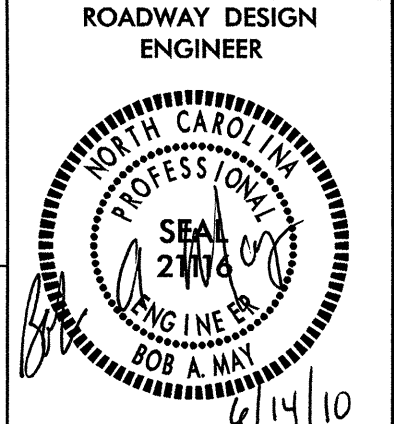
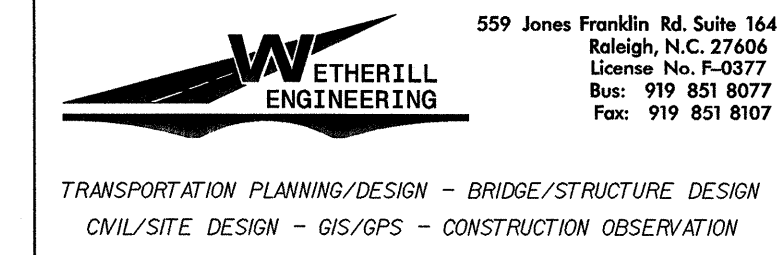


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS



LIST OF ROADWAY STANDARDS

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

2006 ROADWAY ENGLISH STANDARD DRAWINGS

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

| STD.NO. | TITLE |
|---|---|
| DIVISION 2 - EARTHWORK | |
| 200.02 | Method of Clearing - Method II |
| 225.02 | Guide for Grading Subgrade - Secondary and Local |
| 225.04 | Method of Obtaining Superelevation - Two Lane Pavement |
| DIVISION 3 - PIPE CULVERTS | |
| 310.10 | Driveway Pipe Construction |
| DIVISION 5 - SUBGRADE, BASES AND SHOULDERS | |
| 560.01 | Method of Shoulder Construction - High Side of Superelevated Curve - Method I |
| DIVISION 6 - ASPHALT BASES AND PAVEMENTS | |
| 654.01 | Pavement Repairs |
| DIVISION 8 - INCIDENTALS | |
| 806.01 | Concrete Right-of-Way Marker |
| 806.02 | Granite Right-of-Way Marker |
| 815.03 | Pipe Underdrain and Blind Drain |
| 838.07 | Conc. Endwall for Single & Double Pipe Culverts - 40"x31" thru 66"x51" Arch 90 Skew |
| 838.17 | Brick Endwall for Single & Double Pipe Culverts - 40"x31" thru 66"x51" Arch 90 Skew |
| 840.00 | Concrete Base Pad for Drainage Structures |
| 840.14 | Concrete Drop Inlet - 12" thru 30" Pipe |
| 840.15 | Brick Drop Inlet - 12" thru 30" Pipe |
| 840.16 | Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15 |
| 840.18 | Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe |
| 840.22 | Frames and Wide 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 Precast Drainage Structure |
| 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 |
| 862.04 | Anchoring End of Guardrail - B-77 and B-83 Anchor Units |
| 876.02 | Guide for Rip Rap at Pipe Outlets |
| 876.04 | Drainage Ditches with Class 'B' Rip Rap |

GENERAL NOTES

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

UNDERDRAINS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

SUBSURFACE PLANS:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE; PROGRESS ENERGY & BELLSOUTH
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 CONTRACT.

INDEX OF SHEETS

| Sheet Number | Sheet |
|--------------------|---|
| 1 | Title Sheet |
| 1-A | Index of Sheets, Roadway Standards, General Notes |
| 1-B | Conventional Symbols |
| 1-C | Survey Control Sheet |
| 2 Thru 2-A | Typical Sections, Pavement Schedule |
| 2-B | Detour Plan Sheet |
| 2-C | Anchorage For Frames Detail |
| 2-D | Detail for Bridge Approach Fill - Subregional Tier |
| 2-E Thru 2-P | Temporary Shoring Details |
| 2-Q | Detail for Rock Fill in Pond |
| 2-R | Concrete Endwall for Double 53"x41" Pipe Culverts |
| 2-S Thru 2-T | Method of Pipe Installation |
| 3 | Summary of Quantities |
| 3-A | Summary of Earthwork, Summary of Existing Asphalt Pavement Removal, Guardrail Summary and Temporary Guardrail Summary, List of Pipes, Endwalls, Etc., (for pipes 48" & Under) and List of Temporary Pipes, Endwalls, Etc. (For Pipes 48" & Under) |
| 3-B | Plan and Profile Sheets |
| 4 Thru 6 | Traffic Control Plans |
| TCP-1 Thru TCP-7 | Special Sign Detail |
| SD-1 | Pavement Marking Plans |
| PMP-1 Thru PMP-2 | Erosion Control Plans |
| EC-1 Thru EC-6 | Reforestation Plans |
| RF-1 | Signage Plans |
| SIGN-1 Thru SIGN-3 | Utilities by others Plans |
| UO-1 Thru UO-2 | Cross Section Summary Sheet |
| X-1A | Cross Sections |
| X-1 Thru X-8 | Cross Sections |
| S-1 Thru S-23 | Structure Plans |

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 | ○ 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 | ○ |
| Wetland | ⊗ |
| Proposed Lateral, Tail, Head Ditch | ← FLOW |
| 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 | ○ RW |
| Proposed Right of Way Line with Iron Pin and Cap Marker | ○ RW |
| Proposed Right of Way Line with Concrete or Granite Marker | ○ RW |
| Existing Control of Access | ⊗ |
| Proposed Control of Access | ⊗ |
| Existing Easement Line | E |
| Proposed Temporary Construction Easement | E |
| Proposed Temporary Drainage Easement | TDE |
| Proposed Permanent Drainage Easement | PDE |
| Proposed Permanent Utility Easement | PUE |
| Proposed Temporary Utility Easement | TUE |
| Proposed Permanent Easement with Iron Pin and Cap Marker | ◆ |

ROADS AND RELATED FEATURES:

| | |
|----------------------------|-------|
| Existing Edge of Pavement | ----- |
| Existing Curb | ----- |
| Proposed Slope Stakes Cut | C |
| Proposed Slope Stakes Fill | F |
| Proposed Wheel Chair Ramp | WCR |
| Existing Metal Guardrail | ----- |
| Proposed Guardrail | ----- |
| Existing Cable Guiderail | ----- |
| Proposed Cable Guiderail | ----- |
| Equality Symbol | ⊕ |
| Pavement Removal | ⊗ |

VEGETATION:

| | |
|--------------|----------|
| Single Tree | ⊕ |
| Single Shrub | ⊕ |
| Hedge | ----- |
| Woods Line | ----- |
| Orchard | ⊕ |
| Vineyard | Vineyard |

EXISTING STRUCTURES:

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

UTILITIES:

| | |
|-------------------------------------|---|
| POWER: | |
| Existing Power Pole | ● |
| Proposed Power Pole | ○ |
| Existing Joint Use Pole | ● |
| Proposed Joint Use Pole | ○ |
| Power Manhole | ⊕ |
| Power Line Tower | ⊗ |
| Power Transformer | ⊗ |
| U/G Power Cable Hand Hole | ⊕ |
| 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 | W |
| Designated U/G Water Line (S.U.E.*) | W |
| Above Ground Water Line | A/G Water |

TV:

| | |
|--|-------|
| TV Satellite Dish | ⊕ |
| TV Pedestal | ⊕ |
| TV Tower | ⊕ |
| U/G TV Cable Hand Hole | ⊕ |
| 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 |

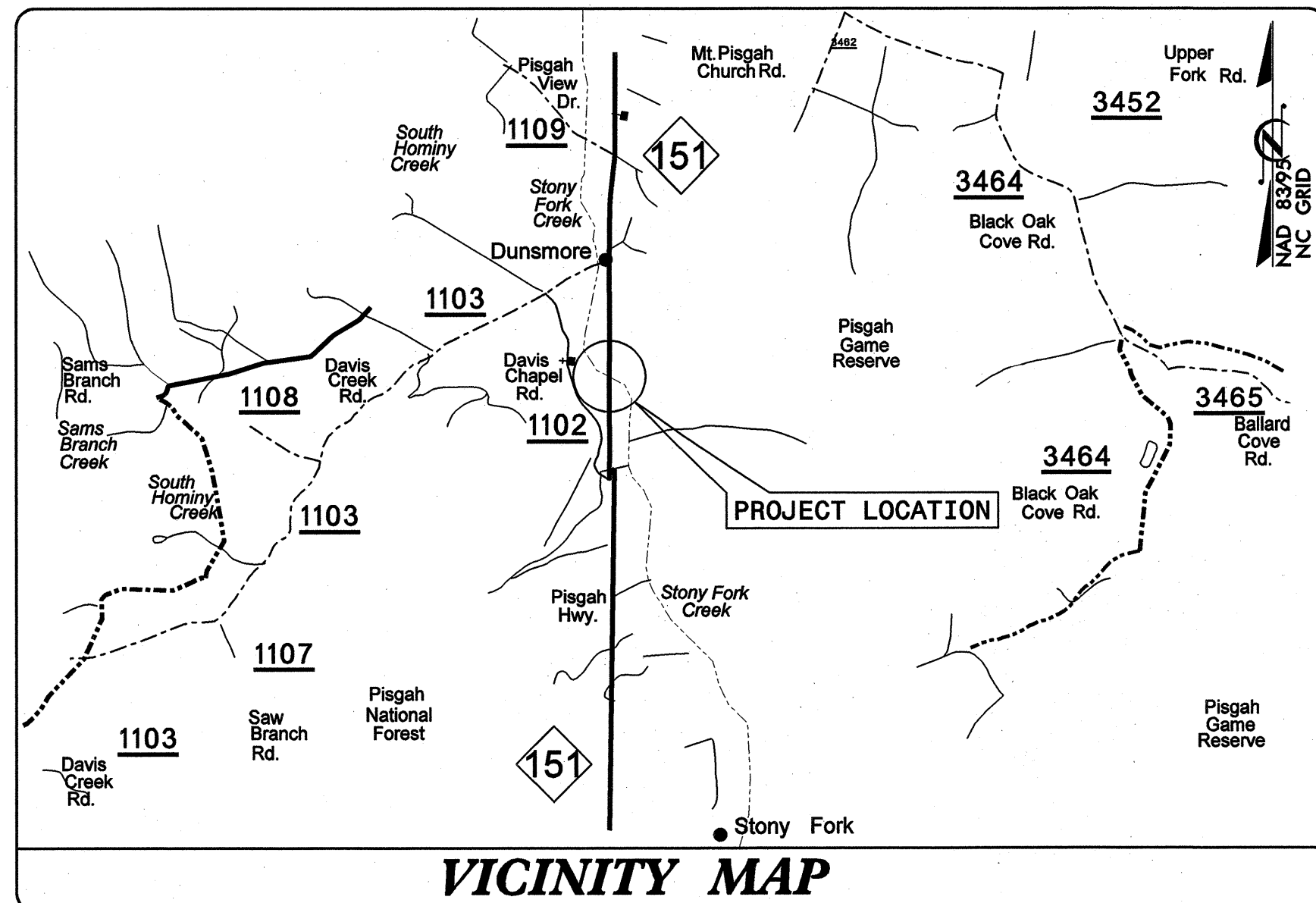
SANITARY SEWER:

| | |
|--|--------------------|
| 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 | UTL |
| 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. |

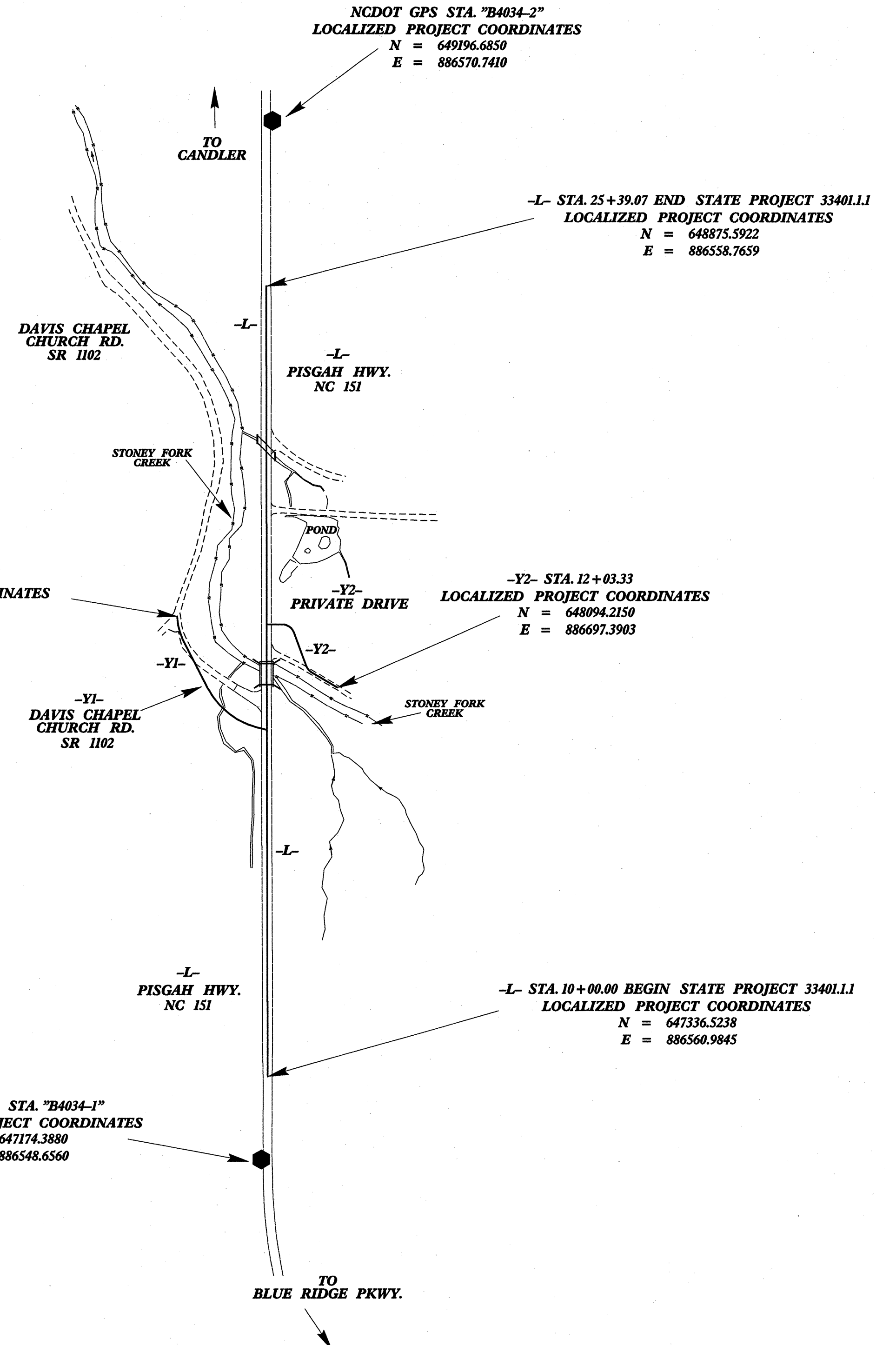
SURVEY CONTROL SHEET B-4034



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4034-1" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 647174.3880(±) EASTING: 886548.6560(±) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999789856 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4034-1" TO -L- STATION 10+00.00 IS S 4°20'54" W 162.60'

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



| BL | POINT | DESC. | NORTH | EAST | ELEVATION | L STATION | OFFSET |
|------|-------|---------|-------------|-------------|-----------|------------------------|----------|
| GPS1 | | B4034-1 | 647174.3880 | 886548.6560 | 2478.47 | OUTSIDE PROJECT LIMITS | |
| 2 | | BL-2 | 647526.5530 | 886546.1180 | 2464.82 | 11+90.05 | 14.59 LT |
| 3 | | BL-3 | 648169.0080 | 886545.3090 | 2438.34 | 18+32.51 | 14.48 LT |
| GPS2 | | B4034-2 | 649196.6850 | 886570.7410 | 2412.59 | OUTSIDE PROJECT LIMITS | |

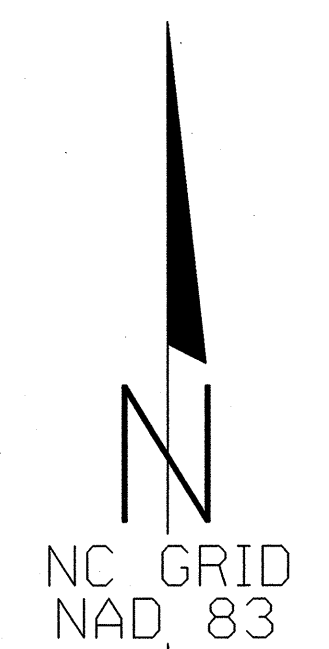
| BY | POINT | DESC. | NORTH | EAST | ELEVATION | Y1 STATION | OFFSET |
|-----|-------|--------|-------------|-------------|-----------|------------------------|-----------|
| 101 | | BY-101 | 648546.5805 | 886475.9826 | 2426.16 | OUTSIDE PROJECT LIMITS | |
| 100 | | BY-100 | 648301.6255 | 886397.5540 | 2437.24 | OUTSIDE PROJECT LIMITS | |
| BY3 | | | 648169.0080 | 886545.3090 | 2438.34 | 11+30.84 | 123.93 LT |

 BM1 ELEVATION = 2442.21
 N 647984 E 886511
 L STATION 16+47 49 LEFT
 RR SPIKE SET IN 30" POPLAR

 BM2 ELEVATION = 2430.35
 N 648489 E 886476
 L STATION 21+53 83 LEFT
 RR SPIKE SET IN 14" SYCAMORE

NOTES:

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/RECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/RECONSTRUCT/HIGHWAY/LOCATION/PROJECT/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:
 B4034_LS_CONTROL_080204.TXT
 SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
 NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)



NOTE: DRAWING NOT TO SCALE

6/2/99
 1/19/2010 AN
 D:\192101\Roadwork\Pro\B4034_1s_1c_080204.dwg

6/22/99

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

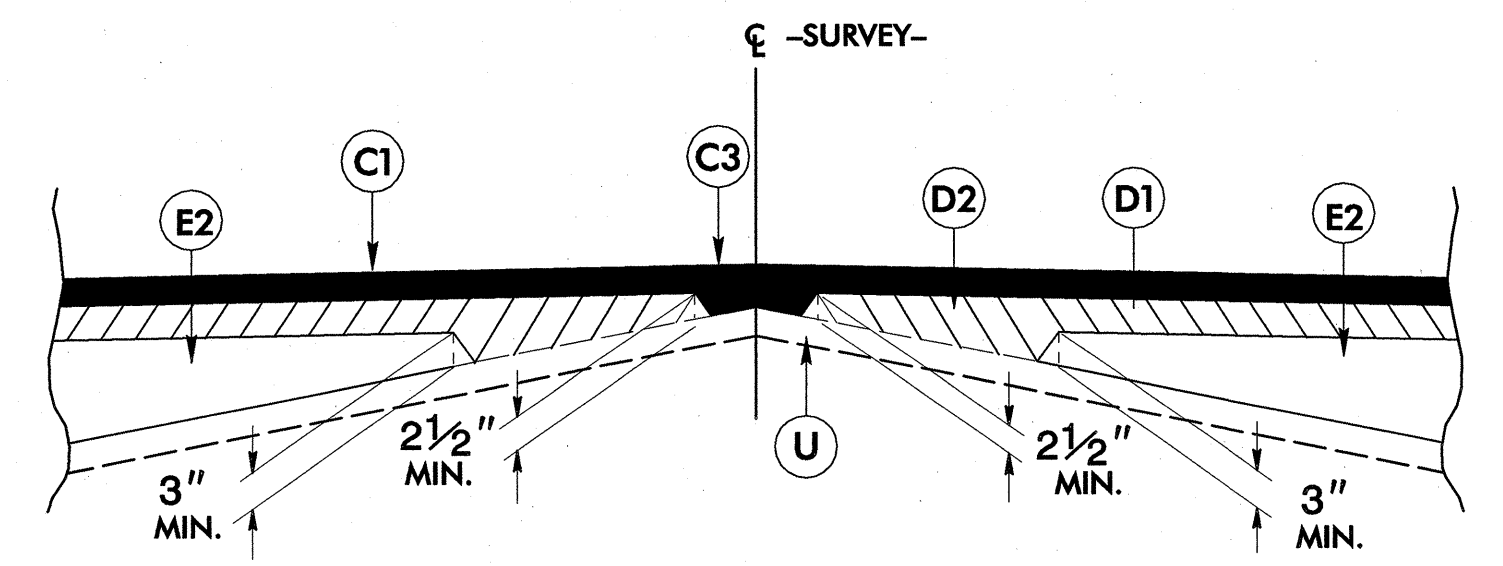
WETHERILL ENGINEERING

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

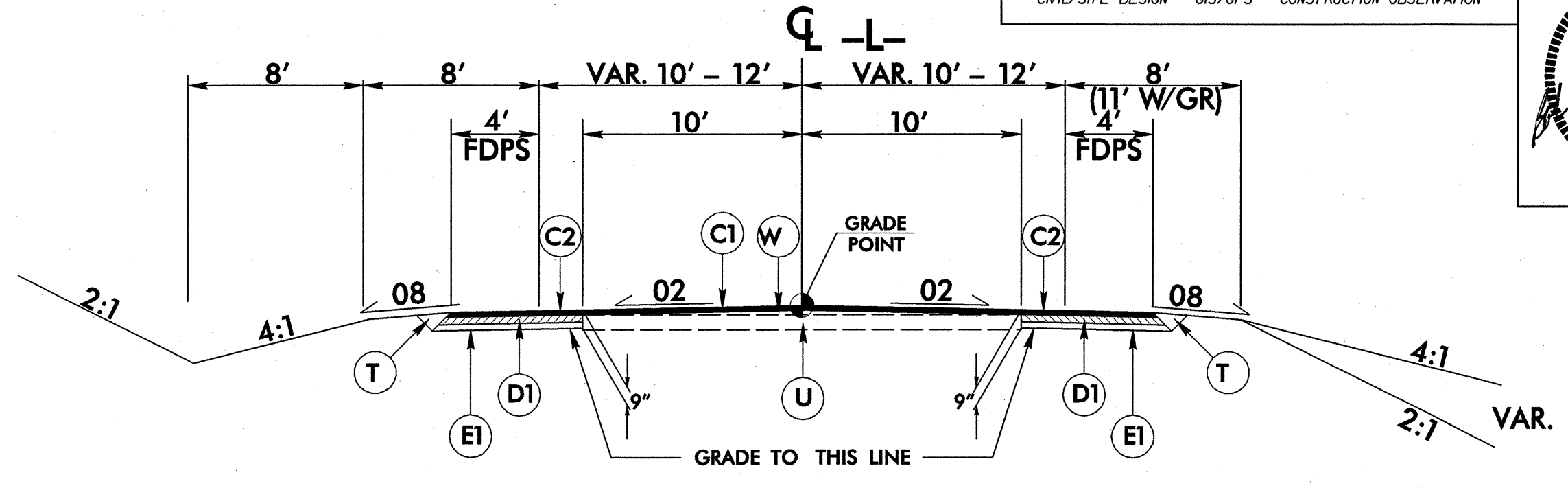
| | |
|---|--|
| PROJECT REFERENCE NO. B-4034 | SHEET NO. 2 |
| ROADWAY DESIGN ENGINEER <i>[Signature]</i> | PAVEMENT DESIGN ENGINEER <i>[Signature]</i> |
| | |

| PAVEMENT SCHEDULE | |
|-------------------|--|
| C1 | PROP. APPROX. 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. |
| C2 | PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS. |
| C3 | PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH. |
| D1 | PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.OB, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD. |
| D2 | PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.OB, 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. |
| E1 | PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.OB, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. |
| E2 | PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.OB, 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. |
| J1 | PROP. 6" AGGREGATE BASE COURSE. |
| J2 | PROP. 8" AGGREGATE BASE COURSE. |
| P | PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YD. |
| T | EARTH MATERIAL. |
| U | EXISTING PAVEMENT. |
| W | VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL) |

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



Detail Showing Method of Wedging



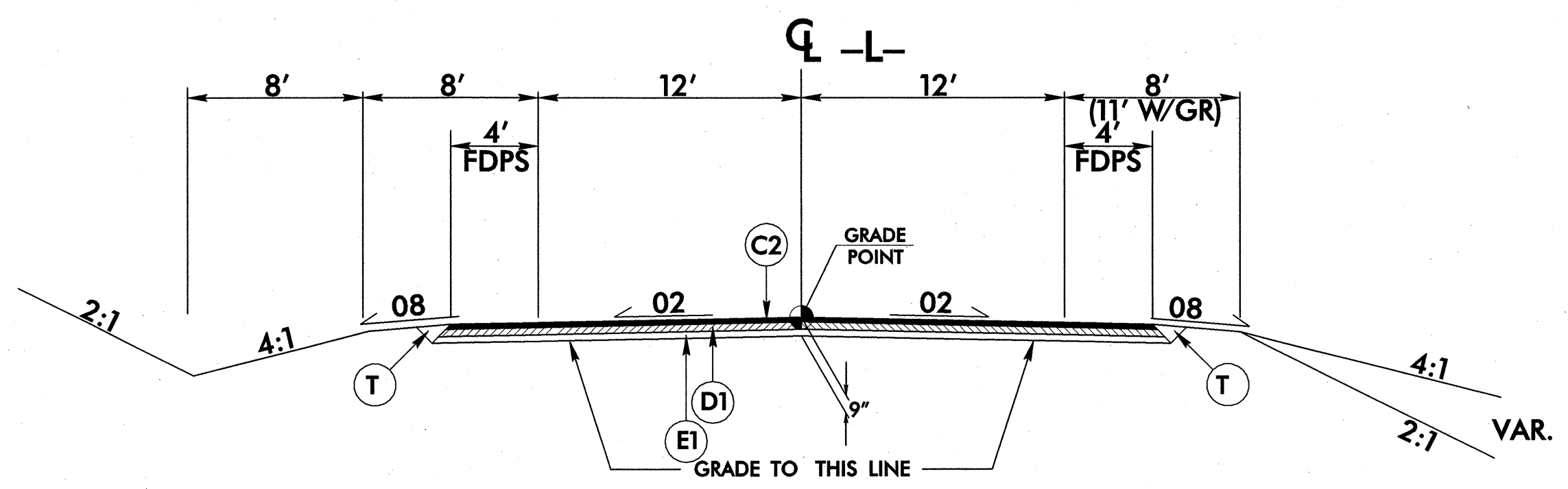
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
 -L- STA. 14+50.00 TO -L- STA. 17+15.38
 -L- STA. 18+85.54 TO -L- STA. 20+62.11

TRANSITION FROM EXISTING TO TYPICAL SECTION NO. 1
 -L- STA. 14+00.00 TO -L- STA. 14+50.00

TRANSITION FROM TYPICAL NO. 1 TO EXISTING
 -L- STA. 20+62.11 TO -L- STA. 21+12.11

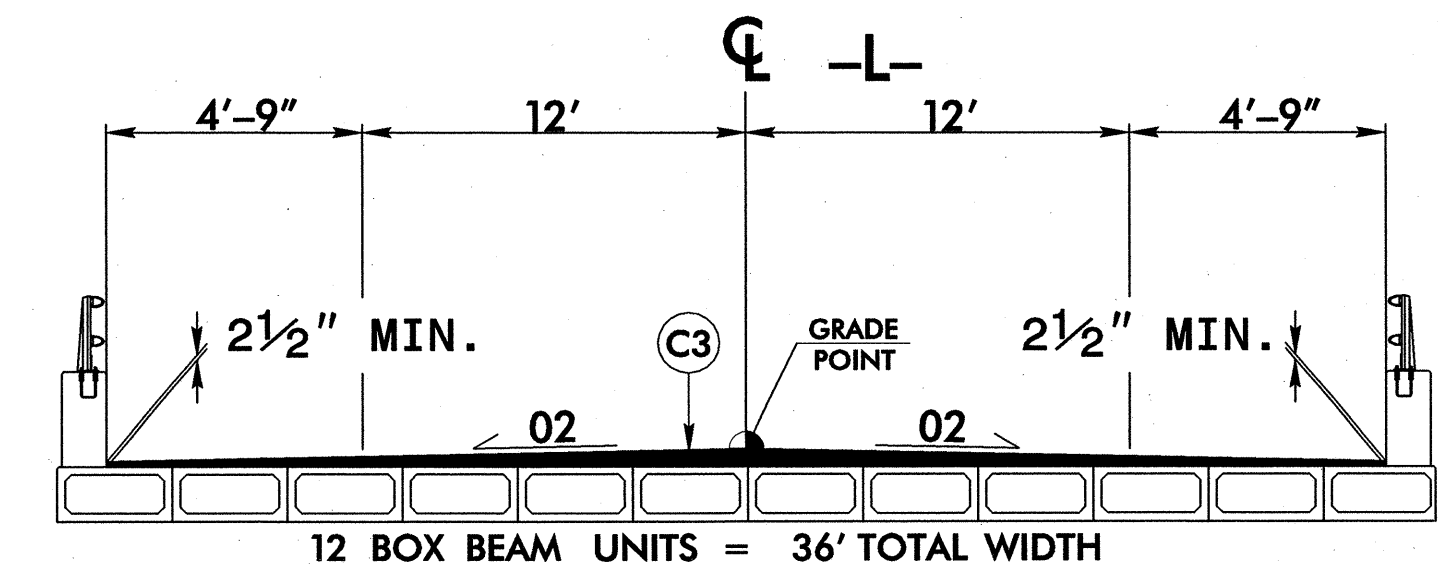
NOTE: RESURFACE -L- AT THE FOLLOWING LOCATIONS
 -L- STA. 13+50.00 TO -L- STA. 14+00.00
 -L- STA. 21+12.11 TO -L- STA. 22+00.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
 -L- STA. 17+15.38 TO -L- STA. 17+46.00 (BEGIN BRIDGE)
 -L- STA. 18+31.00 (END BRIDGE) TO -L- STA. 18+85.54

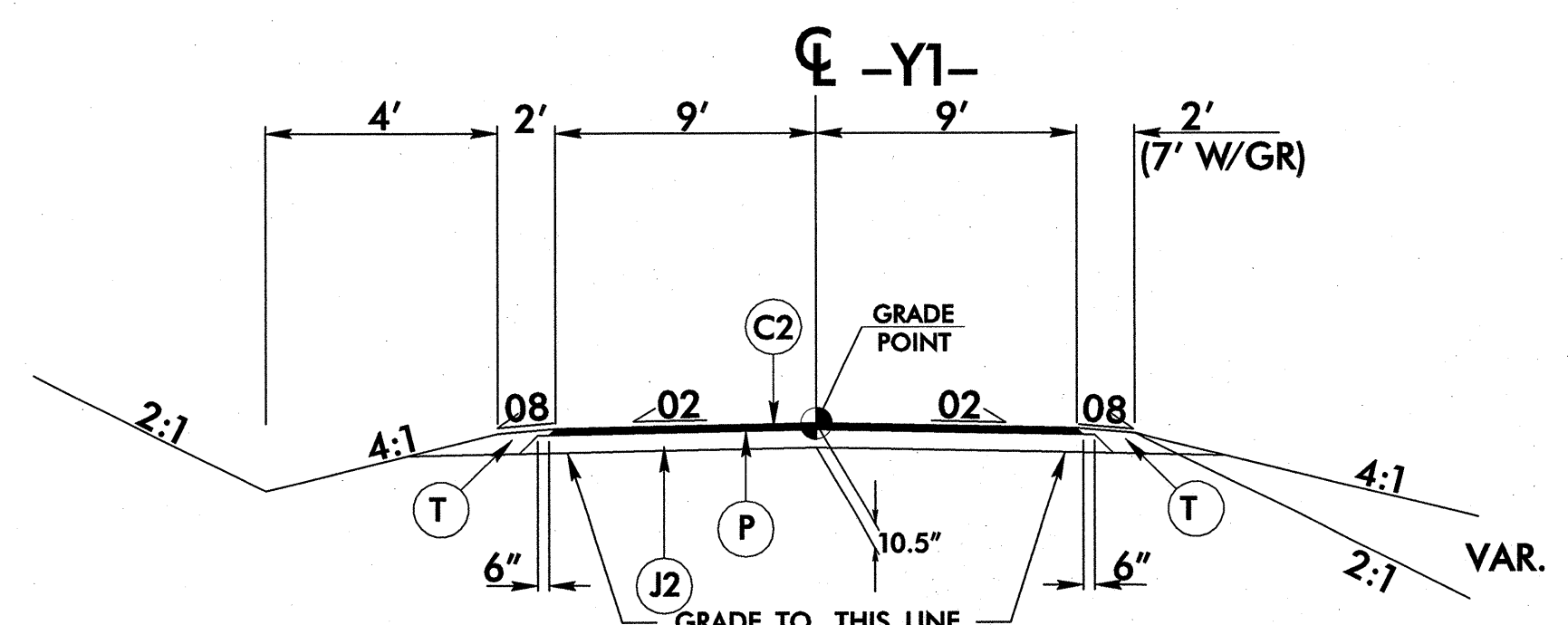
NOTE: A DESIGN EXCEPTION IS REQUIRED FOR THE PROPOSED BRIDGE WIDTH FOR -L-.



