

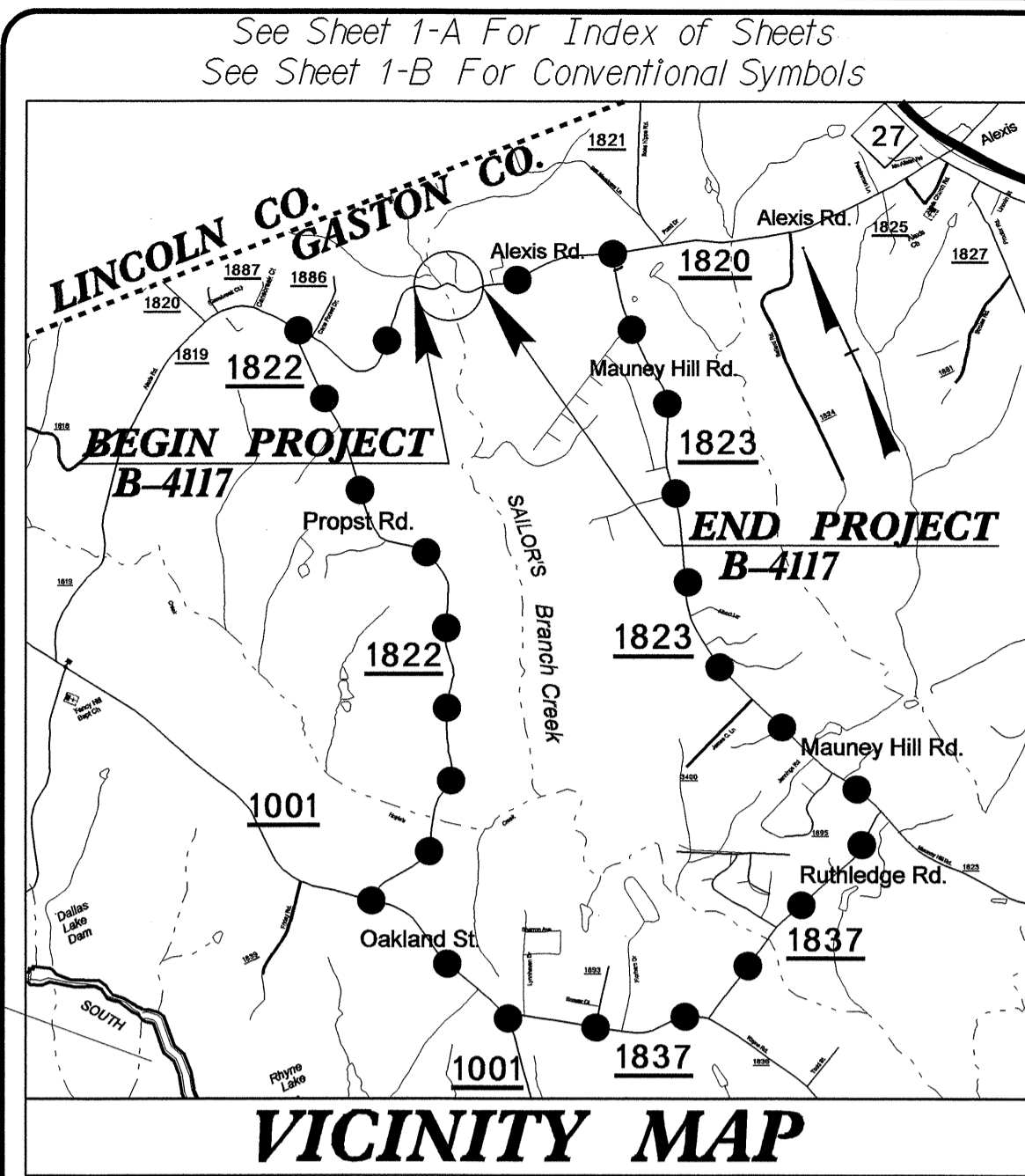
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4117	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33472.1.1	BRZ-1820(3)	PE	
33472.2.1	BRZ-1820(3)	R/W, UTIL.	
33472.3.1	BRZ-1820(3)	CONST.	

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**GASTON COUNTY**

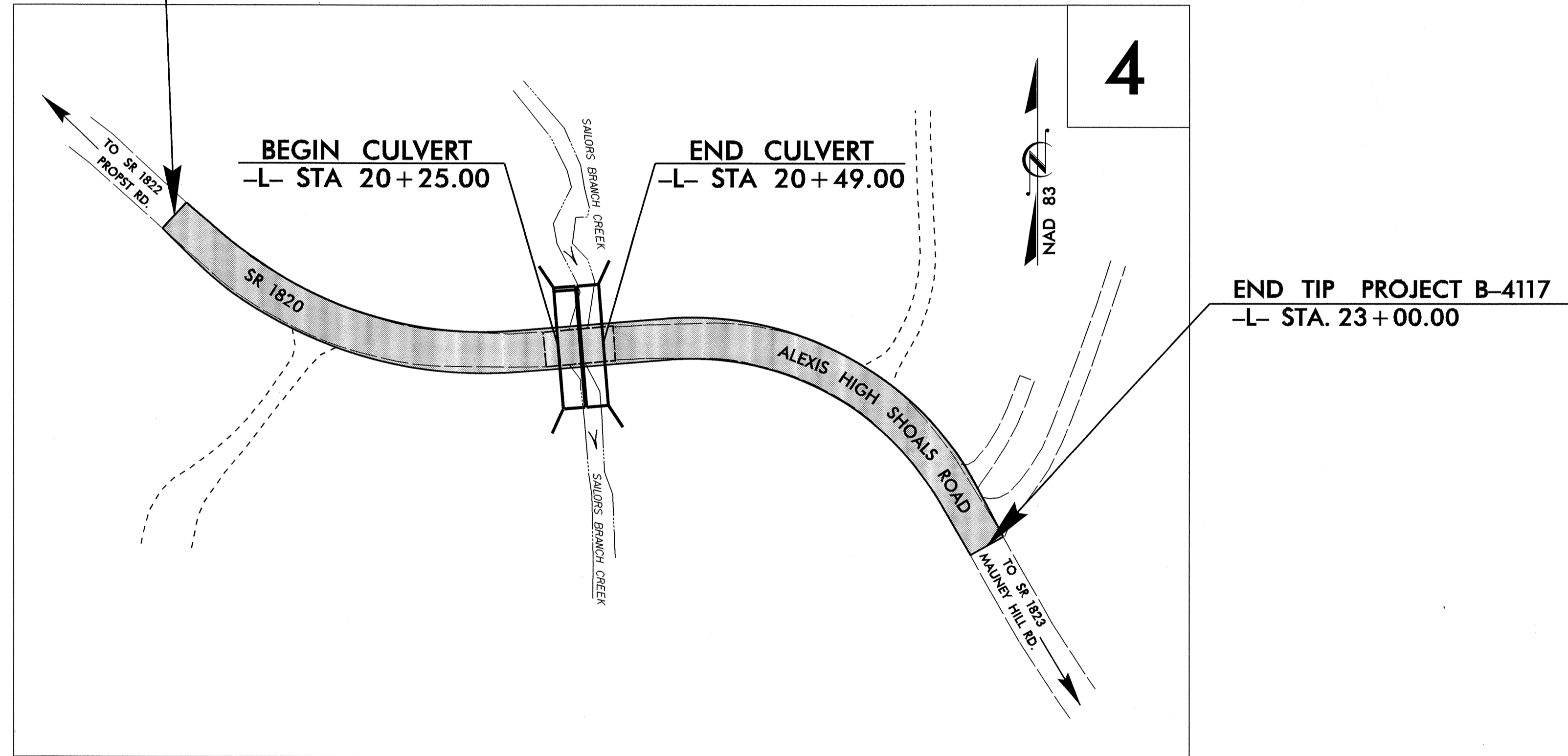
LOCATION: BRIDGE No. 173 OVER SAILOR'S BRANCH CREEK  
ON SR 1820

