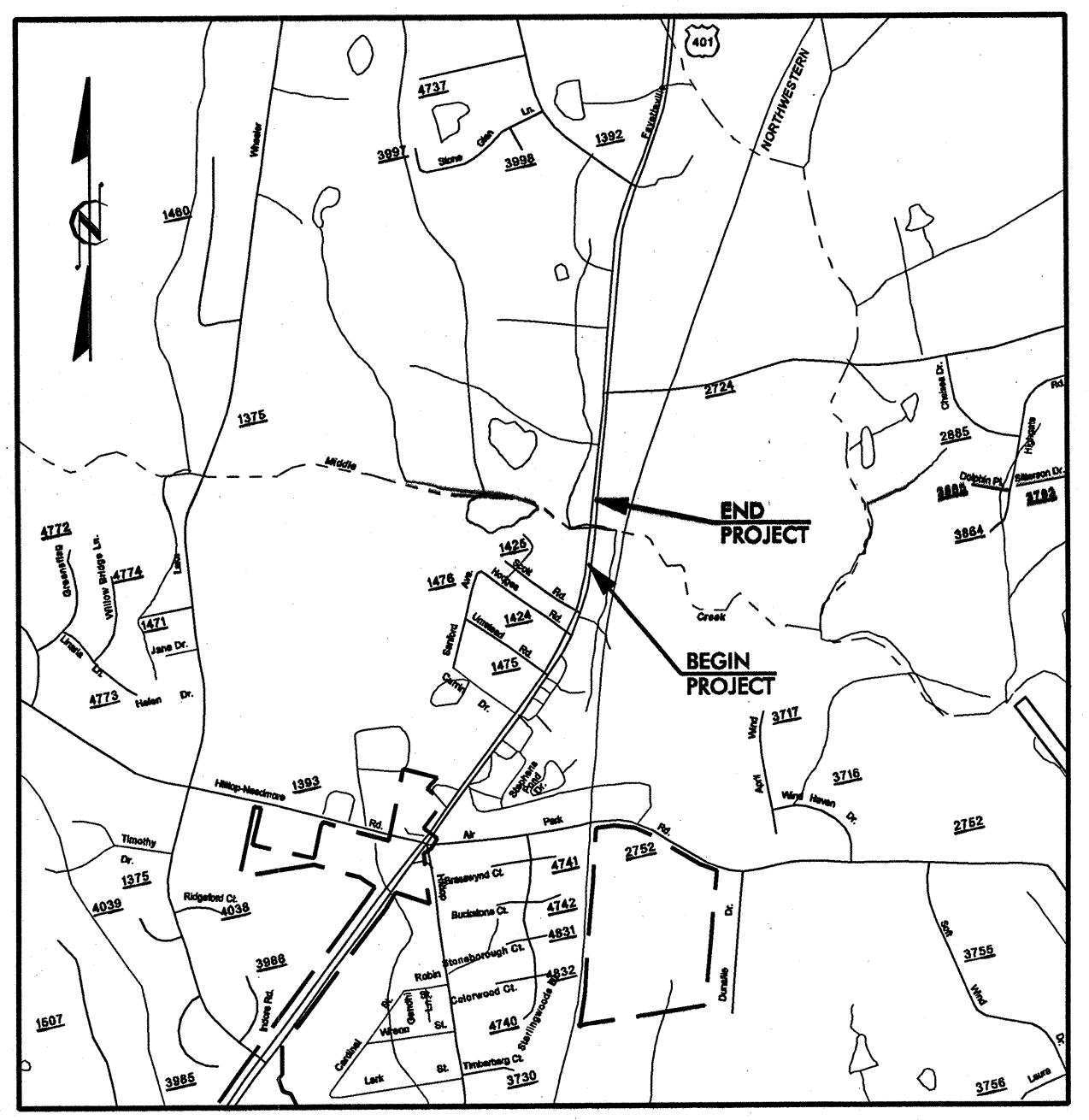
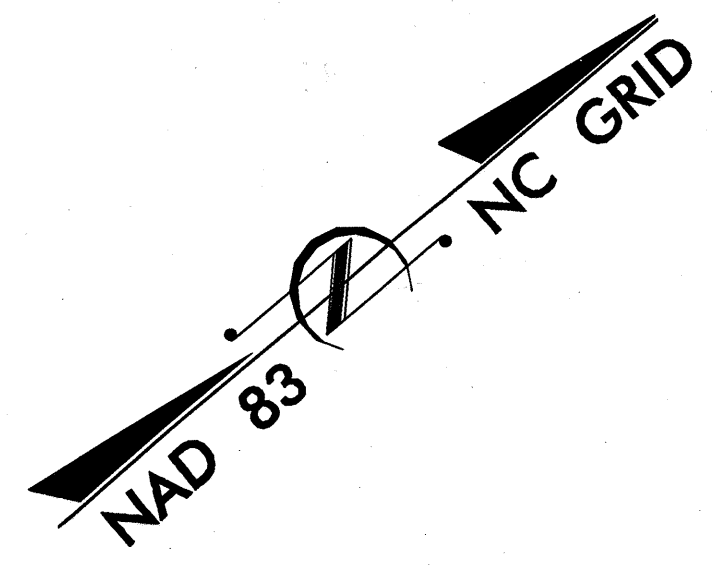


CONTRACT: C201546 TIP PROJECT: B-3916

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



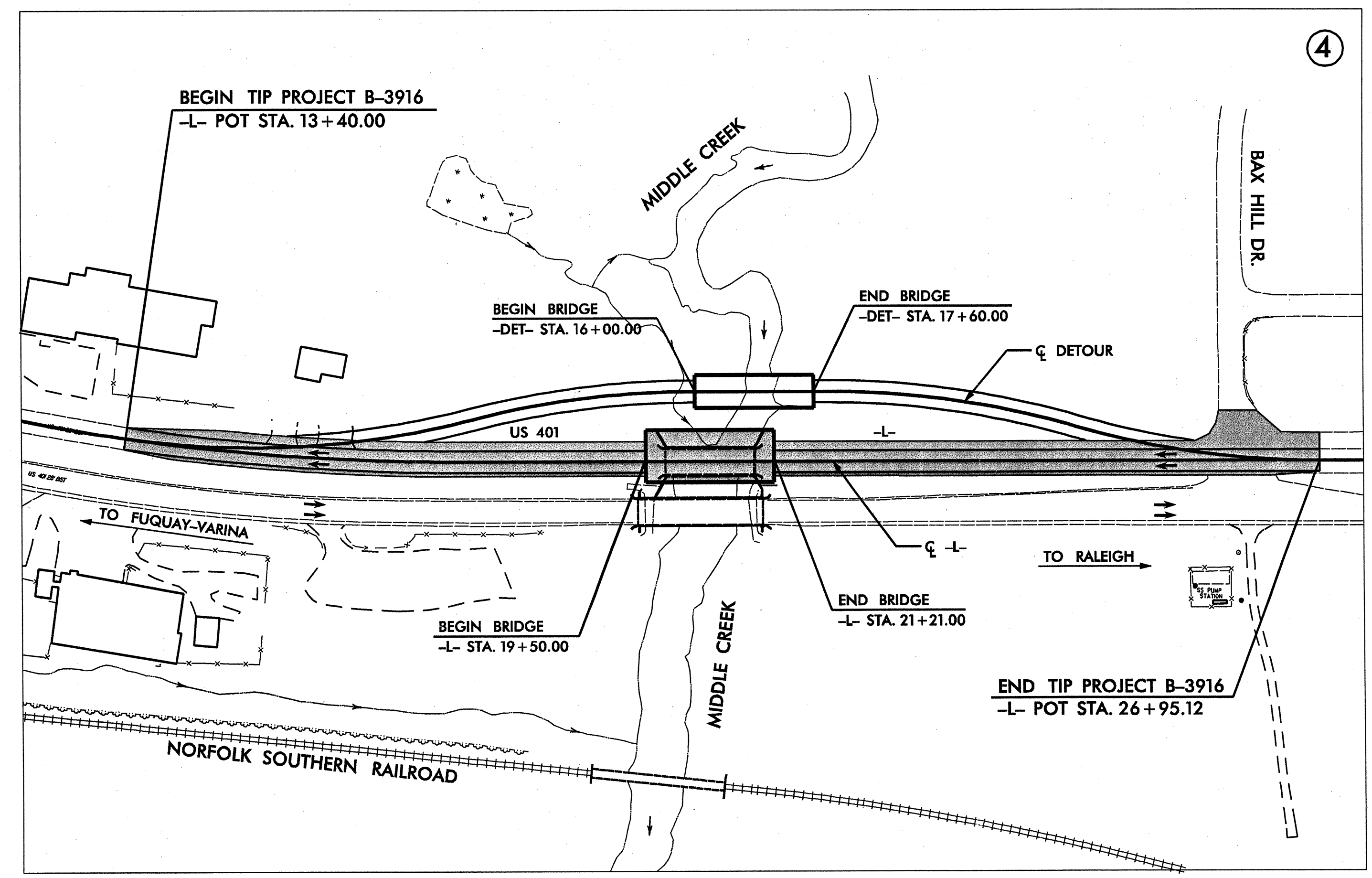
VICINITY MAP



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAKE COUNTY

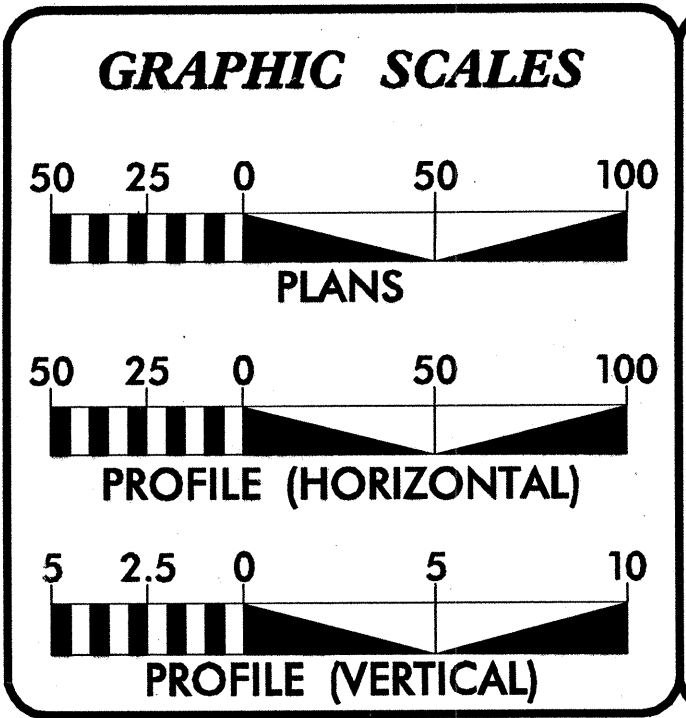
**LOCATION: BRIDGE NO. 63 AND APPROACHES
ON US SOUTHBOUND 401 OVER
MIDDLE CREEK**

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



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3916	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33350.1.1	BRSTP-401(13)	P.E.	
33350.2.1	BRSTP-401(13)	RW & UTILITY	
33350.3.1	BRSTP-401(154)	CONST.	

TRANSITE CONSULTING
ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609



DESIGN DATA

ADT 2007 =	31,250
ADT 2027 =	58,750
DHV =	10 %
D =	60 %
T =	8 % *
V =	60 MPH
V(DET) =	50 MPH
* TTST 4 %	DUAL 4 %

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3916	=	0.225 mi
LENGTH STRUCTURE TIP PROJECT B-3916	=	0.032 mi
TOTAL LENGTH OF TIP PROJECT B-3916	=	0.257 mi

Plans prepared in the office of:

RAMEY KEMP & ASSOCIATES, INC.
TRANSPORTATION ENGINEERS
5408 Forrester Place
Raleigh, North Carolina 27609
919-872-5115 ext. 919-872-5418 fax - www.rkempa.com

for the North Carolina Department of Transportation

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
DECEMBER 16, 2005

LETTING DATE:
MAY 15, 2007

N.C.D.O.T. CONTACT:
CATHY HOUSER, P.E.
PROJECT ENGINEER
ROADWAY DESIGN

HYDRAULICS ENGINEER

RICHARD LEON BOLLINGER, JR.
P.E.
3-20-07

ROADWAY DESIGN ENGINEER

M. SCOTT CLARK
P.E.
2-15-07

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

Aut miller
P.E.

STATE DESIGN ENGINEER

**DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

APPROVED
DIVISION ADMINISTRATOR

DATE

ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO. TITLE

DIVISION 2 - EARTHWORK

- 200.03 Method of Clearing - Method III
- 225.02 Guide for Grading Subgrade - Secondary and Local
- 225.04 Method of Obtaining Super-elevation - Two Lane Pavement

DIVISION 3 - PIPE CULVERTS

- 300.01 Method of Pipe Installation - Method 'A'
- 310.10 Driveway Pipe Construction

DIVISION 4 - MAJOR STRUCTURES

- 422.10 Reinforced Bridge Approach Fills

DIVISION 5 - SUBGRADE, BASES AND SHOULDERS

- 560.01 Method of Shoulder Construction - High Side of Super-elevated Curve - Method I

DIVISION 6 - ASPHALT BASES AND PAVEMENTS

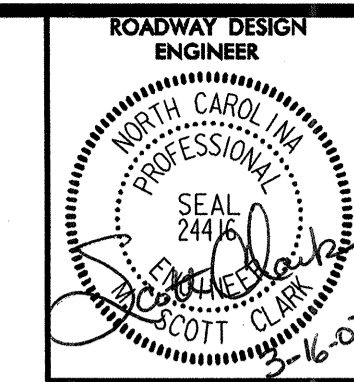
- 654.01 Pavement Repairs

DIVISION 8 - INCIDENTALS

- 806.01 Concrete Right-of-Way Marker
- 806.02 Granite Right-of-Way Marker
- 815.03 Pipe Underdrain and Blind Drain
- 838.05 Concrete 'L' Endwall for Single Pipe Culverts - 15" thru 48" Pipe
- 838.15 Brick 'L' Endwall for Single Pipe Culverts - 15" thru 48" Pipe
- 838.80 Precast Endwalls - 12" thru 72" Pipe 90 Skew
- 840.00 Concrete Base Pad for Drainage Structures
- 840.18 Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
- 840.24 Frames and Narrow Slot Sag Grates
- 840.27 Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
- 840.29 Frames and Narrow Slot Flat Grates
- 840.35 Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
- 840.45 Precast Drainage Structure
- 840.46 Traffic Bearing Drainage Structure
- 862.01 Guardrail Placement
- 862.02 Guardrail Installation
- 862.03 Structure Anchor Units
- 862.04 Anchoring End of Guardrail B-77 and B-83 Anchor Units
- 876.02 Guide for Rip Rap at Pipe Outlets

INDEX OF SHEETS

<u>SHEET NUMBER</u>	<u>SHEET</u>
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEET
2 THRU 2-A	PAVEMENT SCHEDULE, & TYPICAL SECTIONS
2-B	DETAIL OF PREFORMED SCOUR HOLE
2-C	ROCK PLATING DETAIL
2-D	ANCHORAGE FOR FRAMES
2-E THRU 2-Q	TEMPORARY SHORING DETAILS
3	SUMMARY OF QUANTITIES
3-A	GUARDRAIL, PAVEMENT REMOVAL, & EARTHWORK SUMMARY
3-B	DRAINAGE SUMMARY
4	PLAN SHEET
4A	DETOUR PLAN SHEET
5	PROFILE SHEET
TCP-1 THRU TCP-	TRAFFIC CONTROL PLANS
PM-1 THRU PM-	PAVEMENT MARKING PLANS
EC-1 THRU EC-7	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
SIGN-1 THRU SIGN-4	SIGNING PLANS
UO-1 THRU UO-2	UTILITY PLANS BY OTHERS
X-1	CROSS-SECTION SUMMARY
X-2 THRU X-8	CROSS-SECTIONS
S-1 THRU S-30	STRUCTURE PLANS



PROJECT REFERENCE NO.	SHEET NO.
B-3916	1-A

GENERAL NOTES: 2006 SPECIFICATIONS
EFFECTIVE: 7-18-06

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

UNDERDRAINS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

SUBSURFACE PLANS:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE: PROGRESS ENERGY, SOUTHERN BELL, AND TIME WARNER CABLE. ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	⊙ EIP
Property Corner	-----
Property Monument	⊠ ECM
Parcel/Sequence Number	Ⓜ 123
Existing Fence Line	-----
Proposed Woven Wire Fence	-----
Proposed Chain Link Fence	-----
Proposed Barbed Wire Fence	-----
Existing Wetland Boundary	----- WLB
Proposed Wetland Boundary	----- WLB
Existing Endangered Animal Boundary	----- EAB
Existing Endangered Plant Boundary	----- EPB

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	⊙ S
Well	⊙ W
Small Mine	⊗
Foundation	⊠
Area Outline	⊠
Cemetery	⊠
Building	⊠
School	⊠
Church	⊠
Dam	⊠

HYDROLOGY:

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

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	⊙ MILEPOST 35
Switch	⊠ SWITCH
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

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

UTILITIES:

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

TELEPHONE:

Existing Telephone Pole	⊙
Proposed Telephone Pole	⊙
Telephone Manhole	⊙
Telephone Booth	⊠
Telephone Pedestal	⊠
Telephone Cell Tower	⊠
U/G Telephone Cable Hand Hole	⊠
Recorded U/G Telephone Cable	----- T
Designated U/G Telephone Cable (S.U.E.*)	----- T
Recorded U/G Telephone Conduit	----- TC
Designated U/G Telephone Conduit (S.U.E.*)	----- TC
Recorded U/G Fiber Optics Cable	----- T FO
Designated U/G Fiber Optics Cable (S.U.E.*)	----- T FO

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

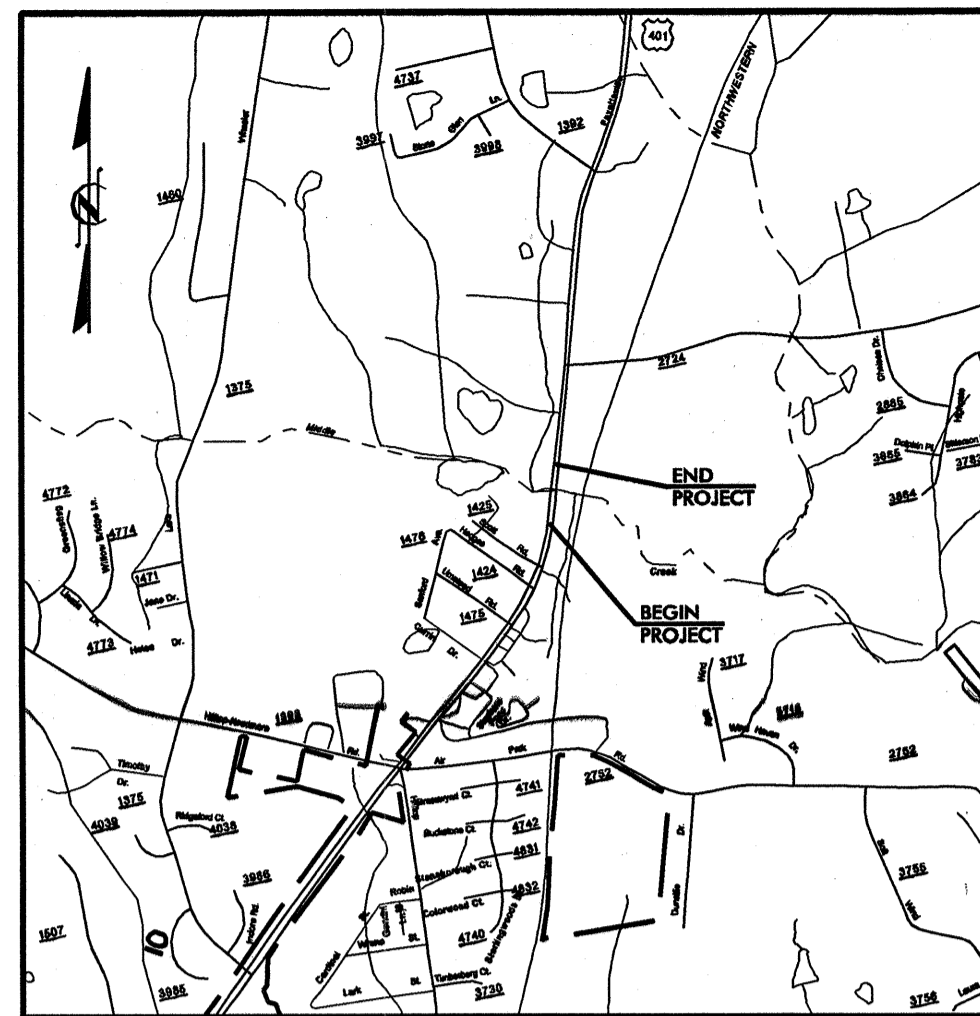
Utility Pole	⊙
Utility Pole with Base	⊙
Utility Located Object	⊙
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line	----- TUTL
U/G Tank; Water, Gas, Oil	⊠
A/G Tank; Water, Gas, Oil	⊠
U/G Test Hole (S.U.E.*)	⊙
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

SURVEY CONTROL SHEET B-3916

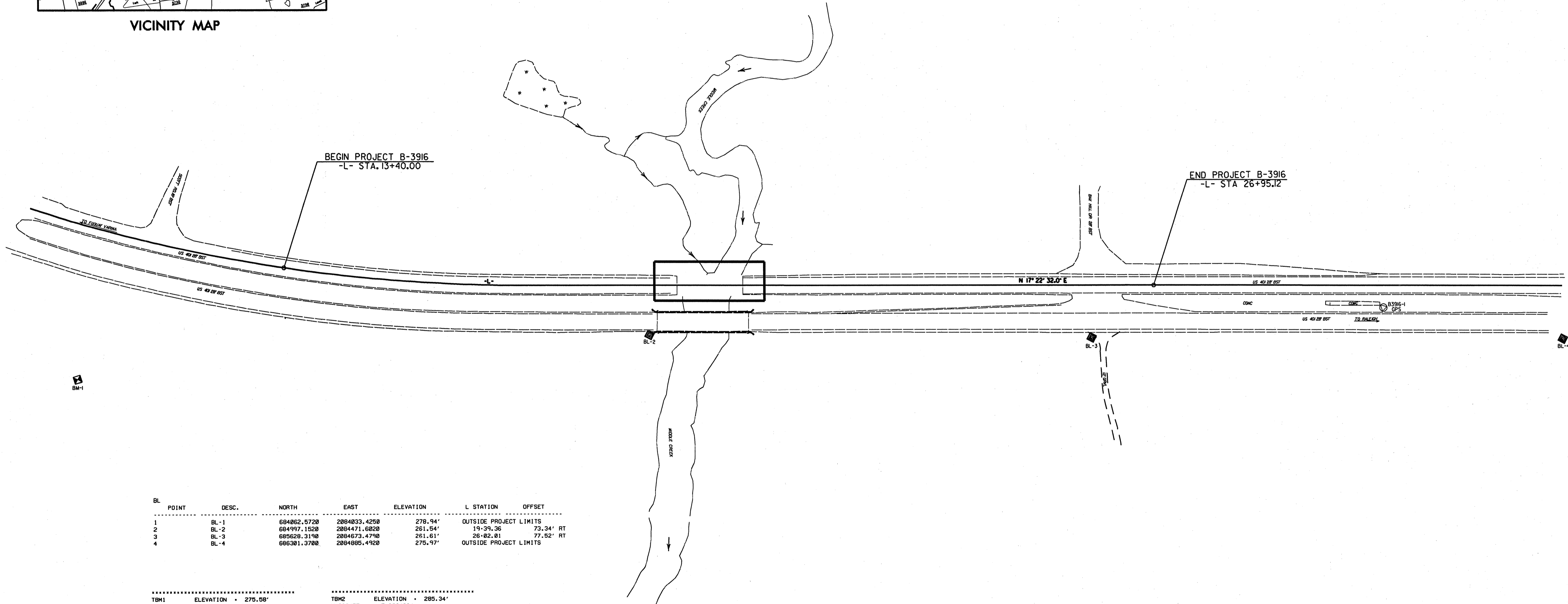
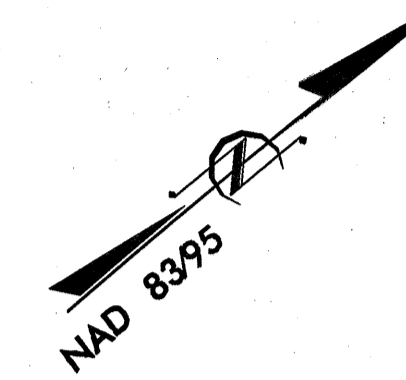
WAKE COUNTY

LOCATION: BRIDGE NO. 63 ON US 401

B-3916



VICINITY MAP



BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL-1	684062.5720	2084033.4250	278.94'	OUTSIDE PROJECT LIMITS	
2	BL-2	684997.1520	2084471.6820	281.54'	19+29.26	73.34' RT
3	BL-3	686520.3190	2084673.4790	281.61'	28+82.81	77.52' RT
4	BL-4	686301.3700	2084885.4920	275.97'	OUTSIDE PROJECT LIMITS	

.....
 TBM1 ELEVATION = 275.58'
 N 684160 E 2084277
 L STATION 11-31 223' RIGHT
 RR SPIKE SET IN 12" PINE TREE

.....
 TBM2 ELEVATION = 285.34'
 N 686475 E 2084964
 OUTSIDE PROJECT LIMITS
 RR SPIKE SET IN 12" PINE TREE

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT 'B3916-1' WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 686050.000(1) EASTING: 2084761.520(1) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99988633 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM 'B3916-1' TO L- STATION 13+40.00 IS S 20° 40' 41" E 1968.99'

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

NOTES:

THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT](http://www.ncdot.org/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT)

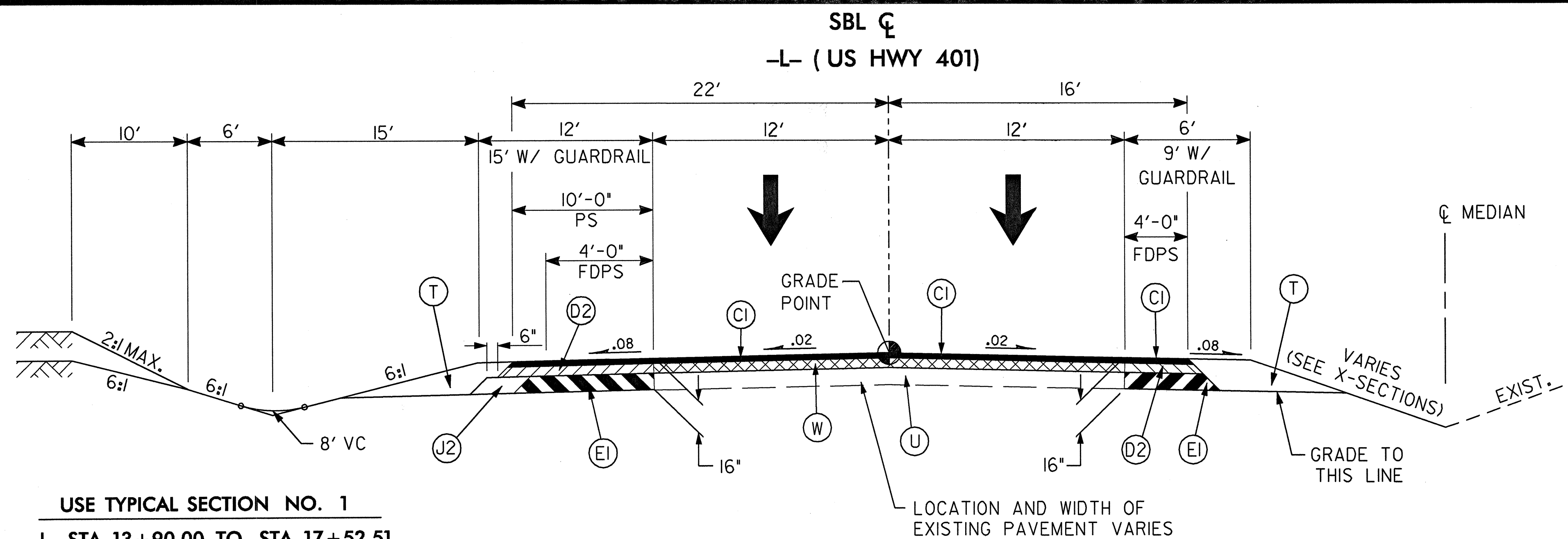
THE FILES TO BE FOUND ARE AS FOLLOWS:
 b3916_la_control_050504.txt

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

○ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

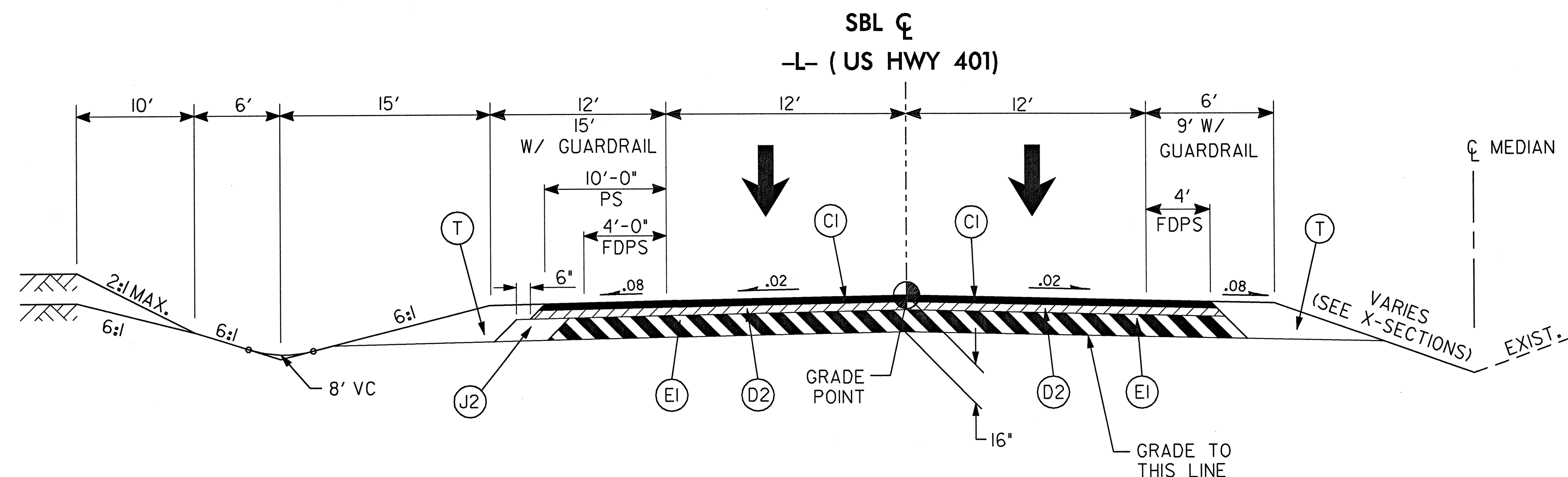
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM. NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING USER SERVICE (OPUS)

NOTE: DRAWING NOT TO SCALE



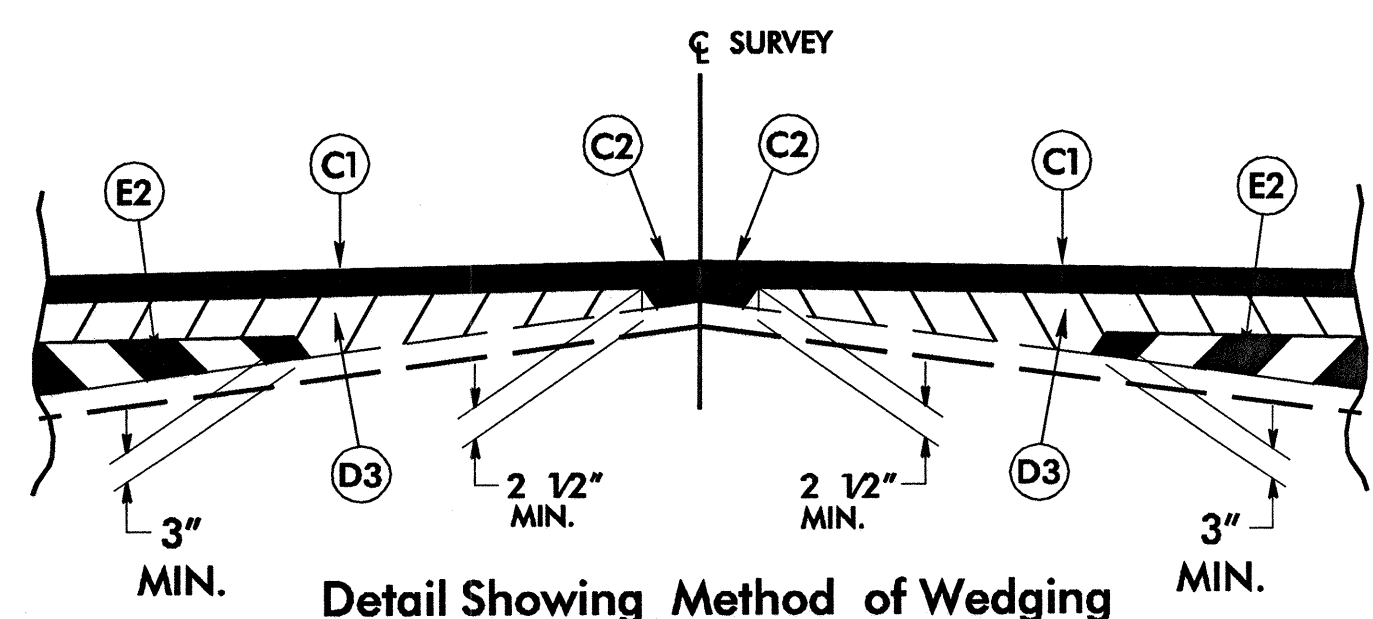
USE TYPICAL SECTION NO. 1
 -L- STA. 13+90.00 TO STA. 17+52.51
 -L- STA. 23+50.00 TO STA. 25+75.00

