

See Sheet 1-A For Index of Sheets

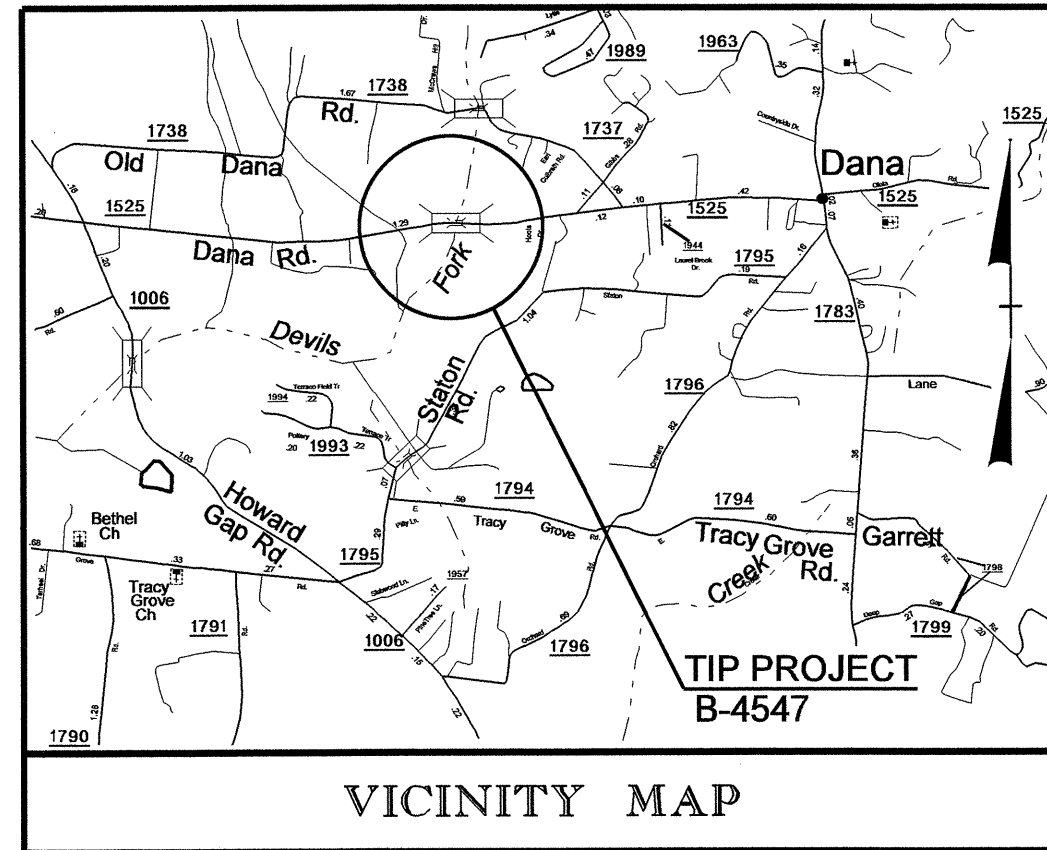
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**HENDERSON COUNTY**

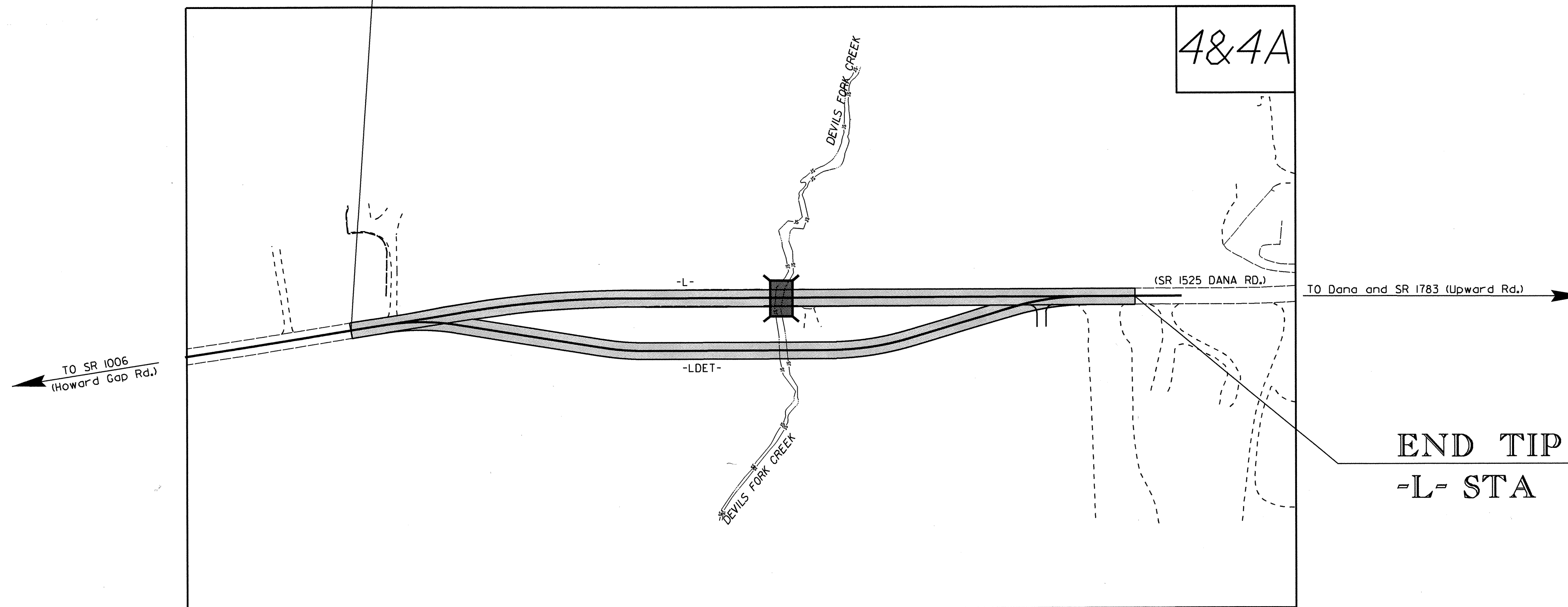
**LOCATION: BRIDGE NO. 45 OVER DEVILS FORK CREEK  
ON SR 1525 (DANA RD.)**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4547	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38407.1.1	BRSTP-1525(8)	PE	
38407.2.1	BRSTP-1525(8)	R/W & UTIL	
38407.3.1	BRSTP-1525(8)	CONSTRUCTION	