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



●●●●● OFFSITE DETOUR

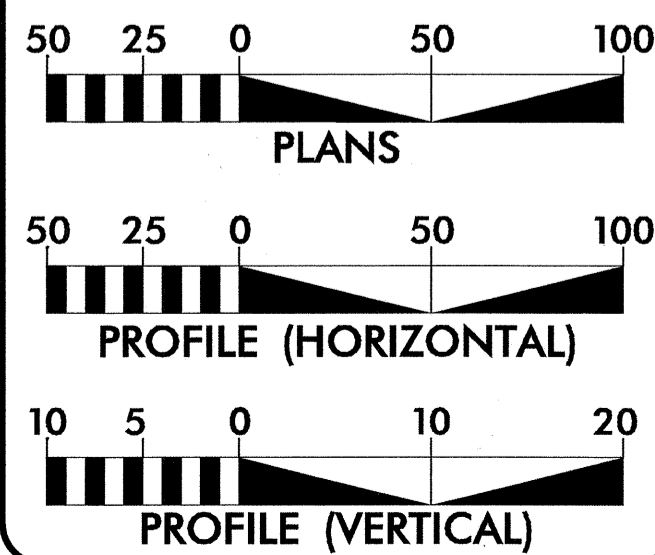
BEGIN TIP PROJECT B-4117  
-L- STA. 18+00.00



END TIP PROJECT B-4117  
-L- STA. 23+00.00

\*\* DESIGN EXCEPTION REQUIRED FOR THE DESIGN SPEED 25 MPH.

**GRAPHIC SCALES**



**DESIGN DATA**

ADT 2010 = 1900  
ADT 2035 = 3500  
DHV = 10 %  
D = 60 %  
T = 4 % \*  
\*\* V = 25 MPH  
\* TTST 1 % DUAL 3 %  
FUNC CLASS: RURAL  
SUB REGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4117 = 0.090  
LENGTH STRUCTURES TIP PROJECT B-4117 = 0.005  
TOTAL LENGTH OF TIP PROJECT B-4117 = 0.095

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
MAY 7, 2009

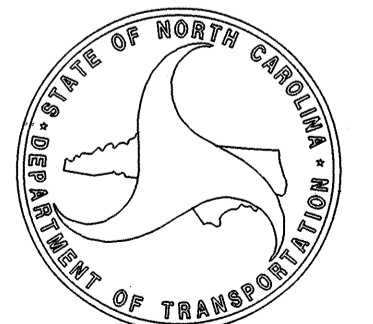
LETTING DATE:  
MAY 18, 2010

JAMES A. SPEER, PE  
PROJECT ENGINEER

NYA K. BOAYUE, PE  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**



STATE HIGHWAY DESIGN ENGINEER

TIP PROJECT: B-4117

CONTRACT: C202374

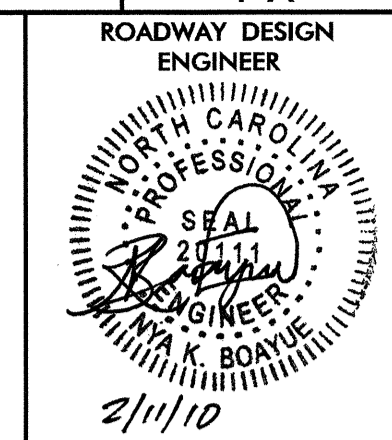
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8/17/99

12-FEB-2010 09:56  
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STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**INDEX OF SHEETS**

PROJECT REFERENCE NO.	SHEET NO.
B-4117	1-A



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	LOCATION AND SURVEYS
2	TYPICAL SECTIONS, PAVEMENT SCHEDULE, AND MISCELLANEOUS DETAILS
2-A THRU 2-B	DETAIL SHEETS
3	SUMMARY OF QUANTITIES
3-A	SUMMARY OF DRAINAGE QUANTITIES, SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY
4	PLAN SHEET AND PROFILE SHEET
TCP-1 THRU TCP-3 PMP-1 THRU PMP-2 SD-1	TRAFFIC CONTROL, MARKING, AND DELINEATION PLANS <b>PAVEMENT MARKING PLANS</b> SPECIAL SIGN DESIGN
EC-1 THRU EC-6	EROSION CONTROL PLANS
UO-1 THRU UO-2	UTILITIES PLANS
X-1A	CROSS-SECTION SUMMARY
X-1 THRU X-5	CROSS-SECTIONS
C-1 THRU C-4	CULVERT PLANS

GENERAL NOTES:

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

GRADE LINE:  
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED 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.

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.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE  
AT & T OF NORTH CAROLINA

RIGHT-OF-WAY MARKERS:

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

2006 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
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 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels

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

3/15/06

Note: Not to Scale

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

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	(23)
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-WLB-
Proposed Wetland Boundary	WLB
Existing Endangered Animal Boundary	EAB
Existing Endangered Plant Boundary	EPB

### BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○
Well	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	○
Switch	□
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite Marker	-----
Existing Control of Access	⊕
Proposed Control of Access	⊕
Existing Easement Line	E
Proposed Temporary Construction Easement	E
Proposed Temporary Drainage Easement	TDE
Proposed Permanent Drainage Easement	PDE
Proposed Permanent Utility Easement	PUE
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	PH
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	PH
Recorded U/G Telephone Cable	T
Designated U/G Telephone Cable (S.U.E.*)	T
Recorded U/G Telephone Conduit	TC
Designated U/G Telephone Conduit (S.U.E.*)	TC
Recorded U/G Fiber Optics Cable	T FO
Designated U/G Fiber Optics Cable (S.U.E.*)	T FO

### WATER:

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

### TV:

TV Satellite Dish	⊕
TV Pedestal	□
TV Tower	⊕
U/G TV Cable Hand Hole	PH
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

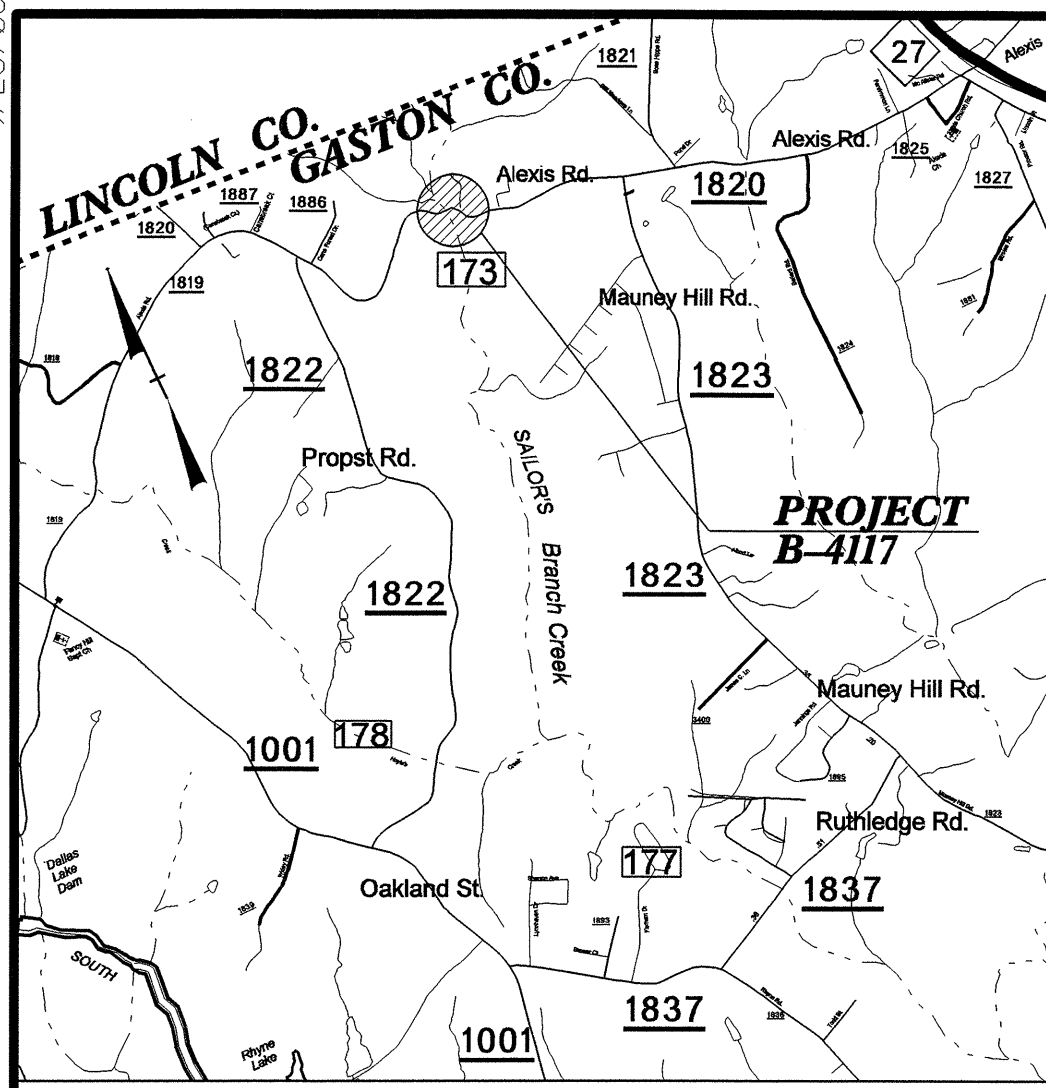
### SANITARY SEWER:

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	U/G
U/G Tank; Water, Gas, Oil	□
A/G Tank; Water, Gas, Oil	□
U/G Test Hole (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

# SURVEY CONTROL SHEET B-4117

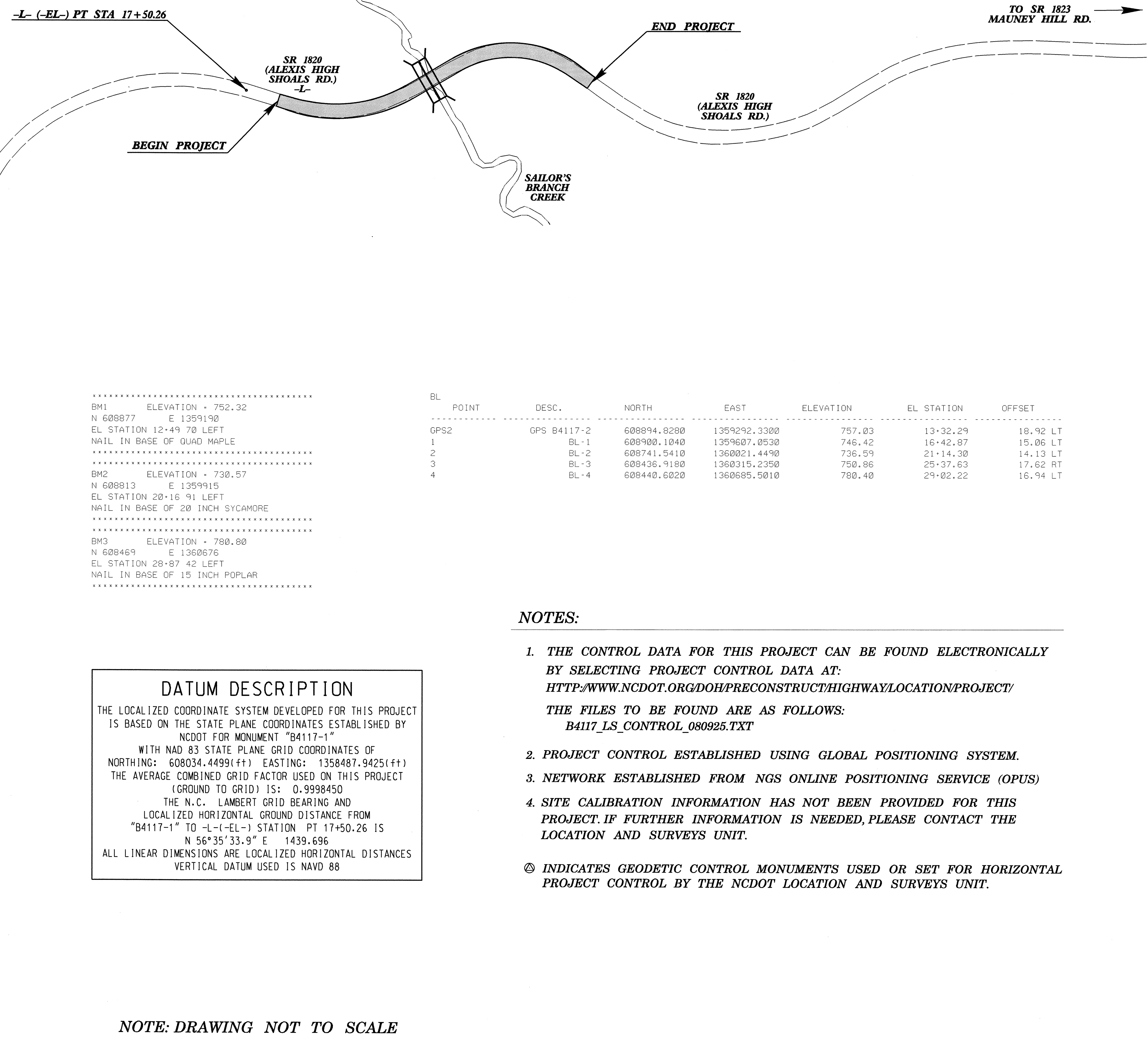


**VICINITY MAP**



NCDOT GPS STATION B4117-2  
LOCALIZED PROJECT COORDINATES  
N = 608894.8280  
E = 1359292.3300

NCDOT GPS STATION B4117-1  
LOCALIZED PROJECT COORDINATES  
N = 608034.4499  
E = 1358487.9425



.....

BM1	ELEVATION = 752.32
N 608877	E 1359190
EL STATION 12+49 70 LEFT	
NAIL IN BASE OF QUAD MAPLE	
.....	
BM2	ELEVATION = 730.57
N 608813	E 1359915
EL STATION 20+16 91 LEFT	
NAIL IN BASE OF 20 INCH SYCAMORE	
.....	
BM3	ELEVATION = 780.80
N 608469	E 1360676
EL STATION 28+87 42 LEFT	
NAIL IN BASE OF 15 INCH POPLAR	
.....	

BL POINT	DESC.	NORTH	EAST	ELEVATION	EL STATION	OFFSET
GPS2	GPS B4117-2	608894.8280	1359292.3300	757.03	13+32.29	18.92 LT
1	BL-1	608900.1040	1359607.0530	746.42	16+42.87	15.06 LT
2	BL-2	608741.5410	1360021.4490	736.59	21+14.30	14.13 LT
3	BL-3	608436.9180	1360315.2350	750.86	25+37.63	17.62 RT
4	BL-4	608440.6020	1360685.5010	780.40	29+02.22	16.94 LT

**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4117-1" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 608034.4499(±ft) EASTING: 1358487.9425(±ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998450 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4117-1" TO -L-(-EL-) STATION PT 17+50.26 IS N 56°35'33.9" E 1439.696 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:  
B4117\_LS\_CONTROL\_080925.TXT
  - PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
  - NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)
  - 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.

