

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

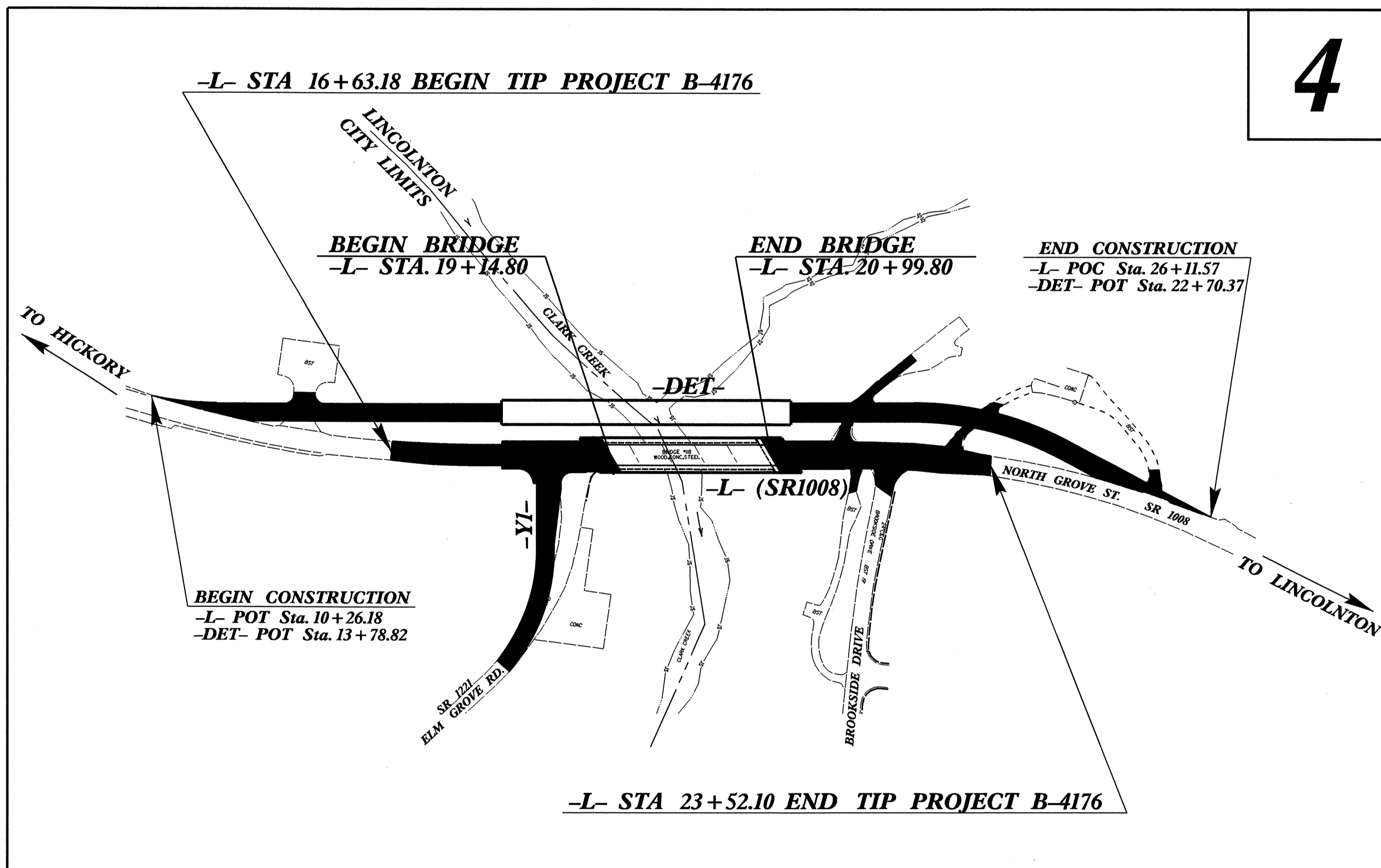
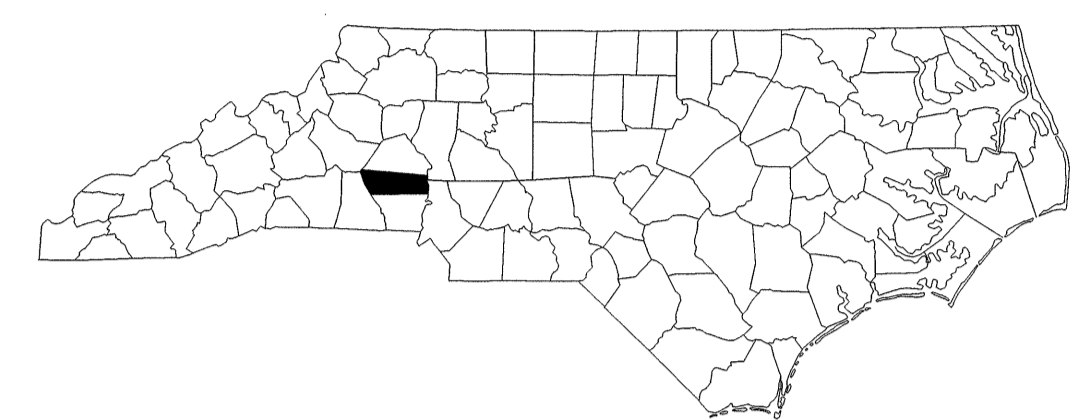
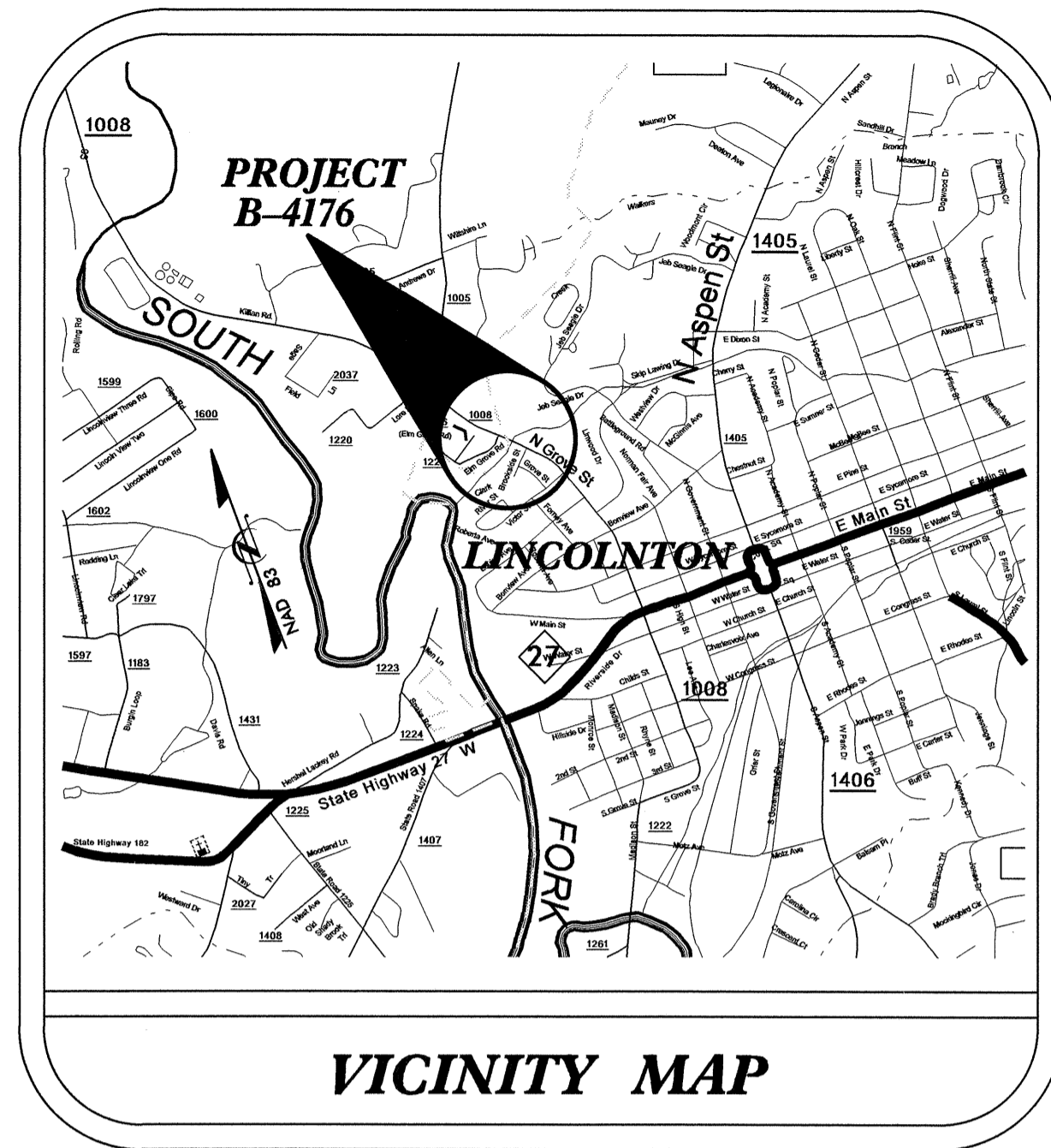
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**LINCOLN COUNTY**

LOCATION: BRIDGE NO. 118 OVER CLARK CREEK ON  
SR 1008 (NORTH GROVE STREET)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

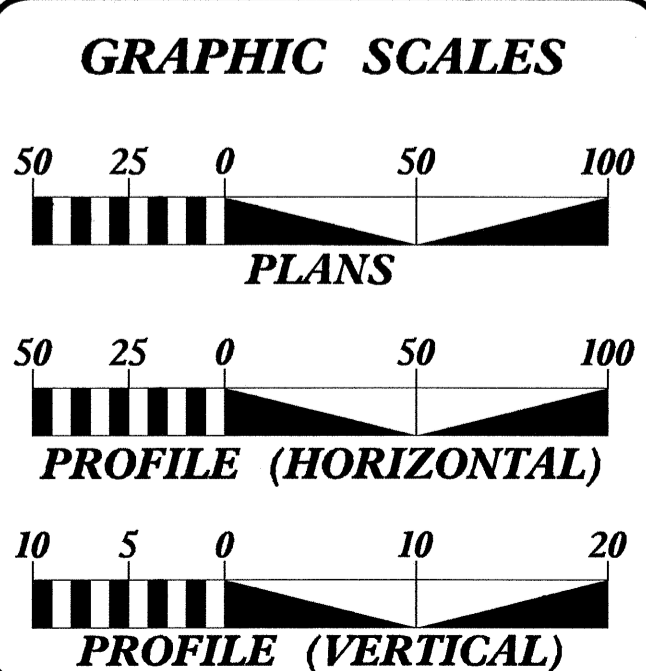
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	<b>B-4176</b>	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
33523.1.1	BRSTP-1008(12)	PE	
33523.2.1	BRSTP-1008(12)	RW & UTIL	
33523.3.1	BRSTP-1008(12)	CONST.	



TIP PROJECT: B-4176

CONTRACT: C202579

SUBREGIONAL TIER DESIGN GUIDELINES WERE USED ON THIS PROJCT  
THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.



**DESIGN DATA**

ADT 2010 = 9,700  
ADT 2030 = 13,700  
DHV = 10 %  
D = 60 %  
T = 4 % \*  
V = 40 MPH  
FUNC. CLASS = COLLECTOR  
\* TTST 1% DUAL 3%

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4176 = 0.095 Mi.  
LENGTH STRUCTURE TIP PROJECT B-4176 = 0.035 Mi.  
TOTAL LENGTH TIP PROJECT B-4176 = 0.131 Mi.

Prepared In the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: **MARCH 1, 2010**

LETTING DATE: **FEBRUARY 15, 2011**

**JIMMY GOODNIGHT, P.E.**  
PROJECT ENGINEER

**MARK HUSSEY**  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

12-7-10  
SIGNATURE: [Signature]

**ROADWAY DESIGN ENGINEER**

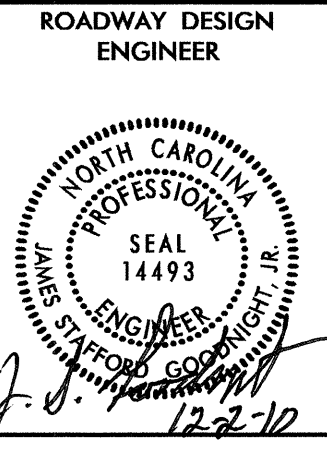
12-2-2010  
SIGNATURE: [Signature]

**DIVISION OF HIGHWAYS**  
STATE OF NORTH CAROLINA

[Seal of State of North Carolina]

**Art McMillan**  
STATE HIGHWAY DESIGN ENGINEER

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

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEETS
2 THRU 2-A	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2-B THRU 2-C	DETAIL OF METHOD OF PIPE INSTALLATION
2D	DETAIL OF ANCHORAGE OF FRAME
2-E THRU 2-O	DETAIL OF TEMPORARY MSE WALL
2-P	DETAIL OF CONVERSION OF DROP INLET TO JUNCTION BOX
3	SUMMARY OF QUANTITIES
3A-3B	SUMMARY OF DRAINAGE QUANTITIES SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TCP-1 THRU TCP-9	TRAFFIC CONTROL PLANS
PM-1 THRU PM-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-6	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
SIGN-1 THRU SIGN-4	SIGNING PLANS
UO-1 THRU UO-2	UTILITIES PLANS
X-1 THRU X-18	CROSS-SECTIONS
S-1 THRU S-42	STRUCTURE PLANS

**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 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 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 AT&T, CITY OF LINCOLNTON, DUKE ENERGY, PIEDMONT NATURAL GAS, CHARTER CABLE, CITY OF LINCOLTON-WATER & SANITARY SEWER  
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.

**2006 ROADWAY ENGLISH STANDARD DRAWINGS**

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

STD.NO.	TITLE
	<b>DIVISION 2 - EARTHWORK</b>
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
	<b>DIVISION 3 - PIPE CULVERTS</b>
310.10	Driveway Pipe Construction
	<b>DIVISION 4 - MAJOR STRUCTURES</b>
422.10	Reinforced Bridge Approach Fills
	<b>DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</b>
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
	<b>DIVISION 8 - INCIDENTALS</b>
815.03	Pipe Underdrain and Blind Drain
816.04	Markers for Drainage Structure and Concrete Pad
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.45	Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

8/17/99

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3/15/06

Note: Not to Scale

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

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	⑫③
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-WLB-
Proposed Wetland Boundary	-WLB-
Existing Endangered Animal Boundary	-EAB-
Existing Endangered Plant Boundary	-EPB-

### BUILDINGS AND OTHER CULTURE:

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

### HYDROLOGY:

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

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	□
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	○
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	□

### VEGETATION:

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

### EXISTING STRUCTURES:

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

### UTILITIES:

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

### TELEPHONE:

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

### WATER:

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

### TV:

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

### GAS:

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

### SANITARY SEWER:

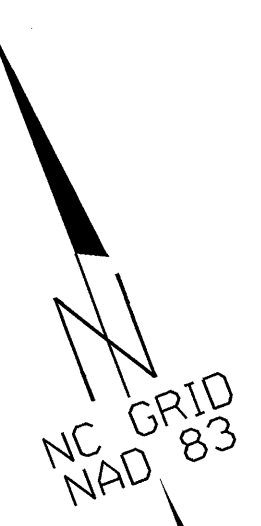
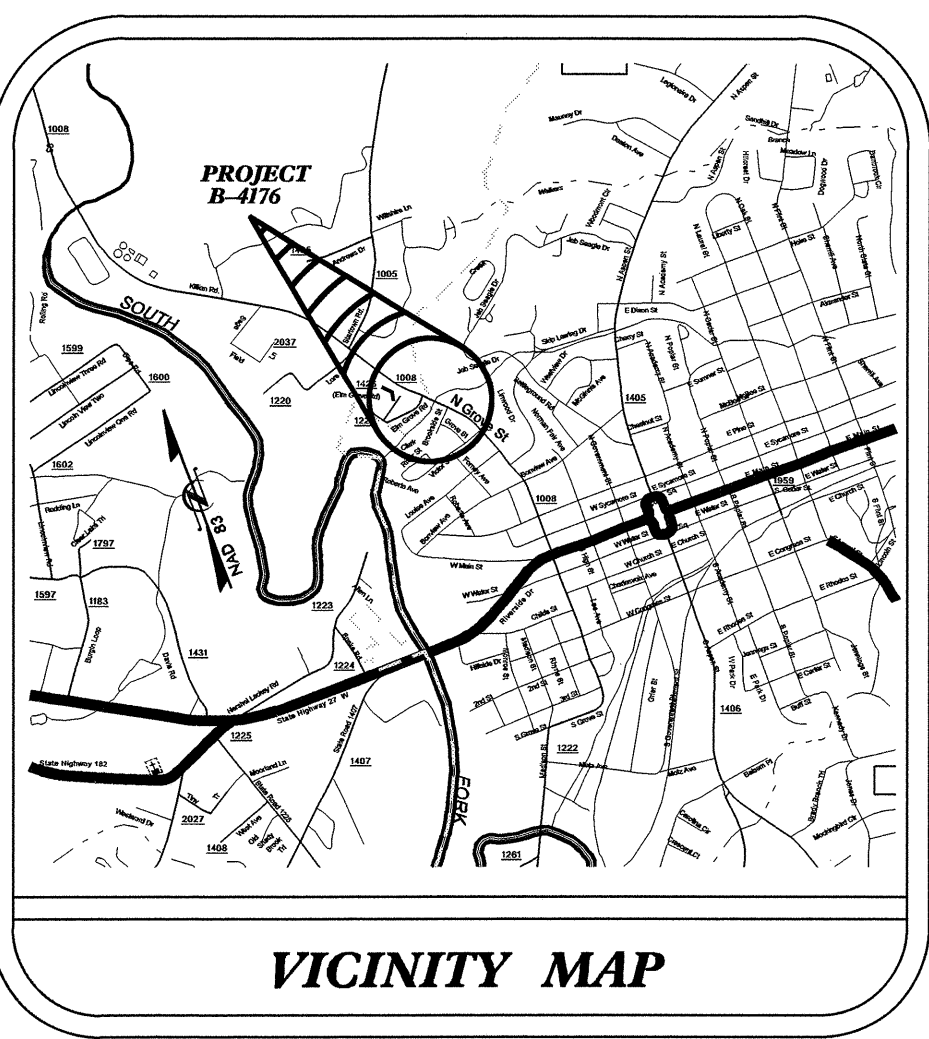
Sanitary Sewer Manhole	○
Sanitary Sewer Cleanout	○
U/G Sanitary Sewer Line	-----
Above Ground Sanitary Sewer	-----
Recorded SS Forced Main Line	-----
Designated SS Forced Main Line (S.U.E.*)	-----

### MISCELLANEOUS:

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

# SURVEY CONTROL SHEET B-4176

PROJECT REFERENCE NO.	SHEET NO.
B-4176	1 C
Location and Surveys	



**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4176-1"

WITH NAD 83 STATE PLANE GRID COORDINATES OF  
 NORTHING: 636003.443(ft) EASTING: 1324339.763(ft)  
 ELEVATION: 772.28(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99984836

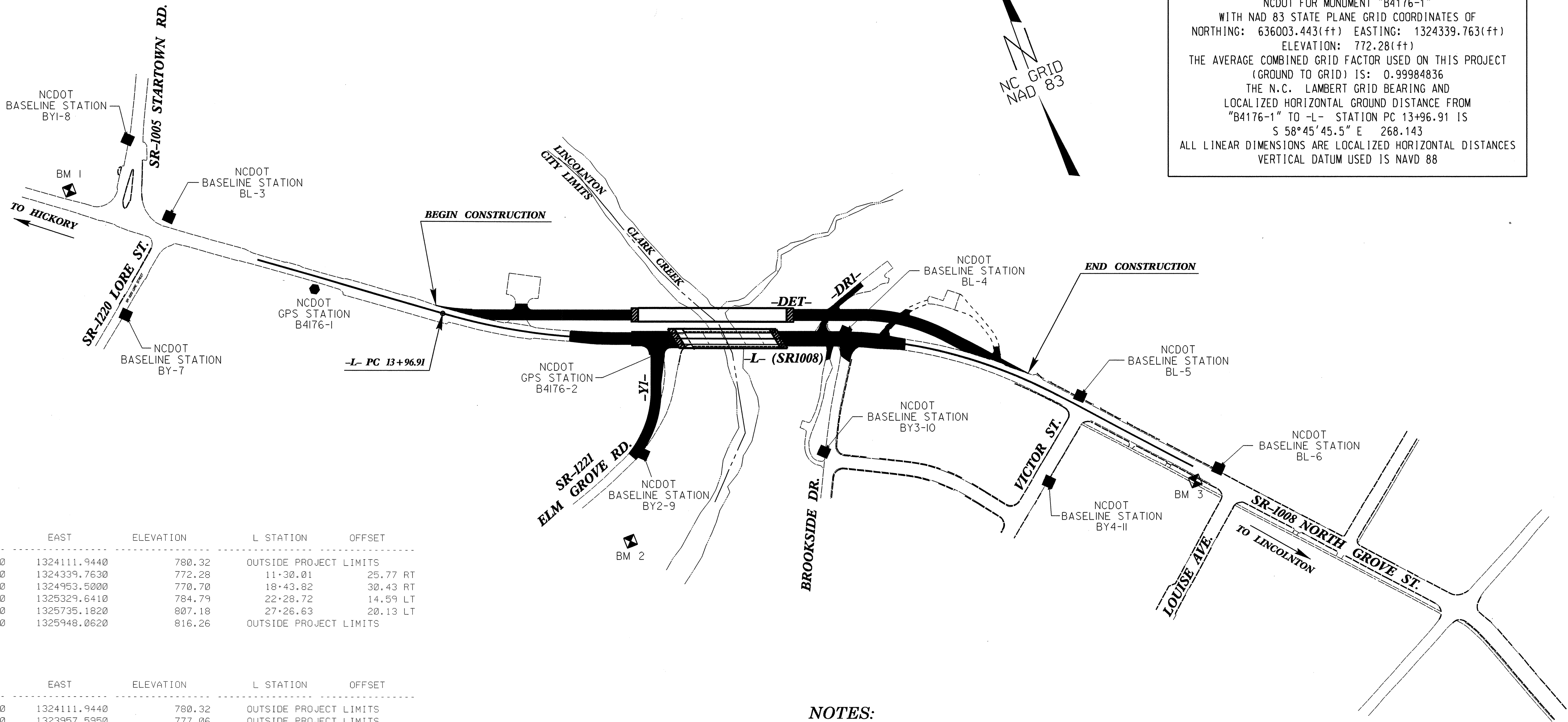
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4176-1" TO -L- STATION PC 13+96.91 IS  
 S 58°45'45.5" E 268.143

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

```

.....
BM1  ELEVATION = 785.82
N 636372  E 1323940
L STATION 6+88
N 52° 46' 08.8" W DIST 2101.32
RR SPIKE IN POWER POLE
.....
BM2  ELEVATION = 770.01
N 635290  E 1324764
Y1 STATION 12+53
S 21° 36' 37.9" W DIST 174.92
RR SPIKE IN 18" SYCAMORE TREE
.....
BM3  ELEVATION = 816.33
N 634996  E 1325895
L STATION 5+83 282 LEFT
RR SPIKE IN POWER POLE
.....

```



BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
3	BL-3	636247.9680	1324111.9440	780.32	OUTSIDE PROJECT LIMITS	
1	B4176-1	636003.4430	1324339.7630	772.28	11+30.01	25.77 RT
2	B4176-2	635631.2910	1324953.5000	770.70	18+43.82	30.43 RT
4	BL-4	635536.5460	1325329.6410	784.79	22+28.72	14.59 LT
5	BL-5	635242.7700	1325735.1820	807.18	27+26.63	20.13 LT
6	BL-6	635002.6070	1325948.0620	816.26	OUTSIDE PROJECT LIMITS	

BY POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
15	BL-3	636247.9680	1324111.9440	780.32	OUTSIDE PROJECT LIMITS	
7	BY-7	636091.7000	1323957.5950	777.06	OUTSIDE PROJECT LIMITS	

BY1 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
8	BY1-8	636427.6480	1324089.1130	786.35	OUTSIDE PROJECT LIMITS	
16	BL-3	636247.9680	1324111.9440	780.32	OUTSIDE PROJECT LIMITS	

BY2 POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
14	B4176-2	635631.2910	1324953.5000	770.70	10+30.43	3.82 LT
9	BY2-9	635449.1970	1324852.2150	771.85	12+35.88	15.19 LT

BY3 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
13	BL-4	635536.5460	1325329.6410	784.79	22+28.72	14.59 LT
10	BY3-10	635322.1780	1325201.7820	798.83	21+85.48	231.58 RT

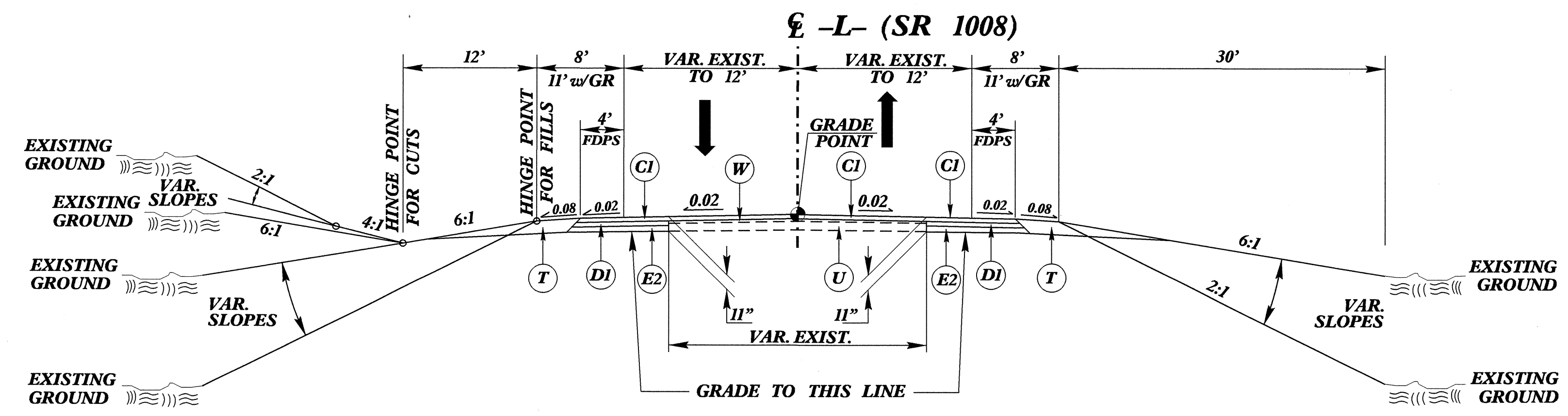
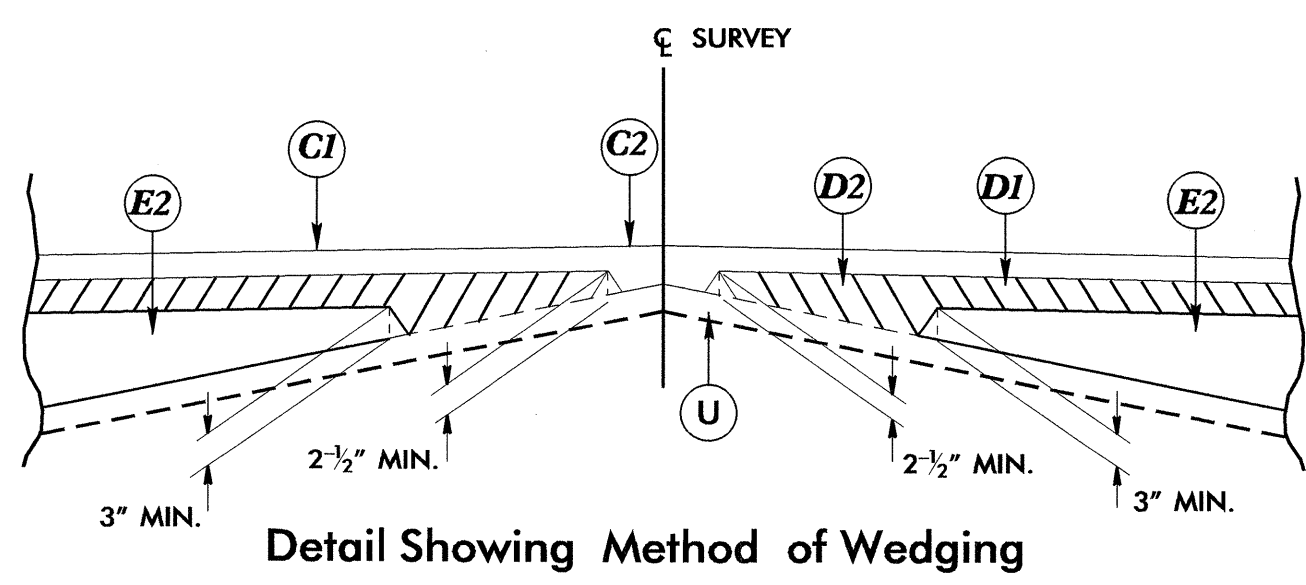
BY4 POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
12	BL-5	635242.7700	1325735.1820	807.18	27+26.63	20.13 LT
11	BY4-11	635100.3420	1325612.5780	824.24	27+52.42	166.02 RT

- 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:  
 B4176\_LS\_CONTROL.TXT & B4176\_LS\_LOCAL.TXT
  - SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
  - PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM. NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)
  - ◆ INDICATES GEODETIC CONTROL MONUMENTS SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
  - ▲ INDICATES SUPPLEMENTAL CONTROL MONUMENTS SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
  - ▼ INDICATES BENCH MARKS SET FOR VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

NOTE: DRAWING NOT TO SCALE

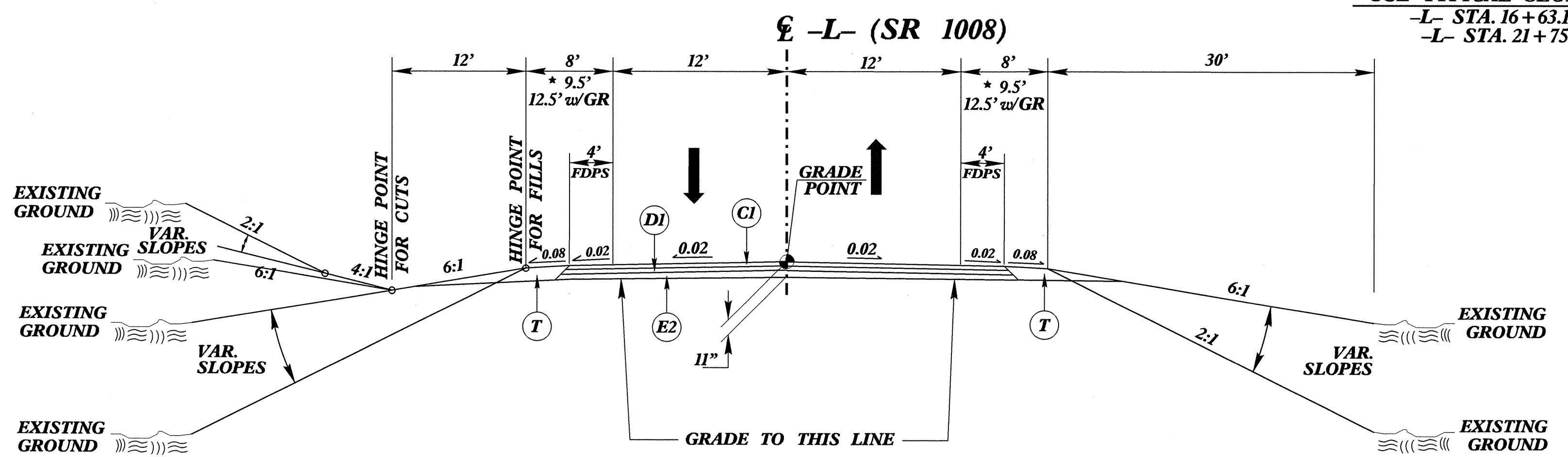
FINAL PAVEMENT SCHEDULE	
<b>C1</b>	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
<b>C2</b>	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
<b>D1</b>	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
<b>D2</b>	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 2-1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
<b>E1</b>	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
<b>E2</b>	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
<b>E3</b>	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 5 1/2" IN DEPTH.
<b>J1</b>	6" AGGREGATE BASE COURSE
<b>J2</b>	8" AGGREGATE BASE COURSE
<b>P</b>	PRIME COAT
<b>R</b>	SHOULDER BERM GUTTER
<b>T</b>	EARTH MATERIAL.
<b>U</b>	EXISTING PAVEMENT.
<b>W</b>	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL).