BEGIN TIP PROJECT B-4547  
-L- STA 14 + 25.00

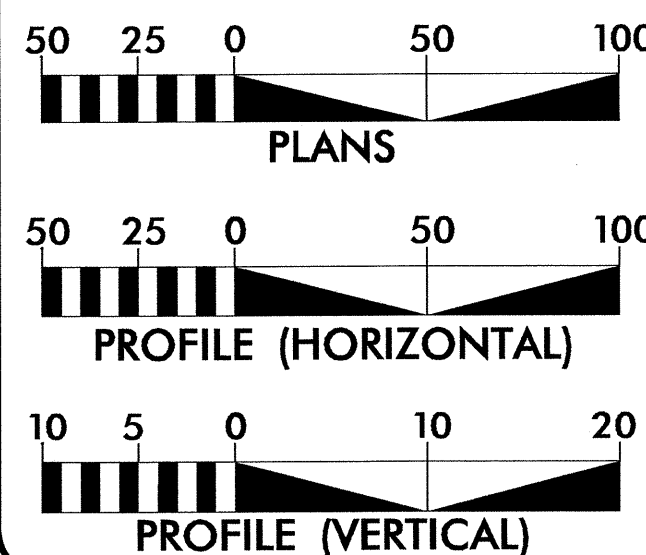


END TIP PROJECT B-4547  
-L- STA 25 + 25.00



DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVE K FACTOR AND NIGHTTIME SSD

**GRAPHIC SCALES**



**DESIGN DATA**

ADT 2012 = 5400  
ADT 2032 = 9400  
DHV = 12 %  
D = 60 %  
T = 4 % \*  
V = 50 MPH  
\* TTST 1% DUAL 3%  
FUNC. CLASS =  
MINOR COLLECTOR  
SUB REGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4547 = 0.208 MILES  
TOTAL LENGTH TIP PROJECT B-4547 = 0.208 MILES

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
March 28, 2012

LETTING DATE:  
May 21, 2013

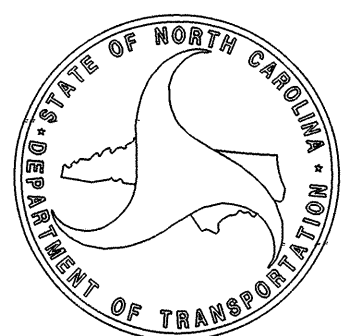
JAMES A. SPEER, PE  
PROJECT ENGINEER

ALLISON K. WHITE  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

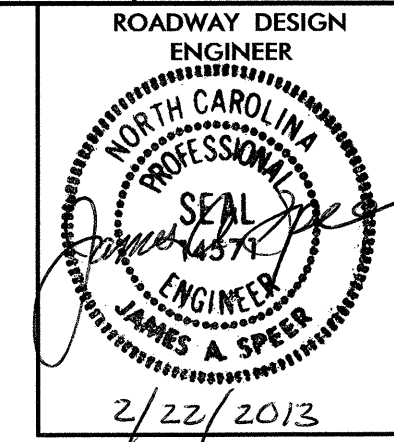
SEAL 20870  
7/22/13  
P.E.  
SIGNATURE: *James A. Speer*

ROADWAY DESIGN  
SEAL  
2/22/2013  
P.E.  
SIGNATURE: *Allison K. White*



TIP PROJECT: B-4547

CONTRACT: C203150



8/17/99

22-FEB-2013 08:25  
 R:\Roadwork\Proj\B-4547\_rdy.tsh.dgn  
 \$\$\$USERNAME\$\$\$

