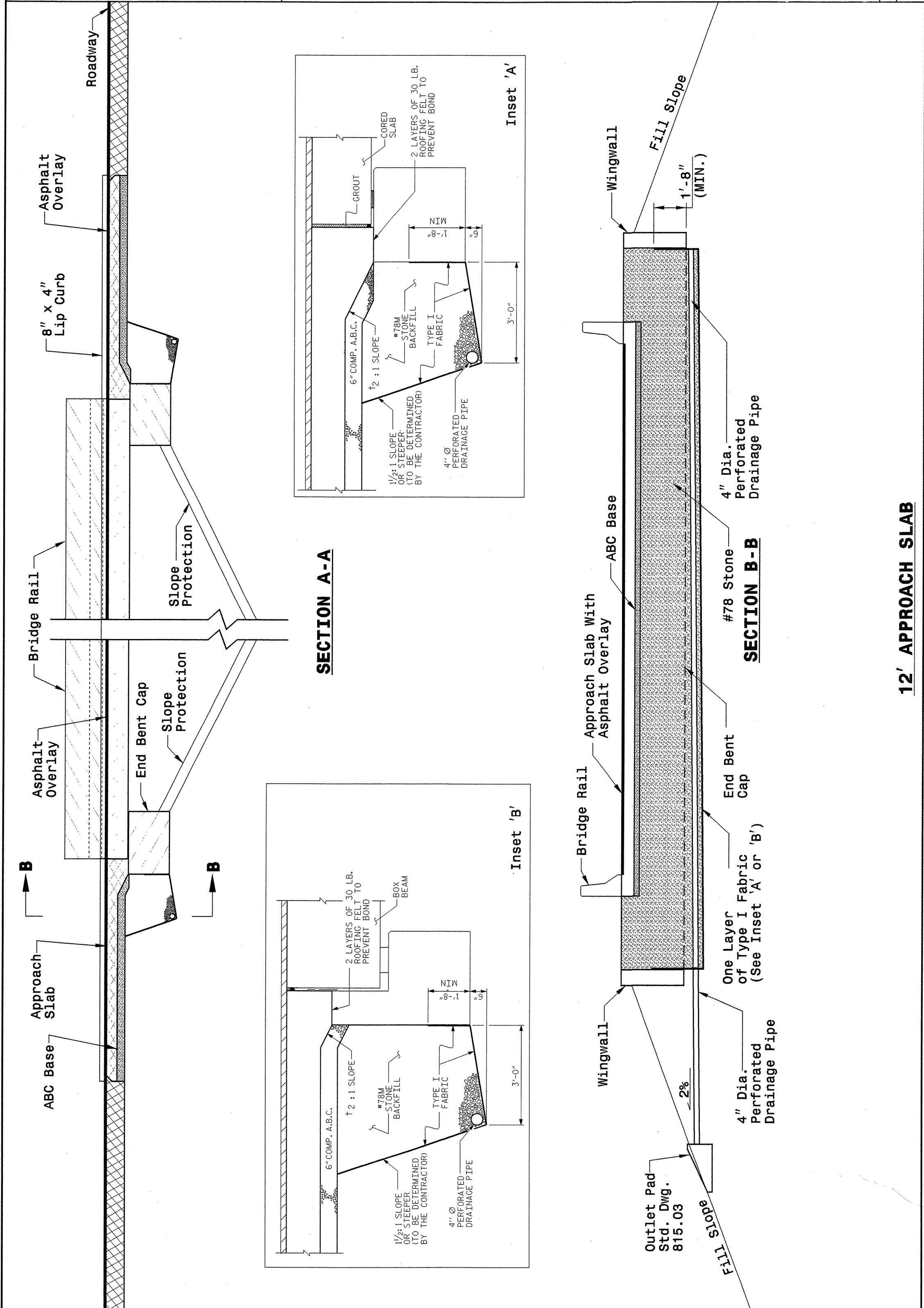
ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

SHEET 1 OF 2
422D11

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

ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

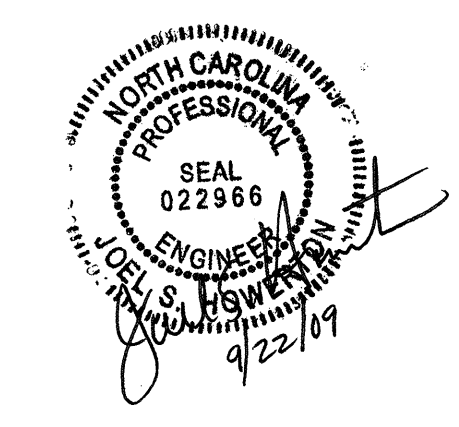
SHEET 2 OF 2
422D11



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

ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

SHEET 2 OF 2
422D11



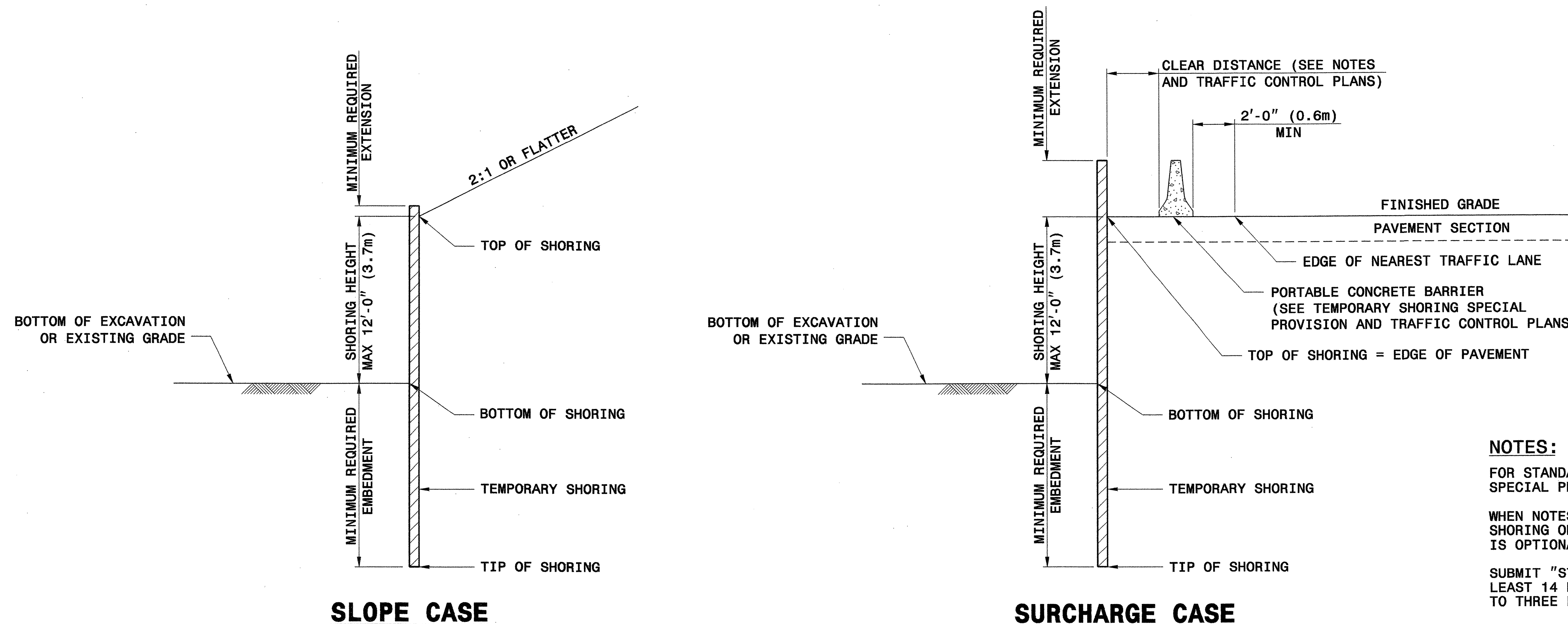
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

ORIGINAL BY: K. A. Kempf DATE: 6-10-08
MODIFIED BY: DATE:
CHECKED BY: DATE: 2/16/09
FILE SPEC.: k Kempf/english/bridge approach fills.dgn



Scott A. Shidden 3/29/07
SIGNATURE DATE



NOTES:

FOR STANDARD TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.

WHEN NOTES ON PLANS DO NOT PROHIBIT STANDARD TEMPORARY SHORING OR STANDARD SHORING, STANDARD TEMPORARY SHORING IS OPTIONAL.

SUBMIT "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 14 DAYS BEFORE BEGINNING SHORING CONSTRUCTION. UP TO THREE LOCATIONS MAY BE INCLUDED ON EACH SELECTION FORM.

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING CONDITIONS:

- 1) MAXIMUM SHORING HEIGHT IS 12'-0" (3.7m).
- 2) TRAFFIC SURCHARGE IS 240 PSF (11.5 KPA) MAXIMUM OR BACKSLOPE IS 2:1 (H:V) OR FLATTER.
- 3) BOTTOM OF EXCAVATION OR EXISTING GRADE IN FRONT OF SHORING IS 6:1 (H:V) SLOPE OR FLATTER.
- 4) H PILE SPACING IS 6'-0" (1.8m).
- 5) H PILE EMBEDMENT DEPTHS ARE FOR DRIVEN PILES.
- 6) TIMBER LAGGING IS A MINIMUM OF 3" (75mm) THICK.

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
 TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/M³)
 FRICTION ANGLE = 30 DEGREES
 COHESION = 0 PSF (0 KPA)
 GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF SHORING.

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

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

VERIFY GROUNDWATER ELEVATION BEFORE BEGINNING SHORING CONSTRUCTION.

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

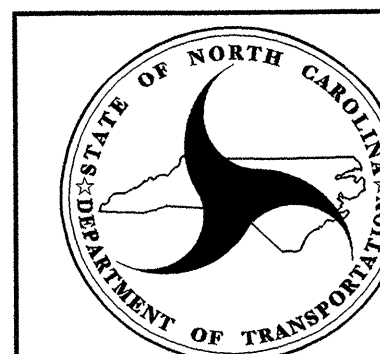
AT THE CONTRACTOR'S OPTION, H PILE EMBEDMENT DEPTHS FOR PILES SET IN DRILLED HOLES MAY BE REDUCED BY 25%. FOR PILE EXCAVATION, SEE TEMPORARY SHORING SPECIAL PROVISION.

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

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

GROUNDWATER CONDITION	SHORING HEIGHT FT (m)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		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
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD DRAWING NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 2-20-07

STANDARD TEMPORARY MSE WALL OPTIONS



Scott A. Hadden 3/29/07
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 INCREMENTS EQUAL TO THE VERTICAL REINFORCEMENT SPACING
 - 3) WITH THE EXCEPTION OF EITHER THE FIRST OR LAST SECTION OF WALL, HORIZONTAL SECTION LENGTHS IN INCREMENTS EQUAL TO THE FOLLOWING:

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

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

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

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

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

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

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

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

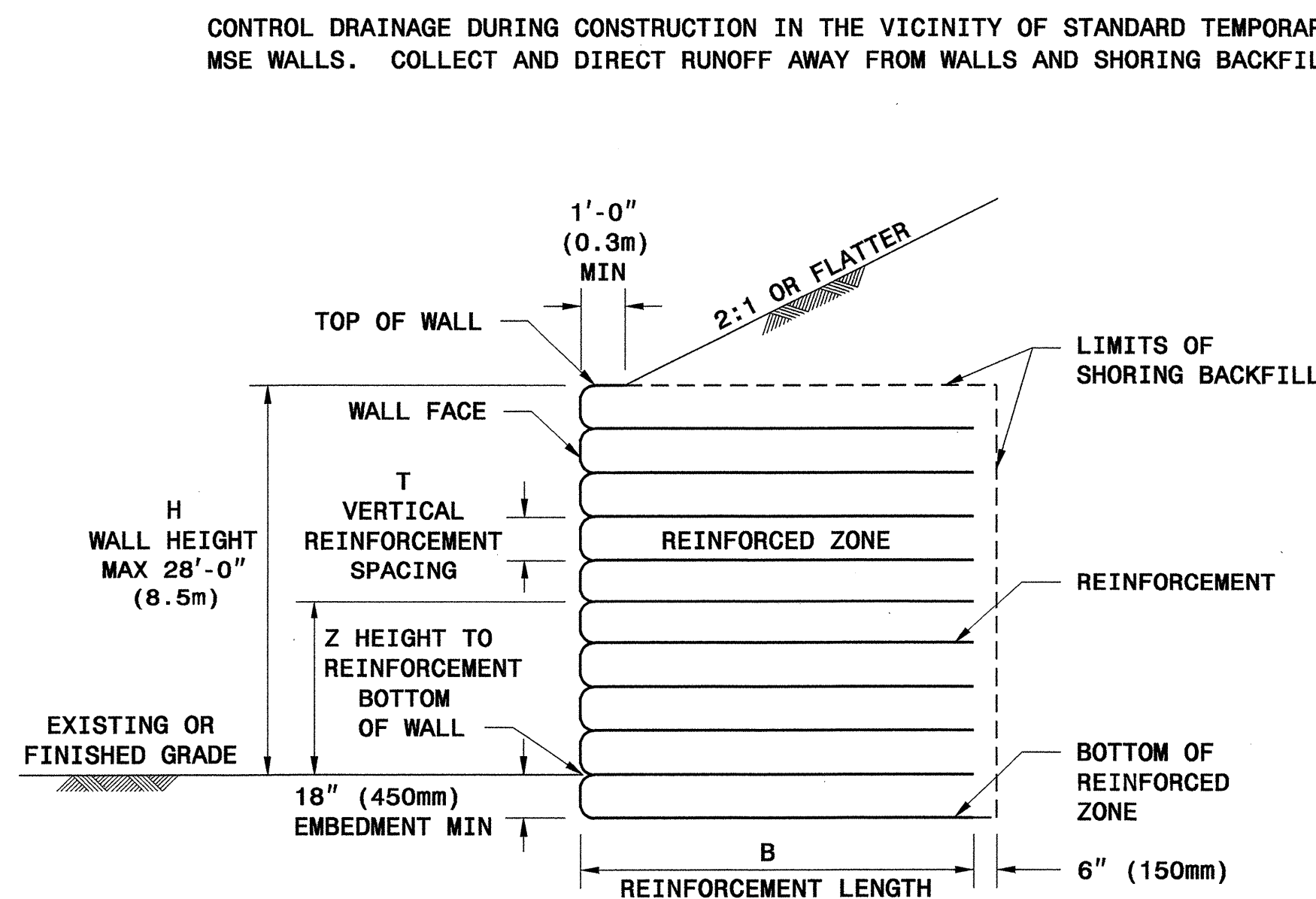
PLACE SHORING BACKFILL IN 8" TO 10" (200mm TO 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

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

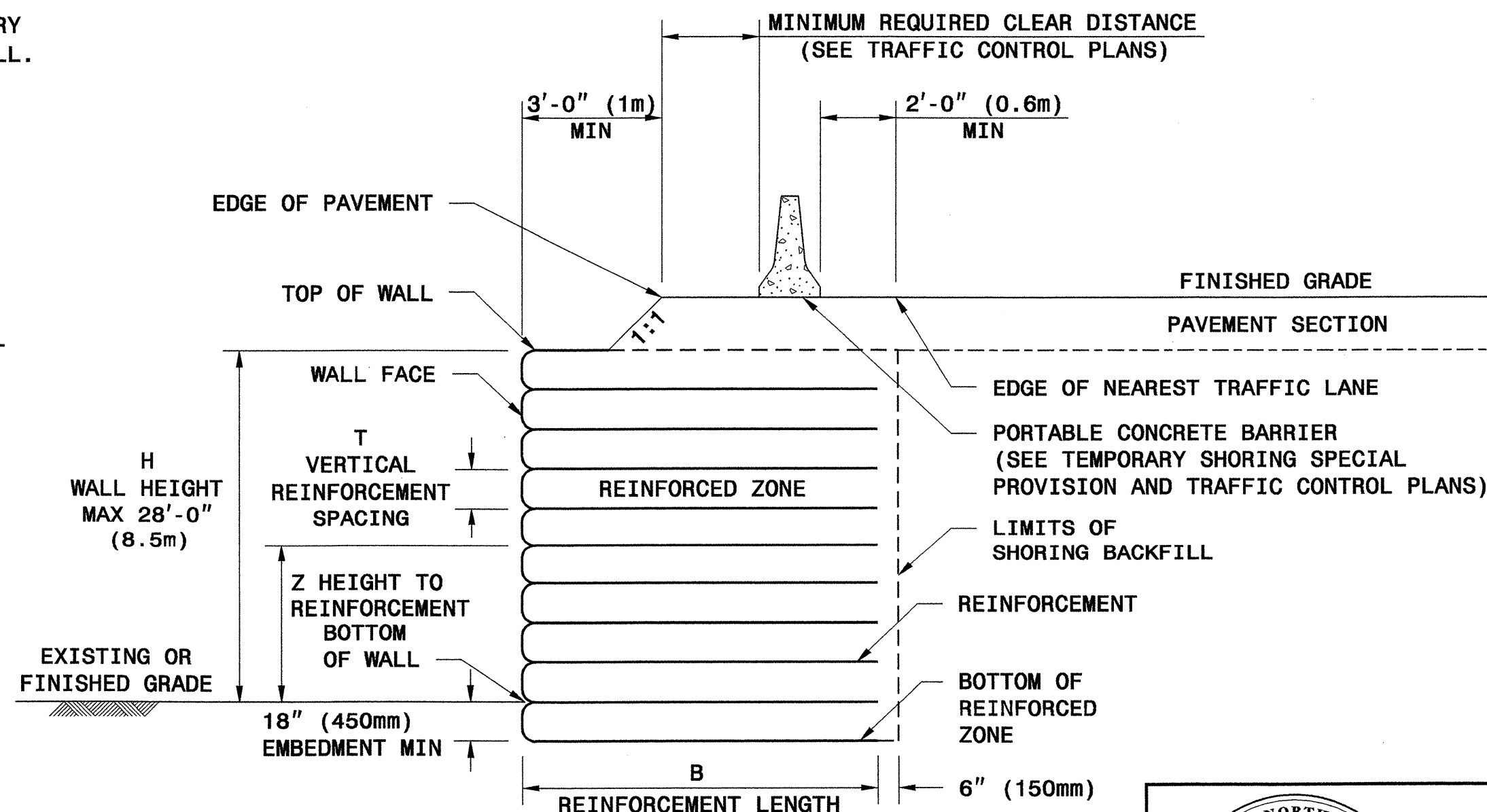
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm AND 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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

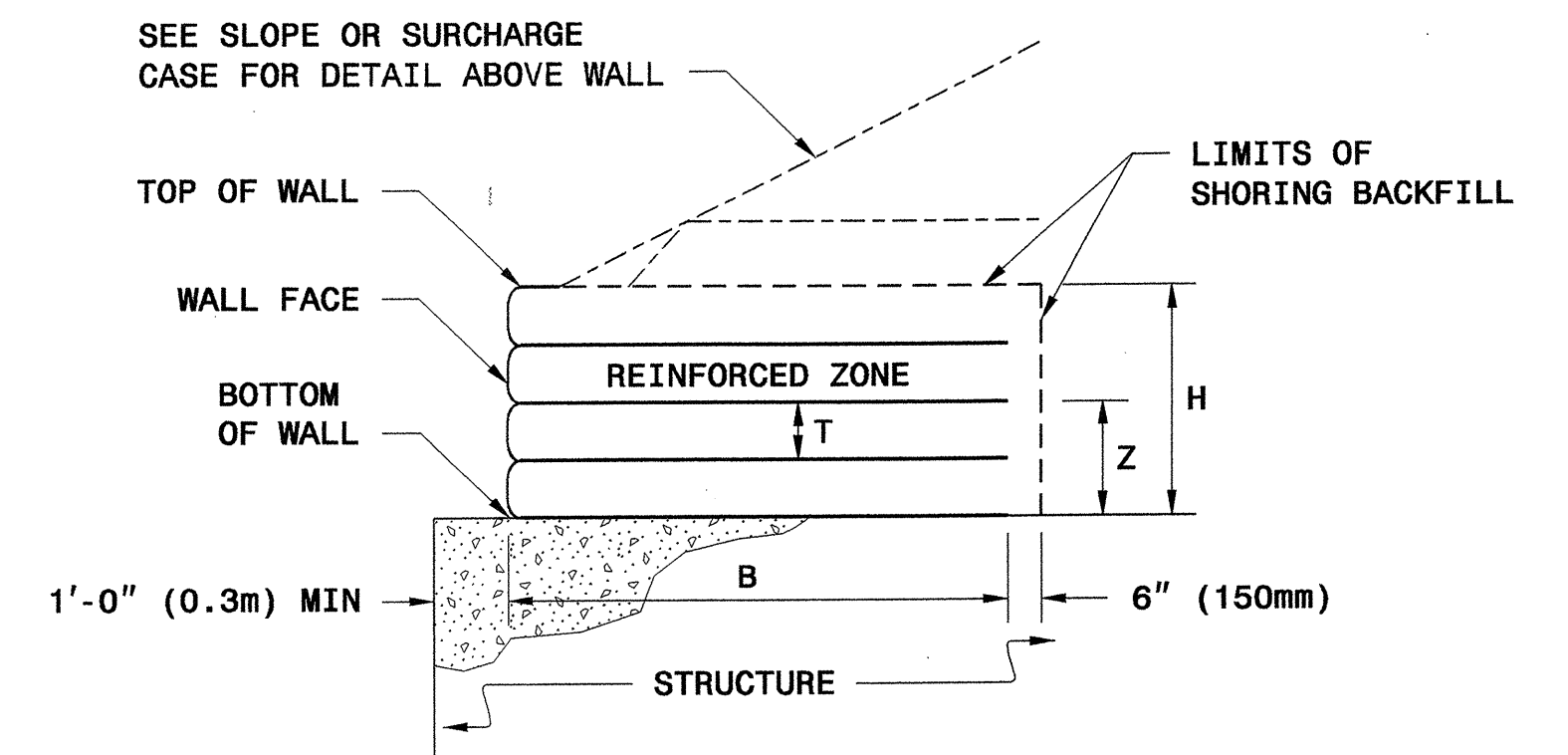
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



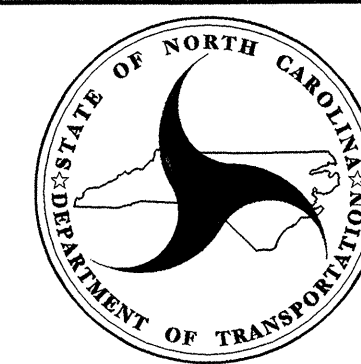
SLOPE CASE



SURCHARGE CASE



TEMPORARY MSE WALL ON STRUCTURE



GEOTECHNICAL ENGINEERING UNIT
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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

GEOTECHNICAL ENGINEER ENGINEER



Scott A. Shidden 3/29/07
SIGNATURE DATE

HOW TO USE THIS SHEET:

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

MINIMUM REQUIRED REINFORCEMENT LENGTH B (FT)

(FOR ALL WALL OPTIONS)

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

TERRATREL TEMPORARY WALL (STRIPS PER LEVEL PER PANEL)

		H (FT)														
		<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28		
															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	4
															11 - 10	4
															10 - 2	5
															8 - 6	5
															6 - 10	5
															5 - 2	5
															3 - 6	5
															1 - 10	5
															0 - 2	5
															-0 - 8	5
SLOPE AND SURCHARGE CASES															Z (FT-INCHES)	

SIERRASCAPE TEMPORARY WALL (GEOGRID TYPE)