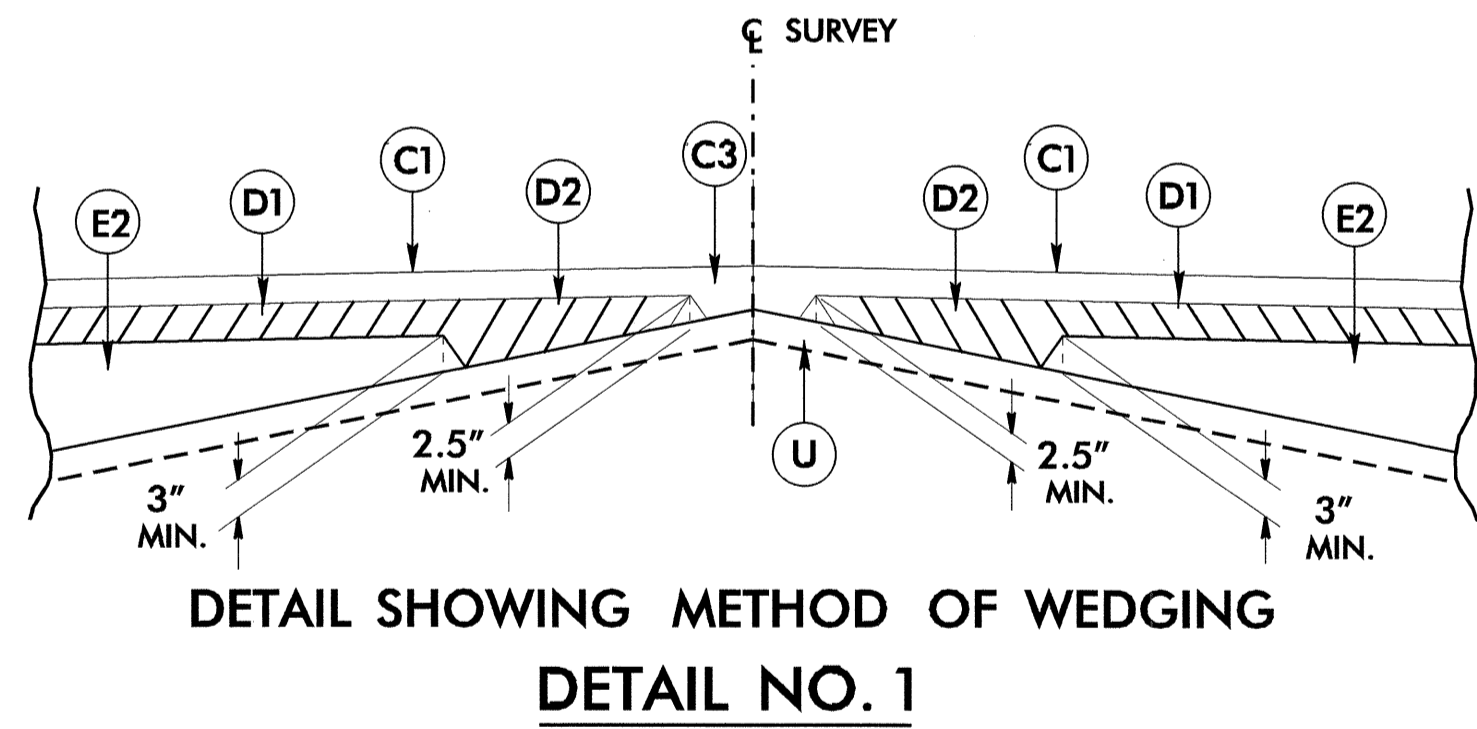
NOTE: DRAWING NOT TO SCALE

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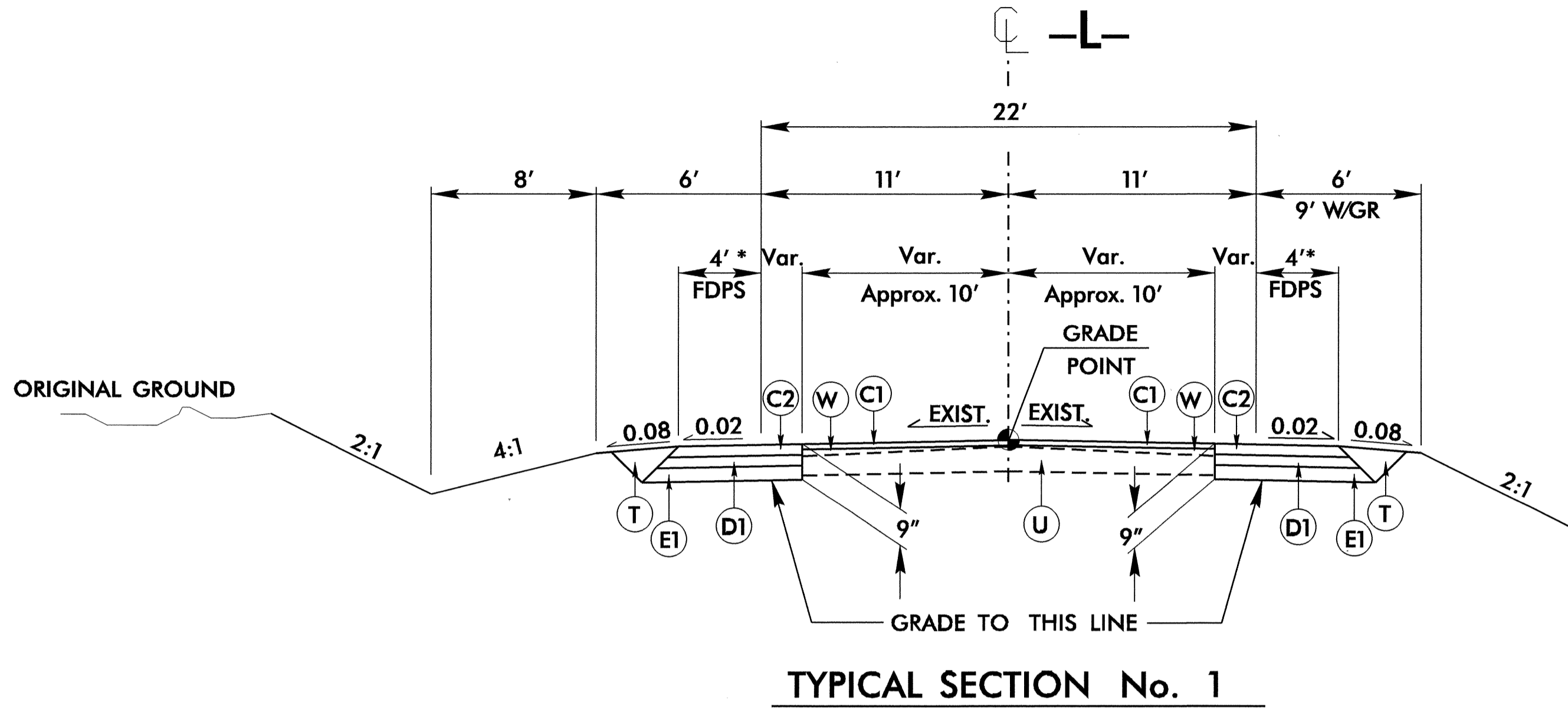
# PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.25" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
C2	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 3" IN DEPTH.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.5" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT GREATER THAN 5.5" IN DEPTH OR LESS THAN 3" IN DEPTH.
T	EARTH MATERIAL.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL No.1)
U	EXISTING PAVEMENT.