TYPICAL SECTION NO. 1

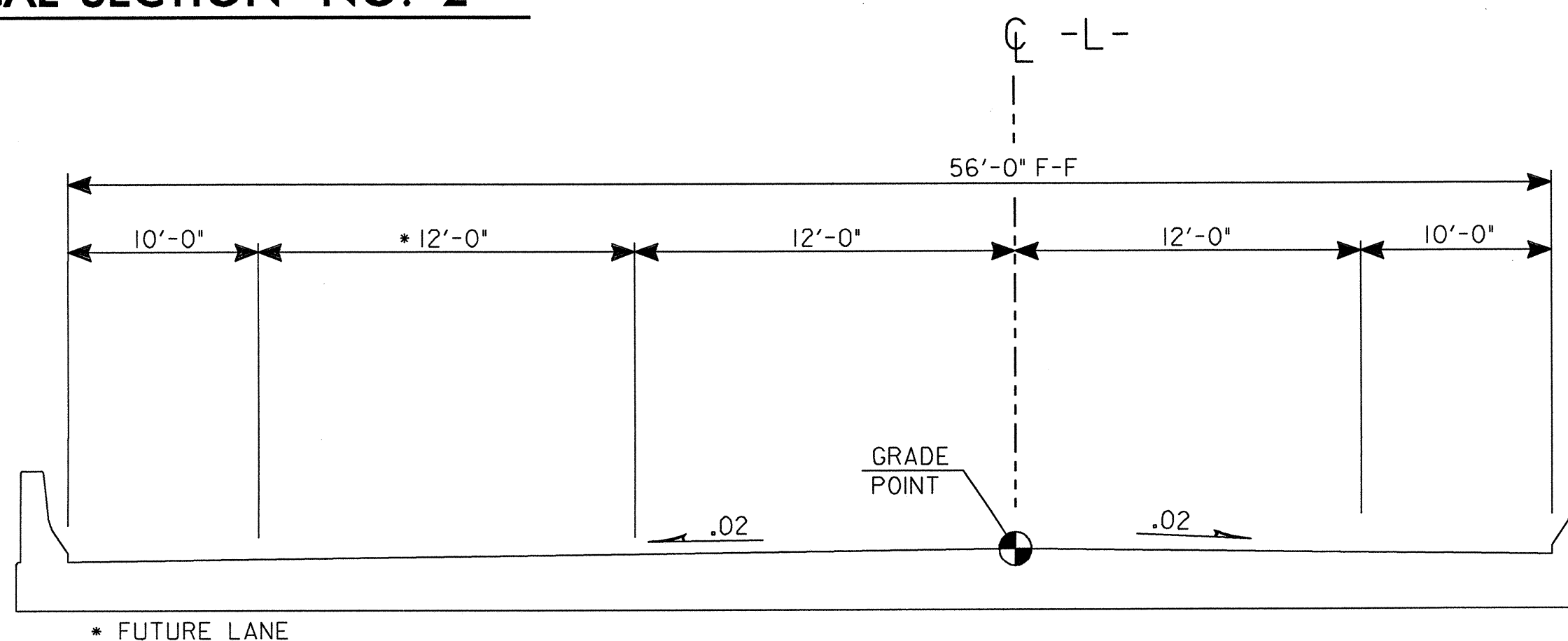


USE TYPICAL SECTION NO. 2
 -L- STA. 17+52.51 TO STA. 19+50.00 (BEGIN BRIDGE)
 -L- STA. 21+21.00 (END BRIDGE) TO STA. 23+50.00

TYPICAL SECTION NO. 2



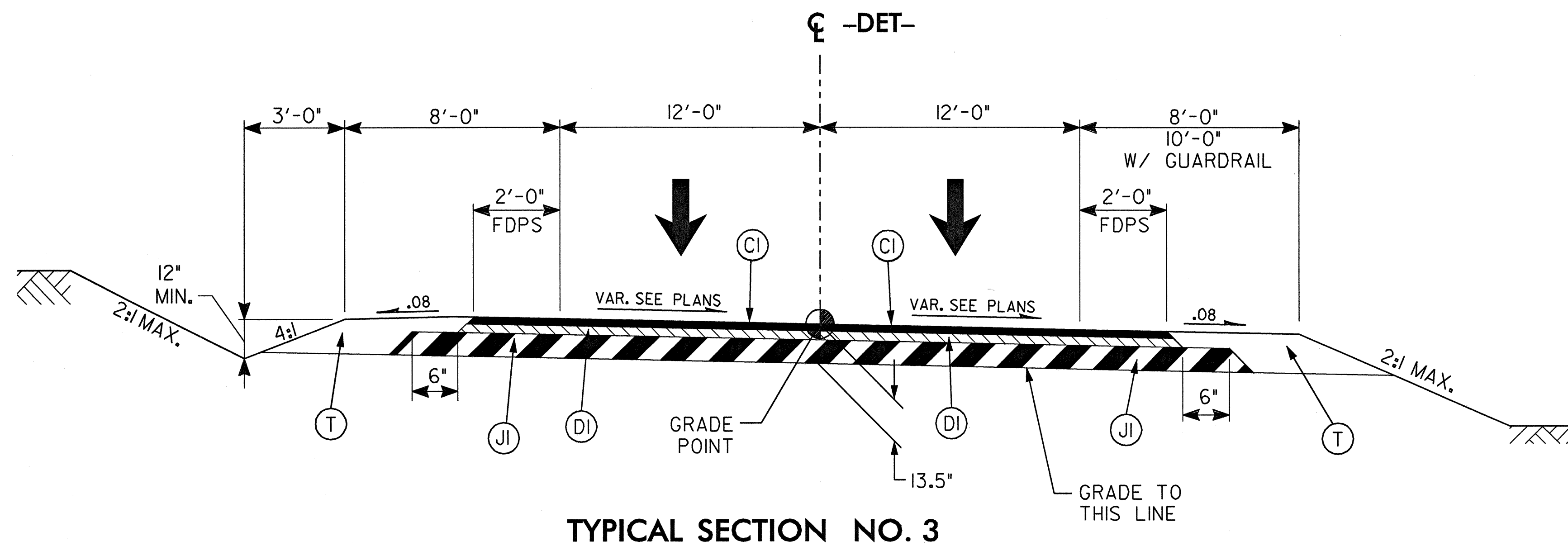
Detail Showing Method of Wedging



TYPICAL SECTION ON STRUCTURE
 (36" PRESTRESSED CONCRETE GIRDER)

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO PLACED IN LAYERS NOT LESS THAN 1 1/2" OR GREATER THAN 2".
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 9" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2".
J1	PROPOSED 8" AGGREGATE BASE COURSE
J2	PROPOSED VARIABLE DEPTH AGGREGATE BASE COURSE
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL THIS SHEET)

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



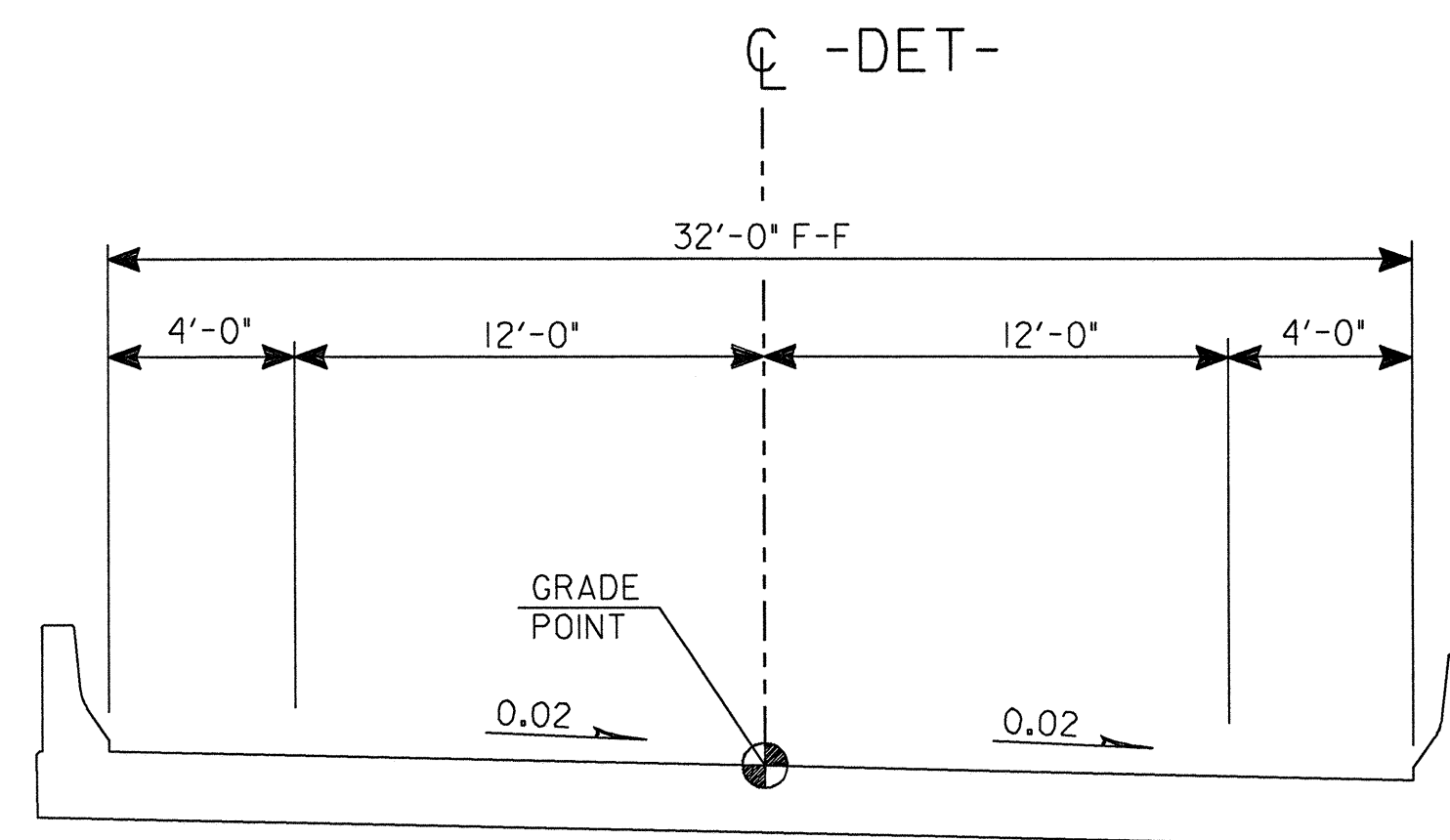
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

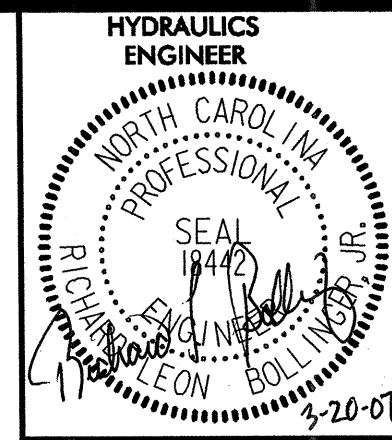
-DET- STA. 11+89.24 TO STA. 16+00.00 (BEGIN BRIDGE)
 -DET- STA. 17+60.00 (END BRIDGE) TO STA. 21+58.54

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
J1	PROPOSED 8" AGGREGATE BASE COURSE
T	EARTH MATERIAL.

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

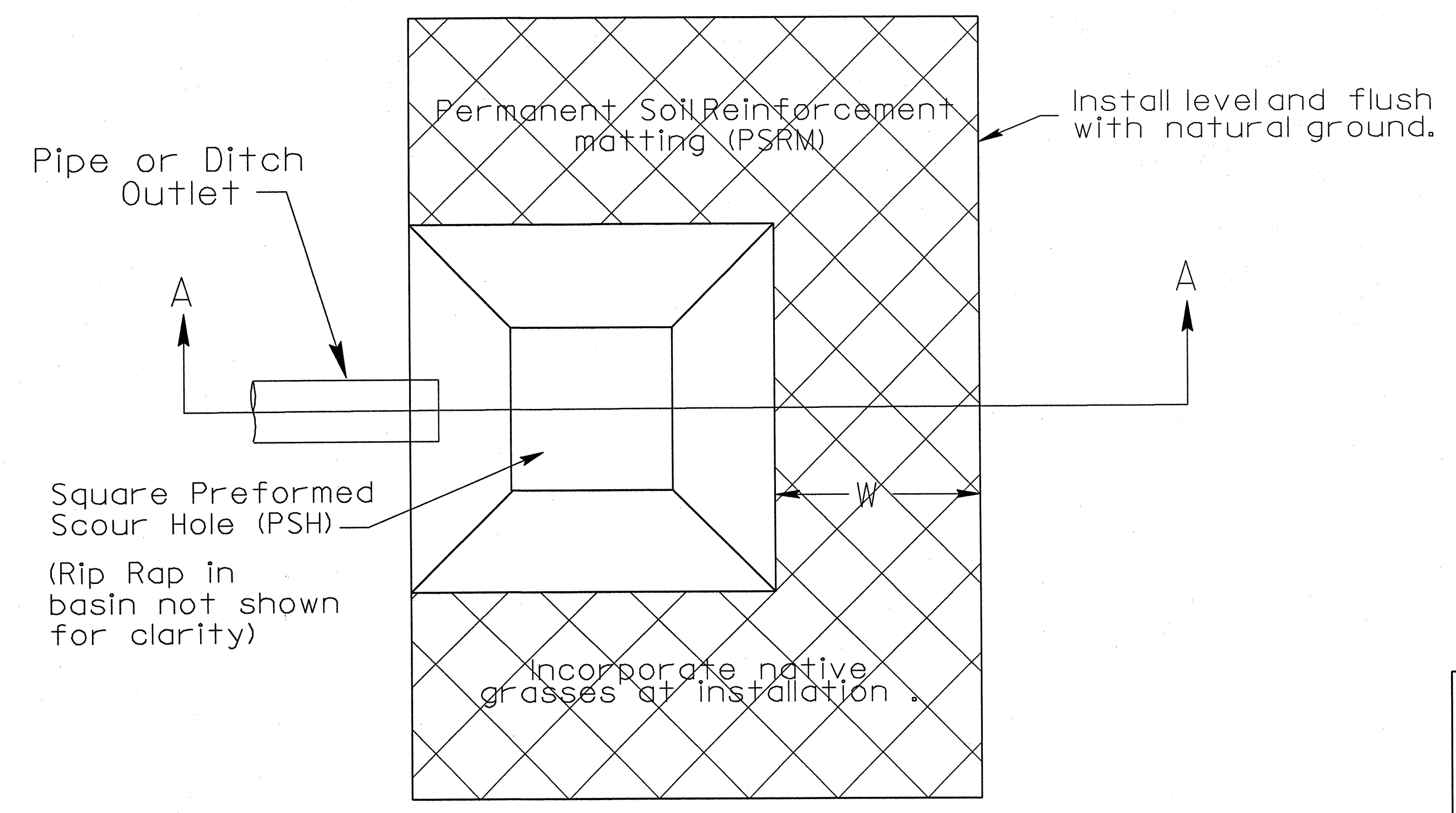


TYPICAL SECTION ON STRUCTURE



PREFORMED SCOUR HOLE DETAIL

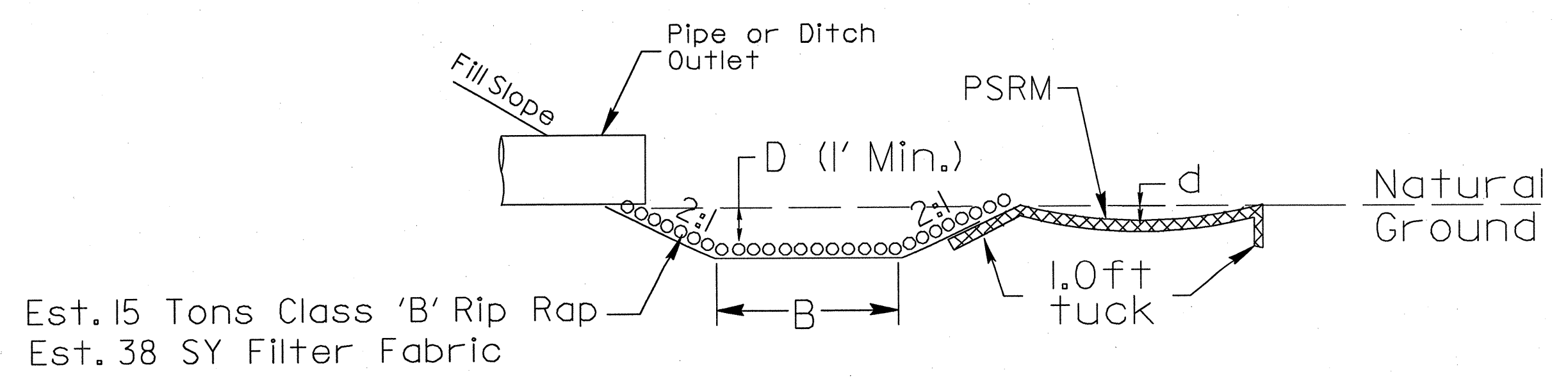
PLAN VIEW



LOCATION (AT OUTLET)
Sta 19+30 -L- (Lt.)
Sta 15+34 -DET- (Lt.)

B	5	ft
D	5	ft
W	5	ft
d	0.5	ft

SECTION A-A



GEOTECHNICAL ENGINEER

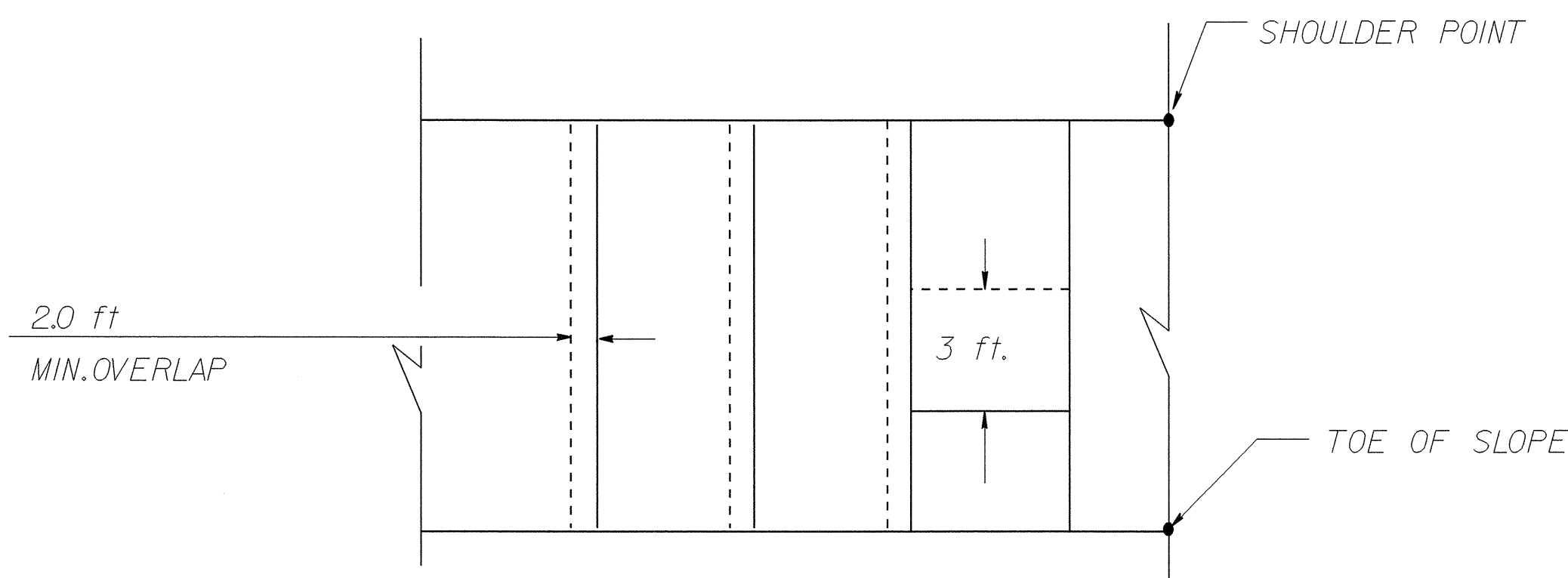
ENGINEER



29 APR 2007

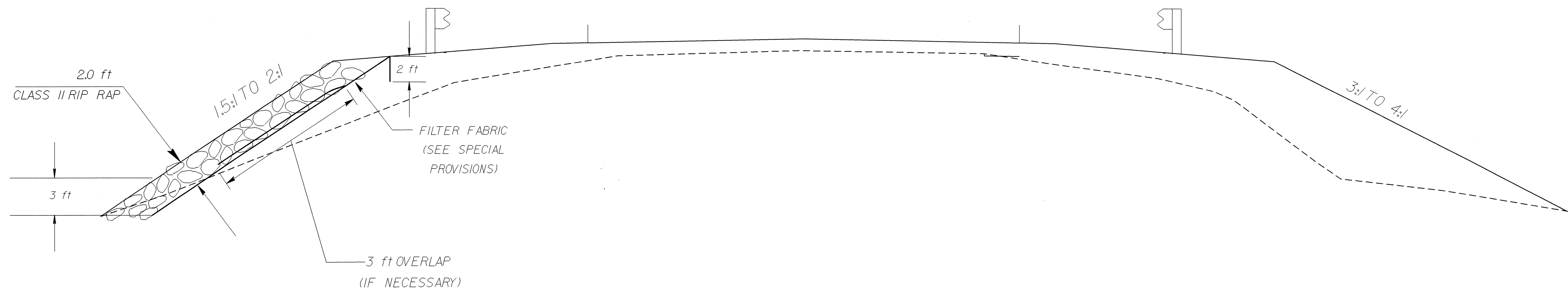
SIGNATURE DATE

SIGNATURE DATE



FABRIC OVERLAP DETAIL

N.T.S.



ROCK PLATING DETAIL

N.T.S.

ROCK PLATING LOCATION

STATION 19+00.00 -L- TO STATION 19+50.00 -L- LEFT

STATION 21+21.00 -L- TO STATION 22+00.00 -L- LEFT

STATION 24+50.00 -L- TO STATION 25+50.00 -L- LEFT

GEOTECHNICAL ENGINEERING UNIT
 EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

ROCK PLATING DETAIL

REVISIONS

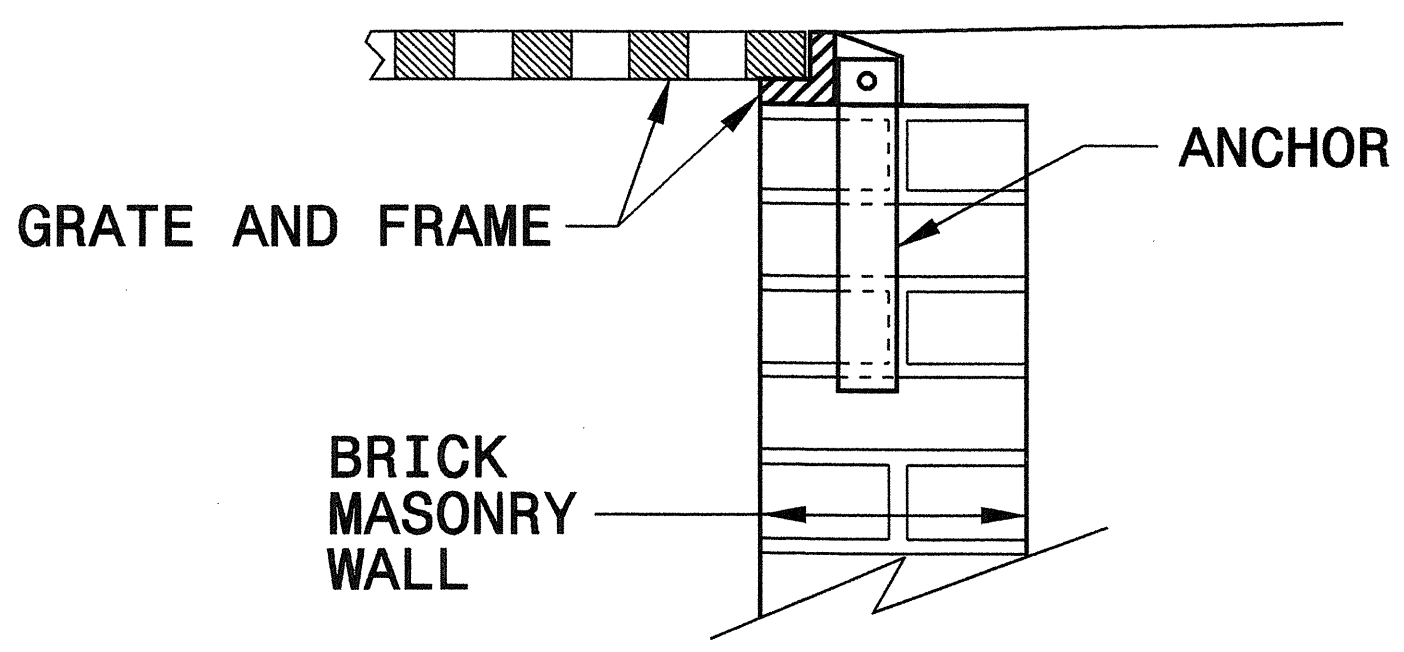
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2			4		

PREPARED BY: NTR	DATE: 2/07
REVIEWED BY: JRB	DATE: 2/07

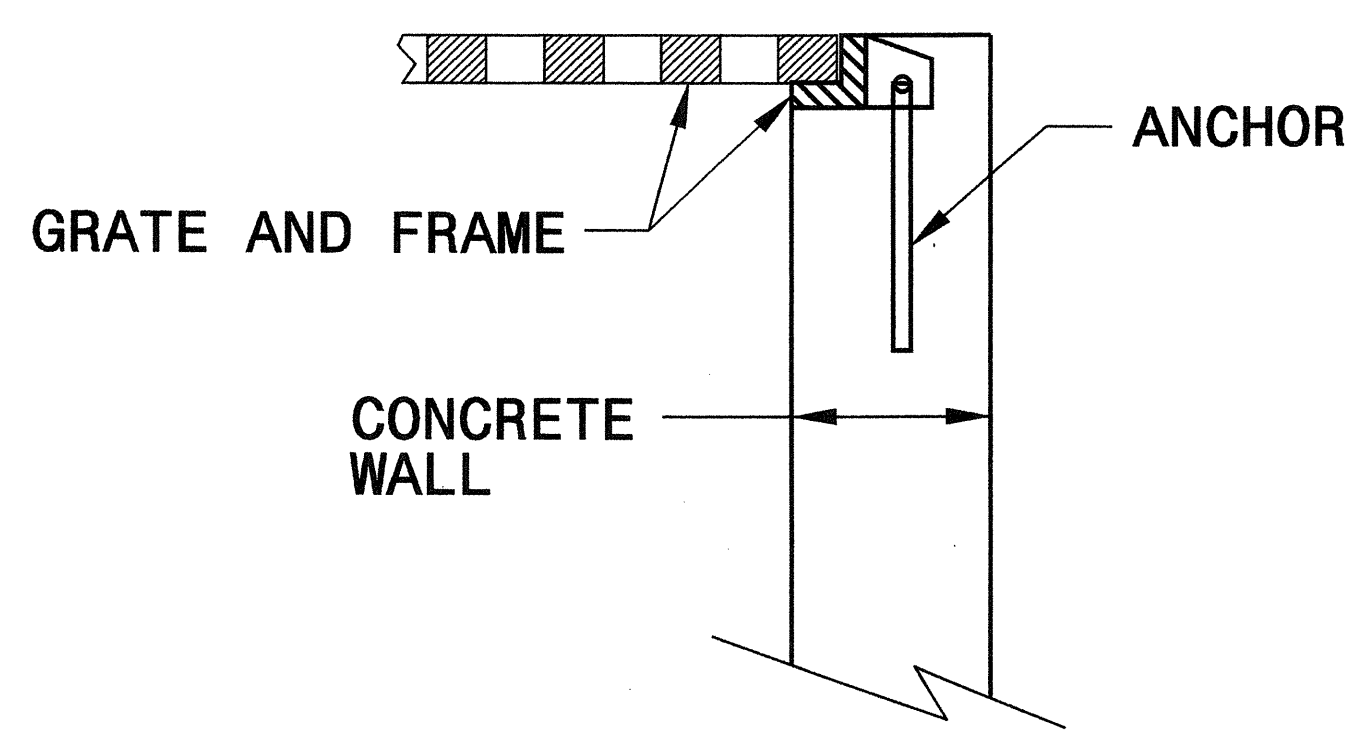
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

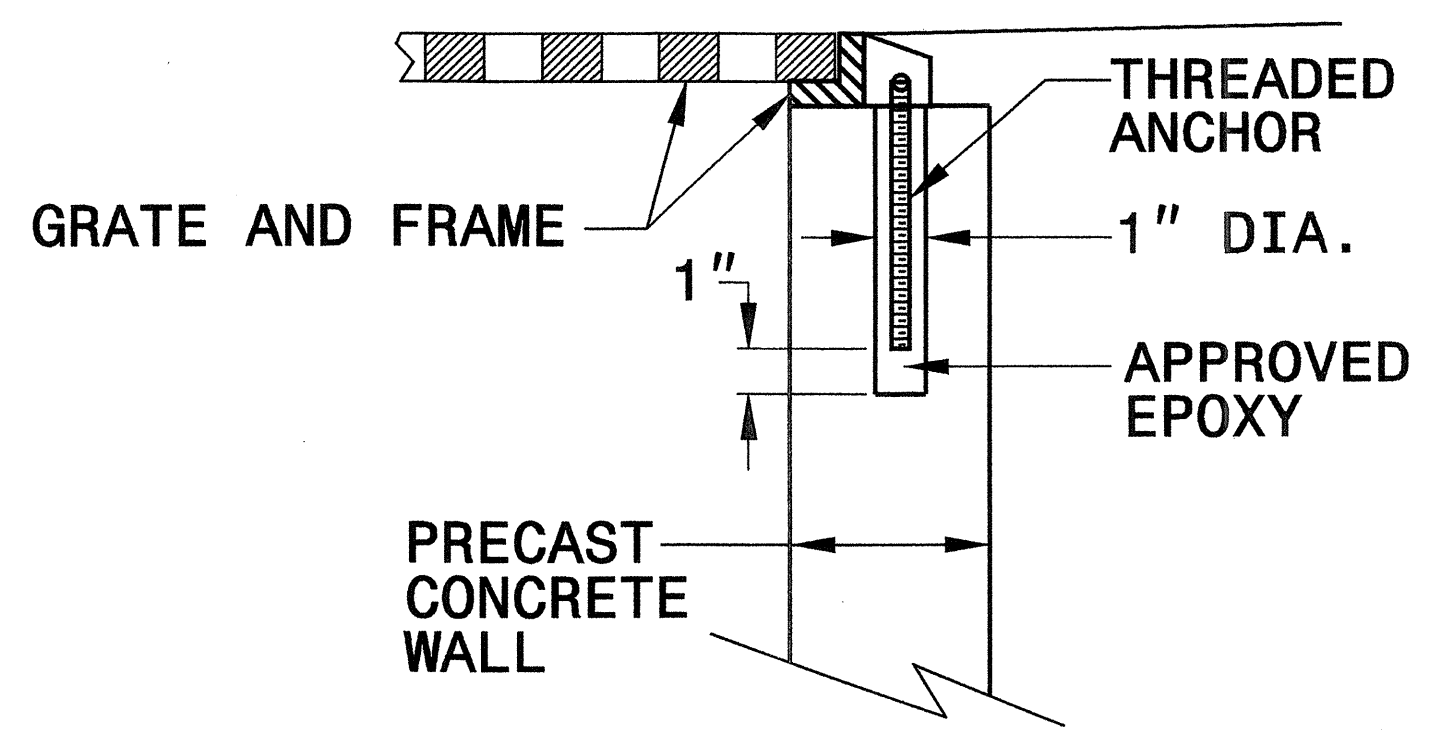
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