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

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

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

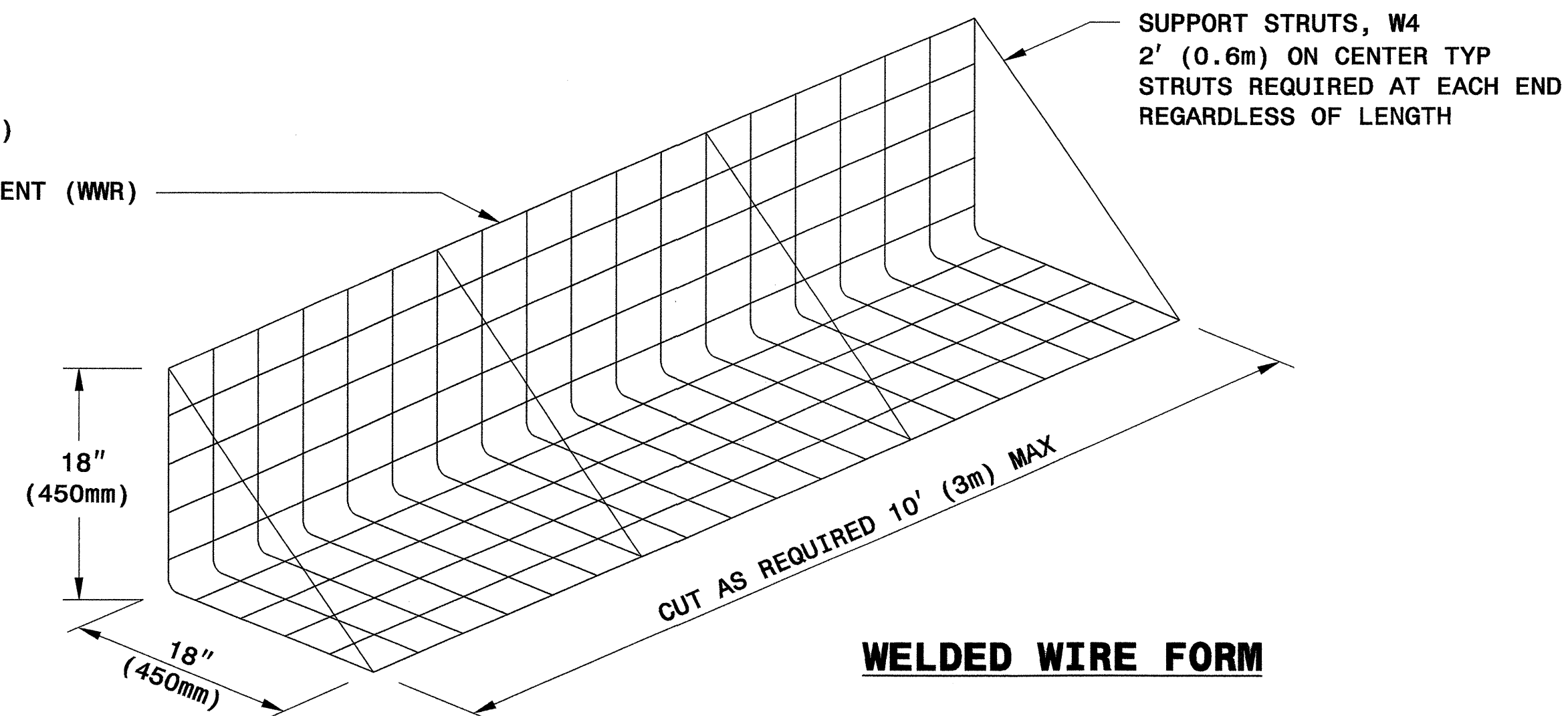
STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

SHEET 2 OF 11 DATE: 2-20-07

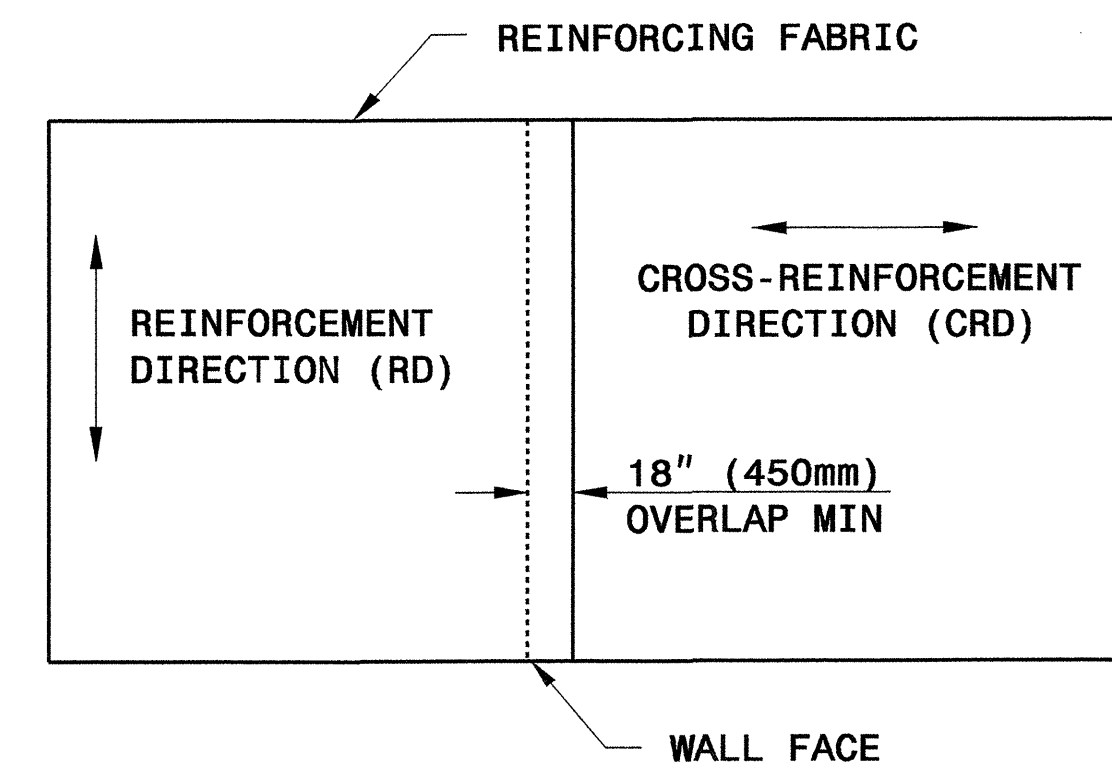


Signature: *Scott A. Shidden* 3/29/07
 DATE: _____
 SIGNATURE: _____ DATE: _____

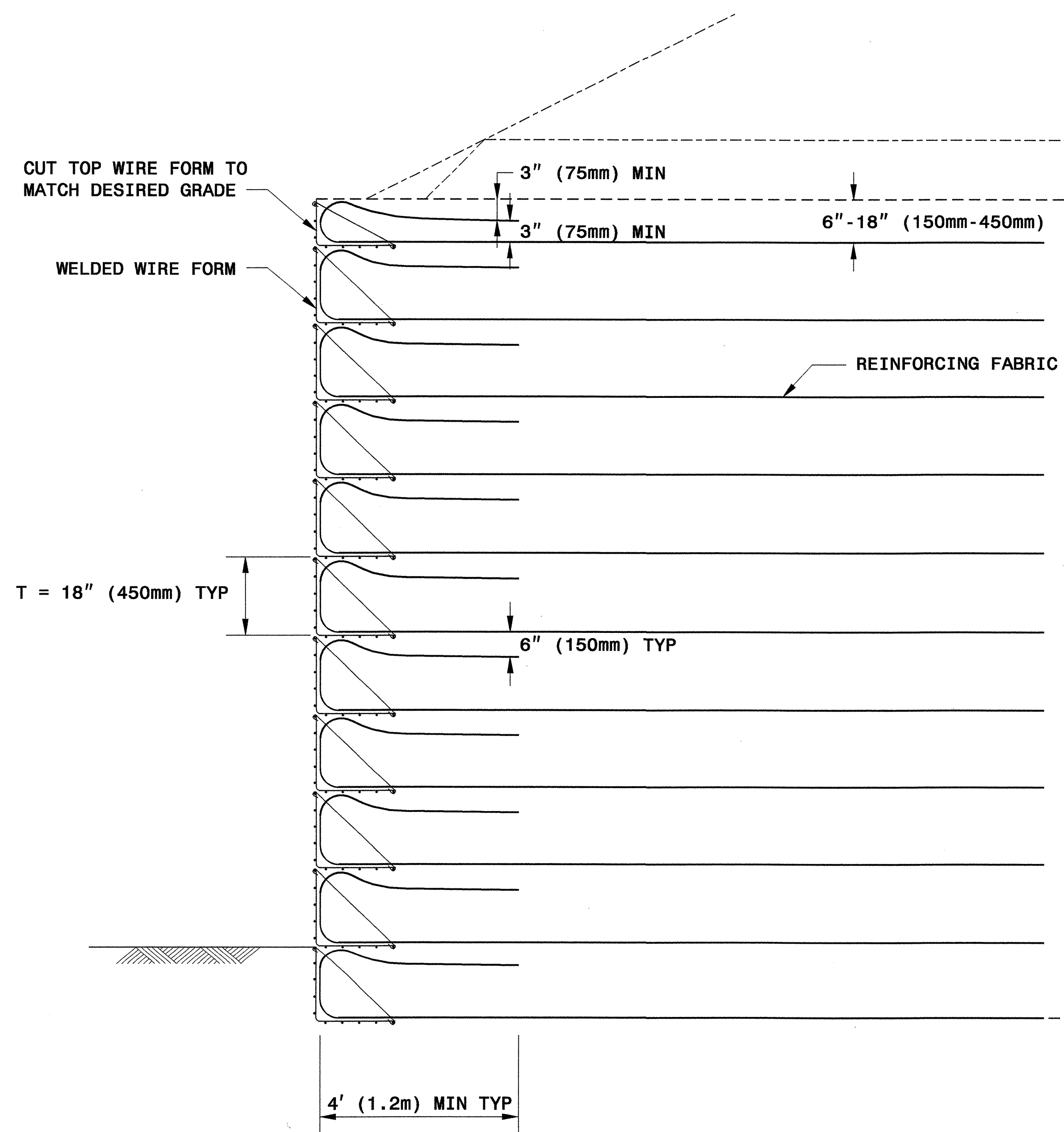
4" X 4" (102mm X 102mm)
 W4 X W4 (MW26 X MW26)
 WELDED WIRE REINFORCEMENT (WWR)



WELDED WIRE FORM



PLAN VIEW OF FABRIC OVERLAP

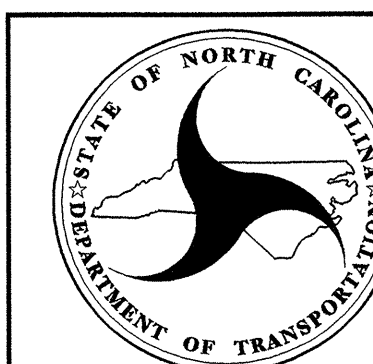


TYPICAL SECTION

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

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

*RD = REINFORCEMENT DIRECTION



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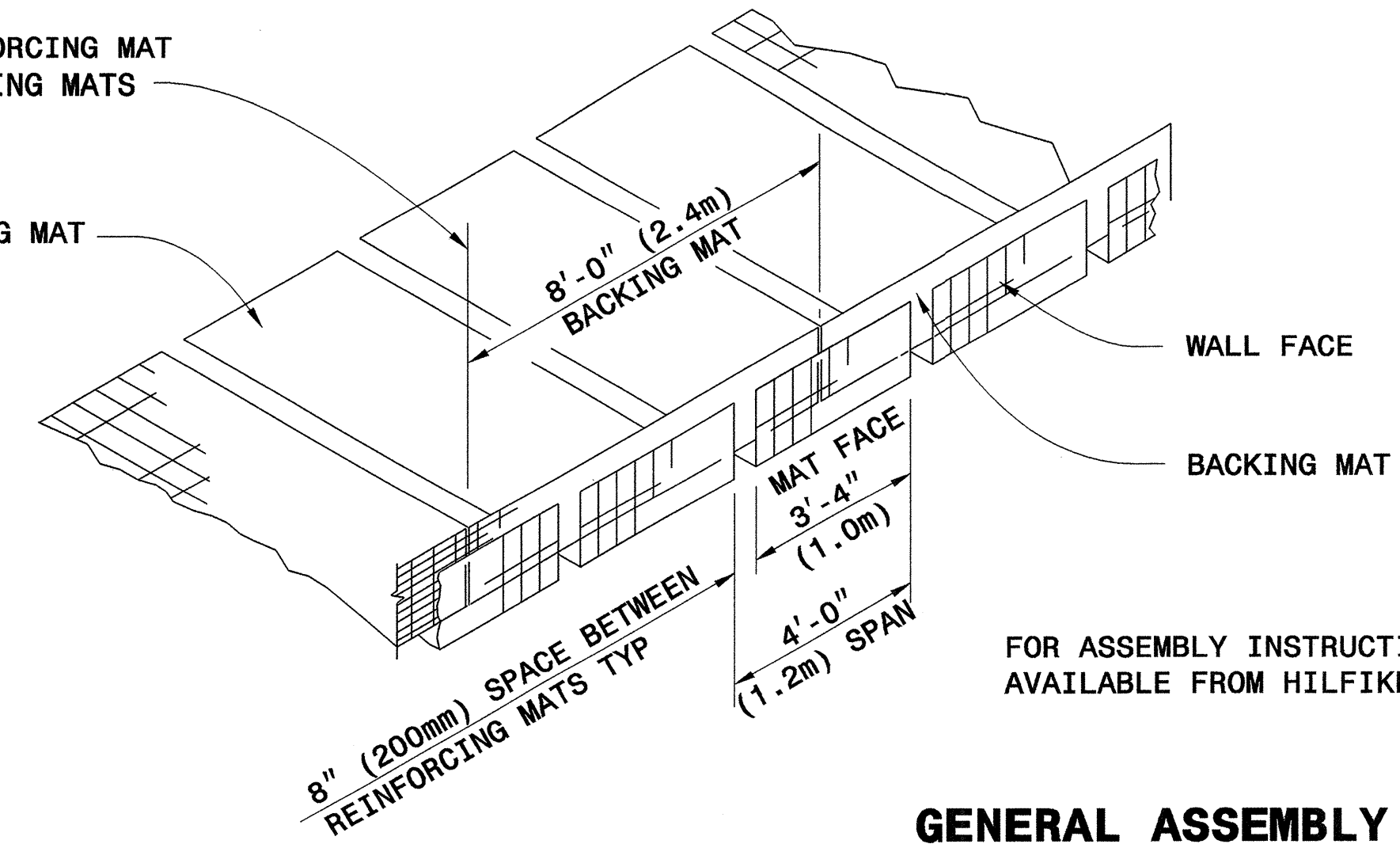
TEMPORARY FABRIC WALL



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

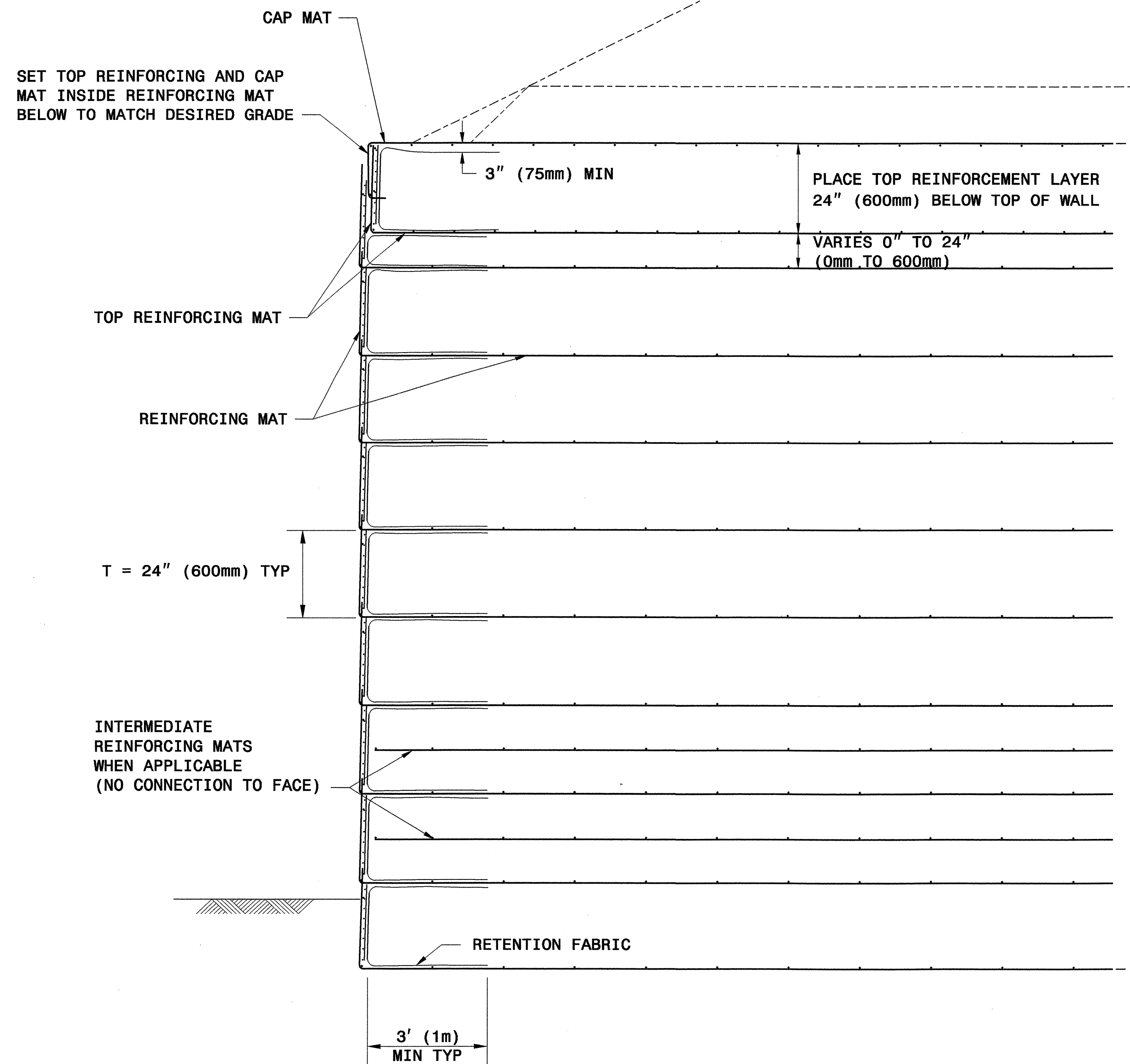
CENTERLINE OF REINFORCING MAT
 FACE = EDGE OF BACKING MATS

REINFORCING MAT



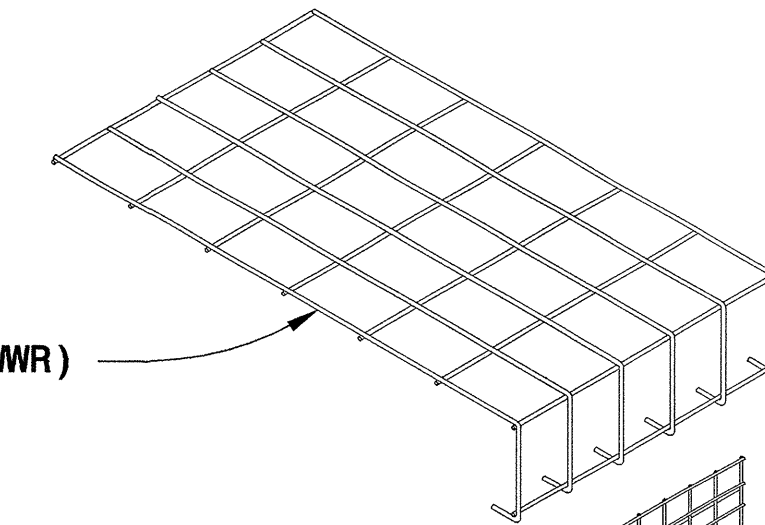
FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

GENERAL ASSEMBLY DETAIL

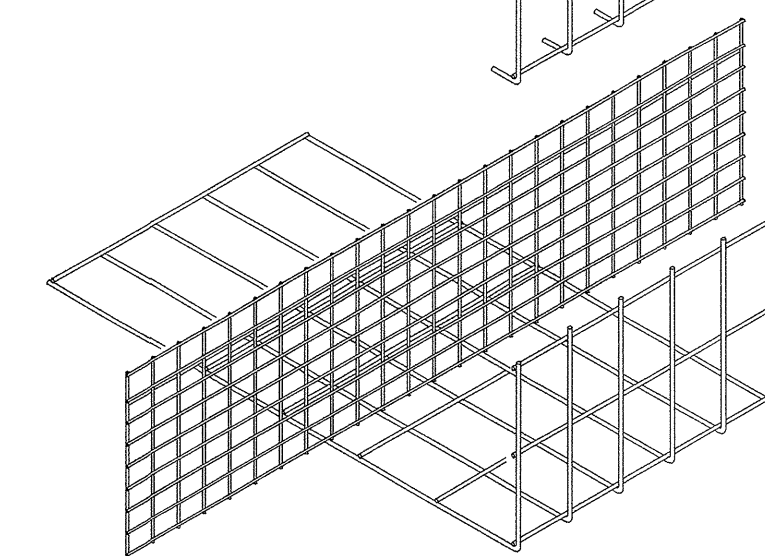


TYPICAL SECTION

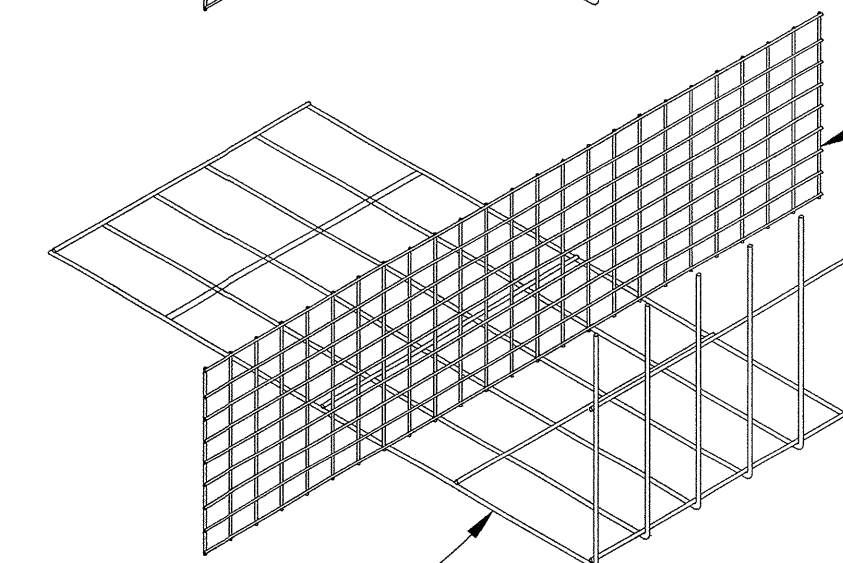
8" X 12" (203mm X 305mm)
 W4.5 X W3.5 (MW29 X MW23)
 CAP MAT
 WELDED WIRE REINFORCEMENT (WWR)



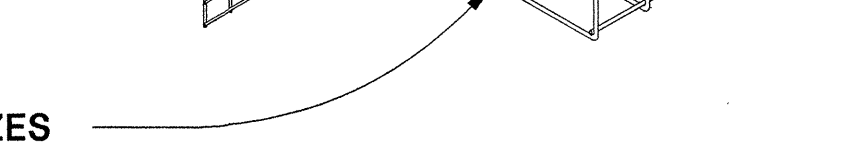
8" X 12" (203mm X 305mm)
 W4.5 X W3.5 (MW29 X MW23) WWR
 TOP REINFORCING MAT (NO PRONGS)



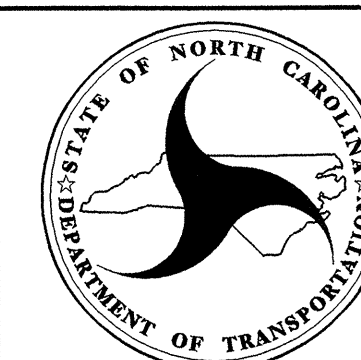
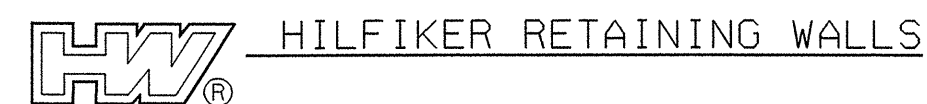
4" X 3" (102mm X 76mm)
 W5 X W2.5 (MW32 X MW16) WWR
 BACKING MAT
 8' (2.4m) WIDE



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



WALL COMPONENTS



GEOTECHNICAL ENGINEERING UNIT
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