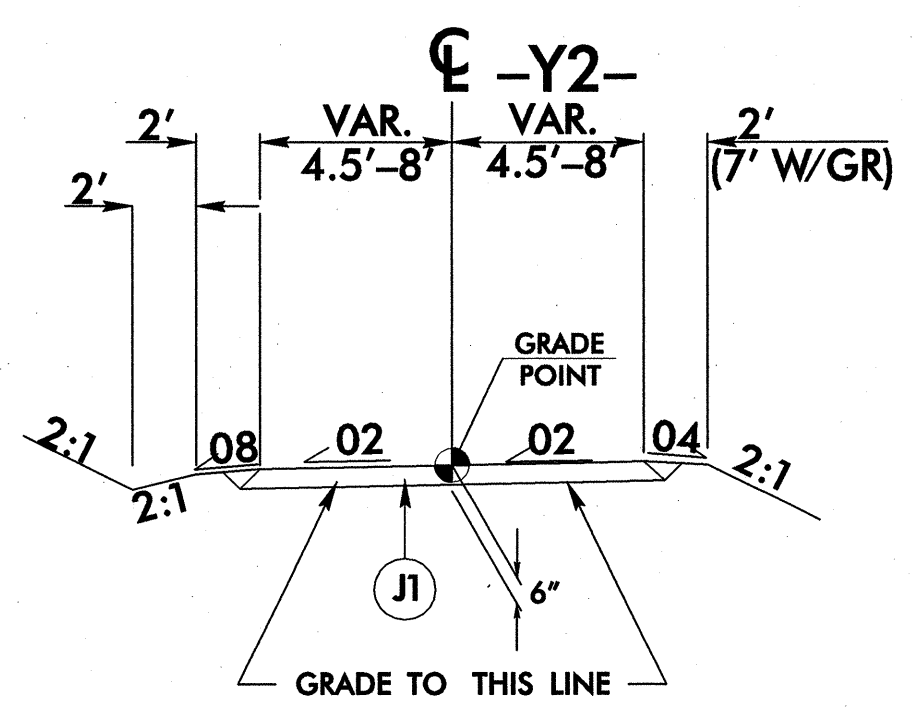
TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3
 -L- STA. 17+46.00 (BEGIN BRIDGE) TO -L- STA. 18+31.00 (END BRIDGE)

1/19/2010 4:01 AM Roadway\Proc\B-4034\rdcu_ttu.dgn

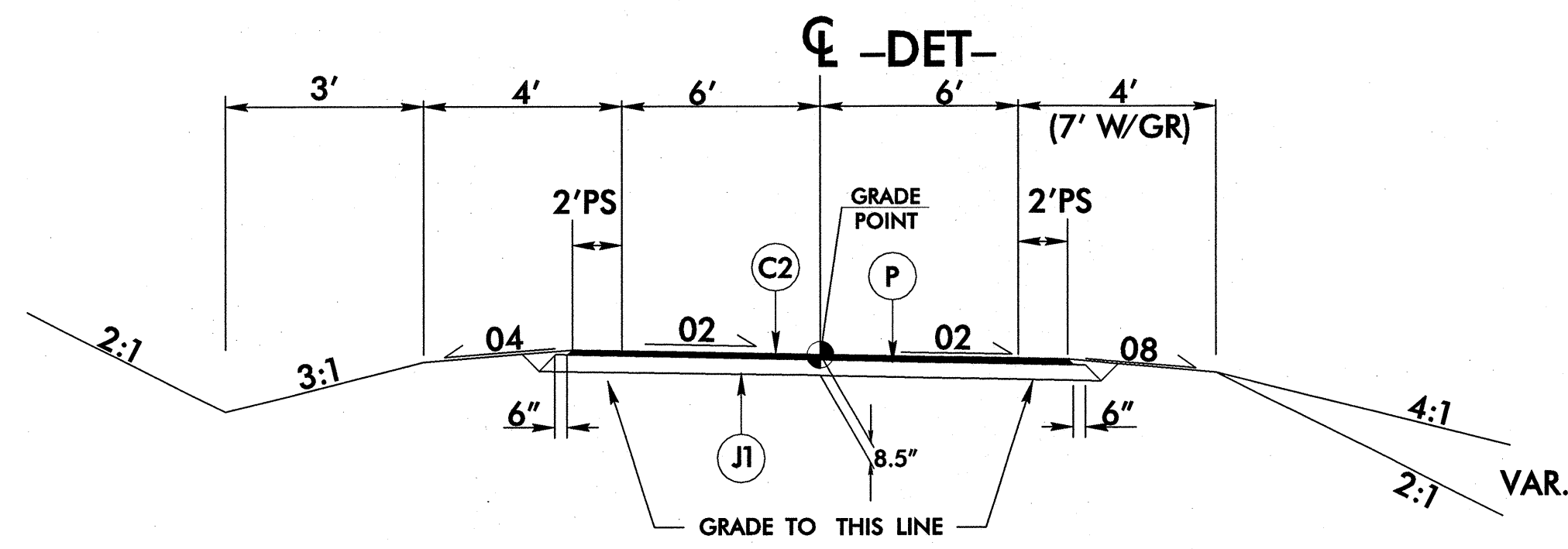


TYPICAL SECTION NO. 4
 USE TYPICAL SECTION NO. 4
 -Y1- STA. 10+00.00 TO -Y1- STA. 12+85.99



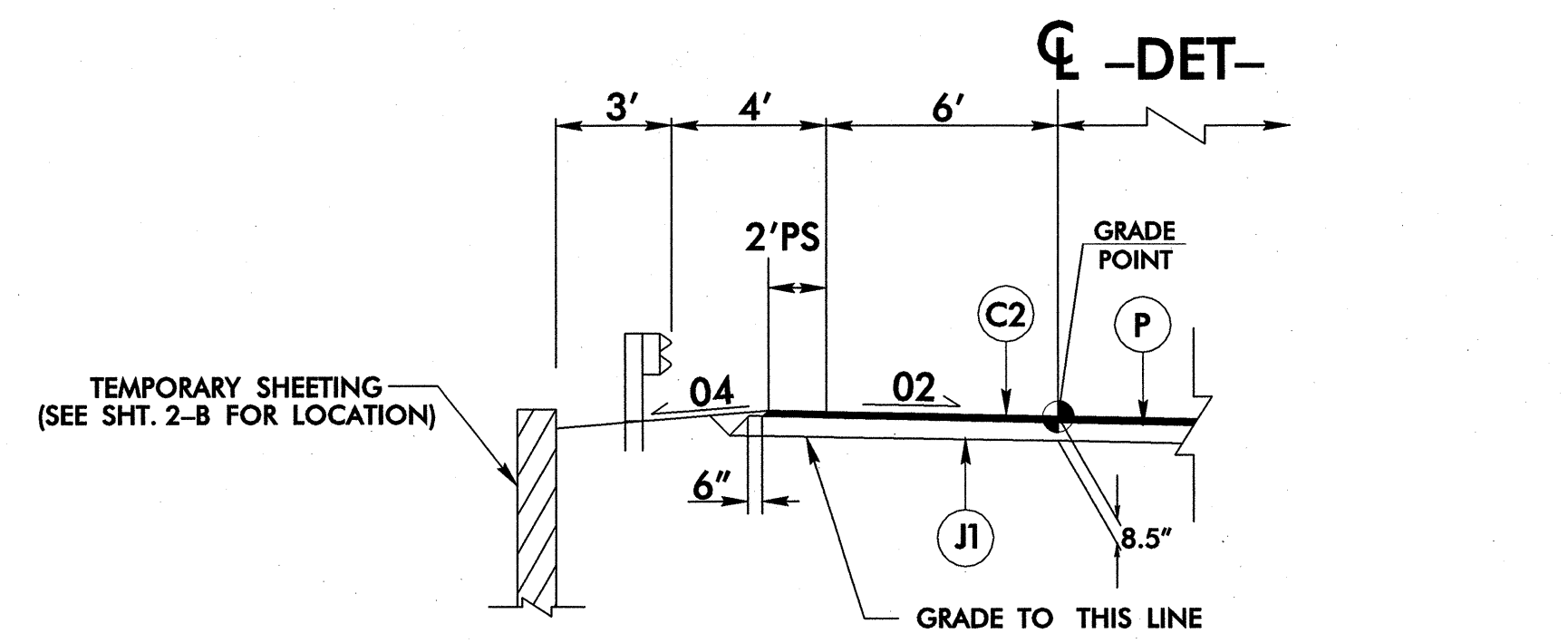
TYPICAL SECTION NO. 5
 USE TYPICAL SECTION NO. 5
 -Y2- STA. 10+27.58 TO -Y2- STA. 11+73.06

NOTE: PAVE -Y2- TO RADIUS RETURN TO RETAIN ABC IN PLACE.

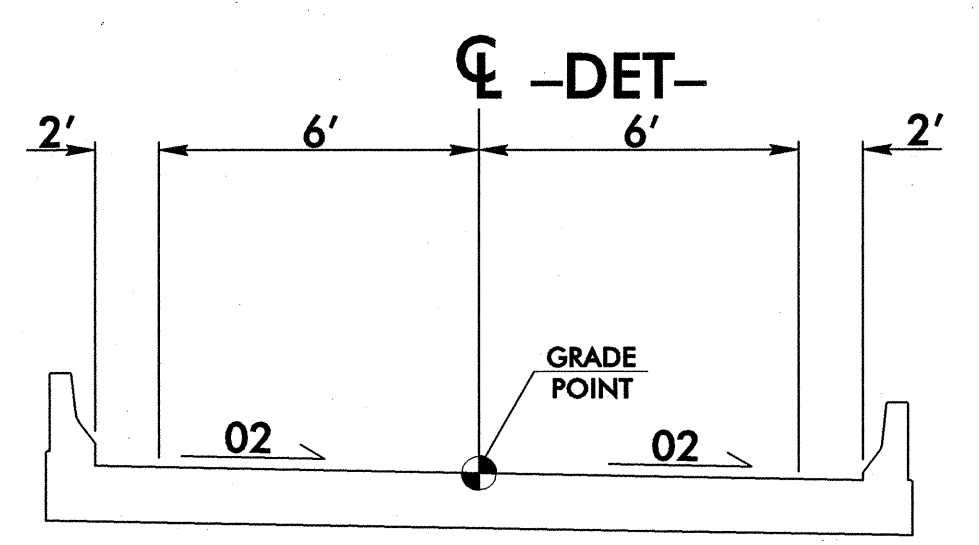


TYPICAL SECTION NO. 6
 USE TYPICAL SECTION NO. 6
 -DET- STA. 11+14.34 TO -DET- STA. 13+60.00 (BEGIN BRIDGE)
 -DET- STA. 14+45.00 (END BRIDGE) TO -DET- STA. 16+60.62

TRANSITION FROM EXISTING TO
 TYPICAL SECTION NO. 6
 -DET- STA. 10+52.33 TO -DET- STA. 11+14.34
 TRANSITION FROM TYPICAL NO. 6
 TO EXISTING
 -DET- STA. 16+60.62 TO -DET- STA. 17+21.36



PARTIAL SECTION NO. 6A
 USE TYPICAL SECTION NO. 6
 -DET- STA. 14+45+/- TO -DET- STA. 14+90+/- LT.



BRIDGE TYPICAL SECTION NO. 7
 USE TYPICAL SECTION NO. 7
 -DET- STA. 13+60.00 (BEGIN BRIDGE) TO -DET- STA. 14+45.00 (END BRIDGE)

PAVEMENT SCHEDULE

| | |
|----|-----------------|
| C1 | 1 1/4" SF9.5A |
| C2 | 2 1/2" SF9.5A |
| C3 | VAR. SF9.5A |
| D1 | 2 1/2" I19.5B |
| D2 | VAR. I19.0B |
| E1 | 4" B25.0B |
| E2 | VAR. B25.0B |
| J1 | 6" ABC |
| J2 | 8" ABC |
| P | PRIME COAT |
| T | EARTH MATERIAL |
| U | EXIST. PAVEMENT |
| W | WEDGING |

6/2/99
 1/19/2010 11:31:42 AM
 S:\B-4034\Roadway\Pro\B-4034_rdw.txd

8/17/99
9:30:35 AM
P:\B-4034\Roadway\Proj\B-4034_rdy_psh_det.dwg
12/2/2010

TEMPORARY SHORING LINE NO. 1

FOR TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.

FOR CONTRACTOR DESIGNED SHORING, SURVEY THE SHORING LOCATION TO DETERMINE EXISTING ELEVATIONS AND ACTUAL DESIGN HEIGHTS BEFORE BEGINNING DESIGN.

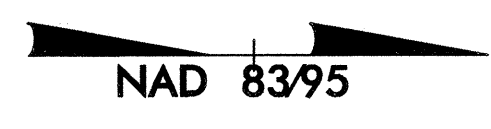
WHEN USING CONTRACTOR DESIGNED SHORING FROM STATION 14+45.00+/- -L-, 13 FT. FROM CENTERLINE OF DETOUR LEFT OF -L-, TO STATION 14+89.00+/- -L-, 13 FT. FROM CENTERLINE OF DETOUR LEFT OF -L-, USE THE FOLLOWING SOIL PARAMETERS.

UNIT WEIGHT OF SOIL ABOVE WATER TABLE, $\gamma = 120$ PCF
 UNIT WEIGHT OF SOIL BELOW WATER TABLE, $\gamma = 60$ PCF
 FRICTION ANGLE, $\phi = 30$ DEGREES
 COHESION, $c = 0$ PSF

NO SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF THE TEMPORARY SHORING FROM STATION 14+45.00+/- -L-, 13 FT. FROM CENTERLINE OF DETOUR LEFT OF -L-, TO STATION 14+89.00+/- -L-, 13 FT. FROM CENTERLINE OF DETOUR LEFT OF -L-. THE INFORMATION PROVIDED FOR DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

FOR PORTABLE CONCRETE BARRIERS ABOVE AND BEHIND TEMPORARY SHORING, USE AN NCDOT PORTABLE CONCRETE BARRIER (UNANCHORED OR ANCHORED) OR AN OREGON TALL F-SHAPE CONCRETE BARRIER IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS.

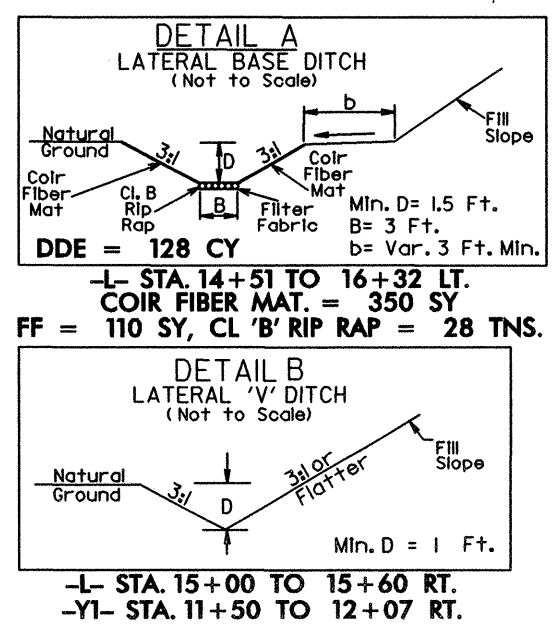
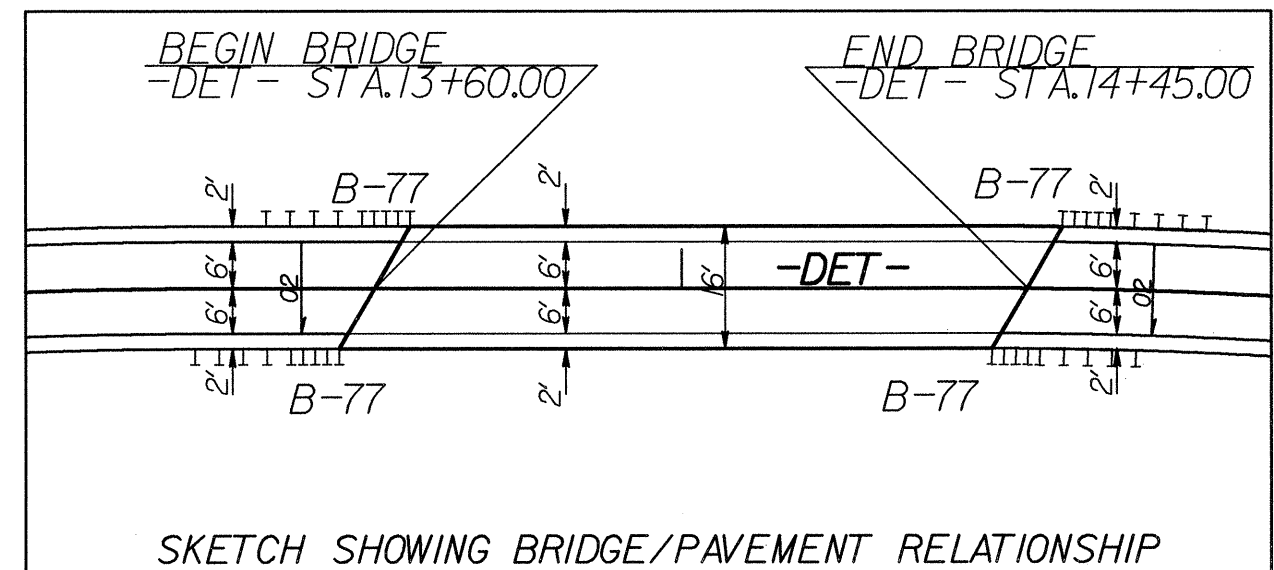
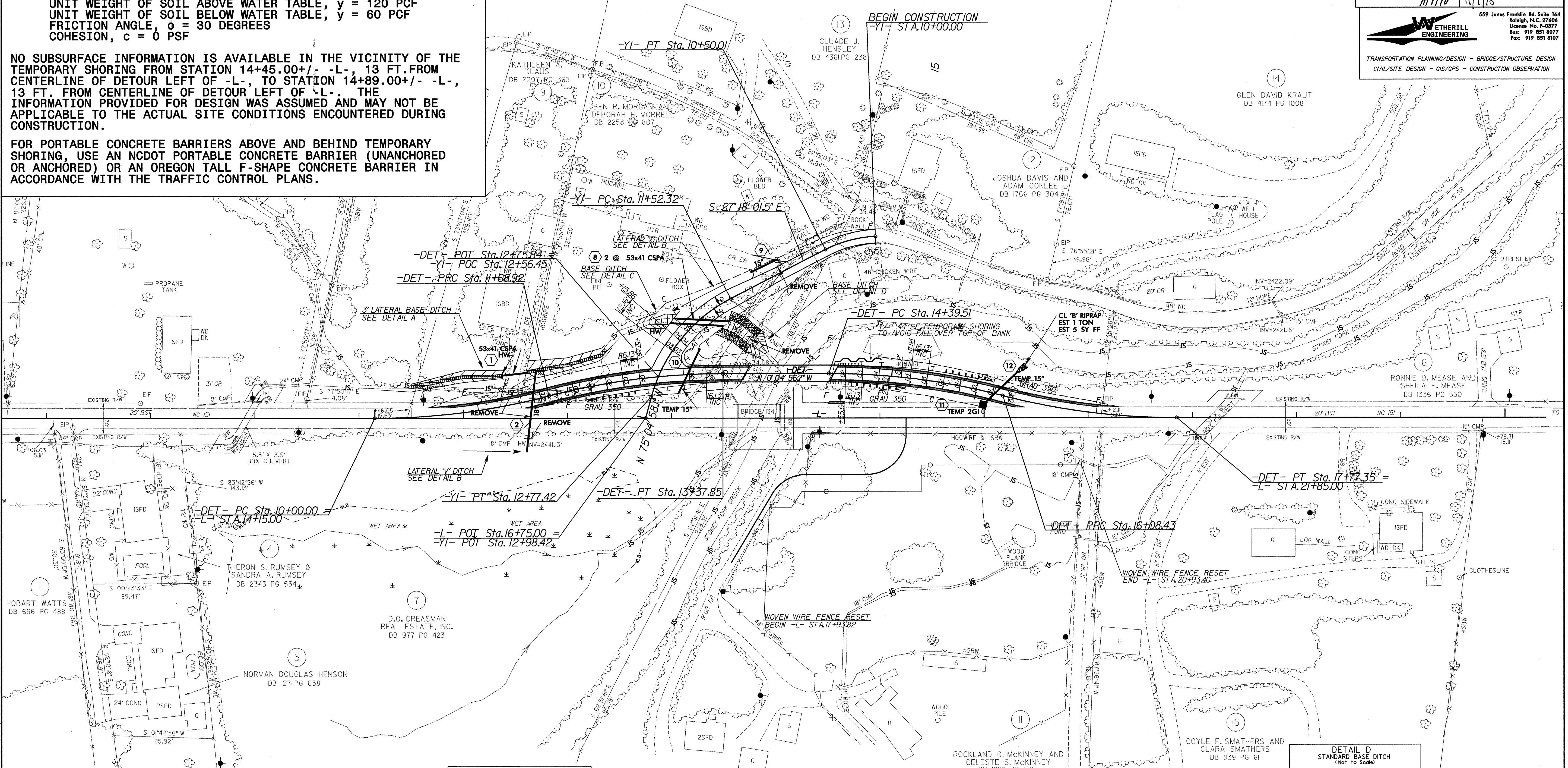
**DETOUR DESIGN
SPEED = 35 MPH**



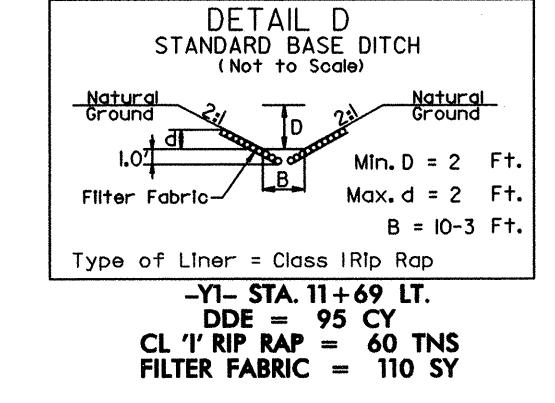
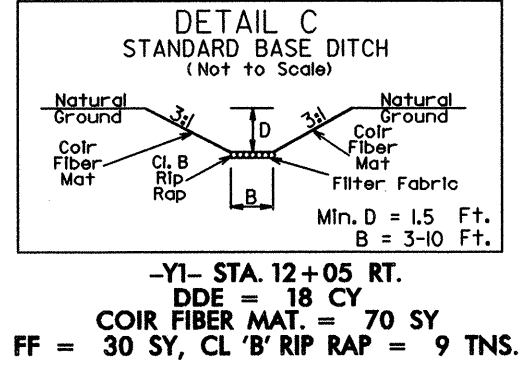
-YI-

| | |
|--|---|
| PI Sta 10+25.41 $\Delta = 24^\circ 55' 00.8" (LT)$ $D = 49' 49" 20.7"$ $L = 500.1'$ $T = 25.41'$ $R = 115.00'$ RO = SEE PLANS SE = SEE PLANS V = 20mph | PI Sta 12+18.77 $\Delta = 47^\circ 46' 56.6" (LT)$ $D = 38' 11" 49.9"$ $L = 125.09'$ $T = 66.44'$ $R = 150.00'$ RO = SEE PLANS SE = SEE PLANS V = 20mph |
|--|---|

| | |
|---|------------------------------------|
| PROJECT REFERENCE NO. B-4034 | SHEET NO. 2-B |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER 11/1/10 | HYDRAULICS ENGINEER 11/1/10 |
| 559 Jones Franklin Rd. Suite 164 Raleigh, N.C. 27606 License No. E-0377 Bus: 919 851 8077 Fax: 919 851 8107 TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION | |



| | | | |
|--|--|--|--|
| PI Sta 10+84.93 $\Delta = 14^\circ 39' 52.7" (LT)$ $D = 8' 40" 52.2"$ $L = 168.92'$ $T = 84.93'$ $R = 660.00'$ RO = SEE PLANS SE = SEE PLANS V = 45mph | PI Sta 12+53.85 $\Delta = 14^\circ 39' 53.3" (RT)$ $D = 8' 40" 52.2"$ $L = 168.93'$ $T = 84.93'$ $R = 660.00'$ RO = SEE PLANS SE = SEE PLANS V = 45mph | PI Sta 15+24.43 $\Delta = 14^\circ 39' 52.0" (RT)$ $D = 8' 40" 52.2"$ $L = 168.92'$ $T = 84.93'$ $R = 660.00'$ RO = SEE PLANS SE = SEE PLANS V = 45mph | PI Sta 16+93.36 $\Delta = 14^\circ 39' 52.6" (LT)$ $D = 8' 40" 52.2"$ $L = 168.92'$ $T = 84.93'$ $R = 660.00'$ RO = SEE PLANS SE = SEE PLANS V = 45mph |
|--|--|--|--|



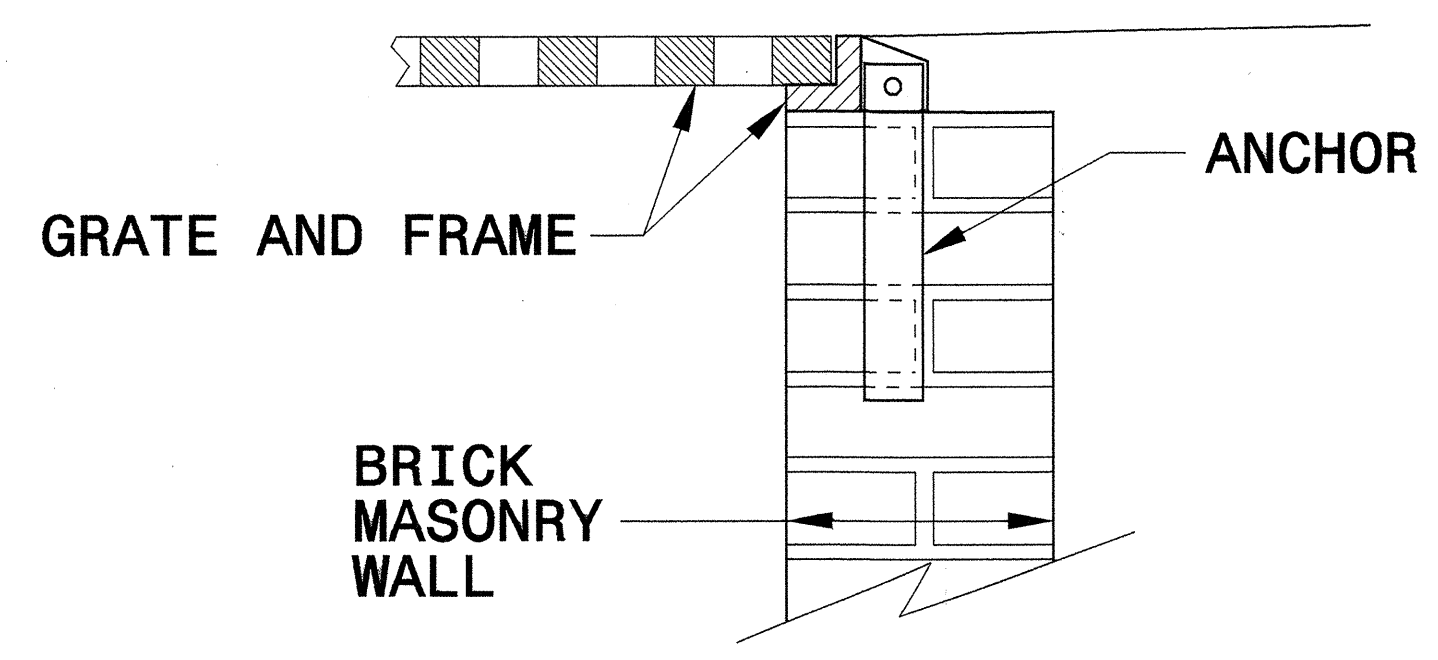
NOTE: ALL DRIVES ARE 16' UNLESS OTHERWISE NOTED

FOR -DET- PROFILE, SEE SHEET 6
 FOR TEMP. -YI- PROFILE, SEE SHEET 6
 FOR -L- PLAN VIEW, SEE SHEET 4
 FOR -YI- PLAN VIEW, SEE SHEET 4

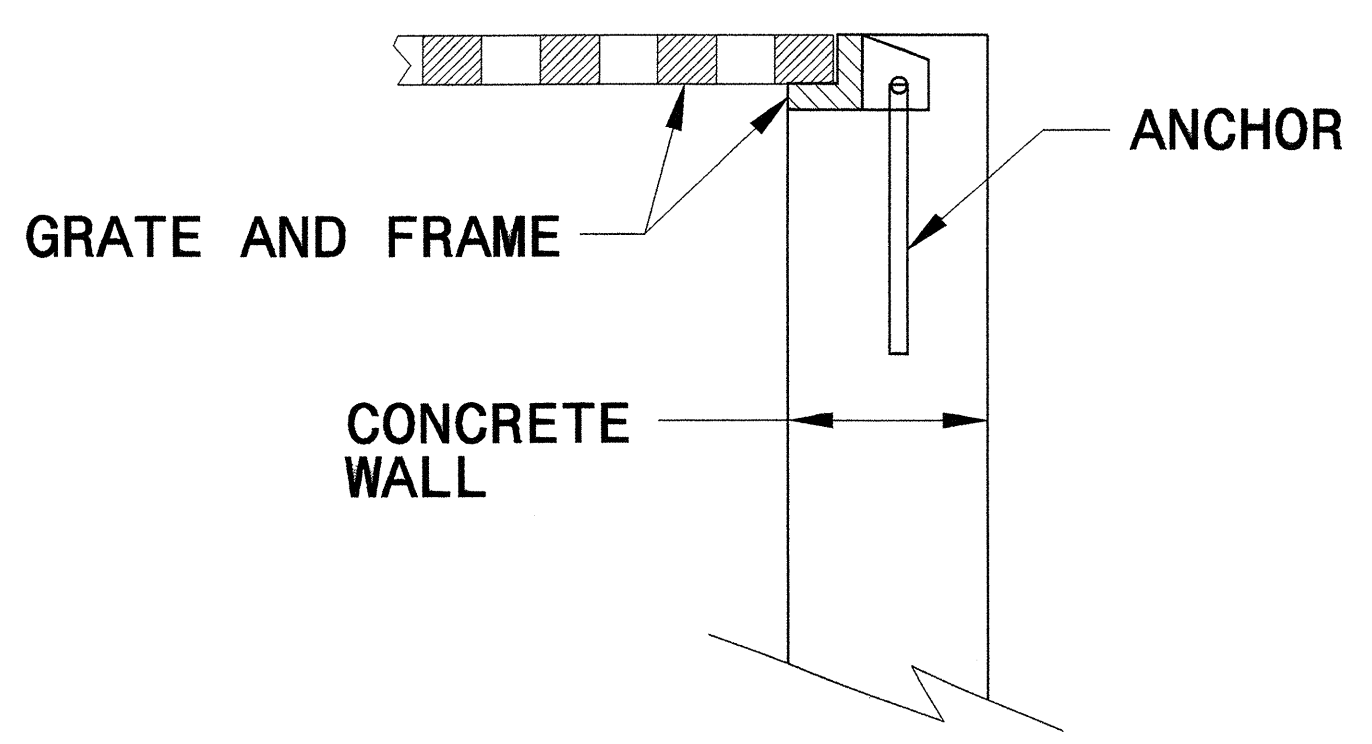
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

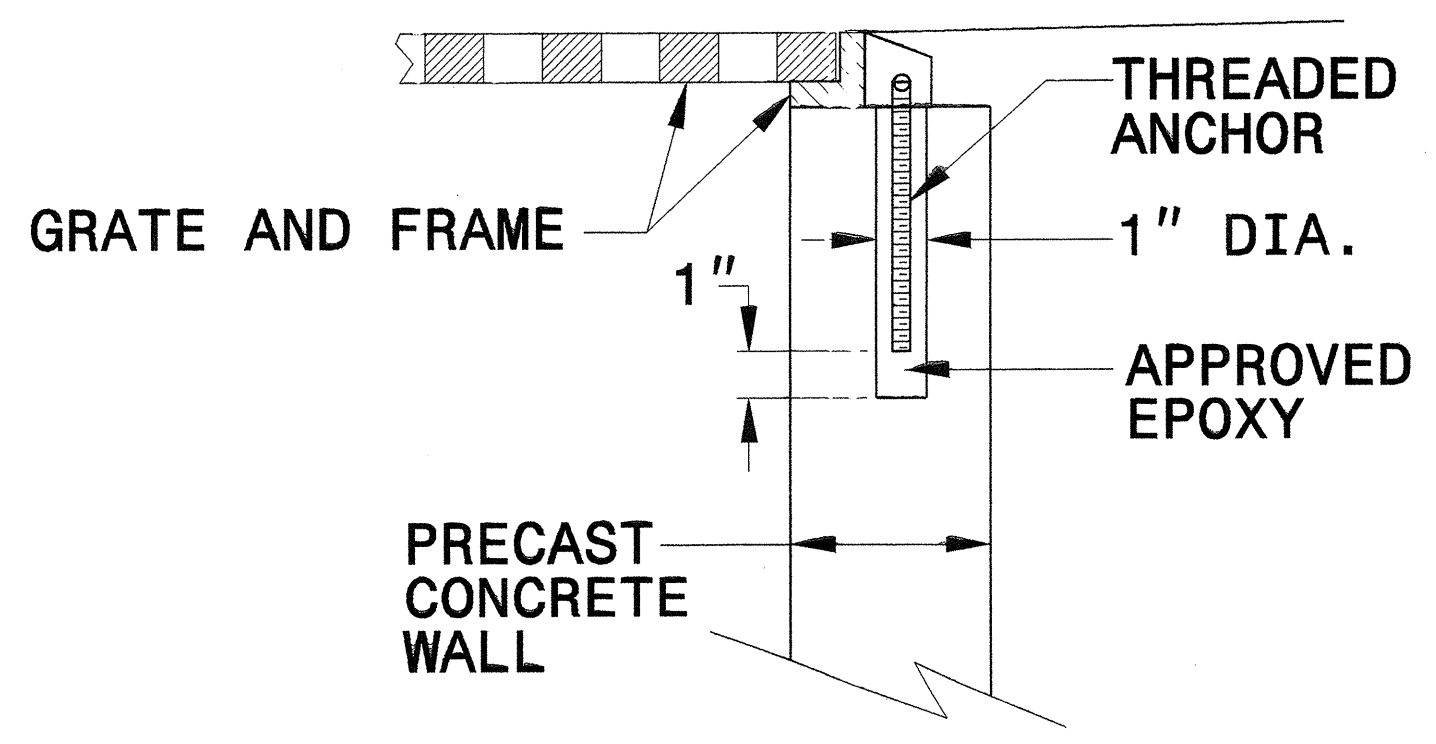
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



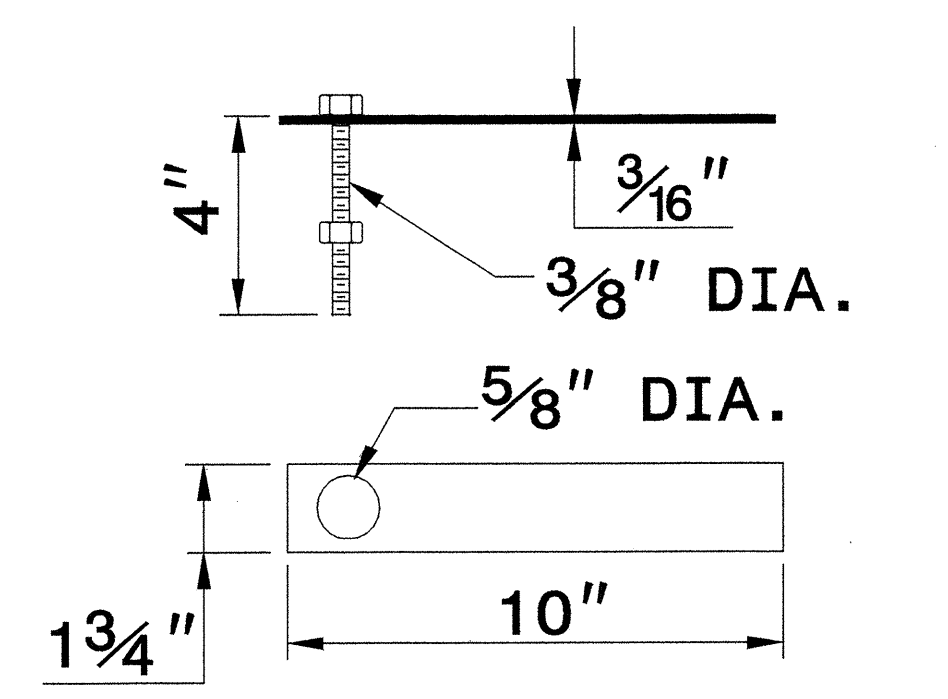
CONCRETE CONSTRUCTION



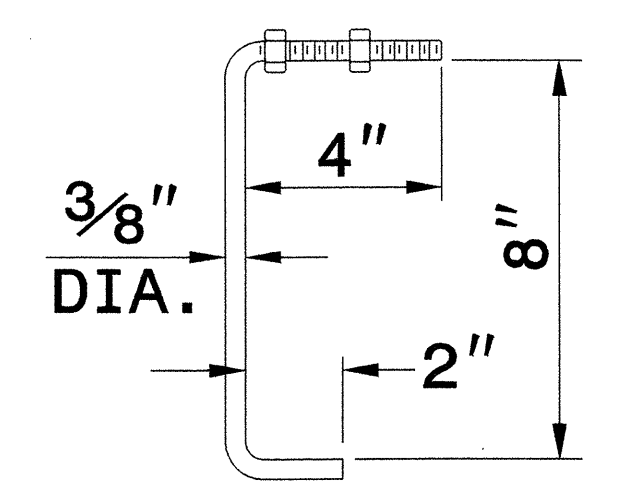
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