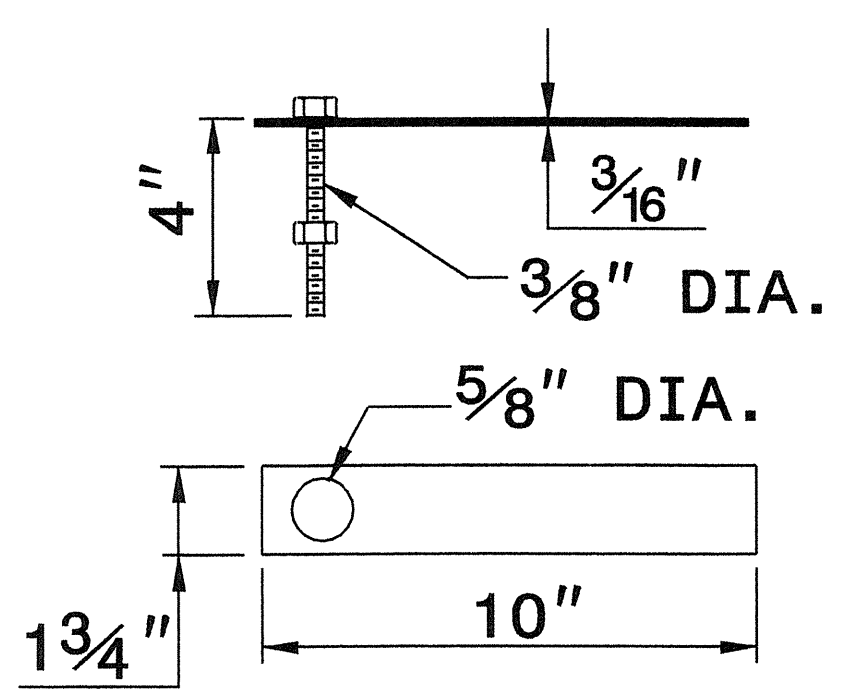
CONCRETE CONSTRUCTION



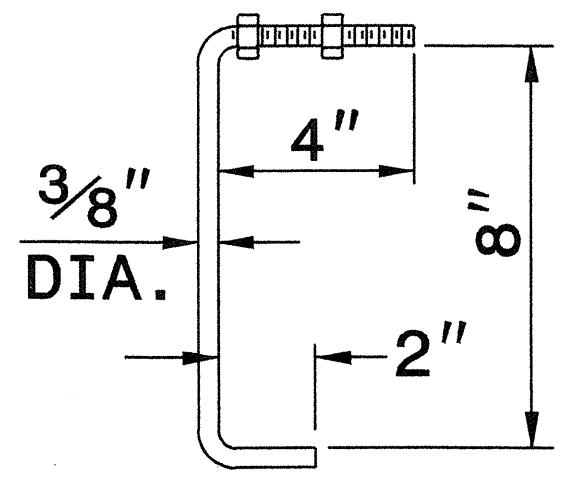
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

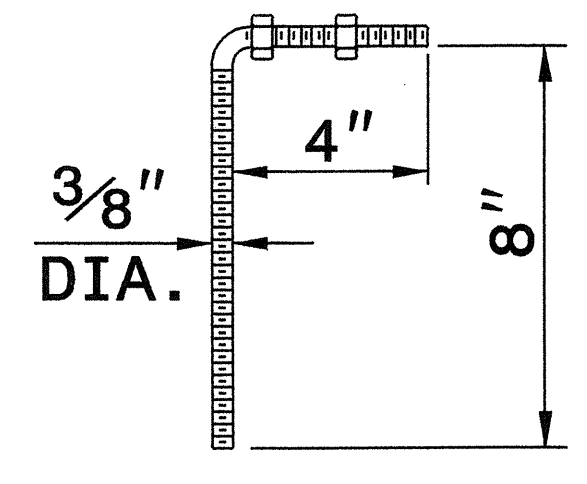
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



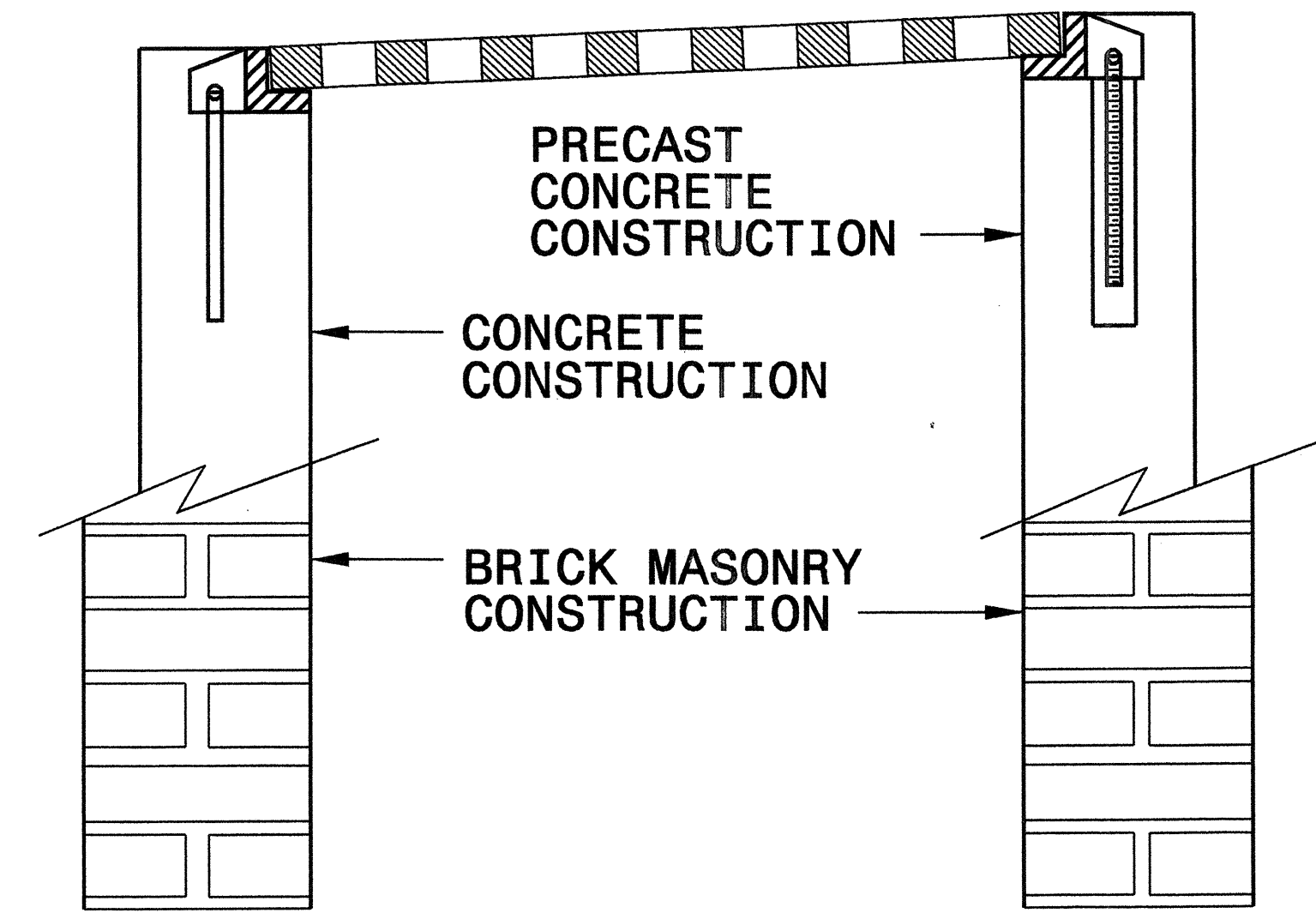
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



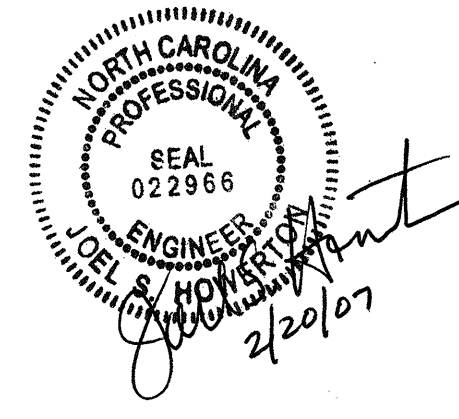
FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

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DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

SHEET 1 OF 1
840D25

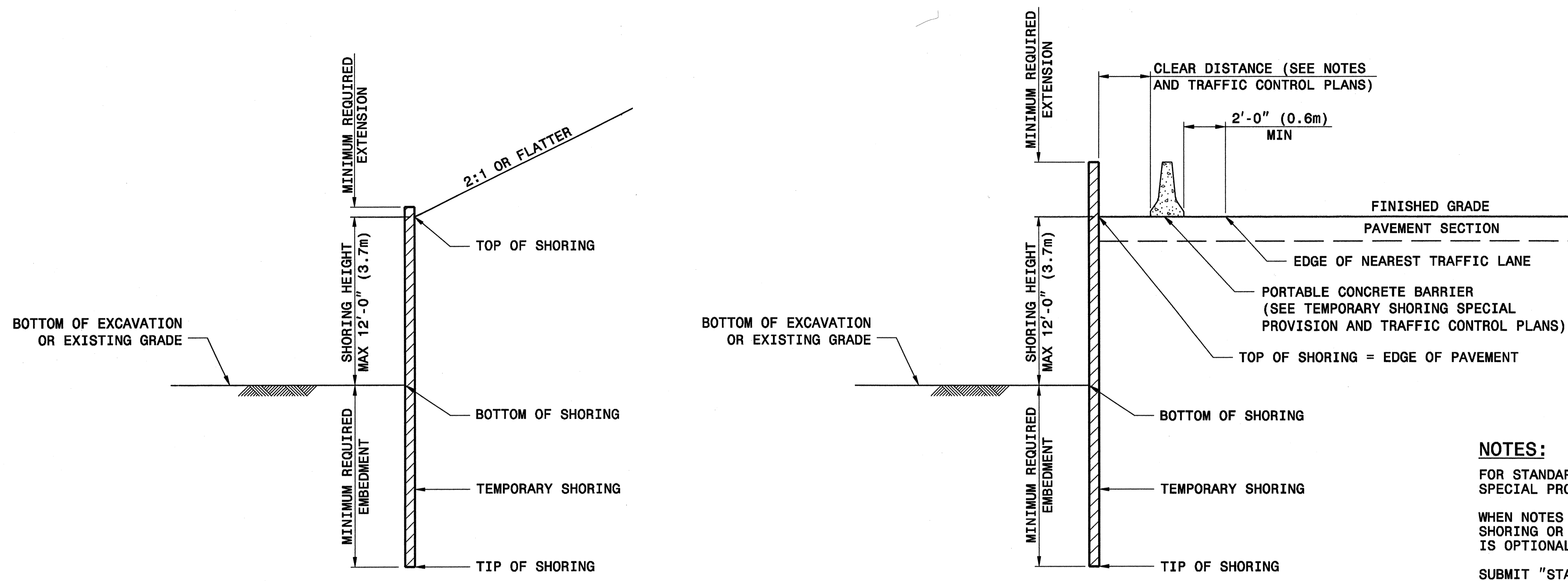
27-SEP-2006 09:01 S:\Contracts\Special Details\stds\06\stds to Special Details\840D25 Anchorage for Frames\0840d25.dgn



**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: *Paul S. Hunt* DATE: 7/27/06
FILE SPEC.: J



SLOPE CASE

SURCHARGE CASE

NOTES:

FOR STANDARD TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.
 WHEN NOTES ON PLANS DO NOT PROHIBIT STANDARD TEMPORARY SHORING OR STANDARD SHORING, STANDARD TEMPORARY SHORING IS OPTIONAL.
 SUBMIT "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 14 DAYS BEFORE BEGINNING SHORING CONSTRUCTION. UP TO THREE LOCATIONS MAY BE INCLUDED ON EACH SELECTION FORM.

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

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

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

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

VERIFY GROUNDWATER ELEVATION BEFORE BEGINNING SHORING CONSTRUCTION.

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

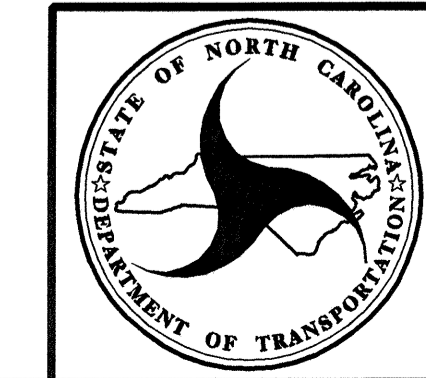
AT THE CONTRACTOR'S OPTION, H PILE EMBEDMENT DEPTHS FOR PILES SET IN DRILLED HOLES MAY BE REDUCED BY 25%. FOR PILE EXCAVATION, SEE TEMPORARY SHORING SPECIAL PROVISION.

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

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

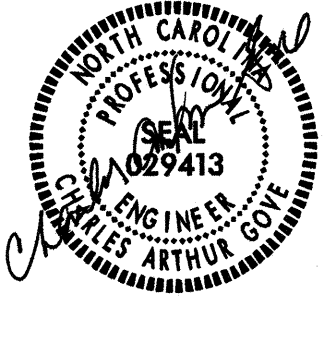
GROUNDWATER CONDITION	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT						SURCHARGE CASE WITH TRAFFIC IMPACT				
	SHORING HEIGHT FT (m)	SHEET PILES		H PILES WITH TIMBER LAGGING			MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN ³ /FT (cm ³ /m)	H PILES WITH TIMBER LAGGING		
		MINIMUM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

PROJECT REFERENCE NO. B-3916	SHEET 2-F
GEOTECHNICAL ENGINEER	ENGINEER
	_____ SIGNATURE DATE
_____ 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	4
HILFIKER TEMPORARY WALL	HILFIKER RETAINING WALLS	1902 HILFIKER LANE, EUREKA, CA 95503-5711 707-443-5093 WWW.HILFIKER.COM	WELDED WIRE MAT	5
SIERRASCAPE TEMPORARY WALL	TENSAR EARTH TECHNOLOGIES, INC	5883 GLENRIDGE DRIVE, SUITE 200 ATLANTA, GA 30328-5363 404-250-1290 WWW.TENSARCORP.COM	GEOGRID	6
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	7-9
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	10-12

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

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

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

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

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

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

TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/M³)
 FRICTION ANGLE = 30 DEGREES
 COHESION = 0 PSF (0 KPA)
 GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF REINFORCED ZONE.

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

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

EXCAVATE AS NECESSARY FOR STANDARD TEMPORARY MSE WALLS IN ACCORDANCE WITH THE FOLLOWING FOR THE WALL OPTION CHOSEN:

- 1) MINIMUM EMBEDMENT OF 18" (450mm) UNLESS WALL BEARS ON ROCK, CONCRETE OR PAVEMENT AS DETERMINED BY THE ENGINEER
- 2) VERTICAL STEPS IN INCREMENT EQUAL TO THE VERTICAL REINFORCEMENT SPACING
- 3) WITH THE EXCEPTION OF EITHER THE FIRST OR LAST SECTION OF WALL, HORIZONTAL SECTION LENGTHS IN INCREMENTS EQUAL TO THE FOLLOWING:

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

DO NOT PLACE SHORING BACKFILL OR FIRST REINFORCEMENT LAYER UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND CHECKING FOUNDATION MATERIAL FOR IN-SITU ASSUMED SOIL PARAMETERS.

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

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

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

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

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

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

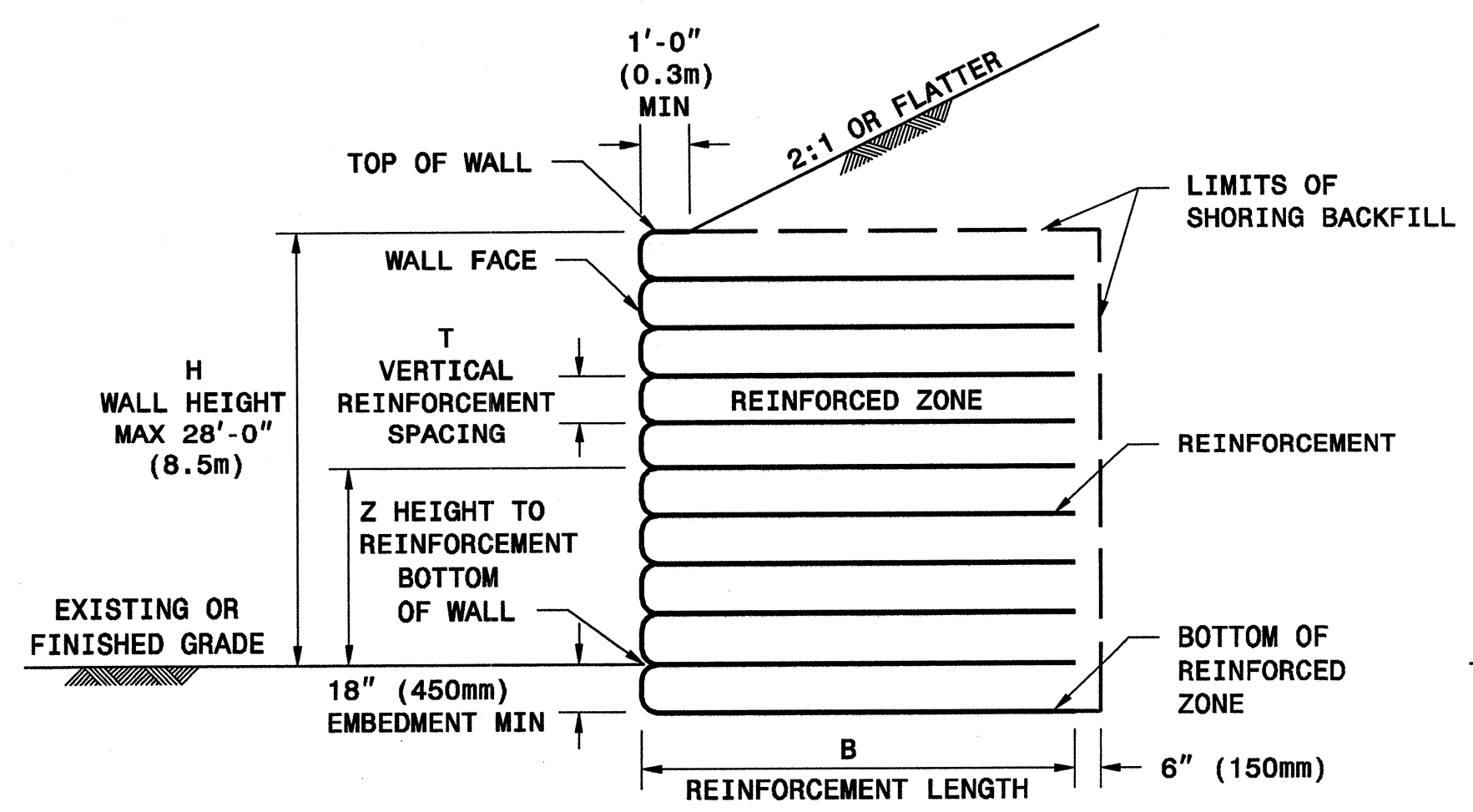
PLACE SHORING BACKFILL IN 8" TO 10" (200mm TO 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

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

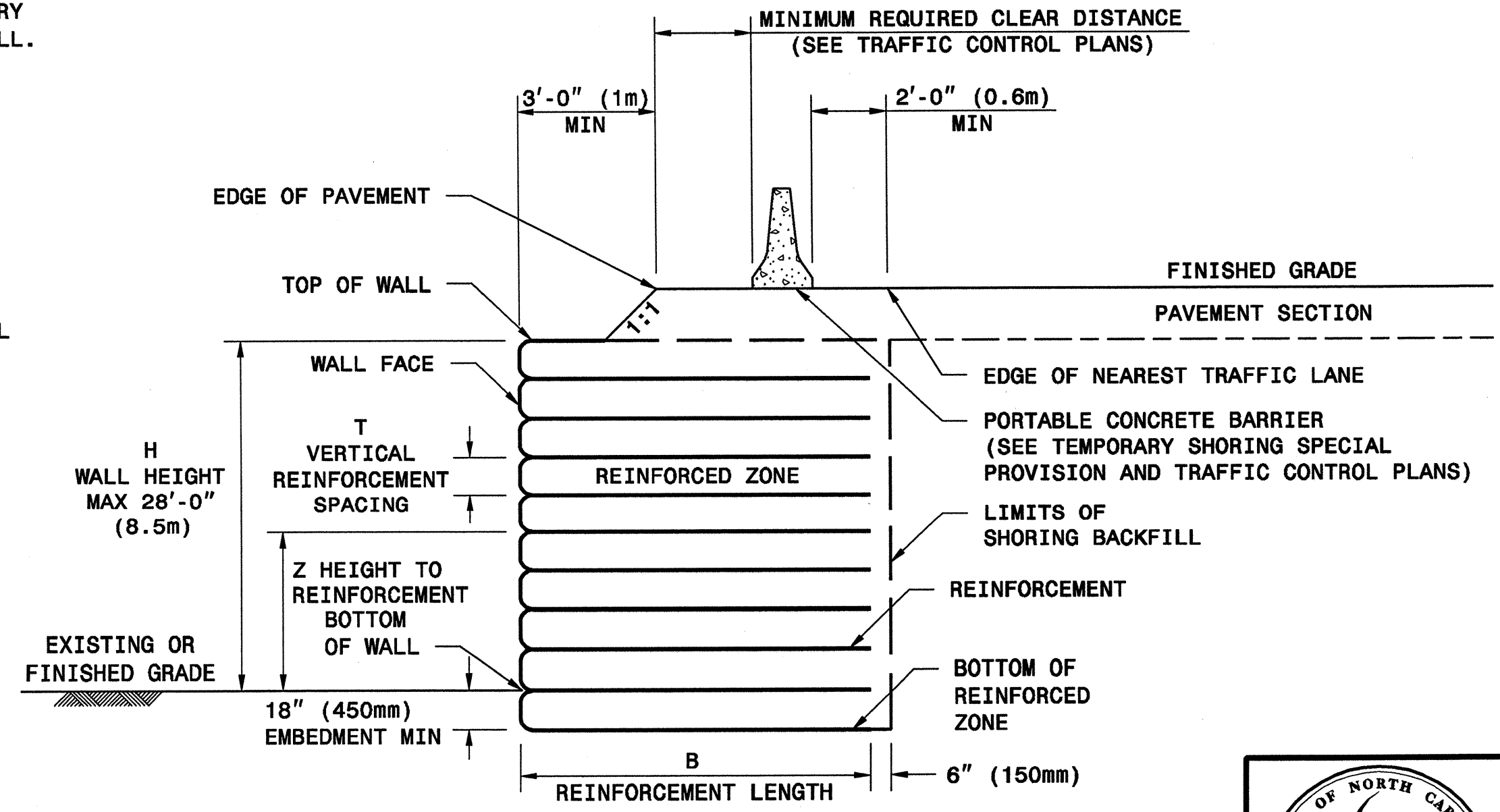
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm AND 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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

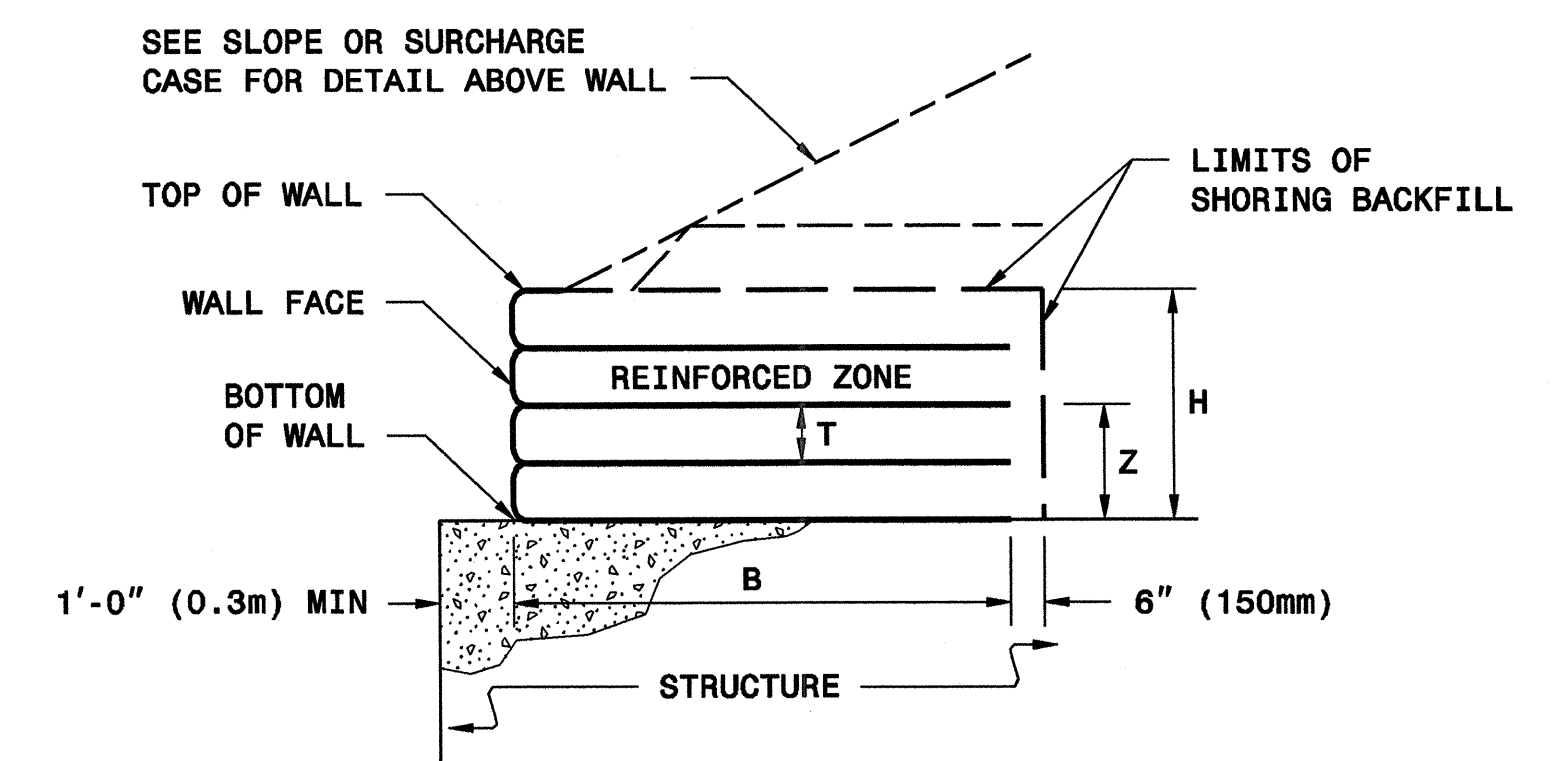
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



SLOPE CASE



SURCHARGE CASE



TEMPORARY MSE WALL ON STRUCTURE



GEOTECHNICAL ENGINEERING UNIT
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS

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 4 FOR FABRIC STRENGTH REQUIREMENTS BASED ON WALL HEIGHT (H)
- FOR ALL OTHER WALL OPTIONS, DETERMINE REINFORCEMENT TYPE FROM TABLES BELOW FOR EACH HEIGHT TO REINFORCEMENT (Z) BASED ON WALL HEIGHT (H) AND SLOPE OR SURCHARGE CASE

MINIMUM REQUIRED REINFORCEMENT LENGTH B (FT)

(FOR ALL WALL OPTIONS)

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

TERRATREL TEMPORARY WALL (STRIPS PER LEVEL PER PANEL)

H (FT)		<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28
SLOPE AND SURCHARGE CASES	Z (FT-IN)	27 - 8												3
	26 - 10													3
	25 - 2													3
	23 - 6													3
	21 - 10													3
	20 - 2													3
	18 - 6													3
	16 - 10													3
	15 - 2													3
	13 - 6													3
	11 - 10													3
	10 - 2													3
8 - 6													3	
6 - 10													3	
5 - 2													3	
3 - 6													3	
1 - 10													3	
0 - 2													3	
-0 - 8													3	

SIERRASCAPE TEMPORARY WALL (GEOGRID TYPE)

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

H (FT)		<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28
SLOPE CASE	Z (FT)	26.5												11
	25.5													11
	24													11
	22.5													11
	21													11
	19.5													11
	18													11
	16.5													11
	15													11
	13.5													11
	12													11
	10.5													11
9													11	
7.5													11	
6													11	
4.5													11	
3													11	
1.5													11	
0													11	
-1.5													11	

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

HILFIKER TEMPORARY WALL (WELDED WIRE MAT TYPE)

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

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

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

RETAINED EARTH TEMPORARY WALL (WELDED WIRE MESH TYPE)

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

NOTES FOR HILFIKER TEMPORARY WALL

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

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 4 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 (M)

(FOR ALL WALL OPTIONS)

WALL HEIGHT H (M)	<2.4	2.4 TO 3.0	3.0 TO 3.7	3.7 TO 4.3	4.3 TO 4.9	4.9 TO 5.5	5.5 TO 6.1	6.1 TO 6.7	6.7 TO 7.3	7.3 TO 7.9	7.9 TO 8.5
SLOPE CASE	2.4	3.4	4.0	4.3	4.9	5.5	6.1	6.7	7.3	7.6	8.2
SURCHARGE CASE	2.4	2.7	3.4	3.7	4.3	4.6	4.9	5.5	5.8	6.4	6.7

TERRATREL TEMPORARY WALL (STRIPS PER LEVEL PER PANEL)

H (M)	<1.2	1.2 TO 1.8	1.8 TO 2.4	2.4 TO 3.0	3.0 TO 3.7	3.7 TO 4.3	4.3 TO 4.9	4.9 TO 5.5	5.5 TO 6.1	6.1 TO 6.7	6.7 TO 7.3	7.3 TO 7.9	7.9 TO 8.5
Z (M)	3	3	3	3	3	3	3	3	3	3	3	3	3
SLOPE AND SURCHARGE CASES	8.4	8.2	7.7	7.2	6.7	6.1	5.6	5.1	4.6	4.1	3.6	3.1	2.6
	2.1	1.6	1.1	0.6	0.1	-0.2							

SIERRASCAPE TEMPORARY WALL (GEOGRID TYPE)

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

H (M)	<1.2	1.2 TO 1.8	1.8 TO 2.4	2.4 TO 3.0	3.0 TO 3.7	3.7 TO 4.3	4.3 TO 4.9	4.9 TO 5.5	5.5 TO 6.1	6.1 TO 6.7	6.7 TO 7.3	7.3 TO 7.9	7.9 TO 8.5
Z (M)	11	11	11	11	11	11	11	11	11	11	11	11	11
SLOPE CASE	8.1	7.8	7.3	6.9	6.4	5.9	5.5	5.0	4.6	4.1	3.7	3.2	2.7
	2.3	1.8	1.4	0.9	0.5	0.0	-0.5						

H (M)	<1.2	1.2 TO 1.8	1.8 TO 2.4	2.4 TO 3.0	3.0 TO 3.7	3.7 TO 4.3	4.3 TO 4.9	4.9 TO 5.5	5.5 TO 6.1	6.1 TO 6.7	6.7 TO 7.3	7.3 TO 7.9	7.9 TO 8.5
Z (M)	11	11	11	11	11	11	11	11	11	11	11	11	11
SURCHARGE CASE	8.1	7.8	7.3	6.9	6.4	5.9	5.5	5.0	4.6	4.1	3.7	3.2	2.7
	2.3	1.8	1.4	0.9	0.5	0.0	-0.5						

HILFIKER TEMPORARY WALL (WELDED WIRE MAT TYPE)

29 = MW29 x MW23
 45 = MW45 x MW23
 61 = MW61 x MW26

H (M)	<1.2	1.2 TO 1.8	1.8 TO 2.4	2.4 TO 3.0	3.0 TO 3.7	3.7 TO 4.3	4.3 TO 4.9	4.9 TO 5.5	5.5 TO 6.1	6.1 TO 6.7	6.7 TO 7.3	7.3 TO 7.9	7.9 TO 8.5
Z (M)	29	29	29	29	29	29	29	29	29	29	29	29	29
SLOPE CASE	7.9	7.3	6.7	6.1	5.5	4.9	4.3	3.7	3.0	2.4	1.8	1.2	0.6
	0.9	0.6	0.3	0.0	-0.5								

H (M)	<1.2	1.2 TO 1.8	1.8 TO 2.4	2.4 TO 3.0	3.0 TO 3.7	3.7 TO 4.3	4.3 TO 4.9	4.9 TO 5.5	5.5 TO 6.1	6.1 TO 6.7	6.7 TO 7.3	7.3 TO 7.9	7.9 TO 8.5
Z (M)	29	29	29	29	29	29	29	29	29	29	29	29	29
SURCHARGE CASE	7.9	7.3	6.7	6.1	5.5	4.9	4.3	3.7	3.0	2.4	1.8	1.2	0.6
	0.9	0.6	0.3	0.0	-0.5								

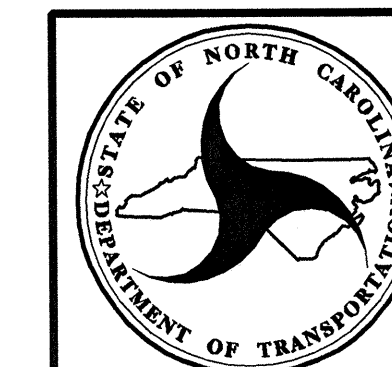
RETAINED EARTH TEMPORARY WALL (WELDED WIRE MESH TYPE)

3X1 = 3MW52 x MW52 x 305mm
 3X2 = 3MW52 x MW52 x 610mm

H (M)	<1.2	1.2 TO 1.8	1.8 TO 2.4	2.4 TO 3.0	3.0 TO 3.7	3.7 TO 4.3	4.3 TO 4.9	4.9 TO 5.5	5.5 TO 6.1	6.1 TO 6.7	6.7 TO 7.3	7.3 TO 7.9	7.9 TO 8.5
Z (M)	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1
SLOPE AND SURCHARGE CASES	8.4	8.2	7.7	7.2	6.7	6.1	5.6	5.1	4.6	4.1	3.6	3.1	2.6
	2.1	1.6	1.1	0.6	0.1	-0.5							

NOTES FOR HILFIKER TEMPORARY WALL

- 1) CAP MAT AT TOP OF WALL IS NOT INCLUDED IN TABLES.
- 2) REINFORCEMENT IS NOT REQUIRED AT 0.3m LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 7.3m.
- 3) REINFORCEMENT IS NOT REQUIRED AT 0.9m LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 7.9m.
- 4) REINFORCEMENT IS NOT REQUIRED AT 0.3m LEVEL FOR SURCHARGE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 7.9m.