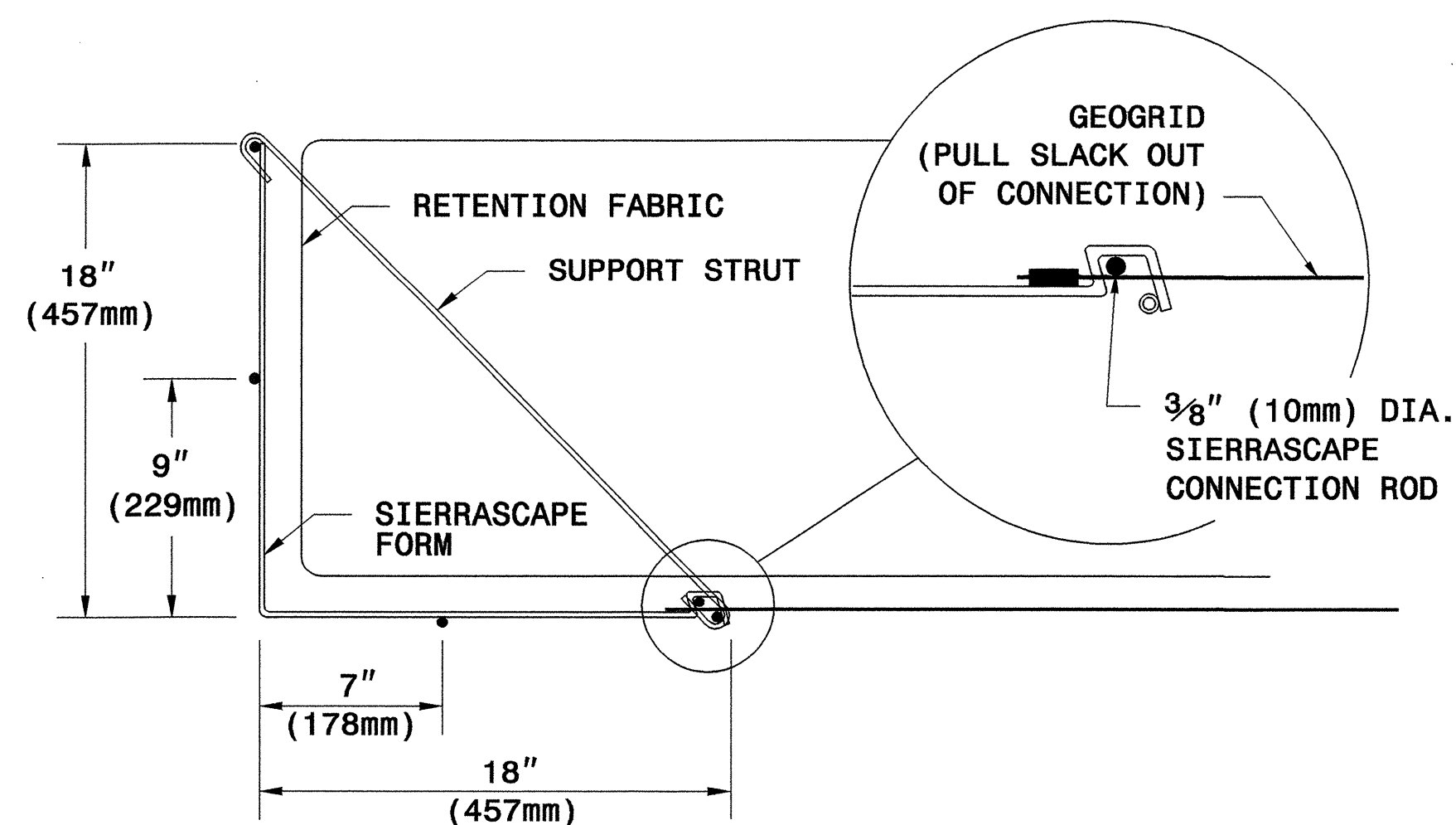
STANDARD DRAWING NO. 1801.02

HILFIKER TEMPORARY WALL

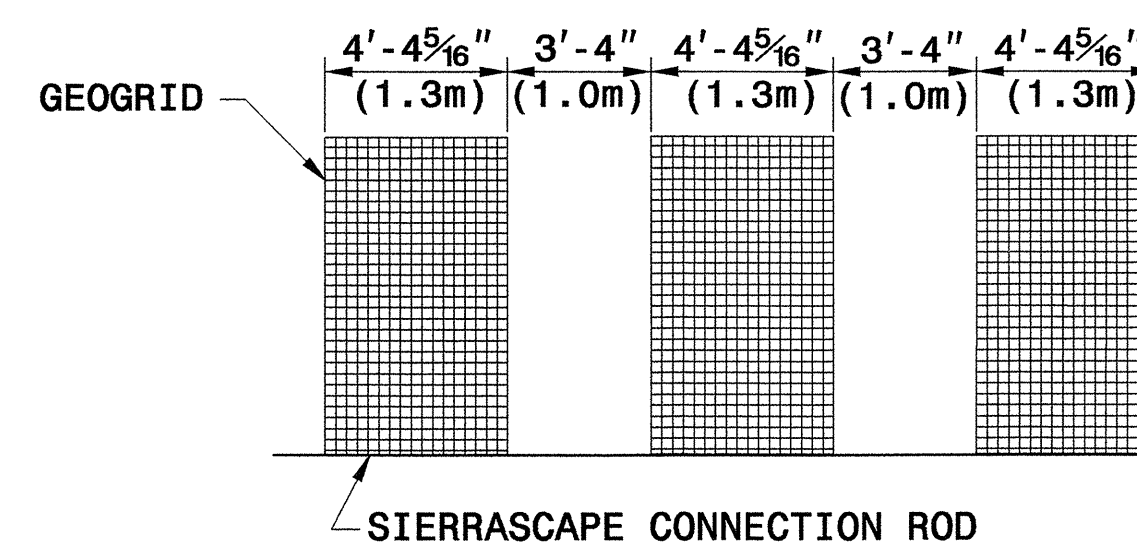
SHEET 4 OF 11 DATE: 12-19-06



Scott A. Hadden 3/29/07



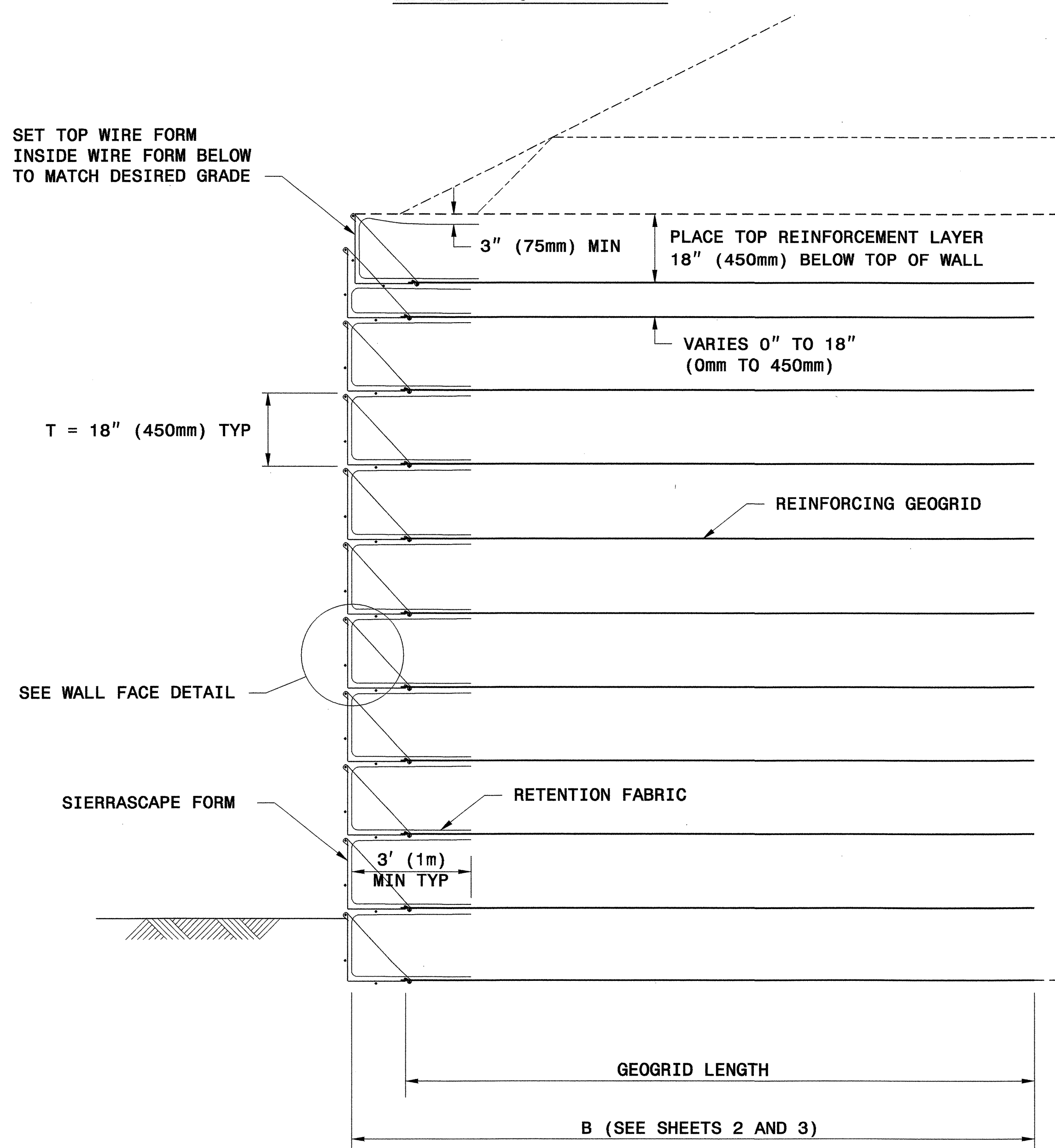
WALL FACE DETAIL



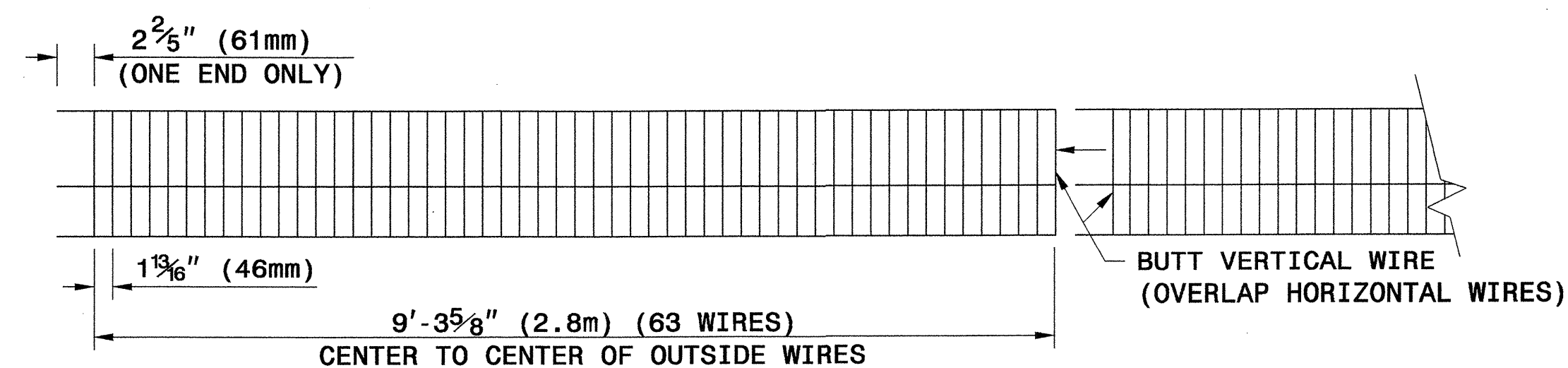
PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

TYPICAL GEOGRID COVERAGE

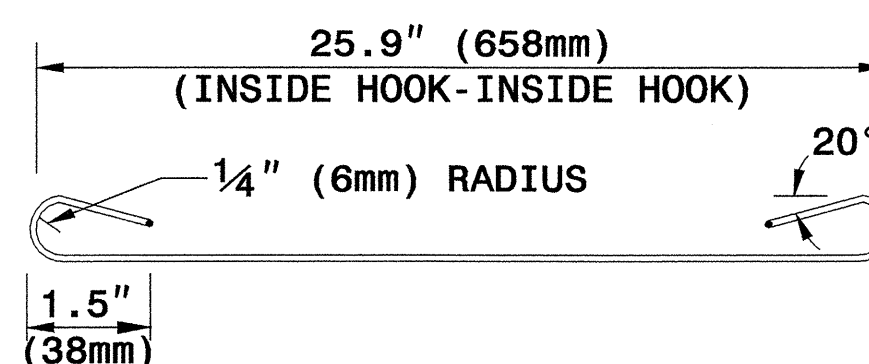
SET TOP WIRE FORM INSIDE WIRE FORM BELOW TO MATCH DESIRED GRADE



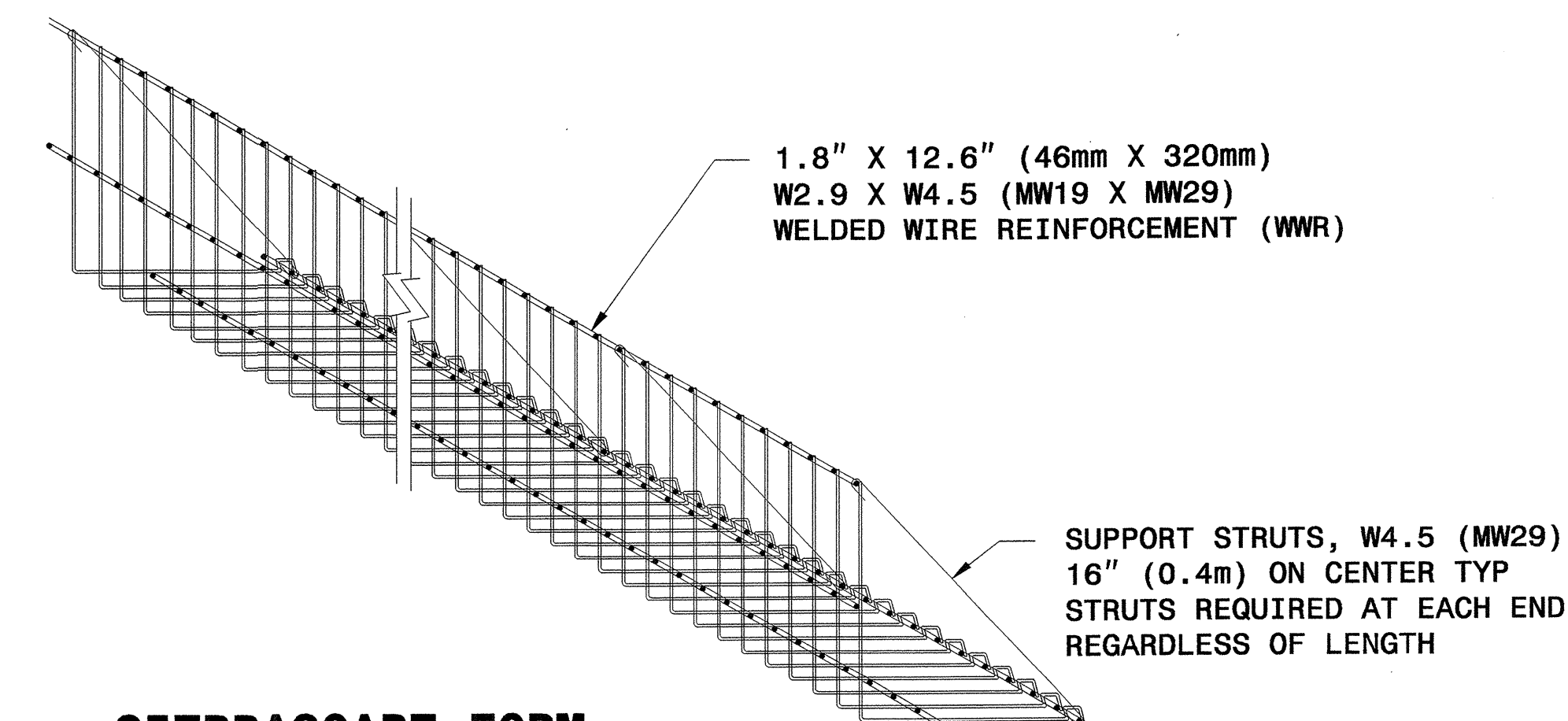
TYPICAL SECTION



ELEVATION VIEW

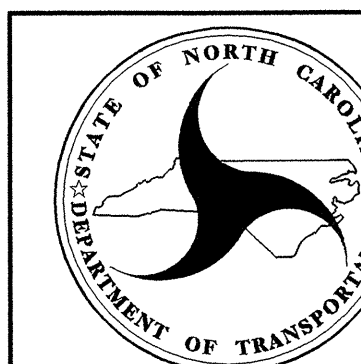
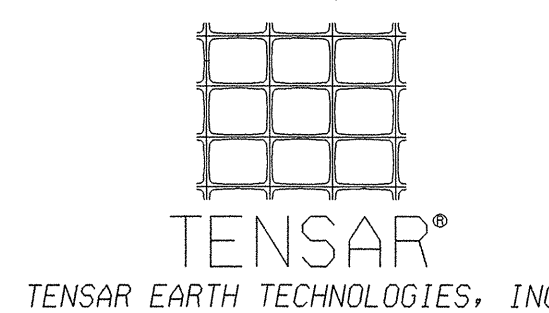


SUPPORT STRUT



SIERRASCAPE FORM

WALL COMPONENTS



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DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

SIERRASCAPE TEMPORARY WALL

SHEET 5 OF 11

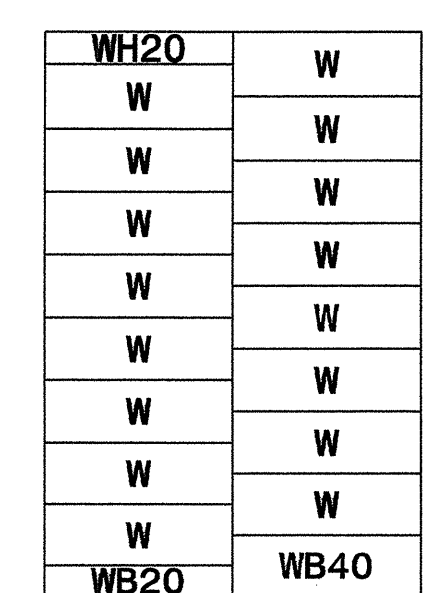
DATE: 12-19-06



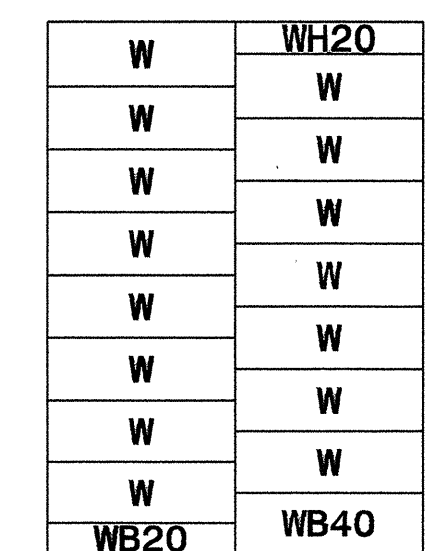
Signature: Scott A. Shidden
Date: 3/29/07

PANEL LAYOUTS

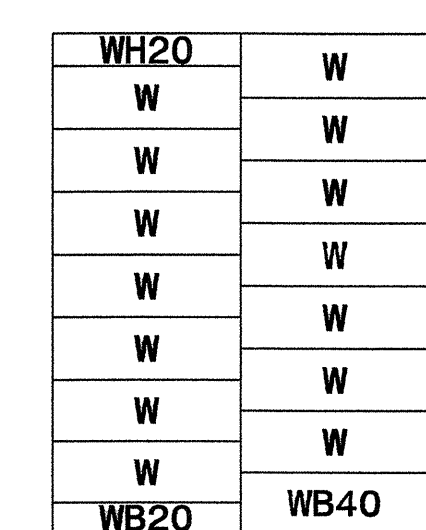
H - WALL HEIGHT
(FEET-INCHES)
(METER)



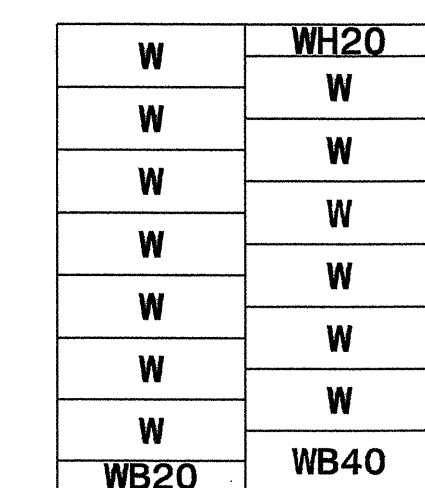
< 28 - 0
< 8.5



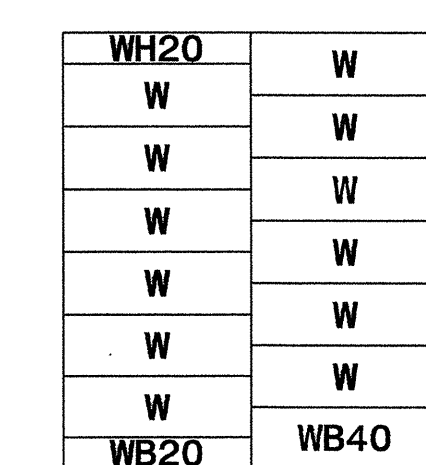
< 27 - 0
< 8.2



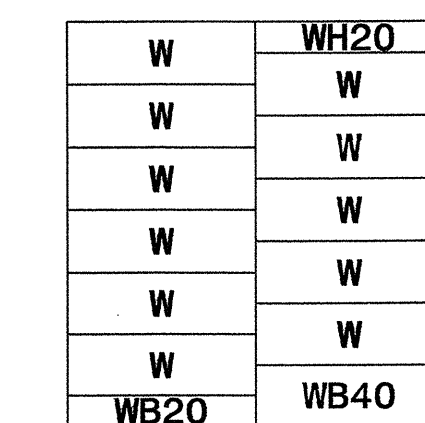
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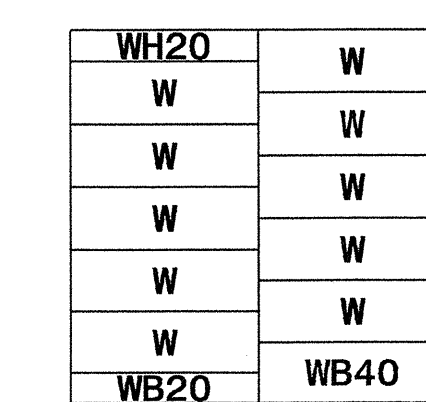
< 23 - 8
< 7.2



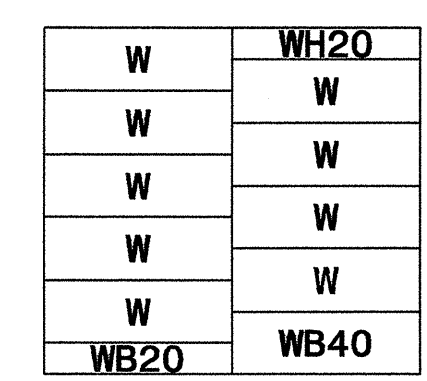
< 22 - 0
< 6.7



< 20 - 4
< 6.2

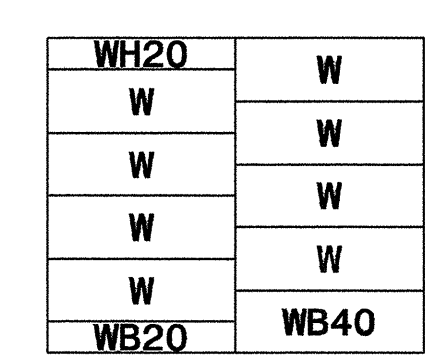


< 18 - 8
< 5.7

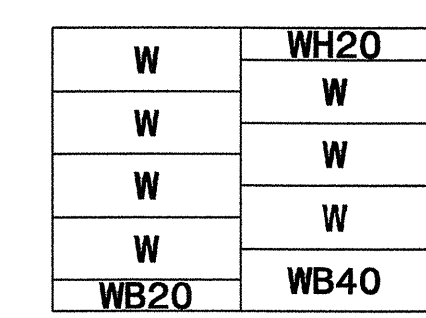


(FEET-INCHES)
(METER)