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



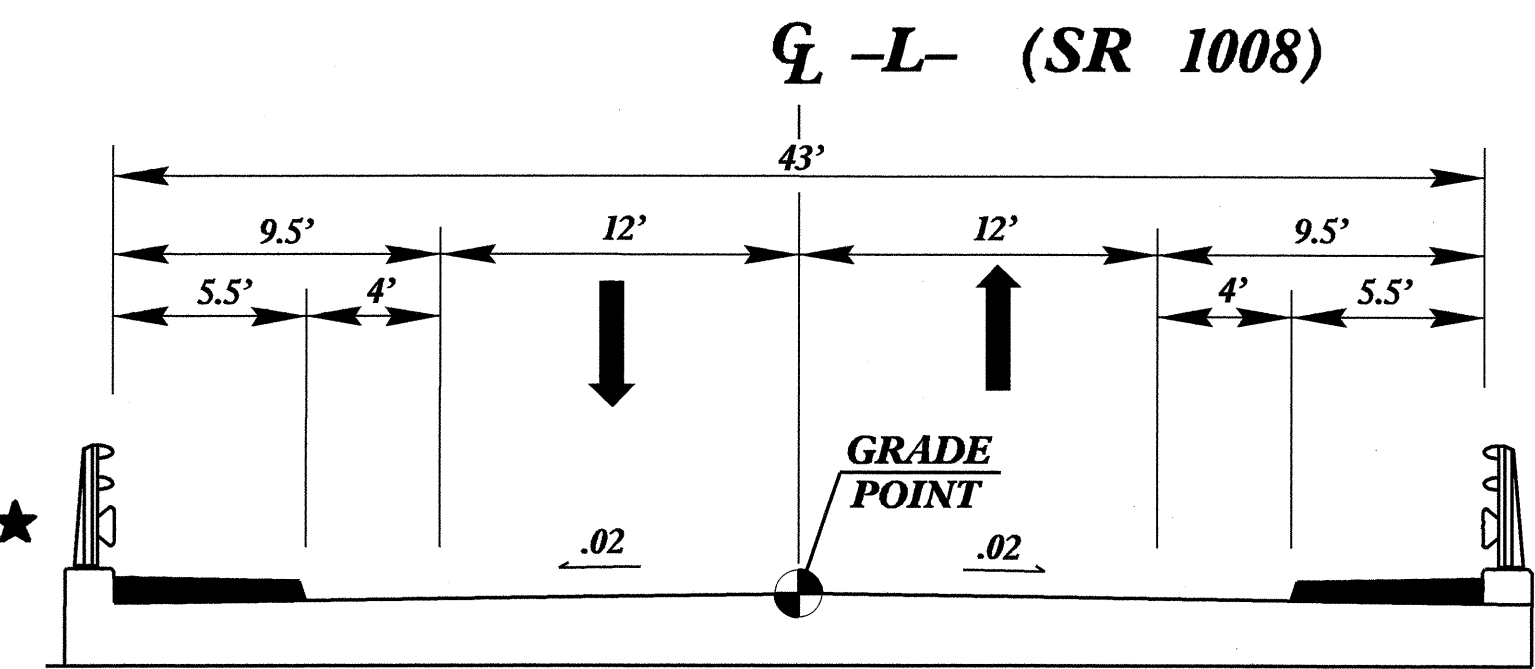
**TYPICAL SECTION NO. 1**

USE TYPICAL SECTION NO. 1 AS FOLLOWS  
 -L- STA. 16+63.18 TO STA. 18+75.00  
 -L- STA. 21+75 TO STA. 23+52.10



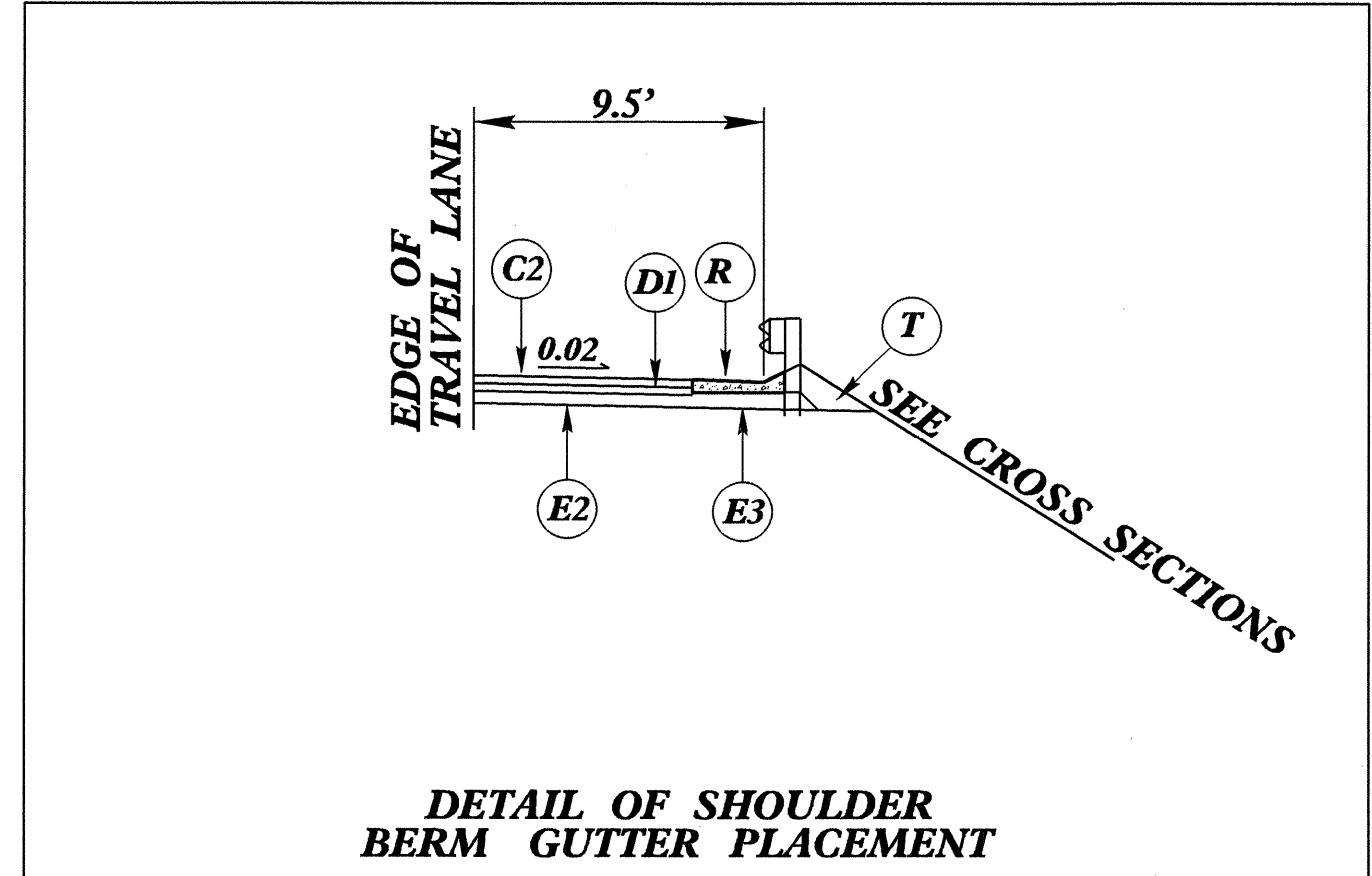
**TYPICAL SECTION NO. 2**

USE TYPICAL SECTION NO. 2 AS FOLLOWS  
 -L- STA. 18+75.00 TO STA. 19+14.80 (BEGIN BRIDGE)  
 -L- STA. 20+99.80 (END BRIDGE) TO STA. 21+75.00  
 \* USE WIDTHS IN THE LOCATION OF GUARDRAIL LT. & RT.



**TYPICAL SECTION ON STRUCTURE**

-L- STA. 19+14.80 TO 20+99.80  
 \* BICYCLE SAFE RAILS REQUIRED



**DETAIL OF SHOULDER BERM GUTTER PLACEMENT**

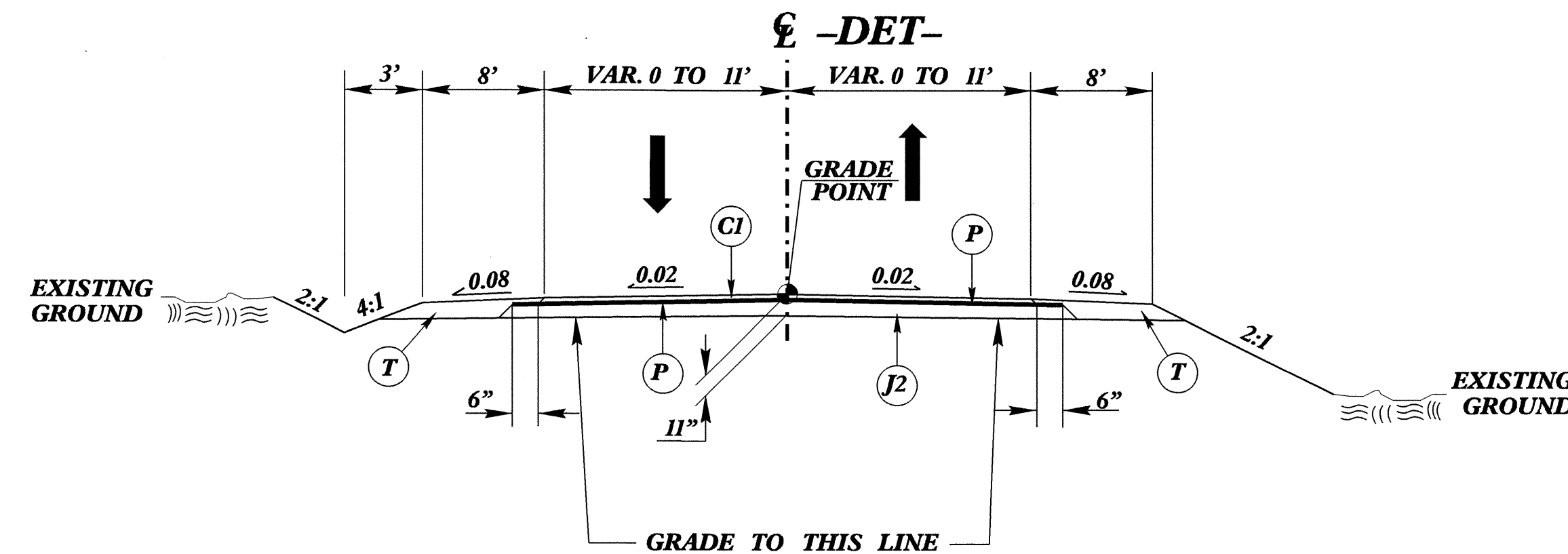
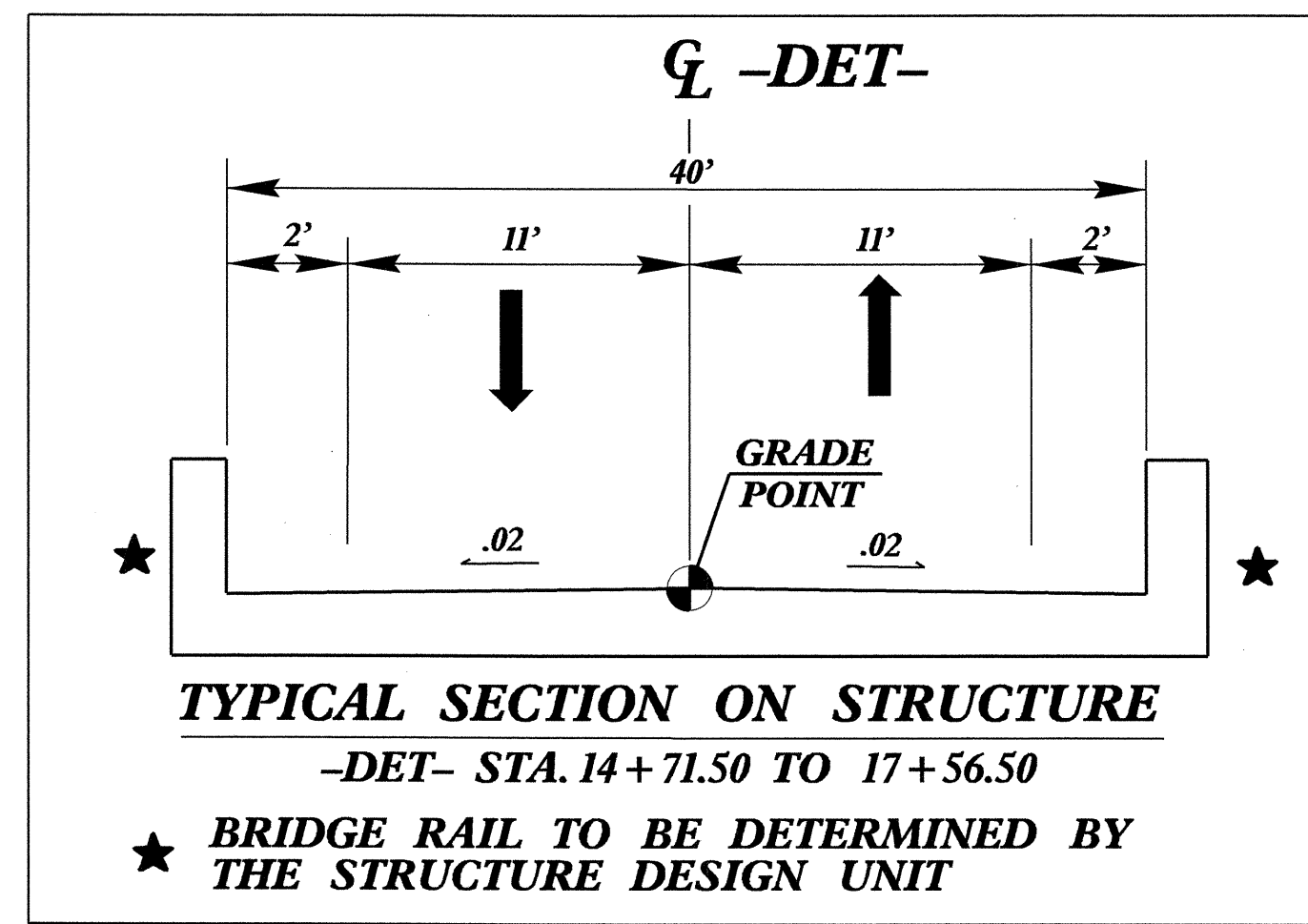
USE IN CONJUNCTION WITH TYPICAL SECTIONS 1 AND 2  
 -L- LT STA. 17+50 TO APPROACH SLAB  
 -L- RT STA. 18+80 TO APPROACH SLAB

01-DEC-2010, 07:35  
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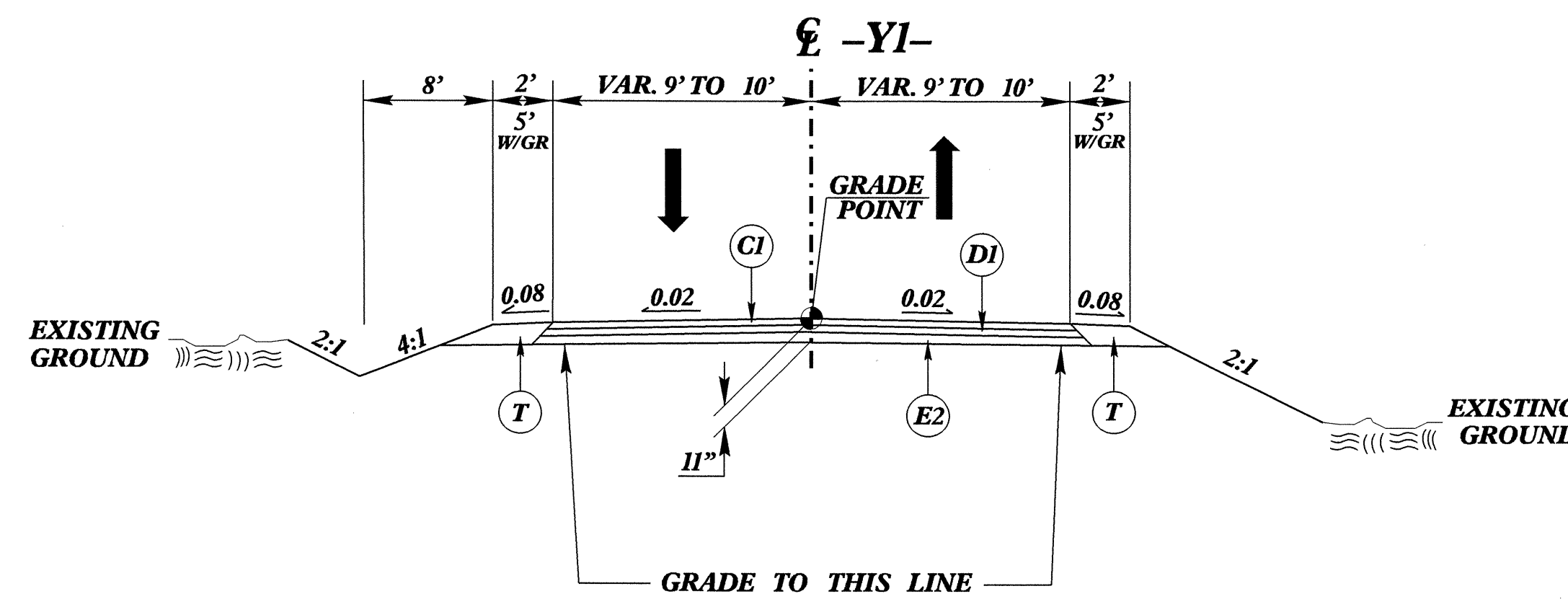
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**FINAL PAVEMENT SCHEDULE**

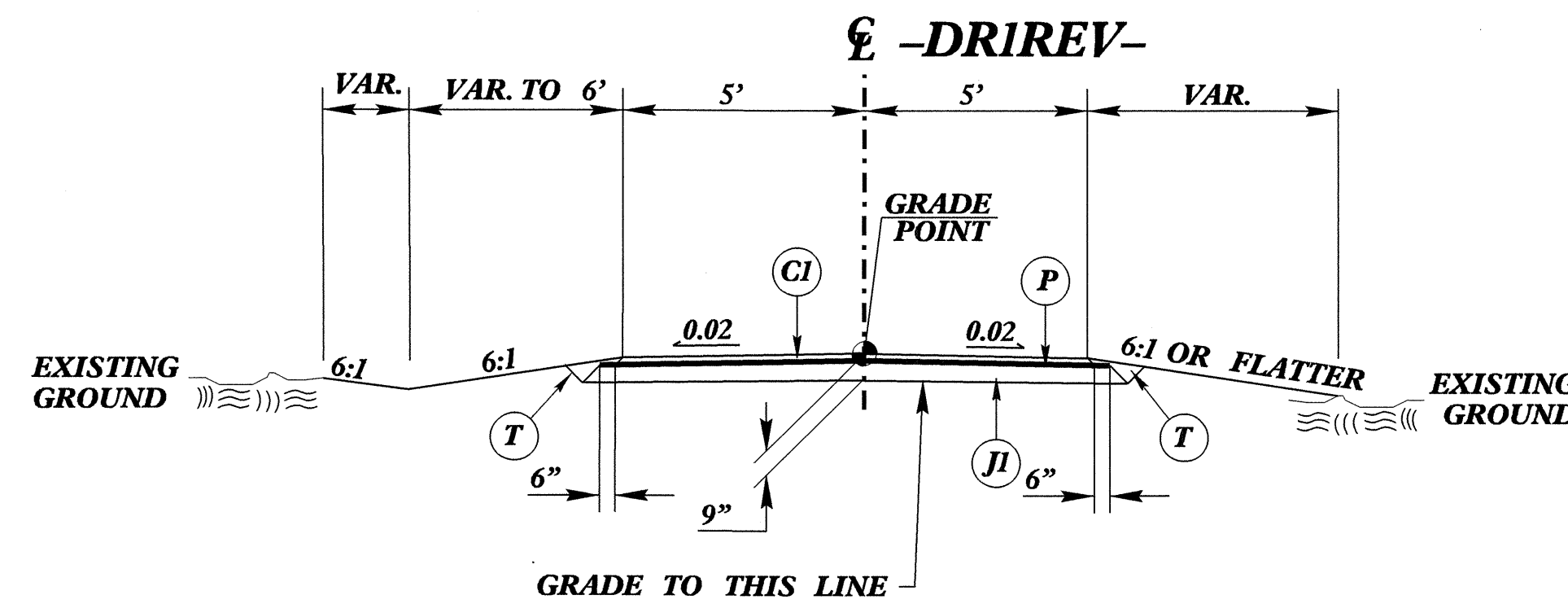
C1	3" S9.5B
C2	VAR. S9.5B
D1	3" I19.0B
D2	VAR. I19.0B
E1	4" B25.0B
E2	5" B25.0B
E3	VAR. B25.0B
J1	6" ABC
J2	8" ABC
P	PRIME COAT
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING



USE TYPICAL SECTION NO. 3 AS FOLLOWS  
 -DET- STA. 10+26.18 TO STA. 14+71.50 (BEGIN BRIDGE)  
 -DET- STA. 17+56.50 (END BRIDGE) TO STA. 22+70.37



USE TYPICAL SECTION NO. 4 AS FOLLOWS  
 -YI- STA. 10+12.00 TO STA. 12+53.42



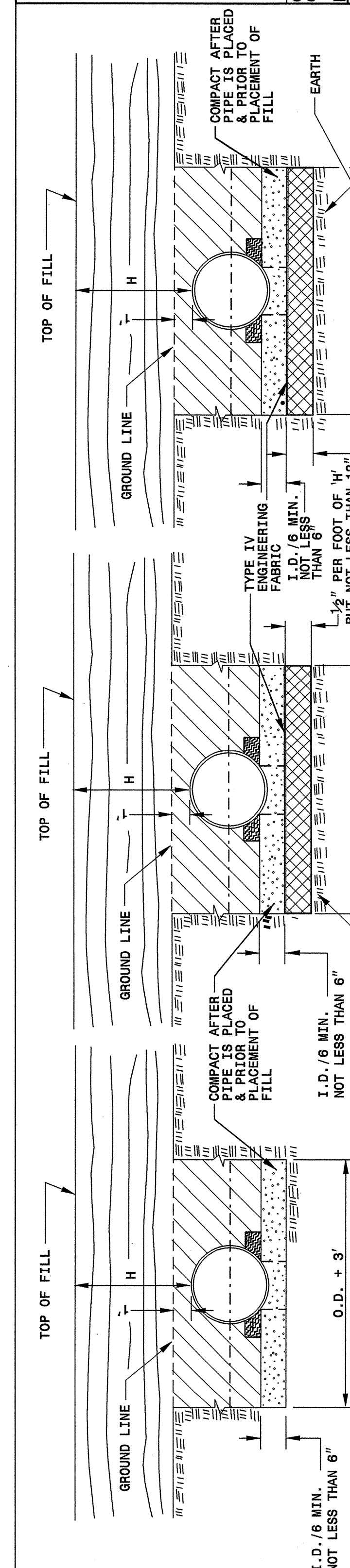
USE TYPICAL SECTION NO. 5 AS FOLLOWS  
 -DRI- STA. 10+19.00 TO STA. 11+24.00

PROJECT REFERENCE NO. <b>B-4176</b>	SHEET NO. <b>2-A</b>
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 

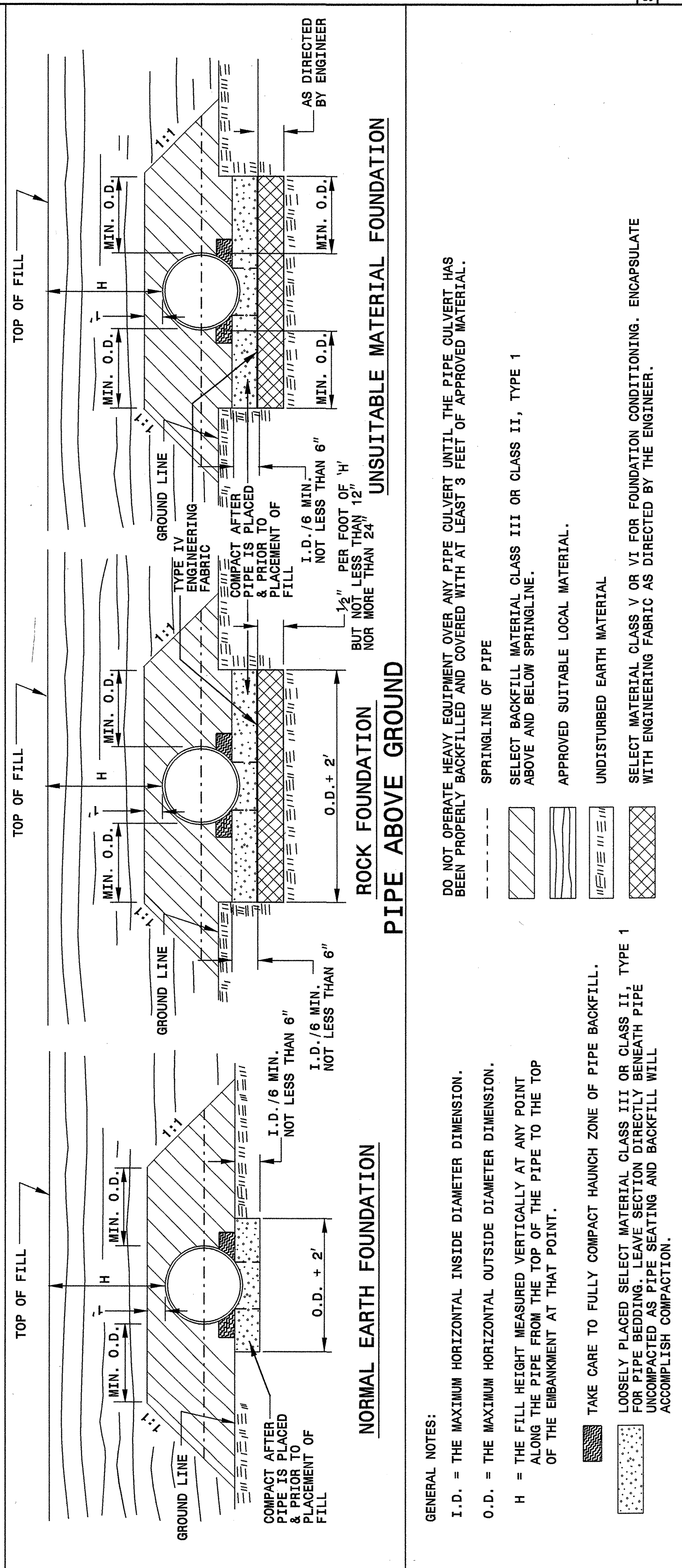
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 jhoverton A1 P5237501

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



ENGLISH DETAIL DRAWING FOR  
**METHOD OF PIPE INSTALLATION**  
 FLEXIBLE PIPE



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ENGLISH DETAIL DRAWING FOR  
**METHOD OF PIPE INSTALLATION**  
 FLEXIBLE PIPE

SHEET 1 OF 3  
**300D01**

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.

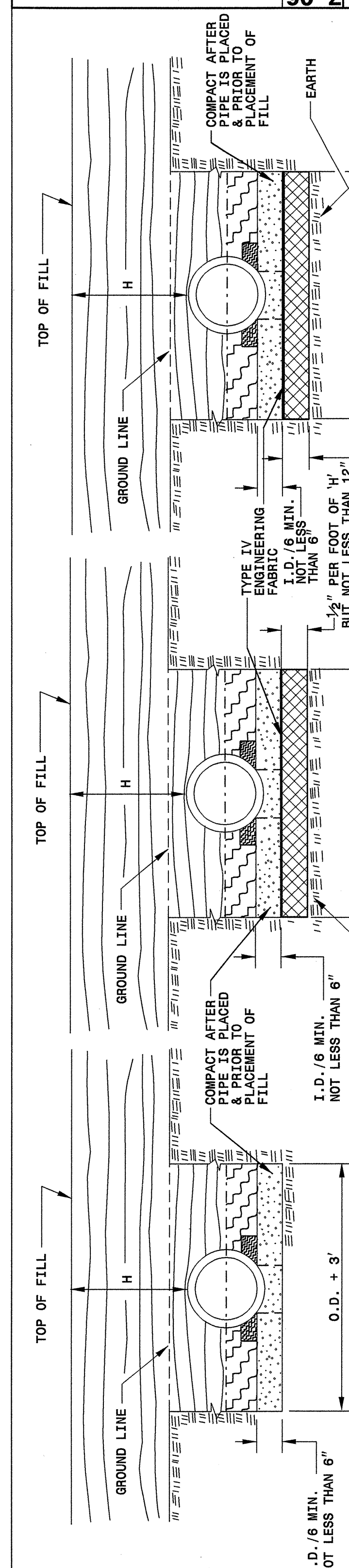
DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

--- SPRINGLINE OF PIPE  
 --- SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.  
 --- APPROVED SUITABLE LOCAL MATERIAL.

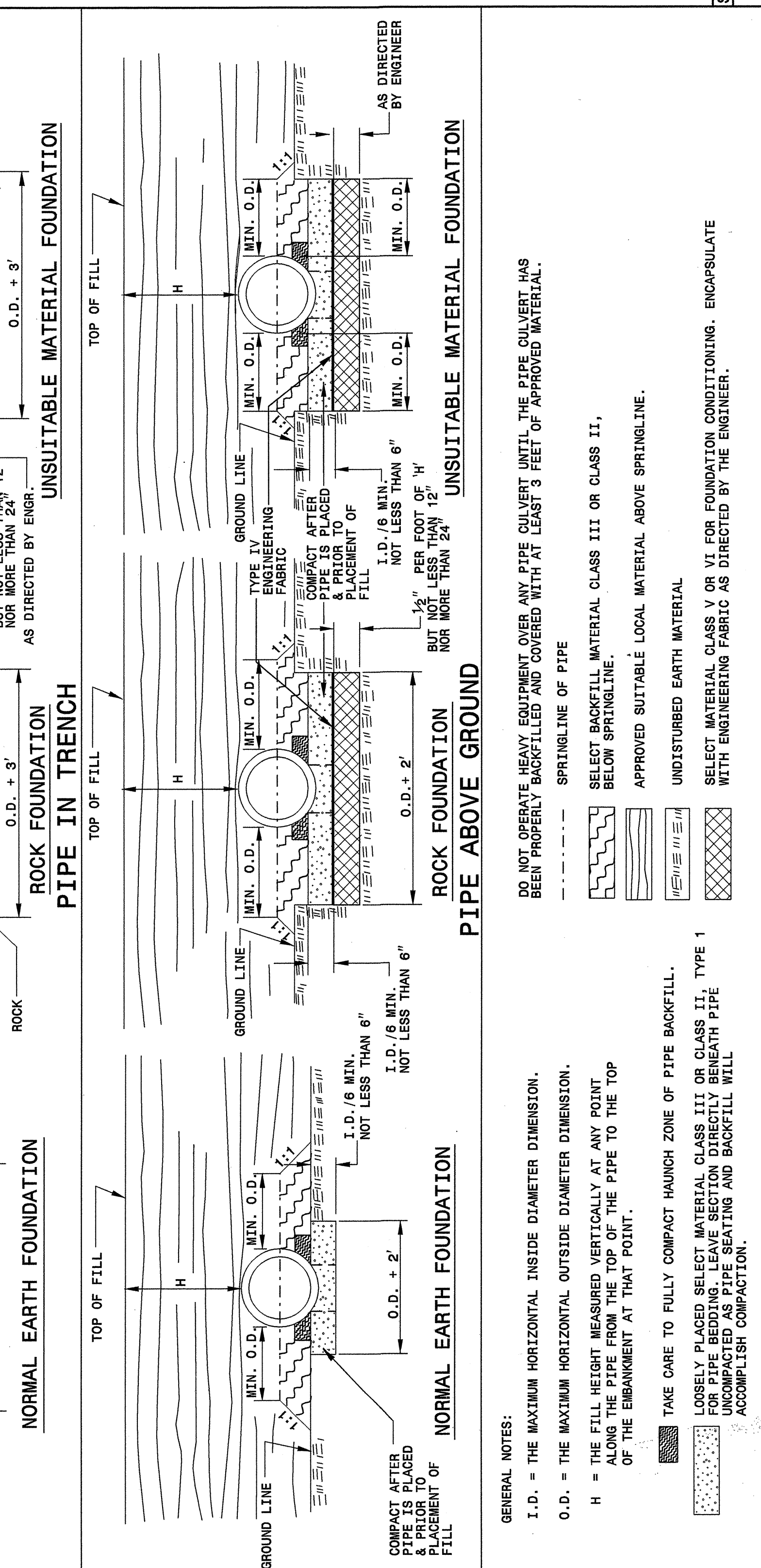
--- UNDISTURBED EARTH MATERIAL  
 --- SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

--- TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.  
 --- LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

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ENGLISH DETAIL DRAWING FOR  
**METHOD OF PIPE INSTALLATION**  
 RIGID PIPE



STATE OF NORTH CAROLINA  
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ENGLISH DETAIL DRAWING FOR  
**METHOD OF PIPE INSTALLATION**  
 RIGID PIPE

SHEET 2 OF 3  
**300D01**

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.

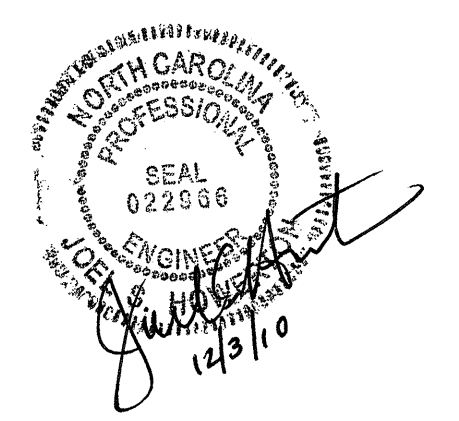
--- SPRINGLINE OF PIPE  
 --- SELECT BACKFILL MATERIAL CLASS III OR CLASS II, BELOW SPRINGLINE.  
 --- APPROVED SUITABLE LOCAL MATERIAL ABOVE SPRINGLINE.  
 --- UNDISTURBED EARTH MATERIAL  
 --- SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED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

--- TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.  
 --- LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

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

**SEE PLATE FOR TITLE**

ORIGINAL BY: K Kempf DATE: 5-15-09  
 MODIFIED BY: [Signature] DATE: 7/30/09  
 CHECKED BY: [Signature] DATE: 7/30/09  
 FILE SPEC: erlover/stds/stdsdetails/30001/0300d01.dgn



30-JUL-2009 08:49  
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 At 1/23/10

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 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 (Ga)	14	12	10 B
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

Round Corrugated Aluminum Pipe  
 2 2/3 x 1/2 corrugation \*\*

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)			
		16 (Ga)	14	12	10 B
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
30	12		60	85	111
36	12		50	71	92
42	12			60	78
48	12			52	68
54	12			46	50
60	12				50
66	12				62
72	12				51
					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

**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

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

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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: K Kempf DATE: 5-15-09  
 MODIFIED BY: DATE:   
 CHECKED BY: DATE: 7/30/09  
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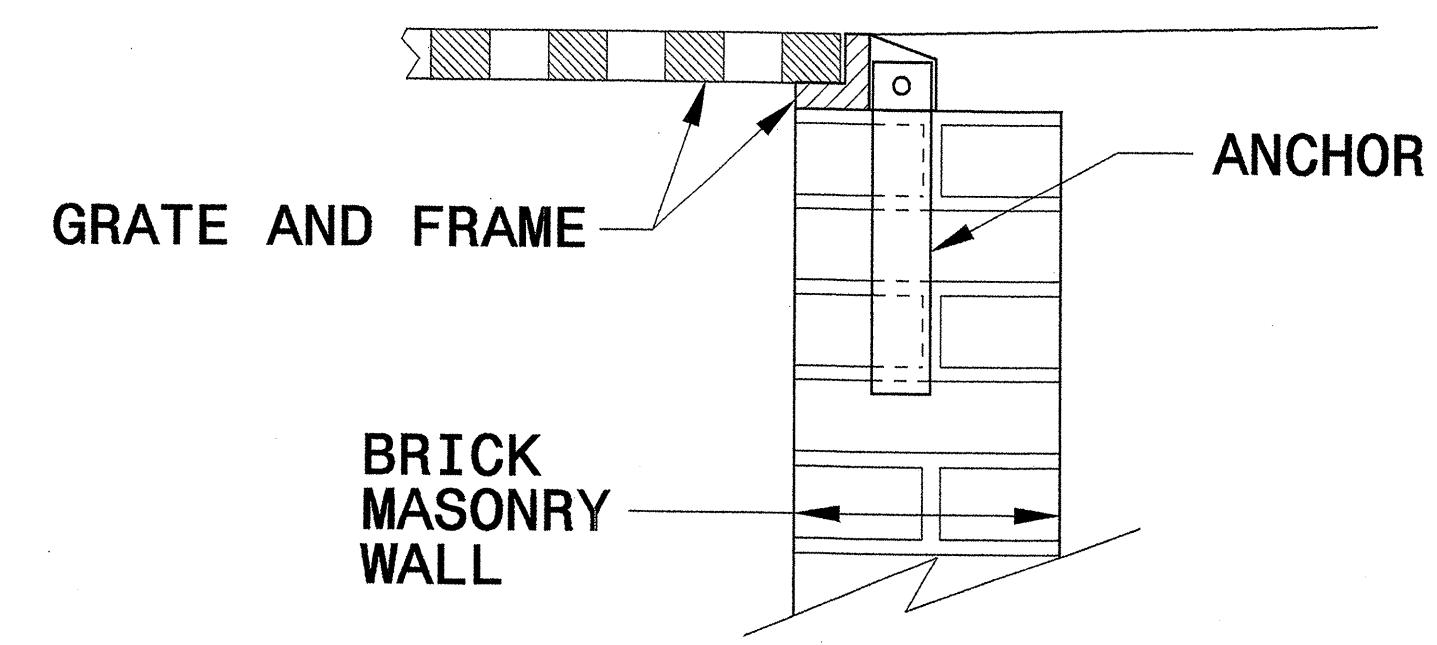




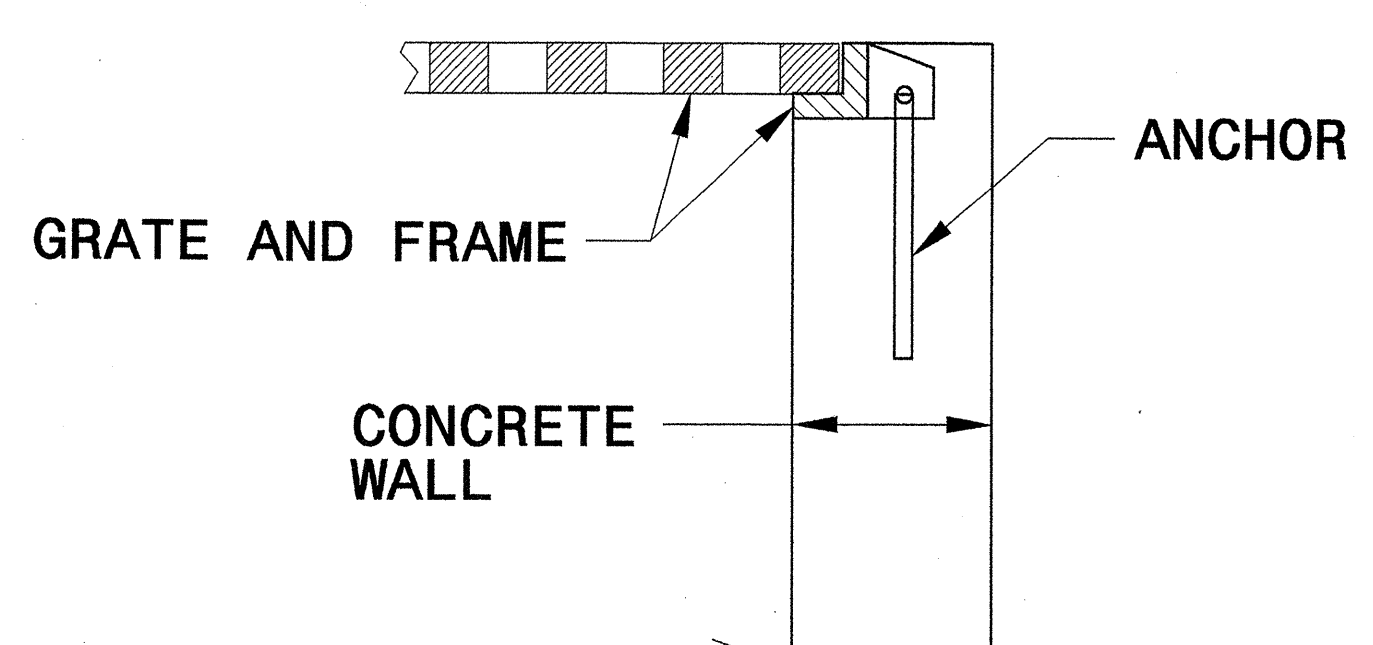
STATE OF  
NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