**INDEX OF SHEETS**

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEET
2 THRU 2A	PAVEMENT SCHEDULE, TYPICAL SECTION, AND WEDGING DETAILS
2B	DETAIL OF 112" X 75" ARCH SANDBAG HEADWALL
3	SUMMARY OF QUANTITIES
3-A	SUMMARY OF DRAINAGE, SUMMARY OF GUARDRAIL, PAVEMENT REMOVAL SUMMARY AND EARTHWORK SUMMARY
4 THRU 4A	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-4	TRANSPORTATION MANAGEMENT PLANS
PMP-1	PAVEMENT MARKING PLANS
EC-1 THRU EC-7	EROSION CONTROL PLANS
RF-1	REFORESTATION
UO-1 THRU UO-2	UTILITY BY OTHERS PLANS
X-1A	CROSS SECTION VOLUME SHEET
X-1 THRU X-7	PROPOSED CROSS SECTIONS
C-1 THRU C-7	CULVERT PLANS

GENERAL NOTES: 2012 SPECIFICATIONS  
 EFFECTIVE: 01-17-12  
 REVISED: 07/30/12

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

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

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

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

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

UNDERDRAINS:  
 SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

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

TEMPORARY SHORING:  
 SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC 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.

UTILITIES:  
 UTILITY OWNERS ON THIS PROJECT ARE  
 Power Distribution - Duke Energy  
 Telephone - AT&T  
 CATV - Morris Broadband  
 ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

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	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
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	
815.03	Pipe Underdrain and Blind Drain
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels

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	○
Property Corner	-----
Property Monument	EDM
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
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	CSX TRANSPORTATION 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 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	-----

### VEGETATION:

Single Tree	○
Single Shrub	○
Hedge	-----
Woods Line	-----

Orchard	-----
Vineyard	Vineyard

### EXISTING STRUCTURES:

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

### UTILITIES:

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

### TELEPHONE:

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

### WATER:

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

### TV:

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

### GAS:

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

### SANITARY SEWER:

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

### MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊙
Utility Unknown U/G Line	-----
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.

04/16/11

# SURVEY CONTROL SHEET B-4547

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
1	BL-1		591513.5800	987946.8920	2131.52	15+36.56	15.17 LT
2	BL-2		591510.3580	988462.3080	2128.45	20+51.28	17.50 RT
3	BL-3		591492.1290	988942.0350	2157.16	25+30.94	37.25 RT

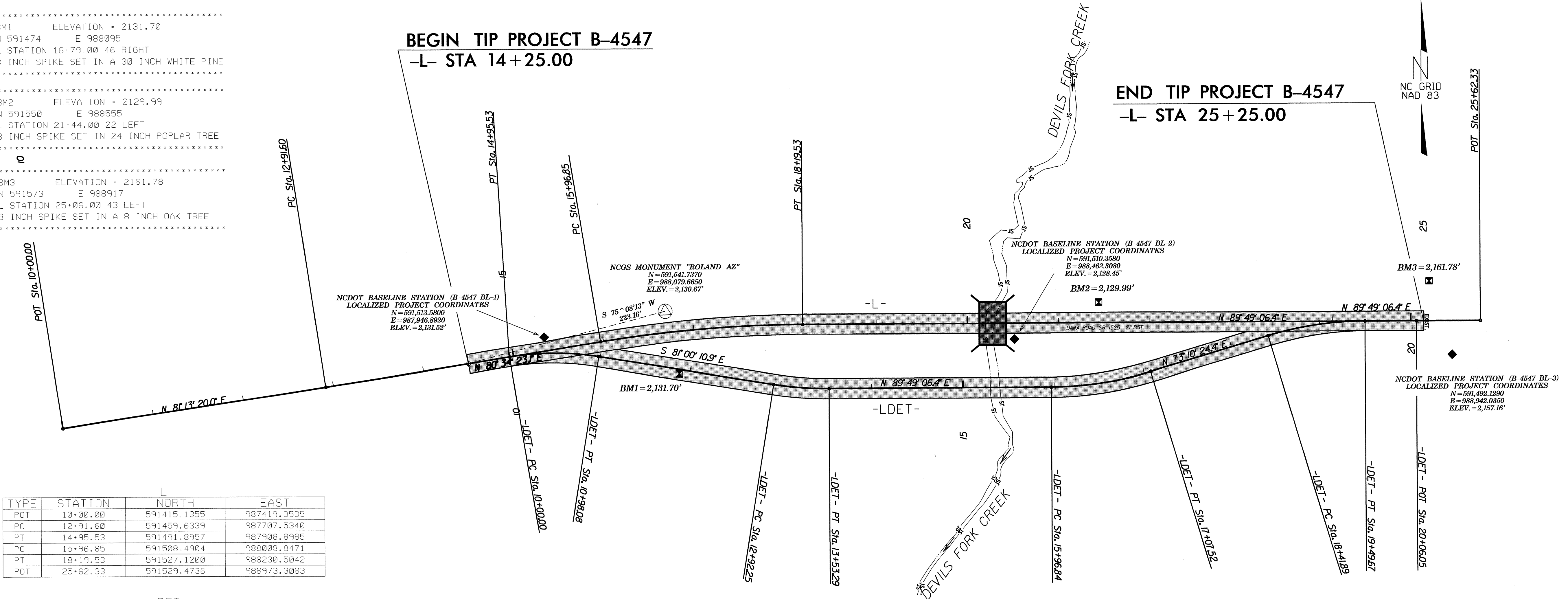
.....  
 BM1 ELEVATION = 2131.70  
 N 591474 E 988095  
 L STATION 16+79.00 46 RIGHT  
 8 INCH SPIKE SET IN A 30 INCH WHITE PINE  
 .....

