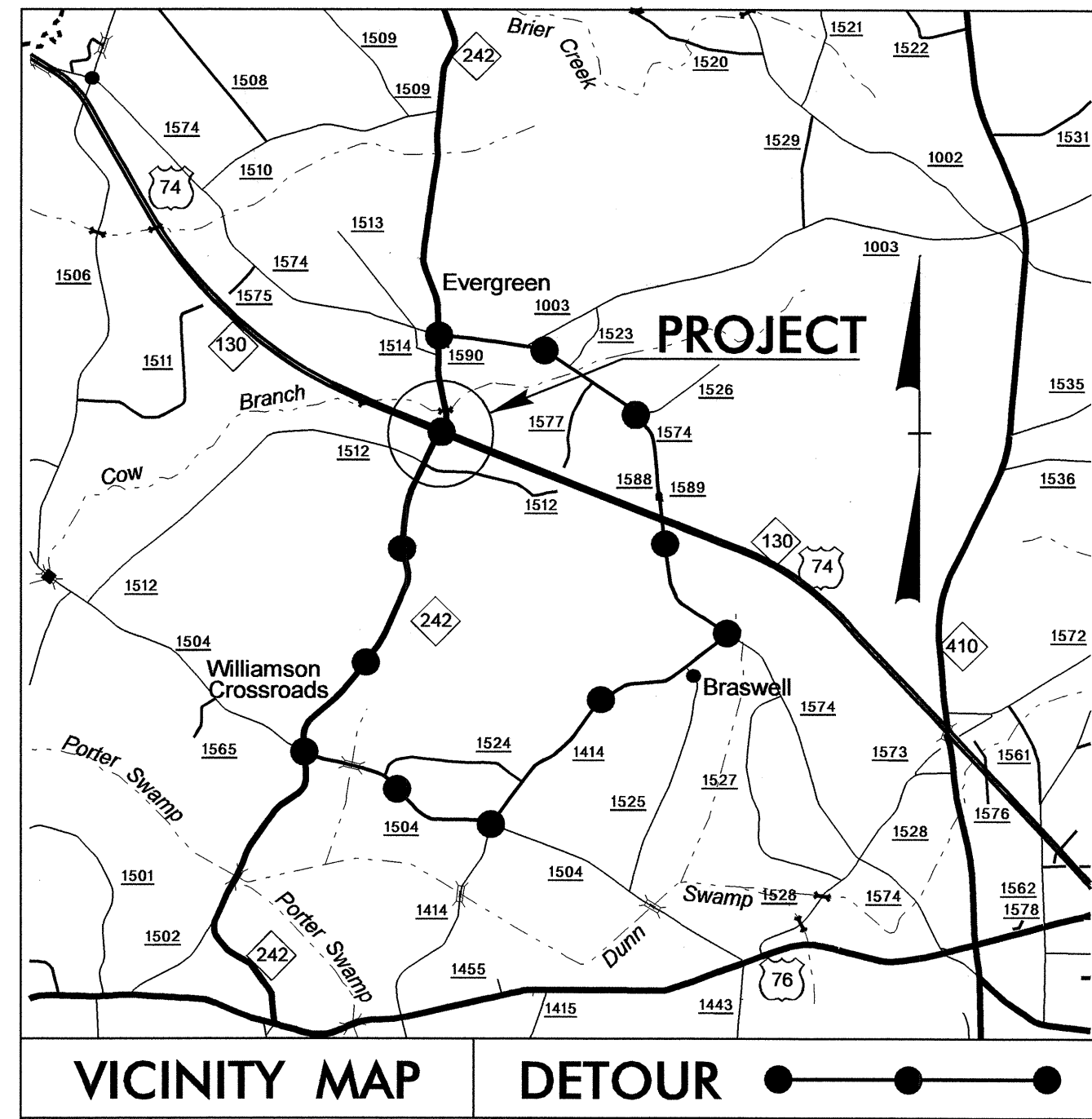


TIP PROJECT: R-4900

CONTRACT: C202441

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



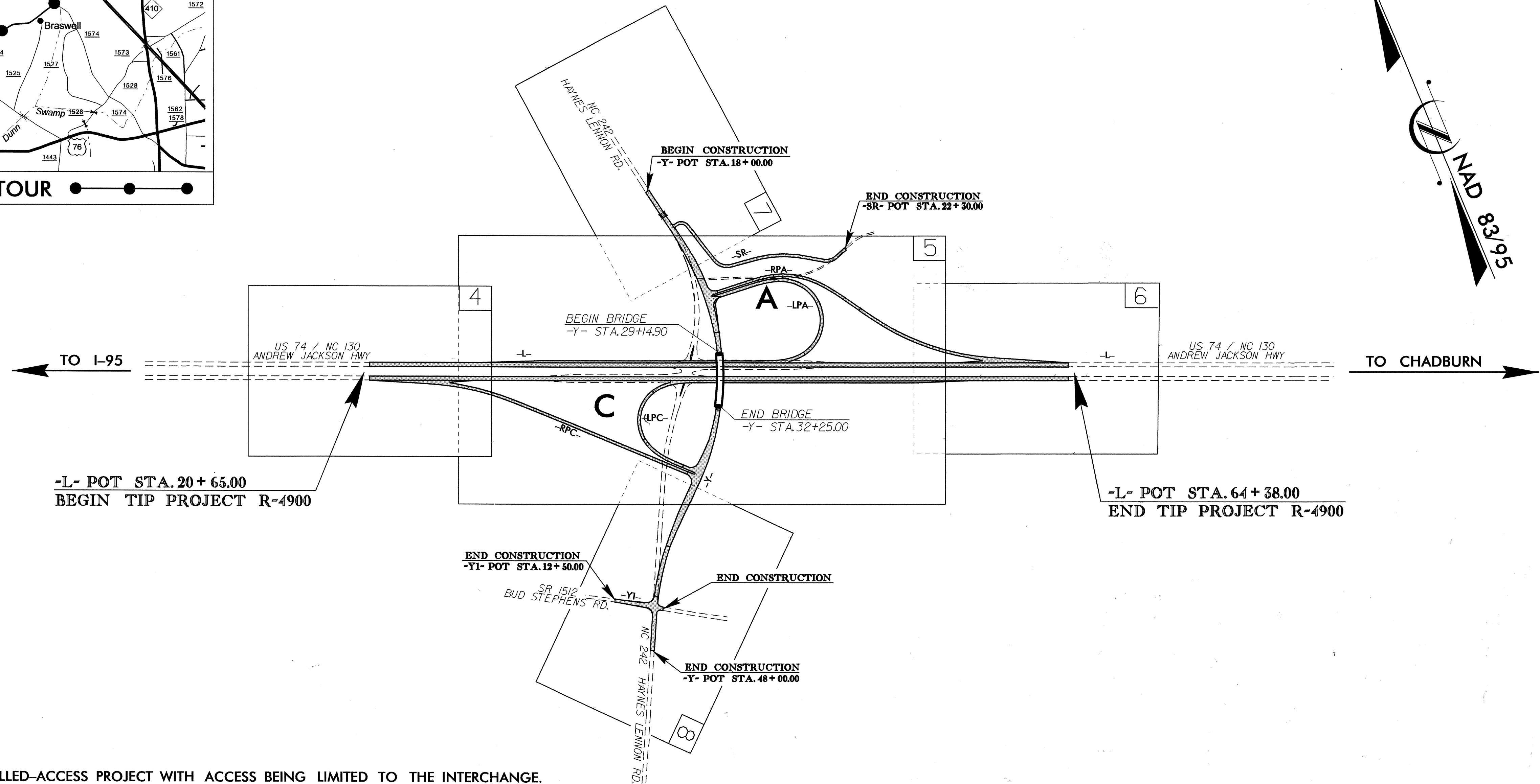
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

COLUMBUS COUNTY

LOCATION: NEW INTERCHANGE US 74 - NC 130 / NC 242 INTERSECTION

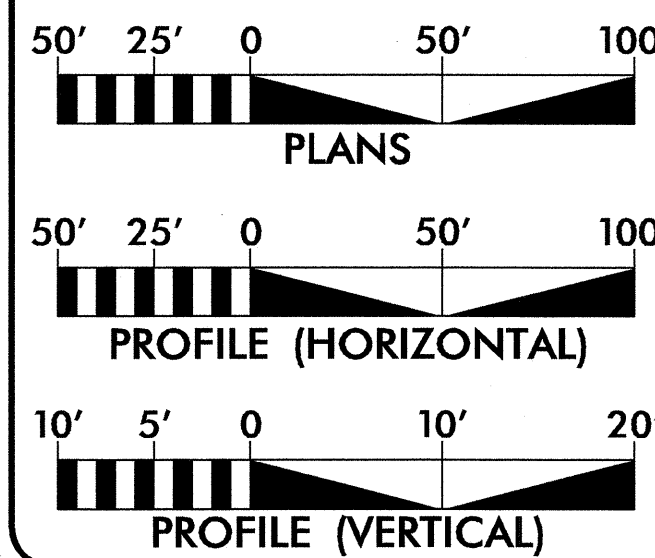
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4900	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40224.1.1	HPPNHF-74(78)	PE	
40224.2.1	HPPNHF-74(78)	RW & UTIL	
40224.3.1	HPPNHF-74(102)	CONSTR.	



NOTE: THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO THE INTERCHANGE.

GRAPHIC SCALES



DESIGN DATA

ADT 2010 = 12,600
ADT 2030 = 19,000
DHV = 10 %
D = 55 %
T = 15 % *
V = 70 MPH
FUNC. CLASS. = INTERSTATE
* TTST 10% DUAL 5 %
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-4900 = 0.828 MI.
TOTAL LENGTH OF TIP PROJECT R-4900 = 0.828 MI.

Prepared in the Office of:
DIVISION OF HIGHWAYS

1000 Birch Ridge Dr.
Raleigh, NC 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 12, 2009

LETTING DATE:
JULY 20, 2010

ROGER D. THOMAS, P.E.
PROJECT ENGINEER

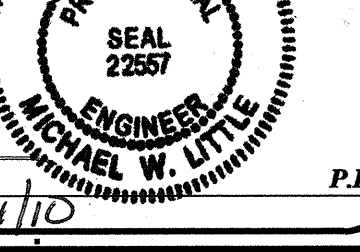
MICHAEL W. LITTLE, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER



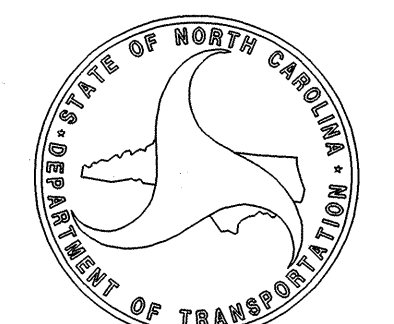
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ROADWAY DESIGN ENGINEER



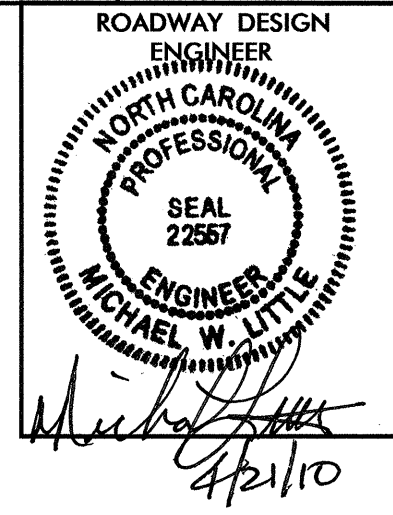
SIGNATURE: [Signature] 4/21/10

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**



[Signature] P.E.
STATE HIGHWAY DESIGN ENGINEER

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS



SHEET NUMBER	INDEX OF SHEETS 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-C	TYPICAL SECTIONS
2-D	DRAINAGE DETAILS
2-E THRU 2-F	DETAIL FOR METHOD OF PIPE INSTALLATION
2-G	DETAIL FOR ANCHORAGE FOR FRAMES
2-H	DETAIL FOR ROCK PLATING
2-I	DETAIL FOR MEDIAN HAZARD PROTECTION
2-J	DETAIL FOR STANDARD TEMPORARY SHORING
2-K	DETAIL FOR EMBANKMENT MONITORING
2-L	DETAIL FOR GROUND IMPROVEMENT WITH WICK DRAINS
3	SUMMARY OF QUANTITIES
3-A THRU 3-B	LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)
3-C	SUMMARIES OF GUARDRAIL, PAVEMENT REMOVAL, SHOULDER BERM GUTTER AND 2'-6" CURB AND GUTTER
3-D	SUMMARY OF EARTHWORK
3-E	PARCEL INDEX SHEET
4 THRU 8	PLAN SHEETS
9 THRU 16	PROFILE SHEETS
TCP-1 THRU TCP-14	TRAFFIC CONTROL PLANS
PMP-1 THRU PMP-6	PAVEMENT MARKING PLANS
EC-1 THRU EC-13	EROSION CONTROL PLANS
RF-1	REFORESTATION SHEET
SIGN-1 THRU SIGN-9	SIGNING PLANS
UC-1 THRU UC-2	UTILITY CONSTRUCTION PLANS
UD-1 THRU UD-4	UTILITIES BY OTHERS PLANS
XS-INDEX	CROSS-SECTION INDEX SHEET
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-47	CROSS-SECTIONS
UT-1 THRU UT-7	CROSS-SECTIONS FOR TEMPORARY U-TURNS
S-1 THRU S-35	STRUCTURE PLANS

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

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

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

SUPERELEVATION:
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE 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 OR 560.02.

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".

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 EMBARO, BRUNSWICK EMC, TIME WARNER CABLE, AND COLUMBUS COUNTY WATER. 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 OTHERS.

2006 ROADWAY ENGLISH STANDARD DRAWINGS
EFF. 07-18-06
REV. 01-02-07

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.07	Grading for False Cut at Grade Separations
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
DIVISION 3 - PIPE CULVERTS	
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.03	Guide for Paving Shoulders Under Bridges - Method III
665.01	Milled Rumble Strips - Asphalt Pavements
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
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
840.14	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
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
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
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
852.01	Concrete Islands
852.06	Method for Placement of Drop Inlets in Concrete Islands
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
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
866.02	Woven Wire Fence - with Wood Post
876.02	Guide for Rip Rap at Pipe Outlets

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	②③
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	----- FLD
False Sump	▽

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	□
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	○
Proposed Right of Way Line with Concrete or Granite Marker	○
Existing Control of Access	○
Proposed Control of Access	○
Existing Easement Line	----- E
Proposed Temporary Construction Easement	----- E
Proposed Temporary Drainage Easement	----- TDE
Proposed Permanent Drainage Easement	----- PDE
Proposed Permanent Drainage / Utility Easement	----- DUE
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	-----
Designated U/G Water Line (S.U.E.*)	-----
Above Ground Water Line	----- A/G Water

TV:

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

GAS:

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

SANITARY SEWER:

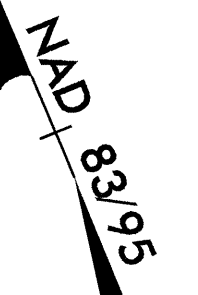
Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	----- SS
Above Ground Sanitary Sewer	----- A/G Sanitary Sewer
Recorded SS Forced Main Line	----- FSS
Designated SS Forced Main Line (S.U.E.*)	----- FSS

MISCELLANEOUS:

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

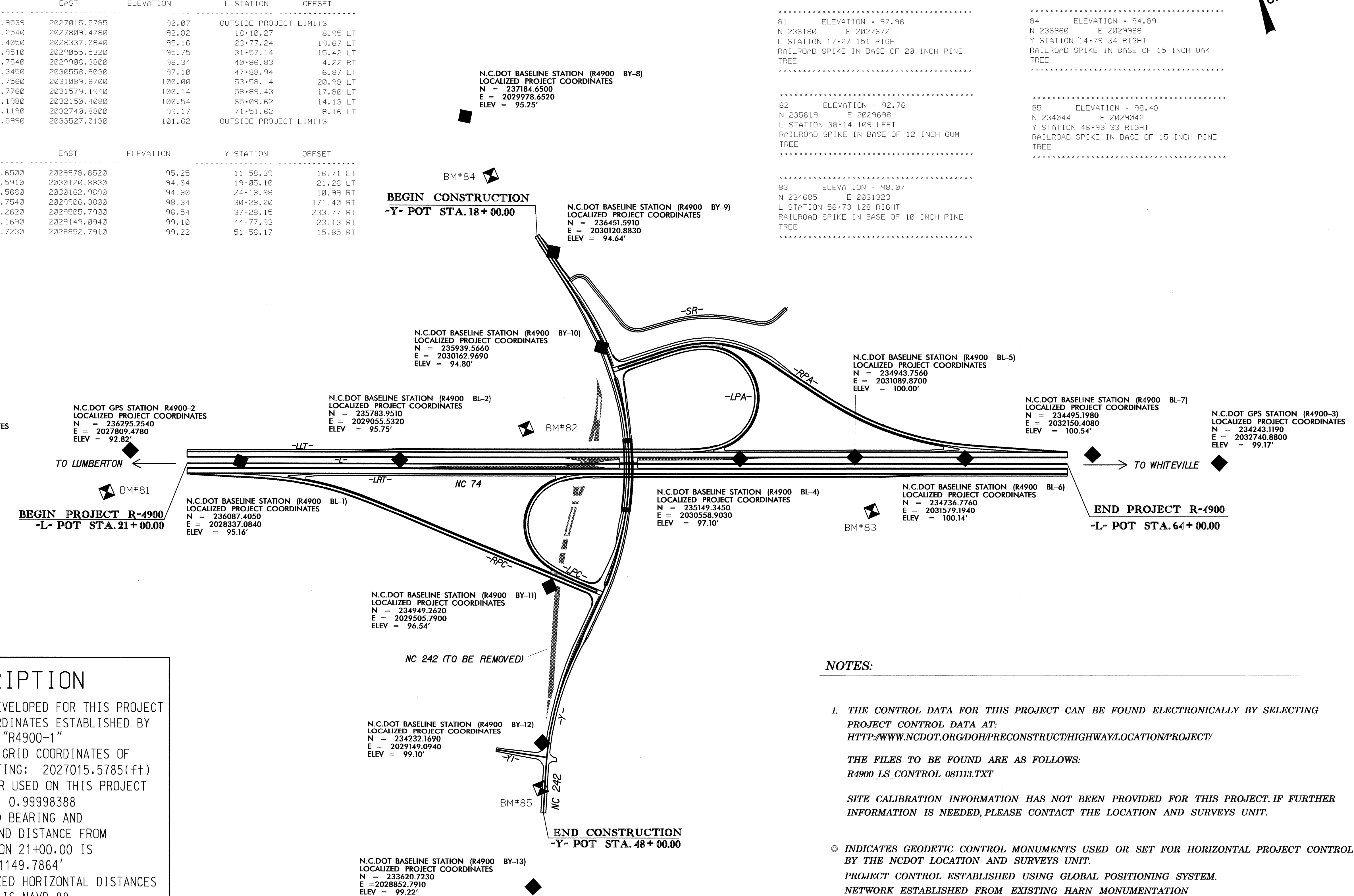
SURVEY CONTROL SHEET R-4900

PROJECT REFERENCE NO.	SHEET NO.
R-4900	1-C
Location and Surveys	



BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
101	R4900-1 (GPS)	236625.9539	2027015.5785	92.07	OUTSIDE PROJECT LIMITS	
102	R4900-2 (GPS)	236295.2540	2027809.4780	92.82	18+10.27	8.95 LT
1	R4900 BL-1	236087.4050	2028337.0840	95.16	23+77.24	19.67 LT
2	R4900 BL-2	235783.9510	2029055.5320	95.75	31+57.14	15.42 LT
3	R4900 BL-3	235408.7540	2029906.3800	98.34	40+86.83	4.22 RT
4	R4900 BL-4	235149.3450	2030558.9030	97.10	47+88.94	6.87 LT
5	R4900 BL-5	234943.7560	2031089.8700	100.00	53+58.14	20.98 LT
6	R4900 BL-6	234736.7760	2031579.1940	100.14	58+89.43	17.80 LT
7	R4900 BL-7	234495.1980	2032150.4080	100.54	65+09.62	14.13 LT
103	R4900-3 (GPS)	234243.1190	2032740.8800	99.17	71+51.62	8.16 LT
104	R4900-4 (GPS)	233917.5990	2033527.0130	101.62	OUTSIDE PROJECT LIMITS	

BY POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
8	R4900 BY-8	237184.6500	2029978.6520	95.25	11+58.39	16.71 LT
9	R4900 BY-9	236451.5910	2030120.8830	94.64	19+05.10	21.26 LT
10	R4900 BY-10	235939.5660	2030162.9690	94.80	24+18.98	10.99 RT
30	R4900 BL-3	235408.7540	2029906.3800	98.34	30+28.20	171.40 RT
11	R4900 BY-11	234949.2620	2029505.7900	96.54	37+28.15	233.77 RT
12	R4900 BY-12	234232.1690	2029149.0940	99.10	44+77.93	23.13 RT
13	R4900 BY-13	233620.7230	2028852.7910	99.22	51+56.17	15.85 RT



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R4900-1" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 236625.9539(++) EASTING: 2027015.5785(++) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99998388 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R4900-1" TO -L- STATION 21+00.00 IS S 66°56'49.6"E 1149.7864'

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

NOTES:

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/doh/preconstruct/highway/location/project/)
THE FILES TO BE FOUND ARE AS FOLLOWS:
R4900_LS_CONTROL_081113.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 HARN MONUMENTATION
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

15-MAR-2010 09:46 P:\Y:\COG\W\H\PCOL\4900_r-dj-1c.dgn

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS	J1	PROP. 8" AGGREGATE BASE COURSE
C2	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS	J2	PROP. 10" AGGREGATE BASE COURSE
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 LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH	P	PRIME COAT AT THE RATE OF 0.35 GAL. PER SQ. YD.
D1	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	R1	2'-6" CONCRETE CURB AND GUTTER
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH	T	EARTH MATERIAL
E1	PROP. APPROX. 4½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.	U	EXISTING PAVEMENT
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 4" IN DEPTH OR GREATER THAN 5½" IN DEPTH	W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)
E3	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	Y	PROP. MILLED RUMBLE STRIPS

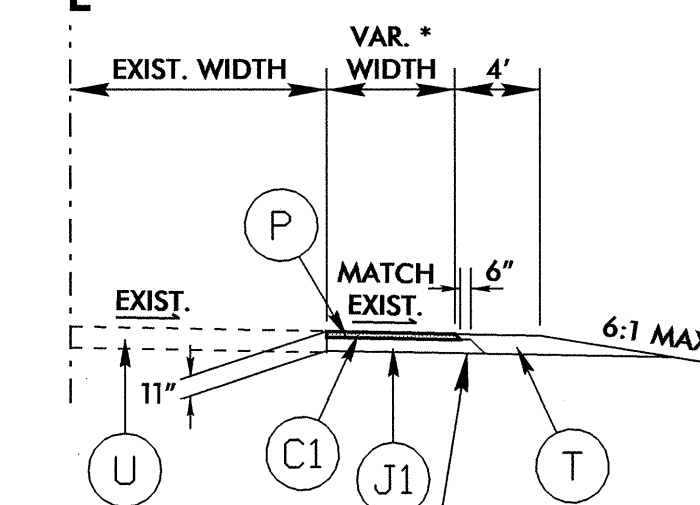
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

DETAIL FOR TEMPORARY PAVEMENT

(FOR PLAN VIEW, REFER TO TRAFFIC CONTROL PLANS)

EXIST.

Q

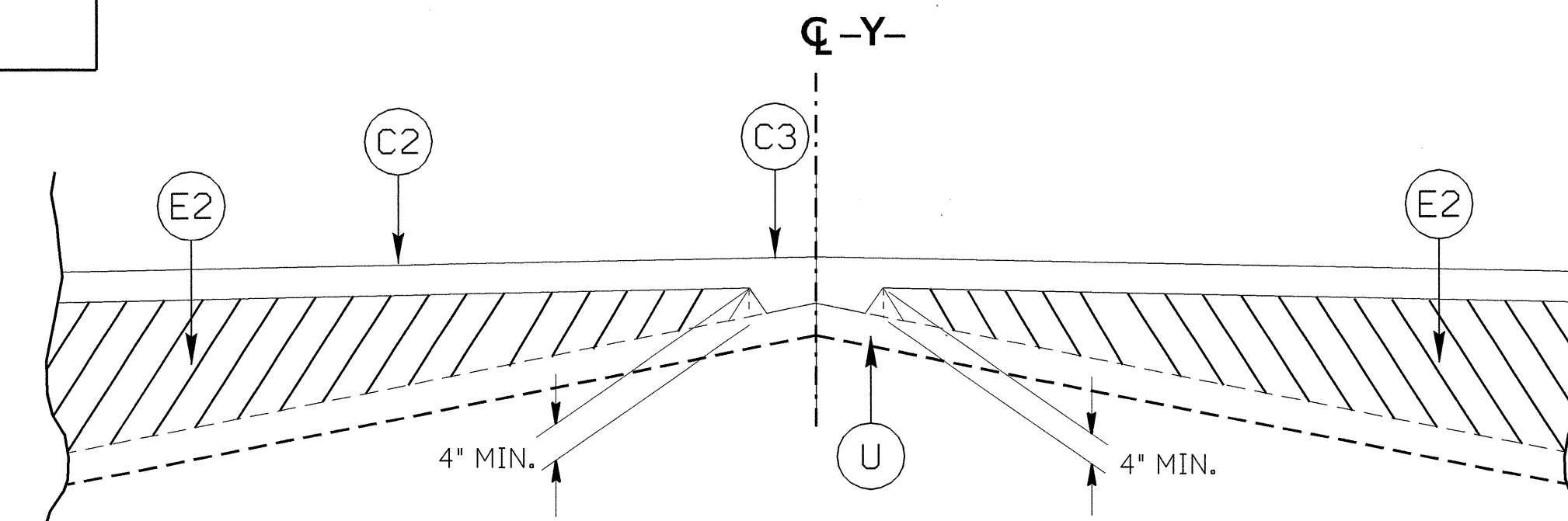


GRADE TO THIS LINE

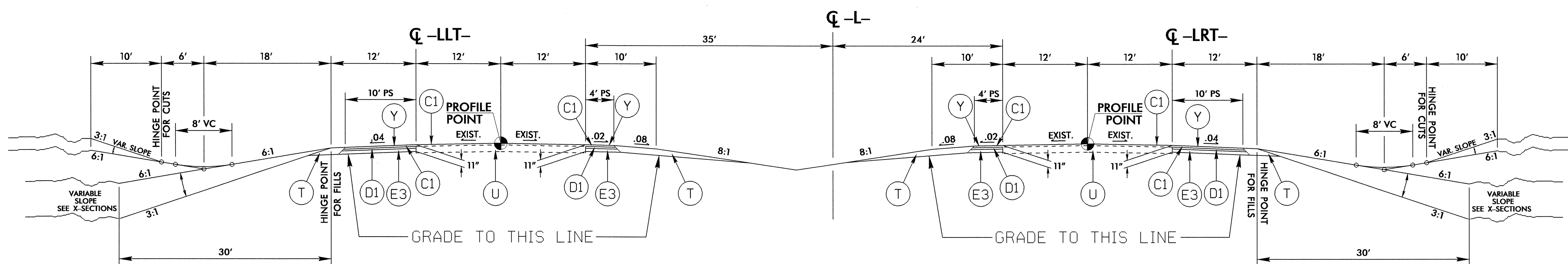
USE DETAIL AT THE FOLLING LOCATIONS:

- L- STA. 24+42.00 TO -L- STA. 31+82.00 * VAR. 0' TO 12'
- L- STA. 53+50.00 TO -L- STA. 60+70.00 * VAR. 0' TO 12'