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

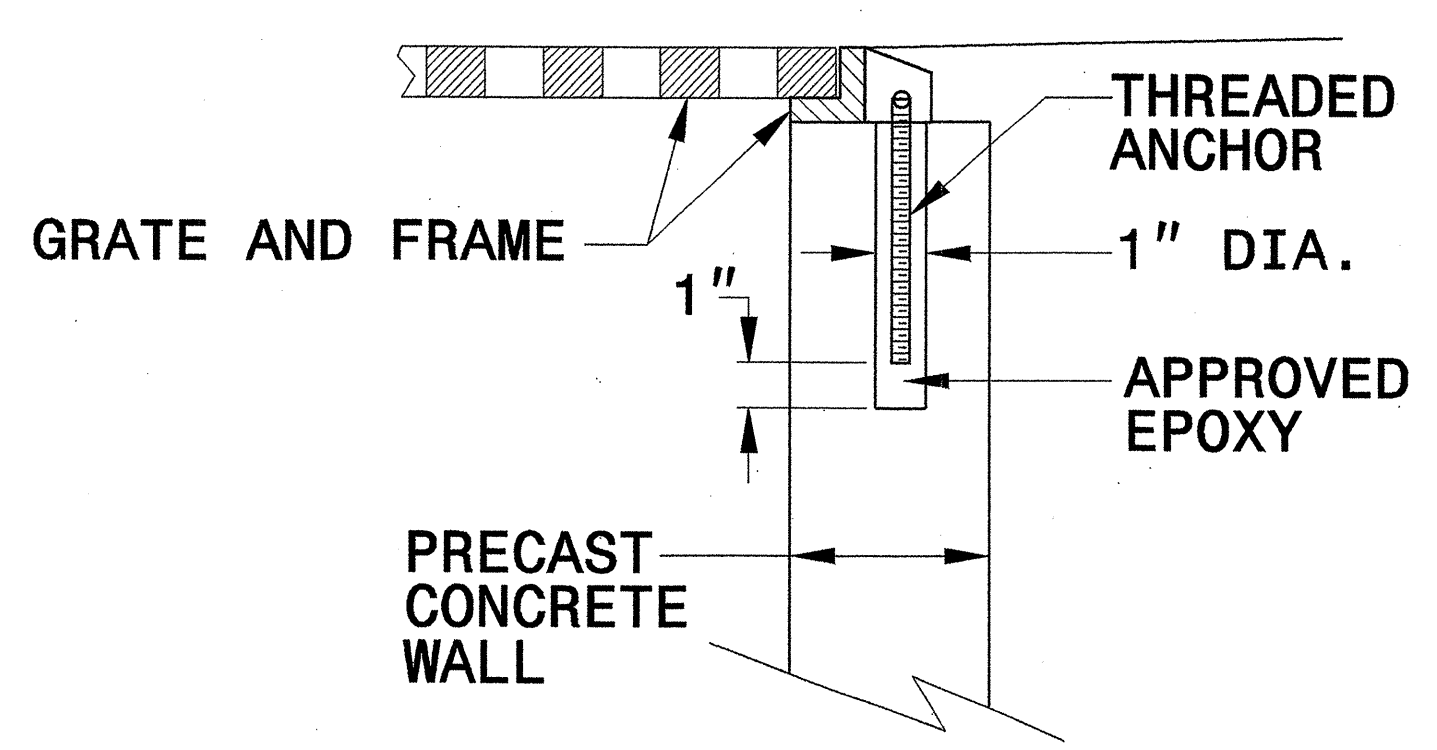
SHEET 1 OF 1  
**840D25**



**BRICK MASONRY  
CONSTRUCTION**



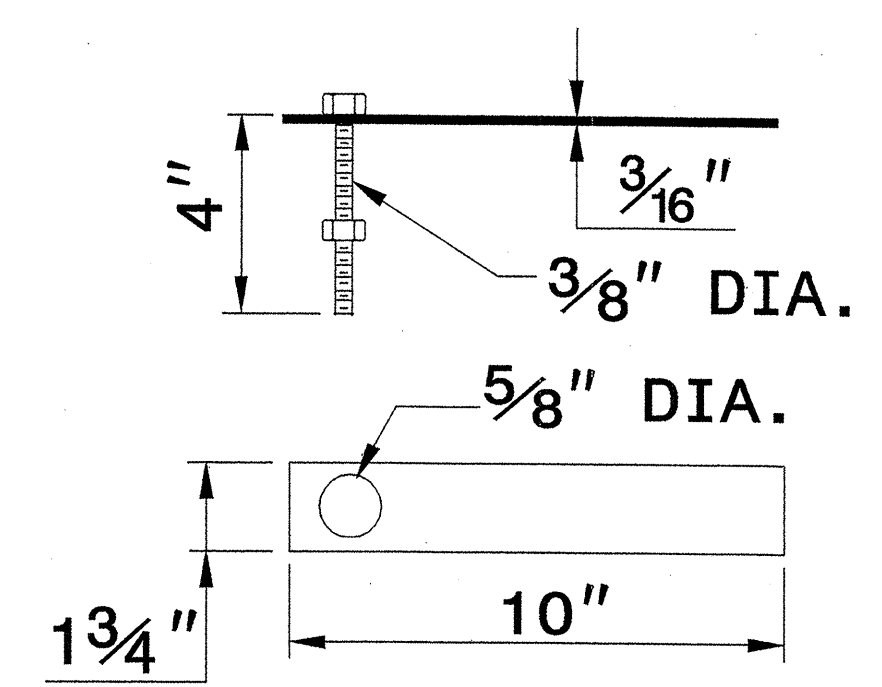
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CONSTRUCTION**



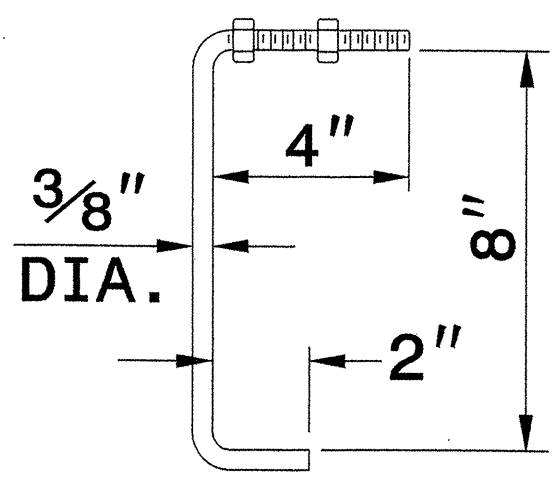
**PRECAST CONCRETE  
CONSTRUCTION**

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

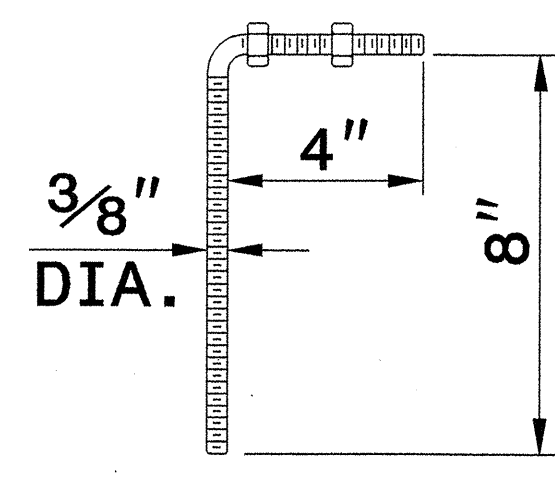
NOTE:  
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL  
OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



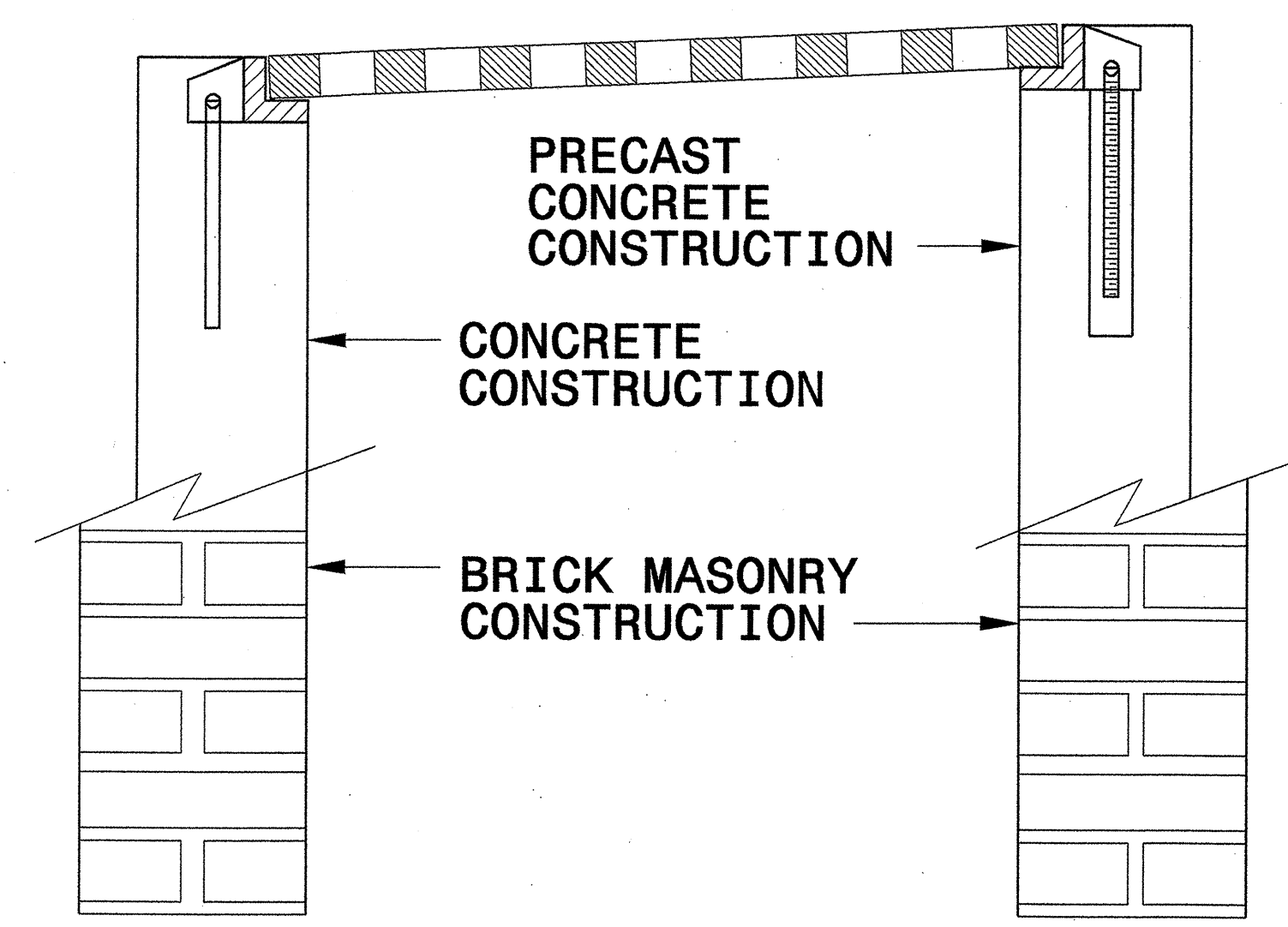
**MASONRY ANCHOR**  
3/8" DIA. BOLT WITH PLATE



**CONCRETE ANCHOR**  
3/8" DIA. BENT BAR



**PRECAST  
CONCRETE ANCHOR**  
3/8" DIA. BENT BAR



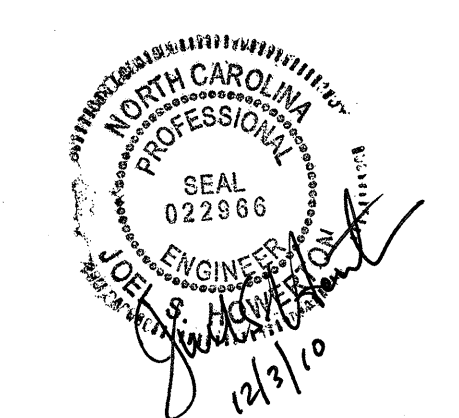
**FRAME AND GRATE INSTALLATION  
FOR NORMAL CROWN AND  
SUPERELEVATED SECTIONS**

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RALEIGH, N.C.

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

SHEET 1 OF 1  
**840D25**

SYSTEMS...  
DRAWING...  
DATE...




**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: [Signature] DATE: 4/13/08  
 FILE SPEC.: [Signature]

# STANDARD TEMPORARY MSE WALL OPTIONS

<b>PROJECT REFERENCE NO.</b>		<b>SHEET</b>
B-4176		2-E
GEOTECHNICAL ENGINEER   Scott A. Hadden 3/29/07 <small>SIGNATURE DATE</small>	ENGINEER    <small>SIGNATURE DATE</small>	

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

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

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

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

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

STANDARD TEMPORARY MSE WALLS ARE BASED ON THE FOLLOWING CONDITIONS:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

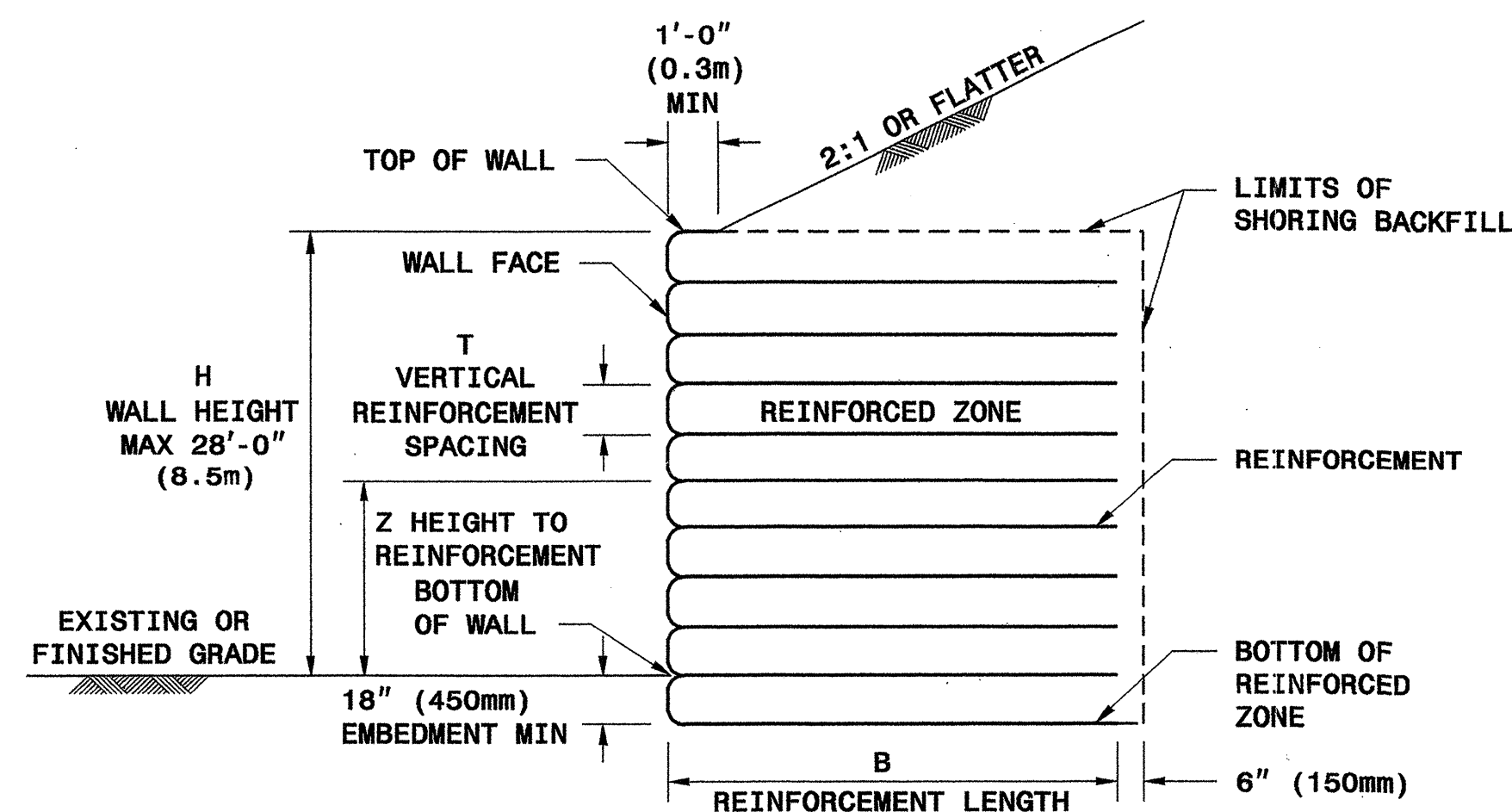
PLACE SHORING BACKFILL IN 8" TO 10" (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

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

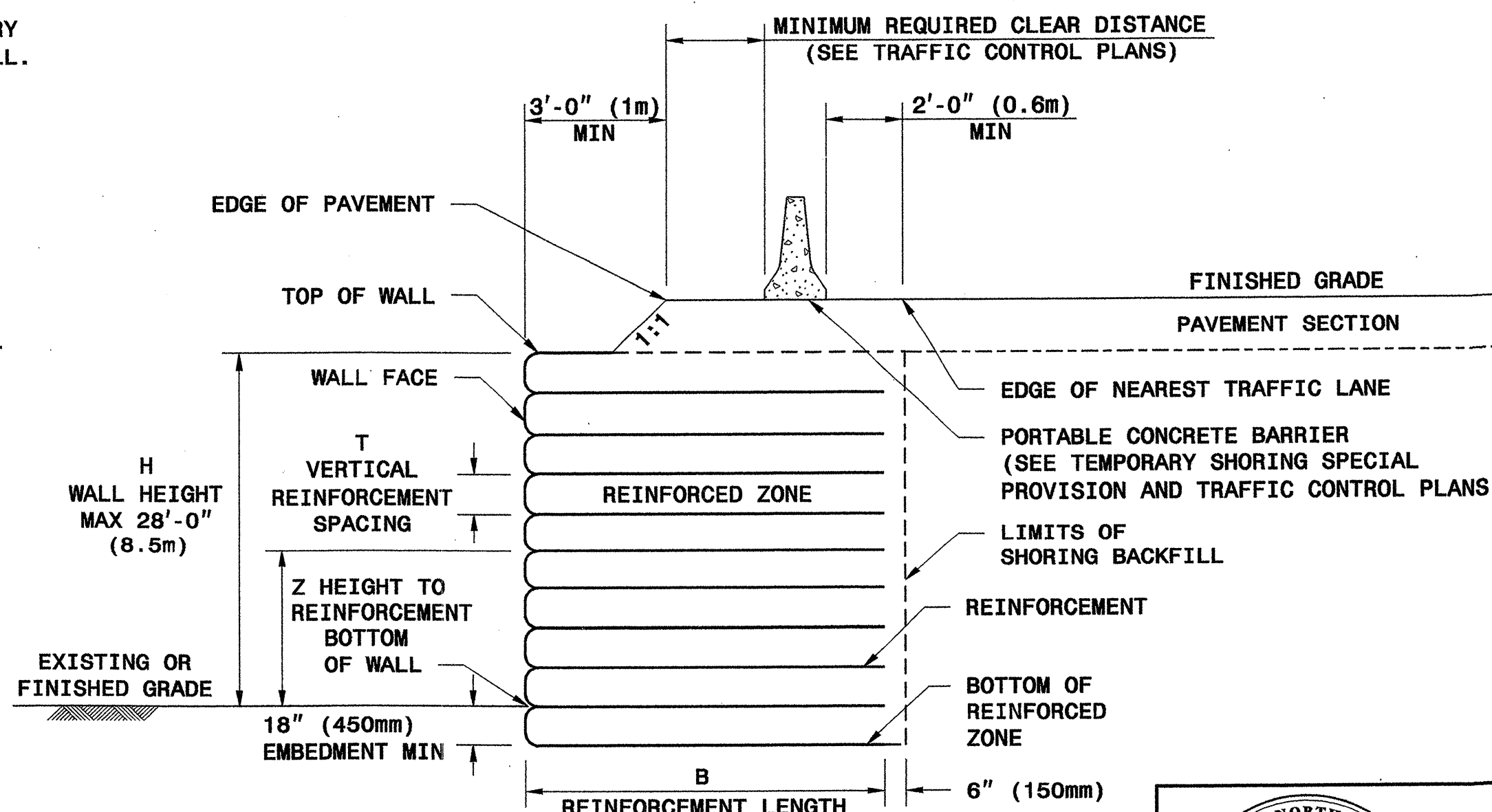
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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

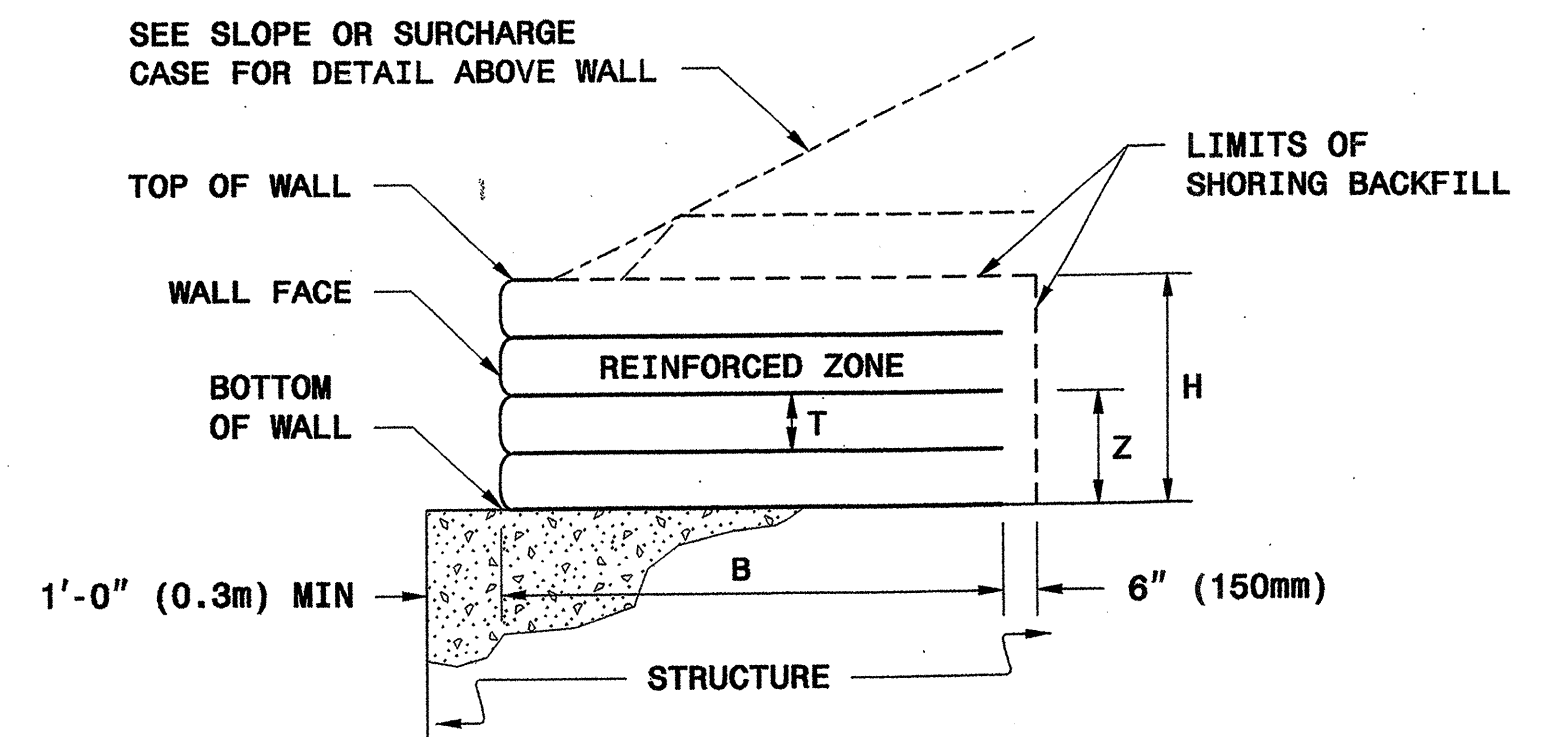
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



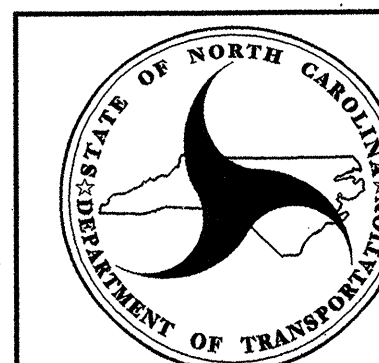
**SLOPE CASE**



**SURCHARGE CASE**



**TEMPORARY MSE WALL ON STRUCTURE**



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

STANDARD DRAWING NO. 1801.02

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

SHEET 1 OF 11      DATE: 2-20-07

GEOTECHNICAL ENGINEER ENGINEER

Scott A. Shidden 3/29/07  
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 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		3	3	3	3	3	3	3	3	3	3	3	3
Z (FT-INCHES)		27 - 8	26 - 10	25 - 2	23 - 6	21 - 10	20 - 2	18 - 6	16 - 10	15 - 2	13 - 6	11 - 10	8 - 6
Z (FT-INCHES)		6 - 10	5 - 2	3 - 6	1 - 10	0 - 2	-0 - 8						

**SIERRASCAPE TEMPORARY WALL**  
(GEOGRID TYPE)

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

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

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

**HILFIKER TEMPORARY WALL**  
(WELDED WIRE MAT TYPE)

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

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

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

**RETAINED EARTH TEMPORARY WALL**  
(WELDED WIRE MESH TYPE)

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

H (FT)		4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28
SLOPE AND SURCHARGE CASES		3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1	3X1
Z (FT-INCHES)		27 - 6	26 - 10	25 - 2	23 - 6	21 - 10	20 - 2	18 - 6	16 - 10	15 - 2	13 - 6	11 - 10	8 - 6
Z (FT-INCHES)		6 - 10	5 - 2	3 - 6	1 - 10	0 - 2	-1 - 6						

**NOTES FOR HILFIKER TEMPORARY WALL**

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

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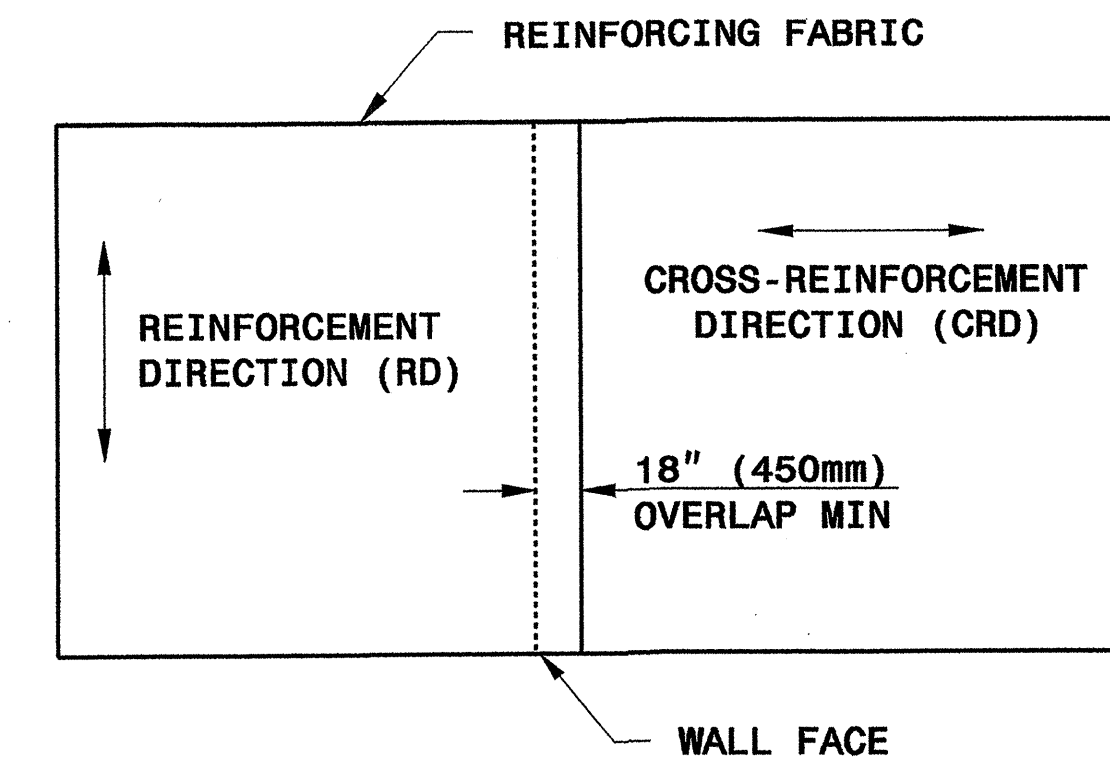
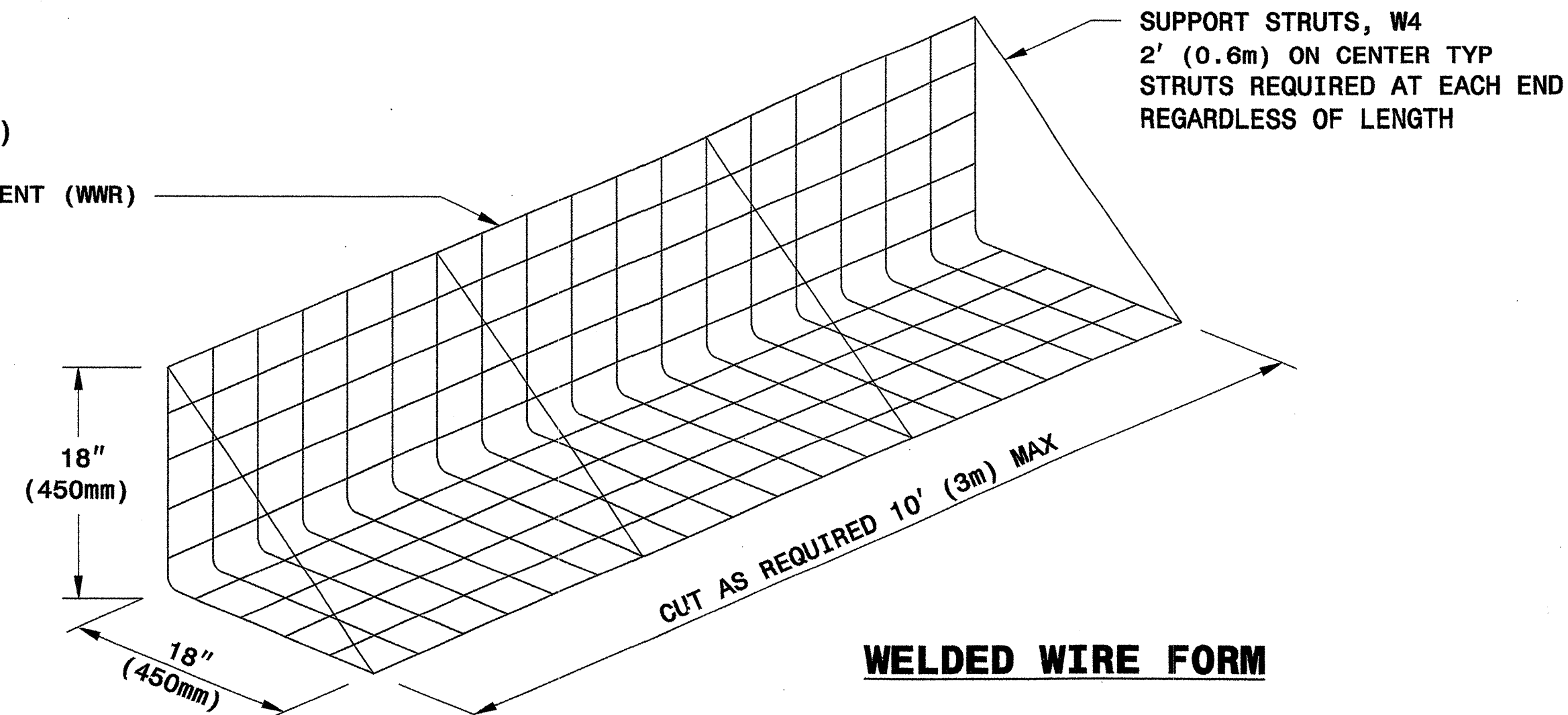
STANDARD DRAWING NO. 1801.02  
STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS  
SHEET 2 OF 11 DATE: 2-20-07



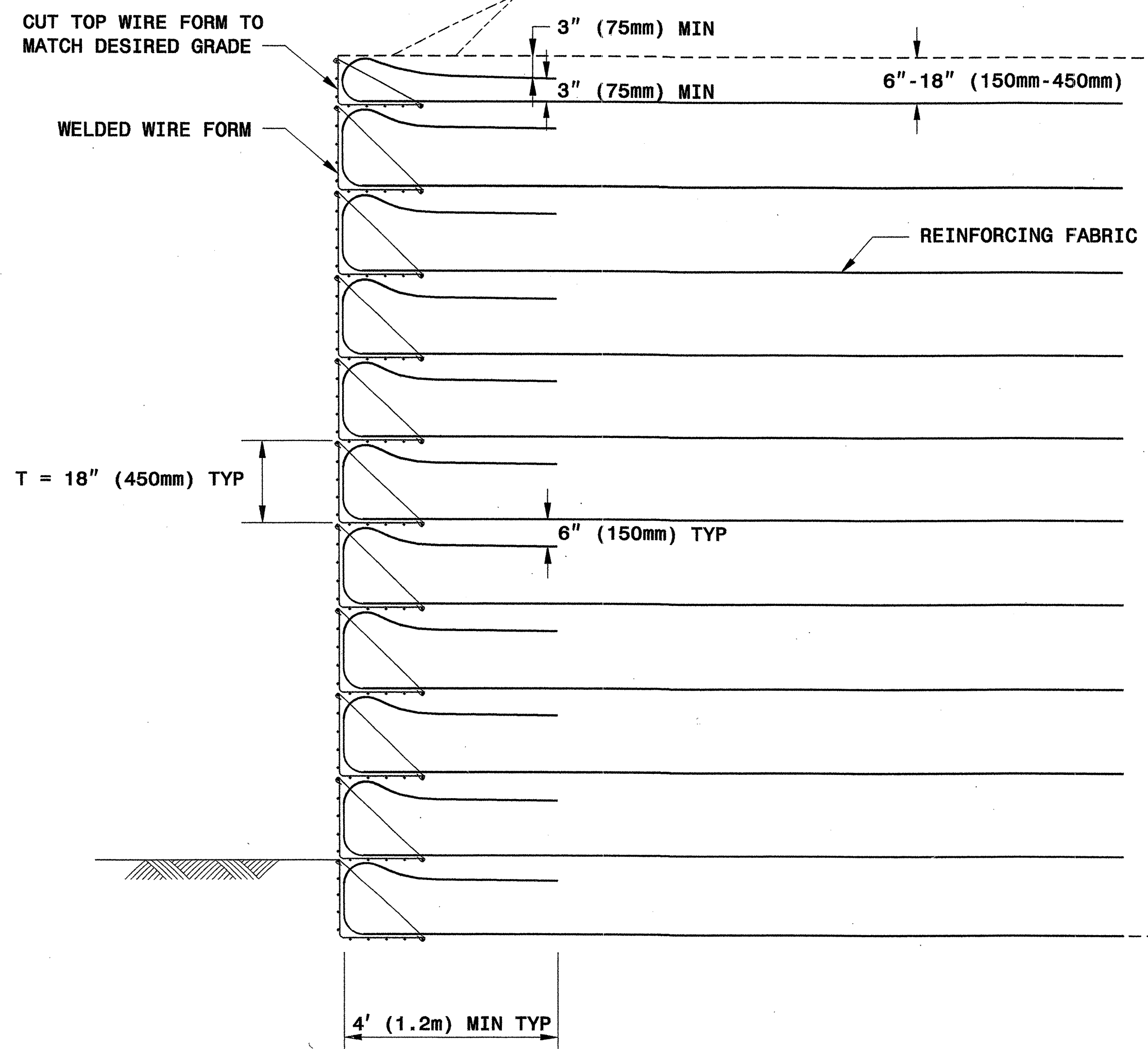
Scott A. Hadden 3/21/07  
SIGNATURE DATE

