

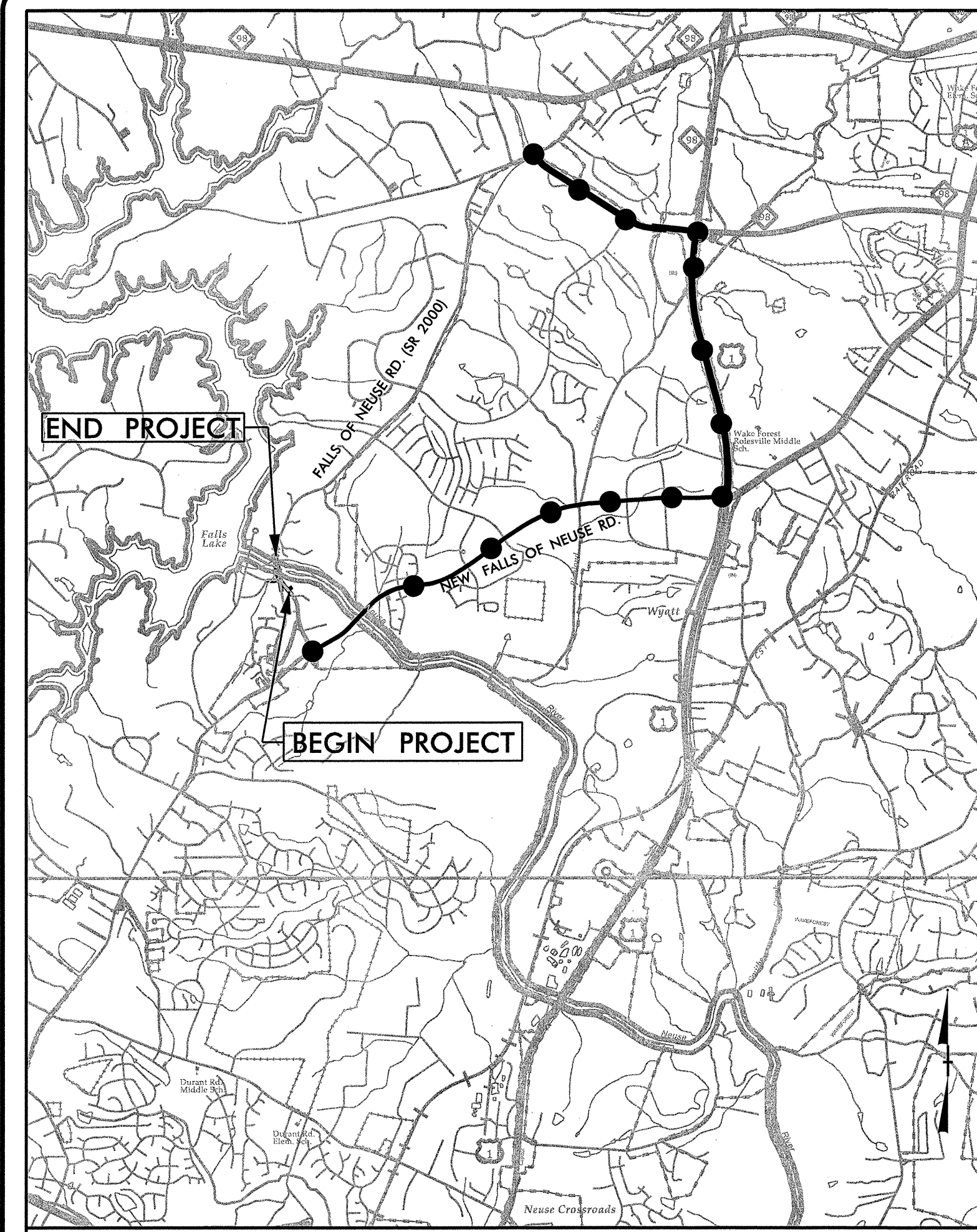
TIP PROJECT: B-4660

CONTRACT: C202580

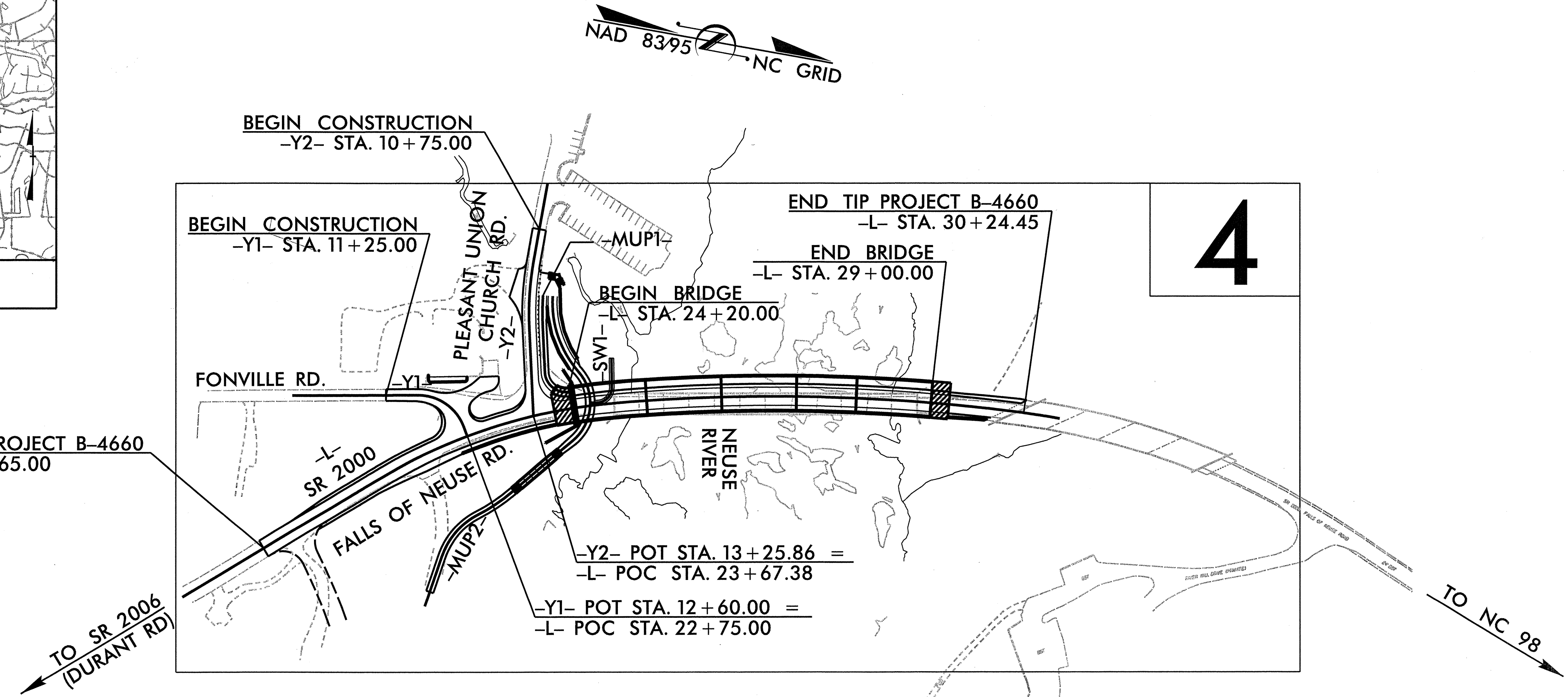
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4660	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33822.1.1	BRSTP-2000(4)	PE	
33822.2.1	BRSTP-2000(4)	RW & UTILITIES	
33822.3.1	BRSTP-2000(4)	CONST.	

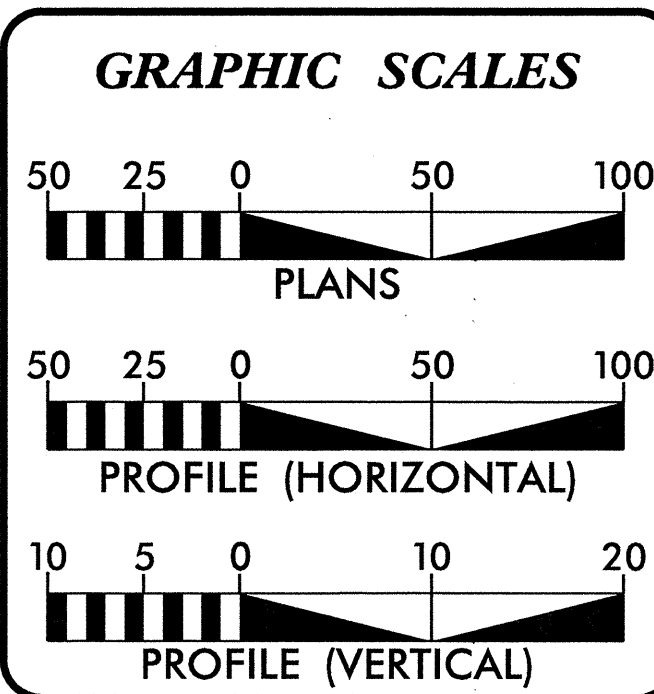
LOCATION: BRIDGE NO. 19 OVER NEUSE RIVER ON SR 2000
TYPE OF WORK: GRADING, PAVING, DRAINAGE, WALLS, AND STRUCTURE



VICINITY MAP
●●● OFF-SITE DETOUR
See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



NCDOT CONTACT: RON McCOLLUM, PE
ROADWAY DESIGN - ENGINEERING COORDINATION



DESIGN DATA

ADT 2011 = 13600
ADT 2030 = 15800
DHV = 10%
D = 60%
T = 3% TTST = 1%
DUAL = 2%
V = 45 MPH
CLASS = RURAL MAJOR COLLECTOR SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4660	= 0.110 mi.
LENGTH STRUCTURE TIP PROJECT B-4660	= 0.091 mi.
TOTAL LENGTH TIP PROJECT B-4660	= 0.201 mi.

STEWART
401 PAVETTAVILLE ST.
SUITE 400
RALEIGH, NC 27601
T: 919.380.8750
F: 919.380.8750
www.stewarteng.com
FIRM NO.: C-1061

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 15, 2010

LETTING DATE:
OCTOBER 18, 2011

Prepared in the Office of:
STEWART ENGINEERING

For
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

BEN CRAWFORD, PE
PROJECT ENGINEER

JONATHAN HEFNER, PE
PROJECT DESIGN ENGINEER

RON McCOLLUM, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

BEN CRAWFORD, PE
SEAL 9334
7/21/11

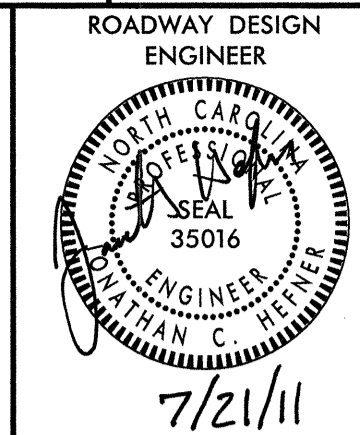
ROADWAY DESIGN ENGINEER

JONATHAN HEFNER, PE
SEAL 35016
7/21/11

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

ART McMillan
SEAL 35016
STATE HIGHWAY DESIGN ENGINEER

7/21/2011 10:46:00 AM B4660_RDY_PLANSHEETS.dgn
USER: jhefner



INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEET
2 THRU 2-A	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2-B	MULTI-USE PATH DETAILS
2-C THRU 2-F	BOARDWALK DETAILS
2-G THRU 2-H	METHOD OF PIPE INSTALLATION
2-I	ANCHORAGE FOR FRAMES
2-J	SHOP-CURVED TYPE III GUARDRAIL ANCHOR UNIT
3	SUMMARY OF QUANTITIES
3-A	EARTHWORK, DRAINAGE, GUARDRAIL, SHOULDER BERM GUTTER, AND ASPHALT PAVEMENT REMOVAL SUMMARIES
4 THRU 6	PLAN & PROFILE SHEETS
TMP-1 THRU TMP-6	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
RF-1	REFORESTATION PLANS
EC-1 THRU EC-7	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-5	SIGNING PLANS
SD-1	SIGN DESIGN PLANS
UC-1 THRU UC-6	UTILITY CONSTRUCTION PLANS
UD-1 THRU UD-2	UTILITIES BY OTHERS PLANS
X-1	CROSS SECTION SUMMARY AND INDEX
X-2 THRU X-16	CROSS-SECTIONS
S-1 THRU S-66	STRUCTURE PLANS
W-1 THRU W-7	RETAINING WALL PLANS

GENERAL NOTES:

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE 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.

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 WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

SUBSURFACE PLANS:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

AT&T Communications

Progress Energy

Time Warner Cable

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

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	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
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
840.56	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.01	Concrete Sidewalk
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

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

04/16/11

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	⊙
Property Corner	-----
Property Monument	⊠
Parcel/Sequence Number	⑫
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	⊠
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-WLB-
Proposed Wetland Boundary	-WLB-
Existing Endangered Animal Boundary	-EAB-
Existing Endangered Plant Boundary	-EPB-
Known Soil Contamination: Boundary or Site	☠
Potential Soil Contamination: Boundary or Site	☠

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	⊙
Switch	⊠
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

Orchard	⊙
Vineyard	⊠

EXISTING STRUCTURES:

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

UTILITIES:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

12/02/2008 k.t.p

B-4660

SURVEY CONTROL SHEET B-4660

WAKE COUNTY

LOCATION: BRIDGE NO. 19 OVER NEUSE RIVER ON SR 2000

ROW MARKER CONCRETE OR GRANITE				
ALIGN	STATION	OFFSET	NORTH	EAST
L	20+50.00	-30.07	797002.0666	2124575.1598
L	20+98.68	-40.00	797032.2171	2124535.6742
L	24+20.00	-40.00	797316.5233	2124360.0728
L	25+20.00	-40.00	797415.9700	2124331.1813
L	29+73.00	-40.00	797869.7603	2124259.1085
L	29+73.00	-29.27	797870.5004	2124269.8117
L	21+98.68	-40.00	797111.2534	2124469.9518
L	25+20.00	34.84	797434.1951	2124403.7711
L	24+20.00	35.00	797341.2405	2124430.8828
L	21+98.68	35.00	797156.4689	2124529.7895
L	20+98.68	29.88	797078.1615	2124588.3291
L	29+45.00	31.61	797847.1223	2124332.6056
L	29+65.00	31.01	797866.7753	2124330.5113
L	29+77.00	72.00	797881.3607	2124370.5769
L	29+90.00	63.00	797893.3559	2124360.7827
L	23+20.00	-63.06	797208.9946	2124381.2796

ROW MARKER CONCRETE OR GRANITE				
ALIGN	STATION	OFFSET	NORTH	EAST
Y1	11+25.00	29.25	797087.5555	2124453.6766

PERMANENT EASEMENT				
ALIGN	STATION	OFFSET	NORTH	EAST
L	20+78.00	-70.00	796996.9124	2124526.6648
L	20+98.68	-70.00	797012.4945	2124513.0685
L	20+78.00	-35.78	797019.4093	2124552.4475
L	23+37.00	-57.96	797227.7706	2124377.5735
L	23+67.00	-50.17	797260.3482	2124371.1485

PERMANENT EASEMENT				
ALIGN	STATION	OFFSET	NORTH	EAST
Y2	11+53.19	-4.47	797250.0608	2124247.6649
Y2	12+42.74	-4.78	797266.7296	2124334.9261
Y2	11+52.77	-7.97	797253.5148	2124246.9310

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "B4660-1" WITH NAD 83/95 STATE PLANE GRID COORDINATES OF NORTHING: 797,292.2505(±) EASTING: 2,123,422.2687(±) ELEVATION: 290.34(±)

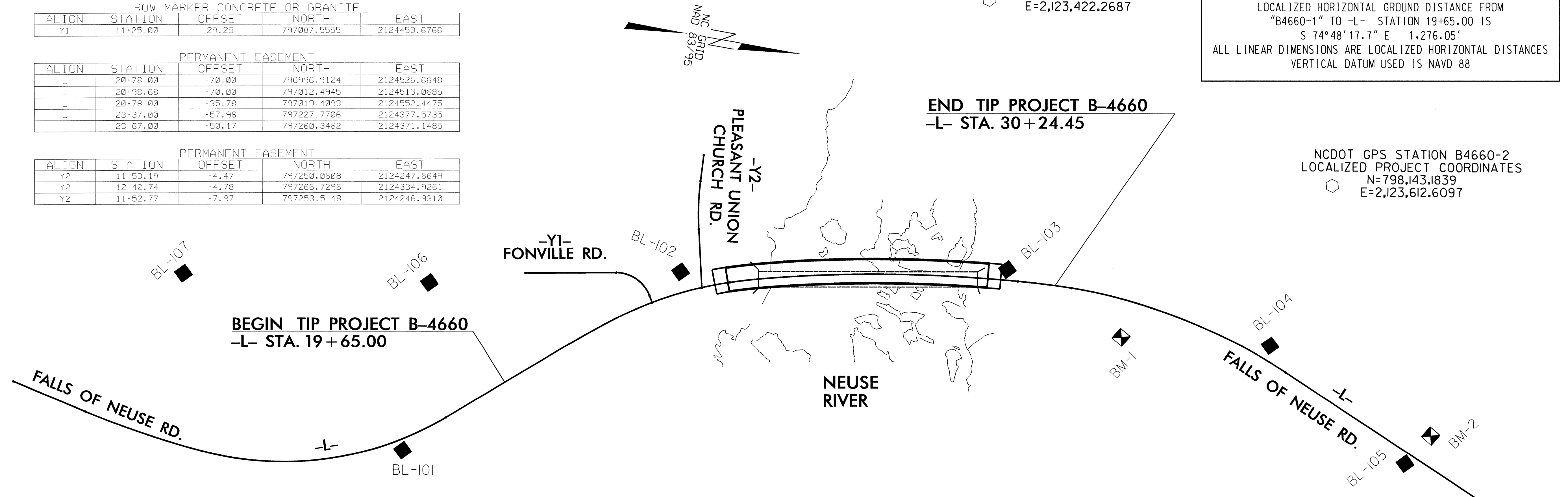
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99993613

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4660-1" TO -L- STATION 19+65.00 IS S 74°48'17.7" E 1,276.05'

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

NCDOT GPS STATION B4660-1
LOCALIZED PROJECT COORDINATES
N=797,292.2505
E=2,123,422.2687

NCDOT GPS STATION B4660-2
LOCALIZED PROJECT COORDINATES
N=798,143.1839
E=2,123,612.6097



CONTROL DATA

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	BL-101	796794.2960	2124811.1060	243.32	17+41.11	19.50 RT
102	BL-102	797239.9950	2124393.6270	215.84	23+40.77	38.19 LT
103	BL-103	797832.1980	2124281.9840	213.97	29+34.29	19.95 LT
104	BL-104	798333.8160	2124334.6930	231.98	34+32.80	26.64 LT
105	BL-105	798617.3400	2124506.1090	256.24	37+59.82	19.10 RT

BY

BY POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
107	BY-107	796338.6010	2124560.3110	293.87	12+26.44	304.92 LT
106	BY-106	796787.8280	2124496.2030	255.72	19+40.48	230.42 LT
A102	BL-102	797239.9950	2124393.6270	215.84	23+40.77	38.19 LT

BENCHMARK DATA

*****	*****
BM1 ELEVATION = 214.41	BM2 ELEVATION = 276.15
N 798061 E 2124368	N 798655 E 2124447
L STATION 31+68 69 RIGHT	L STATION 37+71 50 LEFT
RR SPIKE IN 10" PINE	RR SPIKE IN 24" WHITE OAK
*****	*****

L			
TYPE	STATION	NORTH	EAST
POT	10+00.00	796065.3880	2124813.0560
PC	11+44.54	796206.3984	2124844.8163
PCC	13+71.23	796430.3079	2124879.0168
PT	18+38.68	796862.6087	2124736.7539
TS	20+98.68	797058.5156	2124565.8138
SC	21+98.68	797135.3677	2124501.8657
CS	24+20.00	797329.7058	2124397.8381
SC	25+20.00	797425.7105	2124369.9772
CS	29+73.00	797872.5194	2124299.0132
SC	30+73.00	797972.4216	2124295.0773
PT	32+49.63	798148.1294	2124310.6752

Y1			
TYPE	STATION	NORTH	EAST
POT	10+00.00	796959.3144	2124447.7793
PC	11+67.54	797124.0330	2124417.1397
PT	12+46.51	797191.6784	2124447.6371
POT	12+60.00	797198.6093	2124459.2053

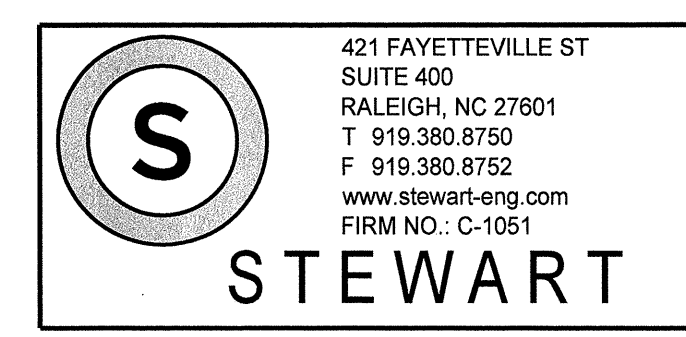
Y2			
TYPE	STATION	NORTH	EAST
POT	9+50.00	797243.9797	2124044.9243
PC	11+17.04	797243.9797	2124211.9631
PT	12+07.52	797254.1693	2124301.6729
POT	13+25.86	797280.7108	2124417.0020

NOTES:

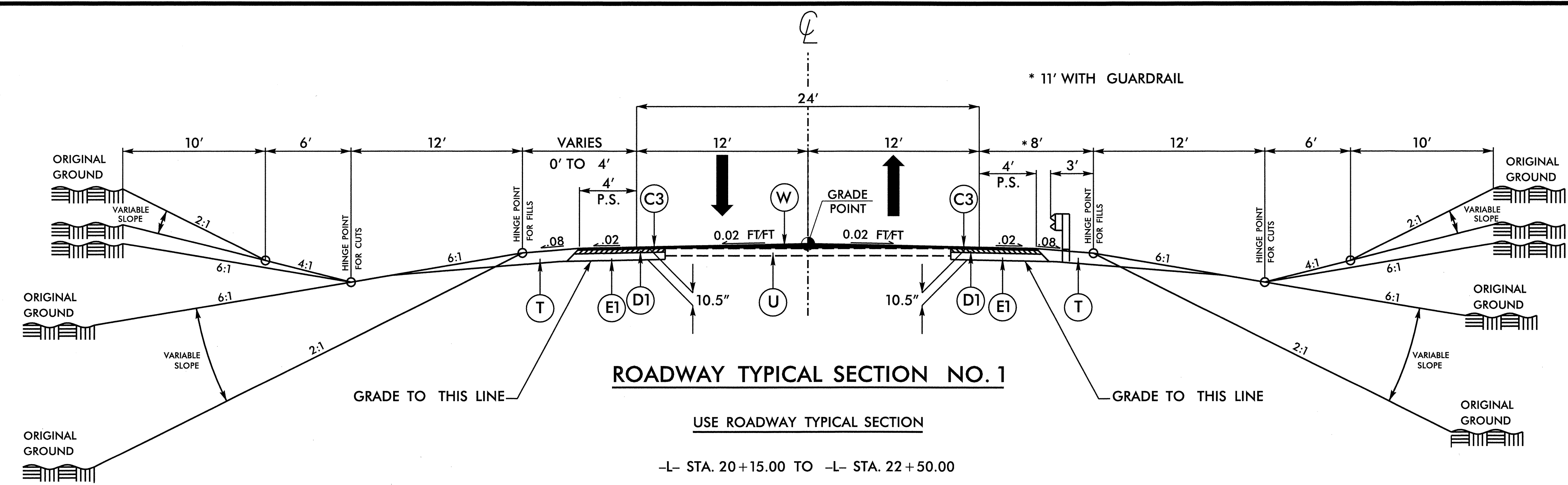
- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/)
THE FILES TO BE FOUND ARE AS FOLLOWS:
B4660_LS_CONTROL_081203.TXT
 - SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING CORS MONUMENTATION

NOTE: DRAWING NOT TO SCALE

26-AUG-2010 09:36 R:\ROADWAY\PROJECTS\B4660\1s-1c.dgn



PROJECT REFERENCE NO. B-4660	SHEET NO. 2
ROADWAY DESIGN ENGINEER <i>[Signature]</i>	PAVEMENT DESIGN ENGINEER <i>[Signature]</i>
PROFESSIONAL SEAL 35016 7/27/11	PROFESSIONAL SEAL 22896 7/29/11

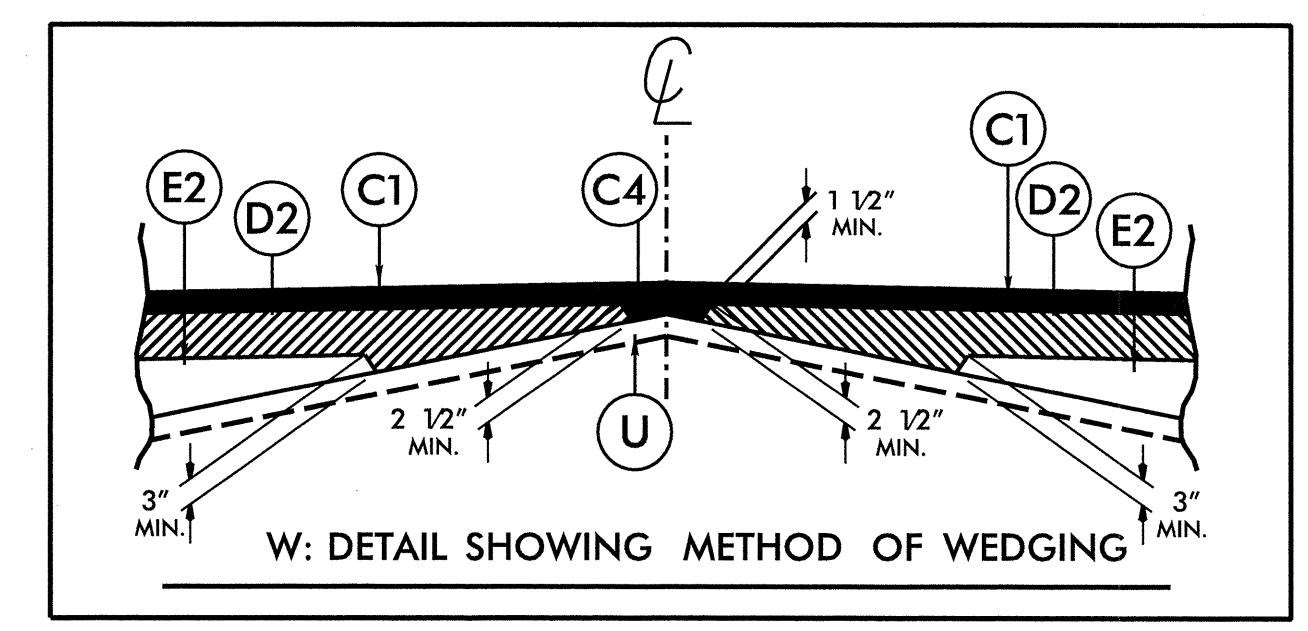


ROADWAY TYPICAL SECTION NO. 1

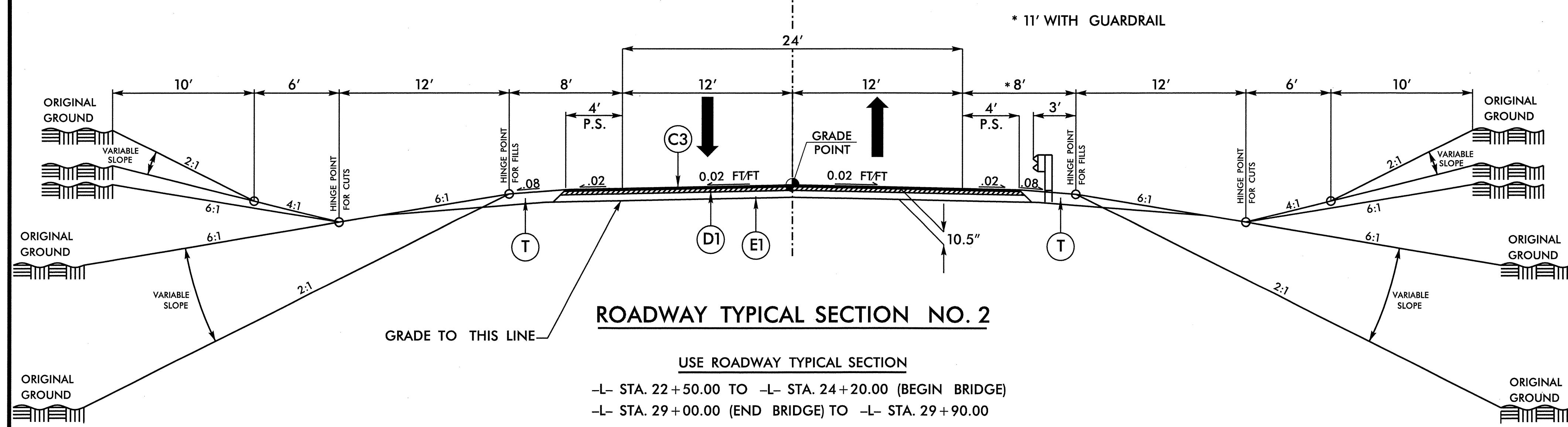
USE ROADWAY TYPICAL SECTION

-L- STA. 20+15.00 TO -L- STA. 22+50.00

- NOTES: - TRANSITION FROM EXISTING TO TYP. SECTION NO. 1 FROM 19+65.00 TO 20+15.00
 - PAVE TO FACE OF GUARDRAIL OR SHOULDER BERM GUTTER