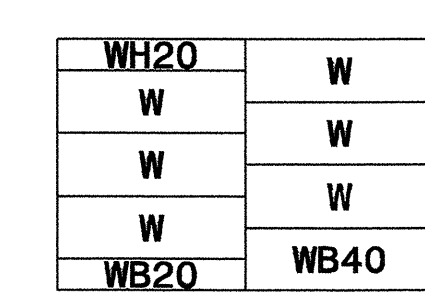
< 17 - 0
< 5.2



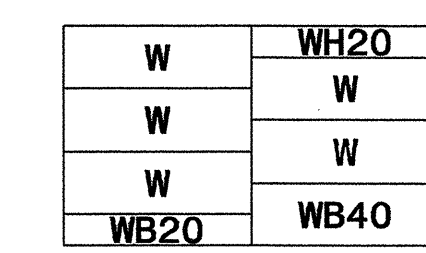
< 15 - 4
< 4.7



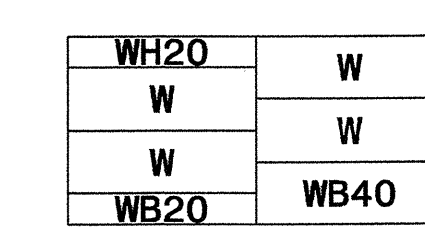
< 13 - 8
< 4.2



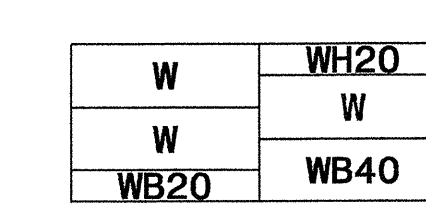
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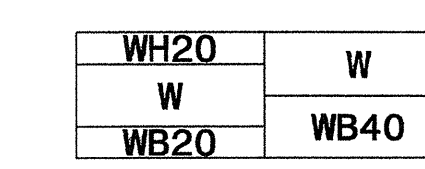
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< 3.2



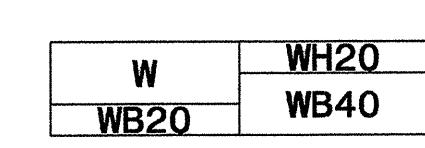
< 8 - 8
< 2.6



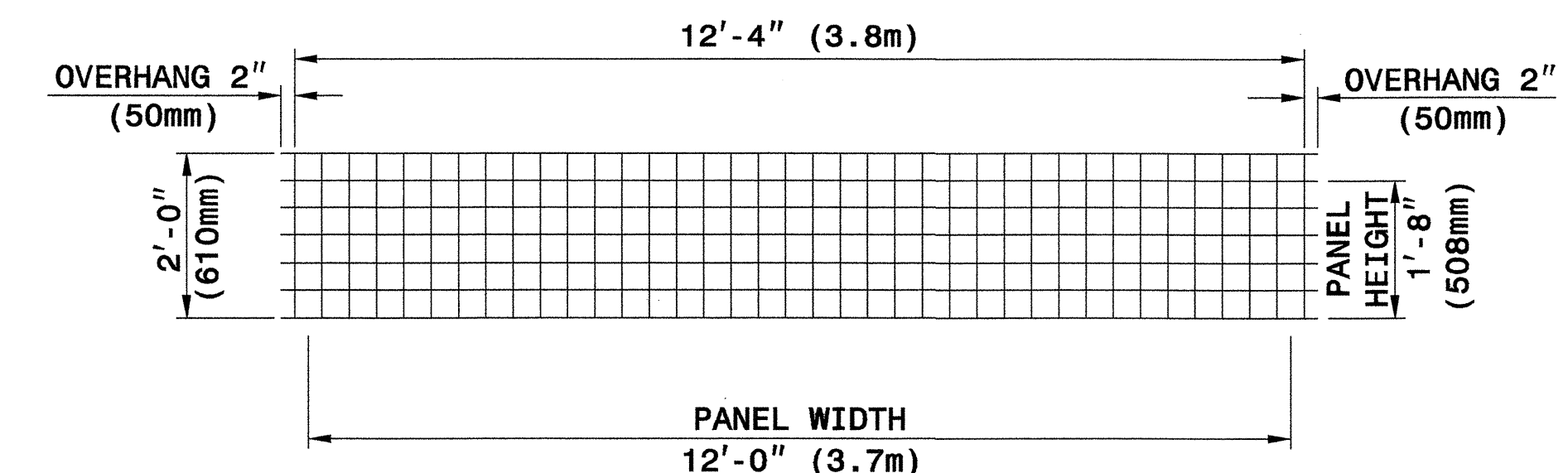
< 7 - 0
< 2.1



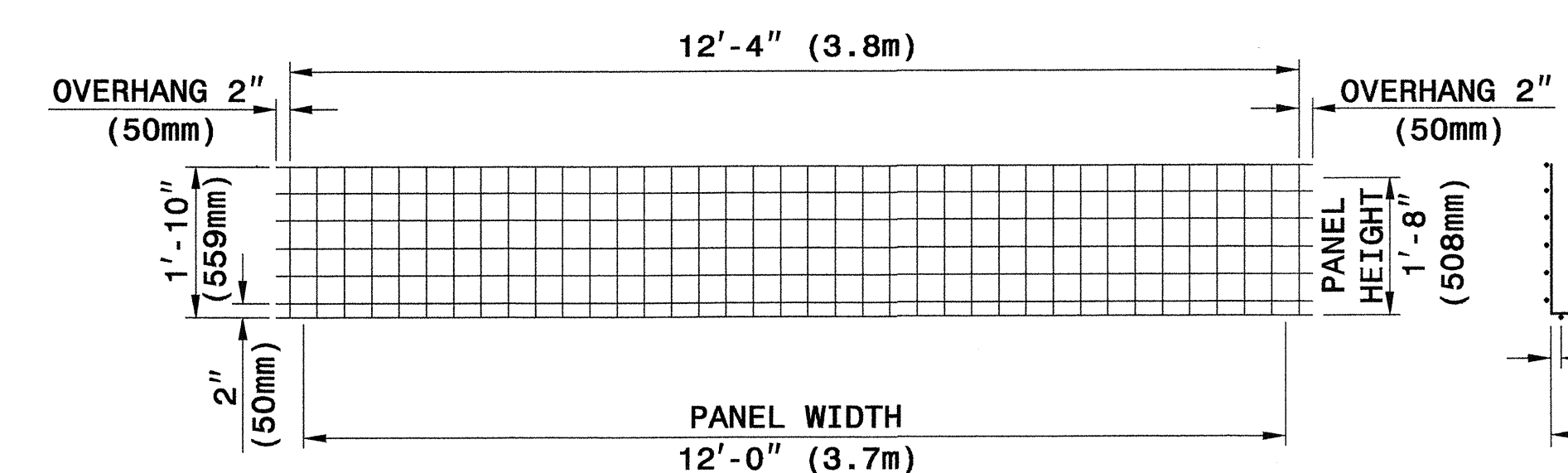
< 5 - 4
< 1.6



< 3 - 8
< 1.1

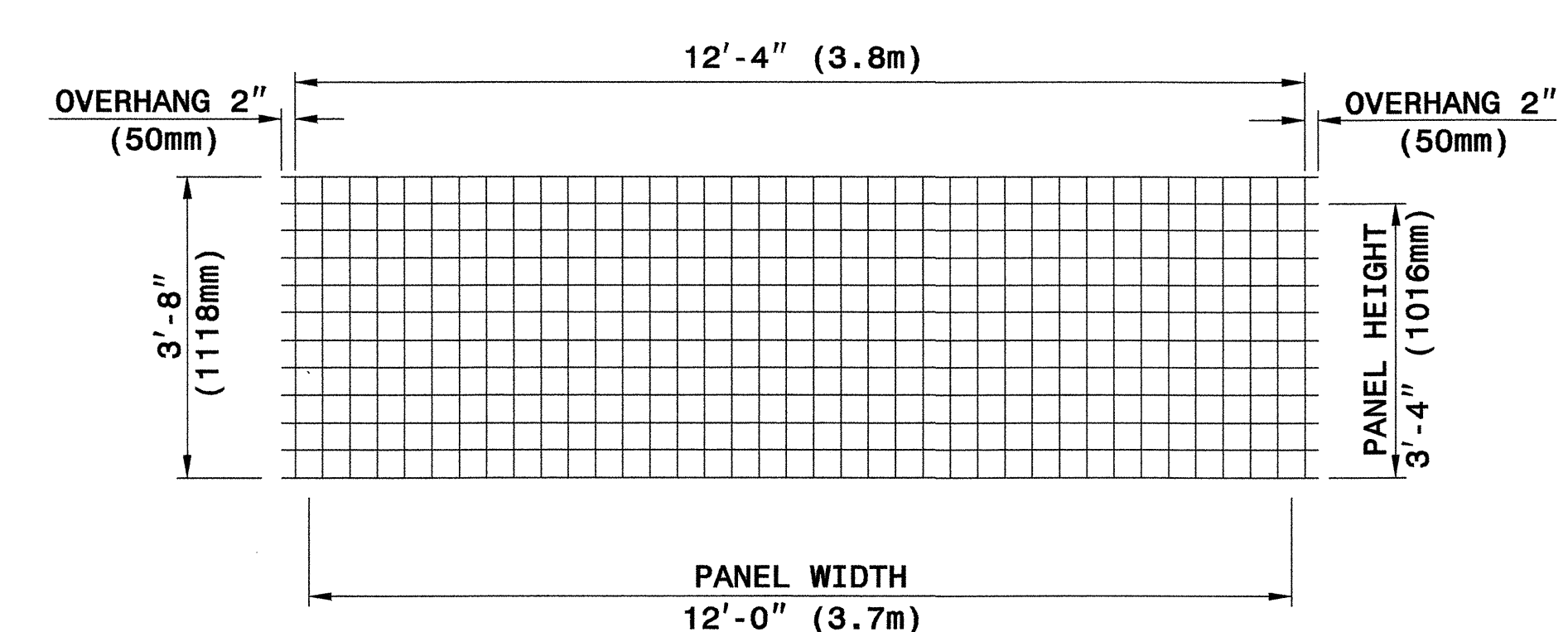


TYPE WH20

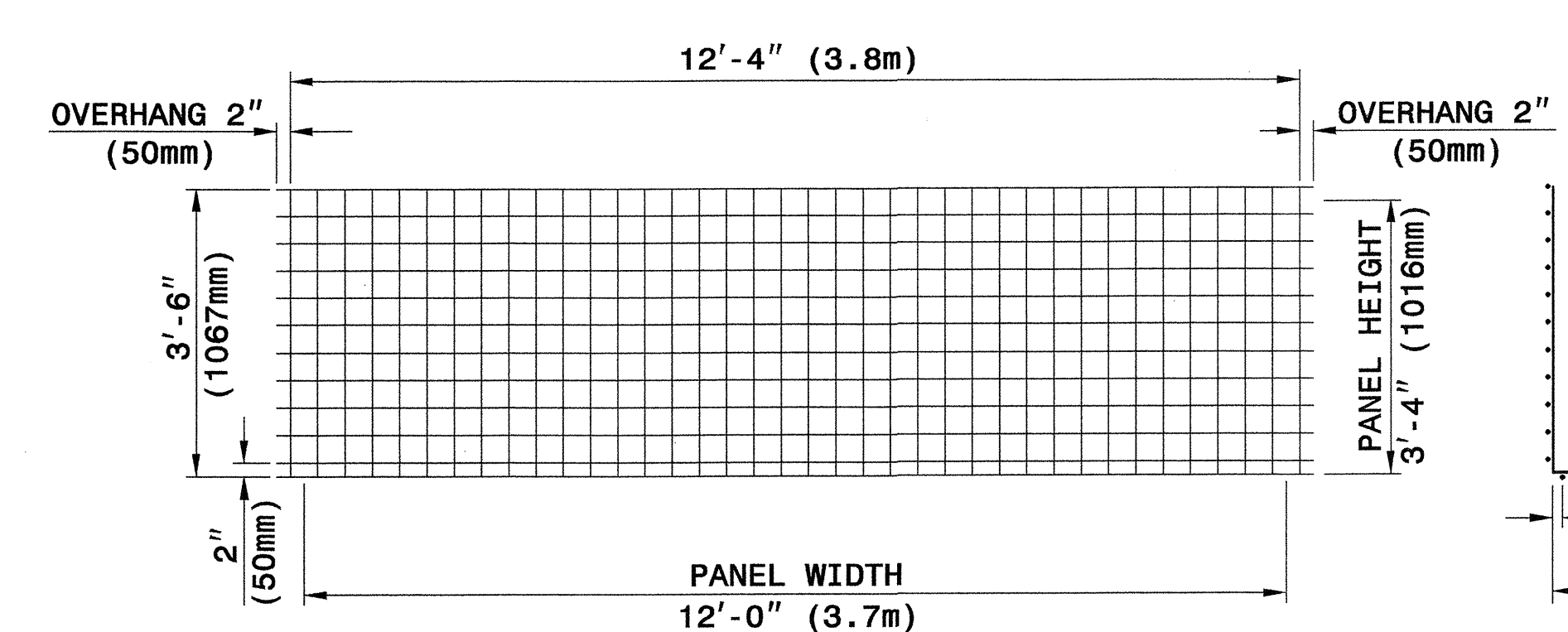


TYPE WB20

SECTION



TYPE W



TYPE WB40

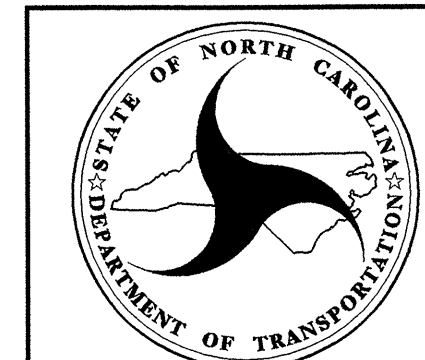
SECTION

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)



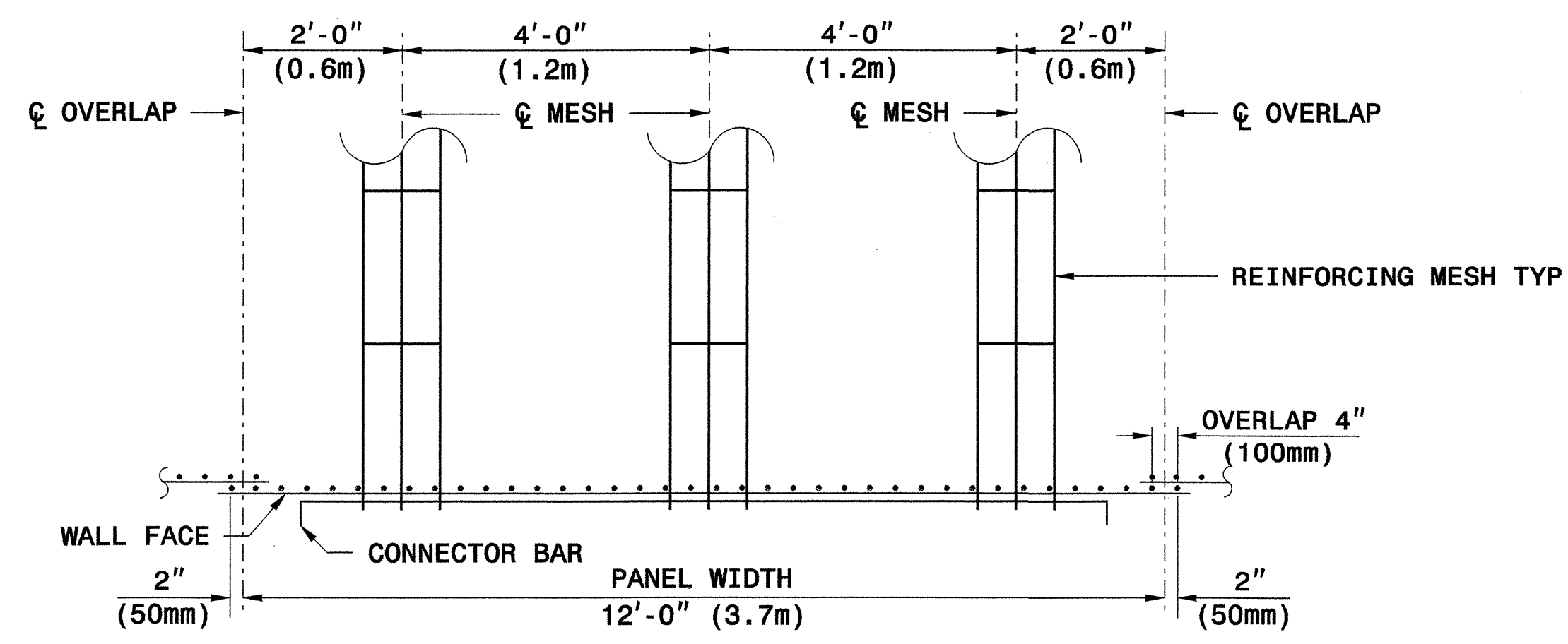
GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL



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



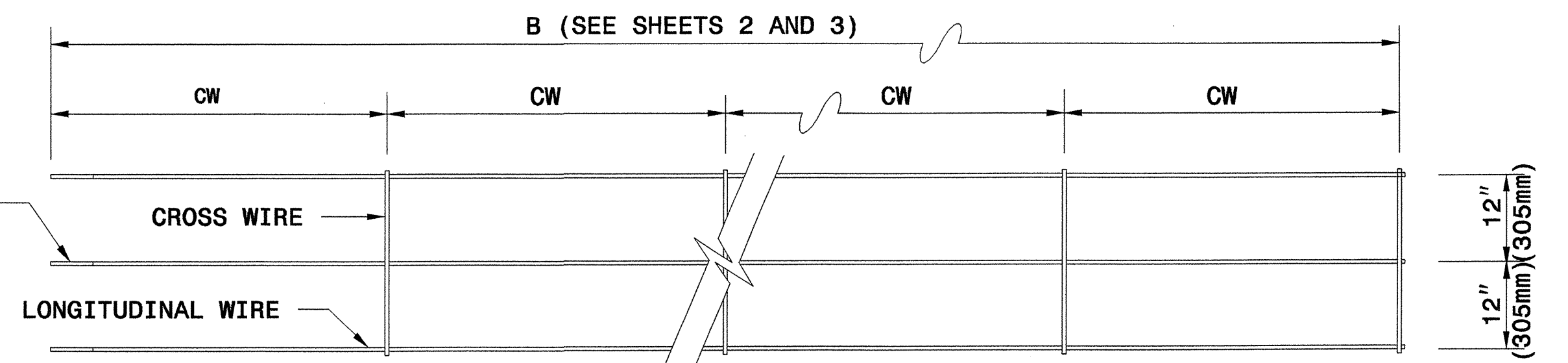
**REINFORCING MESH PLACEMENT DETAIL
(PLAN VIEW)**



1/2" (13mm) DIA. BAR

CONNECTOR BAR

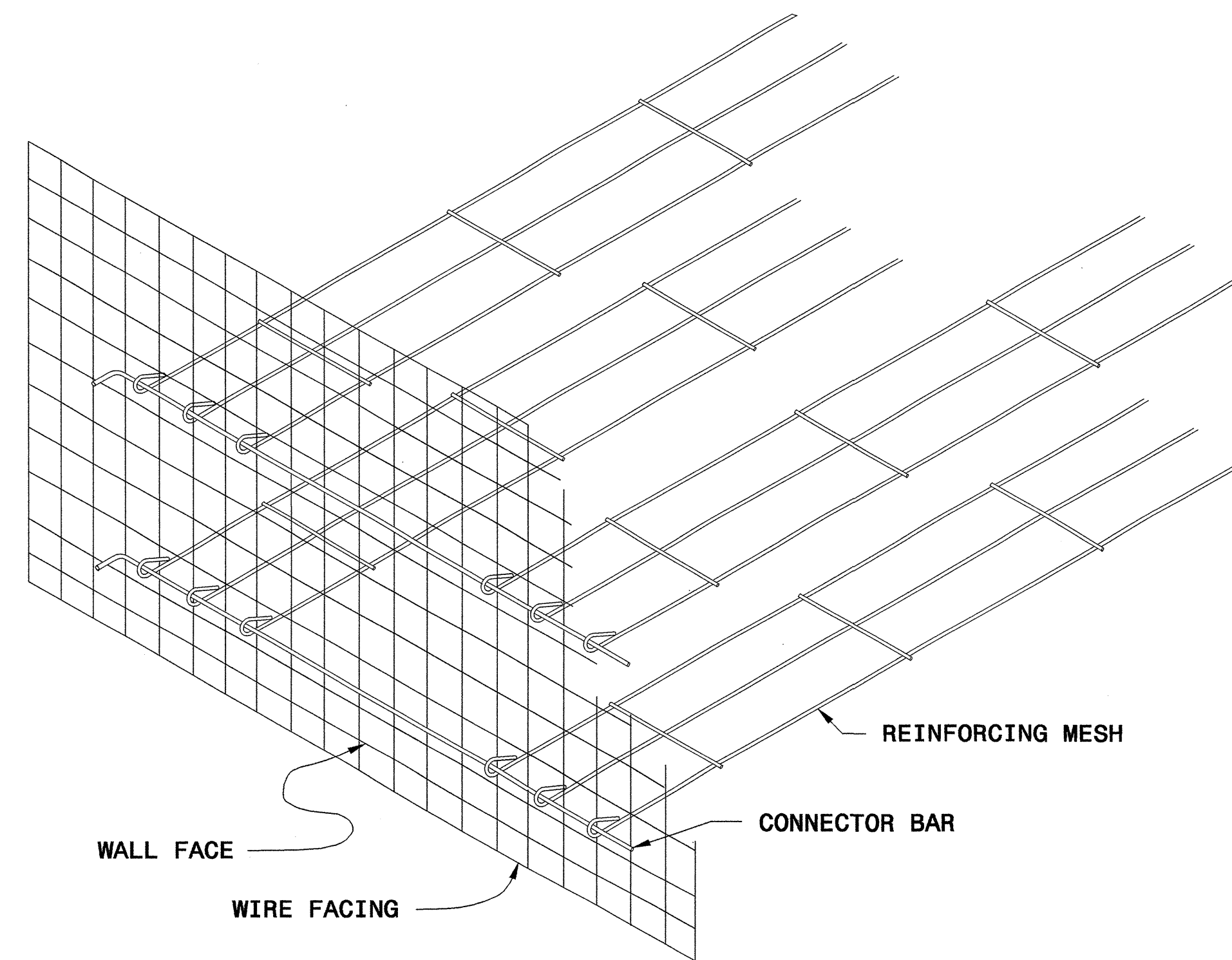
LOOPEd END OF MESH
(SEE REINFORCING MESH LOOP DETAIL)



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

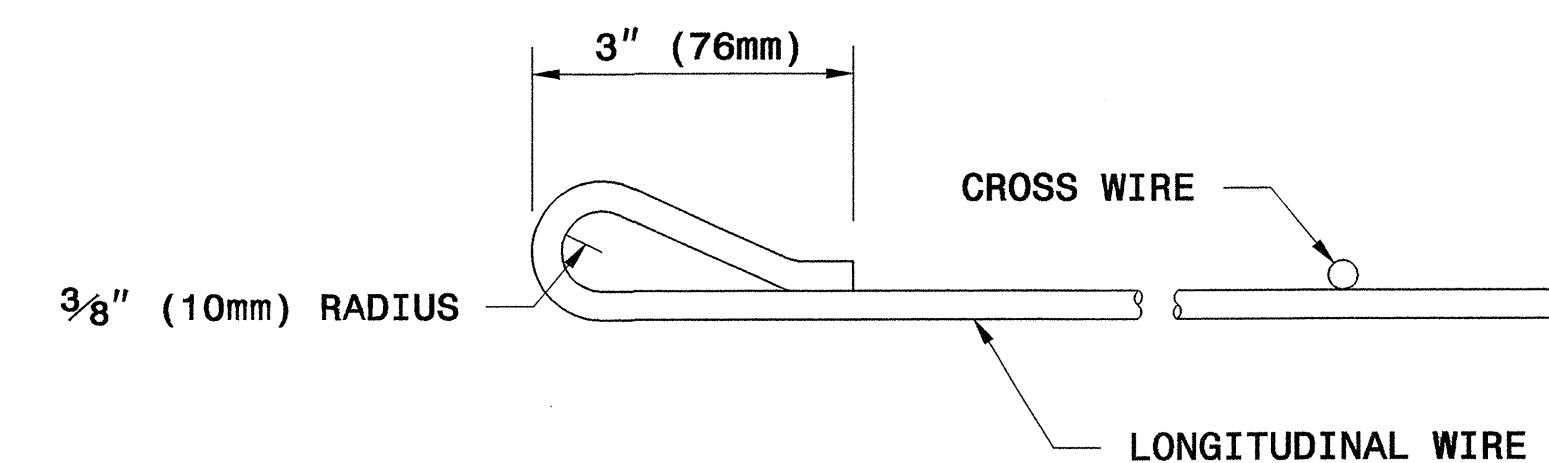
3W8 X W8 x 2.0' (3MW52 X MW52 X 610mm)
 NO. OF LONGITUDINAL WIRES
 GAUGE OF LONGITUDINAL WIRES
 GAUGE OF CROSS WIRES
 SPACING OF CROSS WIRES IN FT (mm), CW