SIGNATURE DATE

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



PLAN VIEW OF FABRIC OVERLAP

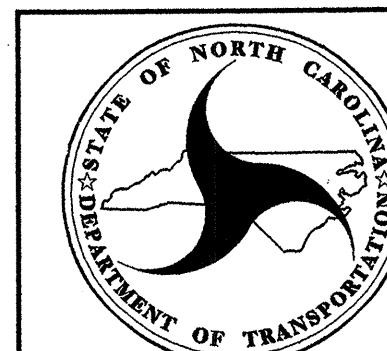


TYPICAL SECTION

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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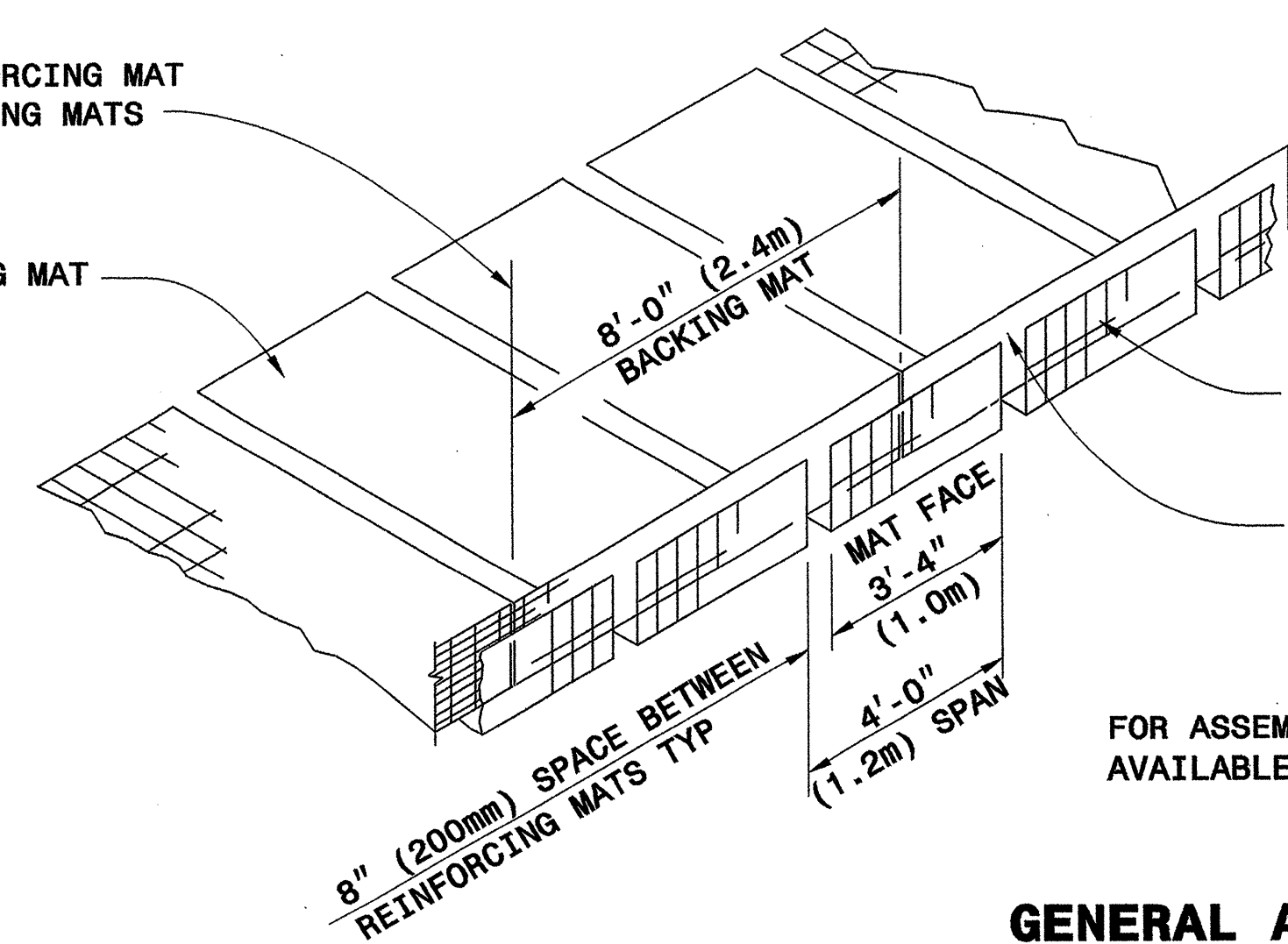
TEMPORARY FABRIC WALL

SHEET 3 OF 11

DATE: 12-19-06

CENTERLINE OF REINFORCING MAT  
FACE = EDGE OF BACKING MATS

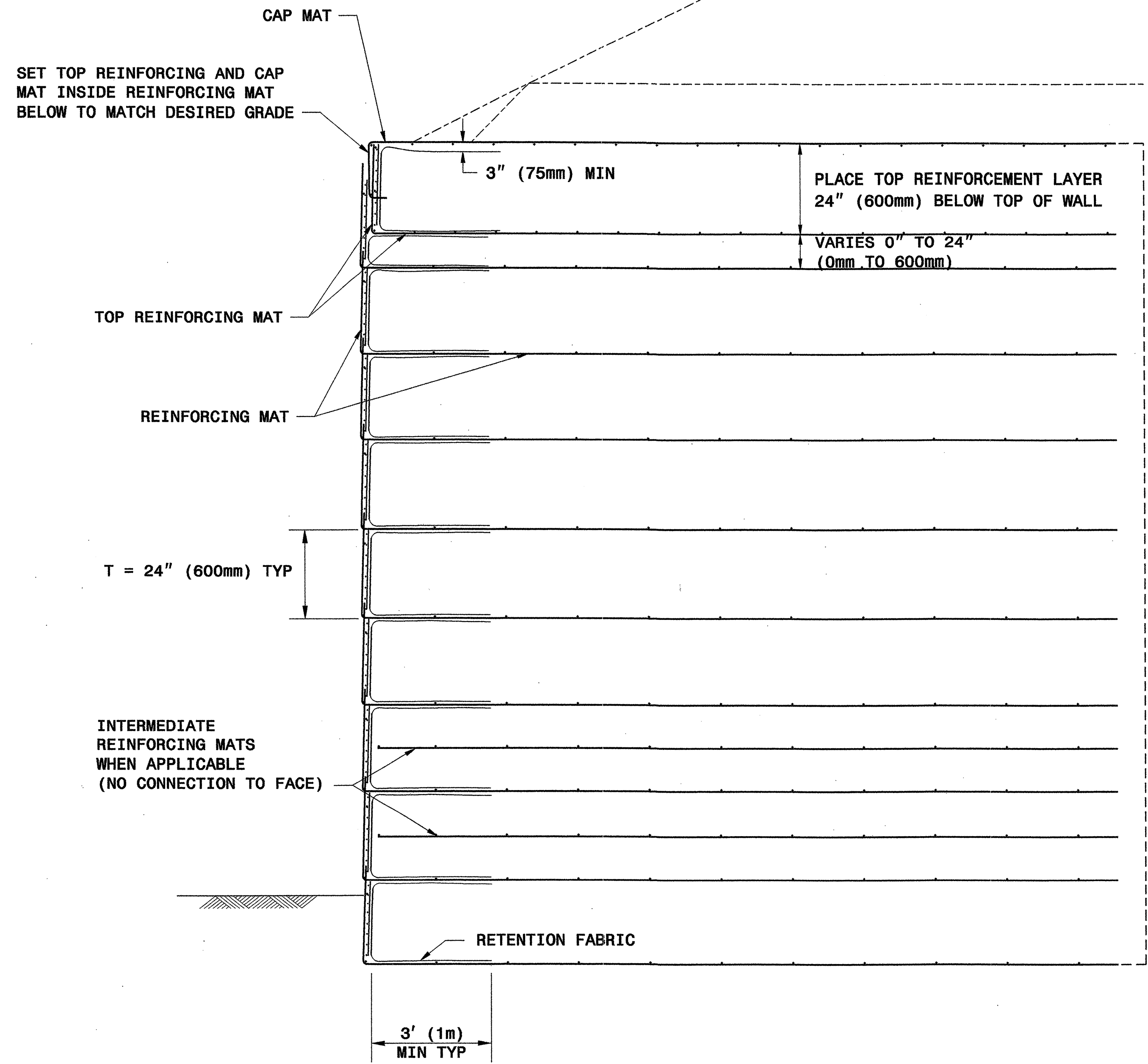
REINFORCING MAT



WALL FACE  
BACKING MAT

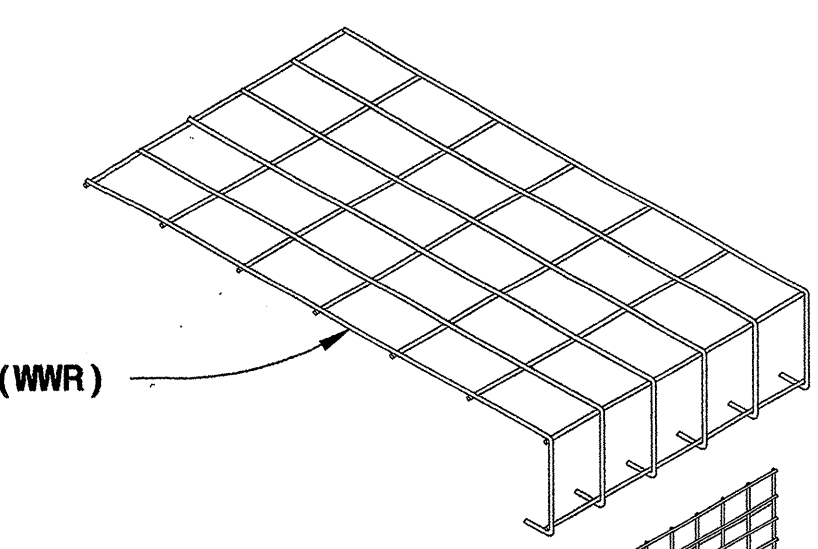
FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

**GENERAL ASSEMBLY DETAIL**

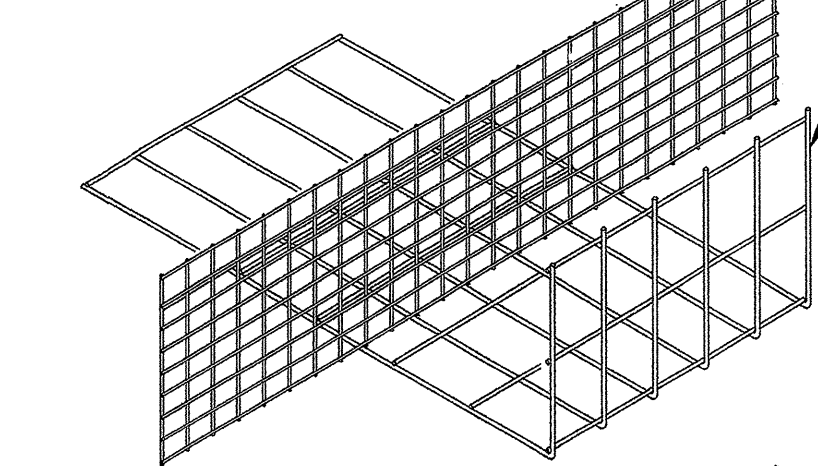


**TYPICAL SECTION**

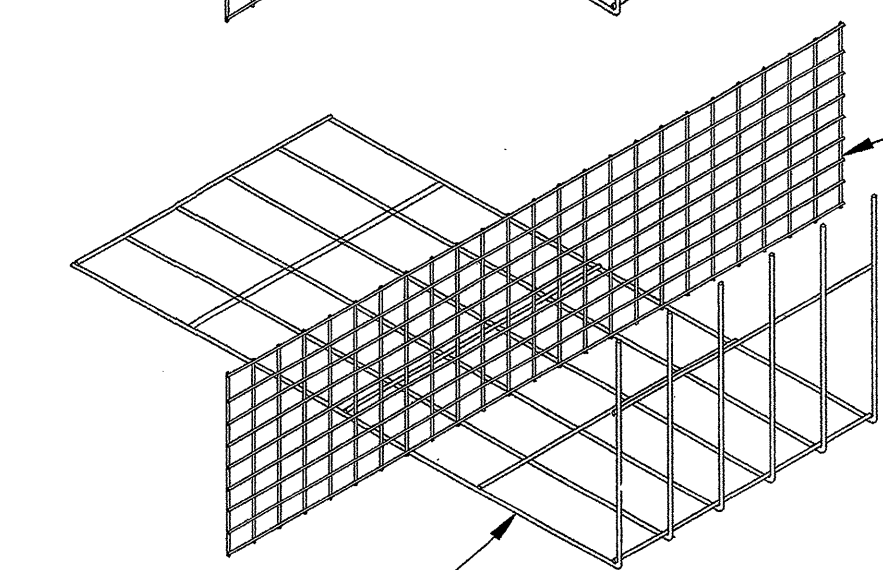
8" X 12" (203mm X 305mm)  
W4.5 X W3.5 (MW29 X MW23)  
CAP MAT  
WELDED WIRE REINFORCEMENT (WWR)



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



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



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



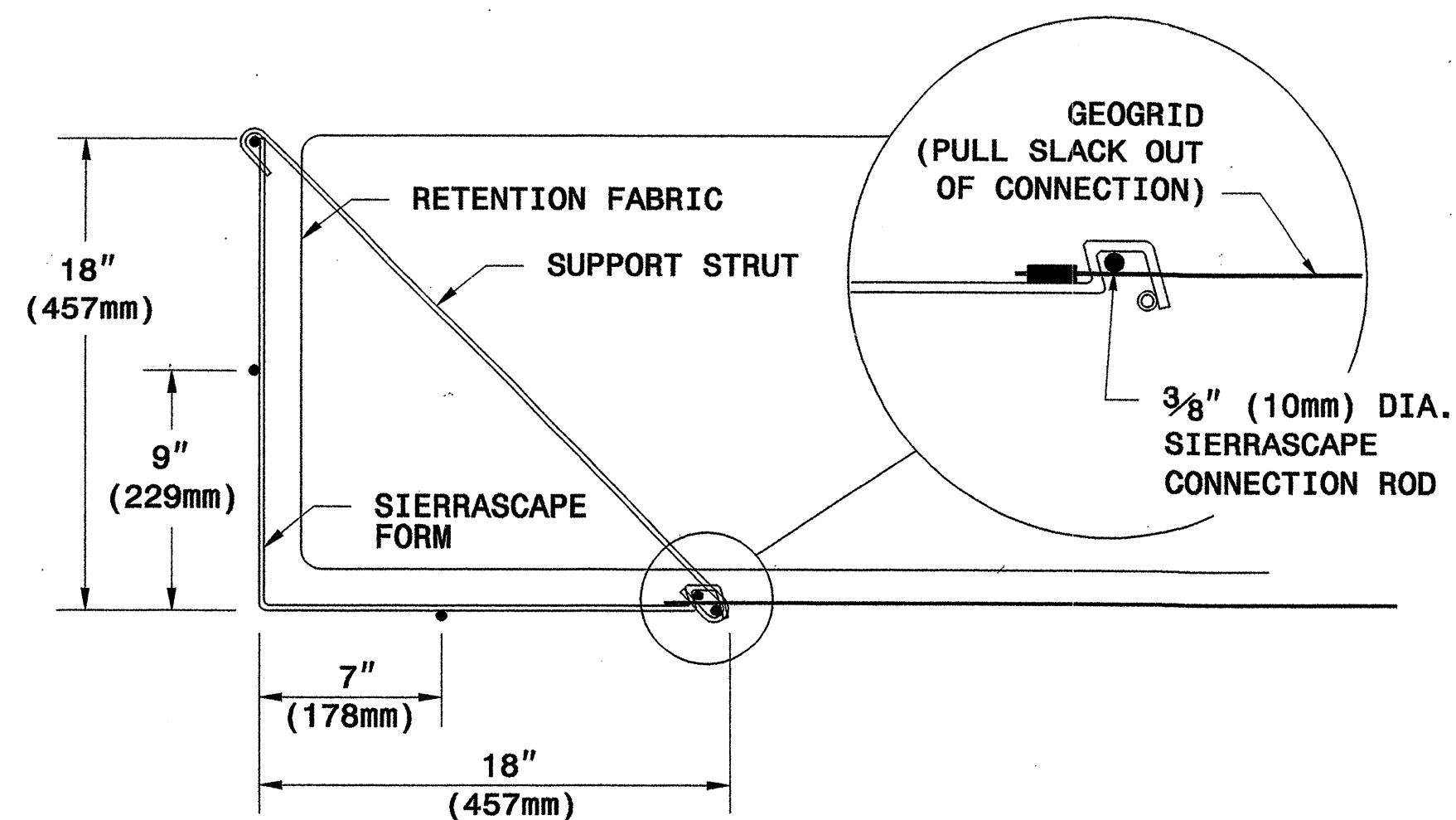
**WALL COMPONENTS**

GEOTECHNICAL ENGINEER

ENGINEER

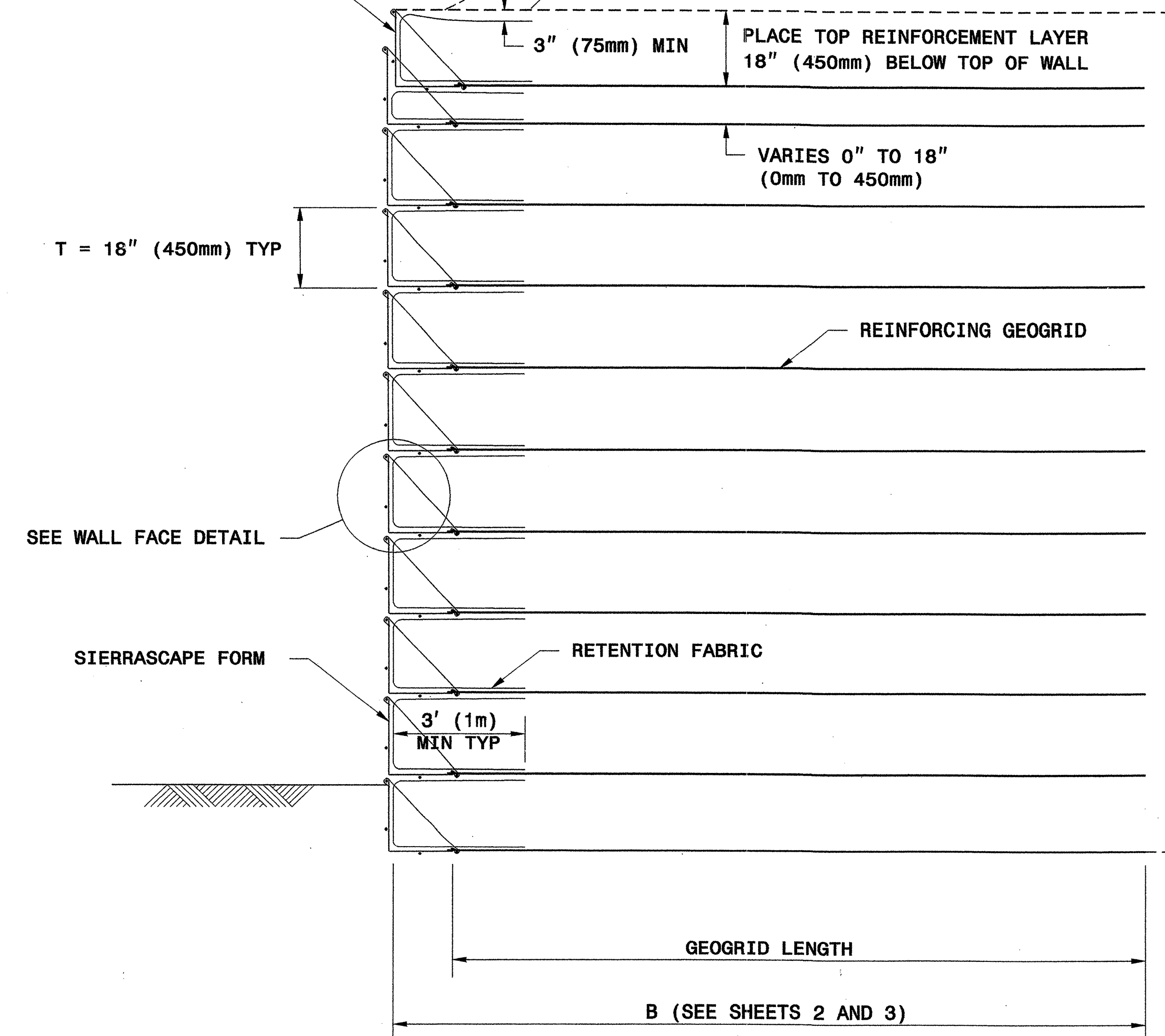


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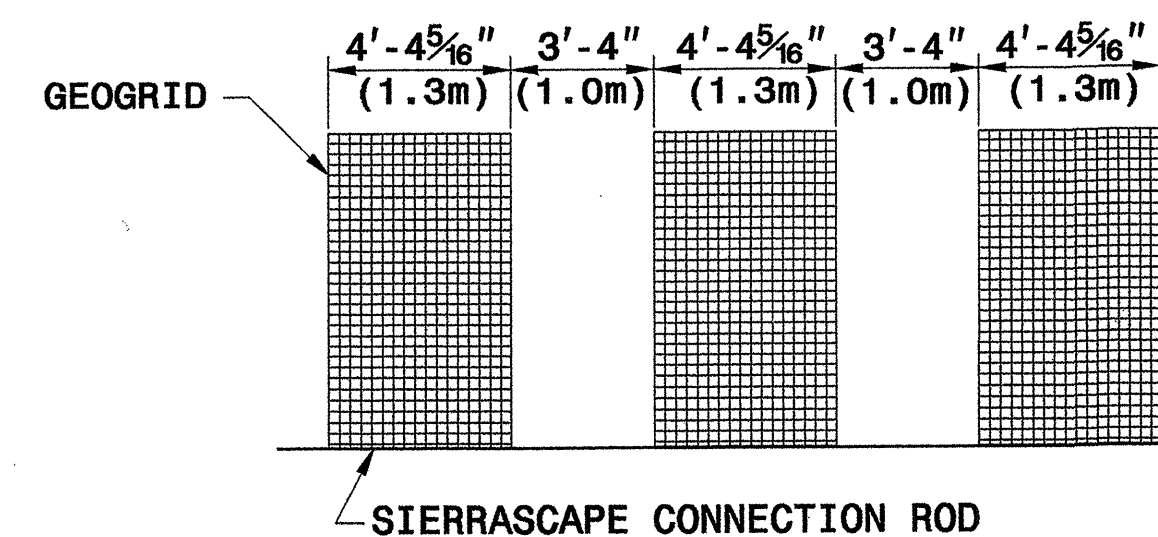


**WALL FACE DETAIL**

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

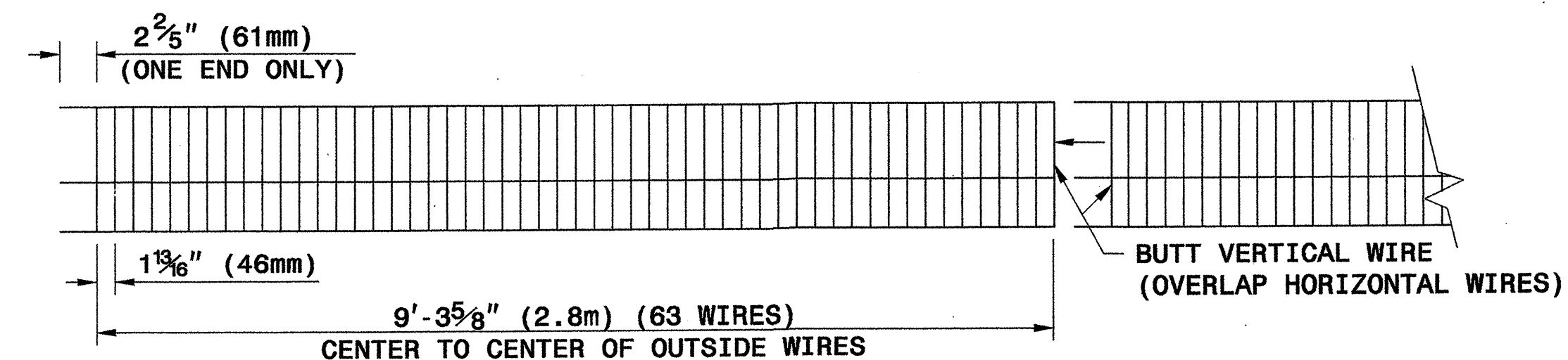


**TYPICAL SECTION**

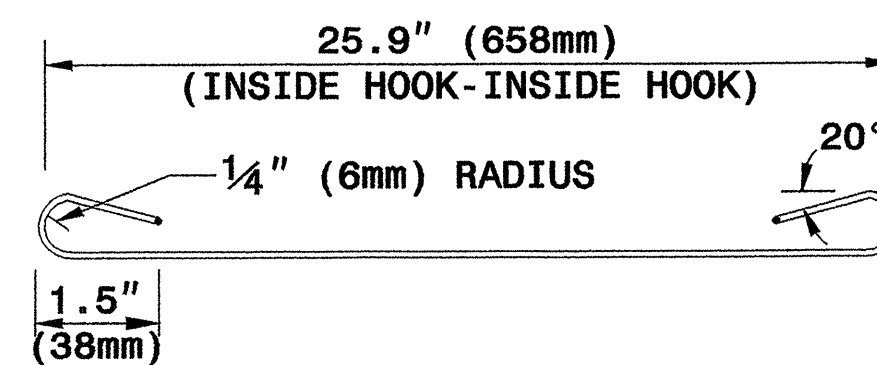


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

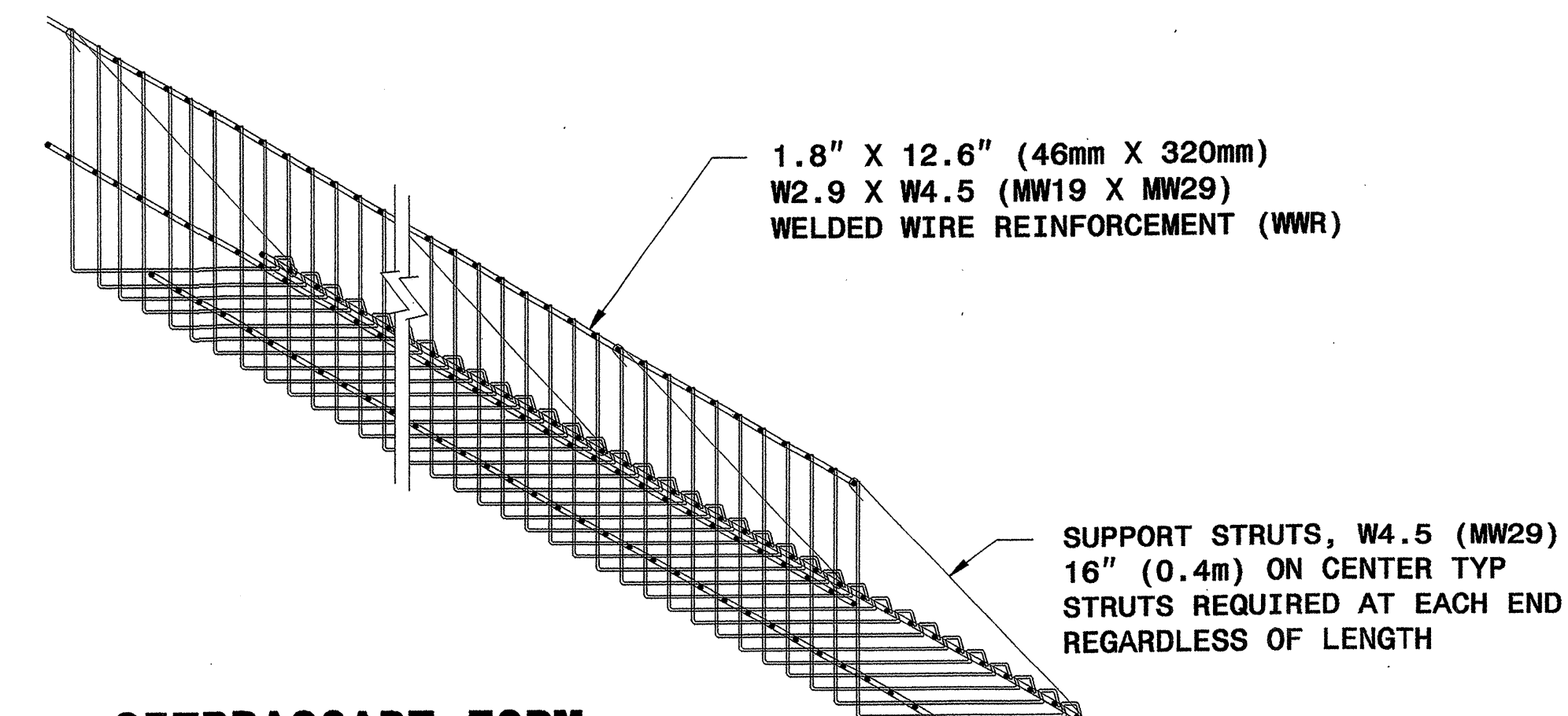
**TYPICAL GEOGRID COVERAGE**



**ELEVATION VIEW**

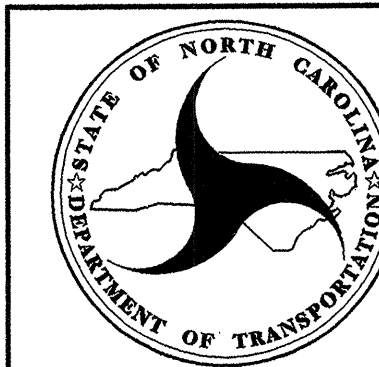
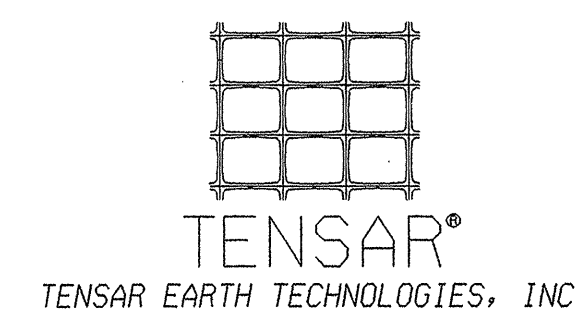


**SUPPORT STRUT**



**SIERRASCAPE FORM**

**WALL COMPONENTS**



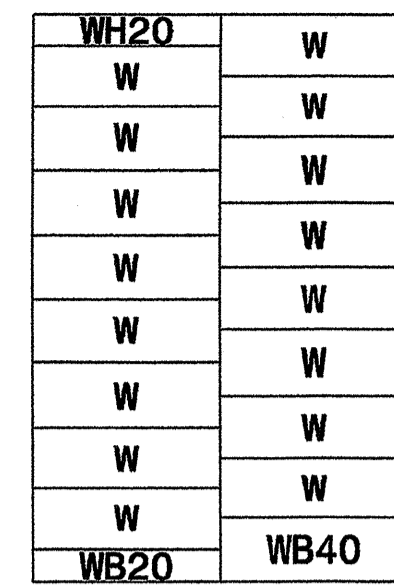
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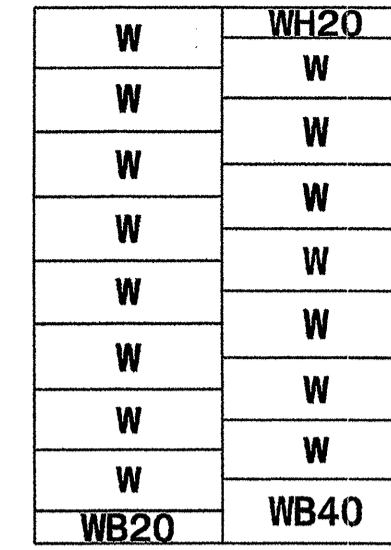
**SIERRASCAPE TEMPORARY WALL**

**PANEL LAYOUTS**

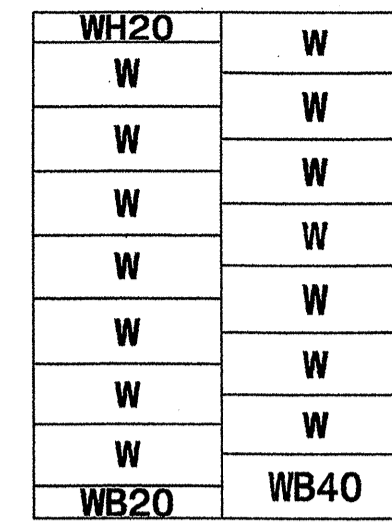
H - WALL HEIGHT  
(FEET-INCHES)  
(METER)



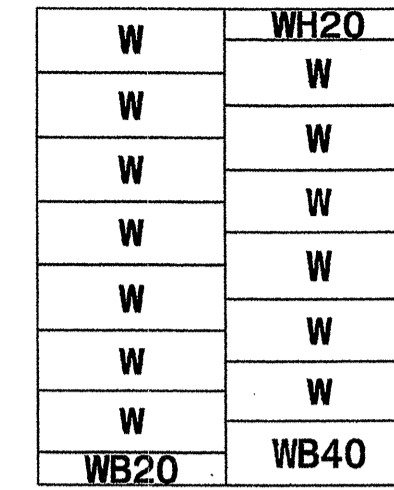
< 28 - 0  
< 8.5



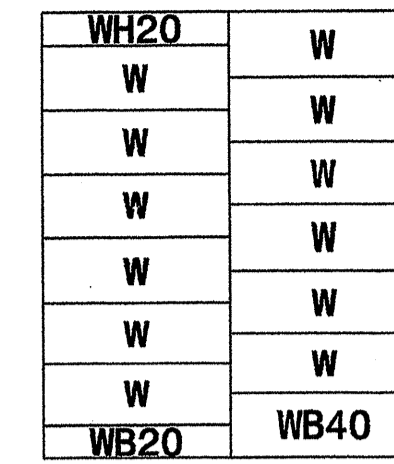
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< 8.2