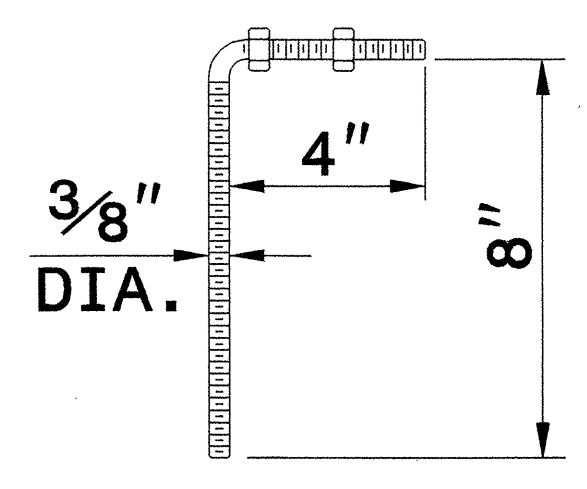
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



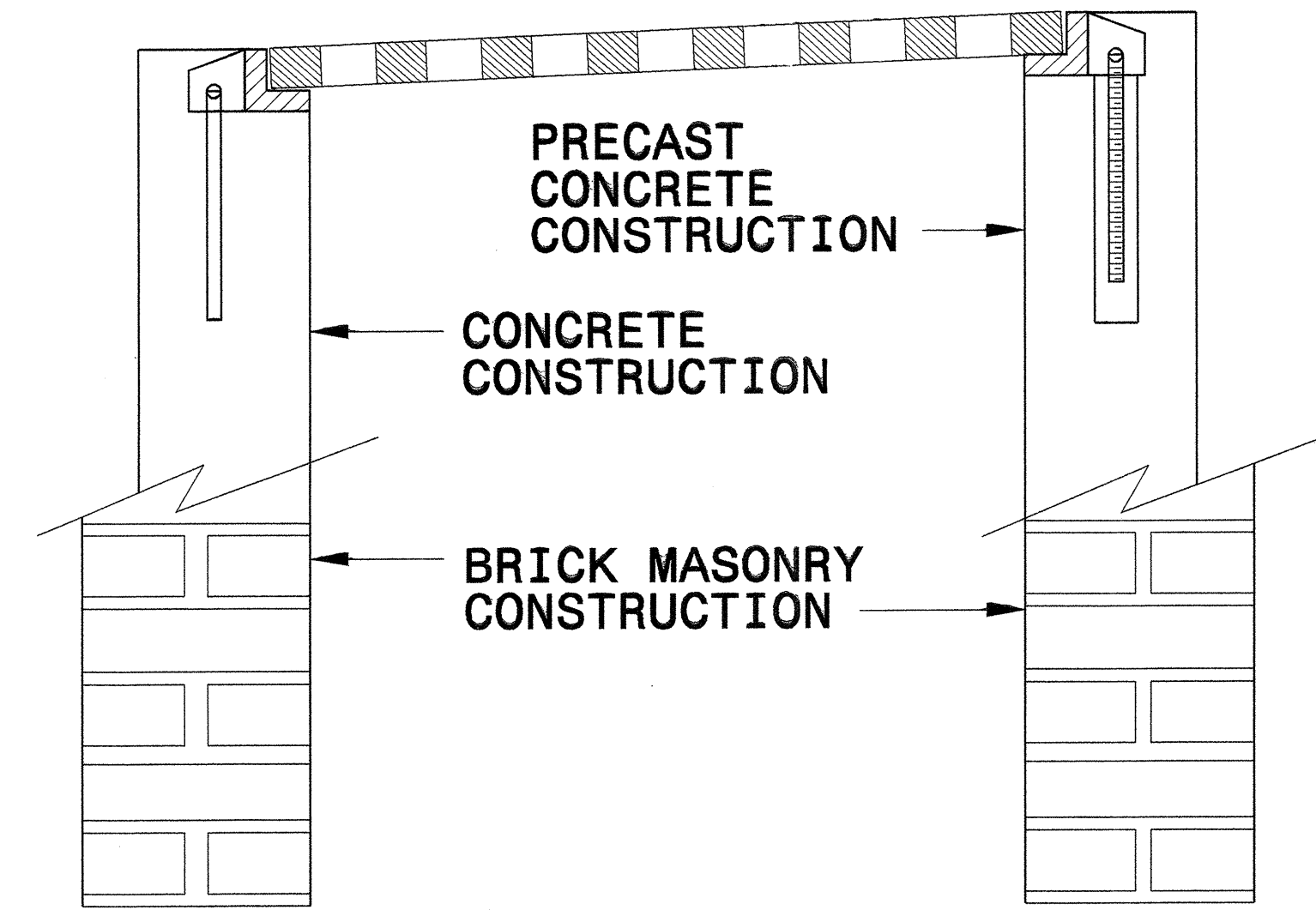
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



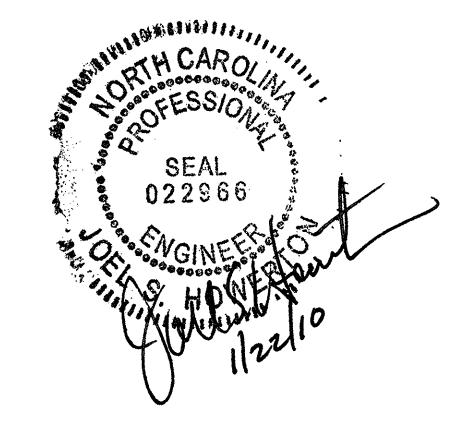
FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

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

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

SHEET 1 OF 1
840D25

SYSTEMS



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

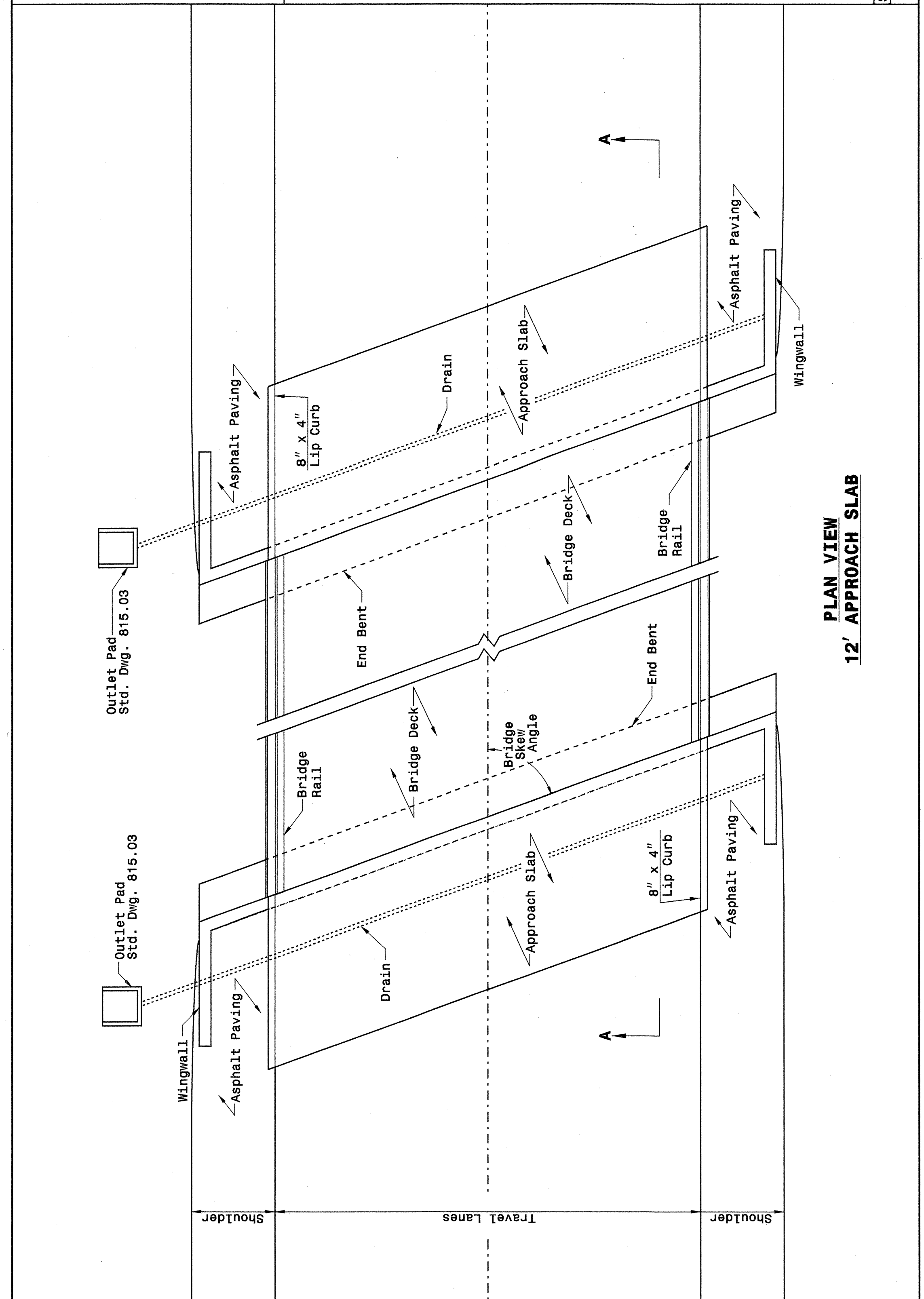
SEE PLATE FOR TITLE

ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06
MODIFIED BY: E.E. WARD DATE: 9/25/06
CHECKED BY: [Signature] DATE: 11/13/06
FILE SPEC.: [Signature]

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

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

SHEET 1 OF 2
422D11



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

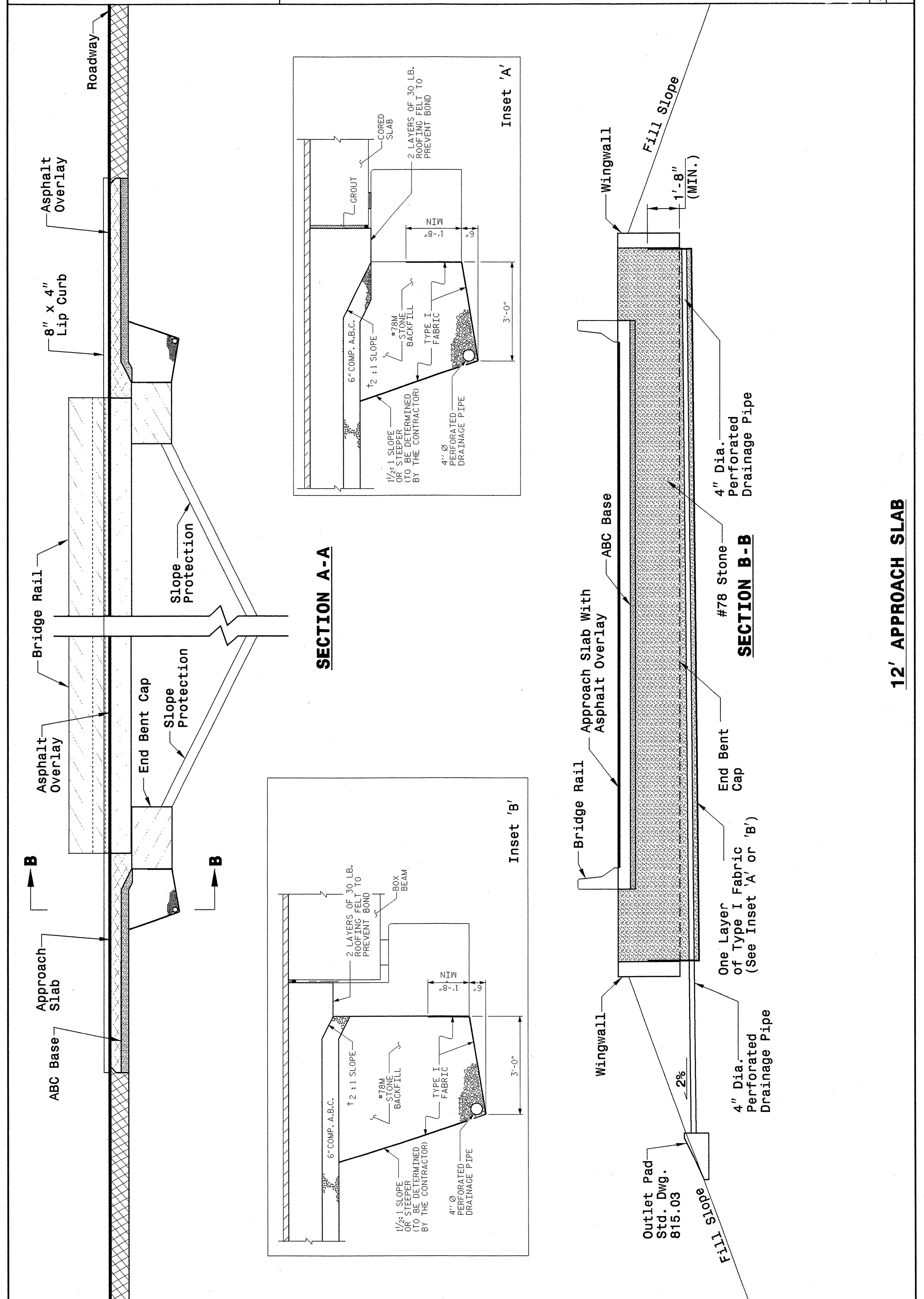
ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

SHEET 1 OF 2
422D11

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

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

SHEET 2 OF 2
422D11



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

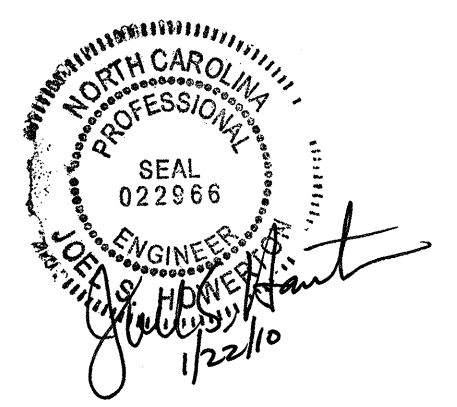
ENGLISH DETAIL DRAWING FOR
BRIDGE APPROACH FILLS
CORED SLAB & BOX BEAM BRIDGES
SUB REGIONAL TIER

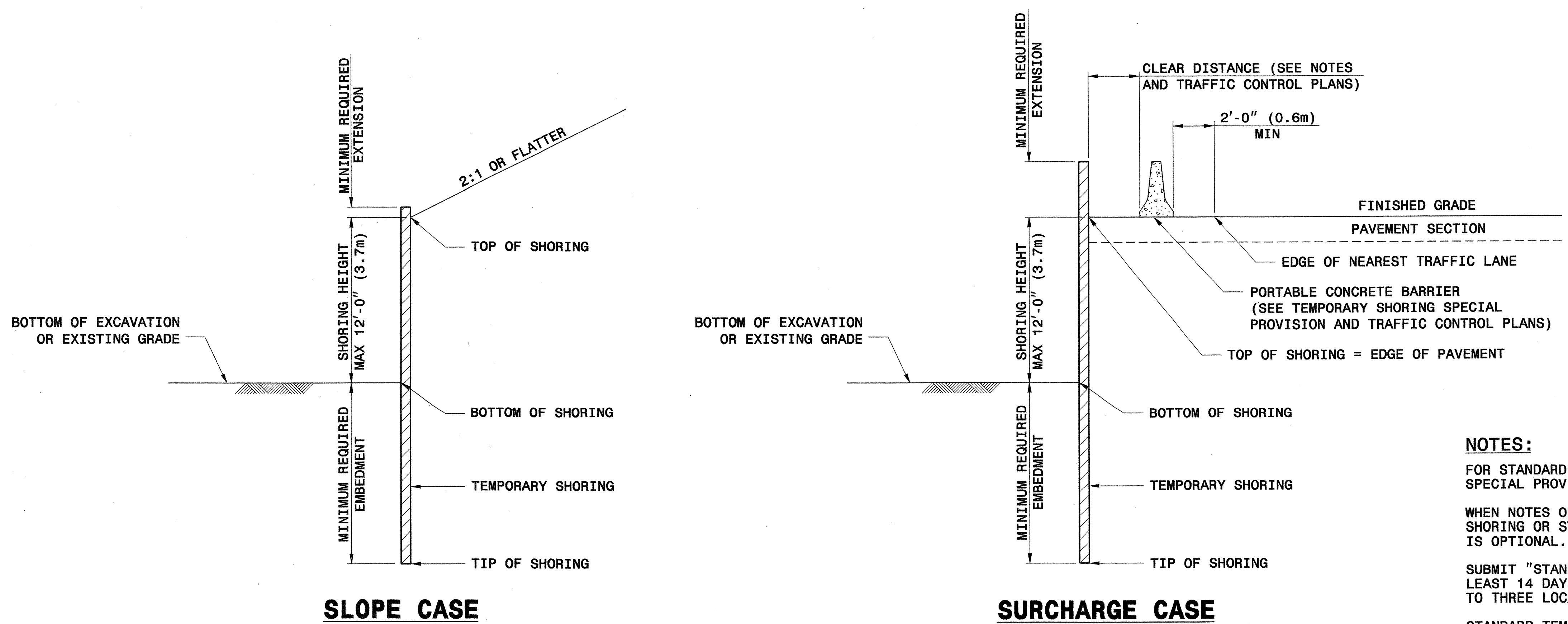
SHEET 2 OF 2
422D11

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

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

ORIGINAL BY: K. A. Kempf DATE: 6-10-08
MODIFIED BY: *[Signature]* DATE: *[Date]*
CHECKED BY: *[Signature]* DATE: 2/16/09
FILE SPEC.: kkempf/english/bridge approach fills.dgn





NOTES:

FOR STANDARD TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.

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

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

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING CONDITIONS:

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

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:

TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/m³)
 FRICTION ANGLE = 30 DEGREES
 COHESION = 0 PSF (0 KPA)
 GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF SHORING.

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

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

VERIFY GROUNDWATER ELEVATION BEFORE BEGINNING SHORING CONSTRUCTION.

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

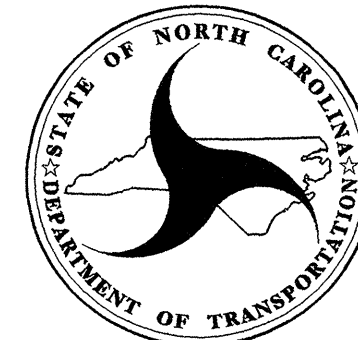
AT THE CONTRACTOR'S OPTION, H PILE EMBEDMENT DEPTHS FOR PILES SET IN DRILLED HOLES MAY BE REDUCED BY 25%. FOR PILE EXCAVATION, SEE TEMPORARY SHORING SPECIAL PROVISION.

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

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

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

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

| | |
|--|---|
|  <p>GEOTECHNICAL ENGINEERING UNIT STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH</p> | STANDARD DRAWING NO. 1801.01 |
| | <p>STANDARD TEMPORARY SHORING</p> <p>DATE: 2-20-07</p> |

STANDARD TEMPORARY MSE WALL OPTIONS



Scott A. Hadden 3/29/07
SIGNATURE DATE

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

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

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

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

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

STANDARD TEMPORARY MSE WALLS ARE BASED ON THE FOLLOWING CONDITIONS:

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

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

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

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

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

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

- 1) MINIMUM EMBEDMENT OF 18" (450mm) UNLESS WALL BEARS ON ROCK, CONCRETE OR PAVEMENT AS DETERMINED BY THE ENGINEER
- 2) VERTICAL STEPS IN INCREMENTS EQUAL TO THE VERTICAL REINFORCEMENT SPACING 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.

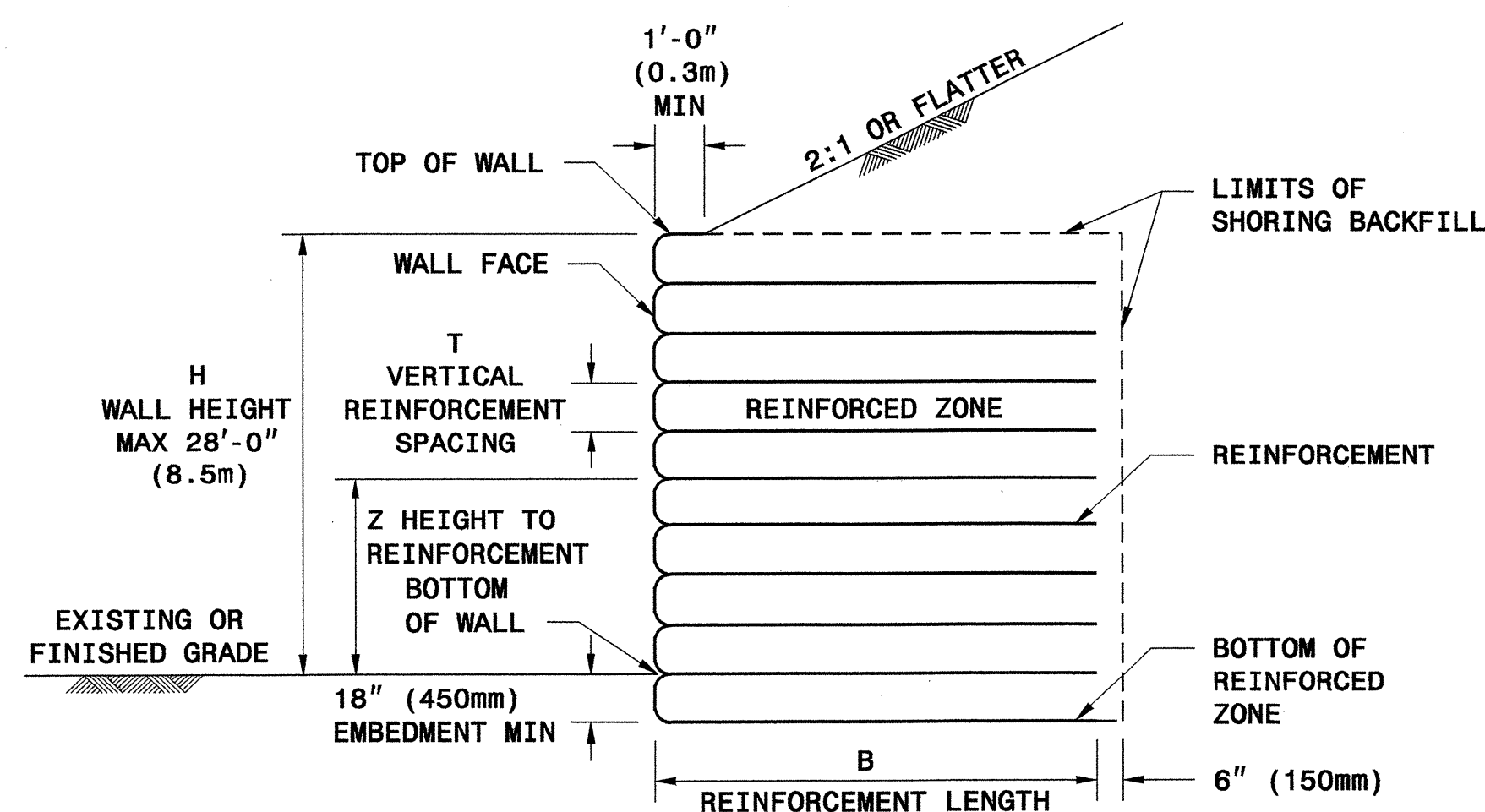
PLACE SHORING BACKFILL IN 8" TO 10" (200mm TO 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

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.

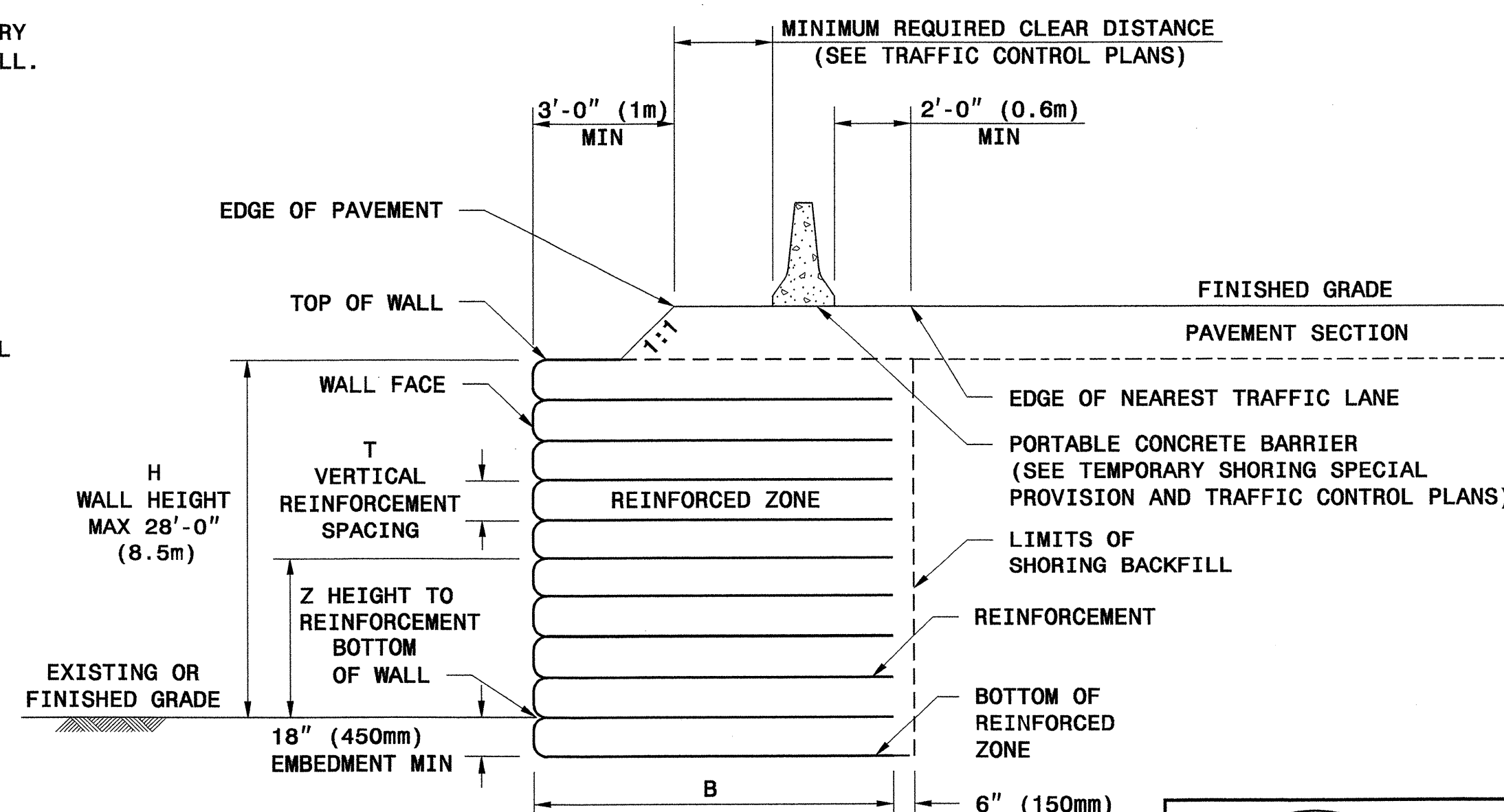
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm AND 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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

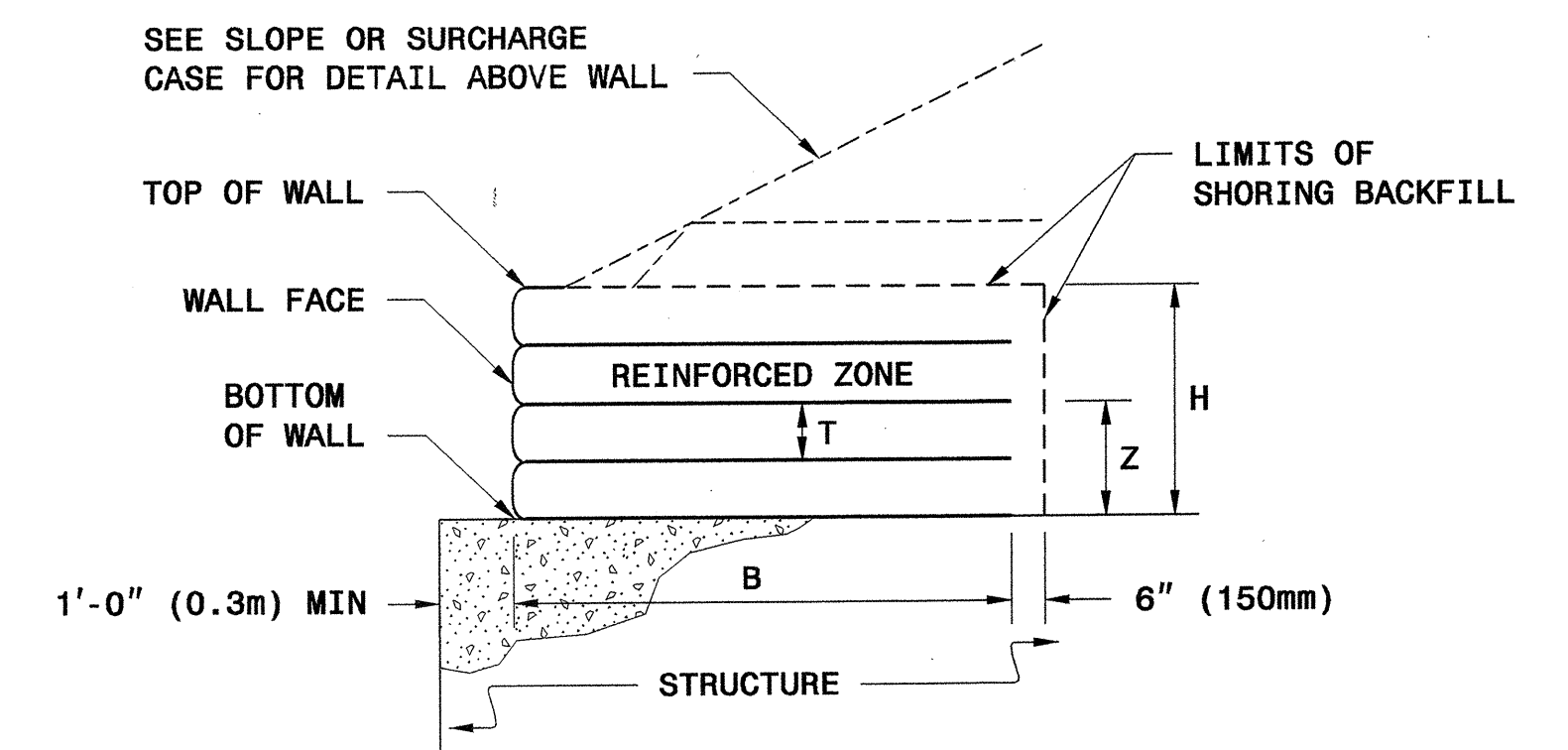
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



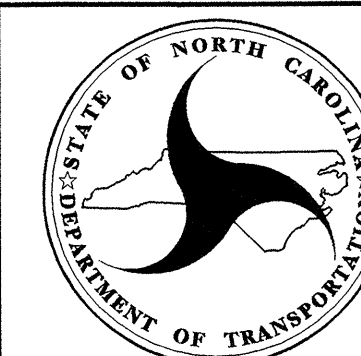
SLOPE CASE



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



Signature: Scott A. Shidden 3/21/07
Date: 3/21/07

HOW TO USE THIS SHEET:

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

MINIMUM REQUIRED REINFORCEMENT LENGTH B (FT)

(FOR ALL WALL OPTIONS)

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

TERRATREL TEMPORARY WALL (STRIPS PER LEVEL PER PANEL)

| H (FT) | | <4 | 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-INCHES) | | | | | | | | | | | | | |
| | 27 - 8 | | | | | | | | | | | | | 3 |
| | 26 - 10 | | | | | | | | | | | | | 3 |
| | 25 - 2 | | | | | | | | | | | | | 3 |
| | 23 - 6 | | | | | | | | | | | | | 3 |
| | 21 - 10 | | | | | | | | | | | | | 3 |
| | 20 - 2 | | | | | | | | | | | | | 3 |
| | 18 - 6 | | | | | | | | | | | | | 3 |
| | 16 - 10 | | | | | | | | | | | | | 3 |
| | 15 - 2 | | | | | | | | | | | | | 3 |
| | 13 - 6 | | | | | | | | | | | | | 3 |
| | 11 - 10 | | | | | | | | | | | | | 3 |
| 10 - 2 | | | | | | | | | | | | | 3 | |
| 8 - 6 | | | | | | | | | | | | | 3 | |
| 6 - 10 | | | | | | | | | | | | | 3 | |
| 5 - 2 | | | | | | | | | | | | | 3 | |
| 3 - 6 | | | | | | | | | | | | | 3 | |
| 1 - 10 | | | | | | | | | | | | | 3 | |
| 0 - 2 | | | | | | | | | | | | | 3 | |
| -0 - 8 | | | | | | | | | | | | | 3 | |

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 | |

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 | |
| 2 | | | | | | | | | | | | | 4.5 | |
| 1 | | | | | | | | | | | | | 4.5 | |
| 0 | | | | | | | | | | | | | 4.5 | |
| -1.5 | | | | | | | | | | | | | 4.5 | |

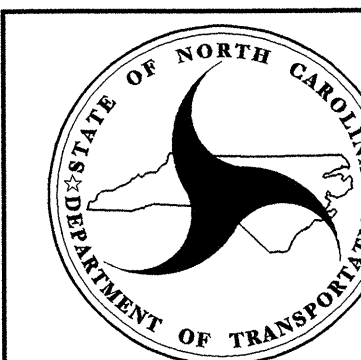
RETAINED EARTH TEMPORARY WALL (WELDED WIRE MESH TYPE)

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-INCHES) | | | | | | | | | | | | | |
| | 27 - 6 | | | | | | | | | | | | | 3X1 |
| | 26 - 10 | | | | | | | | | | | | | 3X1 |
| | 25 - 2 | | | | | | | | | | | | | 3X1 |
| | 23 - 6 | | | | | | | | | | | | | 3X1 |
| | 21 - 10 | | | | | | | | | | | | | 3X1 |
| | 20 - 2 | | | | | | | | | | | | | 3X1 |
| | 18 - 6 | | | | | | | | | | | | | 3X1 |
| | 16 - 10 | | | | | | | | | | | | | 3X1 |
| | 15 - 2 | | | | | | | | | | | | | 3X1 |
| | 13 - 6 | | | | | | | | | | | | | 3X1 |
| | 11 - 10 | | | | | | | | | | | | | 3X1 |
| 10 - 2 | | | | | | | | | | | | | 3X1 | |
| 8 - 6 | | | | | | | | | | | | | 3X1 | |
| 6 - 10 | | | | | | | | | | | | | 3X1 | |
| 5 - 2 | | | | | | | | | | | | | 3X1 | |
| 3 - 6 | | | | | | | | | | | | | 3X1 | |
| 1 - 10 | | | | | | | | | | | | | 3X1 | |
| 0 - 2 | | | | | | | | | | | | | 3X1 | |
| -1 - 6 | | | | | | | | | | | | | 3X1 | |

NOTES FOR HILFIKER TEMPORARY WALL

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



GEOTECHNICAL ENGINEERING UNIT
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RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