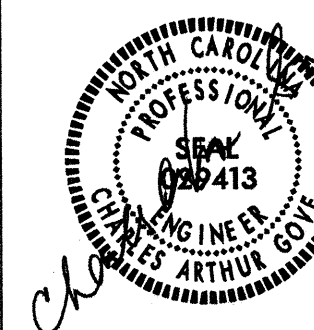


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STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - METRIC

GEOTECHNICAL ENGINEER

ENGINEER



22 March 2007

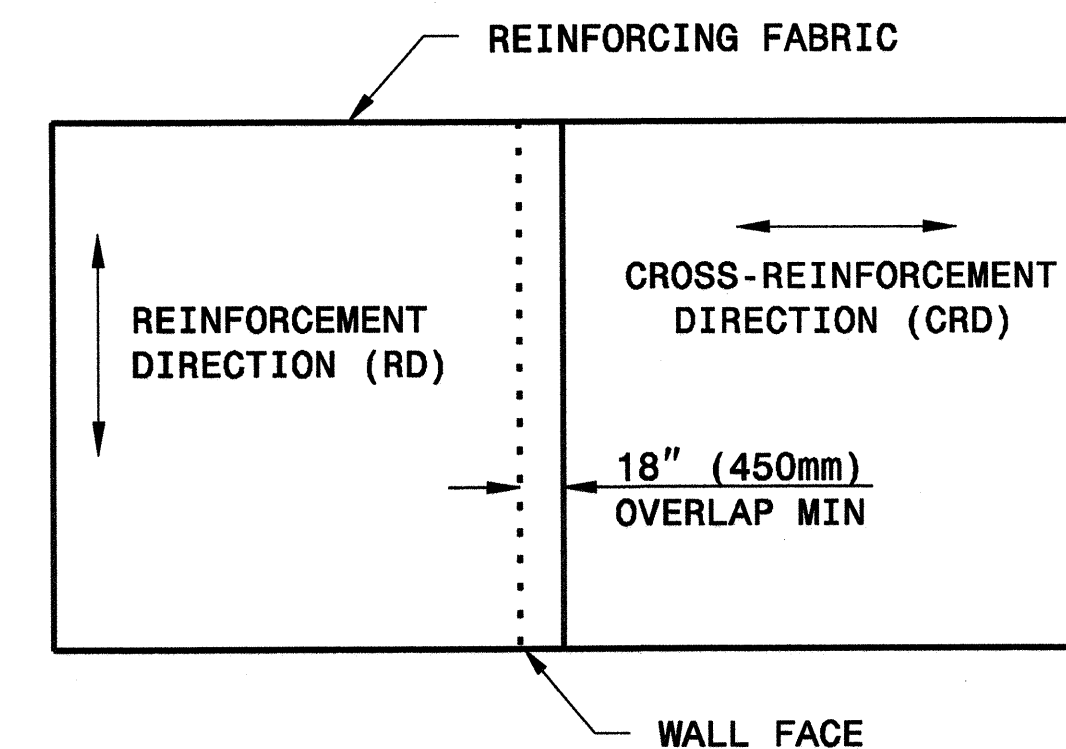
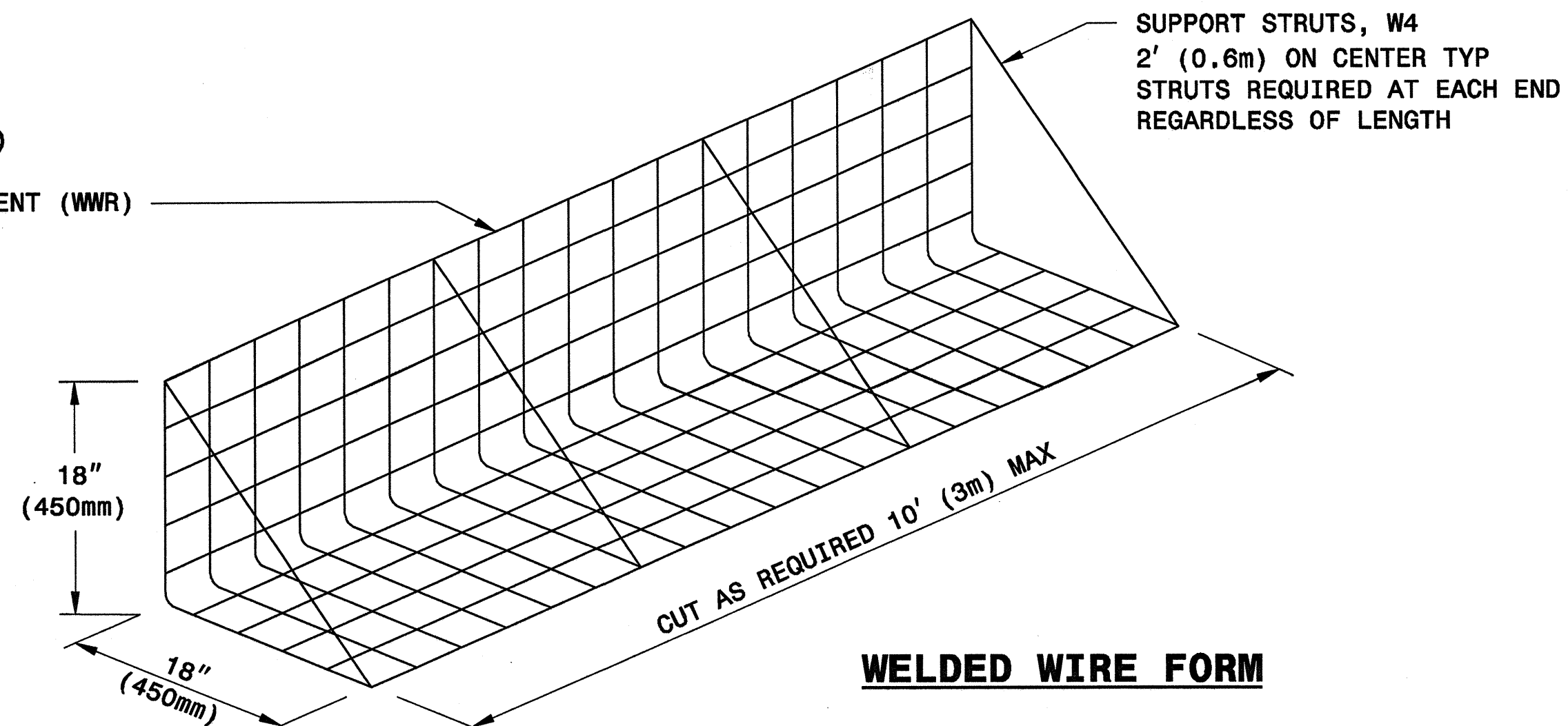
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DATE

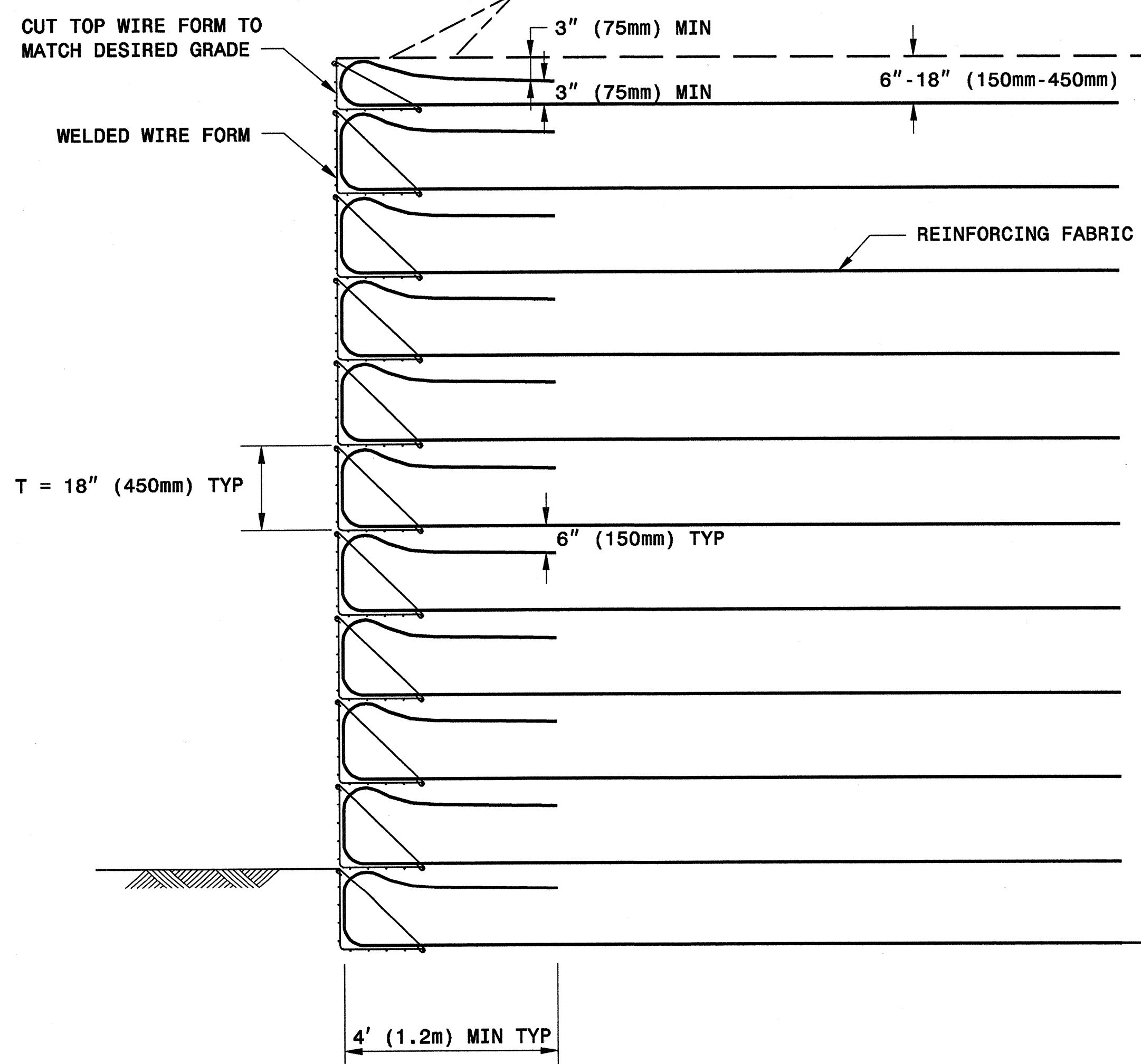
SIGNATURE

DATE

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



PLAN VIEW OF FABRIC OVERLAP

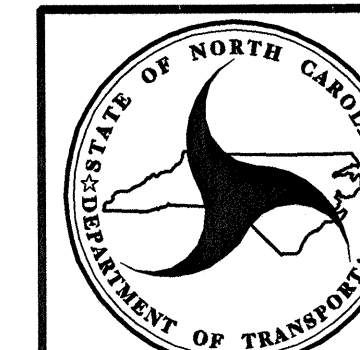


TYPICAL SECTION

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

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

*RD = REINFORCEMENT DIRECTION

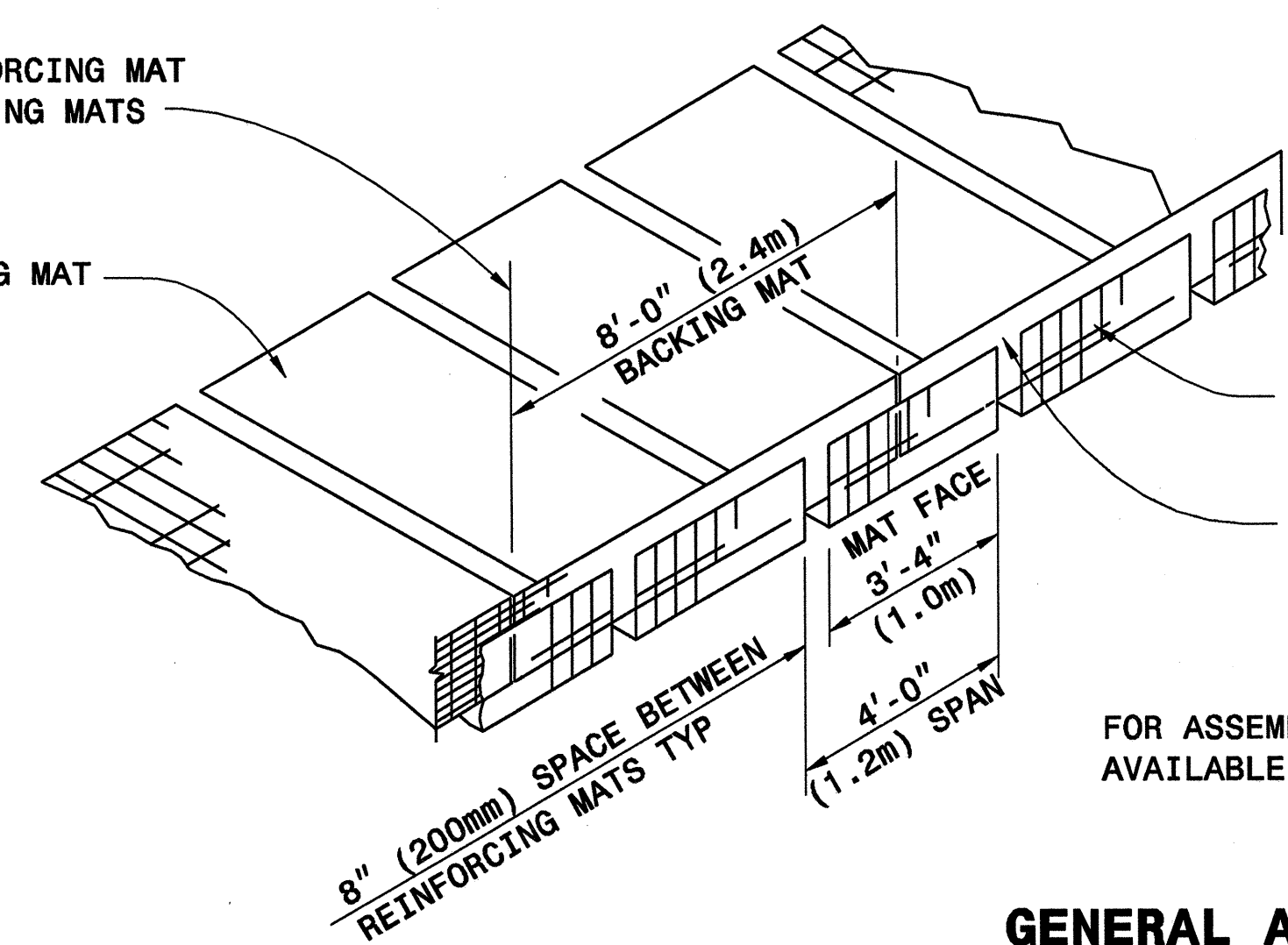


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TEMPORARY FABRIC WALL

CENTERLINE OF REINFORCING MAT
FACE = EDGE OF BACKING MATS

REINFORCING MAT

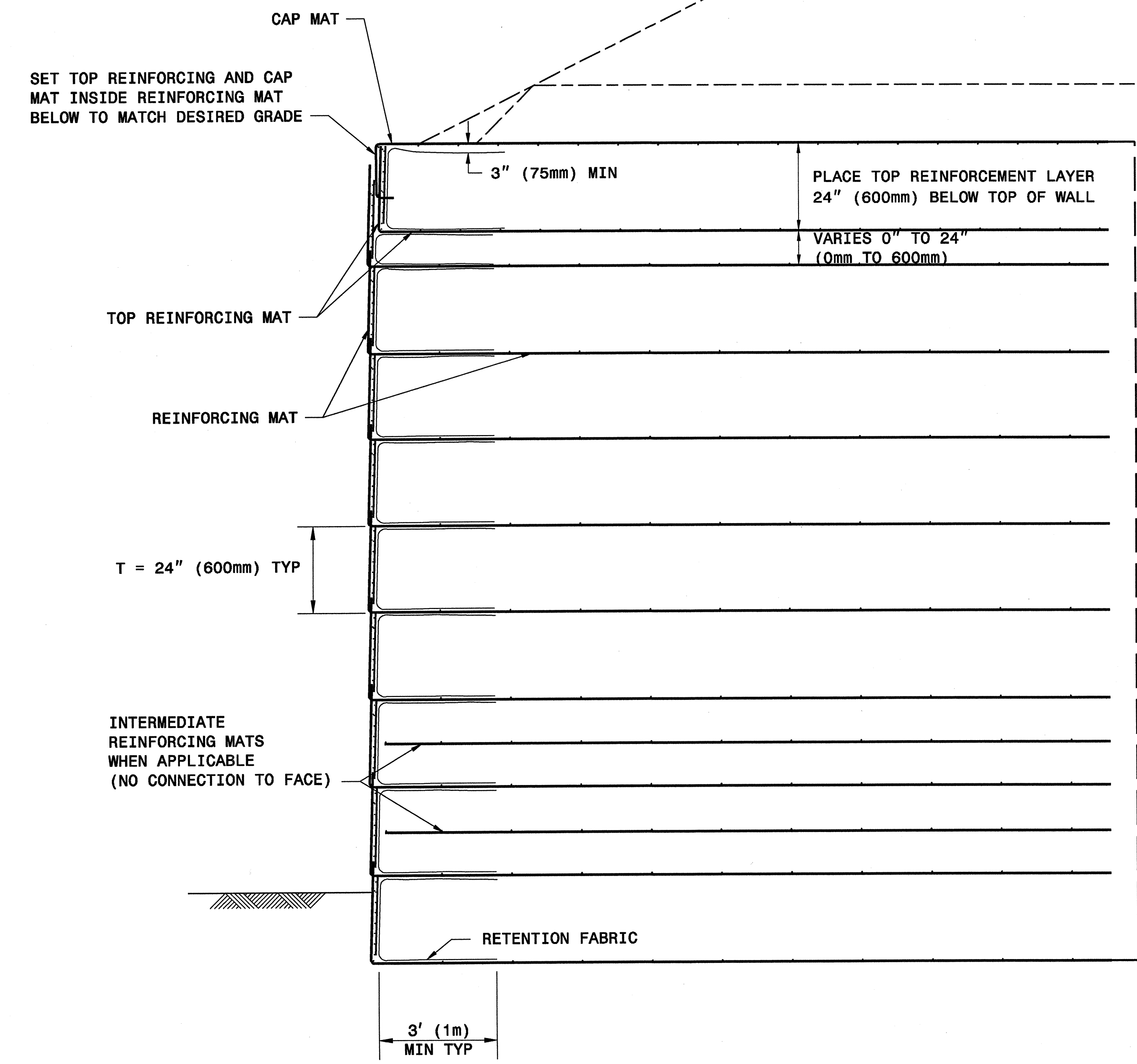


WALL FACE

BACKING MAT

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

GENERAL ASSEMBLY DETAIL



SET TOP REINFORCING AND CAP MAT INSIDE REINFORCING MAT BELOW TO MATCH DESIRED GRADE

PLACE TOP REINFORCEMENT LAYER 24" (600mm) BELOW TOP OF WALL

VARIES 0" TO 24" (0mm TO 600mm)

TOP REINFORCING MAT

REINFORCING MAT

T = 24" (600mm) TYP

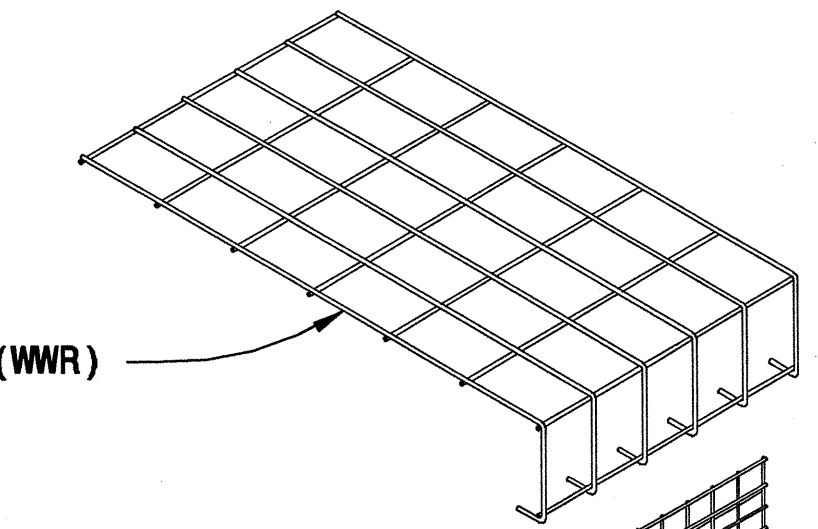
INTERMEDIATE REINFORCING MATS WHEN APPLICABLE (NO CONNECTION TO FACE)

RETENTION FABRIC

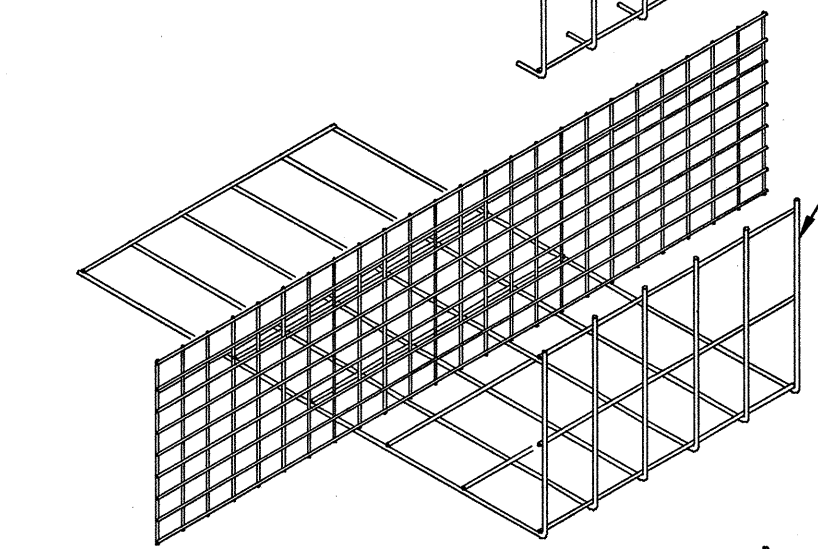
3' (1m) MIN TYP

TYPICAL SECTION

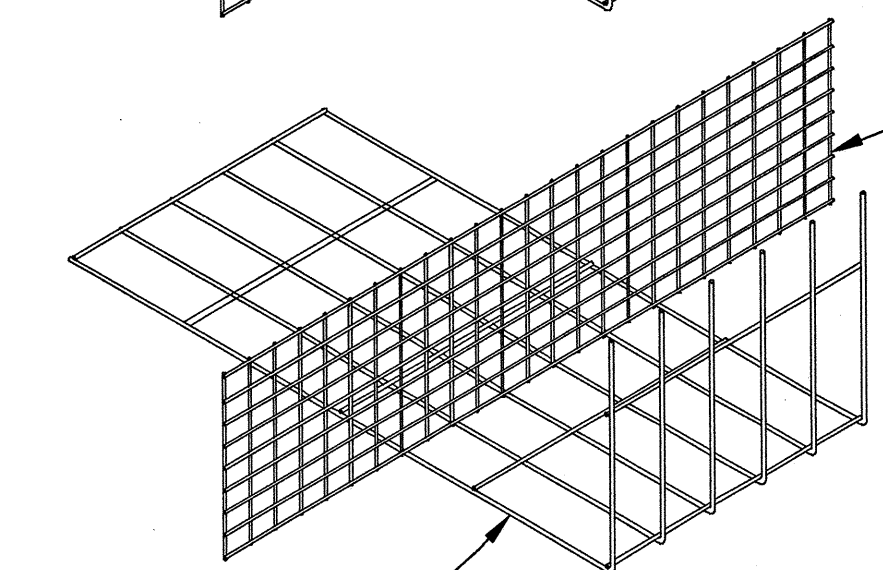
8" X 12" (203mm X 305mm)
W4.5 X W3.5 (MW29 X MW23)
CAP MAT
WELDED WIRE REINFORCEMENT (WWR)



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



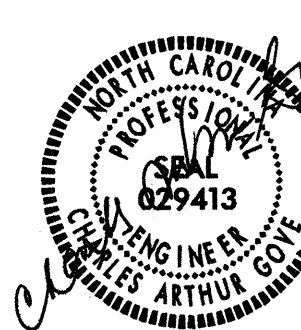
4" X 3" (102mm X 76mm)
W5 X W2.5 (MW32 X MW16) WWR
BACKING MAT
8' (2.4m) WIDE