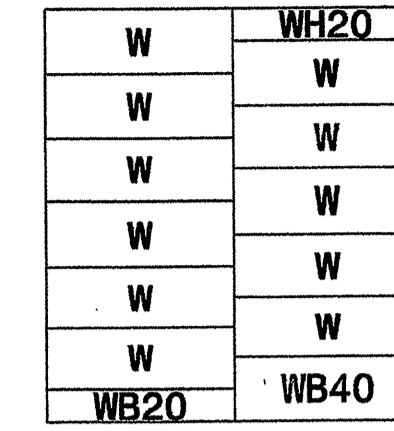
< 25 - 4  
< 7.7



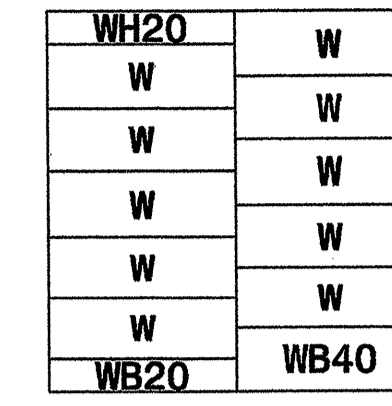
< 23 - 8  
< 7.2



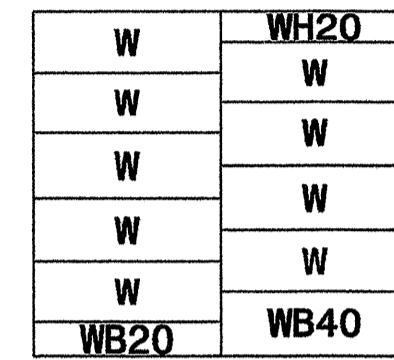
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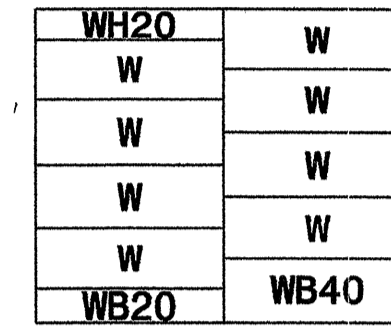
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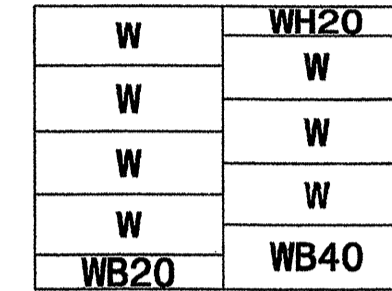
< 18 - 8  
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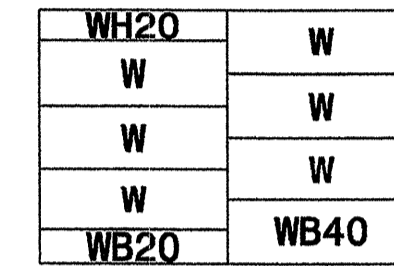
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< 5.2



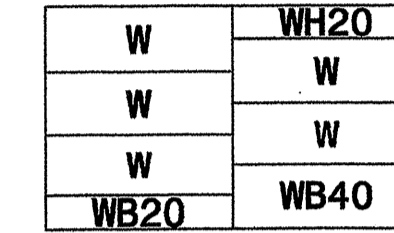
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< 4.7



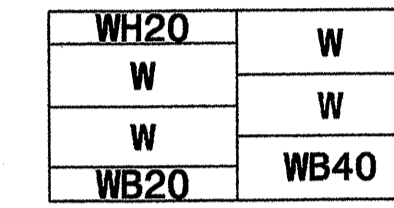
< 13 - 8  
< 4.2



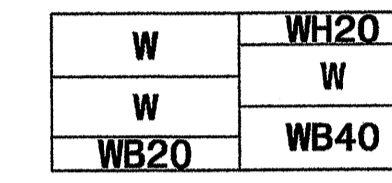
< 12 - 0  
< 3.7



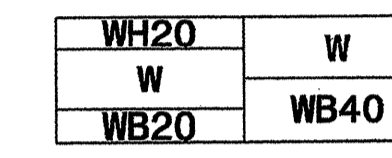
< 10 - 4  
< 3.2



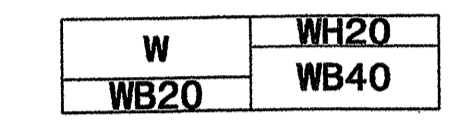
< 8 - 8  
< 2.6



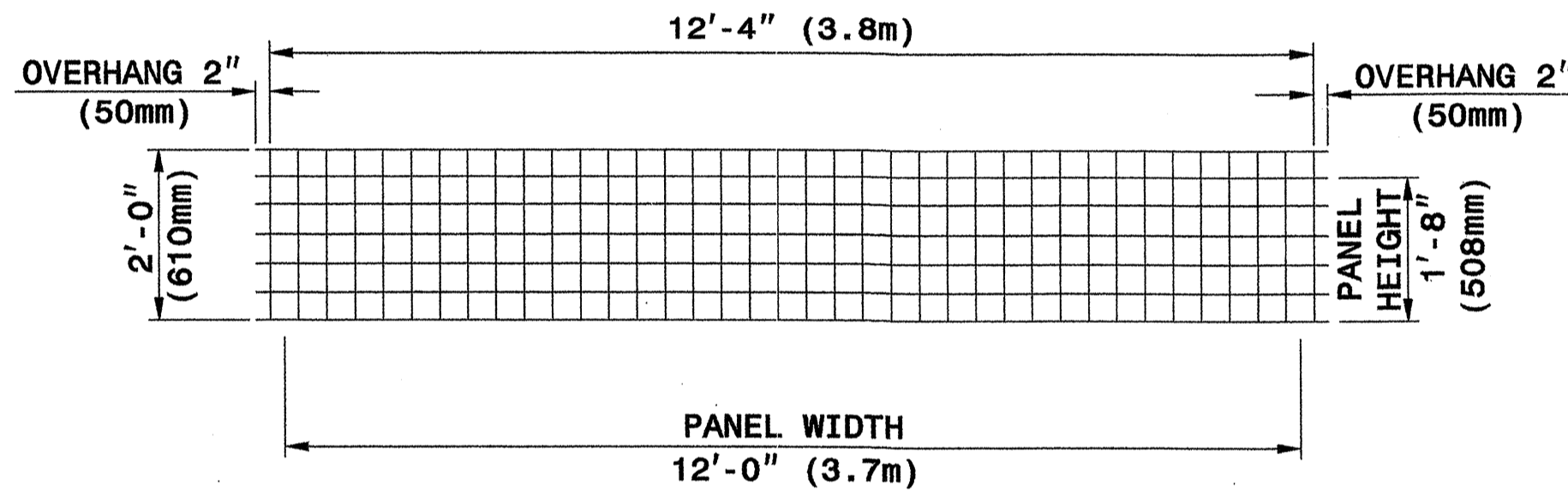
< 7 - 0  
< 2.1



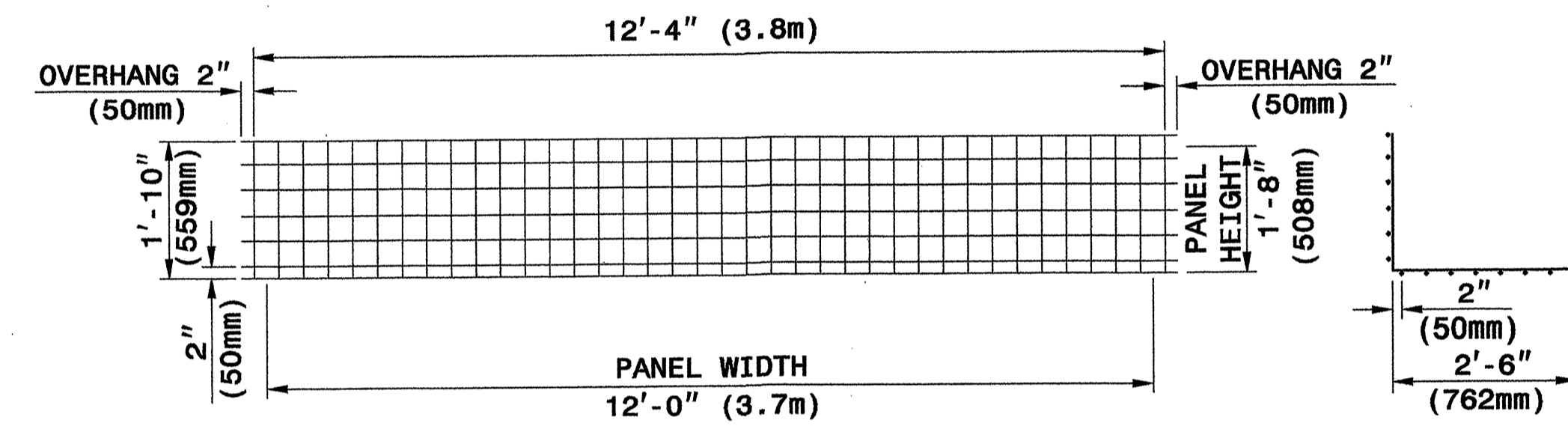
< 5 - 4  
< 1.6



< 3 - 8  
< 1.1

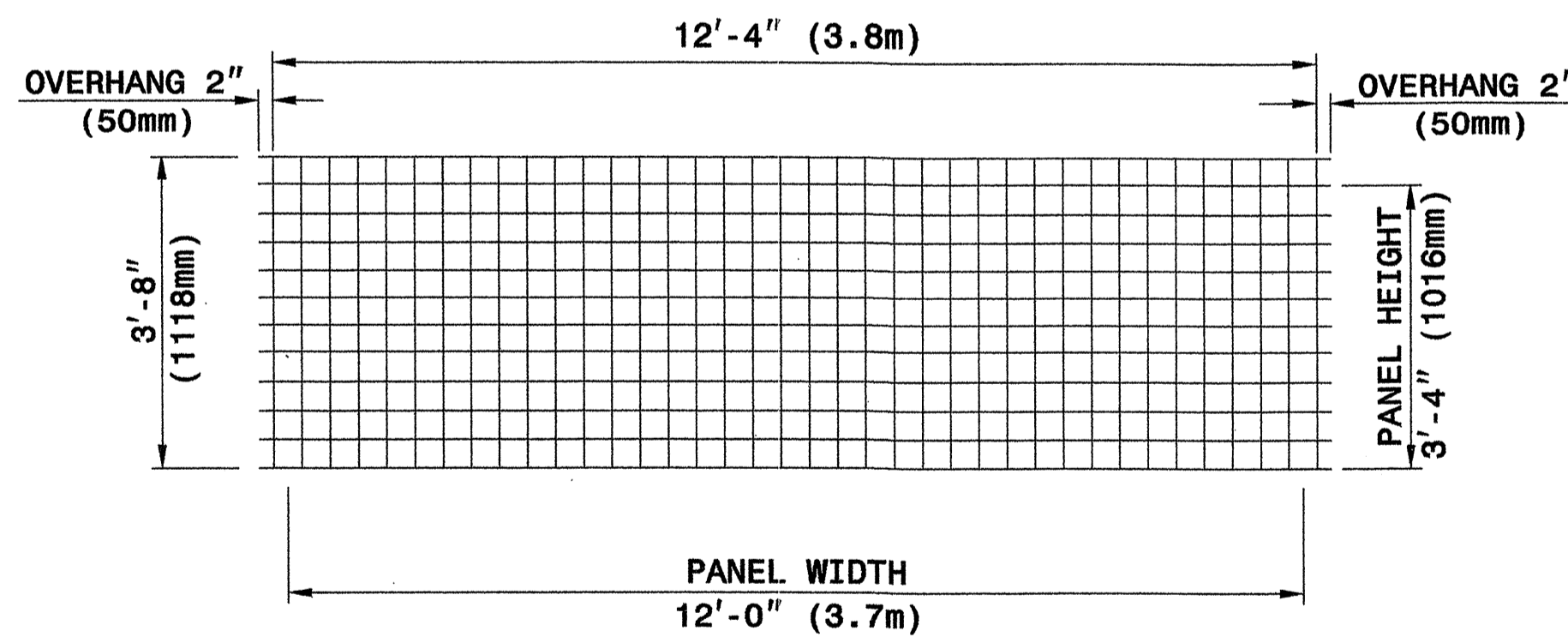


**TYPE WH20**

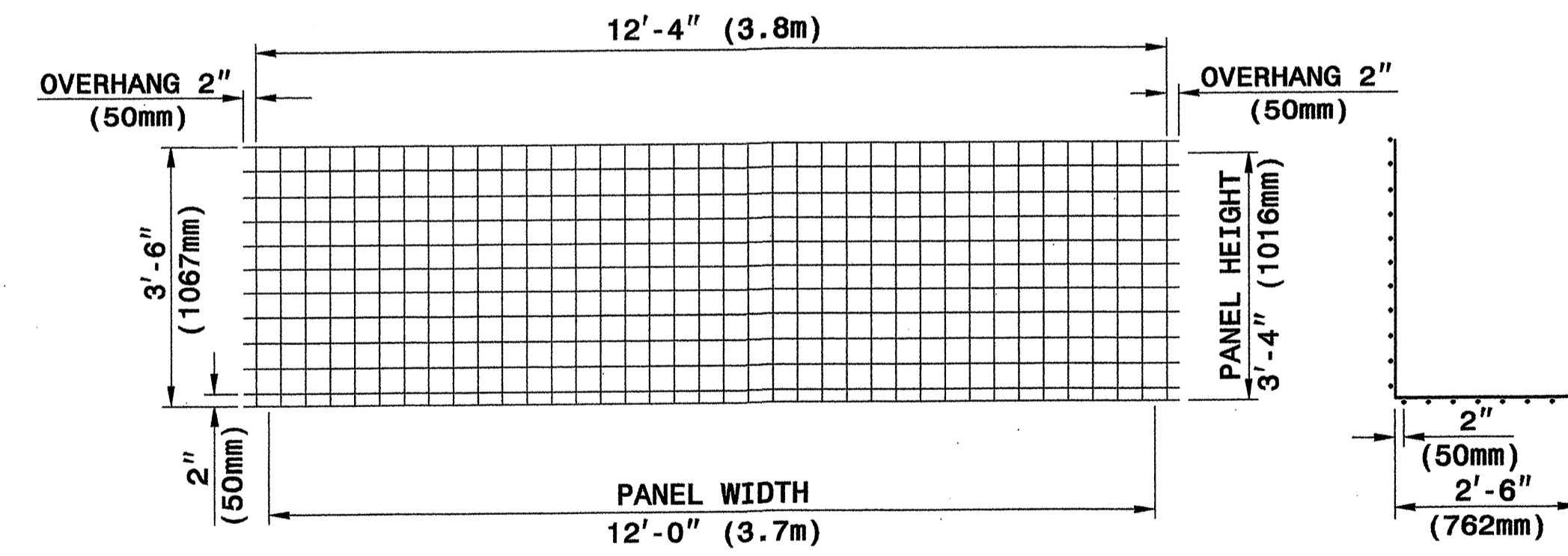


**TYPE WB20**

**SECTION**



**TYPE W**



**TYPE WB40**

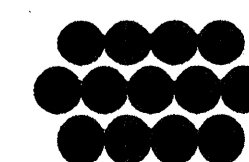
**SECTION**

**WELDED WIRE FACINGS**

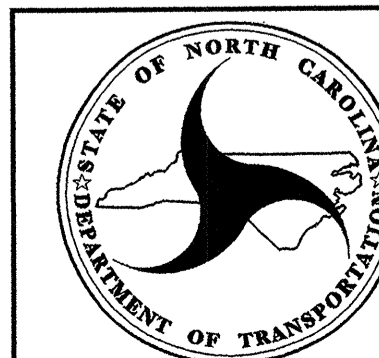
**WELDED WIRE FORMS**

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

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



The Reinforced Earth Company




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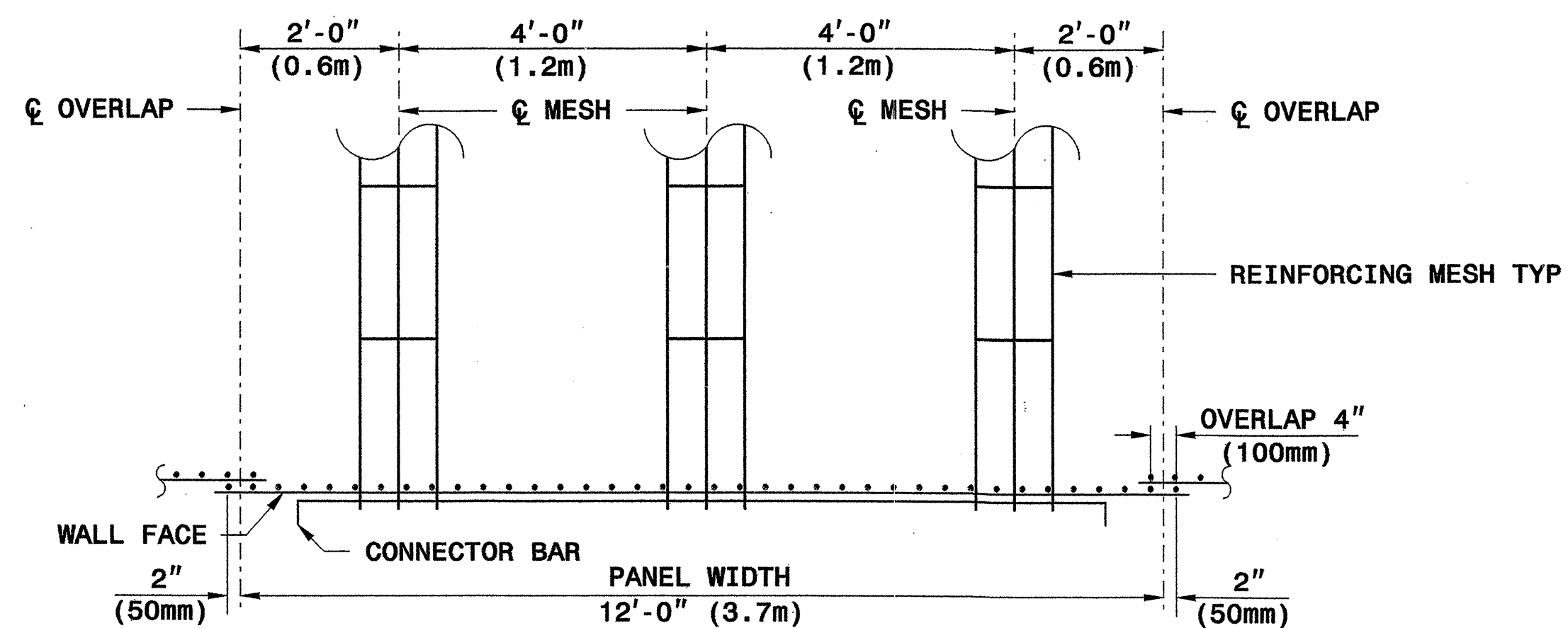
STANDARD DRAWING NO. 1801.02

RETAINED EARTH  
TEMPORARY WALL

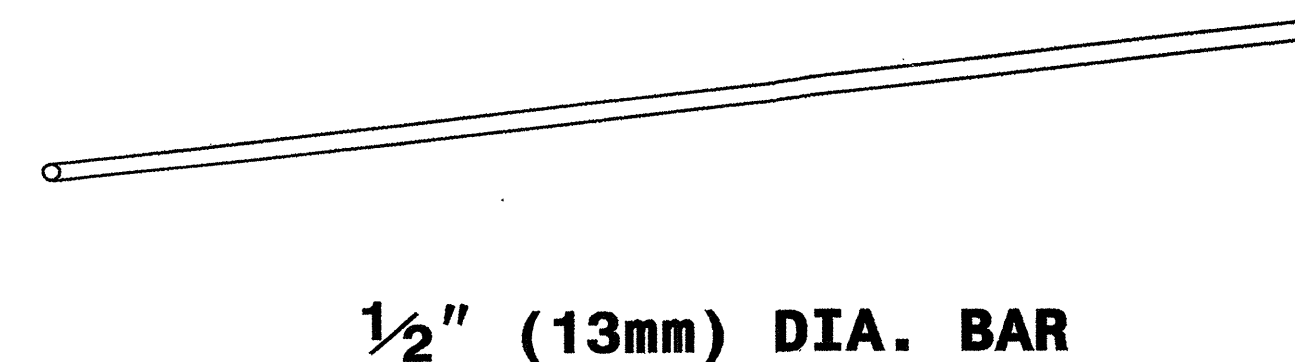
SHEET 6 OF 11

DATE: 12-19-06

GEOTECHNICAL ENGINEER   Scott A. Shidden 3/29/07 SIGNATURE DATE	ENGINEER     SIGNATURE DATE
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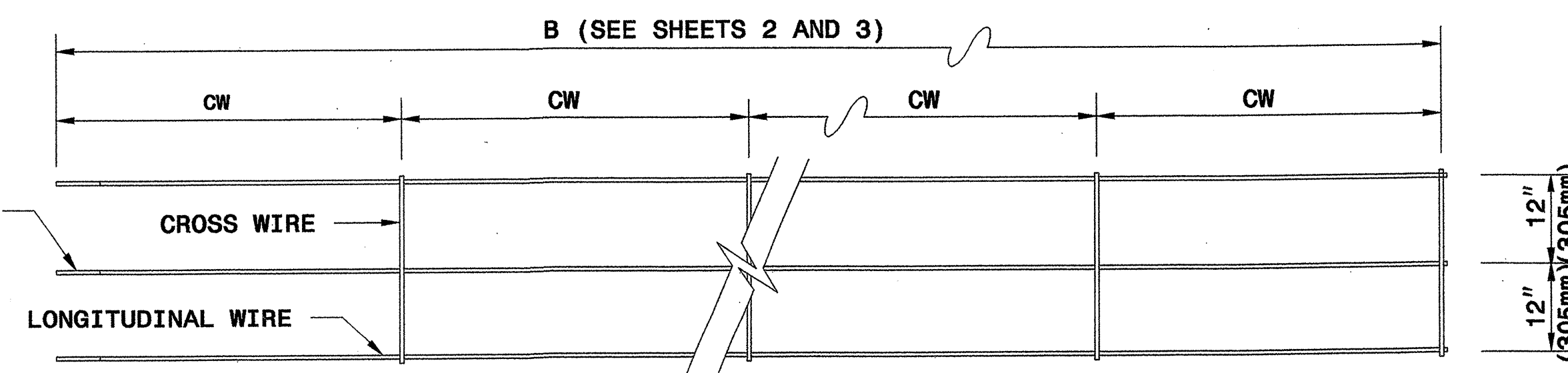


**REINFORCING MESH PLACEMENT DETAIL  
(PLAN VIEW)**



**CONNECTOR BAR**

LOOPEd END OF MESH  
(SEE REINFORCING MESH LOOP DETAIL)

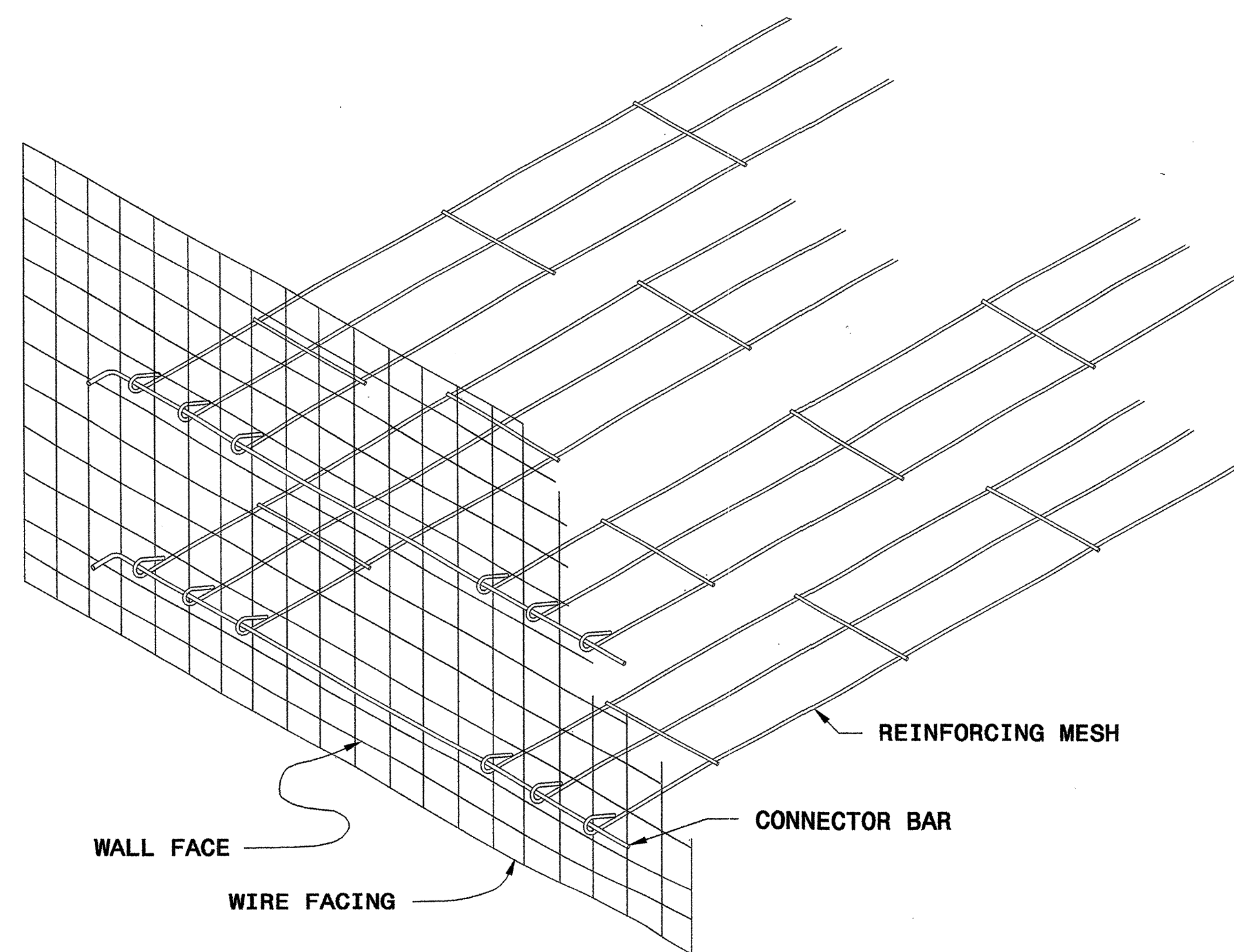


IF REINFORCEMENT LENGTH IS NOT AN INCREMENT OF 2'-0" (610mm) MAKE CW EQUAL TO 12" (305mm) AT THE END OF THE REINFORCING MESH OPPOSITE THE LOOPEd END

**3W8 X W8 x 2.0' (3MW52 X MW52 X 610mm)**

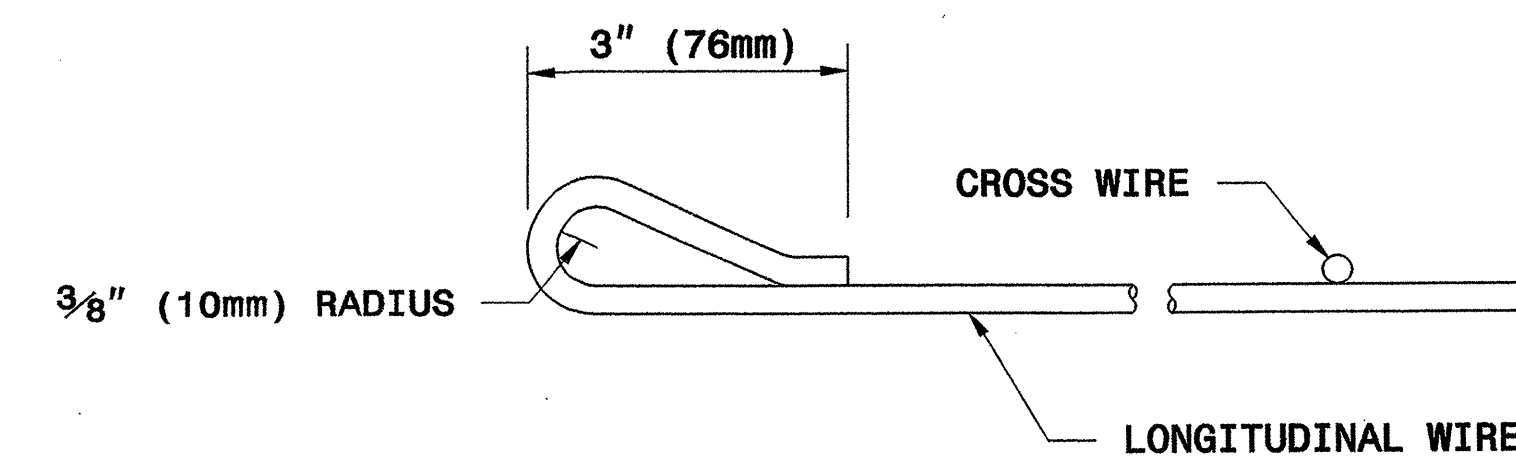
NO. OF LONGITUDINAL WIRES  
GAUGE OF LONGITUDINAL WIRES  
GAUGE OF CROSS WIRES  
SPACING OF CROSS WIRES IN FT (mm), CW