NOTE: ALL SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



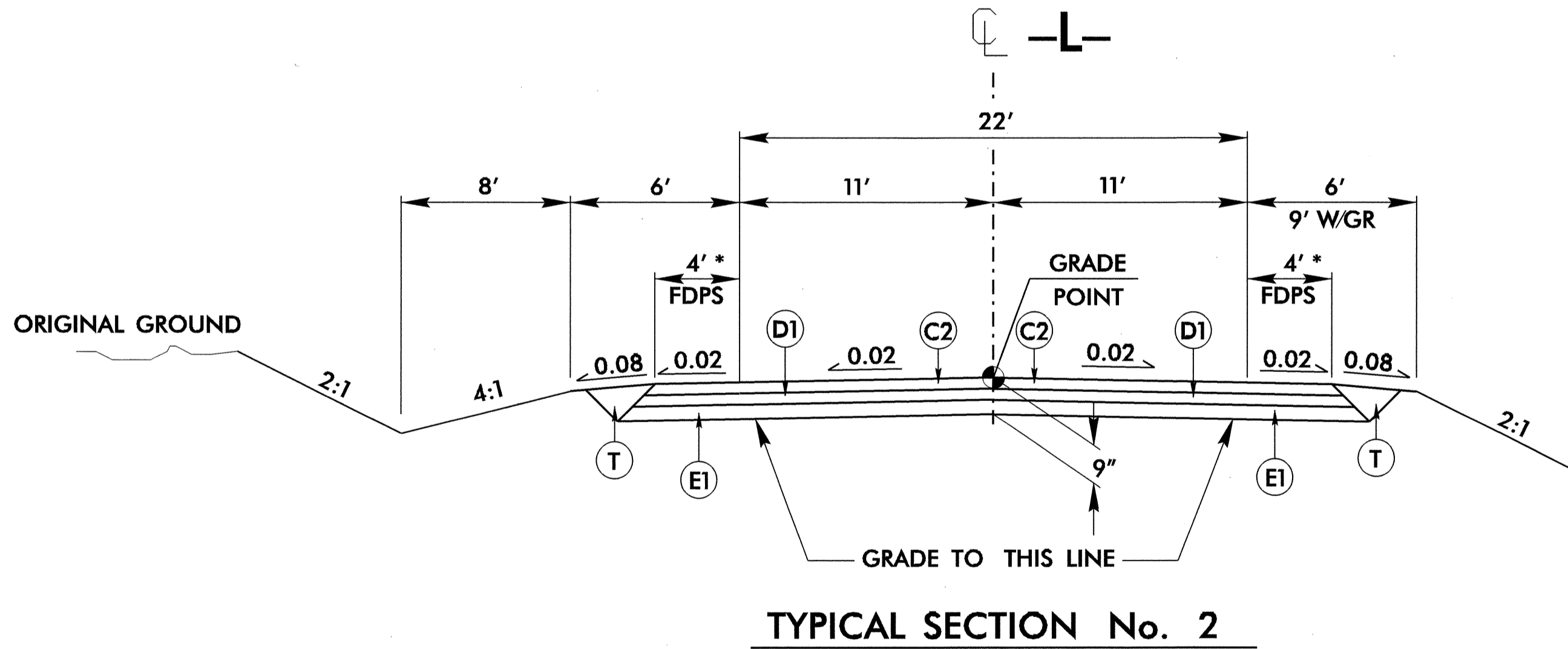
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ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 2011 2/1/10	PAVEMENT DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 22898 2/1/2010



USE TYPICAL SECTION NO. 1 FOR :

- L- STA 18+00.00 TO -L- STA 19+13.00
- L- STA 21+40.00 TO -L- STA 23+00.00

\*NOTE: 4' FDPS USED FOR DESIGNATED BICYCLE ROUTE.



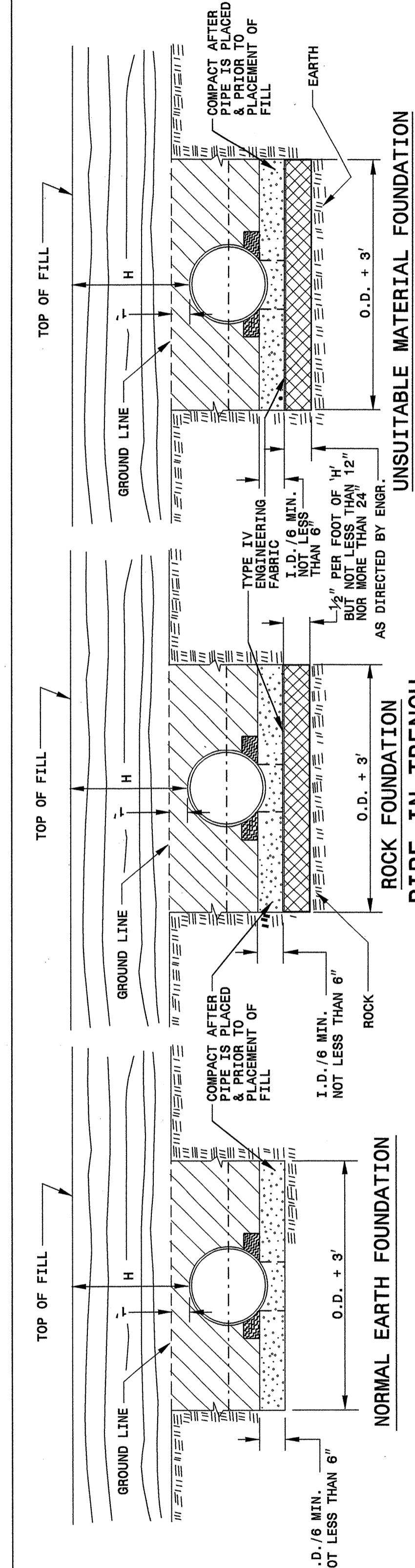
USE TYPICAL SECTION NO. 2 FOR :

- L- STA 19+13.00 TO -L- STA 21+40.00

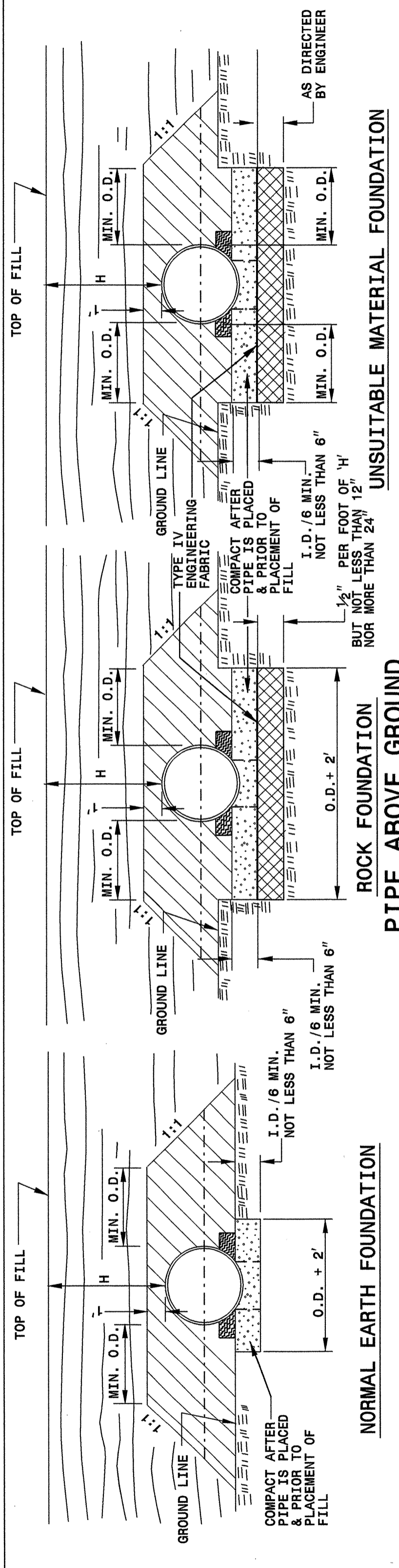
\*NOTE: 4' FDPS USED FOR DESIGNATED BICYCLE ROUTE.

