

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

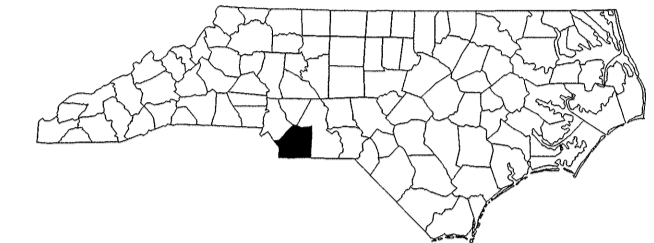
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**UNION COUNTY**

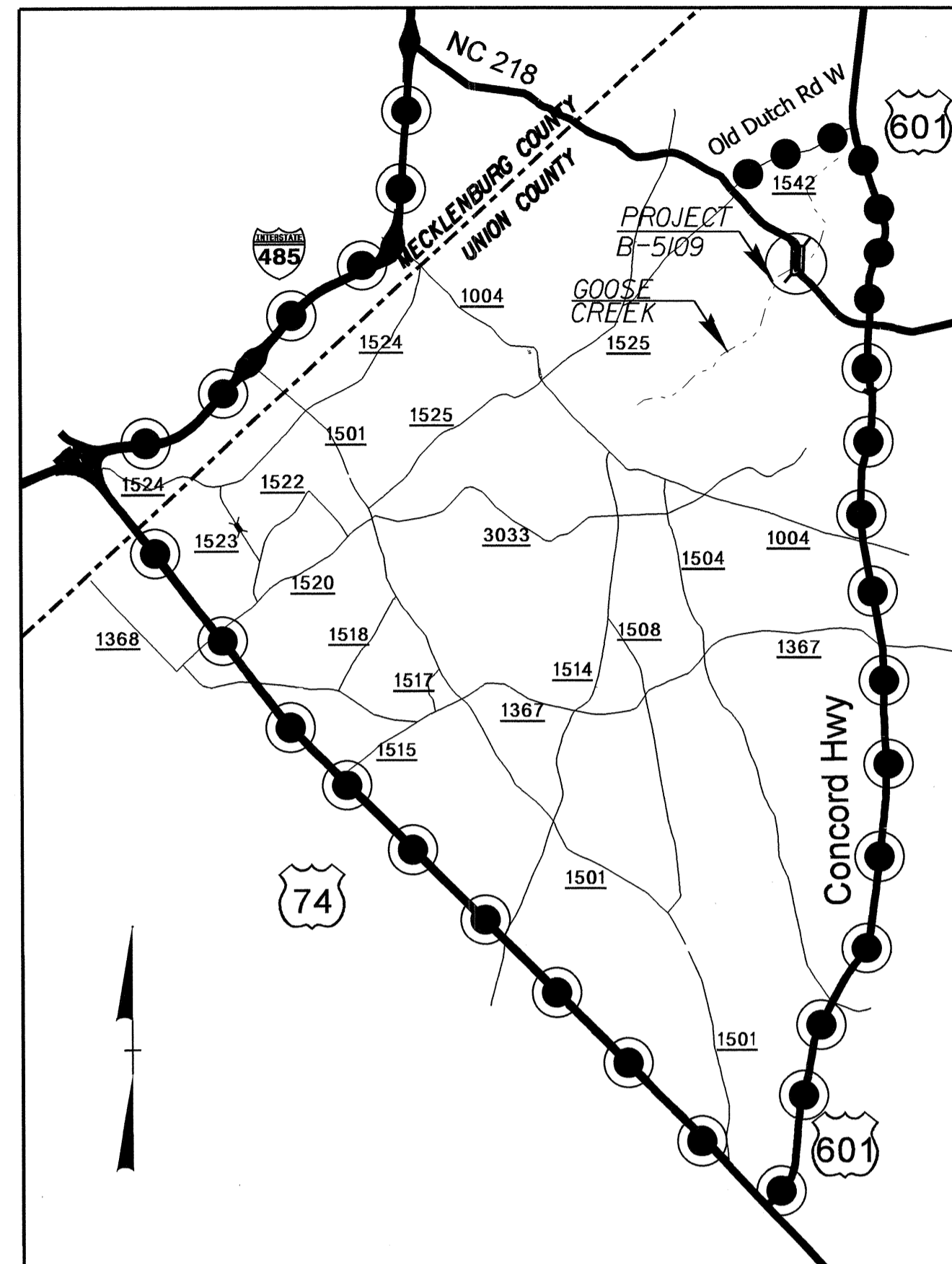
LOCATION: BRIDGE NO. 29 OVER GOOSE CREEK ON NC 218

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5109	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
42246.1.1	BRSTP-0218(7)	PE	
42246.2.1	BRSTP-0218(7)	ROW, UTIL	
42246.3.FR1	BRSTP-0218(7)	CONST	

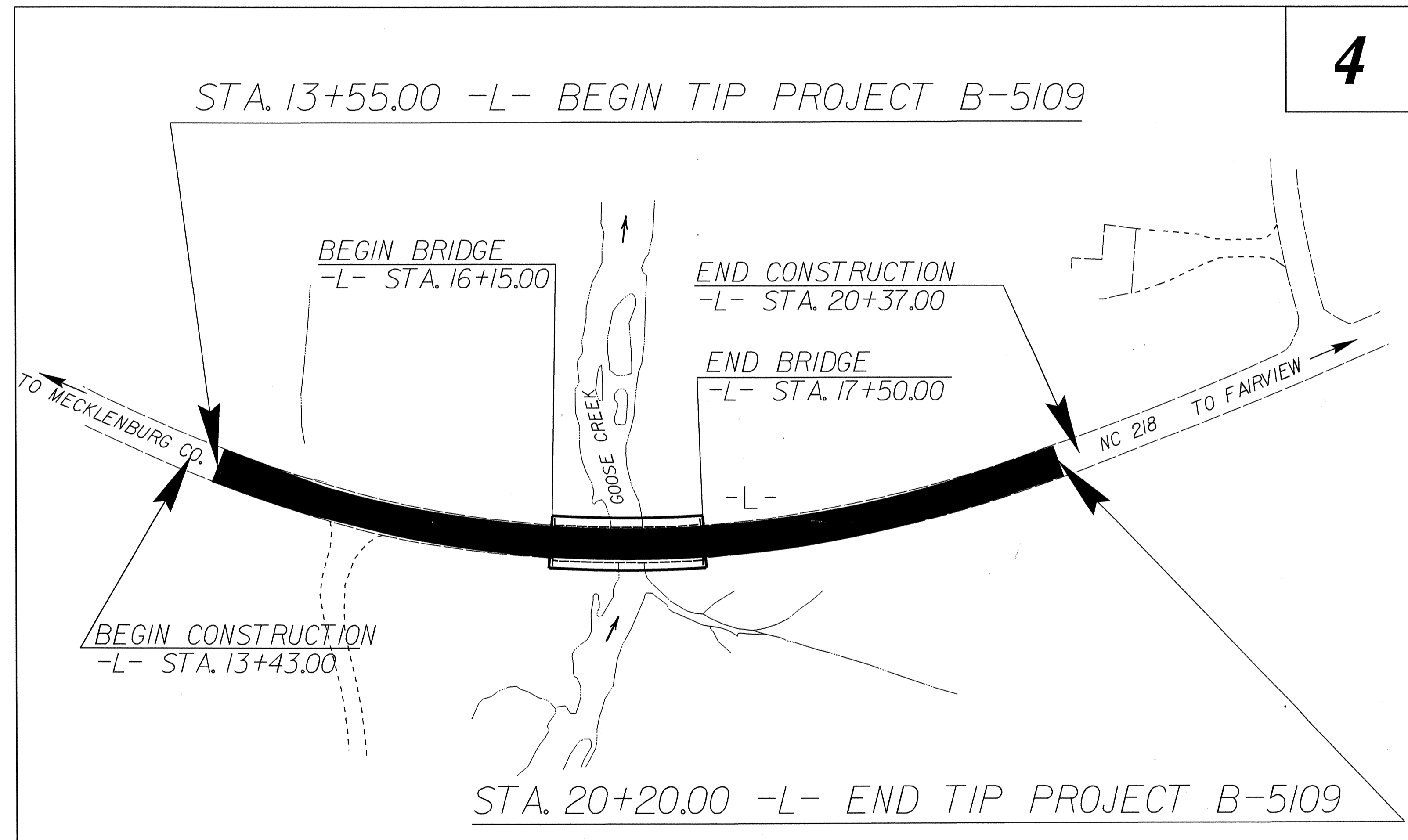
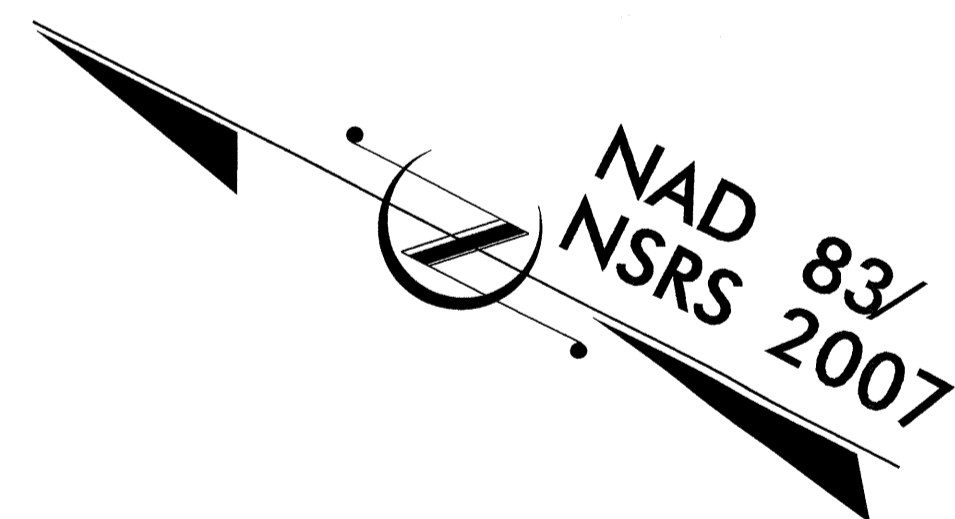


TIP PROJECT: B-5109



**VICINITY MAP**

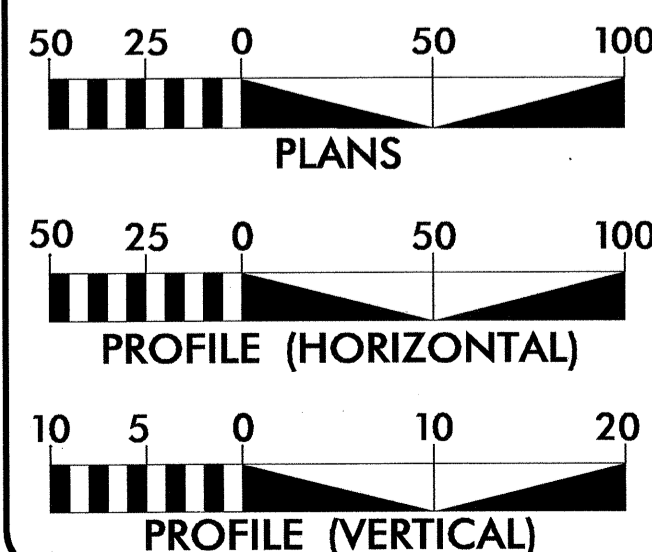
- DETOUR ROUTE
- TRUCK DETOUR ROUTE



4

DESIGN EXCEPTION REQUIRED FOR: MIN. HORIZONTAL CURVE RADIUS AND HORIZONTAL SSD.

**GRAPHIC SCALES**



**DESIGN DATA**

ADT 2013 = 8,480  
ADT 2035 = 15,500  
DHV = 12 %  
D = 65 %  
T = 11 % \*  
V = 55 MPH  
\*(TTST 5% + DUAL 6%)  
MAJOR COLLECTOR  
REGIONAL TIER

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT B-5109 = 0.100 MILES  
LENGTH OF STRUCTURE TIP PROJECT B-5109 = 0.026 MILES  
TOTAL LENGTH OF TIP PROJECT B-5109 = 0.126 MILES

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

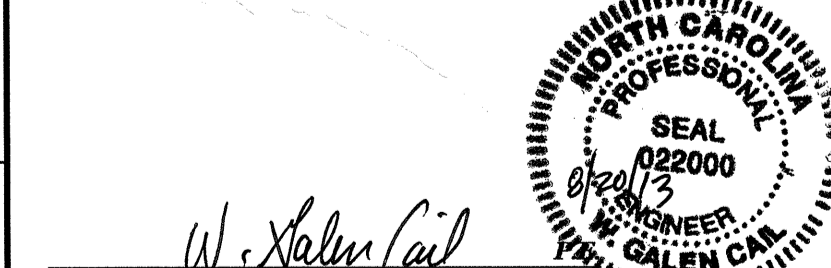
2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
JULY 20, 2012  
LETTING DATE:  
NOVEMBER 19, 2013

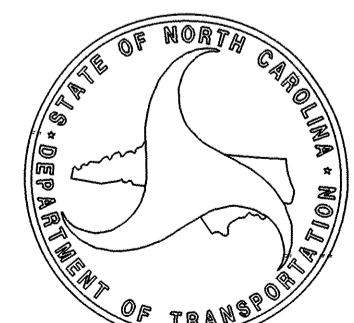
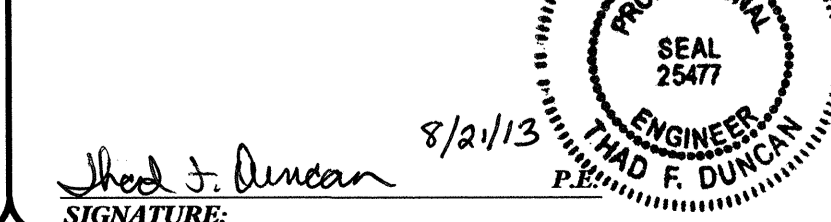
G. E. BREW, PE  
PROJECT ENGINEER

THAD F. DUNCAN, PE  
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

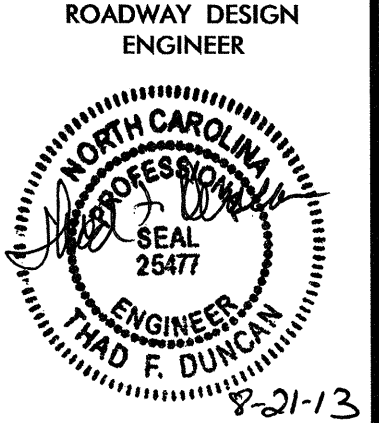


ROADWAY DESIGN ENGINEER



12-AUG-2013 15:33 R:\Roadway\Proj\B-5109\_Rdy\_Tsh.dgn \$\$\$USERNAME\$\$\$

CONTRACT: C203263



8/17/99

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	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2-A	SPILL/DETENTION BASIN DETAIL
3	SUMMARY OF QUANTITIES
3-A	SUMMARY OF DRAINAGE QUANTITIES
3-B	SUMMARY OF: EARTHWORK, GUARDRAIL, AND EXISTING ASPHALT PAVEMENT REMOVAL
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-1A	TRANSPORTATION MANAGEMENT PLANS
PMP-1	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION PLANS
UC-1 THRU UC-4	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-3	UTILITIES BY OTHERS PLANS
X-1A	CROSS SECTION SUMMARY
X-1 THRU X-6	CROSS SECTIONS
S-1 THRU S-40	STRUCTURE PLANS

GENERAL NOTES:

2012 SPECIFICATIONS  
EFFECTIVE: 01-17-2012  
REVISED: 07-30-2012

EFF. 01-17-2012  
REV. 10-30-2012

2012 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 January, 2012 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 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
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 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
840.00	Concrete Base Pad for Drainage Structures
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.25	Anchorage for Frames - Brick or Concrete or Precast
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
840.45	Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units (Details in Lieu of Standard Drawing as March 2013 Letting)
876.02	Guide for Rip Rap at Pipe Outlets

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 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

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

UNION POWER, AT&T, FRONTIER, COMMUNICATIONS, AND UNION COUNTY PUBLIC WORKS.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.  
UTILITIES BY OTHERS PLANS INCLUDED IN THE PROJECT.)  
RIGHT-OF-WAY MARKERS:

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

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

**Note: Not to Scale**

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

**BOUNDARIES AND PROPERTY:**

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	⑫③
Existing Fence Line	-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: Area or Site	☠ ☠
Potential Soil Contamination: Area or Site	☠ ? ☠ ?

**BUILDINGS AND OTHER CULTURE:**

Gas Pump Vent or U/G Tank Cap	○
Sign	○
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	-----
False Sump	▽

**RAILROADS:**

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

**RIGHT OF WAY:**

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	○
Proposed Right of Way Line with Concrete or Granite R/W Marker	○
Proposed Control of Access Line with Concrete CA 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 Aerial Utility Easement	----- AUE
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 Curb Ramp	○ CR
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	⊗
<b>VEGETATION:</b>	
Single Tree	☼
Single Shrub	☼
Hedge	-----
Woods Line	-----

Orchard	☼ ☼ ☼ ☼
Vineyard	□ Vineyard

**EXISTING STRUCTURES:**

<b>MAJOR:</b>	
Bridge, Tunnel or Box Culvert	□ CONC
Bridge Wing Wall, Head Wall and End Wall	} CONC WW {
<b>MINOR:</b>	
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:**

<b>POWER:</b>	
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:**

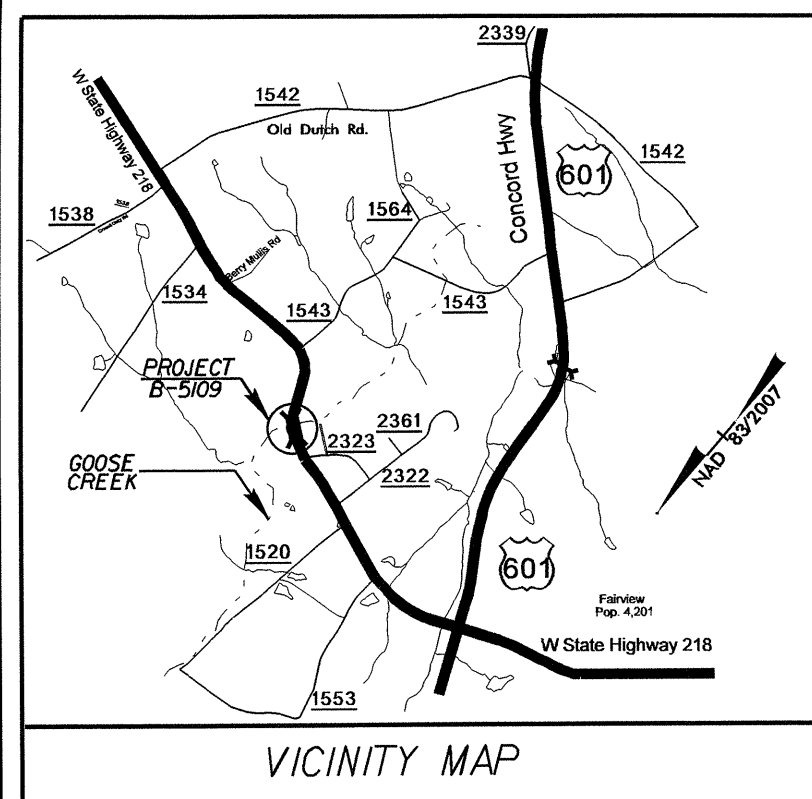
Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	----- SS
Above Ground Sanitary Sewer	----- A/G Sanitary Sewer
Recorded SS Forced Main Line	----- FSS
Designated SS Forced Main Line (S.U.E.*)	----- FSS

**MISCELLANEOUS:**

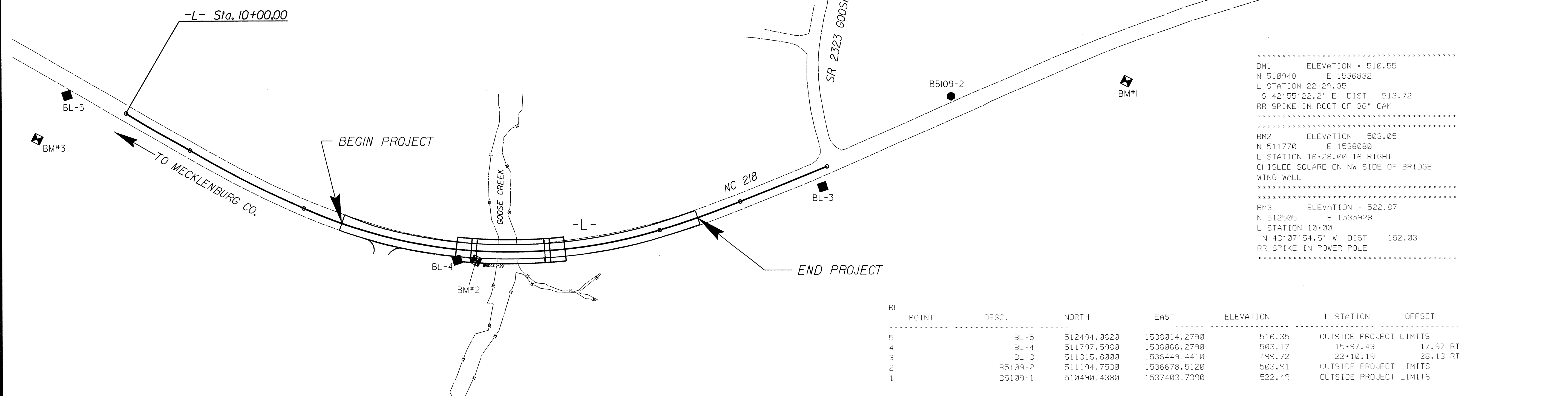
Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line	----- ?UTL
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊕ (UST)
A/G Tank; Water, Gas, Oil	□
Geoenvironmental Boring	⊗
U/G Test Hole (S.U.E.*)	⊕
Abandoned According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

# SURVEY CONTROL SHEET

- Final -



**DATUM DESCRIPTION**  
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5109-2" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 511194.753(++) EASTING: 1536678.512(++) ELEVATION: 503.91(++)  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998550  
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5109-2" TO -L- STATION 10+00.00 IS  
 N 28°19'22.3" W 1362.395  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88



.....  
 BM1 ELEVATION = 510.55  
 N 510948 E 1536832  
 L STATION 22+29.35  
 S 42°55'22.2" E DIST 513.72  
 RR SPIKE IN ROOT OF 36' OAK  
 .....  
 BM2 ELEVATION = 503.05  
 N 511770 E 1536080  
 L STATION 16+28.00 16 RIGHT  
 CHISELED SQUARE ON NW SIDE OF BRIDGE  
 WING WALL  
 .....  
 BM3 ELEVATION = 522.87  
 N 512505 E 1535928  
 L STATION 10+00  
 N 43°07'54.5" W DIST 152.03  
 RR SPIKE IN POWER POLE  
 .....

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
5	BL-5	512494.0620	1536014.2790	516.35	OUTSIDE PROJECT LIMITS	
4	BL-4	511797.5960	1536066.2790	503.17	15+97.43	17.97 RT
3	BL-3	511315.8000	1536449.4410	499.72	22+10.19	20.13 RT
2	B5109-2	511194.7530	1536678.5120	503.91	OUTSIDE PROJECT LIMITS	
1	B5109-1	510490.4380	1537403.7390	522.49	OUTSIDE PROJECT LIMITS	

**NOTES:**

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:  
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION](https://connect.ncdot.gov/resources/location)

THE FILES TO BE FOUND ARE AS FOLLOWS:  
 B5109\_LS\_CONTROL.TXT

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

- ◆ INDICATES CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
  - ▲ INDICATES BENCHMARKS USED OR SET FOR VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

TYPE	STATION	L	
		NORTH	EAST
POT	10+00.00	512394.0531	1536032.1378
PC	11+22.42	512271.8040	1536025.6376
PCC	13+32.54	512061.7963	1536026.4079
PCC	19+33.82	511522.7541	1536263.3584
PT	20+75.01	511425.6386	1536365.7768
POT	22+29.35	511324.4831	1536482.3495

ALIGN	STATION	OFFSET	ROW MARKER IRON PIN AND CAP	
			NORTH	EAST
L	13+43.00	-30.00	512053.5442	1536057.0245
L	13+43.00	30.00	512049.1825	1535997.1832
L	13+43.00	49.00	512047.8013	1535978.2335
L	13+43.00	-60.00	512055.7251	1536086.9451
L	15+05.00	82.00	511870.5415	1535974.9865
L	15+65.00	-83.00	511860.9069	1536150.5205
L	17+75.00	-80.00	511690.5353	1536231.1986
L	18+34.00	96.00	511540.3419	1536121.9922
L	19+42.00	-76.00	511569.9548	1536323.4563
L	19+50.00	86.00	511450.8177	1536213.3900
L	20+37.00	-72.00	511504.1346	1536385.8323
L	20+37.00	-30.82	511473.6819	1536358.1119
L	20+37.00	69.00	511399.8647	1536290.9177
L	20+37.00	30.00	511428.7053	1536317.1707

NOTE: DRAWING NOT TO SCALE

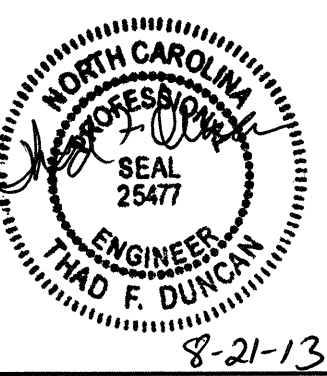
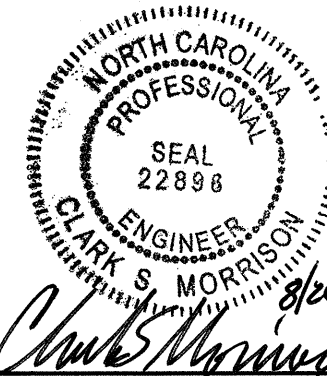
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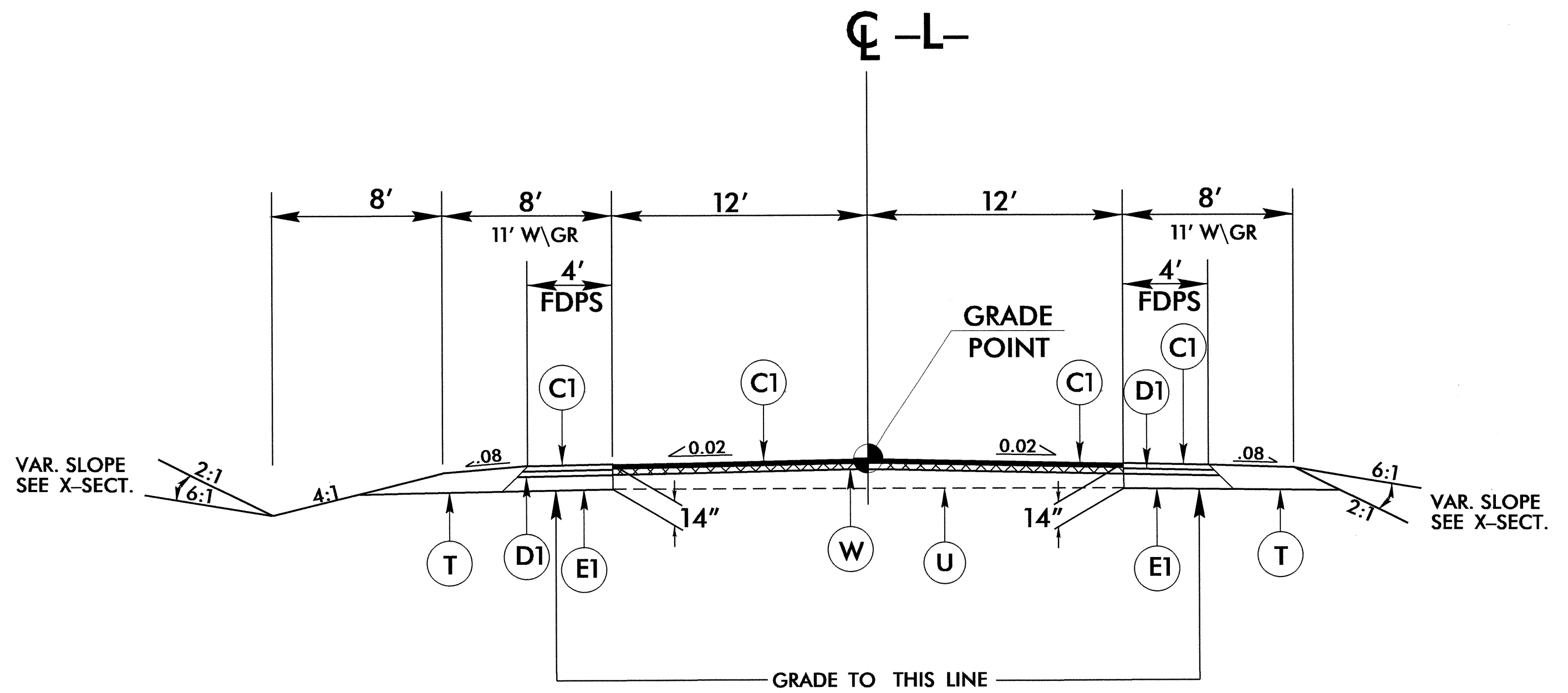
6/2/99