.....  
 BM2 ELEVATION = 2129.99  
 N 591550 E 988555  
 L STATION 21+44.00 22 LEFT  
 8 INCH SPIKE SET IN 24 INCH POPLAR TREE  
 .....

.....  
 BM3 ELEVATION = 2161.78  
 N 591573 E 988917  
 L STATION 25+06.00 43 LEFT  
 8 INCH SPIKE SET IN A 8 INCH OAK TREE  
 .....

**BEGIN TIP PROJECT B-4547**  
**-L- STA 14+25.00**

**END TIP PROJECT B-4547**  
**-L- STA 25+25.00**



TYPE	STATION	NORTH	EAST
POT	10+00.00	591415.1355	987419.3535
PC	12+91.60	591459.6339	987707.5340
PT	14+95.53	591491.8957	987908.8985
PC	15+96.85	591508.4904	988008.8471
PT	18+19.53	591527.1200	988230.5042
POT	25+62.33	591529.4736	988973.3083

TYPE	STATION	NORTH	EAST
PC	10+00.00	591491.8957	987908.8985
PT	10+98.08	591492.2621	988006.5509
PC	12+92.25	591461.8960	988198.3405
PT	13+53.29	591457.2103	988259.1294
PC	15+96.84	591457.9820	988502.6782
PT	17+07.52	591474.2924	988611.7611
PC	18+41.89	591513.1898	988740.3799
PT	19+49.67	591529.0721	988846.5997
POT	20+06.05	591529.2507	988902.9744

ALIGN	STATION	OFFSET	NORTH	EAST
L	18+00.00	-13.00	591539.9180	988210.7539
L	18+00.00	-30.00	591556.9154	988210.4595
L	18+19.53	-30.00	591557.1198	988230.4092
L	20+00.00	-60.00	591587.6915	988410.7868
L	20+60.00	-60.00	591587.8816	988470.7865
L	20+60.00	-30.00	591557.8818	988470.8815
L	23+00.00	-30.00	591558.6422	988710.8803
L	23+00.00	-13.00	591541.6423	988710.9342
L	23+00.00	13.00	591515.6424	988711.0166
L	23+00.00	30.00	591498.6425	988711.0704
L	20+60.00	30.00	591497.8821	988471.0716
L	20+60.00	60.00	591467.8822	988471.1667
L	20+00.00	60.00	591467.6921	988411.1670
L	19+50.00	40.00	591487.5336	988361.1039
L	18+19.53	40.00	591487.1202	988230.6310
L	18+00.00	40.00	591486.9259	988211.6717
L	18+00.00	13.00	591513.9219	988211.2041
L	18+00.00	13.00	591513.9219	988211.2041

**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "ROLAND AZ" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 591,541.7370(+) EASTING: 988,079.6650(+) ELEVATION: 2,130.67(+)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99977583

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "ROLAND AZ" TO -L- STATION 14+50.00 IS S 75°08'13" W 223.16'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 29

**NOTES:**

1. 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:  
 B-4547\_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 GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.  
 PROJECT CONTROL ESTABLISHED USING NCGS MONUMENT "ROLAND AZ".