REINFORCING MESH DESIGNATION

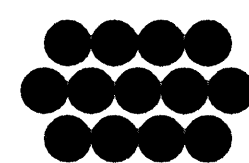


GENERAL ASSEMBLY DETAIL

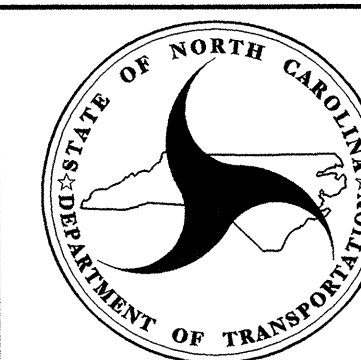
REINFORCING MESH



REINFORCING MESH LOOP DETAIL



The Reinforced Earth Company



GEOTECHNICAL ENGINEERING UNIT

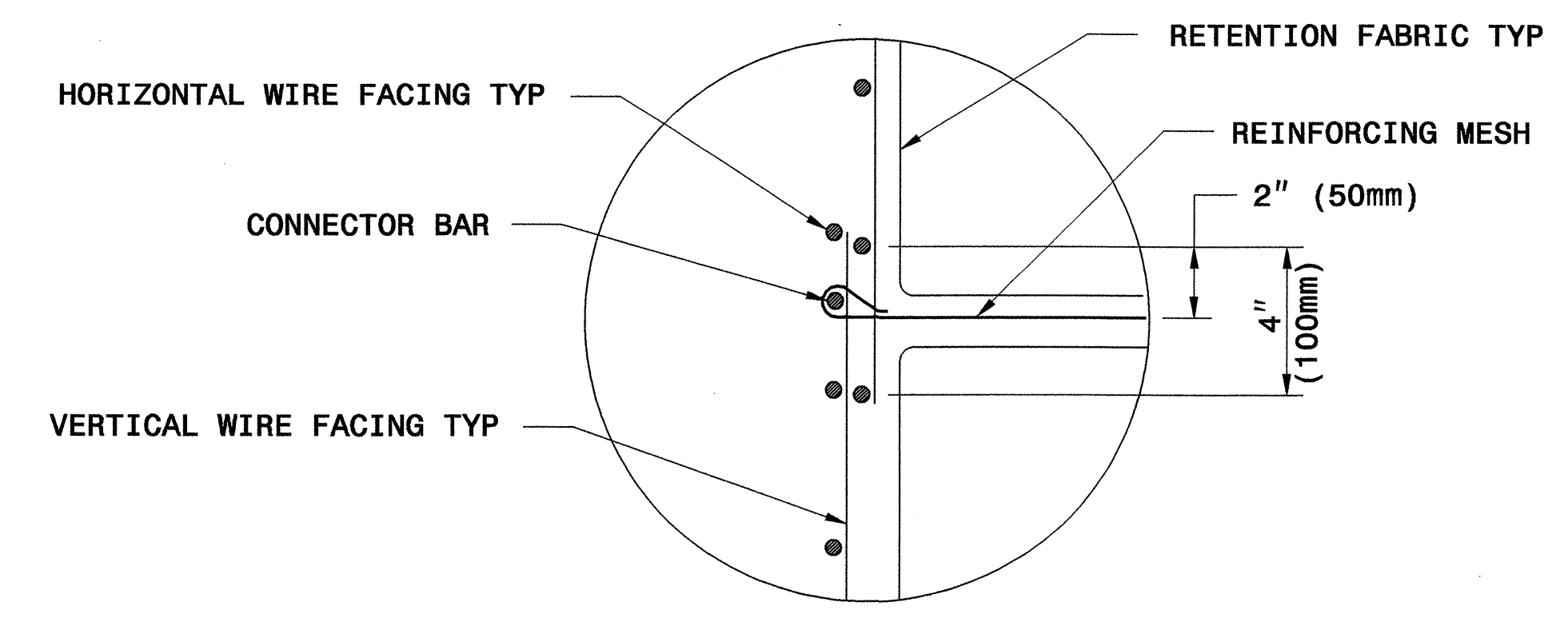
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD DRAWING NO. 1801.02

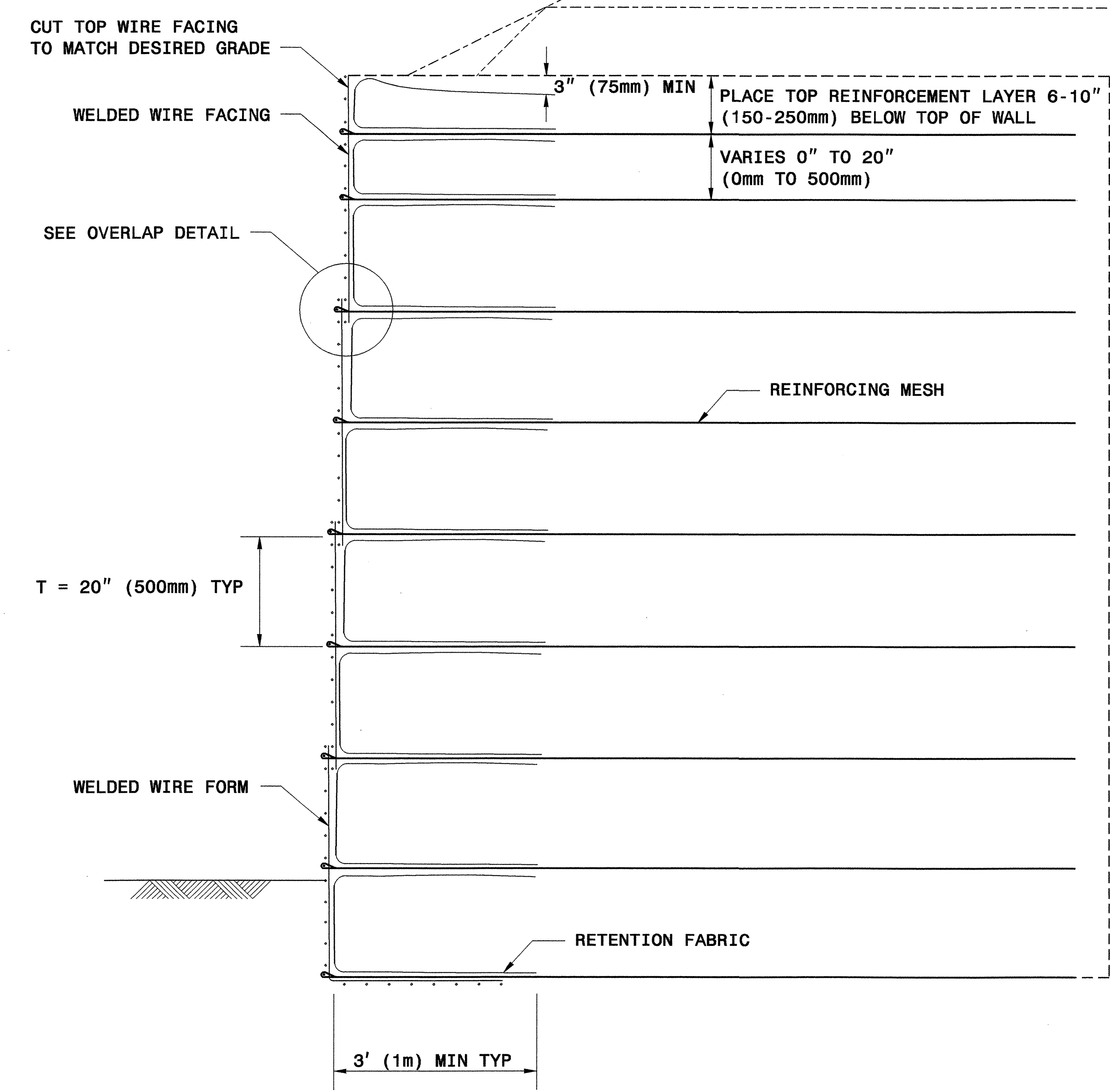
RETAINED EARTH
 TEMPORARY WALL

SHEET 7 OF 11

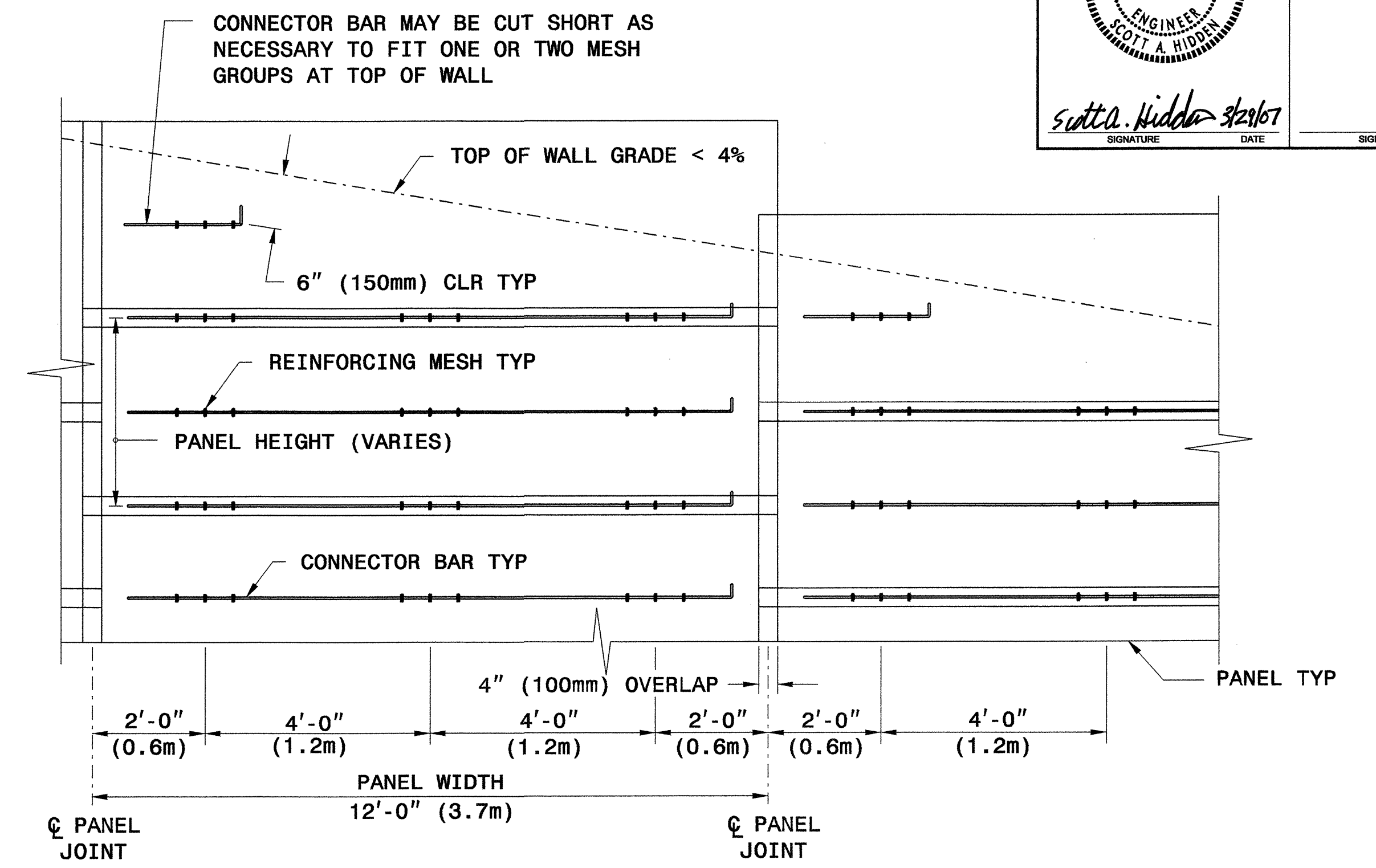
DATE: 12-19-06



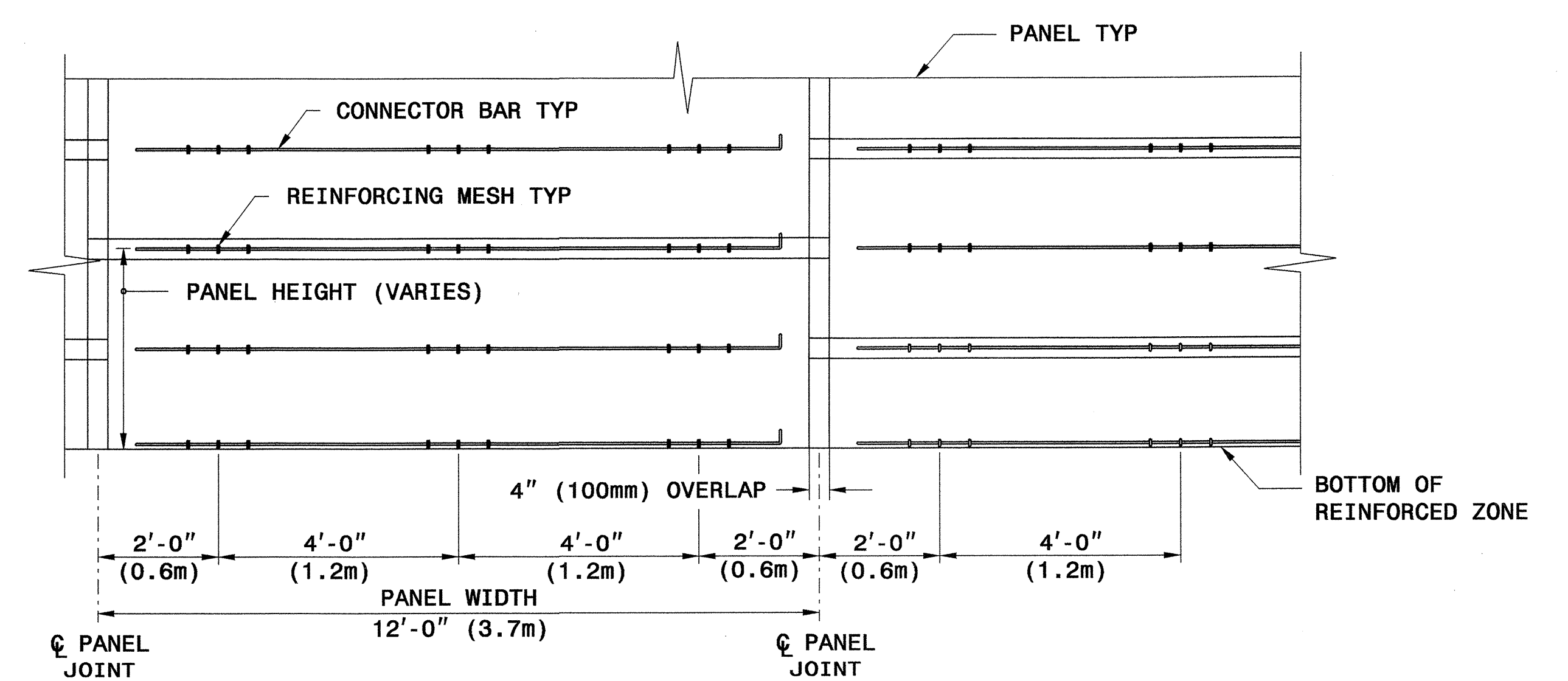
OVERLAP DETAIL



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**

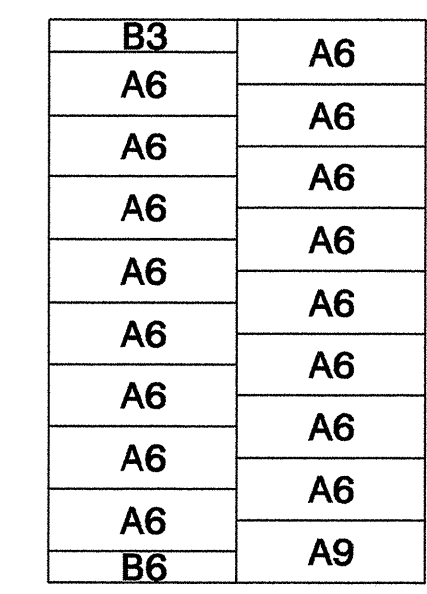
C221427 3/29/2007 std no 1801 shidden GE-Oce34bond



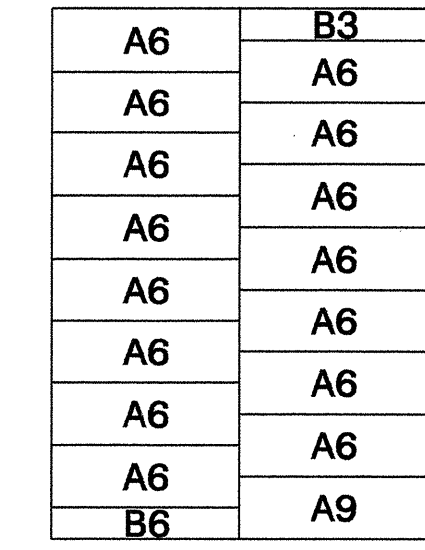
Scott A. Hadden
SIGNATURE DATE

PANEL LAYOUTS

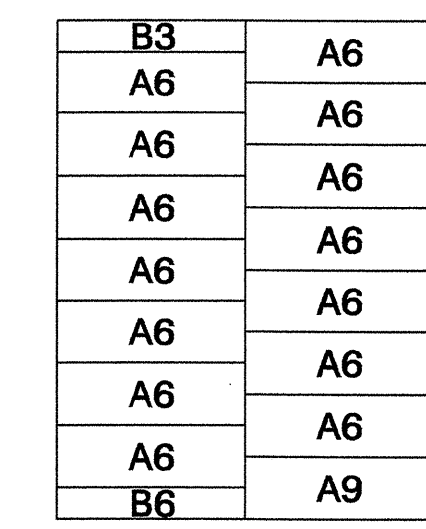
H - WALL HEIGHT
(FEET - INCHES)
(METER)



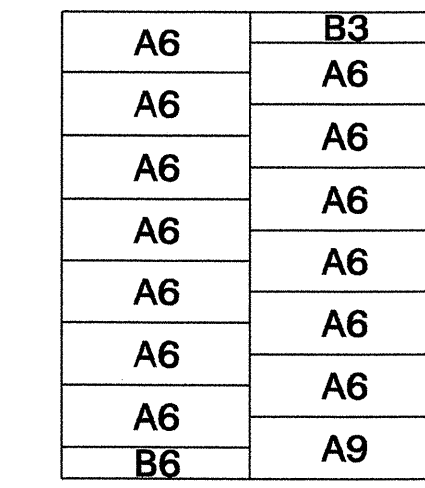
< 28 - 0
< 8.5



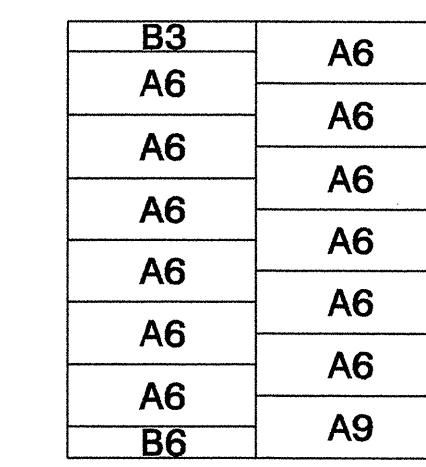
< 27 - 8
< 8.4



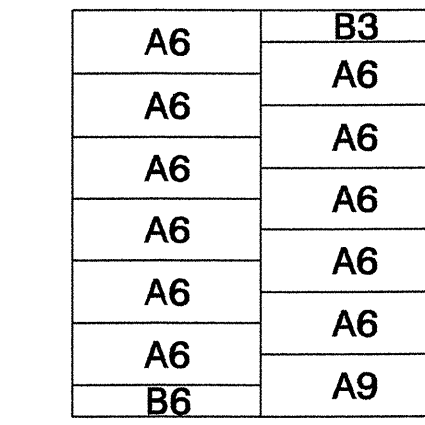
< 26 - 0
< 7.9



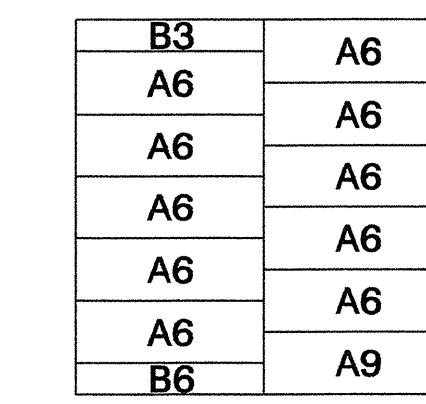
< 24 - 4
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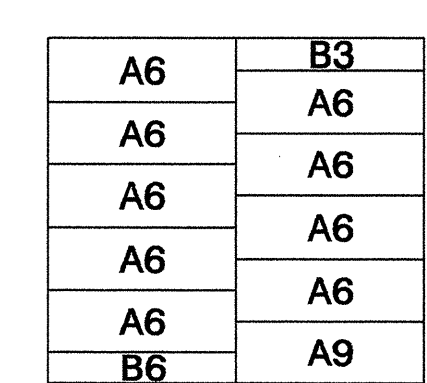
< 22 - 8
< 6.9



< 21 - 0
< 6.4

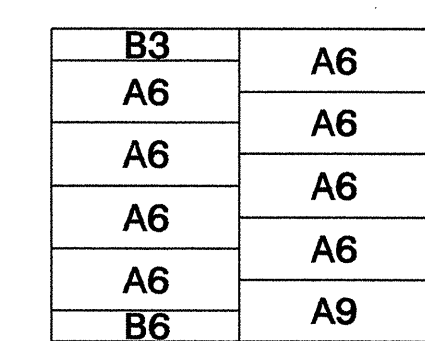


< 19 - 4
< 5.9

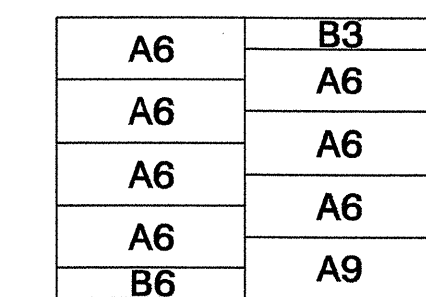


(FEET - INCHES)
(METER)

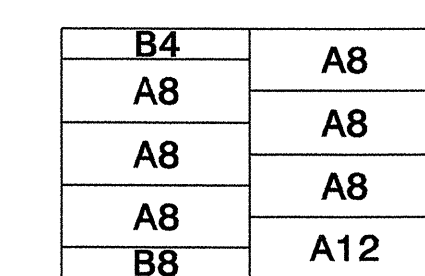
< 17 - 8
< 5.4



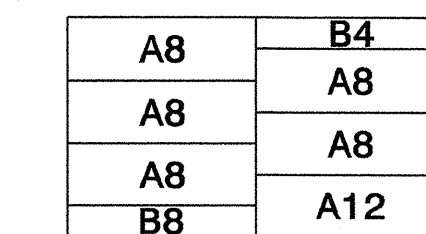
< 16 - 0
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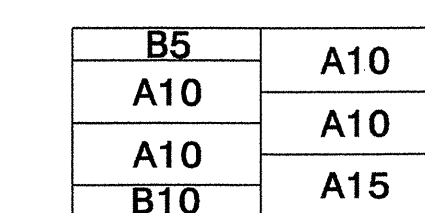
< 14 - 4
< 4.4