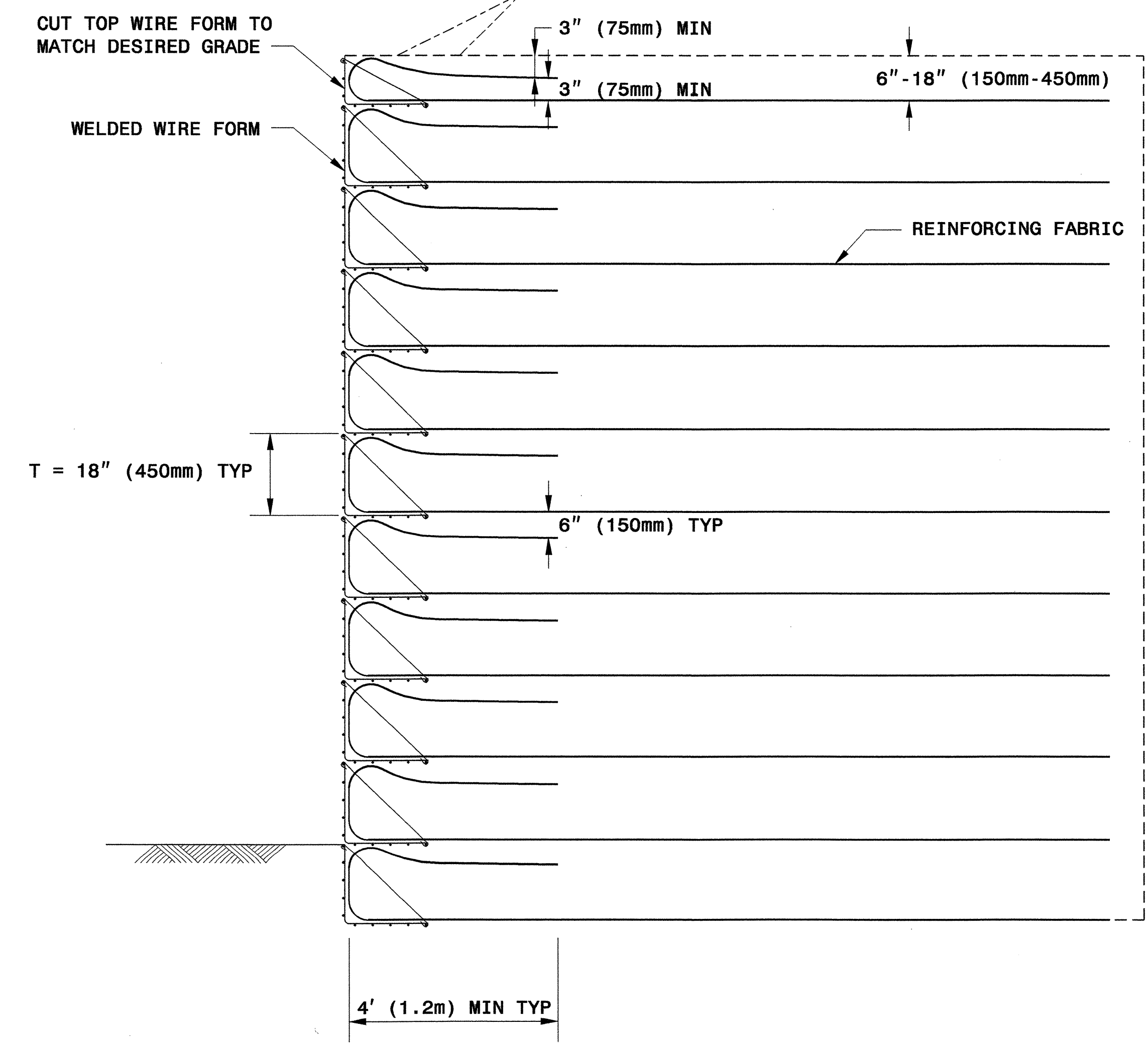
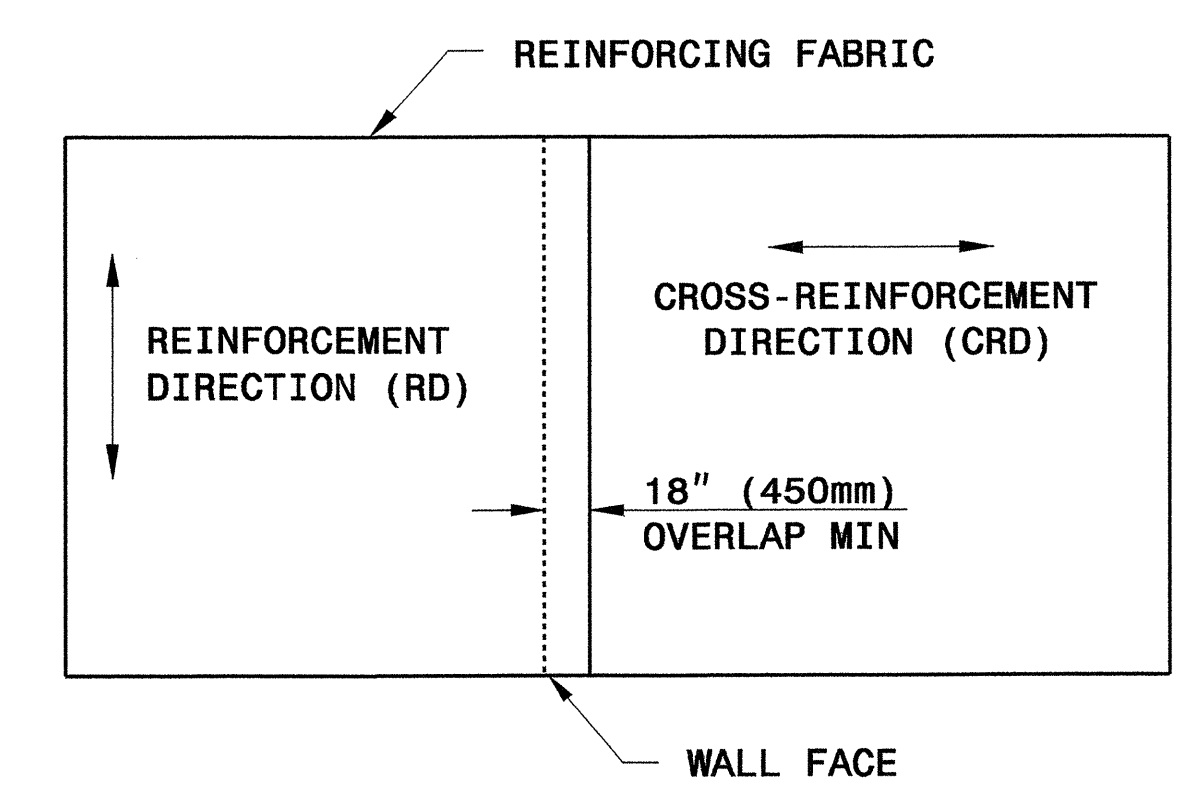
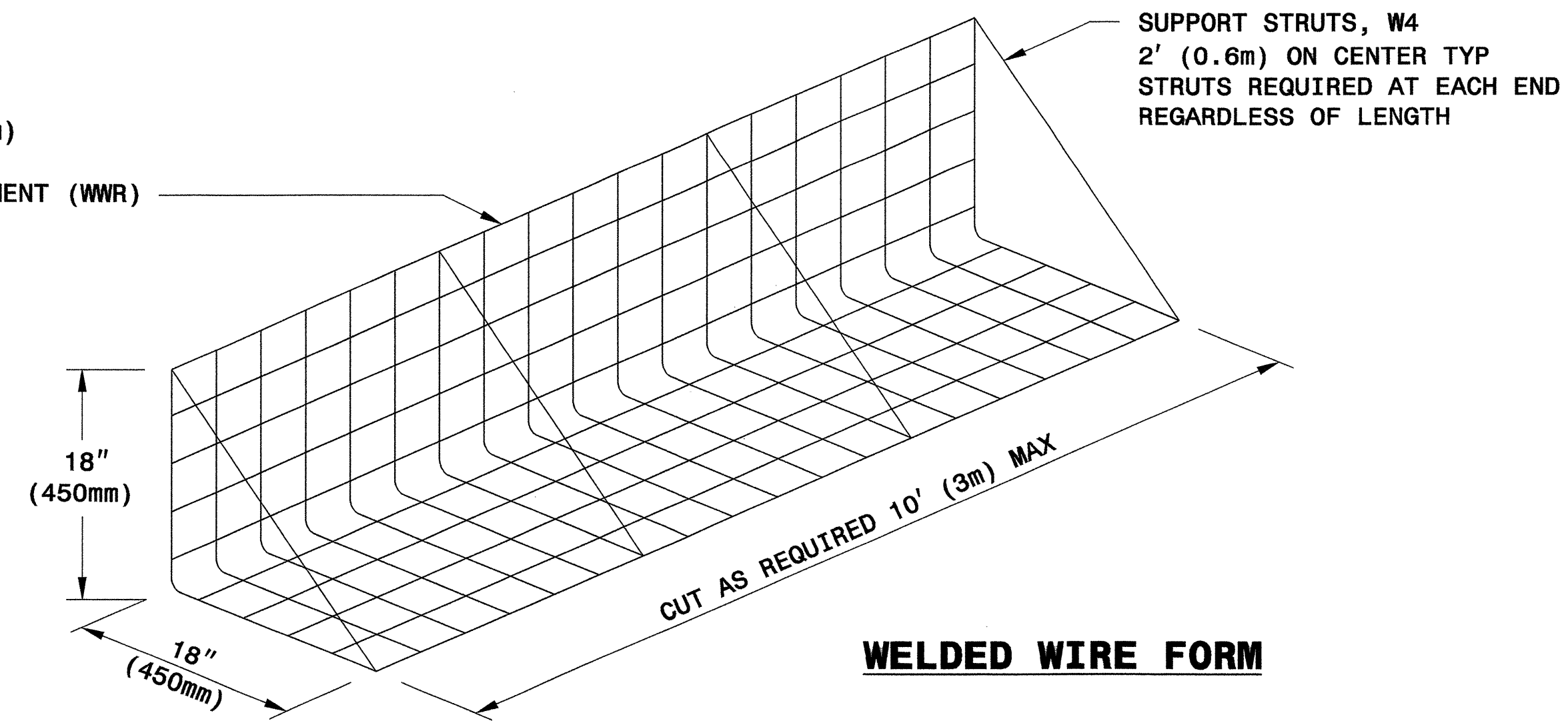
SHEET 2 OF 11 DATE: 2-20-07



Scott A. Shidden 3/29/07
SIGNATURE DATE

SIGNATURE DATE

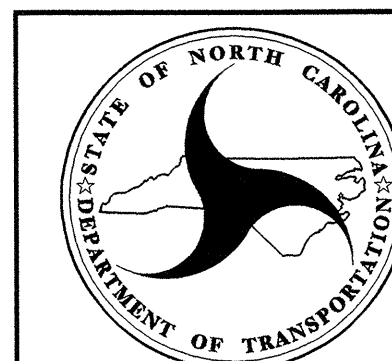
4" X 4" (102mm X 102mm)
W4 X W4 (MW26 X MW26)
WELDED WIRE REINFORCEMENT (WWR)



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

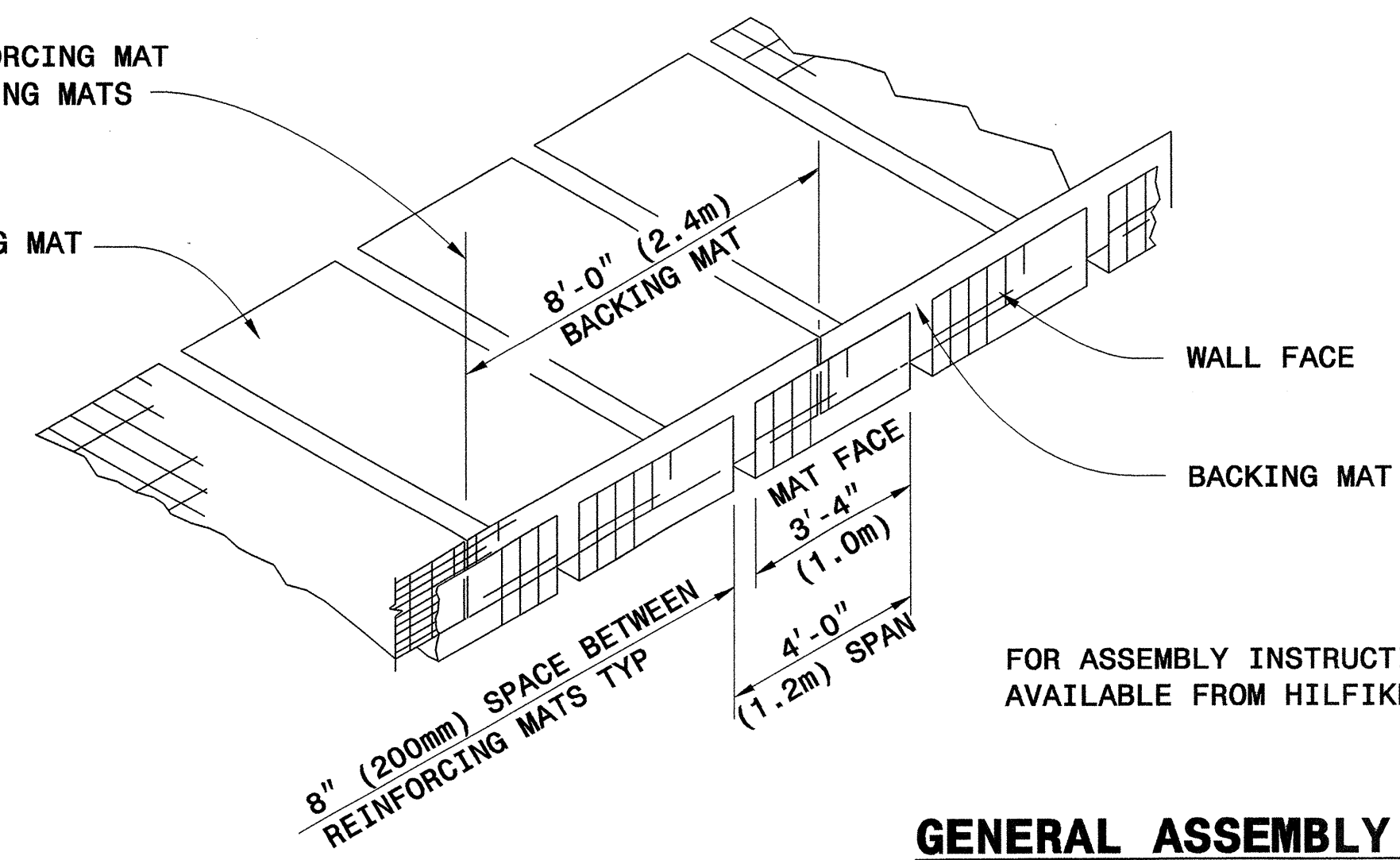


GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA
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RALEIGH

STANDARD DRAWING NO. 1801.02

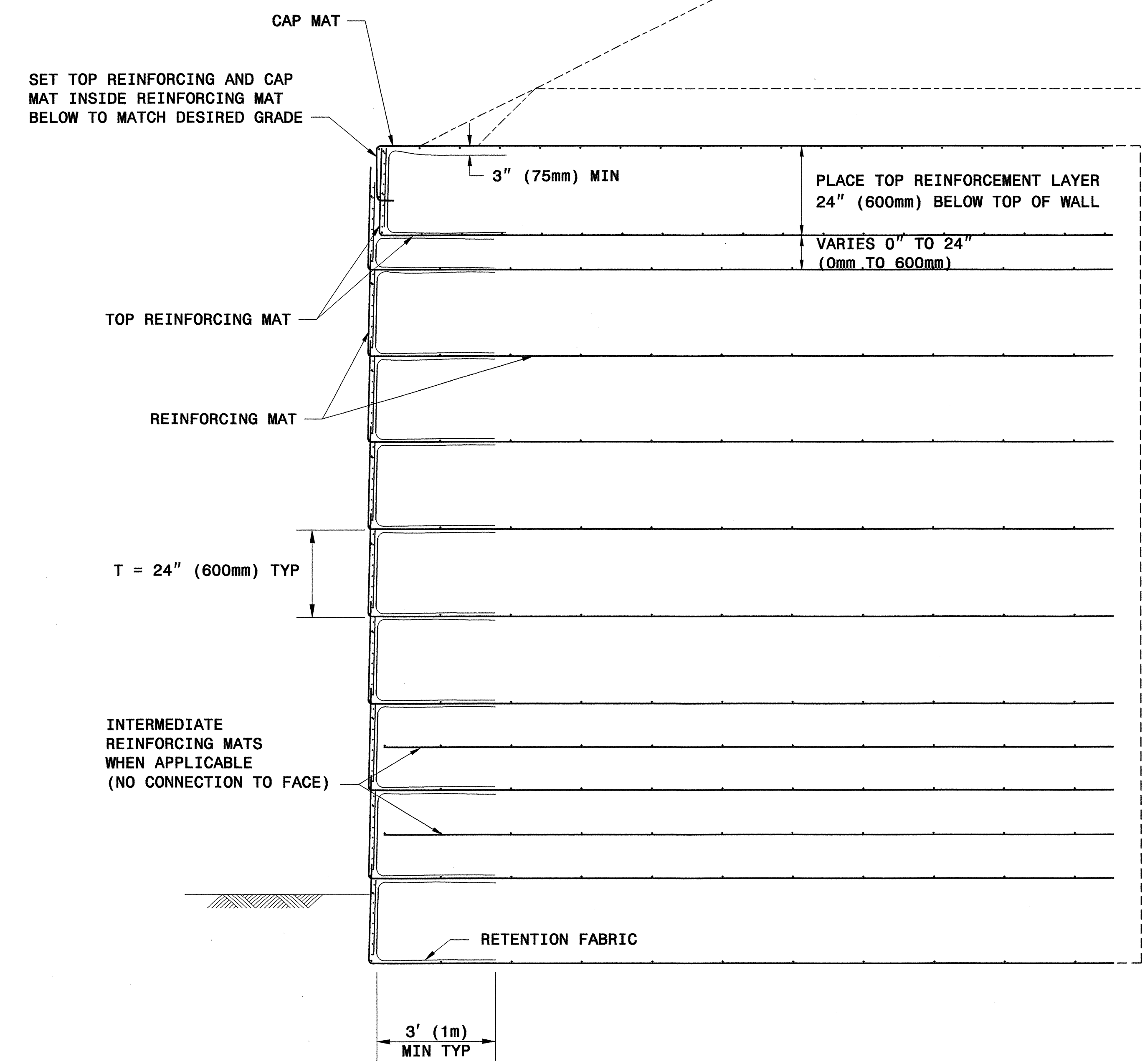
TEMPORARY FABRIC WALL

CENTERLINE OF REINFORCING MAT
FACE = EDGE OF BACKING MATS



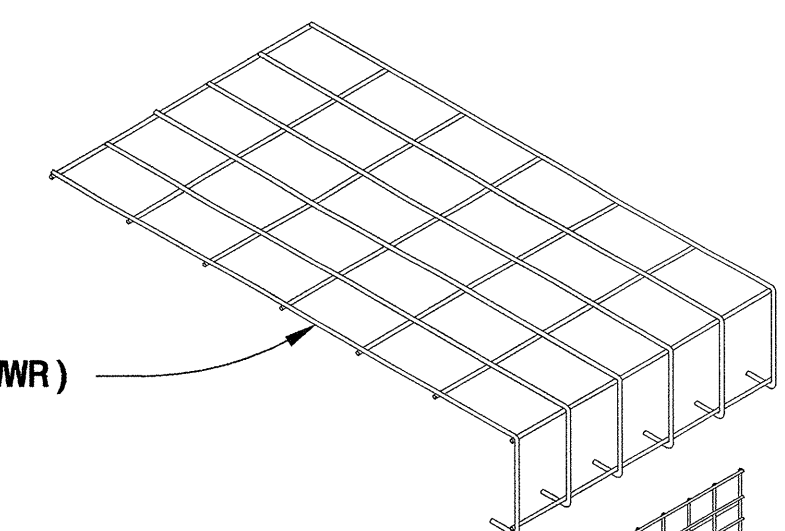
FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

GENERAL ASSEMBLY DETAIL

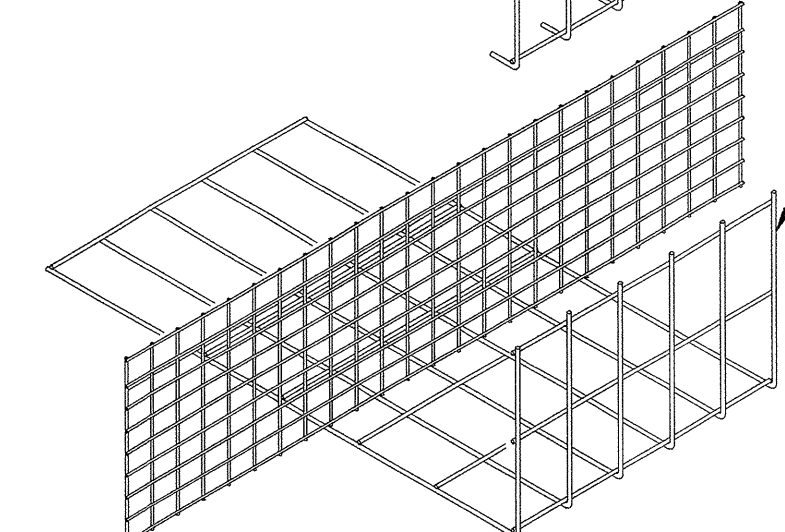


TYPICAL SECTION

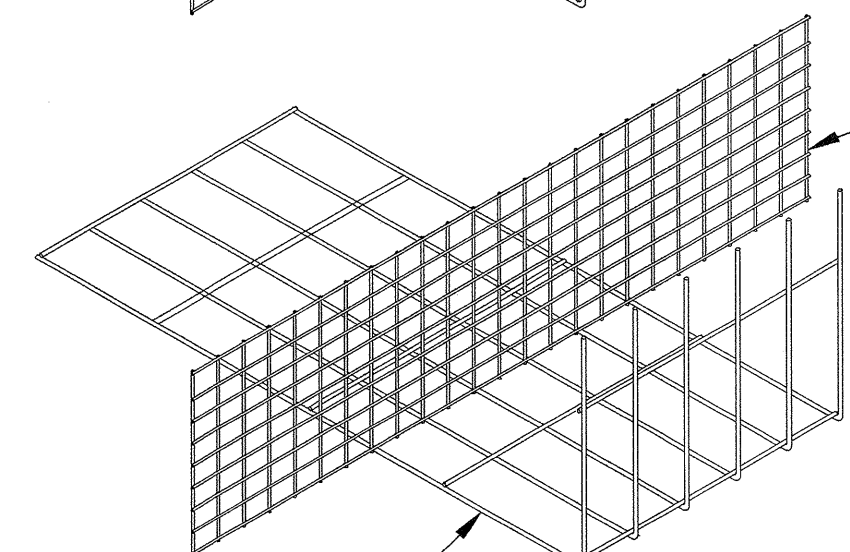
8" X 12" (203mm X 305mm)
W4.5 X W3.5 (MW29 X MW23)
CAP MAT
WELDED WIRE REINFORCEMENT (WWR)



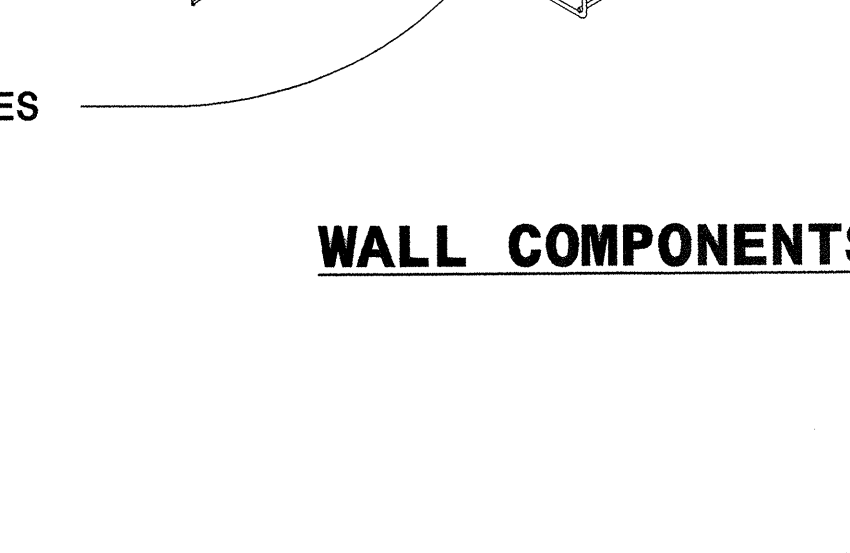
8" X 12" (203mm X 305mm)
W4.5 X W3.5 (MW29 X MW23) WWR
TOP REINFORCING MAT (NO PRONGS)



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



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



WALL COMPONENTS




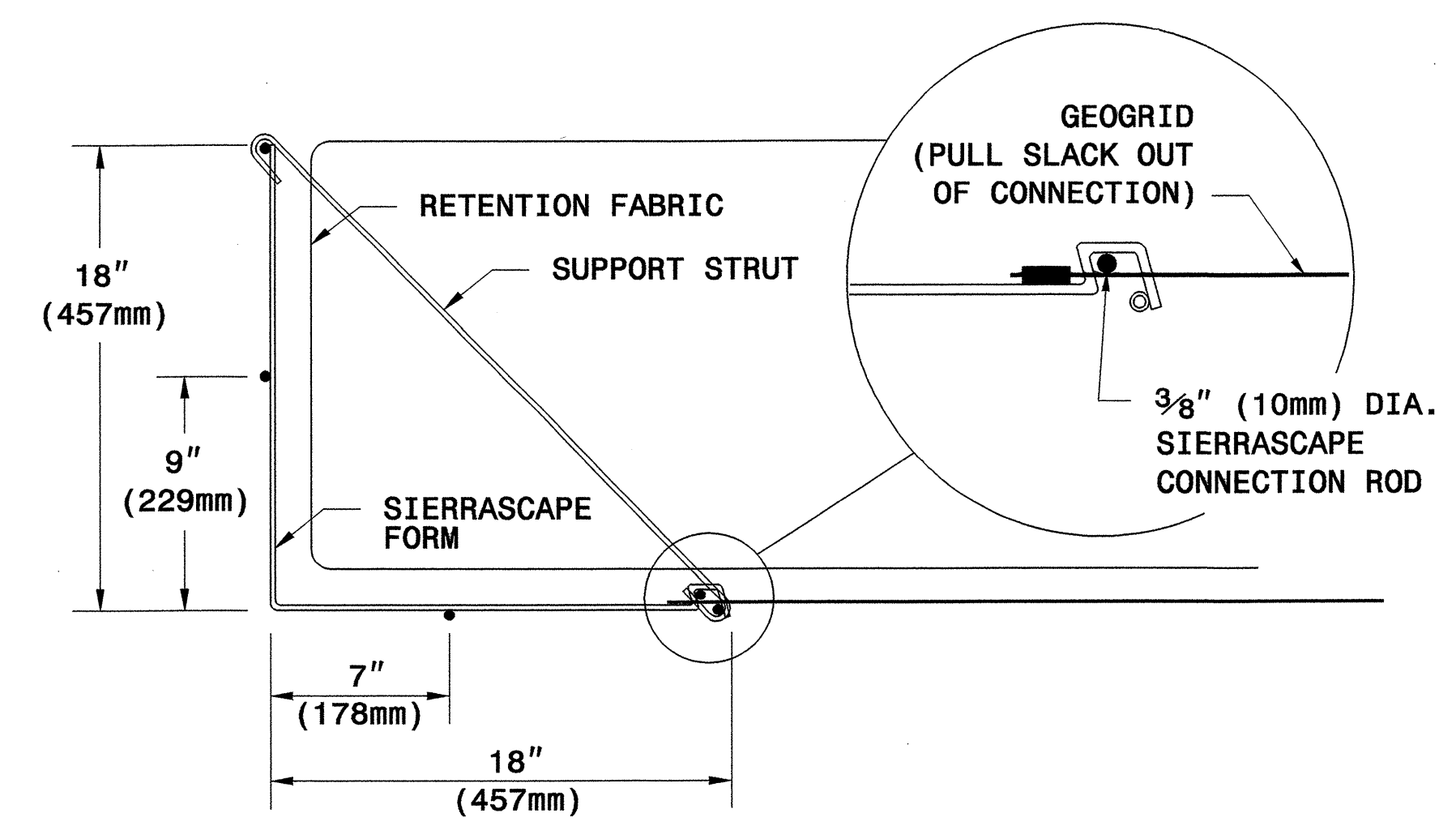
GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA
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RALEIGH

STANDARD DRAWING NO. 1801.02

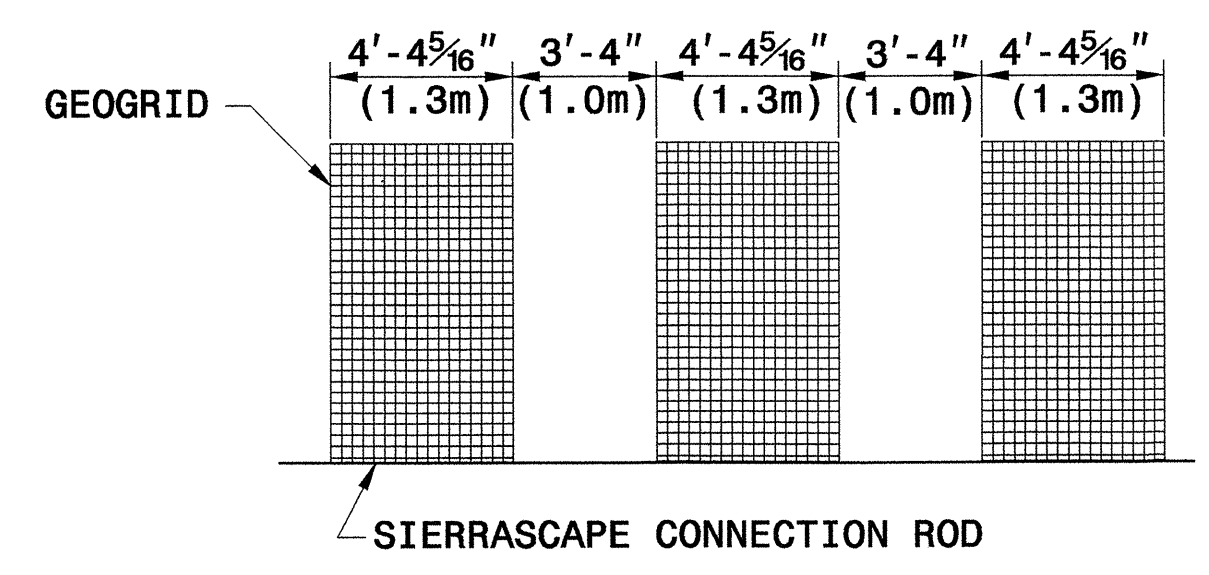
HILFIKER TEMPORARY WALL

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

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



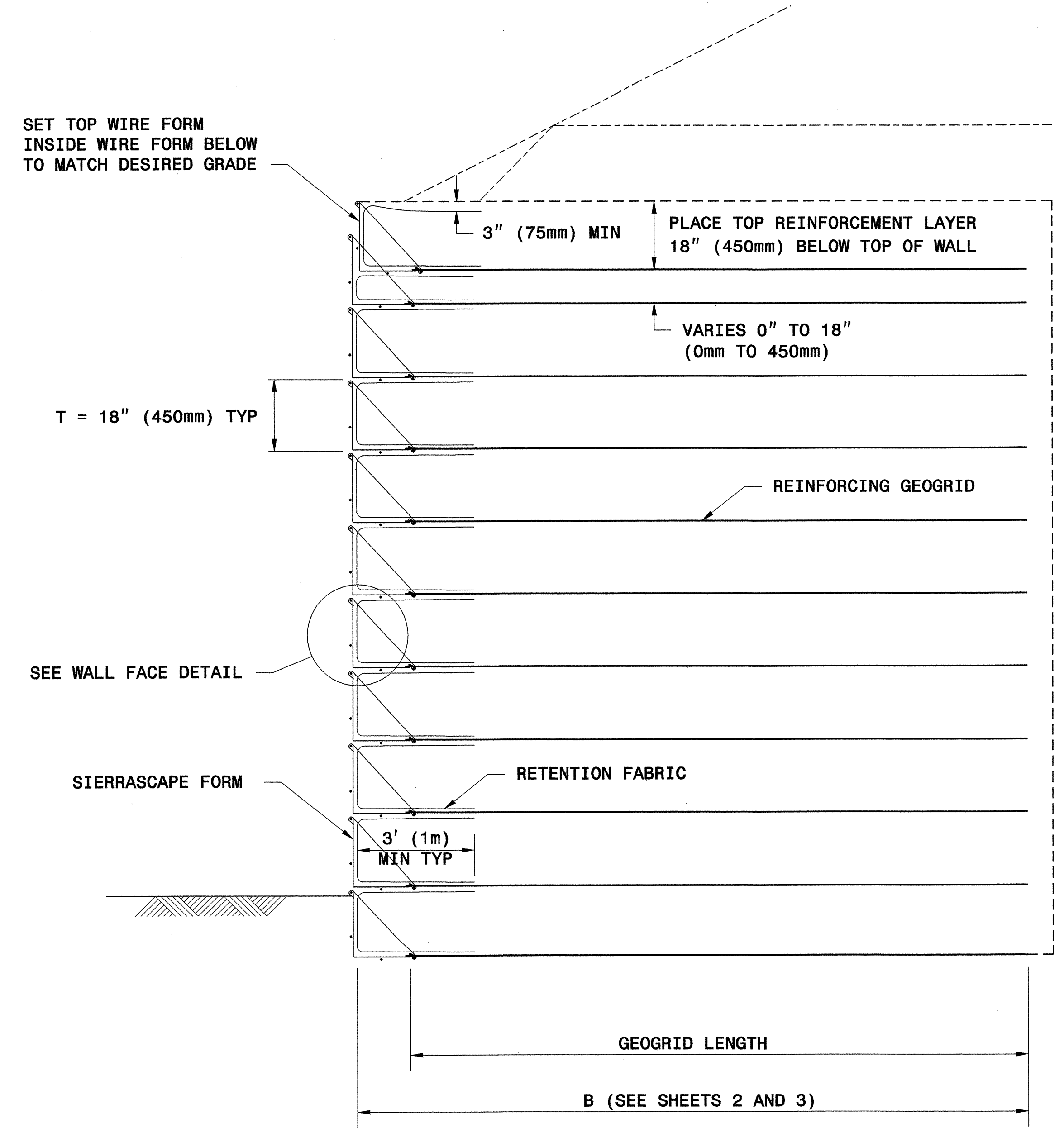
WALL FACE DETAIL



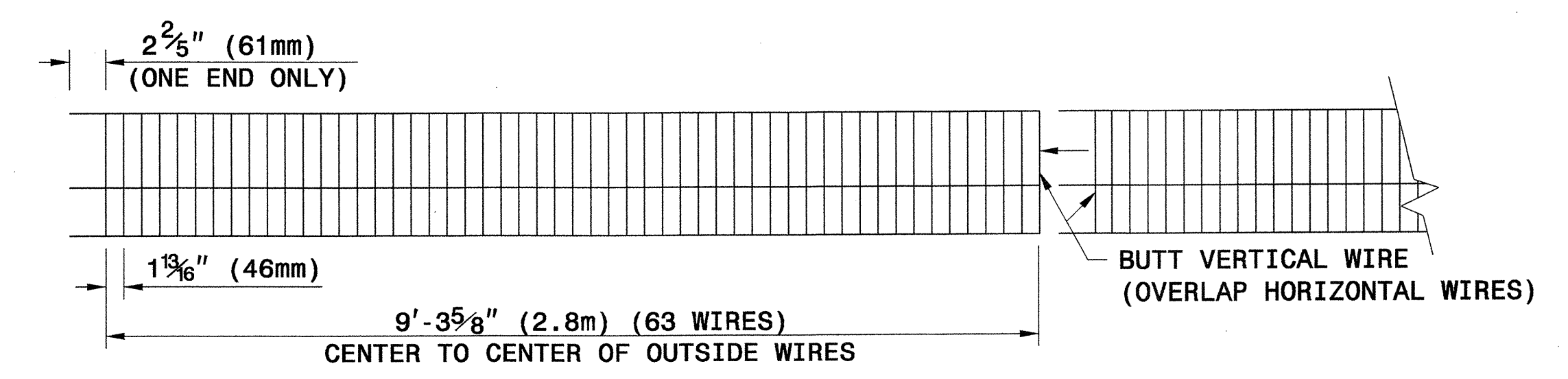
PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