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



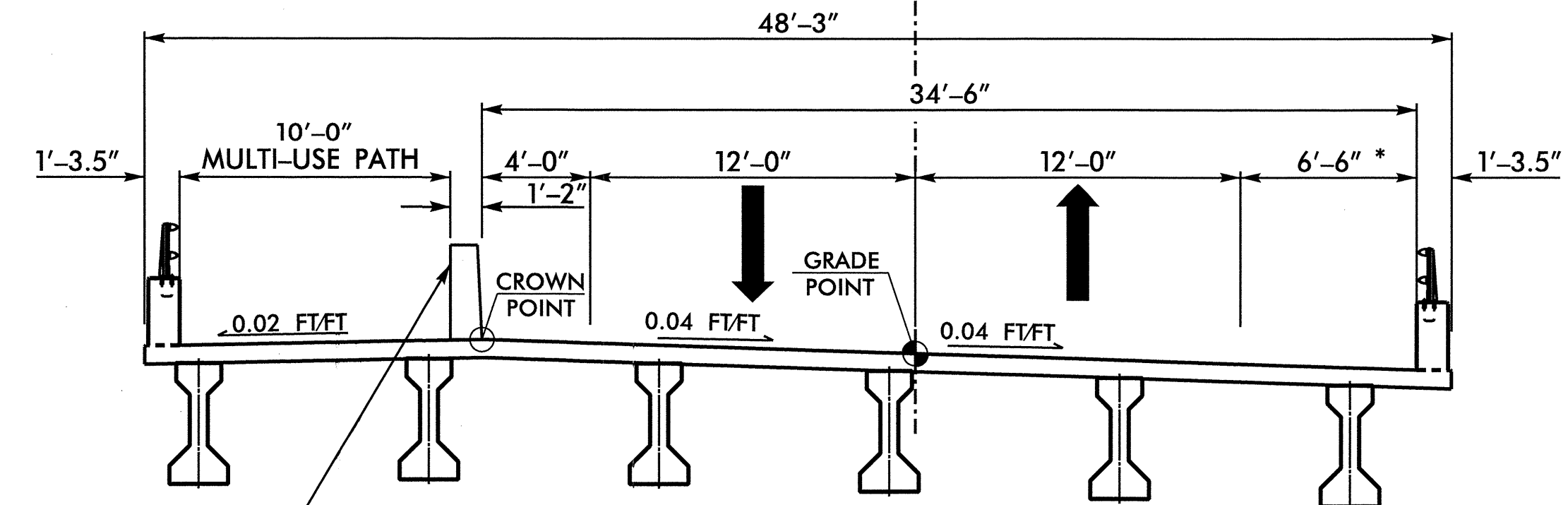
ROADWAY TYPICAL SECTION NO. 2

USE ROADWAY TYPICAL SECTION

-L- STA. 22+50.00 TO -L- STA. 24+20.00 (BEGIN BRIDGE)
 -L- STA. 29+00.00 (END BRIDGE) TO -L- STA. 29+90.00

- NOTES: - TRANSITION FROM TYP. SECTION NO. 2 TO EXISTING FROM 29+90.00 TO 30+00.84 (EXISTING APPROACH SLAB OF SPILLWAY BRIDGE)
 - PAVE TO FACE OF GUARDRAIL OR SHOULDER BERM GUTTER

** SHOULDER ON THE BRIDGE WAS WIDENED TO 6'-6" TO KEEP SPREAD OUT OF THE TRAVEL LANE.



BRIDGE TYPICAL SECTION

USE BRIDGE TYPICAL SECTION

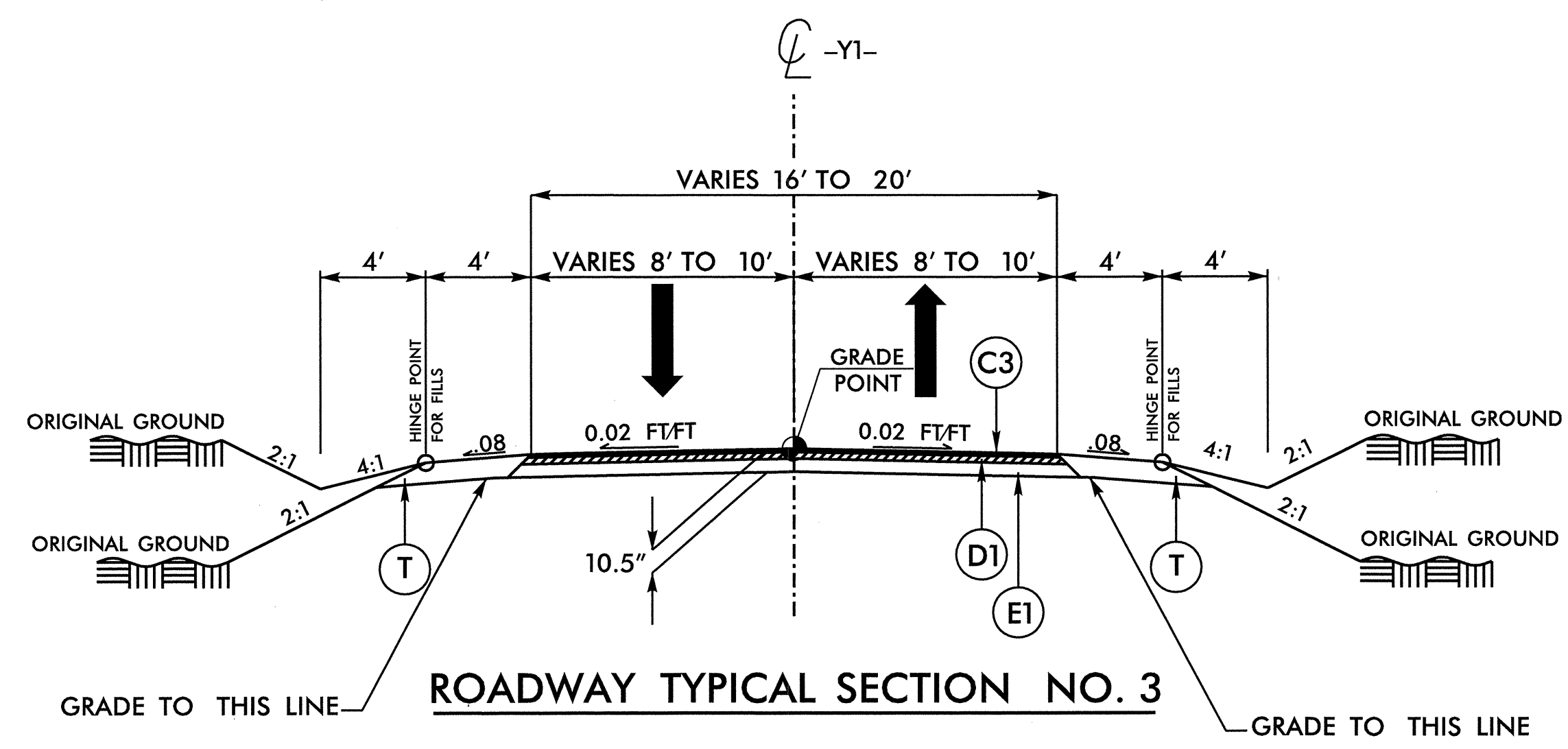
-L- STA. 24+20.00 TO -L- STA. 29+00.00

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 224 LBS. PER SQ. YD.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1 1/2" IN DEPTH.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
J1	PROP. 6" AGGREGATE BASE COURSE.
N	FABRIC FOR SOIL STABILIZATION
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL)

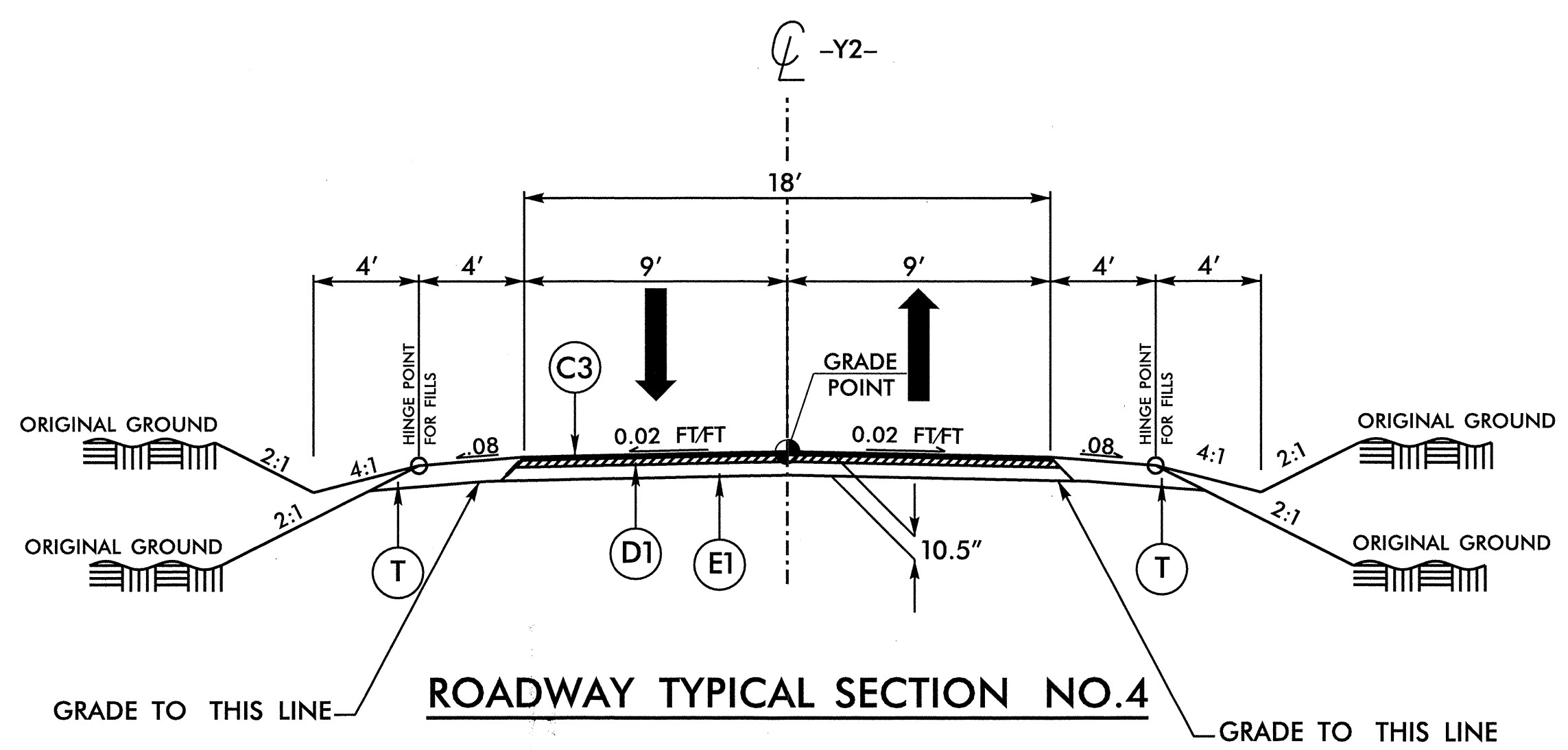
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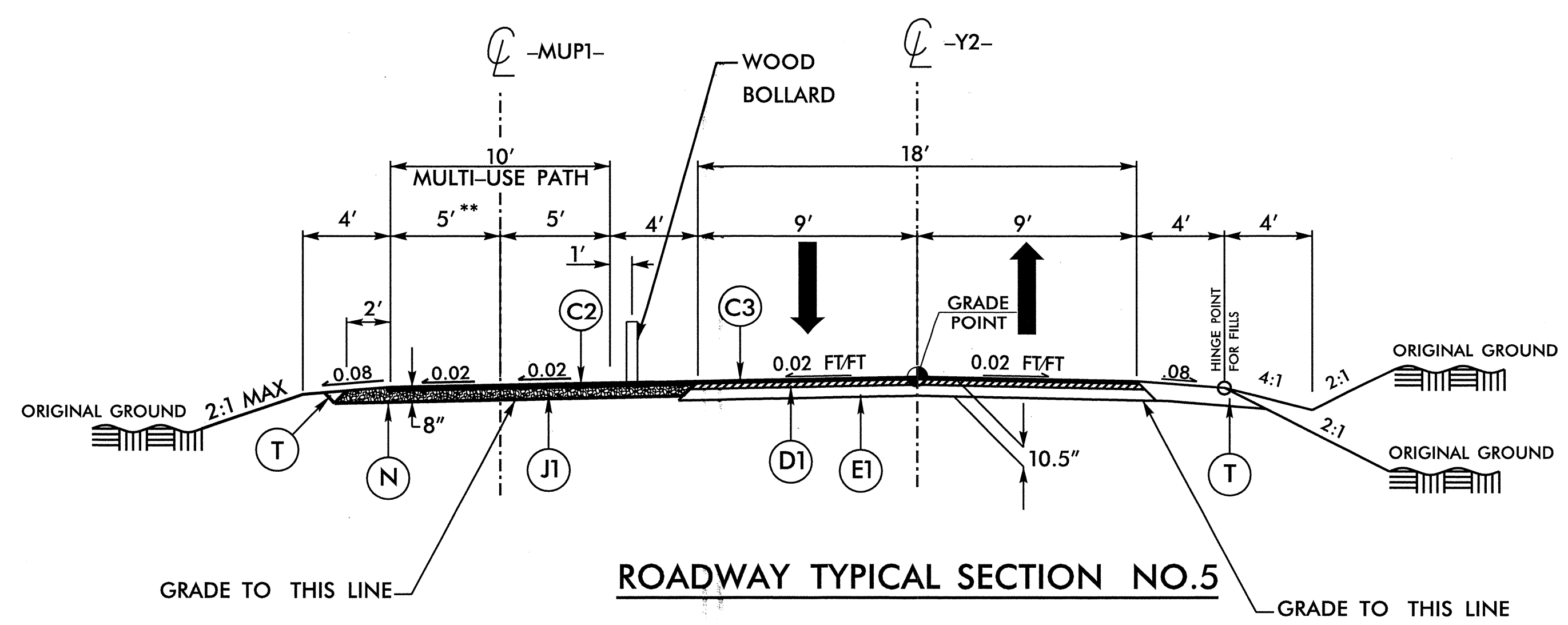
PROJECT REFERENCE NO. B-4660	SHEET NO. 2A
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER
EXCEPT FOR MULTI-USE PATH	
PAVEMENT DESIGN ENGINEER 	
FOR MULTI-USE PATH	



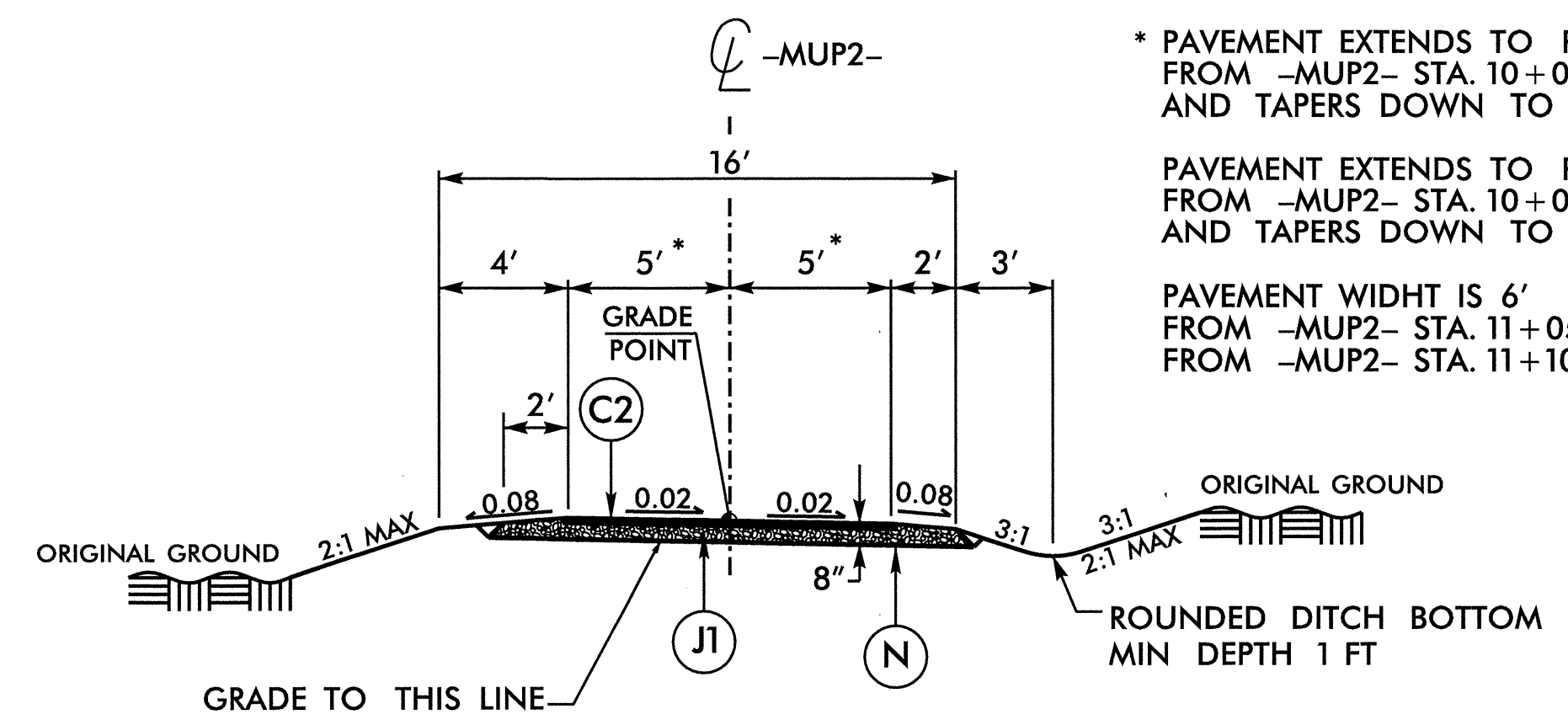
USE ROADWAY TYPICAL SECTION
 -Y1- STA. 11+67.54 TO -Y1- STA. 12+48.00
 NOTE: TRANSITION FROM EXISTING TO TYP. SECTION NO. 3 FROM 11+25.00 TO 11+67.54



USE ROADWAY TYPICAL SECTION
 -Y2- STA. 10+75.00 TO -Y2- STA. 11+63.38

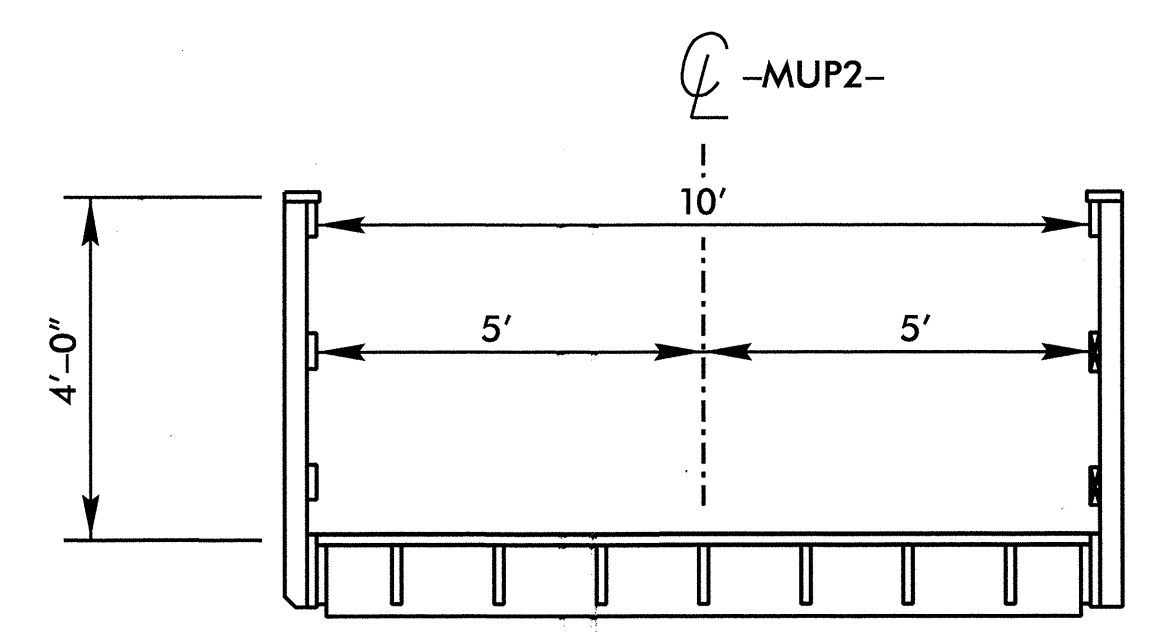


USE ROADWAY TYPICAL SECTION
 -MUPI- STA. 10+15.00 TO -MUPI- STA. 10+26.79
 -Y2- STA. 11+63.38 TO -Y2- STA. 13+13.66



NOTE: USE 4' SHOULDER IN FILL SECTIONS AND 2' SHOULDER IN CUT SECTIONS
MULTI-USE PATH TYPICAL SECTION

USE MULTI-USE PATH TYPICAL SECTION
 -MUP2- STA. 10+00.00 TO -MUP2- STA. 12+45.00 (BEGIN BOARDWALK)
 -MUP2- STA. 13+05.00 (END BOARDWALK) TO -MUP2- STA. 14+97.52



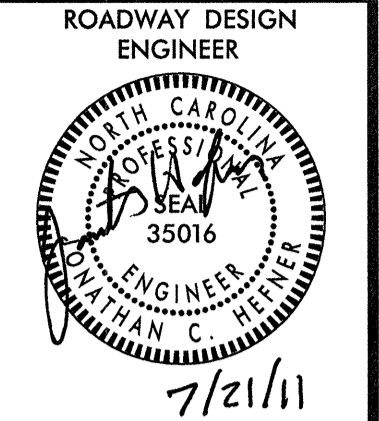
BOARDWALK TYPICAL SECTION

USE BOARDWALK TYPICAL SECTION
 -MUP2- STA. 12+45.00 TO -MUP2- STA. 13+05.00
 SEE SHEETS 2B AND 2C FOR BOARDWALK DETAILS

PAVEMENT SCHEDULE	
C1	1 1/2" S9.5B
C2	2" S9.5B
C3	3" S9.5B
C4	VAR. S9.5B
D1	2 1/2" I19.0B
D2	VAR. I19.0B
E1	5" B25.0B
J1	6" ABC
N	FABRIC FOR SOIL STABILIZATION
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W	WEDGING