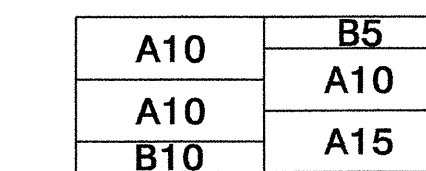
< 12 - 8
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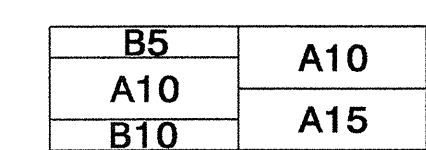
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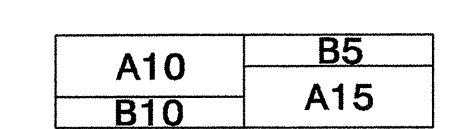
< 9 - 4
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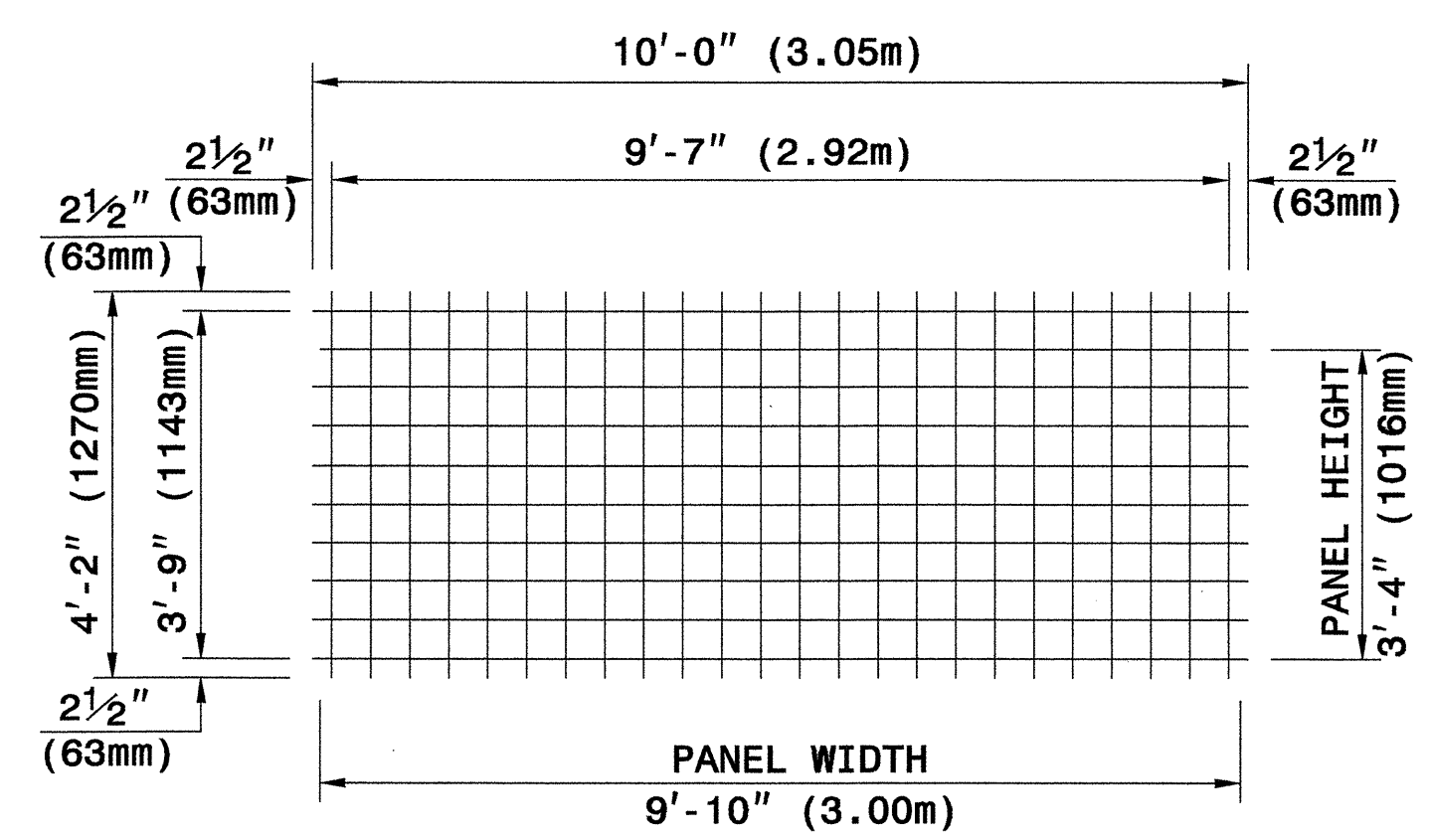
< 7 - 8
< 2.3



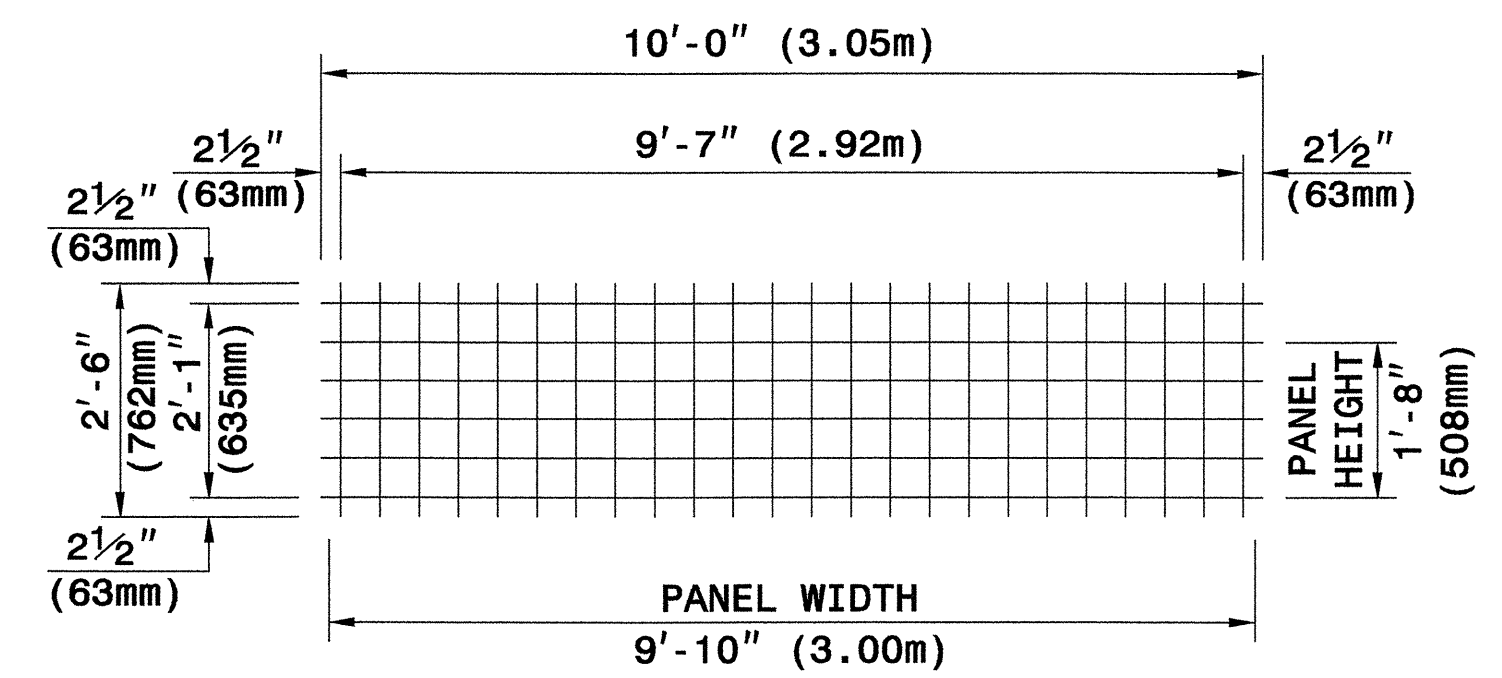
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< 1.8



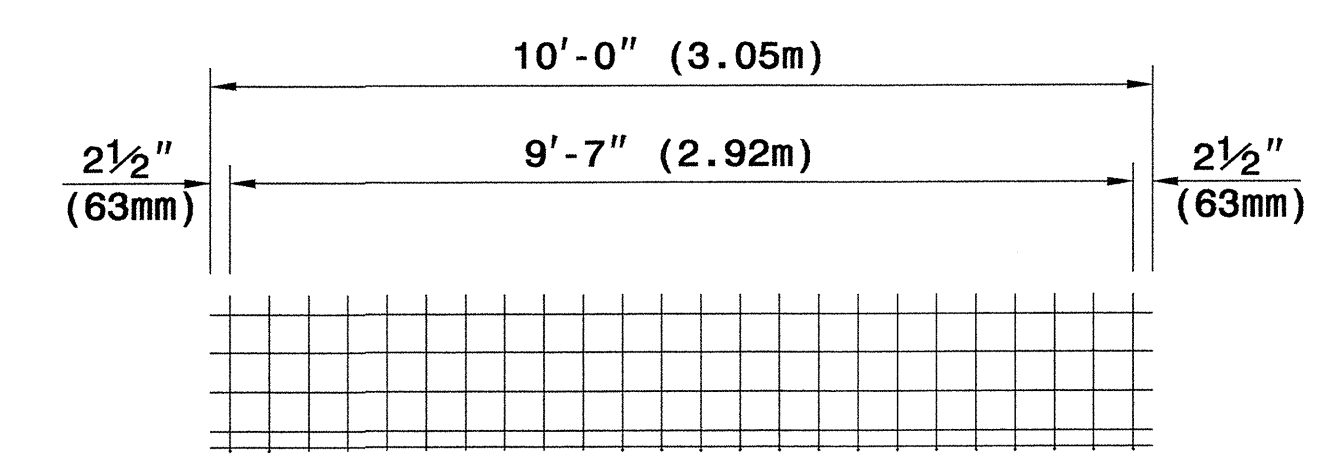
< 4 - 4
< 1.3



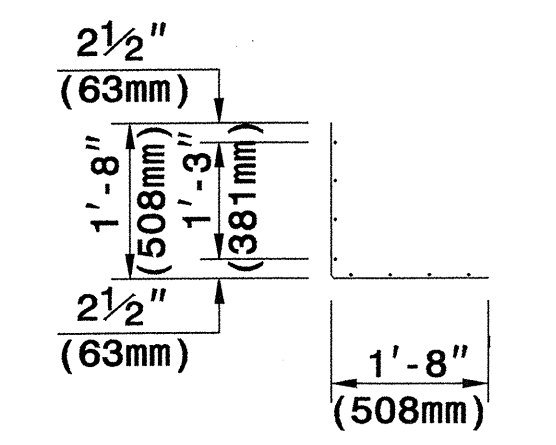
TYPE A



TYPE B



WELDED WIRE FORM

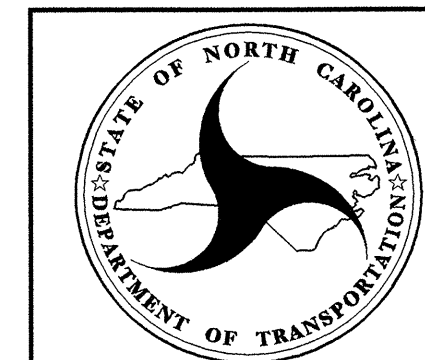


SECTION

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)

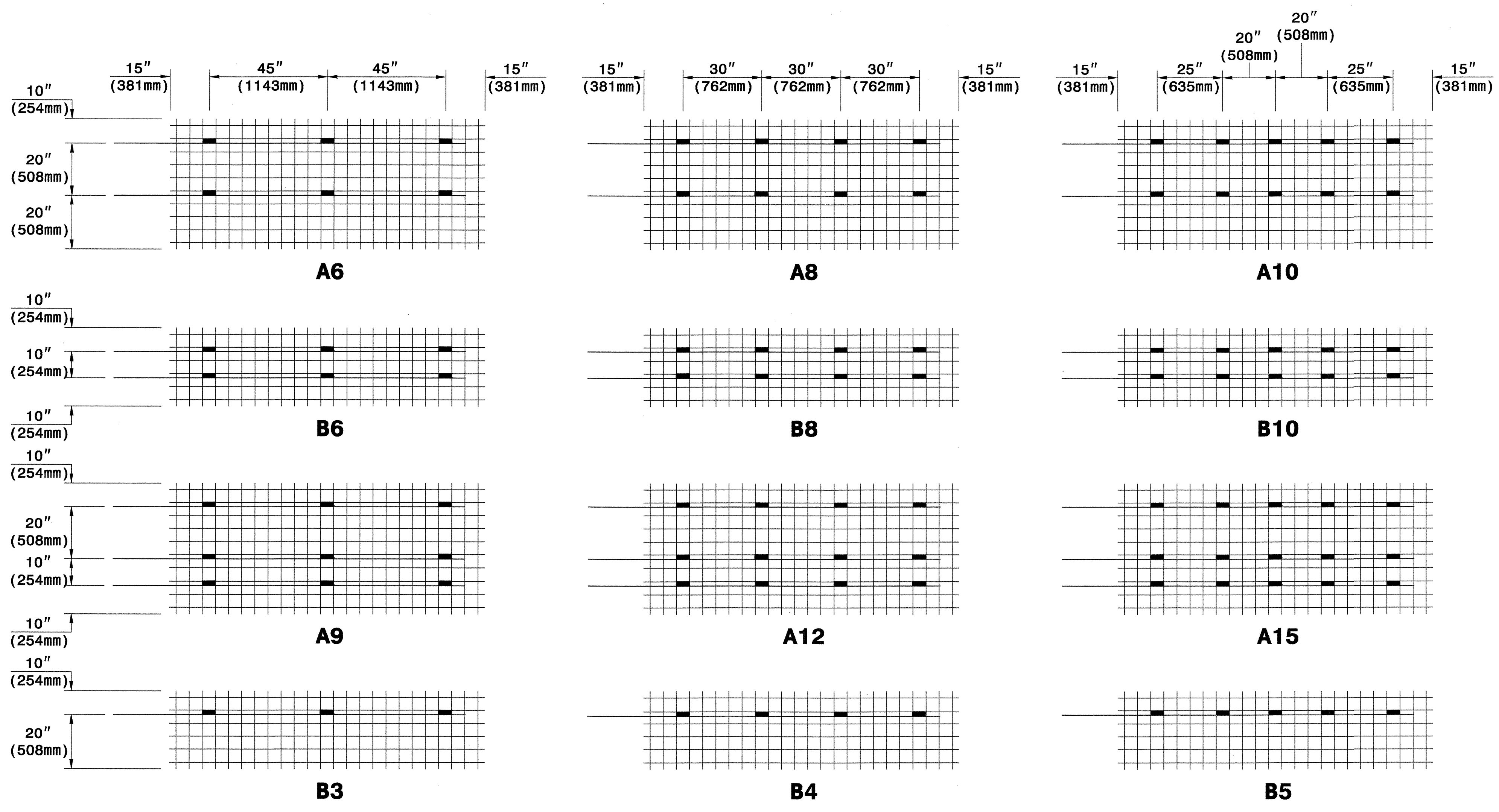


GEOTECHNICAL ENGINEERING UNIT
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RALEIGH

STANDARD DRAWING NO. 1801.02

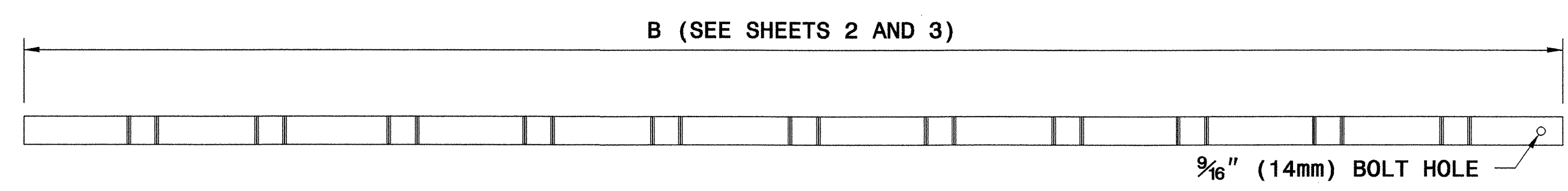
TERRATREL
TEMPORARY WALL

GEOTECHNICAL ENGINEER  Scott A. Hadden 3/2/07 <small>SIGNATURE DATE</small>	ENGINEER <small>SIGNATURE DATE</small>
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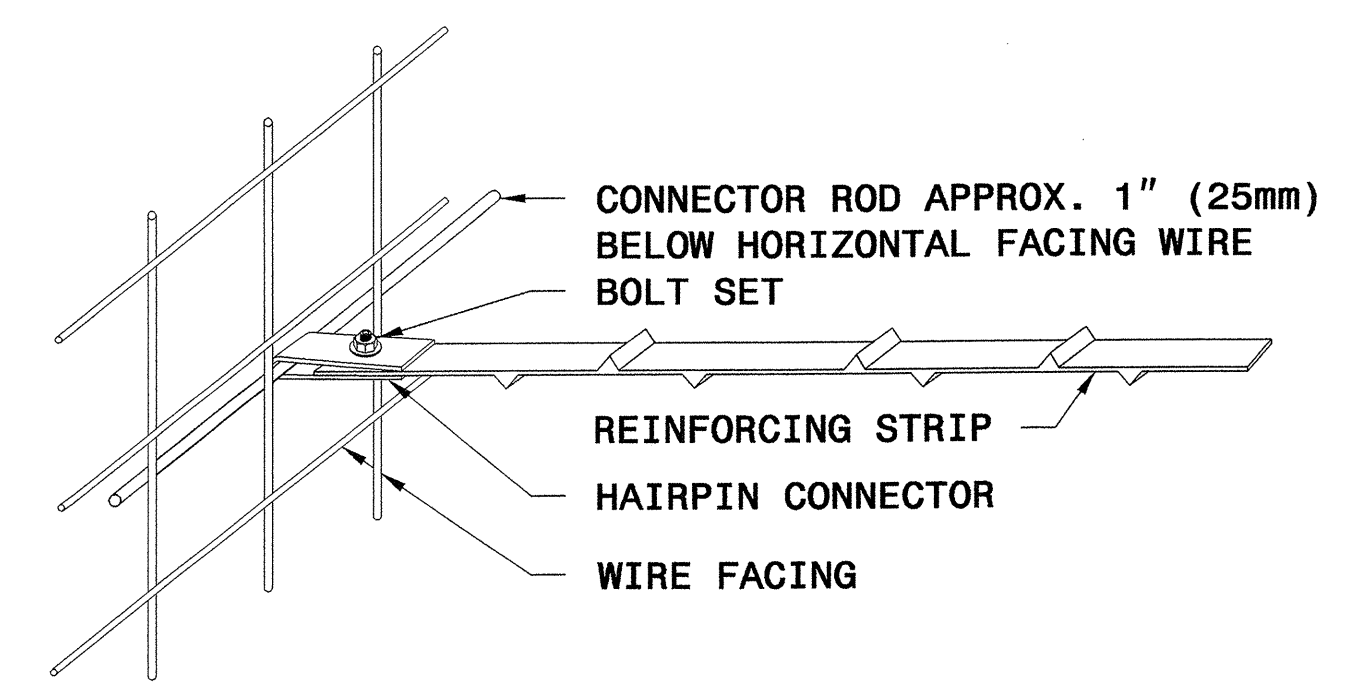


KEY: A8
 NUMBER OF REINFORCING STRIPS
 PANEL TYPE

CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



REINFORCING STRIP - 2" X $\frac{5}{32}$ " (50mm X 4mm)

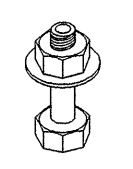


STRIP TO FACING CONNECTION



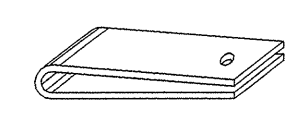
$\frac{1}{2}$ " (13mm) DIA. ROD

CONNECTOR ROD



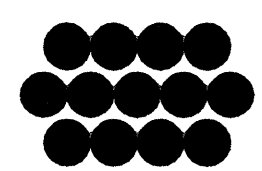
$\frac{1}{2}$ " (13mm) BOLT WITH NUT AND WASHER

BOLT SET

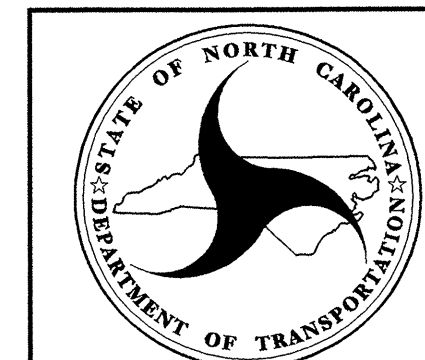


HAIRPIN CONNECTOR

WALL COMPONENTS



The Reinforced Earth Company



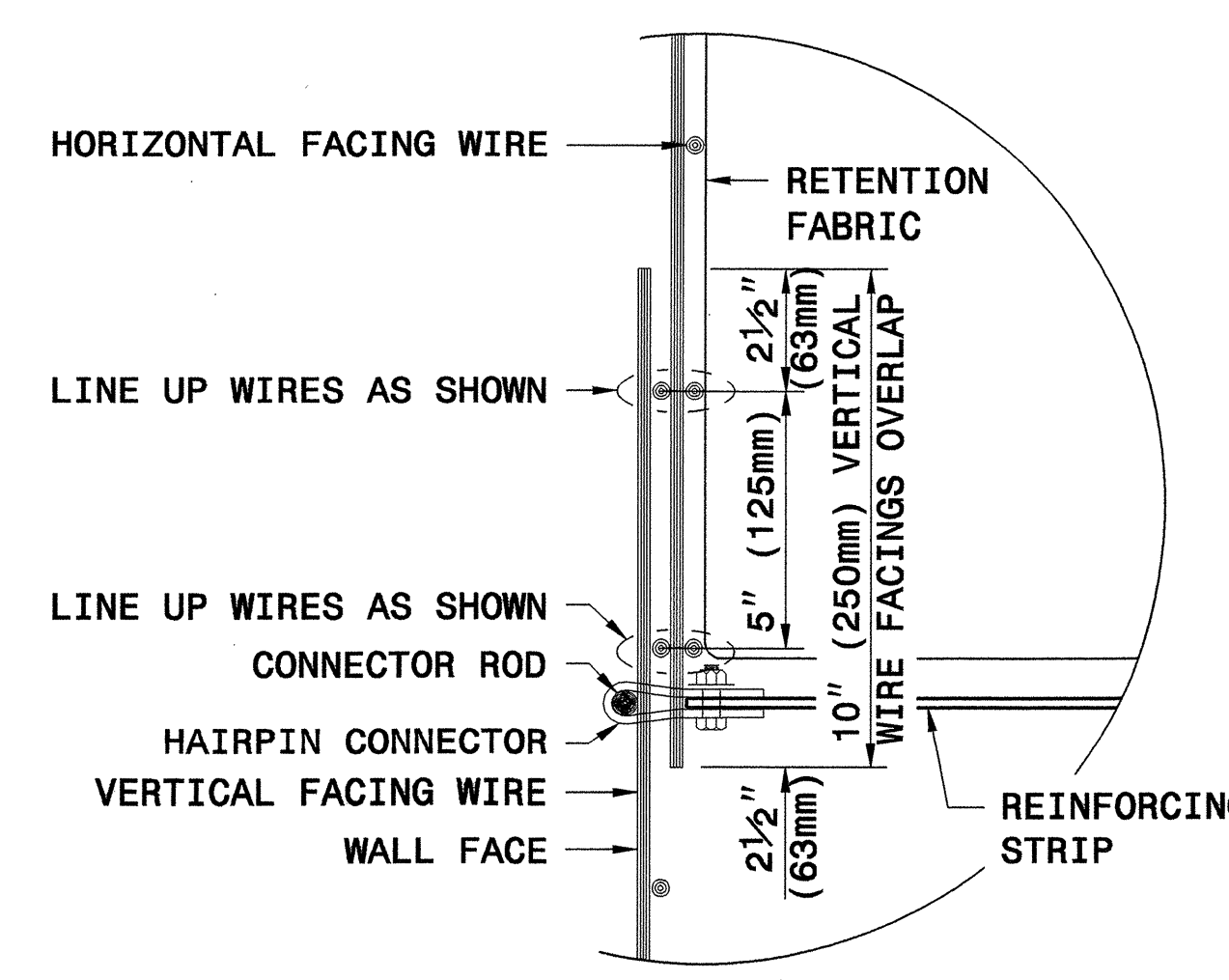
GEOTECHNICAL ENGINEERING UNIT
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL
 TEMPORARY WALL