OR
AS DIRECTED BY THE ENGINEER



Wedging Detail



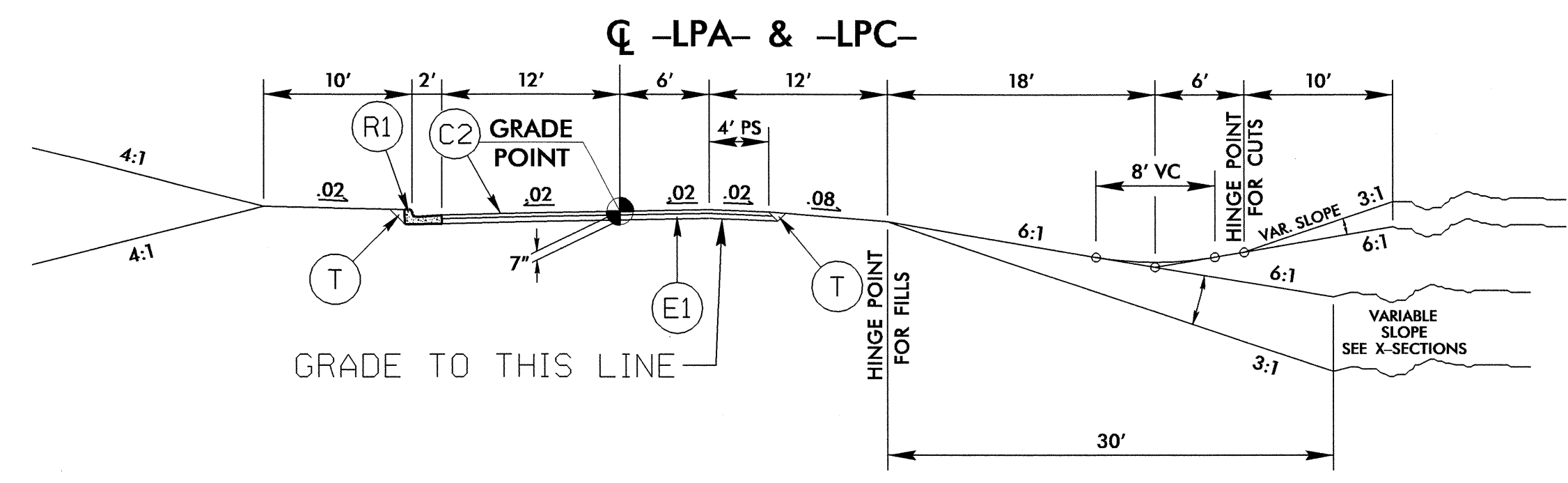
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 FOR:

- L- STA. 21+00.00 TO -L- STA. 64+00.00

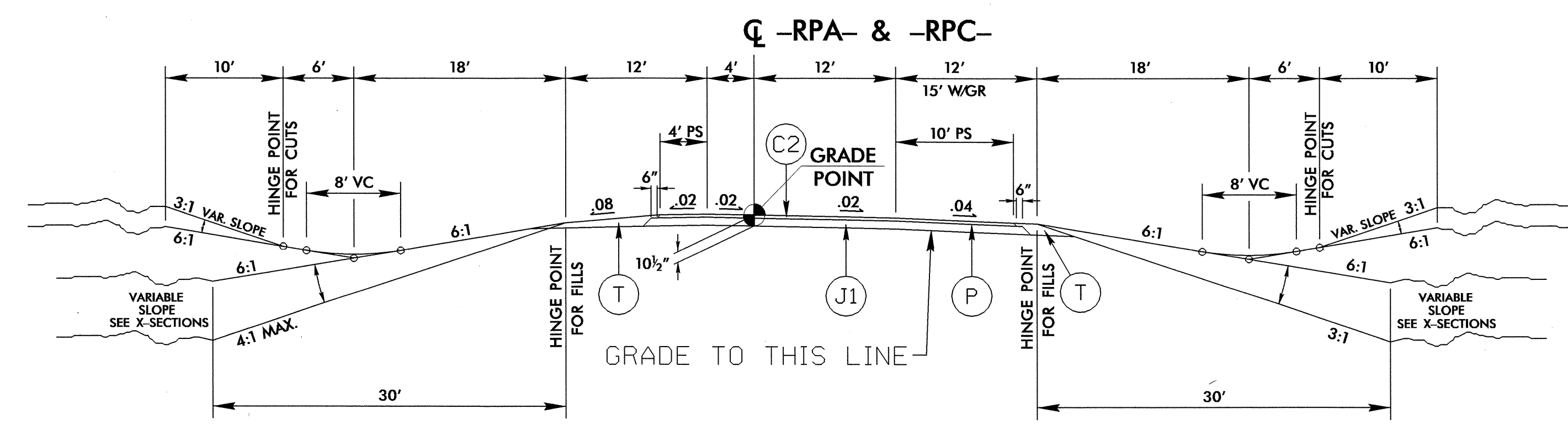
PROJECT REFERENCE NO. R-4900	SHEET NO. 2
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22587 MICHAEL W. LITTLE	PAVEMENT DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 13368 DOON-CHI CHEN 4/23/10

PAVEMENT SCHEDULE	
C2	2½" SF9.5A
E1	4½" B25.0B
J1	8" ABC
P	PRIME COAT
R1	2'-6" CONC. C&G
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING



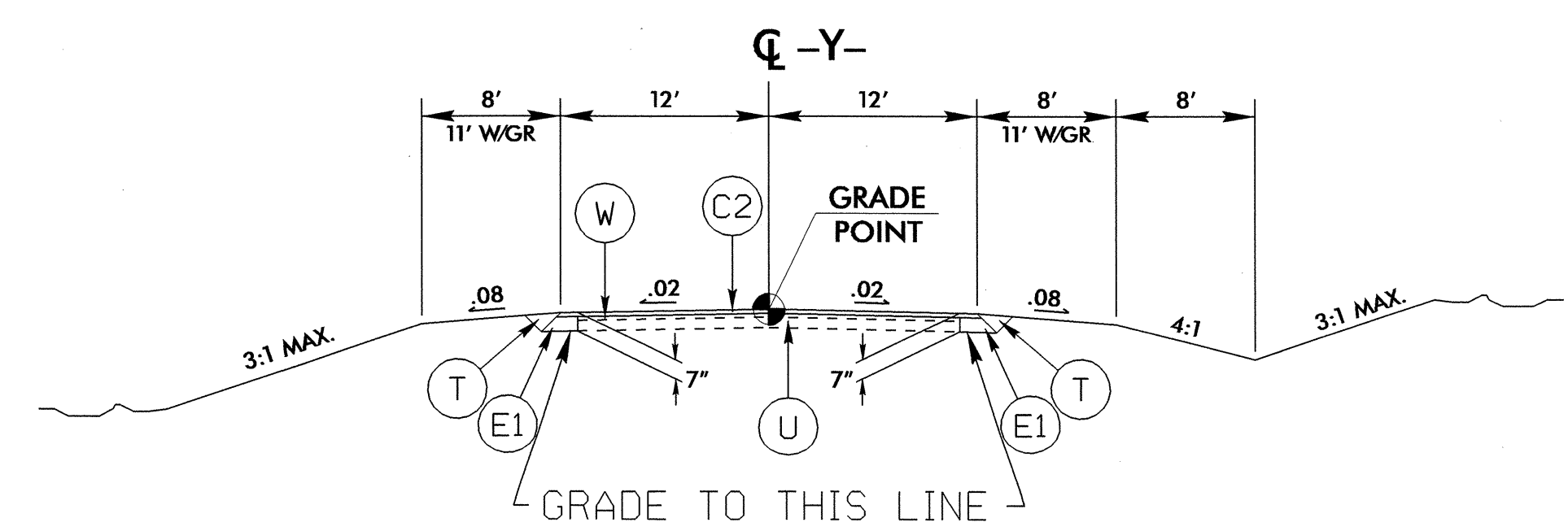
TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 FOR:
 -LPA- STA. 12+42.24 TO -LPA- STA. 23+73.23
 -LPC- STA. 12+35.54 TO -LPC- STA. 20+13.37



TYPICAL SECTION NO. 3

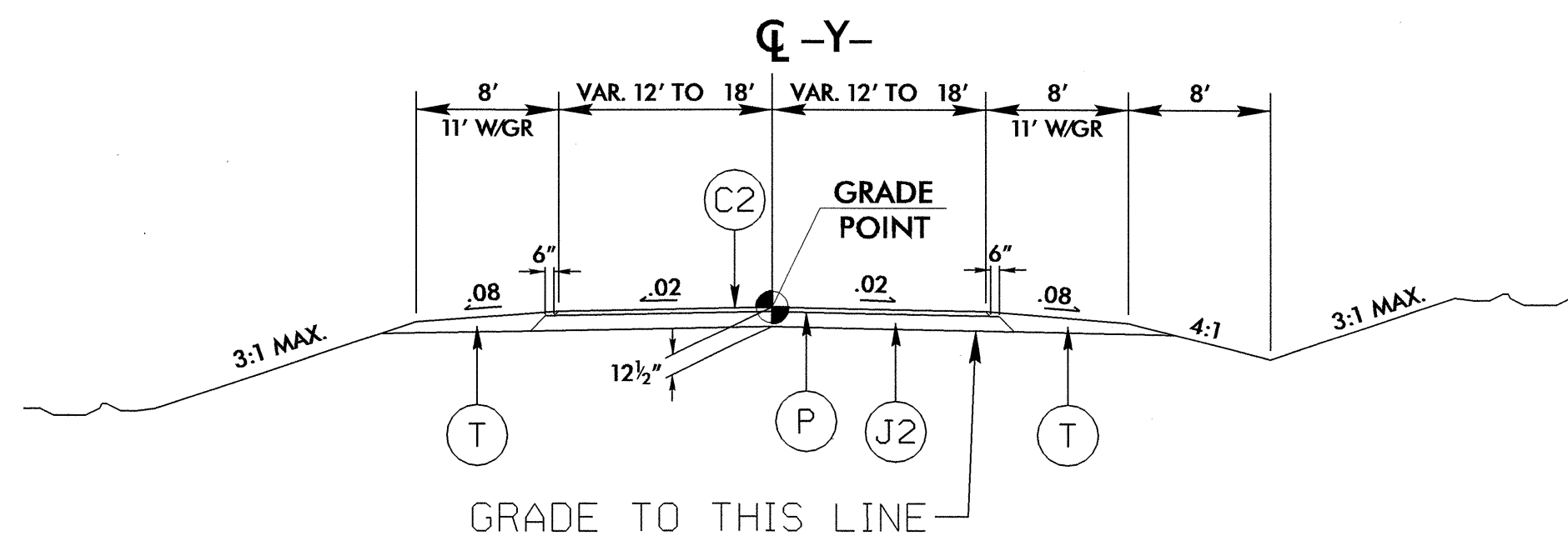
USE TYPICAL SECTION NO. 3 FOR:
 -RPA- STA. 14+19.59 TO -RPA- STA. 31+58.45
 -RPC- STA. 13+64.97 TO -RPC- STA. 28+93.85



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4 FOR:
 -Y- STA. 18+00.00 TO -Y- STA. 20+00.00
 -Y- STA. 44+50.00 TO -Y- STA. 48+00.00

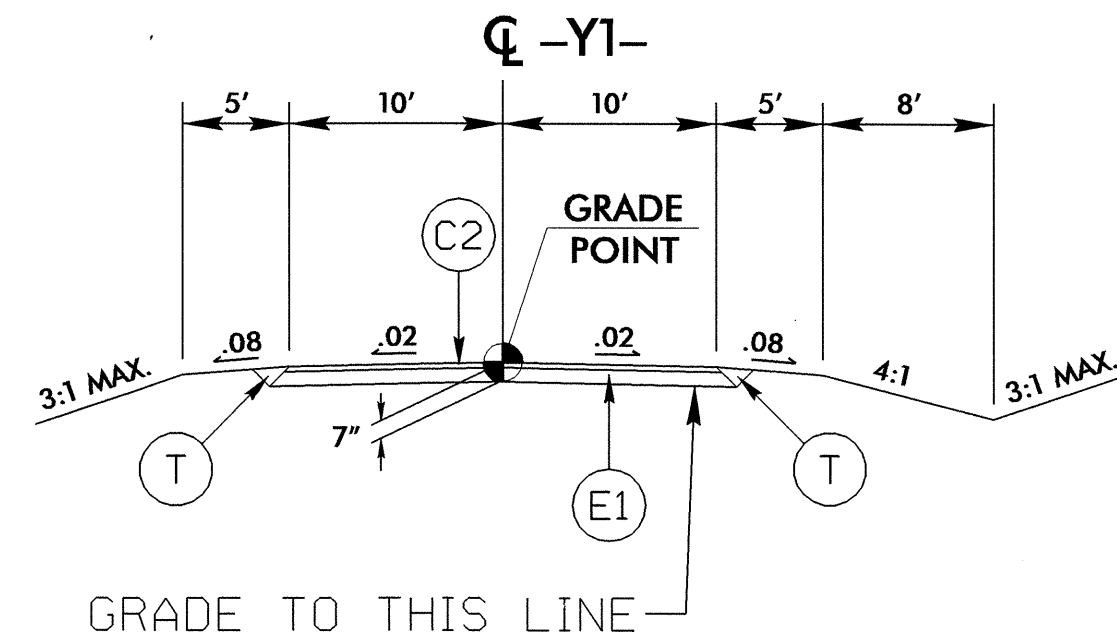
PAVEMENT SCHEDULE	
C2	2½" SF9.5A
E1	4½" B25.0B
J1	8" ABC
J2	10" ABC
P	PRIME COAT
T	EARTH MATERIAL



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5 FOR:

-Y- STA. 20+00.00 TO -Y- STA. 29+14.90 (BEGIN BRIDGE)
 -Y- STA. 32+25.00 (END BRIDGE) TO -Y- STA. 44+50.00



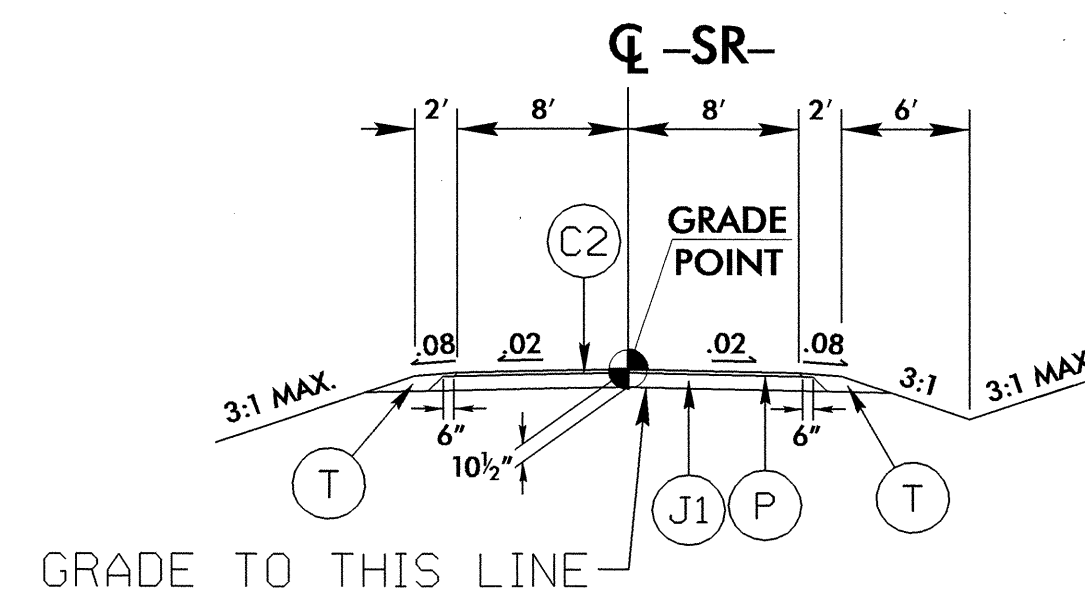
TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6 FOR:

-YI- STA. 10+12.02 TO -YI- STA. 12+00.00

NOTE:

TRANSITION FROM TYPICAL SECTION NO. 6 TO EXISTING
 -YI- STA. 12+00.00 TO -YI- STA. 12+50.00



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7 FOR:

-SR- STA. 10+16.06 TO -SR- STA. 22+30.00

6/22/99



-Y- DESIGN DATA

ADT 2010 = 1,400
 ADT 2030 = 2,100
 D = 60 %
 DHV = 10 %
 TTST = 2 %
 DUAL = 5 %
 V = 50 MPH

MINIMUM VERTICAL CLEARANCE = 17'-0"

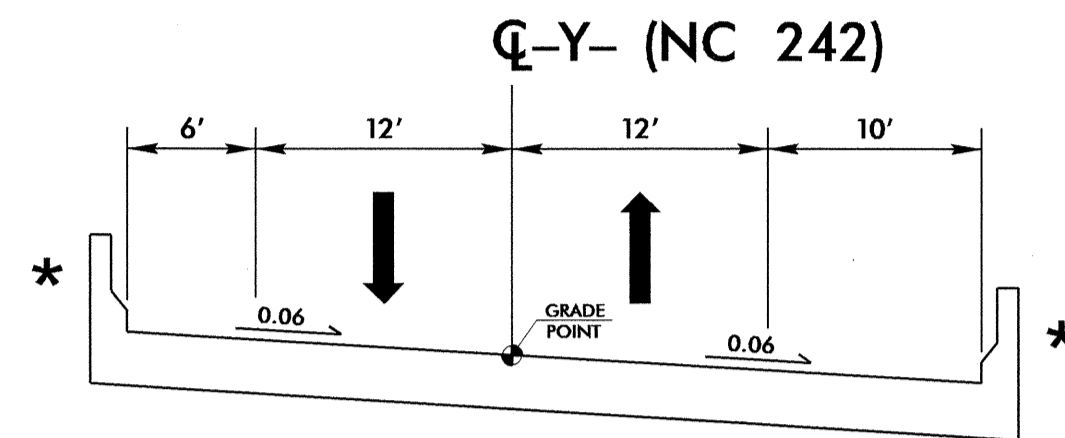
@ SLOPES DETERMINED BY GEOTECHNICAL ENGINEERING UNIT

* BRIDGE RAIL TO BE DETERMINED BY STRUCTURE DESIGN UNIT

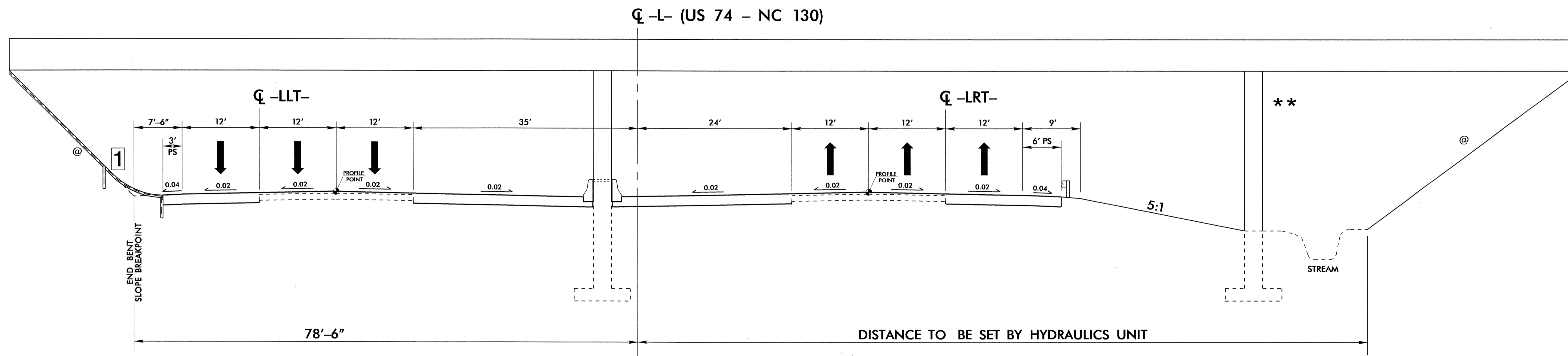
** STRUCTURE DESIGN UNIT TO DETERMINE IF PIER IS NECESSARY

1 SEE STD. 610.03

-Y- STRUCTURE NC 242 (HAYNES LENNON RD.)



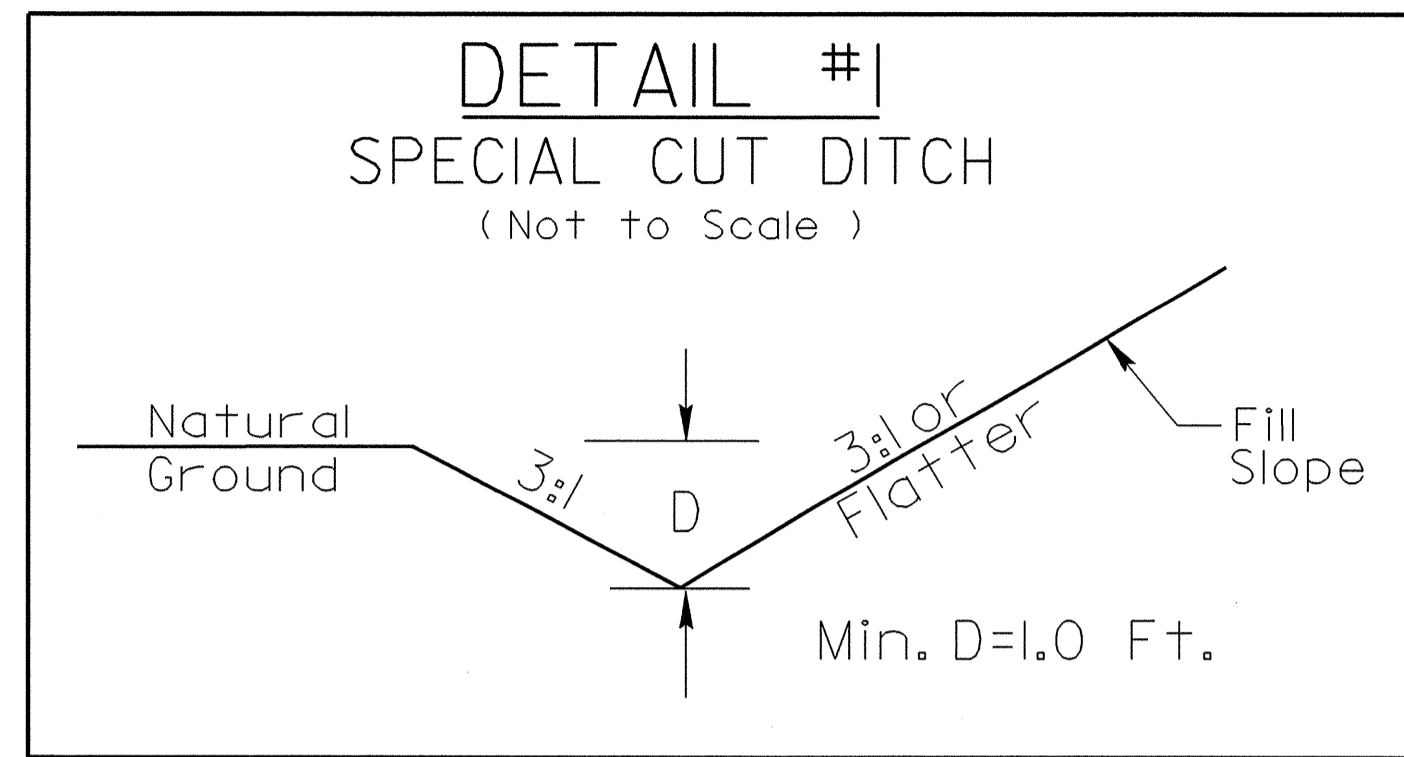
TYPICAL SECTION ON STRUCTURE



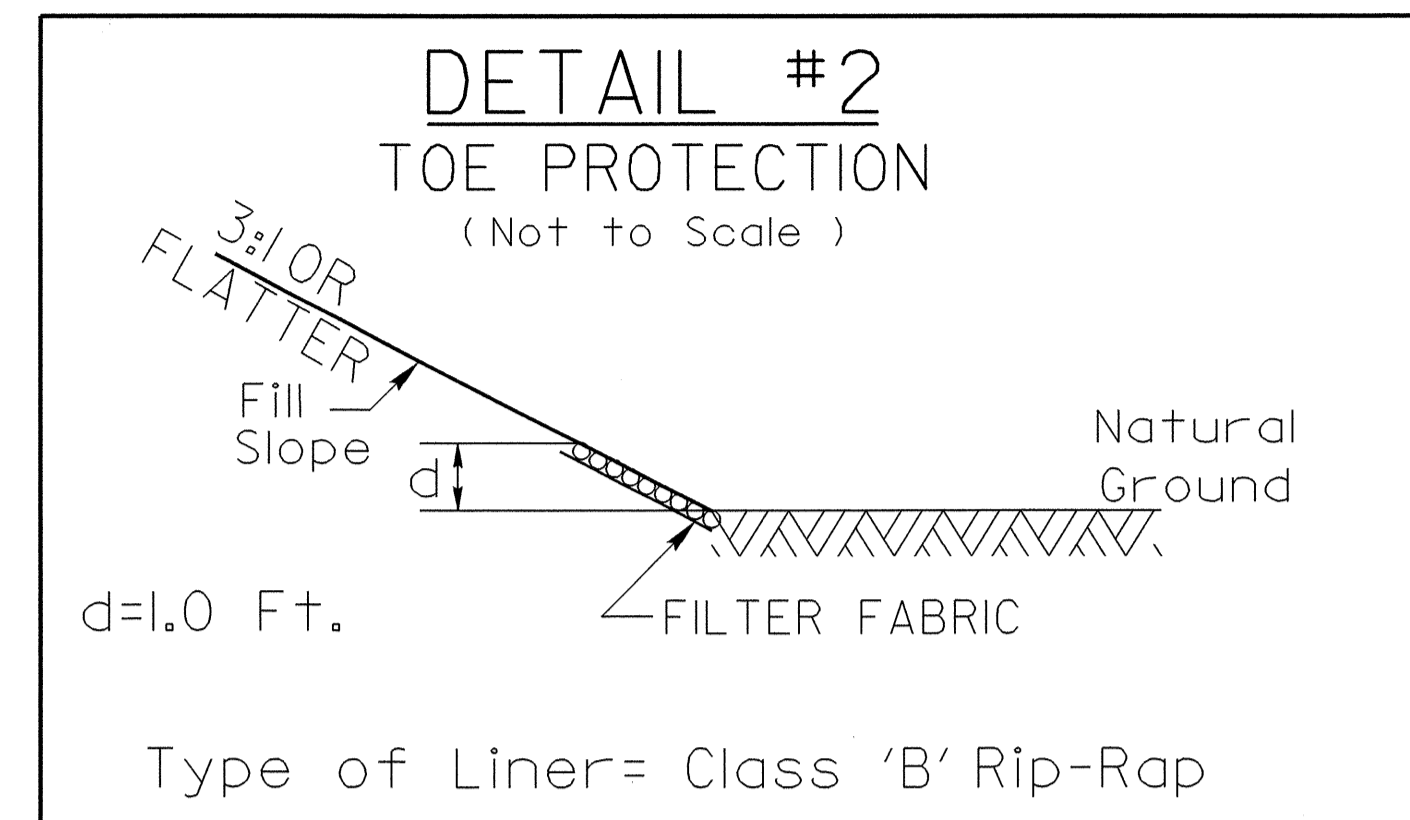
TYPICAL SECTION ON ROADWAY UNDER STRUCTURE

DRAINAGE DETAILS

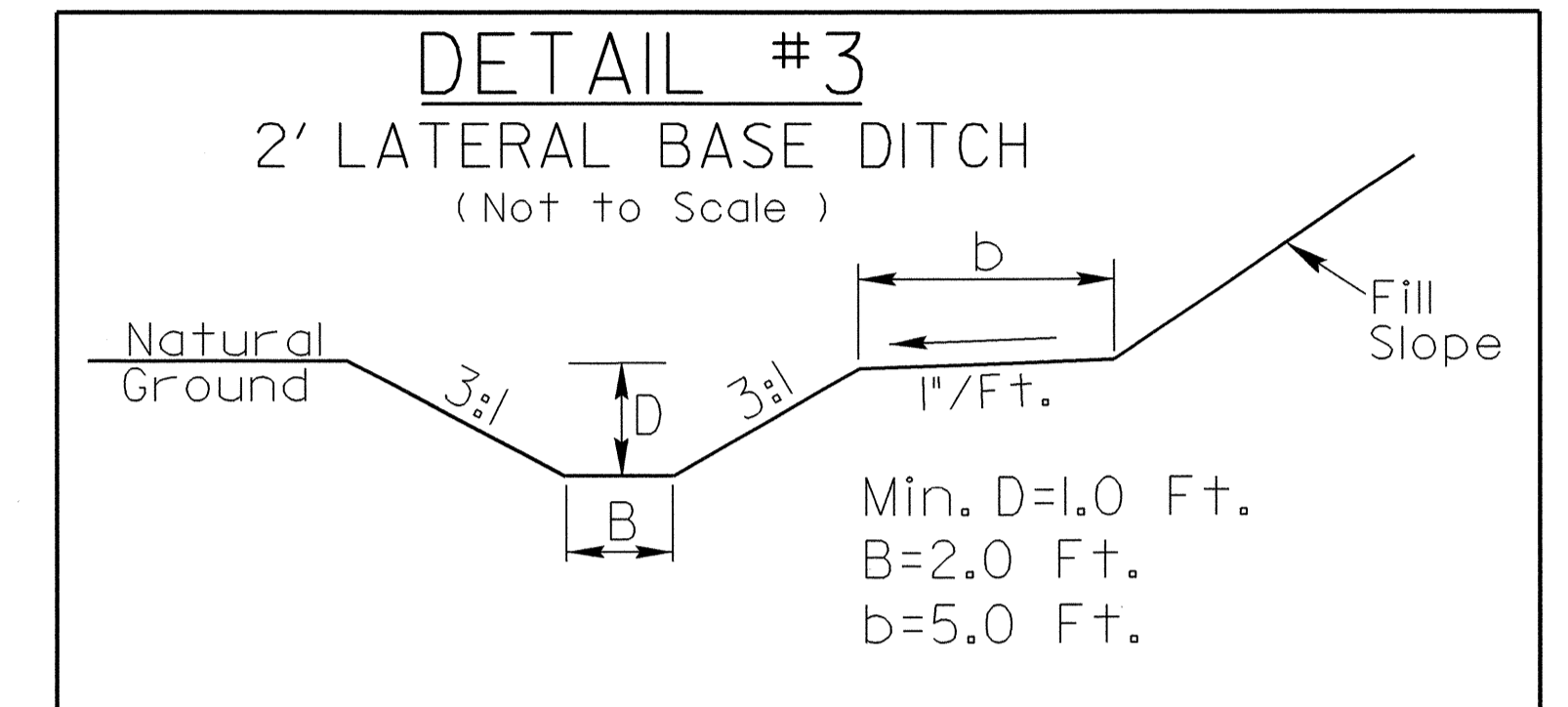
PROJECT REFERENCE NO. R-4900	SHEET NO. 2-D