TYPICAL GEOGRID COVERAGE

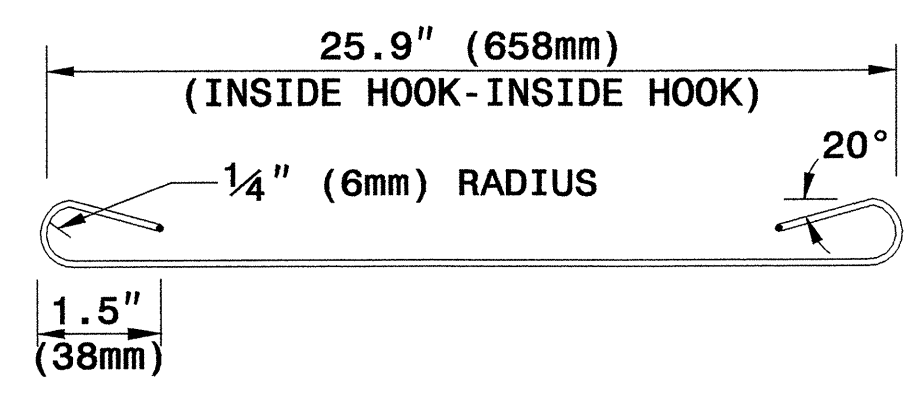
SET TOP WIRE FORM INSIDE WIRE FORM BELOW TO MATCH DESIRED GRADE



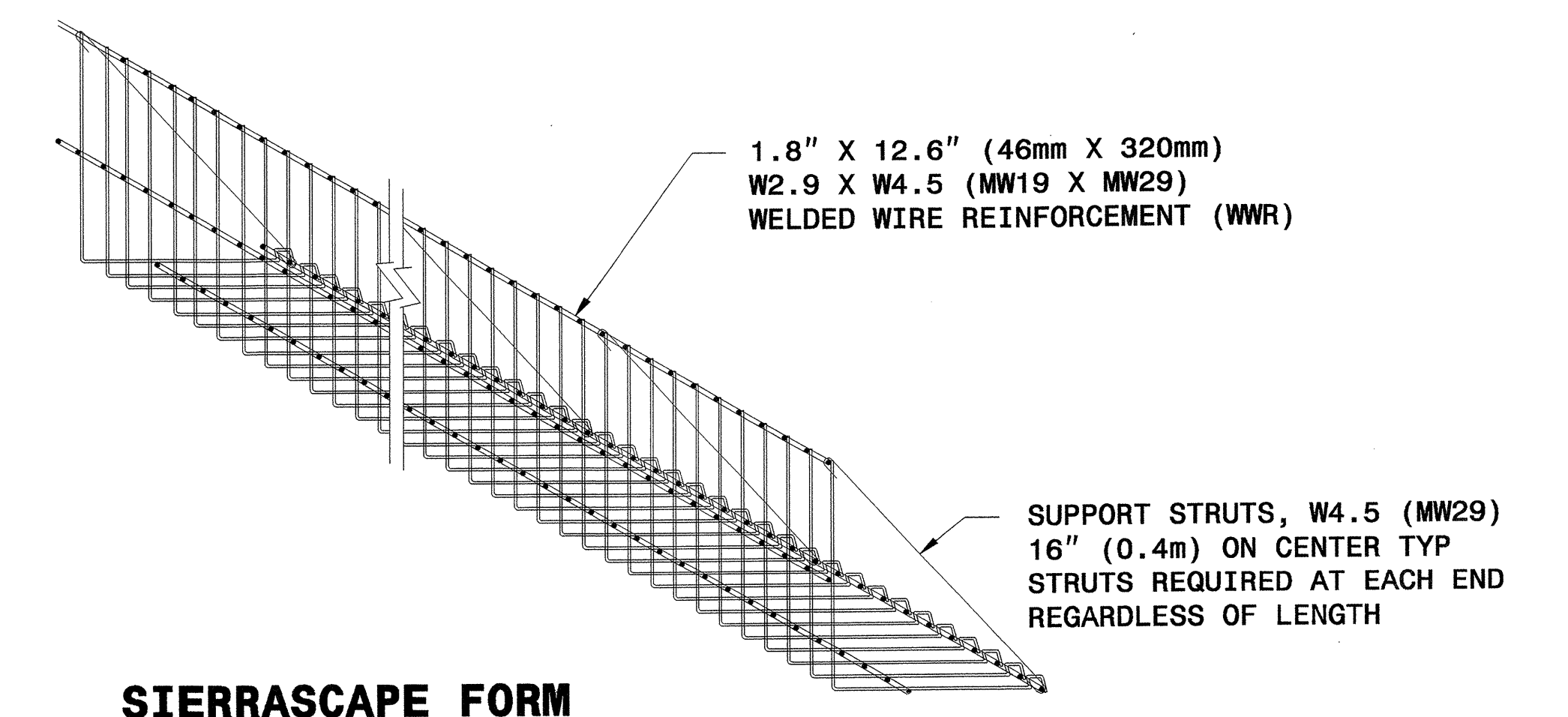
TYPICAL SECTION



ELEVATION VIEW

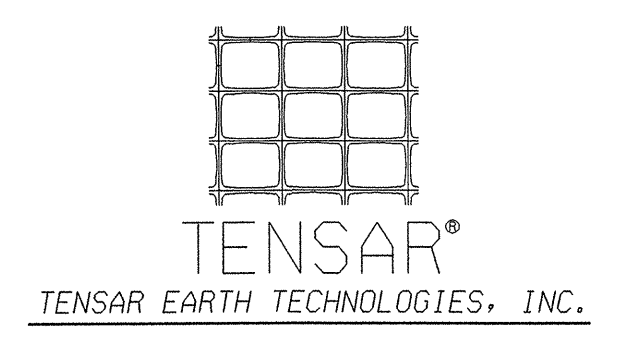


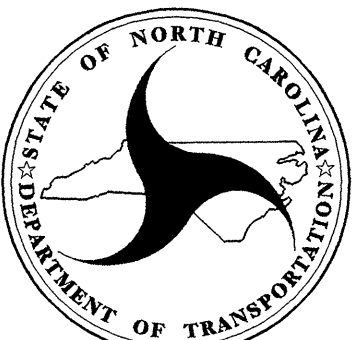
SUPPORT STRUT



SIERRASCAPE FORM

WALL COMPONENTS



| |
|---|
|  GEOTECHNICAL ENGINEERING UNIT STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH |
|---|

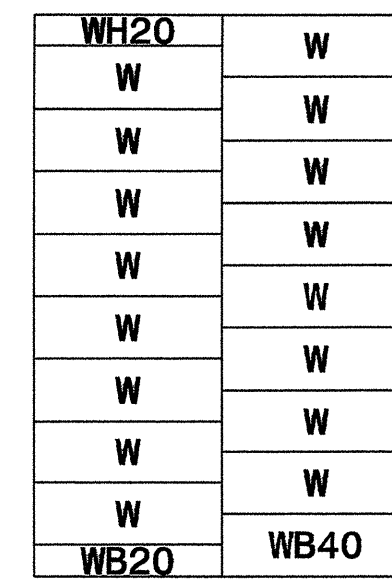
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| STANDARD DRAWING NO. 1801.02 SIERRASCAPE TEMPORARY WALL SHEET 5 OF 11 DATE: 12-19-06 |
|--|



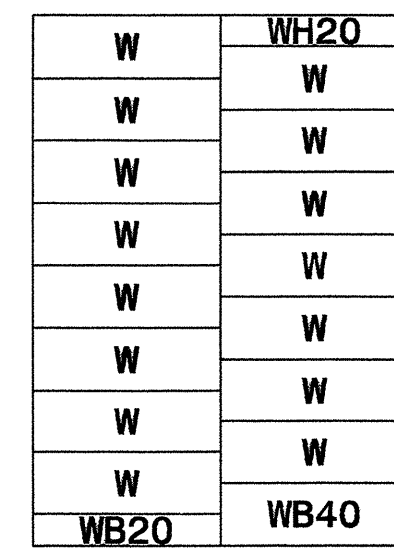
Signature: *S. A. Hadden* 3/29/07

PANEL LAYOUTS

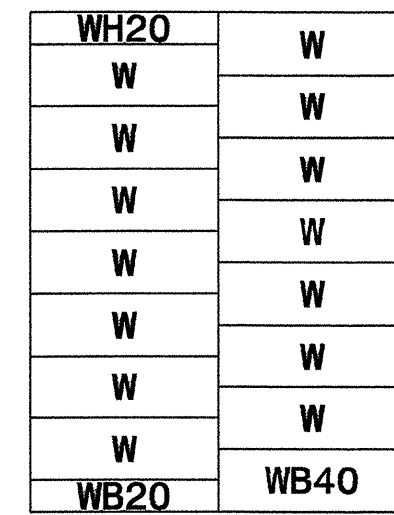
H - WALL HEIGHT
(FEET-INCHES)
(METER)



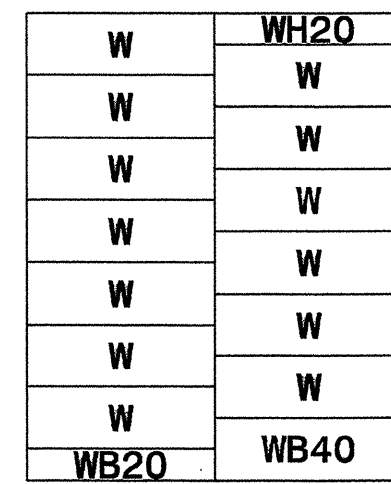
< 28 - 0
< 8.5



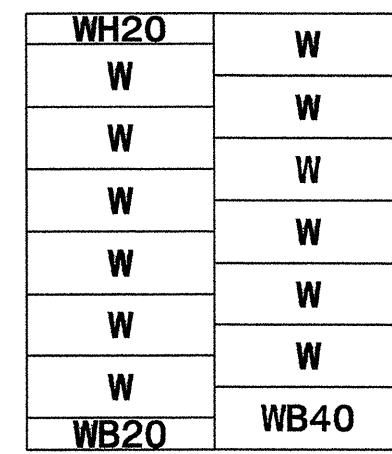
< 27 - 0
< 8.2



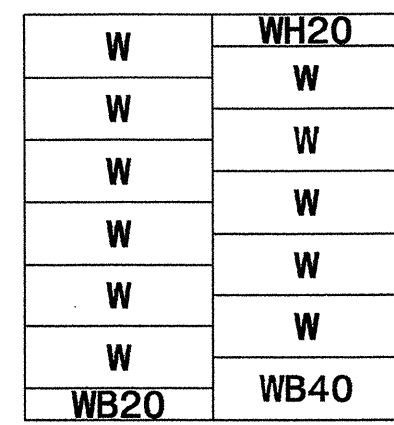
< 25 - 4
< 7.7



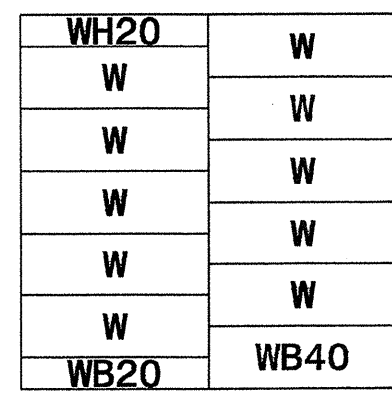
< 23 - 8
< 7.2



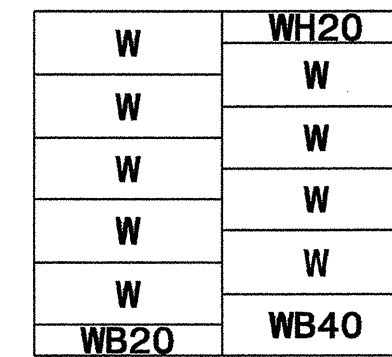
< 22 - 0
< 6.7



< 20 - 4
< 6.2

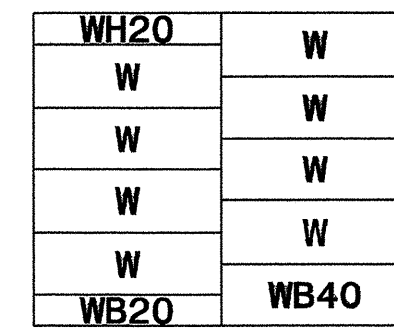


< 18 - 8
< 5.7

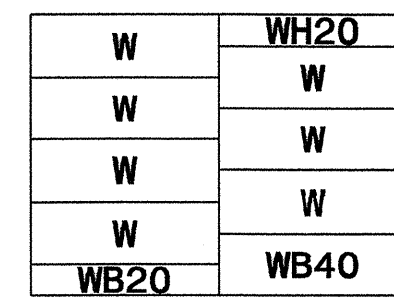


(FEET-INCHES)
(METER)

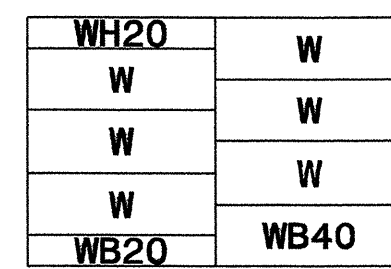
< 17 - 0
< 5.2



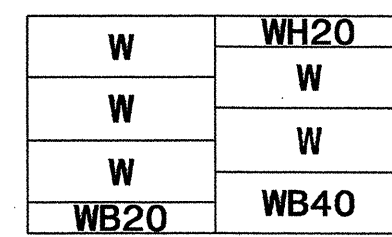
< 15 - 4
< 4.7



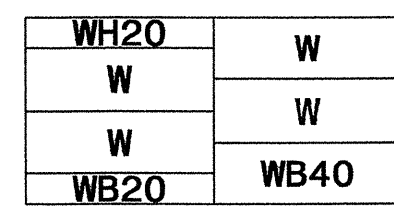
< 13 - 8
< 4.2



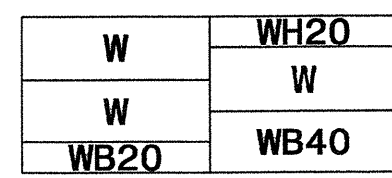
< 12 - 0
< 3.7



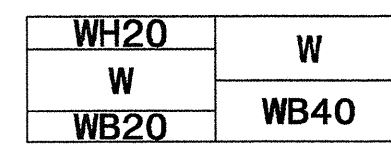
< 10 - 4
< 3.2



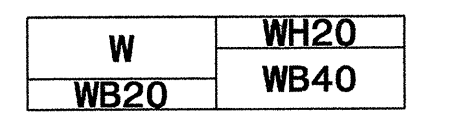
< 8 - 8
< 2.6



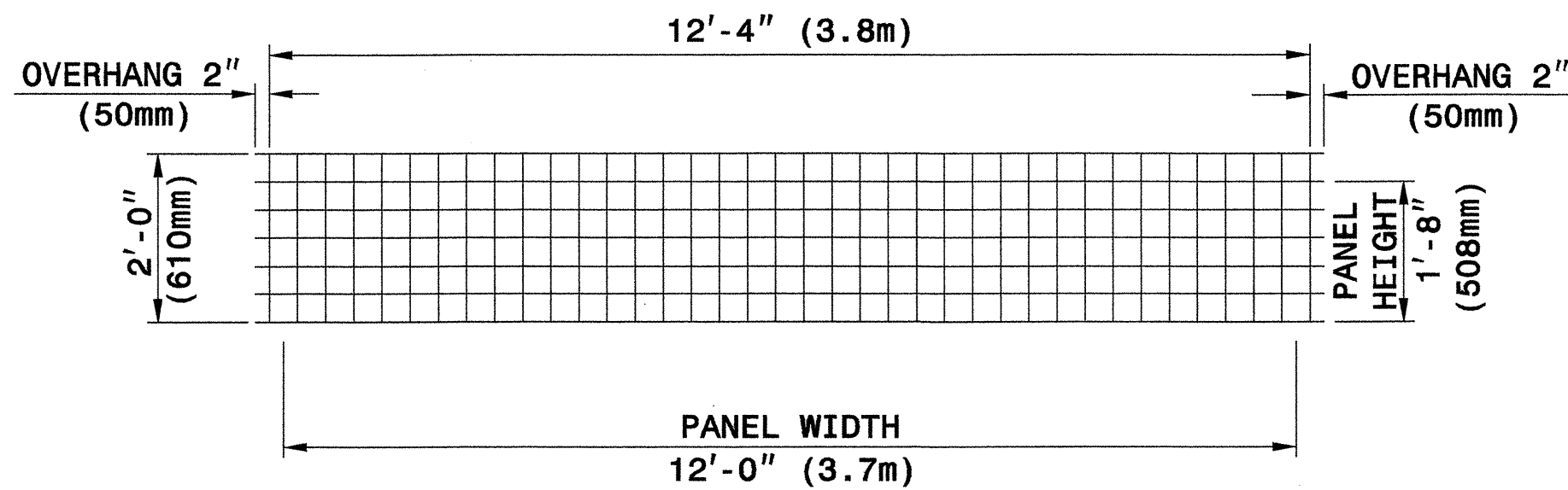
< 7 - 0
< 2.1



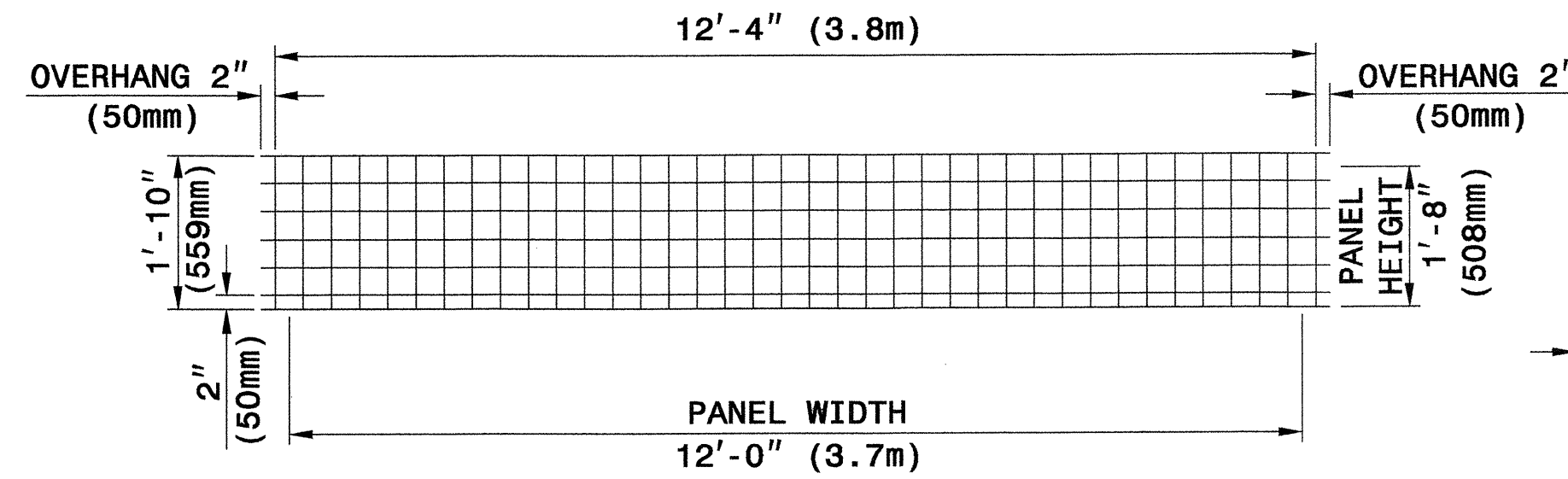
< 5 - 4
< 1.6



< 3 - 8
< 1.1

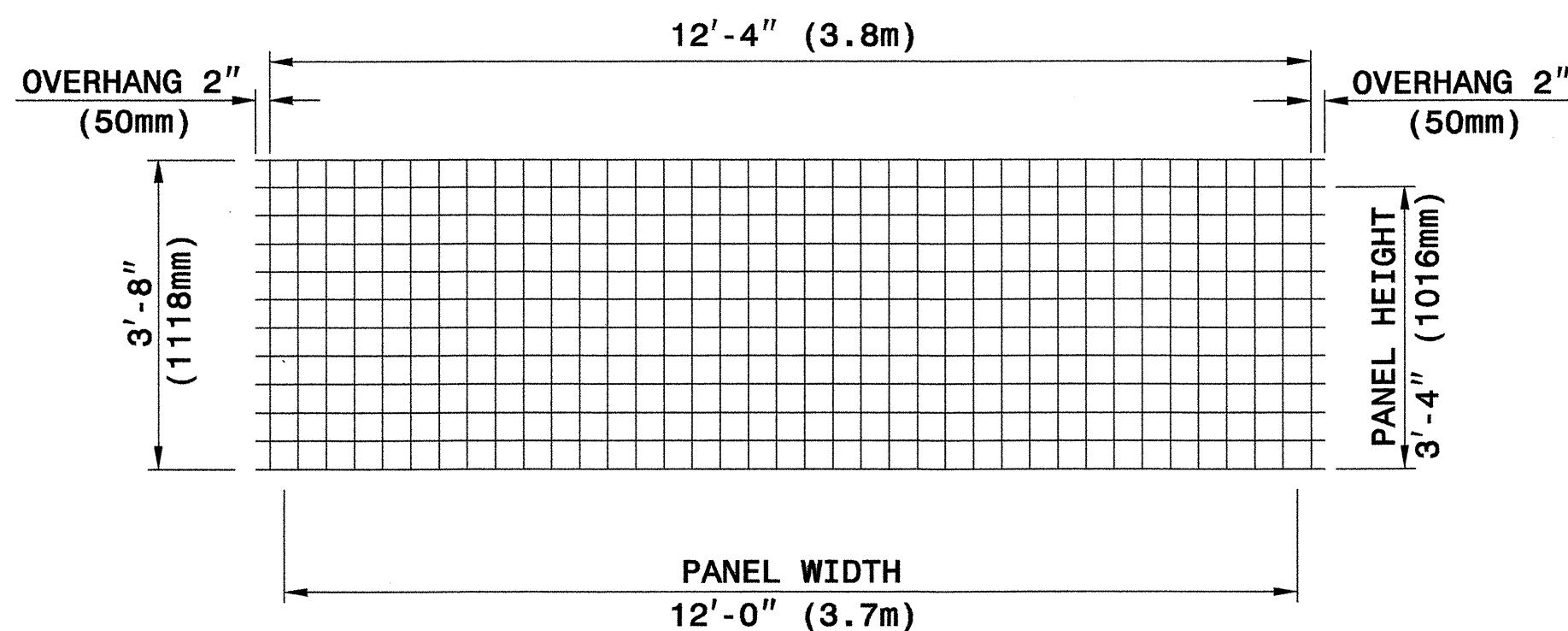


TYPE WH20

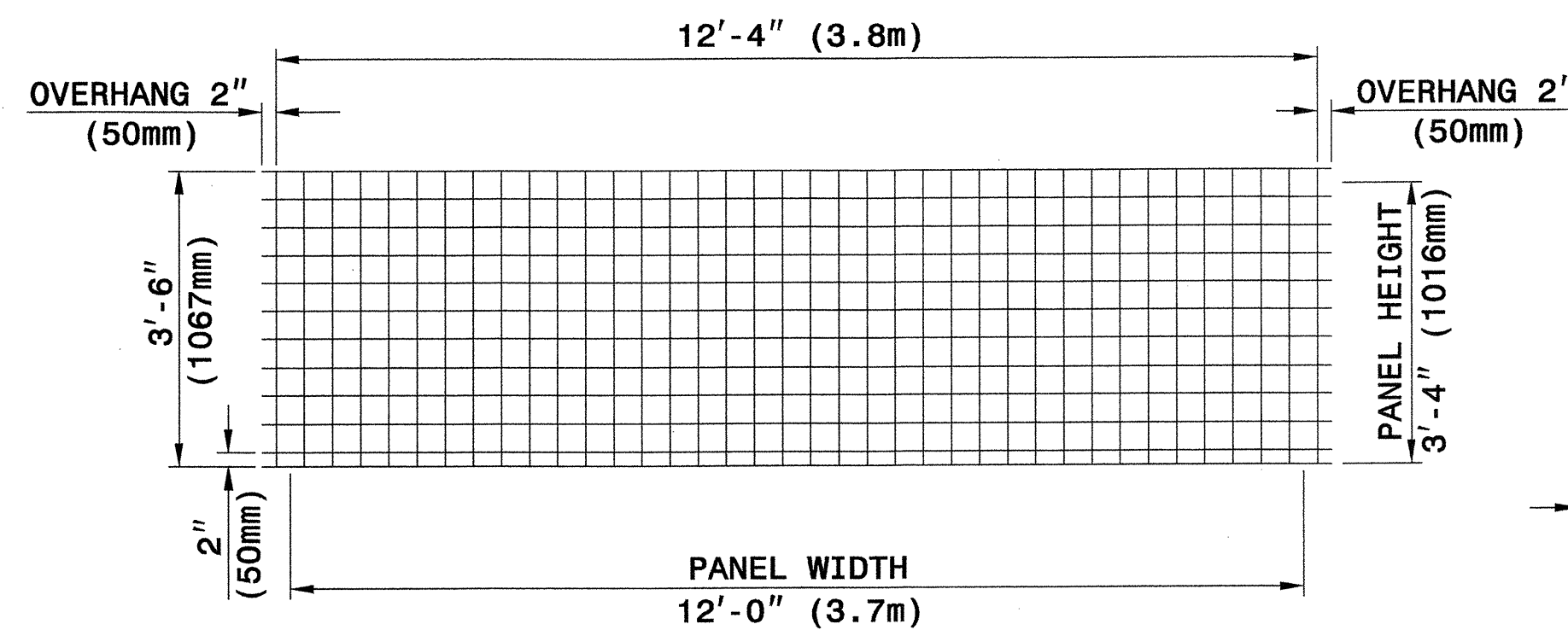


TYPE WB20

SECTION



TYPE W



TYPE WB40

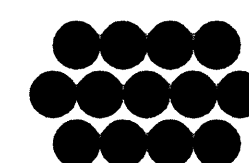
SECTION

WELDED WIRE FACINGS

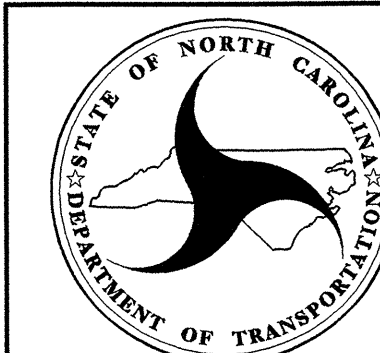
WELDED WIRE FORMS

PANEL TYPES (WELDED WIRE FACINGS AND FORMS)

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



The Reinforced Earth Company



GEOTECHNICAL ENGINEERING UNIT
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH
TEMPORARY WALL

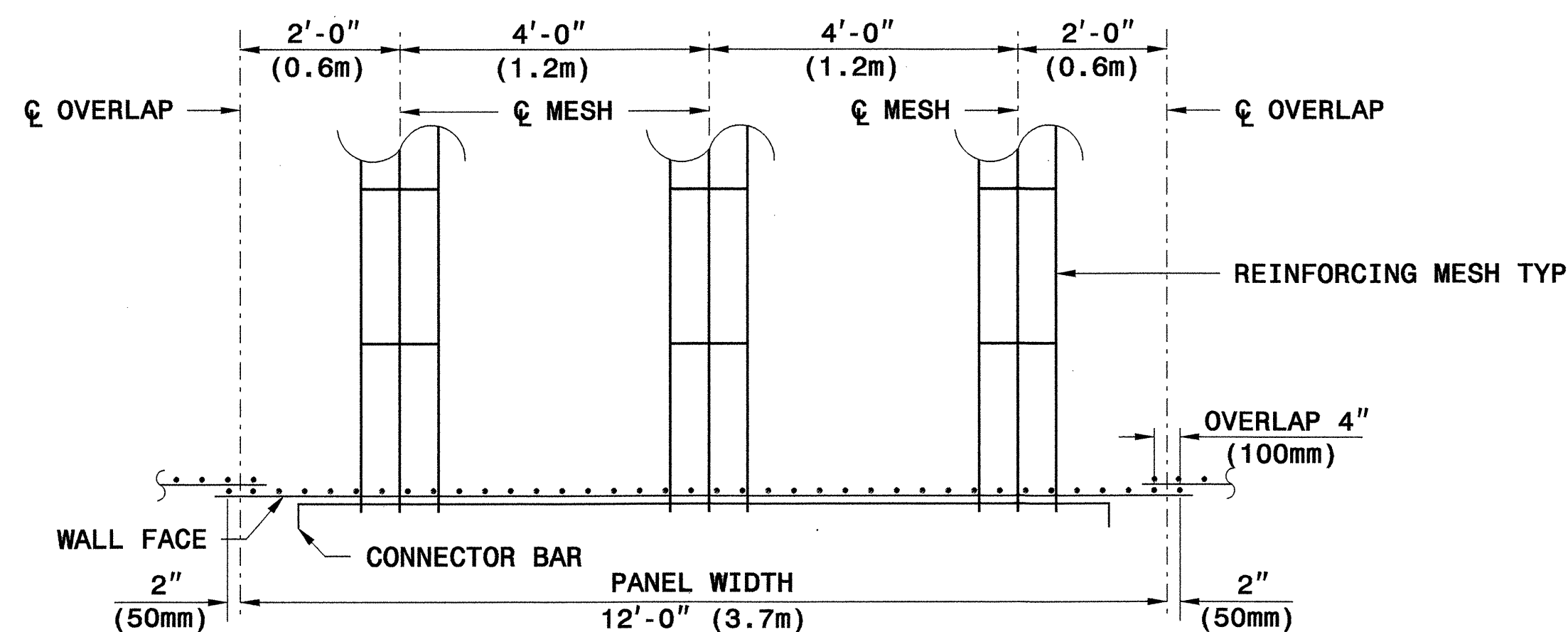
SHEET 6 OF 11

DATE: 12-19-06



Scott A. Hadden 3/29/07
SIGNATURE DATE

SIGNATURE DATE



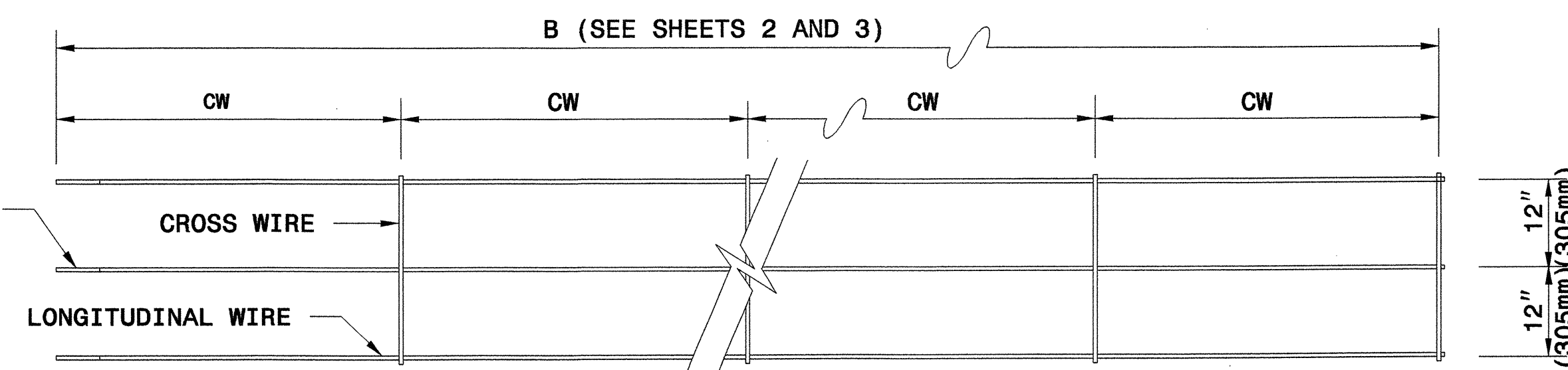
**REINFORCING MESH PLACEMENT DETAIL
(PLAN VIEW)**



1/2" (13mm) DIA. BAR

CONNECTOR BAR

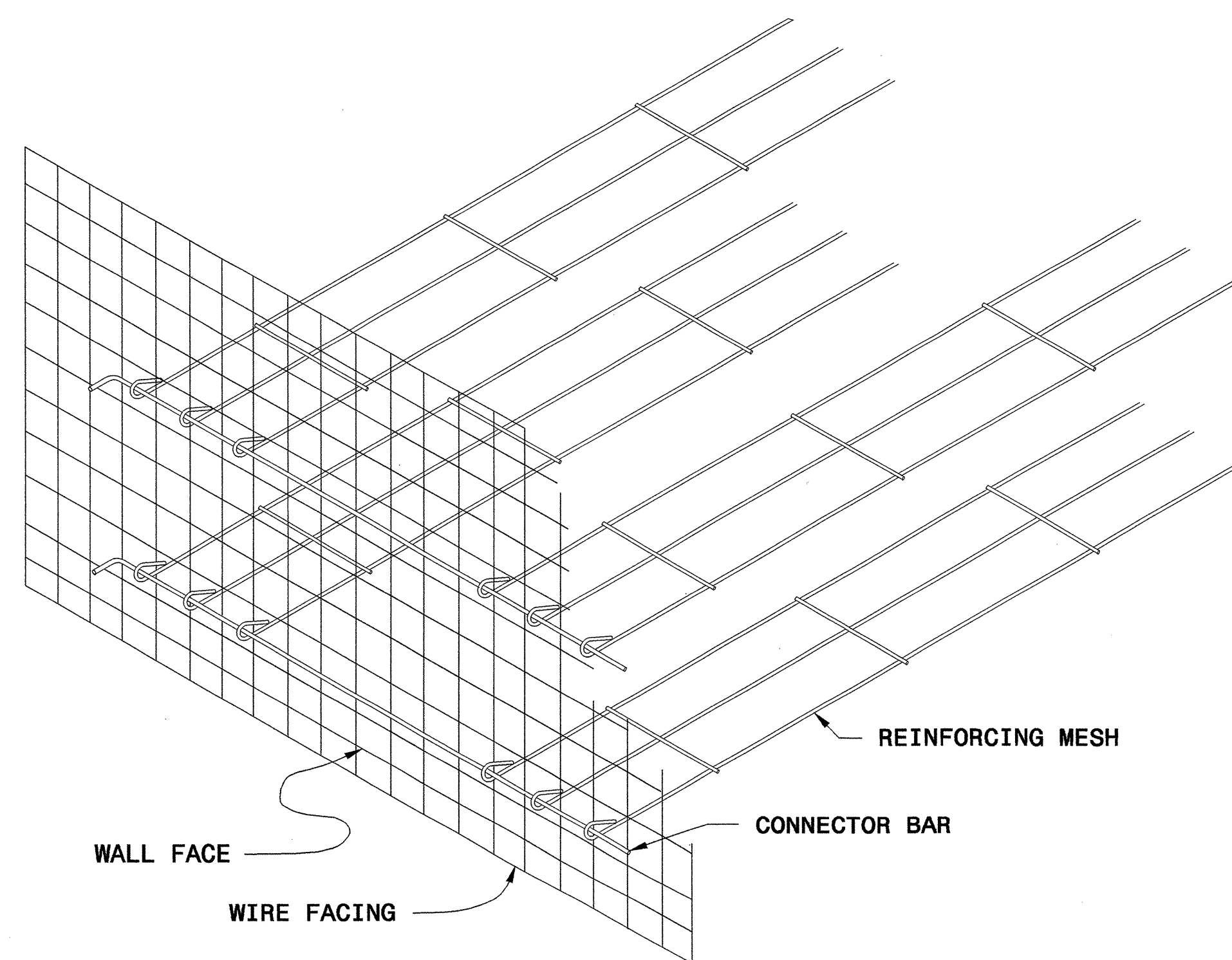
LOOPEd END OF MESH
(SEE REINFORCING MESH LOOP DETAIL)