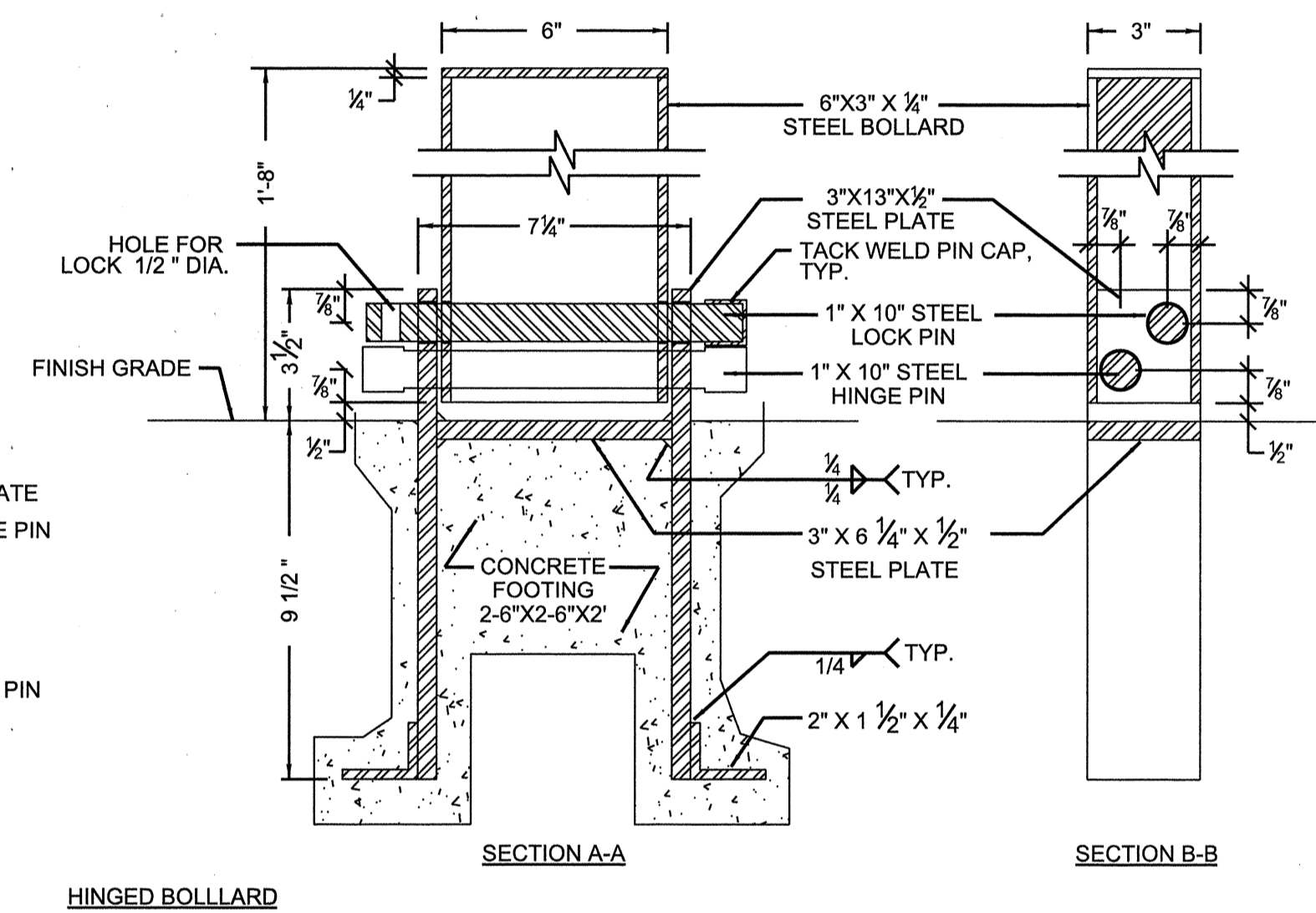
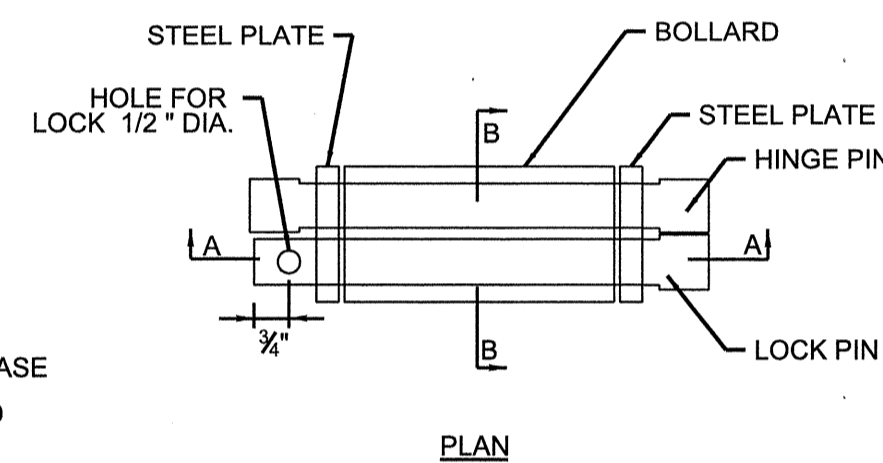
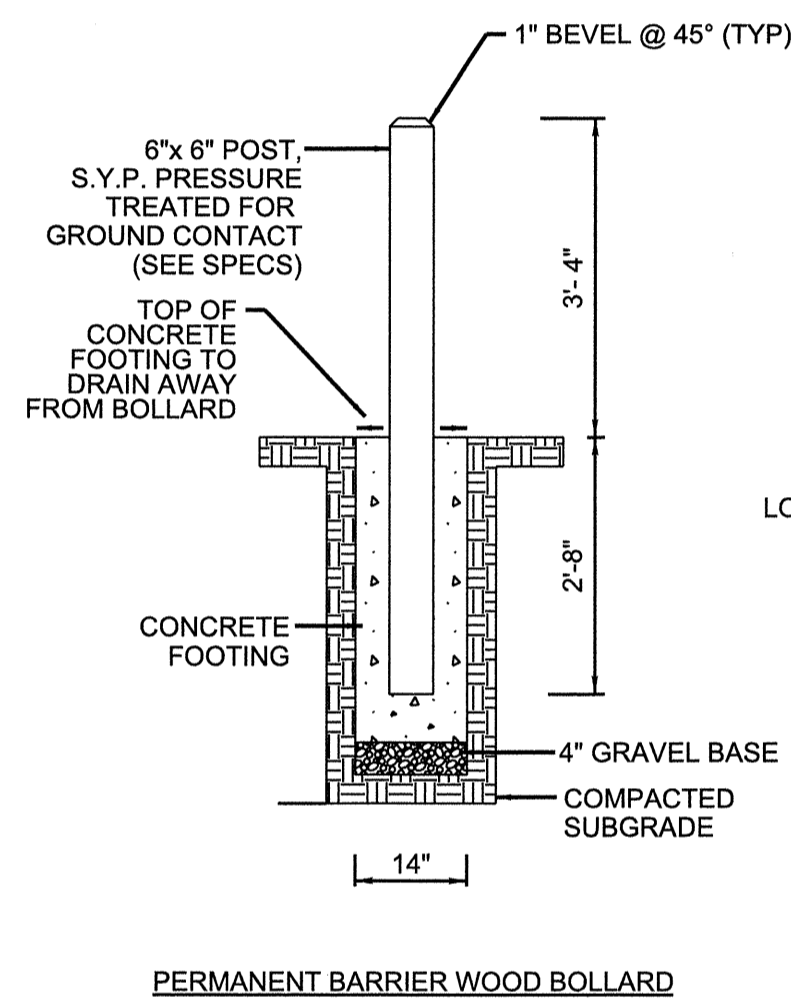
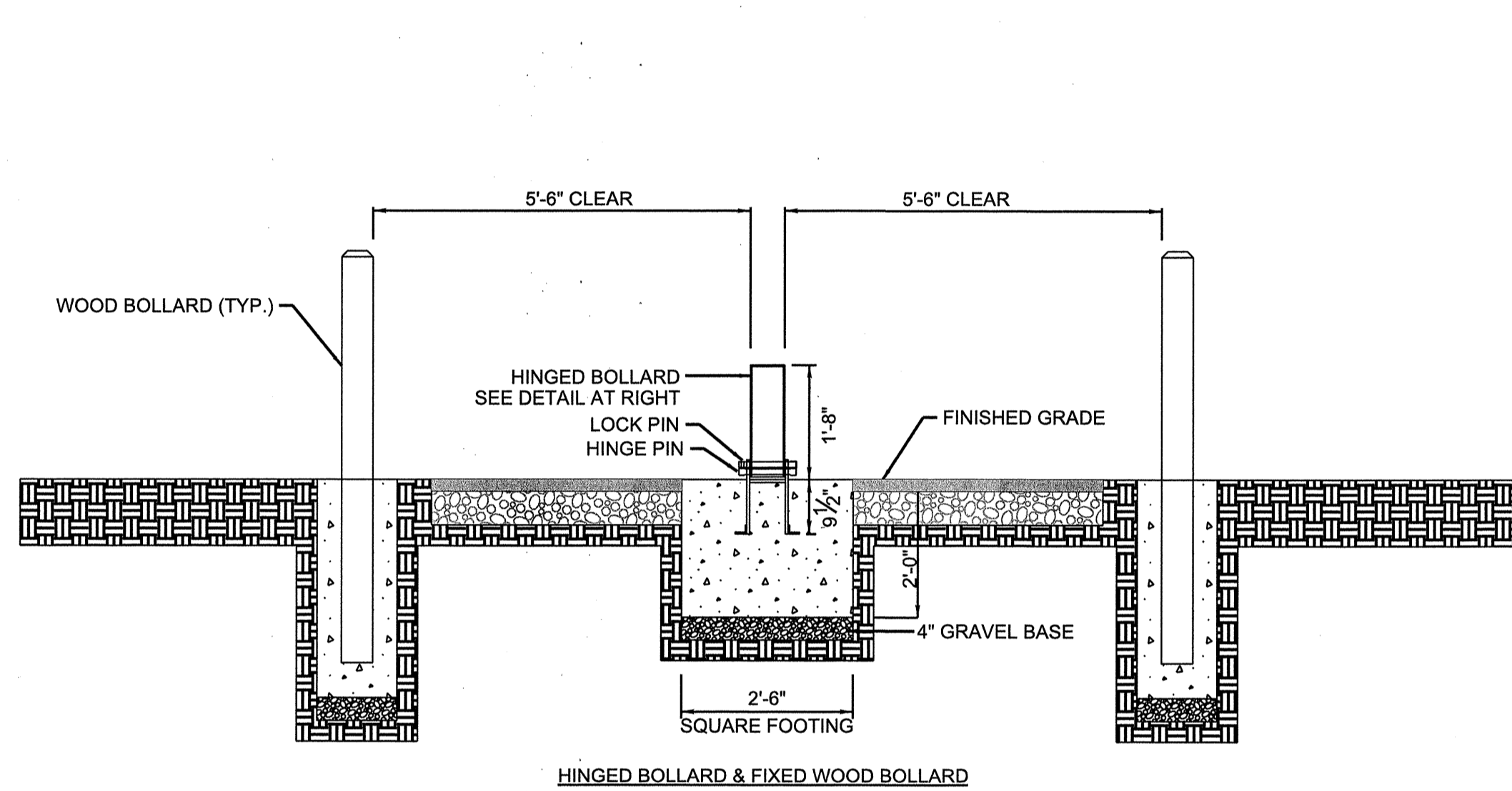
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

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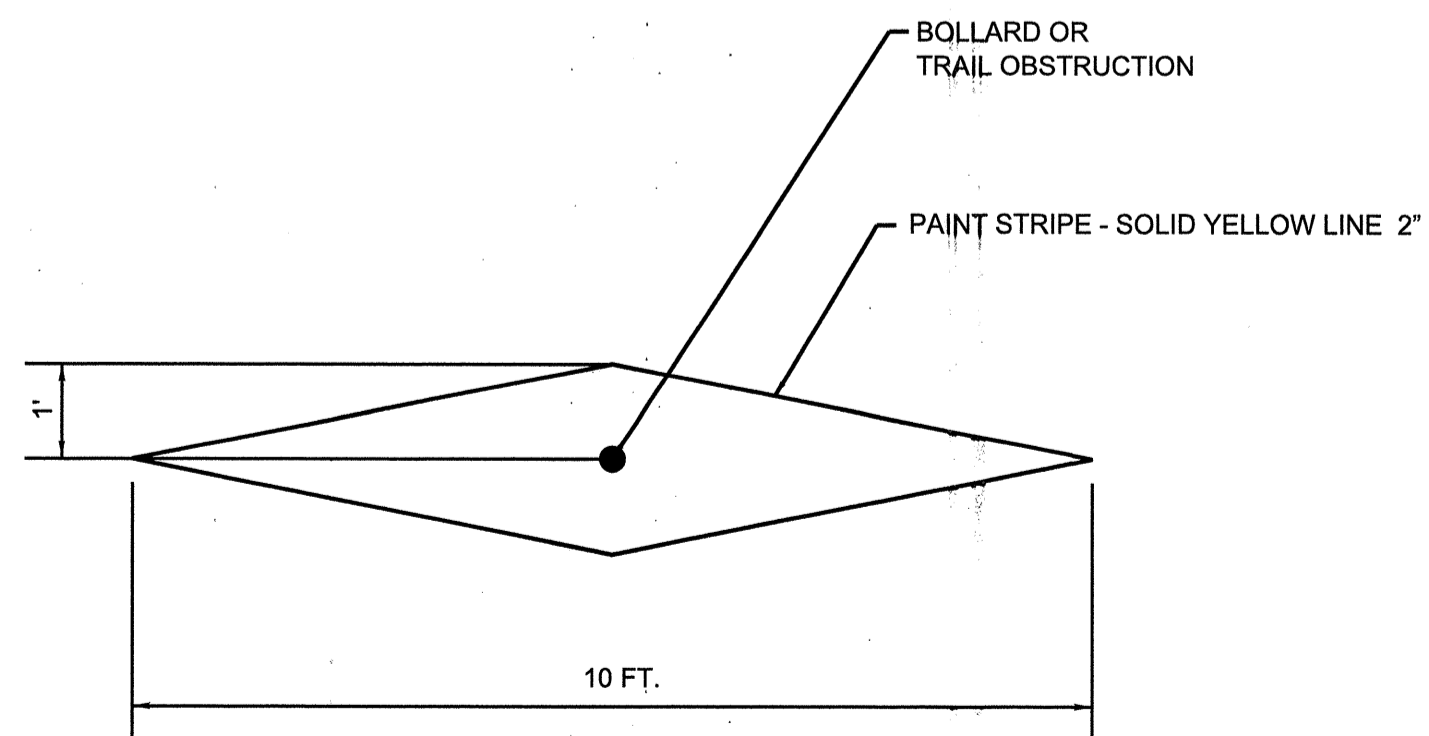
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MULTI-USE PATH DETAILS



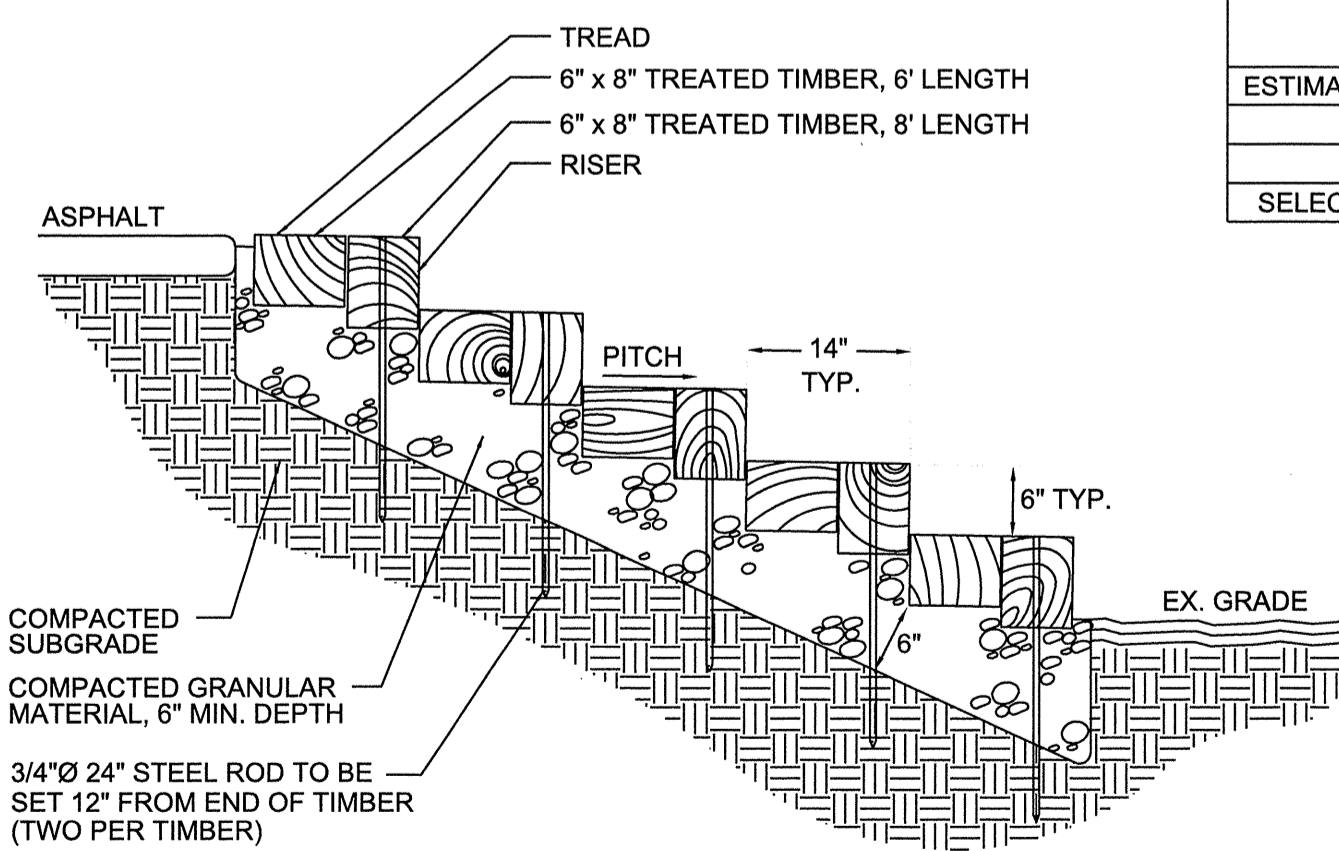
NOTE: BOLLARDS ARE TO BE SPACED NO MORE THAN 6' APART

1 BOLLARDS



2 TRAIL OBSTRUCTION WITHIN PAVEMENT MARKING

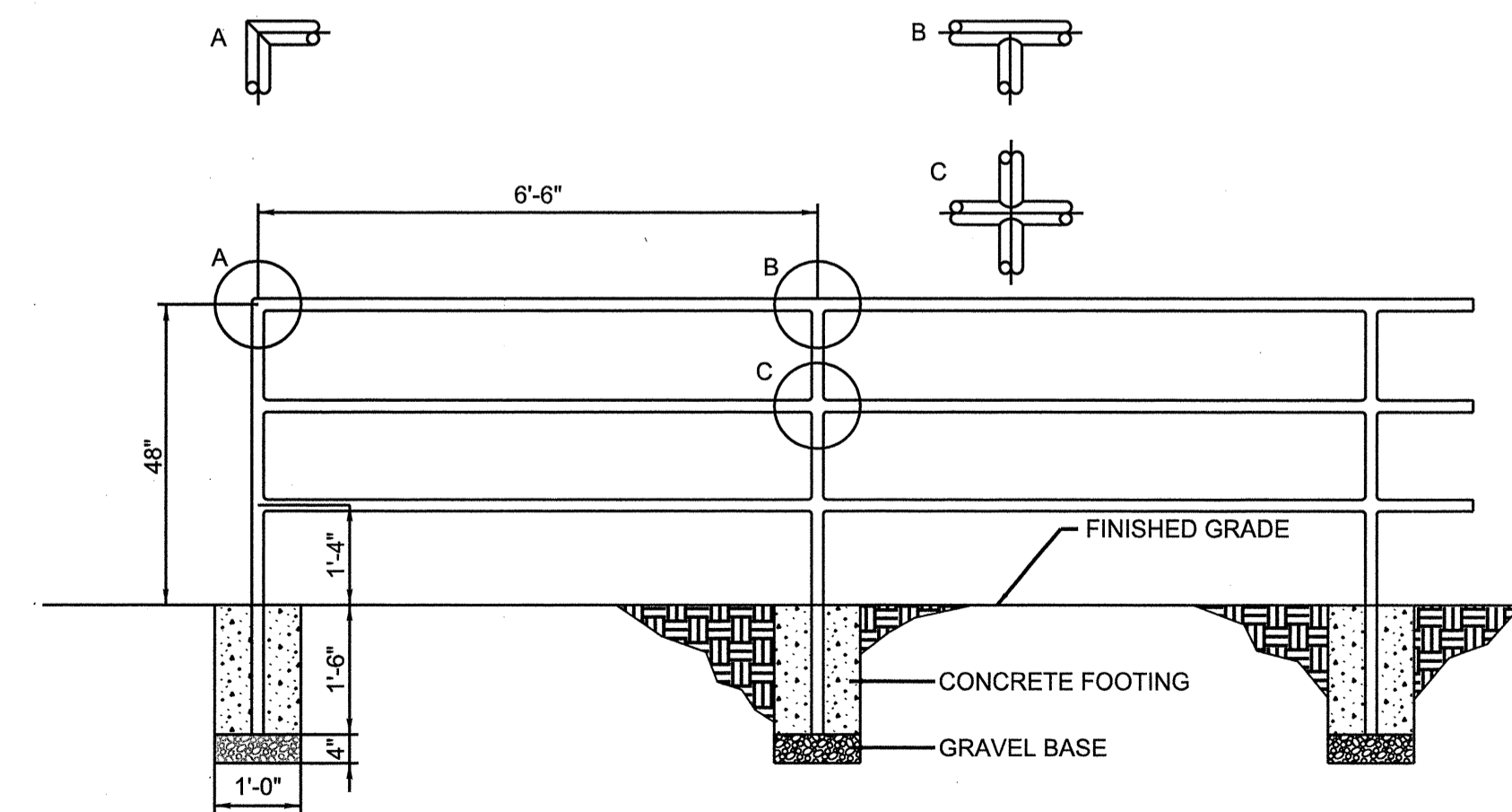
NOTE: SEE 2009 MUTCD



BILL OF MATERIAL	
ESTIMATED NUMBER OF STEPS =	15
6" x 8" TREATED TIMBER =	210 FT
3/4" Ø STEEL ROD =	60 FT
SELECT GRANULAR MATERIAL =	5 CY

NOTES: DETAIL ABOVE IS REPRESENTATIVE.
 ACTUAL NUMBER OF STEPS WILL BE DETERMINED BY CONTOURS AND FIELD LAYOUT OF TRAIL.
 WOOD SHALL MEET THE REQUIREMENTS AS DESCRIBED IN THE BOARDWALK SPECIAL PROVISION.
 STEPS SHALL MEET ADA REQUIREMENTS

3 TIMBER STEPS



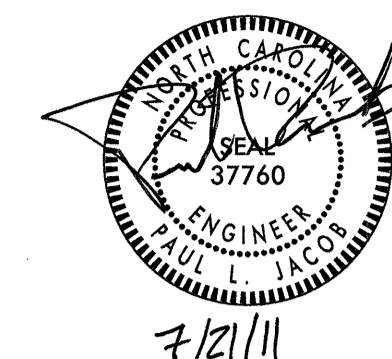
GENERAL NOTES
 1. ALL CONCRETE TO BE 3600 PSI COMPRESSIVE STRENGTH
 2. TYPE OF PIPE TO BE USED IS 1-5/8" MAX. O.D. BLACK IRON, LOW CARBON PIPE
 3. ALL JOINTS TO HAVE A 1/2" FILLET WELD.
 4. ALL METAL SHALL BE GALVANIZED PER NCDOT SPECIFICATIONS.

4 48" SAFETY RAIL

8/17/99

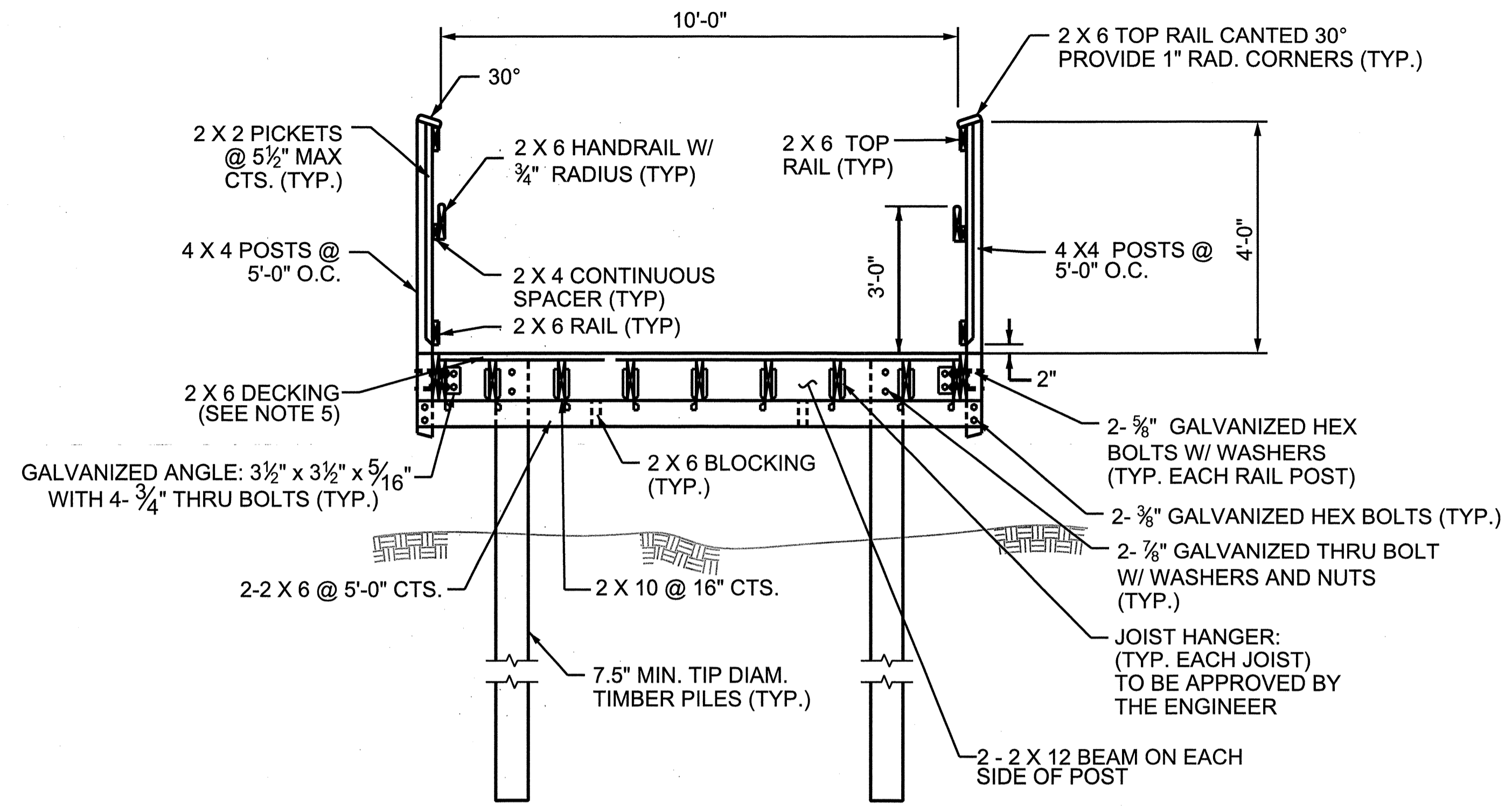
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7/20/2011 4660_RDY_PLANSHEETS.cad
 USER: [unreadable]



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SECTION A-A

BOARDWALK LOCATIONS					
NO.	BEGIN STATION	ELEVATION	END STATION	ELEVATION	LENGTH
1	12+45.00 -MUP2-	201.63	13+05.00 -MUP2-	203.31	60'

NUMBER OF 7.5" MIN. TIP DIAM. TIMBER PILES = 14
ESTIMATED TOTAL LENGTH OF 7.5" MIN. TIP DIAM. TIMBER PILES = 330' *

* NOTE: ESTIMATED LENGTHS ARE ASSUMING 20 FT EMBEDMENT INTO GROUND. THE GEOTECHNICAL ENGINEER SHOULD VERIFY THIS ASSUMPTION.