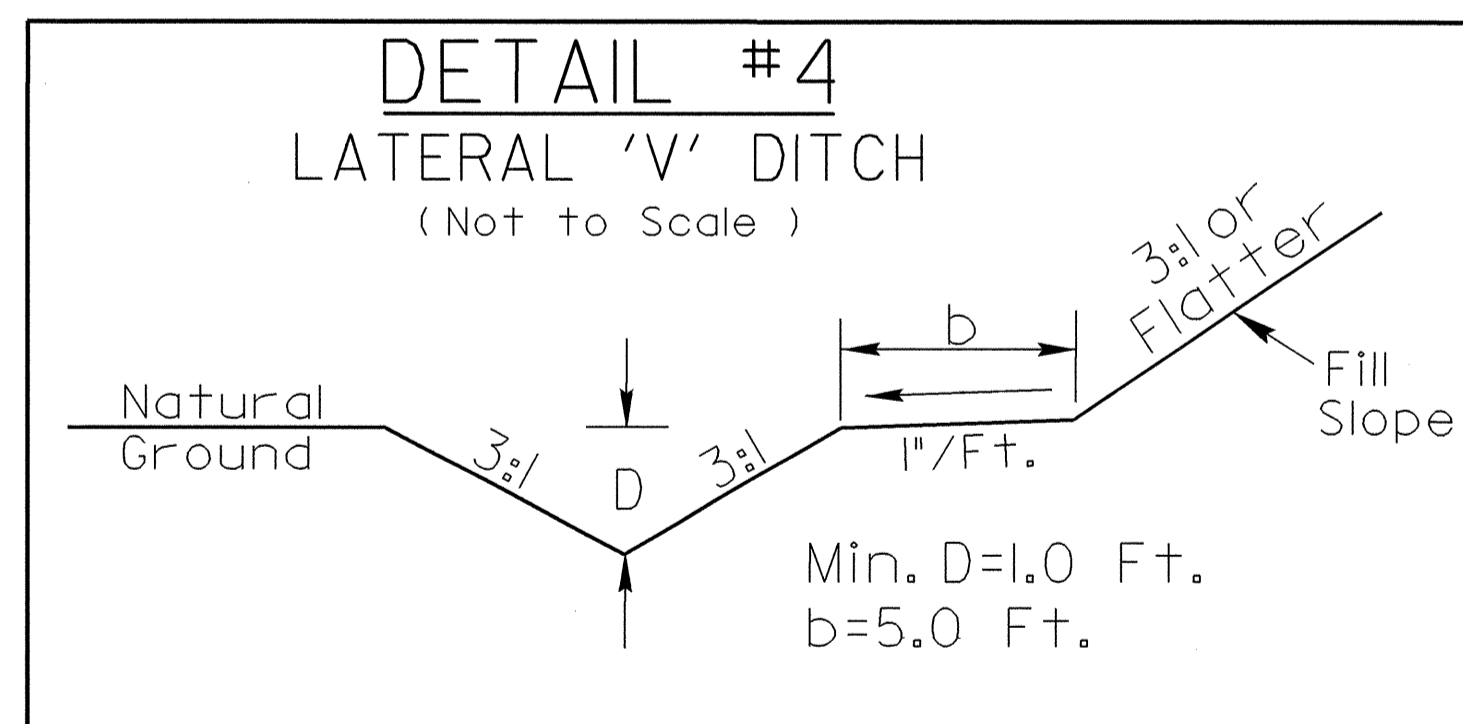
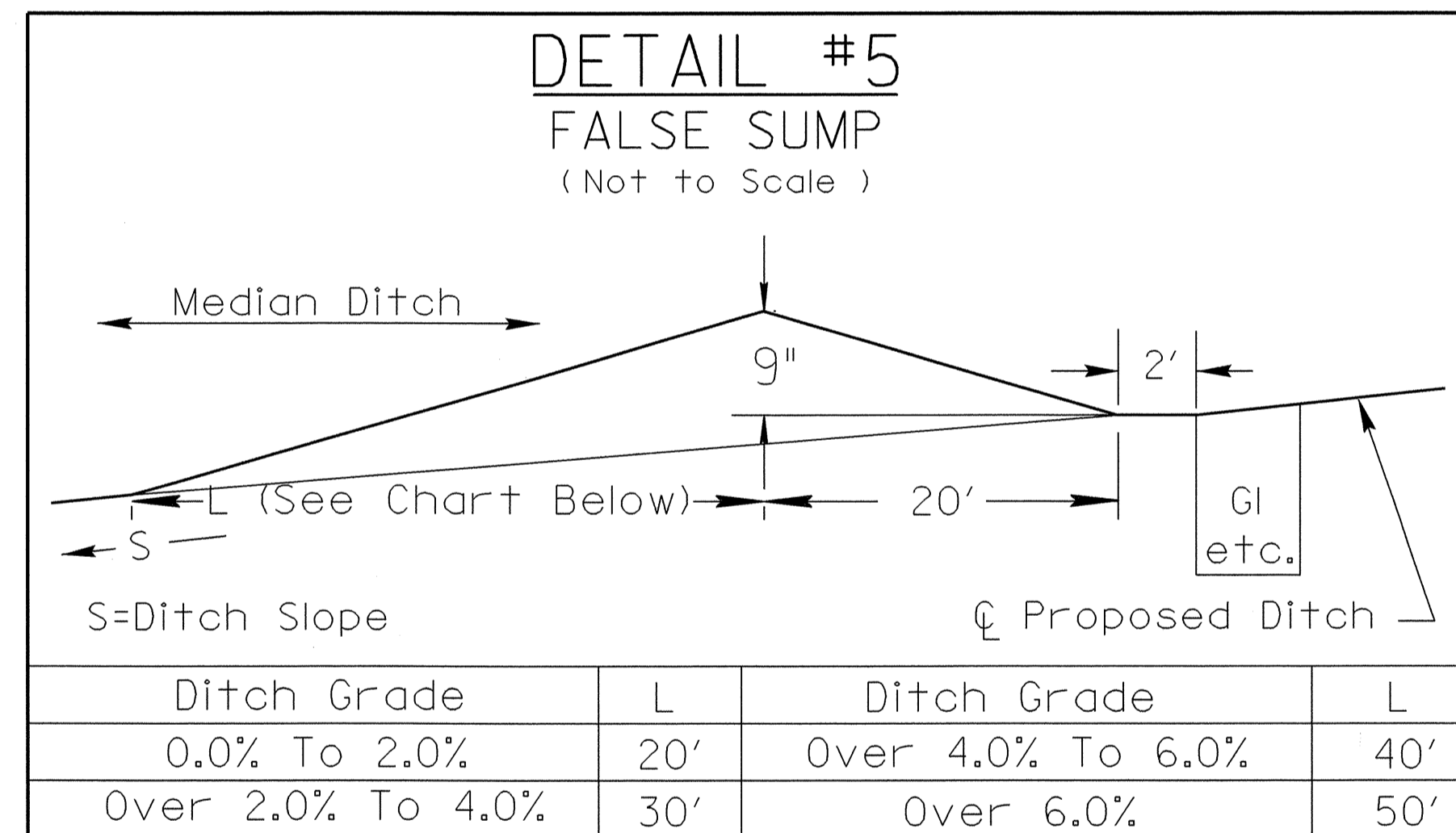
- LRT- Sta. 21+50 TO -LRT- Sta. 24+00 (RT.)
- LLT- Sta. 44+00 TO -LLT- Sta. 47+00 (LT.)
- LPA- Sta. 17+00 TO -LPA- Sta. 22+50 (LT.)
- RPA- Sta. 25+50 TO -RPA- Sta. 26+87 (RT.)
- RPC- Sta. 10+82 TO -RPC- Sta. 15+00 (RT.)
- RPC- Sta. 20+00 TO -RPC- Sta. 25+00 (RT.)
- Y- Sta. 27+00 TO -Y- Sta. 28+00 (LT.)
- Y- Sta. 38+50 TO -Y- Sta. 44+50 (RT.)
- Y- Sta. 39+00 TO -Y- Sta. 41+00 (LT.)
- Y- Sta. 45+82 TO -Y- Sta. 48+00 (RT.)
- Y- Sta. 45+80 TO -Y- Sta. 47+30 (LT.)
- YI- Sta. 10+50 TO -YI- Sta. 12+00 (RT.)



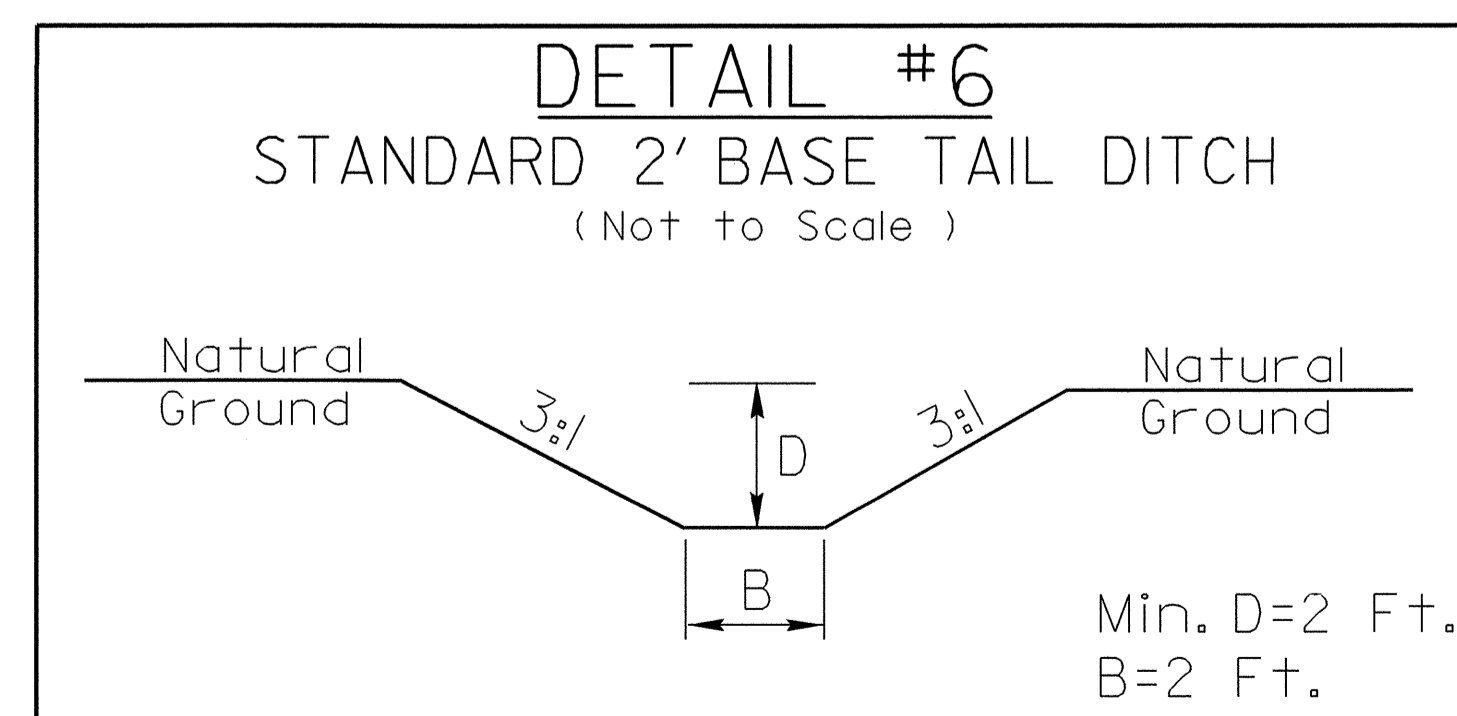
- Y- Sta. 20+00 TO -Y- Sta. 20+35 (LT.)
- Y- Sta. 32+40 TO -Y- Sta. 35+50 (RT.)
- Y- Sta. 34+20 TO -Y- Sta. 36+72 (LT.)



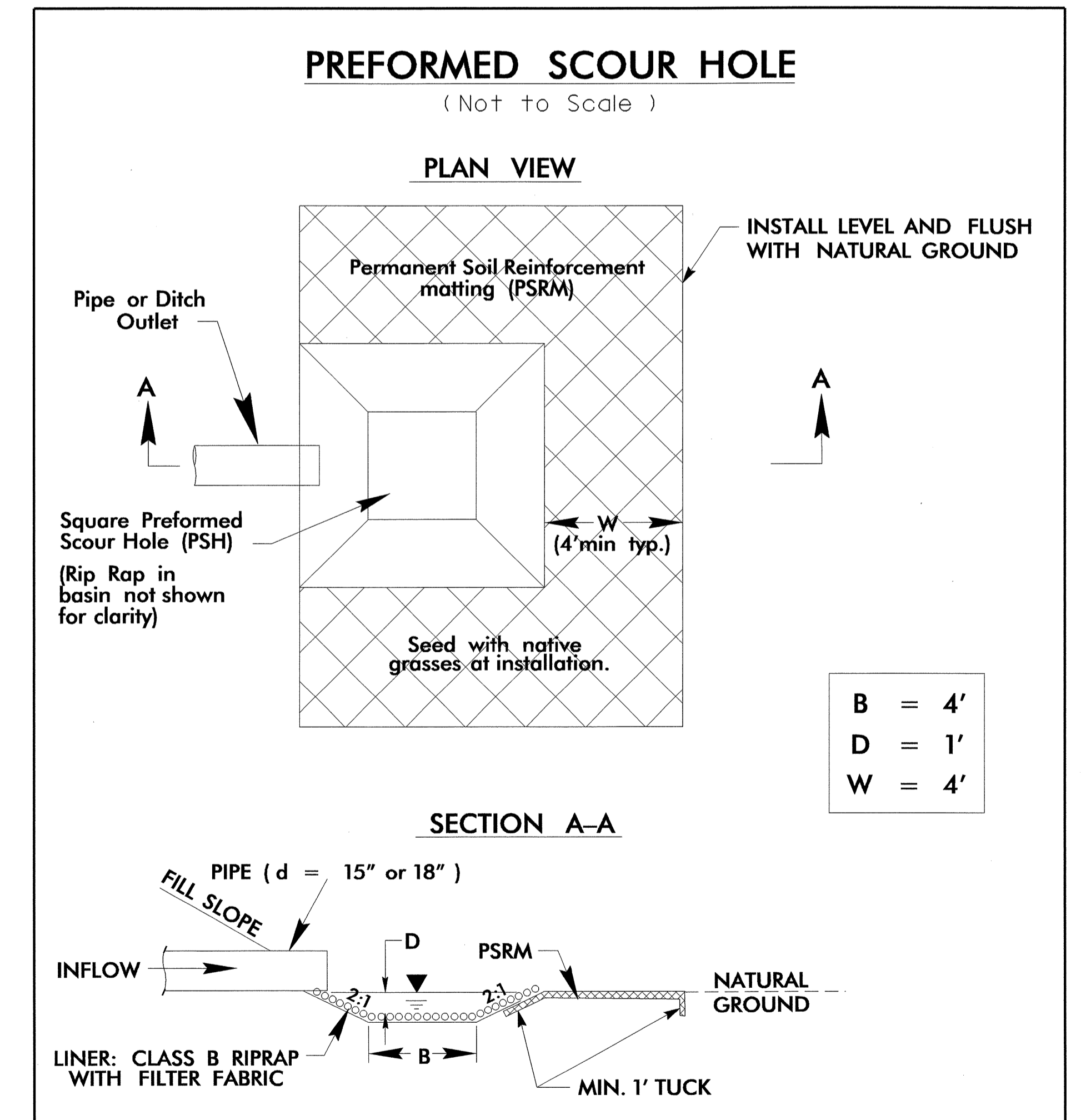
- LPC- Sta. 18+50 TO -LPC- Sta. 19+74 (RT.)
- Y- Sta. 37+43 TO -Y- Sta. 38+50 (RT.)



- RPA- Sta. 24+00 TO -RPA- Sta. 25+50 (RT.)



- LLT- Sta. 40+38 TO -LLT- Sta. 41+12 (LT.)



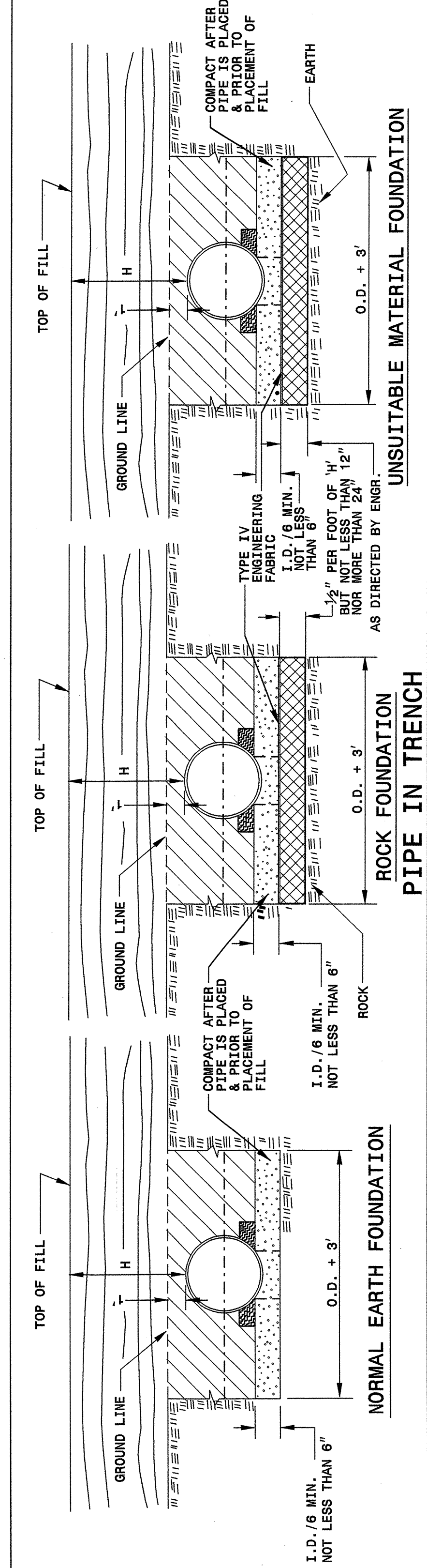
- B = 4'
- D = 1'
- W = 4'

- LPC- Sta. 14+57 (LT.)

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 jhowerton AT PS237501

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

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



ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 FLEXIBLE PIPE

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 FLEXIBLE PIPE

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

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

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

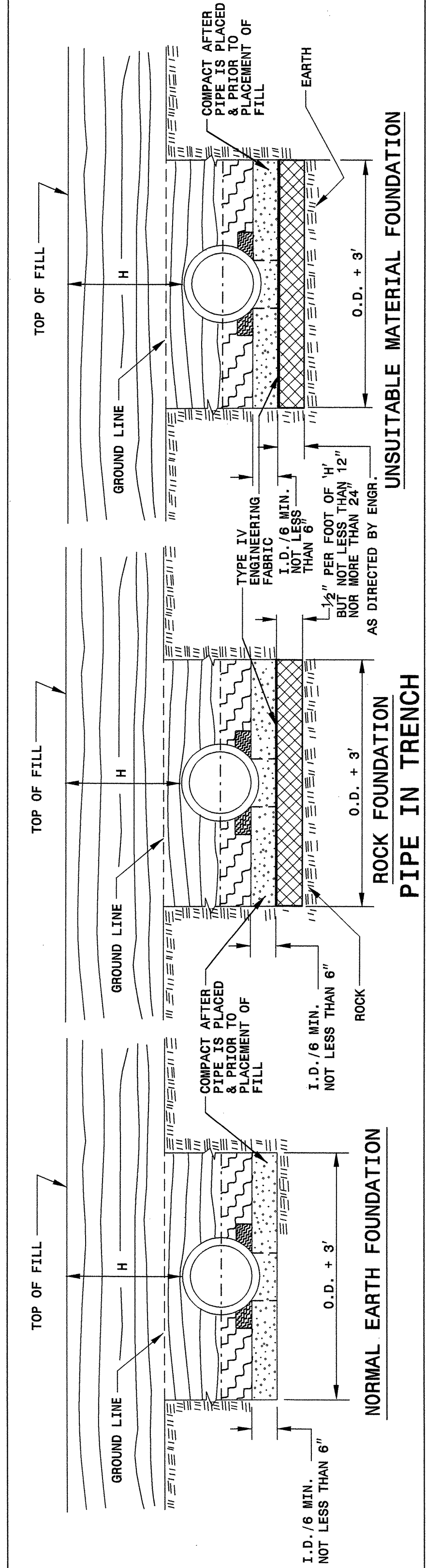
[stippled] TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.
 [dotted] LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

SHEET 1 OF 3
300D01

SHEET 1 OF 3
300D01

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

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



ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 RIGID PIPE

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 RIGID PIPE

GENERAL NOTES:
 I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
 O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
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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
 [diagonal hatching] SELECT BACKFILL MATERIAL CLASS III OR CLASS II, BELOW SPRINGLINE.
 [horizontal hatching] APPROVED SUITABLE LOCAL MATERIAL ABOVE SPRINGLINE.
 [vertical hatching] UNDISTURBED EARTH MATERIAL.
 [cross-hatching] SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

[stippled] TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.
 [dotted] 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.

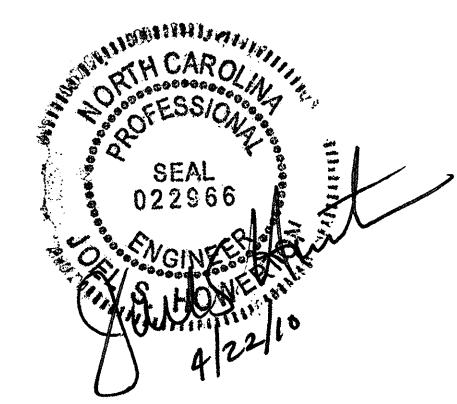
SHEET 2 OF 3
300D01

SHEET 2 OF 3
300D01

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

SEE PLATE FOR TITLE

ORIGINAL BY: K Kempf DATE: 5-15-09
 MODIFIED BY: [signature] DATE: 7/20/09
 CHECKED BY: [signature] DATE: 7/20/09
 FILE SPEC: s:\enward\stds\stdstodetails\30001\0300d01.dgn



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 jhowerton AT P5237501

5/14/99

STATE OF NORTH CAROLINA
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 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)				
		16	14	12	10	8
12	12	204	256			
15	12	162	204			
18	12	135	169	239		
21	12	115	145	204		
24	12	100	126	178		
30	12	79	100	142		
36	12	65	83	117	152	
42	12	55	70	100	130	160
48	12	48	61	87	113	139
54	12		54	77	100	123
60	12			69	90	111
66	12				81	100
72	12				74	91
78	12					81
84	12					69

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

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)				
		16	14	12	10	8
12	12	123	155	218	281	344
15	12	98	123	174	224	275
18	12	81	102	144	187	228
21	12	69	87	123	160	195
24	12	60	76	108	139	171
27	12		67	95	123	151
30	12		60	85	111	136
36	12		50	71	92	113
42	12			60	78	96
48	12			52	68	84
54	12			46	50	74
60	12				50	62
66	12					51
72	12					41

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

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

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

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

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 LRF 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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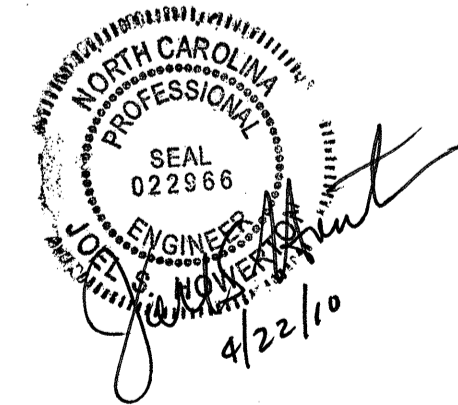
ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
 FILL HEIGHT TABLES