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

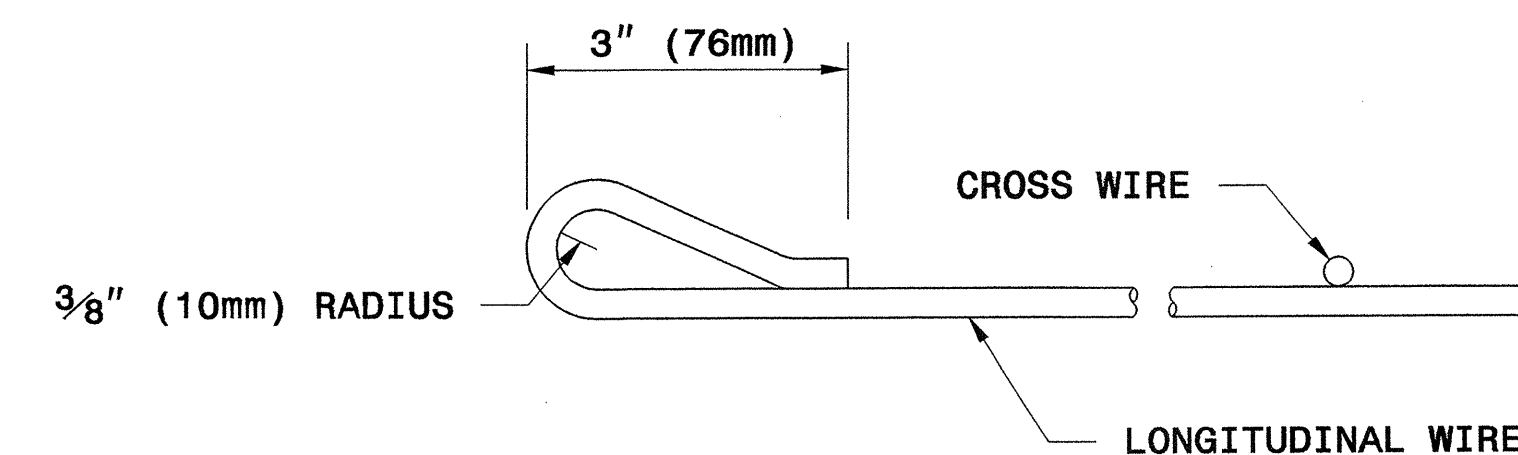
3W8 X W8 x 2.0' (3MW52 X MW52 X 610mm)
 NO. OF LONGITUDINAL WIRES
 GAUGE OF LONGITUDINAL WIRES
 GAUGE OF CROSS WIRES
 SPACING OF CROSS WIRES IN FT (mm), CW

REINFORCING MESH DESIGNATION

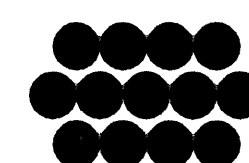


GENERAL ASSEMBLY DETAIL

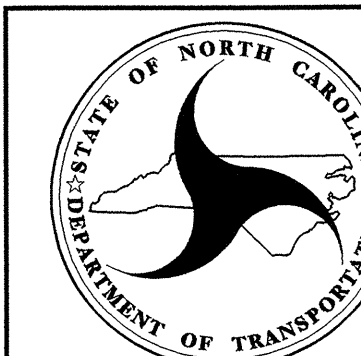
REINFORCING MESH



REINFORCING MESH LOOP DETAIL



The Reinforced Earth Company



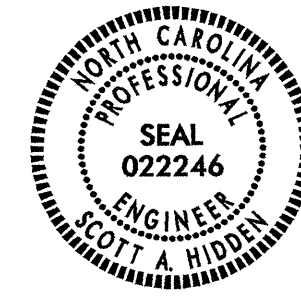
GEOTECHNICAL ENGINEERING UNIT
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

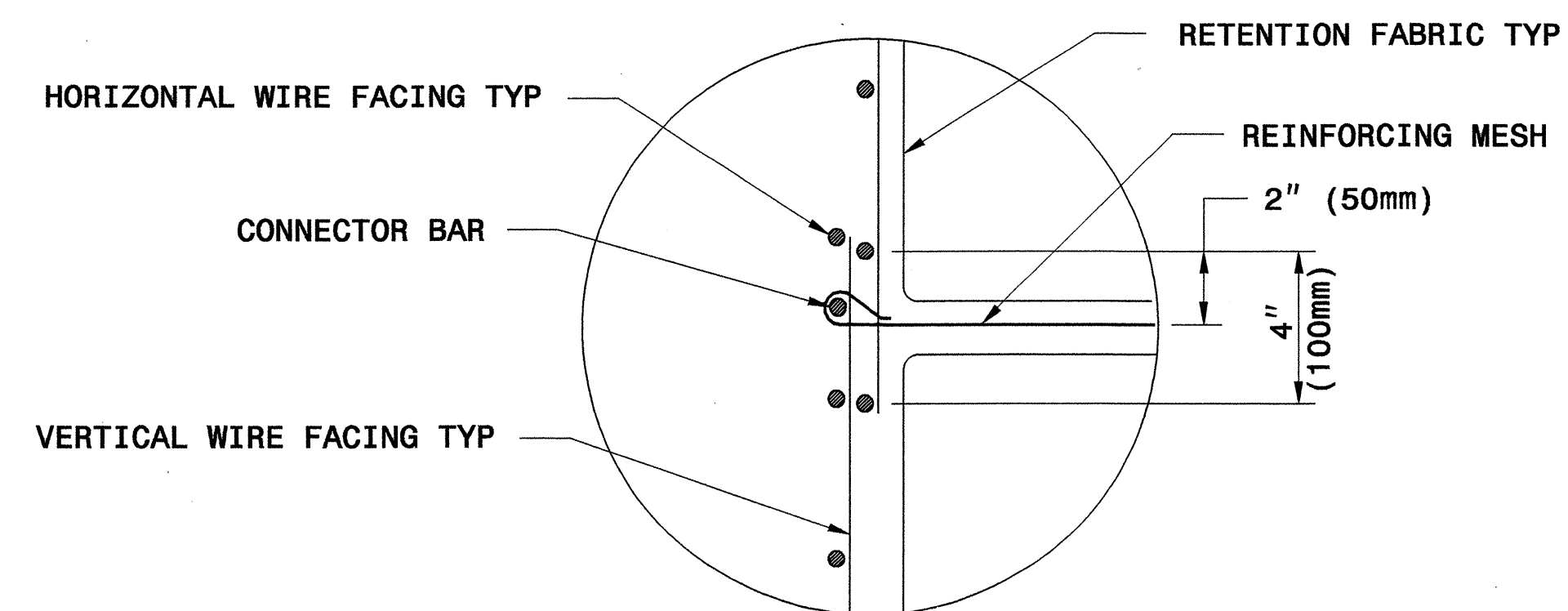
STANDARD DRAWING NO. 1801.02

RETAINED EARTH
 TEMPORARY WALL

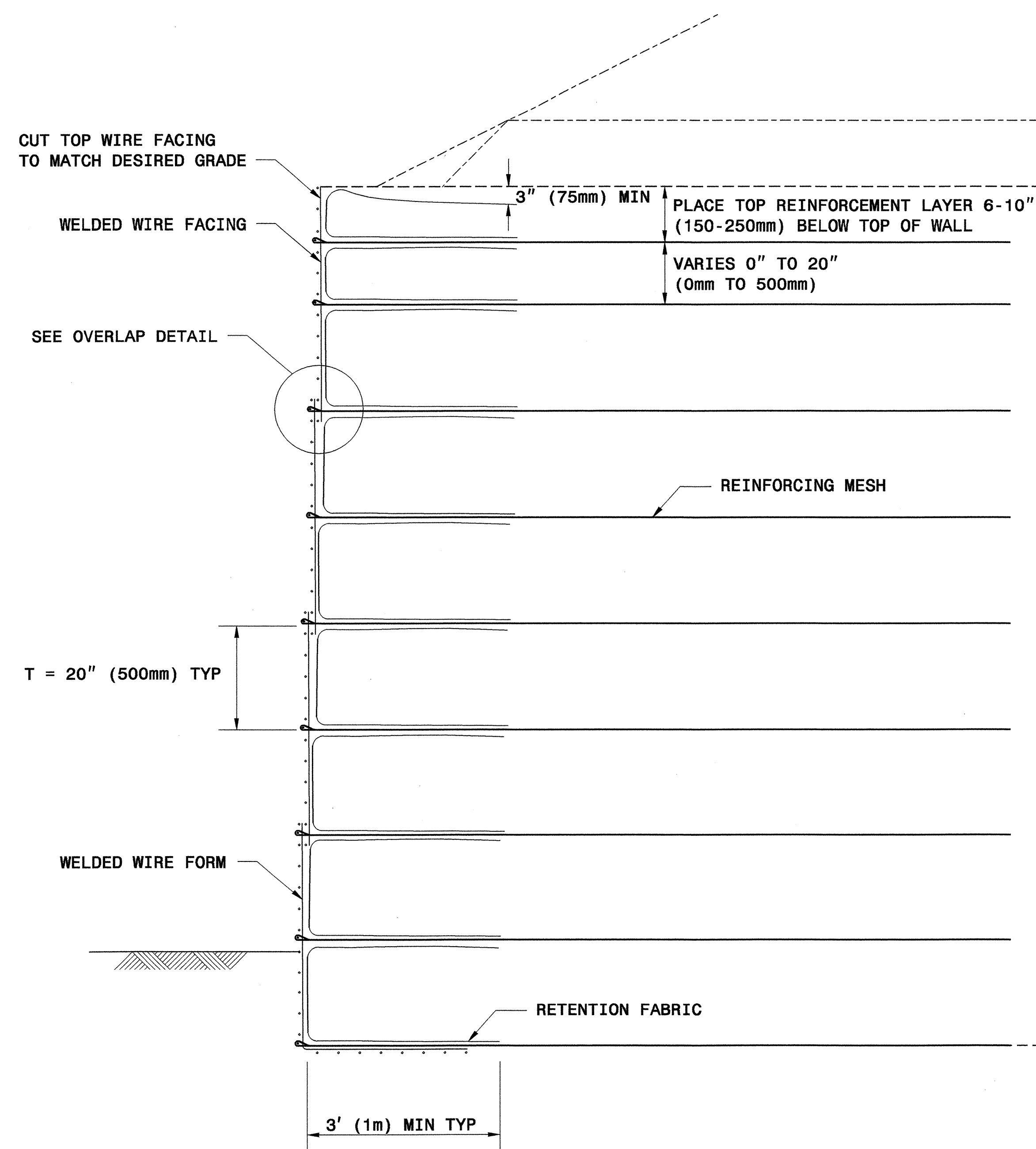
SHEET 7 OF 11

DATE: 12-19-06

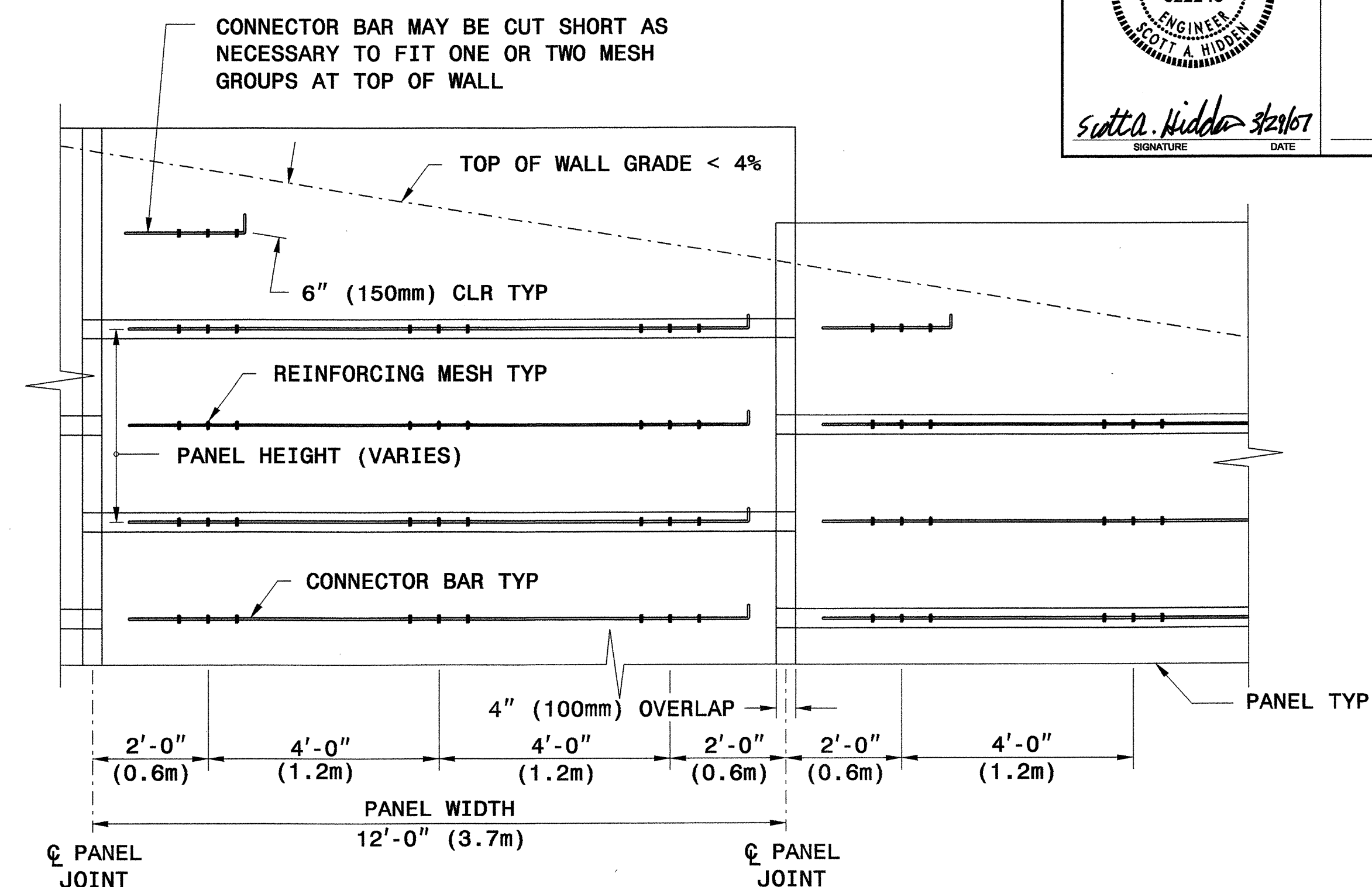
| | |
|--|----------------------------|
| GEOTECHNICAL ENGINEER  SCOTT A. SHIDDEN SIGNATURE DATE | ENGINEER SIGNATURE DATE |
|--|----------------------------|



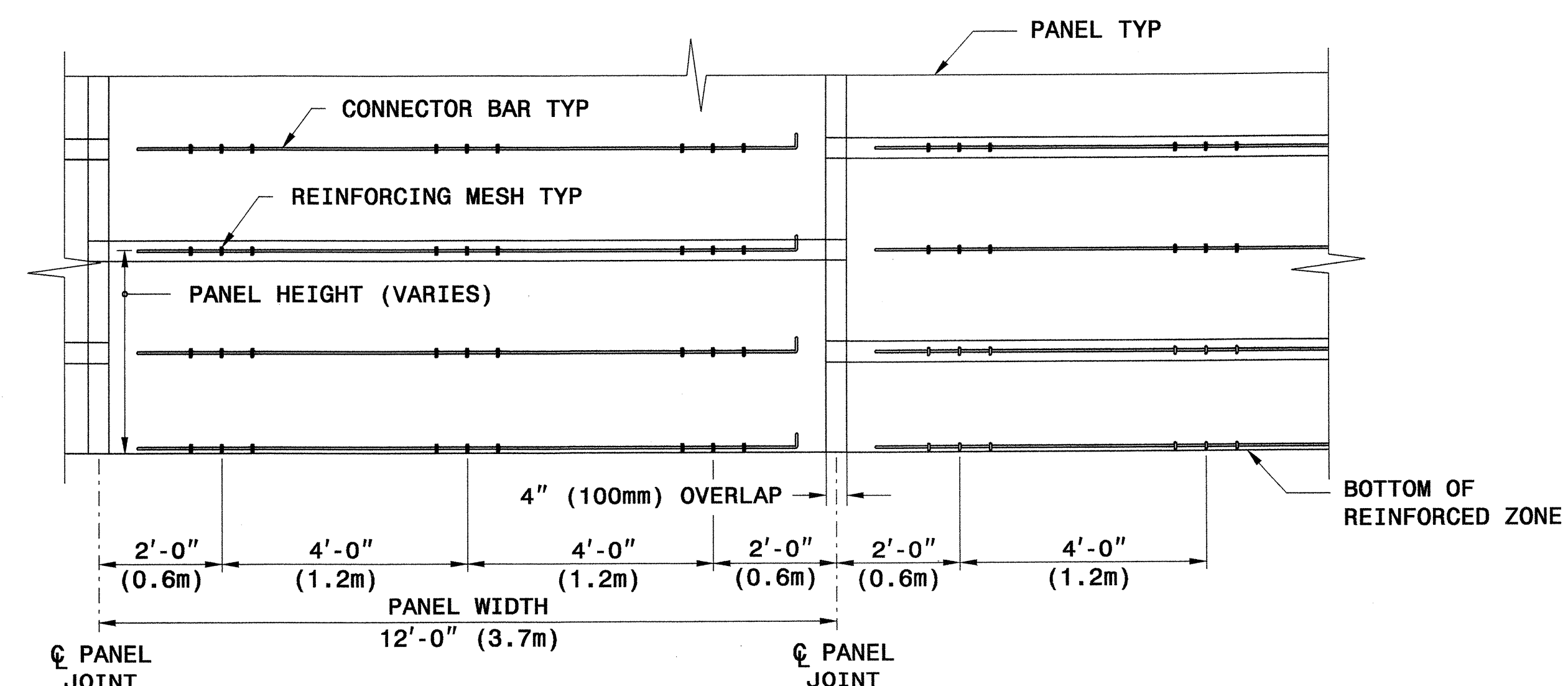
OVERLAP DETAIL



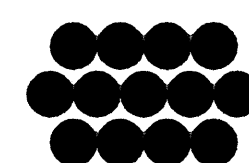
TYPICAL SECTION



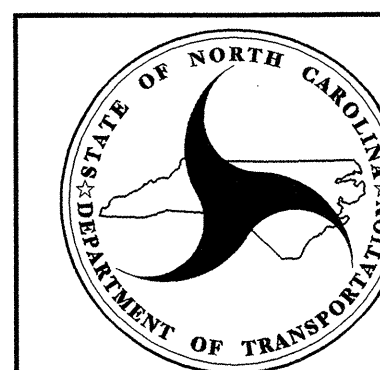
**TYPICAL ELEVATION @ TOP OF WALL
(WIRES NOT SHOWN FOR CLARITY)**



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



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GEOTECHNICAL ENGINEERING UNIT
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL



Signature: *Scott A. Hadden* 3/2/07
 SIGNATURE DATE

PANEL LAYOUTS

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

| | |
|----|----|
| B3 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| B6 | A9 |

< 28 - 0
 < 8.5

| | |
|----|----|
| A6 | B3 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| B6 | A9 |

< 27 - 8
 < 8.4

| | |
|----|----|
| B3 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| B6 | A9 |

< 26 - 0
 < 7.9

| | |
|----|----|
| A6 | B3 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| B6 | A9 |

< 24 - 4
 < 7.4

| | |
|----|----|
| B3 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| B6 | A9 |

< 22 - 8
 < 6.9

| | |
|----|----|
| A6 | B3 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| B6 | A9 |

< 21 - 0
 < 6.4

| | |
|----|----|
| B3 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| B6 | A9 |

< 19 - 4
 < 5.9

| | |
|----|----|
| A6 | B3 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| B6 | A9 |

(FEET - INCHES)
 (METER)

< 17 - 8
 < 5.4

| | |
|----|----|
| B3 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| B6 | A9 |

< 16 - 0
 < 4.9

| | |
|----|----|
| A6 | B3 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| A6 | A6 |
| B6 | A9 |

< 14 - 4
 < 4.4

| | |
|----|-----|
| B4 | A8 |
| A8 | A8 |
| A8 | A8 |
| A8 | A8 |
| B8 | A12 |

< 12 - 8
 < 3.9

| | |
|----|-----|
| A8 | B4 |
| A8 | A8 |
| A8 | A8 |
| B8 | A12 |

< 11 - 0
 < 3.4

| | |
|-----|-----|
| B5 | A10 |
| A10 | A10 |
| A10 | A10 |
| B10 | A15 |

< 9 - 4
 < 2.8

| | |
|-----|-----|
| A10 | B5 |
| A10 | A10 |
| B10 | A15 |

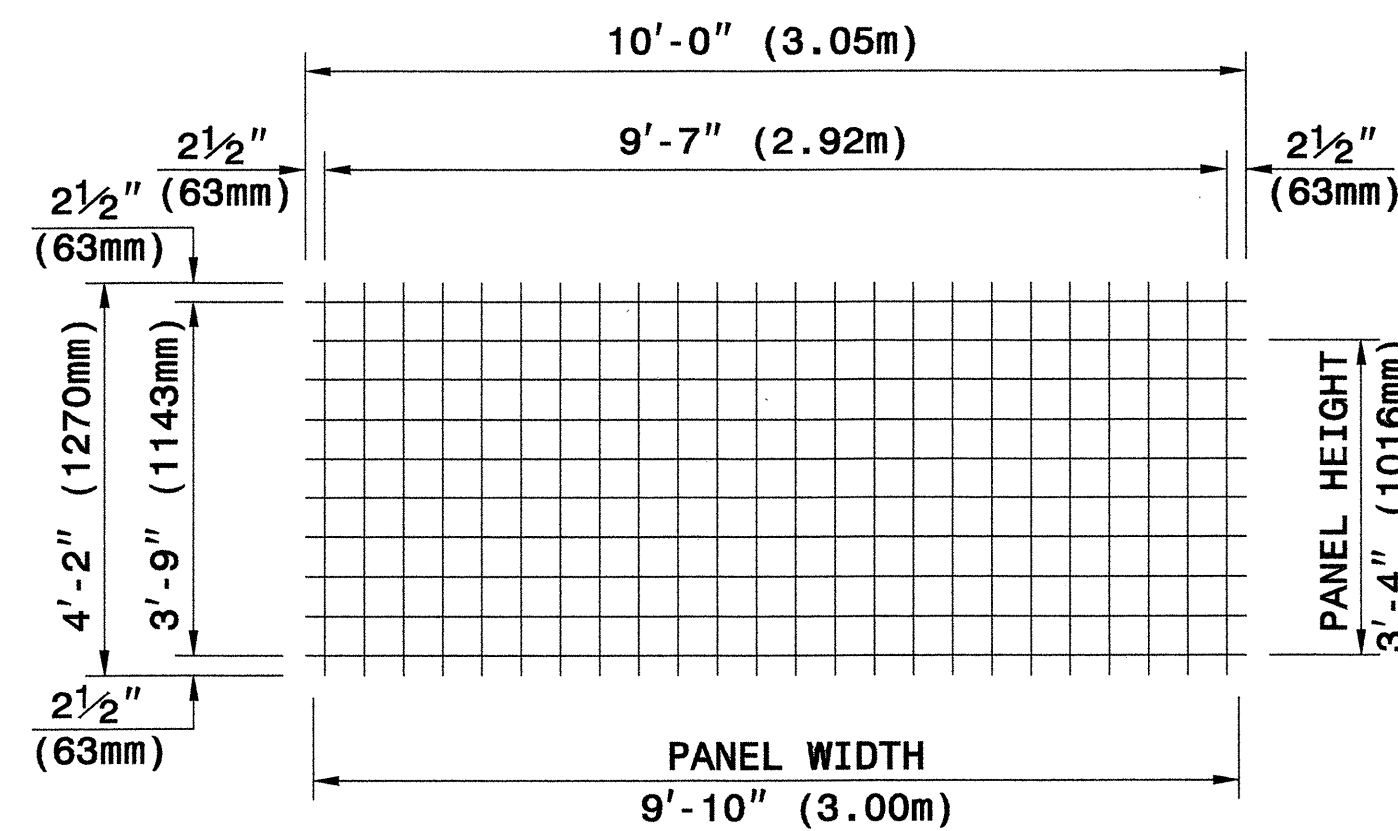
< 7 - 8
 < 2.3

| | |
|-----|-----|
| B5 | A10 |
| A10 | A10 |
| B10 | A15 |

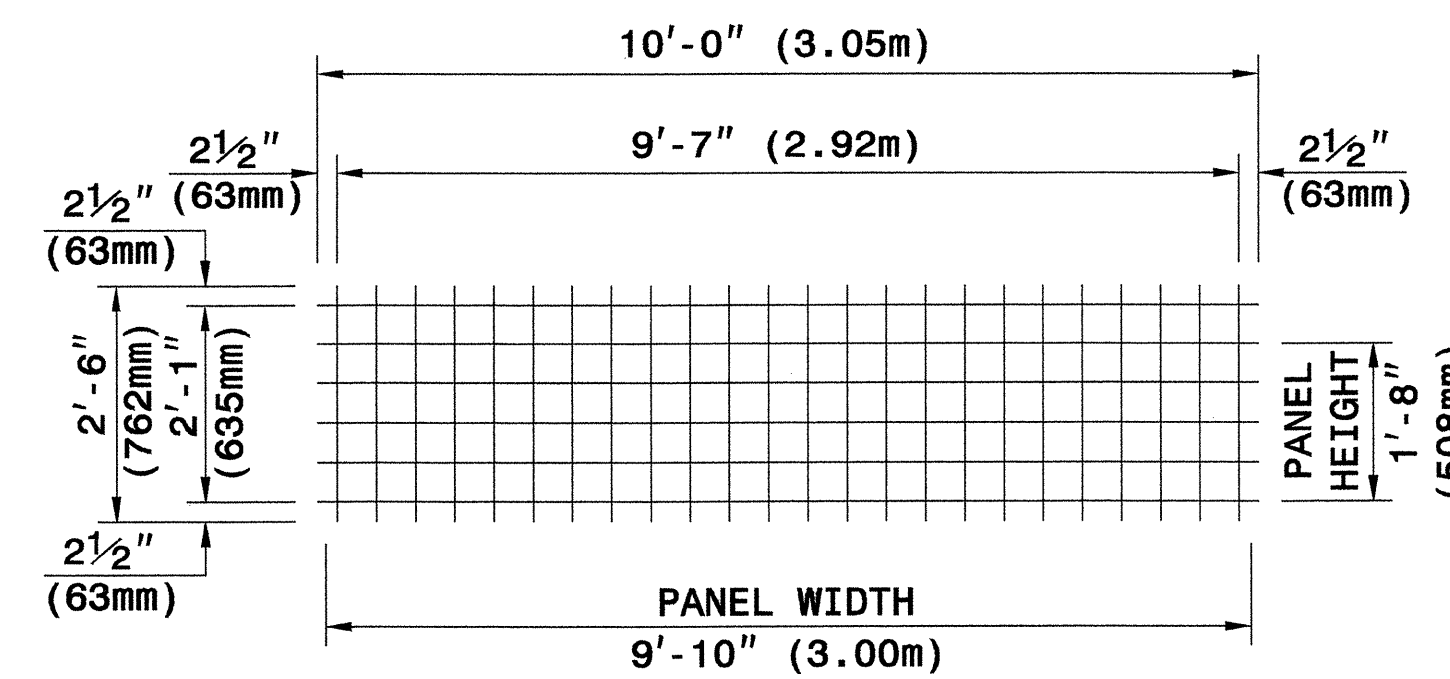
< 6 - 0
 < 1.8

| | |
|-----|-----|
| A10 | B5 |
| B10 | A15 |

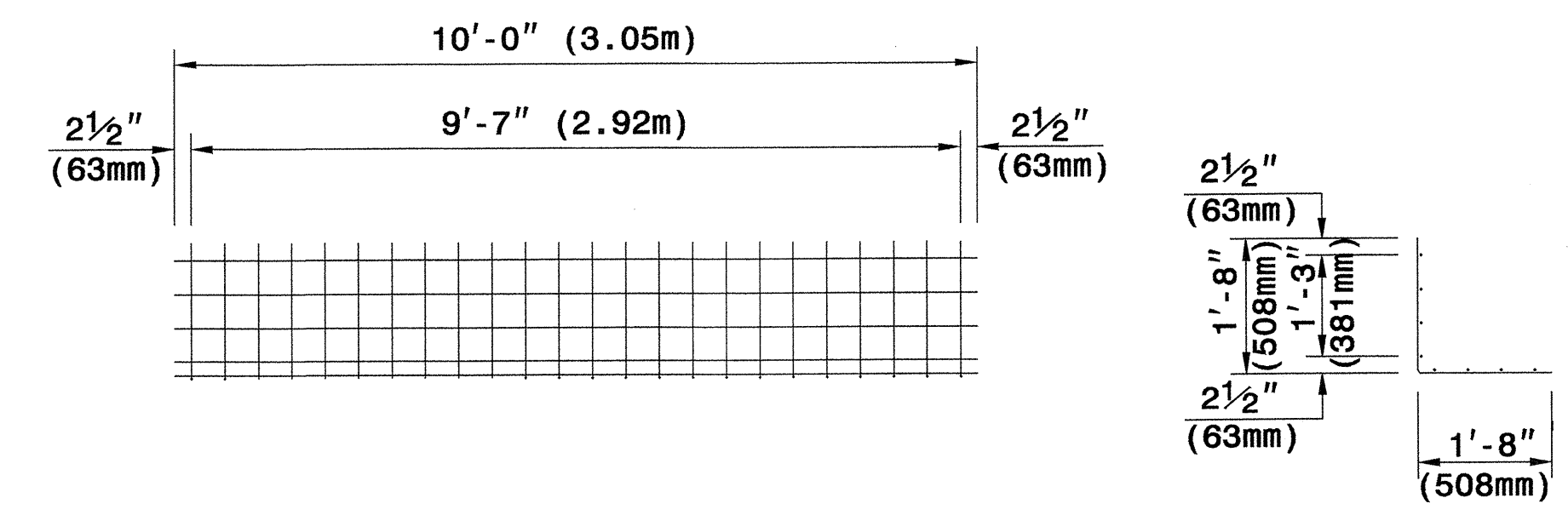
< 4 - 4
 < 1.3



TYPE A



TYPE B



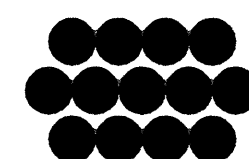
WELDED WIRE FORM

SECTION

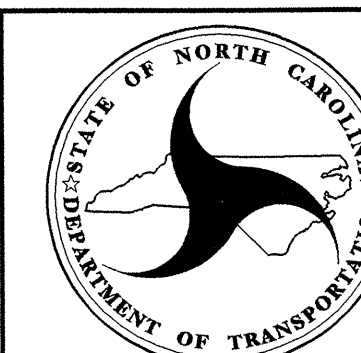
WELDED WIRE FACINGS

PANEL TYPES (WELDED WIRE FACINGS AND FORM)

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




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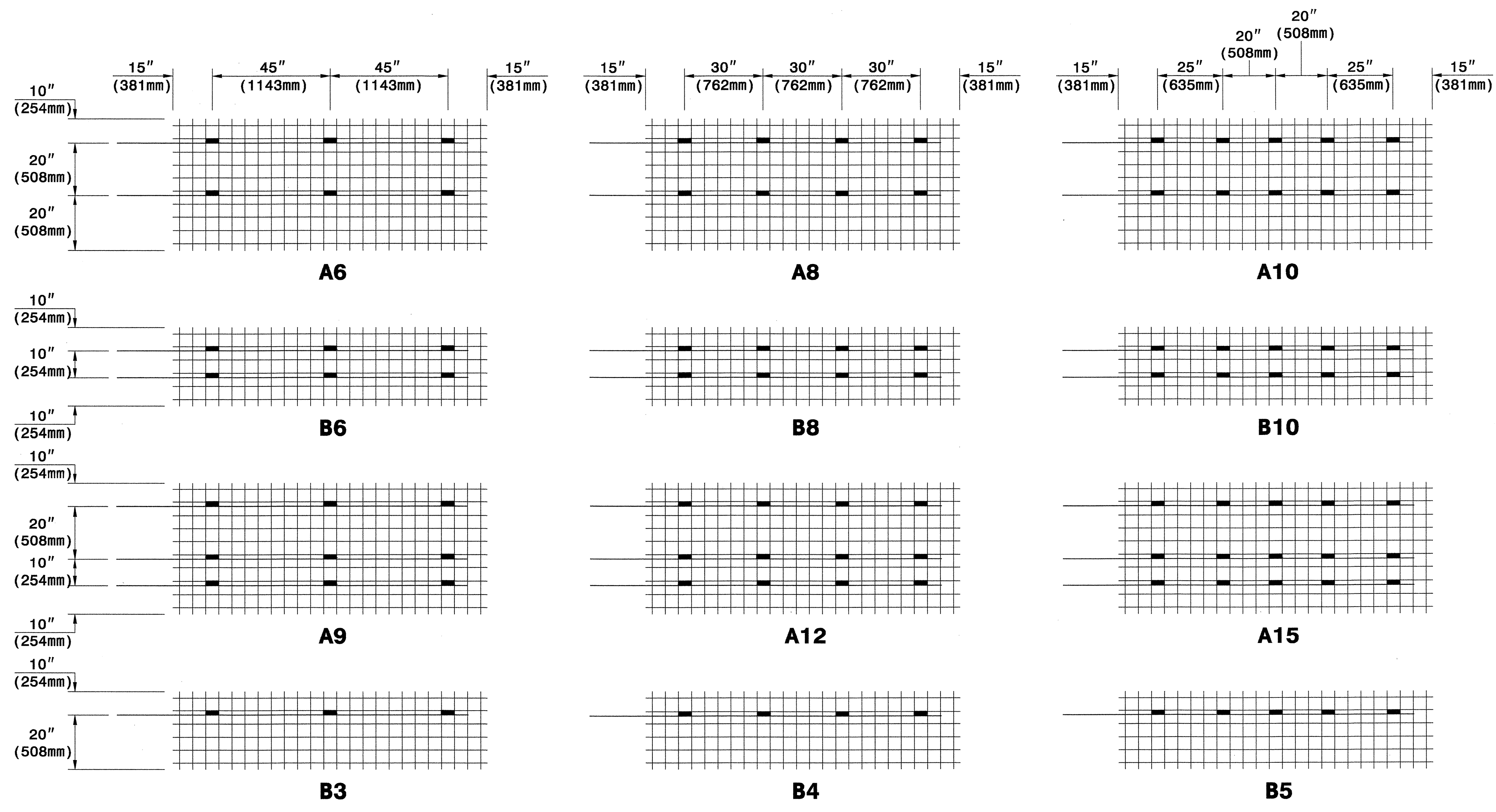


GEOTECHNICAL ENGINEERING UNIT
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD DRAWING NO. 1801.02

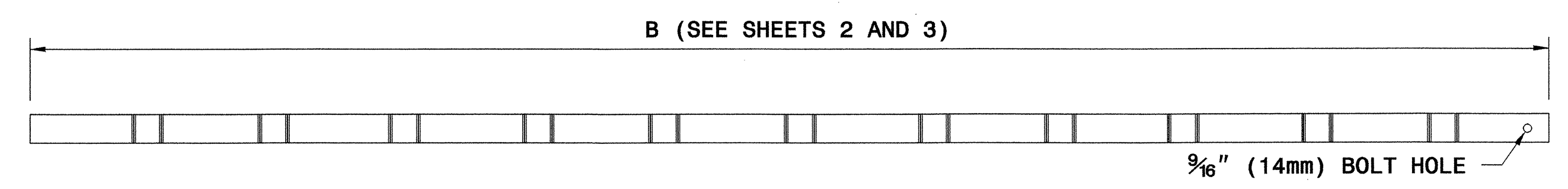
TERRATREL
 TEMPORARY WALL

| | |
|---|----------------------------|
| GEOTECHNICAL ENGINEER  Scott A. Hadden 3/27/07 SIGNATURE DATE | ENGINEER SIGNATURE DATE |
|---|----------------------------|