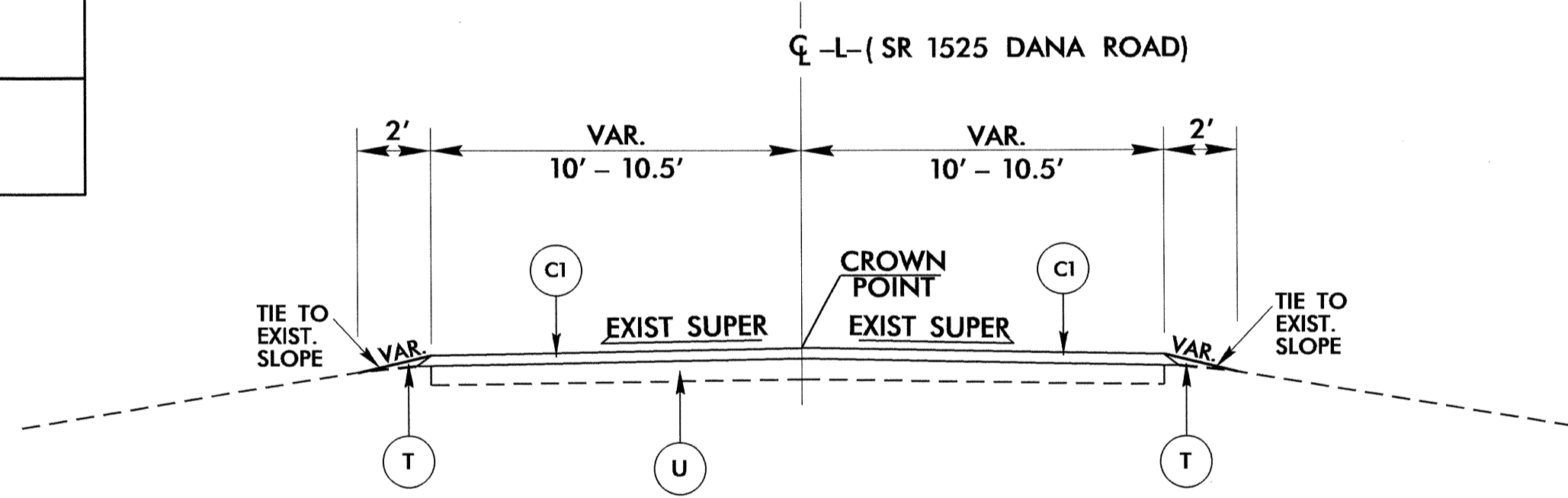
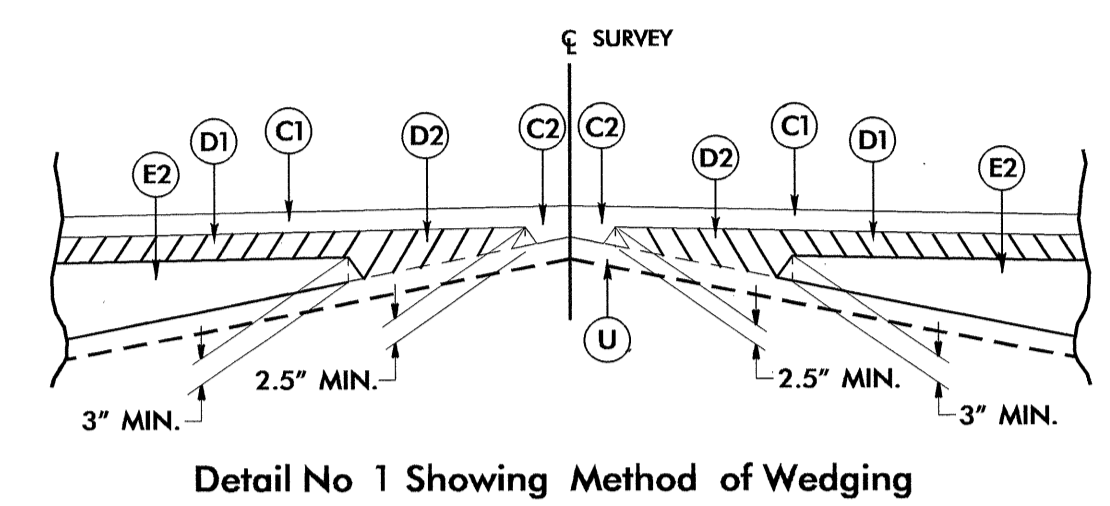
NOTE: DRAWING NOT TO SCALE

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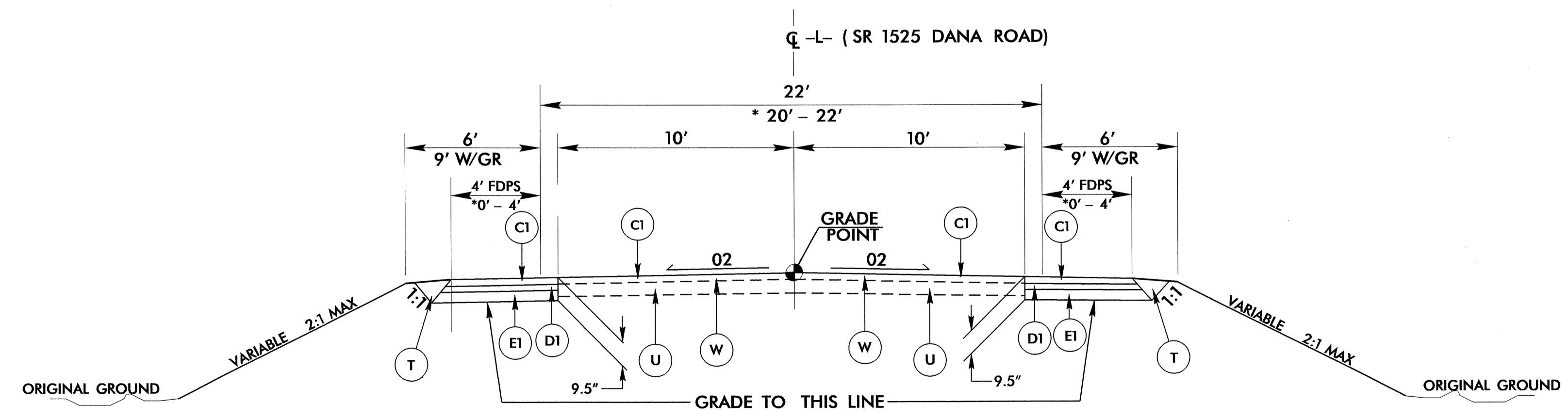
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PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 2½" 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 2½" 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 LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
J	PROP. 6" AGGREGATE BASE COURSE.
P	PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL NO. 1)