**REINFORCING MESH DESIGNATION**

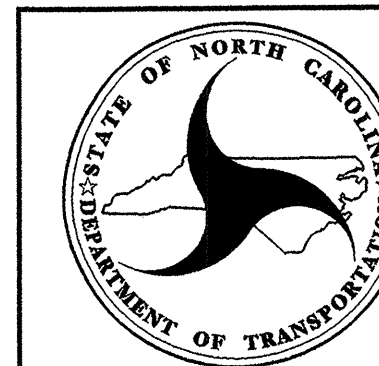


**GENERAL ASSEMBLY DETAIL**

**REINFORCING MESH**



**REINFORCING MESH LOOP DETAIL**



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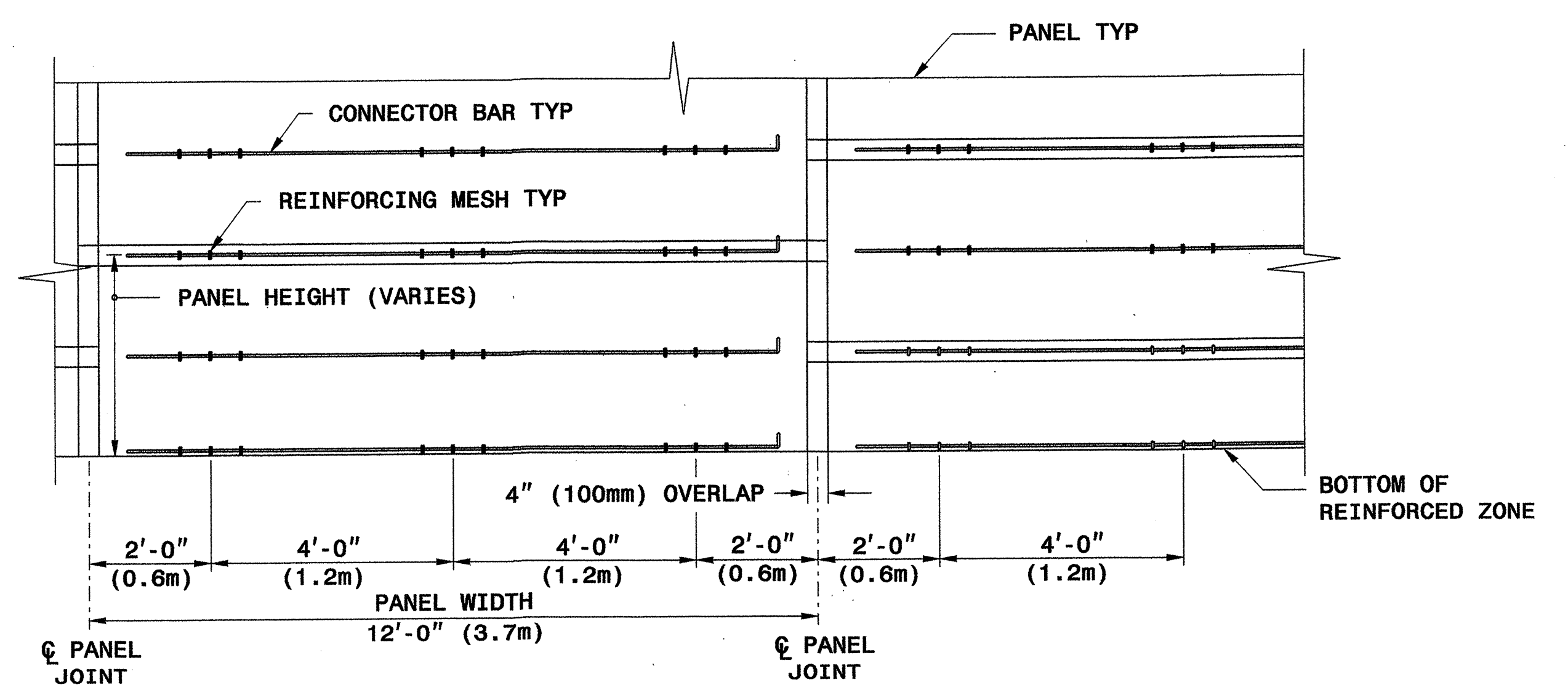
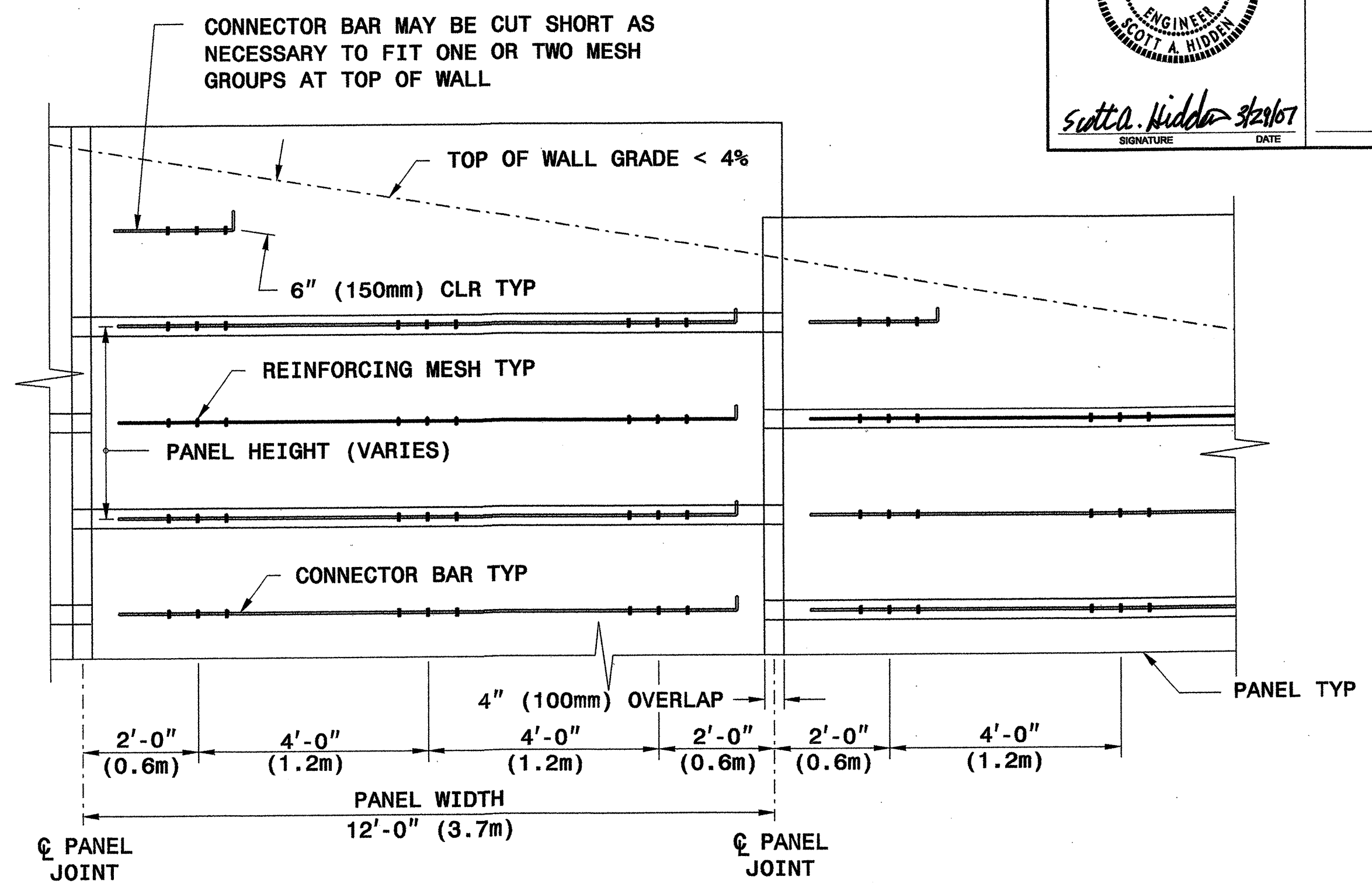
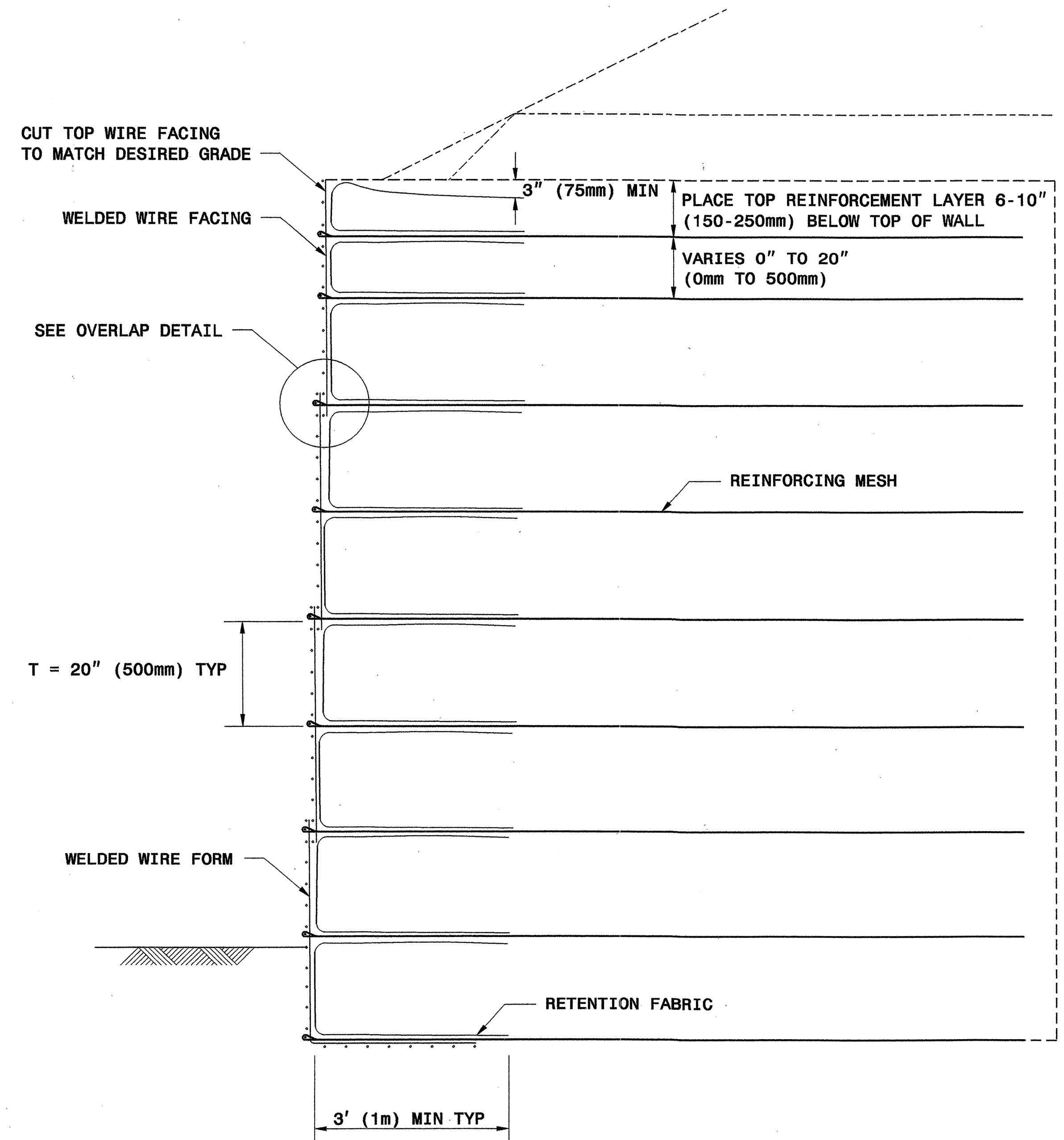
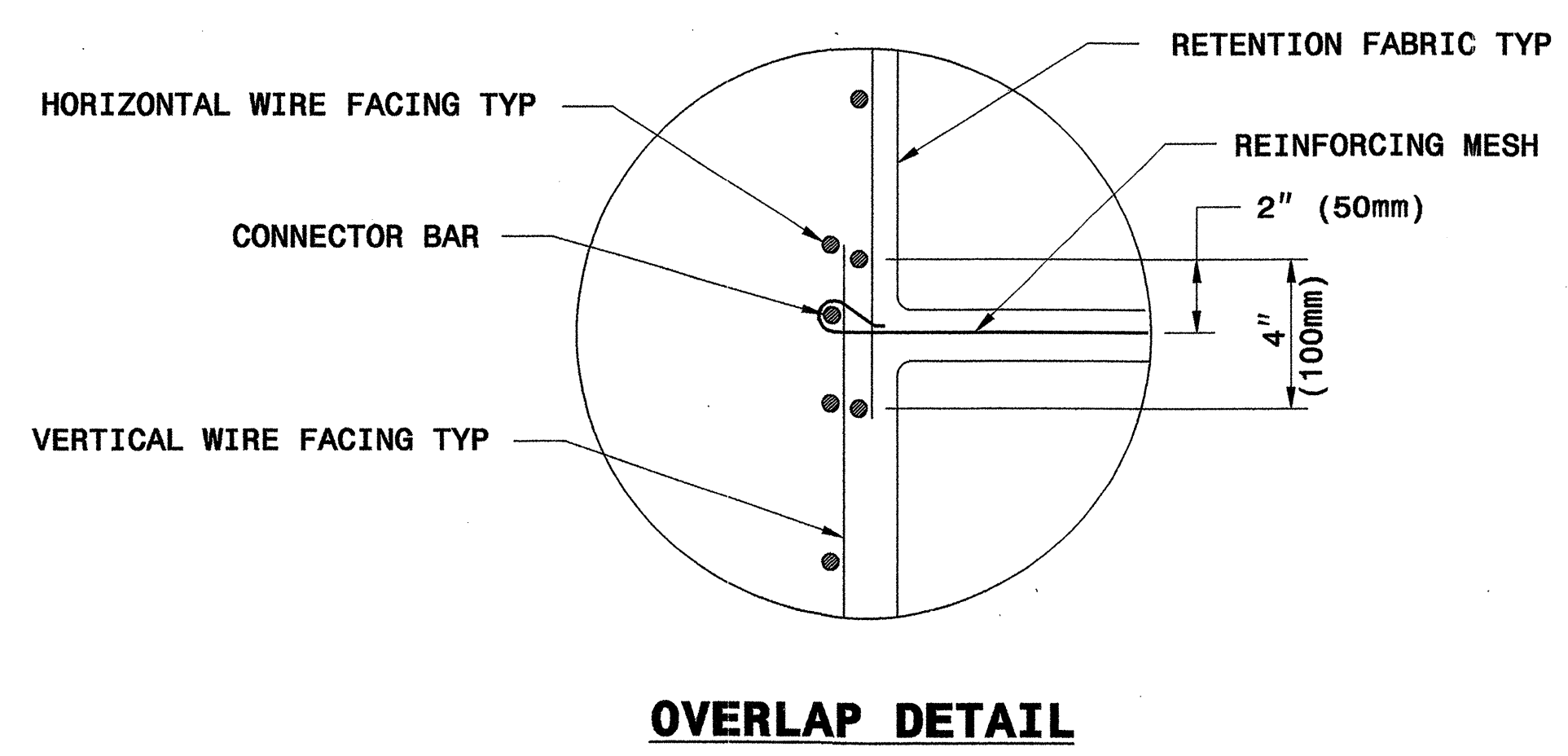
RETAINED EARTH  
TEMPORARY WALL

SHEET 7 OF 11

DATE: 12-19-06




GEOTECHNICAL ENGINEER   Scott A. Hadden 3/29/07 SIGNATURE DATE	ENGINEER     SIGNATURE DATE
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**TYPICAL SECTION**

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

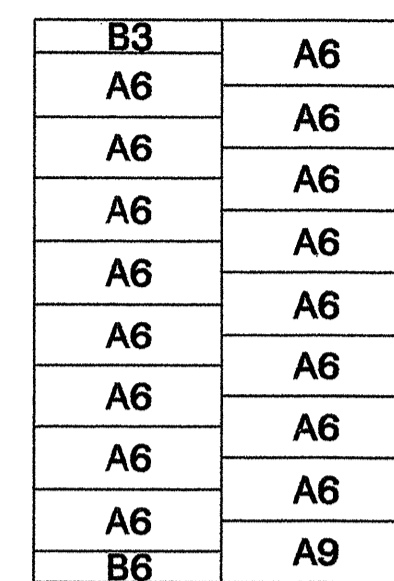


  
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ENGINEERING UNIT**  
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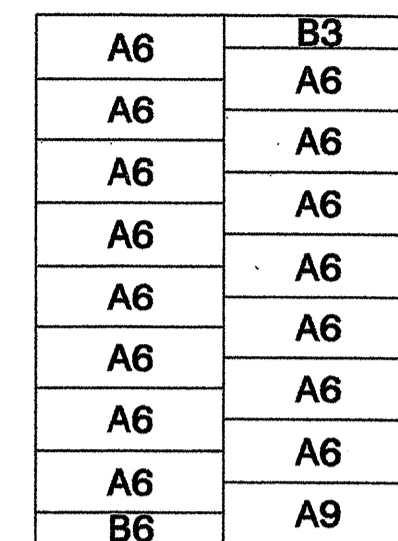
STANDARD DRAWING NO. 1801.02  
  
**RETAINED EARTH  
TEMPORARY WALL**  
  
 SHEET 8 OF 11      DATE: 12-19-06

**PANEL LAYOUTS**

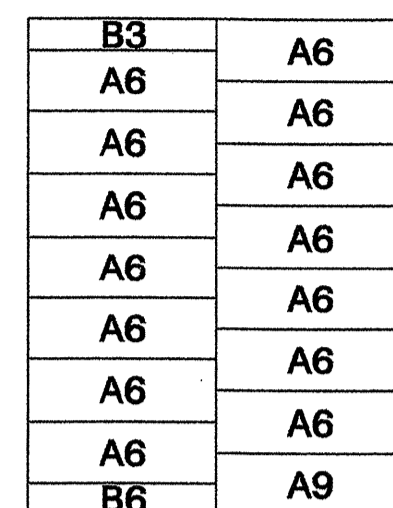
H - WALL HEIGHT  
(FEET-INCHES)  
(METER)



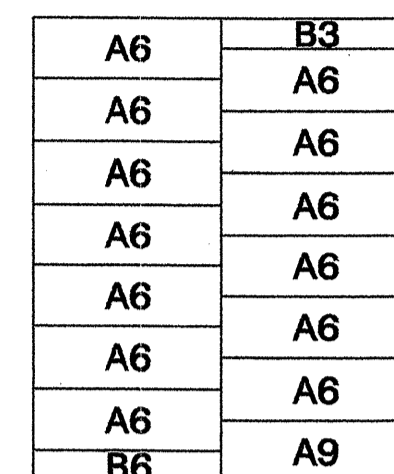
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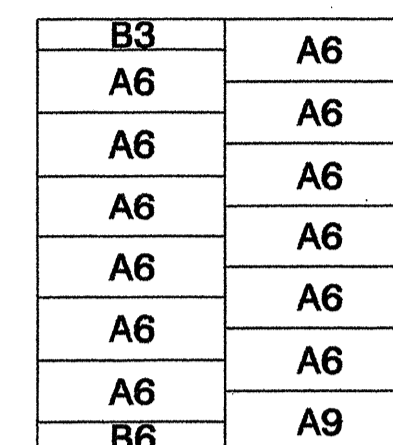
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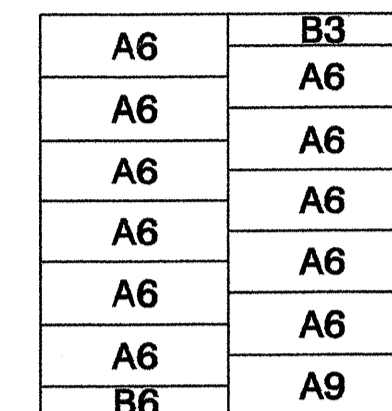
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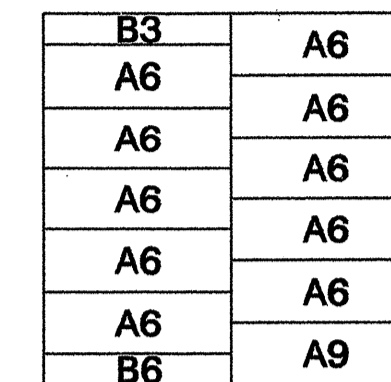
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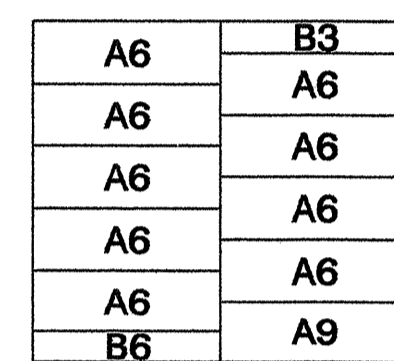
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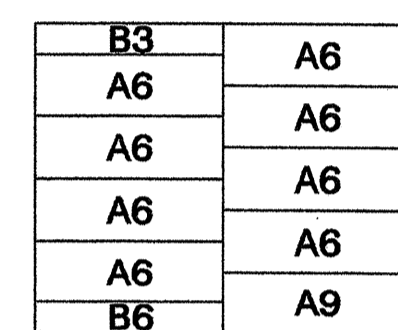


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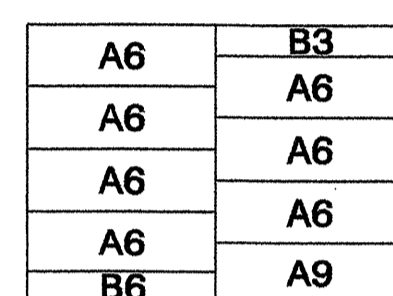


(FEET-INCHES)  
(METER)

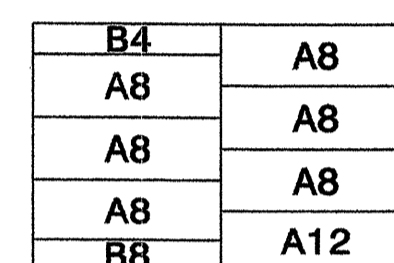
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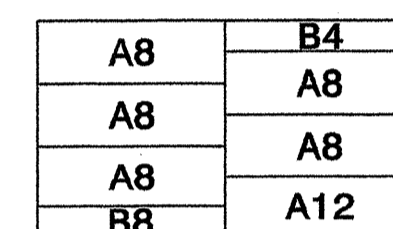
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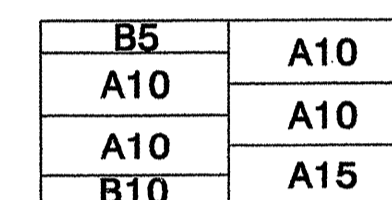
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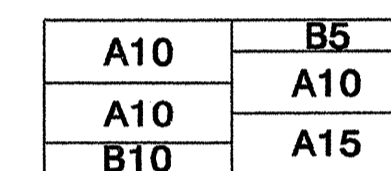
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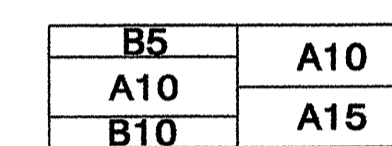
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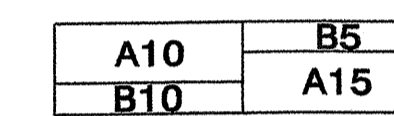
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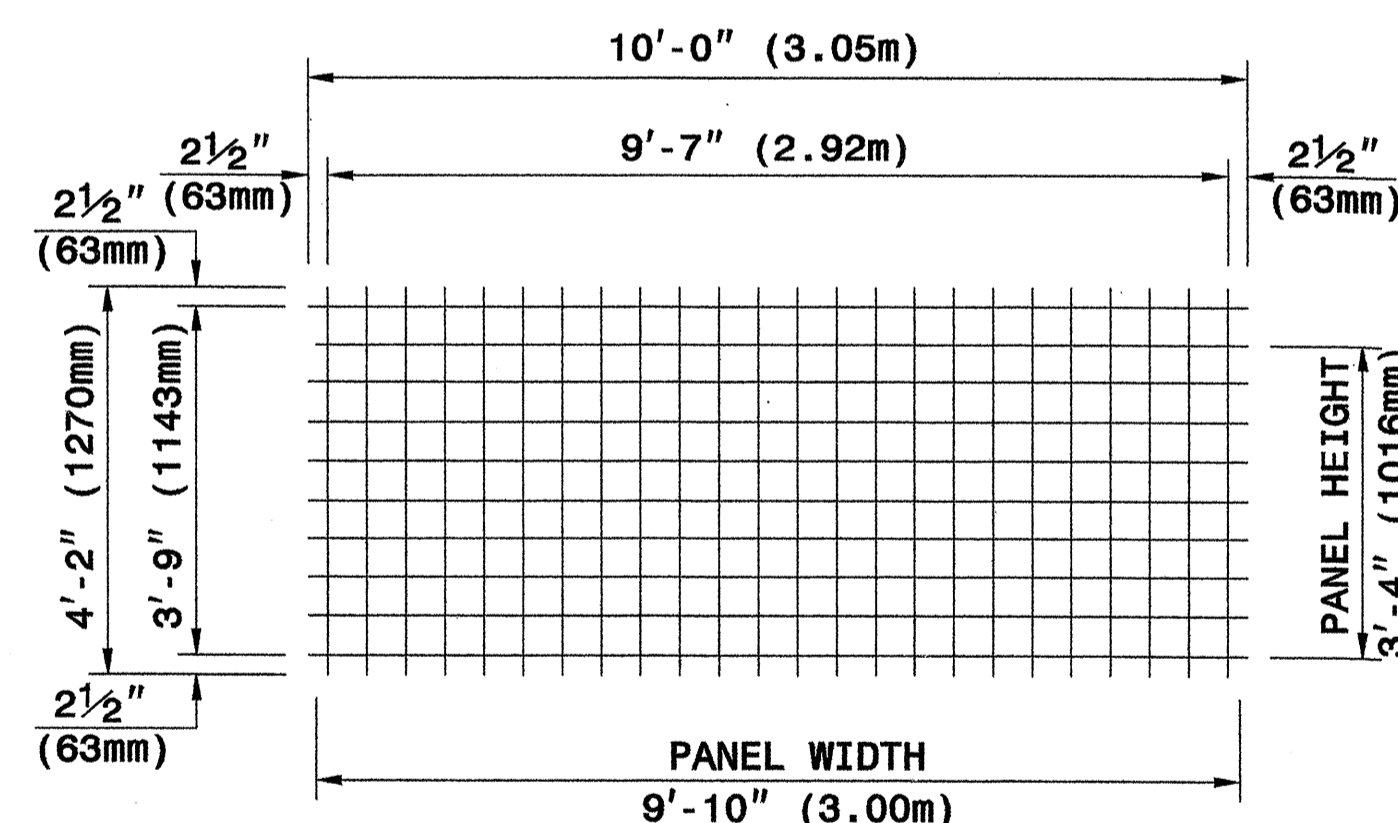
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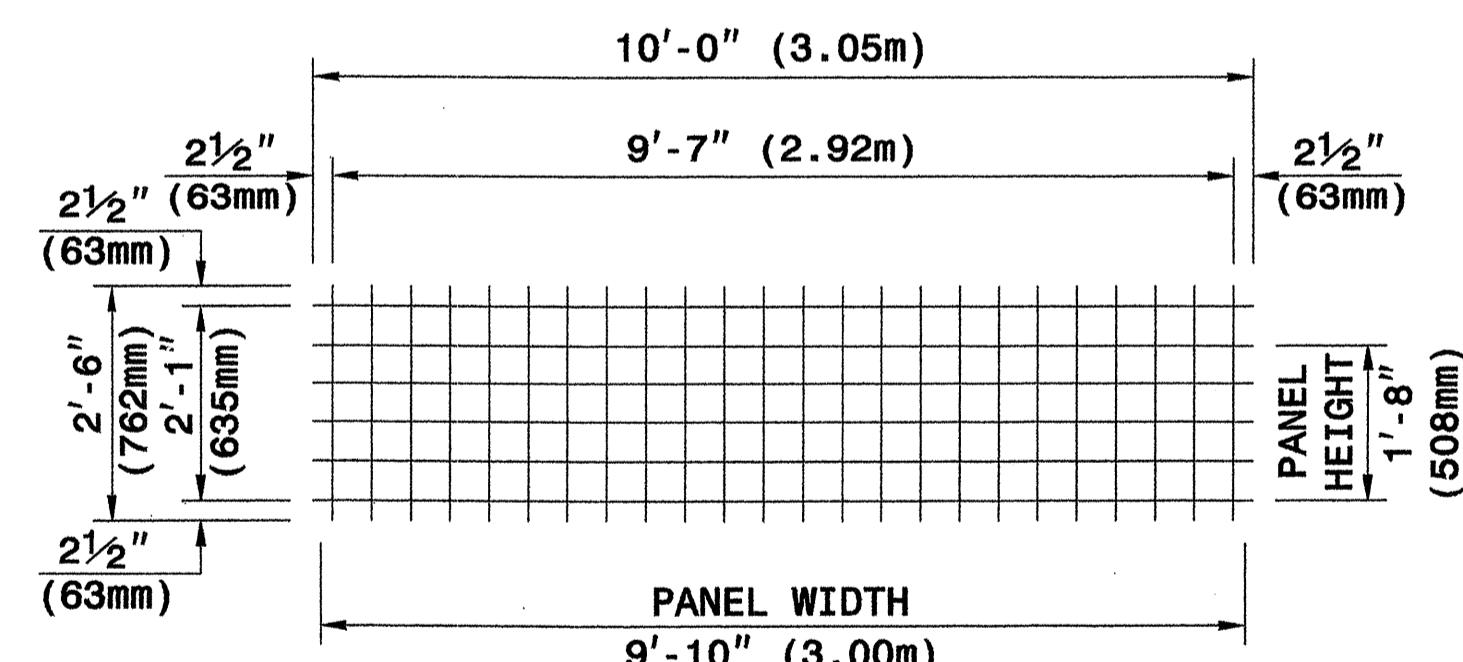
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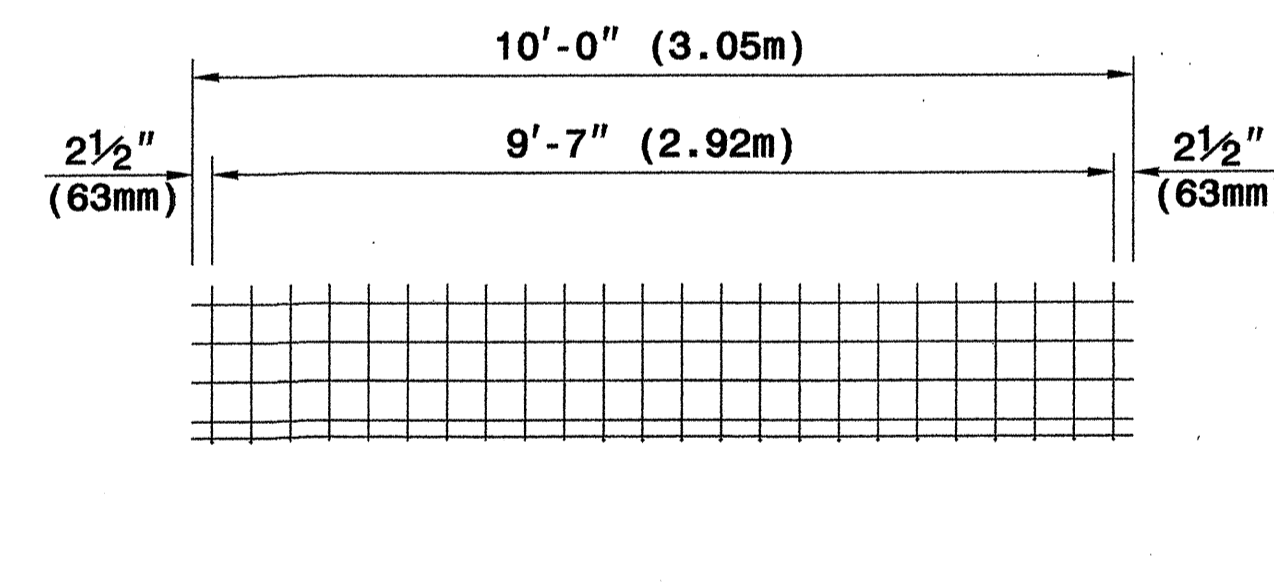
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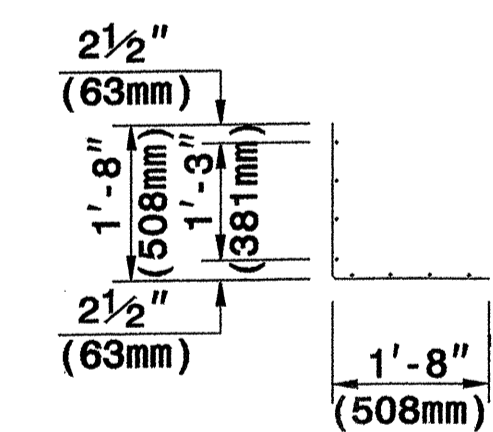
**TYPE A**



**TYPE B**



**WELDED WIRE FORM**

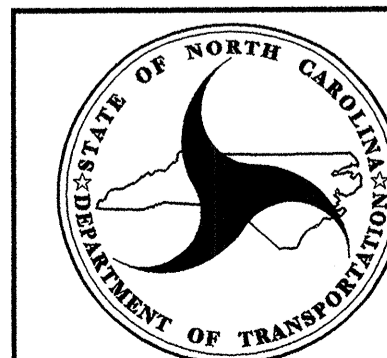


**SECTION**

**WELDED WIRE FACINGS**

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

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



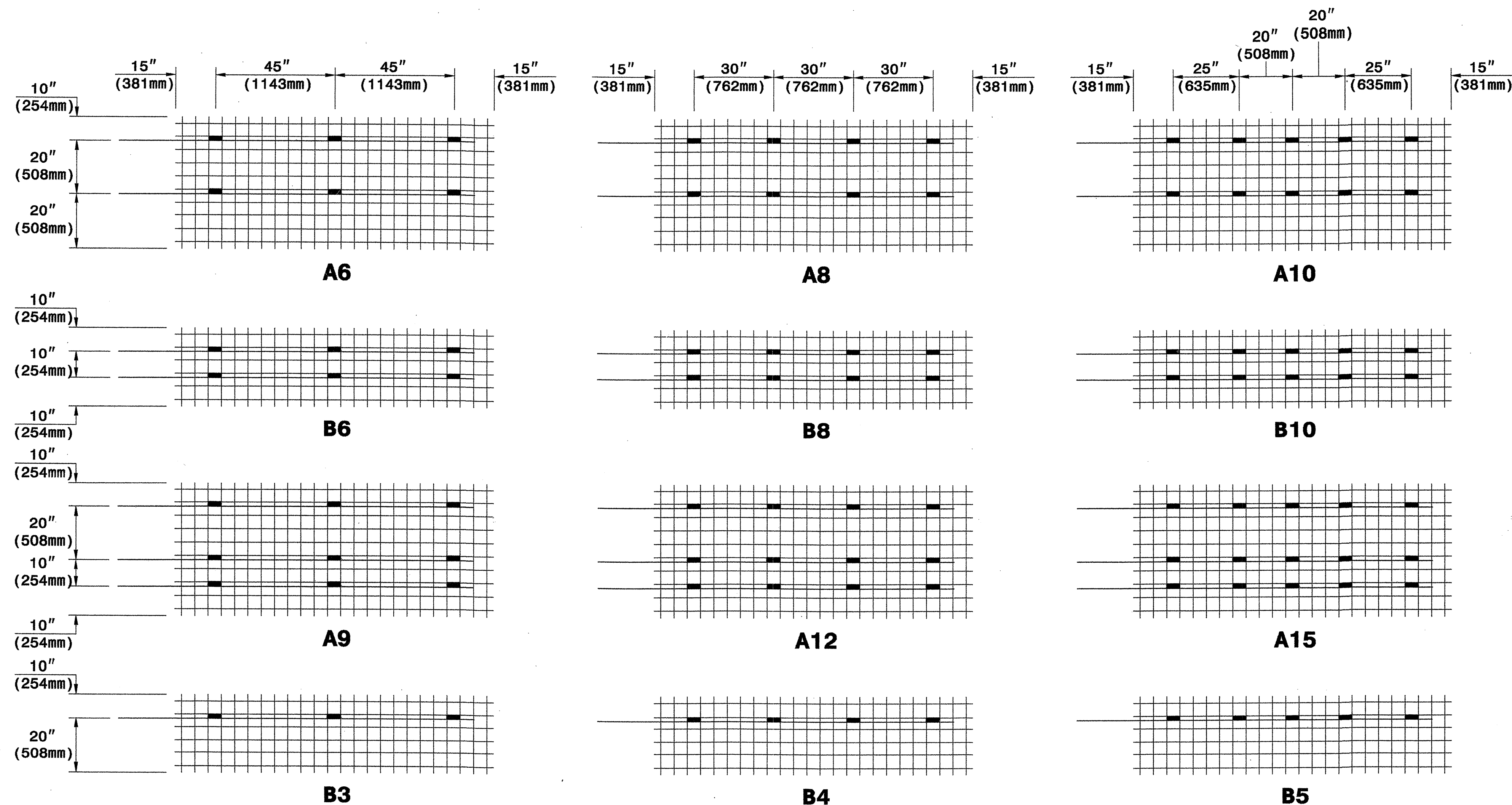
**GEOTECHNICAL ENGINEERING UNIT**  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL  
TEMPORARY WALL

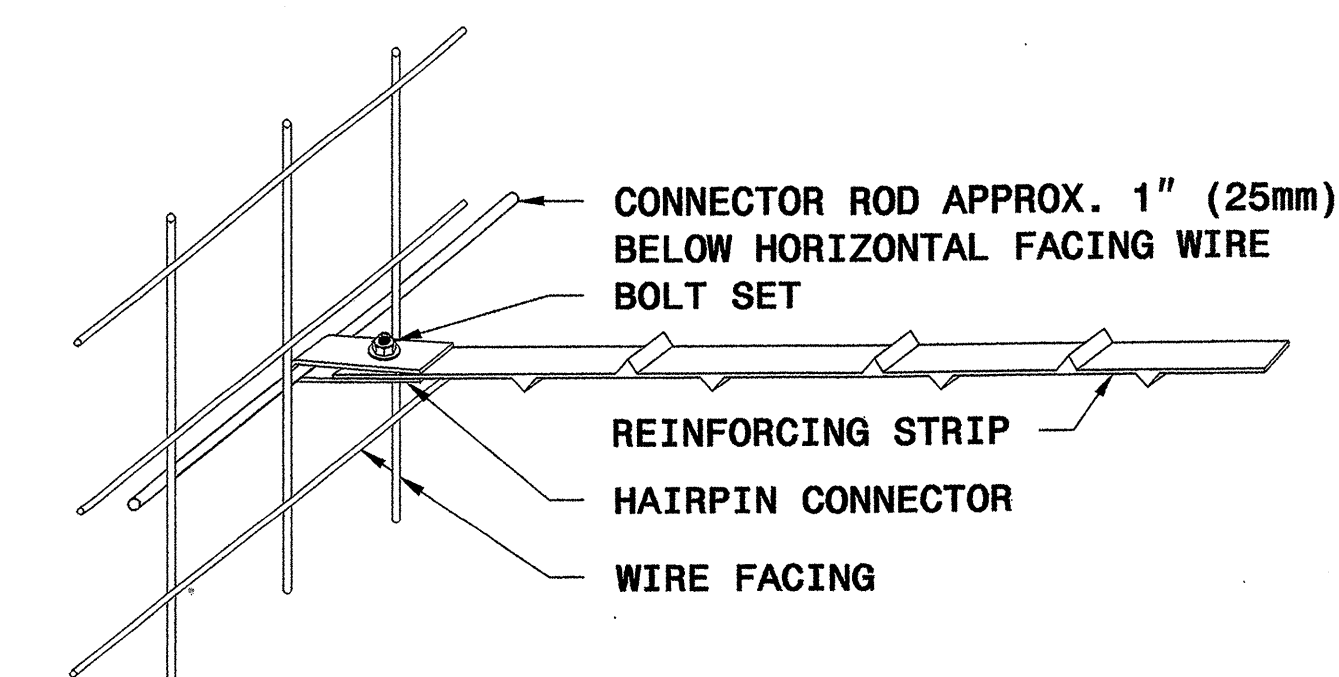
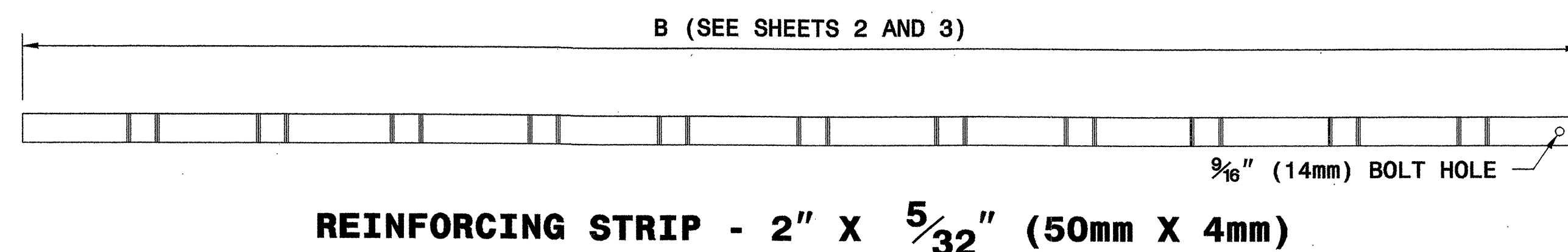
SHEET 9 OF 11

DATE: 12-19-06

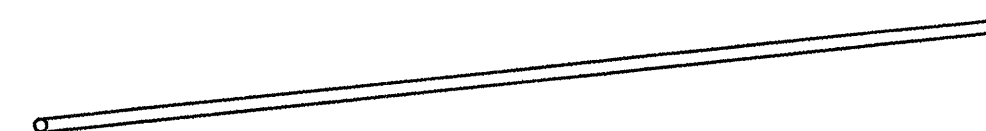


**KEY: A8**  
 NUMBER OF REINFORCING STRIPS  
 PANEL TYPE

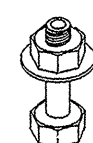
**CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS**