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



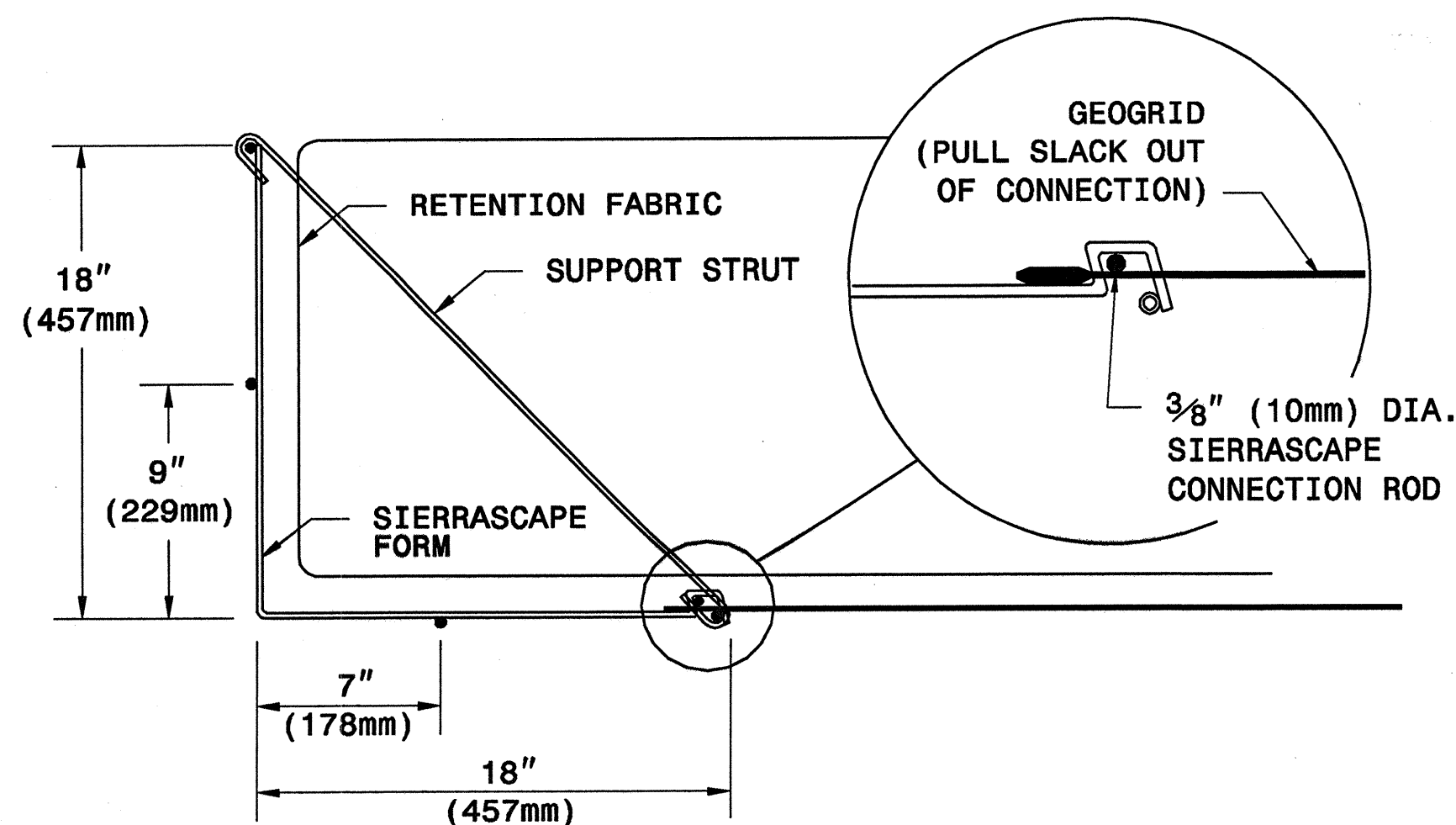
WALL COMPONENTS



22 MARCH 2007

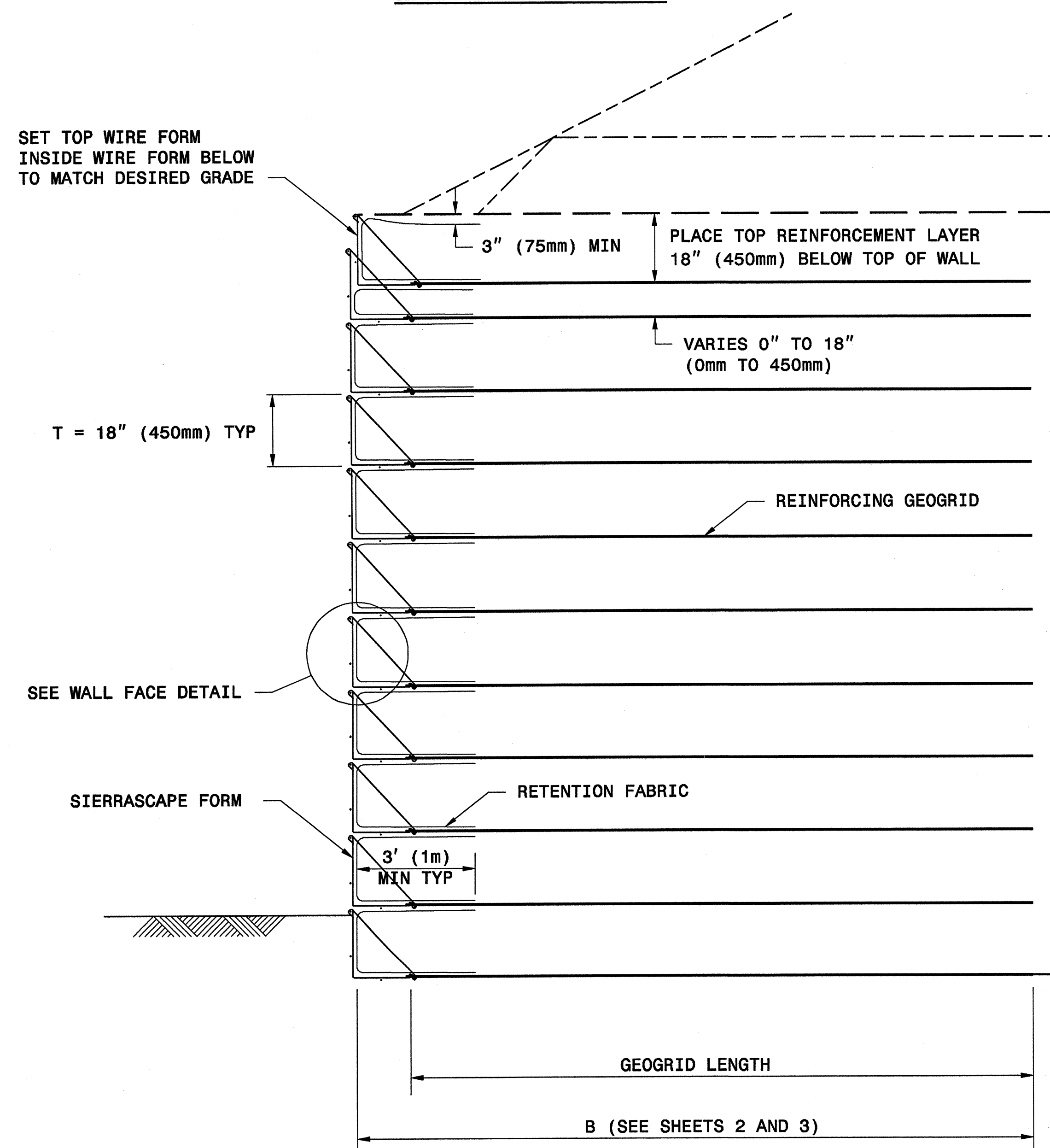
SIGNATURE DATE

SIGNATURE DATE

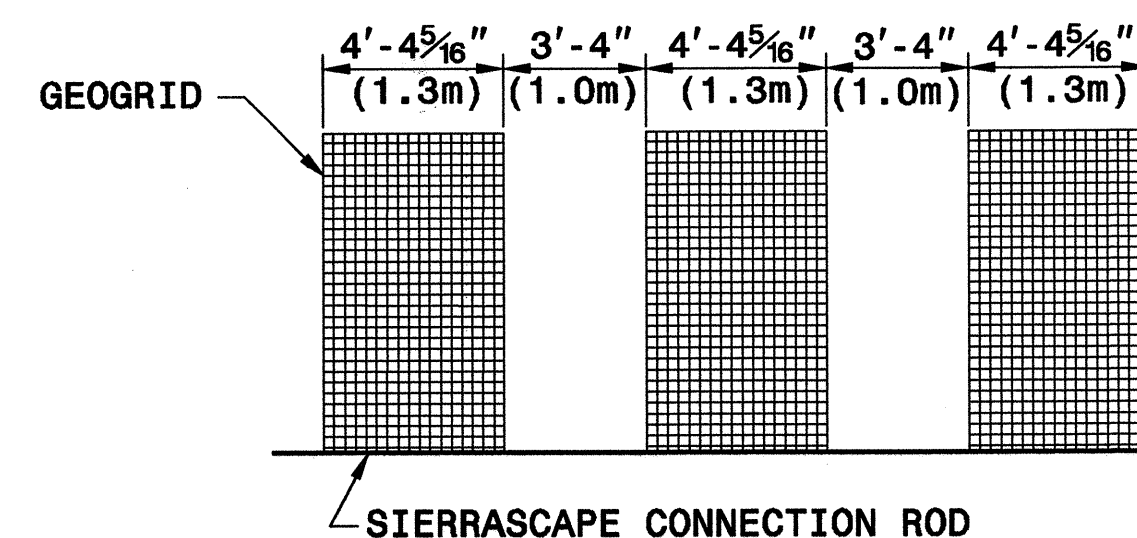


WALL FACE DETAIL

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

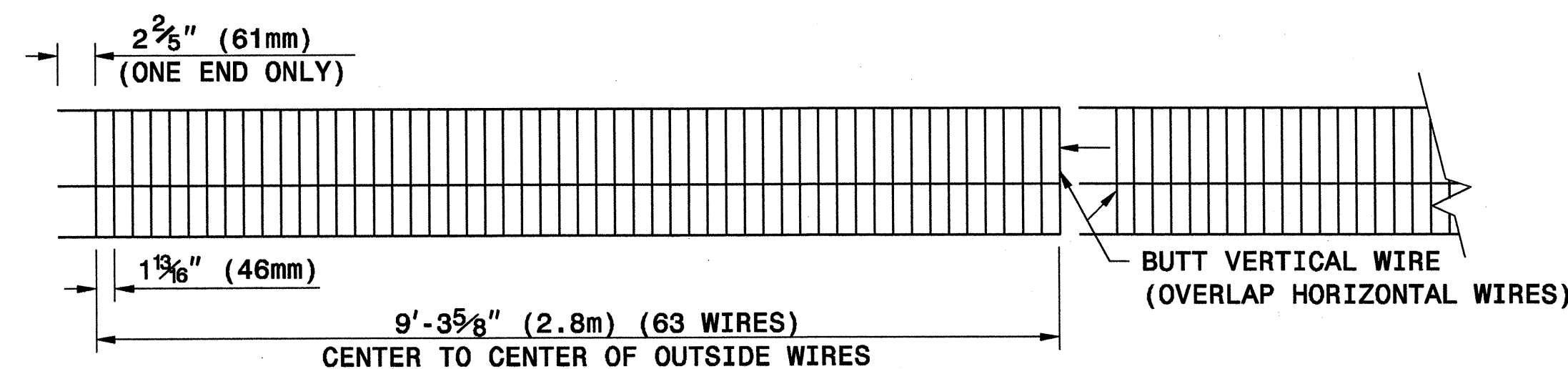


TYPICAL SECTION

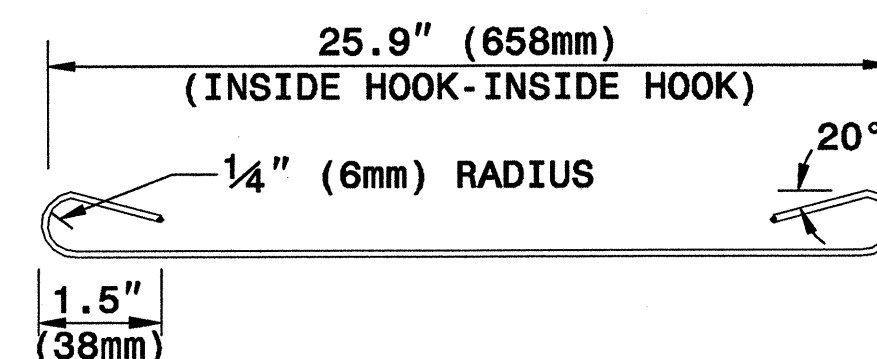


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN
SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

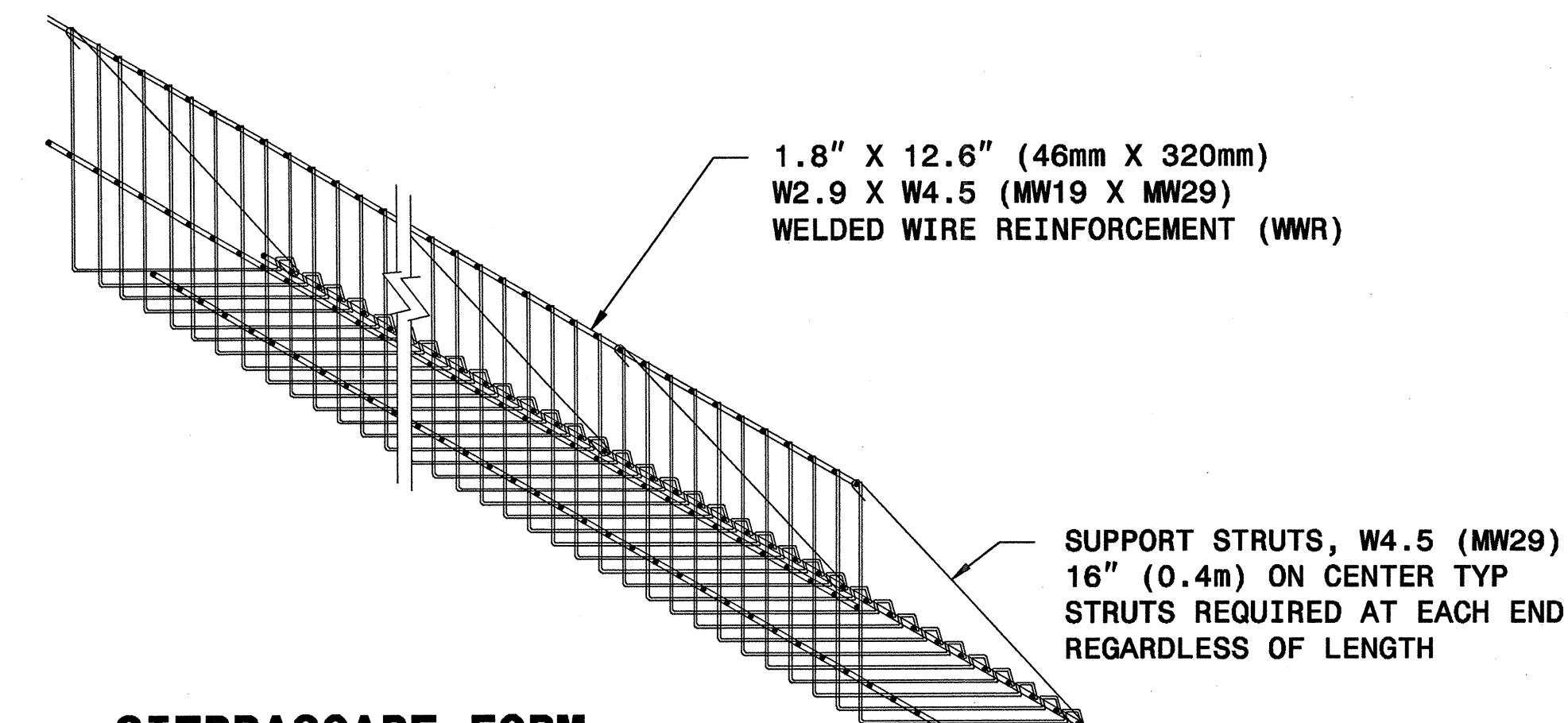
TYPICAL GEOGRID COVERAGE



ELEVATION VIEW

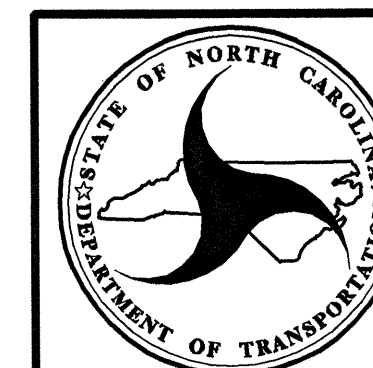
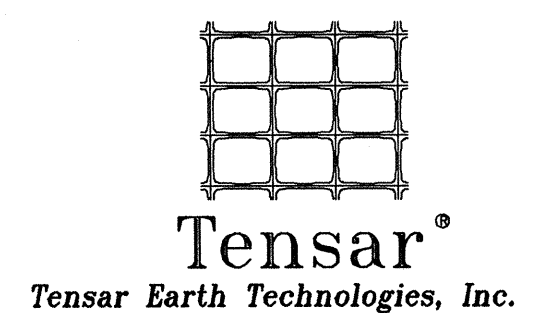


SUPPORT STRUT



SIERRASCAPE FORM

WALL COMPONENTS

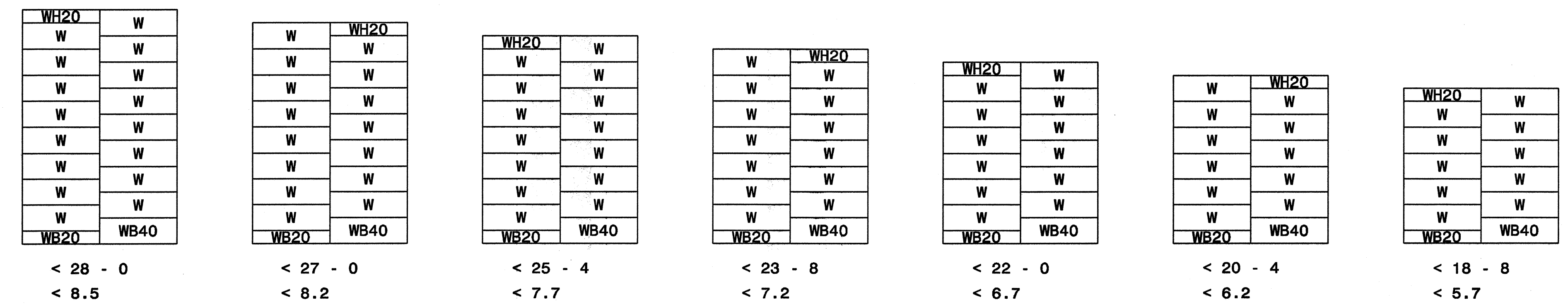


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DEPARTMENT OF TRANSPORTATION
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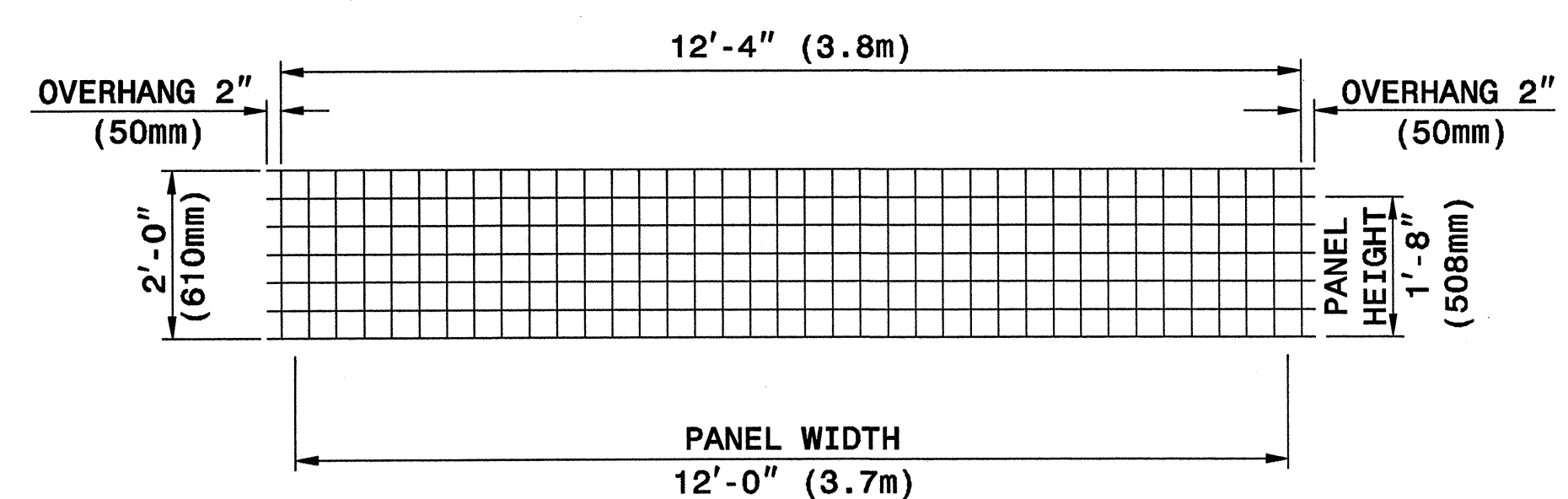
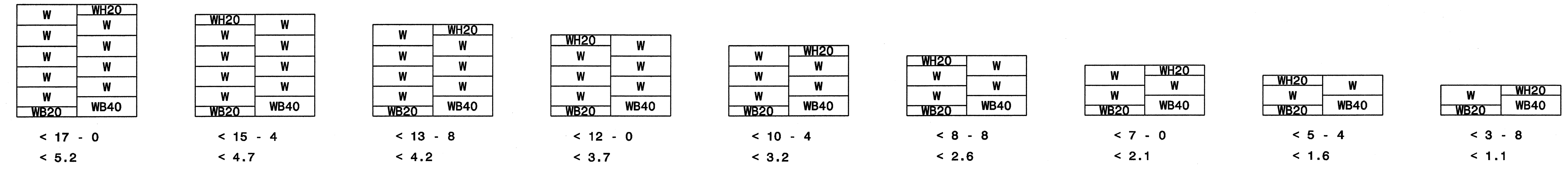
**SIERRASCAPE
TEMPORARY WALL**

PANEL LAYOUTS

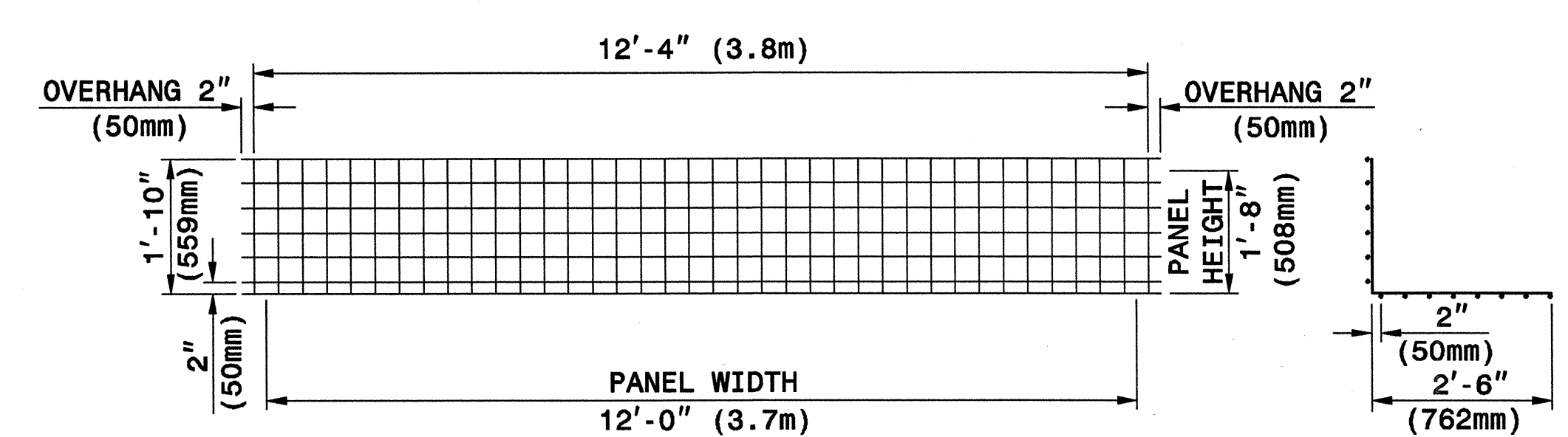
H - WALL HEIGHT
(FEET-INCHES)
(METER)



(FEET-INCHES)
(METER)

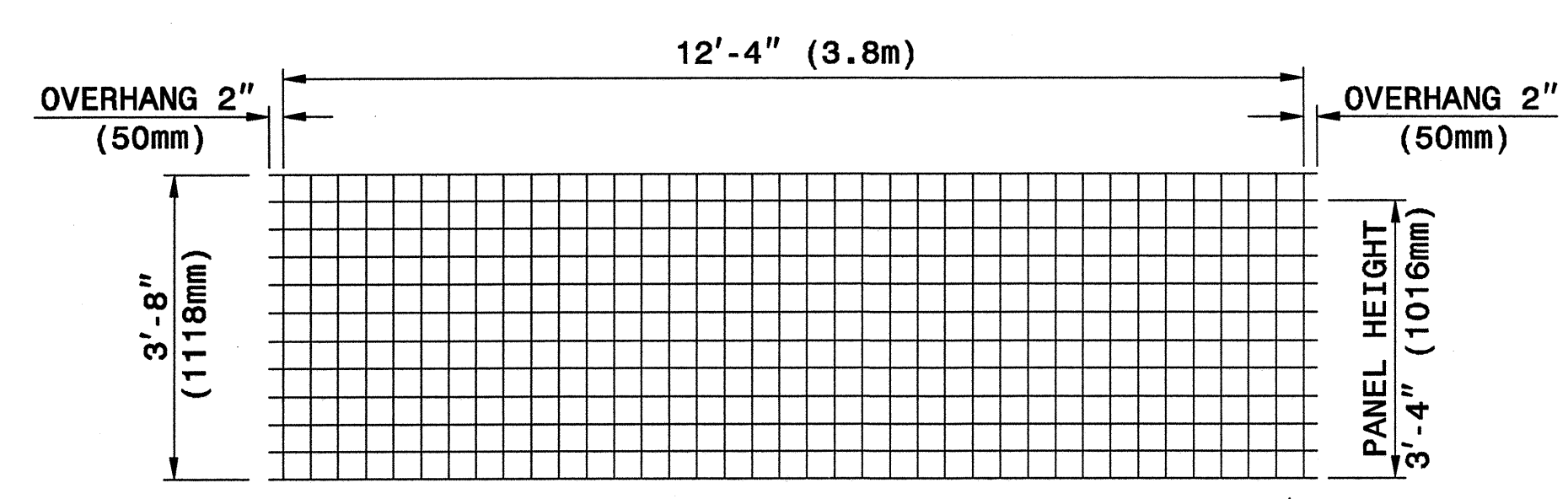


TYPE WH20

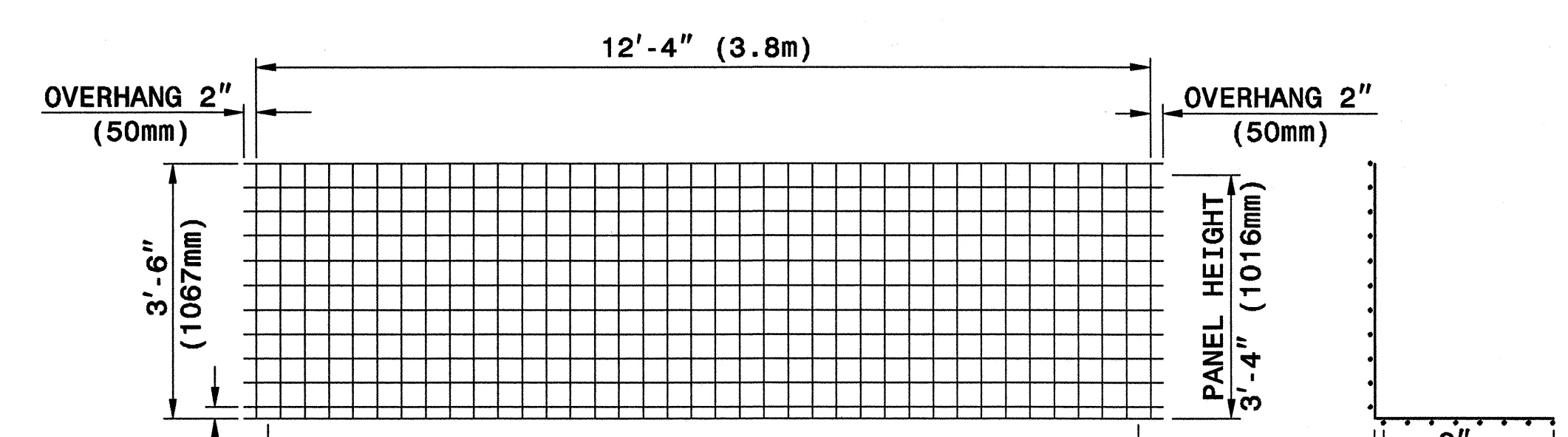


TYPE WB20

SECTION



TYPE W



TYPE WB40

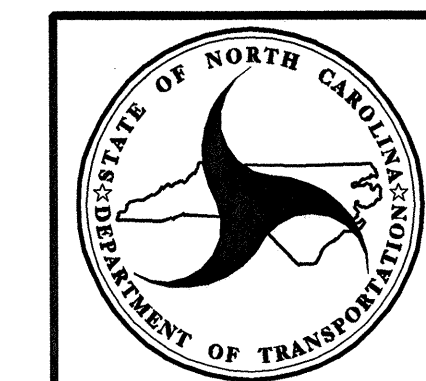
SECTION

WELDED WIRE FACINGS

WELDED WIRE FORMS

PANEL TYPES (WELDED WIRE FACINGS AND FORMS)

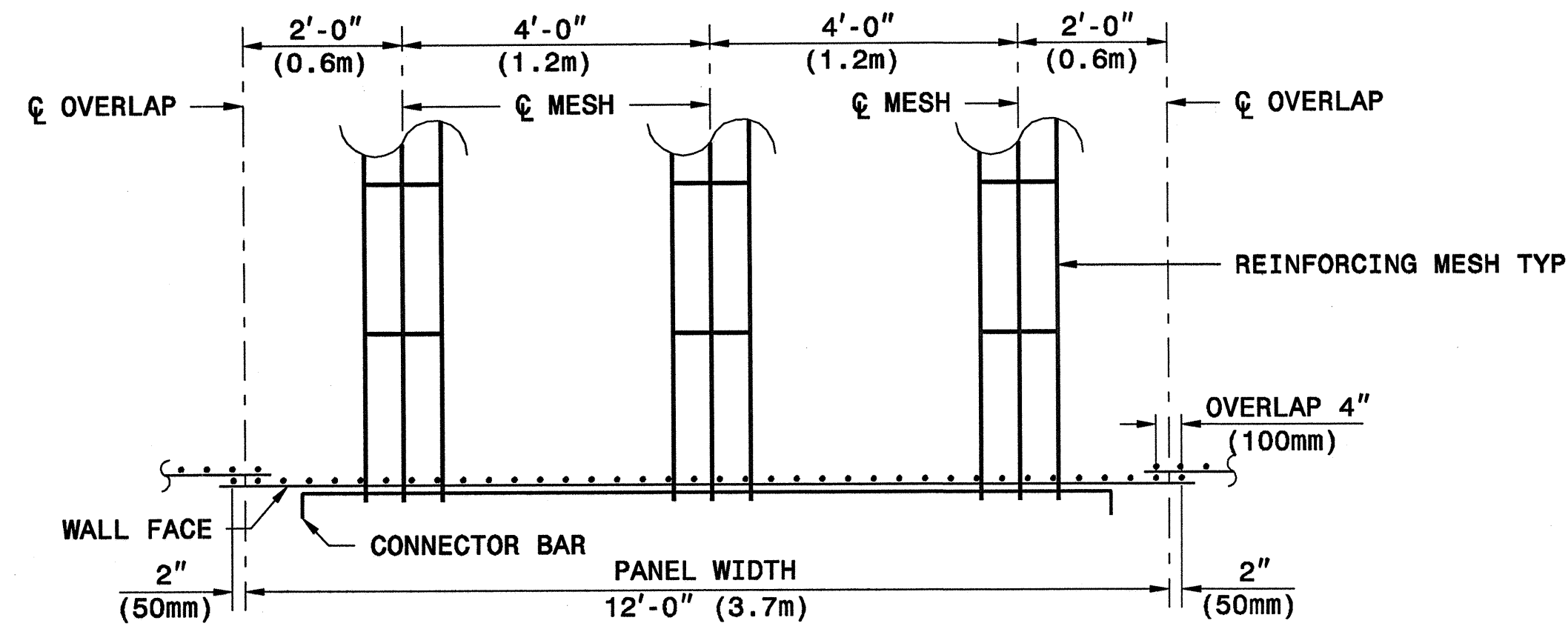
4" X 4" (100mm X 100mm), W8 X W8 (MW52 X MW52) WELDED WIRE REINFORCEMENT (WWR)



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RETAINED EARTH
TEMPORARY WALL