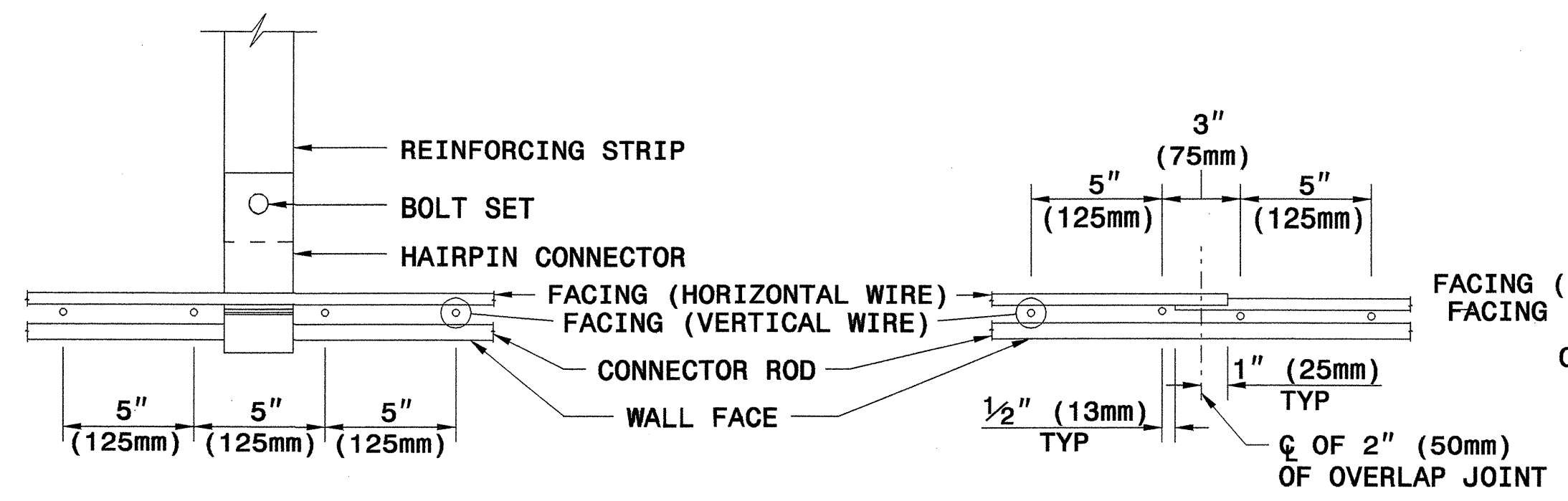
SHEET 10 OF 11

DATE: 12-19-06

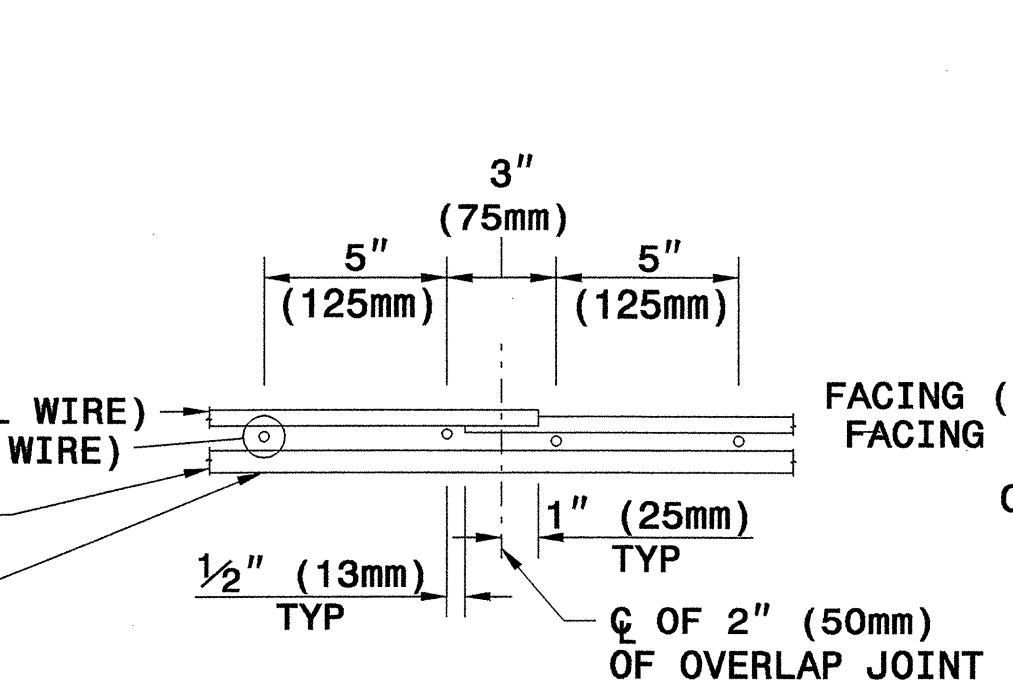


OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

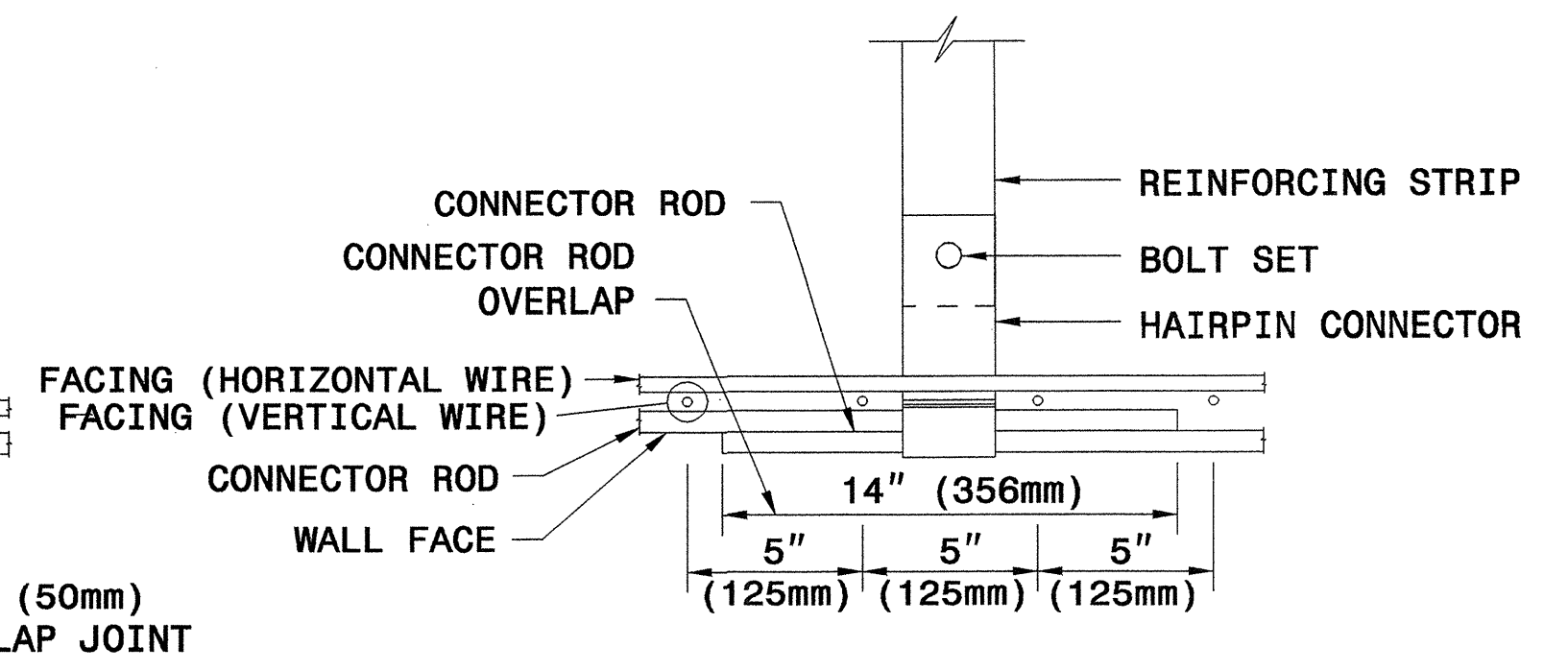
VERTICAL OVERLAP DETAIL



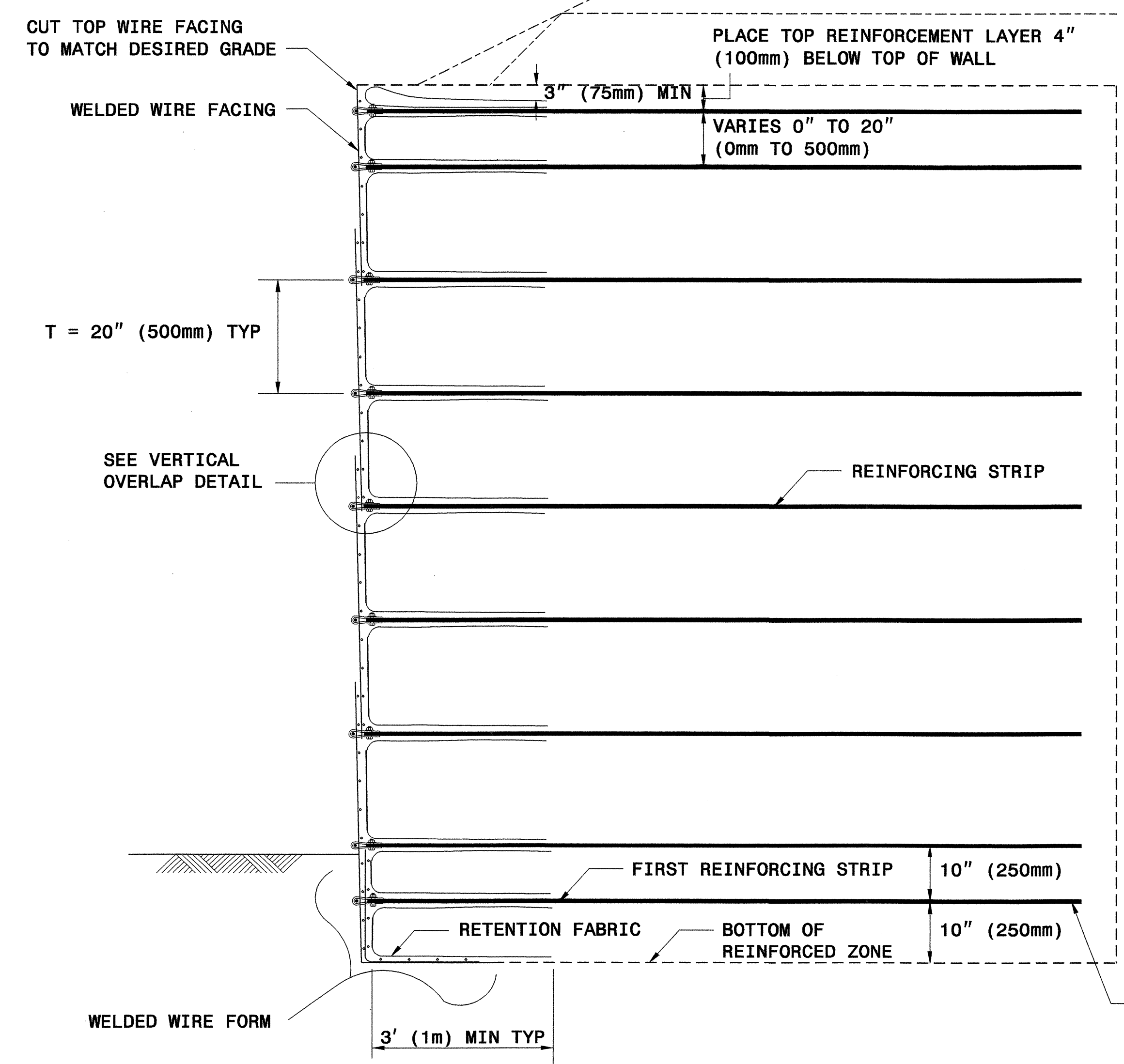
PLAN DETAIL 'A' STRIP CONNECTION



PLAN DETAIL 'B' HORIZONTAL OVERLAP DETAIL

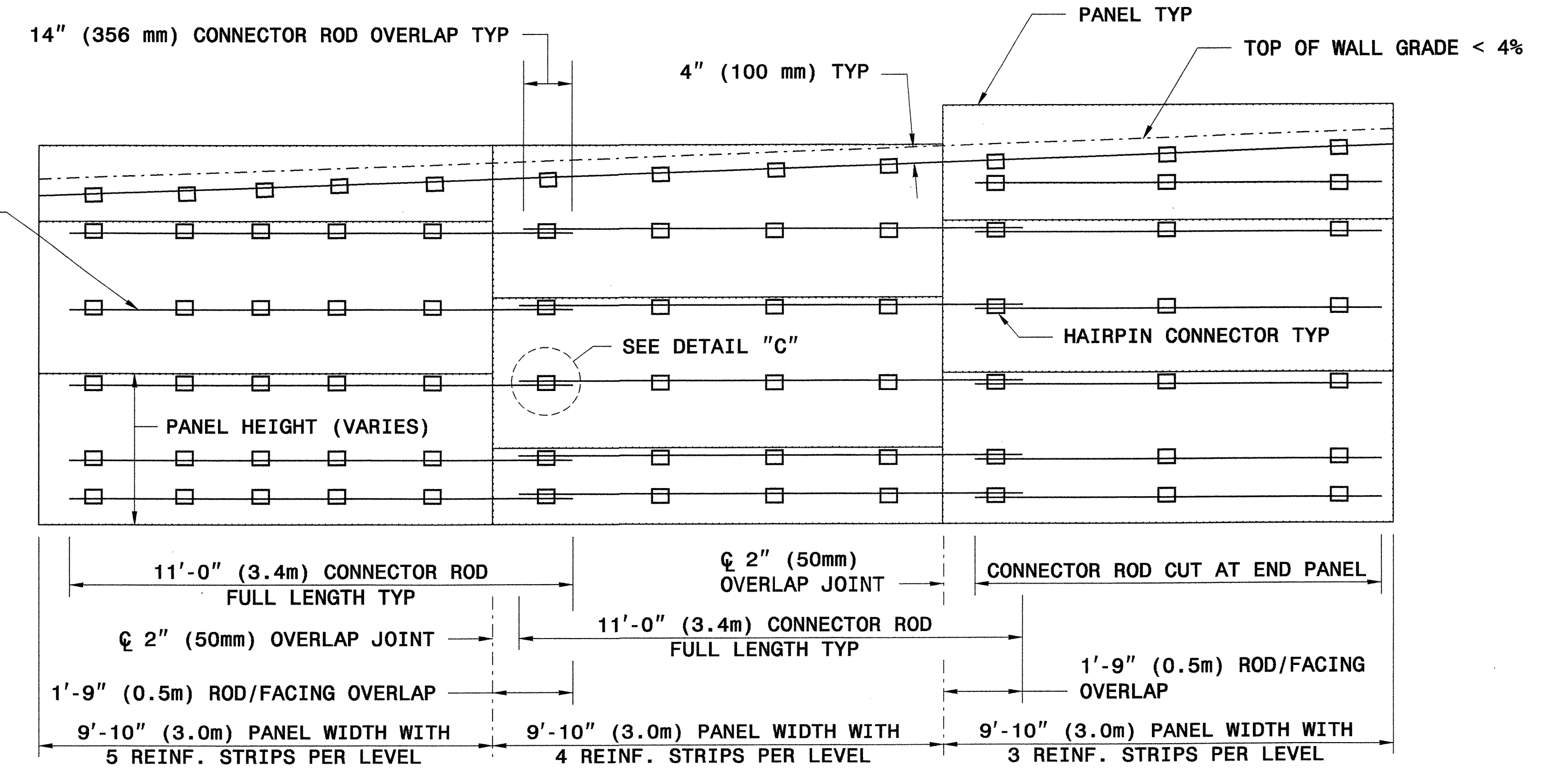


PLAN DETAIL 'C' STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL

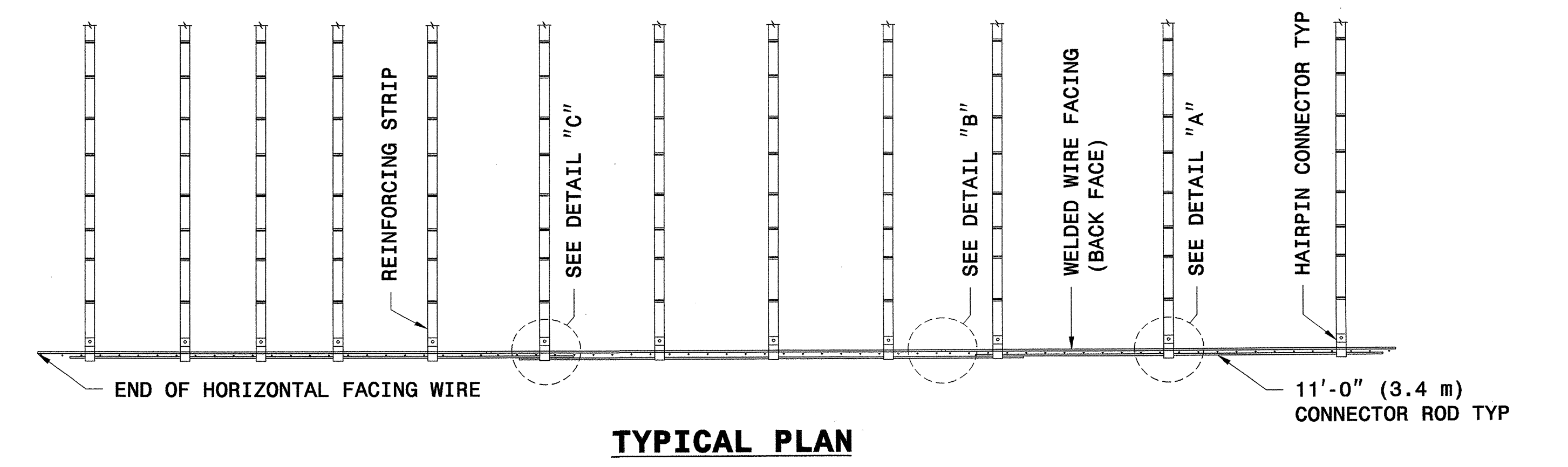


TYPICAL SECTION

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 DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

7-06

ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 3
300D01

GENERAL NOTES:
 I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
 O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
 H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

--- SPRINGLINE OF PIPE
 SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.
 APPROVED SUITABLE LOCAL MATERIAL.
 UNDISTURBED EARTH MATERIAL
 SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

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

7-06

ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 3
300D01

GENERAL NOTES:
 I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
 O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
 H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

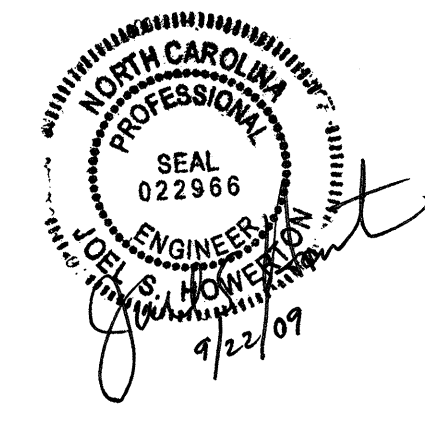
DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

--- SPRINGLINE OF PIPE
 SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1, BELOW SPRINGLINE.
 APPROVED SUITABLE LOCAL MATERIAL ABOVE SPRINGLINE.
 UNDISTURBED EARTH MATERIAL
 SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

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

SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
 MODIFIED BY: DATE: 7/29/09
 CHECKED BY: DATE: 7/29/09
 FILE SPEC: ericward/stds/stdstodetails/30001/0300d01.dgn



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

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

FLEXIBLE PIPE

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

- HDPE - * (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 60"
 * (Maximum fill) 20' for pipe diameters ≤ 24"
 17' for pipe diameters ≥ 30" and ≤ 60"
- PVC - * (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 36"
 * (Maximum fill) 30' for pipe diameters ≥ 12" and ≤ 36"

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

RIGID PIPE

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

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

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

Round Corrugated Aluminum Pipe 2 2/3 x 1/2 corrugation **					
Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)			
		16	14	12	8
12	12	123	155	218	281
15	12	98	123	174	224
18	12	81	102	144	187
21	12	69	87	123	160
24	12	60	76	108	139
27	12	67	95	123	151
30	12	60	85	111	136
36	12	50	71	92	113
42	12		60	78	96
48	12		52	68	84
54	12		46	50	74
60	12			50	62
66	12				51
72	12				41

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

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

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

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

- RCP - AASHTO M170

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

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

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

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

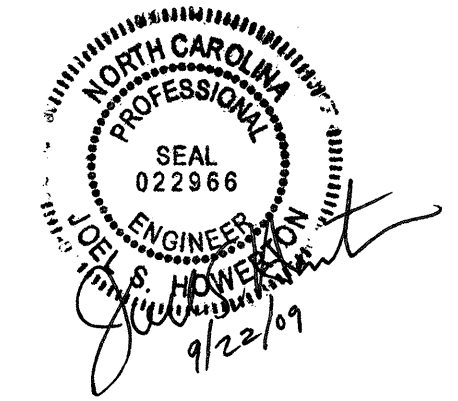
FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

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

SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
 MODIFIED BY: *[Signature]* DATE: 7/20/09
 CHECKED BY: *[Signature]* DATE: 7/20/09
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DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202159

ItemNumber	Sec #	Quantity	Unit	Description
000010000-N	800	Lump Sum		MOBILIZATION
003000000-N	SP	Lump Sum		BRIDGE APPROACH FILL - SUB REGIONAL TIER, STATION ***** (15+05.00)
005000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
005700000-E	226	200	CY	UNDERCUT EXCAVATION
006300000-N	SP	Lump Sum		GRADING
008000000-E	SP	100	TON	CLASS IV SUBGRADE STABILIZATION
010600000-E	230	4,200	CY	BORROW EXCAVATION
013400000-E	240	70	CY	DRAINAGE DITCH EXCAVATION
019500000-E	265	100	CY	SELECT GRANULAR MATERIAL
019600000-E	270	100	SY	FABRIC FOR SOIL STABILIZATION
019900000-E	SP	780	SF	TEMPORARY SHORING
031800000-E	300	13	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
032000000-E	SP	45	SY	FOUNDATION CONDITIONING FABRIC
036600000-E	310	48	LF	15" RC PIPE CULVERTS, CLASS III
057600000-E	310	72	LF	*** CS PIPE CULVERTS, ***** THICK (72", 0.109")
099500000-E	340	72	LF	PIPE REMOVAL
112100000-E	520	456	TON	AGGREGATE BASE COURSE
122000000-E	545	100	TON	INCIDENTAL STONE BASE
148900000-E	610	160	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
149800000-E	610	100	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
152500000-E	610	430	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
156000000-E	620	40	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
169300000-E	654	20	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
202200000-E	815	23	CY	SUBDRAIN EXCAVATION
203300000-E	815	17	CY	SUBDRAIN FINE AGGREGATE
204400000-E	815	100	LF	6" PERFORATED SUBDRAIN PIPE
205500000-E	815	3	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
207700000-E	815	6	LF	6" OUTLET PIPE (SUBDRAINS)
213200000-N	816	1	EA	CONCRETE PAD FOR SHOULDER DRAIN PIPE OUTLET
222000000-E	838	15	CY	REINFORCED ENDWALLS
228600000-N	840	2	EA	MASONRY DRAINAGE STRUCTURES
236700000-N	840	2	EA	FRAME WITH TWO GRATES, STD 840.29
255600000-E	846	50	LF	SHOULDER BERM GUTTER
338000000-E	862	137.5	LF	TEMPORARY STEEL BM GUARDRAIL
338910000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY
342000000-E	SP	350	LF	GENERIC GUARDRAIL ITEM PAINTED STEEL BM GUARDRAIL
342000000-E	SP	50	LF	GENERIC GUARDRAIL ITEM PAINTED STEEL BM GUARDRAIL, SHOP CURVED
343500000-N	SP	5	EA	GENERIC GUARDRAIL ITEM PAINTED ADDITIONAL GUARDRAIL POSTS
343500000-N	SP	3	EA	GENERIC GUARDRAIL ITEM PAINTED GUARDRAIL ANCHOR UNITS, TYPE 350
343500000-N	SP	1	EA	GENERIC GUARDRAIL ITEM PAINTED GUARDRAIL ANCHOR UNITS, TYPE AT-1
343500000-N	SP	4	EA	GENERIC GUARDRAIL ITEM PAINTED GUARDRAIL ANCHOR UNITS, TYPE III
364900000-E	876	26	TON	RIP RAP, CLASS B
365600000-E	876	425	SY	FILTER FABRIC FOR DRAINAGE
440000000-E	1110	163	SF	WORK ZONE SIGNS (STATIONARY)
440500000-E	1110	144	SF	WORK ZONE SIGNS (PORTABLE)
441000000-E	1110	36	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)