# 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.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
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 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 8" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE STANDARD WEDGING DETAIL THIS SHEET)

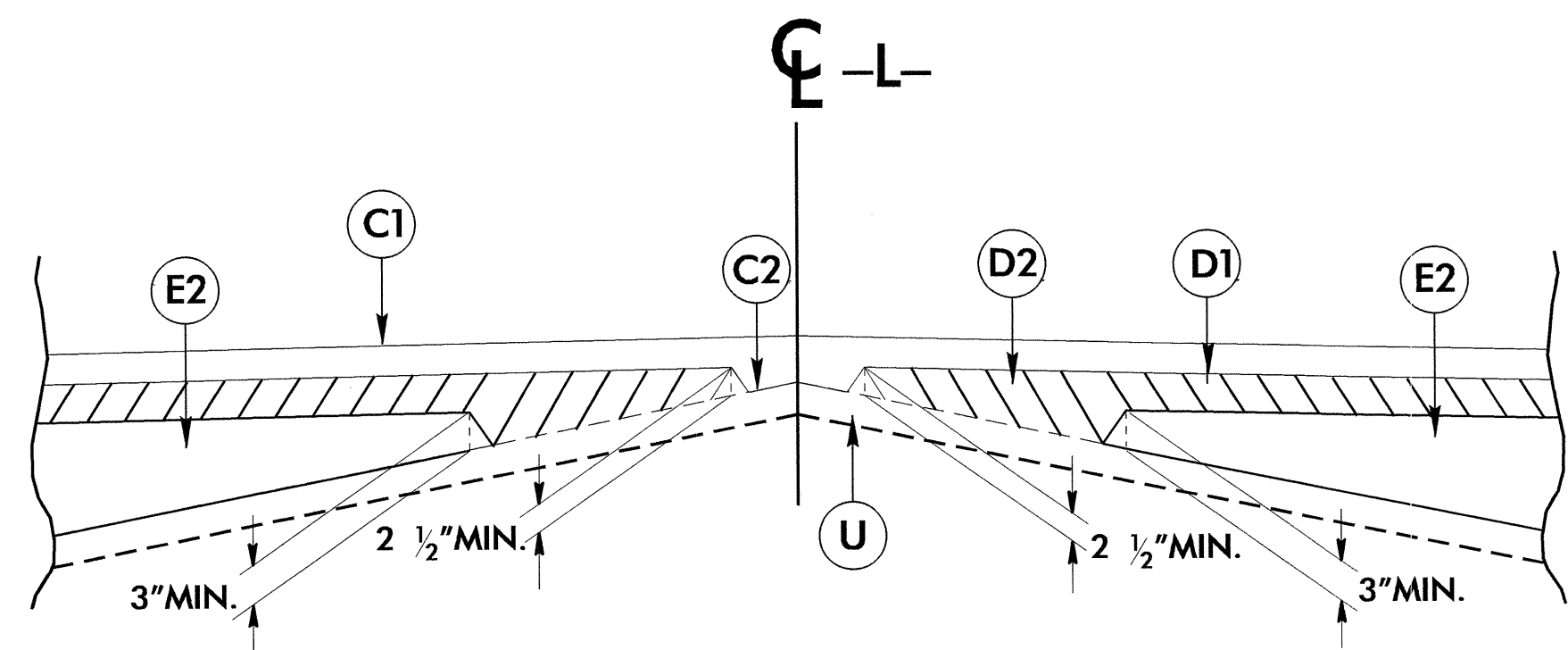
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

PROJECT REFERENCE NO. B-5109	SHEET NO. 2
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 
8-21-13	

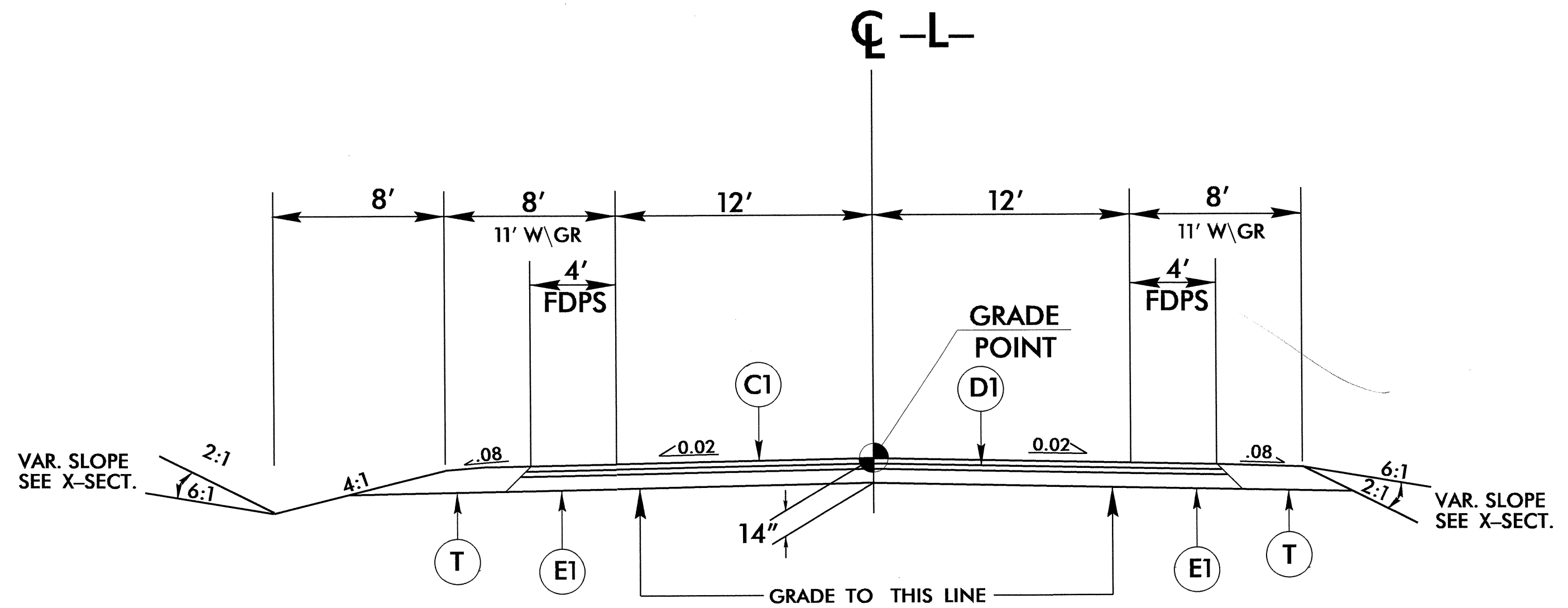


**USE TYPICAL SECTION NO. 1**

-L- STA. 13+55.00 TO 15+00.00  
-L- STA. 18+25.00 TO 20+20.00



Detail Showing Method of Wedging

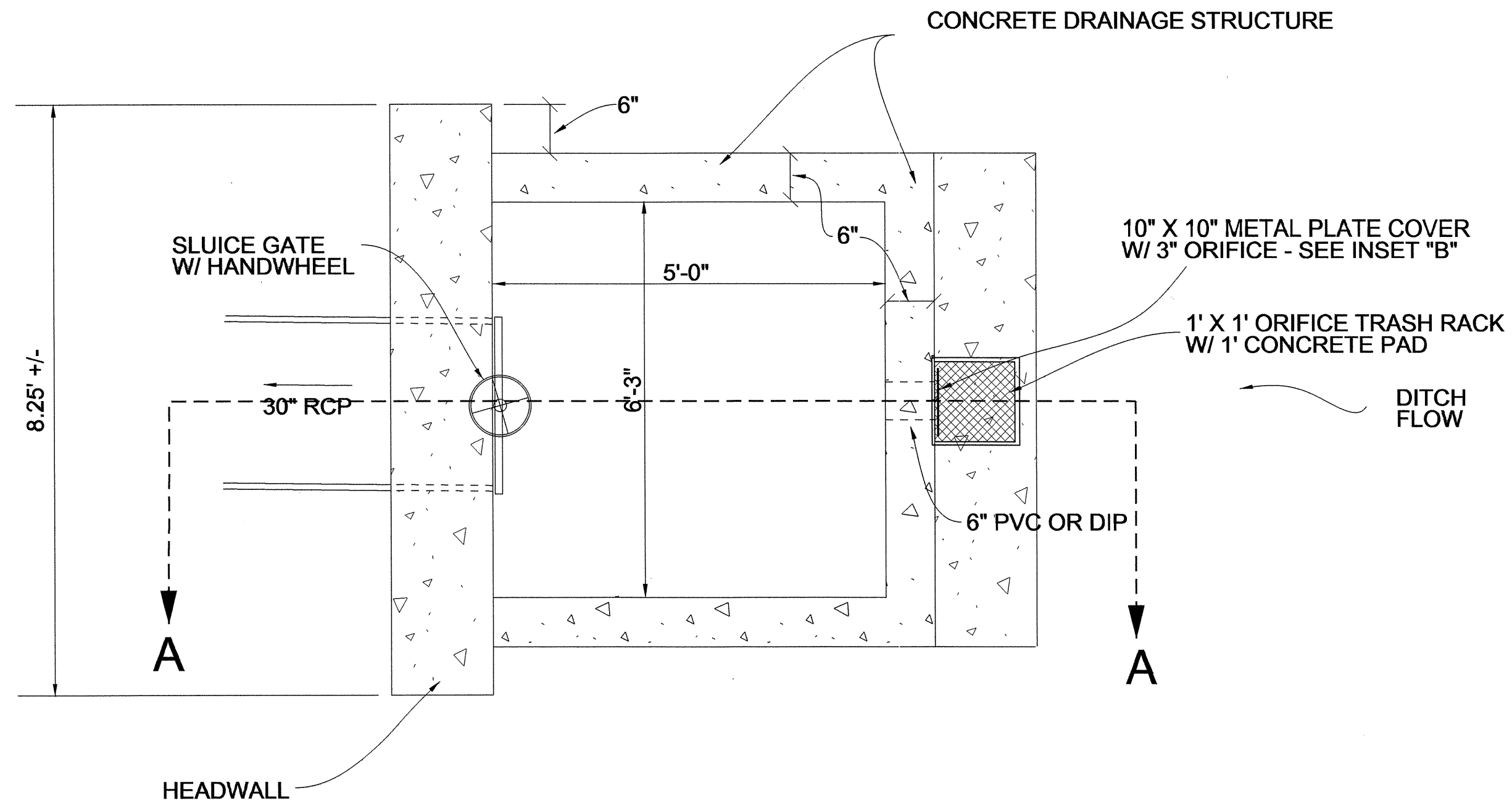


**USE TYPICAL SECTION NO. 2**

-L- STA. 15+00.00 TO BEGIN BRIDGE 16+15.00  
-L- END BRIDGE 17+50.00 TO 18+25.00

19-AUG-2013 10:12 P:\PROJECTS\12 AB-5109\_Rdy\_tjw.dgn

METHOD OF CONNECTION (6" CONCRETE WALLS)  
TO THE PROPOSED HEADWALL:  
THREE (3) 14" X 5/8" Ø  
DOWEL BARS @ 12" O.C. VERTICALLY. EMBED  
INTO PROPOSED HEADWALL 7" (TYP).

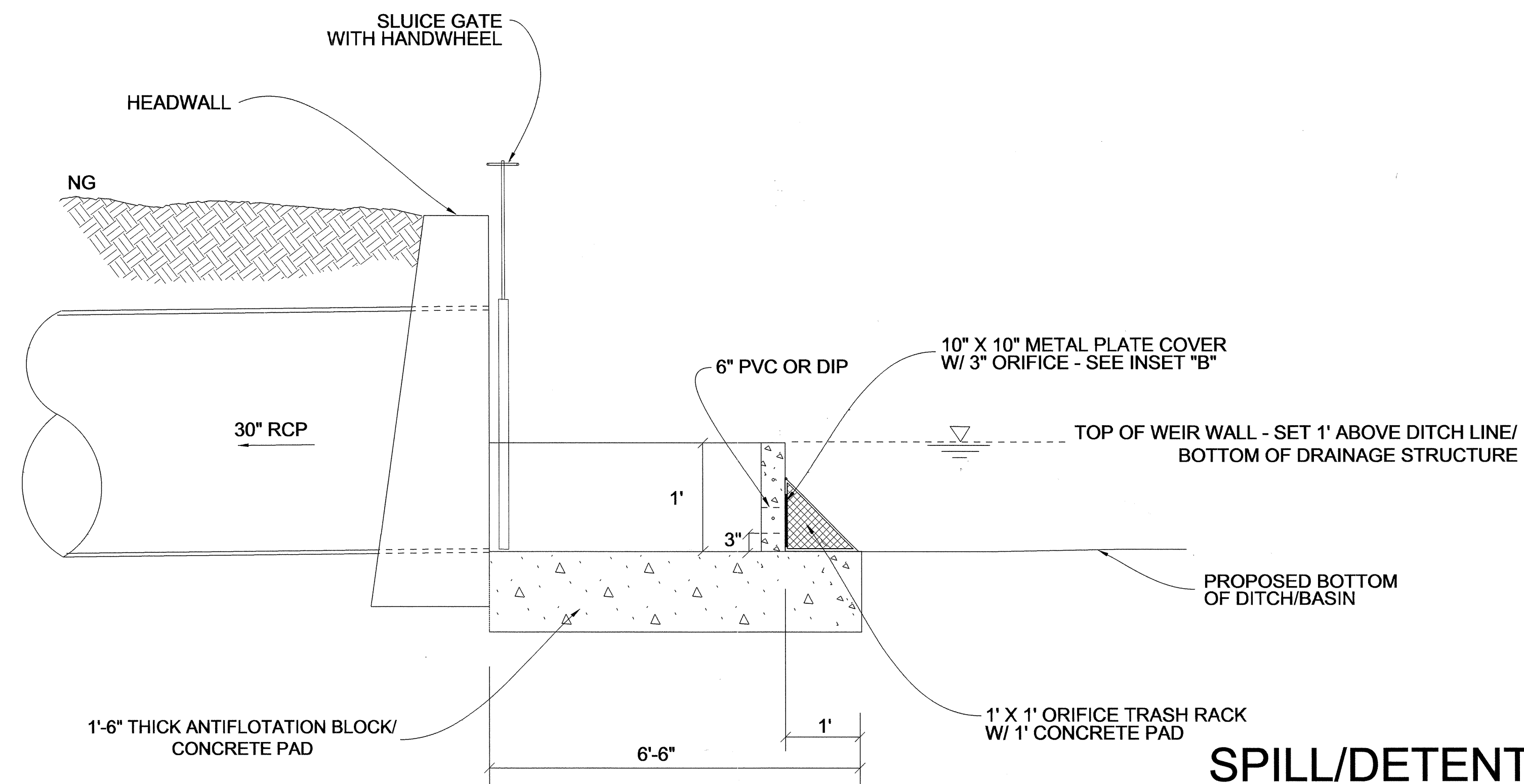


**SPILL BASIN PLAN VIEW**

NOT TO SCALE

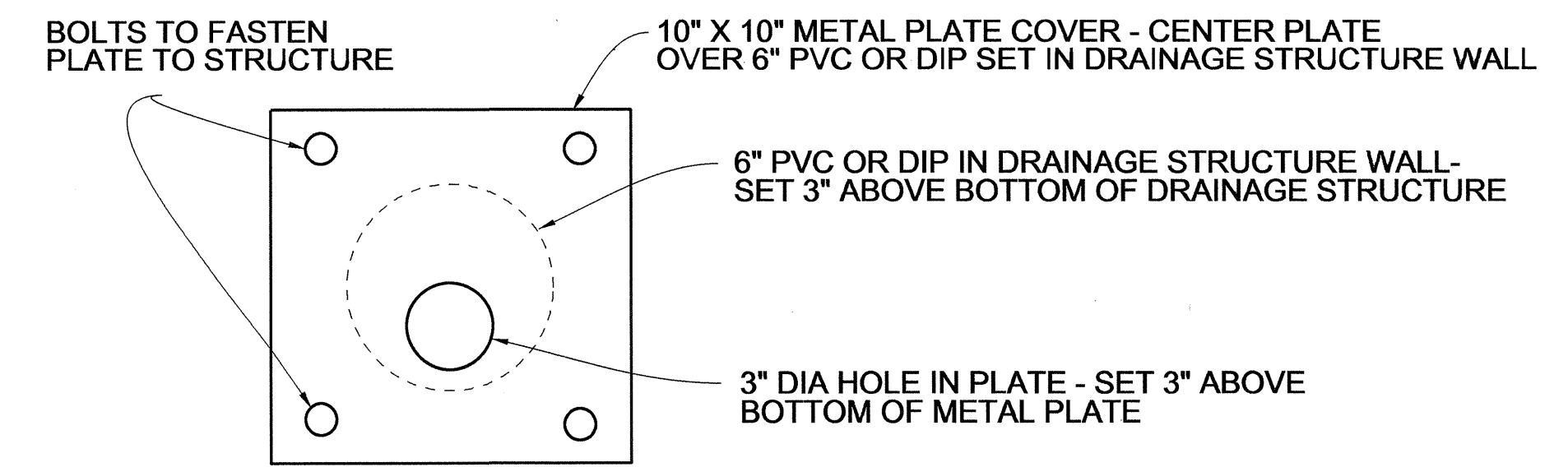
**GENERAL NOTES:**

- 1) INSTALL DOWEL BARS IN ACCORDANCE WITH THE DETAILS SHOWN AND THE FOLLOWING PROVISIONS:
- 2) PROVIDE ADHESIVE BONDING MATERIAL (CEMENT GROUT OR EPOXY RESIN) SPECIFIED BY SECTION 1081 OF THE NC-DOT STANDARD SPECIFICATIONS FOR TYPE 3 OR 3A ADHESIVES.
- 3) PROVIDE ADDITIONAL NO. 3 REBAR CENTERED AT EACH PIPE OPENING. INSTALL ADDITIONAL REBAR AT A 45 DEGREE ANGLE TO TYPICAL WALL REBAR, WITH 3-INCH SPACING (THIRD LAYER). ADDITIONAL REBAR SHALL ENCIRCLE EACH PIPE OPENING.



**SPILL BASIN SECTION VIEW A-A**

NOT TO SCALE

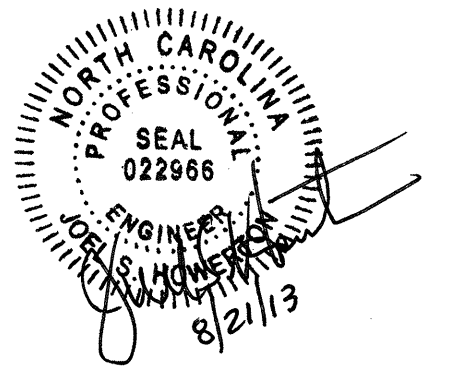


**INSET B**

NOT TO SCALE

**SPILL/DETENTION BASIN WEIR WALL DETAIL**

STA 17+10 -L- LT  
STA 18+20 -L- RT



**CONTRACT SERVICES & DEVELOPMENT UNIT**  
**STANDARDS AND SPECIAL DESIGN**  
Office 919-707-6950 FAX 919-250-4119

**SPILL/ DETENTION BASIN**  
**DETAIL**

ORIGINAL BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
MODIFIED BY: rnbritt DATE: 3-27-09  
CHECKED BY: [Signature] DATE: 7/17/13  
FILE SPEC.: d:\11\11\britt\english\hydro\r402.41m x 1.7m csap sk90.dgn

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C203263

ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description	ItemNumber	Sec #	Quantity	Unit	Description
00010000-N	800	Lump Sum		MOBILIZATION	157500000-E	620	70	TON	ASPHALT BINDER FOR PLANT MIX	477000000-E	1205	744	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (II)
00040000-N	801	Lump Sum		CONSTRUCTION SURVEYING	169300000-E	654	25	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR	490000000-N	1251	8	EA	PERMANENT RAISED PAVEMENT MARKERS
002900000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ***** (16+82.50 -L-)	220900000-E	838	4.6	CY	ENDWALLS	532620000-E	1510	270	LF	12" WATER LINE
003600000-E	225	600	CY	UNDERCUT EXCAVATION	225300000-E	840	0.399	CY	PIPE COLLARS	555800000-E	1515	1	EA	12" VALVE
005000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING	228600000-N	840	7	EA	MASONRY DRAINAGE STRUCTURES	580400000-E	1530	277	LF	ABANDON 12" UTILITY PIPE
006300000-N	SP	Lump Sum		GRADING	236700000-N	840	4	EA	FRAME WITH TWO GRATES, STD 840.29	600000000-E	1605	1,990	LF	TEMPORARY SILT FENCE
010600000-E	230	4,000	CY	BORROW EXCAVATION	239600000-N	840	1	EA	FRAME WITH COVER, STD 840.54	600600000-E	1610	195	TON	STONE FOR EROSION CONTROL, CLASS A
013400000-E	240	700	CY	DRAINAGE DITCH EXCAVATION	246200000-E	SP	2	EA	*** SLUICE GATE (30")	600900000-E	1610	70	TON	STONE FOR EROSION CONTROL, CLASS B
019500000-E	265	1,400	CY	SELECT GRANULAR MATERIAL	255600000-E	846	258	LF	SHOULDER BERM GUTTER	601200000-E	1610	350	TON	SEDIMENT CONTROL STONE
019600000-E	270	1,500	SY	GEOTEXTILE FOR SOIL STABILIZATION	303000000-E	862	375	LF	STEEL BM GUARDRAIL	601500000-E	1615	2	ACR	TEMPORARY MULCHING
031800000-E	300	44	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES	315000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS	601800000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
032000000-E	300	190	SY	FOUNDATION CONDITIONING GEOTEXTILE	321500000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III	602100000-E	1620	1.25	TON	FERTILIZER FOR TEMPORARY SEEDING
033520000-E	305	56	LF	15" DRAINAGE PIPE	327000000-N	SP	3	EA	GUARDRAIL ANCHOR UNITS, TYPE 350	602400000-E	1622	200	LF	TEMPORARY SLOPE DRAINS
033550000-E	305	28	LF	30" DRAINAGE PIPE	328500000-N	SP	1	EA	GUARDRAIL ANCHOR UNITS, TYPE M-350	602900000-E	SP	1,000	LF	SAFETY FENCE
033585000-E	305	4	EA	*** DRAINAGE PIPE ELBOWS (15")	336000000-E	863	482	LF	REMOVE EXISTING GUARDRAIL	603000000-E	1630	310	CY	SILT EXCAVATION
036600000-E	310	32	LF	15" RC PIPE CULVERTS, CLASS III	362800000-E	876	152	TON	RIP RAP, CLASS I	603600000-E	1631	4,000	SY	MATTING FOR EROSION CONTROL
044820000-E	310	160	LF	15" RC PIPE CULVERTS, CLASS IV	364900000-E	876	2	TON	RIP RAP, CLASS B	603700000-E	SP	250	SY	COIR FIBER MAT
109950000-E	505	300	CY	SHALLOW UNDERCUT	365600000-E	876	1,488	SY	GEOTEXTILE FOR DRAINAGE	603800000-E	SP	1,340	SY	PERMANENT SOIL REINFORCEMENT MAT
109970000-E	505	570	TON	CLASS IV SUBGRADE STABILIZATION	365900000-N	SP	2	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON	604200000-E	1632	120	LF	1/4" HARDWARE CLOTH
122000000-E	545	50	TON	INCIDENTAL STONE BASE	440000000-E	1110	251	SF	WORK ZONE SIGNS (STATIONARY)	604800000-E	SP	150	SY	FLOATING TURBIDITY CURTAIN
133000000-E	607	150	SY	INCIDENTAL MILLING	441000000-E	1110	269	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)	607000000-N	1639	12	EA	SPECIAL STILLING BASINS
149100000-E	610	720	TON	ASPHALT CONC BASE COURSE, TYPE B25.0C	444500000-E	1145	176	LF	BARRICADES (TYPE III)	6071012000-E	SP	105	LF	COIR FIBER WATTLE
150300000-E	610	250	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C	468500000-E	1205	172	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	6071020000-E	SP	35	LB	POLYACRYLAMIDE (PAM)
152300000-E	610	380	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	468600000-E	1205	173	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	6071030000-E	1640	150	LF	COIR FIBER BAFFLE
										6071050000-E	SP	2	EA	*** SKIMMER (1-1/2")
										608400000-E	1660	2	ACR	SEEDING & MULCHING
										608700000-E	1660	1	ACR	MOWING
										609000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
										609300000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
										609600000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
										610800000-E	1665	1.5	TON	FERTILIZER TOPDRESSING
										611450000-N	1667	10	MHR	SPECIALIZED HAND MOWING
										611700000-N	SP	25	EA	RESPONSE FOR EROSION CONTROL
										612300000-E	1670	0.1	ACR	REFORESTATION