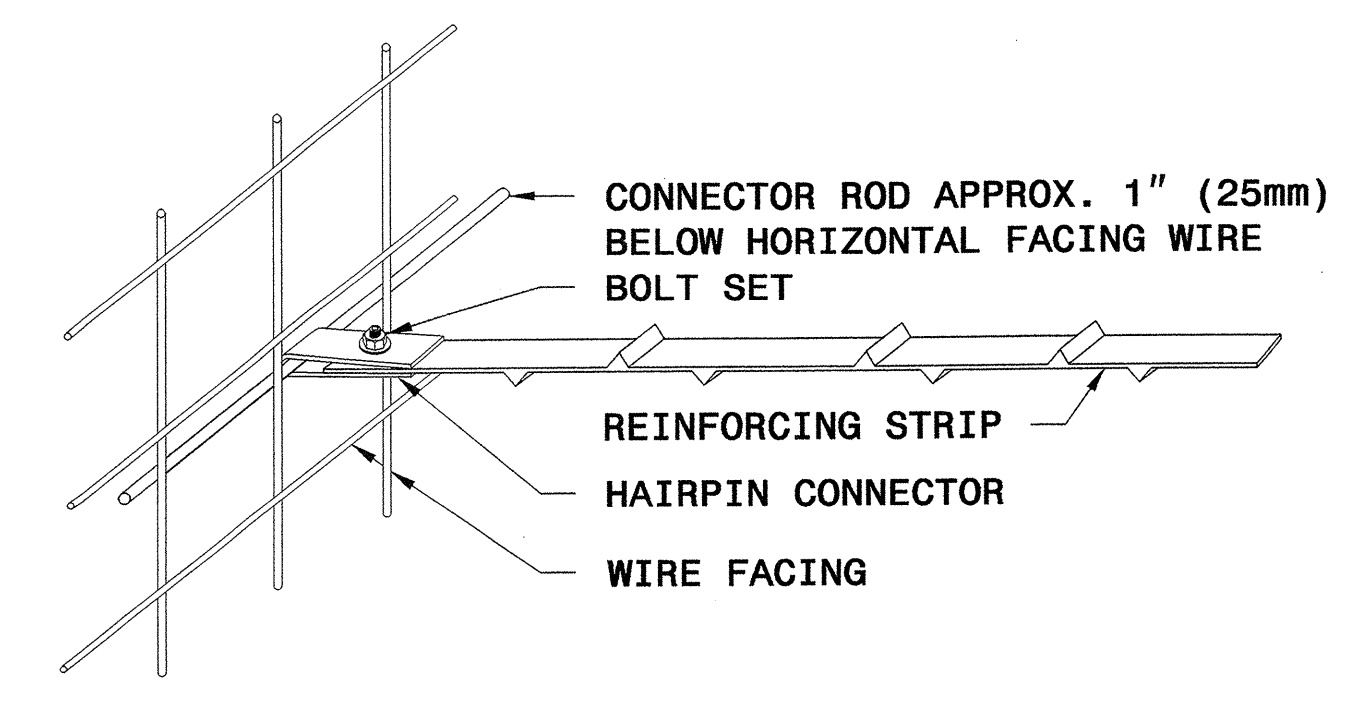


KEY: A8
 NUMBER OF REINFORCING STRIPS
 PANEL TYPE

CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



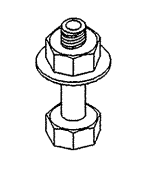
REINFORCING STRIP - 2" X 5/32" (50mm X 4mm)



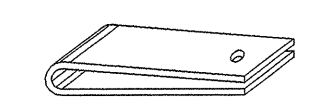
STRIP TO FACING CONNECTION



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

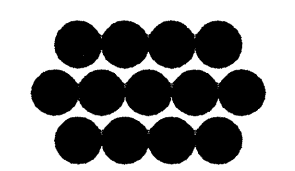


1/2" (13mm) BOLT WITH NUT AND WASHER
BOLT SET

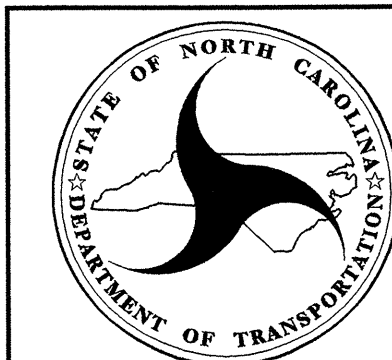


HAIRPIN CONNECTOR

WALL COMPONENTS



The Reinforced Earth Company

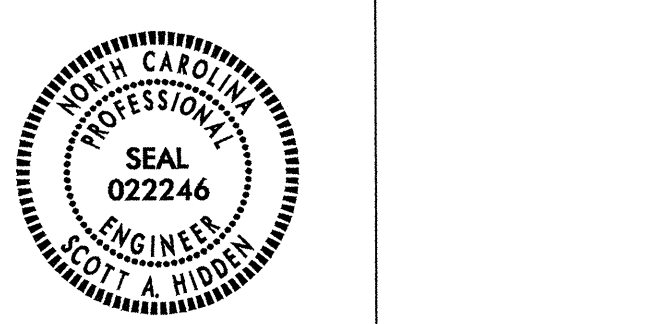


GEOTECHNICAL ENGINEERING UNIT
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

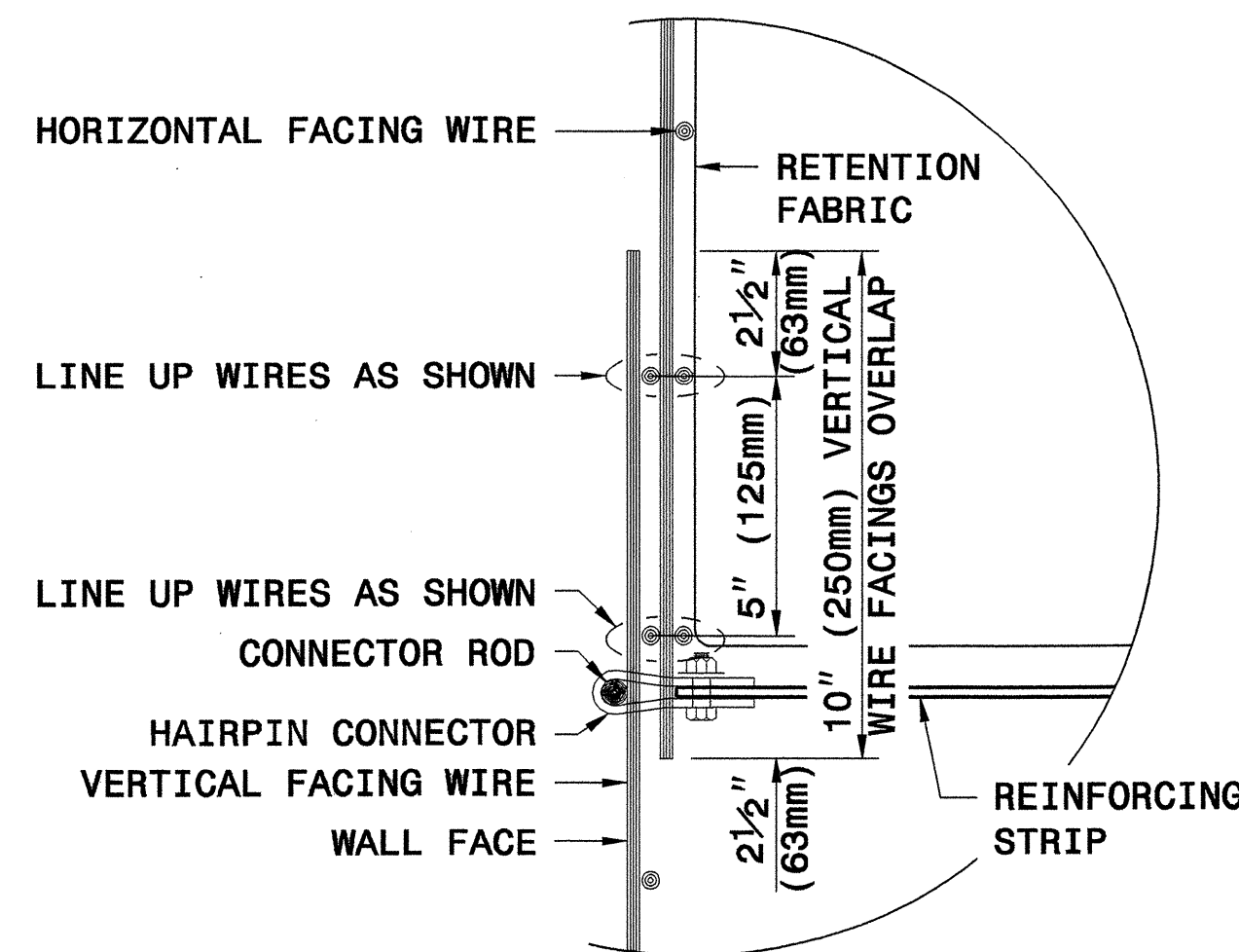
STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

SHEET 10 OF 11 DATE: 12-19-06

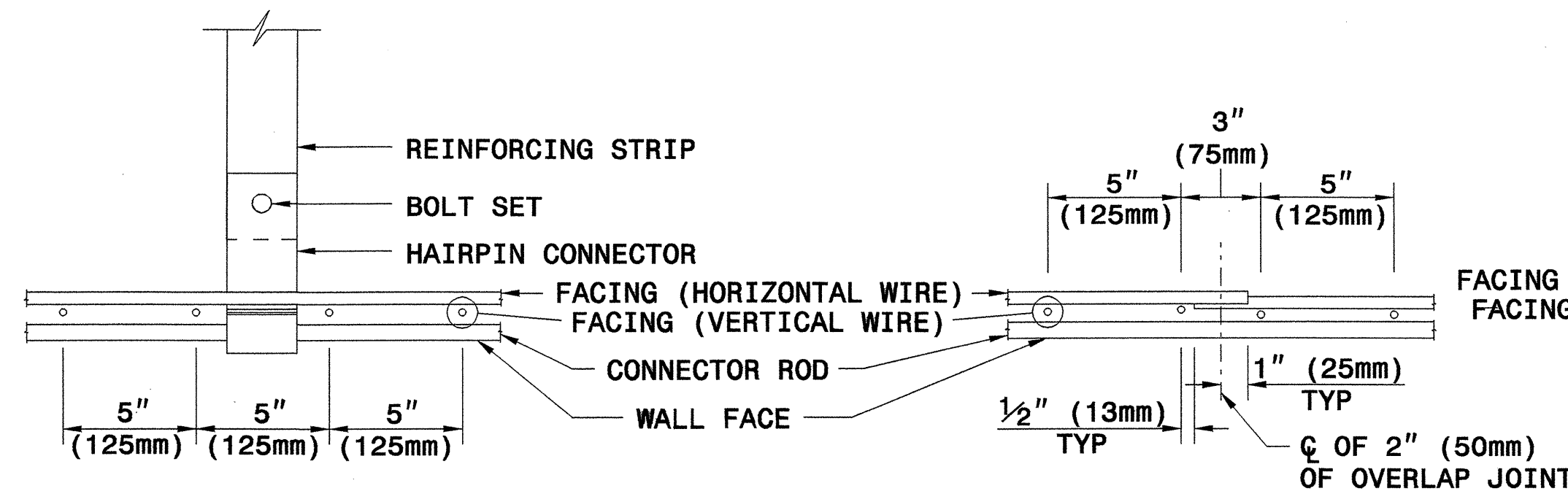


Signature: Scott A. Hadden, Date: [blank]



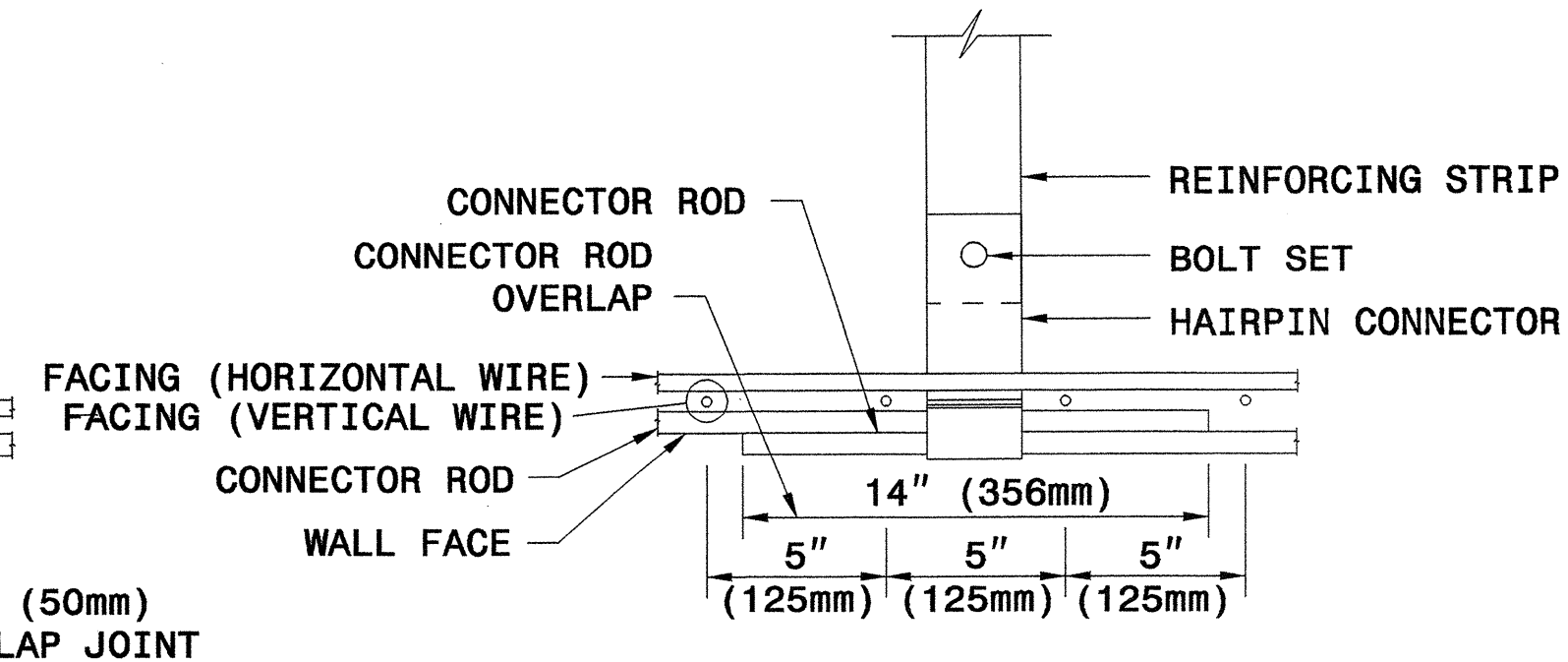
OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

VERTICAL OVERLAP DETAIL

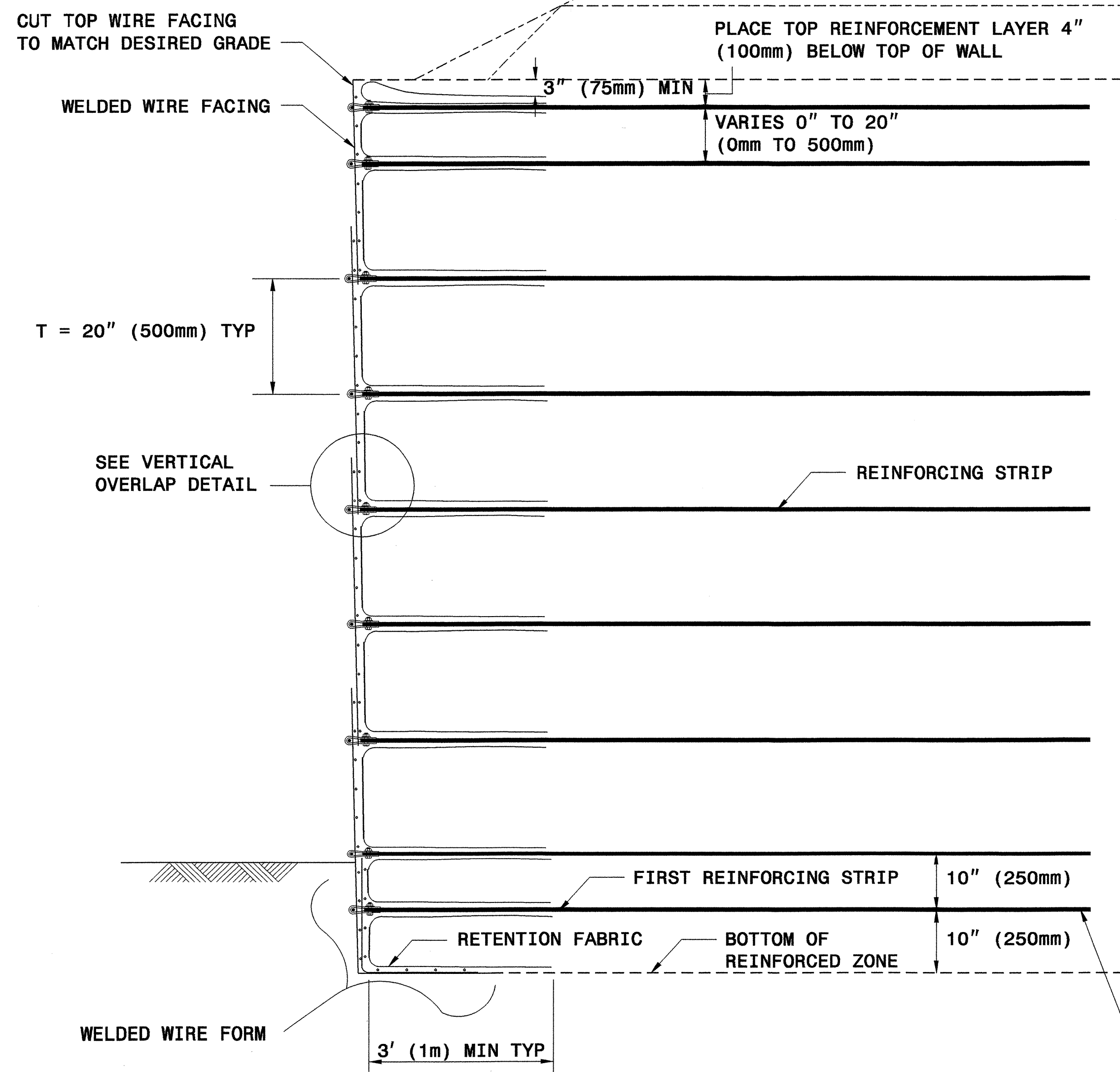


PLAN DETAIL 'A' STRIP CONNECTION

PLAN DETAIL 'B' HORIZONTAL OVERLAP DETAIL

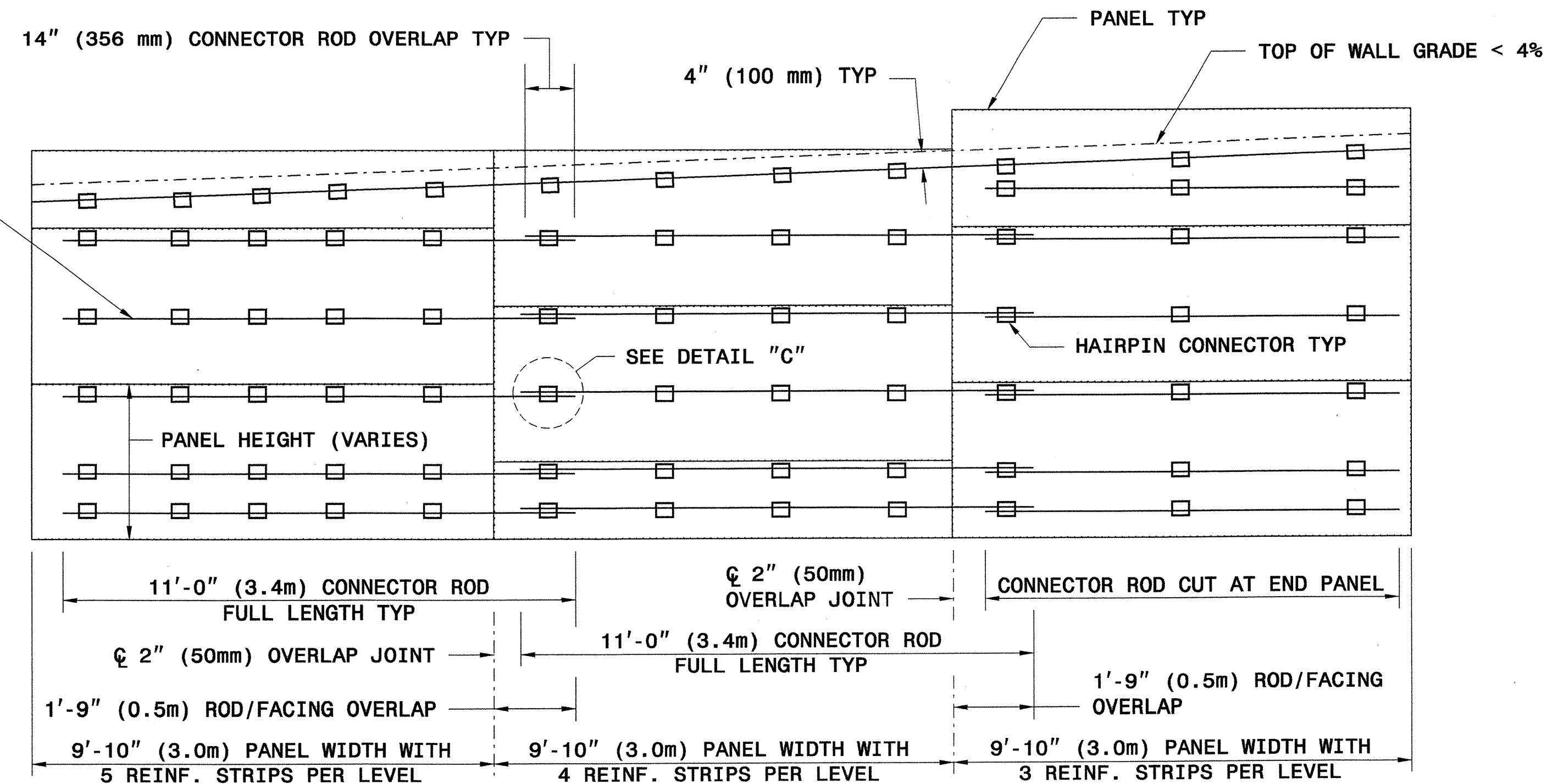


PLAN DETAIL 'C' STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL

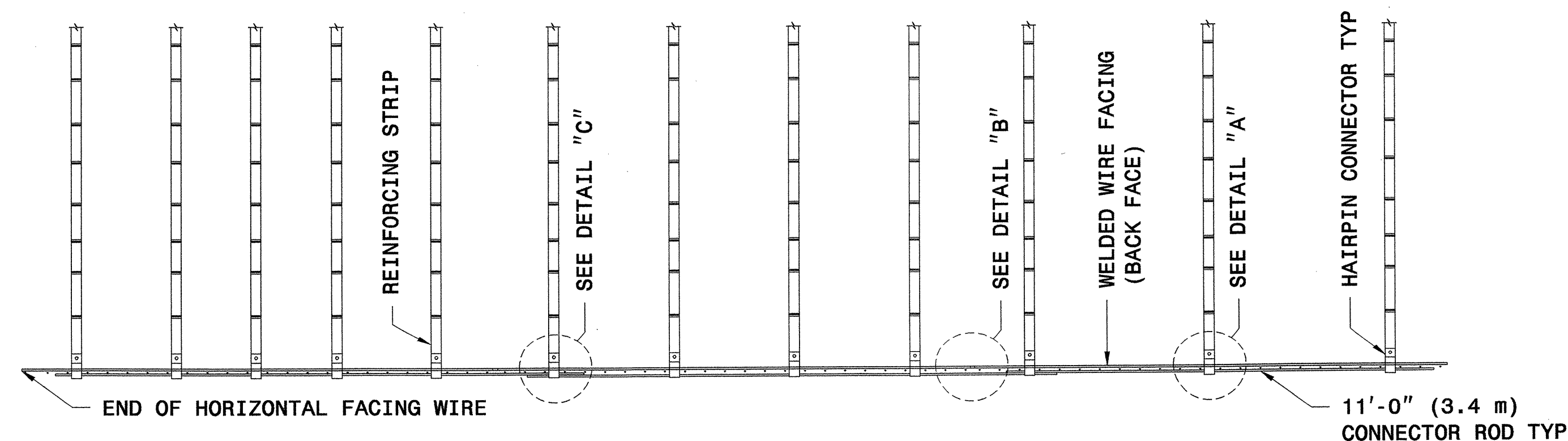


TYPICAL SECTION

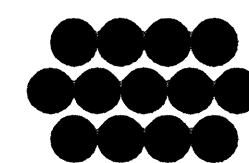
PLACE LOWEST REINFORCING STRIP 10" (250mm) FROM BOTTOM OF REINFORCED ZONE



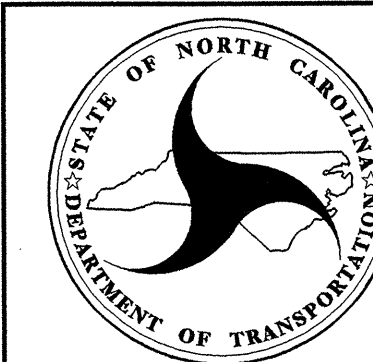
TYPICAL ELEVATION (WIRES NOT SHOWN FOR CLARITY)



TYPICAL PLAN



The Reinforced Earth Company

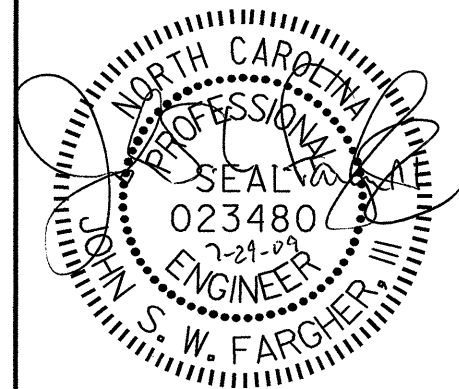


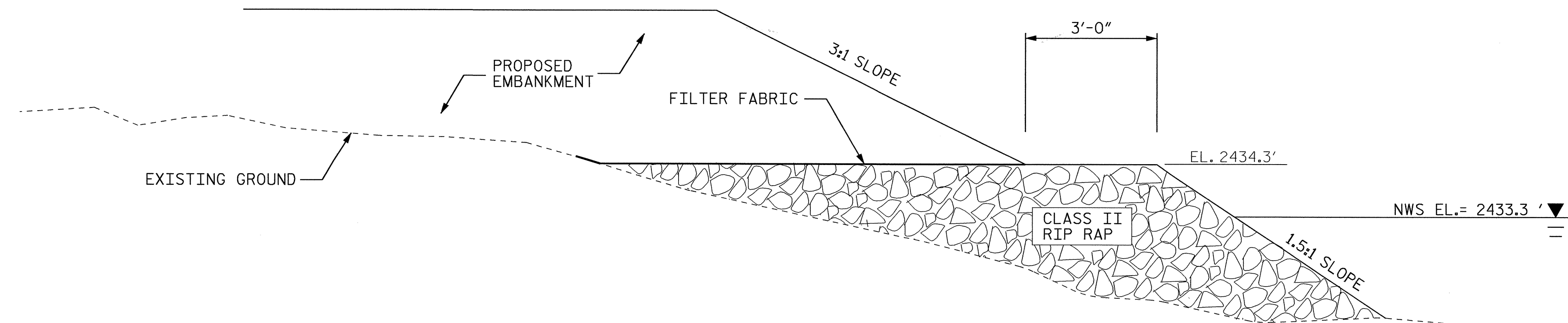
GEOTECHNICAL ENGINEERING UNIT STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

SHEET 11 OF 11 DATE: 12-19-06

| | | | |
|---|------|--------------|------|
| PROJECT REFERENCE NO. | | SHEET | |
| B-4034 | | 2 Q | |
| GEOTECHNICAL ENGINEER | | ENGINEER | |
|  | | | |
| SIGNATURE | DATE | SIGNATURE | DATE |



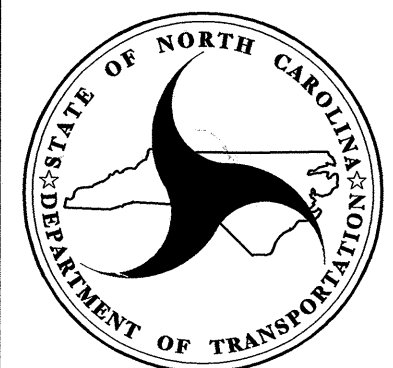
ROCK FILL IN POND

N.T.S.

| | |
|------------------|------------|
| PREPARED BY: EJS | DATE: 2/09 |
| REVIEWED BY: JSF | DATE: 2/09 |

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

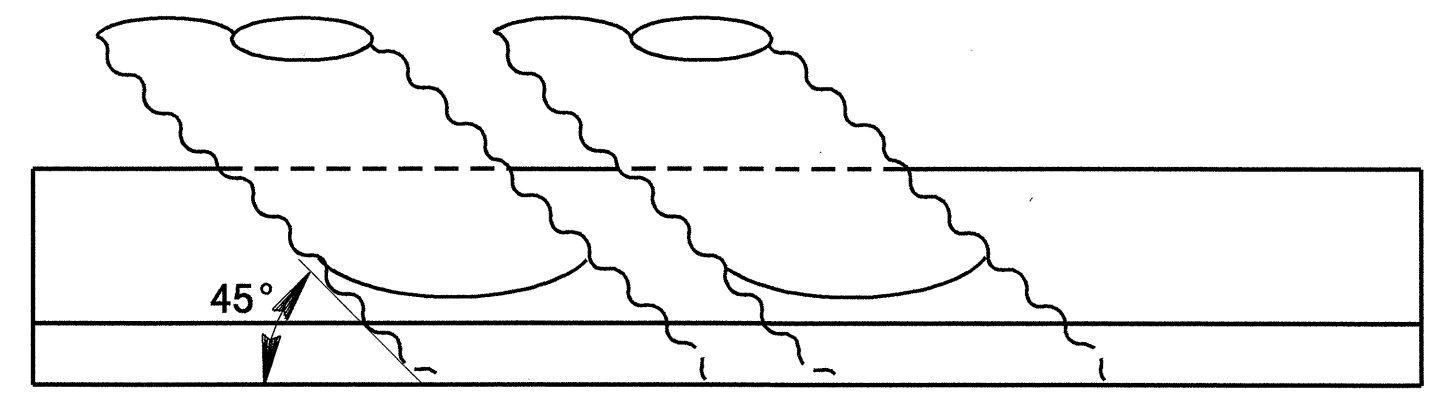
| ROCK FILL IN POND | | | | | |
|--------------------------|----|------|-----|----|------|
| REVISIONS | | | | | |
| NO. | BY | DATE | NO. | BY | DATE |
| 1 | | | 3 | | |
| 2 | | | 4 | | |