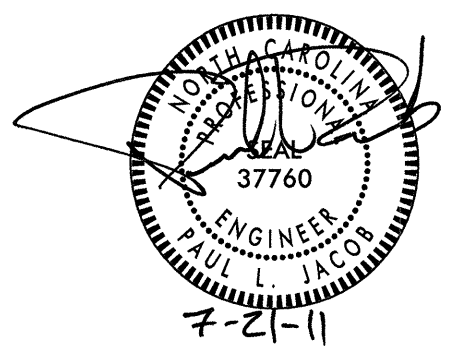
- NOTES:**
- BOARDWALK IS PLACED ON 7.5" MIN. TIP DIAM. ROUND TIMBER PILES.
 - MINIMUM POST PENETRATION, PILE CAPACITIES, AND DRIVING REQUIREMENTS TO BE ESTABLISHED BY GEOTECHNICAL ENGINEER.
 - ALL TIMBER DIMENSIONS ARE BASED ON NOMINAL TIMBER SIZES.
 - ALL EXPOSED CORNERS OF 2 X 6 TOP RAILS SHALL BE FINISHED WITH 1/2" MINIMUM RADIUS.
 - PRE-DRILLED HOLES MAY BE NECESSARY TO PREVENT SPLITTING OF TIMBERS DURING CONSTRUCTION. 2 X 6 DECKING TO BE ATTACHED TO JOISTS USING 3" X 1/8" GALVANIZED SCREWS. DECKING SHALL BE ATTACHED WITH TWO GALVANIZED OR STAINLESS STEEL SCREWS AT EVERY JOIST.
 - ALL BOLTS, NUTS, WASHERS, ETC. SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A153. SIMPSON STRONG TIE CONNECTORS (WHERE USED) SHALL BE GALVANIZED.
 - TREATED TIMBER AND LUMBER SHALL BE USED AND SHALL BE IN ACCORDANCE WITH 2006 NCDOT STANDARD SPECIFICATIONS, SECTION 1082 AND SHALL BE SOUTHERN PINE, GRADE 1 OR BETTER.
 - ALL WORK SHALL BE ACCOMPLISHED AS DIRECTED BY THE ENGINEER. ANY DISCREPANCIES FOUND ON THIS DRAWING SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING.
 - BASIS OF PAYMENT FOR THE BOARDWALK WILL BE AT THE CONTRACT PRICE PER LINEAR FOOT FOR BOARDWALK AND BOARDWALK POSTS 7.5" MIN. TIP DIAMETER, AND WILL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, LABOR, TOOLS, AND INCIDENTALS NECESSARY FOR INSTALLING IN PLACE.
 - FOR TIMBER BOARDWALK, SEE SPECIAL PROVISIONS.
 - 2 X 10 AND 2 X 12 BLOCKING OCCURS AT MID-SPAN OF EACH UNIT.
 - ALL 2 X 6 RAIL POST BRACING SHALL BE ATTACHED TO EACH JOIST WITH HURRICANE TIES.
 - SPLICES FOR 2 X 12 FASCIA BOARDS SHALL BE OFFSET FROM SPLICES FOR ATTACHED 2 X 10 STRINGER.
 - 2X6 BOTTOM RAIL TO BE INSTALLED 2" ABOVE DECK SURFACE.
 - THE PILE HAMMER USED BY THE CONTRACTOR MUST BE APPROVED BY THE NCDOT GEOTECHNICAL UNIT'S EASTERN REGIONAL OPERATIONS ENGINEER PRIOR TO CONSTRUCTION.
 - UNO = UNLESS NOTED OTHERWISE

TYPICAL BOARDWALK DETAILS

8/17/99

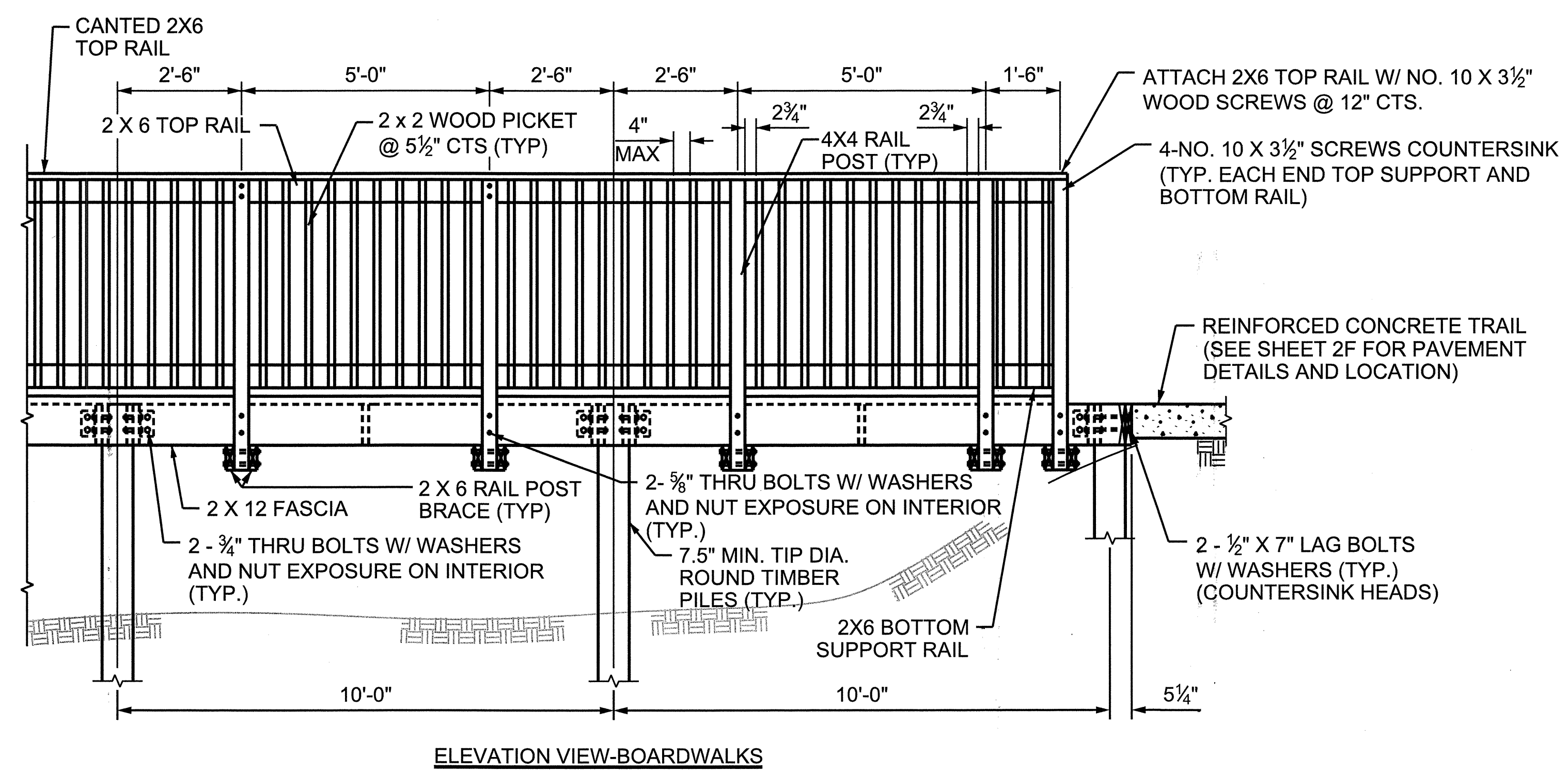
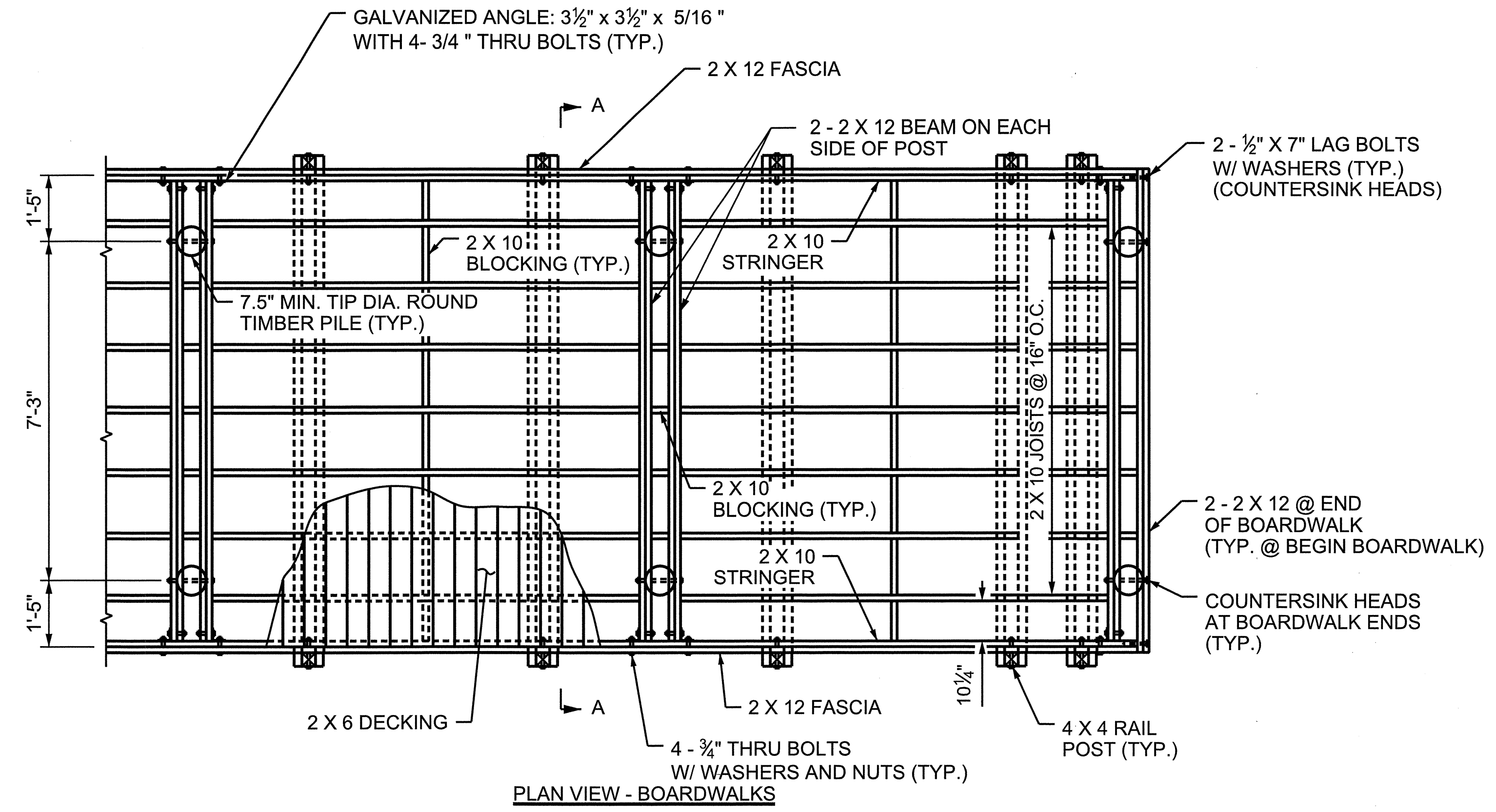
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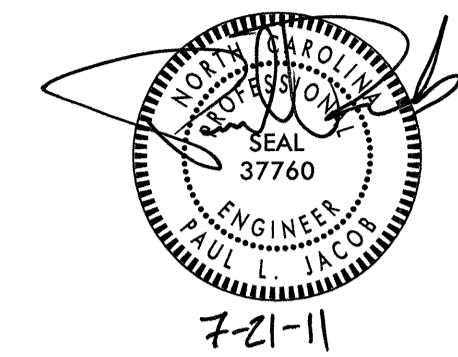
DESIGN LOADS
 PEDESTRIAN LIVE LOAD 90 PSF
 WIND LOAD ON SUPERSTRUCTURE 35 PSF

TYPICAL BOARDWALK DETAILS

REVISIONS

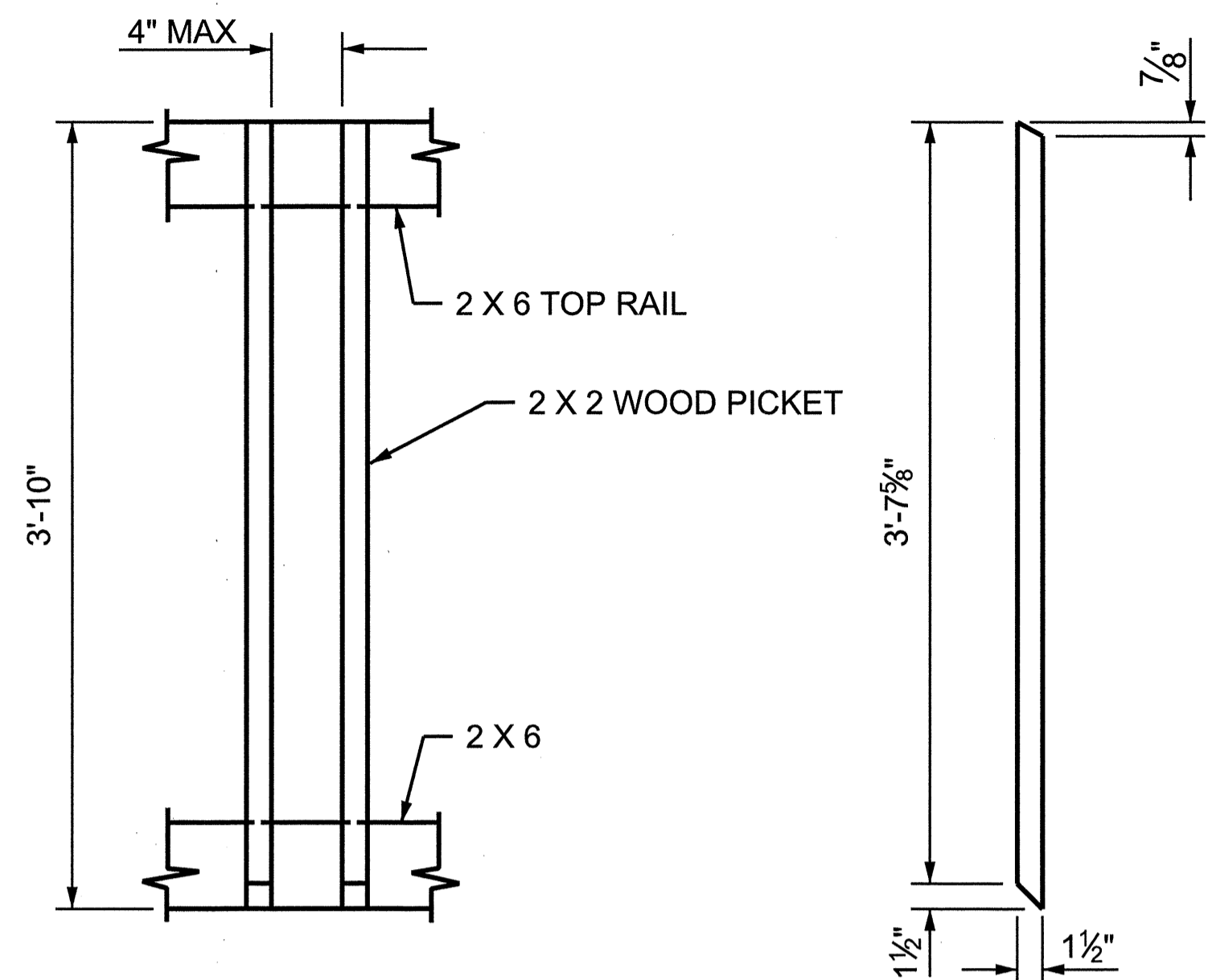
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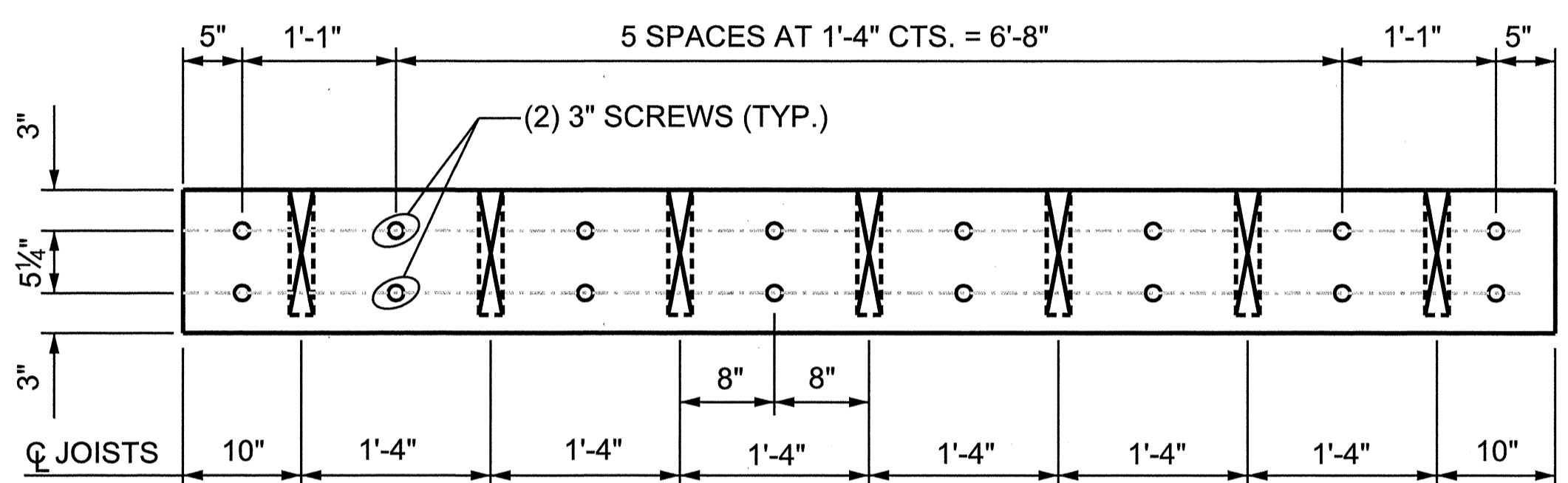


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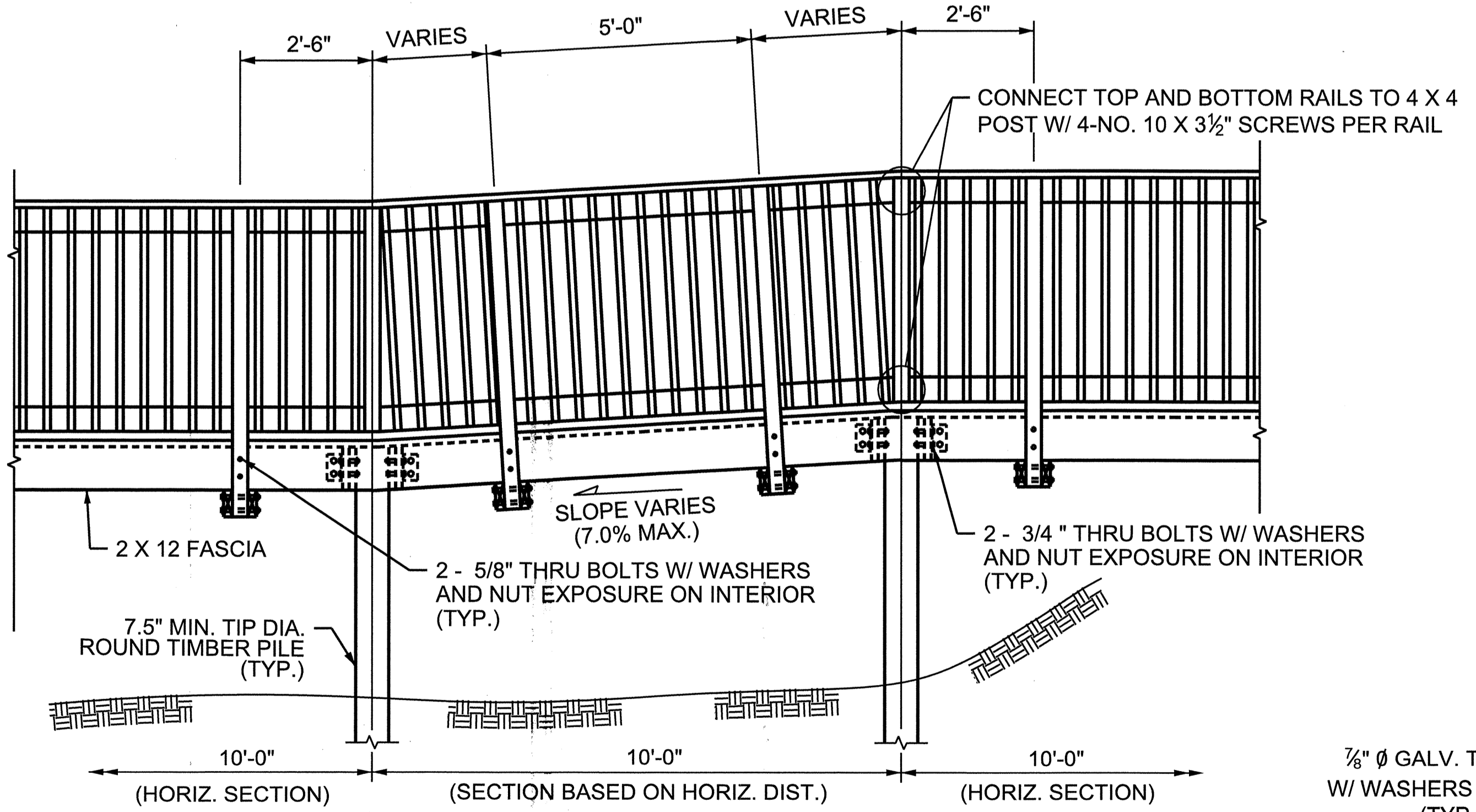