5/28/99

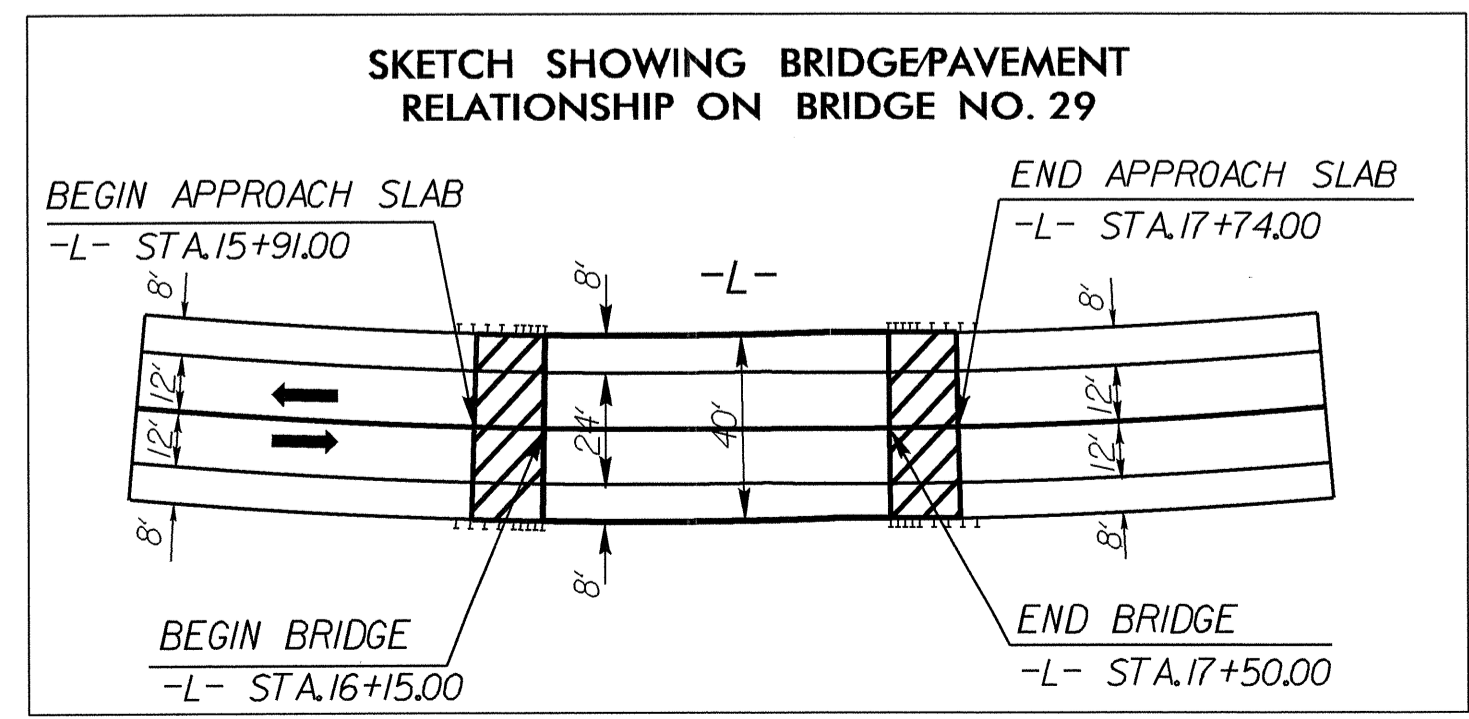
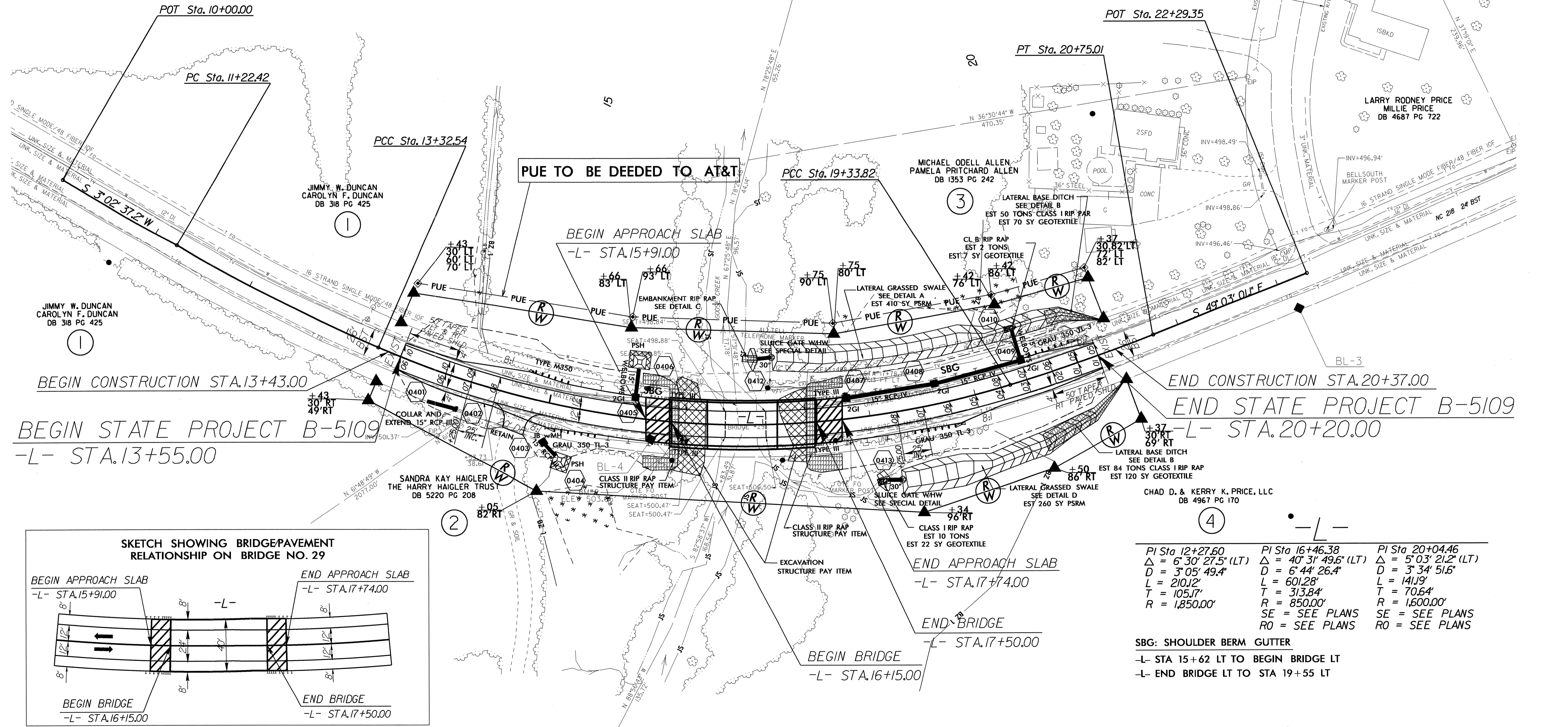
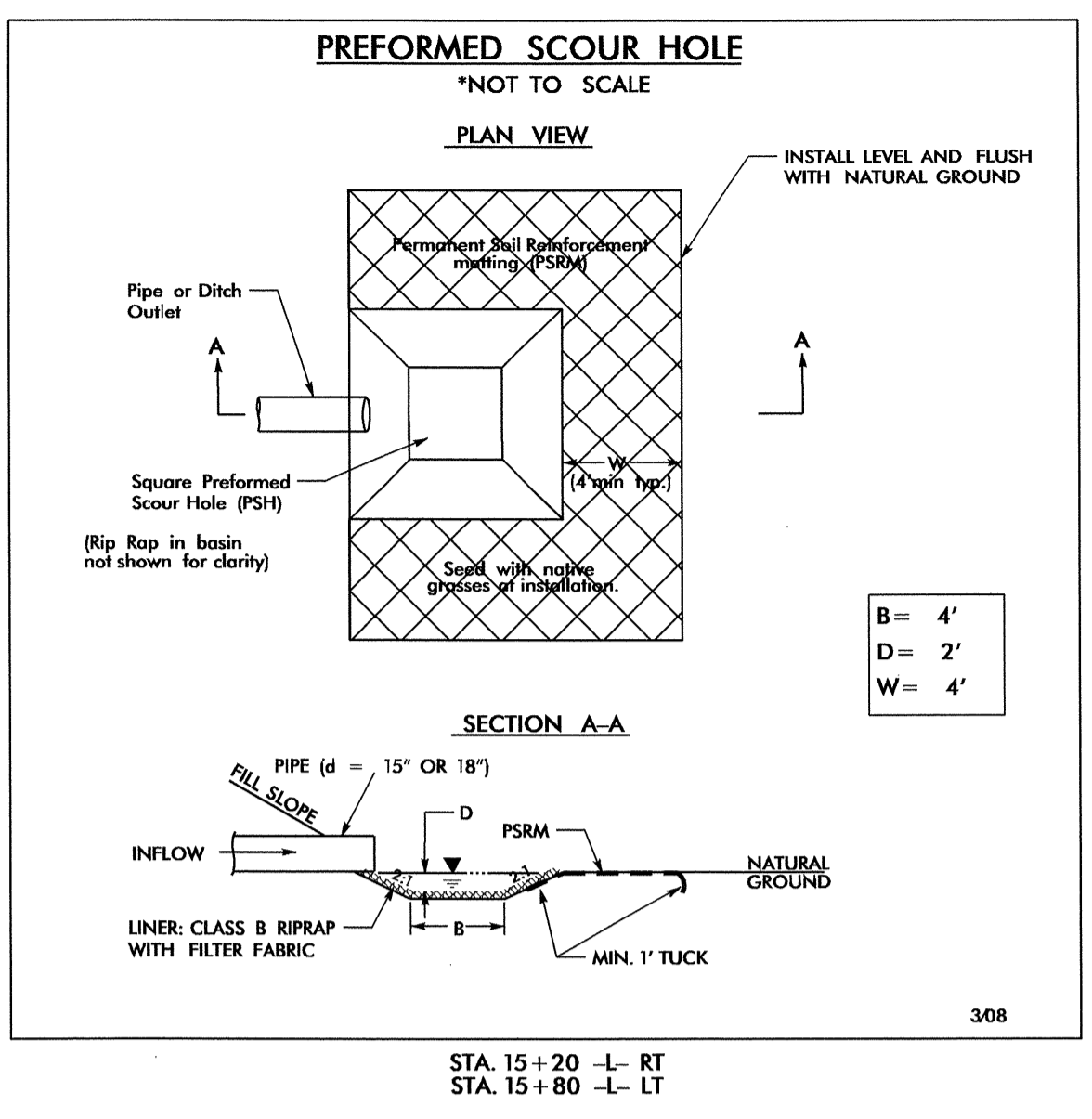
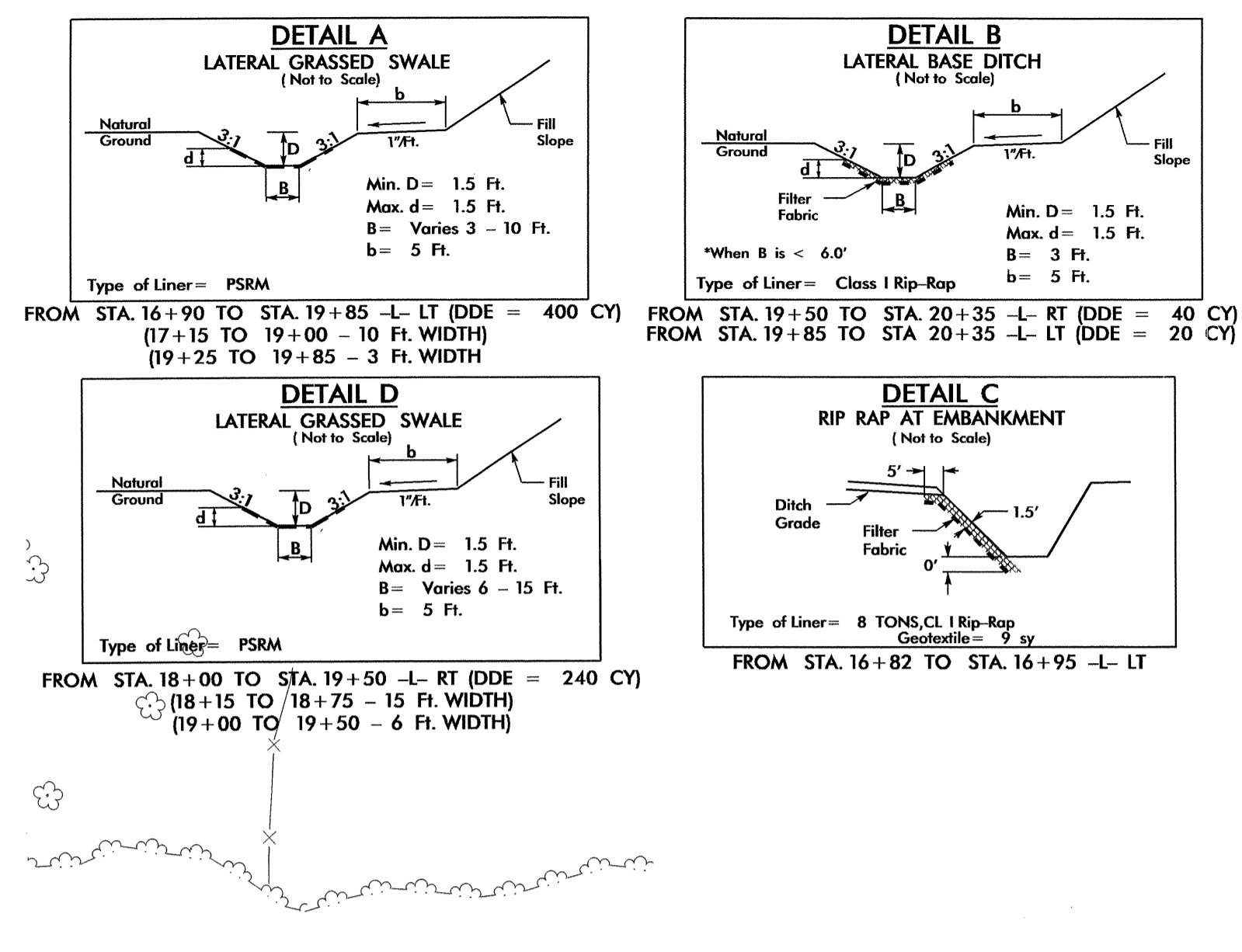
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FOR -L- PROFILE SEE SHEET 5  
FOR STRUCTURE SEE SHEET S1 TO S40



PI Sta 12+27.60 Δ = 6' 30" 27.5' (LT) D = 3' 05" 49.4" L = 210.12' T = 105.17' R = 1,850.00'	PI Sta 16+46.38 Δ = 40' 31" 49.6' (LT) D = 6' 44" 26.4" L = 601.28' T = 313.84' R = 850.00' SE = SEE PLANS RO = SEE PLANS	PI Sta 20+04.46 Δ = 5' 03" 21.2' (LT) D = 3' 34" 51.5" L = 141.19' T = 70.64' R = 1,600.00' SE = SEE PLANS RO = SEE PLANS
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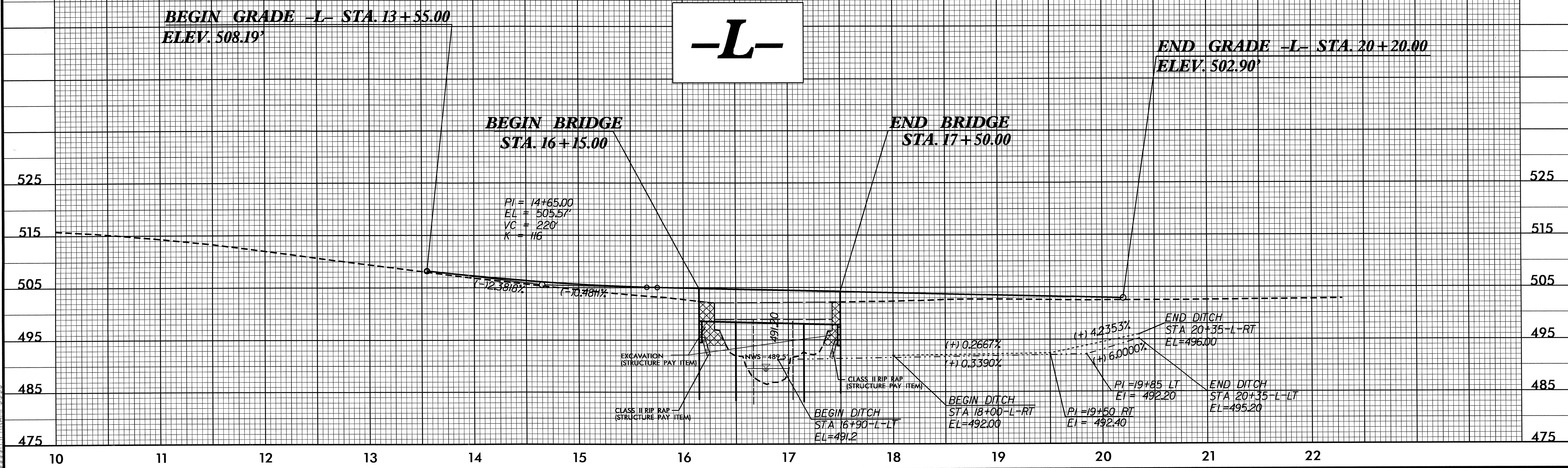
SBG: SHOULDER BERM GUTTER  
-L- STA 15+62 LT TO BEGIN BRIDGE LT  
-L- END BRIDGE LT TO STA 19+55 LT

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14-AUG-2015 14:45 P:\05-16-10-B-5109-Rdw\_psh.dgn

5/14/99

BM # 2 ELEV. 503.05'  
DESCRIPTION: CHISLED SQUARE ON NW SIDE OF BRIDGE WING WALL

BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	= 4030	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 497.8	FT
BASE DISCHARGE	= 4900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 498.57	FT
OVERTOPPING DISCHARGE	= +7480	CFS
OVERTOPPING FREQUENCY	= +500	YRS
OVERTOPPING ELEVATION	= 502.3	FT
	=	FT
DATE OF SURVEY	=	
N.W.S. ELEVATION AT DATE OF SURVEY	= 489.5	FT



19-AUG-2013 11:09  
R:\Roadview\Proj\AB-5109\Roadview\_pfl.dgn



## MANAGEMENT STRATEGIES

TRAFFIC WILL BE MAINTAINED OFFSITE DURING CONSTRUCTION.  
 TRAFFIC WILL FOLLOW SR 1542 AND US 601.  
 TRUCK TRAFFIC FROM THE NORTH WILL FOLLOW I-485 AND US 74.  
 TRUCK TRAFFIC FROM THE SOUTH WILL FOLLOW US 601 AND US 74.

## PHASING

- STEP 1) HAVE STATE FORCES INSTALL OFF-SITE DETOUR SIGNING.
- STEP 2) ONCE STATE FORCES HAVE INSTALL THE OFF-SITE DETOUR SIGNING, USE ROADWAY STANDARD DRAWING 1101.03 SHEET 1-2 OF 9 TO INSTALL ROAD CLOSURE. DETOUR TRAFFIC OFFSITE AND CLOSE -L- (NC 218). BEHIND ROAD CLOSURE, CONSTRUCT -L-, INCLUDING NEW STRUCTURE, UP TO BUT NOT INCLUDING THE FINAL LIFT OF SURFACE COURSE.
- STEP 3) PLACE THE FINAL LIFT OF SURFACE COURSE, PAVEMENT MARKINGS, AND MARKERS (SEE PAVEMENT MARKING PLAN).
- STEP 4) REMOVE ALL TRAFFIC CONTROL DEVICES, ROAD CLOSURE SIGNING, AND OPEN -L- TO TRAFFIC. REMOVE ALL OFFSITE DETOUR SIGNING.

## GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRABLE OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

### TRAFFIC PATTERN ALTERATIONS

- A) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

### SIGNING

- B) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- C) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

STATE FORCE WILL BE RESPONSIBLE FOR PROVIDING SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.

- D) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

STATE FORCE WILL COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

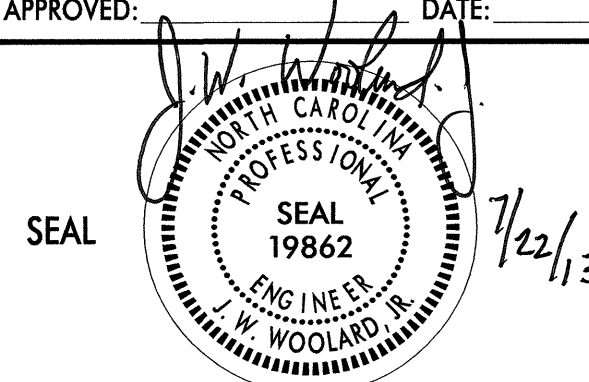

- E) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

### TRAFFIC CONTROL DEVICES

- F) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

### PAVEMENT MARKINGS AND MARKERS


- G) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

APPROVED: 	DATE: 7/22/13		<b>TRANSPORTATION OPERATIONS PLAN</b>
---	---------------	---	---

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN  
UNION COUNTY

LOCATION: BRIDGE NO.29 ON NC 218 OVER GOOSE CREEK

TIP NO.	SHEET NO.
B-5109	PMP-1
APPROVED:	<i>[Signature]</i>
DATE:	7/19/13
SEAL	

T.I.P.: B-5109

CONTRACT: C203263

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
NC 218	Thermoplastic	Raised
Concrete Bridge Deck	Cold Applied Plastic (Type II or III)	Raised

B) PLACE TWO APPLICATIONS OF PAINT PAVEMENT MARKINGS ON THE FINAL WEARING SURFACE. PLACE THE SECOND APPLICATION OF PAINT UPON SUFFICIENT DRYING TIME OF THE FIRST.

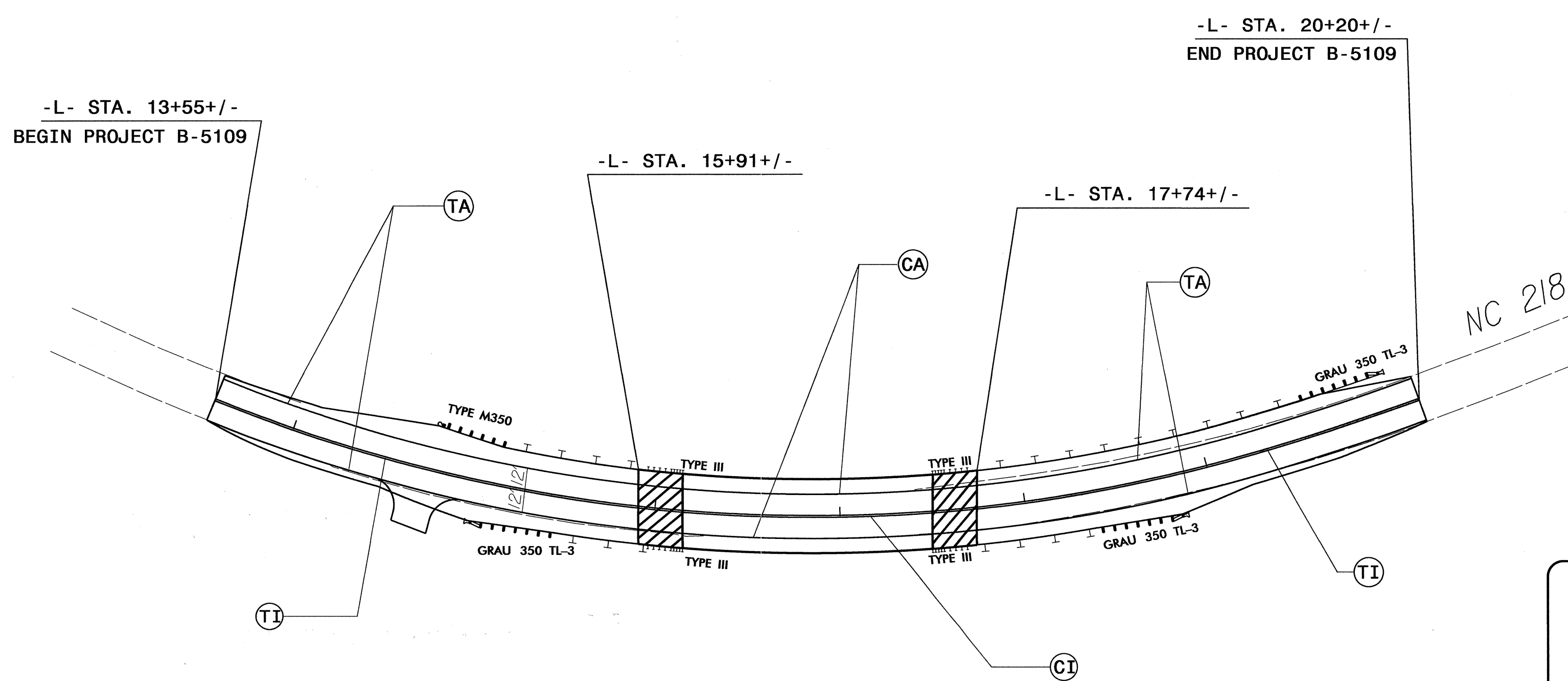
C) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

D) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

E) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

F) REMOVE ALL RESIDUE AND SURFACE LAITANCE BY ACCEPTABLE METHODS ON CONCRETE BRIDGE DECKS PRIOR TO PLACING Cold Applied Plastic (Type II or III) PAVEMENT MARKING MATERIAL.

G) TYPE III COLD APPLIED PLASTIC MAY BE USED IN LIEU OF TYPE II COLD APPLIED PLASTIC. IF TYPE III COLD APPLIED PLASTIC IS USED, IT SHALL BE PAID FOR USING THE TYPE II COLD APPLIED PLASTIC PAY ITEM.



INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE AND SCHEDULE SHEET

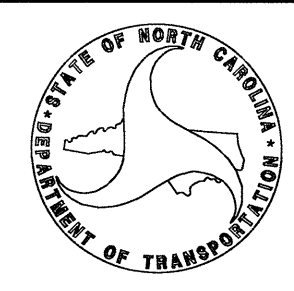
PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
TA	Thermoplastic(4",120 MILS) WHITE EDGELINE (2x)
TI	Thermoplastic(4",90 MILS) YELLOW DOUBLE CENTER (2x)
CA	Cold Applied Plastic(4") WHITE EDGELINE (2x)
CI	Cold Applied Plastic(4") YELLOW DOUBLE CENTER (2x)

PLAN PREPARED BY: N.C.D.O.T. SIGNING AND DELINEATION UNIT

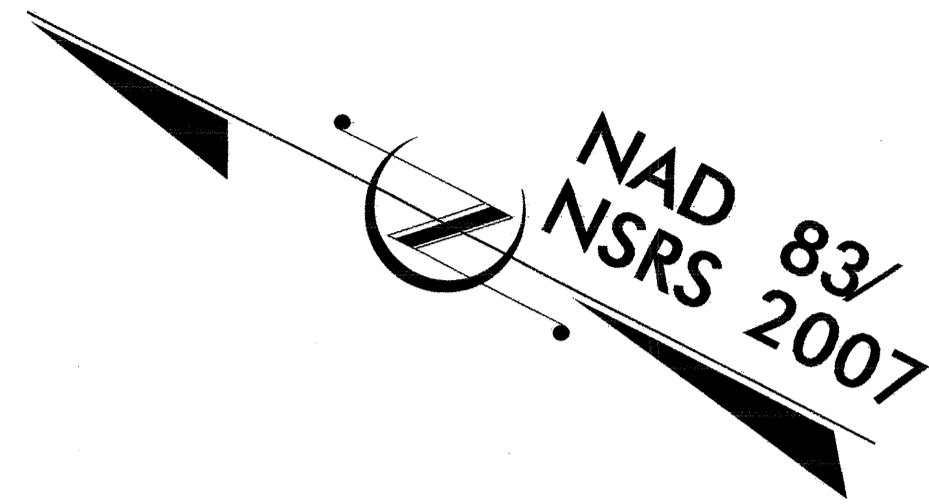
Kelvin Jordan SIGNING & DELINEATION REGIONAL ENGINEER

J.Navarrete SIGNING & DELINEATION PROJECT DESIGN ENGINEER



19-Jul-2013 10:31 P:\TIP\Projects-B\B5109\Traffic\Signing\CADD\Signing Layout Plans\B-5109\_Sgn\_BPMP.dgn jnavarrete AT 12:26:20

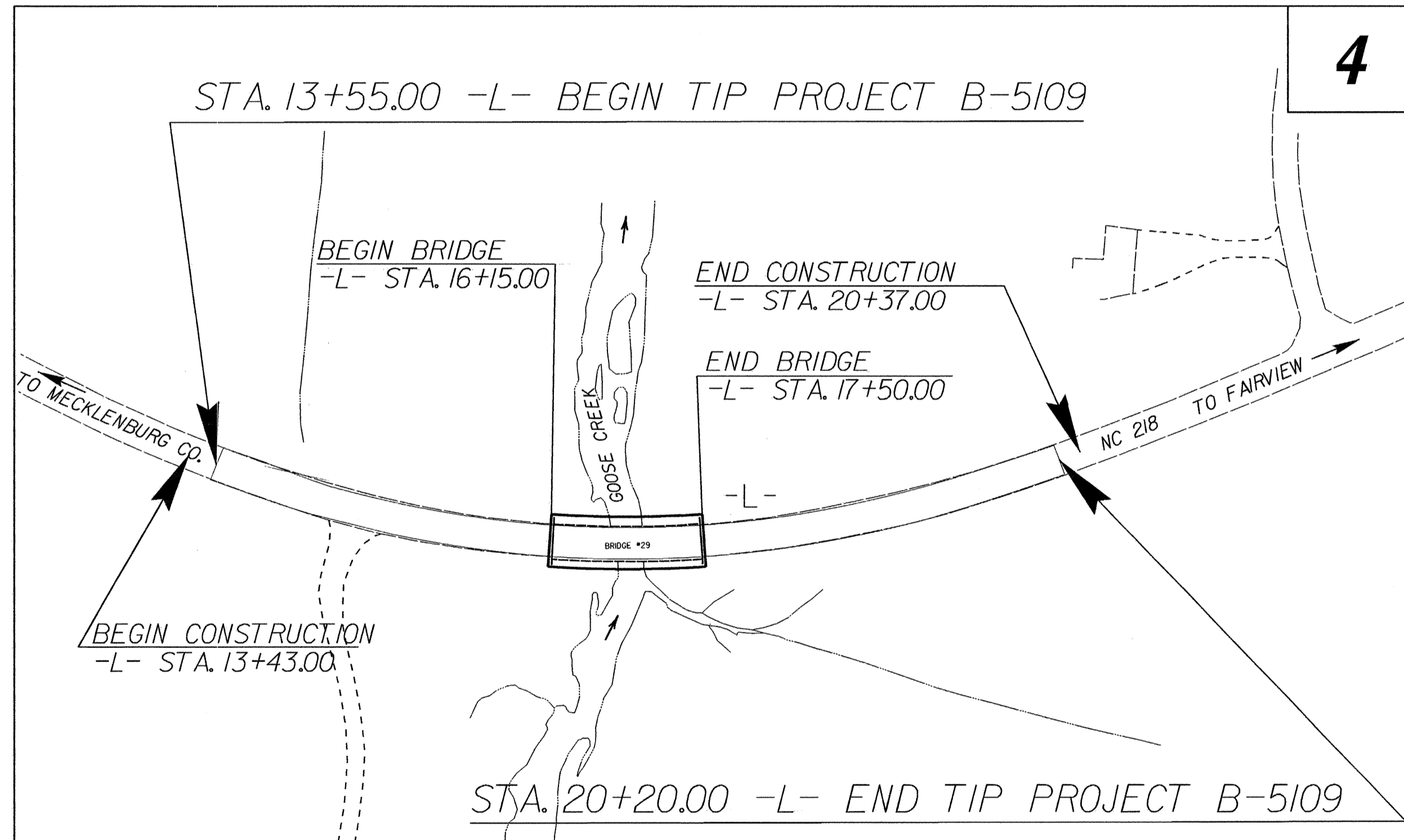
**TIP PROJECT: B-5109**



STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS  
 PLAN FOR PROPOSED  
 HIGHWAY EROSION CONTROL  
**UNION COUNTY**

**LOCATION: BRIDGE NO. 29 ON NC 218 OVER GOOSE CREEK**

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



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5109	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

**EROSION AND SEDIMENT CONTROL MEASURES**

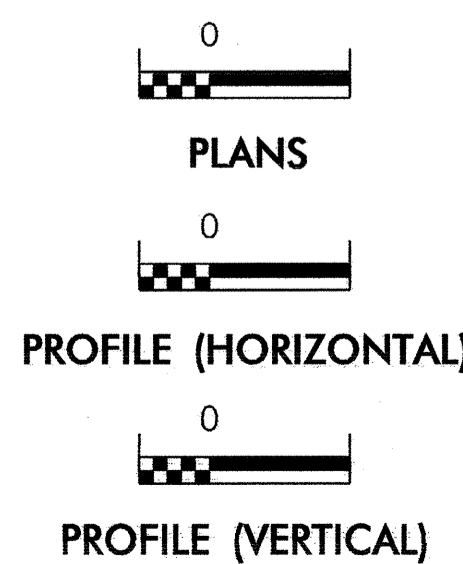
Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	III III III
1606.01	Special Sediment Control Fence	III III III
1622.01	Temporary Berms and Slope Drains	TD
1630.02	Silt Basin Type B	SB
1633.01	Temporary Rock Silt Check Type-A	RS
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	RS
1633.02	Temporary Rock Silt Check Type-B	RS
	Wattle / Coir Fiber Wattle	W
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	W
1634.01	Temporary Rock Sediment Dam Type-A	RD
1634.02	Temporary Rock Sediment Dam Type-B	RD
1635.01	Rock Pipe Inlet Sediment Trap Type-A	RPI
1635.02	Rock Pipe Inlet Sediment Trap Type-B	RPI
1630.04	Stilling Basin	SB
1630.06	Special Stilling Basin	SB
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	SK
	Tiered Skimmer Basin	SK
	Infiltration Basin	IB

**THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.**

**THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.**

**ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT**  
 Refer To E. C. Special Provisions for Special Considerations.