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



TYPICAL SECTION NO. 1



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 1 AS FOLLOWS:  
 -L- STA. 14+25.00 TO STA. 18+24.00  
 -L- STA. 22+50.00 TO STA. 25+25.00

\* -L- STA. 18+24.00 TO STA. 18+74.00  
 -L- STA. 18+74.00 TO STA. 19+90.00  
 -L- STA. 20+70.00 TO STA. 22+00.00  
 \* -L- STA. 22+00.00 TO STA. 22+50.00

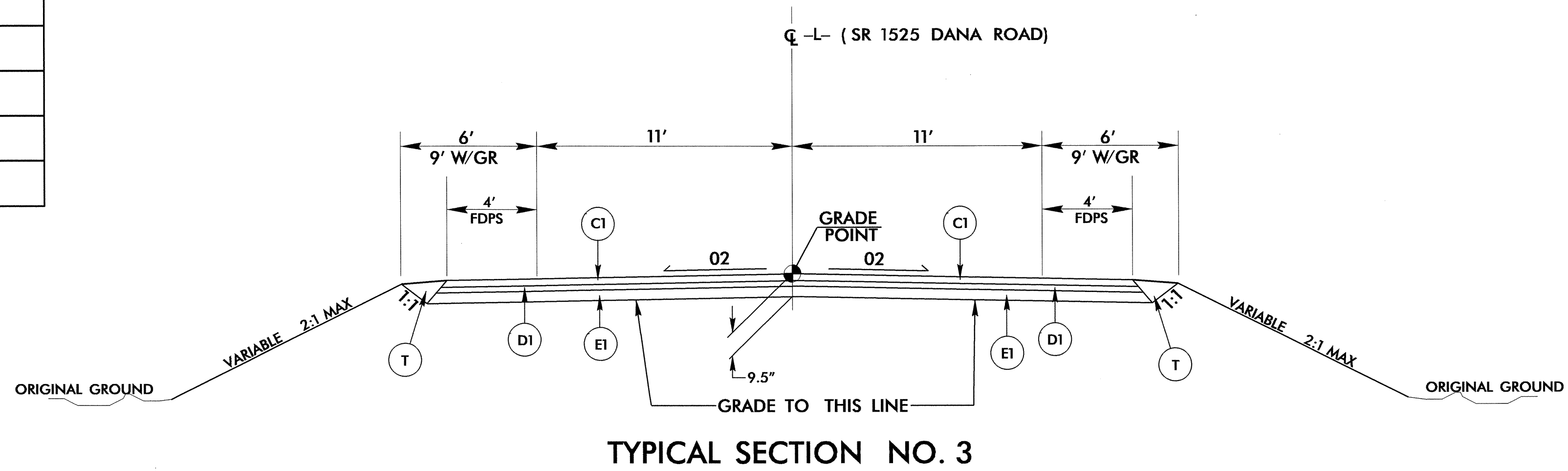
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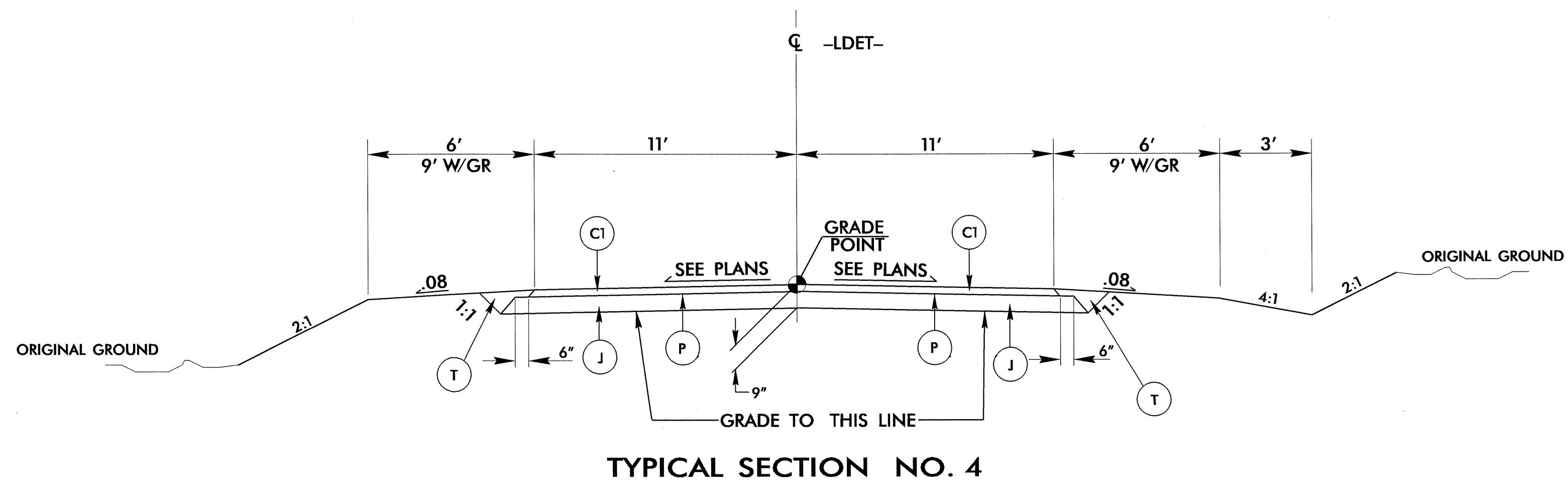
PROJECT REFERENCE NO. <b>B-4547</b>	SHEET NO. <b>2-A</b>
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PAVEMENT SCHEDULE	
C1	3" S9.5B
C2	VAR. S9.5B
D1	2 1/2" I19.0B
D2	VAR. I19.0B
E1	4" B25.0B
E2	VAR. B25.0B
J	6" ABC
P	PRIME COAT
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL NO. 1)