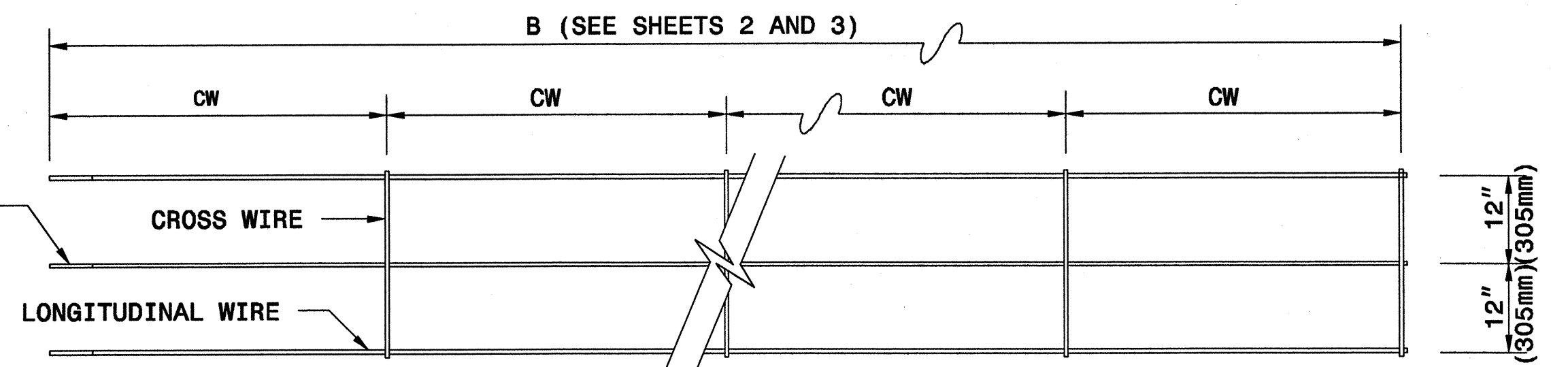


**REINFORCING MESH PLACEMENT DETAIL
(PLAN VIEW)**



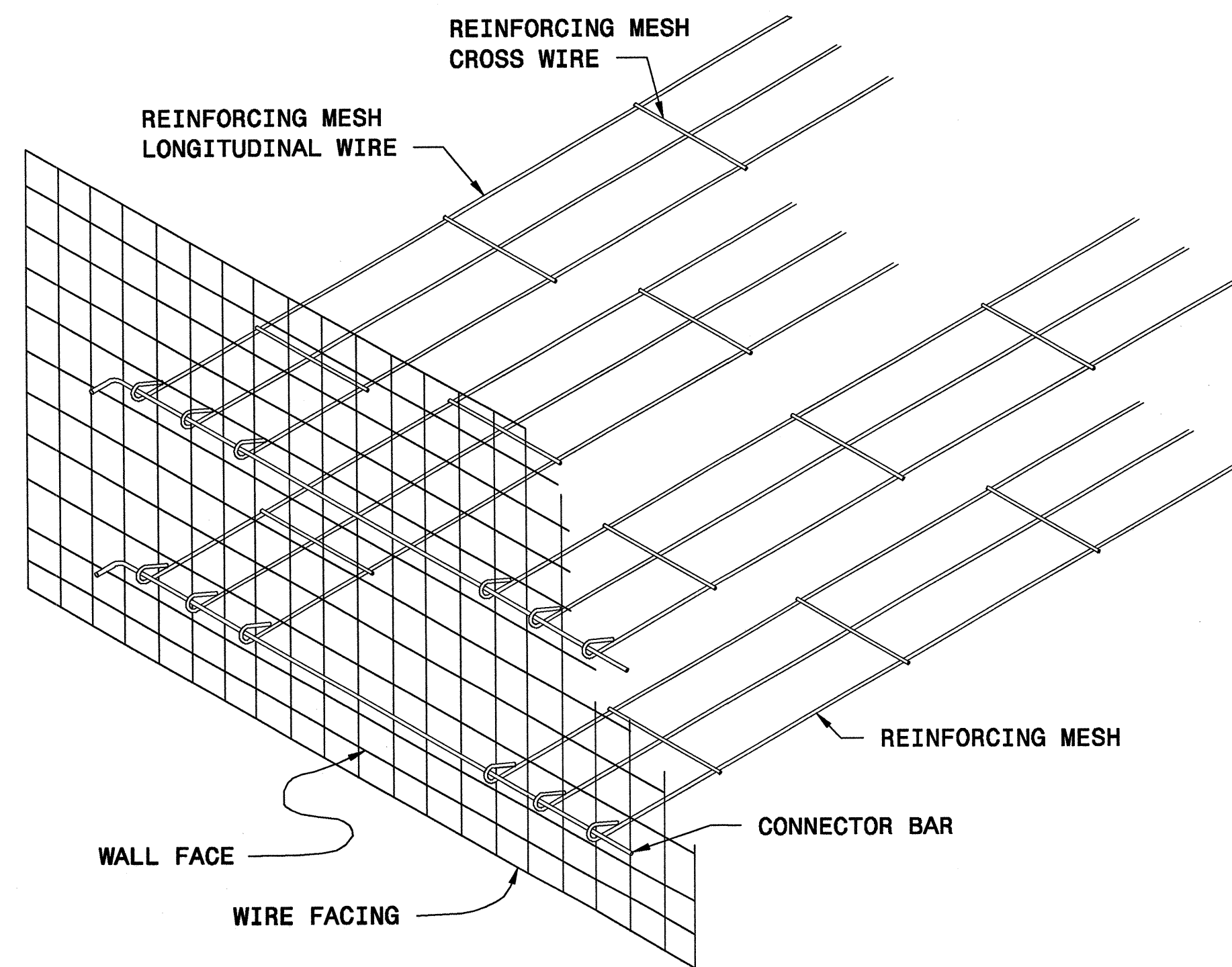
1/2" (13 mm) DIA. BAR

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



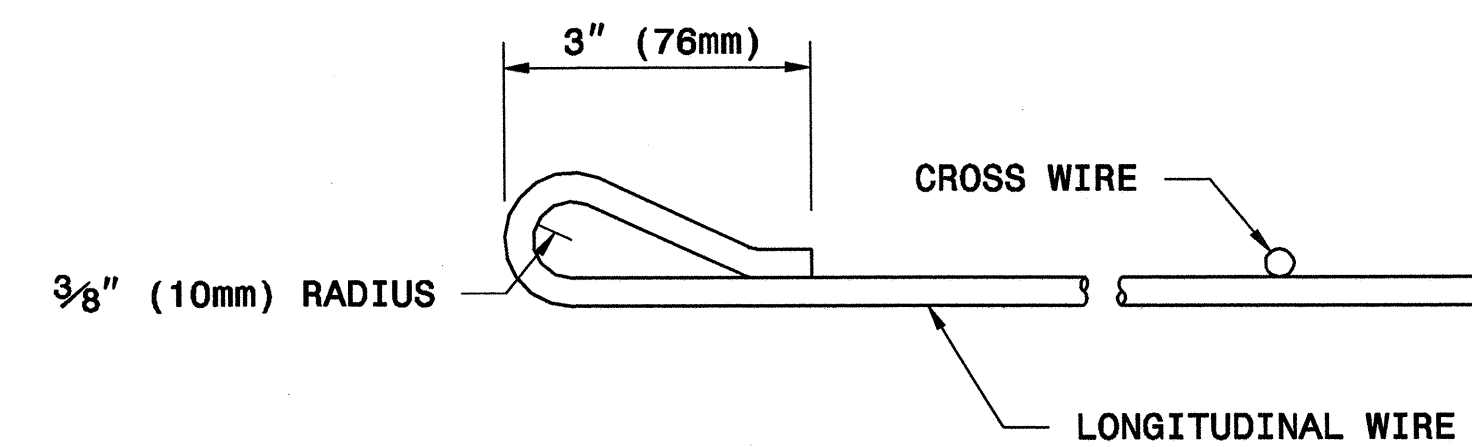
GENERAL ASSEMBLY DETAIL

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

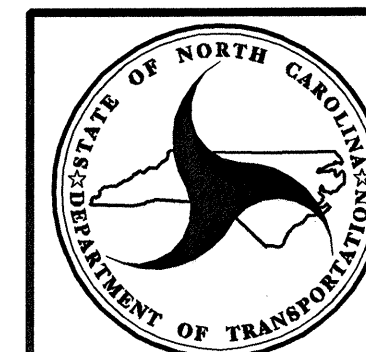
REINFORCING MESH



REINFORCING MESH LOOP DETAIL

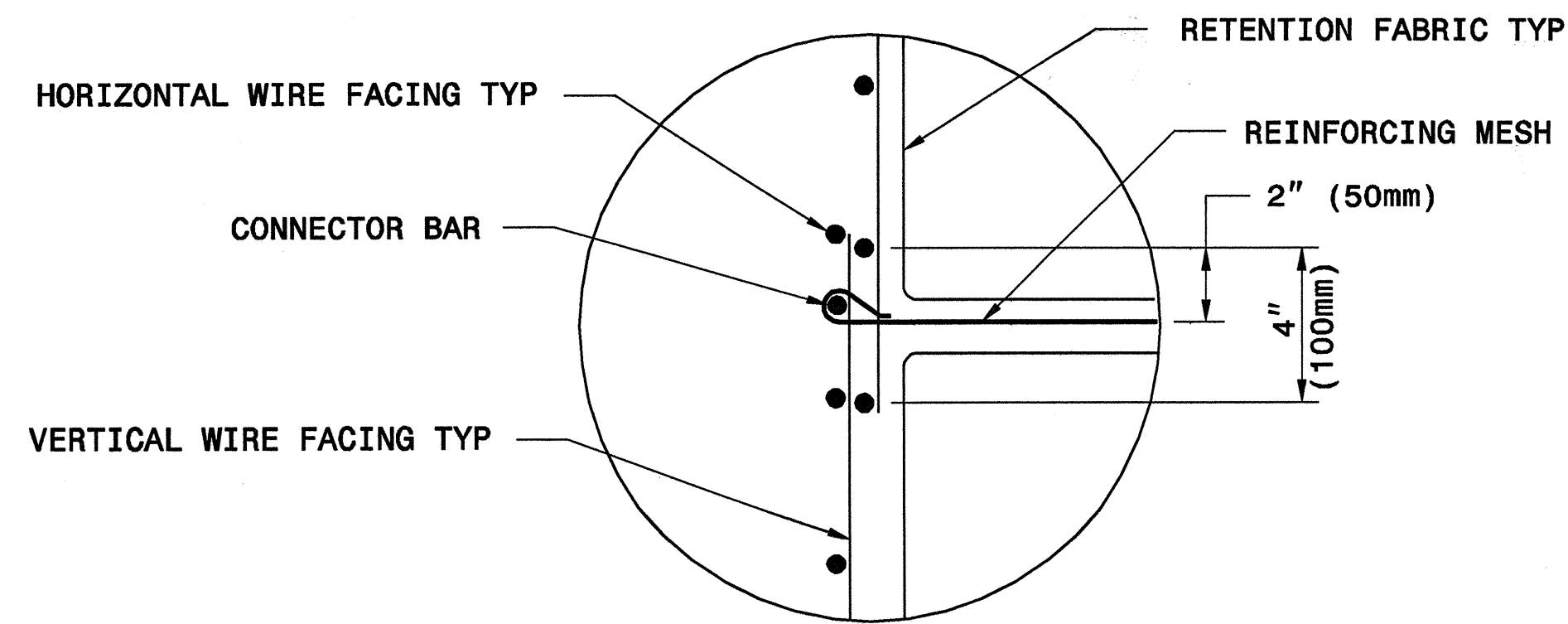


The Reinforced Earth Company

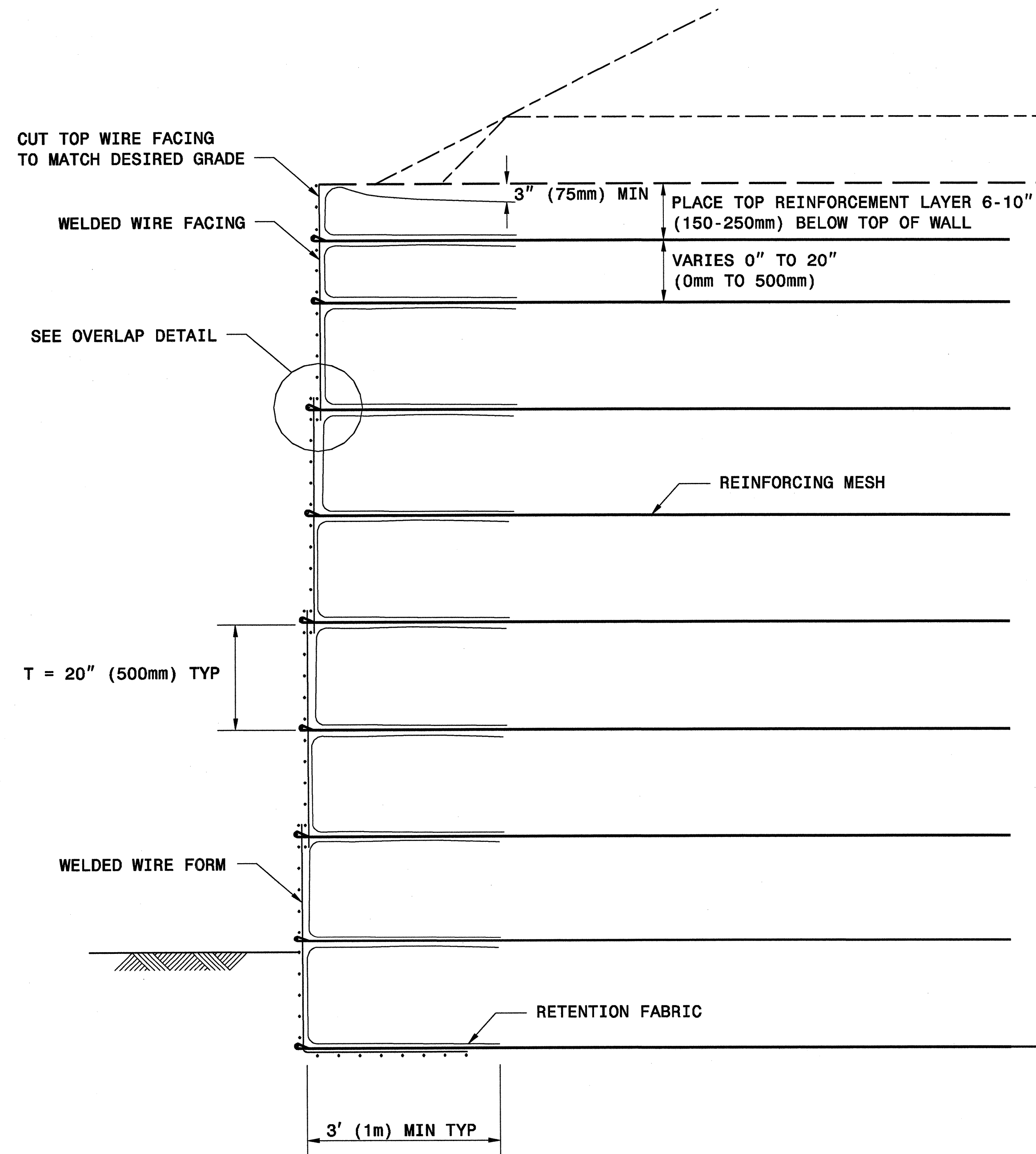


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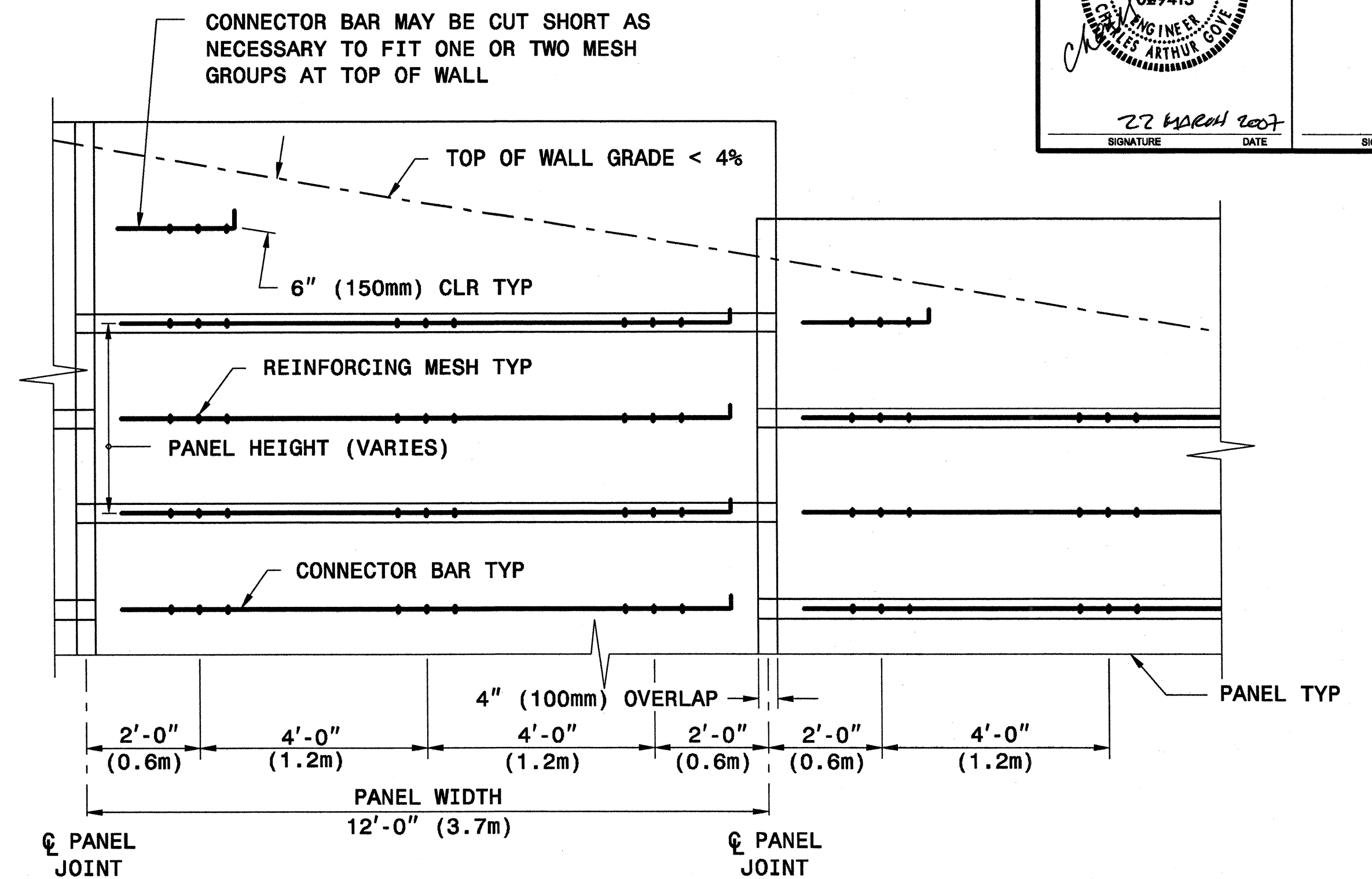
RETAINED EARTH
 TEMPORARY WALL



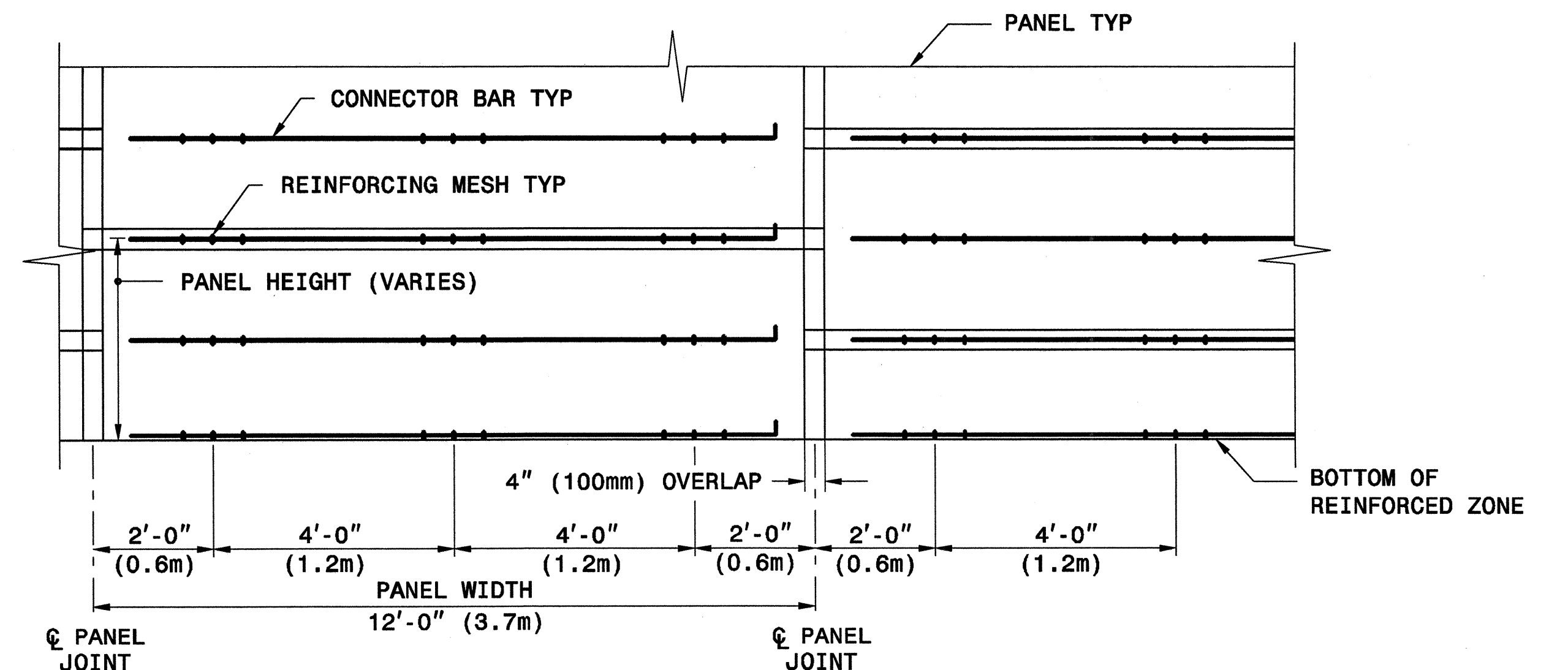
OVERLAP DETAIL



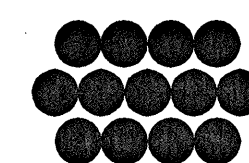
TYPICAL SECTION



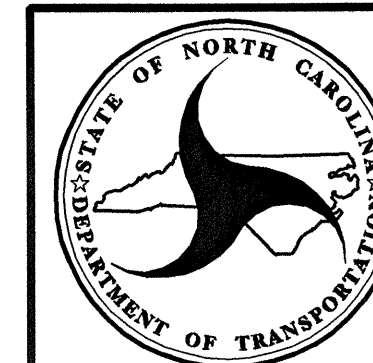
**TYPICAL ELEVATION @ TOP OF WALL
(WIRES NOT SHOWN FOR CLARITY)**



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



The Reinforced Earth Company

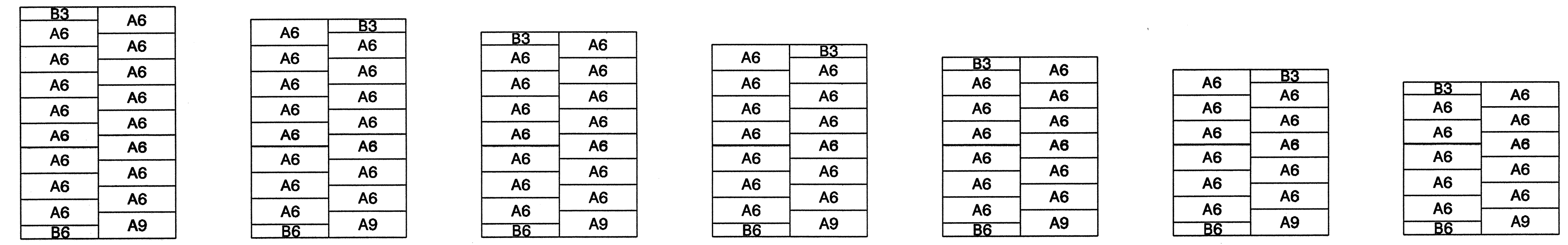


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 RALEIGH

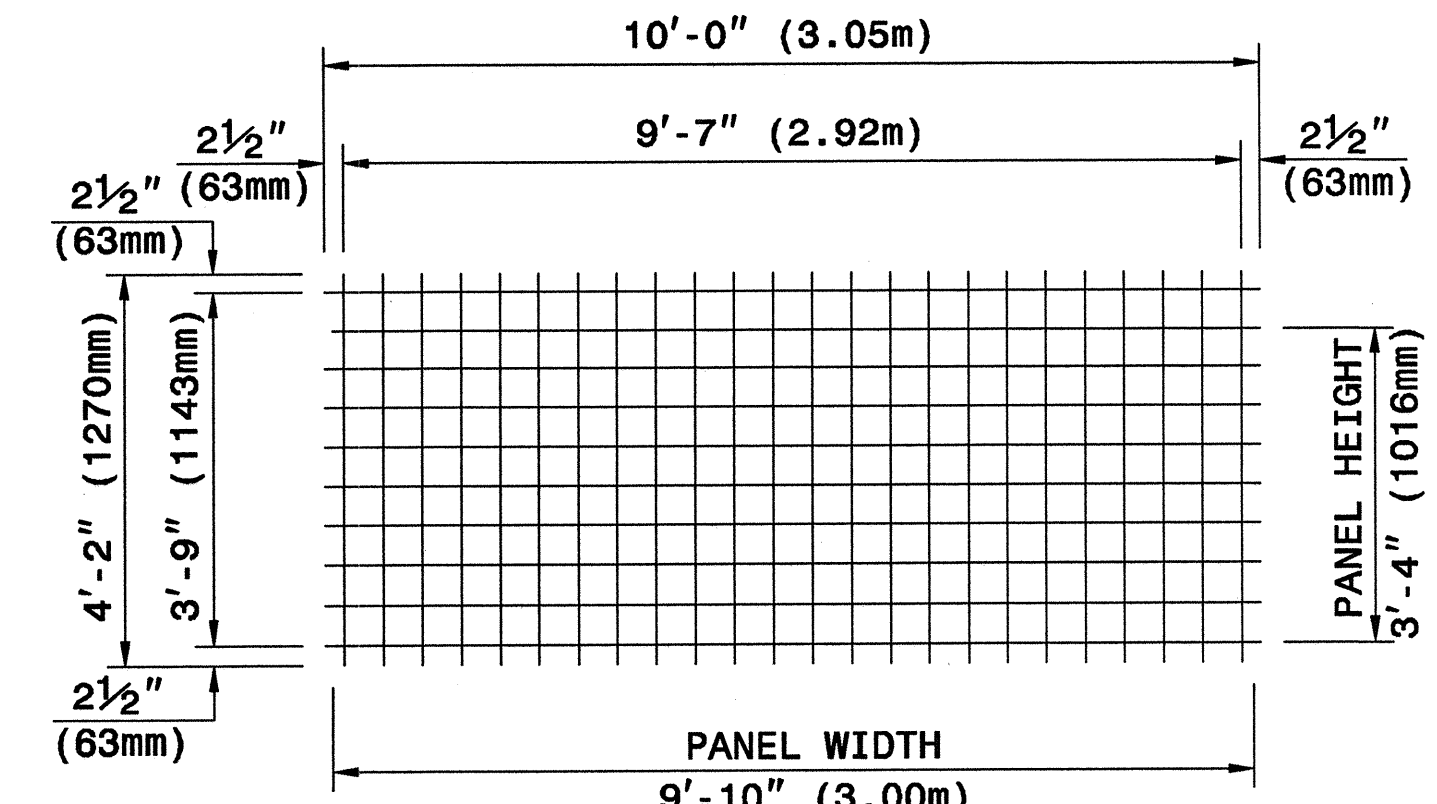
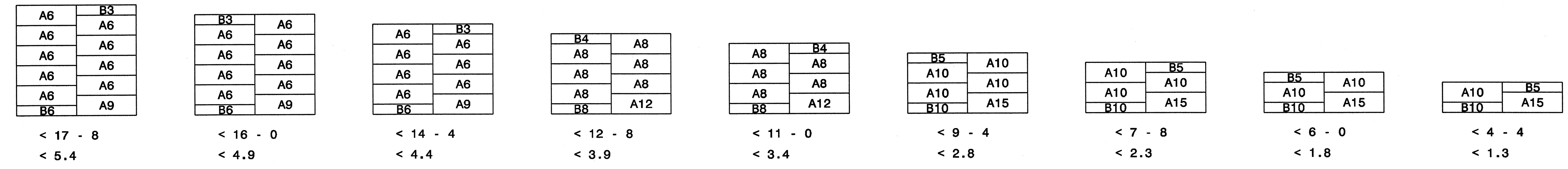
RETAINED EARTH
 TEMPORARY WALL

PANEL LAYOUTS

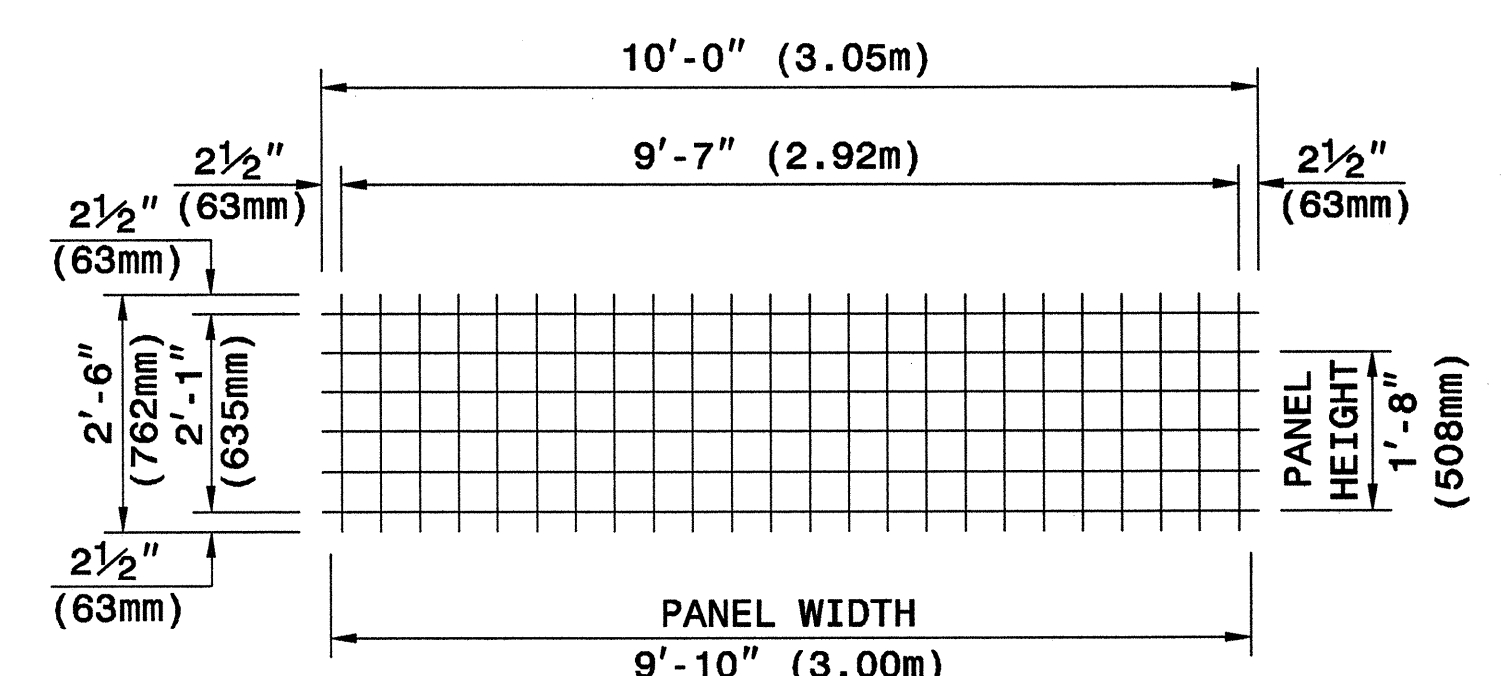
H - WALL HEIGHT
(FEET-INCHES)
(METER)



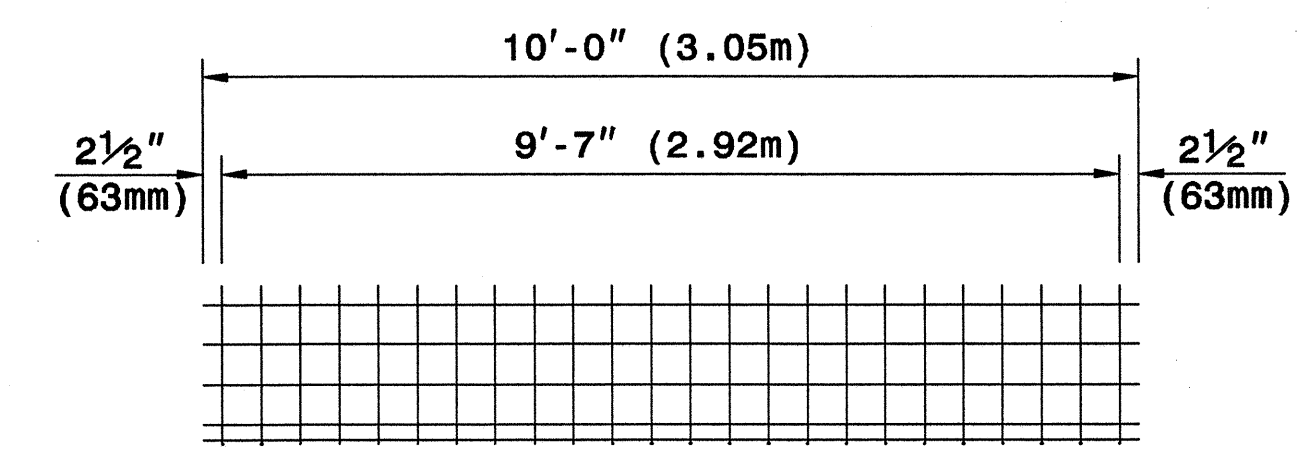
(FEET-INCHES)
(METER)



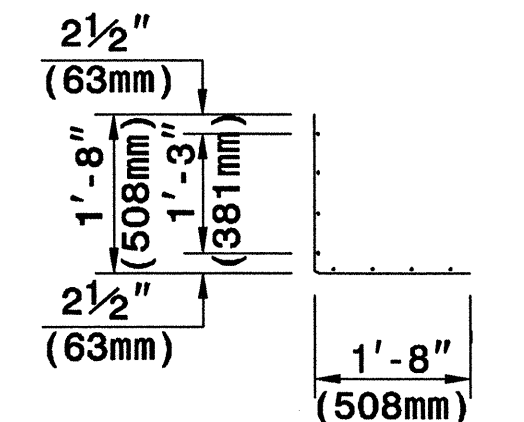
TYPE A



TYPE B



WELDED WIRE FORM

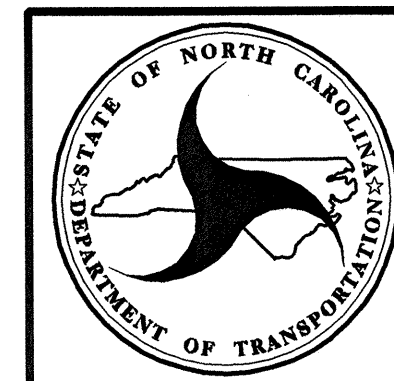


SECTION

WELDED WIRE FACINGS

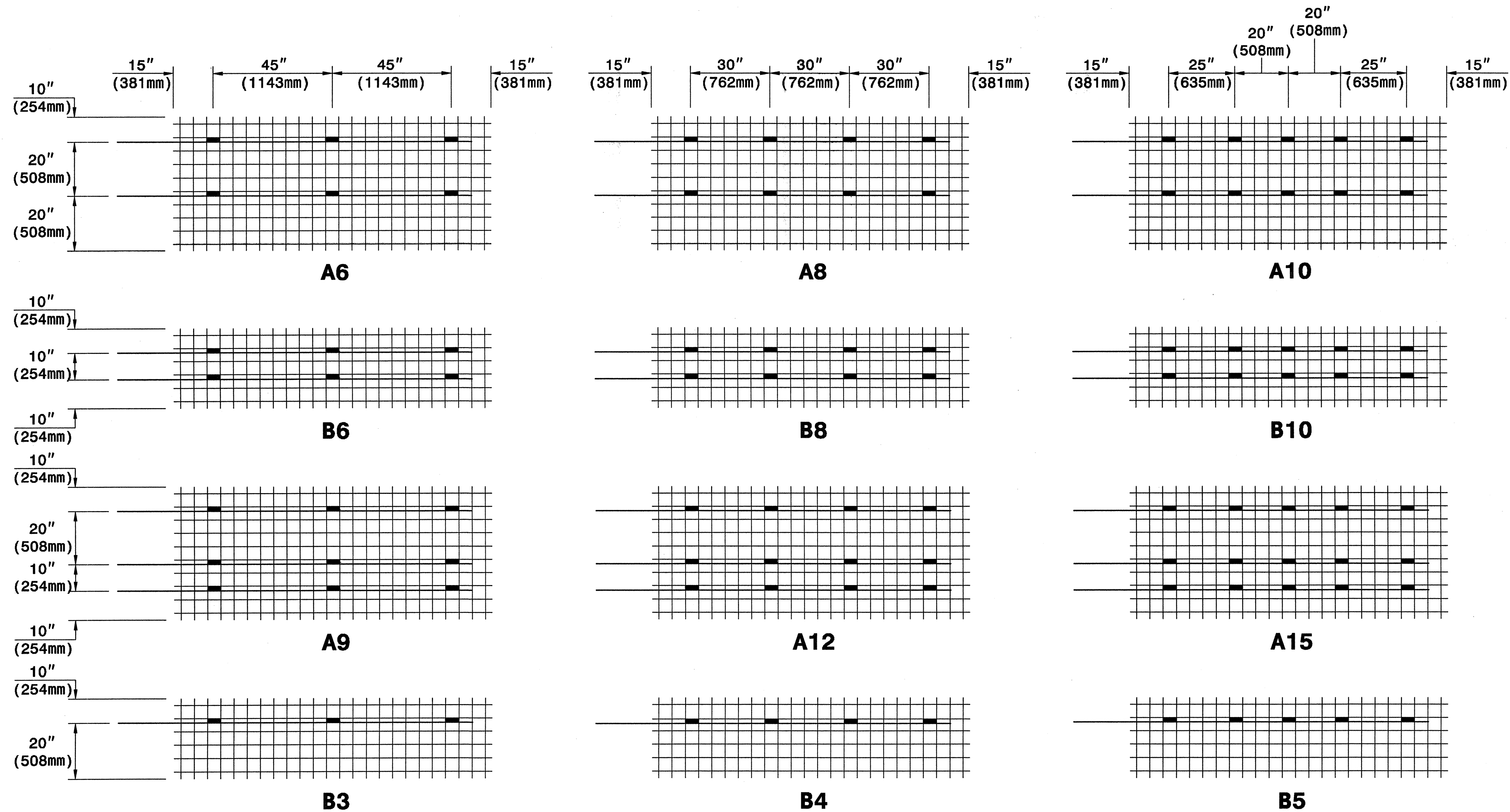
PANEL TYPES (WELDED WIRE FACINGS AND FORM)