**GRAPHIC SCALE**



ROADSIDE ENVIRONMENTAL UNIT  
 DIVISION OF HIGHWAYS  
 STATE OF NORTH CAROLINA

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared In the Office of:  
**ROADSIDE ENVIRONMENTAL UNIT**  
 1 South Wilmington St.  
 Raleigh, NC 27611  
**2012 STANDARD SPECIFICATIONS**

**Roadway Standard Drawings**

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2012 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

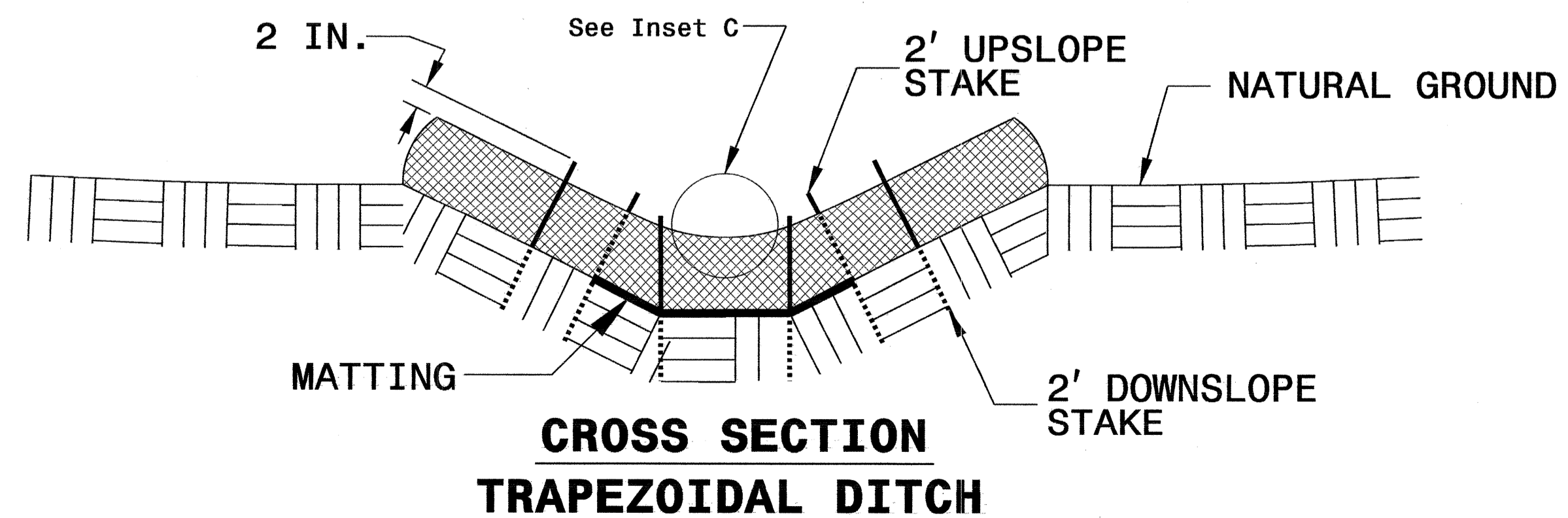
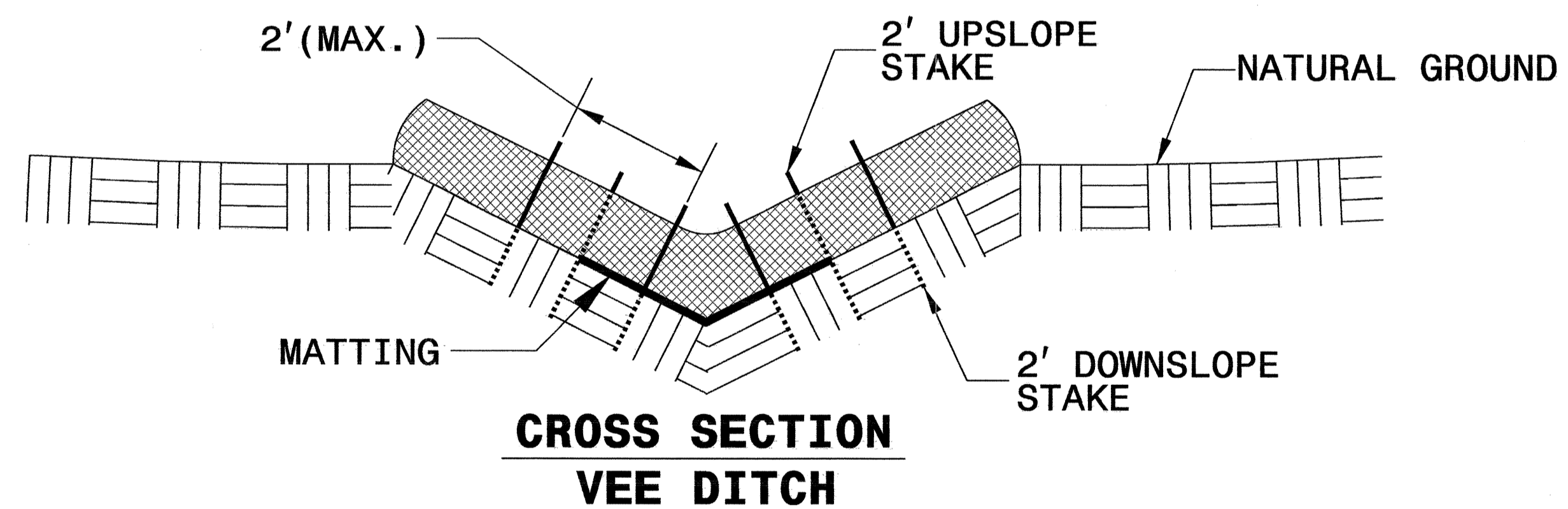
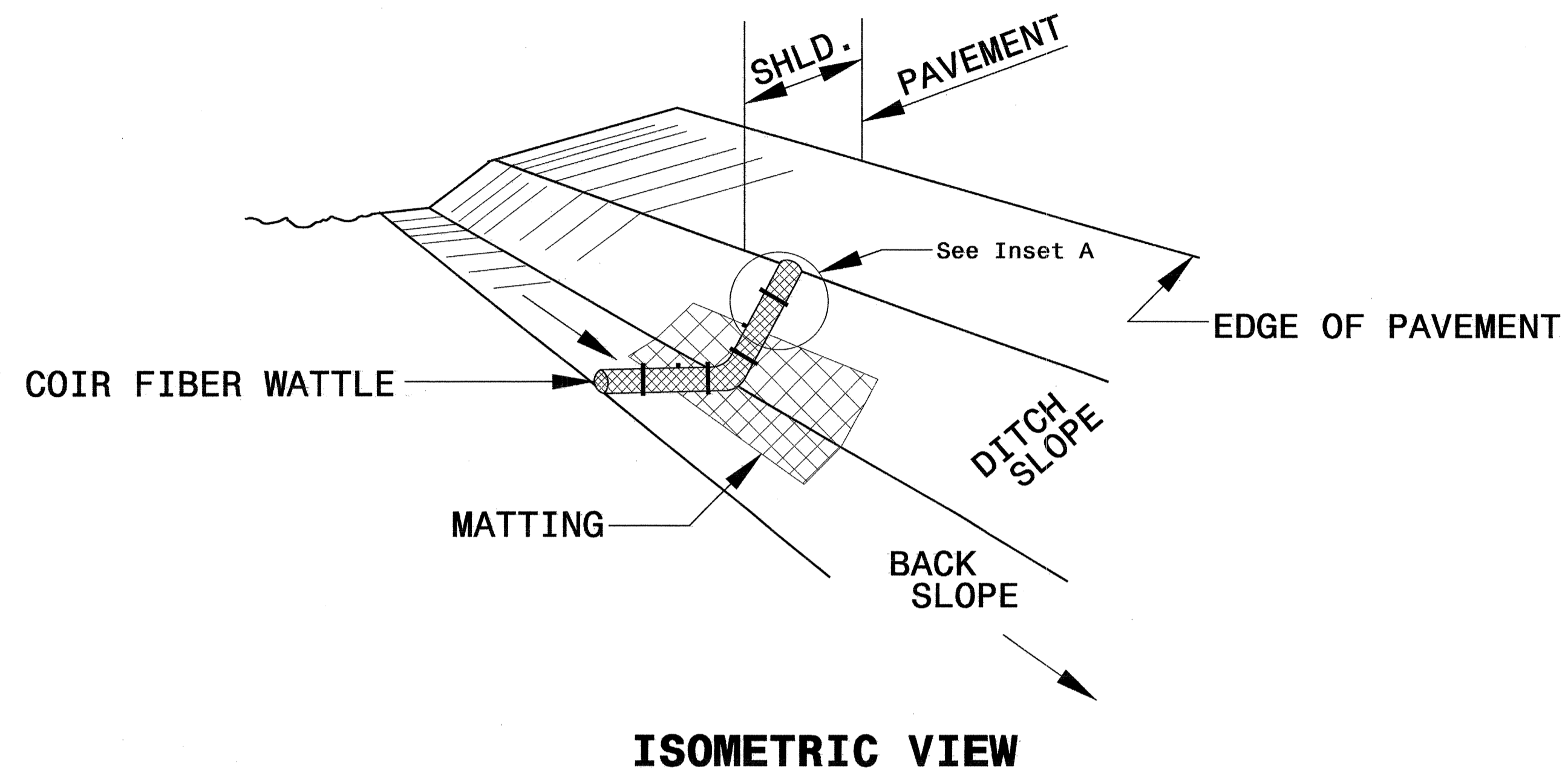
1604.01 Railroad Erosion Control Detail	1632.01 Rock Inlet Sediment Trap Type A
1605.01 Temporary Silt Fence	1632.02 Rock Inlet Sediment Trap Type B
1606.01 Special Sediment Control Fence	1632.03 Rock Inlet Sediment Trap Type C
1607.01 Gravel Construction Entrance	1633.01 Temporary Rock Silt Check Type A
1622.01 Temporary Berms and Slope Drains	1633.02 Temporary Rock Silt Check Type B
1630.01 Riser Basin	1634.01 Temporary Rock Sediment Dam Type A
1630.02 Silt Basin Type B	1634.02 Temporary Rock Sediment Dam Type B
1630.03 Temporary Silt Ditch	1635.01 Rock Pipe Inlet Sediment Trap Type A
1630.04 Stilling Basin	1635.02 Rock Pipe Inlet Sediment Trap Type B
1630.05 Temporary Diversion	1640.01 Coir Fiber Baffle
1630.06 Special Stilling Basin	1645.01 Temporary Stream Crossing
1631.01 Matting Installation	





# COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL

PROJECT REFERENCE NO. B-5109	SHEET NO. EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



**NOTES:**

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

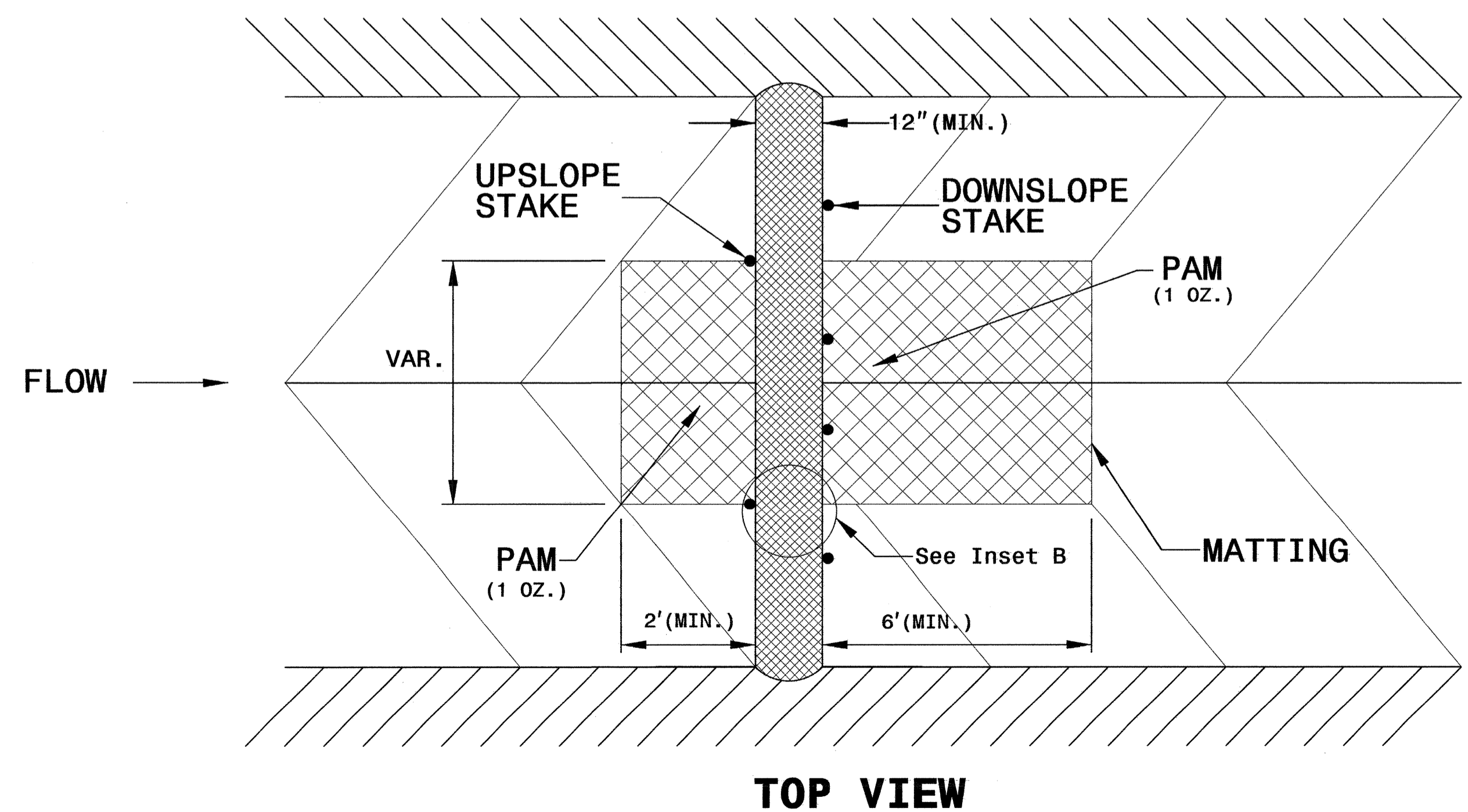
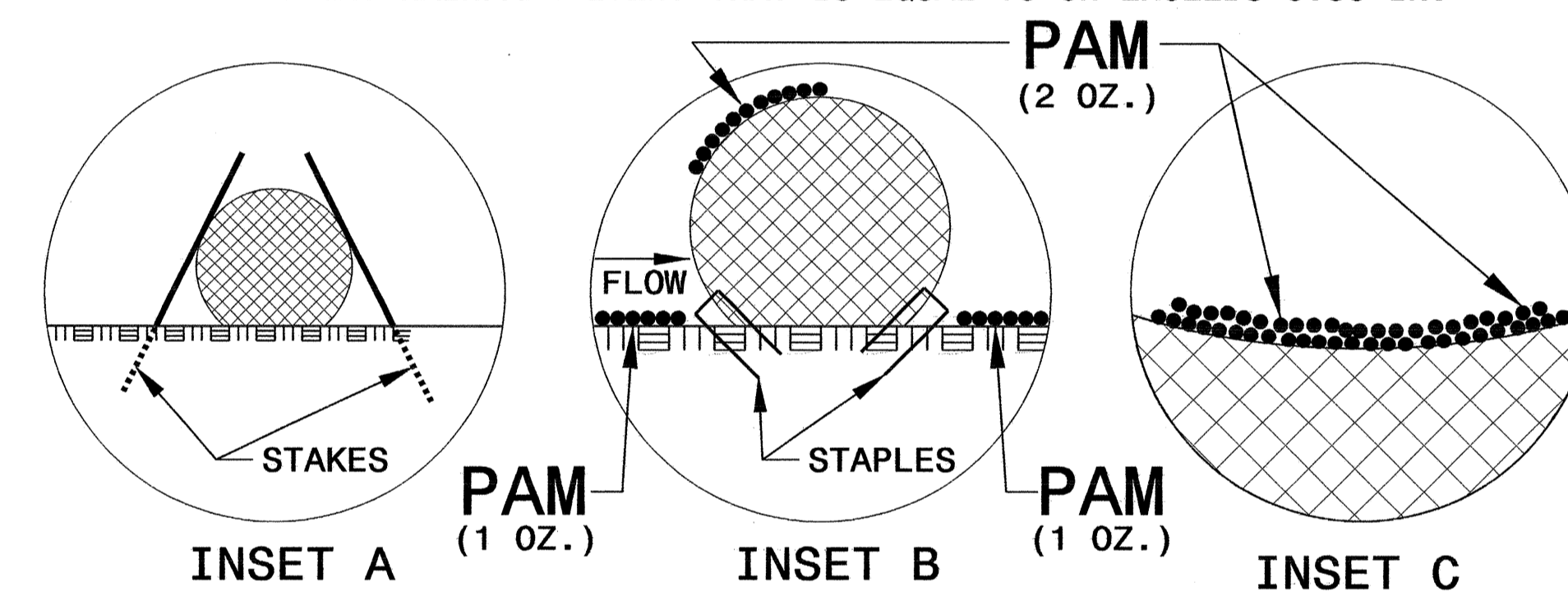
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.



DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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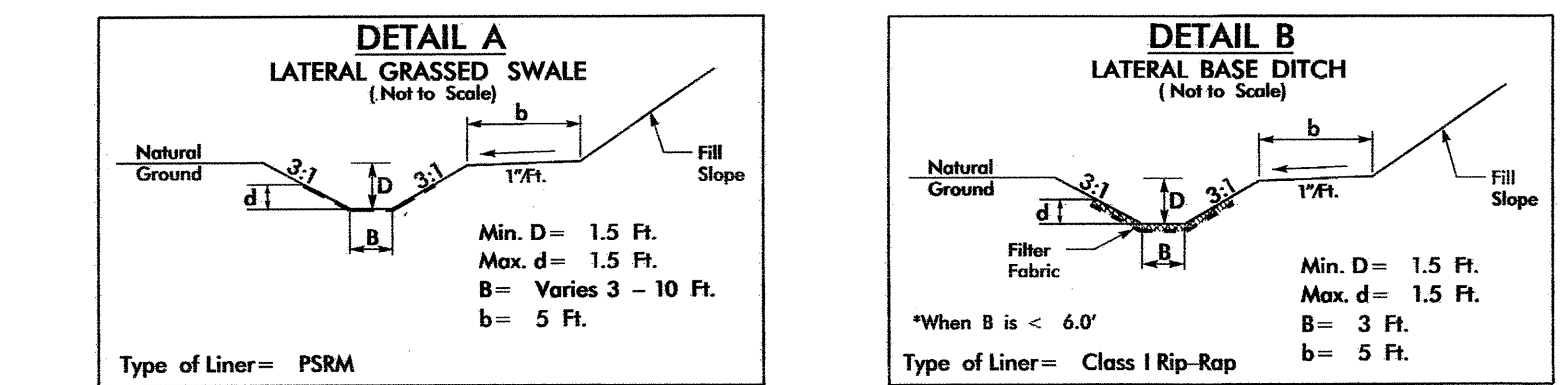
PROJECT REFERENCE NO. <i>B-5109</i>	SHEET NO. <i>EC-3</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

## ***SOIL STABILIZATION TIMEFRAMES***

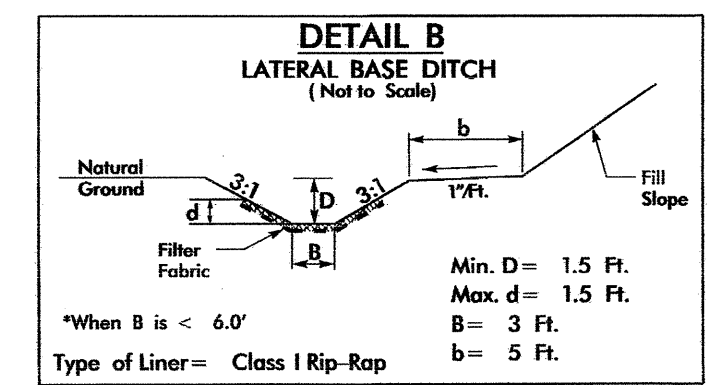
<i>SITE DESCRIPTION</i>	<i>STABILIZATION TIME</i>	<i>TIMEFRAME EXCEPTIONS</i>
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

PROJECT REFERENCE NO. B-5109	SHEET NO. EC-4/CONST.4
RAW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

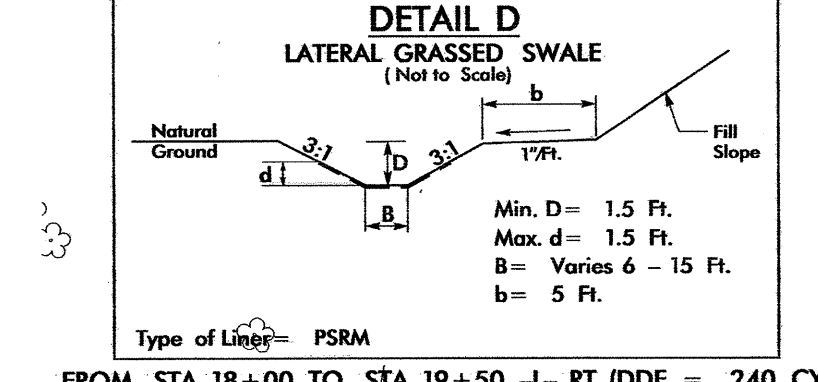
FOR -L- PROFILE SEE SHEET 5



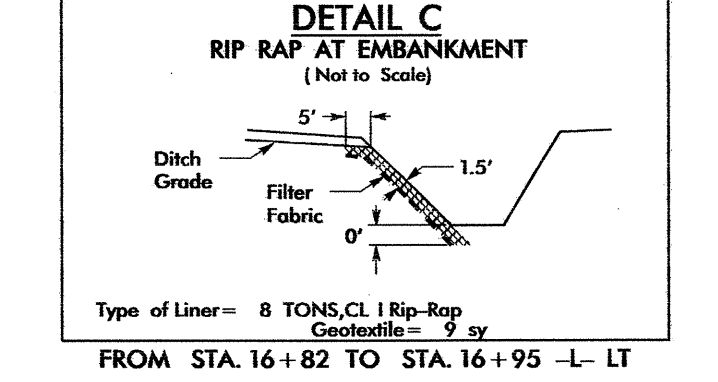
FROM STA. 16+90 TO STA. 19+85 -L- LT (DDE = 400 CY)  
(17+15 TO 19+00 - 10 Ft. WIDTH)  
(19+25 TO 19+85 - 3 Ft. WIDTH)



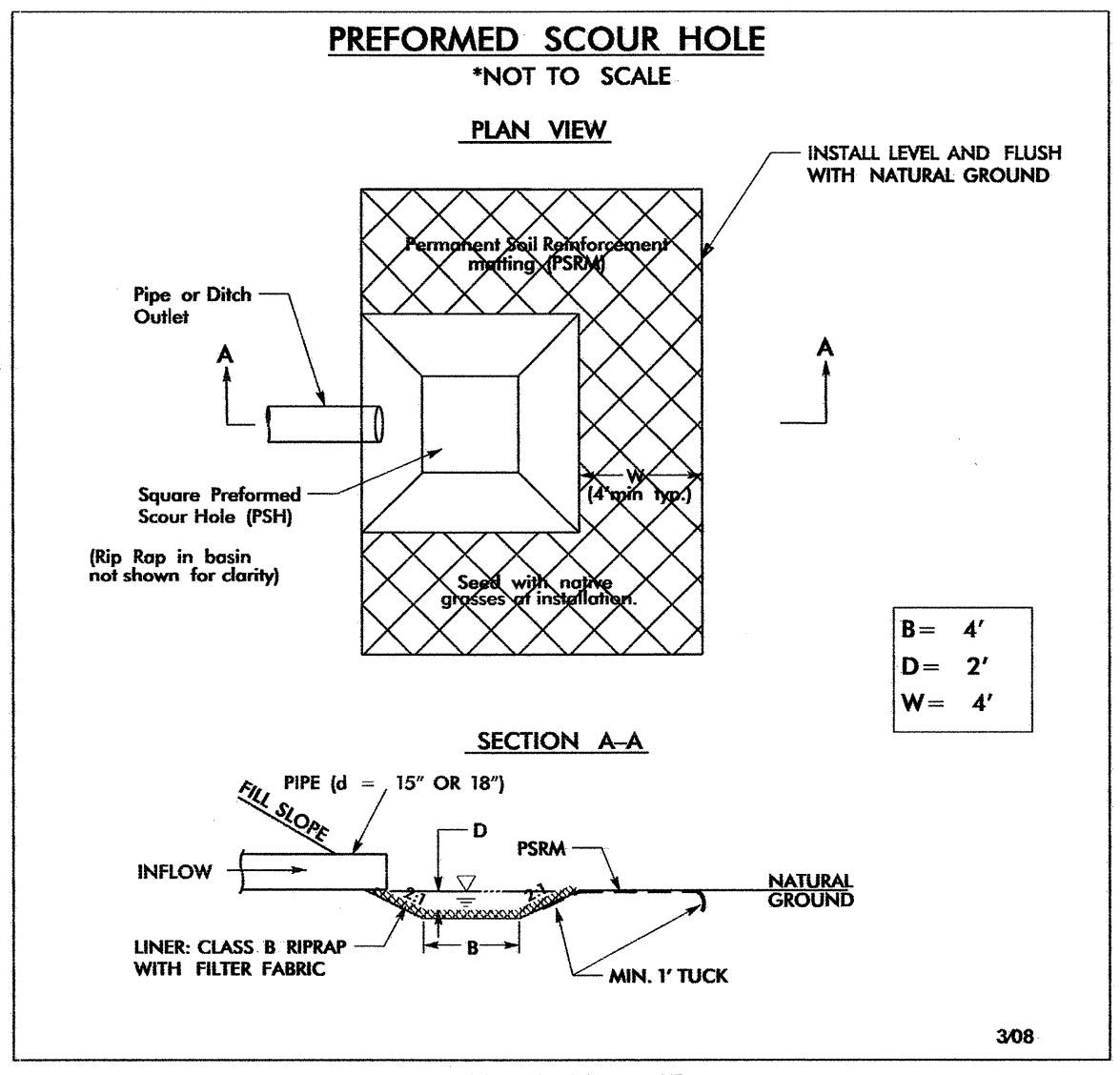
FROM STA. 19+50 TO STA. 20+35 -L- RT (DDE = 40 CY)  
FROM STA. 19+85 TO STA. 20+35 -L- LT (DDE = 20 CY)



FROM STA. 18+00 TO STA. 19+50 -L- RT (DDE = 240 CY)  
(18+15 TO 18+75 - 15 Ft. WIDTH)  
(19+00 TO 19+50 - 6 Ft. WIDTH)



FROM STA. 16+82 TO STA. 16+95 -L- LT



STA. 15+20 -L- RT  
STA. 15+80 -L- LT

42 x 21 x 3  
1.5 inch Skimmer  
with 0.750 inch  
Orifice Diameter  
7 ft. weir  
ID 4.1C

UTILIZE FLOATING  
TURBIDITY  
CURTAIN AS NEEDED

PUE TO BE DEEDED TO AT&T

BEGIN APPROACH SLAB  
-L- STA. 15+91.00

END CONSTRUCTION STA. 20+37.00

END STATE PROJECT B-5109  
-L- STA. 20+20.00

BEGIN CONSTRUCTION STA. 13+43.00

BEGIN STATE PROJECT B-5109  
-L- STA. 13+55.00

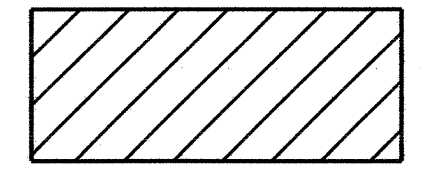
END APPROACH SLAB  
-L- STA. 17+74.00

END BRIDGE  
-L- STA. 17+50.00

BEGIN BRIDGE  
-L- STA. 16+15.00

31 x 15 x 3  
1.5 inch Skimmer  
with 0.5 inch  
Orifice Diameter  
4 ft. weir  
ID 4.2C

CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 4



ENVIRONMENTALLY SENSITIVE AREA  
SEE PROJECT SPECIAL PROVISIONS

NOTE:  
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING  
BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

NOTE:  
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B  
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT  
DRAINAGE OUTLETS.