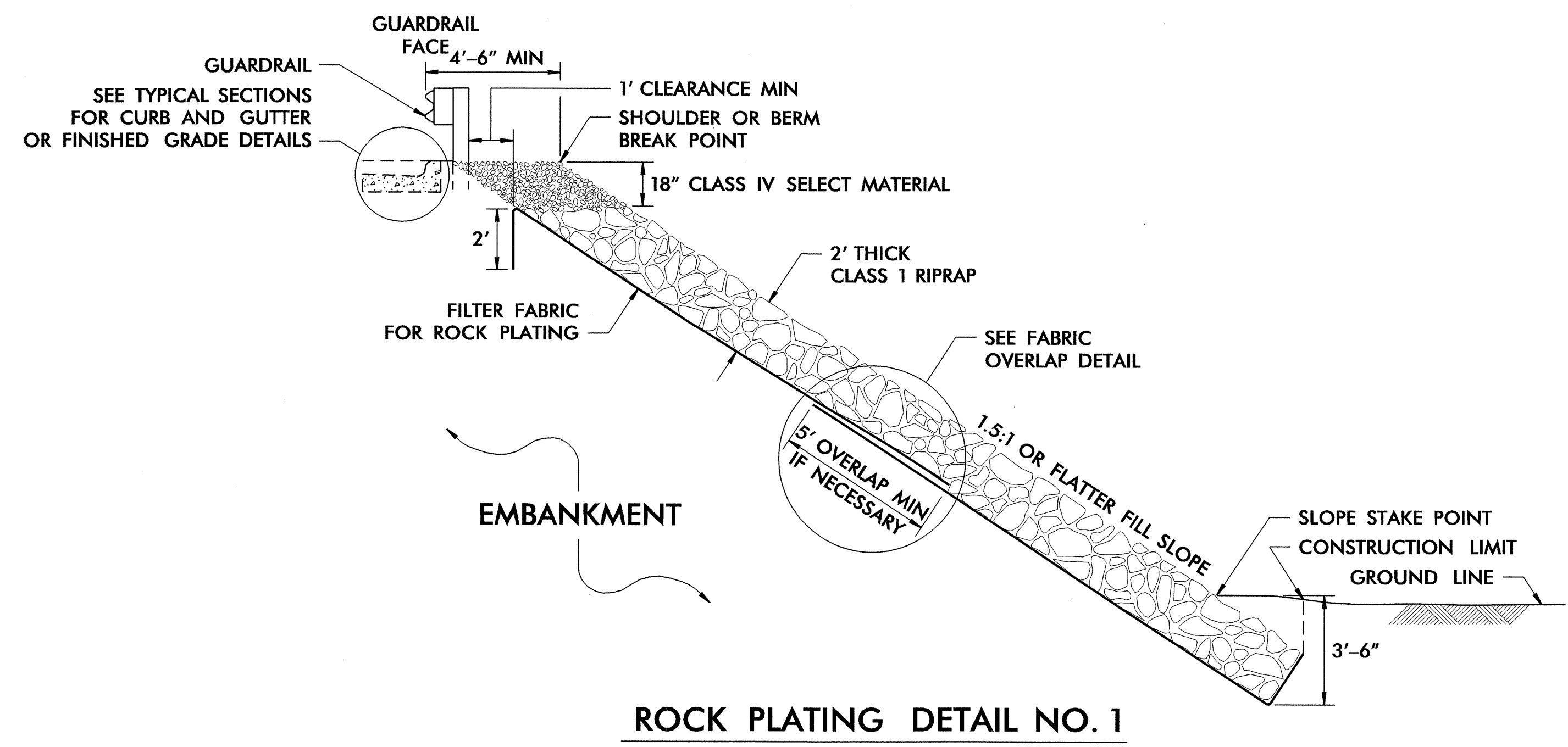
SHEET 3 OF 3
300D01

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

SEE PLATE FOR TITLE

ORIGINAL BY: K Kempf DATE: 5-15-09
 MODIFIED BY: *[Signature]* DATE: 7/30/09
 CHECKED BY: *[Signature]* DATE: 7/30/09
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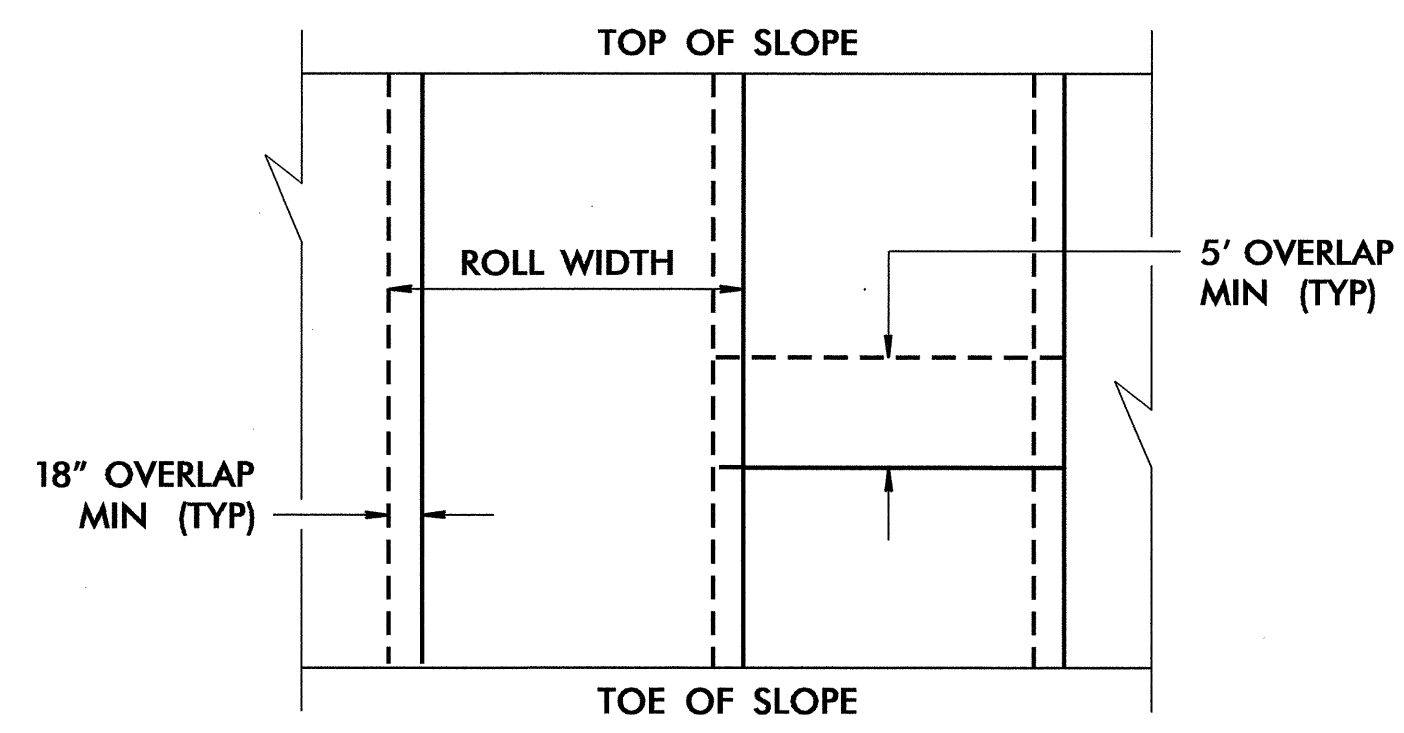


USE ROCK PLATING DETAIL NO. 1

- L- STA. 60+50.00 TO -L- STA. 61+50.00 LT.
- Y- STA. 19+15.00 TO -Y- STA. 20+00.00 LT.
- Y- STA. 19+15.00 TO -Y- STA. 20+00.00 RT.

NOTES:

- (1) EXTEND ROCK PLATING LIMITS TO EXISTING GROUND OR DITCH SLOPES.
- (2) EXTEND ROCK PLATING LIMITS TO 2.5:1 SLOPES.

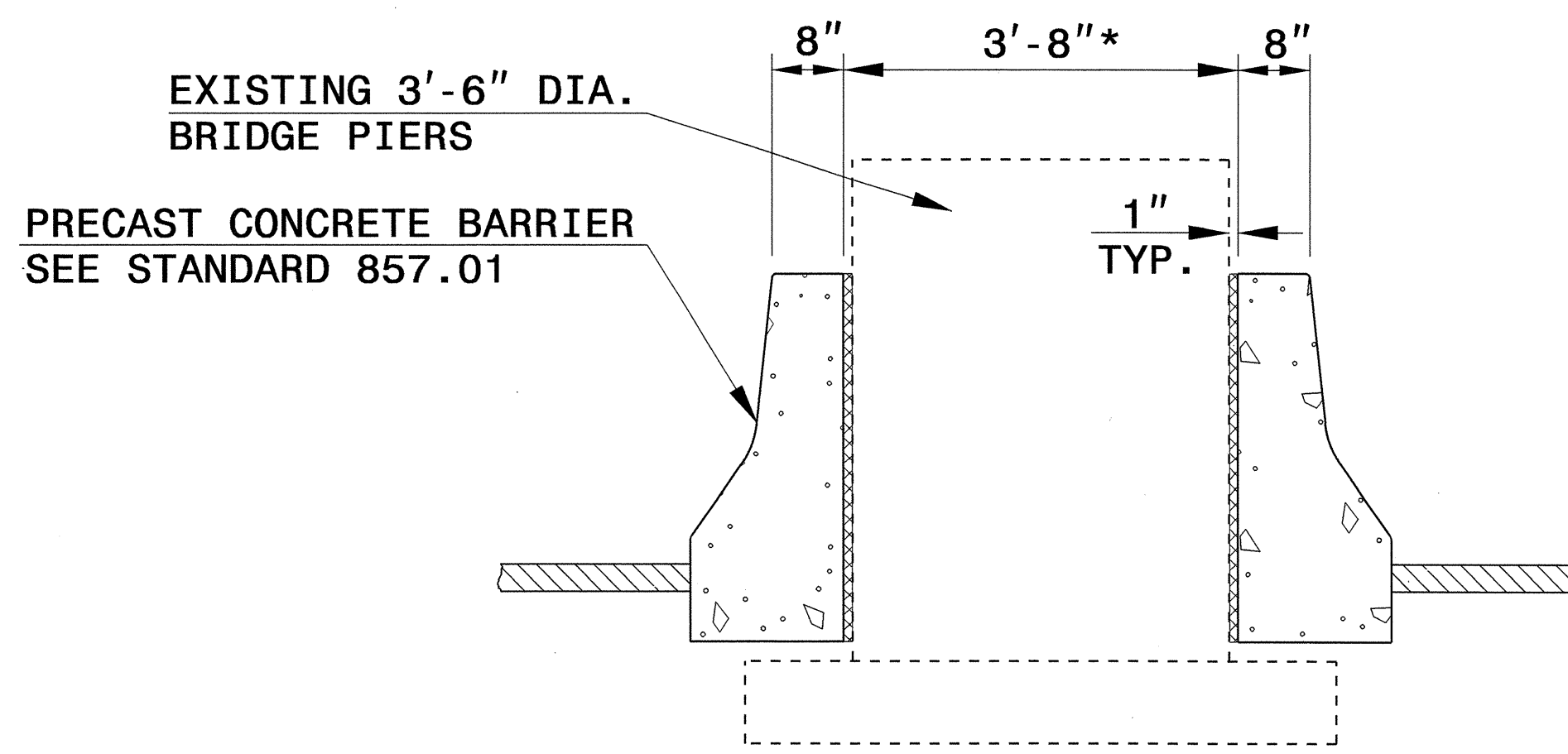
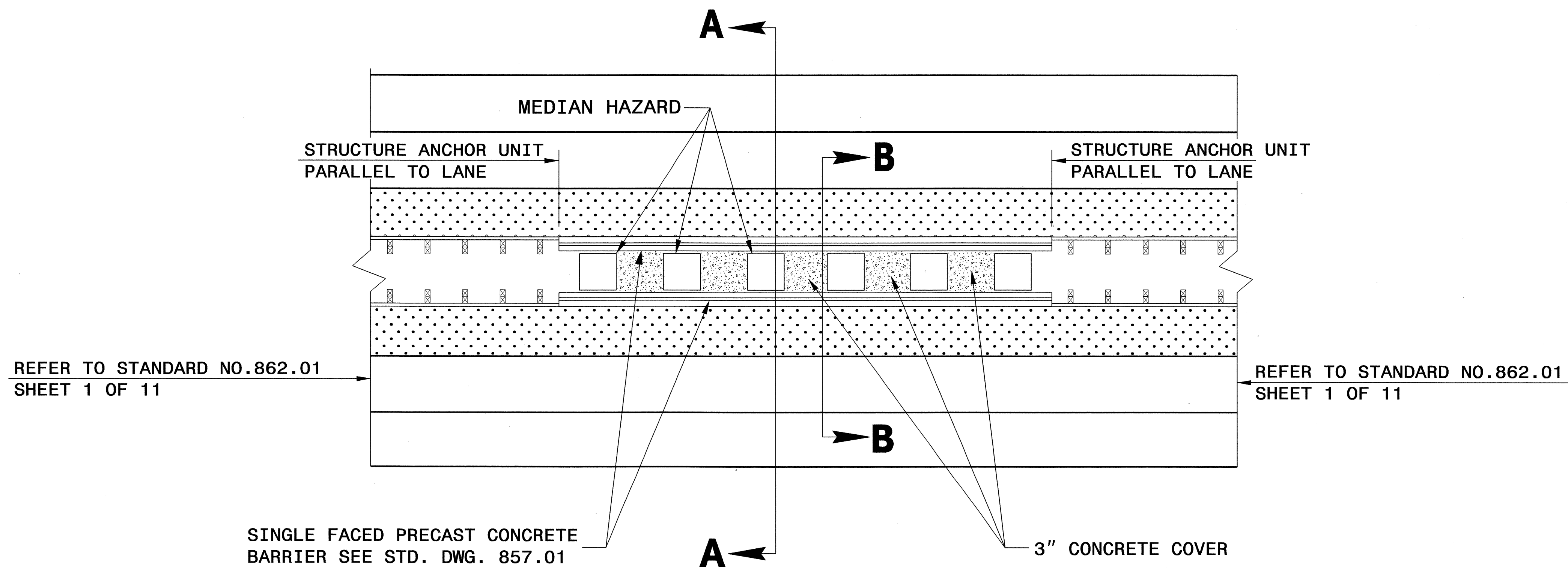


FABRIC OVERLAP DETAIL
(PLAN VIEW) - N. T. S.

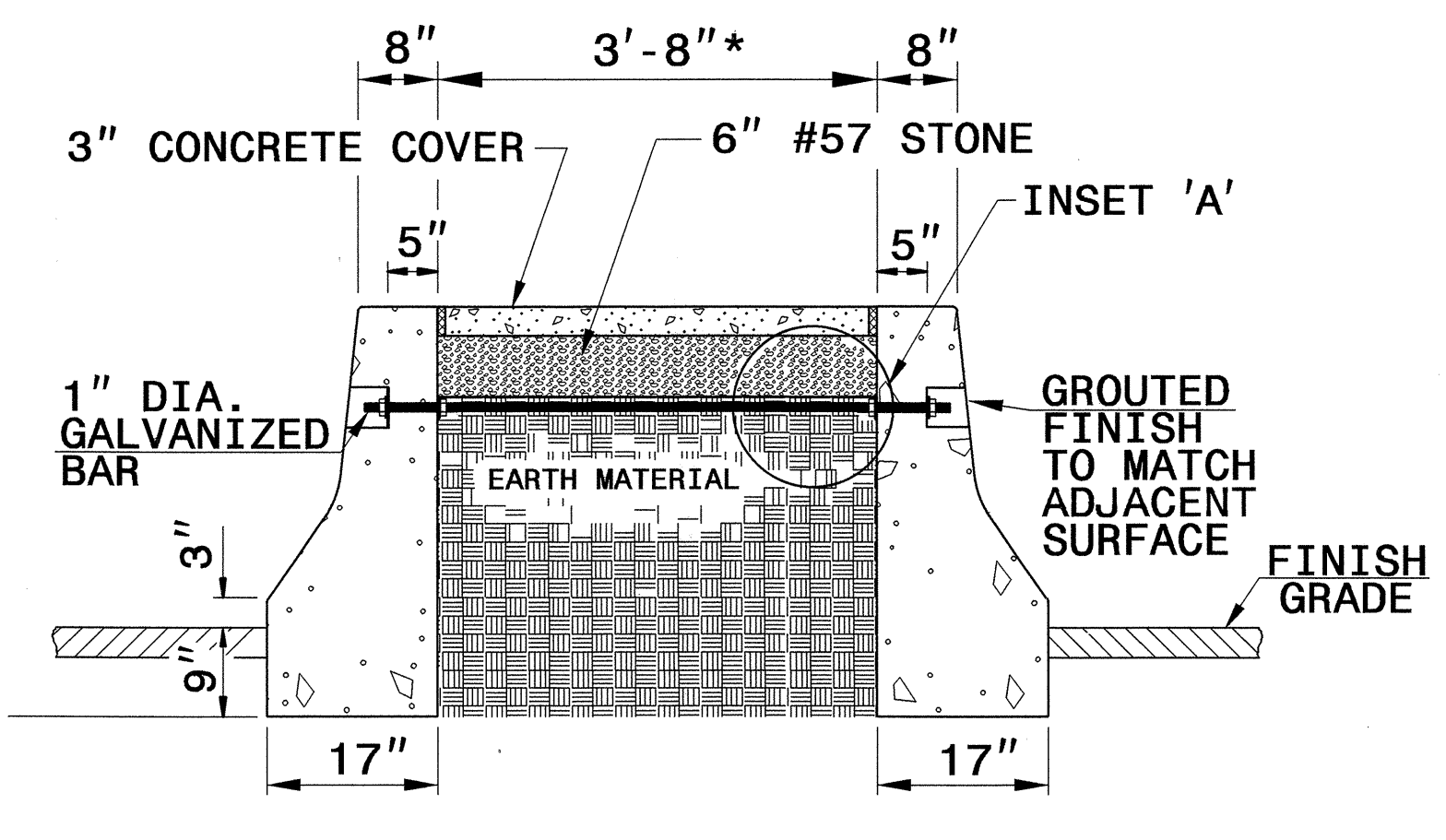
FOR ROCK PLATING,
SEE ROCK PLATING SPECIAL PROVISION.

ROCK PLATING DETAILS AND LOCATIONS WERE PROVIDED THROUGH A SEALED DOCUMENT FROM THE GEOTECHNICAL ENGINEERING UNIT. THE DOCUMENT WAS SUBMITTED TO THE ROADWAY DESIGN UNIT ON 10/14/09 AND SEALED BY A PROFESSIONAL ENGINEER, JAMES R. BATTS, JR., LICENSE NO. 18899 AND A LICENSED GEOLOGIST, JOSEPH L. STONE LICENSE NO. 2007.

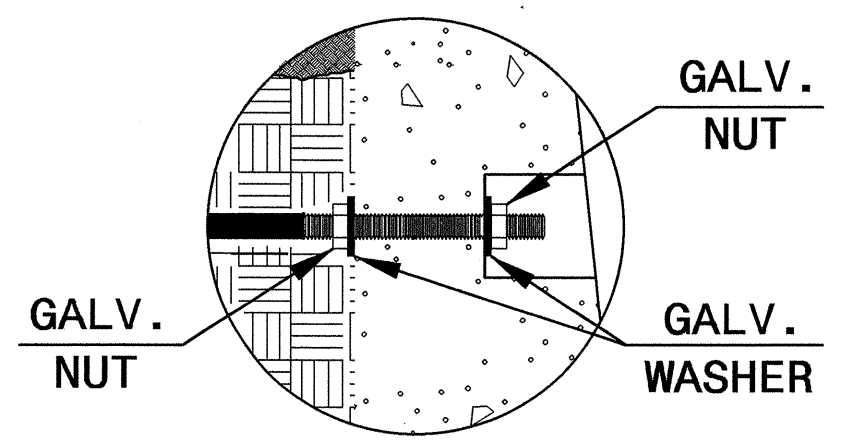
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SECTION A-A



SECTION B-B



INSET 'A'

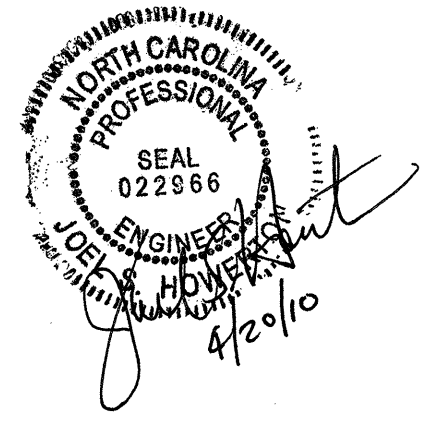
GENERAL NOTES:

- *THE 3'-8" DIMENSION MAY VARY DEPENDING ON THE EXISTING PIER WIDTH.
- INSET FIRST 1" DIA. GALVANIZED BAR 12'-6" AND SPACE THE REMAINING 1' BARS AT 25'-0".
- USE AN APPROVED BONDING SYSTEM IN ACCORDANCE WITH SECTION 1081-1, TYPE 3A OF THE STANDARD SPECIFICATIONS.
- SEAL ALL EXPANSION JOINTS WITH JOINT FILLER (SEE SECTION 1028 OF THE SPECIFICATIONS).
- THE #57 STONE, 1" GALV. BAR AND EARTH MATERIAL WILL BE INCIDENTAL TO THE 3" CONCRETE COVER.

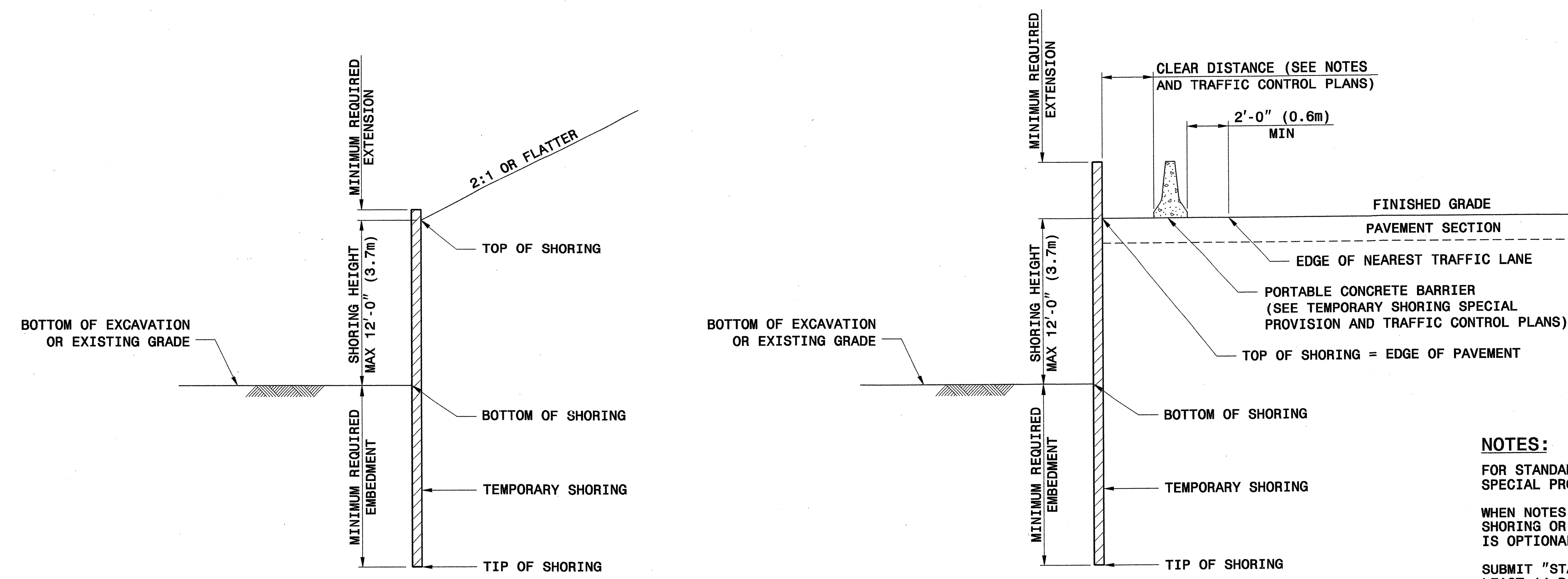
**PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN**
Office 919-250-4128 FAX 919-250-4119

**DETAIL OF MEDIAN
HAZARD PROTECTION**

ORIGINAL BY: T.S. Spell DATE: 2-4-10
 MODIFIED BY: [Signature] DATE: 4/20/10
 CHECKED BY: [Signature] DATE: 4/20/10
 FILE SPEC.: enaj\details\stand\transition barrier_862d01.dgn



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SLOPE CASE

SURCHARGE CASE

NOTES:

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

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

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

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

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

VERIFY GROUNDWATER ELEVATION BEFORE BEGINNING SHORING CONSTRUCTION.

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

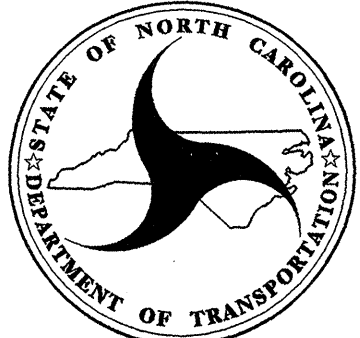
AT THE CONTRACTOR'S OPTION, H PILE EMBEDMENT DEPTHS FOR PILES SET IN DRILLED HOLES MAY BE REDUCED BY 25%. FOR PILE EXCAVATION, SEE TEMPORARY SHORING SPECIAL PROVISION.

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

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

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

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



GEOTECHNICAL ENGINEERING UNIT
 STATE OF NORTH CAROLINA
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 RALEIGH

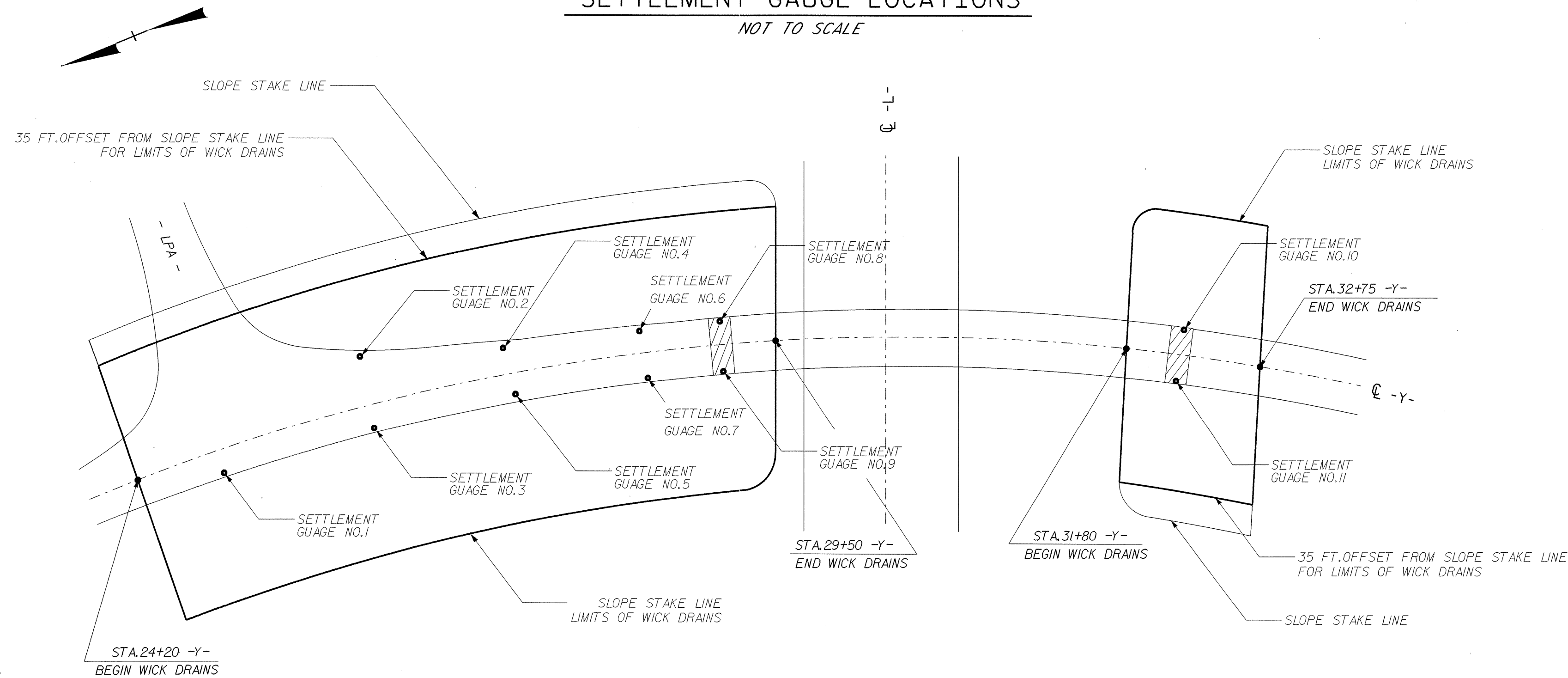
STANDARD DRAWING NO. 1801.01

STANDARD TEMPORARY SHORING

DATE: 2-20-07

SETTLEMENT GAUGE LOCATIONS

NOT TO SCALE



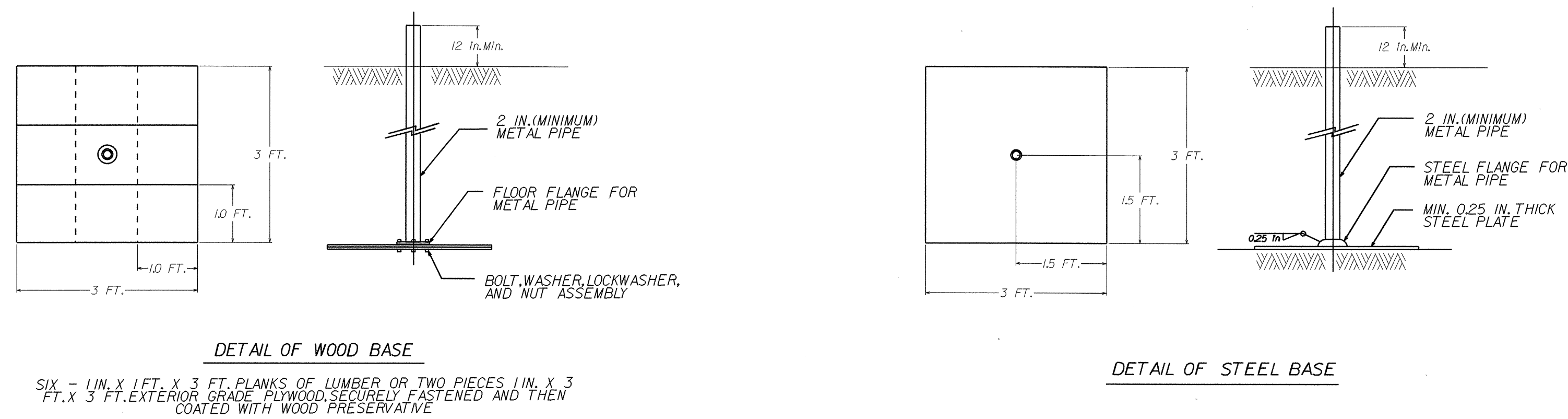
SETTLEMENT GAUGE LOCATIONS		
GAUGE NO.	STATION -Y-	OFFSET FROM -Y-
1	25 + 00 ±	15 FT. ±, RT
2	26 + 50 ±	30 FT. ±, LT
3	26 + 50 ±	20 FT. ±, RT
4	27 + 50 ±	20 FT. ±, LT
5	27 + 50 ±	20 FT. ±, RT
6	28 + 50 ±	18 FT. ±, LT
7	28 + 50 ±	20 FT. ±, RT
8	29 + 17 ±	18 FT. ±, LT
9	29 + 17 ±	20 FT. ±, RT
10	32 + 33 ±	18 FT. ±, LT
11	32 + 33 ±	20 FT. ±, RT

NOTES

1. THE USE OF EITHER THE WOOD BASE OR THE STEEL BASE SETTLEMENT GAUGE SHALL BE THE CONTRACTOR'S OPTION.
2. SETTLEMENT GAUGES SHALL BE INSTALLED BEFORE ANY FILL IS PLACED.
3. SETTLEMENT GAUGE ELEVATIONS ARE TO BE DETERMINED AND RECORDED WEEKLY BY THE RESIDENT ENGINEER.
4. THE INITIAL ELEVATION OF THE SETTLEMENT GAUGE PLATE (AT TOP OF PLATE) SHALL BE DETERMINED AT THE TIME OF INSTALLATION ALONG WITH THE EMBANKMENT ELEVATION. WHEN NEW SECTIONS OF THE PIPE ARE ADDED, ELEVATIONS SHALL BE RECORDED AT THE TOP OF EXISTING PIPE AND AT THE TOP OF THE NEW PIPE. THIS IS TO TAKE INTO ACCOUNT INTERIM SETTLEMENT, VARIABLE PIPE LENGTHS, AND THREAD LENGTHS IN COUPLING.
5. RESULTS OF SETTLEMENT GAUGE READINGS SHALL BE FORWARDED TO MR. K.J. KIM, EASTERN REGIONAL GEOTECHNICAL MANAGER, WITHIN THREE DAYS.