PICKETT DETAIL

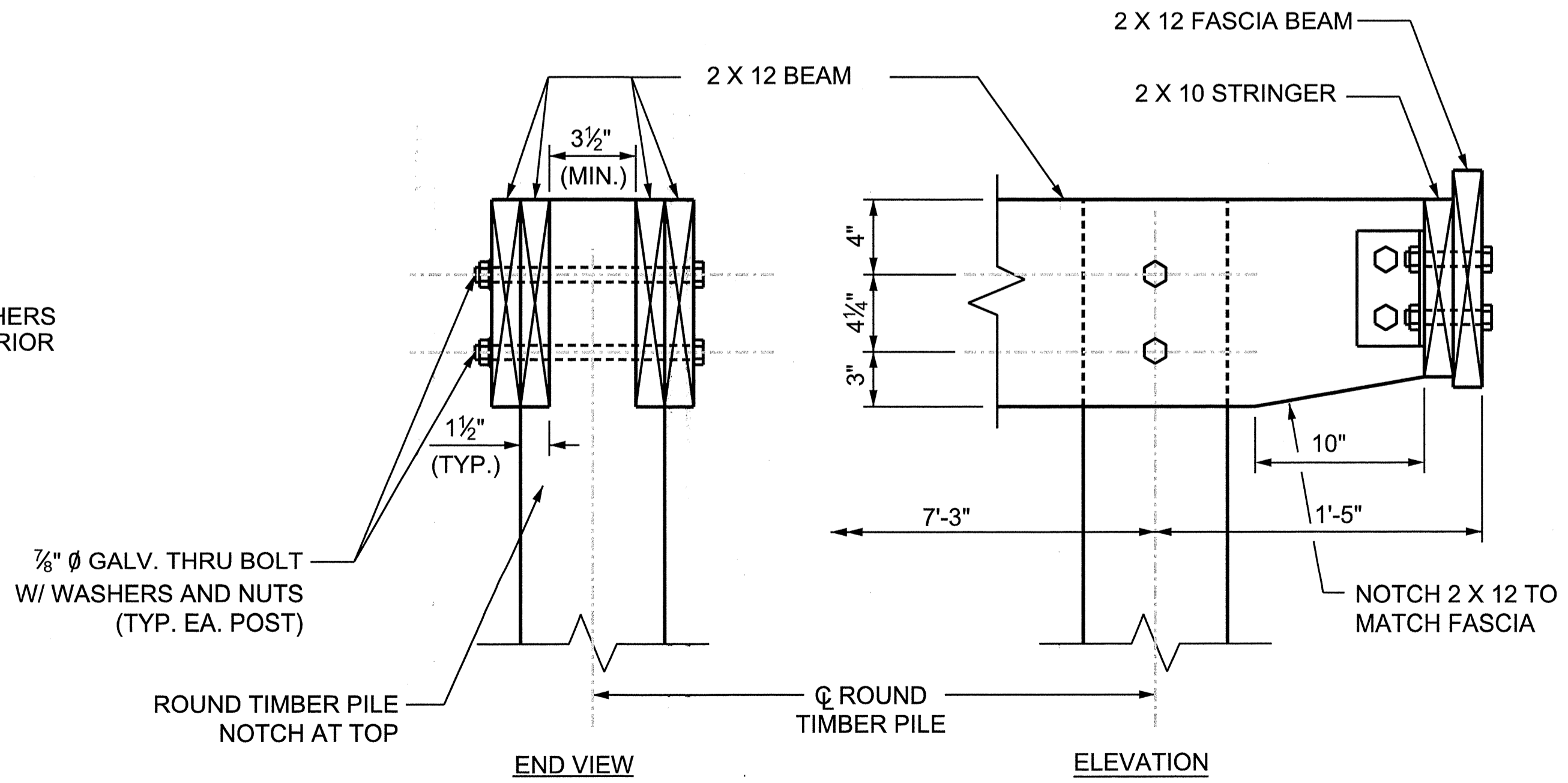


DOUBLE 2" X 12" GIRDER NAILING PATTERN

NOTE: SCREW FROM OPPOSITE FACE AT ADJACENT SETS OF SCREWS



ELEVATION VIEW WITH SLOPED DECKING

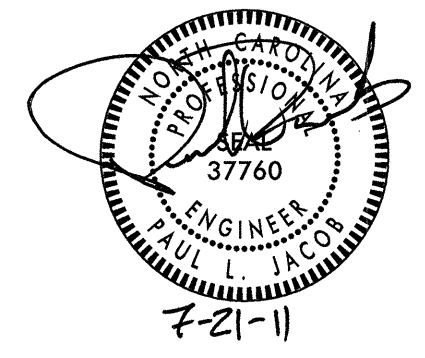


BEAM CONNECTION TO POSTS

TYPICAL BOARDWALK DETAILS

REVISIONS

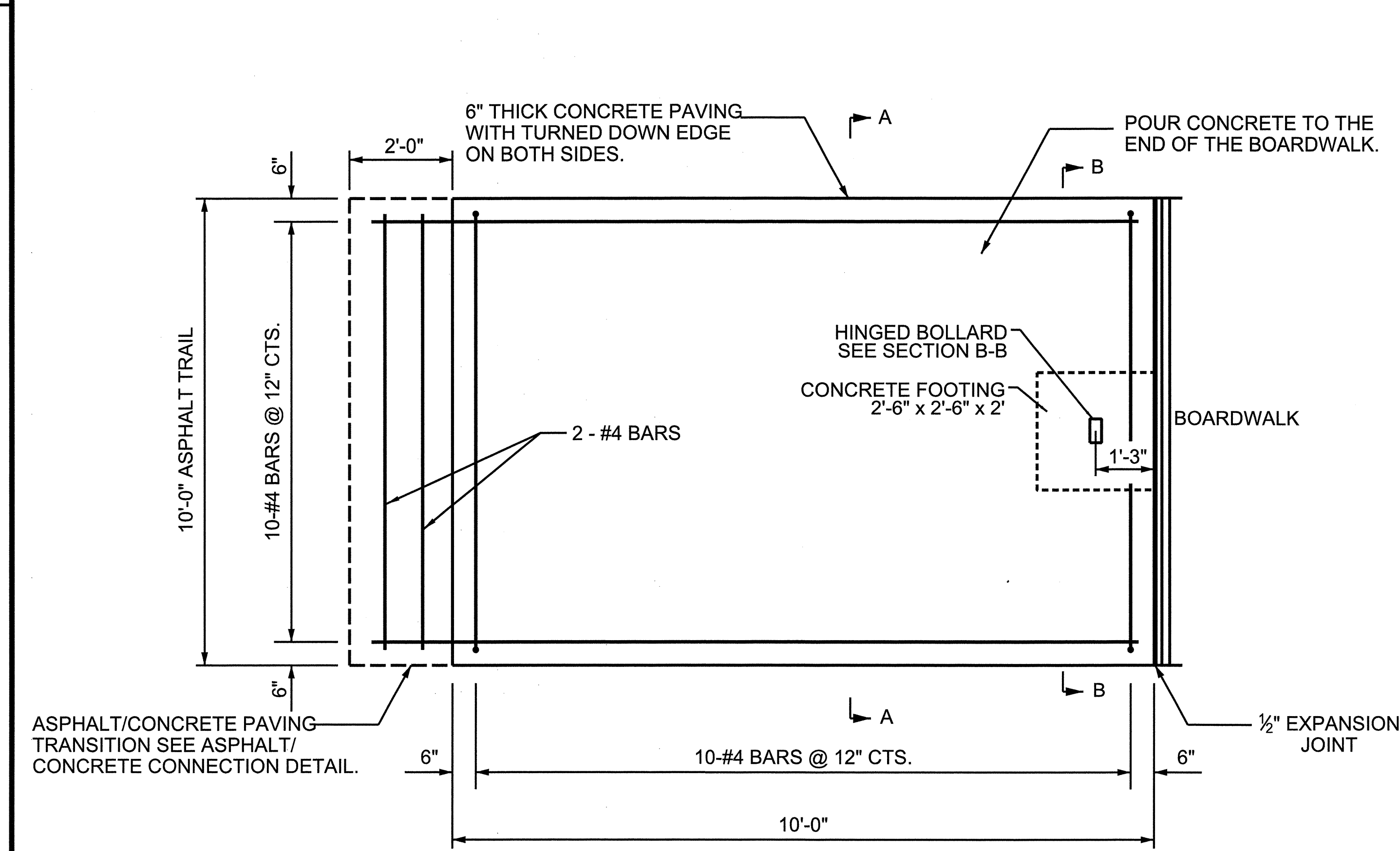
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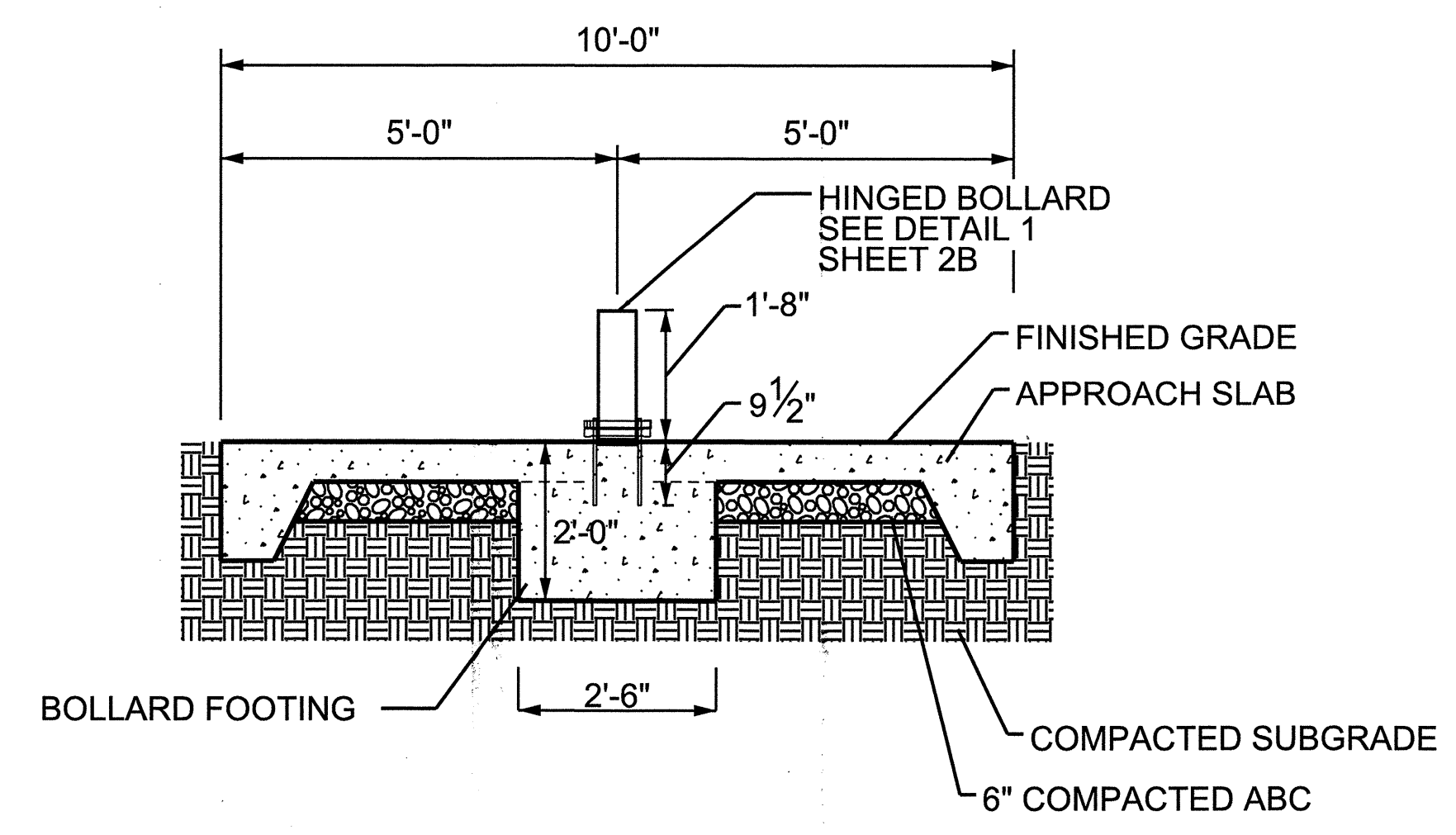
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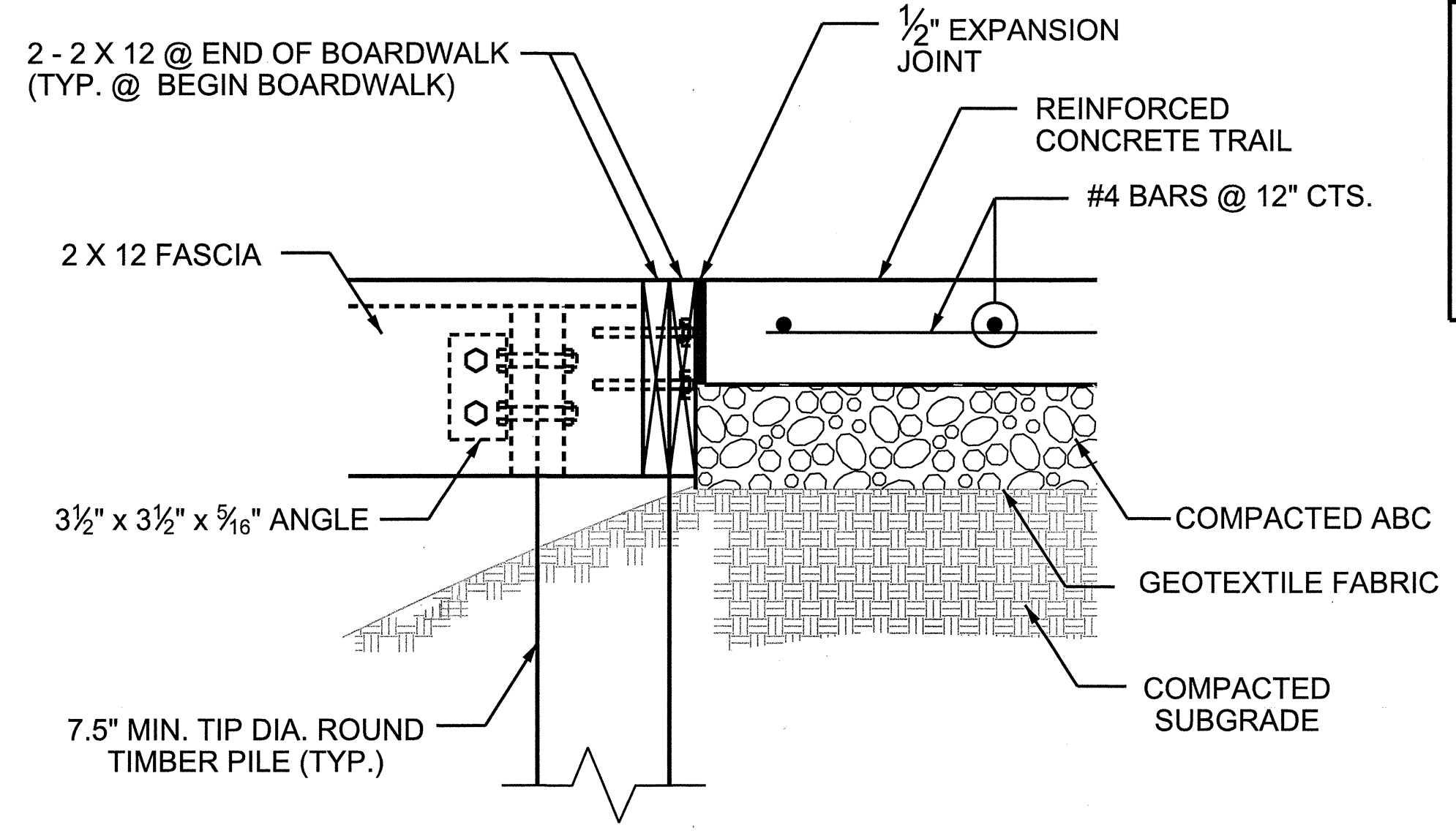
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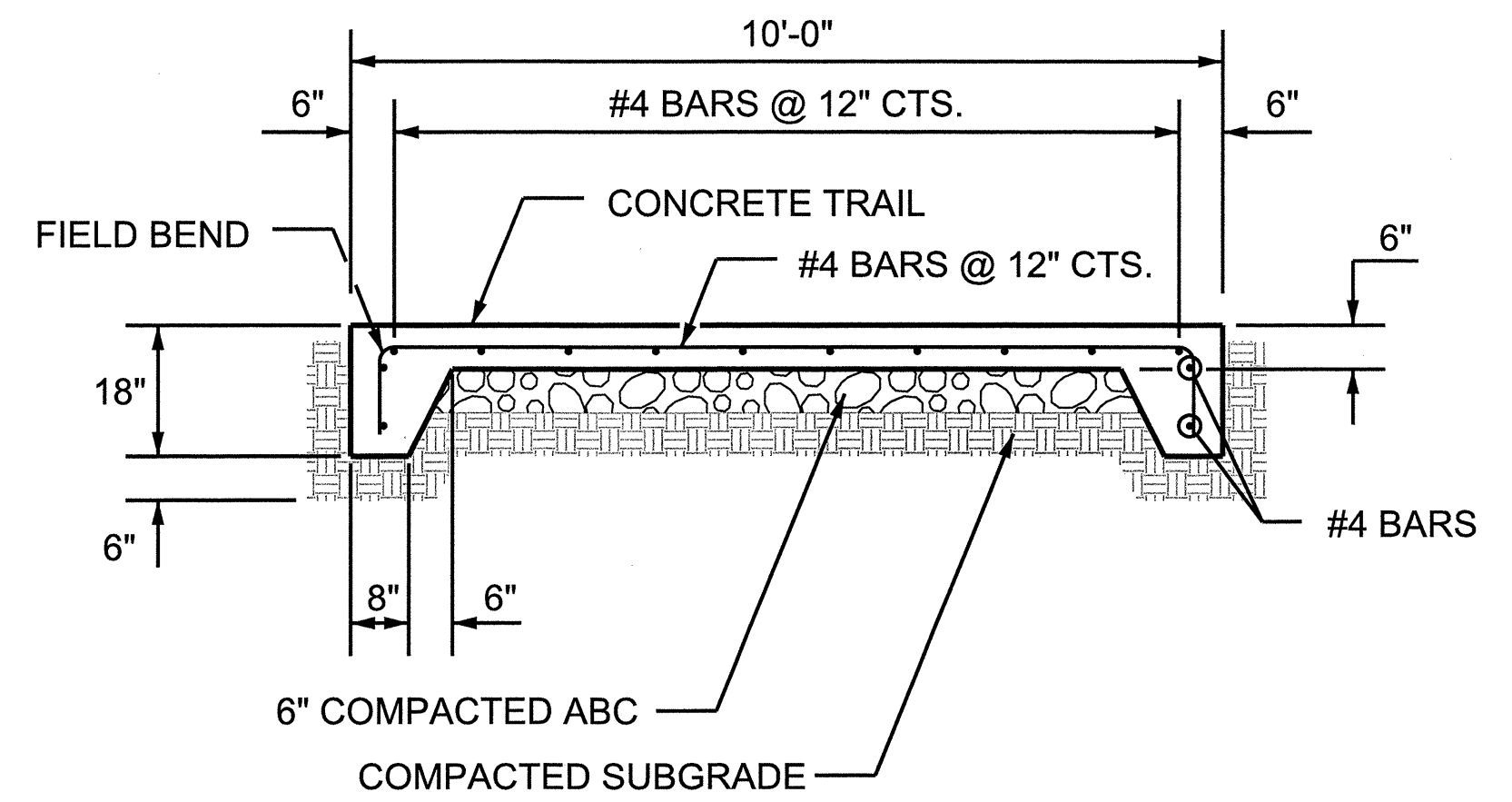
PLAN VIEW



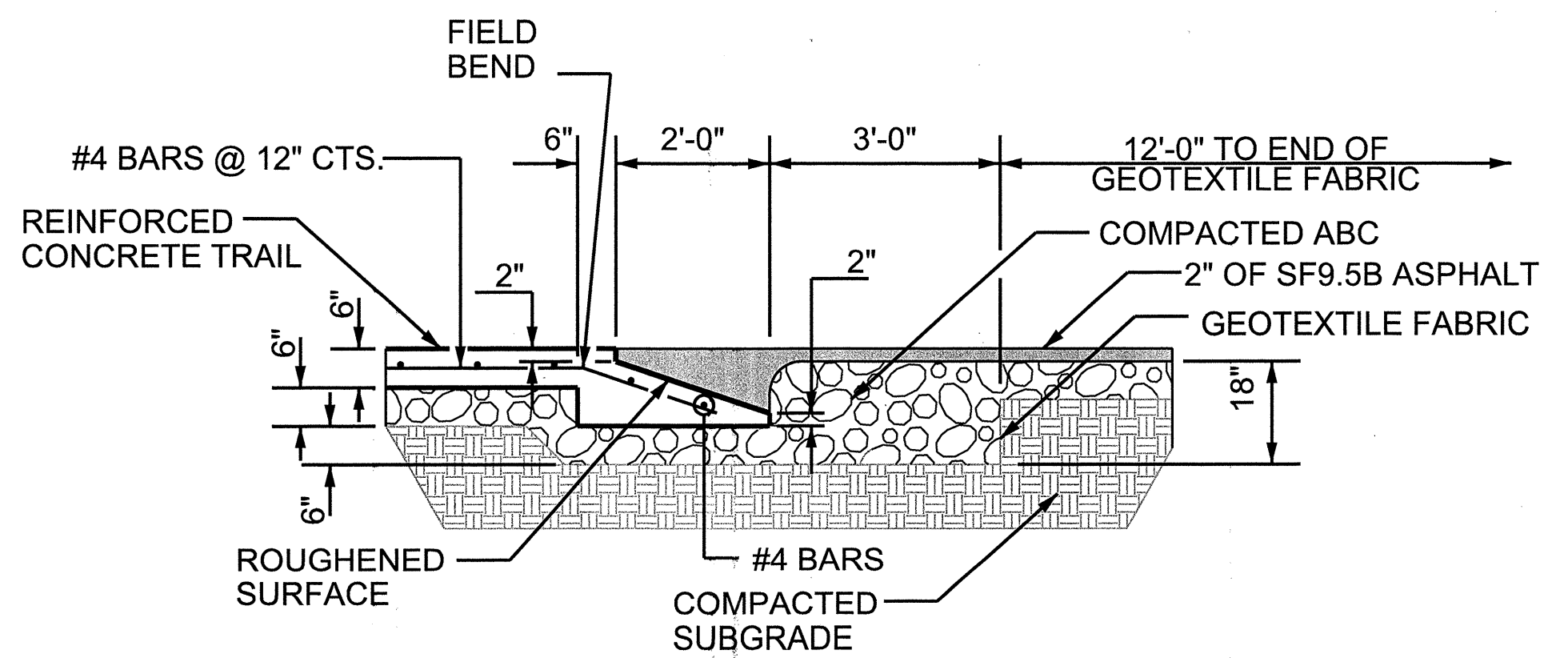
SECTION B-B



CONCRETE/BOARDWALK CONNECTION



SECTION A-A



ASPHALT/CONCRETE CONNECTION

NOTE:
 PAYMENT FOR CONCRETE TRAIL AT EACH END OF BOARDWALK WILL BE MADE UNDER THE PAY ITEM "CONCRETE APPROACH TO BOARDWALK".

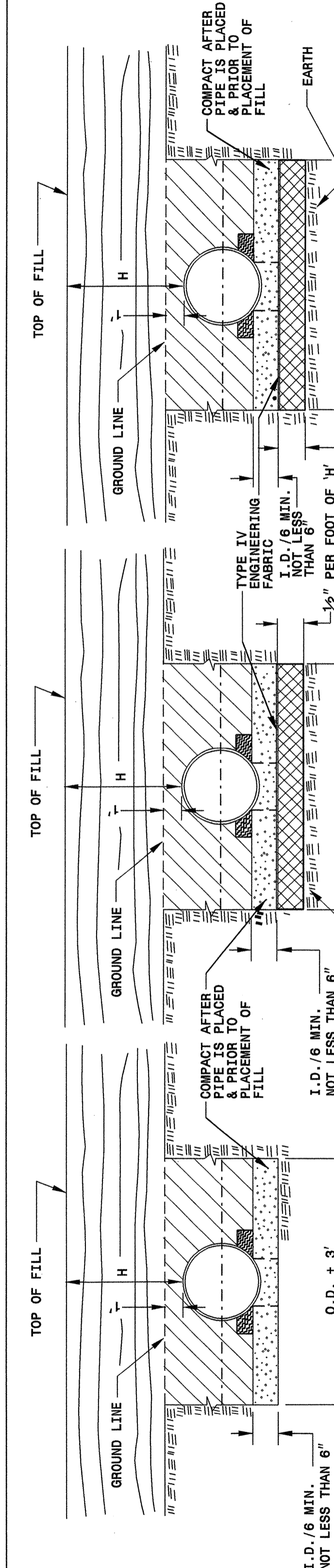
NOTE: GEOTEXTILE TO EXTEND FULL WIDTH OF TRANSITION. COST OF GEOTEXTILE TO BE INCLUDED WITH THE PAY ITEM "CONCRETE APPROACH TO BOARDWALK".

TYPICAL DETAILS FOR BOARDWALK APPROACH

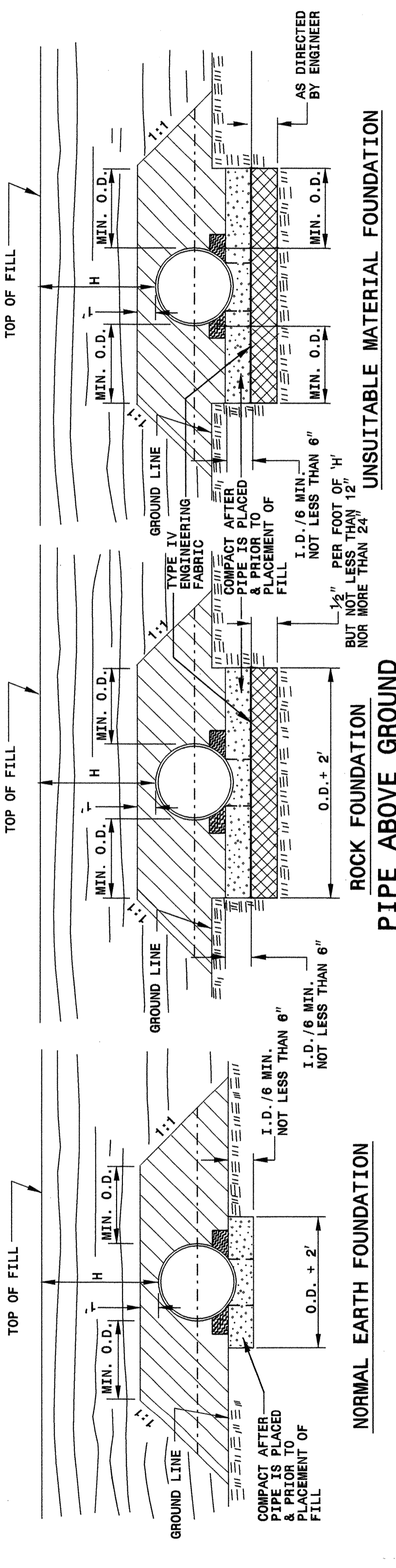
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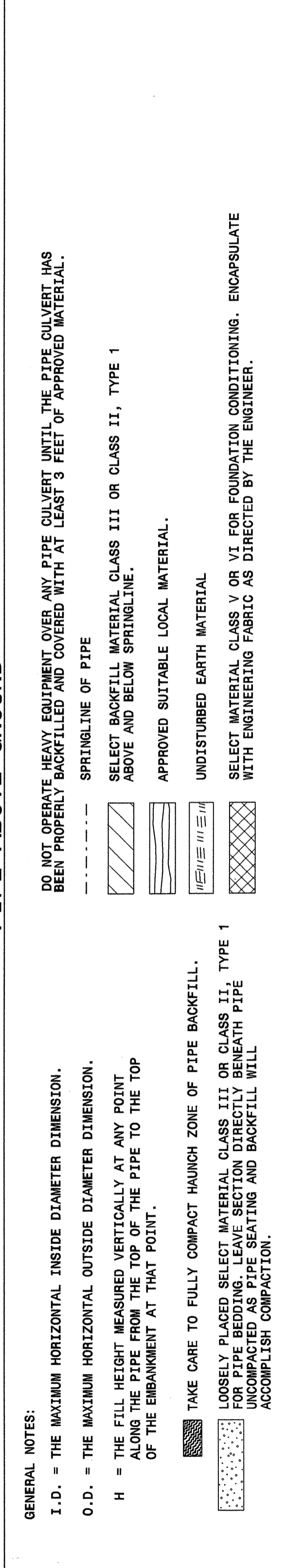
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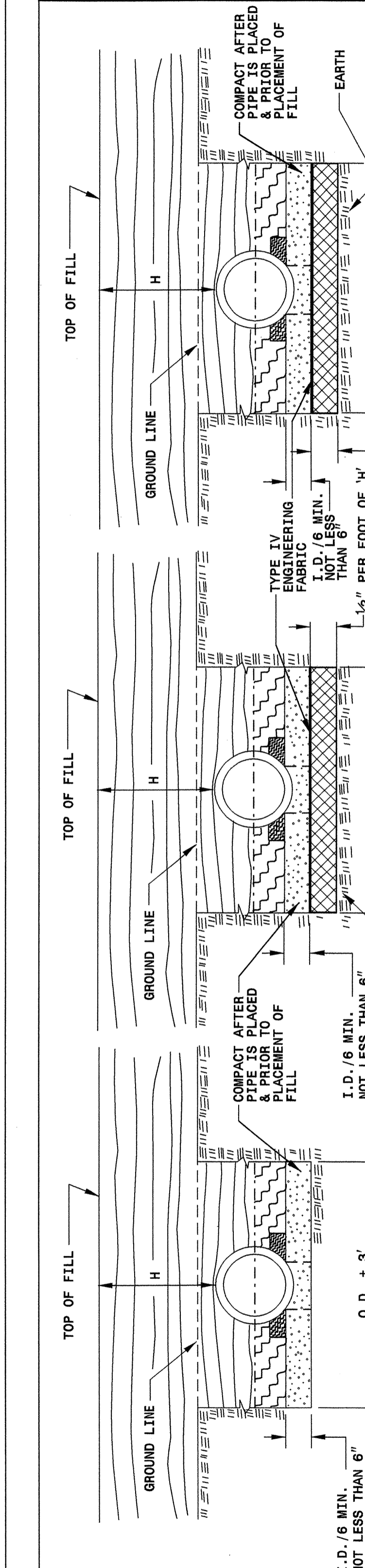
ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 FLEXIBLE PIPE



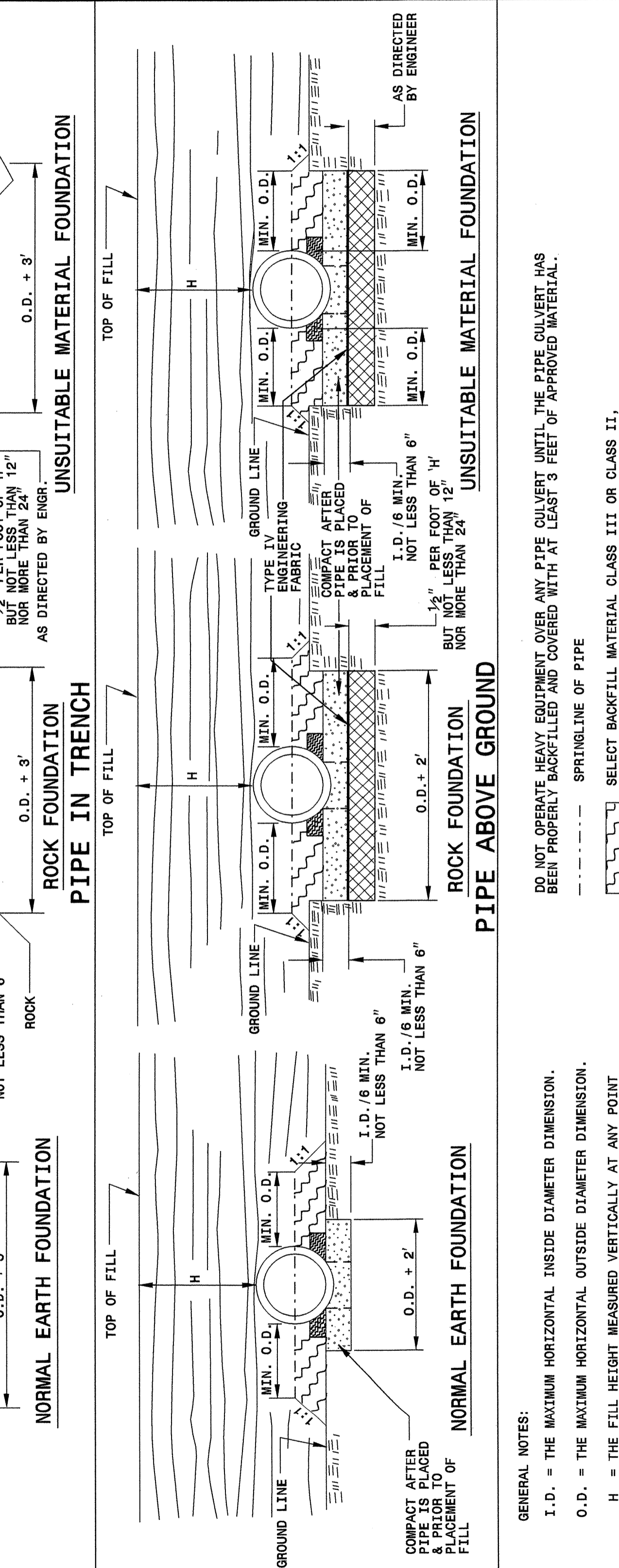
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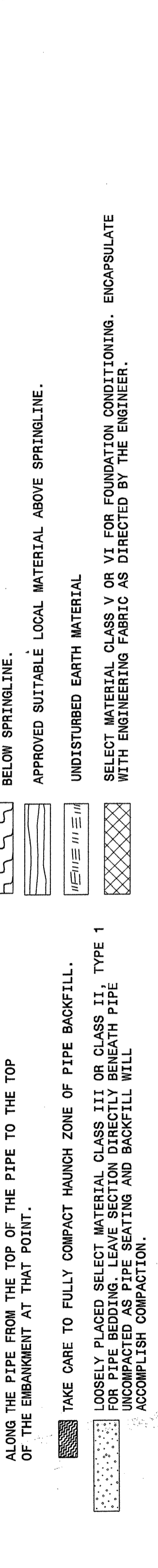
ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 RIGID PIPE