ItemNumber	Sec #	Quantity	Unit	Description
443500000-N	1135	31	EA	CONES
444500000-E	1145	72	LF	BARRICADES (TYPE III)
445000000-N	1150	720	HR	FLAGGER
446500000-N	1160	2	EA	TEMPORARY CRASH CUSHIONS
465000000-N	1251	30	EA	TEMPORARY RAISED PAVEMENT MARKERS
481000000-E	1205	10,858	LF	PAINT PAVEMENT MARKING LINES (4")
485000000-E	1205	765	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
600000000-E	1605	2,310	LF	TEMPORARY SILT FENCE
600600000-E	1610	160	TON	STONE FOR EROSION CONTROL, CLASS A
600900000-E	1610	190	TON	STONE FOR EROSION CONTROL, CLASS B
601200000-E	1610	50	TON	SEDIMENT CONTROL STONE
601500000-E	1615	3	ACR	TEMPORARY MULCHING
601800000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
602100000-E	1620	1.25	TON	FERTILIZER FOR TEMPORARY SEEDING
602400000-E	1622	130	LF	TEMPORARY SLOPE DRAINS
602900000-E	SP	350	LF	SAFETY FENCE
603000000-E	1630	430	CY	SILT EXCAVATION
603600000-E	1631	1,460	SY	MATTING FOR EROSION CONTROL
603700000-E	SP	50	SY	COIR FIBER MAT
603800000-E	SP	180	SY	PERMANENT SOIL REINFORCEMENT MAT
604200000-E	1632	40	LF	1/4" HARDWARE CLOTH
6071030000-E	SP	360	LF	COIR FIBER BAFFLES
6071050000-E	SP	7	EA	*** SKIMMER (1-1/2")
608400000-E	1660	5	ACR	SEEDING & MULCHING
608700000-E	1660	2	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	1.5	TON	FERTILIZER TOPDRESSING
611400000-N	SP	5	HR	SPECIALIZED HAND MOWING
611700000-N	SP	27	EA	RESPONSE FOR EROSION CONTROL
612300000-E	1670	0.5	ACR	REFORESTATION

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DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

LOCATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
SUMMARY 1				
-DET- 12+43.66 TO 17+86.88	64	2588	2524	
SUBTOTAL SUMMARY 1	64	2588	2524	
SUMMARY 2				
-L- 12+25.00 TO 14+62.50 (BEG. BR)	69	784	715	
-L- 15+47.50 (END BR) TO 17+75.00	3	584	581	
SUBTOTAL SUMMARY 2	72	1368	1296	
SUMMARY 3				
-DET- 12+43.66 TO 17+86.88	2207	2		2205
SUBTOTAL SUMMARY 3	2207	2		2205
PROJECT TOTALS:	2343	3958	3820	2205
5% TO REPLACE TOPSOIL			191	
GRAND TOTALS:	2343		4011	
SAY:	2500		4200	

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LVR/CL	YD ³
-DETOUR-	12+43.66	17+86.88	CL	905.21
-L-	14+35.00	TO EX. BR.	CL	105.44
-L-	FROM EX. BR.	15+75.00	CL	102.74
TOTAL:				1113.39
SAY:				1200.00

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- LT.	15+61.50	15+85.00	23.50'
-L- RT.	15+61.50	15+85.00	23.50'
TOTAL:			47.00'
SAY:			50.00'

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

NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, FINE FINE GRADING, CLEARING & GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL TO BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING".

LIST OF TEMPORARY PIPES, ENDWALLS, ETC. (FOR PIPES 54" & OVER)

STATION	SIZE	THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)	STRUCTURE NO.	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	C.S. PIPE CULVERTS				BITUMINOUS COATED C.S. PIPE TYPE B				STRUCTURAL PLATE PIPE				REINFORCED ENDWALLS STD. 838.39 & STD. 838.69		MASONRY DRAINAGE STRUCTURES CUBIC YARDS	REINF. CONC. FLARED END SECTIONS NO. & SIZE	CORR. STEEL FLARED END SECTIONS NO. & SIZE	REINF. CONC. ELBOWS NO. & SIZE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	PIPE REMOVAL LIN. FT.	REMARKS							
									54"	60"	66"	72"	78"	84"	54"	60"	66"	72"	60"	66"	72"	WITH R.C. - C.Y.									WITH C.S. - C.Y.						
-DETOUR-																																					
15+32.00	CL	4			1590.9	1590.5																															

- ABBREVIATIONS**
- C.B. CATCH BASIN
 - N.D.I. NARROW DROP INLET
 - D.I. DROP INLET
 - G.D.I. GRATED DROP INLET
 - G.D.I. (N.S.) GRATED DROP INLET (NARROW SLOT)
 - J.B. JUNCTION BOX
 - M.H. MANHOLE
 - T.B.D.I. TRAFFIC BEARING DROP INLET
 - T.B.J.B. TRAFFIC BEARING JUNCTION BOX

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12/06/07

COMPUTED BY: BAM DATE: 3/2008
CHECKED BY: ABP DATE: 3/4/09

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. B-4072
SHEET NO. 3-B

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

Table with columns for Station, Location, Structure No., Top Elevation, Invert Elevation, Slope Critical, Pipe Size (12" to 48"), Material (Class III R.C. Pipe, Bituminous Coated C.S. Pipe, Class III R.C. Pipe), Endwalls, Quantities for Drainage Structures, Frame, Grates and Hood Standard, Type of Grate, and Remarks.

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
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY (PAINTED)

Summary table for Guardrail (Painted) with columns: Survey Line, Beg. Sta., End Sta., Location, Length (Straight, Shop Curved, Double Faced), Warrant Point (Approach End, Trailing End), Total Shoulder Width, Flare Length, W, Anchors (XI MOD, XI, GRAU 350, M-350, TYPE III, CAT-1, VI MOD, BIC, AT-1), Impact Attenuator Type 350, Single Faced Guardrail, Remove Existing Guardrail, Remove and Stockpile Existing Guardrail, Remarks.

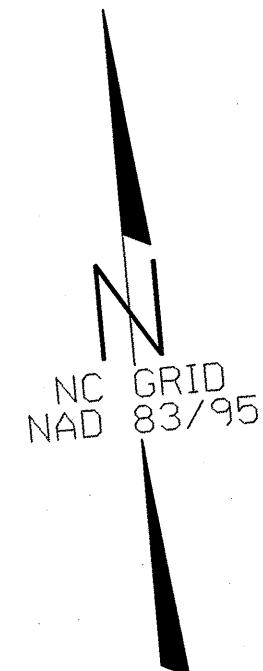
N = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING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

TEMPORARY GUARDRAIL SUMMARY

Summary table for Temporary Guardrail with columns: Survey Line, Beg. Sta., End Sta., Location, Length (Straight, Shop Curved, Double Faced), Warrant Point (Approach End, Trailing End), Total Shoulder Width, Flare Length, W, Anchors (XI MOD, XI, GRAU 350, M-350, XIII, CAT-1, VI MOD, BIC, AT-1), Impact Attenuator Type 350, Single Faced Guardrail, Remove Existing Guardrail, Remove and Stockpile Existing Guardrail, Remarks.

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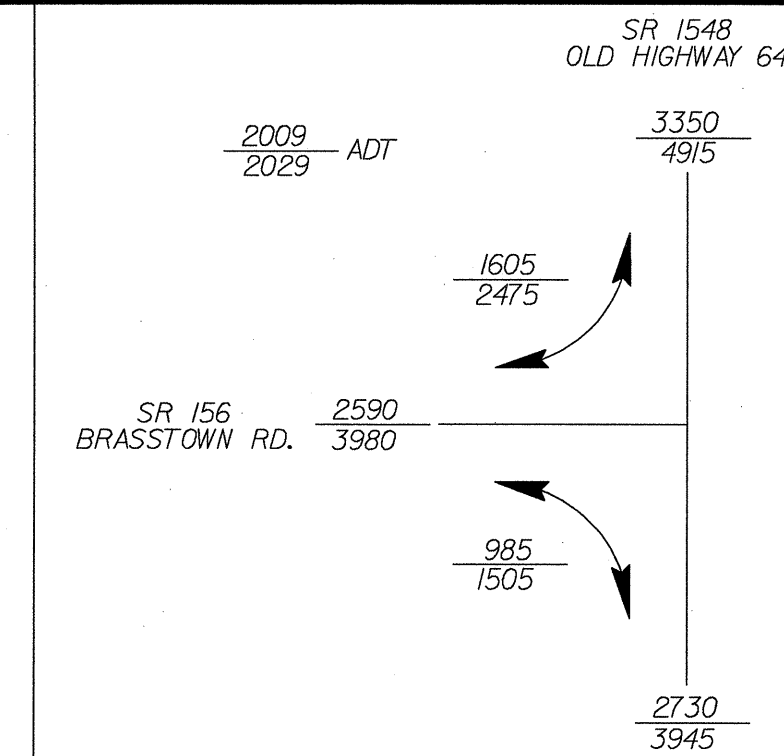


JOHN C. CAMPBELL FOLK SCHOOL
 DB 97 PG 37
 DB 102 PG 449
 DB 96 PG 554
 DB III PG 483
 DB 89 PG 117
 DB 304 PG 67
 DB 97 PG 249
 DB 775 PG 144

PI Sta 11+88.04 $\Delta = 38^{\circ}11'08.3"$ (LT)
 $D = 30^{\circ}09'20.4"$
 $L = 126.63'$
 $T = 65.77'$
 $R = 190.00'$

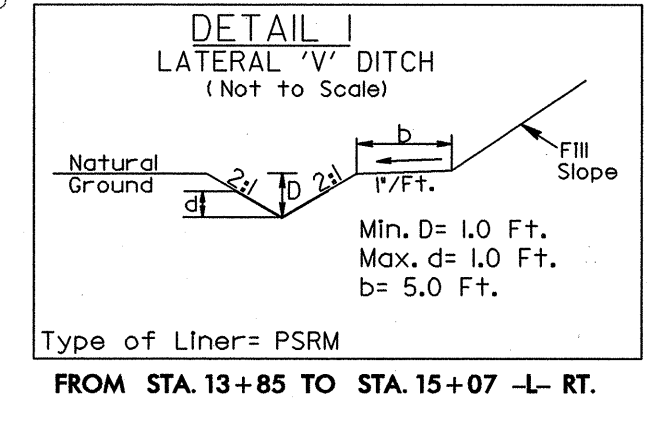
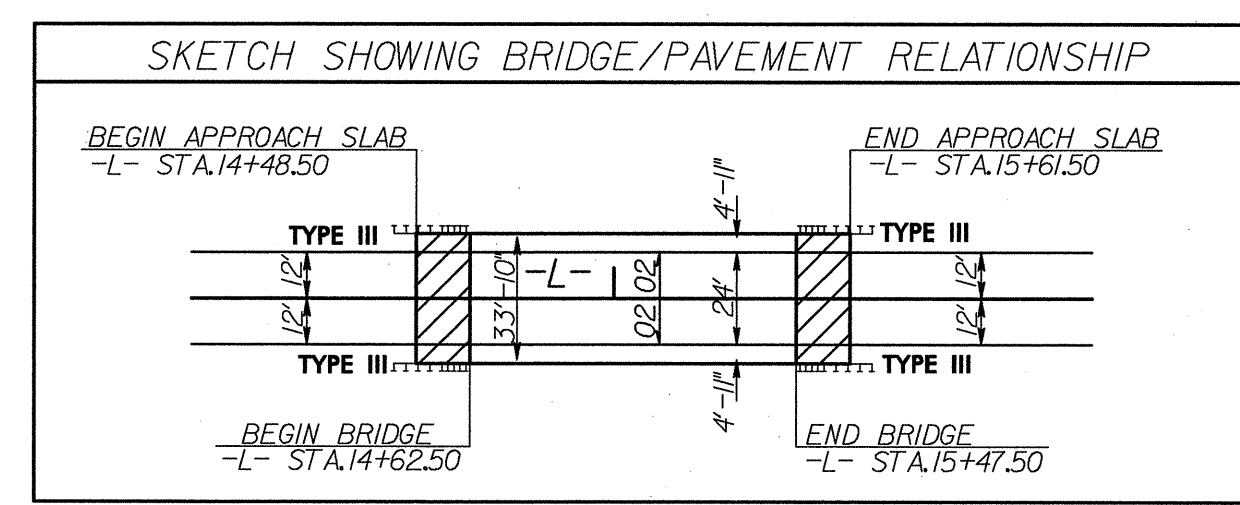
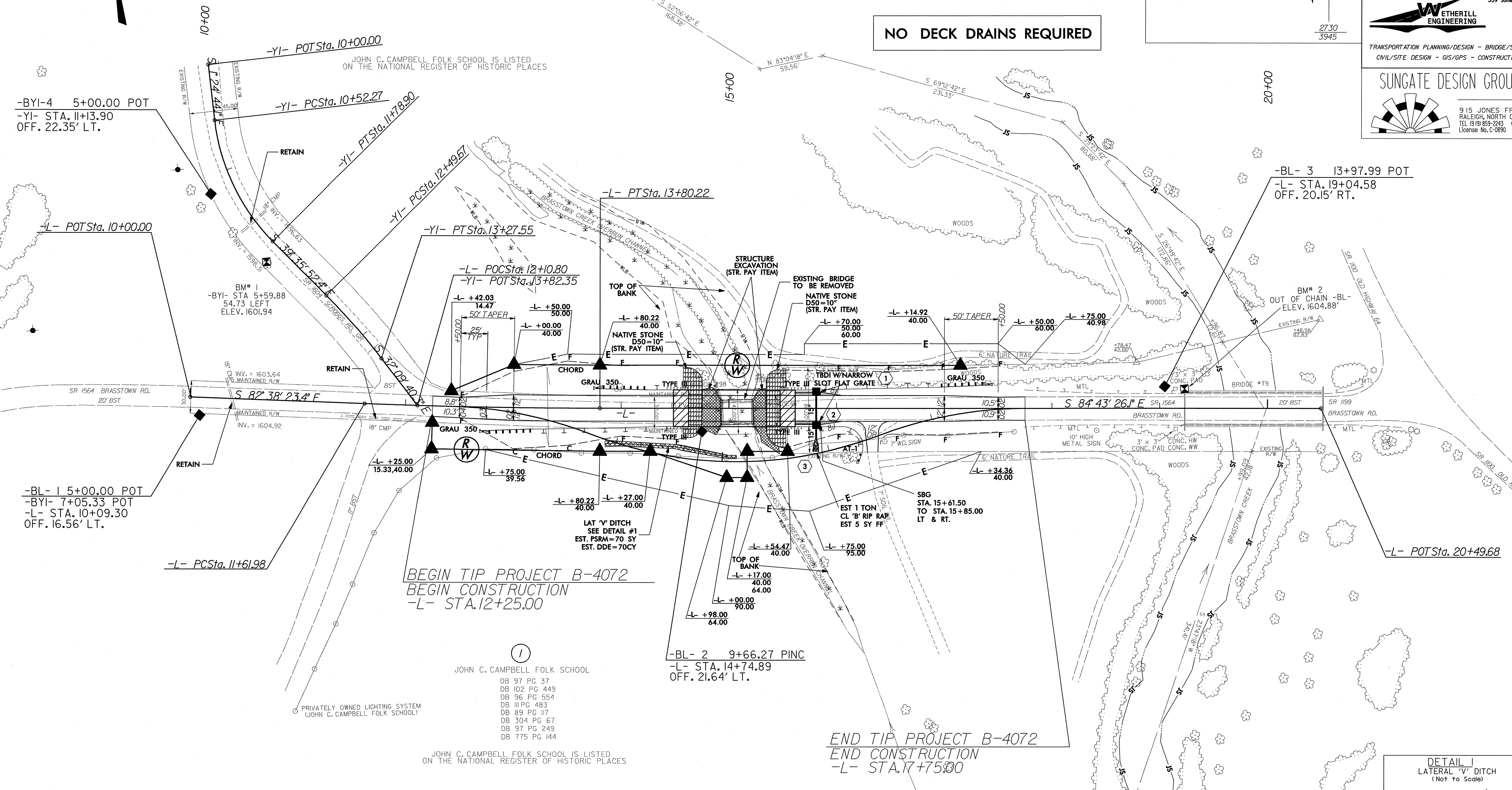
PI Sta 12+88.67 $\Delta = 7^{\circ}26'12.1"$ (RT)
 $D = 9^{\circ}32'57.5"$
 $L = 77.88'$
 $T = 38.99'$
 $R = 600.00'$

PI Sta 12+71.11 $\Delta = 2^{\circ}05'02.7"$ (LT)
 $D = 0^{\circ}57'17.7"$
 $L = 218.24'$
 $T = 109.13'$
 $R = 6,000.00'$
 $SE = NC$
 $V = 45$ MPH



PROJECT REFERENCE NO. B-4072		SHEET NO. 4	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
		559 Jones Franklin Rd. Suite 164 Raleigh, N.C. 27606 License No. F-0377 Bus: 919 851 8077 Fax: 919 851 8107	
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 License No. C-0890			

NO DECK DRAINS REQUIRED



SEE SHEET 2-A FOR DETOUR ALIGNMENT
 SEE SHEET 5 FOR PROFILE
 SEE SHEETS S-1 THRU S-19 FOR STRUCTURE PLANS

REVISIONS

P:22:32 PM
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 10/5/2009

5/28/09

BM #1
8" SPIKE SET IN BASE OF 14"WALNUT TREE
-BY1- STA. 5+59.88, 54.73' LT.
ELEV. = 1601.94'
N 506757 E 515314

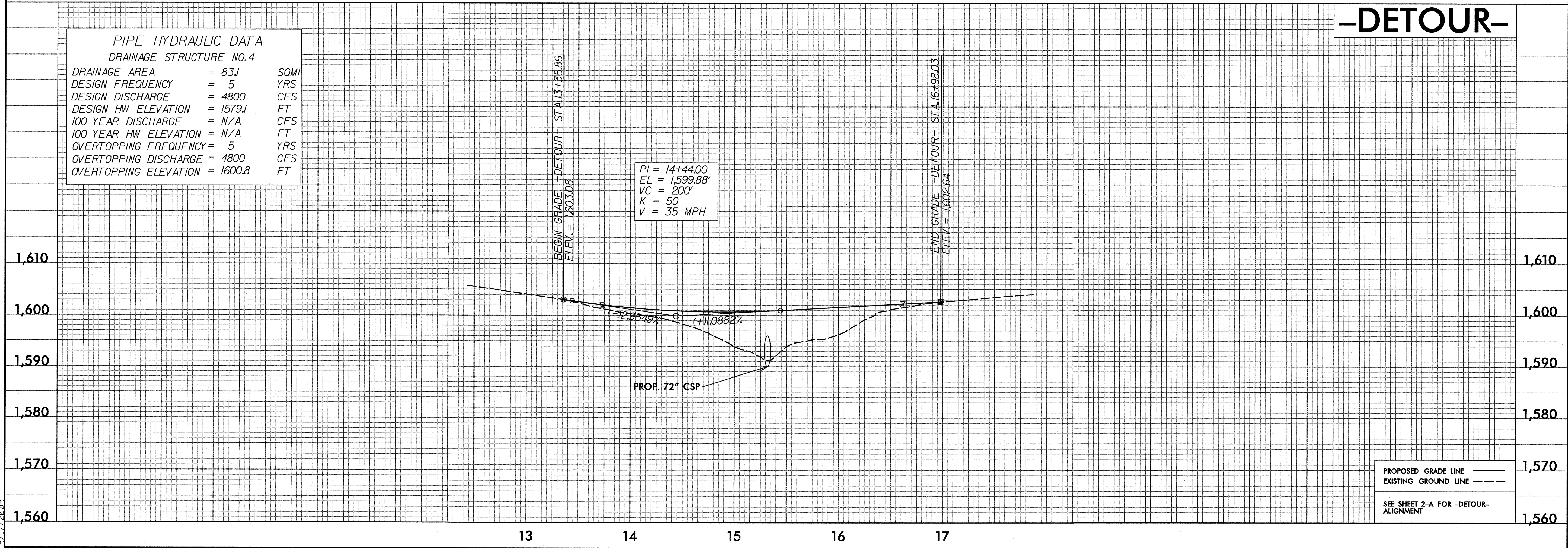
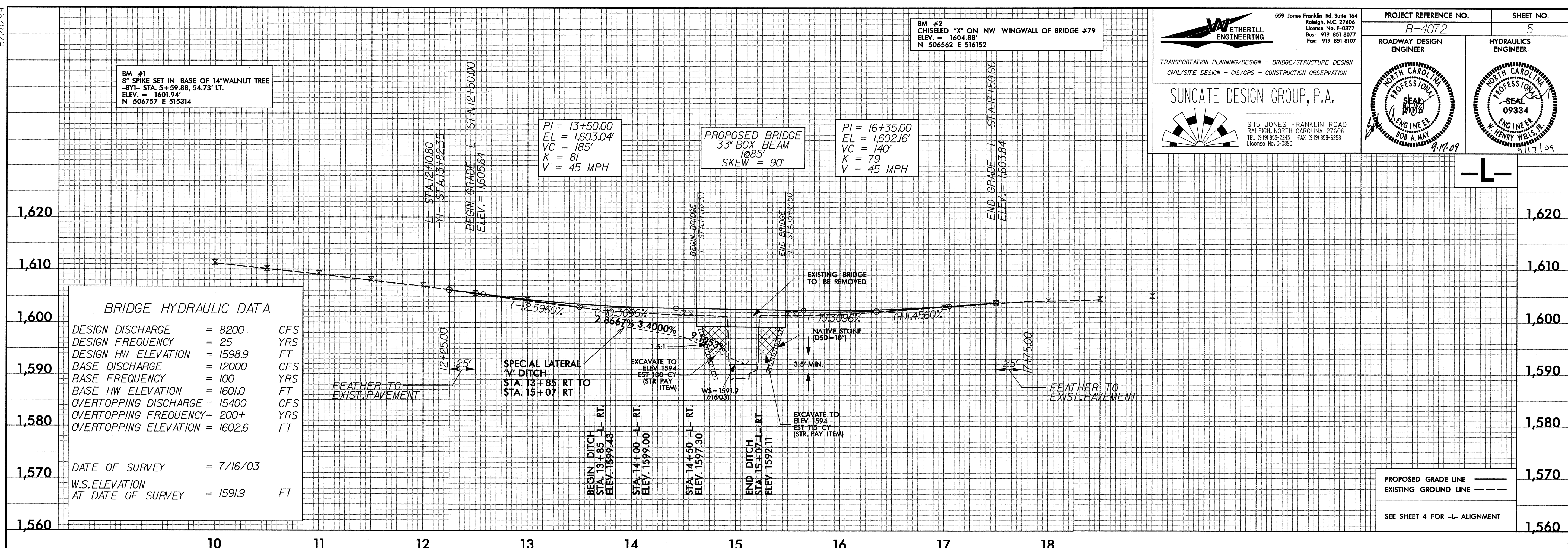
BM #2
CHISELED "X" ON NW WINGWALL OF BRIDGE #79
ELEV. = 1604.88'
N 506562 E 516152

ETHERILL ENGINEERING
559 Jones Franklin Rd. Suite 164
Raleigh, N.C. 27606
License No. E-0377
Bus: 919 851 8077
Fax: 919 851 8107

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: 919 855-2243 FAX: 919 853-6258
License No. C-9880

PROJECT REFERENCE NO. B-4072	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



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5/17/2009