SETTLEMENT GAUGE DETAILS

NOT TO SCALE



SIX - 1 IN. X 1 FT. X 3 FT. PLANKS OF LUMBER OR TWO PIECES 1 IN. X 3 FT. X 3 FT. EXTERIOR GRADE PLYWOOD SECURELY FASTENED AND THEN COATED WITH WOOD PRESERVATIVE

SETTLEMENT GAUGE QUANTITIES	
EMBANKMENT SETTLEMENT GAUGES	11 EA.

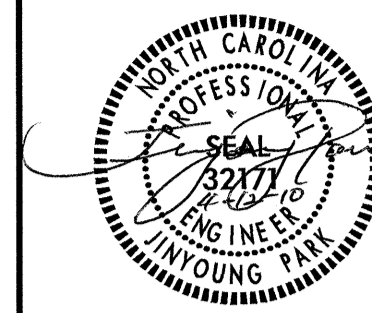
PREPARED BY: JYP DATE: 03/2010
 REVIEWED BY: JRB DATE: 03/2010

GEOTECHNICAL ENGINEERING UNIT
 EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

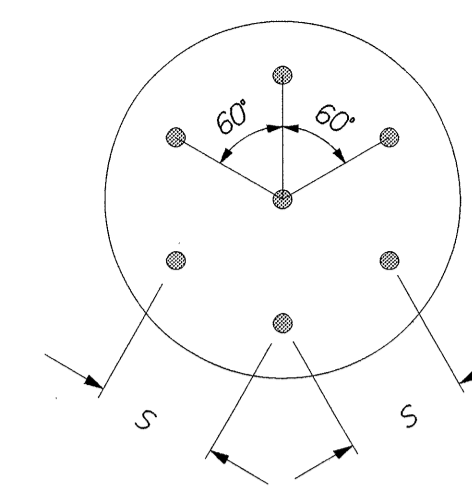
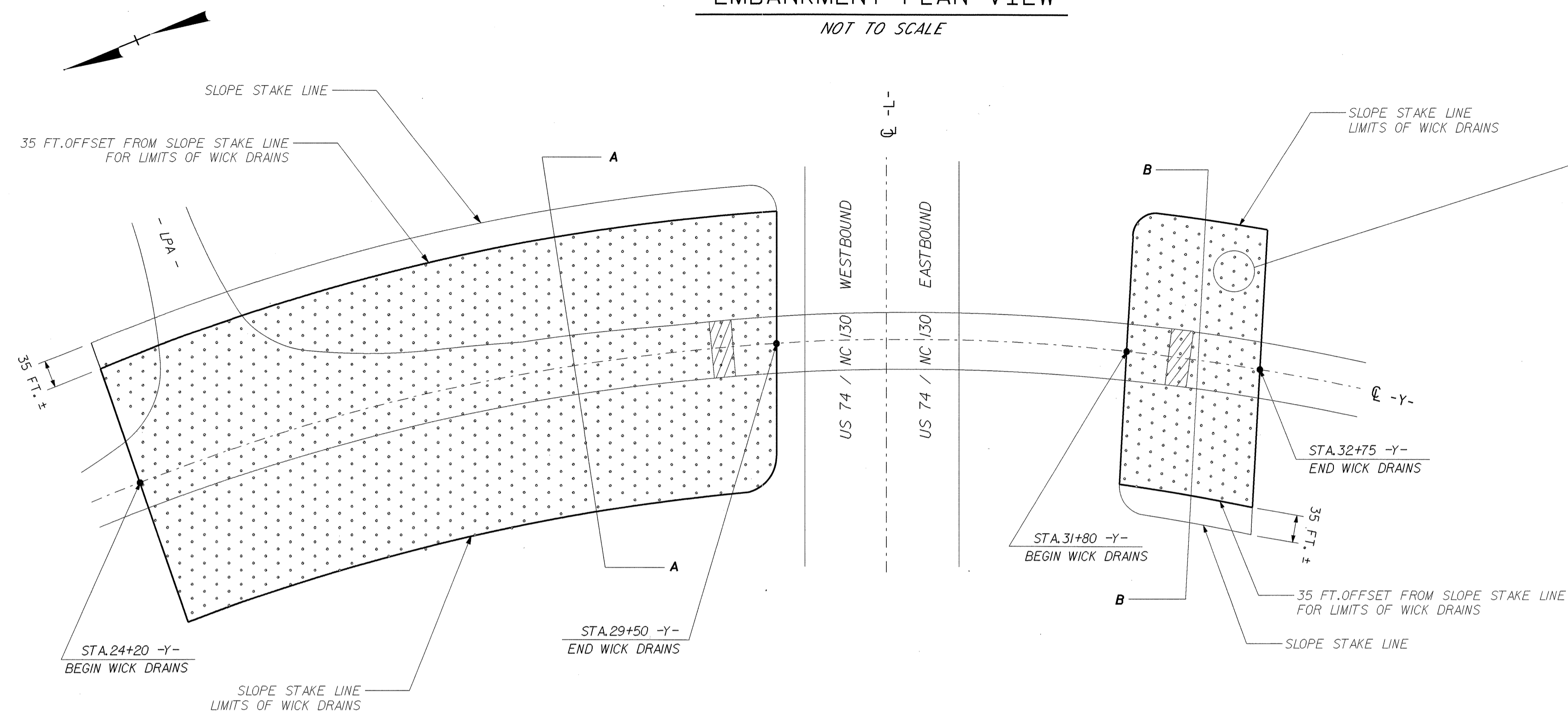
EMBANKMENT MONITORING DETAIL

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		



EMBANKMENT PLAN VIEW

NOT TO SCALE



FOR WICK DRAIN SPACING, S SEE TABLE

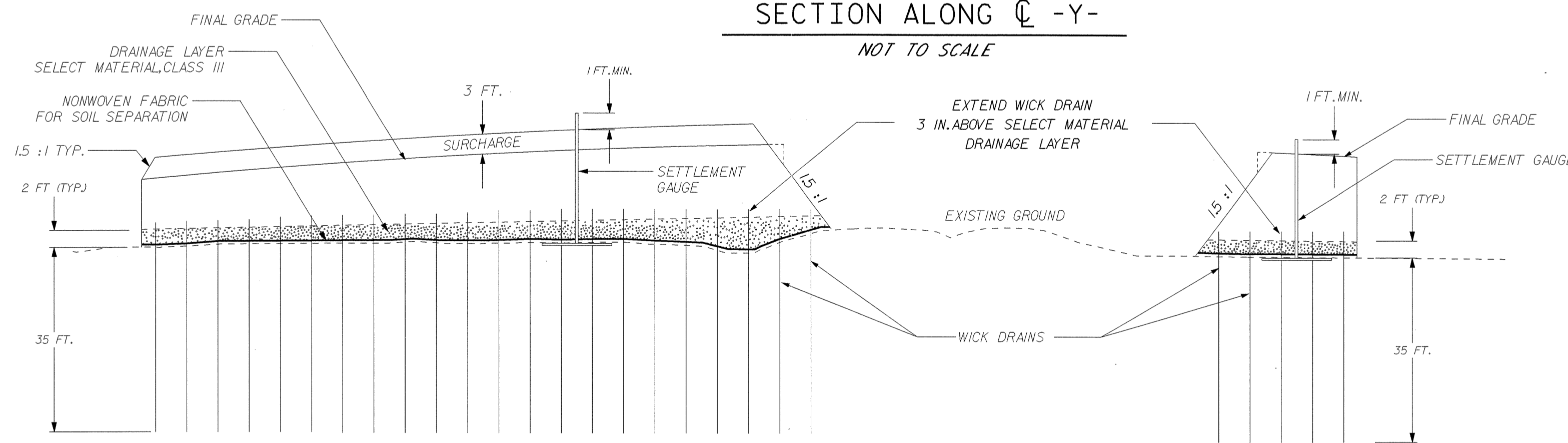
WICK DRAIN SYSTEM CONFIGURATION					
STATIONS		LINE	WICK DRAIN SPACING, S	MINIMUM SURCHARGE	MINIMUM WAITING PERIOD
FROM	TO				
24 + 20	26 + 00	- Y -	5 FT.	3.0 FT.	4 MONTH
26 + 00	29 + 50	- Y -	4 FT.	3.0 FT.	4 MONTH
31 + 80	32 + 75	- Y -	5 FT.	0.0 FT.	3 MONTH

NOTES

- FOR WICK DRAINS, SEE INSTALLATION OF VERTICAL WICK DRAINS AND DRAINAGE LAYER SPECIAL PROVISION.
- NONWOVEN FABRIC FOR SOIL SEPARATION SHALL BE PLACED ON EXISTING GROUND AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER. SEE NONWOVEN FABRIC FOR SOIL SEPARATION SPECIAL PROVISION.
- THE DRAINAGE LAYER OF SELECT MATERIAL CLASS III SHALL BE INSTALLED AS SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER.
- INSTALL WICK DRAINS AS DIRECTED BY PROVISIONS, PLANS, AND/OR ENGINEER AFTER THE SELECT BACKFILL HAS BEEN PLACED AND COMPACTED. WICK DRAINS SHALL PENETRATE THE BACKFILL AND SHALL BE INSTALLED TO THE LENGTH SHOWN ON THE PLANS AND/OR DIRECTED BY THE ENGINEER.
- PRE-AUGERING MAY BE REQUIRED TO INSTALL THE WICK DRAINS. IF PRE-AUGERING IS NECESSARY, THE COST OF PRE-AUGERING IS INCIDENTAL TO THE COST OF THE WICK DRAINS.
- CONSTRUCT EMBANKMENT TO THE FINAL GRADE.
- INSTALL SURCHARGE MATERIAL AS SHOWN ON THE PLANS. SEE SURCHARGE PLACEMENT, MAINTENANCE AND REMOVAL SPECIAL PROVISION.
- MAINTAIN THE SURCHARGE OR EMBANKMENT ELEVATIONS THROUGHOUT THE WAITING PERIODS.
- FOR SETTLEMENT GAUGE, SEE EMBANKMENT MONITORING SPECIAL PROVISION AND EMBANKMENT MONITORING DETAIL SHEET.
- WAITING PERIOD BEGINS AFTER INSTALLING SURCHARGE OR EMBANKMENT.
- PROTECT 1.5 : 1 FILL BRIDGE END SLOPE AS NEEDED TO PREVENT SLOUGHING FAILURE.

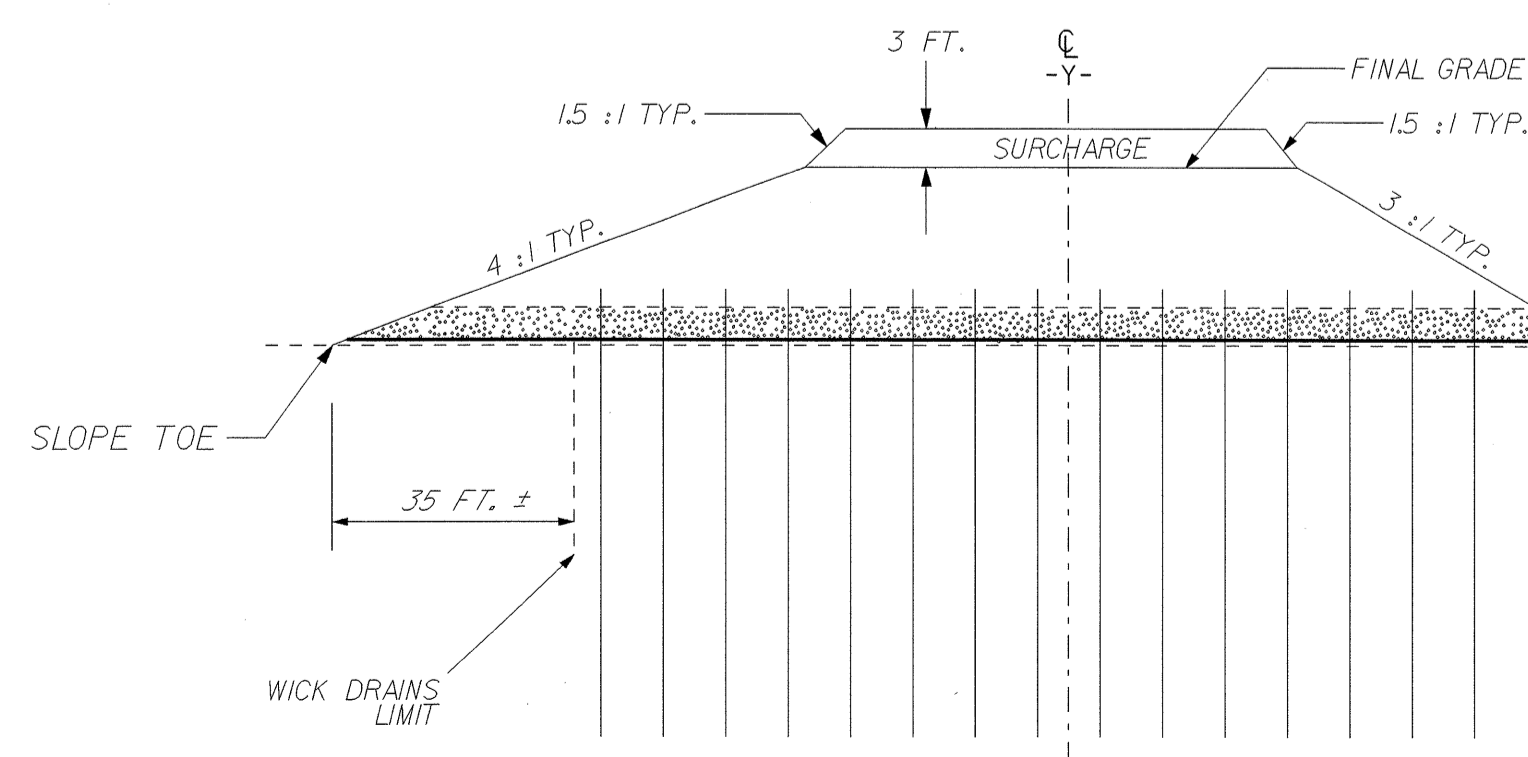
SECTION ALONG C-Y-

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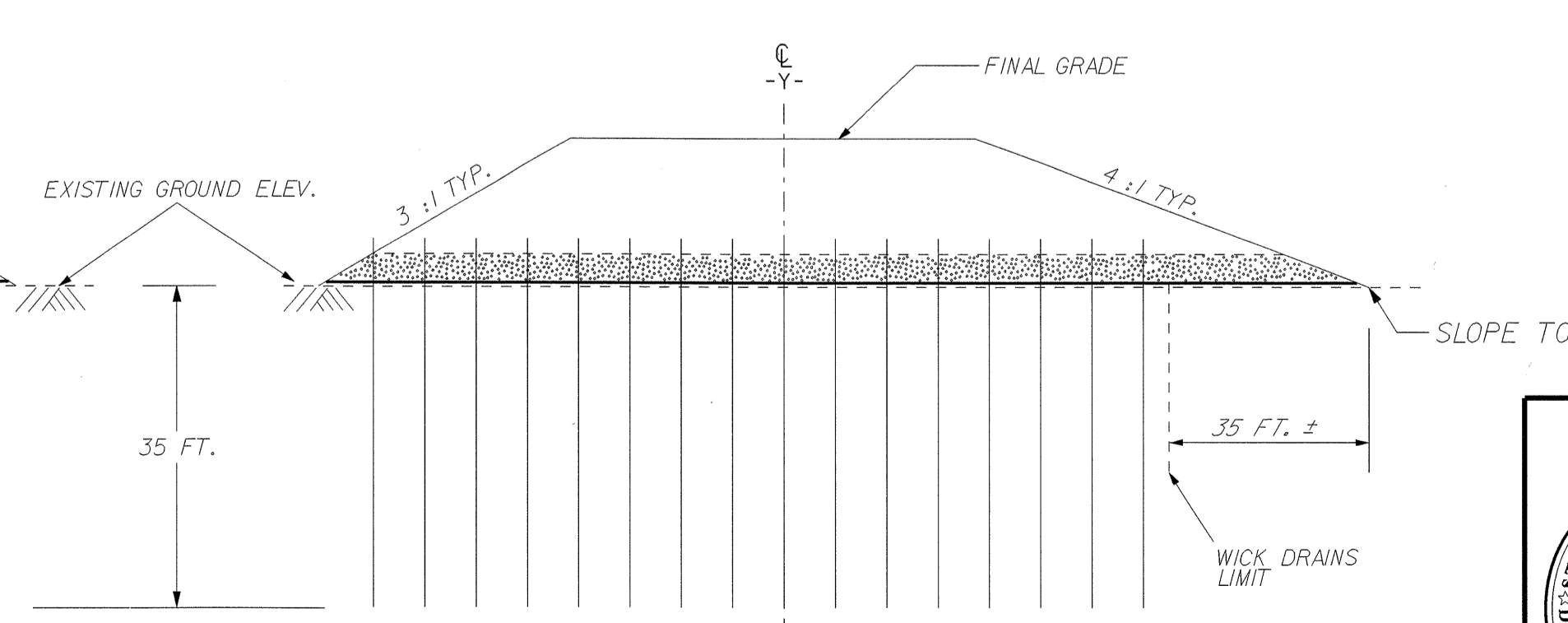
A-A CROSS SECTION

NOT TO SCALE



B-B CROSS SECTION

NOT TO SCALE



ESTIMATED QUANTITIES

WICK DRAINS	306,000 FT.
SELECT MATERIAL, CLASS III	11,100 CY.
NONWOVEN FABRIC FOR SOIL SEPARATION	16,600 SY.
BORROW EXCAVATION (FOR SURCHARGE)	3,500 CY.
UNCLASSIFIED EXCAVATION (FOR SURCHARGE)	4,100 CY.

GEOTECHNICAL ENGINEERING UNIT
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GROUND IMPROVEMENT WITH WICK DRAINS

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

PREPARED BY: JYP DATE: 03/2010
 REVIEWED BY: JRB DATE: 03/2010

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202441

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	
0000100000-N	800	Lump Sum		MOBILIZATION																
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING																
0001000000-E	200	Lump Sum		CLEARING & GRUBBING .. ACRE(S)																
0008000000-E	200	2	ACR	SUPPLEMENTARY CLEARING & GRUBBING	1693000000-E	654	200	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR	4110000000-N	904	9	EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)	6037000000-E	SP	30	SY	COIR FIBER MAT	
0022000000-E	225	28,000	CY	UNCLASSIFIED EXCAVATION	1840000000-E	665	18,000	LF	MILLED RUMBLE STRIPS (ASPHALT CEMENT CONCRETE)	4114000000-N	904	2	EA	SIGN ERECTION, MILEMARKERS	6038000000-E	SP	850	SY	PERMANENT SOIL REINFORCEMENT MAT	
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (30+69.95)	2070000000-N	SP	3	EA	SUBDRAIN PIPE OUTLETS	4152000000-N	907	6	EA	DISPOSAL OF SIGN SYSTEM, STEEL BEAM	6042000000-E	1632	1,600	LF	1/4" HARDWARE CLOTH	
0036000000-E	225	19,100	CY	UNDERCUT EXCAVATION	2209000000-E	838	11.8	CY	ENDWALLS	4155000000-N	907	43	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	6070000000-N	SP	6	EA	SPECIAL STILLING BASINS	
0084000000-E	SP	306,000	LF	WICK DRAINS	2253000000-E	840	4.21	CY	PIPE COLLARS	4400000000-E	1110	800	SF	WORK ZONE SIGNS (STATIONARY)	6071010000-E	SP	1,450	LF	WATTLE	
0106000000-E	230	362,000	CY	BORROW EXCAVATION	2264000000-E	840	0.045	CY	PIPE PLUGS	4405000000-E	1110	335	SF	WORK ZONE SIGNS (PORTABLE)	6071020000-E	SP	500	LB	POLYACRYLAMIDE (PAM)	
0127000000-N	SP	11	EA	EMBANKMENT SETTLEMENT GAUGES	2286000000-N	840	20	EA	MASONRY DRAINAGE STRUCTURES	4410000000-E	1110	170	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)	6071030000-E	SP	11,770	LF	COIR FIBER BAFFLES	
0134000000-E	240	350	CY	DRAINAGE DITCH EXCAVATION	2308000000-E	840	22.86	LF	MASONRY DRAINAGE STRUCTURES	4415000000-N	1115	1	EA	FLASHING ARROW PANELS, TYPE C	6071050000-E	SP	1	EA	*** SKIMMER (1-1/2")	
0156000000-E	250	16,000	SY	REMOVAL OF EXISTING ASPHALT PAVEMENT	2364000000-N	840	3	EA	FRAME WITH TWO GRATES, STD 840.16	4415000000-N	1115	1	EA	FLASHING ARROW PANELS, TYPE C	6084000000-E	1660	69	ACR	SEEDING & MULCHING	
0177000000-E	250	1,300	SY	BREAKING OF EXISTING ASPHALT PAVEMENT	2365000000-N	840	10	EA	FRAME WITH TWO GRATES, STD 840.22	4420000000-N	1120	2	EA	CHANGEABLE MESSAGE SIGN	6087000000-E	1660	75	ACR	MOWING	
0195000000-E	SP	33,700	CY	SELECT GRANULAR MATERIAL	2367000000-N	840	4	EA	FRAME WITH TWO GRATES, STD 840.29	4422000000-N	1120	30	DAY	CHANGEABLE MESSAGE SIGN (SHORT TERM)	6090000000-E	1661	650	LB	SEED FOR REPAIR SEEDING	
0196000000-E	270	6,200	SY	FABRIC FOR SOIL STABILIZATION	2374000000-N	840	2	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)	4430000000-N	1130	150	EA	DRUMS	6093000000-E	1661	2.5	TON	FERTILIZER FOR REPAIR SEEDING	
0199000000-E	SP	1,050	SF	TEMPORARY SHORING	2374000000-N	840	1	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	4435000000-N	1135	50	EA	CONES	6096000000-E	1662	1,725	LB	SEED FOR SUPPLEMENTAL SEEDING	
0223000000-E	SP	340	SY	ROCK PLATING	2374000000-N	840	1	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)	4445000000-E	1145	100	LF	BARRICADES (TYPE III)	6108000000-E	1665	51.25	TON	FERTILIZER TOPDRESSING	
0234000000-E	SP	11,100	CY	GENERIC GRADING ITEM SELECT MATERIAL, CLASS III	2396000000-N	840	4	EA	FRAME WITH COVER, STD 840.54	4450000000-N	1150	75	MD	FLAGGER	6114500000-N	SP	30	MHR	SPECIALIZED HAND MOWING	
0241000000-E	SP	16,600	SY	GENERIC GRADING ITEM NONWOVEN FABRIC FOR SOIL SEPARATION	2451000000-N	852	2	EA	CONCRETE TRANSITIONAL SECTION FOR DROP INLETS	4465000000-N	1160	10	EA	TEMPORARY CRASH CUSHIONS	6117000000-N	SP	27	EA	RESPONSE FOR EROSION CONTROL	
0320000000-E	SP	1,236	SY	FOUNDATION CONDITIONING FABRIC	2484000000-E	SP	18	LF	GENERIC DRAINAGE ITEM 6" OUTLET PIPE (SUBDRAINS)	4480000000-N	1165	1	EA	TMIA	6123000000-E	1670	1.5	ACR	REFORESTATION	
0330000000-E	SP	394	TON	GENERIC DRAINAGE ITEM FOUNDATION CONDITIONING MATERIAL, MINOR STRS	2484000000-E	SP	1,500	LF	GENERIC DRAINAGE ITEM 6" PERFORATED SUBDRAIN PIPE	4485000000-E	1170	2,800	LF	PORTABLE CONCRETE BARRIER	6138000000-E	SP	72,000	CY	GENERIC EROSION CONTROL ITEM BORROW PIT DEWATERING BASIN	
0448300000-E	SP	184	LF	18" RC PIPE CULVERTS, CLASS IV	2495000000-E	SP	504	CY	GENERIC DRAINAGE ITEM SUBDRAIN EXCAVATION	4685000000-E	1205	30,983	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)						
0448500000-E	SP	588	LF	30" RC PIPE CULVERTS, CLASS IV	2495000000-E	SP	252	CY	GENERIC DRAINAGE ITEM SUBDRAIN FINE AGGREGATE	4686000000-E	1205	9,609	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)						
0986000000-E	SP	408	LF	GENERIC PIPE ITEM 15" CAA PIPE CULVERTS, 0.064" THICK	2549000000-E	846	1,700	LF	2'-6" CONCRETE CURB & GUTTER	4695000000-E	1205	3,274	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)						
0986000000-E	SP	256	LF	GENERIC PIPE ITEM 15" RC PIPE CULVERTS, CLASS III	2556000000-E	846	820	LF	SHOULDER BERM GUTTER	4710000000-E	1205	104	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)						
0986000000-E	SP	20	LF	GENERIC PIPE ITEM 15" SIDE DRAIN PIPE	2612000000-E	848	60	SY	6" CONCRETE DRIVEWAY	4725000000-E	1205	32	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)						
0986000000-E	SP	652	LF	GENERIC PIPE ITEM 18" RC PIPE CULVERTS, CLASS III	2647000000-E	852	1,000	SY	5' MONOLITHIC CONCRETE ISLANDS (SURFACE MOUNTED)	4770000000-E	1205	1,228	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (III)						
0986000000-E	SP	456	LF	GENERIC PIPE ITEM 24" RC PIPE CULVERTS, CLASS III	2738000000-E	SP	16	SY	GENERIC PAVING ITEM 3" CONCRETE ISLAND COVER	4810000000-E	1205	197,570	LF	PAINT PAVEMENT MARKING LINES (4")						
0986000000-E	SP	1,076	LF	GENERIC PIPE ITEM 30" RC PIPE CULVERTS, CLASS III	2995000000-N	SP	4	EA	GENERIC DRAINAGE ITEM CONVERT DROP INLET TO 2 GRATE INLET	4820000000-E	1205	6,560	LF	PAINT PAVEMENT MARKING LINES (8")						
0986000000-E	SP	24	LF	GENERIC PIPE ITEM 48" RC PIPE CULVERTS, CLASS III	3000000000-N	SP	2	EA	IMPACT ATTENUATOR UNIT, TYPE 350	4835000000-E	1205	100	LF	PAINT PAVEMENT MARKING LINES (24")						
0992000000-E	SP	10	EA	GENERIC PIPE ITEM 15" CAA PIPE ELBOWS, 0.064" THICK	3030000000-E	862	3,300	LF	STEEL BM GUARDRAIL	4845000000-N	1205	44	EA	PAINT PAVEMENT MARKING SYMBOL						
0995000000-E	340	298	LF	PIPE REMOVAL	3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS	4900000000-N	1251	481	EA	PERMANENT RAISED PAVEMENT MARKERS						
1000000000-E	462	45	SY	6" SLOPE PROTECTION	3210000000-N	862	3	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1	4935000000-N	1267	30	EA	FLEXIBLE DELINEATORS (CRYSTAL)						
1011000000-N	500	Lump Sum		FINE GRADING	3270000000-N	SP	9	EA	GUARDRAIL ANCHOR UNITS, TYPE 350	4940000000-N	1267	30	EA	FLEXIBLE DELINEATORS (YELLOW)						
1110000000-E	510	6,300	TON	STABILIZER AGGREGATE	3317000000-N	862	8	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77	4945000000-N	1267	10	EA	FLEXIBLE DELINEATORS (CRYSTAL & RED)						
1121000000-E	520	14,700	TON	AGGREGATE BASE COURSE	3360000000-E	863	256	LF	REMOVE EXISTING GUARDRAIL	4950000000-N	1267	10	EA	FLEXIBLE DELINEATORS (YELLOW & RED)						
1220000000-E	545	100	TON	INCIDENTAL STONE BASE	3503000000-E	866	5,400	LF	WOVEN WIRE FENCE, 47" FABRIC	5325800000-E	1510	227	LF	8" WATER LINE						
1275000000-E	600	9,800	GAL	PRIME COAT	3509000000-E	866	350	EA	4" TIMBER FENCE POSTS, 7'-6" LONG	5672000000-N	1515	1	EA	RELOCATE FIRE HYDRANT						
1489000000-E	610	1,750	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B	3515000000-E	866	75	EA	5" TIMBER FENCE POSTS, 8'-0" LONG	6000000000-E	1605	30,800	LF	TEMPORARY SILT FENCE						
1491000000-E	610	5,600	TON	ASPHALT CONC BASE COURSE, TYPE B25.0C	3628000000-E	876	350	TON	RIP RAP, CLASS I	6006000000-E	1610	1,260	TON	STONE FOR EROSION CONTROL, CLASS A						
1503000000-E	610	3,300	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C	3649000000-E	876	150	TON	RIP RAP, CLASS B	6009000000-E	1610	5,550	TON	STONE FOR EROSION CONTROL, CLASS B						
1523000000-E	610	7,700	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	3656000000-E	876	1,960	SY	FILTER FABRIC FOR DRAINAGE	6012000000-E	1610	3,450	TON	SEDIMENT CONTROL STONE						
1525000000-E	610	4,500	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A	3659000000-N	SP	1	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON	6015000000-E	1615	82	ACR	TEMPORARY MULCHING						
1560000000-E	620	765	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22	4048000000-E	902	11	CY	REINFORCED CONCRETE SIGN FOUNDATIONS	6018000000-E	1620	1,650	LB	SEED FOR TEMPORARY SEEDING						
1565000000-E	620	465	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22	4060000000-E	903	8,641	LB	SUPPORTS, BREAKAWAY STEEL BEAM	6021000000-E	1620	7.75	TON	FERTILIZER FOR TEMPORARY SEEDING						
					4072000000-E	903	1,477	LF	SUPPORTS, 3-LB STEEL U-CHANNEL	6024000000-E	1622	10,000	LF	TEMPORARY SLOPE DRAINS						
					4078000000-E	903	2	EA	SUPPORTS, 2-LB STEEL U-CHANNEL	6027000000-N	1622	175	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS						
					4096000000-N	904	9	EA	SIGN ERECTION, TYPE D	6029000000-E	SP	17,600	LF	SAFETY FENCE						
					4102000000-N	904	42	EA	SIGN ERECTION, TYPE E	6030000000-E	1630	5,805	CY	SILT EXCAVATION						
					4108000000-N	904	12	EA	SIGN ERECTION, TYPE F	6036000000-E	1631	30,000	SY	MATTING FOR EROSION CONTROL						