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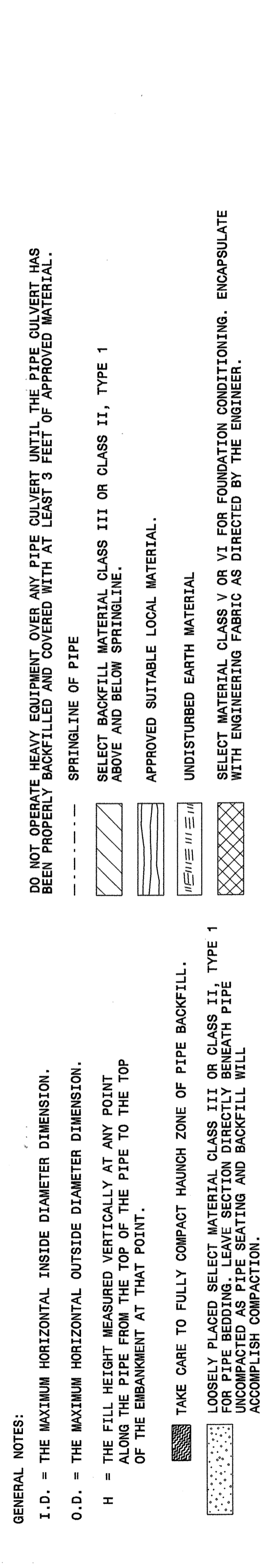
STATE OF NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.



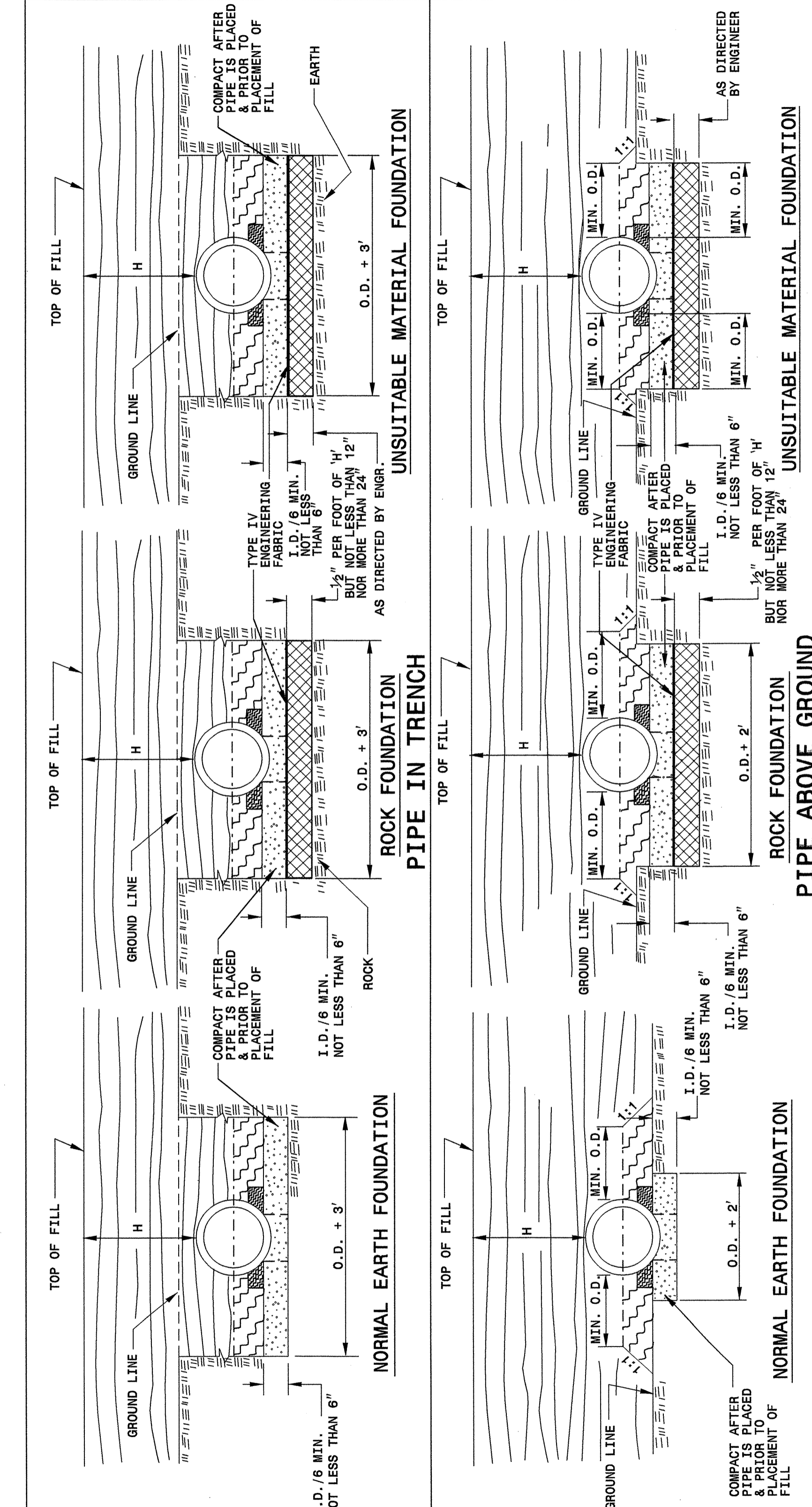
ENGLISH DETAIL DRAWING FOR  
**METHOD OF PIPE INSTALLATION**  
 FLEXIBLE PIPE



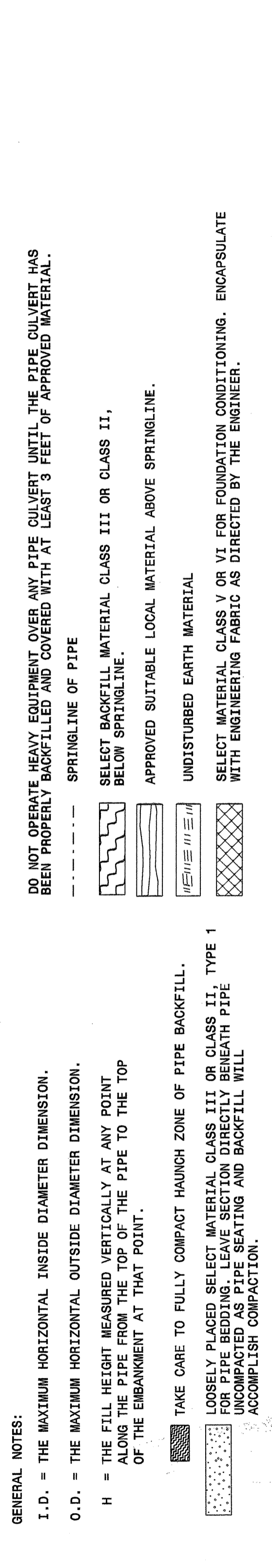
STATE OF NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.



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



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

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

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

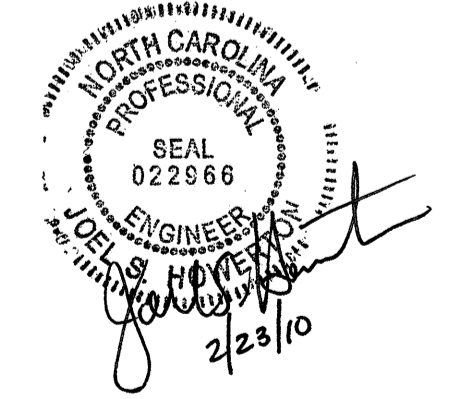
**GENERAL NOTES:**  
 I. D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.  
 O. D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.  
 H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.  
 TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.  
 LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.  
 DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.  
 SPRINGLINE OF PIPE  
 SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.  
 APPROVED SUITABLE LOCAL MATERIAL.  
 UNDISTURBED EARTH MATERIAL  
 SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

**GENERAL NOTES:**  
 I. D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.  
 O. D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.  
 H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.  
 TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.  
 LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.  
 DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.  
 SPRINGLINE OF PIPE  
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 APPROVED SUITABLE LOCAL MATERIAL ABOVE SPRINGLINE.  
 UNDISTURBED EARTH MATERIAL  
 SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH ENGINEERING FABRIC AS DIRECTED BY THE ENGINEER.