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



GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

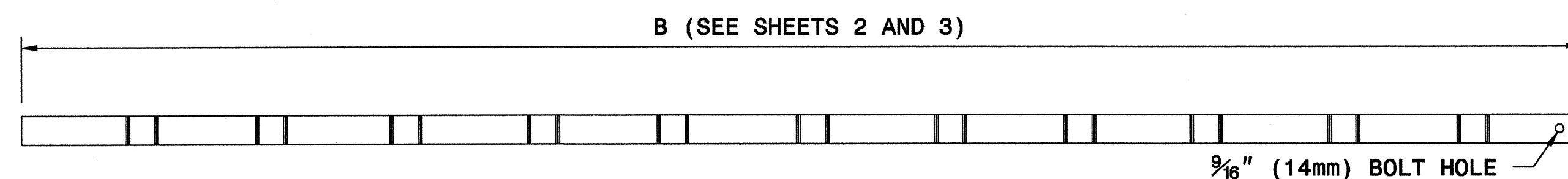
TERRATREL
TEMPORARY WALL



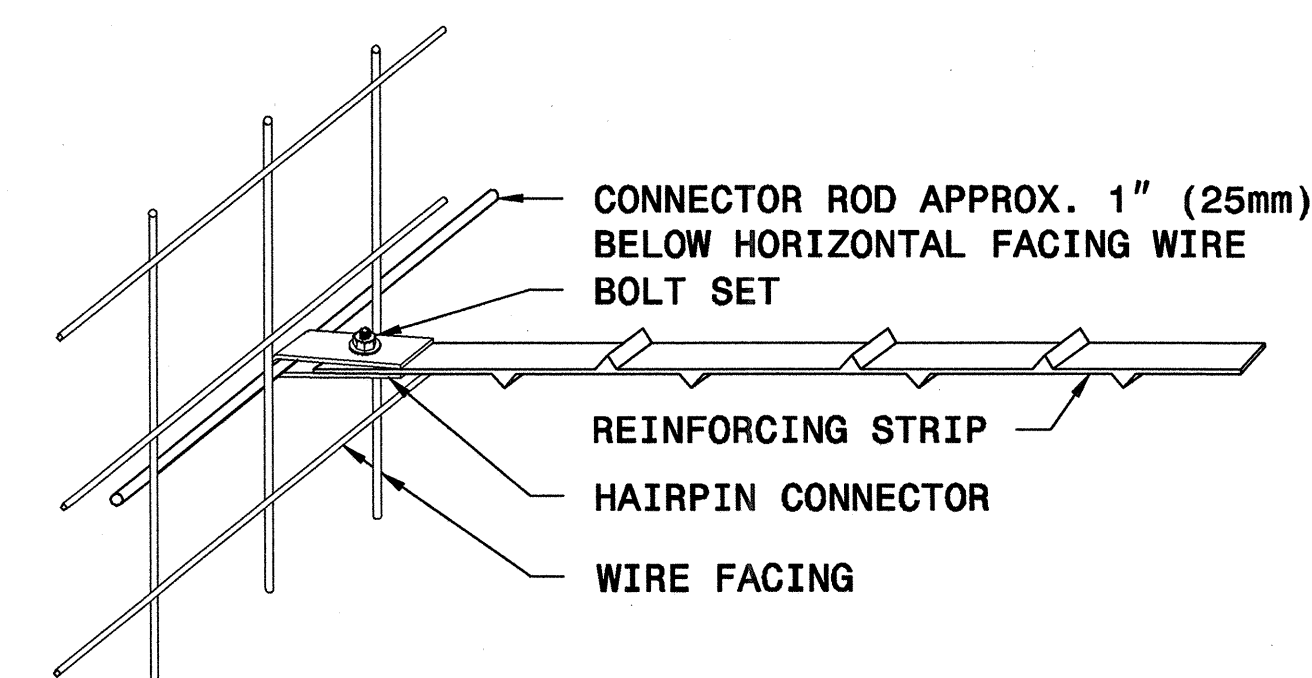
KEY: A8

NUMBER OF REINFORCING STRIPS
PANEL TYPE

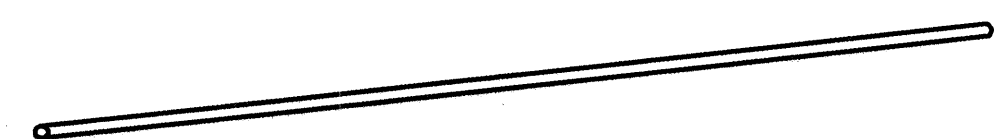
CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



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



STRIP TO FACING CONNECTION



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



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

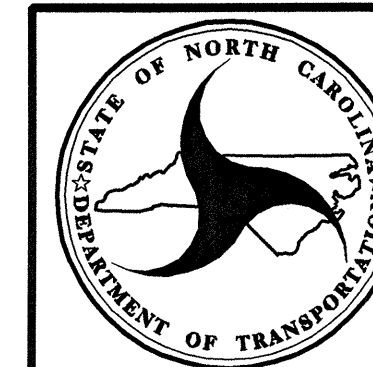


HAIRPIN CONNECTOR

WALL COMPONENTS

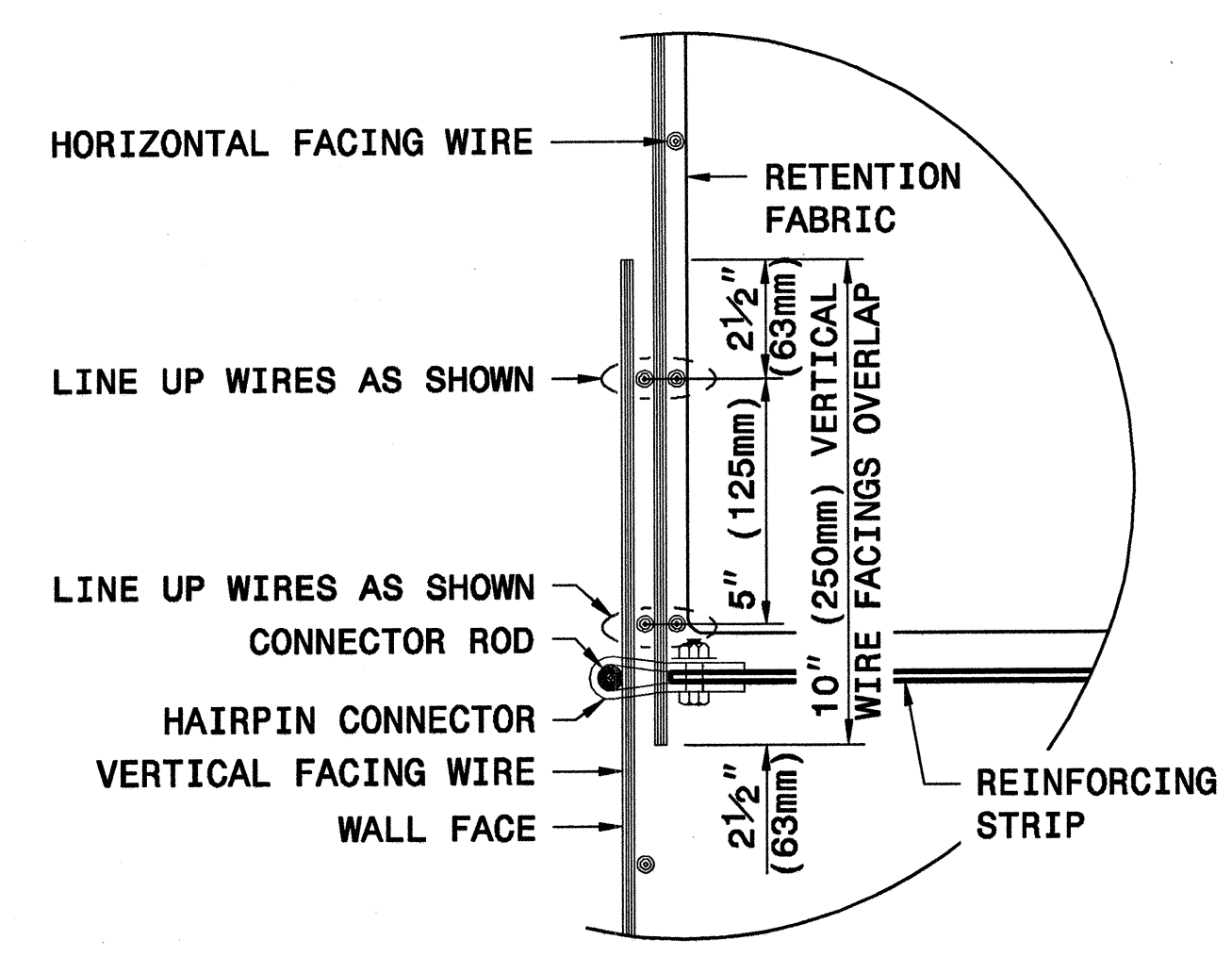


The Reinforced Earth Company



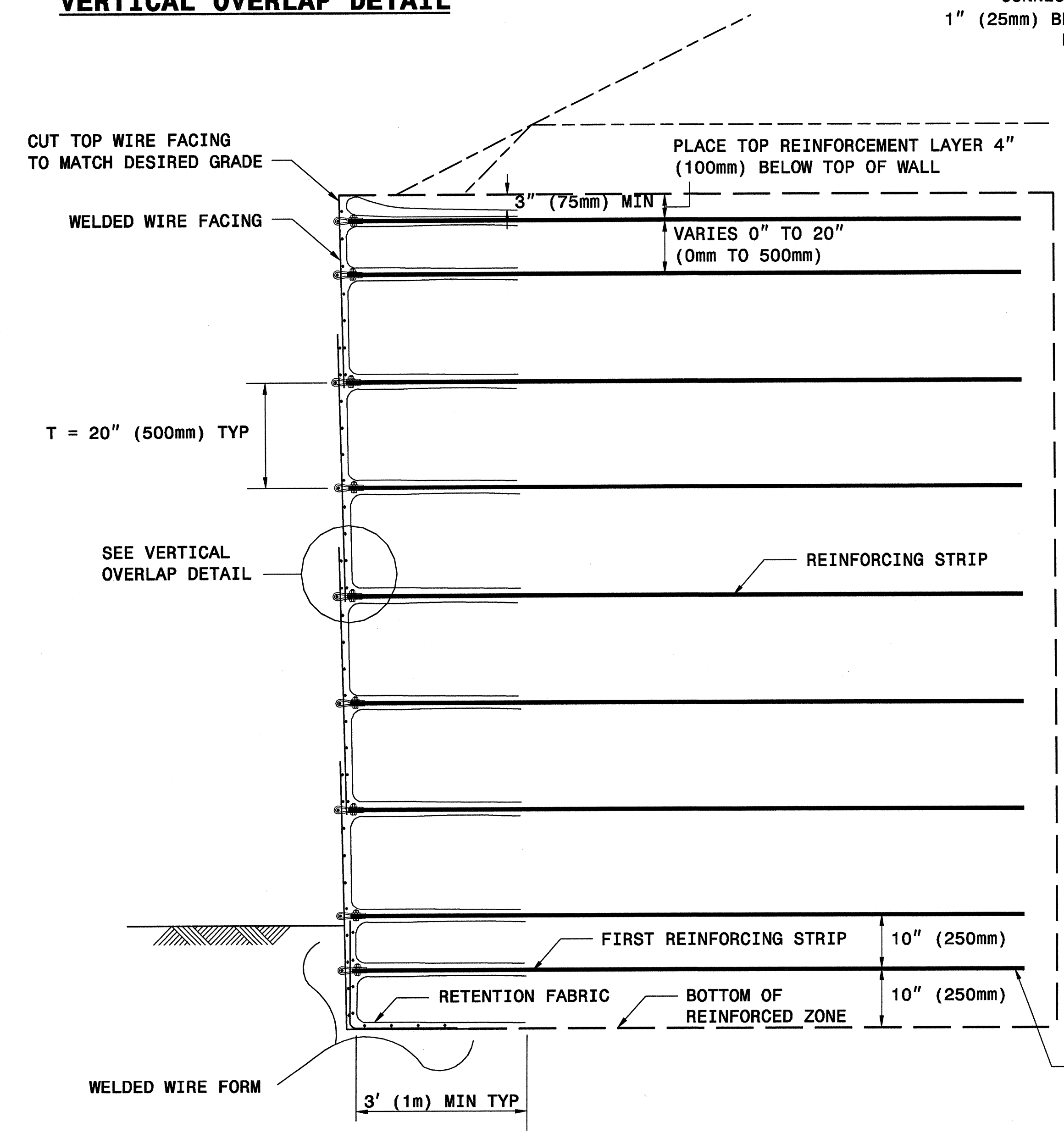
GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TERRATREL
TEMPORARY WALL

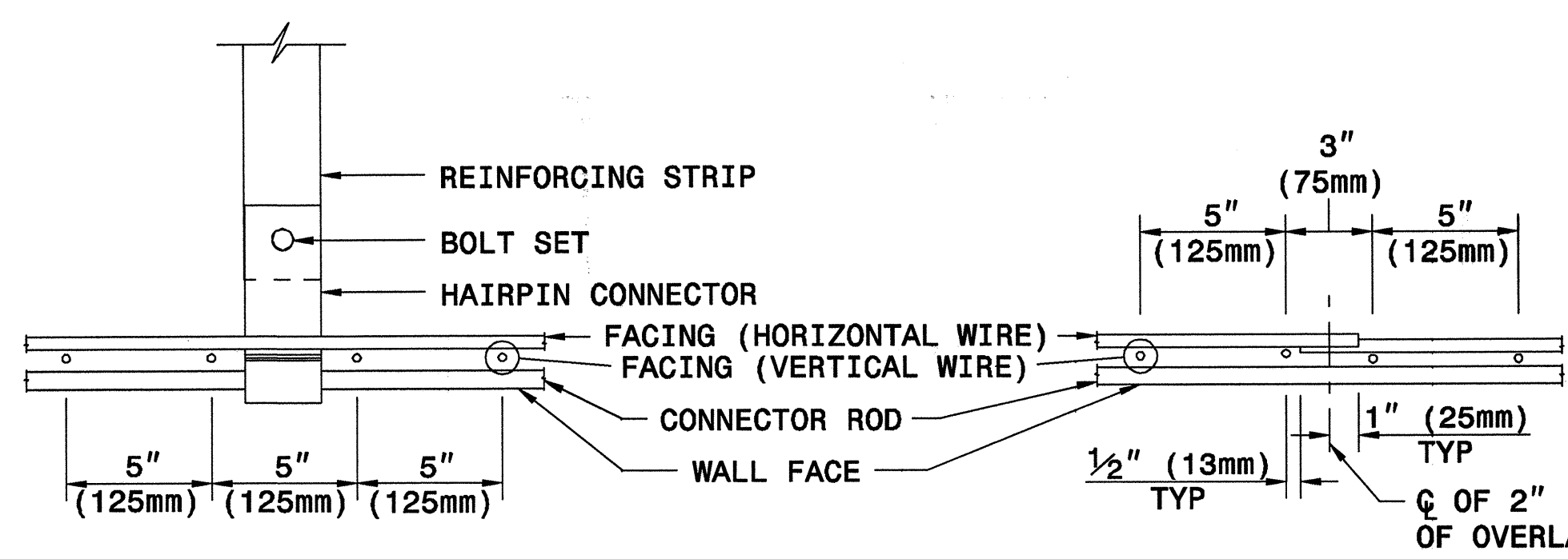


OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

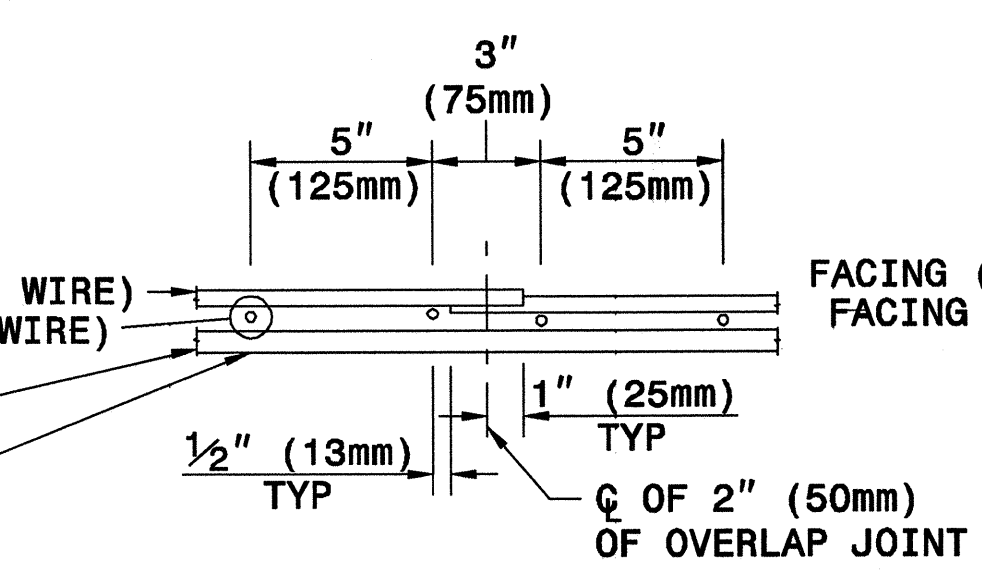
VERTICAL OVERLAP DETAIL



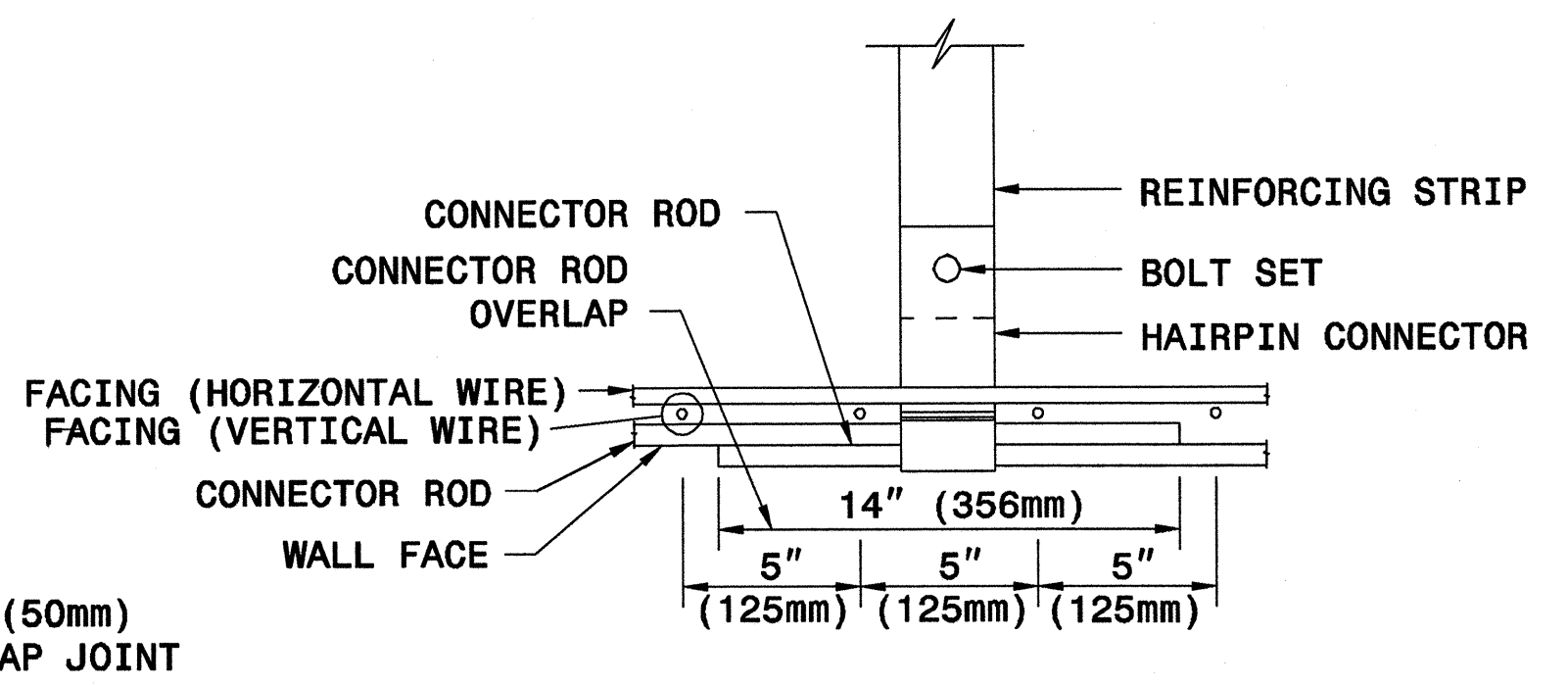
TYPICAL SECTION



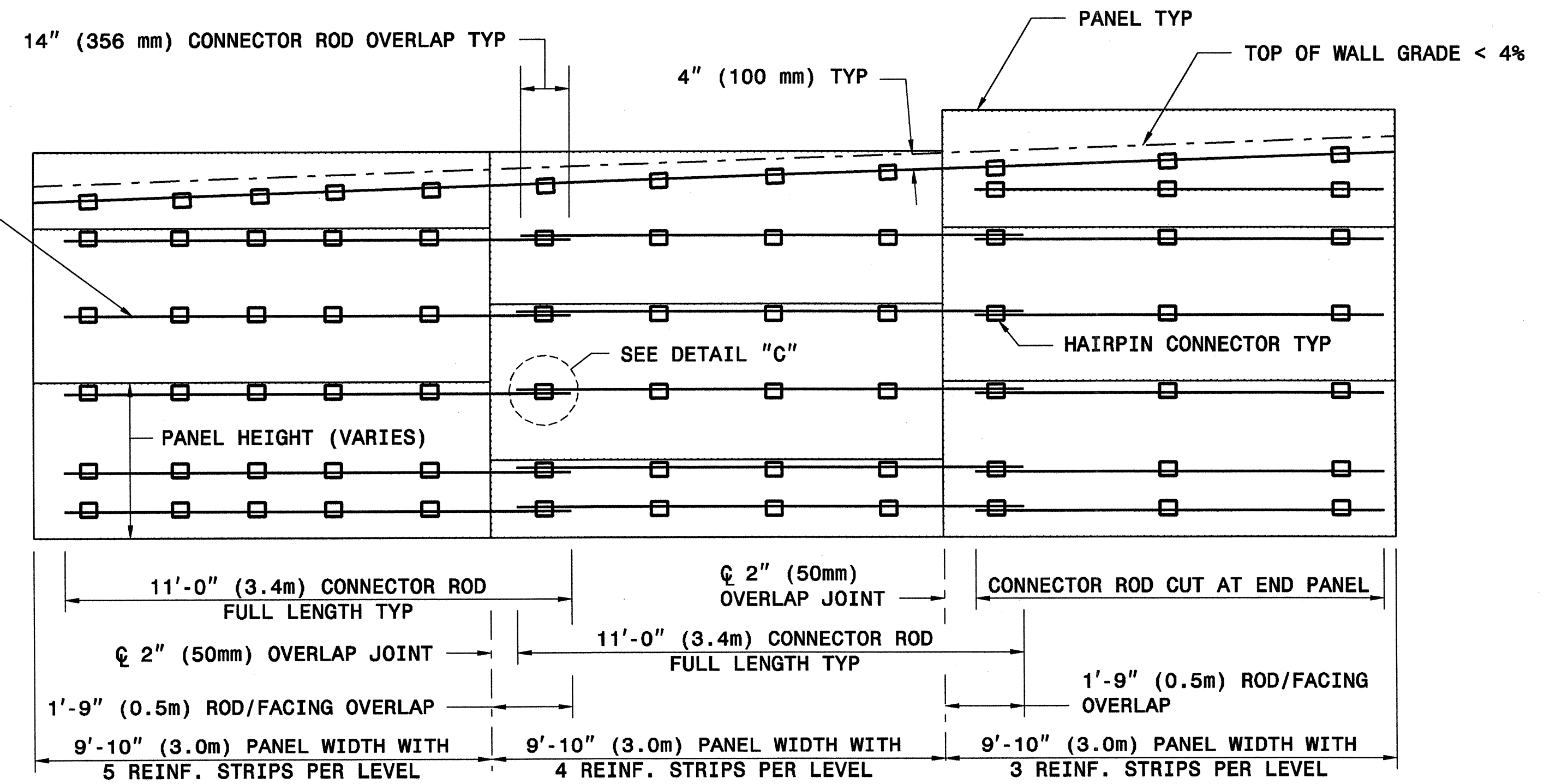
PLAN DETAIL 'A' STRIP CONNECTION



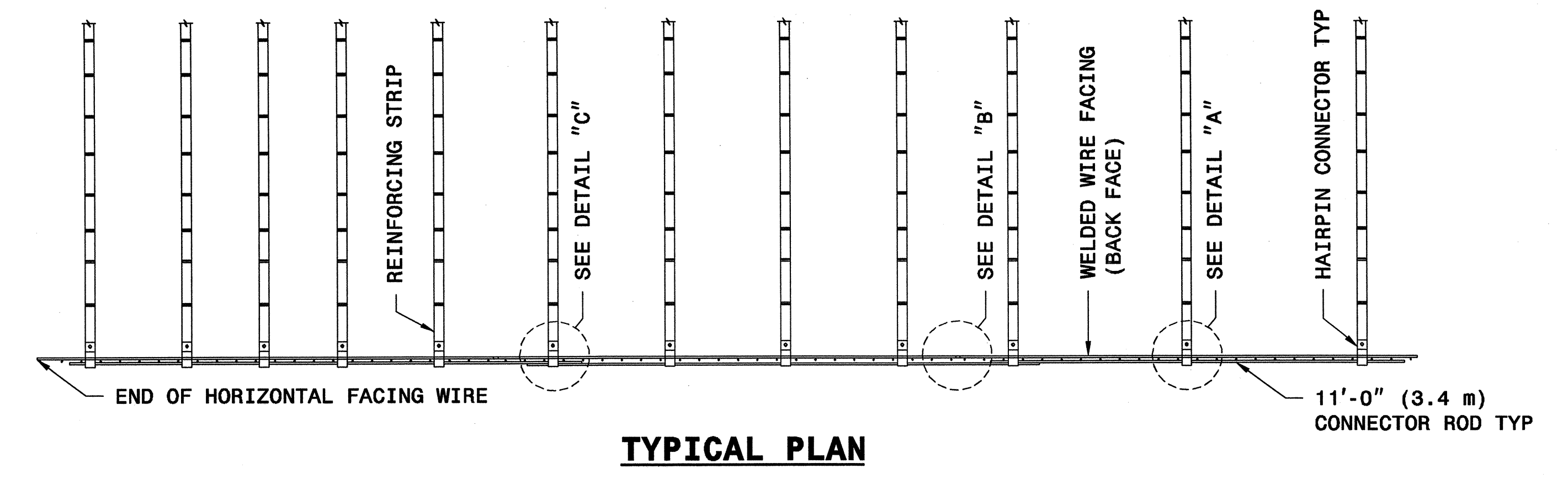
PLAN DETAIL 'B' HORIZONTAL OVERLAP DETAIL



PLAN DETAIL 'C' STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL

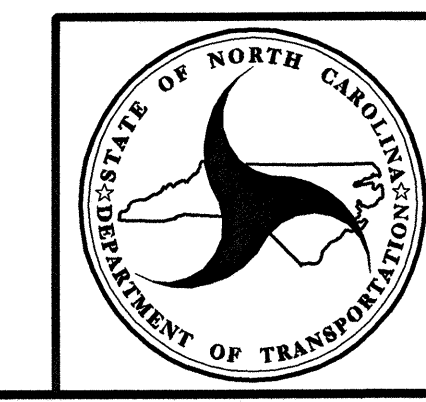


TYPICAL ELEVATION (WIRES NOT SHOWN FOR CLARITY)



TYPICAL PLAN

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



GEOTECHNICAL ENGINEERING UNIT
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

TERRATREL TEMPORARY WALL
 SHEET 12 OF 12 DATE: 2/2/07

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201546

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL STATION ***** (20+35.50)
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	500	CY	UNDERCUT EXCAVATION
0134000000-E	240	700	CY	DRAINAGE DITCH EXCAVATION
0195000000-E	265	200	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	960	SY	FABRIC FOR SOIL STABILIZATION
0199000000-E	SP	750	SF	TEMPORARY SHORING
0318000000-E	300	51	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0345000000-E	310	36	LF	24" SIDE DRAIN PIPE
0714000000-E	310	160	LF	18" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0973100000-E	330	64	LF	*** WELDED STEEL PIPE IN SOIL (15")
0995000000-E	340	55	LF	PIPE REMOVAL
1121000000-E	520	1,805	TON	AGGREGATE BASE COURSE
1220000000-E	545	75	TON	INCIDENTAL STONE BASE
1491000000-E	610	1,350	TON	ASPHALT CONC BASE COURSE, TYPE B25.0C
1503000000-E	610	1,105	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C
1523000000-E	610	1,305	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5C
1560000000-E	620	110	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1565000000-E	620	74	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22
1693000000-E	654	25	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	806	6	EA	RIGHT OF WAY MARKERS
2022000000-E	815	45	CY	SUBDRAIN EXCAVATION
2033000000-E	815	35	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	200	LF	6" PERFORATED SUBDRAIN PIPE
2055000000-E	815	6	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
2066000000-N	815	1	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
2077000000-E	815	6	LF	6" OUTLET PIPE (SUBDRAINS)
2209000000-E	838	2	CY	ENDWALLS
2286000000-N	840	6	EA	MASONRY DRAINAGE STRUCTURES
2366000000-N	840	5	EA	FRAME WITH TWO GRATES, STD 840.24
2367000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.29
2556000000-E	846	40	LF	SHOULDER BERM GUTTER
3030000000-E	862	787.5	LF	STEEL BM GUARDRAIL
3045000000-E	862	62.5	LF	STEEL BM GUARDRAIL, SHOP CURVED
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3195000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
3210000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
3285000000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE M-350
3317000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3360000000-E	863	1,048	LF	REMOVE EXISTING GUARDRAIL
3380000000-E	862	325	LF	TEMPORARY STEEL BM GUARDRAIL
3387000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** TEMPORARY (CAT-1)
3387000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** TEMPORARY (TYPE III)
3389100000-N	SP	5	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY
3628000000-E	876	25	TON	RIP RAP, CLASS I

SUMMARY OF QUANTITIES

ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
3635000000-E	876	900	TON	RIP RAP, CLASS II	4686000000-E	1205	408	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
3649000000-E	876	5	TON	RIP RAP, CLASS B	4725000000-E	1205	1	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
3656000000-E	876	1,590	SY	FILTER FABRIC FOR DRAINAGE	4770000000-E	1205	385	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (4)
3659000000-N	SP	2	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON	4810000000-E	1205	13,894	LF	PAINT PAVEMENT MARKING LINES (4")
4025000000-E	901	13.3	SF	CONTRACTOR FURNISHED, TYPE *** SIGN (D)	4835000000-E	1205	60	LF	PAINT PAVEMENT MARKING LINES (24")
4025000000-E	901	26	SF	CONTRACTOR FURNISHED, TYPE *** SIGN (E)	4850000000-E	1205	1,202	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4072000000-E	903	136	LF	SUPPORTS, 3-LB STEEL U-CHANNEL	4905000000-N	1253	17	EA	SNOWPLOWABLE PAVEMENT MARKERS
4096000000-N	904	2	EA	SIGN ERECTION, TYPE D	6000000000-E	1605	1,950	LF	TEMPORARY SILT FENCE
4102000000-N	904	4	EA	SIGN ERECTION, TYPE E	6006000000-E	1610	150	TON	STONE FOR EROSION CONTROL, CLASS A
4116100000-N	904	1	EA	SIGN ERECTION, RELOCATE, TYPE *** (GROUND MOUNTED) (D)	6009000000-E	1610	230	TON	STONE FOR EROSION CONTROL, CLASS B
4155000000-N	907	6	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	6012000000-E	1610	375	TON	SEDIMENT CONTROL STONE
4158000000-N	907	1	EA	DISPOSAL OF SIGN SYSTEM, WOOD	6015000000-E	1615	2	ACR	TEMPORARY MULCHING
4400000000-E	1110	260	SF	WORK ZONE SIGNS (STATIONARY)	6018000000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
4405000000-E	1110	128	SF	WORK ZONE SIGNS (PORTABLE)	6021000000-E	1620	0.25	TON	FERTILIZER FOR TEMPORARY SEEDING
4410000000-E	1110	52	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)	6024000000-E	1622	150	LF	TEMPORARY SLOPE DRAINS
4415000000-N	1115	1	EA	FLASHING ARROW PANELS, TYPE C	6027000000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
4420000000-N	1120	1	EA	CHANGEABLE MESSAGE SIGN	6029000000-E	SP	350	LF	SAFETY FENCE
4430000000-N	1130	136	EA	DRUMS	6030000000-E	1630	1,150	CY	SILT EXCAVATION
4445000000-E	1145	48	LF	BARRICADES (TYPE III)	6036000000-E	1631	2,500	SY	MATTING FOR EROSION CONTROL
4465000000-N	1160	1	EA	TEMPORARY CRASH CUSHIONS	6037000000-E	SP	20	SY	COIR FIBER MAT
4470000000-N	1160	1	EA	RESET TEMPORARY CRASH CUSHIONS	6038000000-E	SP	1,015	SY	PERMANENT SOIL REINFORCEMENT MAT
4480000000-N	1165	1	EA	TMIA	6042000000-E	1632	150	LF	1/4" HARDWARE CLOTH
4650000000-N	1251	83	EA	TEMPORARY RAISED PAVEMENT MARKERS	6070000000-N	SP	12	EA	SPECIAL STILLING BASINS
4685000000-E	1205	2,710	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	6071030000-E	SP	160	LF	COIR FIBER BAFFLES
					6071050000-E	SP	2	EA	*** SKIMMER (2-1/2")
					6084000000-E	1660	2	ACR	SEEDING & MULCHING
					6087000000-E	1660	1	ACR	MOWING
					6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
					6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
					6096000000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
					6108000000-E	1665	1.5	TON	FERTILIZER TOPDRESSING
					6114000000-N	SP	2	HR	SPECIALIZED HAND MOWING
					6117000000-N	SP	8	EA	RESPONSE FOR EROSION CONTROL
					6123000000-E	1670	0.88	ACR	REFORESTATION