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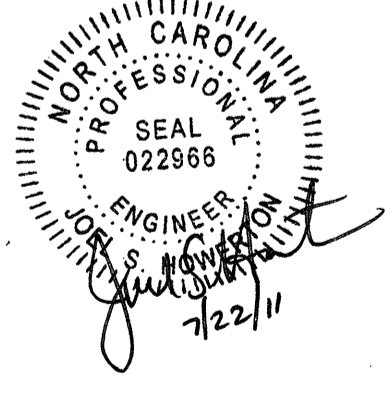
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PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
 Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

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 MODIFIED BY: [Signature] DATE: [Blank]
 CHECKED BY: [Signature] DATE: 7/30/09
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7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

FLEXIBLE PIPE

Round Corrugated Steel Pipe 2 2/3 x 1/2 corrugation **			
Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)	8
12	12	204	256
15	12	162	204
18	12	135	169
21	12	115	145
24	12	100	126
30	12	79	100
36	12	65	83
42	12	55	70
48	12	48	61
54	12	44	54
60	12	39	48
66	12	34	42
72	12	29	36
78	12	24	30
84	12	19	24

Round Corrugated Aluminum Pipe 2 2/3 x 1/2 corrugation **			
Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)	8
12	12	123	156
15	12	98	123
18	12	81	102
21	12	69	87
24	12	60	76
27	12	52	66
30	12	46	58
36	12	38	48
42	12	32	40
48	12	27	34
54	12	23	29
60	12	19	24
66	12	16	20
72	12	13	16

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

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

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

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

RIGID PIPE

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

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

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

- RCP - AASHTO M170

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

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

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ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

FILL HEIGHT TABLES

SHEET 3 OF 3
300D01

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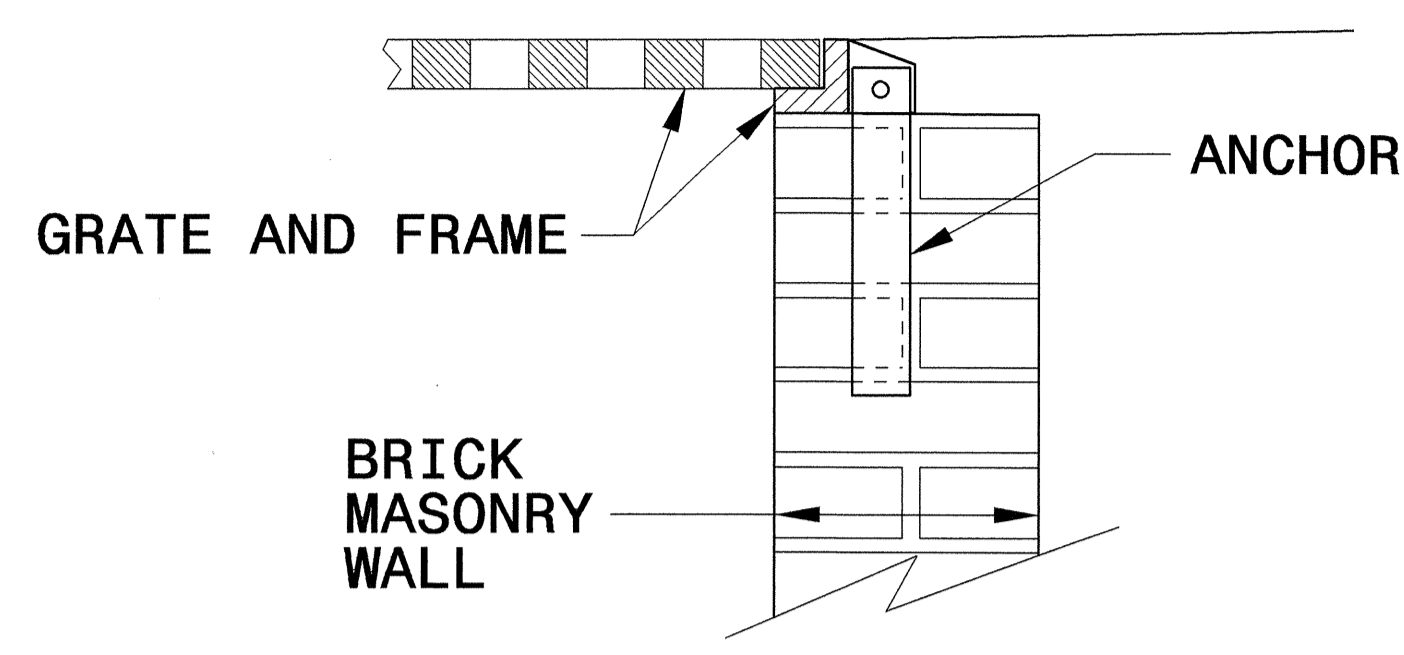
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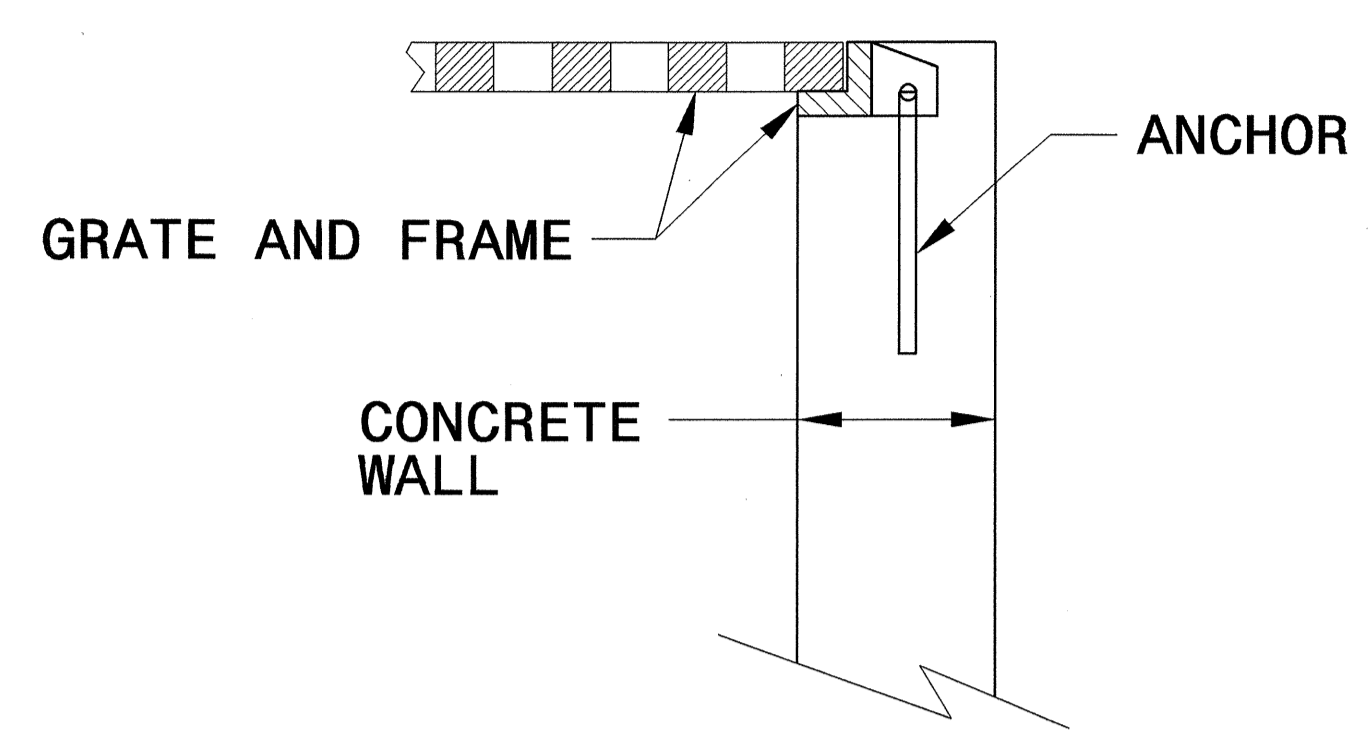
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

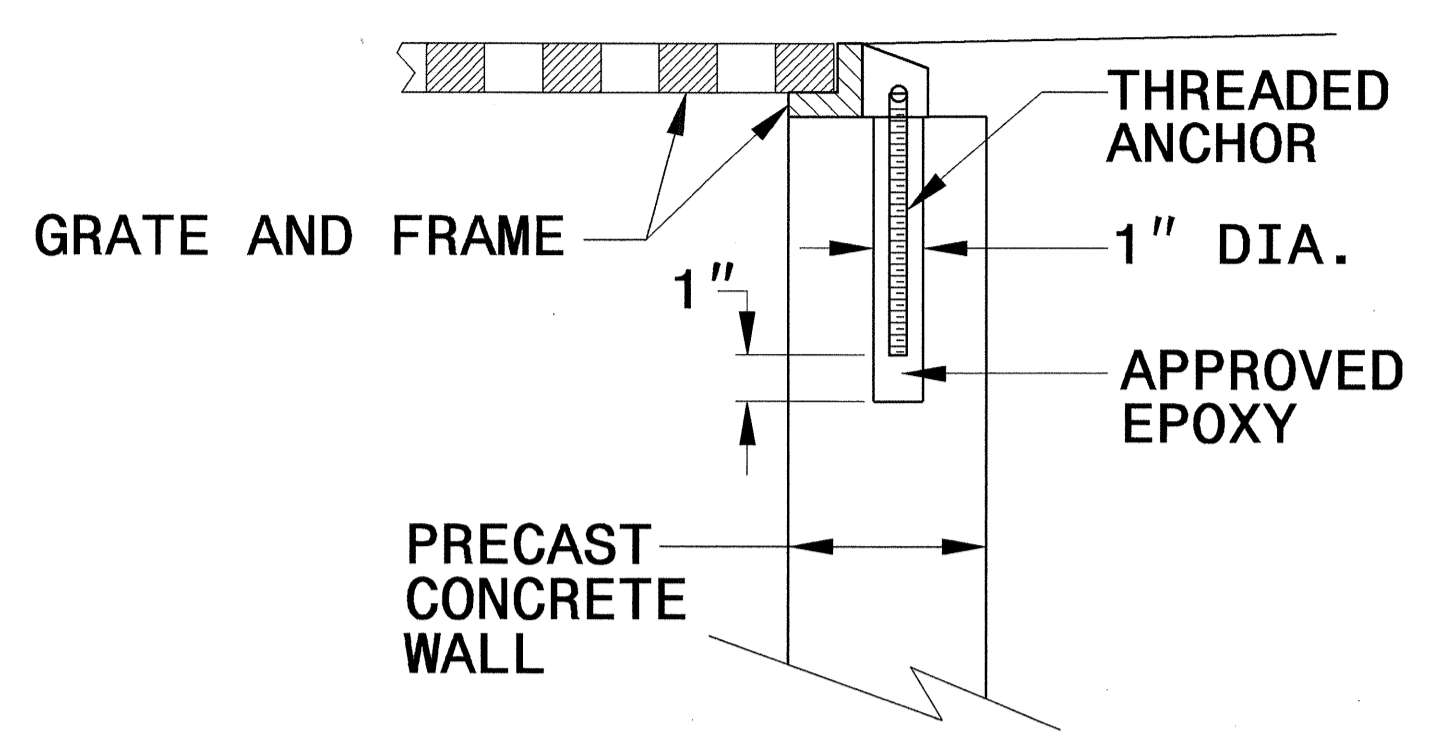
SHEET 1 OF 1
840D25



BRICK MASONRY CONSTRUCTION



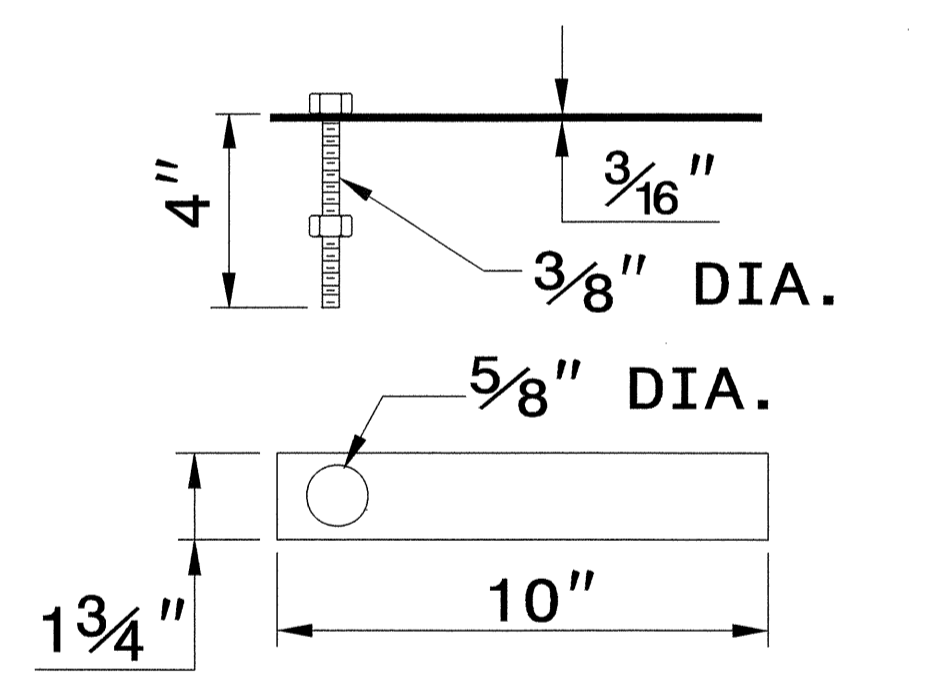
CONCRETE CONSTRUCTION



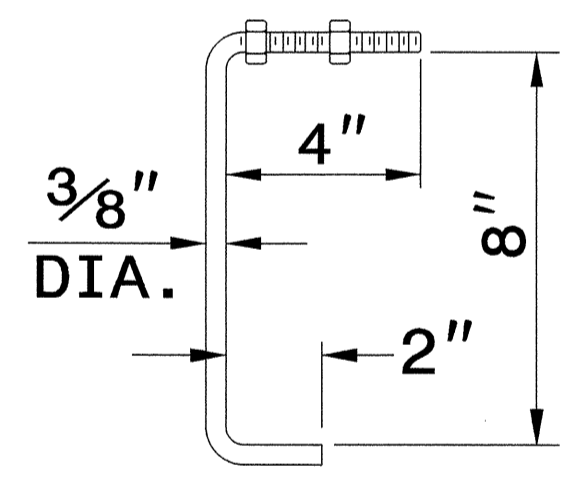
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

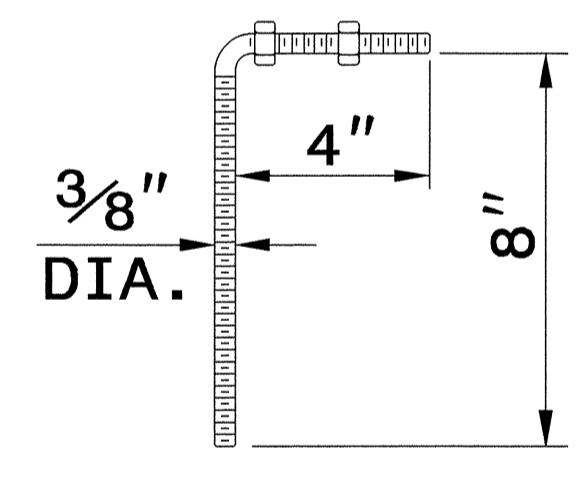
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



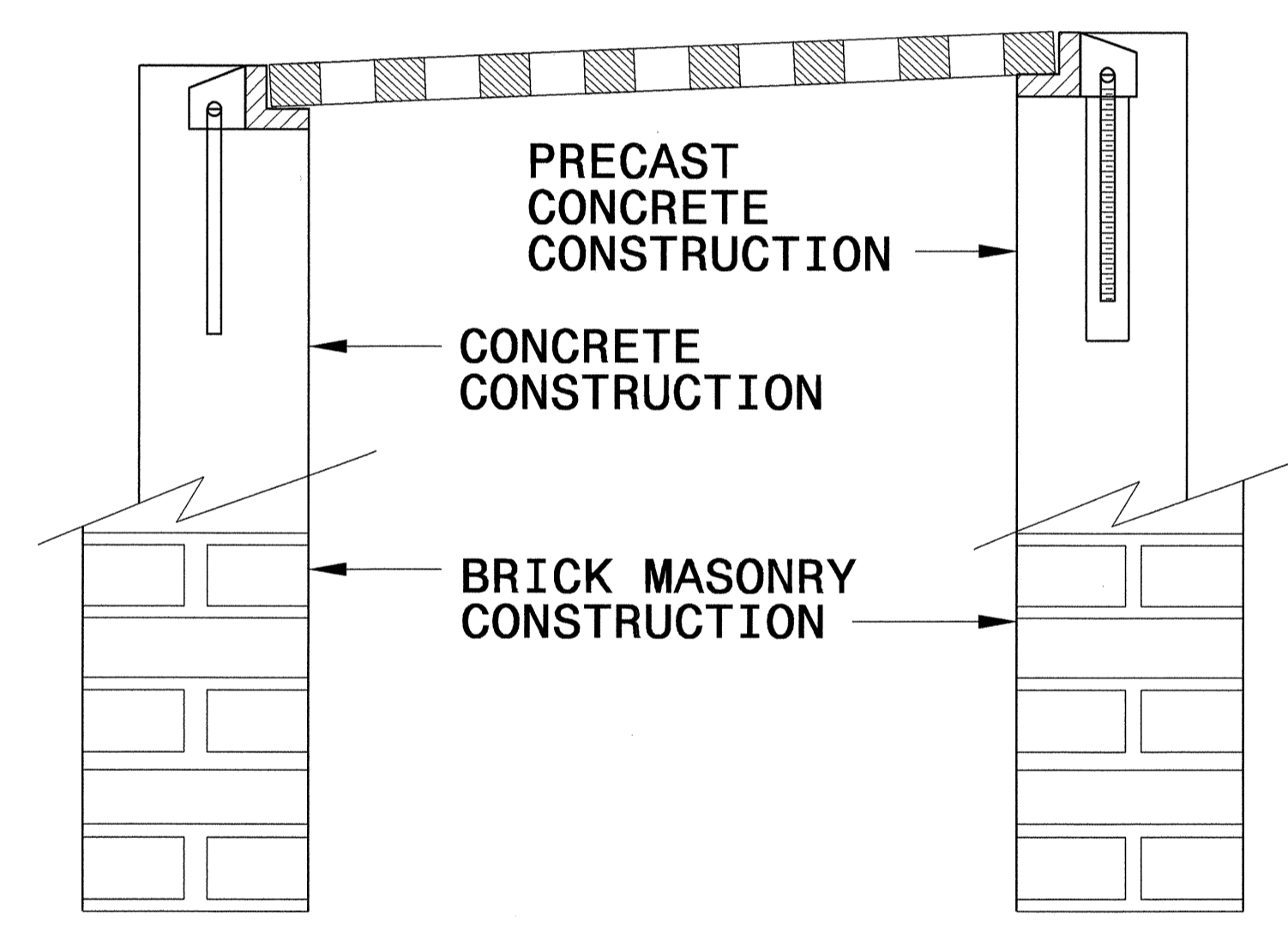
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



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.

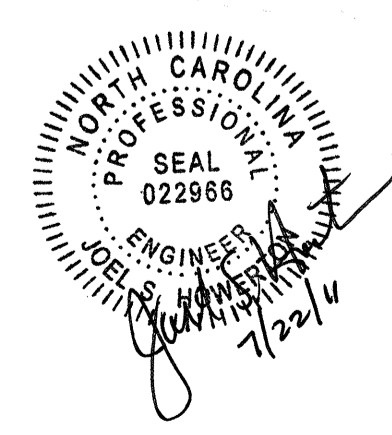
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1
840D25

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

SEE PLATE FOR TITLE

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

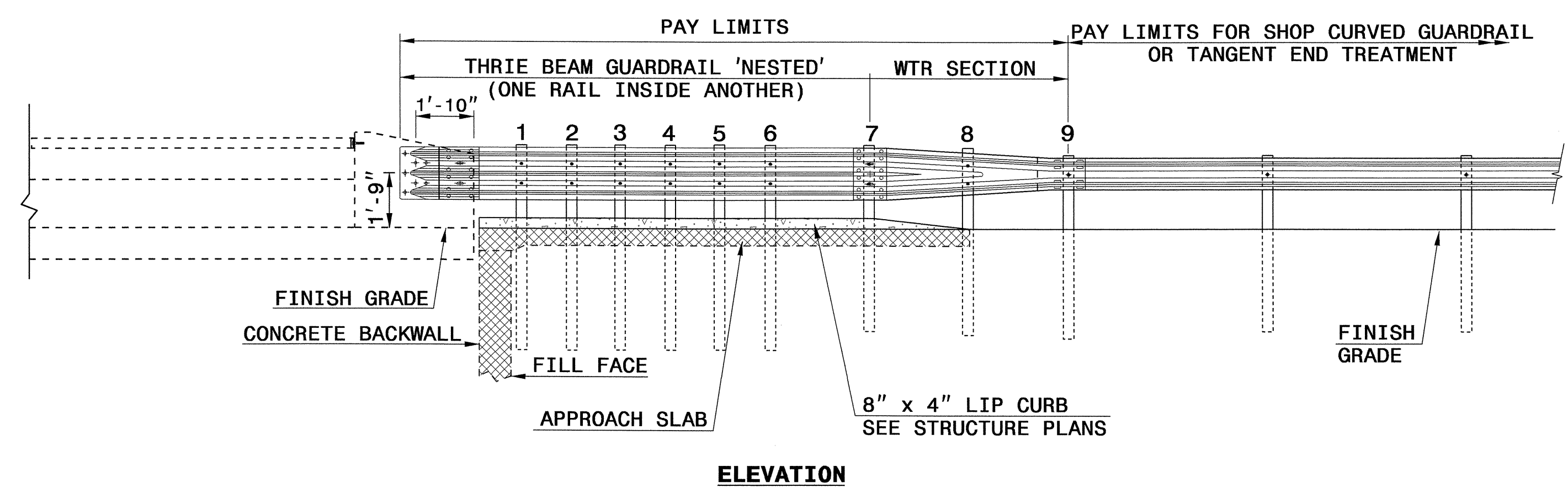


C:\TEMP\840D25\840D25.DWG

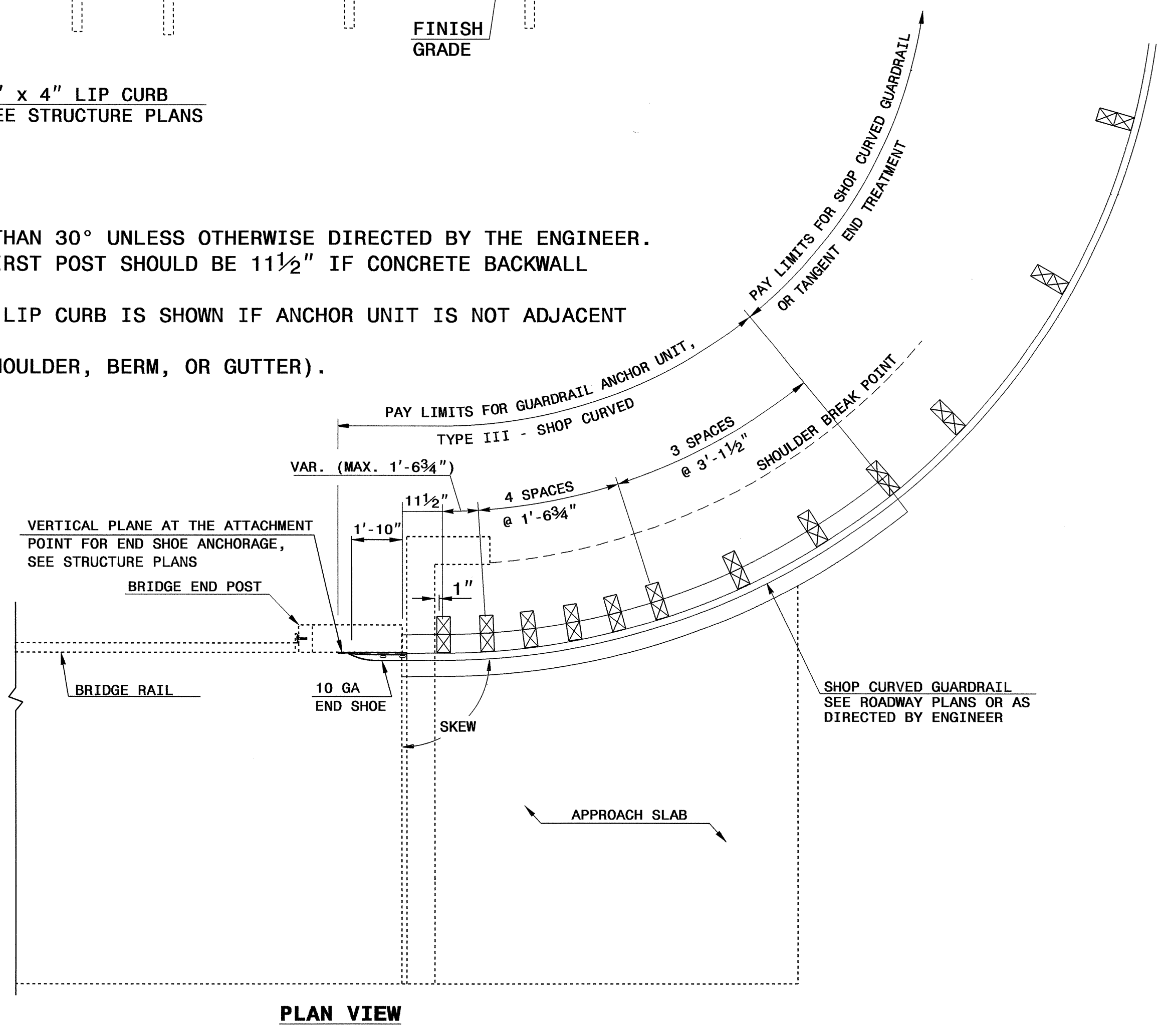
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH DETAIL DRAWING FOR
**TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT**

SHEET 1 OF 1
TYPE III SC



NOTE:
 **POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 *THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
 -SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
 -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
 -USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
 -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
 -SEE STANDARD 862.03 SHEET 4 FOR POST SECTIONS 1 THRU 9.