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: J. S. H. DATE: 7/29/09  
 CHECKED BY: J. S. H. DATE: 7/29/09  
 FILE SPEC: /enward/stds/stdsdetails/30001/0300d01.dgn



30-JUL-2009 08:49 J:\projects\special details\ward\stds\06\stds to special details\30001\0300d01.dgn J:\overton - AT PS237501

5/14/99

**FLEXIBLE PIPE**

Round Corrugated Steel Pipe 2 2/3 x 1/2 corrugation **							
Diameter (inches)	Minimum cover (inches)	(Ga)	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	89	90	111		
66	12	81	100	81	100		
72	12	74	91	74	91		
78	12	81	81	81	81		
84	12	69	69	69	69		

Round Corrugated Aluminum Pipe 2 2/3 x 1/2 corrugation **							
Diameter (inches)	Minimum cover (inches)	(Ga)	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	71	92	113		
48	12	52	68	84			
54	12	46	50	74			
60	12	50	50	62			
66	12	50	50	62			
72	12	50	50	62			

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

7-06

ENGLISH DETAIL DRAWING FOR  
METHOD OF PIPE INSTALLATION  
FILL HEIGHT TABLES

ENGLISH DETAIL DRAWING FOR  
METHOD OF PIPE INSTALLATION  
FILL HEIGHT TABLES

SHEET 3 OF 3  
300D01

SHEET 3 OF 3  
300D01

- HDPE - \* (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 60"
- \* (Maximum fill) 20' for pipe diameters ≤ 24" and ≤ 60"
- 17' for pipe diameters ≥ 30" and ≤ 60"
- PVC - \* (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 36"
- \* (Maximum fill) 30' for pipe diameters ≥ 12" and ≤ 36"

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

**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 LFRD 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 LFRD BRIDGE DESIGN SPECIFICATIONS

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

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

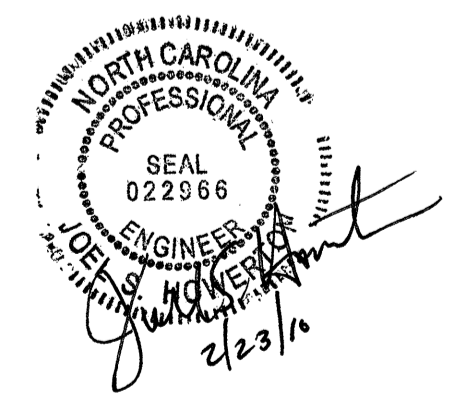
REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS  
CSP - AASHTO M96  
CAAP - AASHTO M196  
HDPE - AASHTO M294  
PVC - ASTM F949 or AASHTO M304

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LFRD BRIDGE DESIGN SPECIFICATIONS  
1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

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

**SEE PLATE FOR TITLE**

ORIGINAL BY: KKempf DATE: 5-15-09  
 MODIFIED BY: *Joe S. Hoverton* DATE: 7/30/09  
 CHECKED BY: *Joe S. Hoverton* DATE: 7/30/09  
 FILE SPEC: ericward/stds/stdstodetails/30001/0300d01.dgn



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**SUMMARY OF QUANTITIES**

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202374

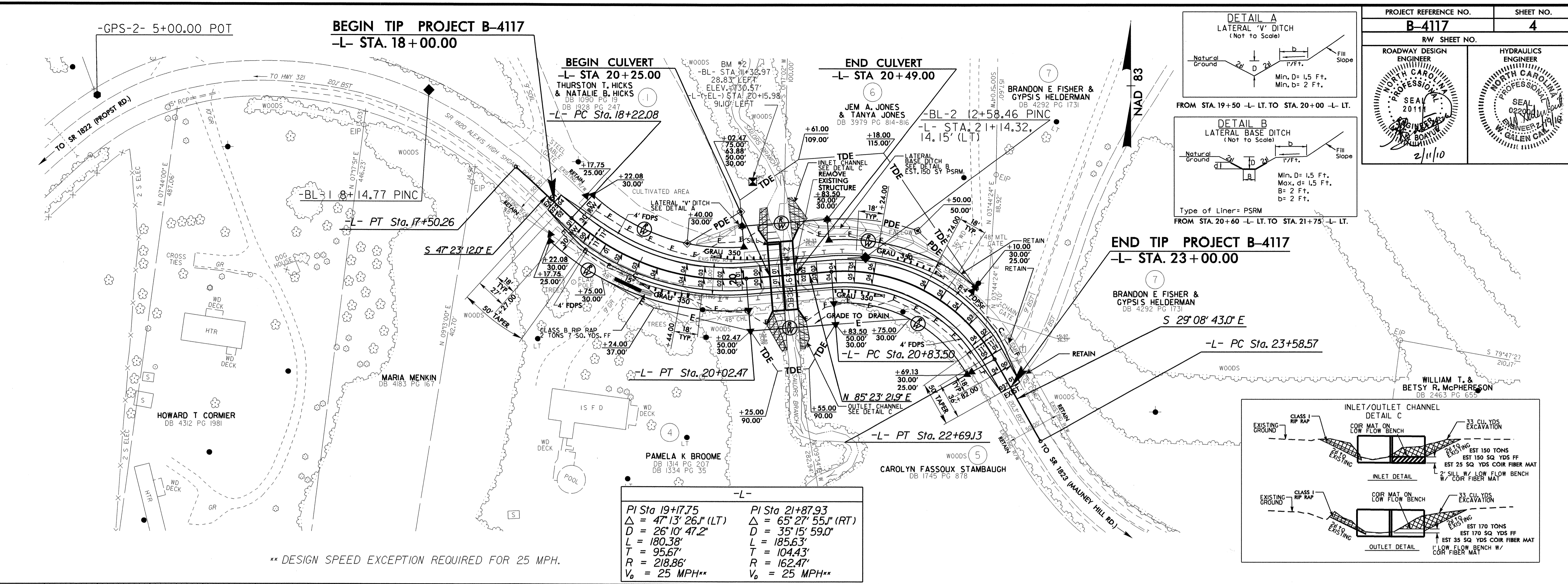
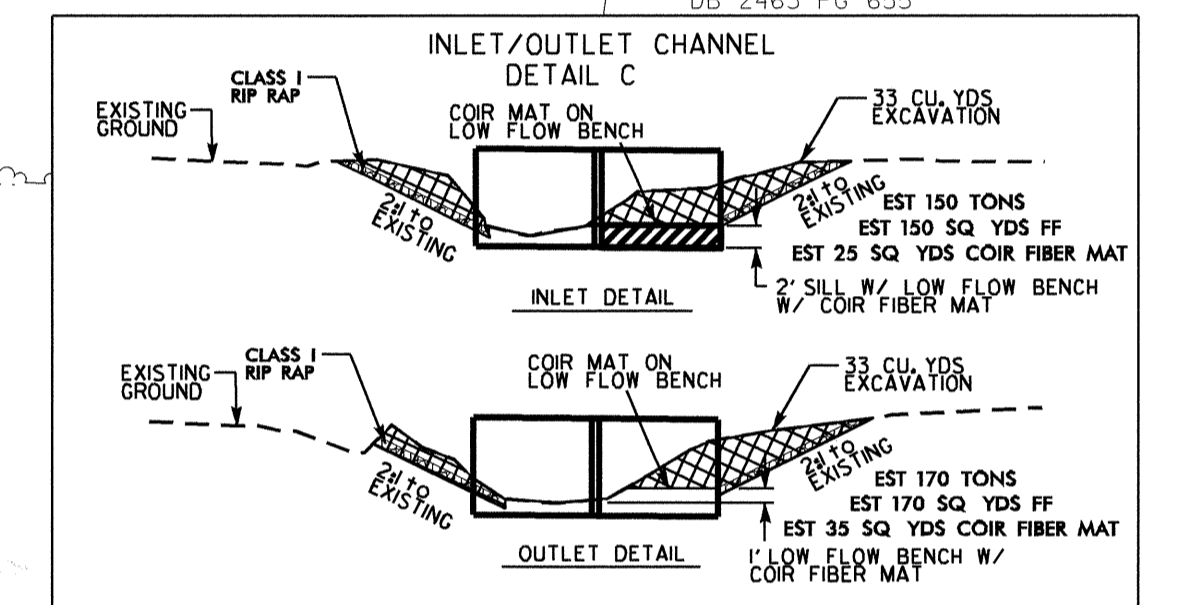
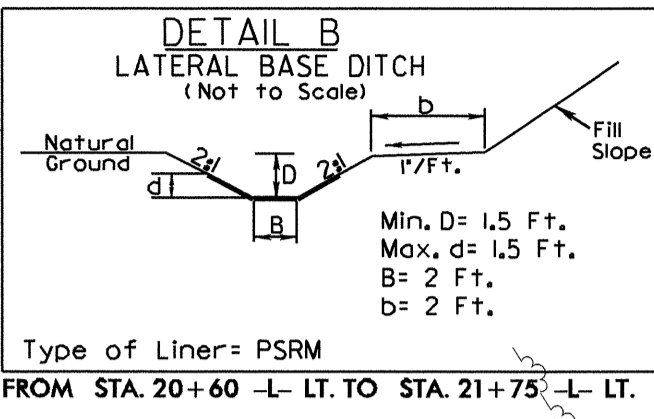
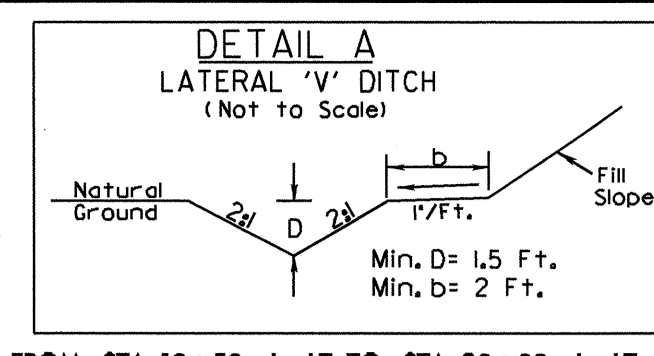
ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0038000000-E	SP	85	CY	SHALLOW UNDERCUT
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
0057000000-E	226	250	CY	UNDERCUT EXCAVATION
0080000000-E	SP	175	TON	CLASS IV SUBGRADE STABILIZATION
0134000000-E	240	170	CY	DRAINAGE DITCH EXCAVATION
0196000000-E	270	250	SY	FABRIC FOR SOIL STABILIZATION
0234000000-E	SP	250	CY	GENERIC GRADING ITEM SELECT GRANULAR MATERIAL
0320000000-E	SP	11	SY	FOUNDATION CONDITIONING FABRIC
0330000000-E	SP	4	TON	GENERIC DRAINAGE ITEM FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0986000000-E	SP	32	LF	GENERIC PIPE ITEM 15" SIDE DRAIN PIPE
1220000000-E	545	100	TON	INCIDENTAL STONE BASE
1489000000-E	610	296	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	222	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE 119.0B
1525000000-E	610	192	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1560000000-E	620	40	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1693000000-E	654	25	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
3030000000-E	862	262.5	LF	STEEL BM GUARDRAIL
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3270000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3628000000-E	876	320	TON	RIP RAP, CLASS I
3649000000-E	876	2	TON	RIP RAP, CLASS B
3656000000-E	876	810	SY	FILTER FABRIC FOR DRAINAGE