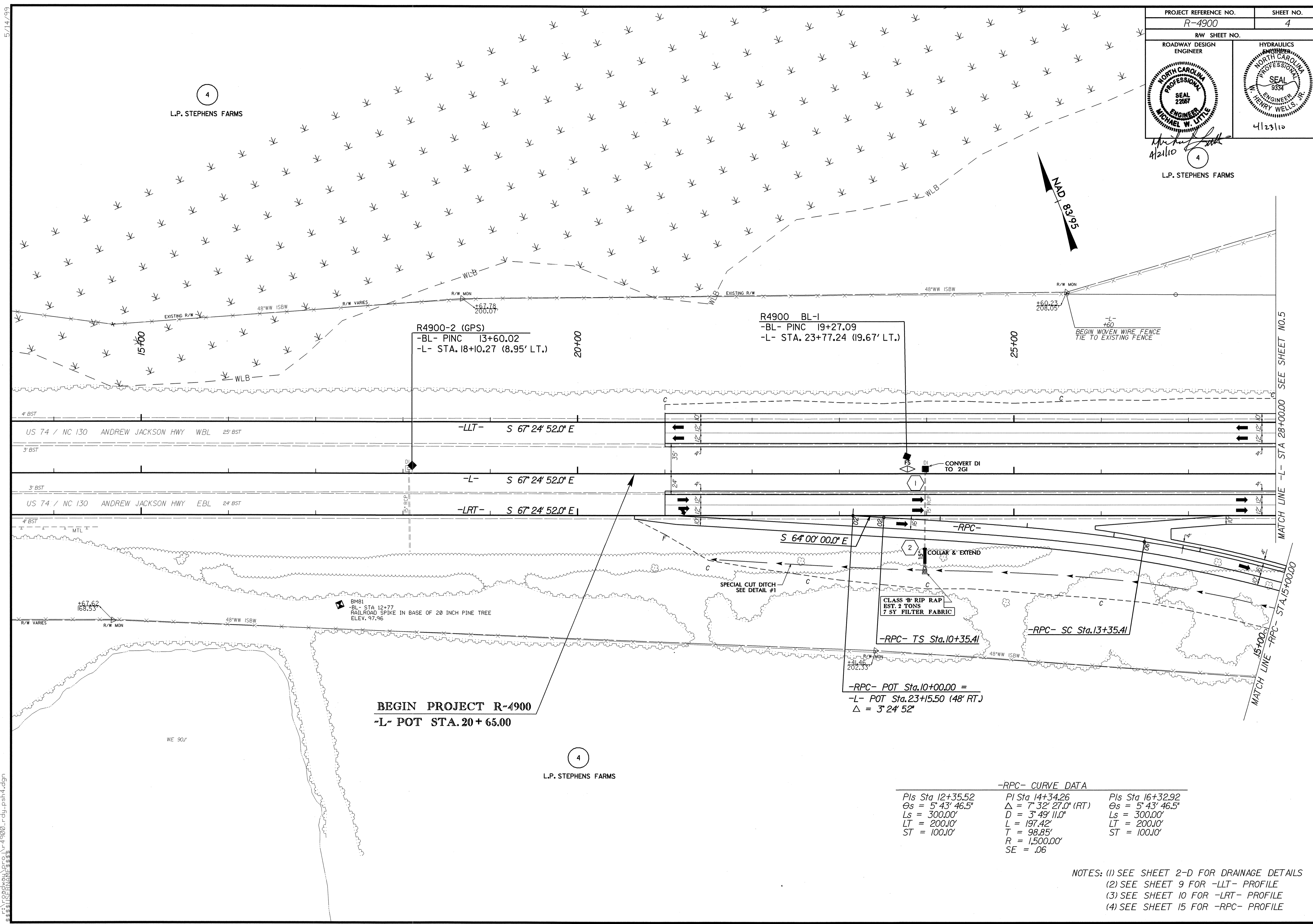
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STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
SUMMARY OF EARTHWORK
 IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+ %	BORROW	WASTE
-L- STA. 20+65.00 TO -L- STA. 64+38.00	17,386		20,370	2,984	
SUBTOTAL 1	17,386		20,370	2,984	
-Y- STA. 18+00.00 TO -Y- STA. 29+14.90	54	5,880	103,365	103,311	5,880
-LPA- STA. 13+50.00 TO -LPA- STA. 23+85.23	584		108,584	108,000	
-RPA- STA. 15+50.00 TO -RPA- STA. 24+00.00			18,274	18,274	
-SR- STA. 18+00.00 TO -SR- STA. 22+30.00	155	700	435	311	731
SUBTOTAL 2	793	6,580	230,658	229,896	6,611
-Y- STA. 32+25.00 TO -Y- STA. 48+00.00	1,157	10,820	82,291	81,134	10,820
-LPC- STA. 13+00.00 TO -LPC- STA. 20+25.37	270		10,701	10,431	
-RPC- STA. 15+00.00 TO -RPC- STA. 25+00.00	3,972		6,355	2,383	
-Y1- STA. 10+12.02 TO -Y1- STA. 12+50.00	66		601	535	
SUBTOTAL 3	5,465	10,820	99,948	94,483	10,820
PROJECT SUBTOTAL	23,644	17,400	350,976	327,363	17,431
SHOULDER CONSTRUCTION			13,375	13,375	
ADDITIONAL UNDERCUT		1,700			1,700
SURCHARGE	4,100		3,500	3,500	4,100
PROJECT TOTAL	27,744	19,100	367,851	344,238	23,231
EST. 5 % TO REPLACE TOPSOIL ON BORROW PIT				17,212	
GRAND TOTAL	27,744			361,450	
SAY	28,000 CY			362,000 CY	

EST. DDE = 350 Cubic Yards

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



4
L.P. STEPHENS FARMS

4
L.P. STEPHENS FARMS

4
L.P. STEPHENS FARMS

BEGIN PROJECT R-4900
-L- POT STA. 20 + 65.00

R4900 BL-1
-BL- PINC 19+27.09
-L- STA. 23+77.24 (19.67' LT.)

R4900-2 (GPS)
-BL- PINC 13+60.02
-L- STA. 18+10.27 (8.95' LT.)

-RPC- POT Sta. 10+00.00 =
-L- POT Sta. 23+15.50 (48' RT.)
Δ = 3' 24' 52"

CLASS "B" RIP RAP
EST. 2 TONS
7 SY FILTER FABRIC

-RPC- TS Sta. 10+35.41

-RPC- SC Sta. 13+35.41

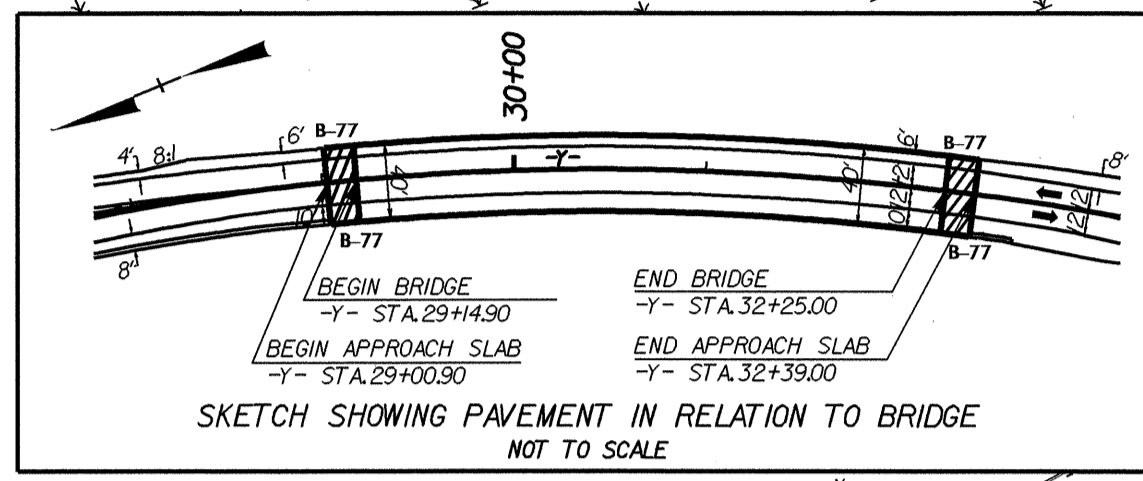
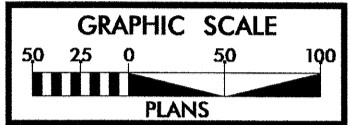
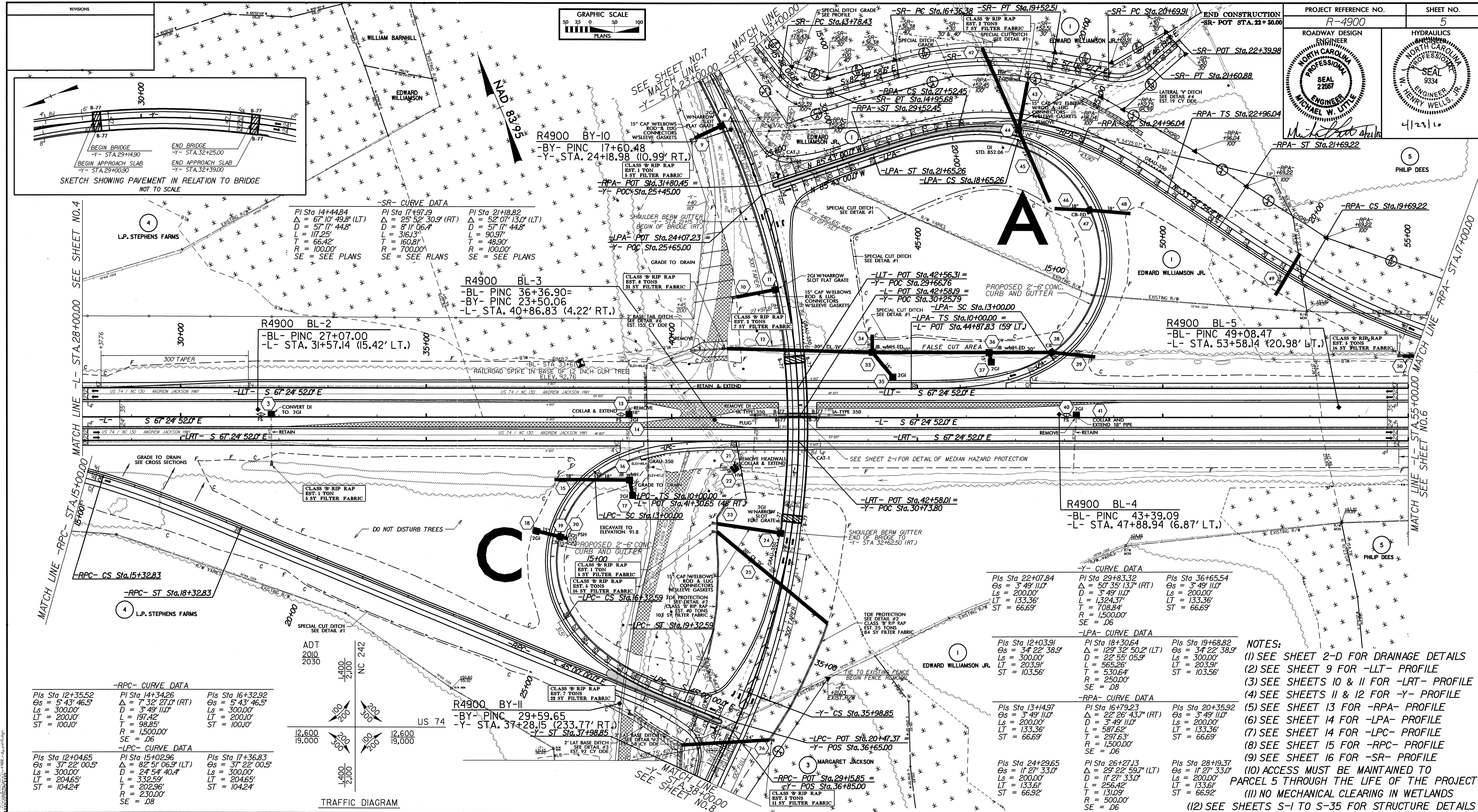
-RPC- CURVE DATA

Pls Sta 12+35.52	Pl Sta 14+34.26	Pls Sta 16+32.92
Os = 5' 43' 46.5"	Δ = 7' 32' 27.0" (RT)	Os = 5' 43' 46.5"
Ls = 300.00'	D = 3' 49' 11.0"	Ls = 300.00'
LT = 200.10'	L = 197.42'	LT = 200.10'
ST = 100.10'	T = 98.85'	ST = 100.10'
	R = 1,500.00'	
	SE = .06	

NOTES: (1) SEE SHEET 2-D FOR DRAINAGE DETAILS
(2) SEE SHEET 9 FOR -LLT- PROFILE
(3) SEE SHEET 10 FOR -LRT- PROFILE
(4) SEE SHEET 15 FOR -RPC- PROFILE

5/14/95

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MATCH LINE -L- STA. 28+00.00 SEE SHEET NO. 4

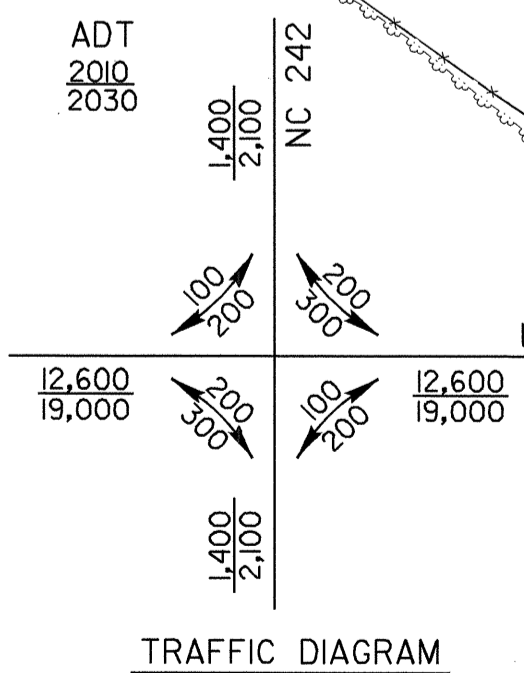
MATCH LINE -L- STA. 55+00.00 MATCH LINE -RPA- STA. 17+00.00

-RPC- CURVE DATA

Pls Sta 12+35.52 Os = 5'43'46.5" Ls = 300.0' LT = 200.0' ST = 100.0'	Pls Sta 14+34.26 Δ = 7'32'27.0" (RT) D = 3'49'11.0" L = 197.42' T = 98.85' R = 1,500.0' SE = .06	Pls Sta 16+32.92 Os = 5'43'46.5" Ls = 300.0' LT = 200.0' ST = 100.0'
----------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------

-LPC- CURVE DATA

Pls Sta 12+04.65 Os = 37'22'00.5" Ls = 300.0' LT = 204.65' ST = 104.24'	Pls Sta 15+02.96 Δ = 82'51'06.9" (LT) D = 24'54'40.4" L = 532.59' T = 202.96' R = 2,300.0' SE = .08	Pls Sta 17+36.83 Os = 37'22'00.5" Ls = 300.0' LT = 204.65' ST = 104.24'
-------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------



PROJECT REFERENCE NO. **R-4900** SHEET NO. **5**

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22657
MICHAEL W. LITTLE

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 9334
HENRY WELLS JR.

4/23/10

PHILIP DEES

- NOTES:**
- (1) SEE SHEET 2-D FOR DRAINAGE DETAILS
 - (2) SEE SHEET 9 FOR -LLT- PROFILE
 - (3) SEE SHEETS 10 & 11 FOR -LRT- PROFILE
 - (4) SEE SHEETS 11 & 12 FOR -Y- PROFILE
 - (5) SEE SHEET 13 FOR -RPA- PROFILE
 - (6) SEE SHEET 14 FOR -LPA- PROFILE
 - (7) SEE SHEET 14 FOR -LPC- PROFILE
 - (8) SEE SHEET 15 FOR -RPC- PROFILE
 - (9) SEE SHEET 16 FOR -SR- PROFILE
 - (10) ACCESS MUST BE MAINTAINED TO PARCEL 5 THROUGH THE LIFE OF THE PROJECT
 - (11) NO MECHANICAL CLEARING IN WETLANDS
 - (12) SEE SHEETS S-1 TO S-35 FOR STRUCTURE DETAILS

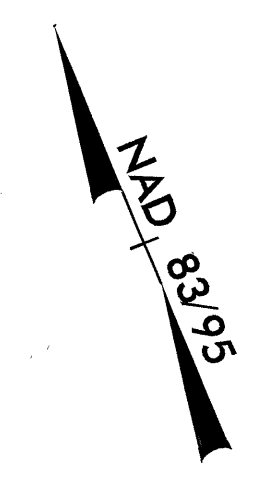
5/14/99

PROJECT REFERENCE NO. R-4900	SHEET NO. 6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER MICHAEL W. LITTLE SEAL 22567	HYDRAULICS ENGINEER TERRY WELLS, JR. SEAL 9334

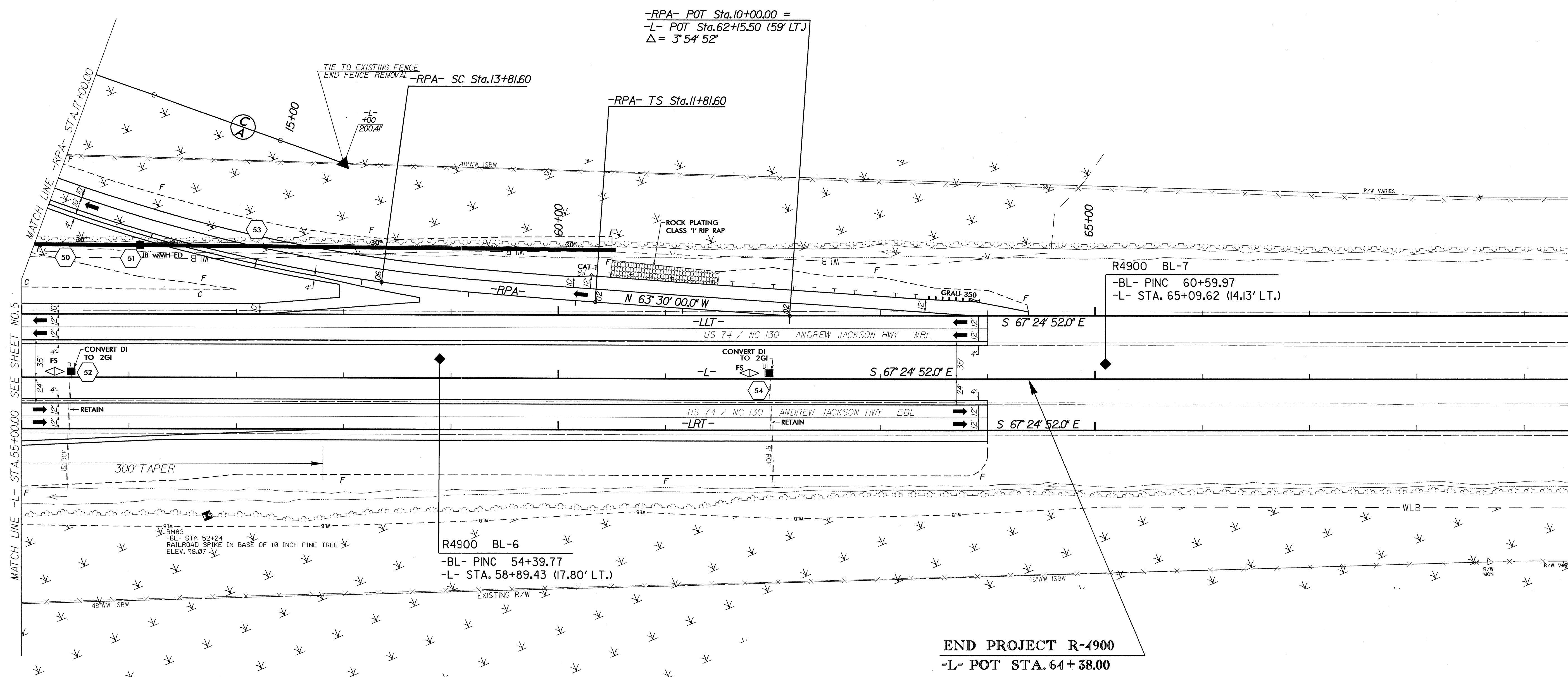
4/23/10

-RPA- CURVE DATA

Pls Sta 13+14.97	PI Sta 16+79.23	Pls Sta 20+35.92
$\theta_s = 3^\circ 49' 11.0''$	$\Delta = 22^\circ 26' 43.7''$ (RT)	$\theta_s = 3^\circ 49' 11.0''$
$L_s = 200.00'$	$D = 3^\circ 49' 11.0''$	$L_s = 200.00'$
$LT = 133.36'$	$L = 587.62'$	$LT = 133.36'$
$ST = 66.69'$	$T = 297.63'$	$ST = 66.69'$
	$R = 1,500.00'$	
	$SE = .06$	



5
PHILIP DEES



5
PHILIP DEES

END PROJECT R-4900
-L- POT STA. 64+38.00

MATCH LINE -L- STA. 55+00.00 SEE SHEET NO. 5

MATCH LINE -RPA- STA. 17+00.00

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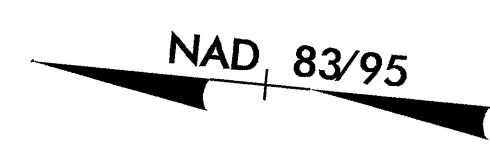
- NOTES: (1) SEE SHEET 2-D FOR DRAINAGE DETAILS
 (2) SEE SHEETS 9 & 10 FOR -LLT- PROFILE
 (3) SEE SHEET 11 FOR -LRT- PROFILE
 (4) SEE SHEET 13 FOR -RPA- PROFILE
 (5) SEE SHEET 2-H FOR ROCK PLATING DETAIL
 (6) NO MECHANICAL CLEARING IN WETLANDS

5/14/99

PROJECT REFERENCE NO. R-4900	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22557 MICHAEL W. LITTLE	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 9334 HENRY WELLS JR.
<i>Michael Little</i>	4/23/10

-Y- CURVE DATA
 Pls Sta 22+07.84 Pls Sta 29+83.32
 $\theta_s = 3^\circ 49' 11.0''$ $\Delta = 50^\circ 35' 13.7''$ (RT)
 $L_s = 200.00'$ $D = 3^\circ 49' 11.0''$
 $LT = 133.36'$ $L = 1,324.37'$
 $ST = 66.69'$ $T = 708.84'$
 $R = 1,500.00'$
 $SE = .06$

-SR- CURVE DATA
 Pls Sta 10+85.00
 $\Delta = 84^\circ 49' 43.2''$ (RT)
 $D = 114^\circ 35' 29.6''$
 $L = 74.03'$
 $T = 45.68'$
 $R = 50.00'$
 SE = SEE PLANS



R4900 BY-8
 -BY- POT 5+00.00
 -Y- STA. 11+58.39 (16.71' LT.)