**STRIP TO FACING CONNECTION**



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

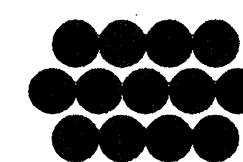


1/2" (13mm) BOLT WITH NUT AND WASHER  
**BOLT SET**

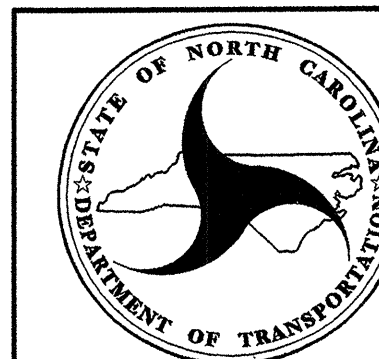


**HAIRPIN CONNECTOR**

**WALL COMPONENTS**



The Reinforced Earth Company



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

STANDARD DRAWING NO. 1801.02

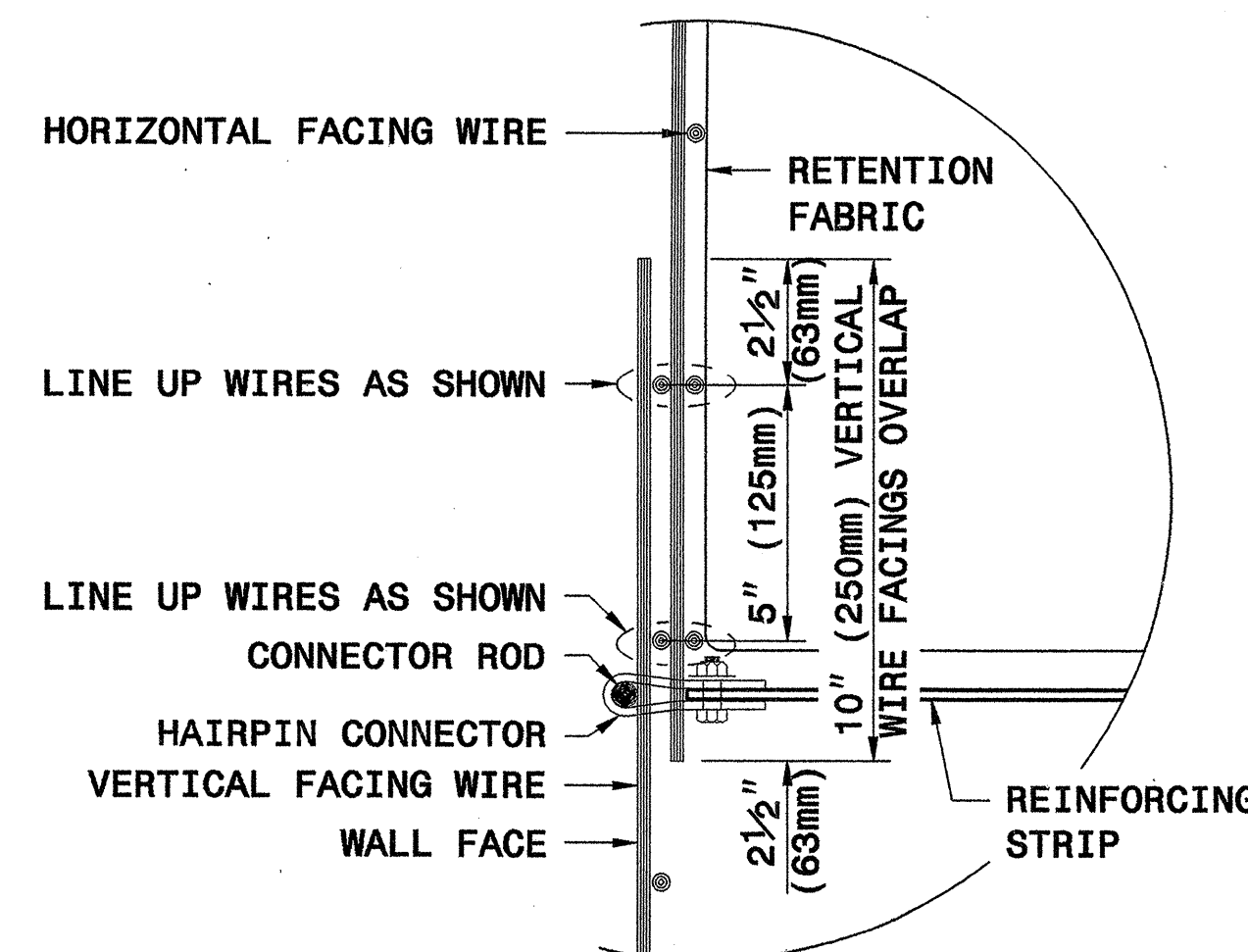
TERRATREL  
 TEMPORARY WALL

SHEET 10 OF 11

DATE: 12-19-06

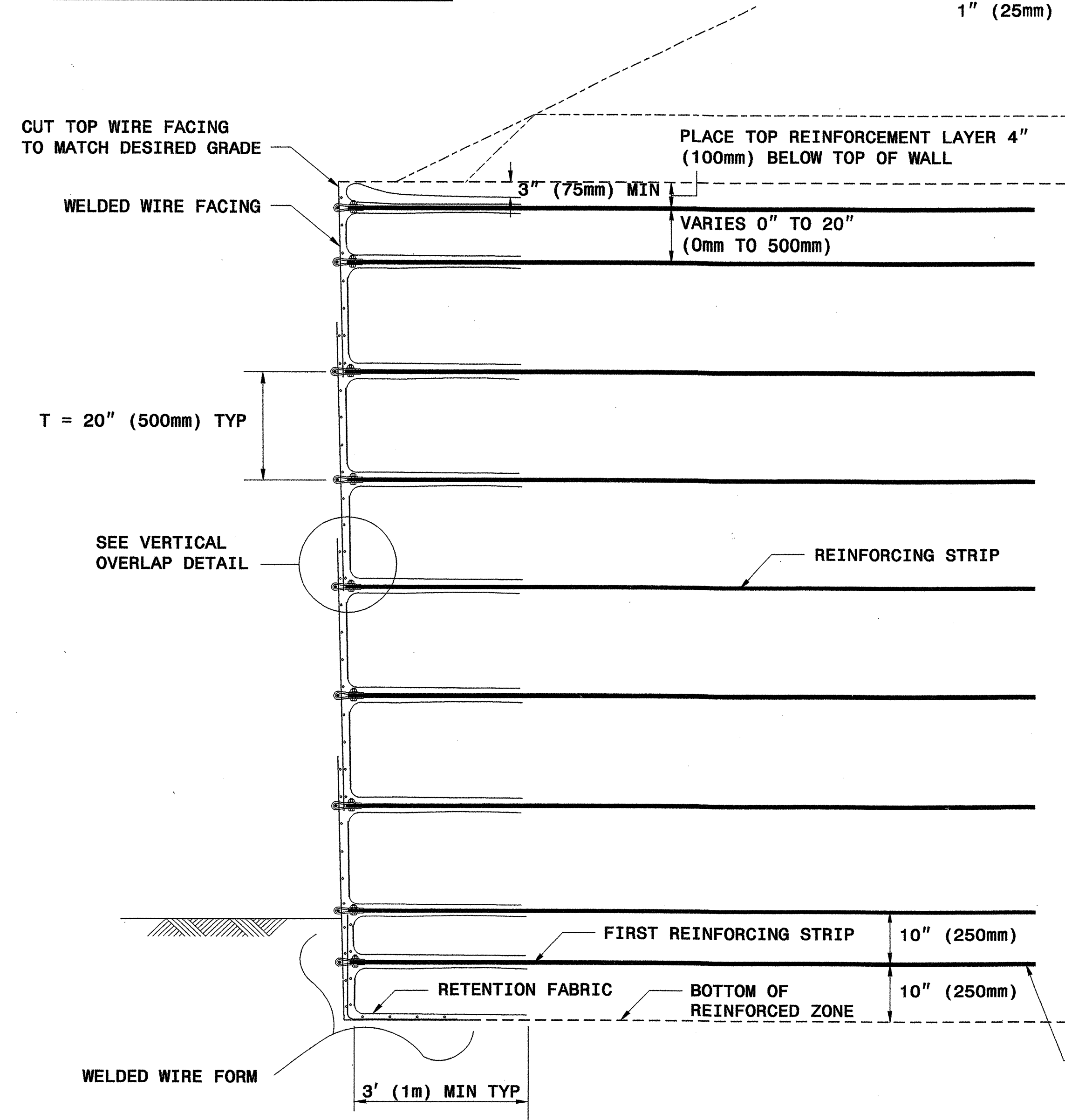


Scott A. Hadden  
SIGNATURE DATE



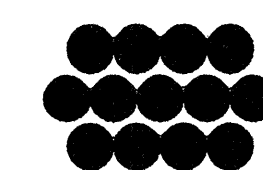
OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

**VERTICAL OVERLAP DETAIL**

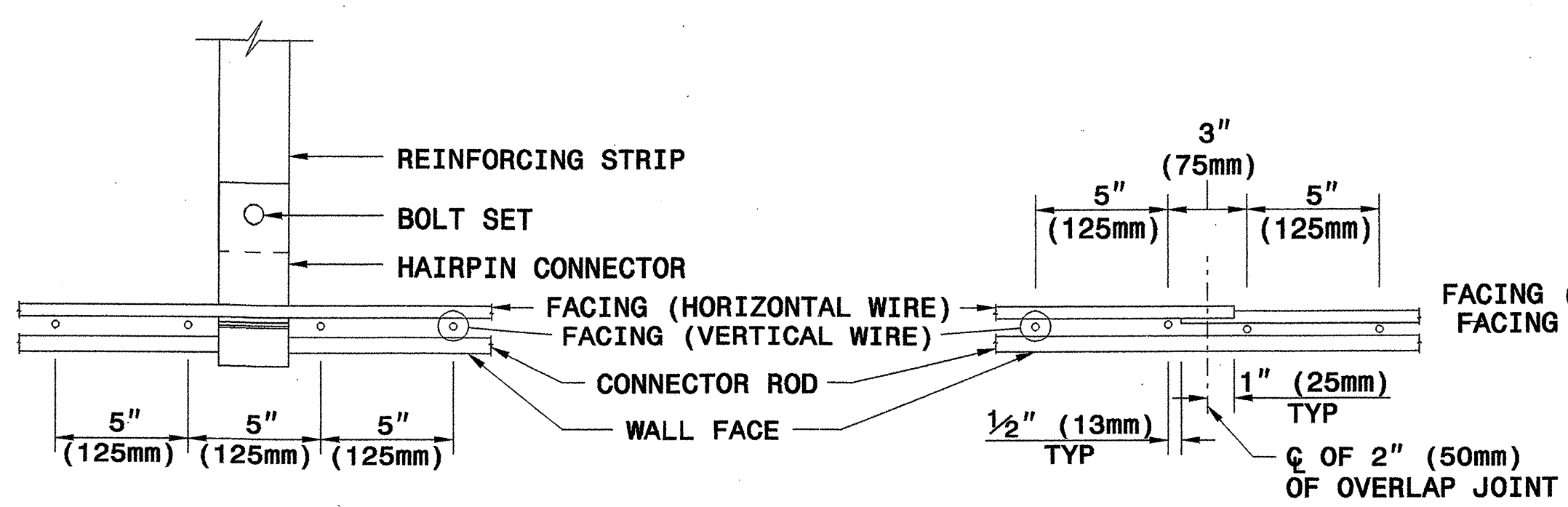


**TYPICAL SECTION**

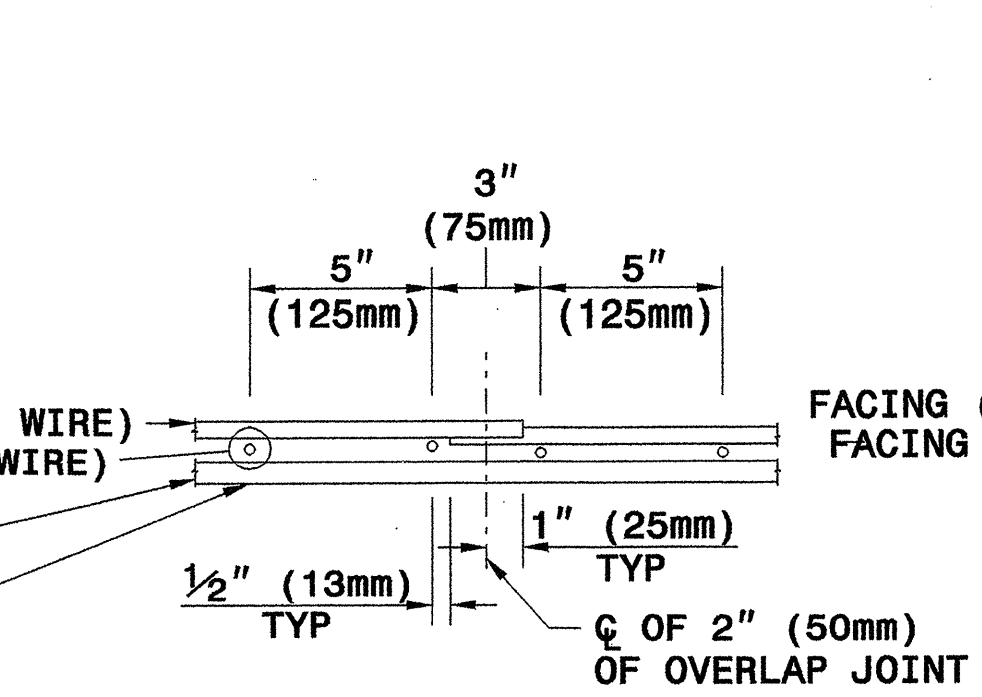
PLACE LOWEST REINFORCING STRIP 10" (250mm) FROM BOTTOM OF REINFORCED ZONE



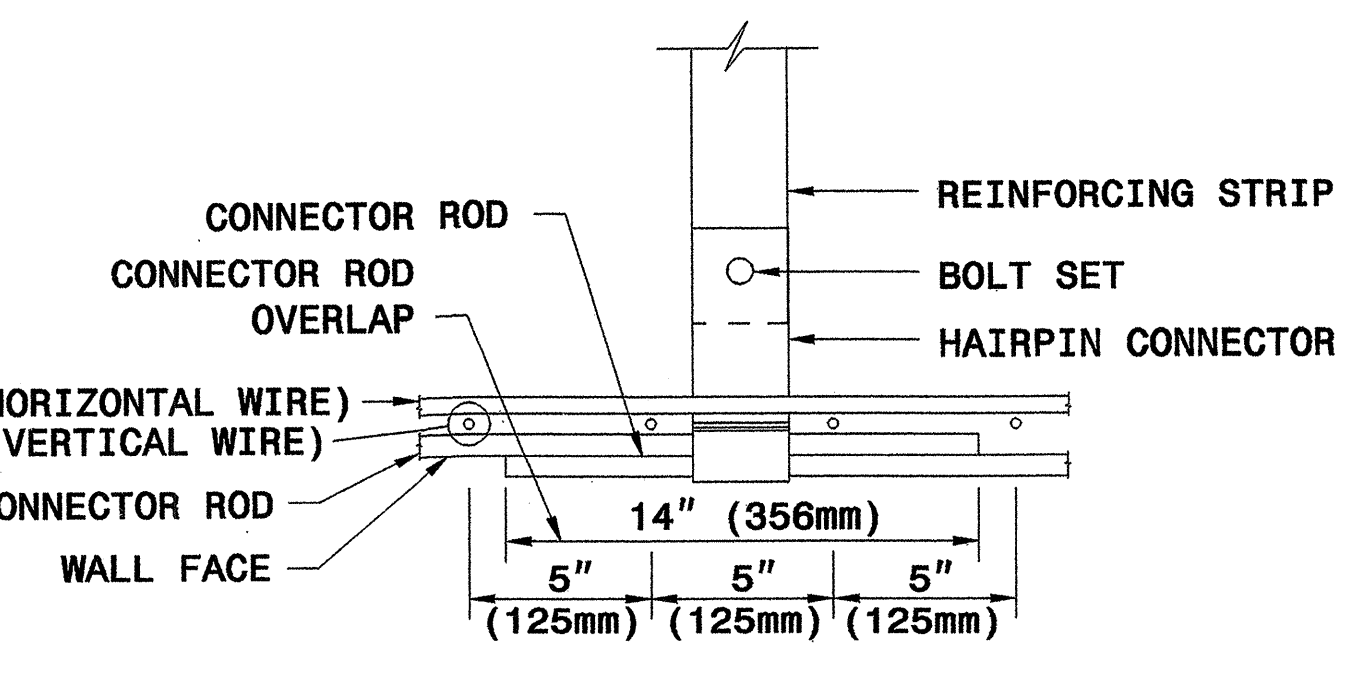
The Reinforced Earth Company



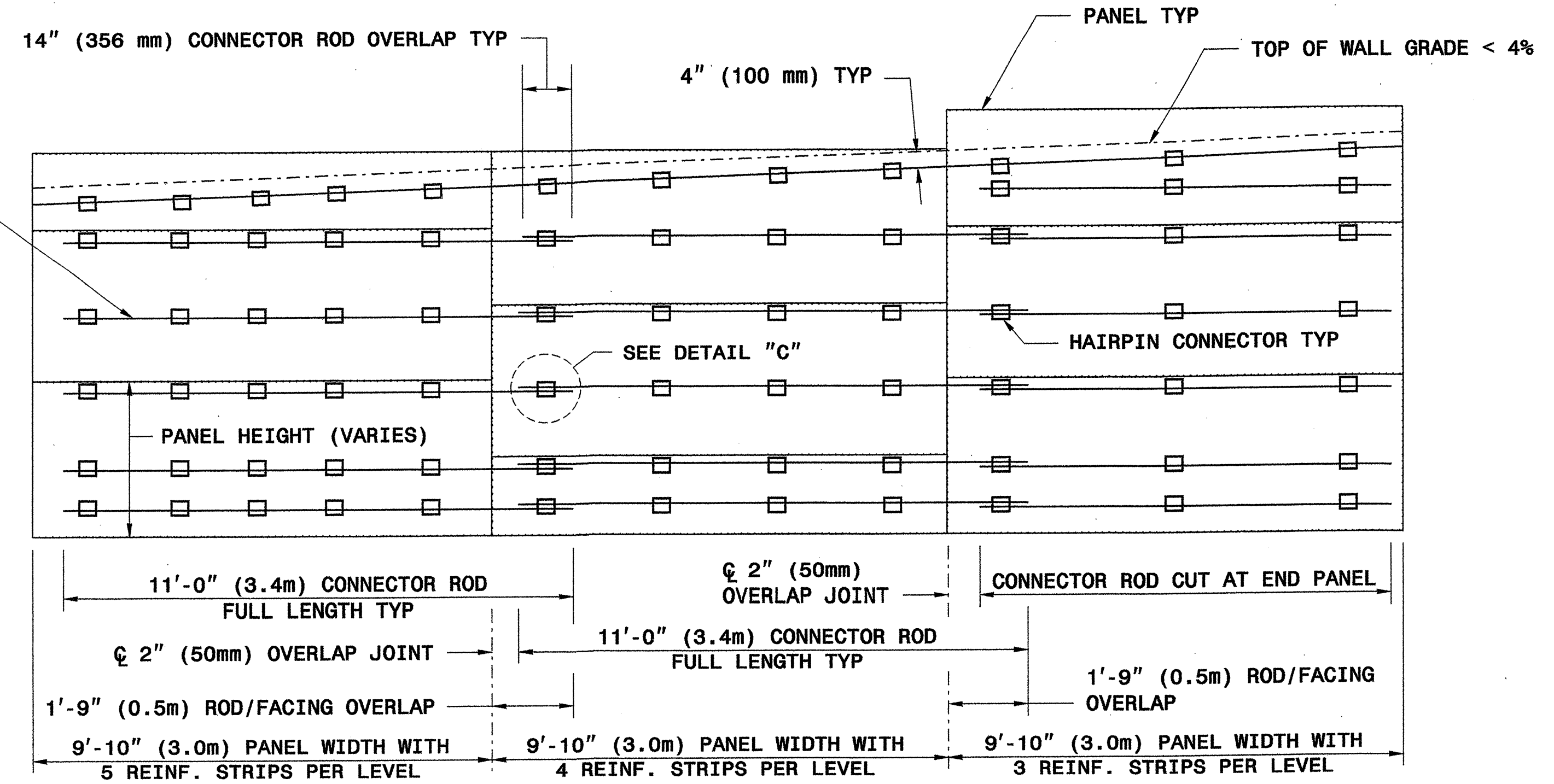
**PLAN DETAIL 'A' STRIP CONNECTION**



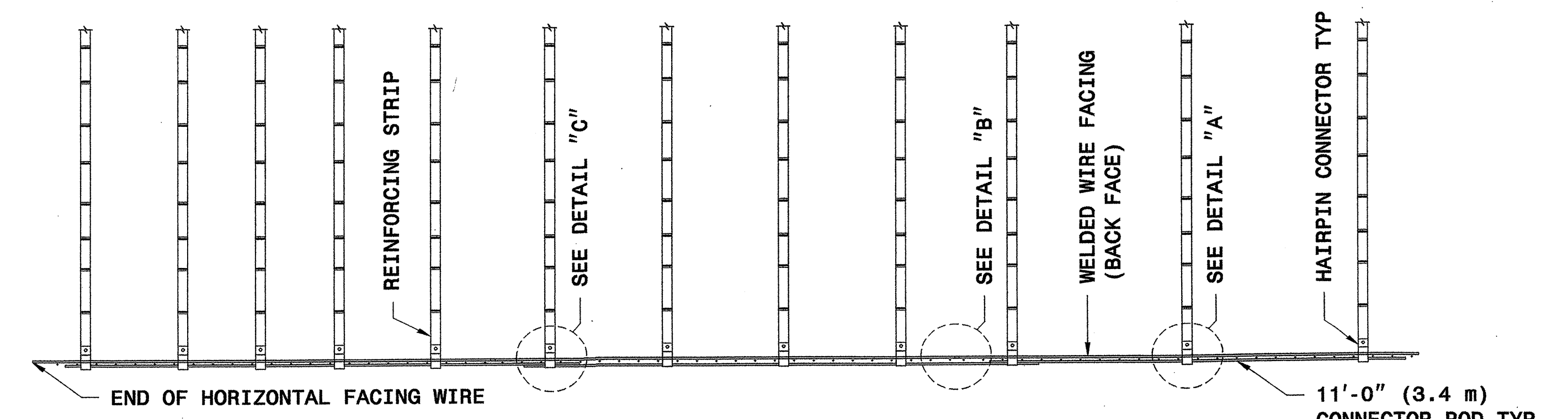
**PLAN DETAIL 'B' HORIZONTAL OVERLAP DETAIL**



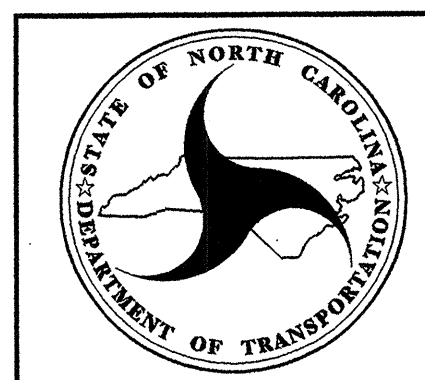
**PLAN DETAIL 'C' STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL**



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



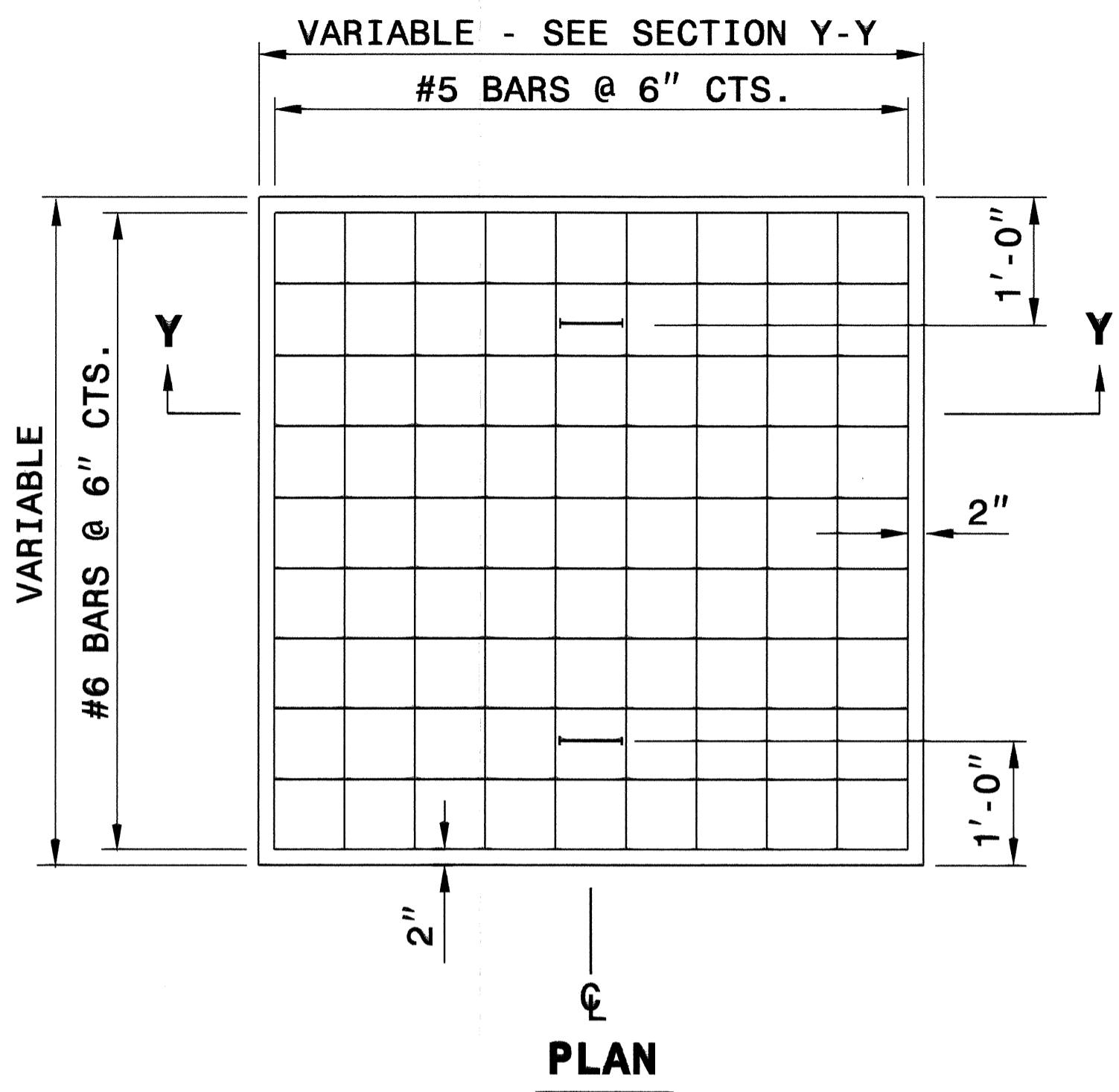
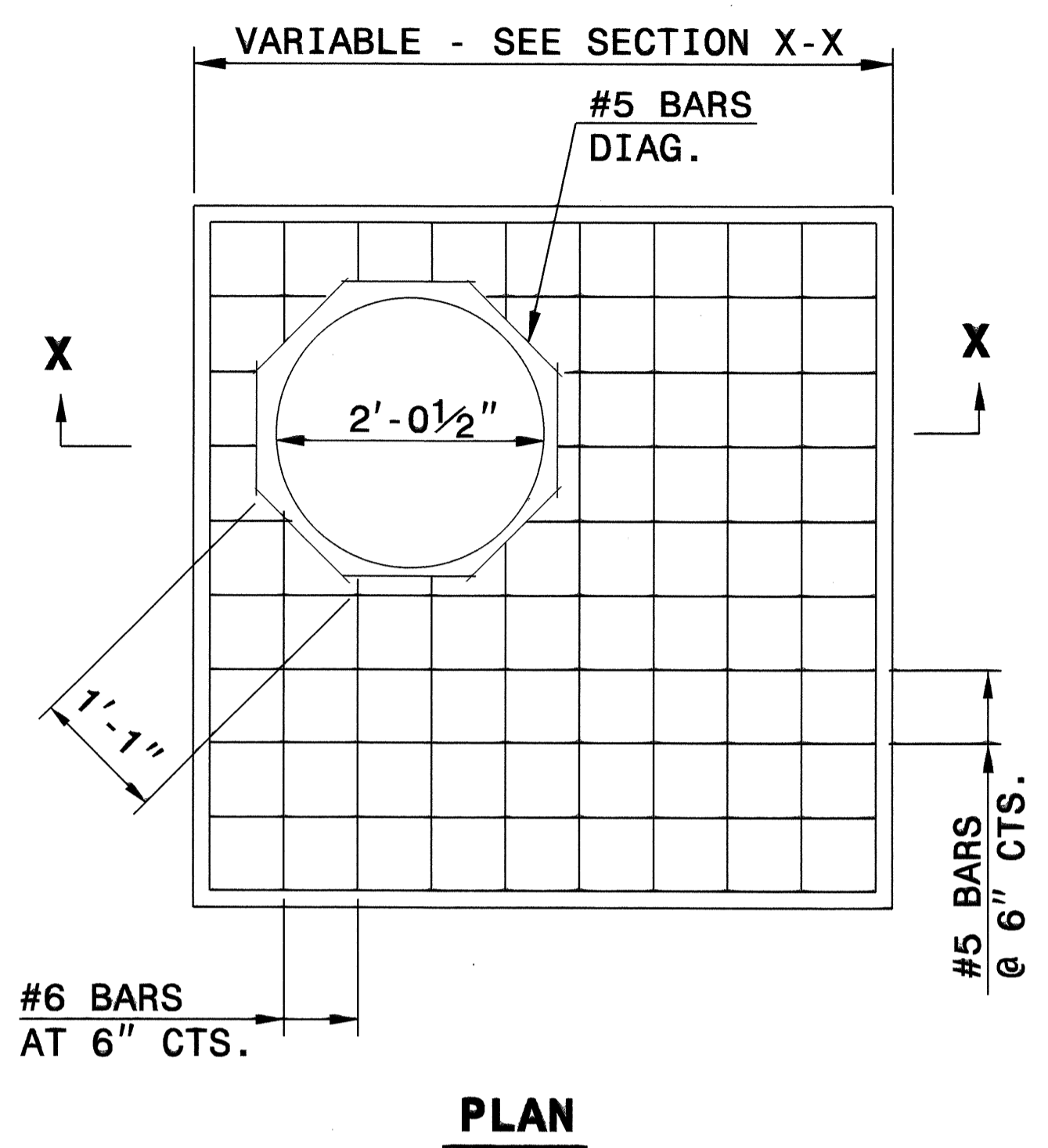
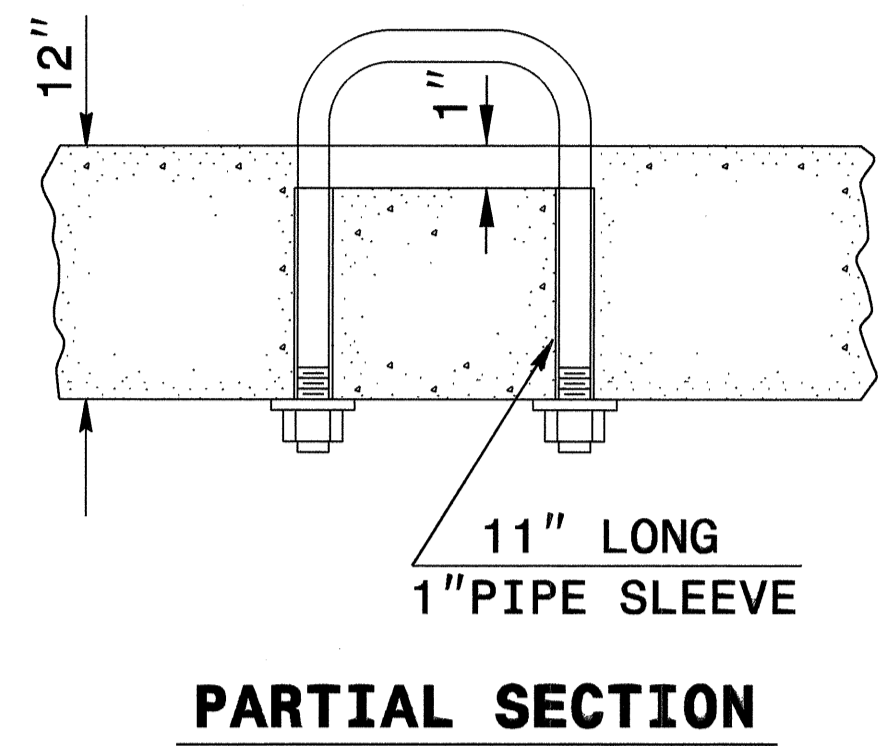
**TYPICAL PLAN**



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

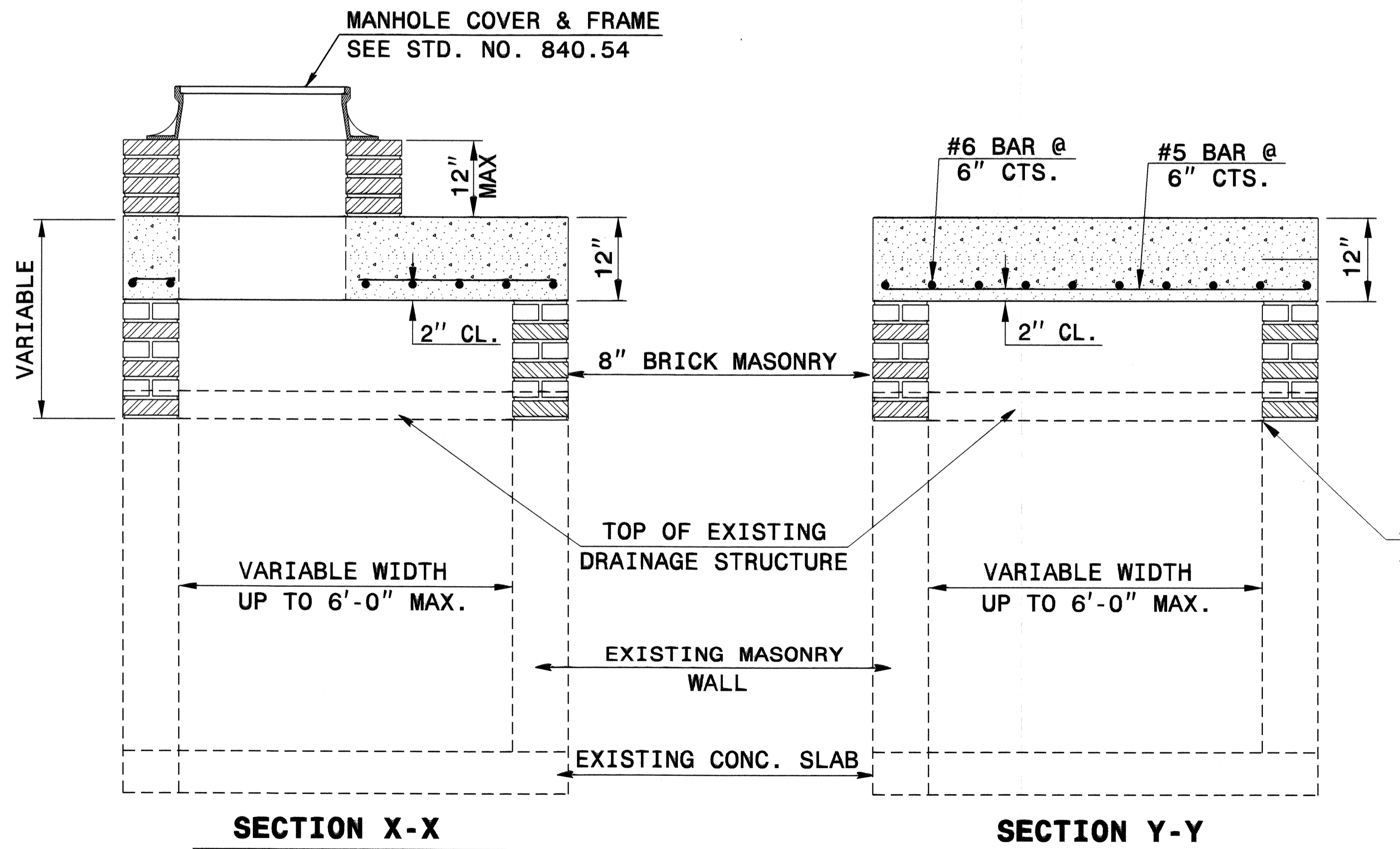
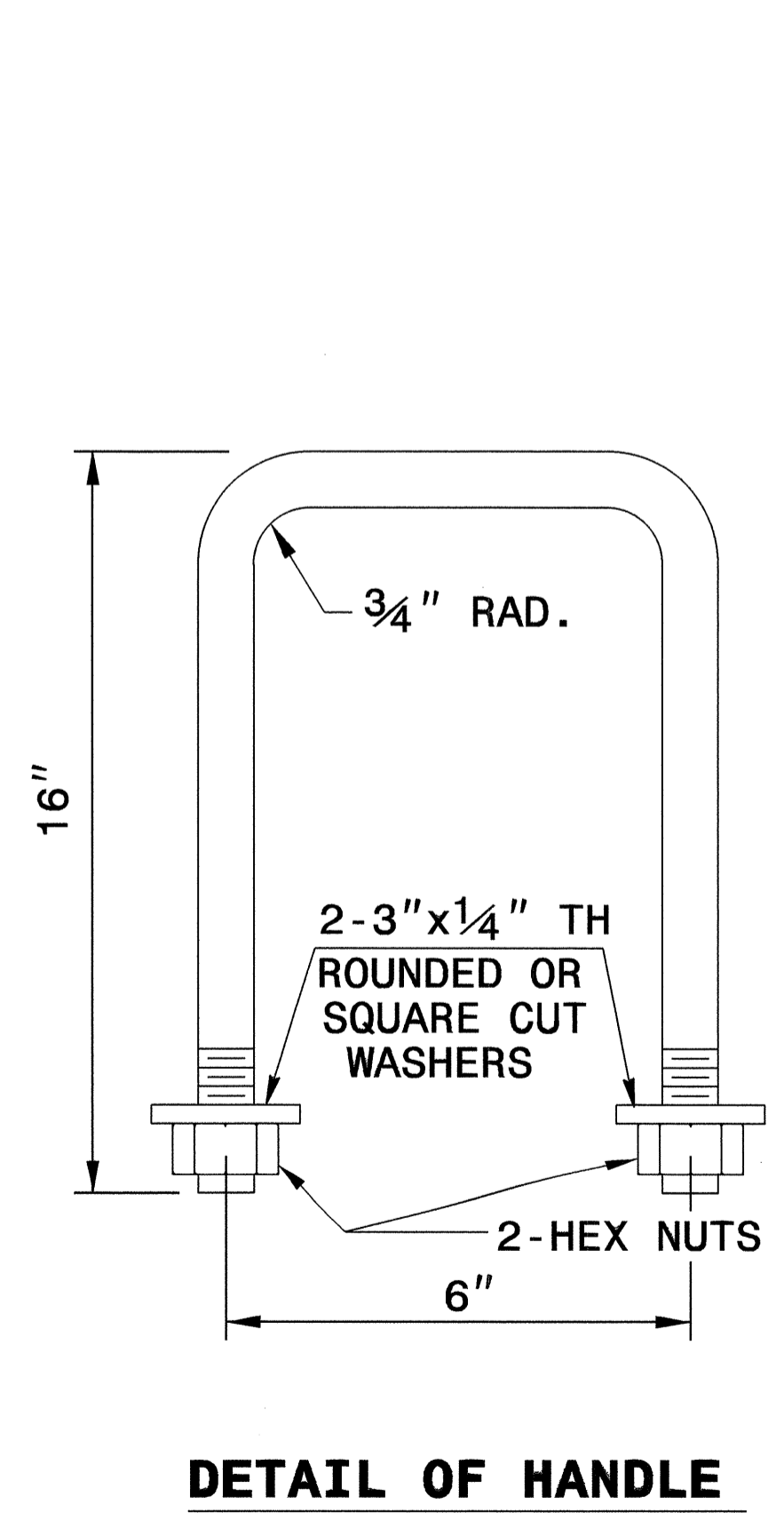
STANDARD DRAWING NO. 1801.02

**TERRATREL TEMPORARY WALL**



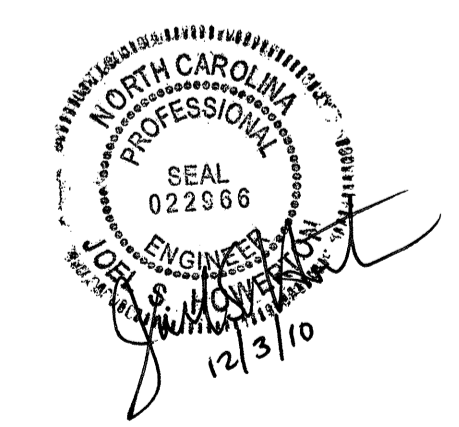
**GENERAL NOTES:**  
 CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.  
 FIELD VERIFY THE DIMENSIONS FOR THE EXISTING BOXES.