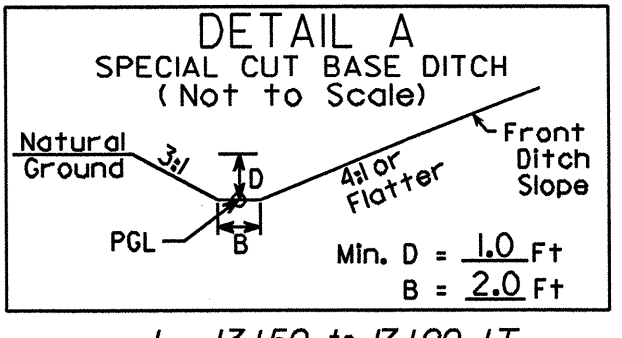
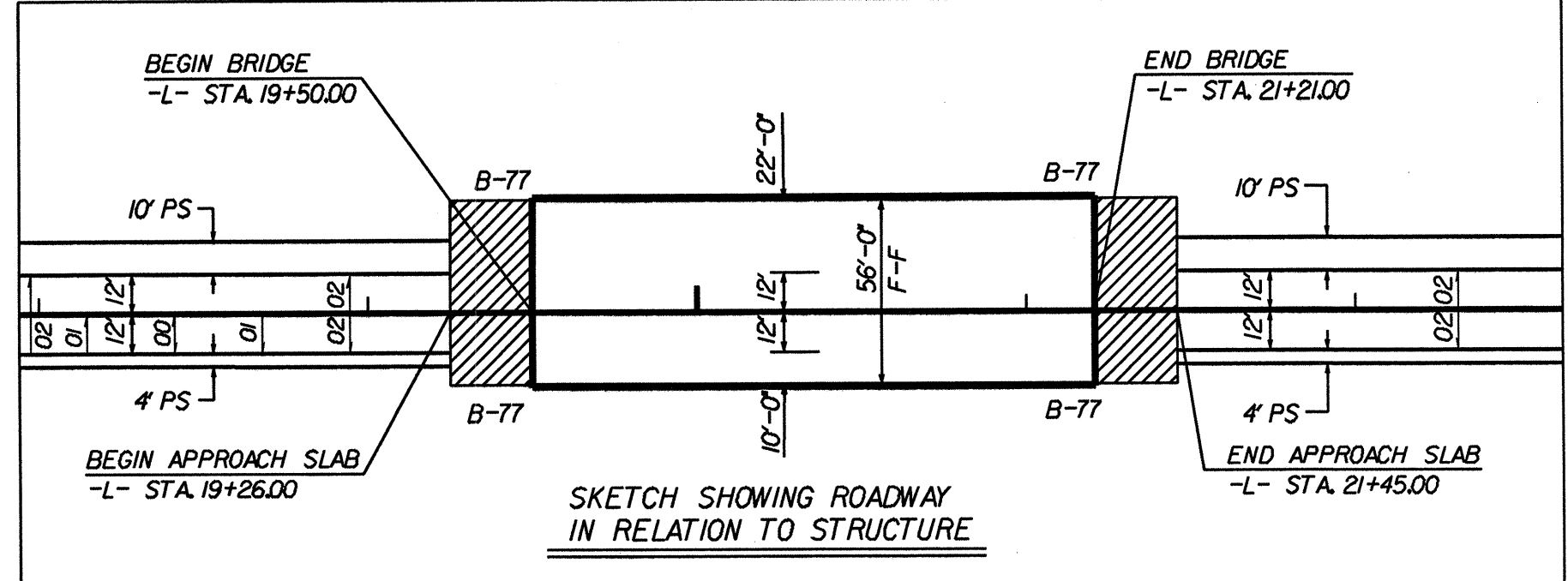
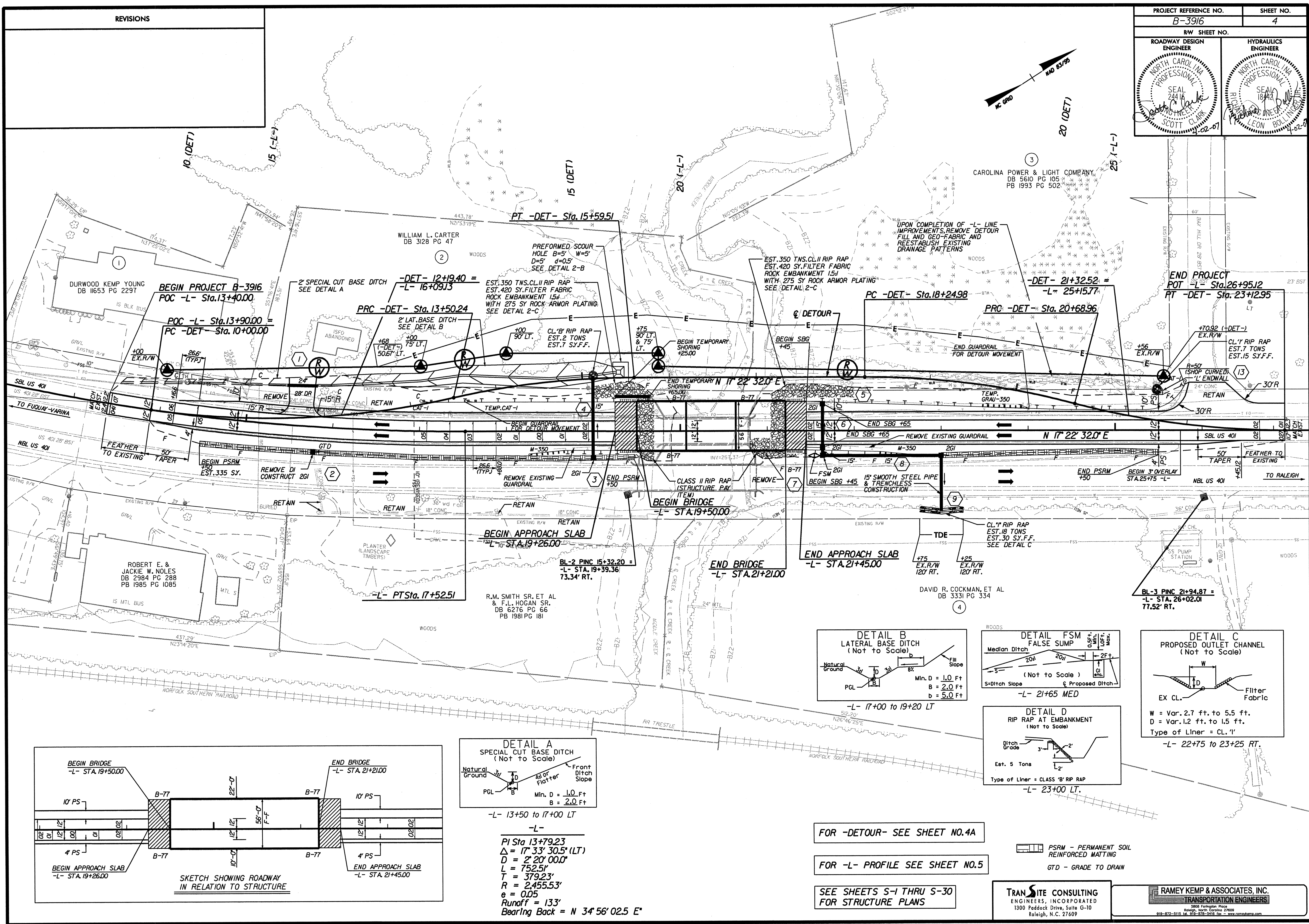
***** BEGIN SCHEDULE AA *****
***** (3 ALTERNATES) *****

0366000000-E	310	284	LF	15" RC PIPE CULVERTS, CLASS III
AA1				
*** OR ***				
0366000000-E	310	148	LF	15" RC PIPE CULVERTS, CLASS III
AA2				
0536000000-E	SP	136	LF	*** HDPE PIPE CULVERTS (15")
AA2				
*** OR ***				
0366000000-E	310	148	LF	15" RC PIPE CULVERTS, CLASS III
AA3				
0540000000-E	SP	136	LF	*** ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, *** THICK (15", 0.064")
AA3				

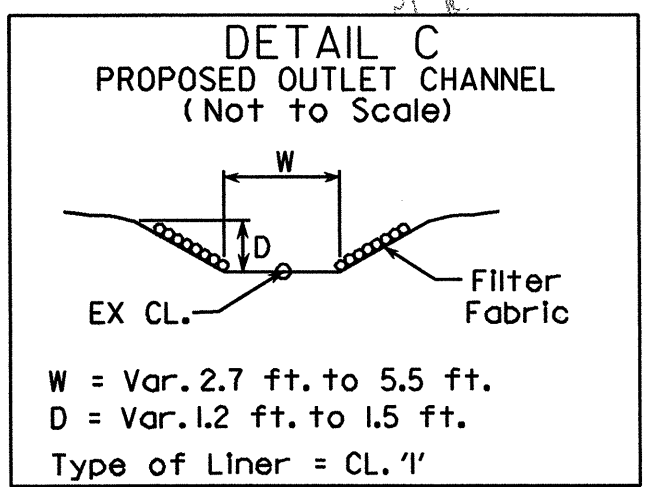
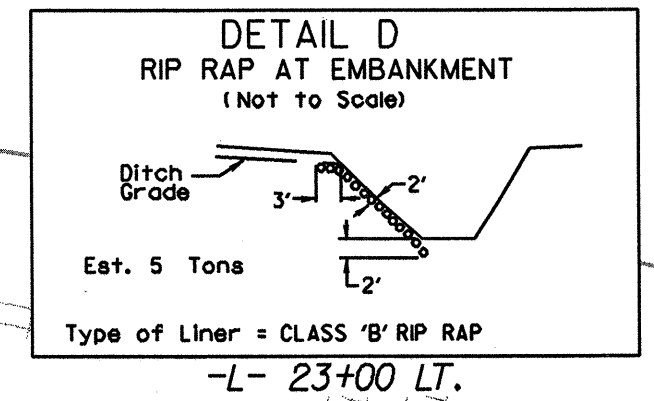
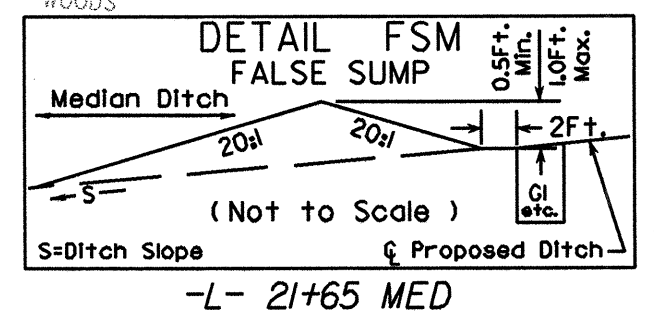
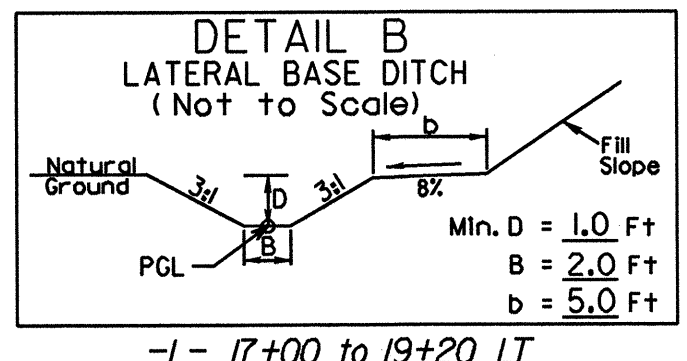
***** END SCHEDULE AA *****

REVISIONS

PROJECT REFERENCE NO. B-3916	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL SCOTT CLARK 4-02-07	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL LEON BOLLINGER 4-02-07



P_i Sta 13+79.23
 $\Delta = 17' 33'' 30.5''$ (LT)
 $D = 2' 20'' 00.0''$
 $L = 752.51'$
 $T = 379.23'$
 $R = 2,455.53'$
 $e = 0.05$
 Runoff = 133'
 Bearing Back = N 34° 56' 02.5 E"



FOR -DETOUR- SEE SHEET NO. 4A

FOR -L- PROFILE SEE SHEET NO. 5

SEE SHEETS S-1 THRU S-30 FOR STRUCTURE PLANS

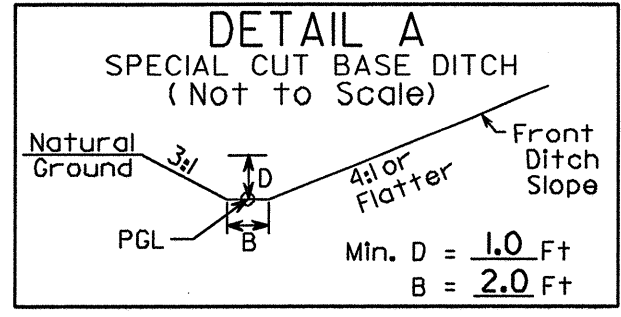
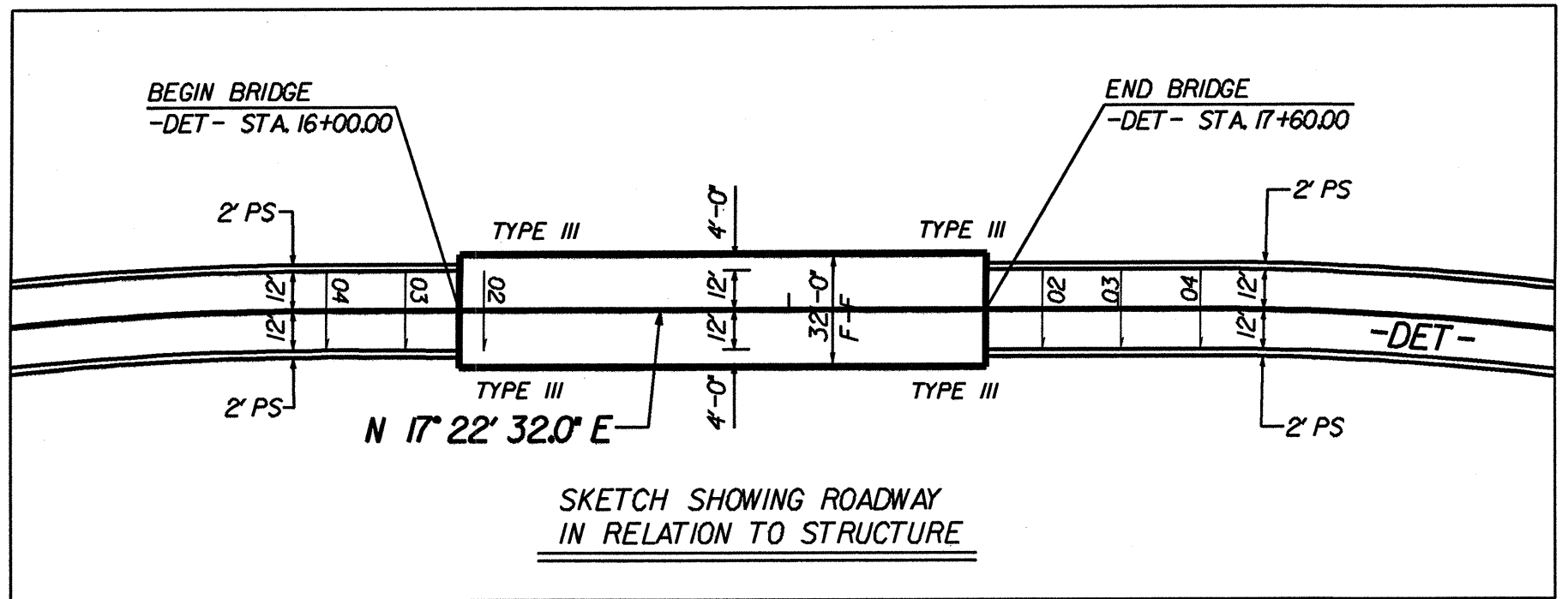
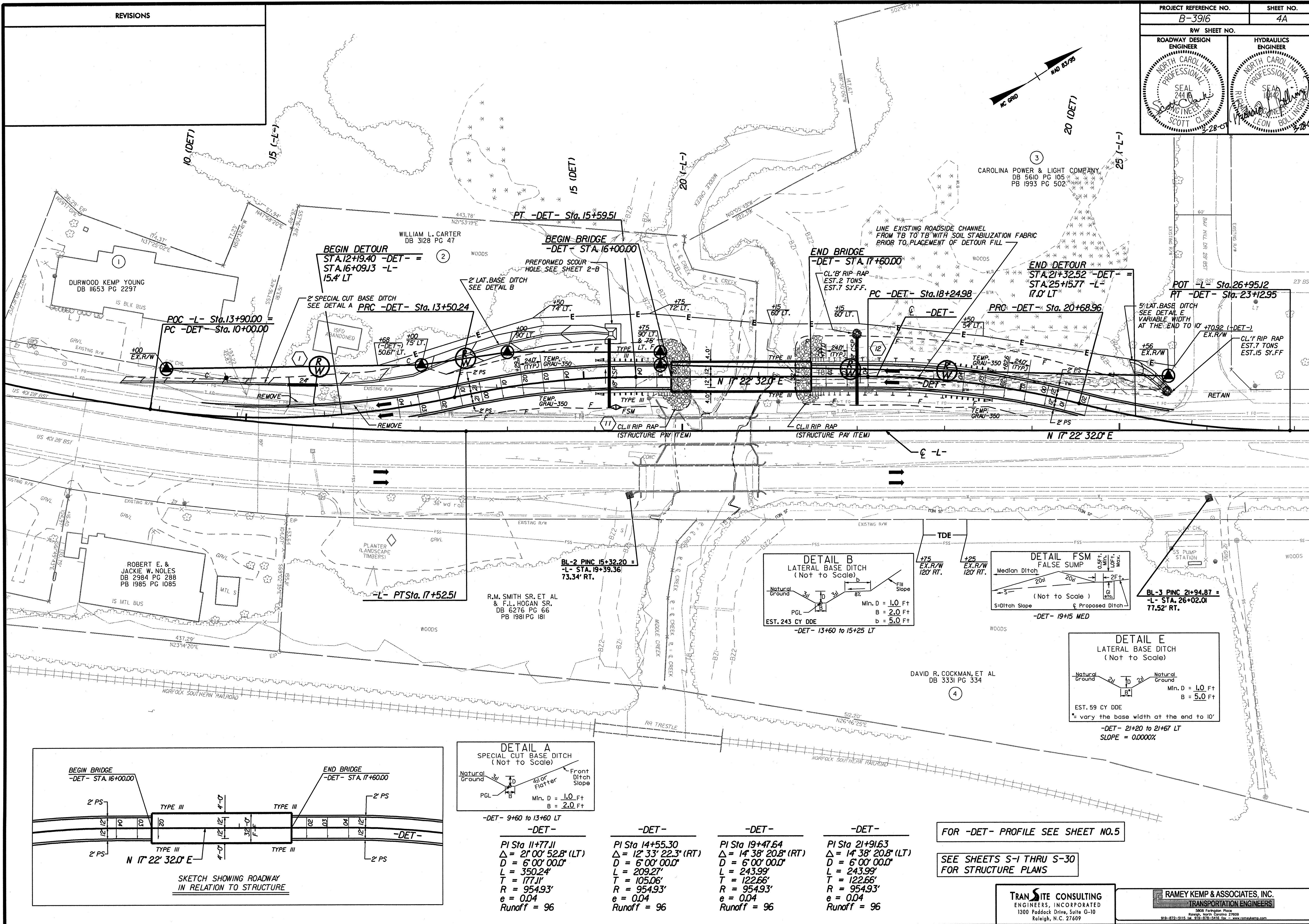
PSRM - PERMANENT SOIL REINFORCED MATTING
GTD - GRADE TO DRAIN

TRAN SITE CONSULTING ENGINEERS, INCORPORATED
1300 Paddock Drive, Suite G-10
Raleigh, N.C. 27609

RAMEY KEMP & ASSOCIATES, INC. TRANSPORTATION ENGINEERS
5805 Farrington Road
Raleigh, North Carolina 27609
919-872-5119 fax 919-872-5416 www.rkeng.com

REVISIONS

PROJECT REFERENCE NO. B-3916	SHEET NO. 4A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER



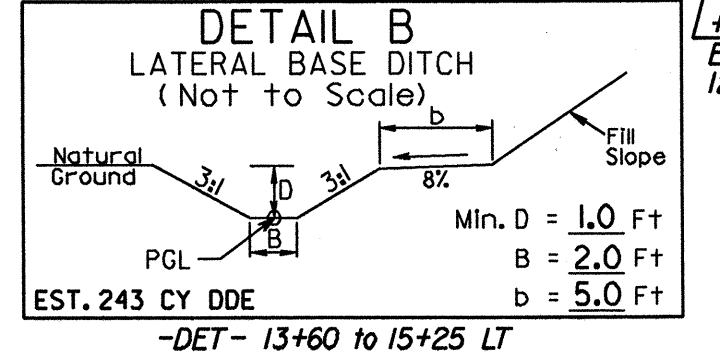
-DET- 9+60 to 13+60 LT
-DET-
PI Sta 11+77.11
 $\Delta = 21^{\circ} 00' 52.8''$ (LT)
D = 6' 00" 00.0"
L = 350.24'
T = 177.11'
R = 954.93'
e = 0.04
Runoff = 96

-DET-
PI Sta 14+55.30
 $\Delta = 12^{\circ} 33' 22.3''$ (RT)
D = 6' 00" 00.0"
L = 209.27'
T = 105.06'
R = 954.93'
e = 0.04
Runoff = 96

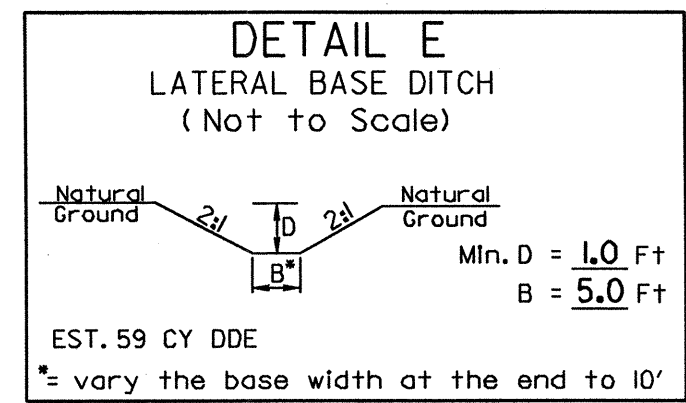
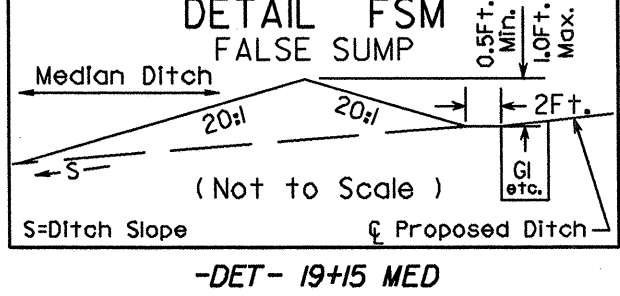
-DET-
PI Sta 19+47.64
 $\Delta = 14^{\circ} 38' 20.8''$ (RT)
D = 6' 00" 00.0"
L = 243.99'
T = 122.66'
R = 954.93'
e = 0.04
Runoff = 96

-DET-
PI Sta 21+91.63
 $\Delta = 14^{\circ} 38' 20.8''$ (LT)
D = 6' 00" 00.0"
L = 243.99'
T = 122.66'
R = 954.93'
e = 0.04
Runoff = 96

FOR -DET- PROFILE SEE SHEET NO.5
SEE SHEETS S-1 THRU S-30 FOR STRUCTURE PLANS



TDE
+75 EX.R/W 120' RT.
+25 EX.R/W 120' RT.



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Raleigh, N.C. 27609

RAMEY KEMP & ASSOCIATES, INC. TRANSPORTATION ENGINEERS
5808 Farrington Place
Raleigh, North Carolina 27609
919-872-5115 fax: 919-872-5416 www.rameykemp.com

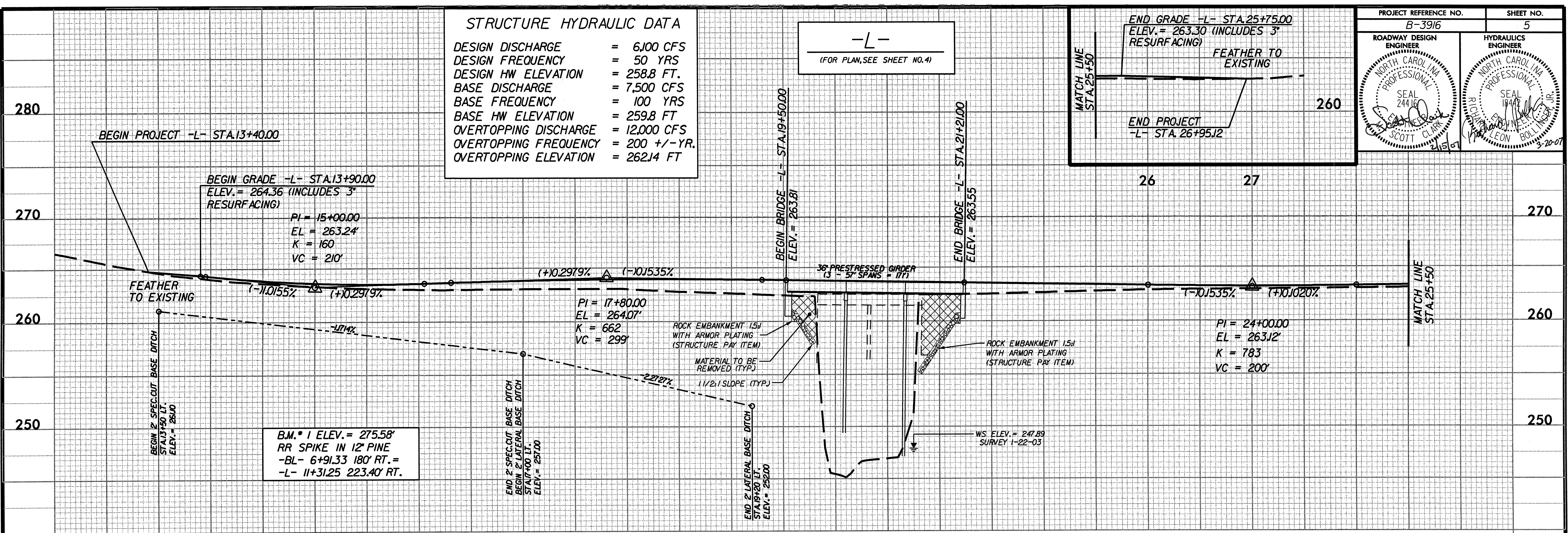
STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE = 6,100 CFS
 DESIGN FREQUENCY = 50 YRS
 DESIGN HW ELEVATION = 258.8 FT.
 BASE DISCHARGE = 7,500 CFS
 BASE FREQUENCY = 100 YRS
 BASE HW ELEVATION = 259.8 FT
 OVERTOPPING DISCHARGE = 12,000 CFS
 OVERTOPPING FREQUENCY = 200 +/- YR.
 OVERTOPPING ELEVATION = 262.14 FT

-L-
(FOR PLAN, SEE SHEET NO. 4)

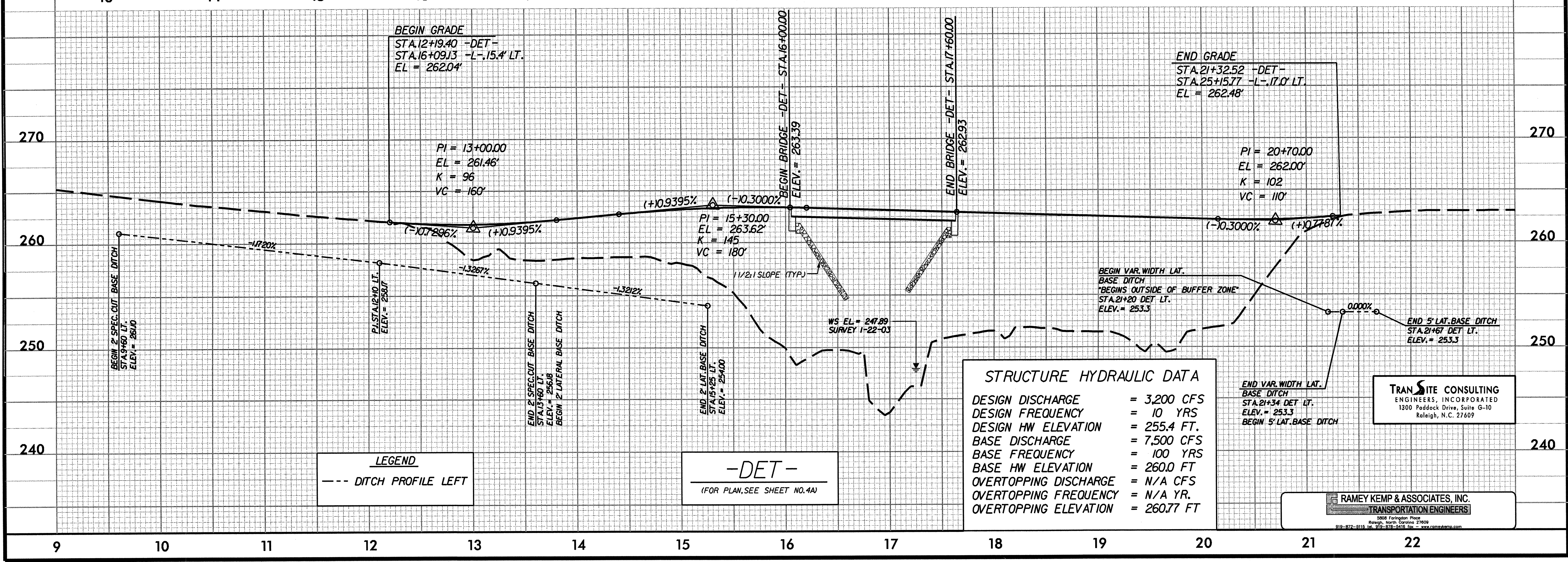
END GRADE -L- STA. 25+75.00
 ELEV. = 263.30 (INCLUDES 3" RESURFACING)
 FEATHER TO EXISTING

END PROJECT -L- STA. 26+95.12



B.M. # 1 ELEV. = 275.58'
 RR SPIKE IN 12" PINE
 -BL- 6+91.33 180' RT. =
 -L- 11+31.25 223.40' RT.

13 14 15 16 17 18 19 20 21 22 23 24 25



LEGEND
 --- DITCH PROFILE LEFT

-DET-
(FOR PLAN, SEE SHEET NO. 4A)

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE = 3,200 CFS
 DESIGN FREQUENCY = 10 YRS
 DESIGN HW ELEVATION = 255.4 FT.
 BASE DISCHARGE = 7,500 CFS
 BASE FREQUENCY = 100 YRS
 BASE HW ELEVATION = 260.0 FT
 OVERTOPPING DISCHARGE = N/A CFS
 OVERTOPPING FREQUENCY = N/A YR.
 OVERTOPPING ELEVATION = 260.77 FT

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9 10 11 12 13 14 15 16 17 18 19 20 21 22