8/17/09

REVISIONS

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swlmar

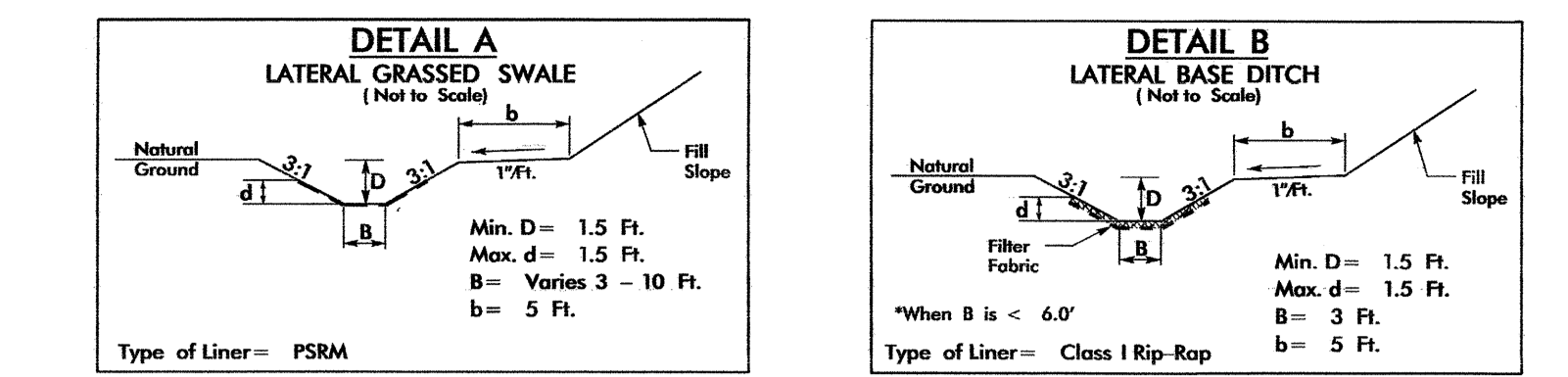
8/17/95

REVISIONS

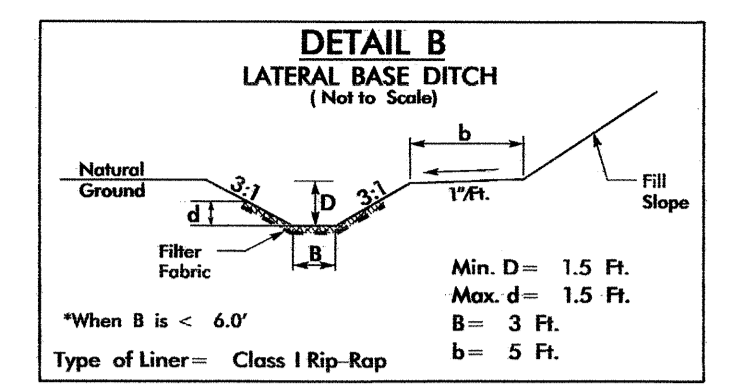
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Author: AT BENNY26593

PROJECT REFERENCE NO. B-5109	SHEET NO. EC-5/CONST.4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

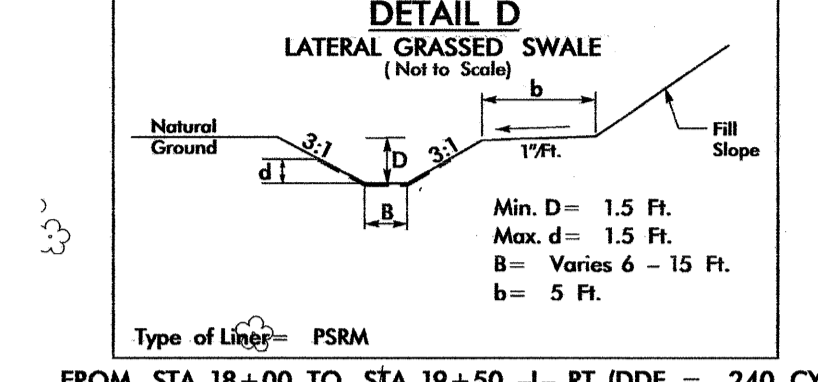
FOR -L- PROFILE SEE SHEET 5



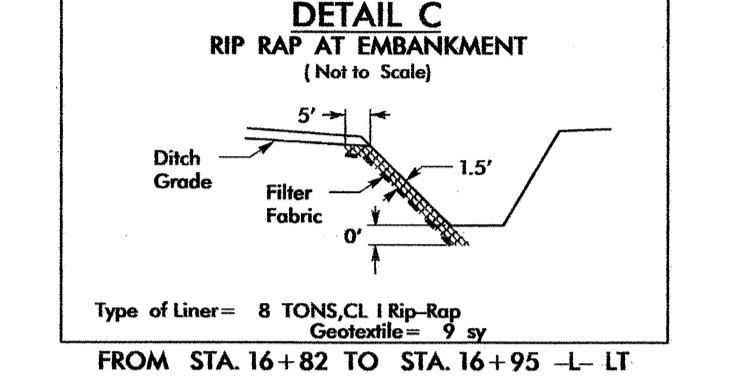
FROM STA. 16+90 TO STA. 19+85 -L- LT (DDE = 400 CY)  
(17+15 TO 19+00 - 10 Ft. WIDTH)  
(19+25 TO 19+85 - 3 Ft. WIDTH)



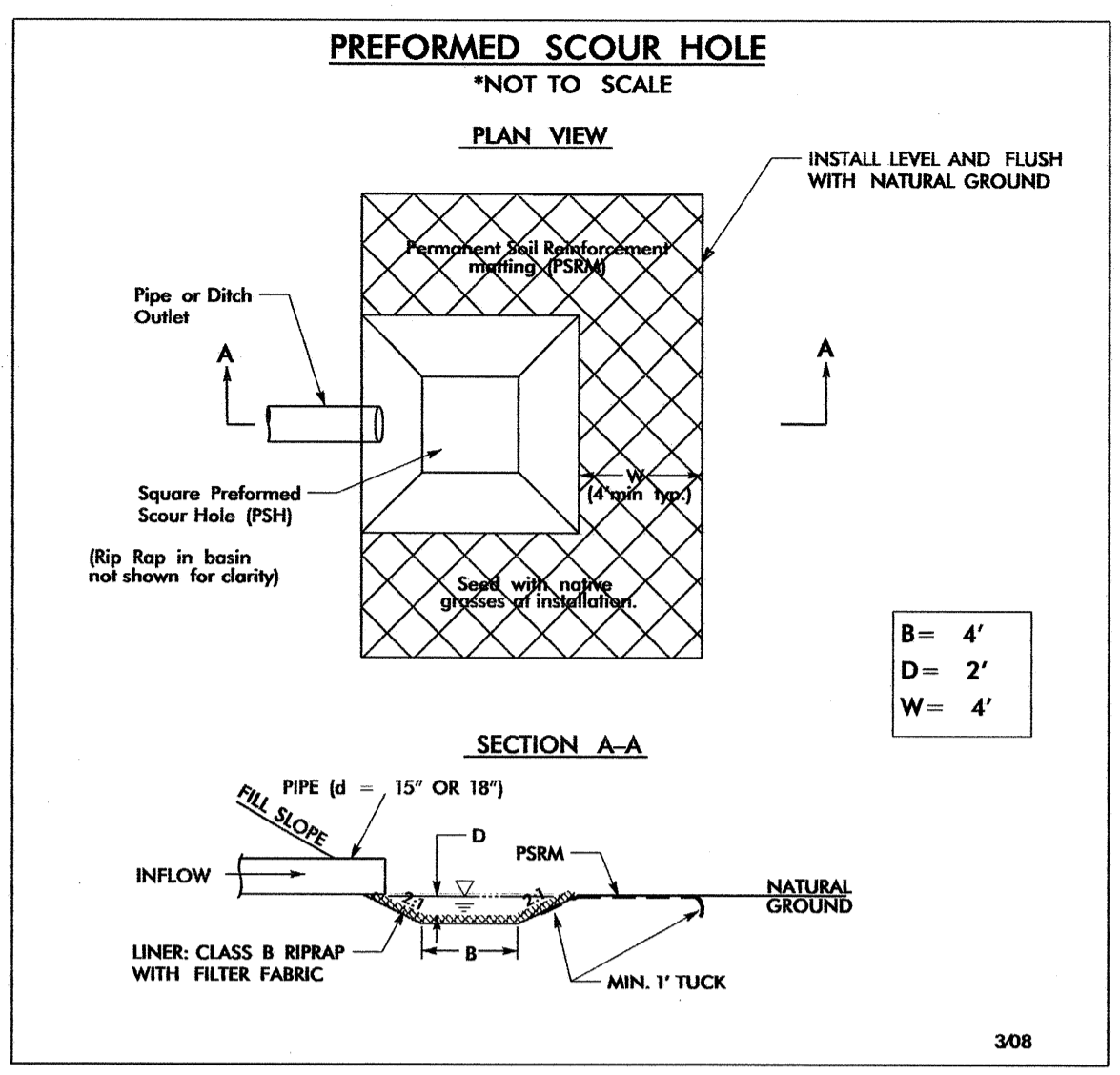
FROM STA. 19+50 TO STA. 20+35 -L- RT (DDE = 40 CY)  
FROM STA. 19+85 TO STA. 20+35 -L- LT (DDE = 20 CY)



FROM STA. 18+00 TO STA. 19+50 -L- RT (DDE = 240 CY)  
(18+15 TO 18+75 - 15 Ft. WIDTH)  
(19+00 TO 19+50 - 6 Ft. WIDTH)



FROM STA. 16+82 TO STA. 16+95 -L- LT

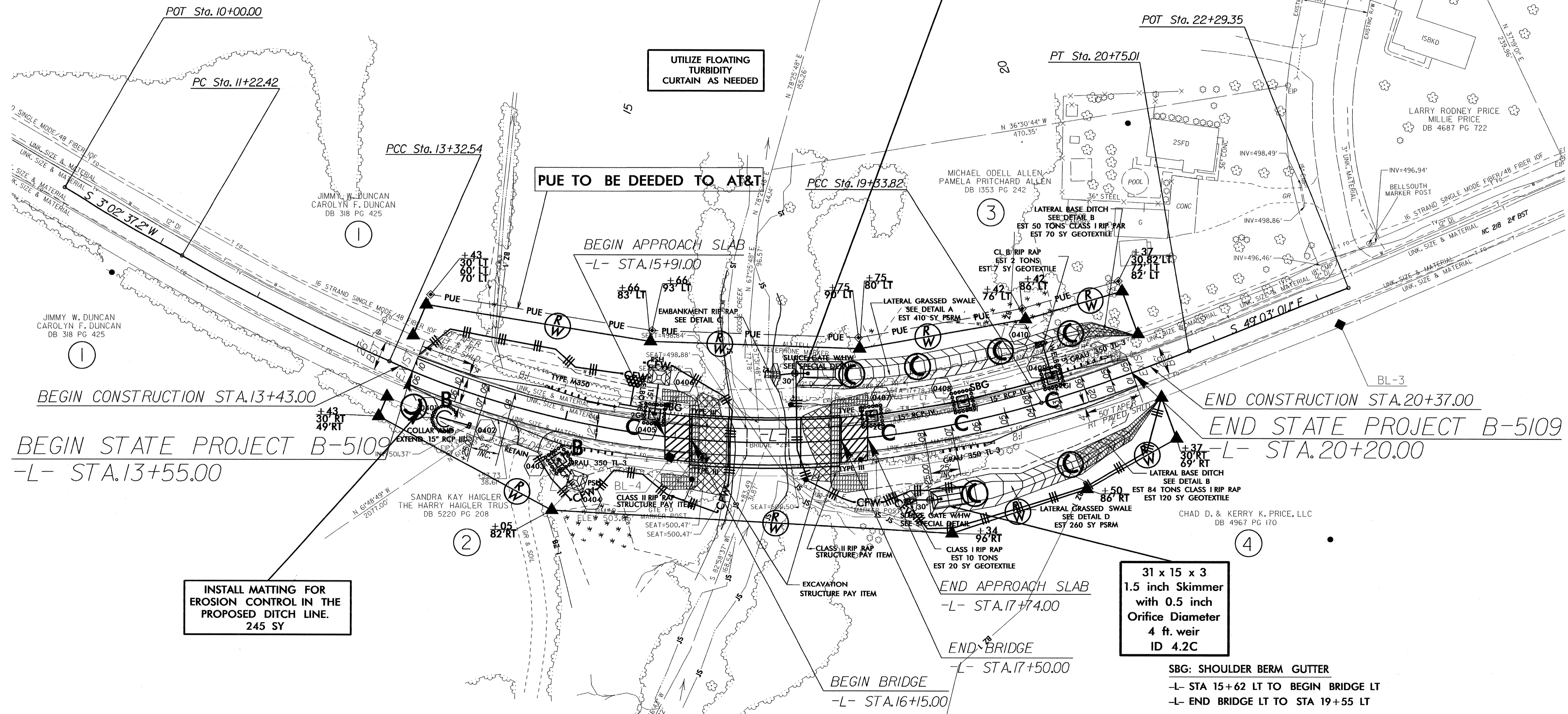


STA. 15+20 -L- RT  
STA. 15+80 -L- LT

42 x 21 x 3  
1.5 inch Skimmer  
with 0.750 inch  
Orifice Diameter  
7 ft. weir  
ID 4.1C

UTILIZE FLOATING  
TURBIDITY  
CURTAIN AS NEEDED

PUE TO BE DEEDED TO AT&T



INSTALL MATTING FOR  
EROSION CONTROL IN THE  
PROPOSED DITCH LINE.  
245 SY

31 x 15 x 3  
1.5 inch Skimmer  
with 0.5 inch  
Orifice Diameter  
4 ft. weir  
ID 4.2C

NOTE:  
UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING  
BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

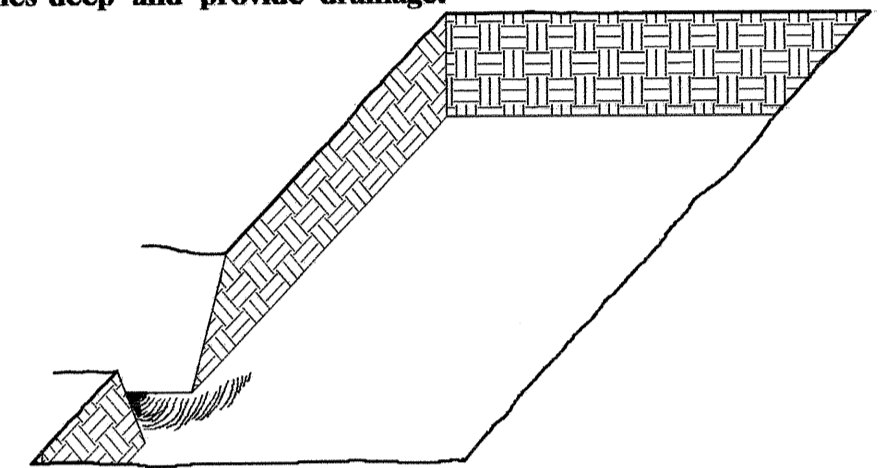
SBG: SHOULDER BERM GUTTER  
-L- STA 15+62 LT TO BEGIN BRIDGE LT  
-L- END BRIDGE LT TO STA 19+55 LT

# PLANTING DETAILS

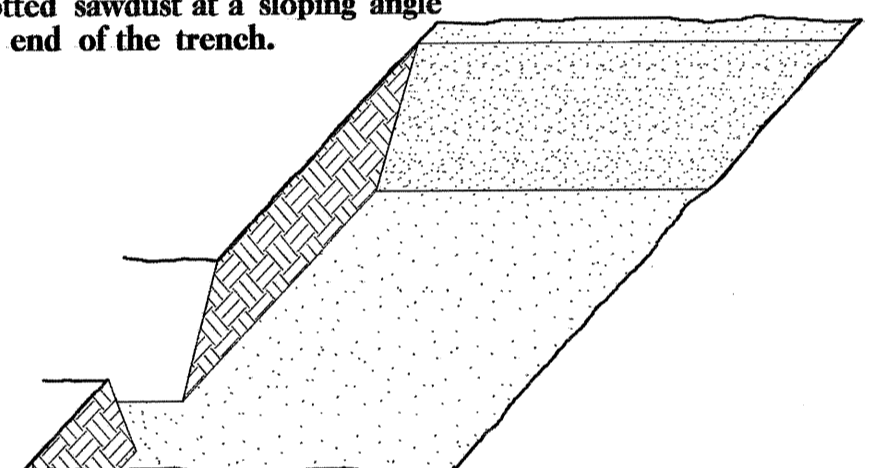
## SEEDLING / LINER BAREROOT PLANTING DETAIL

### HEALING IN

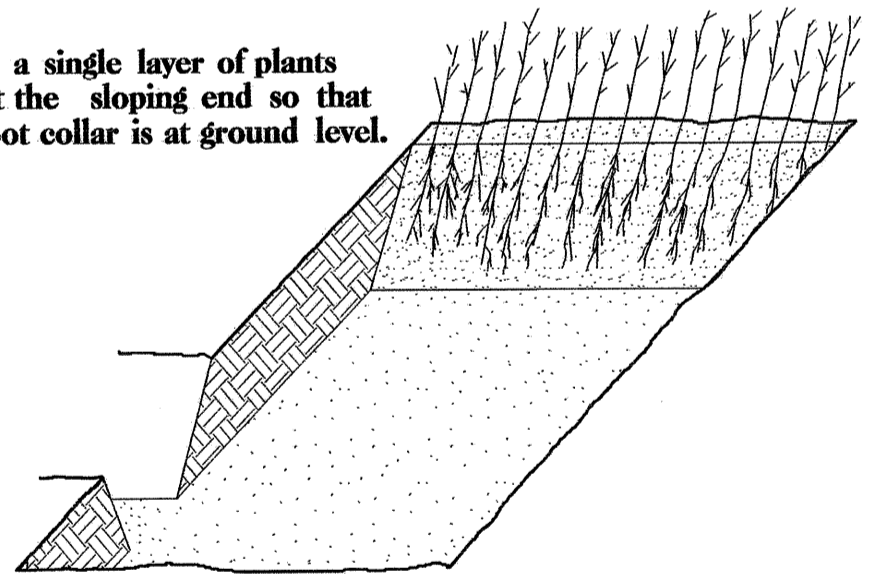
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



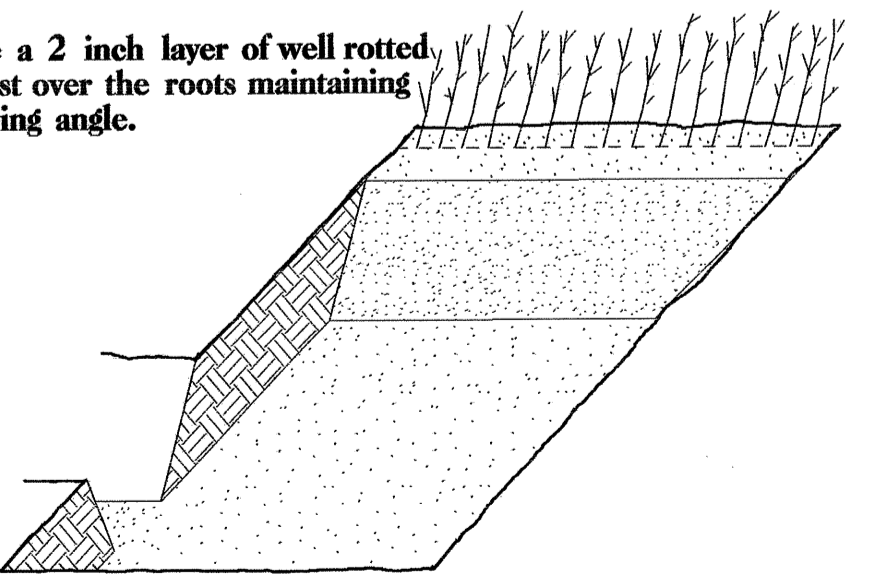
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

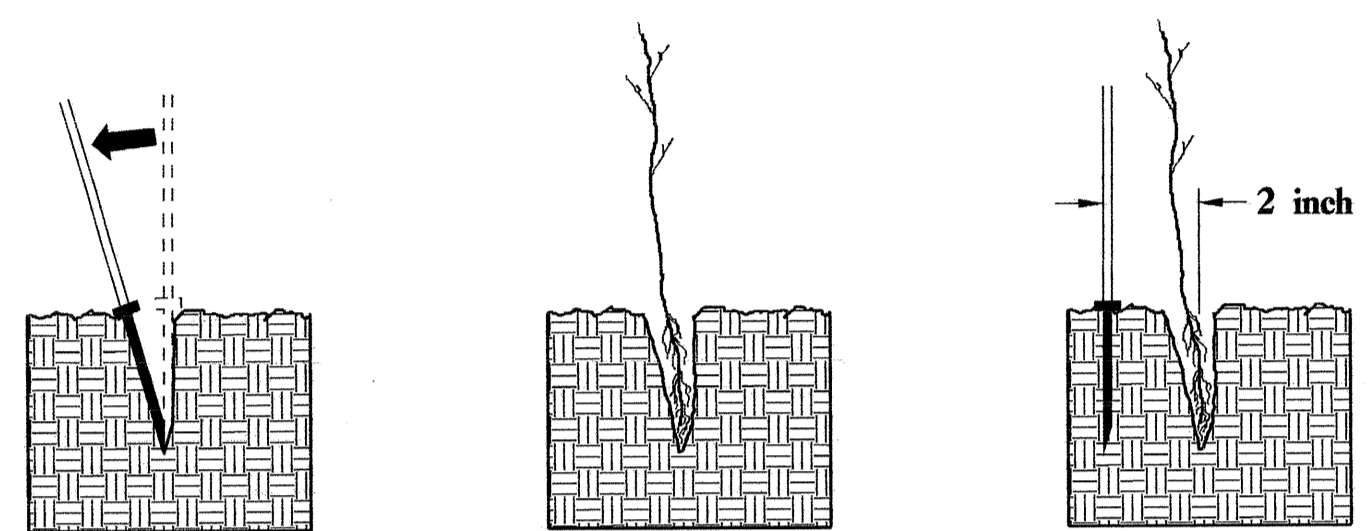


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

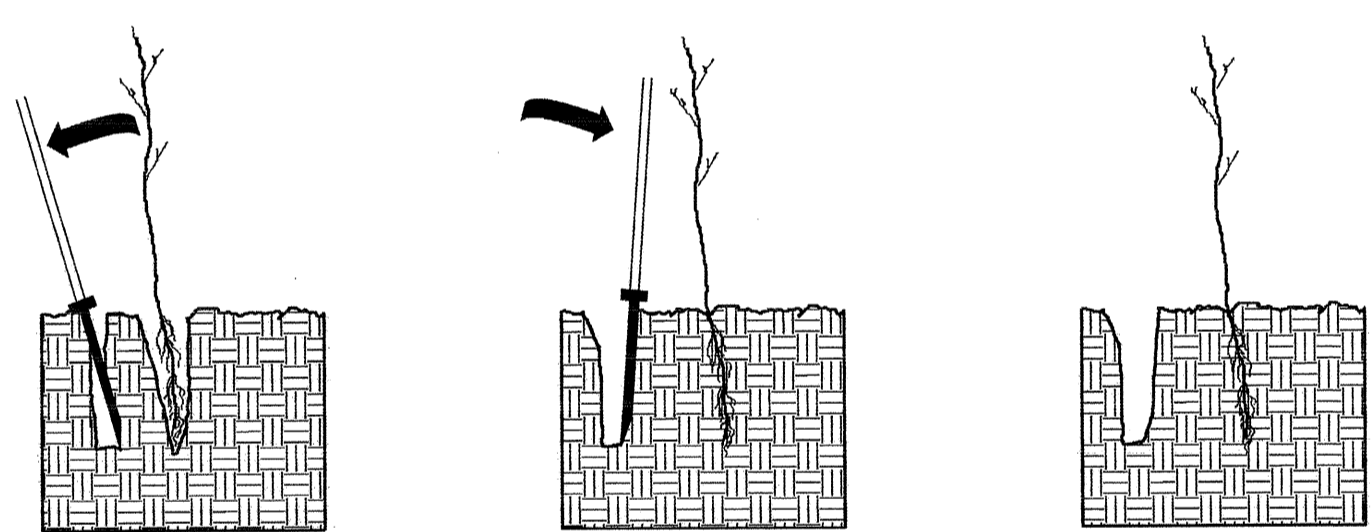


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

### DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



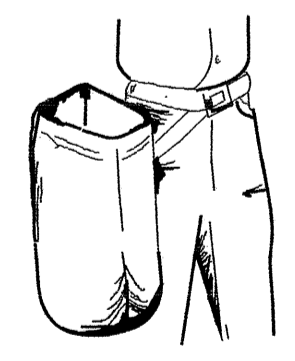
1. Insert planting bar as shown and pull handle toward planter.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches toward planter from seedling.



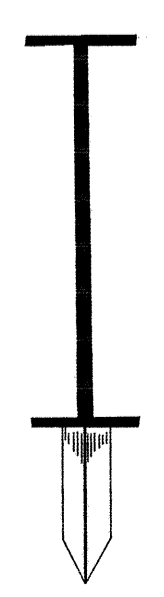
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

### PLANTING NOTES:

**PLANTING BAG**  
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.



**KBC PLANTING BAR**  
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.



**ROOT PRUNING**  
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

# REFORESTATION

- TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

### REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

30% PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in - 18 in BR
35% NYSSA SYLVATICA	BLACKGUM	12 in - 18 in BR
35% QUERCUS RUBRA	NORTHERN RED OAK	12 in - 18 in BR

## REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

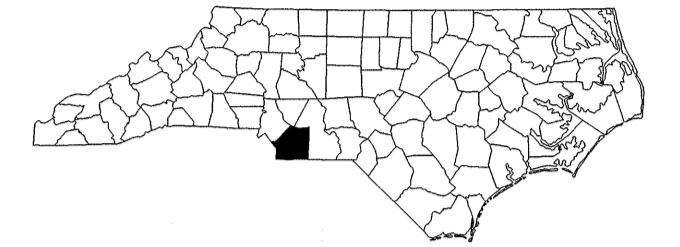
See Sheet 1-A For Index of Sheets.  
See Sheet 1-B For Conventional Symbols.