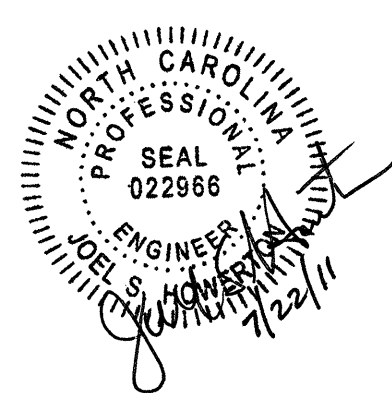


**GUARDRAIL ANCHOR UNIT, TYPE III - SHOP CURVED
FOR ATTACHMENT TO RAIL ON BRIDGE**

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

ENGLISH DETAIL DRAWING FOR
**TYPE III - SHOP CURVED
STRUCTURE ANCHOR UNIT**

SHEET 1 OF 1
TYPE III SC



CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: E.E. WARD DATE: 4-4-02
 MODIFIED BY: *[Signature]* DATE: 7/14/11
 CHECKED BY: *[Signature]* DATE: 7/14/11
 FILE SPEC.: *[Path]*

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202580

ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION	3215000000-N	862	3	EA	GUARDRAIL ANCHOR UNITS, TYPE III	6042000000-E	1632	555	LF	1/4" HARDWARE CLOTH
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING	3270000000-N	SP	1	EA	GUARDRAIL ANCHOR UNITS, TYPE 350	6048000000-E	SP	900	SY	FLOATING TURBIDITY CURTAIN
0000900000-N	SP	Lump Sum		GENERIC MISCELLANEOUS ITEM TIMBER STEPS	3360000000-E	863	752	LF	REMOVE EXISTING GUARDRAIL	6070000000-N	SP	24	EA	SPECIAL STILLING BASINS
0000930000-E	SP	274	LF	GENERIC MISCELLANEOUS ITEM 48" SAFETY RAIL	3628000000-E	876	7	TON	RIP RAP, CLASS I	6071010000-E	SP	300	LF	WATTLE
0000930000-E	SP	60	LF	GENERIC MISCELLANEOUS ITEM BOARDWALK	3635000000-E	876	10	TON	RIP RAP, CLASS II	6071020000-E	SP	80	LB	POLYACRYLAMIDE (PAM)
0000930000-E	SP	330	LF	GENERIC MISCELLANEOUS ITEM BOARDWALK POSTS 7-1/2" MIN TIP DIAMETER	3649000000-E	876	41	TON	RIP RAP, CLASS B	6071030000-E	SP	10	LF	COIR FIBER BAFFLE
0001020000-N	SP	2	EA	GENERIC MISCELLANEOUS ITEM CONCRETE APPROACH TO BOARDWALK	3656000000-E	876	2,410	SY	FILTER FABRIC FOR DRAINAGE	6084000000-E	1660	2	ACR	SEEDING & MULCHING
0001020000-N	SP	3	EA	GENERIC MISCELLANEOUS ITEM HINGED BOLLARD	4072000000-E	903	250	LF	SUPPORTS, 3-LB STEEL U-CHANNEL	6087000000-E	1660	2	ACR	MOWING
0001020000-N	SP	20	EA	GENERIC MISCELLANEOUS ITEM WOOD BOLLARD	4096000000-N	904	4	EA	SIGN ERECTION, TYPE D	6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (26+60.00)	4102000000-N	904	6	EA	SIGN ERECTION, TYPE E	6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
0043000000-N	226	Lump Sum		GRADING	4116100000-N	904	1	EA	SIGN ERECTION, RELOCATE, TYPE **** (GROUND MOUNTED) (E)	6096000000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB- BING	4155000000-N	907	19	EA	DISPOSAL OF SIGN SYSTEM, U- CHANNEL	6108000000-E	1665	1.25	TON	FERTILIZER TOPDRESSING
0057000000-E	226	200	CY	UNDERCUT EXCAVATION	4192000000-N	907	1	EA	DISPOSAL OF SUPPORT, U-CHANNEL	6114500000-N	SP	10	MHR	SPECIALIZED HAND MOWING
0134000000-E	240	30	CY	DRAINAGE DITCH EXCAVATION	4400000000-E	1110	516	SF	WORK ZONE SIGNS (STATIONARY)	6117000000-N	SP	25	EA	RESPONSE FOR EROSION CONTROL
0195000000-E	SP	200	CY	SELECT GRANULAR MATERIAL	4405000000-E	1110	112	SF	WORK ZONE SIGNS (PORTABLE)	6123000000-E	1670	0.1	ACR	REFORESTATION
0196000000-E	270	1,400	SY	FABRIC FOR SOIL STABILIZATION	4410000000-E	1110	214	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)					
0318000000-E	SP	70	TON	FOUNDATION CONDITIONING MATE- RIAL, MINOR STRS	4422000000-N	1120	28	DAY	CHANGEABLE MESSAGE SIGN (SHORT TERM)					
0320000000-E	SP	160	SY	FOUNDATION CONDITIONING FABRIC	4430000000-N	1130	50	EA	DRUMS					
0335200000-E	SP	152	LF	15" DRAINAGE PIPE	4445000000-E	1145	200	LF	BARRICADES (TYPE III)					
0335500000-E	SP	24	LF	30" DRAINAGE PIPE	4450000000-N	1150	48	HR	FLAGGER					
0335850000-E	SP	2	EA	*** DRAINAGE PIPE ELBOWS (15")	4685000000-E	1205	1,126	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)					
0366000000-E	SP	56	LF	15" RC PIPE CULVERTS, CLASS III	4686000000-E	1205	1,342	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)					
0448200000-E	SP	96	LF	15" RC PIPE CULVERTS, CLASS IV	4710000000-E	1205	29	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)					
0448300000-E	SP	48	LF	18" RC PIPE CULVERTS, CLASS IV	4810000000-E	1205	4,481	LF	PAINT PAVEMENT MARKING LINES (4")					
0448500000-E	SP	76	LF	30" RC PIPE CULVERTS, CLASS IV	4835000000-E	1205	29	LF	PAINT PAVEMENT MARKING LINES (24")					
0995000000-E	340	178	LF	PIPE REMOVAL	4891000000-E	1205	1,920	LF	GENERIC PAVEMENT MARKING ITEM COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE II OR III (4")					
1121000000-E	520	407	TON	AGGREGATE BASE COURSE	4900000000-N	1251	14	EA	PERMANENT RAISED PAVEMENT MARKERS					
1220000000-E	545	1,000	TON	INCIDENTAL STONE BASE	5326200000-E	1510	66	LF	12" WATER LINE					
1330000000-E	607	210	SY	INCIDENTAL MILLING	5691300000-E	1520	110	LF	8" SANITARY GRAVITY SEWER					
1489000000-E	610	690	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B	5775000000-E	1525	2	EA	4" DIA UTILITY MANHOLE					
1498000000-E	610	370	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE 119.0B	5781000000-E	1525	1	LF	UTILITY MANHOLE WALL, 4" DIA					
1519000000-E	610	600	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B	5801000000-E	1530	70	LF	ABANDON 8" UTILITY PIPE					
1575000000-E	SP	85	TON	ASPHALT BINDER FOR PLANT MIX	5804000000-E	1530	600	LF	ABANDON 12" UTILITY PIPE					
2000000000-N	806	13	EA	RIGHT OF WAY MARKERS	5900000000-E	SP	20	TON	GENERIC UTILITY ITEM BEDDING MATERIAL, UTILITIES					
2286000000-N	840	8	EA	MASONRY DRAINAGE STRUCTURES	6000000000-E	1605	2,850	LF	TEMPORARY SILT FENCE					
2308000000-E	840	2.8	LF	MASONRY DRAINAGE STRUCTURES	6006000000-E	1610	385	TON	STONE FOR EROSION CONTROL, CLASS A					
2366000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.24	6009000000-E	1610	80	TON	STONE FOR EROSION CONTROL, CLASS B					
2367000000-N	840	6	EA	FRAME WITH TWO GRATES, STD 840.29	6012000000-E	1610	685	TON	SEDIMENT CONTROL STONE					
2374000000-N	840	1	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	6015000000-E	1615	2	ACR	TEMPORARY MULCHING					
2549000000-E	846	75	LF	2'-6" CONCRETE CURB & GUTTER	6018000000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING					
2556000000-E	846	190	LF	SHOULDER BERM GUTTER	6021000000-E	1620	0.25	TON	FERTILIZER FOR TEMPORARY SEED- ING					
2591000000-E	848	90	SY	4" CONCRETE SIDEWALK	6024000000-E	1622	200	LF	TEMPORARY SLOPE DRAINS					
3030000000-E	862	287.5	LF	STEEL BM GUARDRAIL	6027000000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS					
3045000000-E	862	12.5	LF	STEEL BM GUARDRAIL, SHOP CURVED	6029000000-E	SP	500	LF	SAFETY FENCE					
3150000000-N	862	3	EA	ADDITIONAL GUARDRAIL POSTS	6030000000-E	1630	70	CY	SILT EXCAVATION					
3180000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE ***** (III, SHOP CURVED)	6036000000-E	1631	7,750	SY	MATTING FOR EROSION CONTROL					
3195000000-N	862	1	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1	6037000000-E	SP	950	SY	COIR FIBER MAT					
					6038000000-E	SP	300	SY	PERMANENT SOIL REINFORCEMENT MAT					

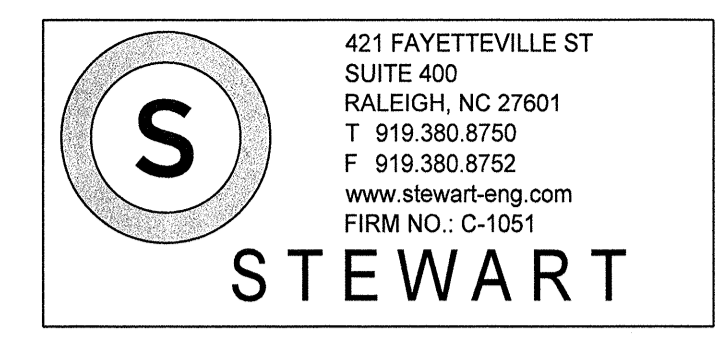
5/28/99

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JSEB

12/06/07

COMPUTED BY: JCH DATE: 7-1-11
CHECKED BY: BRC DATE: 7-1-11

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS



PROJECT REFERENCE NO. B-4660
SHEET NO. 3A

SUMMARY OF EARTHWORK

Table with columns: STATION, UNCL. EXCAV., EMBANK. +%, BORROW, WASTE. Rows include station ranges like -L- STA. 19+65.00 to -L- STA. 24+20.00 and subtotals.

PER GEOTECH RECOMMENDATIONS, UNDERCUT EXCAVATION = 200 CY
PER GEOTECH RECOMMENDATIONS, SELECT GRANULAR MATERIAL = 200 CY
PER GEOTECH RECOMMENDATIONS, FABRIC FOR SOIL STABILIZATION = 200 SY
DDE = 30 CY

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

SHOULDER BERM GUTTER SUMMARY

Table with columns: SURVEY LINE, STATION, LOCATION, LENGTH. Rows show station ranges like 22+60.00 to 23+96.00 and a total length of 190.

SUMMARY OF REMOVAL EXISTING ASPHALT PAVEMENT

Table with columns: SURVEY LINE, STATION, LOCATION, YD. Rows show station ranges like 22+50 to 24+78 and a total quantity of 2350.96.

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

Large table listing pipe details: STATION, LOCATION, STRUCTURE NO., DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC), C.S. PIPE, R.C. PIPE (CLASS III), R.C. PIPE (CLASS IV), ENDWALLS, QUANTITIES FOR DRAINAGE STRUCTURES, TYPE OF GRATE, CONCRETE TRANSITIONAL SECTION, PIPE REMOVAL IN LIN. FT., and REMARKS.

GUARDRAIL SUMMARY

Table with columns: SURVEY LINE, BEG. STA., END STA., LOCATION, LENGTH (STRAIGHT, SHOP CURVED, DOUBLE FACED), WARRANT POINT (APPROACH END, TRAILING END), "N" DIST. FROM E.O.L., TOTAL SHOUL. WIDTH, FLARE LENGTH (APPROACH END, TRAILING END), W (XI MOD, XI, GRAU 350, M-350, III, CAT-1, VI MOD, BIC, AT-1), IMPACT ATTENUATOR TYPE 350 (EA, G, NG), SINGLE FACED GUARDRAIL, REMOVE EXISTING GUARDRAIL, REMOVE AND STOCKPILE EXISTING GUARDRAIL, and REMARKS.

7/30/2018 4:46:00 PM RDY_PLANSHEETS.dgn

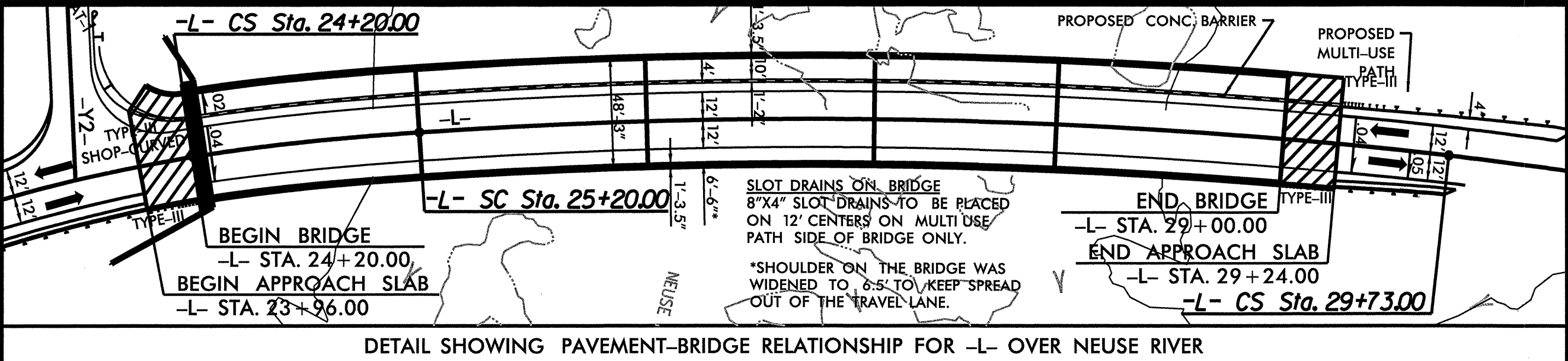
"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING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

* GUARDRAIL FLARES TO TIE TO EXISTING
** SHOP CURVED

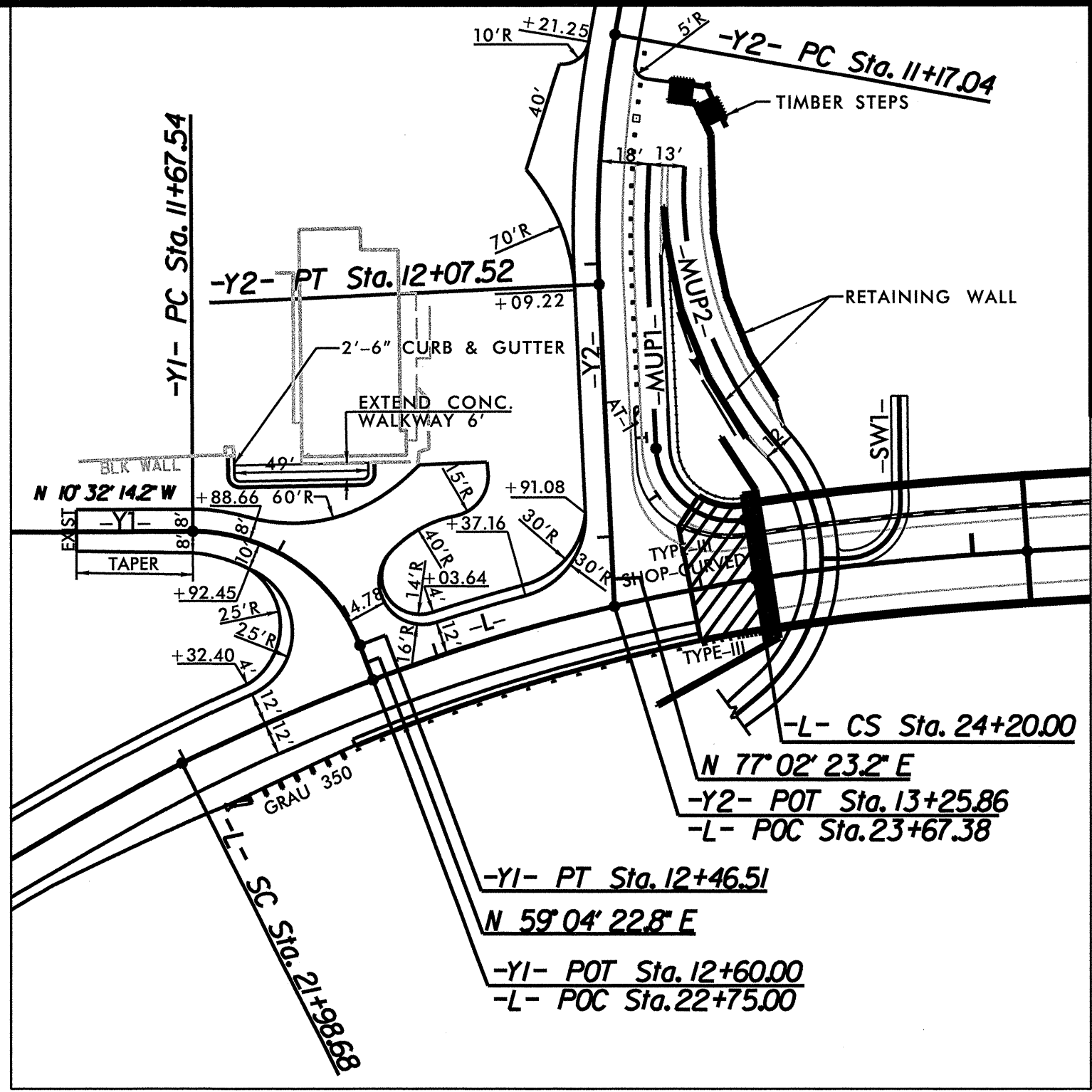
ADDITIONAL GUARDRAIL POSTS = 3

8/17/99

8/23/2001 14660.RDY.PLAN SHEETS.dgn



DETAIL SHOWING PAVEMENT-BRIDGE RELATIONSHIP FOR -L- OVER NEUSE RIVER



INTERSECTION DETAILS

PROJECT REFERENCE NO. **B-4660** SHEET NO. **4**

RW SHEET NO. _____

ROADWAY DESIGN ENGINEER: [Signature]

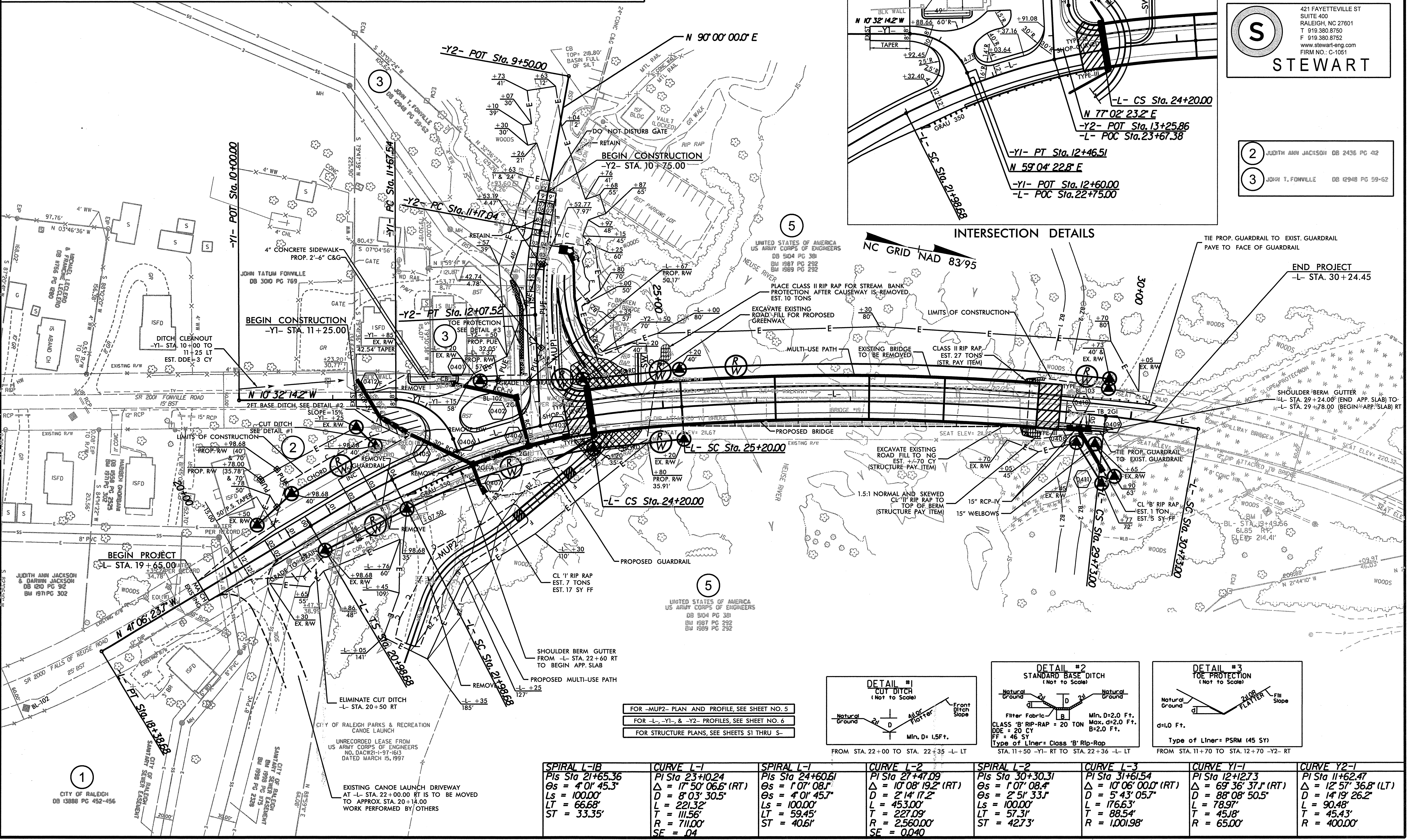
HYDRAULICS ENGINEER: [Signature]

8-25-11 8/30/11

STEWART

421 FAYETTEVILLE ST
SUITE 400
RALEIGH, NC 27601
T 919.380.8750
F 919.380.8752
www.stewart-eng.com
FIRM NO.: C-1051

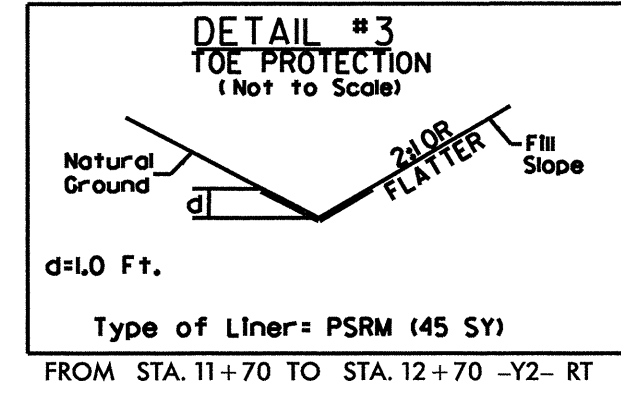
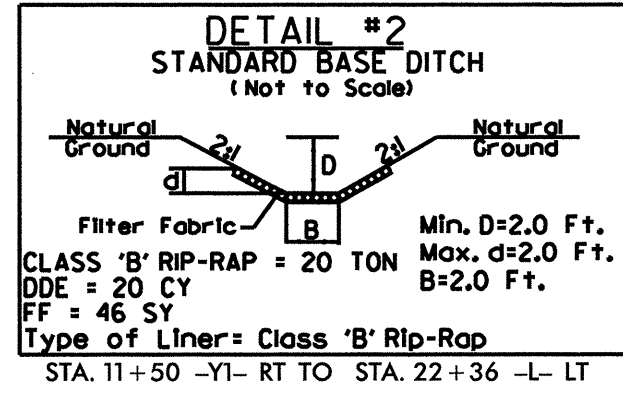
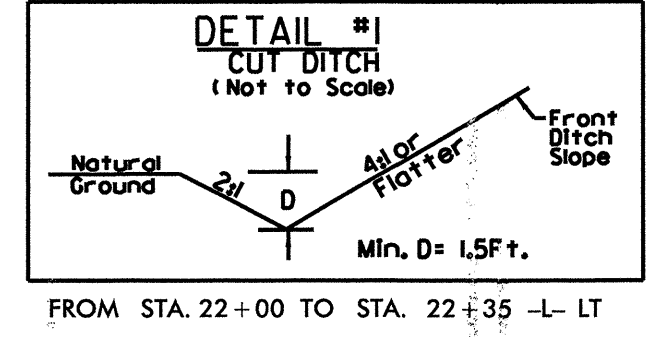
- 2 JUDITH ANN JACKSON DB 2436 PG 42
- 3 JOHN T. FONVILLE DB 12948 PG 59-62



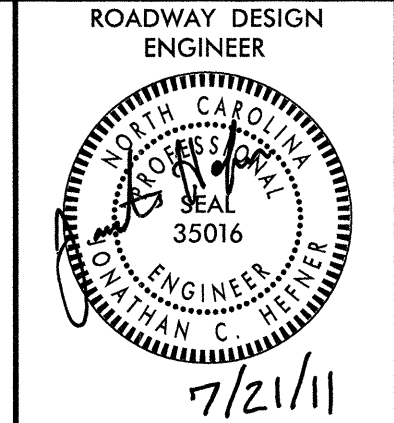
REVISIONS

1 CITY OF RALEIGH DB 13898 PG 452-456

- FOR -MUP2- PLAN AND PROFILE, SEE SHEET NO. 5
- FOR -L-, -Y1-, & -Y2- PROFILES, SEE SHEET NO. 6
- FOR STRUCTURE PLANS, SEE SHEETS S1 THRU S-