R4900 BY-9
 -BY- PINC 12+46.73
 -Y- STA. 19+05.10 (21.26' LT.)
BEGIN CONSTRUCTION
 -Y- POT STA. 18+00.00

-SR- PT Sta. 11+13.35

-SR- PC Sta. 10+39.32

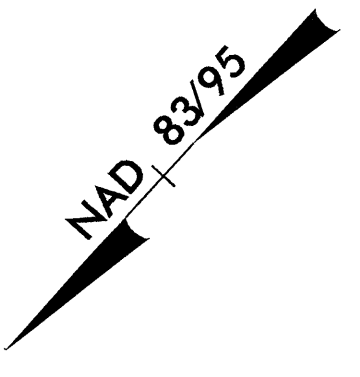
-SR- POT Sta. 10+00.00 =
 -Y- POT Sta. 20+70.00
 -Y- TS Sta. 20+74.48

- NOTES:**
- (1) SEE SHEET 2-D FOR DRAINAGE DETAILS
 - (2) SEE SHEET 11 FOR -Y- PROFILE
 - (3) SEE SHEET 16 FOR -SR- PROFILE
 - (4) ACCESS MUST BE MAINTAINED TO PARCEL 5 THROUGH THE LIFE OF THE PROJECT
 - (5) SEE SHEET 2-H FOR ROCK PLATING DETAIL
 - (6) NO MECHANICAL CLEARING IN WETLANDS
 - (7) SEE SHEET 2-J FOR STANDARD TEMPORARY SHORING

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-Y- CURVE DATA

Pls Sta 40+32.21 Cs = 3' 49' 11.0" Ls = 200.00' LT = 133.36' ST = 66.69'	Pls Sta 42+79.98 Δ = 13' 46' 13.7" (LT) D = 3' 49' 11.0" L = 360.51' T = 181.13' R = 1,500.00' SE = .06	Pls Sta 45+26.05 Cs = 3' 49' 11.0" Ls = 200.00' LT = 133.36' ST = 66.69'
--------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------



R4900 BY-13
-BY- POT 44+40.02
-Y- STA. 51+56.17 (15.85' RT.)
-Y- POT Sta. 51+75.49

END CONSTRUCTION
-Y- POT STA. 48+00.00

END CONSTRUCTION

-Y- POT Sta. 10+00.00 =
-Y- POS Sta. 45+29.51

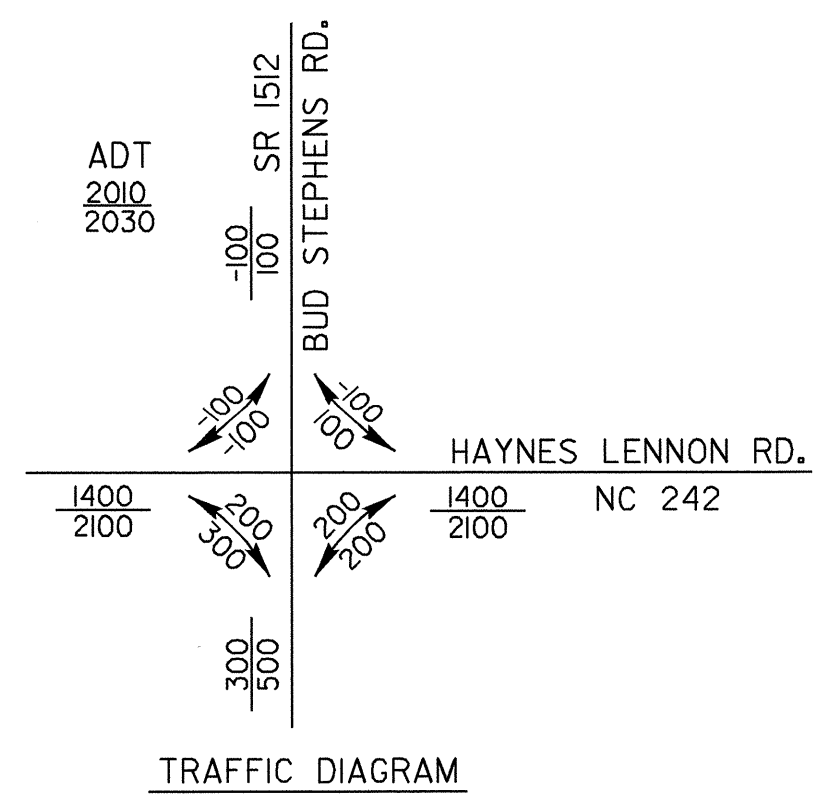
R4900 BY-12
-BY- PINC 37+60.56
-Y- STA. 44+77.93 (23.13' RT.)

-Y- CS Sta. 44+59.36

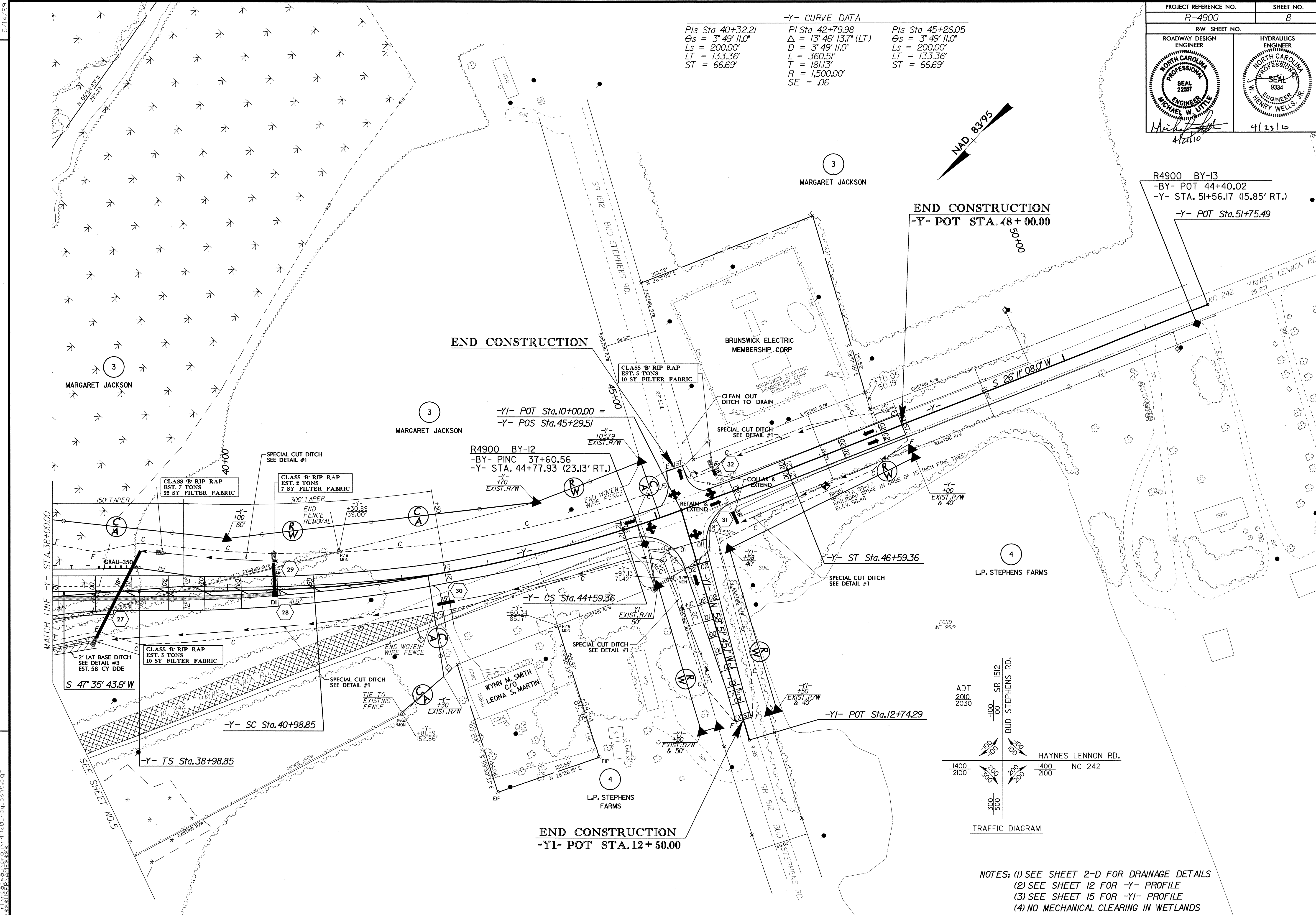
-Y- ST Sta. 46+59.36

-Y- POT Sta. 12+74.29

END CONSTRUCTION
-Y1- POT STA. 12+ 50.00



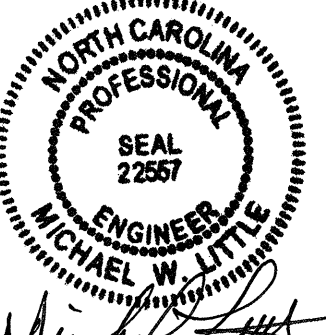
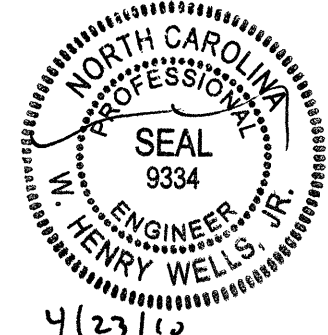
NOTES: (1) SEE SHEET 2-D FOR DRAINAGE DETAILS
(2) SEE SHEET 12 FOR -Y- PROFILE
(3) SEE SHEET 15 FOR -Y1- PROFILE
(4) NO MECHANICAL CLEARING IN WETLANDS

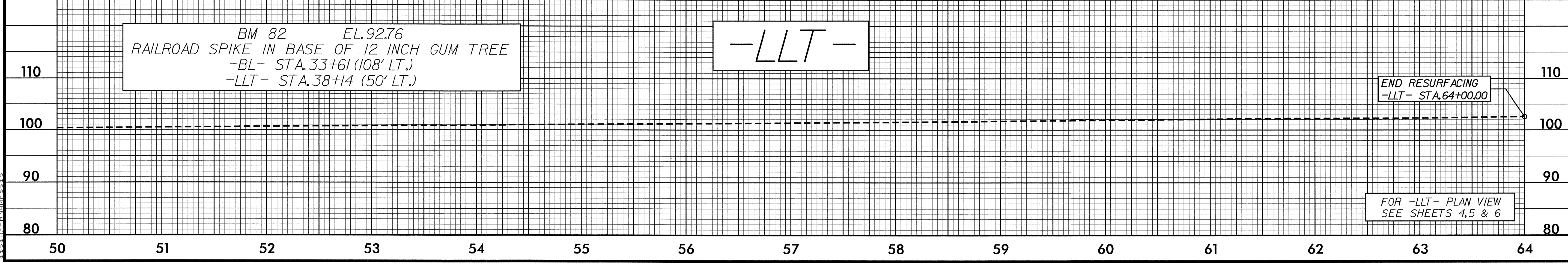
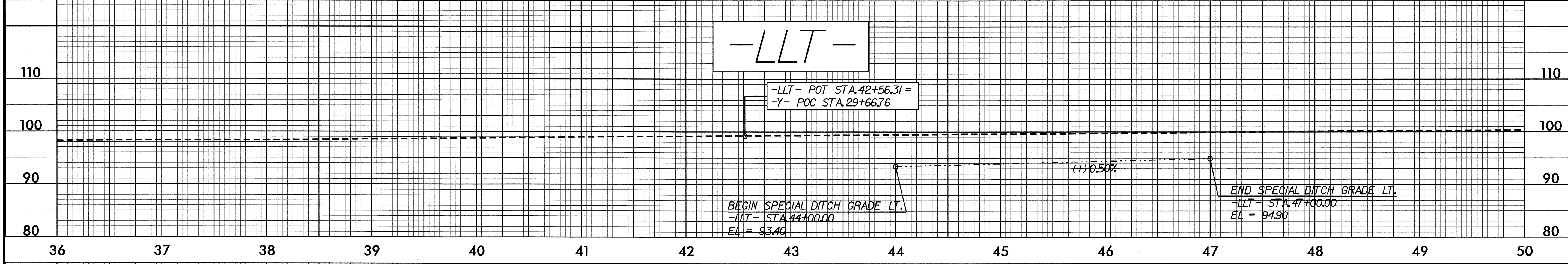
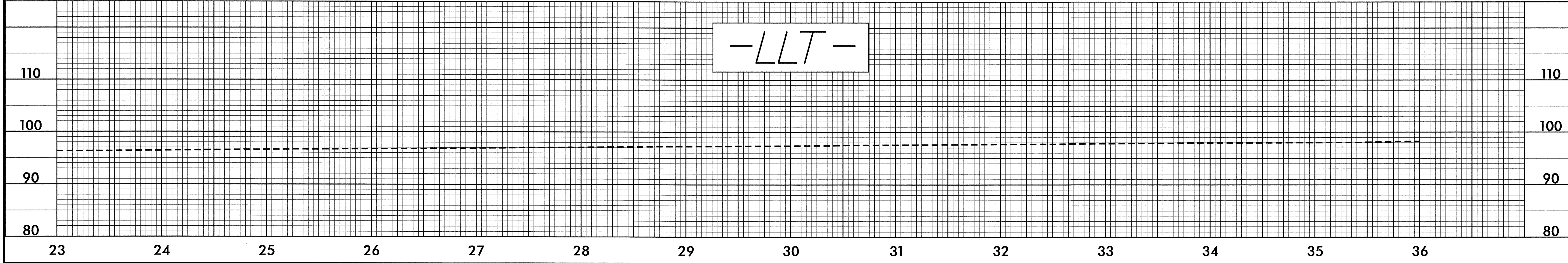
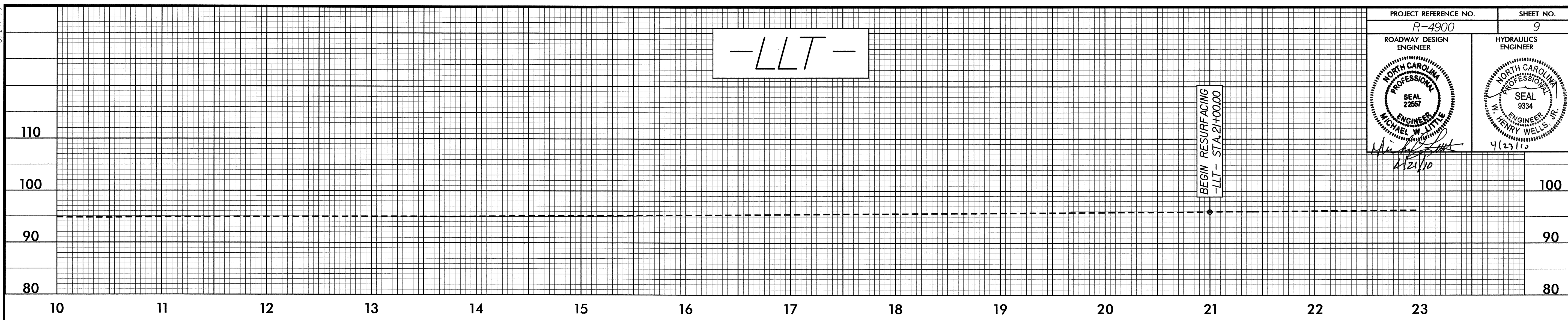


REVISIONS

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5/14/99

5/14/09

PROJECT REFERENCE NO. R-4900	SHEET NO. 9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	
<i>Michael W. Little</i> 4/24/10	4/27/10

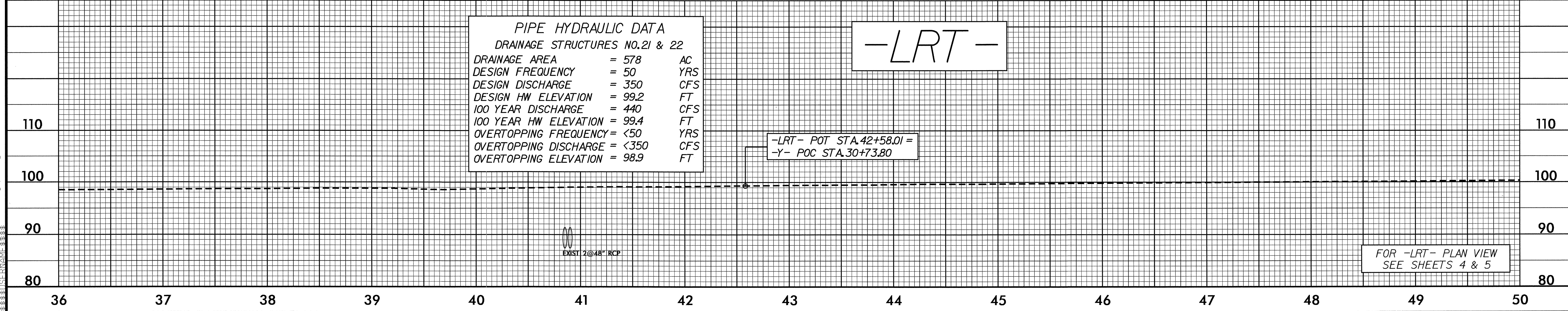
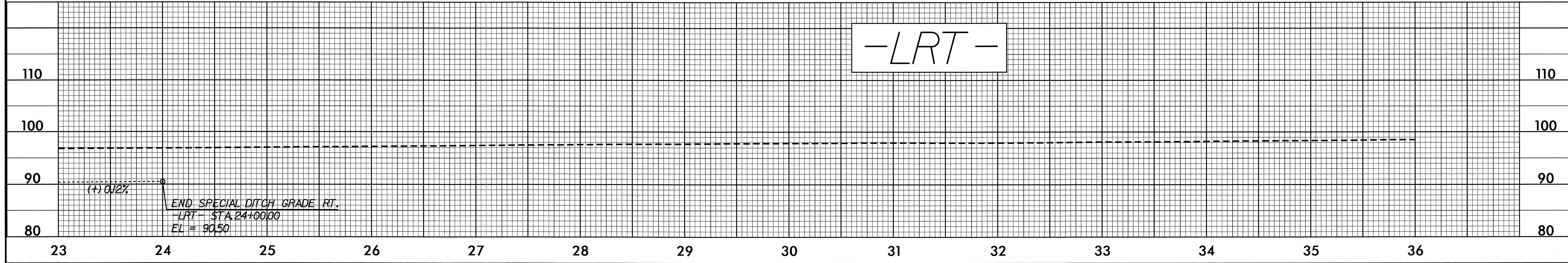
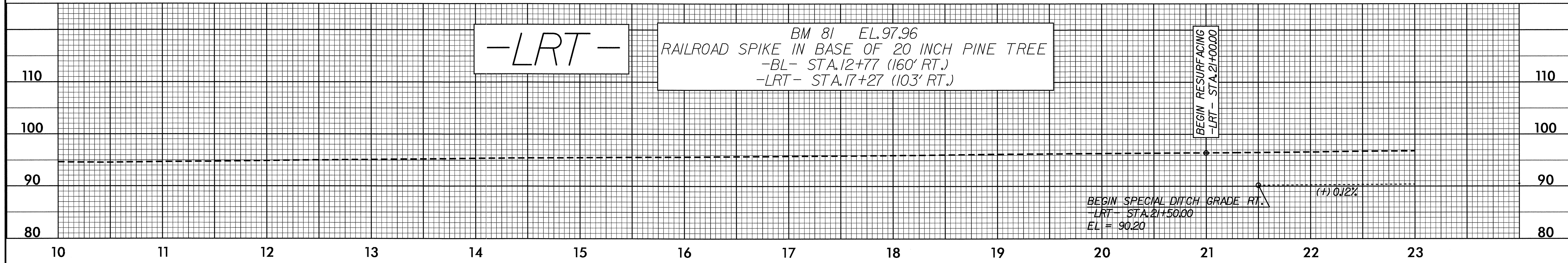
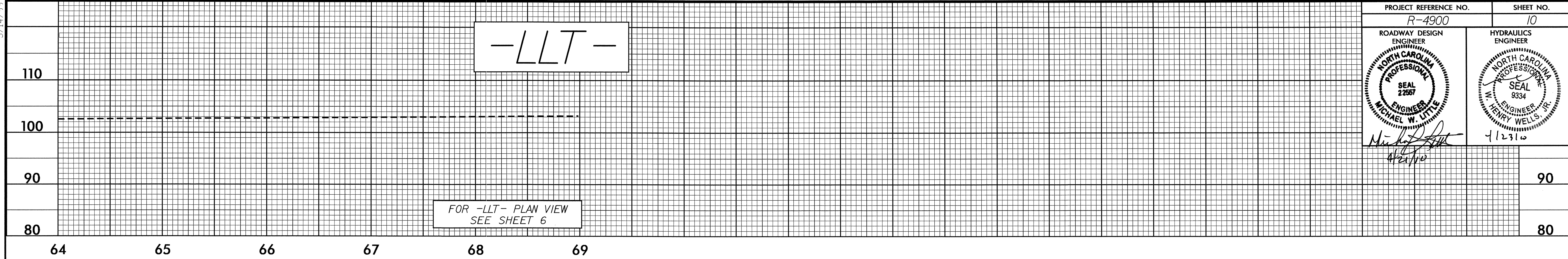


BM 82 EL. 92.76
RAILROAD SPIKE IN BASE OF 12 INCH GUM TREE
-BL- STA. 33+61 (108' LT.)
-LLT- STA. 38+14 (50' LT.)

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5/14/99

PROJECT REFERENCE NO. R-4900	SHEET NO. 10
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 2257 MICHAEL W. LITTLE	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 9334 HENRY WELLS, JR.
<i>Michael W. Little</i>	12310



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURES NO.21 & 22

DRAINAGE AREA	= 578	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 350	CFS
DESIGN HW ELEVATION	= 99.2	FT
100 YEAR DISCHARGE	= 440	CFS
100 YEAR HW ELEVATION	= 99.4	FT
OVERTOPPING FREQUENCY	= <50	YRS
OVERTOPPING DISCHARGE	= <350	CFS
OVERTOPPING ELEVATION	= 98.9	FT

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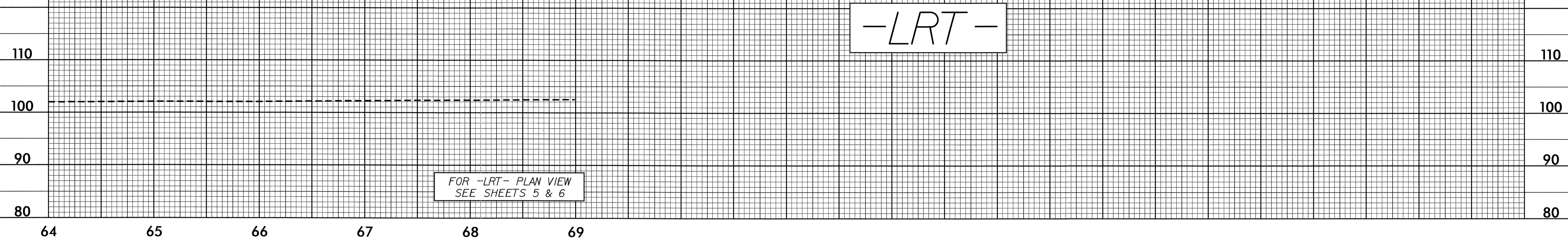
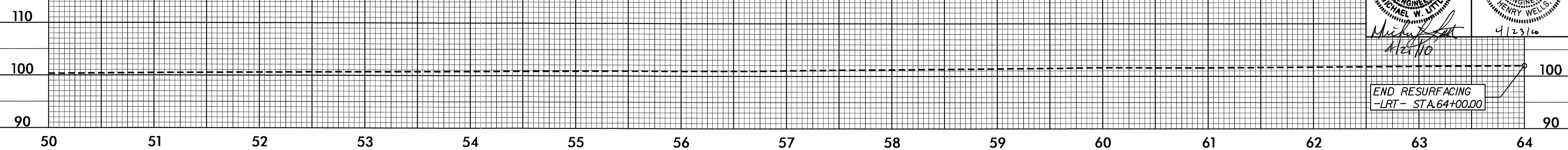
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BM 83 EL.98.07
RAILROAD SPIKE IN BASE OF 10 INCH PINE TREE
-BL- STA.52+24 (148' RT.)
-LRT- STA.56+73 (80' RT.)