T.I.P. NO.	SHEET NO.
B-5109	UC-1

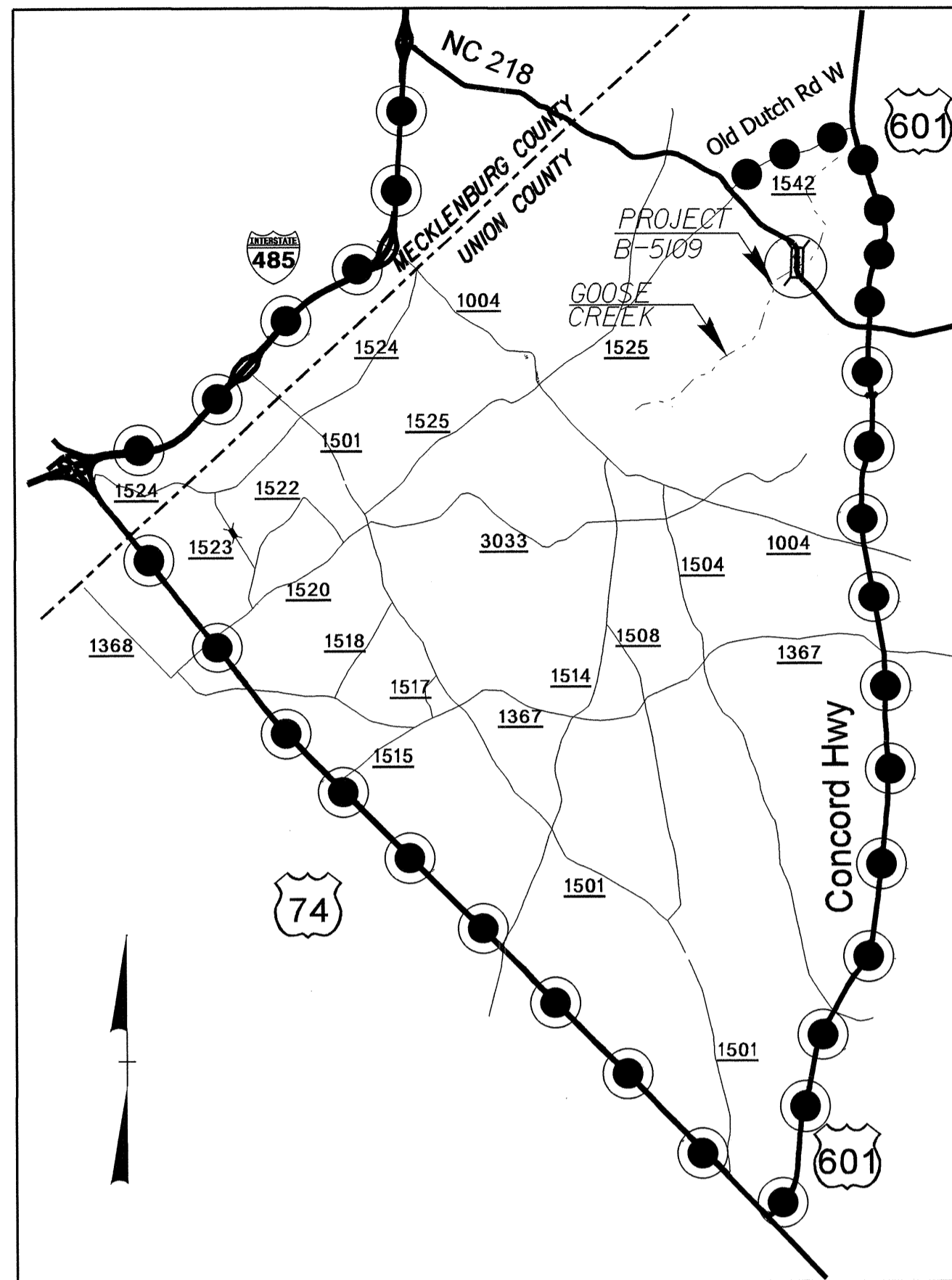
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**UTILITY CONSTRUCTION PLANS  
UNION COUNTY**

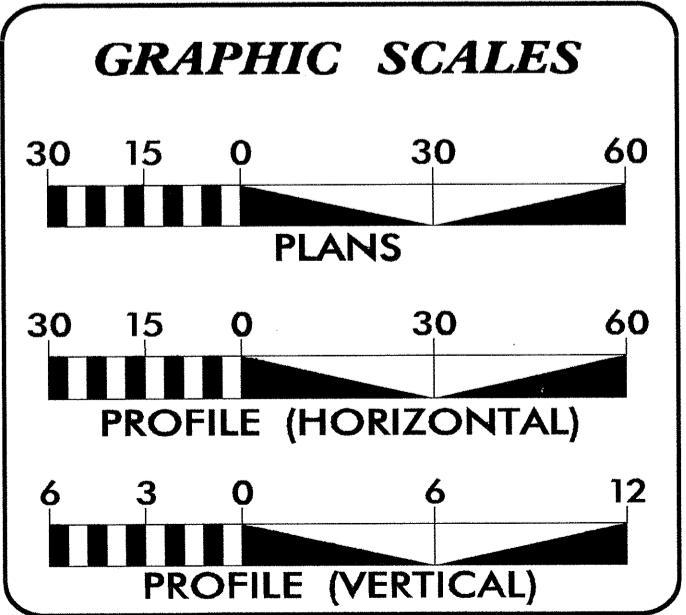
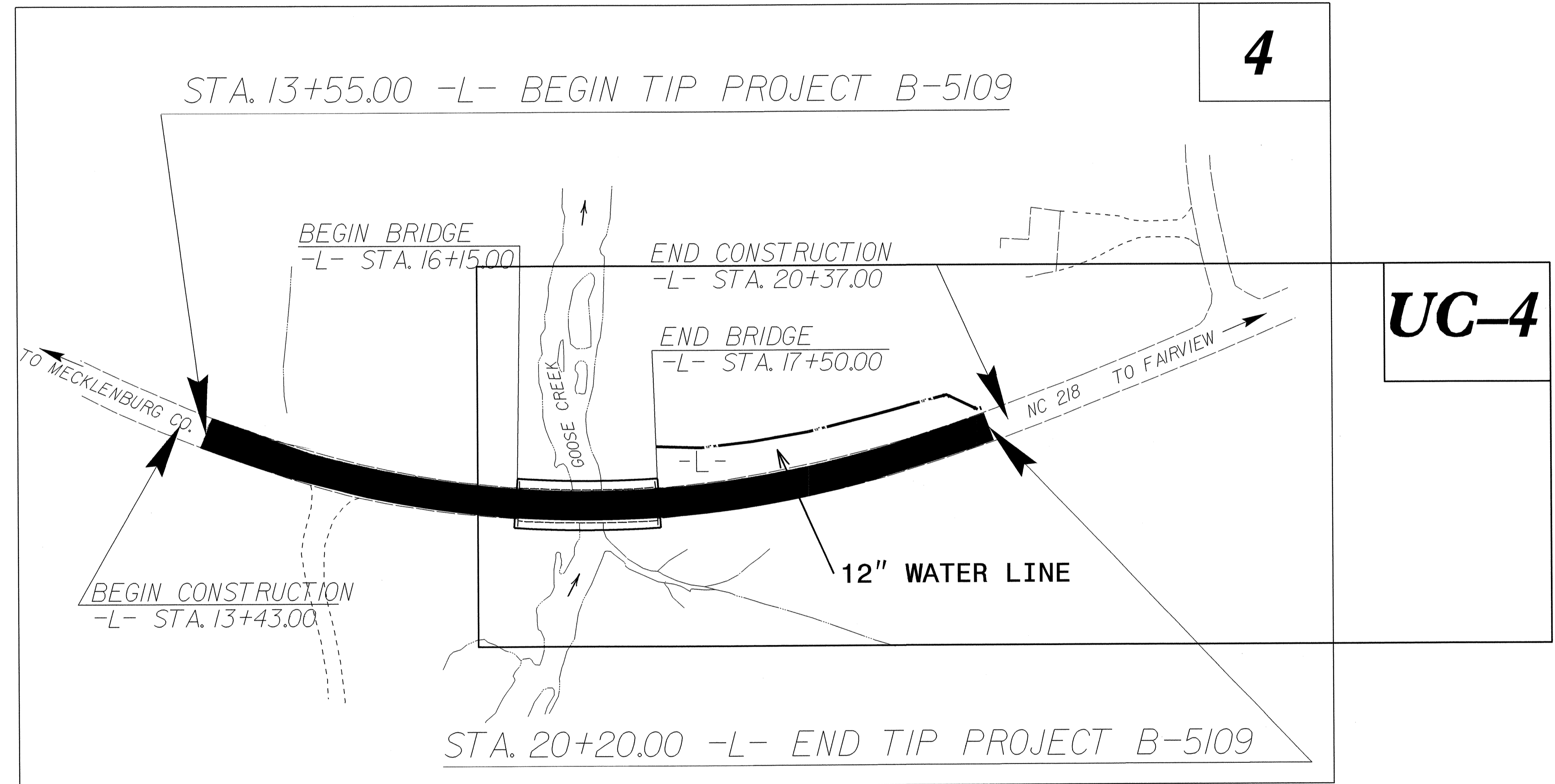
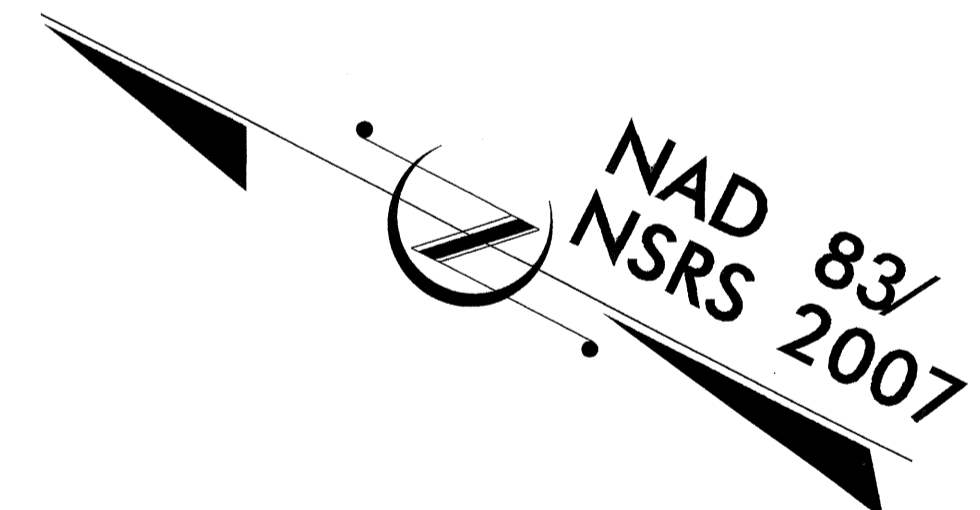
**LOCATION: BRIDGE NO. 29 ON NC 218 OVER GOOSE CREEK  
TYPE OF WORK: WATER**



**TIP PROJECT: B-5109**



●—●—●— DETOUR ROUTE  
○-○-○- TRUCK DETOUR ROUTE

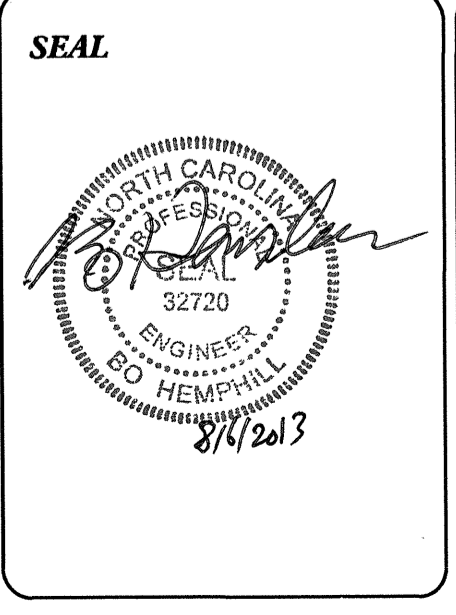


**INDEX OF SHEETS**

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A	DETAILS
UC-4	UTILITY CONSTRUCTION SHEET

**WATER AND SEWER OWNERS ON PROJECT**

(1) Water - Union County Public Works



PREPARED IN THE OFFICE OF:  
**DIVISION OF HIGHWAYS  
UTILITIES UNIT  
UTILITIES ENGINEERING**

1591 MAIL SERVICES CENTER  
RALEIGH NC 27699-1591  
PHONE (919) 707-6690  
FAX (919) 250-4151

**Roger Worthington, P.E.** UTILITIES SECTION ENGINEER  
**Carl Barclay, P.E.** UTILITIES SQUAD LEADER PROJECT ENGINEER  
**Bo Hemphill, PE** UTILITIES PROJECT DESIGNER

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STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# UTILITIES PLAN SHEET SYMBOLS

## PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	
11 1/4 Degree Bend	
22 1/2 Degree Bend	
45 Degree Bend	
90 Degree Bend	
Plug	
Tee	
Cross	
Reducer	
Gate Valve	
Butterfly Valve	
Tapping Valve	
Line Stop	
Line Stop with Bypass	
Blow Off	
Fire Hydrant	
Relocate Fire Hydrant	
Remove Fire Hydrant	REM FH
Water Meter	
Relocate Water Meter	
Remove Water Meter	REM WM
Water Pump Station	
RPZ Backflow Preventer	
DCV Backflow Preventer	
Relocate RPZ Backflow Preventer	
Relocate DCV Backflow Preventer	

## PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	
Force Main Sewer Line (Sized as Shown)	
Manhole (Sized per Note)	
Sewer Pump Station	

## PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Telephone Pedestal	
Utility Line by Others (Type as Shown)	
Trenchless Installation	
Encasement by Open Cut	
Encasement	

Thrust Block	
Air Release Valve	
Utility Vault	
Concrete Pier	
Steel Pier	
Plan Note	
Pay Item Note	

NOTE

PAY ITEM

## EXISTING UTILITIES SYMBOLS

Power Pole		*Underground Power Line	
Telephone Pole		*Underground Telephone Cable	
Joint Use Pole		*Underground Telephone Conduit	
Utility Pole		*Underground Fiber Optics Telephone Cable	
Utility Pole with Base		*Underground TV Cable	
H-Frame Pole		*Underground Fiber Optics TV Cable	
Power Transmission Line Tower		*Underground Gas Pipeline	
Water Manhole		Aboveground Gas Pipeline	
Power Manhole		*Underground Water Line	
Telephone Manhole		Aboveground Water Line	
Sanitary Sewer Manhole		*Underground Gravity Sanitary Sewer Line	
Hand Hole for Cable		Aboveground Gravity Sanitary Sewer Line	
Power Transformer		*Underground SS Forced Main Line	
Telephone Pedestal		Underground Unknown Utility Line	
CATV Pedestal		SUE Test Hole	
Gas Valve		Water Meter	
Gas Meter		Water Valve	
Located Miscellaneous Utility Object		Fire Hydrant	
Abandoned According to Utility Records	AATUR	Sanitary Sewer Cleanout	
End of Information	E.O.I.		

\*For Existing Utilities

Utility Line Drawn from Record (Type as Shown)	
Designated Utility Line (Type as Shown)	

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 REV: 2/1/2012

5/14/99

PROJECT REFERENCE NO. <b>B-5109</b>	SHEET NO. <b>UC-3</b>
DESIGNED BY: <b>BH</b>	
DRAWN BY: <b>BH</b>	
CHECKED BY: <b>CAB</b>	
APPROVED BY: <b>CAB</b>	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

# UTILITY CONSTRUCTION

## GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. THE EXISTING UTILITIES BELONG TO UNION COUNTY PUBLIC WORKS .
3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES, DIVISION OF ENVIRONMENTAL HEALTH. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, DIVISION OF WATER QUALITY. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.
4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPROTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITONAL COST TO THE DEPARTMENT.
7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.
8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.
9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

## PROJECT SPECIFIC NOTES:

10. THE WATER LINE WITHIN THE PROJECT LIMITS MAY BE TAKEN OUT OF SERVICE FOR THE PERIOD REQUIRED TO CONNECT THE NEWLY CONSTRUCTED SEGMENT TO THE REMAINING EXISTING LINE. COORDINATE ANY SHUT DOWN OF THE LINE WITH UNION COUNTY PUBLIC WORKS.
11. THE PROPOSED WATER LINE SHALL BE D.I.R.J. (DUCTILE IRON RESTRAINED JOINT) PIPE.
12. AT WATER LINE STATION 00+00, REMOVE THE HORIZONTAL BEND SHOWN ON THE SURVEYED WATER LINE AND TIE IN AT THAT POINT.
13. PROPERLY RESTRAIN EXISTING PIPE OR USE THRUST COLLAR AND BLOCK ON EXISTING PIPE.

## LIST OF STANDARD DRAWINGS

- 1515.01 WATER METER

## UTILITY CONSTRUCTION

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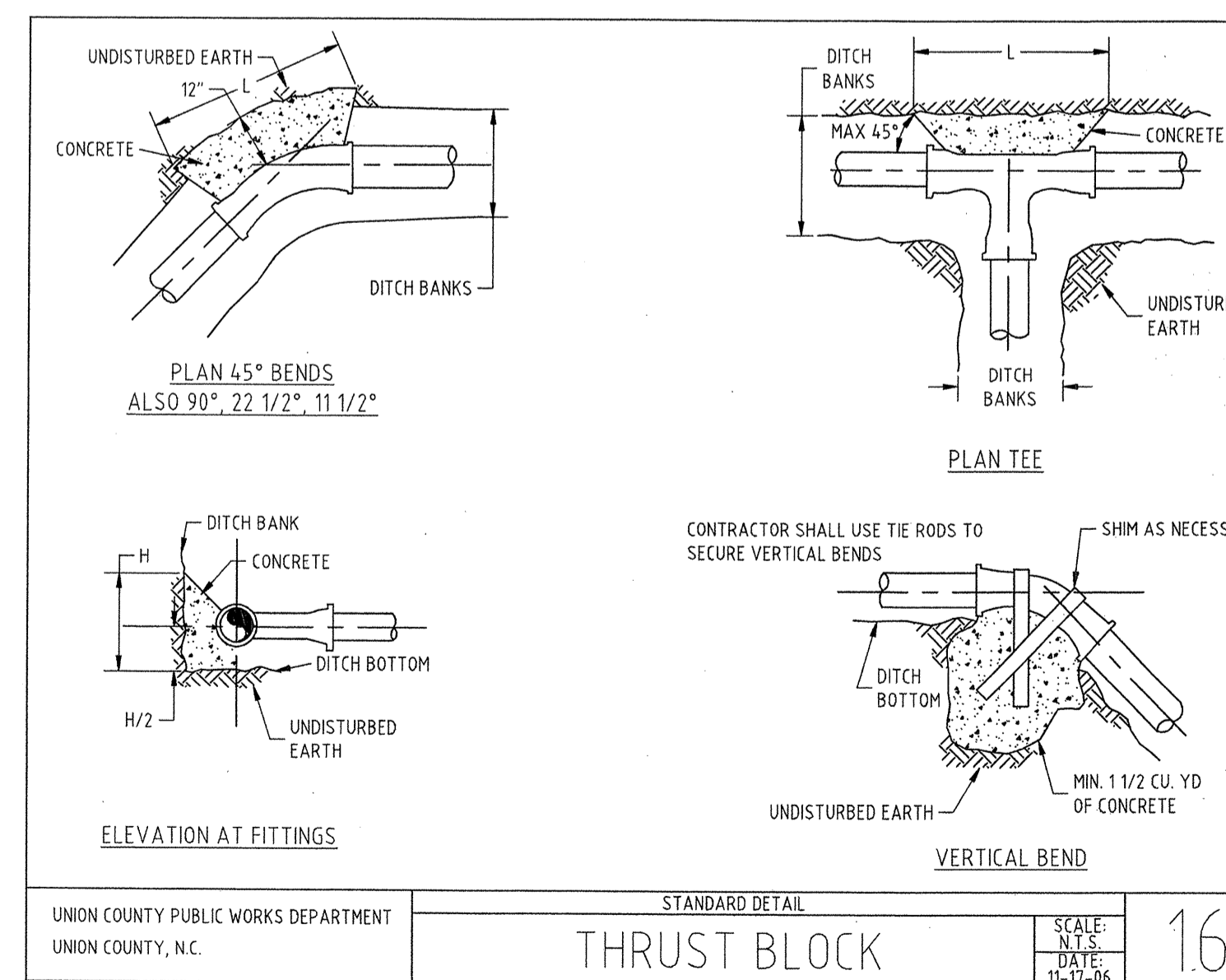
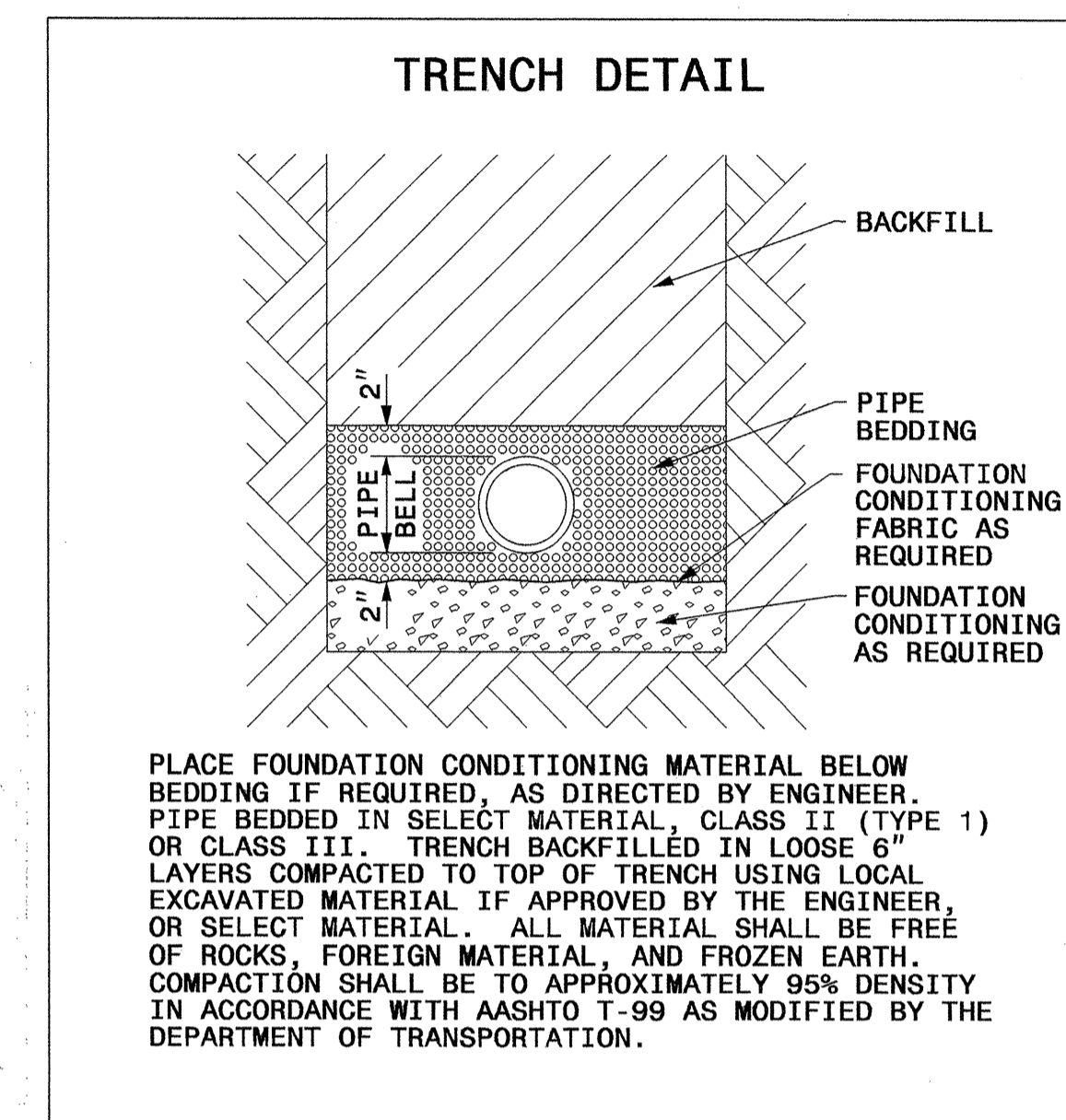
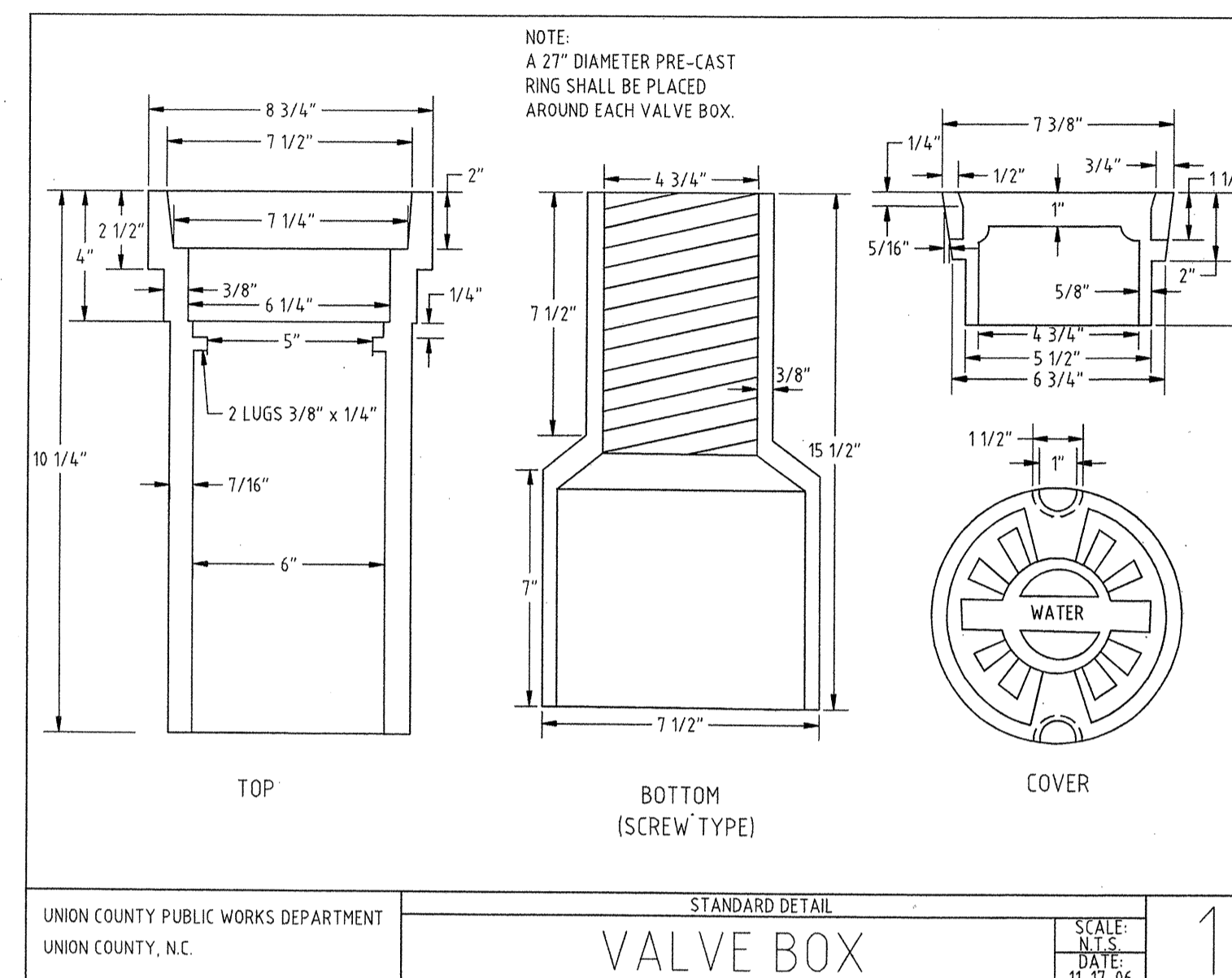
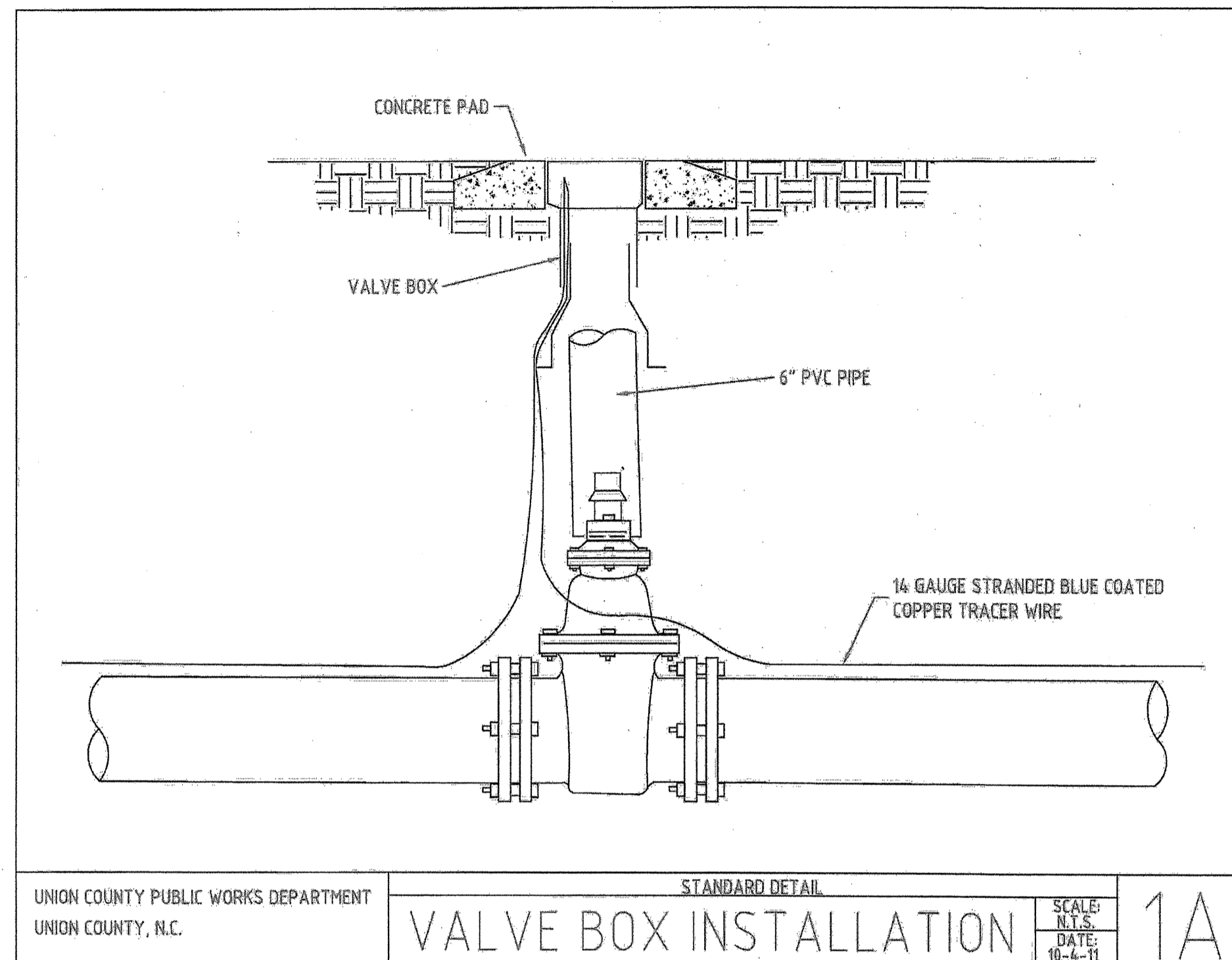


5/14/99

# PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
<b>B-5109</b>	<b>UC-3A</b>
DESIGNED BY: <b>BH</b>	
DRAWN BY: <b>BH</b>	
CHECKED BY: <b>CAB</b>	
APPROVED BY: <b>CAB</b>	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