<b>BILL OF MATERIALS</b>			
<b>MASONRY</b>			
TOP SLAB CONCRETE CLASS "A"		.037YDS <sup>3</sup>	PER FT <sup>2</sup>
BRICK MASONRY		.025YDS <sup>3</sup>	PER FT <sup>2</sup>
REINFORCING STEEL		7.64LBS	PER FT <sup>2</sup>
<b>MANHOLE OPTION QUANTITIES</b>			
SIZE	QTY.	LENGTH	REINF. STEEL LBS.
#5 DIAG.	8	1'-1"	9.04



**NOTE:**  
 CONCRETE AND REINFORCING STEEL QUANTITIES BASED ON SQUARE FOOT AREA OF THE PROPOSED TOP SLAB FOR THE EXISTING DRAINAGE STRUCTURE.  
 BRICK MASONRY QUANTITY IS BASED ON THE TOTAL SQUARE FOOTAGE OF EXTERIOR WALL SURFACE AREA TO BE CONSTRUCTED.

ALIGN PROPOSED BRICK VERTICAL ADJUSTMENT TO INNER FACE OF WALL



<b>CONTRACT STANDARDS AND DEVELOPMENT UNIT</b>			
Office 919-250-4128		FAX 919-250-4119	
<b>DETAIL TO CONVERT EXISTING DROP INLET OR CATCH BASIN TO TRAFFIC BEARING JUNCTION BOX (MANHOLE OPTIONAL)</b>			
ORIGINAL BY:	T.S.S.	DATE:	FEB. 2000
MODIFIED BY:	E.E.W.	DATE:	NOV. 2001
CHECKED BY:		DATE:	
FILE SPEC.:	w:ericward/usr/details/stand/boxtotbjbe.dgn		

5/14/99  
 02\_DEC-2010\_1034  
 \$\$\$\$SUBSERIALNAME\$\$\$\$  
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STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202579					STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202579				
ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION	3649000000-E	876	5	TON	RIP RAP, CLASS B
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (20+07.30)	3656000000-E	876	1,010	SY	FILTER FABRIC FOR DRAINAGE
0038000000-E	SP	150	CY	SHALLOW UNDERCUT	3659000000-N	SP	1	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
0043000000-N	226	Lump Sum		GRADING	4072000000-E	903	73	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB- BING	4096000000-N	904	1	EA	SIGN ERECTION, TYPE D
0057000000-E	226	750	CY	UNDERCUT EXCAVATION	4102000000-N	904	3	EA	SIGN ERECTION, TYPE E
0080000000-E	SP	300	TON	CLASS IV SUBGRADE STABILIZA- TION	4116100000-N	904	1	EA	SIGN ERECTION, RELOCATE, TYPE *** (GROUND MOUNTED) (D)
0196000000-E	270	1,050	SY	FABRIC FOR SOIL STABILIZATION	4155000000-N	907	10	EA	DISPOSAL OF SIGN SYSTEM, U- CHANNEL
0199000000-E	SP	3,350	SF	TEMPORARY SHORING	4400000000-E	1110	164	SF	WORK ZONE SIGNS (STATIONARY)
0318000000-E	SP	60	TON	FOUNDATION CONDITIONING MATE- RIAL, MINOR STRS	4410000000-E	1110	60	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
0320000000-E	SP	160	SY	FOUNDATION CONDITIONING FABRIC	4430000000-N	1130	110	EA	DRUMS
0335200000-E	SP	128	LF	15" DRAINAGE PIPE	4445000000-E	1145	120	LF	BARRICADES (TYPE III)
0343000000-E	SP	72	LF	15" SIDE DRAIN PIPE	4450000000-N	1150	1,280	HR	FLAGGER
0344000000-E	SP	36	LF	18" SIDE DRAIN PIPE	4465000000-N	1160	2	EA	TEMPORARY CRASH CUSHIONS
0448000000-E	SP	164	LF	**** RC PIPE CULVERTS, CLASS IV (15")	4485000000-E	1170	380	LF	PORTABLE CONCRETE BARRIER
0582000000-E	SP	214	LF	15" CS PIPE CULVERTS, 0.064" THICK	4650000000-N	1251	125	EA	TEMPORARY RAISED PAVEMENT MARKERS
0588000000-E	SP	24	LF	18" CS PIPE CULVERTS, 0.064" THICK	4685000000-E	1205	832	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
0636000000-E	SP	4	EA	*** CS PIPE ELBOWS, ***** THICK (15", 0.064)	4686000000-E	1205	1,028	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
0995000000-E	340	374	LF	PIPE REMOVAL	4770000000-E	1205	740	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (II)
1121000000-E	520	1,040	TON	AGGREGATE BASE COURSE	4810000000-E	1205	22,800	LF	PAINT PAVEMENT MARKING LINES (4")
1220000000-E	545	150	TON	INCIDENTAL STONE BASE	4905000000-N	1253	7	EA	SNOWFLOWABLE PAVEMENT MARKERS
1264000000-E	SP	140	LF	DITCHING	6000000000-E	1605	2,100	LF	TEMPORARY SILT FENCE
1275000000-E	600	865	GAL	PRIME COAT	6006000000-E	1610	315	TON	STONE FOR EROSION CONTROL, CLASS A
1489000000-E	610	510	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B	6009000000-E	1610	485	TON	STONE FOR EROSION CONTROL, CLASS B
1498000000-E	610	340	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE 119.0B	6012000000-E	1610	465	TON	SEDIMENT CONTROL STONE
1519000000-E	610	1,020	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	6015000000-E	1615	12	ACR	TEMPORARY MULCHING
1560000000-E	620	100	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22	6018000000-E	1620	400	LB	SEED FOR TEMPORARY SEEDING
2022000000-E	SP	84	CY	SUBDRAIN EXCAVATION	6021000000-E	1620	2.5	TON	FERTILIZER FOR TEMPORARY SEED- ING
2033000000-E	SP	42	CY	SUBDRAIN FINE AGGREGATE	6024000000-E	1622	500	LF	TEMPORARY SLOPE DRAINS
2044000000-E	SP	250	LF	6" PERFORATED SUBDRAIN PIPE	6027000000-N	1622	10	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
2070000000-N	SP	1	EA	SUBDRAIN PIPE OUTLETS	6029000000-E	SP	650	LF	SAFETY FENCE
2077000000-E	SP	6	LF	6" OUTLET PIPE (SUBDRAINS)	6030000000-E	1630	1,020	CY	SILT EXCAVATION
2286000000-N	840	8	EA	MASONRY DRAINAGE STRUCTURES	6036000000-E	1631	10,000	SY	MATTING FOR EROSION CONTROL
2366000000-N	840	4	EA	FRAME WITH TWO GRATES, STD 840.24	6037000000-E	SP	200	SY	COIR FIBER MAT
2367000000-N	840	3	EA	FRAME WITH TWO GRATES, STD 840.29	6038000000-E	SP	275	SY	PERMANENT SOIL REINFORCEMENT MAT
2396000000-N	840	1	EA	FRAME WITH COVER, STD 840.54	6042000000-E	1632	275	LF	1/4" HARDWARE CLOTH
2556000000-E	846	155	LF	SHOULDER BERM GUTTER	6070000000-N	SP	8	EA	SPECIAL STILLING BASINS
2995000000-N	SP	1	EA	GENERIC DRAINAGE ITEM CONVERT EXISTING DROP INLET TO TBIB	6071010000-E	SP	650	LF	WATTLE
3030000000-E	862	275	LF	STEEL BM GUARDRAIL	6071020000-E	SP	180	LB	POLYACRYLAMIDE (PAM)
3045000000-E	862	62.5	LF	STEEL BM GUARDRAIL, SHOP CURVED	6071030000-E	SP	500	LF	COIR FIBER BAFFLES
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS	6071050000-E	SP	2	EA	*** SKIMMER (1-1/2")
3165000000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** (350 TL-2)	6084000000-E	1660	12	ACR	SEEDING & MULCHING
3195000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1	6087000000-E	1660	5	ACR	MOWING
3215000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III	6090000000-E	1661	150	LB	SEED FOR REPAIR SEEDING
3380000000-E	862	300	LF	TEMPORARY STEEL BM GUARDRAIL	6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
3387000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** TEMPORARY (III)	6096000000-E	1662	300	LB	SEED FOR SUPPLEMENTAL SEEDING
3389000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** TEMPORARY (350 TL-2)	6108000000-E	1665	9	TON	FERTILIZER TOPDRESSING
					6114500000-N	SP	40	MHR	SPECIALIZED HAND MOWING
					6117000000-N	SP	20	EA	RESPONSE FOR EROSION CONTROL
					6123000000-E	1670	1	ACR	REFORESTATION

5/14/99  
 Q1-DEC-2010 07:41  
 P:\Roadwork\Projects\B4176\_rdy\_sum.dgn  
 4:58:58 PM

COMPUTED BY: J. Johnson DATE: 11/04/10  
CHECKED BY: G.J.L. DATE: 11/04/10

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
SUBREGIONAL

PROJECT REFERENCE NO. B-4176  
SHEET NO. 3-A

NOTE: Invert Elevations are for Bid Purposes only and shall not be used for project construction stakeout.  
See "Standard Specifications For Roads and Structures, Section 300-5".

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

Main data table with columns for Station, Location, Structure No., Invert Elevation, Slope, Drainage Pipe, C.S. Pipe, R.C. Pipe (Class III/IV), Endwalls, Concrete Transitional Section, Frame, Grates, and Hoop, and Remarks.

**GUARDRAIL SUMMARY**

Summary table for Guardrail, including columns for Survey Line, Beg. Sta., End Sta., Location, Length (Straight, Shop Curved), Warrant Point, Flare Length, Anchors, Impact Attenuator, and Remarks. Includes a summary of guardrail and anchor deductions at the bottom.

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R:\Roadway\Proj\04176\_rdy-sum.dgn

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

**SUMMARY OF EARTHWORK**

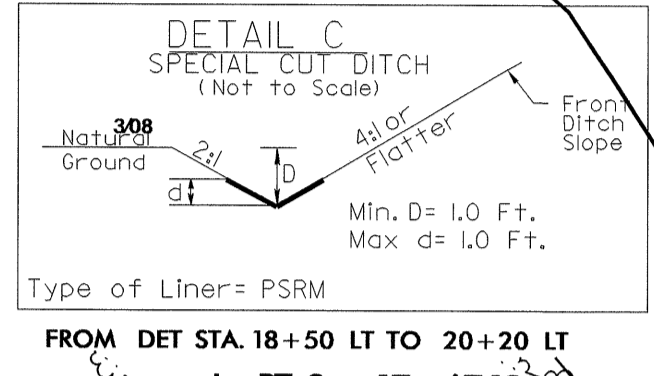
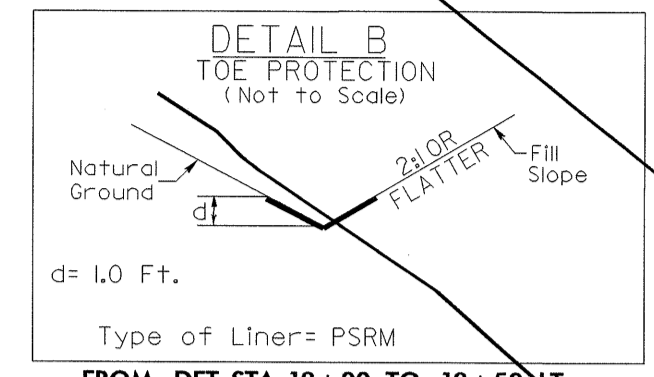
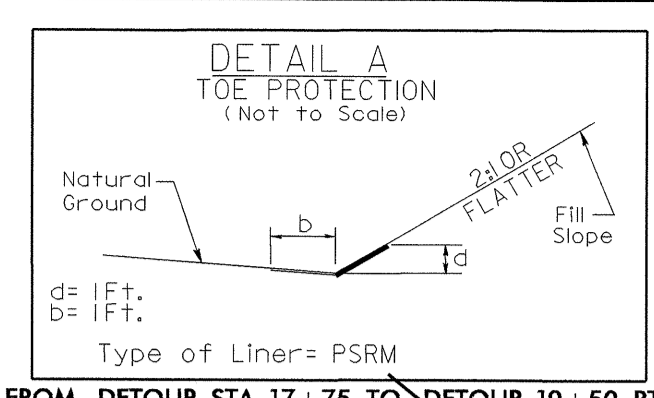
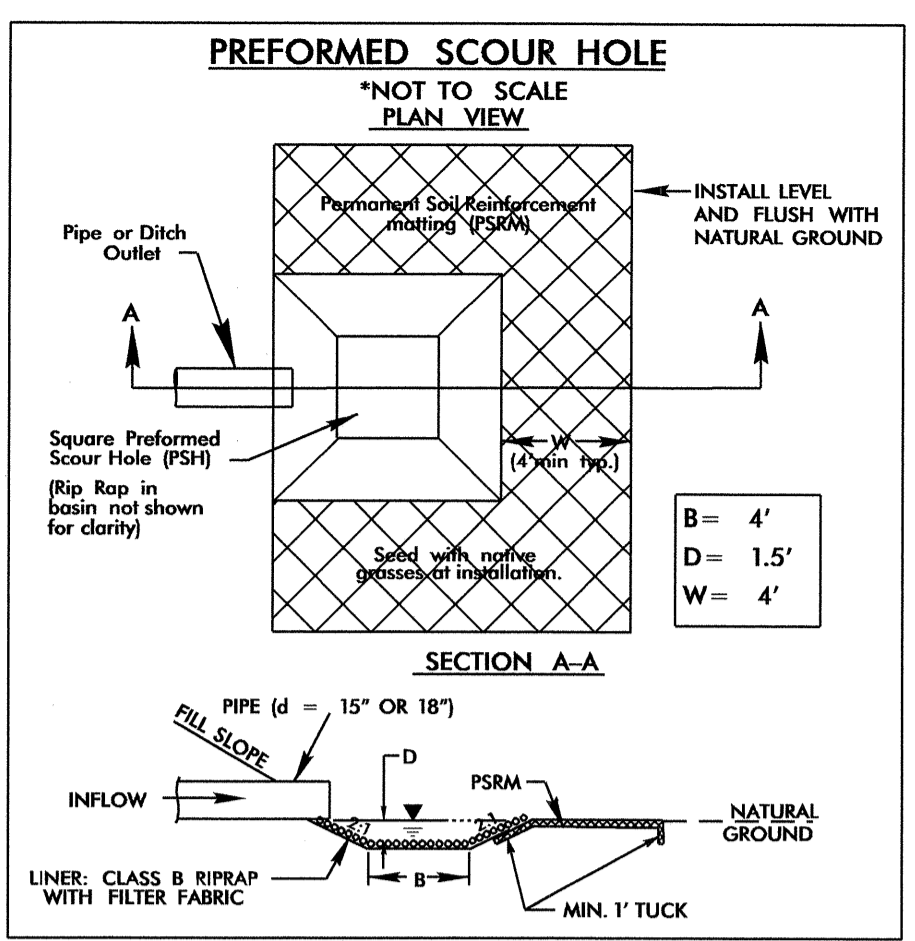
STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE	GEOTECH RECOMMENDATIONS FEBRUARY 9, 2009
-DET- 13+78.82	-DET- 18+57.30	25	4,374	4,349		UNDERCUT=750 CY
-DET- 20+50.18	-DET- 26+11.57	624	7,769	7,145		FABRIC FOR SOIL STABILIZATION=750 SY
-DRIREV- 10+19	-DRIREV- 11+24	36			36	
SUMMARY SUBTOTALS #1:		685	12,143	11,494		
-L- 16+75.00	-L- 19+38.13	97	750	653		
-L- 20+61.23	-L- 23+25.00	203	416	213		
-Y1- 10+12.00	-Y1- 12+53.42	578	22		556	
SUMMARY SUBTOTALS #2:		878	1,188	866		
SUMMARY TOTALS:		1,563	13,331	12,360	592	
SHOULDER MATERIAL (-L-, -DET-, -DRI-):			742	742		
TOTALS:		1,563	14,072	13,102		SHALLOW UNDERCUT STANDARD
USE WASTE IN LIEU OF BORROW:				-592	-592	SPECIAL PROVISION:
5% TO REPLACE TOPSOIL ON BORROW PIT				625		SHALLOW UNDERCUT=150 CY
PROJECT TOTALS:		1,563		13,135		FABRIC FOR SOIL STABILIZATION=200 SY
DETOUR REMOVAL TOTALS:		9,732	821	43	8,954	CLASS IV SUBGRADE STABILIZATION=300 TONS
GRAND TOTALS		11,295		13,178	0	UNDERDRAIN=250 LF
SAY:		11,325		13,195		
<p>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.</p> <p>Note: Approximate quantities only. Borrow Excavation, Fine Grading, Unclassified Excavation, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."</p>						

**PAVEMENT REMOVAL SUMMARY**

SURVEY LINE	STATION	STATION	LOCATION LY/RY/CL	YD'	
-L-	18+75.00	19+06.14	CL	67.12	
-L-	20+93.65	21+75.00	CL	217.04	
-DET-	10+26.18	11+44.39	CL	144.48	
-DET-	11+44.39	14+71.43	CL	799.43	
-DET-	17+56.43	21+33.84	CL	922.56	
-DET-	21+33.84	22+70.37	CL	166.87	
-Y1-	10+12.00	12+53.42	CL	503.67	
-DRIREV-	10+19.00	11+24.00	CL	116.67	
				TOTAL	2,937.84
				SAY	2,940



8/17/99



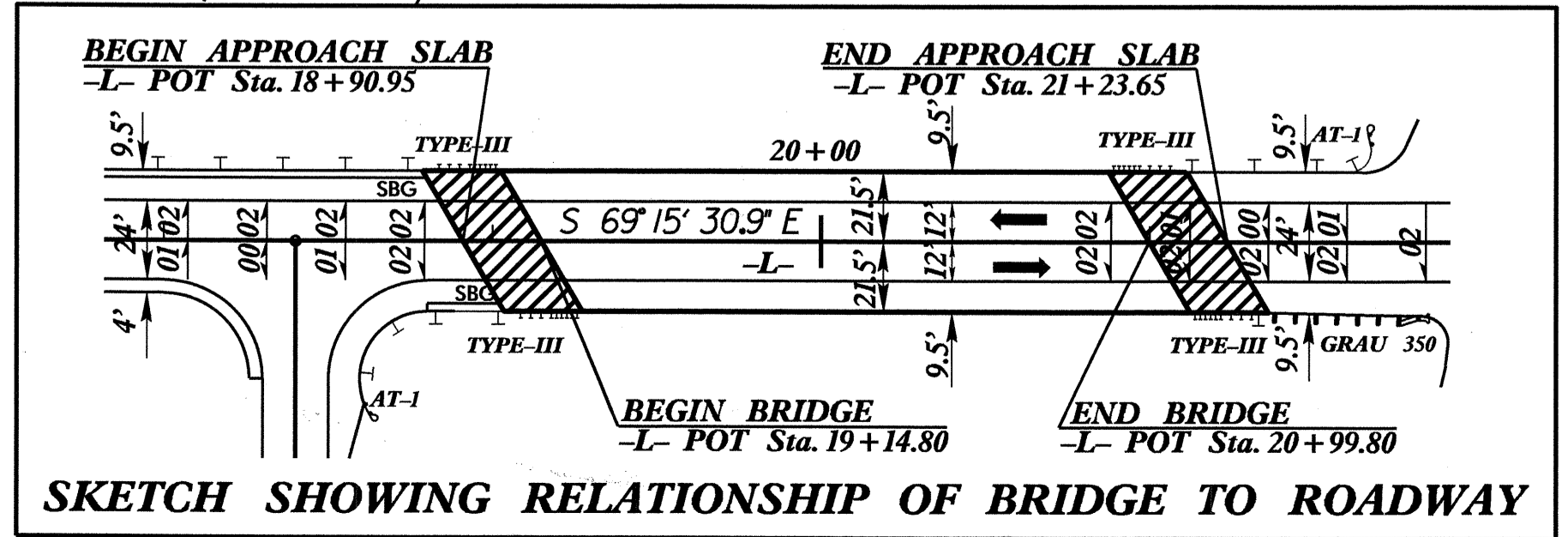
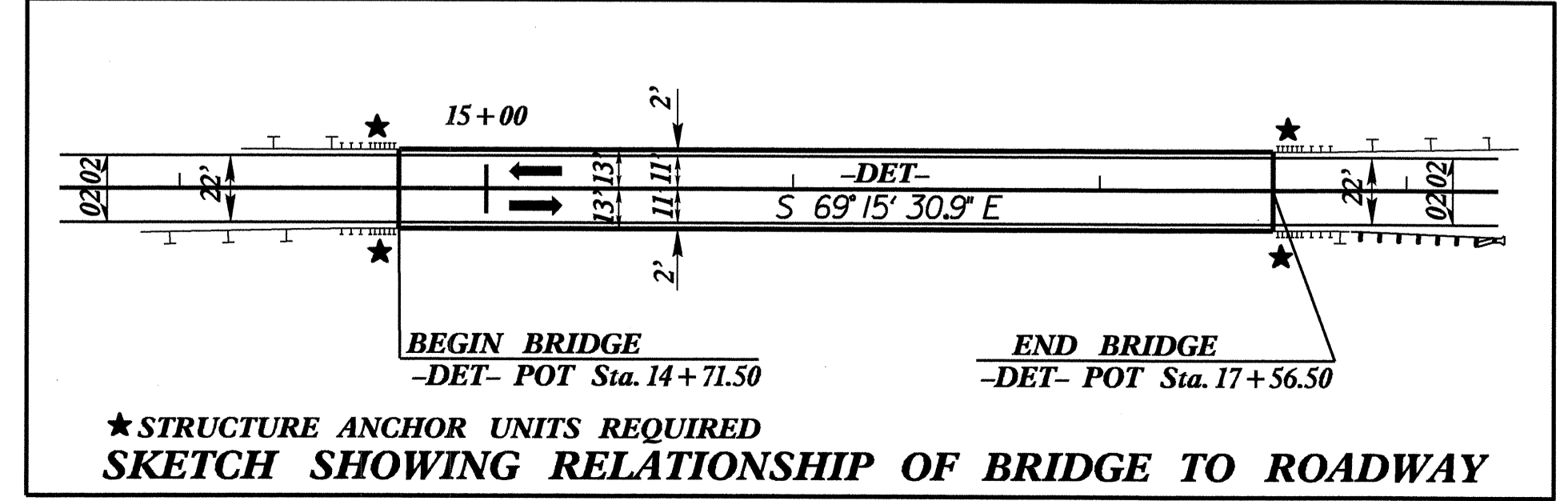
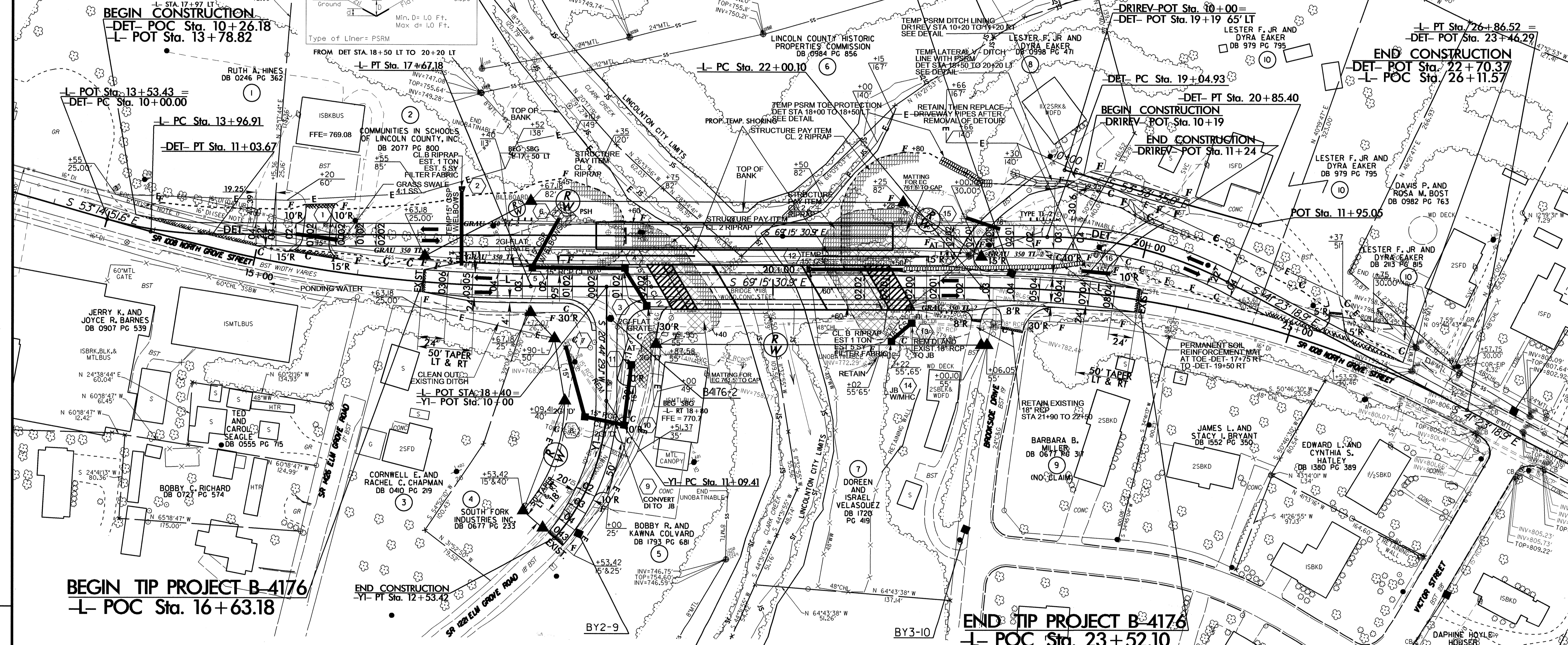
**-L-**  
 PI Sta 15+83.26  
 $\Delta = 16'00'' 39.3''$  (LT)  
 $D = 4'19'' 27.2''$   
 $L = 370.26'$   
 $T = 186.35'$   
 $R = 1,325.00'$   
 SE = SEE PLANS  
 RO = SEE PLANS

**-YI-**  
 PI Sta 24+48.22  
 $\Delta = 27'52'' 12.0''$  (RT)  
 $D = 5'43'' 46.5''$   
 $L = 486.42'$   
 $T = 248.12'$   
 $R = 1,000.00'$   
 SE = SEE PLANS  
 RO = SEE PLANS

**-YI-**  
 PI Sta 11+84.70  
 $\Delta = 4'15'' 25.4''$  (RT)  
 $D = 28'38'' 52.4''$   
 $L = 144.01'$   
 $T = 75.29'$   
 $R = 200.00'$   
 SE = SEE PLANS  
 RO = SEE PLANS

**-DET-**  
 PI Sta 10+52.18  
 $\Delta = 16'00'' 39.3''$  (LT)  
 $D = 15'26'' 37.0''$   
 $L = 103.67'$   
 $T = 52.18'$   
 $R = 371.00'$   
 SE = 04  
 RO = SEE PLANS

**-DET-**  
 PI Sta 19+96.99  
 $\Delta = 27'52'' 12.0''$  (RT)  
 $D = 15'26'' 37.0''$   
 $L = 180.46'$   
 $T = 92.05'$   
 $R = 371.00'$   
 SE = 04  
 RO = SEE PLANS



SEE SHEET 5 FOR -L- PROFILE  
 SEE SHEET 5 FOR -DET- PROFILE  
 SEE SHEET S-1 THROUGH S-42 FOR STRUCTURE PLANS  
 -DETOUR- SLOPE STAKES - - -  
 -L- SLOPE STAKES - - -

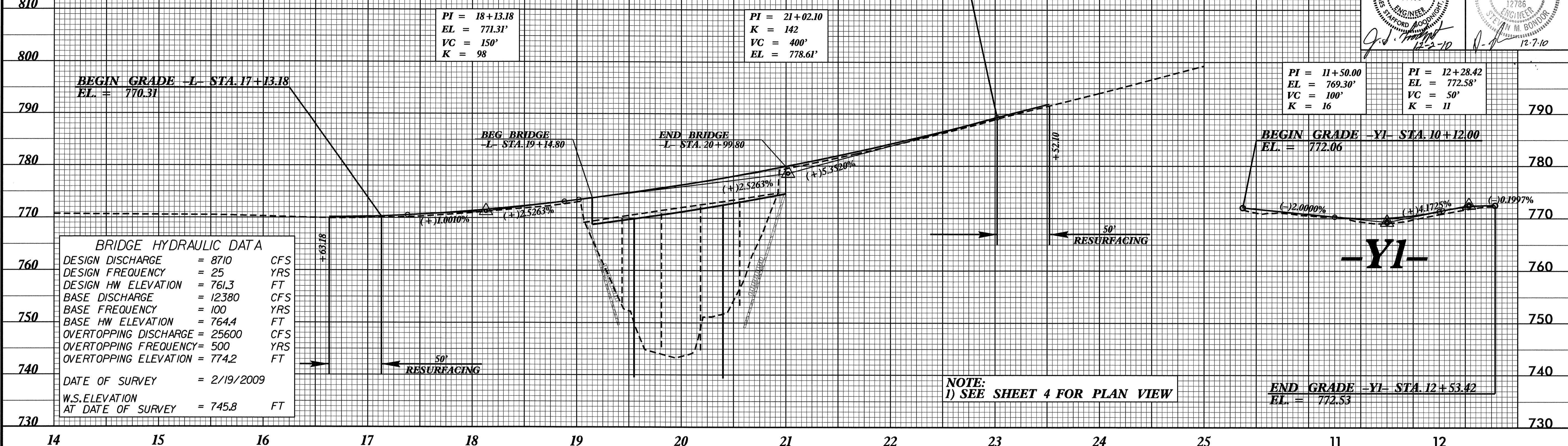
10-DEC-2010 10:00  
 C:\Hoodman\pco\B4176-Rdy\_psh04.dgn

5/28/99

BM # 2 N 635290 E 1324764  
RR SPIKE IN 18" SYCAMORE TREE  
BY2 STATION 7+08.00  
ELEV. = 770.01

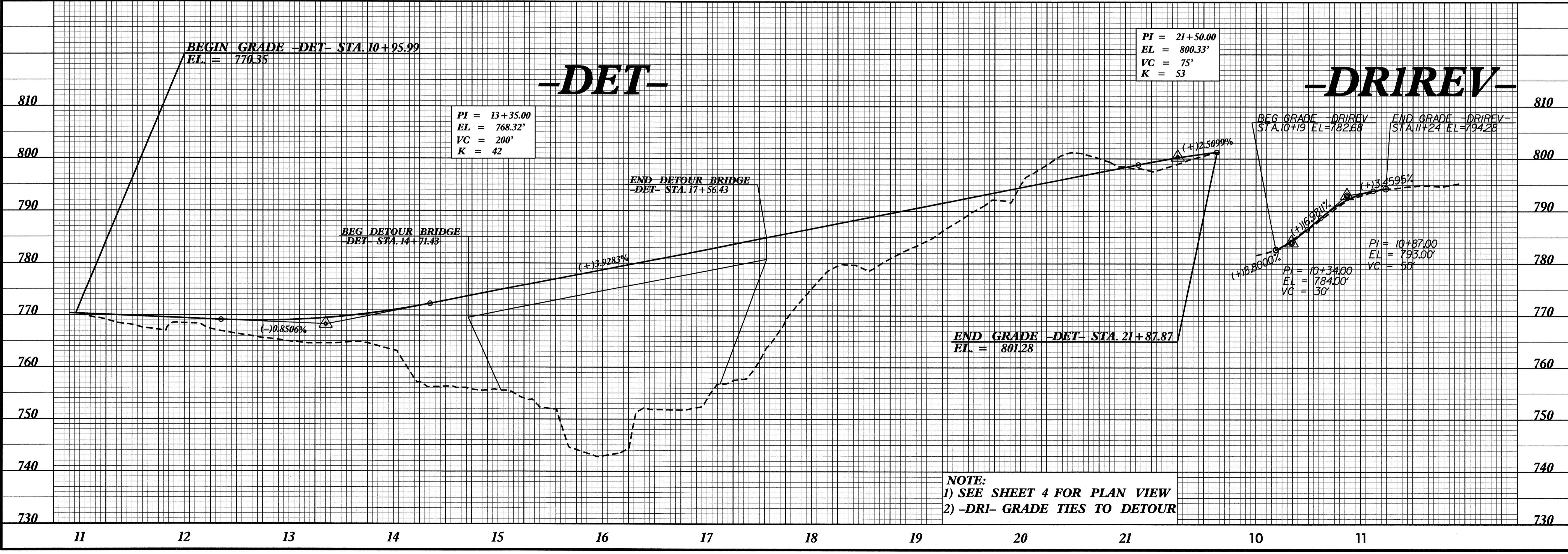
**-L-**

PROJECT REFERENCE NO. <b>B-4176</b>	SHEET NO. <b>5</b>
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 



**-DET-**

**-DRIREV-**



01-DEC-2010 07:41  
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