ItemNumber	Sec #	Quantity	Unit	Description
4400000000-E	1110	312	SF	WORK ZONE SIGNS (STATIONARY)
4410000000-E	1110	94	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4445000000-E	1145	96	LF	BARRICADES (TYPE III)
4810000000-E	1205	4,000	LF	PAINT PAVEMENT MARKING LINES (4")
6000000000-E	1605	1,000	LF	TEMPORARY SILT FENCE
6006000000-E	1610	225	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	120	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	40	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	1.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	1.25	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	200	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	410	LF	SAFETY FENCE
6030000000-E	1630	230	CY	SILT EXCAVATION
6036000000-E	1631	8,000	SY	MATting FOR EROSION CONTROL
6037000000-E	SP	140	SY	COIR FIBER MAT
6038000000-E	SP	170	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	70	LF	1/4" HARDWARE CLOTH
6045000000-E	SP	100	LF	*** TEMPORARY PIPE (24")
6069000000-E	1638	100	CY	STILLING BASINS
6071030000-E	SP	200	LF	COIR FIBER BAFFLES
6071050000-E	SP	2	EA	*** SKIMMER (1-1/2")
6084000000-E	1660	3	ACR	SEEDING & MULCHING
6087000000-E	1660	3	ACR	MOWING

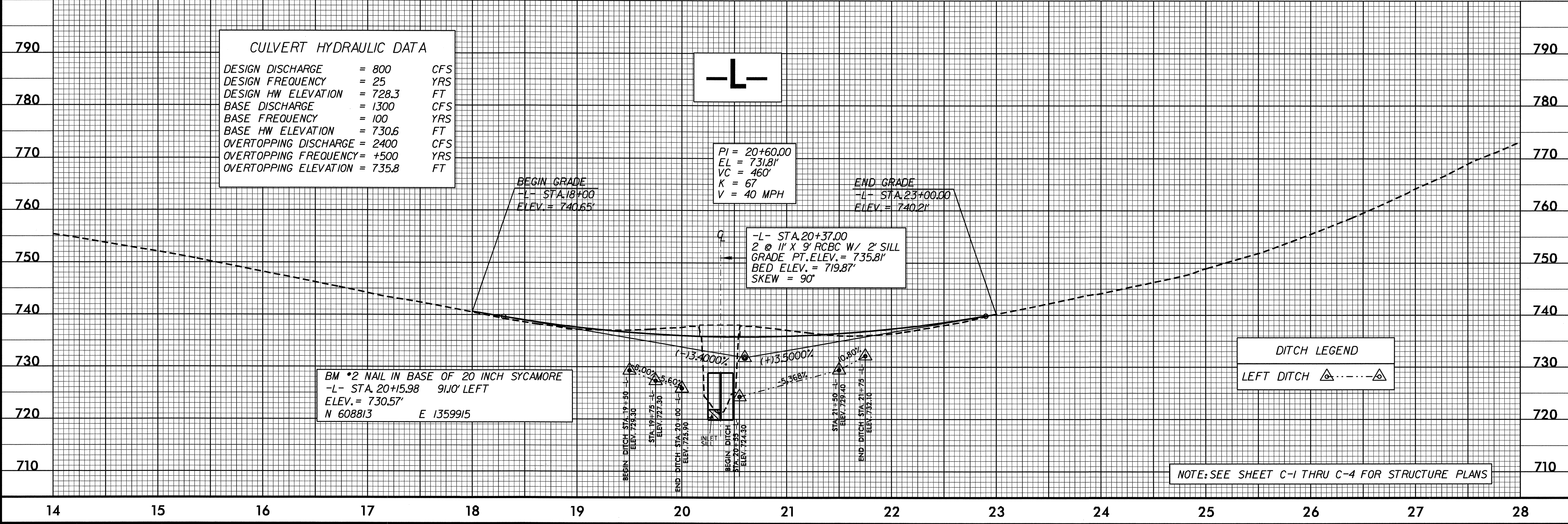
ItemNumber	Sec #	Quantity	Unit	Description
6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	0.75	TON	FERTILIZER TOPDRESSING
6111000000-E	SP	175	LF	IMPERVIOUS DIKE
6114500000-N	SP	20	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	12	EA	RESPONSE FOR EROSION CONTROL







DESIGN DISCHARGE	= 800	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 728.3	FT
BASE DISCHARGE	= 1300	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 730.6	FT
OVERTOPPING DISCHARGE	= 2400	CFS
OVERTOPPING FREQUENCY	= +500	YRS
OVERTOPPING ELEVATION	= 735.8	FT



8/17/99

REVISIONS

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