## UTILITY CONSTRUCTION



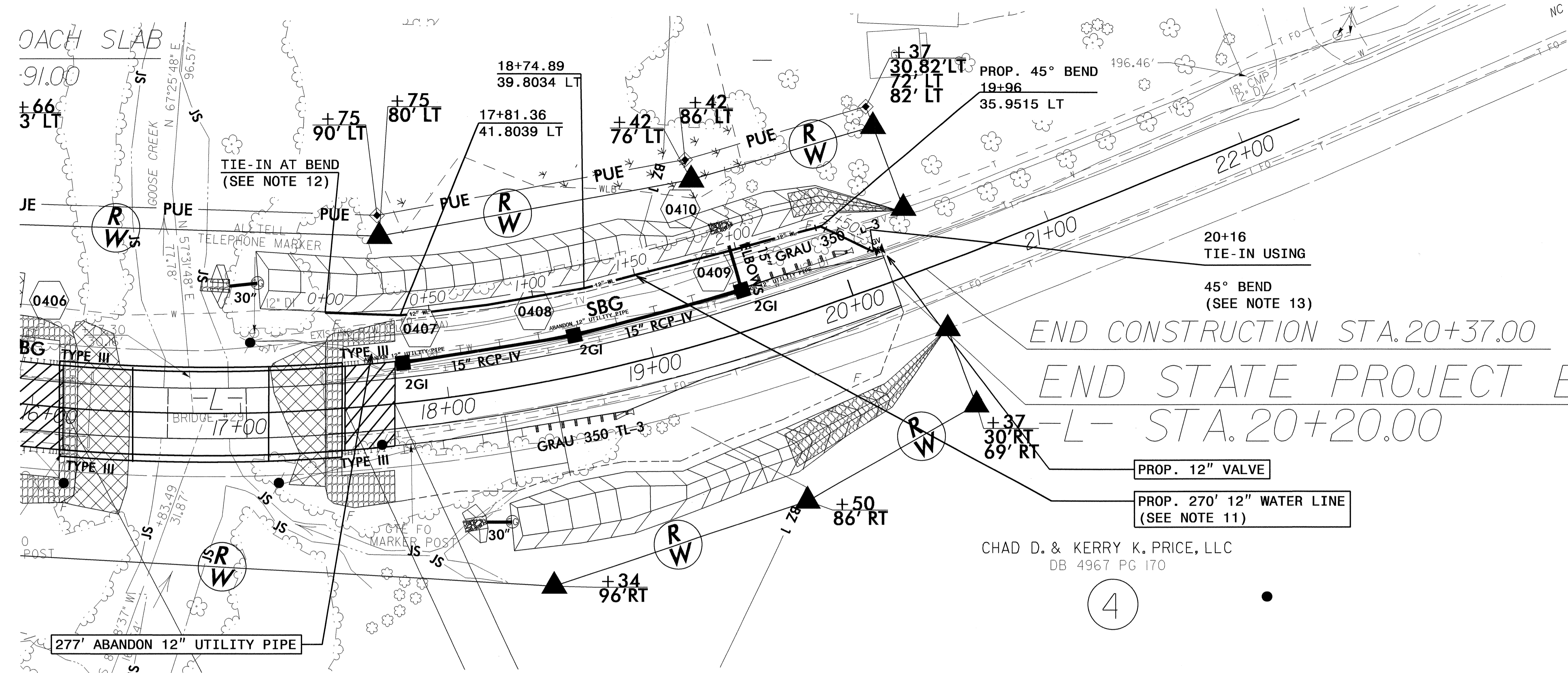
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5/14/99

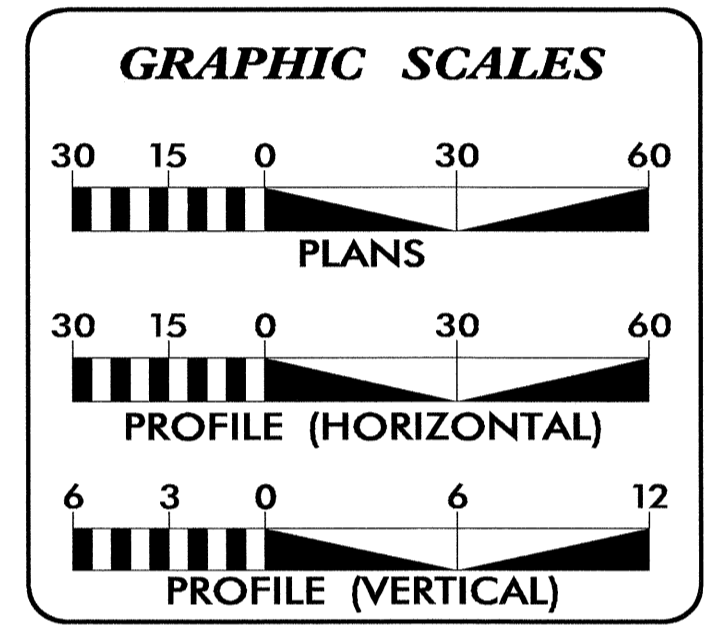
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PROJECT REFERENCE NO.	SHEET NO.
B-5109	UC-4
DESIGNED BY: BH	
DRAWN BY: BH	
CHECKED BY: CAB	
APPROVED BY: CAB	
REVISD:	UTILITY ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITY CONSTRUCTION PLANS ONLY	

### UTILITY CONSTRUCTION



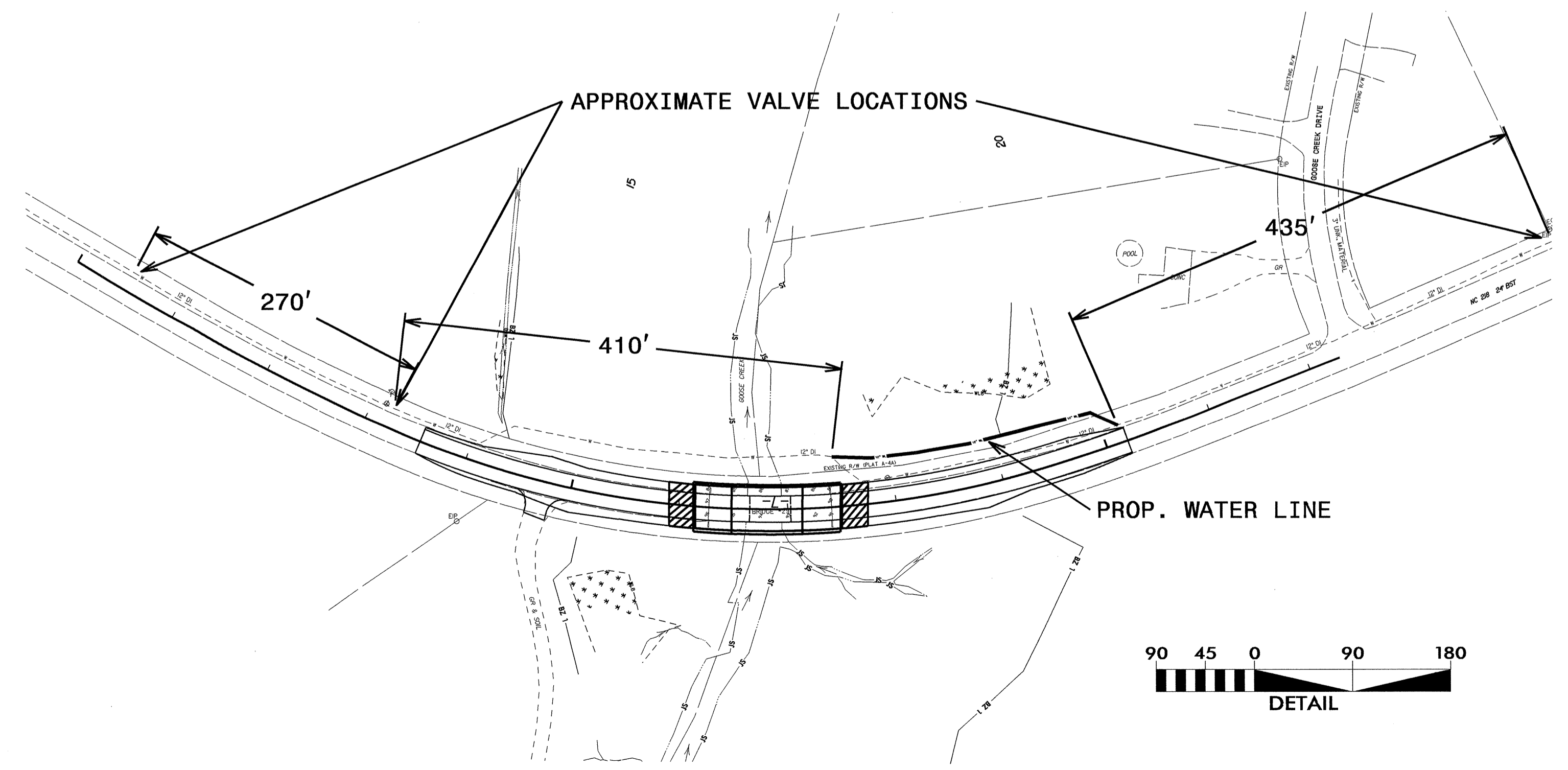
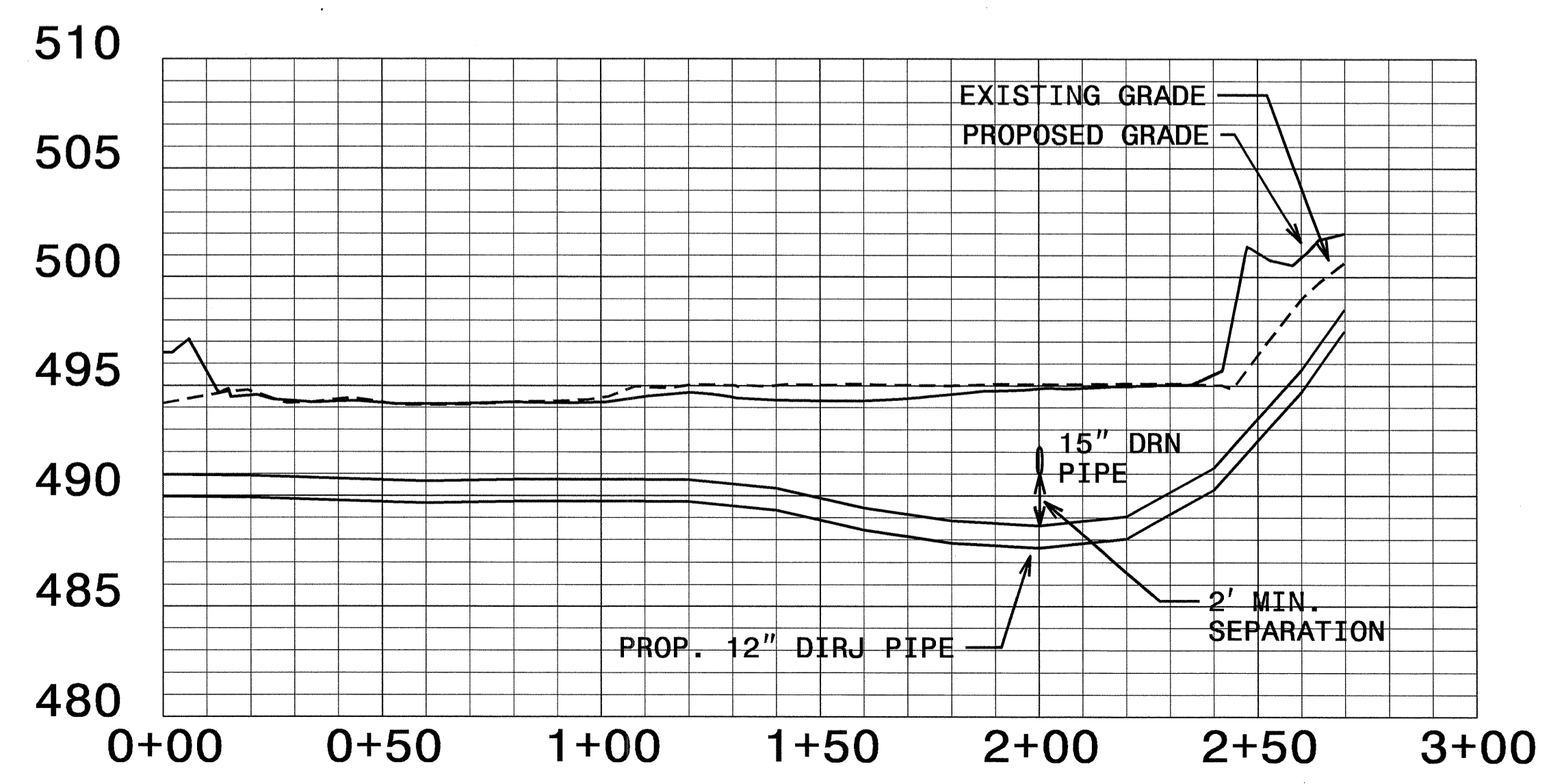
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 END STATE PROJECT B-5109  
 -L- STA. 20+20.00



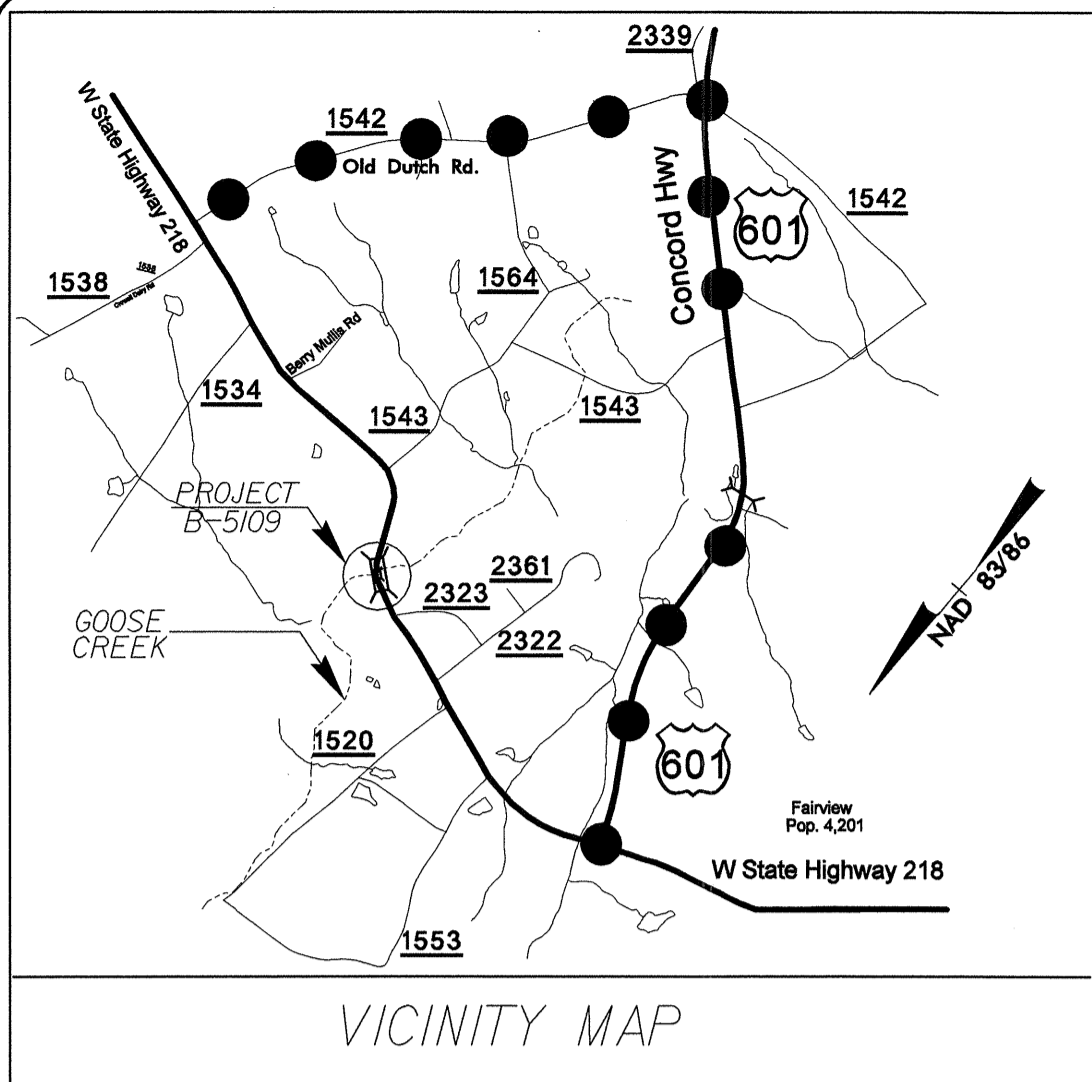
## VALVE LOCATION DETAIL

DISTANCE IS APPROXIMATE  
 AND IS MEASURED ALONG WATER LINE

## WATER LINE PROFILE



**TIP PROJECT: B-5109**



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

●●●● DETOUR ROUTE

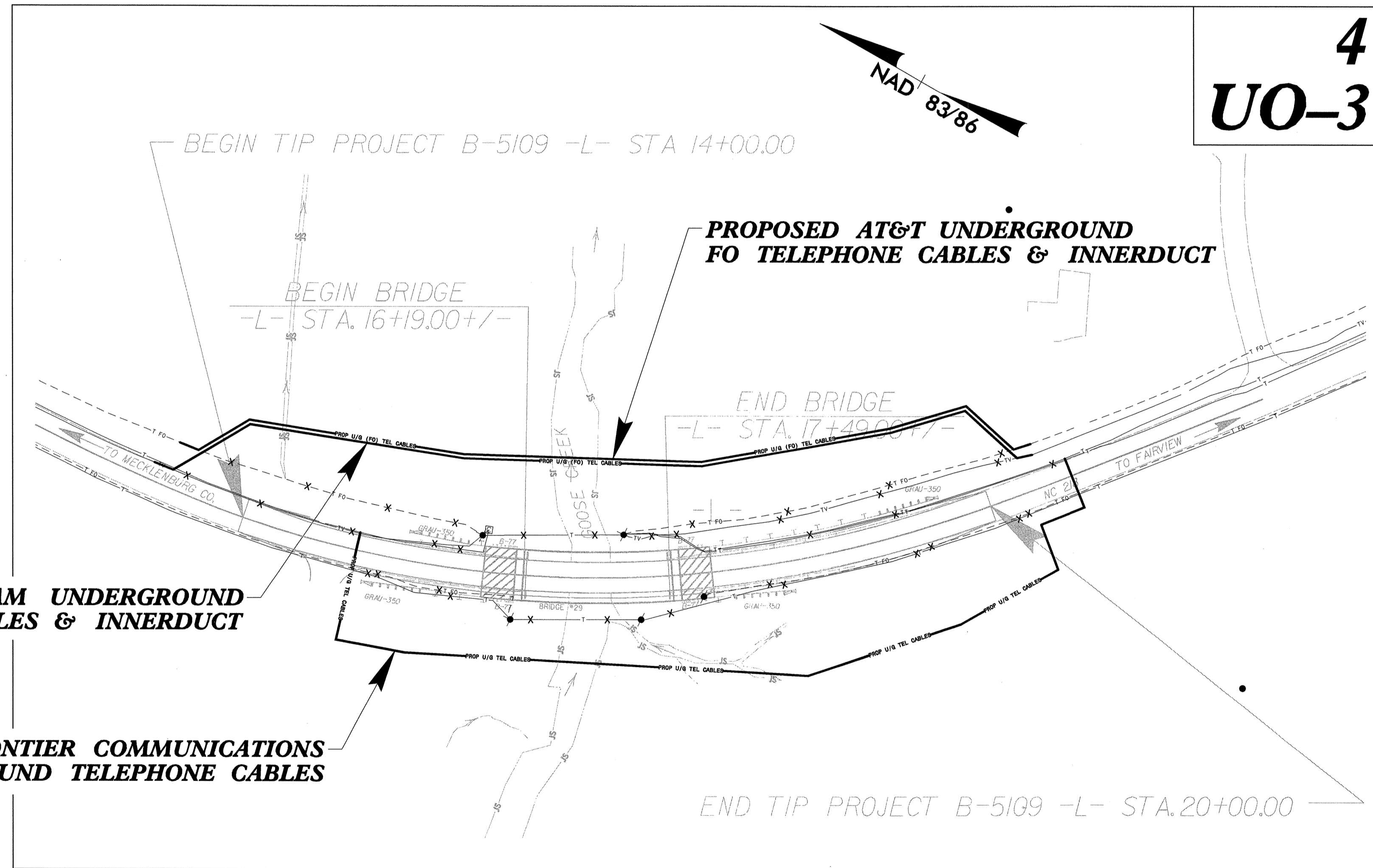
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**UTILITIES BY OTHERS PLANS  
UNION COUNTY**

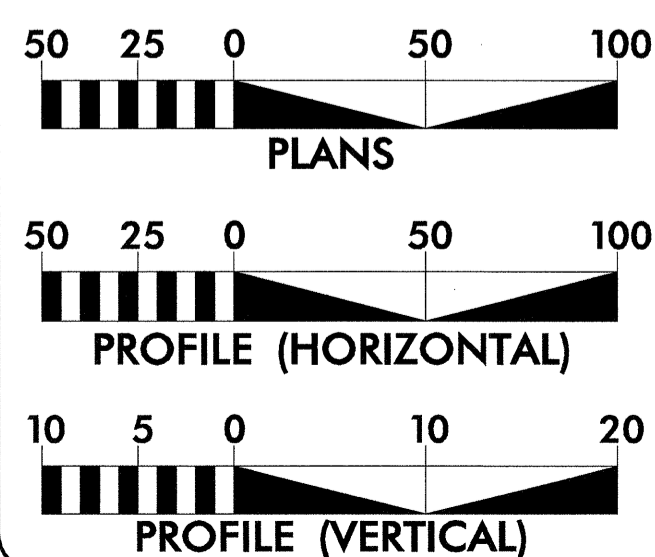
**LOCATION: BRIDGE NO. 29 ON NC 218 OVER GOOSE CREEK**

**TYPE OF WORK: ELECTRIC POWER DISTRIBUTION, TELEPHONE**

T.I.P. NO.	SHEET NO.
B-5109	UO-1



**GRAPHIC SCALES**



**INDEX OF SHEETS**

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
UO-1	TITLE SHEET
UO-2	UTILITY SYMBOLOGY SHEET
UO-3	UBO PLAN SHEET

**PRIVATE UTILITY OWNERS ON PROJECT**

- (A) UNION POWER - POWER
- (B) AT&T - TELECOMMUNICATIONS
- (C) WINDSTREAM - TELECOMMUNICATIONS
- (D) FRONTIER - TELECOMMUNICATIONS

**HINDE ENGINEERING**  
License No. C-2639  
7620 E. Independence Blvd., Suite 230 Charlotte, NC 28227



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. SHEET NO.  
B-5109 UO-2

UTILITIES BY OTHERS

NOTE:  
ALL PROPOSED UTILITY WORK  
SHOWN ON THIS SHEET WILL  
BE DONE BY OTHERS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	----- 12" WL -----
11¼ Degree Bend	----- ++
22½ Degree Bend	----- +x
45 Degree Bend	----- +X
90 Degree Bend	----- +†
Plug	-----
Tee	----- +†
Cross	----- +†
Reducer	----- ▶
Gate Valve	----- GV
Butterfly Valve	----- BV
Tapping Valve	----- TGV
Line Stop	----- LS
Line Stop with Bypass	----- LS/BP
Blow Off	----- BO
Fire Hydrant	----- PFH
Relocate Fire Hydrant	----- RFH
Remove Fire Hydrant	----- REM FH
Water Meter	----- PNM
Relocate Water Meter	----- RNM
Remove Water Meter	----- REM WM
Water Pump Station	----- PS(W)
RPZ Backflow Preventer	----- PRPZ
DCV Backflow Preventer	----- PBFP
Relocate RPZ Backflow Preventer	----- RRPZ
Relocate DCV Backflow Preventer	----- RBFP

PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	----- 12" SS -----
Force Main Sewer Line (Sized as Shown)	----- 12" FSS -----
Manhole (Sized per Note)	----- •
Sewer Pump Station	----- PS(SS)

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	----- ○
Telephone Pole	----- ○-
Joint Use Pole	----- ○-
Telephone Pedestal	----- TEL PED
Utility Line by Others (Type as Shown)	----- PROP O/H POW LINES -----
Trenchless Installation	----- 12" TL INSTALL -----
Encasement by Open Cut	----- 24" ENCAS BY OC -----
Encasement	----- 24" ENCASUREMENT -----

Thrust Block	-----
Air Release Valve	----- AR
Utility Vault	----- UV
Concrete Pier	----- CP
Steel Pier	----- SP
Plan Note	----- ← NOTE
Pay Item Note	----- ← PAY ITEM

EXISTING UTILITIES SYMBOLS

Power Pole	----- •	*Underground Power Line	----- P -----
Telephone Pole	----- •	*Underground Telephone Cable	----- T -----
Joint Use Pole	----- •	*Underground Telephone Conduit	----- TC -----
Utility Pole	----- •	*Underground Fiber Optics Telephone Cable	----- T FO -----
Utility Pole with Base	----- □	*Underground TV Cable	----- TV -----
H-Frame Pole	----- ••	*Underground Fiber Optics TV Cable	----- TV FO -----
Power Transmission Line Tower	----- ⊠	*Underground Gas Pipeline	----- G -----
Water Manhole	----- ⊙	Aboveground Gas Pipeline	----- A/G Gas -----
Power Manhole	----- ⊙	*Underground Water Line	----- W -----
Telephone Manhole	----- ⊙	Aboveground Water Line	----- A/G Water -----
Sanitary Sewer Manhole	----- ⊙	*Underground Gravity Sanitary Sewer Line	----- SS -----
Hand Hole for Cable	----- ⊠	Aboveground Gravity Sanitary Sewer Line	----- A/G Sanitary Sewer -----
Power Transformer	----- ⊠	*Underground SS Forced Main Line	----- FSS -----
Telephone Pedestal	----- ⊠	Underground Unknown Utility Line	----- ?UTL -----
CATV Pedestal	----- ⊠	SUE Test Hole	----- ⊕
Gas Valve	----- ◇	Water Meter	----- ○
Gas Meter	----- ⊕	Water Valve	----- ⊕
Located Miscellaneous Utility Object	----- ○	Fire Hydrant	----- ⊕
Abandoned According to Utility Records	----- AATUR	Sanitary Sewer Cleanout	----- ⊕
End of Information	----- E.O.I.		