-LRT-

PROJECT REFERENCE NO. R-4900	SHEET NO. 11
ROADWAY DESIGN ENGINEER MICHAEL W. LITTLE	HYDRAULICS ENGINEER HENRY WELLS JR.
<i>Michael W. Little</i>	4/23/00

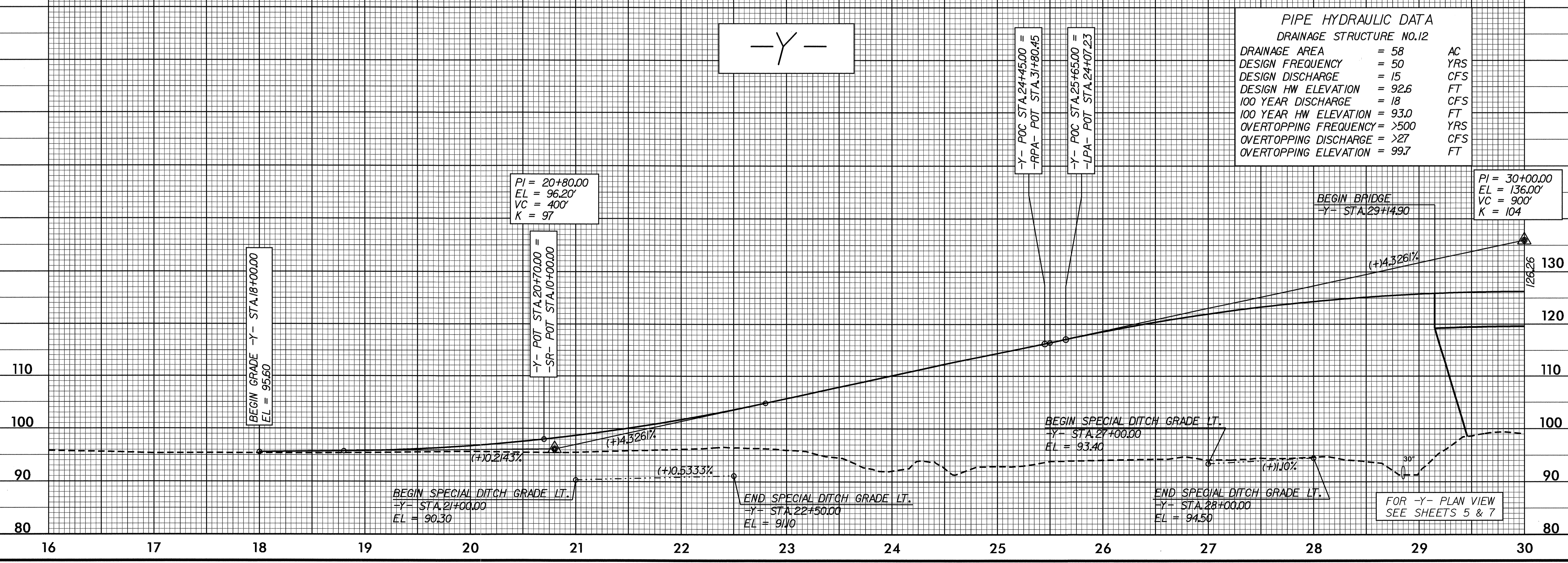
END RESURFACING
-LRT- STA.64+00.00



-Y-

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.12

DRAINAGE AREA	= 58	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 15	CFS
DESIGN HW ELEVATION	= 92.6	FT
100 YEAR DISCHARGE	= 18	CFS
100 YEAR HW ELEVATION	= 93.0	FT
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING DISCHARGE	= >27	CFS
OVERTOPPING ELEVATION	= 99.7	FT



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PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.25

DRAINAGE AREA	= 31	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 14	CFS
DESIGN HW ELEVATION	= 92.2	FT
100 YEAR DISCHARGE	= 17	CFS
100 YEAR HW ELEVATION	= 92.5	FT
OVERTOPPING FREQUENCY	= >25	YRS
OVERTOPPING DISCHARGE	= >500	CFS
OVERTOPPING ELEVATION	= 95.0	FT

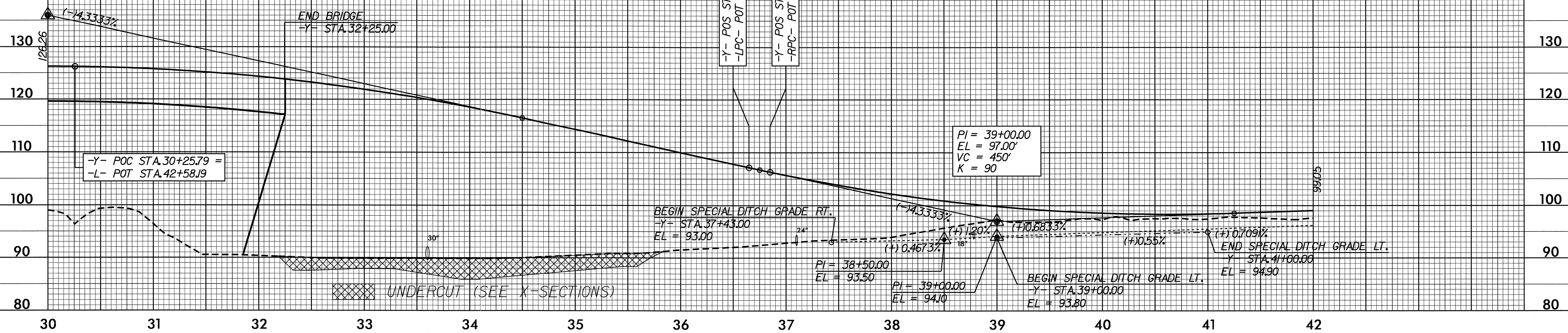
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.26

DRAINAGE AREA	= 20	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 9	CFS
DESIGN HW ELEVATION	= 94.5	FT
100 YEAR DISCHARGE	= 11	CFS
100 YEAR HW ELEVATION	= 94.8	FT
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING DISCHARGE	= >16	CFS
OVERTOPPING ELEVATION	= 98.31	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.27

DRAINAGE AREA	= 1	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 4J	CFS
DESIGN HW ELEVATION	= 97.4	FT
100 YEAR DISCHARGE	= 4.4	CFS
100 YEAR HW ELEVATION	= 97.5	FT
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING DISCHARGE	= >5J	CFS
OVERTOPPING ELEVATION	= 98.31	FT

PI = 30+00.00
EL = 136.00'
VC = 900'
K = 104

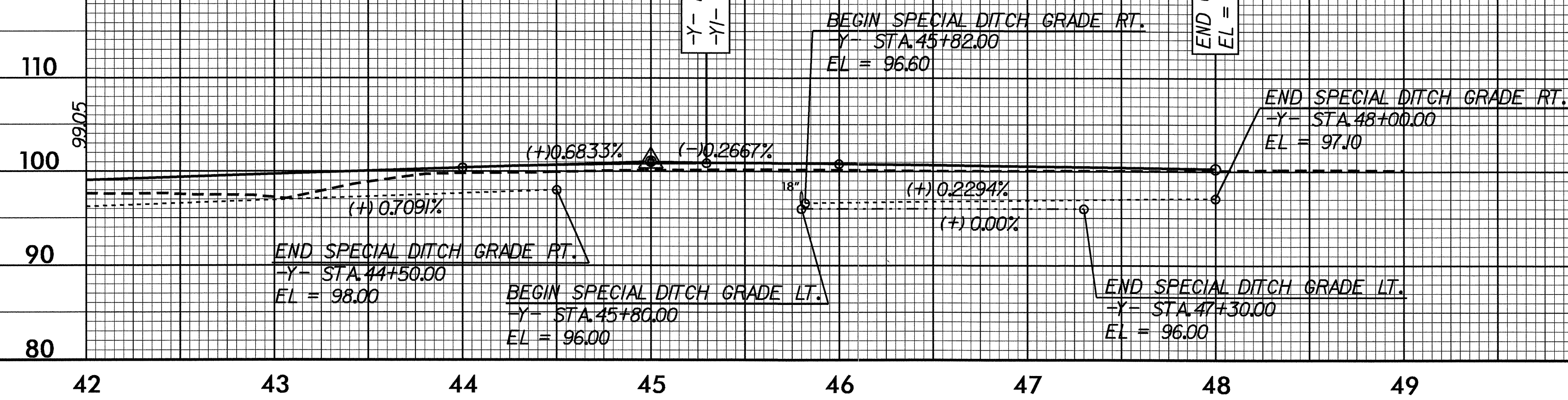


BM 85 EL. 98.48
RAILROAD SPIKE IN BASE OF 15 INCH PINE TREE
-BY- STA. 39+77 (14' RT.)
-Y- STA. 46+93 (33' RT.)

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.31

DRAINAGE AREA	= 0.85	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 3.5	CFS
DESIGN HW ELEVATION	= 97.7	FT
100 YEAR DISCHARGE	= 3.8	CFS
100 YEAR HW ELEVATION	= 97.8	FT
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING DISCHARGE	= >4.3	CFS
OVERTOPPING ELEVATION	= 100.3	FT

PI = 45+00.00
EL = 101.00'
VC = 200'
K = 211



FOR -Y- PLAN VIEW
SEE SHEETS 5 & 8

5/14/16 24-MAR-2010 14:22 -4900-rdy-pl.dgn

5/14/99

PROJECT REFERENCE NO. R-4900	SHEET NO. 13
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 2257 MICHAEL W. LITTLE	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 9334 HENRY WELLS, III
<i>Michael Little</i> 4/24/10	412316

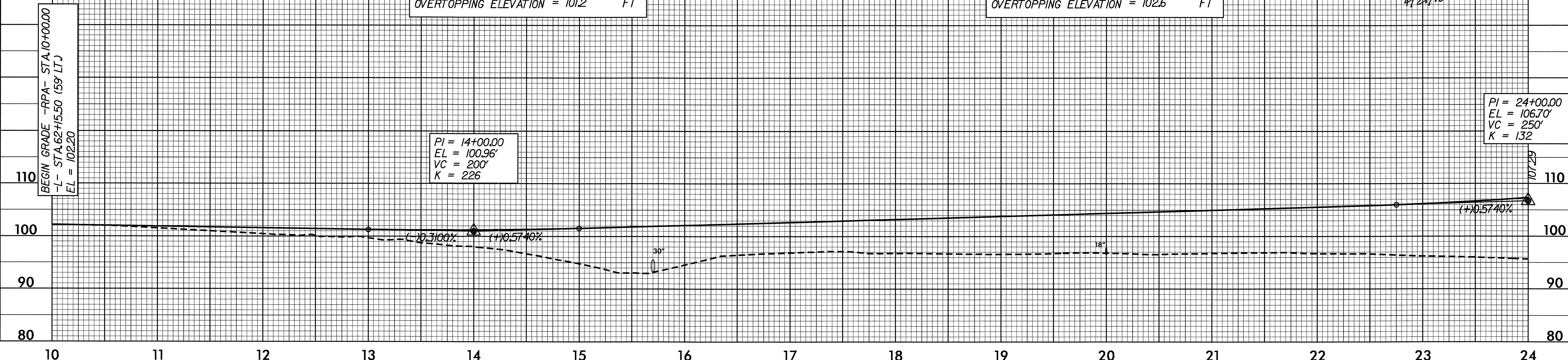
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.53

DRAINAGE AREA	= 55	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 13	CFS
DESIGN HW ELEVATION	= 95.2	FT
100 YEAR DISCHARGE	= 16	CFS
100 YEAR HW ELEVATION	= 95.7	FT
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING DISCHARGE	= >23	CFS
OVERTOPPING ELEVATION	= 101.2	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.49

DRAINAGE AREA	= 21	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 8.6	CFS
DESIGN HW ELEVATION	= 92.2	FT
100 YEAR DISCHARGE	= 9.2	CFS
100 YEAR HW ELEVATION	= 92.5	FT
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING DISCHARGE	= >10.7	CFS
OVERTOPPING ELEVATION	= 102.6	FT

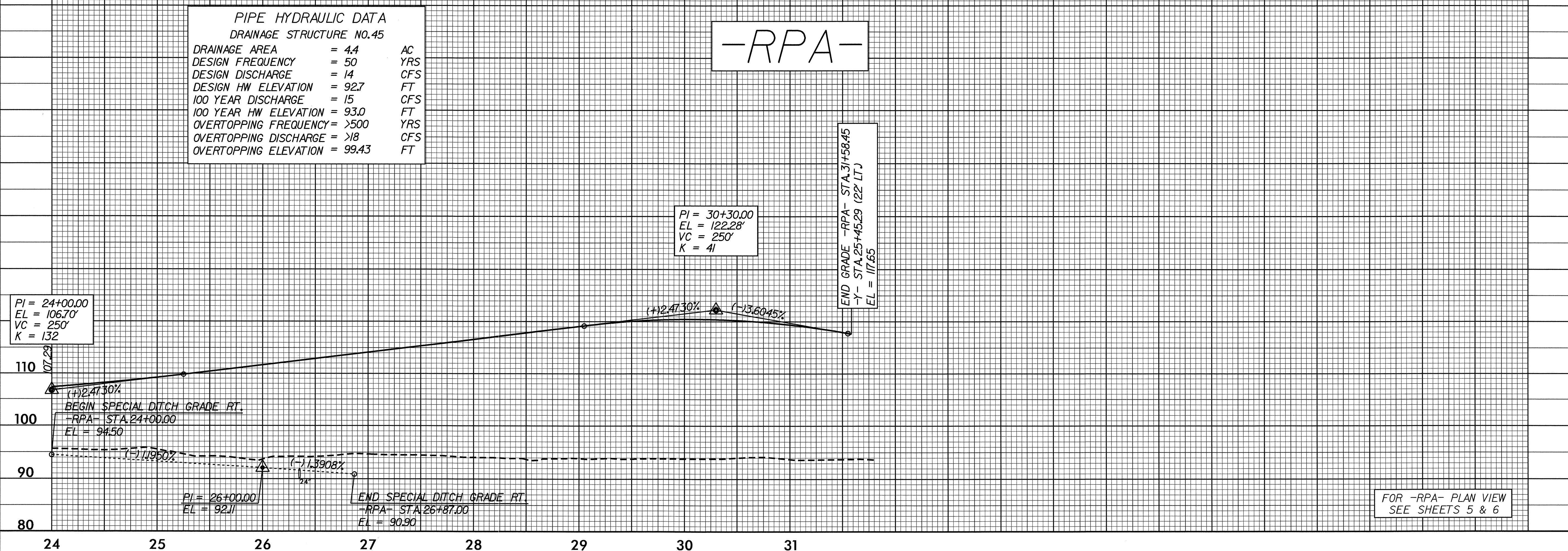
-RPA-



PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.45

DRAINAGE AREA	= 4.4	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 14	CFS
DESIGN HW ELEVATION	= 92.7	FT
100 YEAR DISCHARGE	= 15	CFS
100 YEAR HW ELEVATION	= 93.0	FT
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING DISCHARGE	= >18	CFS
OVERTOPPING ELEVATION	= 99.43	FT

-RPA-



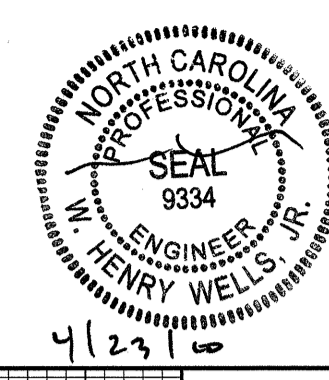
FOR -RPA- PLAN VIEW
SEE SHEETS 5 & 6

24-MAR-2010 12:29
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5/14/99

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER



4/23/00

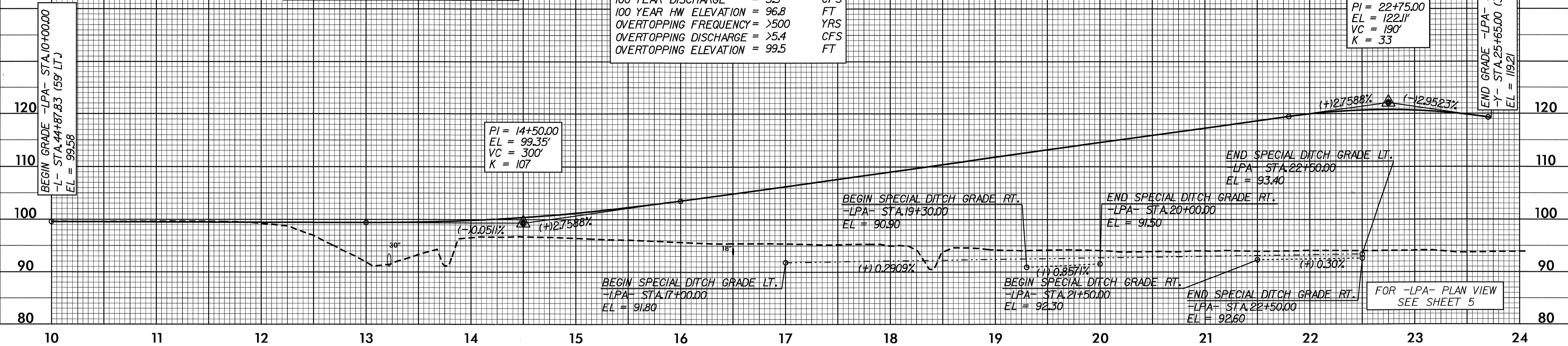
PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.39

DRAINAGE AREA	= 57	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 14	CFS
DESIGN HW ELEVATION	= 93.2	FT
100 YEAR DISCHARGE	= 17	CFS
100 YEAR HW ELEVATION	= 93.5	FT
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING DISCHARGE	= 25+	CFS
OVERTOPPING ELEVATION	= 99.43	FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.48

DRAINAGE AREA	= 1.8	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 5.2	CFS
DESIGN HW ELEVATION	= 96.8	FT
100 YEAR DISCHARGE	= 5.5	CFS
100 YEAR HW ELEVATION	= 96.8	FT
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING DISCHARGE	= >5.4	CFS
OVERTOPPING ELEVATION	= 99.5	FT

-LPA-



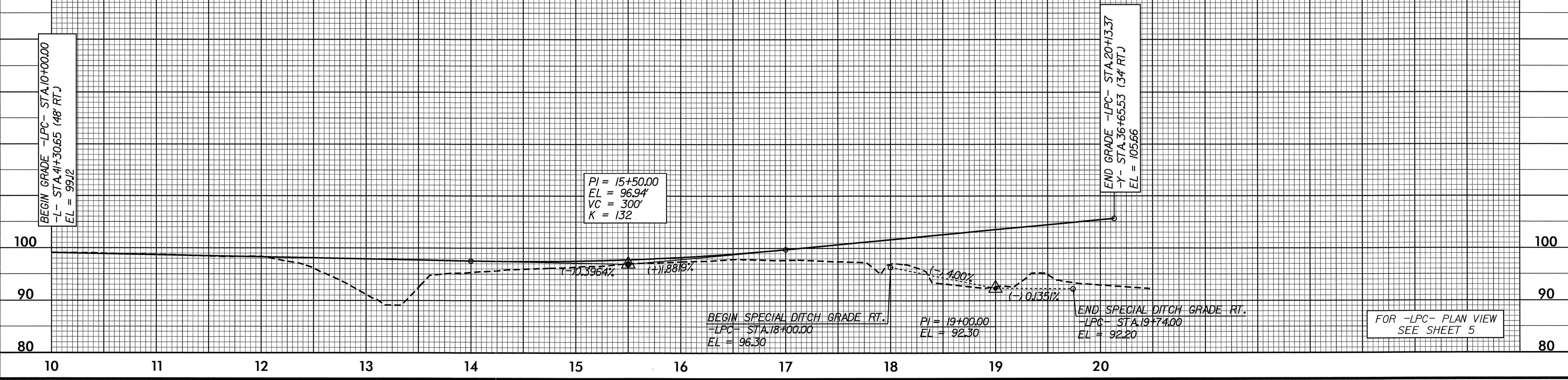
BEGIN GRADE -LPA- STA.10+00.00
-L- STA.44+87.83 (59' LT.)
EL = 99.58

END GRADE -LPA- STA.23+73.23
-Y- STA.25+65.00 (34' LT.)
EL = 119.21

PI = 22+75.00
EL = 122.11'
VC = 190'
K = 33

FOR -LPA- PLAN VIEW
SEE SHEET 5

-LPC-



BEGIN GRADE -LPC- STA.10+00.00
-L- STA.41+30.65 (48' RT.)
EL = 99.12

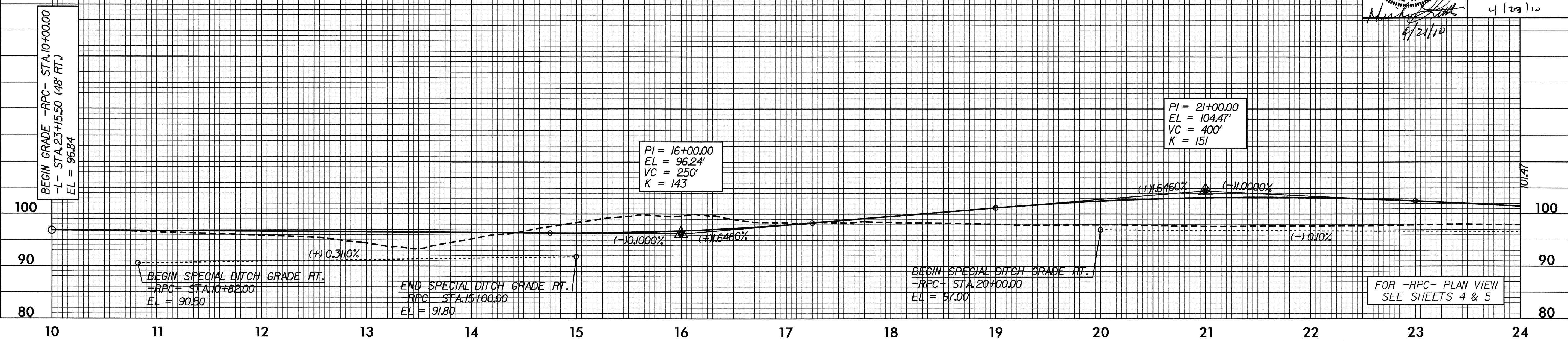
END GRADE -LPC- STA.20+13.37
-Y- STA.36+65.53 (34' RT.)
EL = 105.66

FOR -LPC- PLAN VIEW
SEE SHEET 5

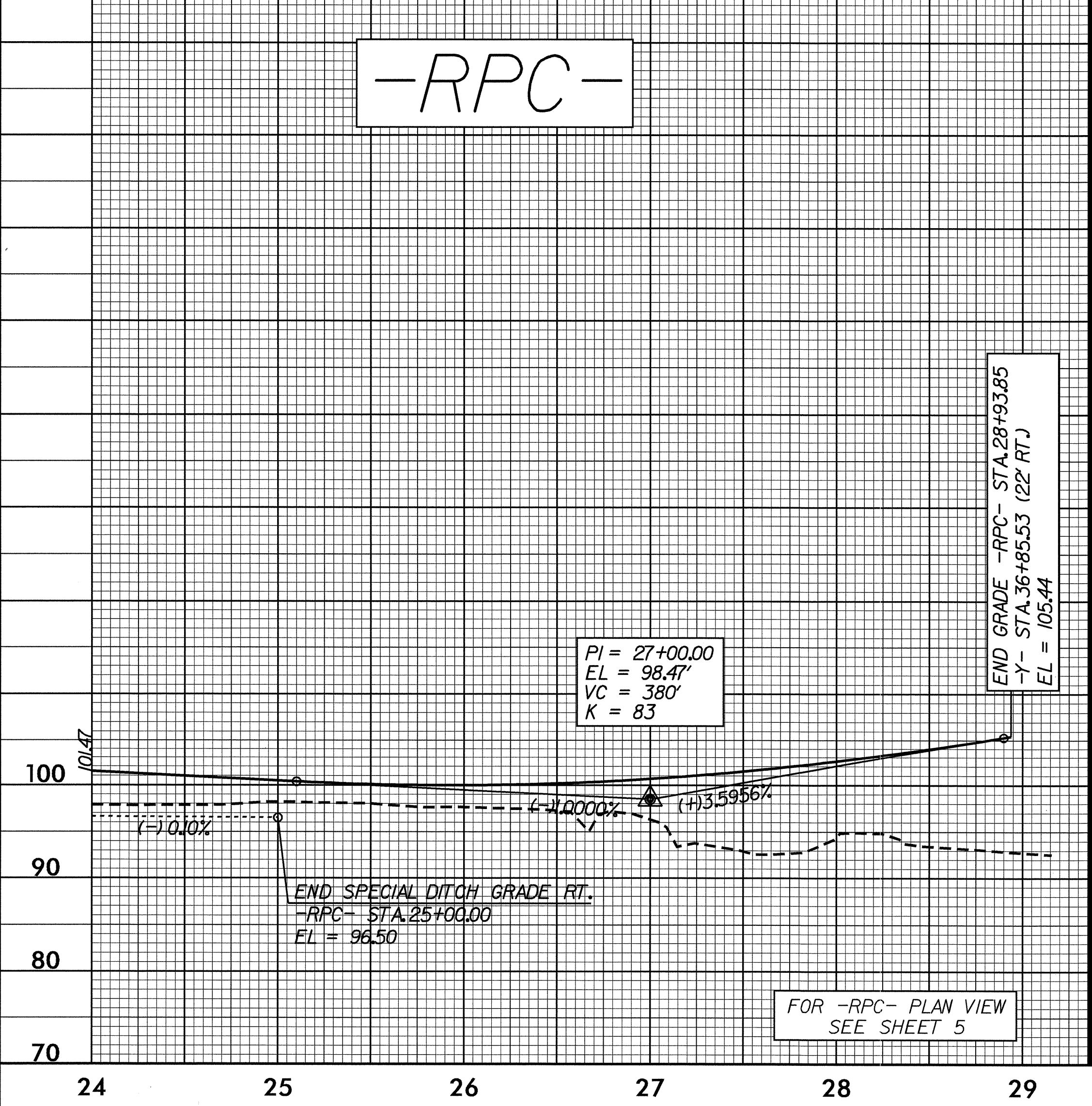
5/14/99

PROJECT REFERENCE NO. R-4900	SHEET NO. 15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<i>Michael W. Little</i> 4/23/10	<i>Henry Wells</i> 4/23/10

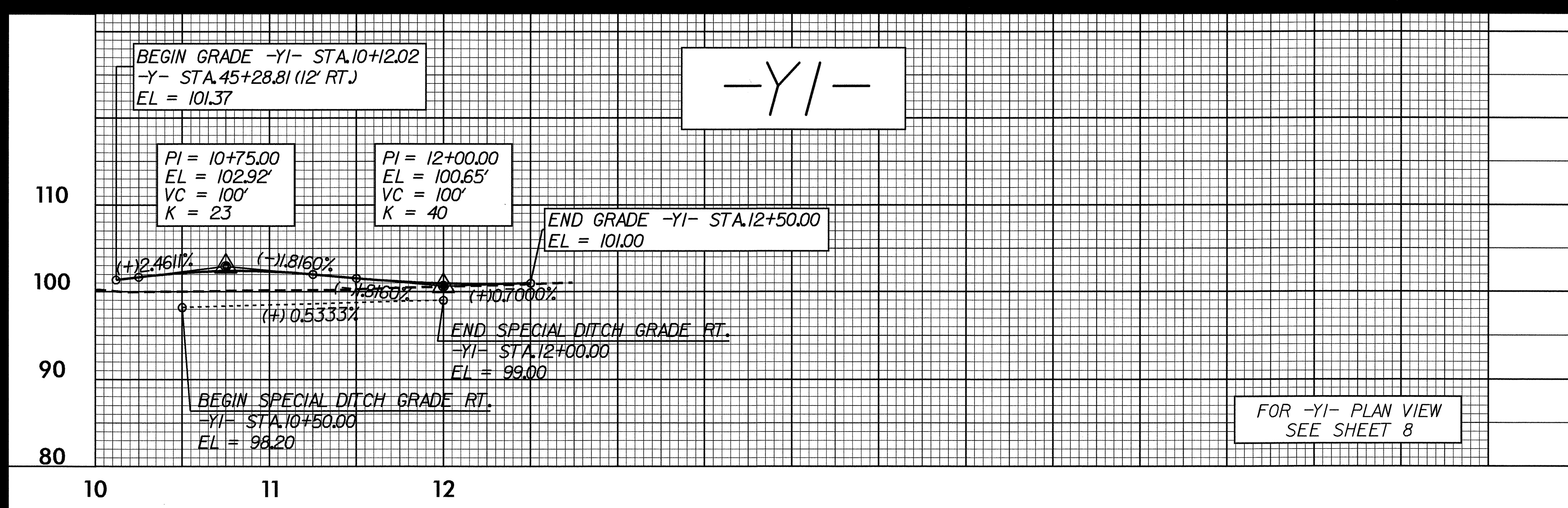
-RPC-



-RPC-



-YI-



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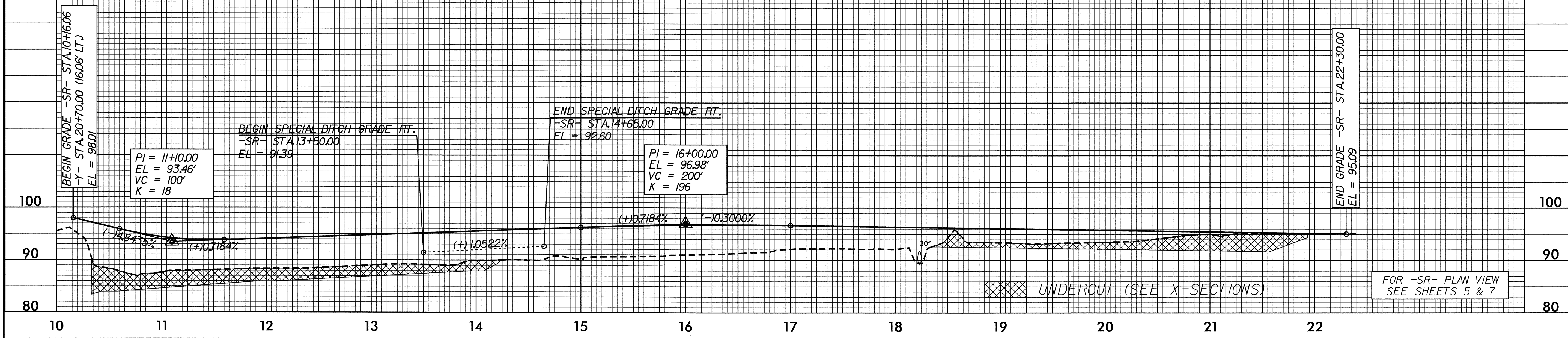
5/14/99

-SR-

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO.42

DRAINAGE AREA	= 7.4	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 24	CFS
DESIGN HW ELEVATION	= 91.9	FT
100 YEAR DISCHARGE	= 26	CFS
100 YEAR HW ELEVATION	= 92.1	FT
OVERTOPPING FREQUENCY	= >500	YRS
OVERTOPPING DISCHARGE	= >29	CFS
OVERTOPPING ELEVATION	= 94.0	FT

PROJECT REFERENCE NO.	R-4900	SHEET NO.	16
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
			4/23/10



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