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

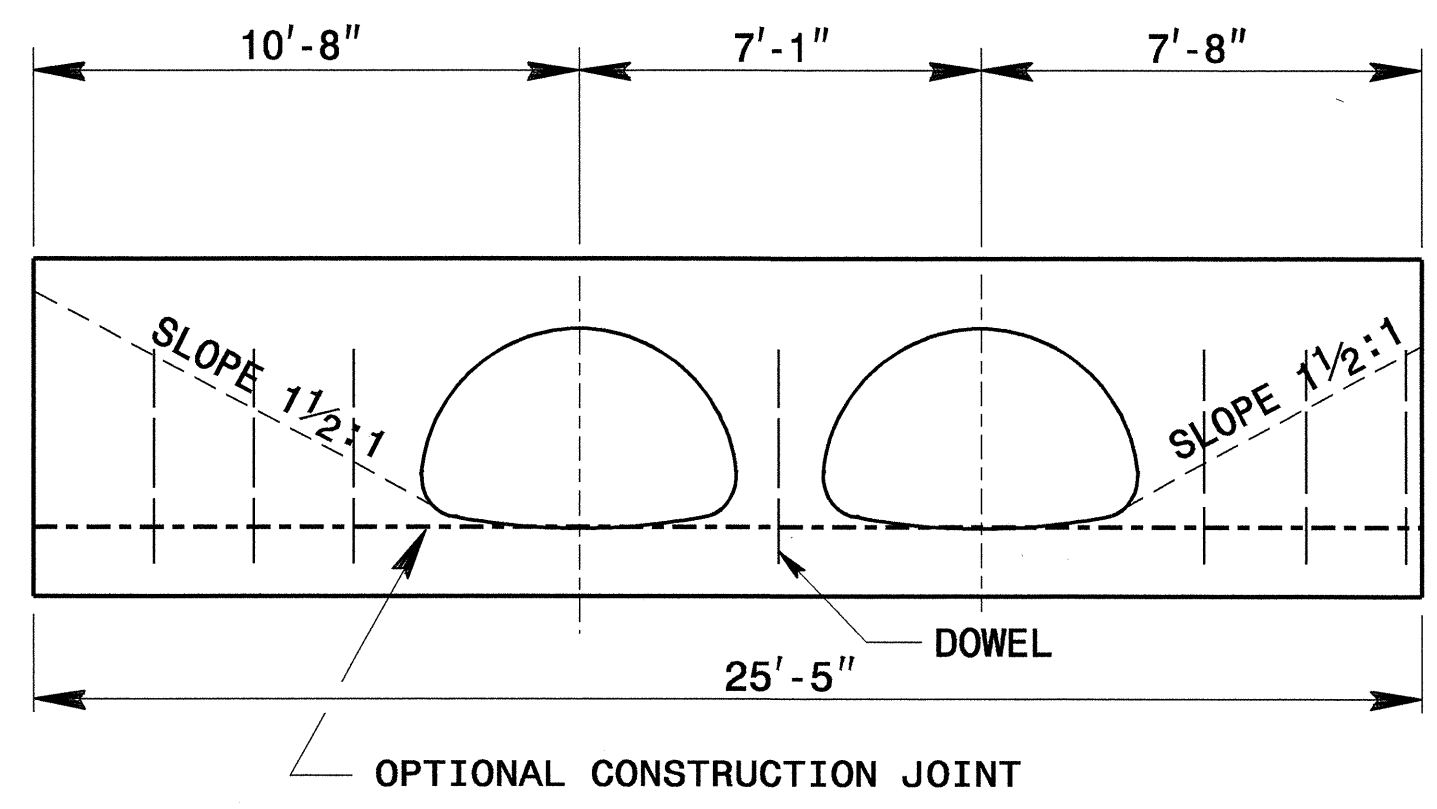
7-06

ENGLISH DETAIL DRAWING FOR
CONCRETE ENDWALL FOR
DOUBLE 53"X41" PIPE CULVERTS
45° SKEW

SHEET 1 OF 1
838D04

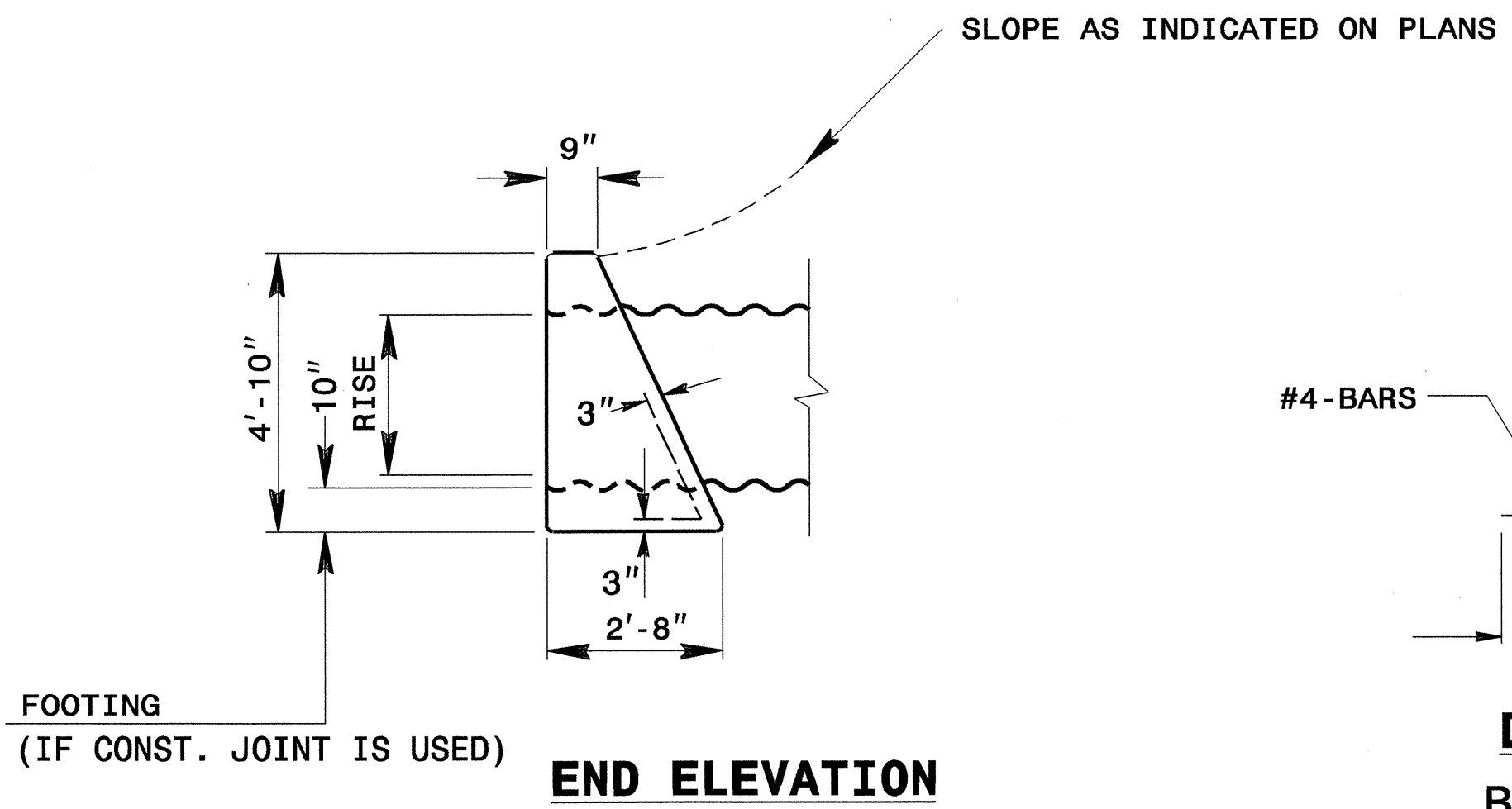


PLAN

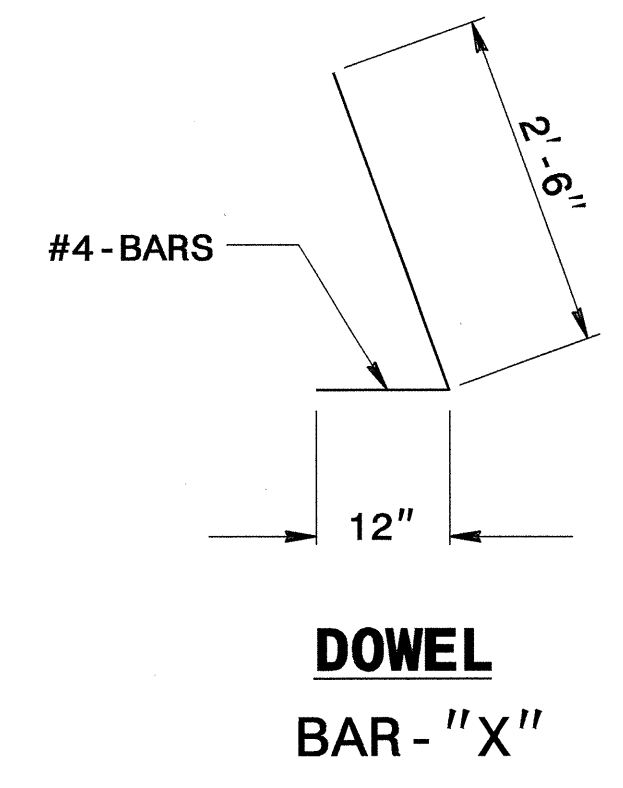


ELEVATION

GENERAL NOTES:
 -CHAMFER ALL CORNERS 1". USE CLASS "B" CONCRETE.
 -PLACE 2 #6 "Y" BARS IN THE TOP OF ALL ENDWALL FOR PIPE CULVERTS 42" AND OVER WITH A MINIMUM OF 3" COVER AND A LENGTH OF 6" LESS THAN ENDWALL LENGTH.
 -CONSTRUCT BOTTOM SLAB WITH FORMS.
 -WHEN THE CONTRACTOR ELECTS TO USE A CONSTRUCTION JOINT AT THE BOTTOM OF THE PIPE, PLACE BAR "X" DOWELS IN THE BASE AS SHOWN ON PLANS. SPACE BARS APPROXIMATELY ON 12" CENTERS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 -WHEN THE CONTRACTOR ELECTS TO USE A CONSTRUCTION JOINT AT THE BOTTOM OF THE PIPE AND POUR THE BASE SEPARATELY LEAVE THE POUR ROUGH.
 -DO NOT INTERPRET WALL THICKNESS (T) SHOWN FOR THE THICKNESS ACCEPTABLE, BUT IS USED IN COMPUTING ENDWALL QUANTITIES.



END ELEVATION



DOWEL BAR - "X"

| QUANTITIES | | |
|------------|---------|------|
| | QTY. | LBS. |
| "X" BARS | 10 | 23 |
| CONCRETE | 4.8 CY. | |

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

7-06

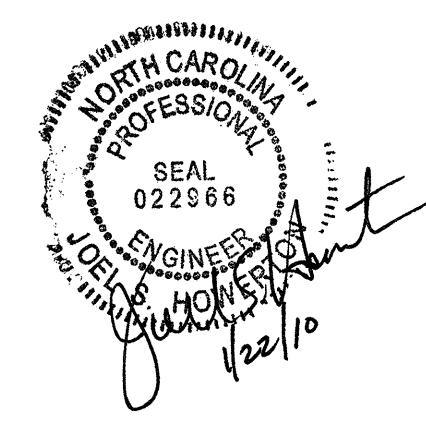
ENGLISH DETAIL DRAWING FOR
CONCRETE ENDWALL FOR
DOUBLE 53"X41" PIPE CULVERTS
45° SKEW

SHEET 1 OF 1
838D04

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

CONCRETE ENDWALL FOR
DOUBLE 53"X41" PIPE CULVERTS

ORIGINAL BY: _____ DATE: _____
 MODIFIED BY: *pbritt* DATE: 11/05/09
 CHECKED BY: *Joel H. Britt* DATE: _____
 FILE SPEC.: detail/nbritt/english/bridge/b4034.dbl 53x41ew.dgn



5/14/99
 04-NOV-2009 09:48
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 \$\$\$USERNAME\$\$\$

30-JUL-2009 08:48 s:\contracts\con\030001\stds\stds\06\stds to special details\30001\030001.dgn
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 5/14/99

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. 7-06

ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 3 300D01

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

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.

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
 [Hatched pattern] SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.
 [Horizontal line pattern] APPROVED SUITABLE LOCAL MATERIAL.
 [Vertical line pattern] UNDISTURBED EARTH MATERIAL
 [Cross-hatched pattern] SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. 7-06

ENGLISH DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 3 300D01

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

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.

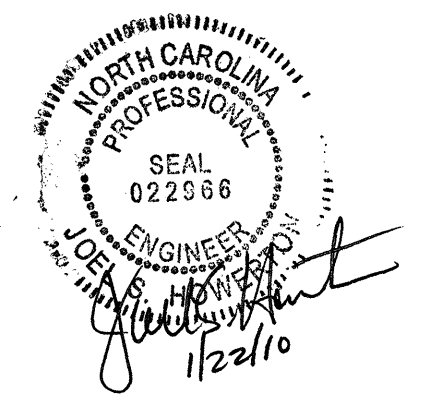
DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

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

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

SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
 MODIFIED BY: [Signature] DATE: [Blank]
 CHECKED BY: [Signature] DATE: 7/20/09
 FILE SPEC:\powercon\stds\stds\stds\06\stds to special details\30001\030001.dgn



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

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) | | | |
|-------------------|------------------------|----|--------------------------------|-----|-----|-----|
| | 12 | 14 | 16 | 18 | 20 | 8 |
| 12 | 12 | 12 | 204 | 256 | | |
| 15 | 12 | 12 | 162 | 204 | | |
| 18 | 12 | 12 | 135 | 169 | 239 | |
| 21 | 12 | 12 | 115 | 145 | 204 | |
| 24 | 12 | 12 | 100 | 126 | 178 | |
| 30 | 12 | 12 | 79 | 100 | 142 | |
| 36 | 12 | 12 | 65 | 83 | 117 | 152 |
| 42 | 12 | 12 | 55 | 70 | 100 | 130 |
| 48 | 12 | 12 | 48 | 61 | 87 | 113 |
| 54 | 12 | 12 | 42 | 54 | 77 | 100 |
| 60 | 12 | 12 | 36 | 47 | 69 | 90 |
| 66 | 12 | 12 | 30 | 40 | 61 | 81 |
| 72 | 12 | 12 | 24 | 33 | 53 | 74 |
| 78 | 12 | 12 | 18 | 26 | 45 | 67 |
| 84 | 12 | 12 | 12 | 20 | 38 | 60 |

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

| Diameter (inches) | Minimum cover (inches) | | Maximum Height of Cover (feet) | | | |
|-------------------|------------------------|----|--------------------------------|-----|-----|-----|
| | 12 | 14 | 16 | 18 | 20 | 8 |
| 12 | 12 | 12 | 123 | 155 | 218 | 281 |
| 15 | 12 | 12 | 98 | 123 | 174 | 224 |
| 18 | 12 | 12 | 81 | 102 | 144 | 187 |
| 21 | 12 | 12 | 69 | 87 | 123 | 160 |
| 24 | 12 | 12 | 60 | 76 | 108 | 139 |
| 27 | 12 | 12 | 53 | 67 | 95 | 123 |
| 30 | 12 | 12 | 46 | 60 | 85 | 111 |
| 36 | 12 | 12 | 39 | 50 | 71 | 92 |
| 42 | 12 | 12 | 32 | 42 | 60 | 78 |
| 48 | 12 | 12 | 26 | 35 | 52 | 68 |
| 54 | 12 | 12 | 20 | 28 | 46 | 60 |
| 60 | 12 | 12 | 15 | 21 | 38 | 50 |
| 66 | 12 | 12 | 10 | 15 | 30 | 43 |
| 72 | 12 | 12 | 7 | 11 | 23 | 31 |

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

- CSP - AASHTO M96
- 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

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

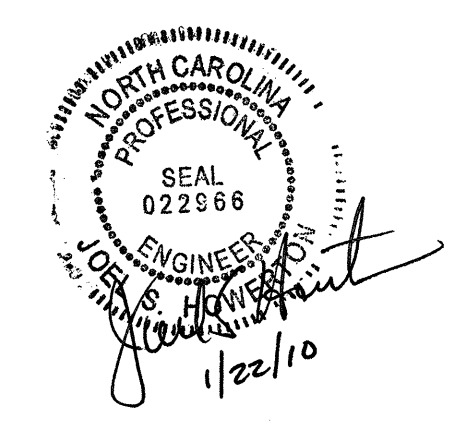
ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

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

SEE PLATE FOR TITLE

ORIGINAL BY: KKempf DATE: 5-15-09
 MODIFIED BY: *[Signature]* DATE: *[Blank]*
 CHECKED BY: *[Signature]* DATE: 7/30/09
 FILE SPEC: ericward/stds/stdstodetails/30001/0300d01.dgn



STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS SUMMARY OF QUANTITIES

Table with columns: ItemNumber, Sec #, Quantity, Unit, Description. Contains detailed list of construction items and quantities.

Table with columns: ItemNumber, Sec #, Quantity, Unit, Description. Contains detailed list of construction items and quantities.

Table with columns: ItemNumber, Sec #, Quantity, Unit, Description. Contains detailed list of construction items and quantities.

8/17/19

RAW SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

NOTE: A DESIGN EXCEPTION IS REQUIRED FOR THE PROPOSED BRIDGE WIDTH AND CREST VERTICAL CURVE K VALUE FOR -L-.

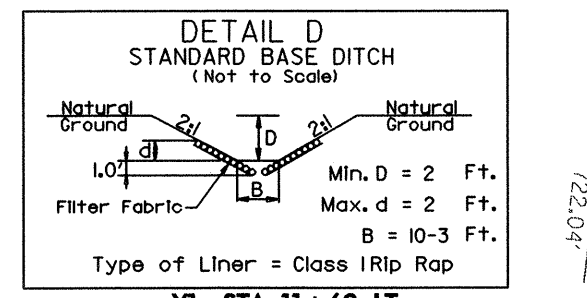
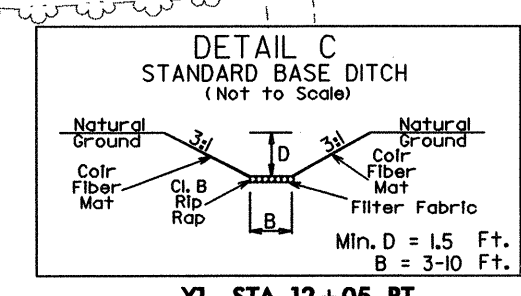
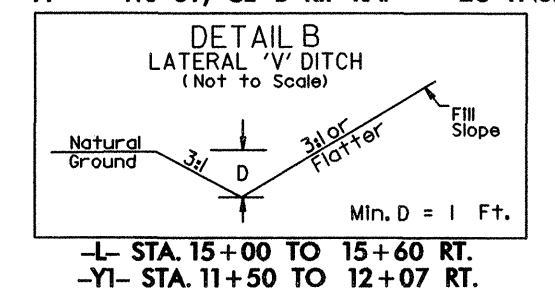
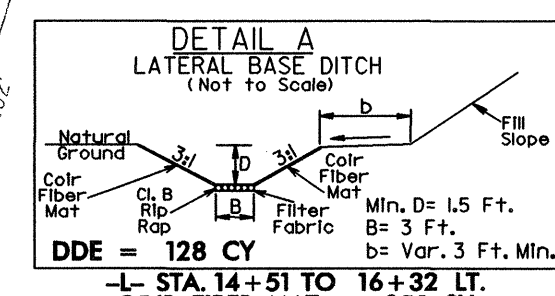
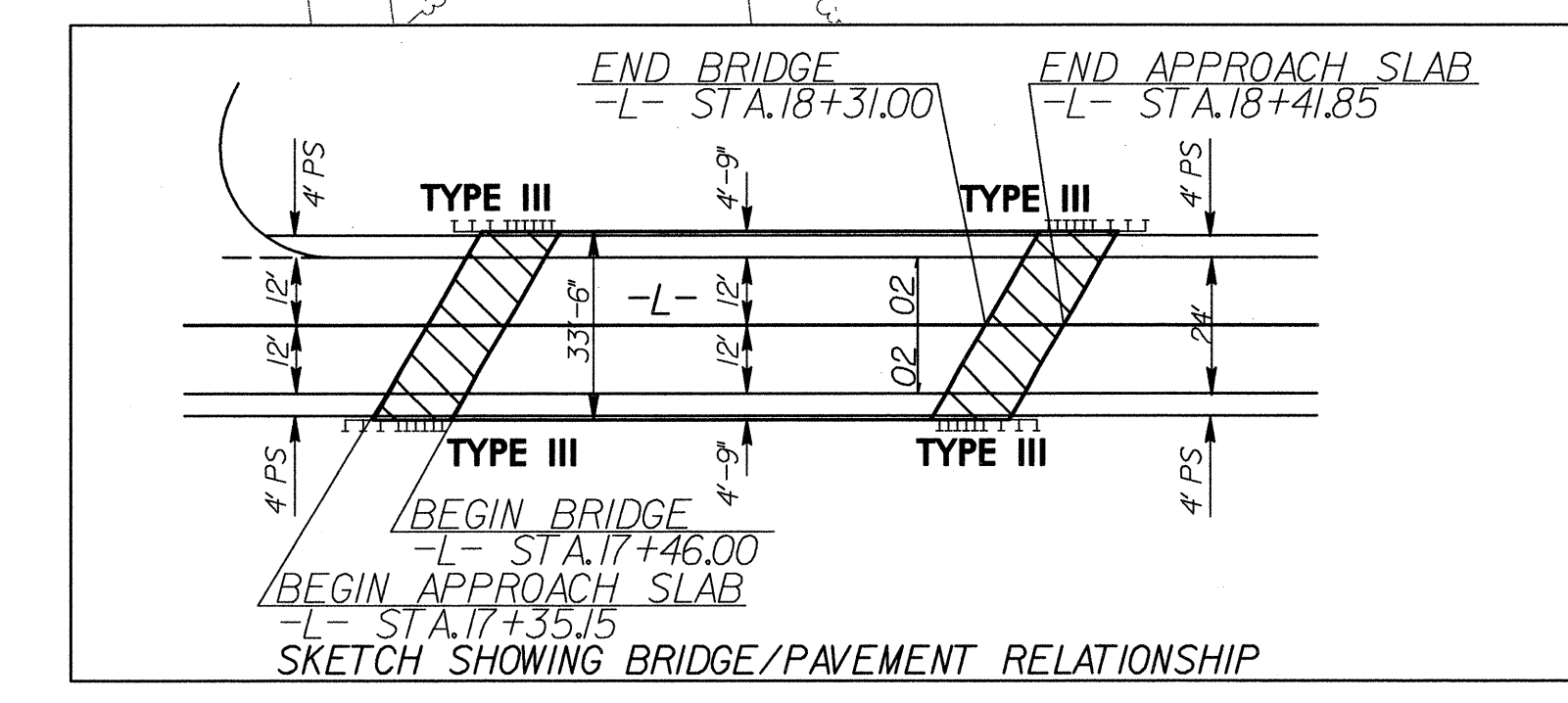
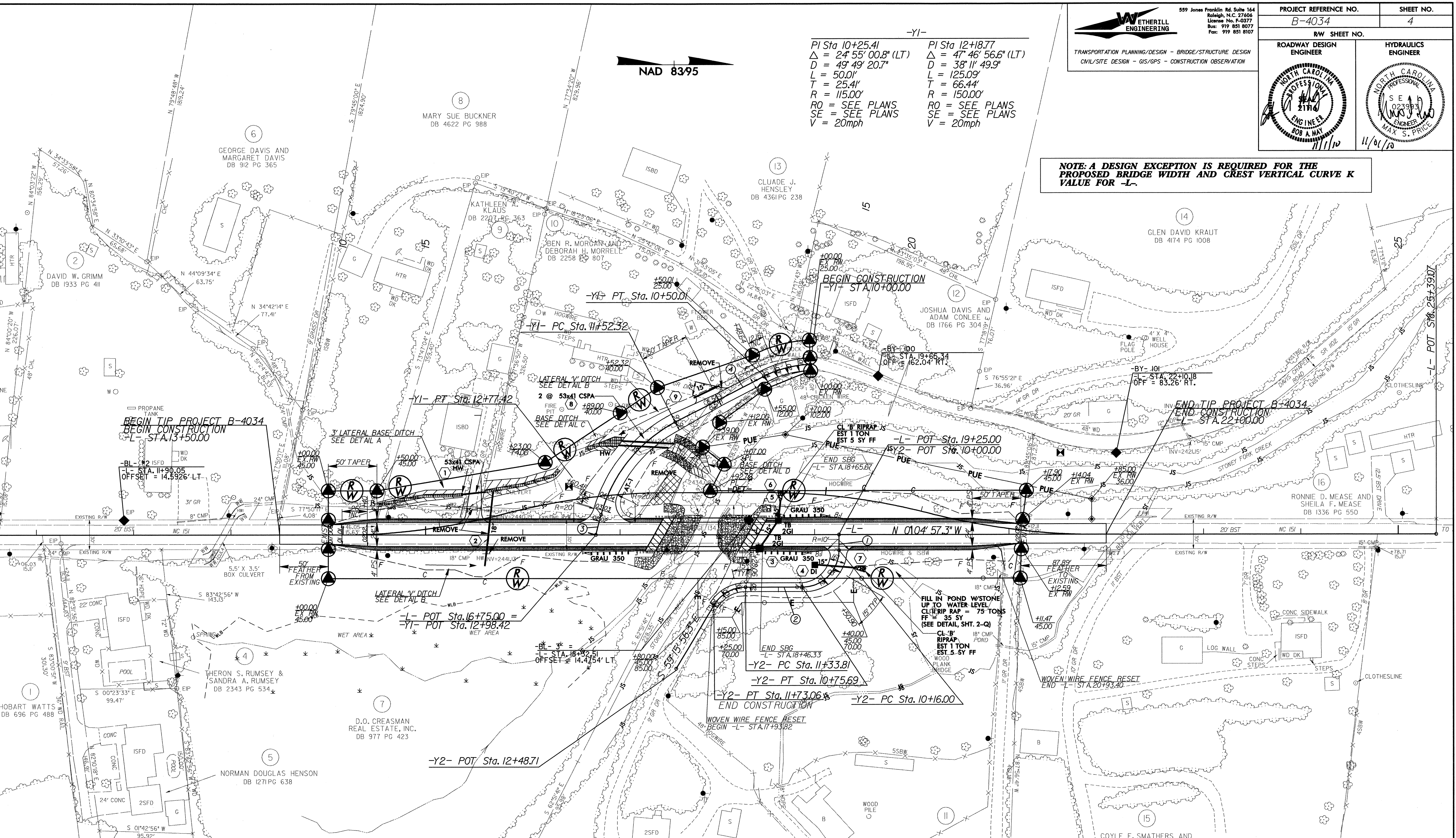
NAD 83/95

-Y1-

| | |
|------------------------------------|------------------------------------|
| PI Sta 10+25.41 | PI Sta 12+18.77 |
| $\Delta = 24^\circ 55' 00.8" (LT)$ | $\Delta = 47^\circ 46' 56.6" (LT)$ |
| $D = 49' 49' 20.7"$ | $D = 38' 11' 49.9"$ |
| $L = 50.01'$ | $L = 125.09'$ |
| $T = 25.41'$ | $T = 66.44'$ |
| $R = 115.00'$ | $R = 150.00'$ |
| RO = SEE PLANS | RO = SEE PLANS |
| SE = SEE PLANS | SE = SEE PLANS |
| $V = 20\text{mph}$ | $V = 20\text{mph}$ |

-Y2-

| | |
|------------------------------------|------------------------------------|
| PI Sta 10+54.00 | PI Sta 11+55.39 |
| $\Delta = 90^\circ 00' 00.0" (RT)$ | $\Delta = 59^\circ 10' 59.0" (LT)$ |
| $D = 150' 46' 42.1"$ | $D = 150' 46' 42.1"$ |
| $L = 59.69'$ | $L = 39.25'$ |
| $T = 38.00'$ | $T = 21.58'$ |
| $R = 38.00'$ | $R = 38.00'$ |
| RO = SEE PLANS | RO = SEE PLANS |
| SE = SEE PLANS | SE = SEE PLANS |
| $V < 15\text{mph}$ | $V < 15\text{mph}$ |



| | |
|---|-------------------|
| 1 | N 89° 55' 02.7° E |
| 2 | S 0° 04' 57.3° E |
| 3 | S 75° 04' 58.1° E |
| 4 | S 27° 18' 01.5° E |

-Y1- STA. 12+05 RT.
 DDE = 95 CY
 CL 'B' RIP RAP = 60 TNS
 COIR FIBER MAT = 70 SY
 FF = 30 SY, CL 'B' RIP RAP = 9 TNS.

NOTE: ALL DRIVES ARE 16' UNLESS OTHERWISE NOTED
 SEE SHEET S-1 THRU S-23 FOR STRUCTURE PLANS
 FOR -L- PROFILE, SEE SHEET 5
 FOR -Y1- PROFILE, SEE SHEET 5
 FOR -Y2- PROFILE, SEE SHEET 5
 FOR -DET- PLAN, SEE SHEET 2-B

REVISIONS

8:05:19 AM
 P:\B-4034-Roadway\Proj\B-4034_rdl_psh.dgn
 11/2/2010

5/28/99

STRUCTURE HYDRAULIC DATA

| | | |
|-----------------------|-----------|-----|
| DESIGN DISCHARGE | = 1200 | CFS |
| DESIGN FREQUENCY | = 25 | YRS |
| DESIGN HW ELEVATION | = 2441.50 | FT |
| BASE DISCHARGE | = 1980 | CFS |
| BASE FREQUENCY | = 100 | YRS |
| BASE HW ELEVATION | = 2442.70 | FT |
| OVERTOPPING DISCHARGE | = 700 | CFS |
| OVERTOPPING FREQUENCY | = 5 +/- | YRS |
| OVERTOPPING ELEVATION | = 2438.50 | FT |

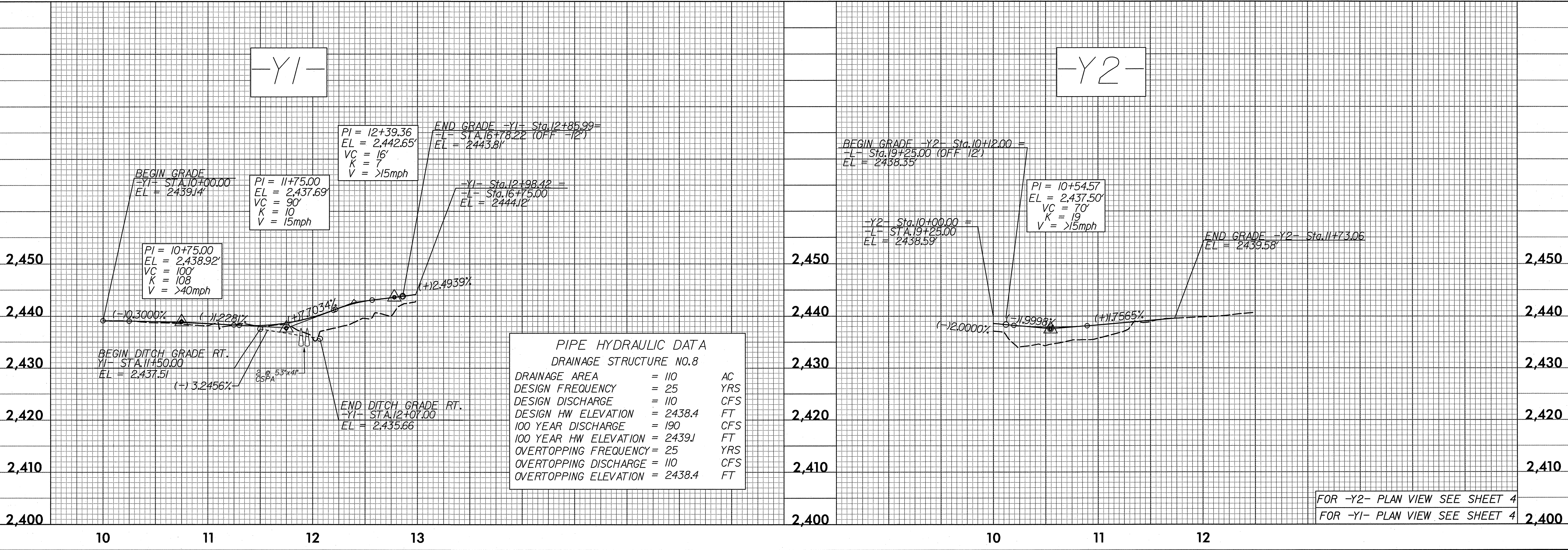
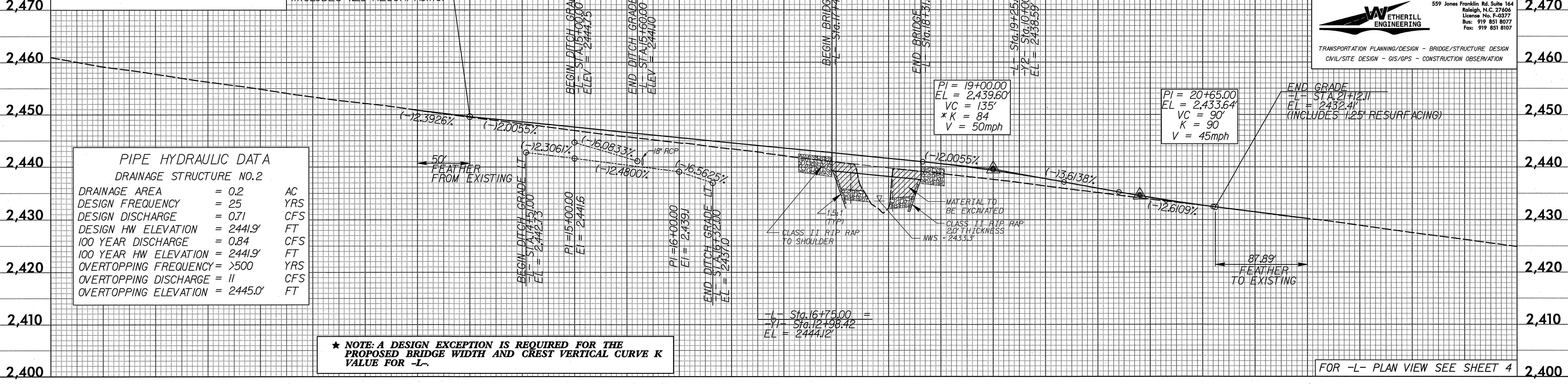
BM*1 N 647983.7954 E 886510.7862
 EL = 2442.21'
 RAILROAD SPIKE SET IN 30" POPLAR
 -L- STA.16+47 (OFF 49' LEFT)

BM*2 N 648489.2496 E 886475.9051
 EL = 2430.35'
 RAILROAD SPIKE SET IN 14" SYCAMORE
 -L- STA.21+53 (OFF 83' LEFT)

| | | | |
|-------------------------|--------|---------------------|---|
| PROJECT REFERENCE NO. | B-4034 | SHEET NO. | 5 |
| ROADWAY DESIGN ENGINEER | | HYDRAULICS ENGINEER | |
| | | | |
| 1/19/2010 | | | |

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

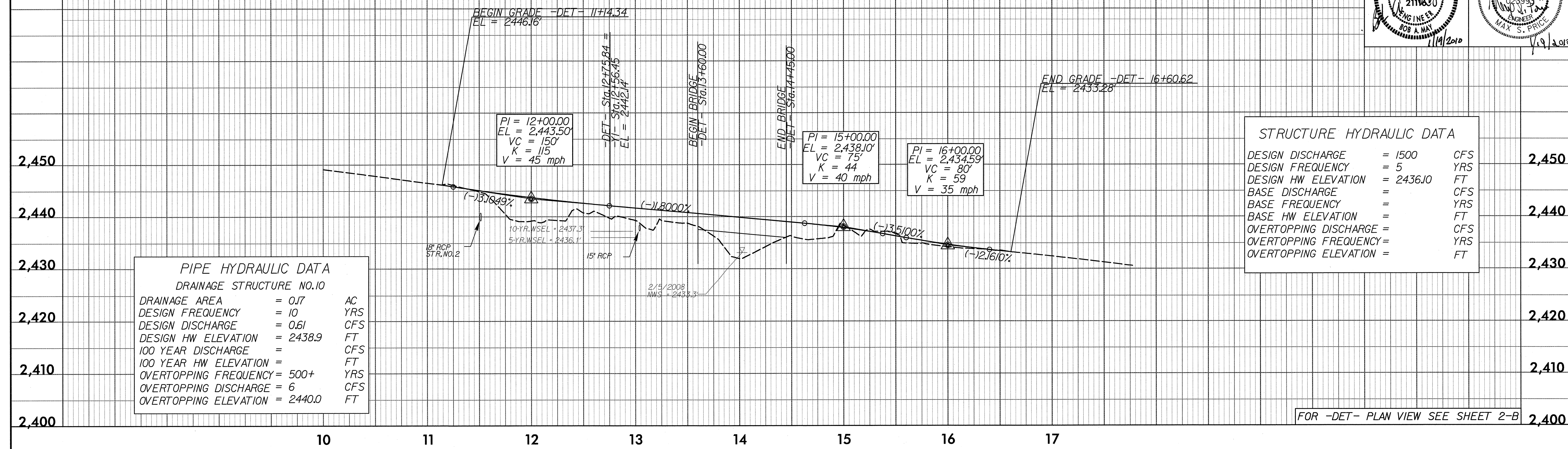
TRANSPORTATION PLANNING/DESIGN - BRIDGE/STRUCTURE DESIGN
 CIVIL/SITE DESIGN - GIS/GPS - CONSTRUCTION OBSERVATION



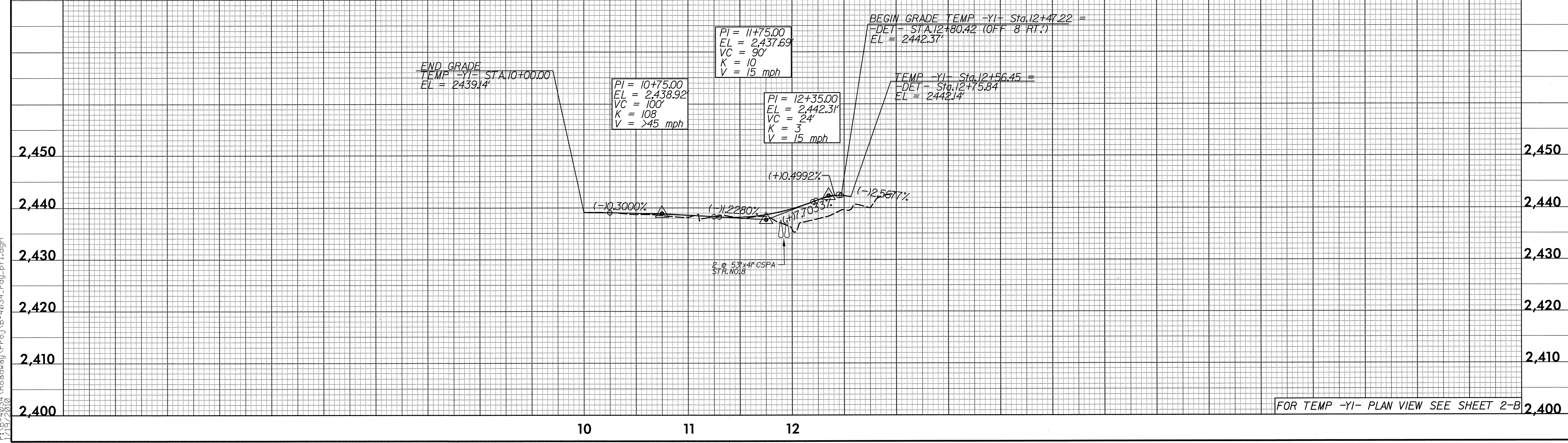
5/28/99 11:19:20 AM Roadway\Proj\B-4034_rdy.pfl.dgn

5/28/99

-DET-



TEMP -YI-



11:35:45 AM 5/18/2010 Roadway\Proj\B-4034-rdy-pl.dgn