\*For Existing Utilities  
Utility Line Drawn from Record -----  
(Type as Shown)  
Designated Utility Line -----  
(Type as Shown)

NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
ENGINEERING DIVISION  
RALEIGH, NORTH CAROLINA

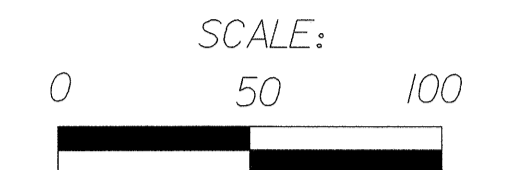
BRIDGE NO. 29 ON NC 218  
OVER GOOSE CREEK

Designed By:	Checked By:	Date:	Sheet:	Of:
OTHERS	OTHERS	10-1-13	UO-2	UO-3

**HINDE**  
ENGINEERING  
License No. C-2639  
7520 E. Independence Blvd., Suite 230 Charlotte, NC 28227

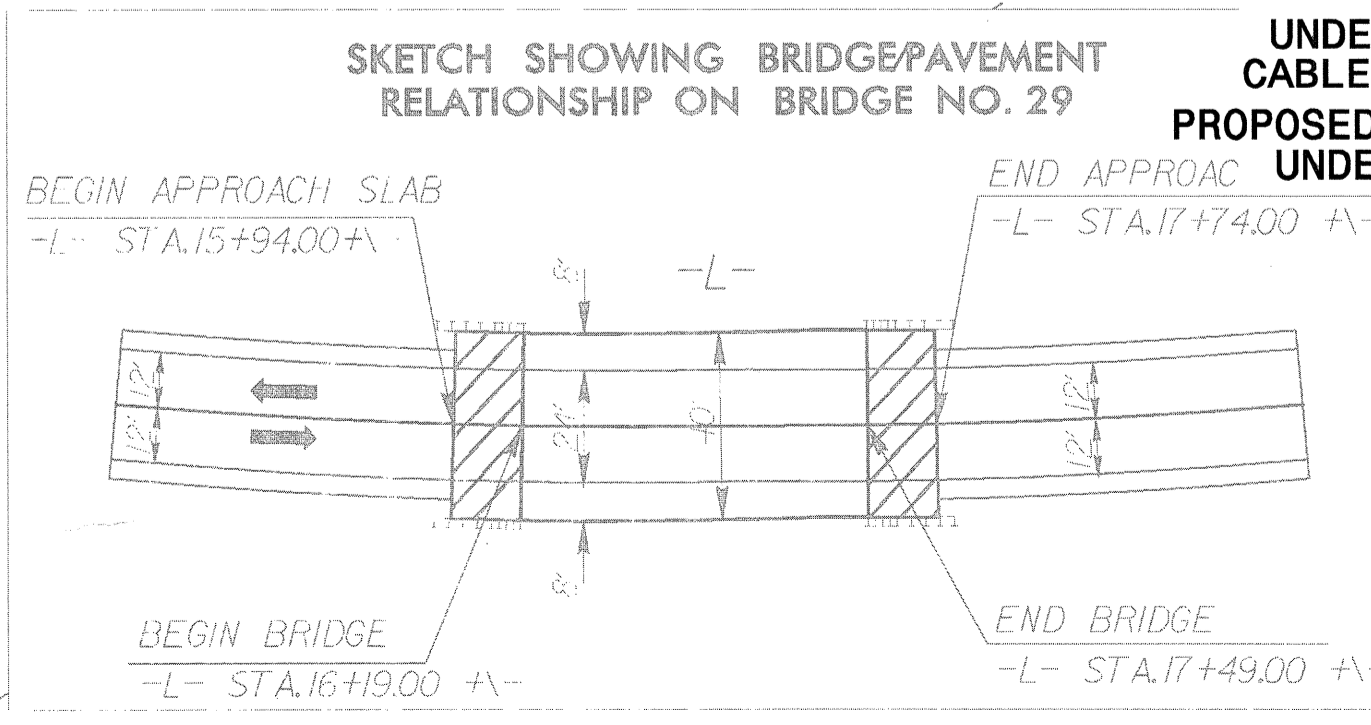
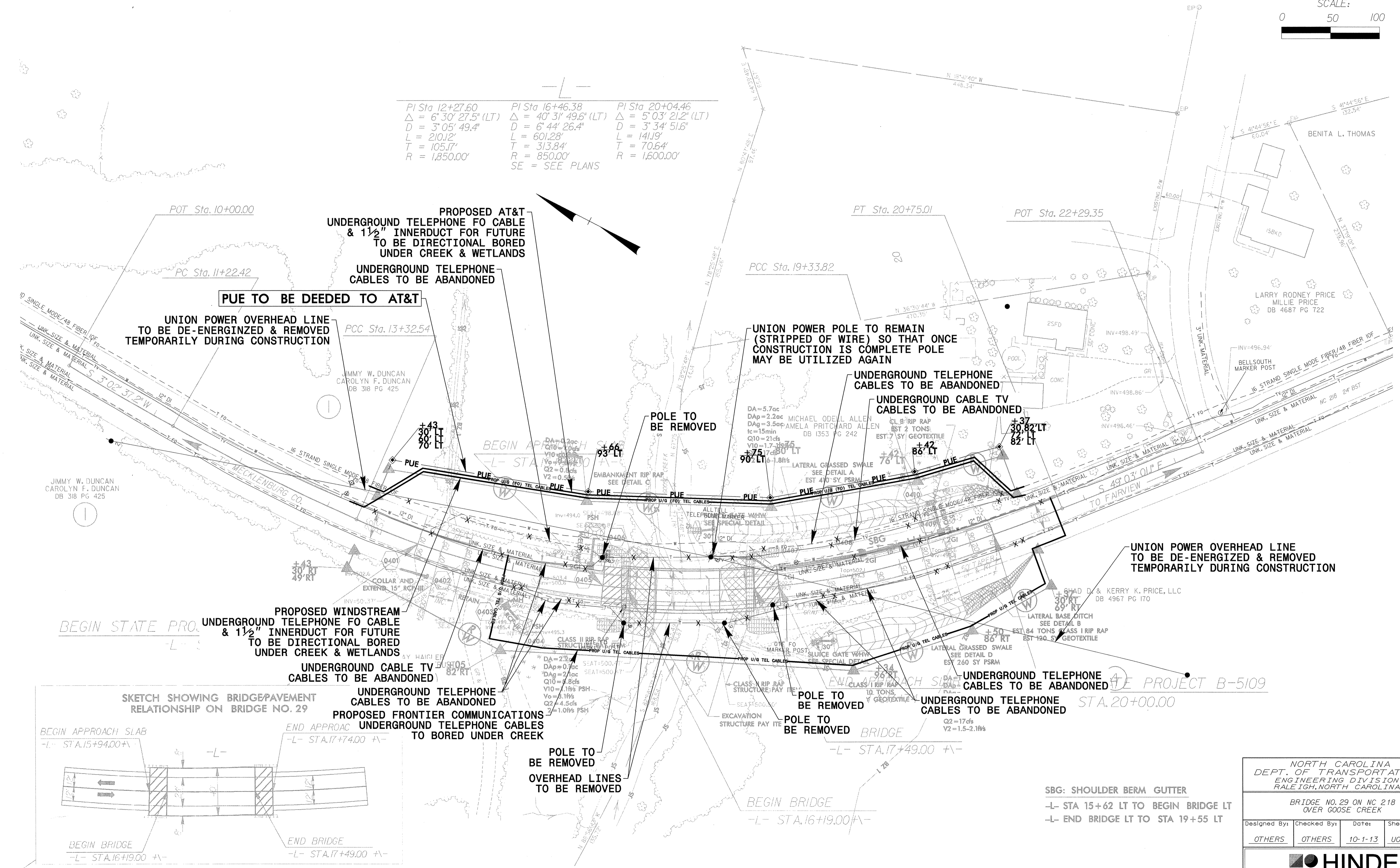
**UTILITIES BY OTHERS**

**NOTE:**  
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS



PI Sta 12+27.60 Δ = 6° 30' 27.5" (LT) D = 3° 05' 49.4" L = 210.12' T = 105.17' R = 1,850.00'	PI Sta 16+46.38 Δ = 40° 31' 49.6" (LT) D = 6° 44' 26.4" L = 601.28' T = 313.84' R = 850.00'	PI Sta 20+04.46 Δ = 5° 03' 21.2" (LT) D = 3° 34' 51.6" L = 141.9' T = 70.64' R = 1,600.00'
---	--	---

SE = SEE PLANS



SBG: SHOULDER BERM GUTTER  
-L- STA 15+62 LT TO BEGIN BRIDGE LT  
-L- END BRIDGE LT TO STA 19+55 LT

NORTH CAROLINA DEPT. OF TRANSPORTATION ENGINEERING DIVISION RALEIGH, NORTH CAROLINA

BRIDGE NO. 29 ON NC 218 OVER GOOSE CREEK

Designed By:	Checked By:	Date:	Sheet:	Of:
OTHERS	OTHERS	10-1-13	UO-3	UO-3

**HINDE ENGINEERING**  
License No. C-2839  
7820 E. Independence Blvd., Suite 230 Charlotte, NC 28227

# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

PROJ. REFERENCE NO.	SHEET NO.
B-5109	X-1A

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

## CROSS-SECTION SUMMARY

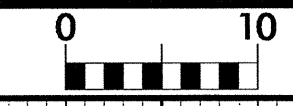
Approximate quantities only. Unclassified excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".

Station	Uncl. Exc.	Embt
L	(cu. yd.)	(cu. yd.)
13+55.00	0	0
13+75.00	2	33
14+00.00	5	98
14+25.00	4	128
14+50.00	2	171
14+75.00	0	176
15+00.00	0	178
15+25.00	0	187
15+50.00	0	148
15+75.00	0	130
16+00.00	0	152
16+15.00	0	101

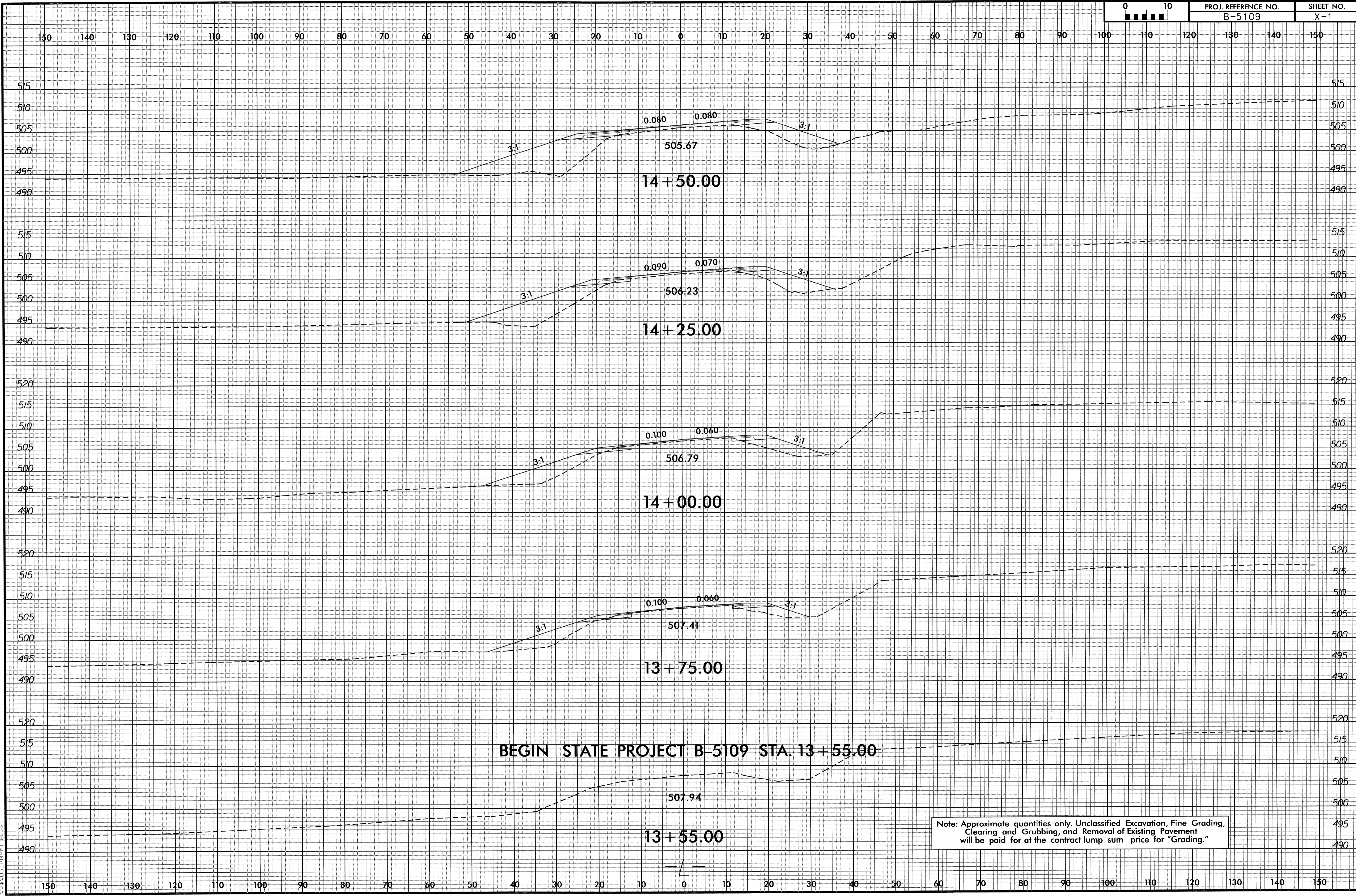
Chain	Beg Sta	End Sta	LOC	Sheet No.
L	13+55.	20+20.	CL	X-1 TO X-6

Station	Uncl. Exc.	Embt
L	(cu. yd.)	(cu. yd.)
17+50.00	0	0
17+75.00	0	185
18+00.00	0	170
18+25.00	0	167
18+50.00	0	183
18+75.00	1	177
19+00.00	2	154
19+25.00	2	133
19+33.82	1	37
19+50.00	1	65
19+75.00	3	110
20+00.00	3	77
20+20.00	2	32

8/23/99

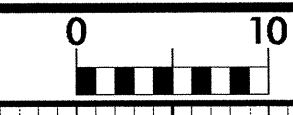


PROJ. REFERENCE NO. B-5109	SHEET NO. X-1
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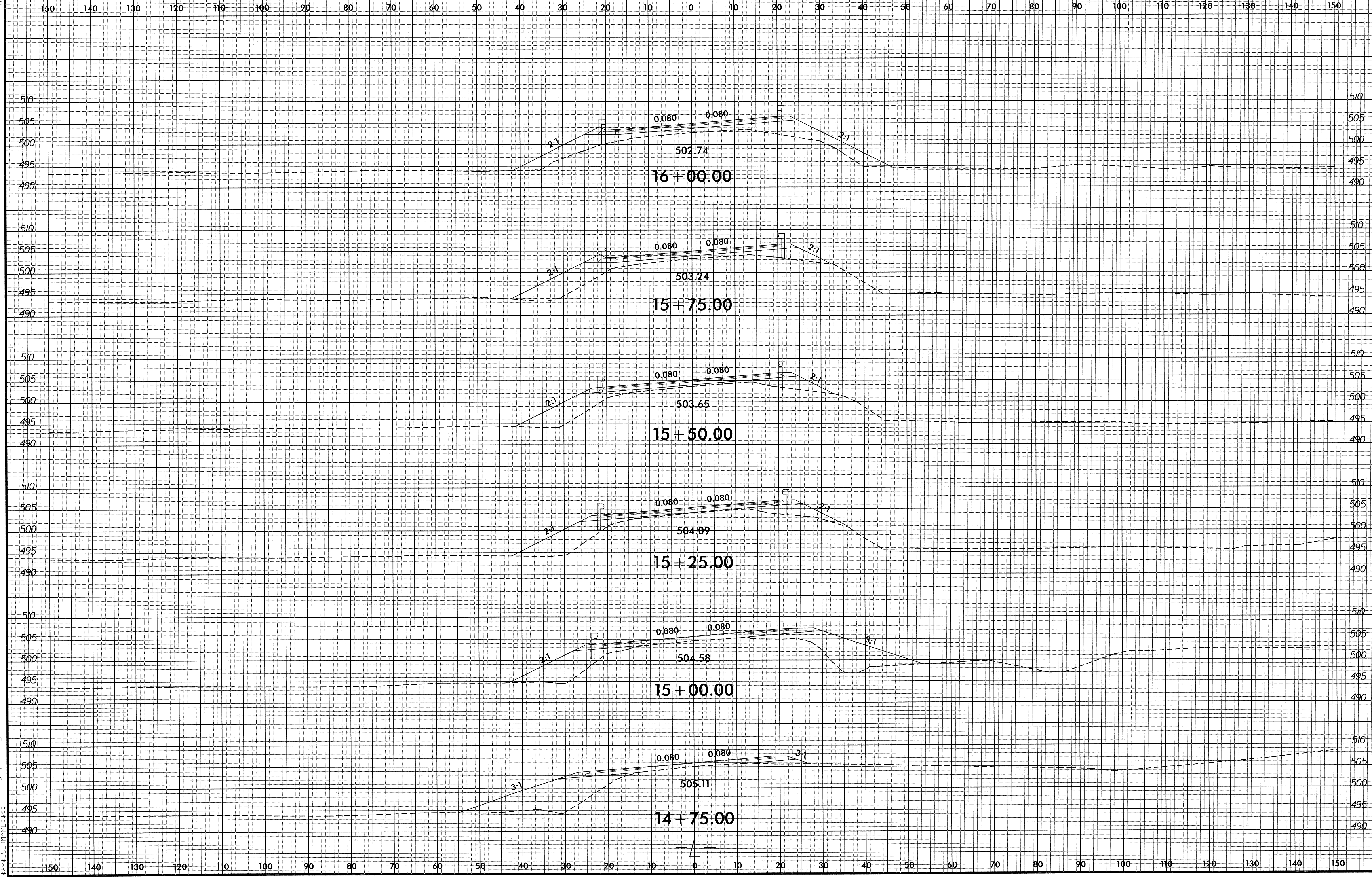


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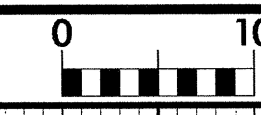
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SHEET NO. X-2



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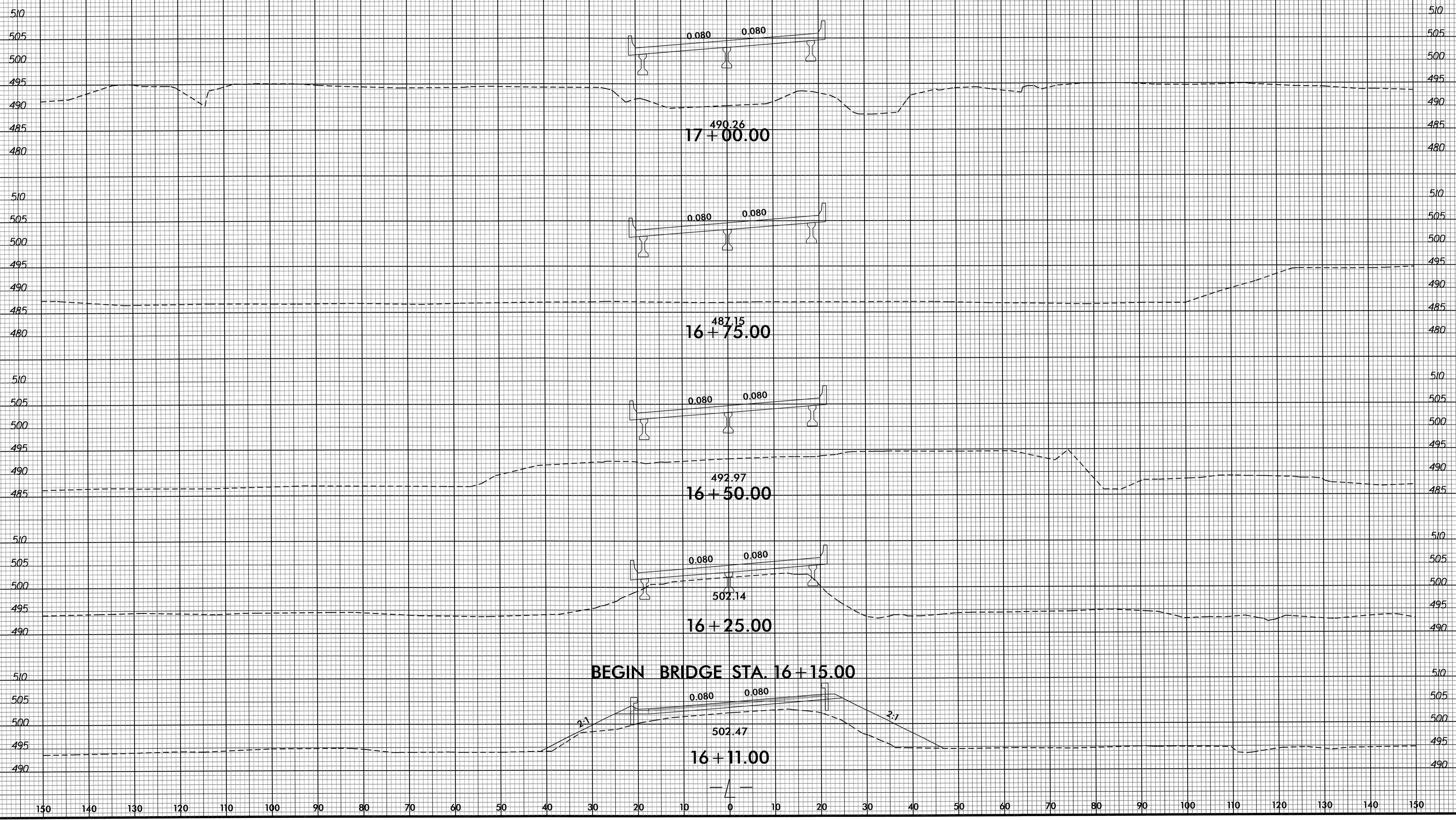
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PROJ. REFERENCE NO.  
B-5109

SHEET NO.  
X-3

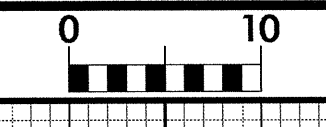
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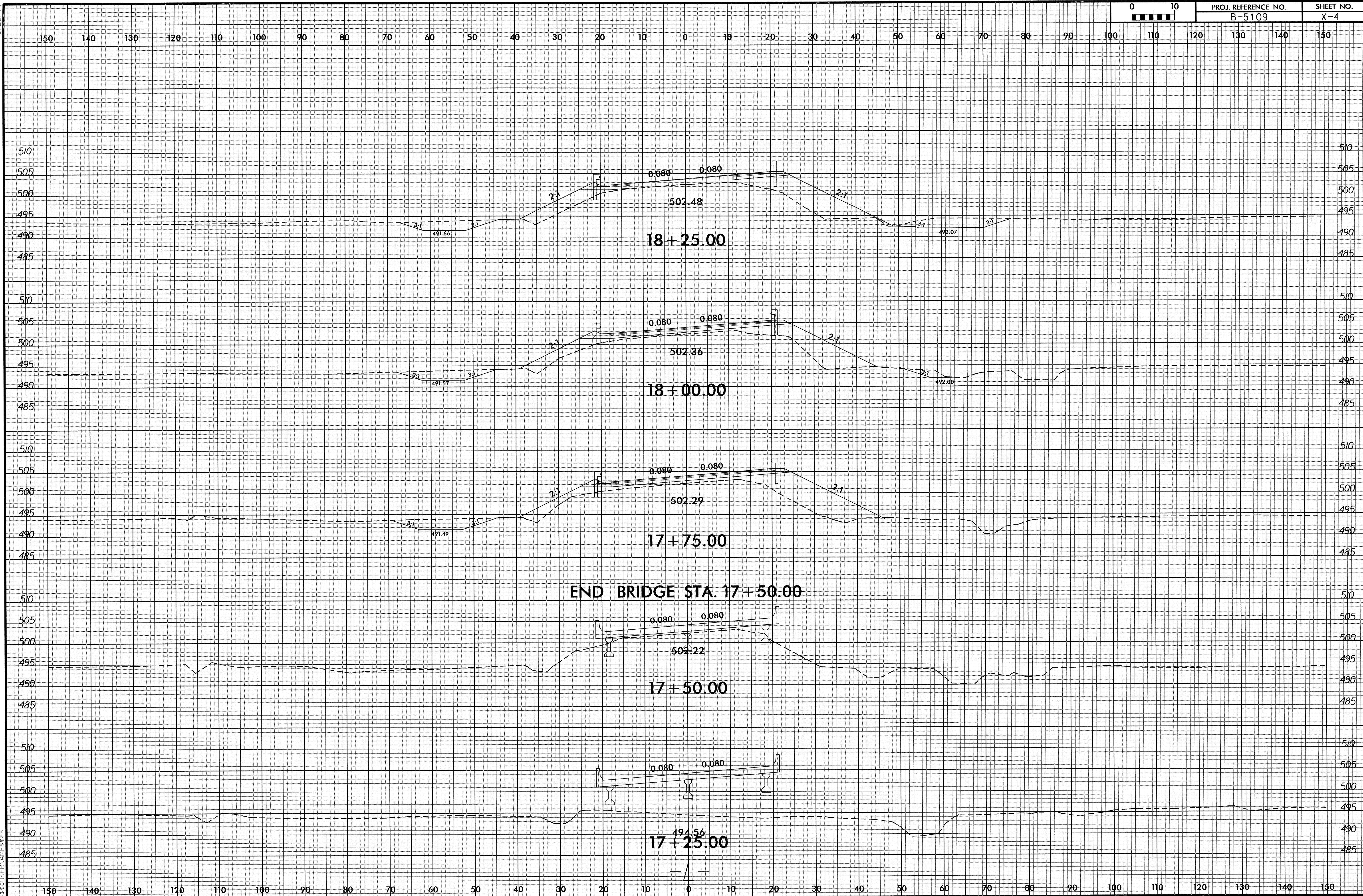
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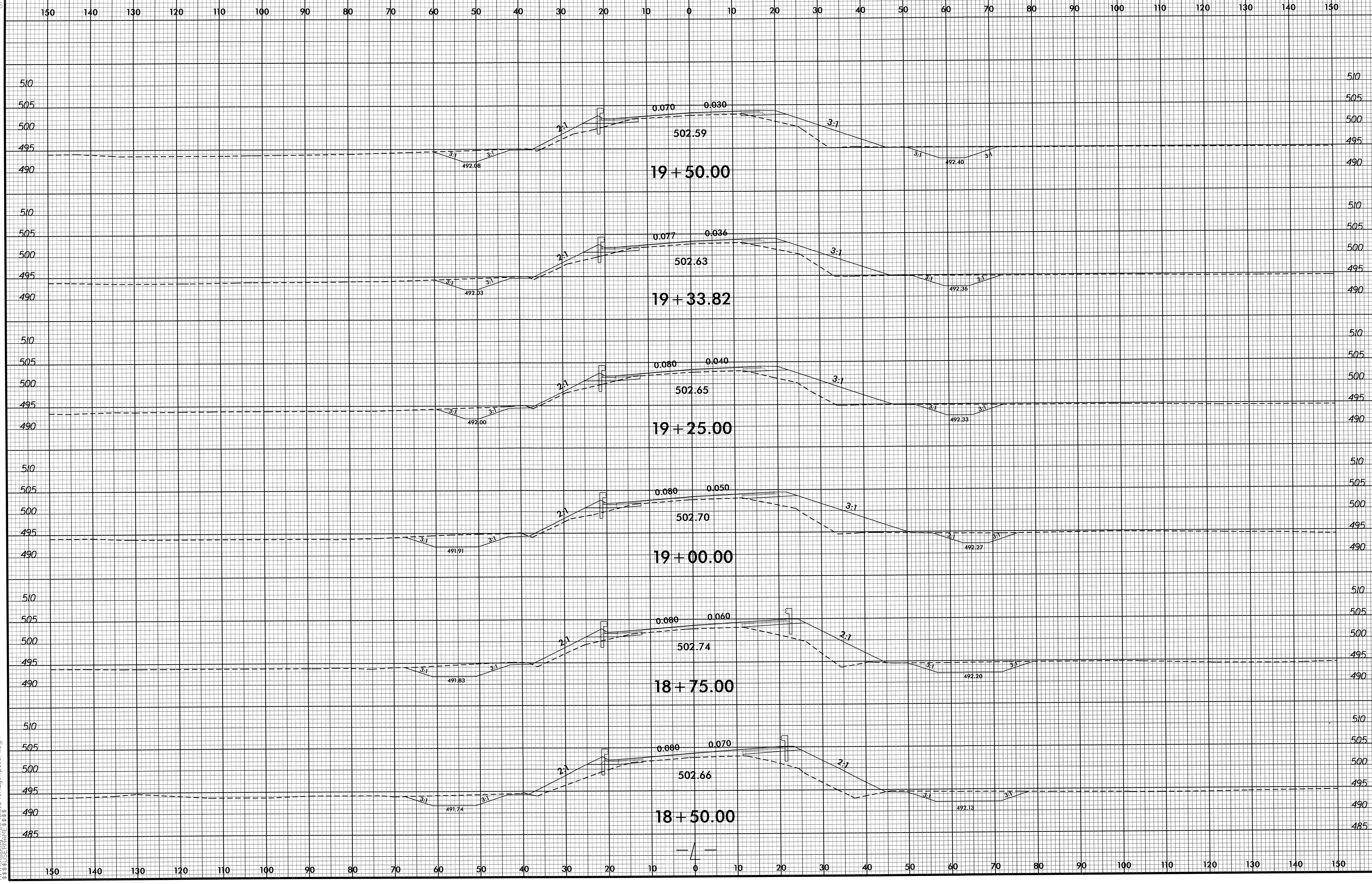


PROJ. REFERENCE NO.	SHEET NO.
B-5109	X-4



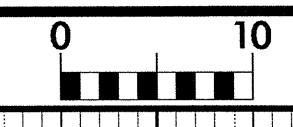
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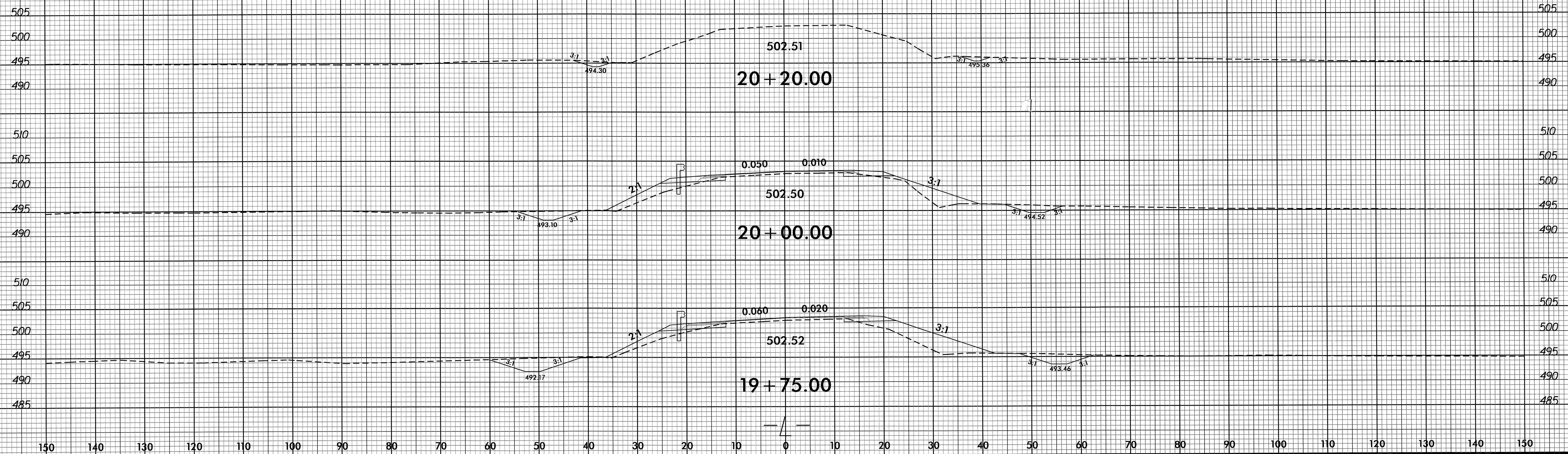
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PROJ. REFERENCE NO.	SHEET NO.
B-5109	X-6

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### END STATE PROJECT B-5109 STA. 20+20.00



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