SPIRAL L-1B	CURVE L-1	SPIRAL L-1	CURVE L-2	SPIRAL L-2	CURVE L-3	CURVE Y1-1	CURVE Y2-1
Pis Sta 21+65.36 θs = 4° 01' 45.3" Ls = 100.00' LT = 66.68' ST = 33.35'	PI Sta 23+10.24 θs = 17° 50' 06.6" (RT) D = 8° 03' 30.5" L = 221.32' T = 111.56' R = 711.00' SF = 04	Pis Sta 24+60.61 θs = 1° 07' 08.1" Ls = 100.00' LT = 59.45' ST = 40.61'	PI Sta 27+47.09 θs = 10° 08' 19.2" (RT) D = 2° 14' 17.2" L = 453.30' T = 227.09' R = 2,560.00' SF = 00.40	Pis Sta 30+30.31 θs = 1° 07' 08.4" Ls = 100.00' LT = 57.31' ST = 42.73'	PI Sta 31+61.54 θs = 10° 06' 00.0" (RT) D = 5° 43' 05.7" L = 176.63' T = 88.54' R = 1,001.98'	PI Sta 12+12.73 θs = 69° 36' 37.1" (RT) D = 88° 08' 50.5" L = 78.97' T = 45.18' R = 65.00'	PI Sta 11+62.47 θs = 12° 57' 26.2" (LT) D = 14° 19' 26.2" L = 90.48' T = 45.43' R = 400.00'



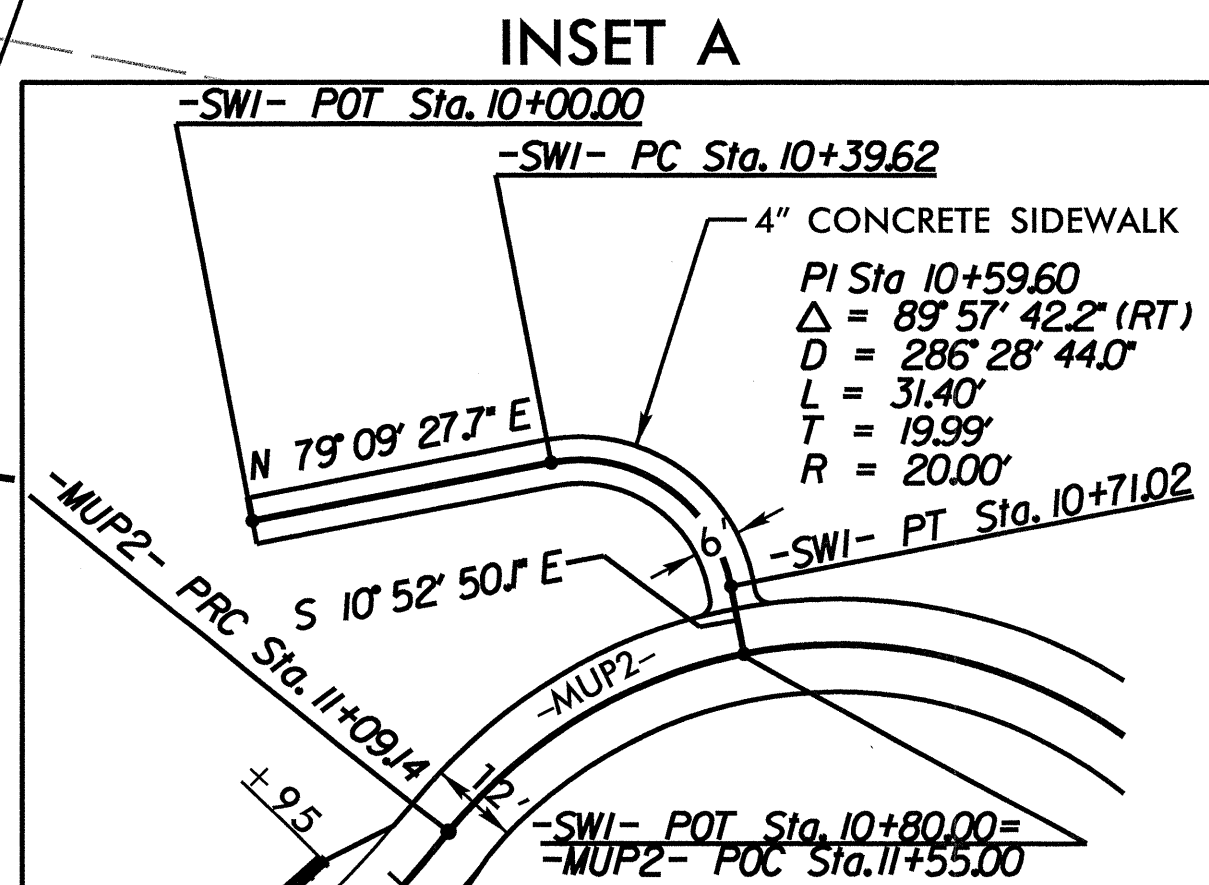
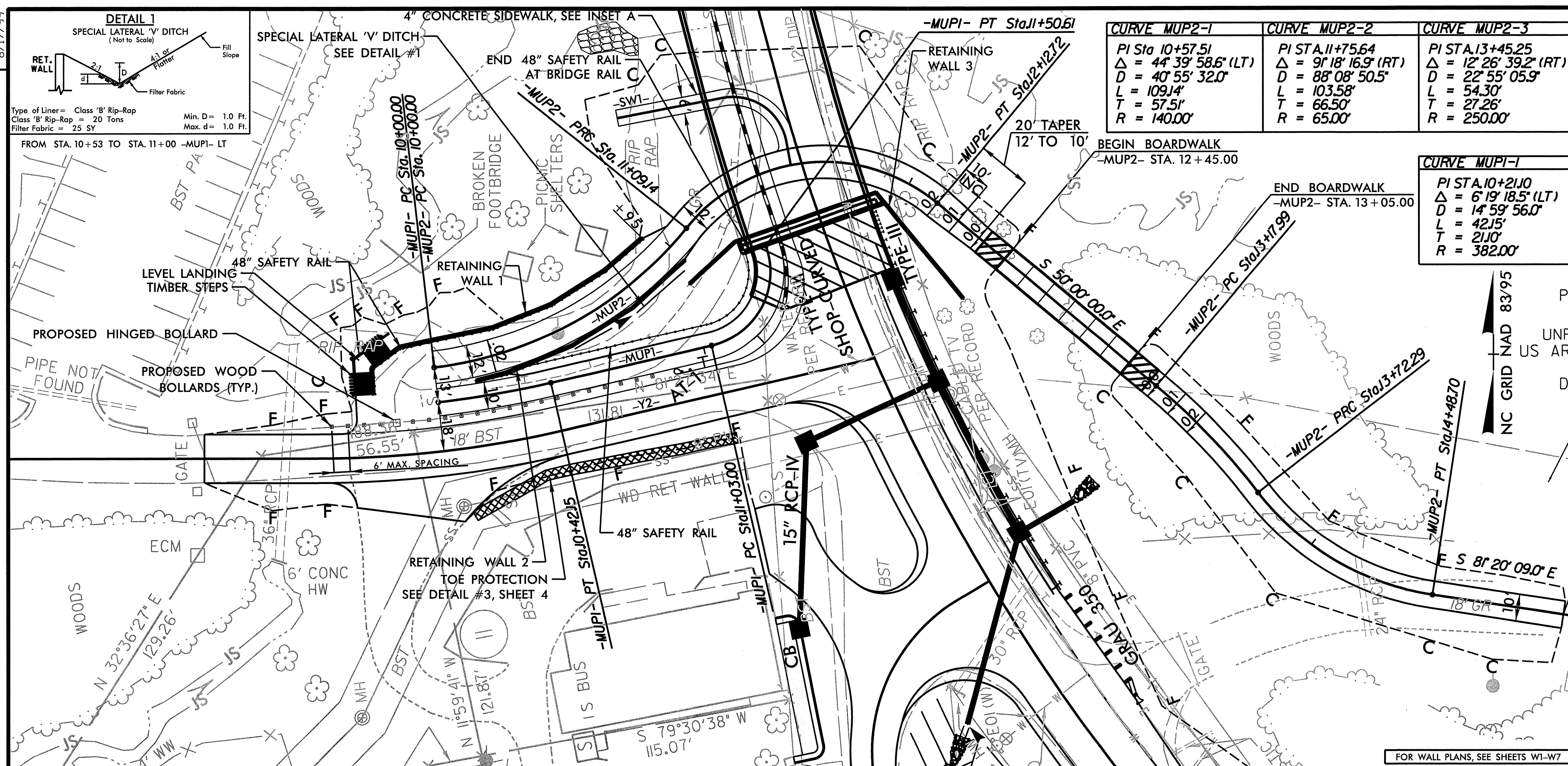
421 FAYETTEVILLE ST
SUITE 400
RALEIGH, NC 27601
T 919.380.8750
F 919.380.8752
www.stewart-eng.com
FIRM NO.: C-1051

STEWART

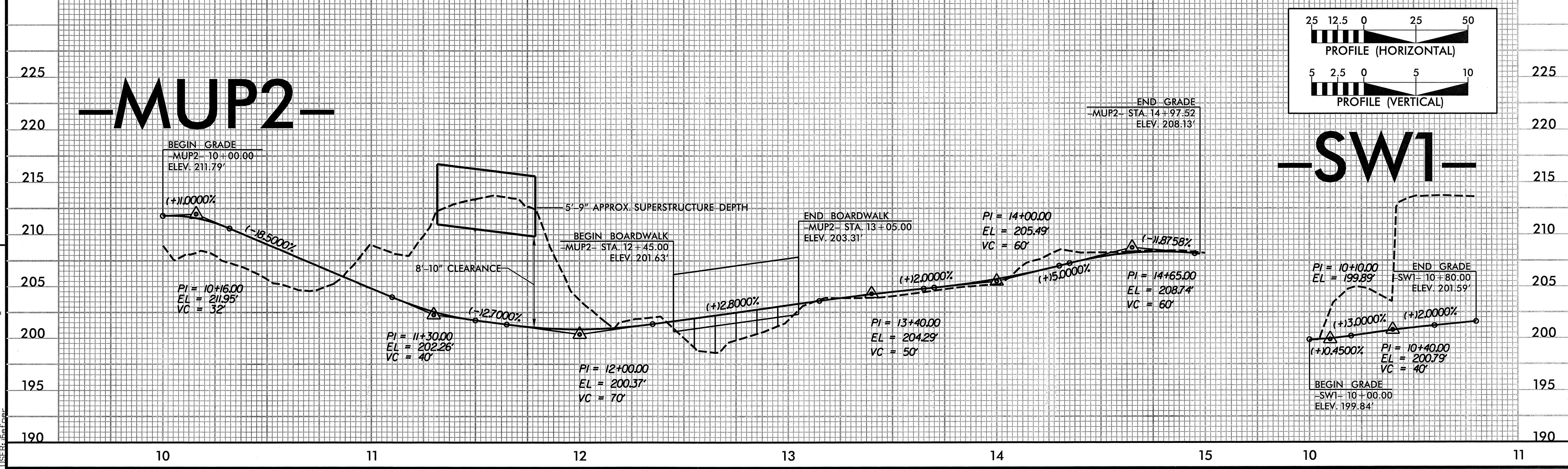
UNRECORDED LEASE FROM
US ARMY CORPS OF ENGINEERS
NO. DACW21-I-97-1613
DATED MARCH 15, 1997

CURVE MUP2-1	CURVE MUP2-2	CURVE MUP2-3	CURVE MUP2-4
PI STA 10+57.51 Δ = 44° 39' 58.6" (LT) D = 40° 55' 32.0" L = 109.14' T = 57.51' R = 140.00'	PI STA 11+75.64 Δ = 91° 18' 16.9" (RT) D = 88° 08' 50.5" L = 103.58' T = 66.50' R = 65.00'	PI STA 13+45.25 Δ = 12° 26' 39.2" (RT) D = 22° 55' 05.9" L = 54.30' T = 27.26' R = 250.00'	PI STA 14+12.47 Δ = 43° 46' 48.1" (LT) D = 57° 17' 44.8" L = 76.41' T = 40.18' R = 100.00'

CURVE MUP1-1	CURVE MUP1-2
PI STA 10+21.10 Δ = 6° 19' 18.5" (LT) D = 14° 59' 56.0" L = 42.15' T = 21.10' R = 382.00'	PI STA 11+34.89 Δ = 97° 25' 32.8" (LT) D = 204° 37' 40.0" L = 47.61' T = 31.89' R = 28.00'



MULTI-USE PATH DESIGN



8/17/99

REVISIONS

7/20/2018 B4660_RDY_PLANSHEETS.dgn

5/28/99

PROJECT REFERENCE NO. B-4660	SHEET NO. 6
ROADWAY DESIGN ENGINEER SEAL 35016 7/21/11	HYDRAULICS ENGINEER SEAL 9334 7/21/11

S

421 FAYETTEVILLE ST
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FIRM NO.: C-1051

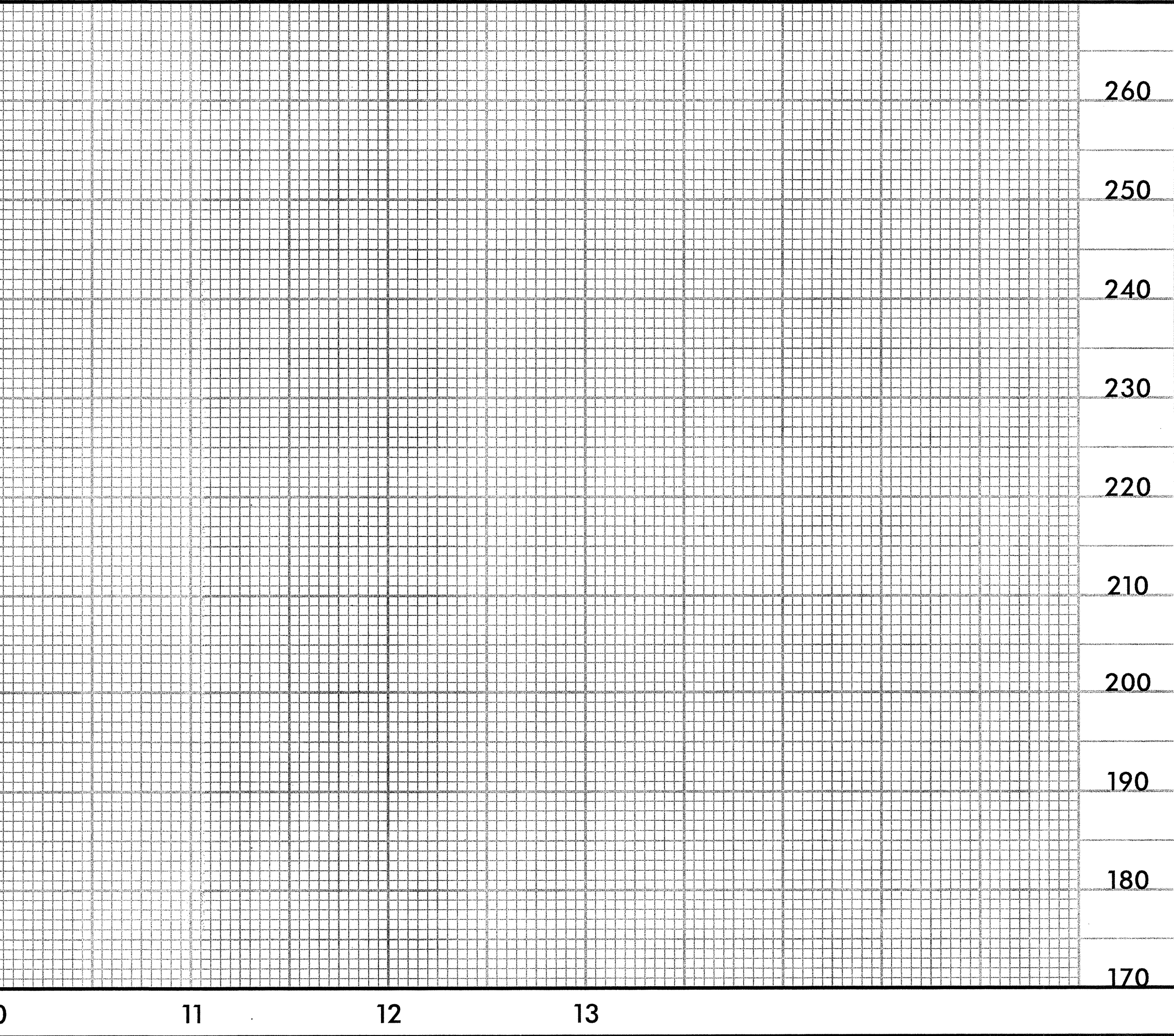
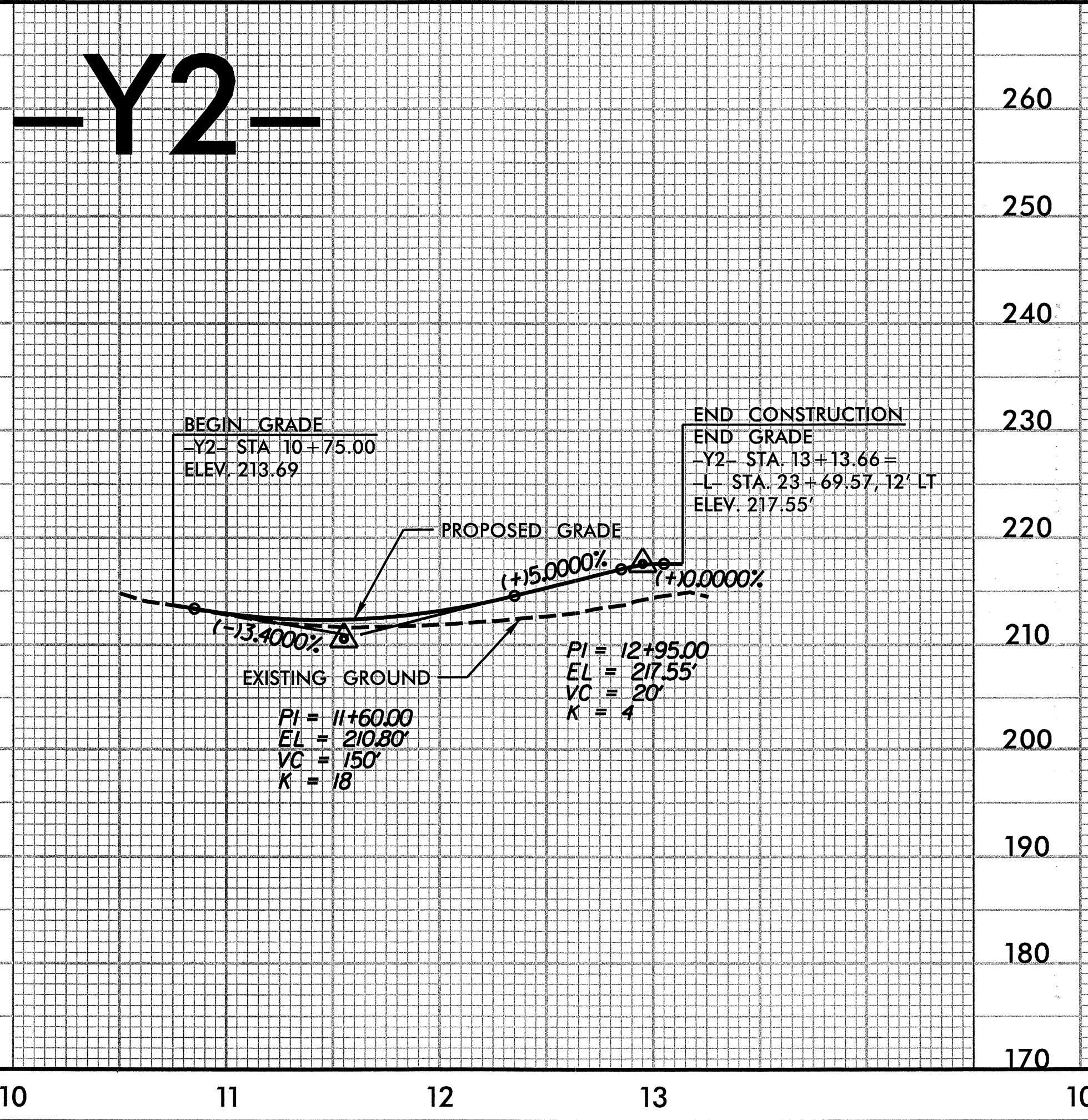
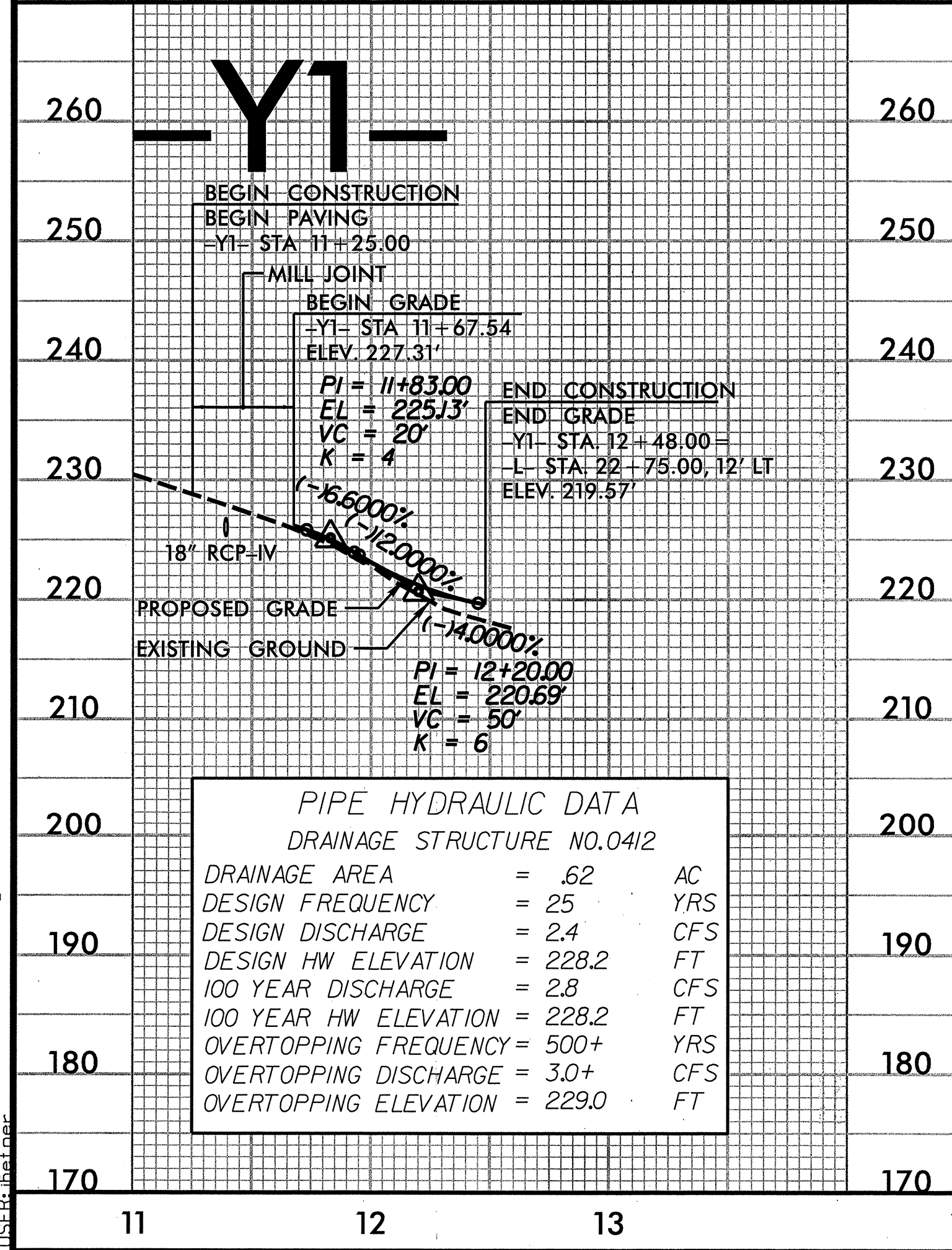
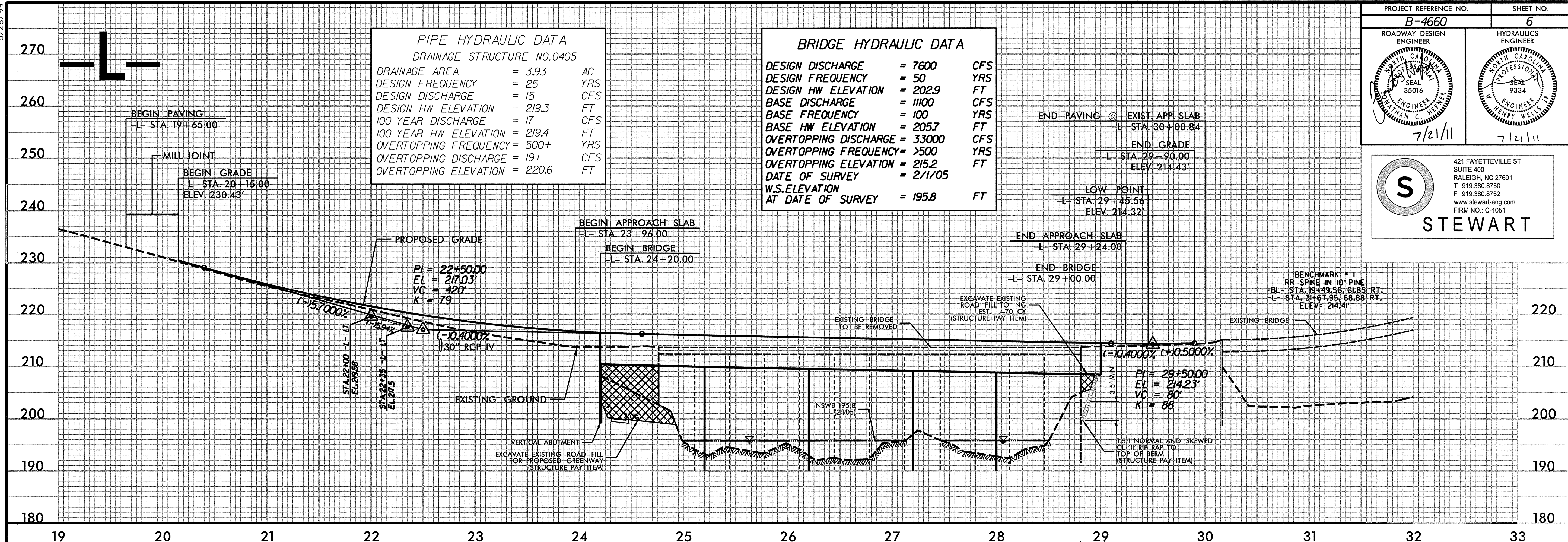
STEWART

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.0405

DRAINAGE AREA	= 3.93	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 15	CFS
DESIGN HW ELEVATION	= 219.3	FT
100 YEAR DISCHARGE	= 17	CFS
100 YEAR HW ELEVATION	= 219.4	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 19+	CFS
OVERTOPPING ELEVATION	= 220.6	FT

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 7600	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 202.9	FT
BASE DISCHARGE	= 1100	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 205.7	FT
OVERTOPPING DISCHARGE	= 33000	CFS
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING ELEVATION	= 215.2	FT
DATE OF SURVEY	= 2/1/05	
W.S.ELEVATION AT DATE OF SURVEY	= 195.8	FT



7/20/2011 14:46:00 .RDY_ PLANSHEETS.dgn