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

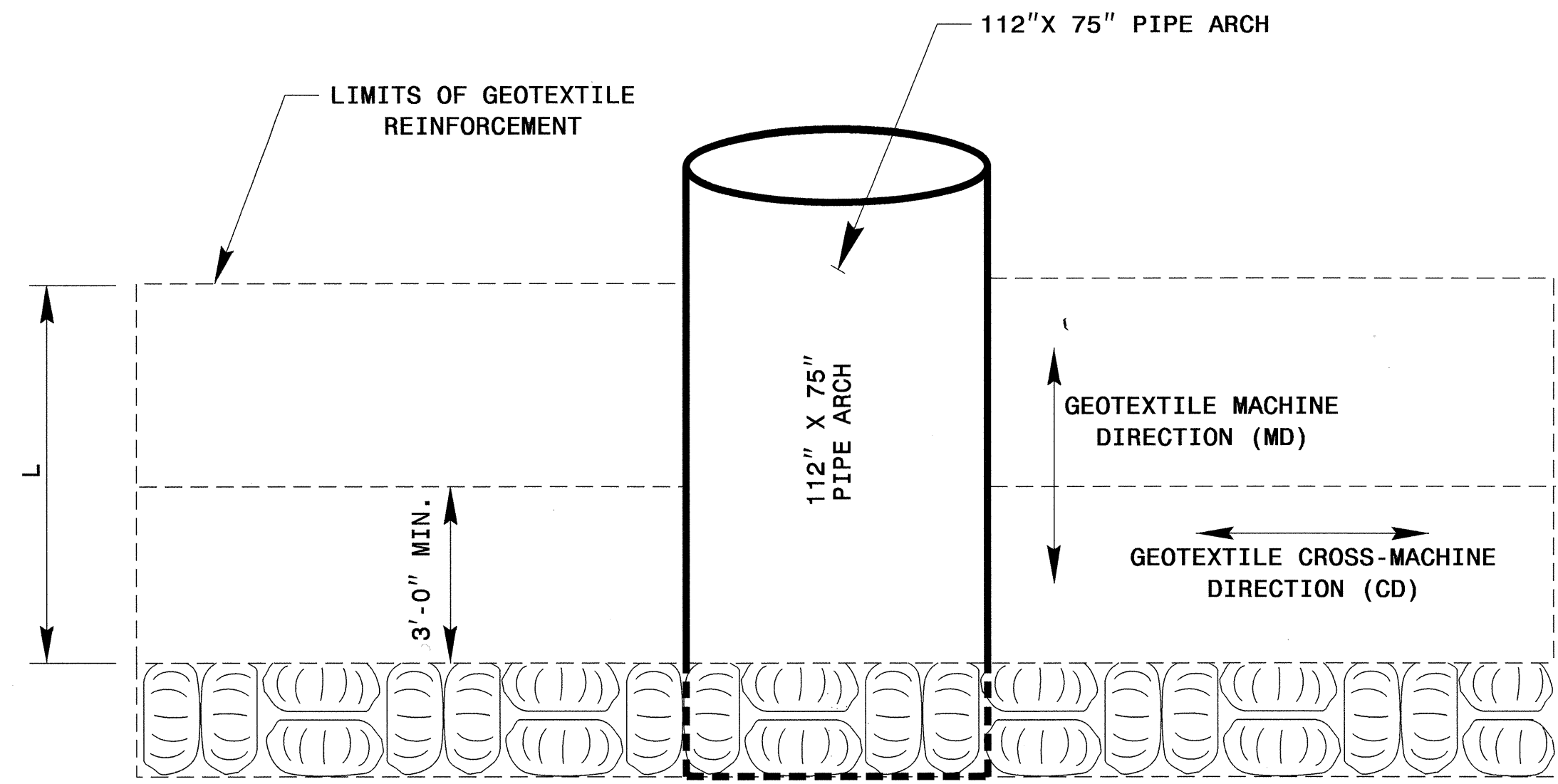


USE TYPICAL SECTION NO. 3 AS FOLLOWS:  
-L- STA. 19+90.00 TO STA. 20+70.00

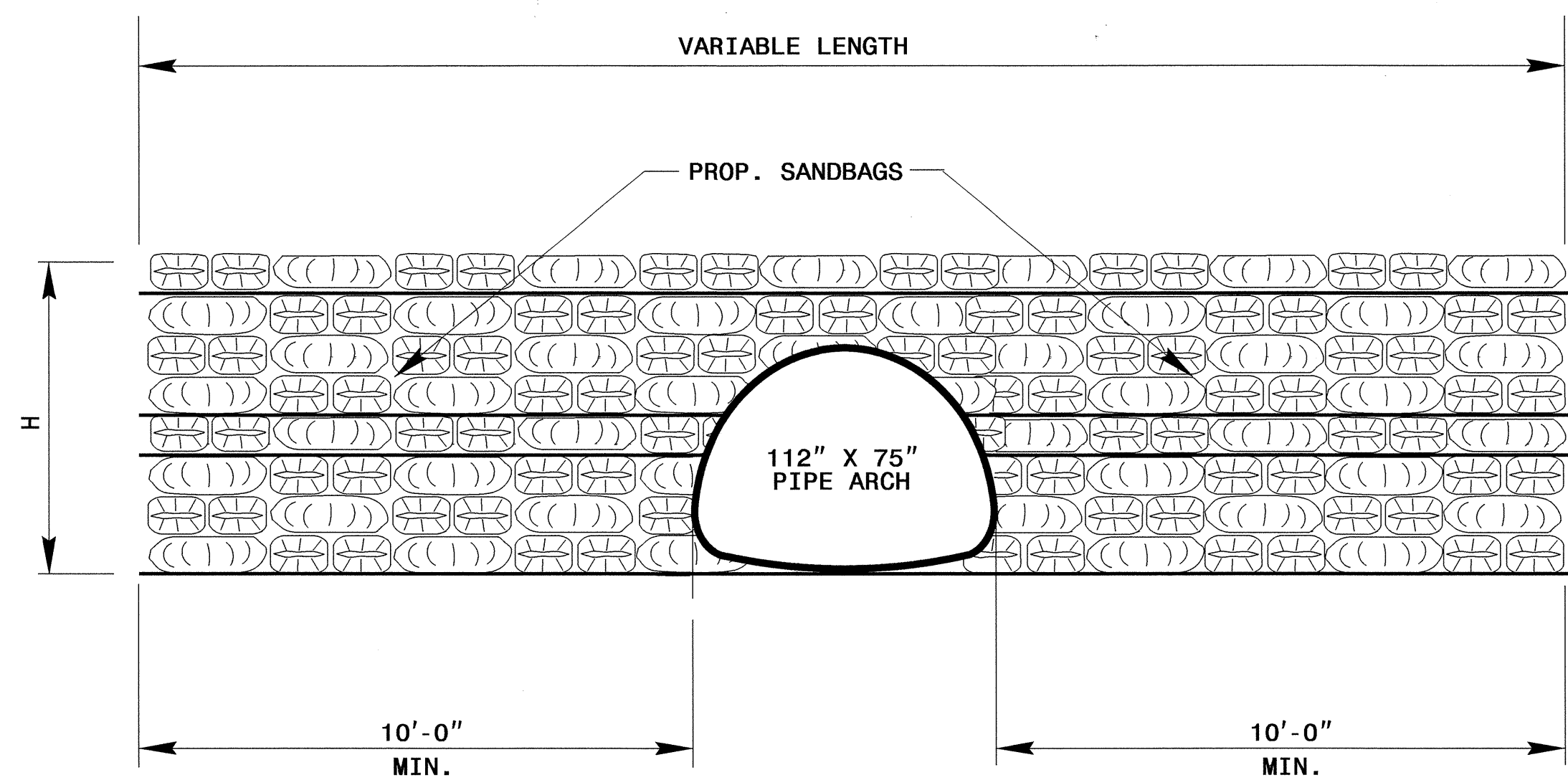


USE TYPICAL SECTION NO. 4 AS FOLLOWS:  
-LDET- STA. 10+79.74 TO STA. 18+59.95

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**PLAN**



**FRONT ELEVATION**

**GEOTEXTILE REINFORCEMENT  
(TYPE 5 GEOTEXTILE)**

WALL HEIGHT H (ft)	REINF. LENGTH L (ft)	WIDE WIDTH TENSILE STRENGTH @ ULTIMATE (MD) (lb/ft)
< 4	6	2400
4 TO 6	6	3400
6 TO 8	= H	4300
8 TO 10	= H	5200

TOTAL AREA SANDBAG HEADWALL = 192 S.F.

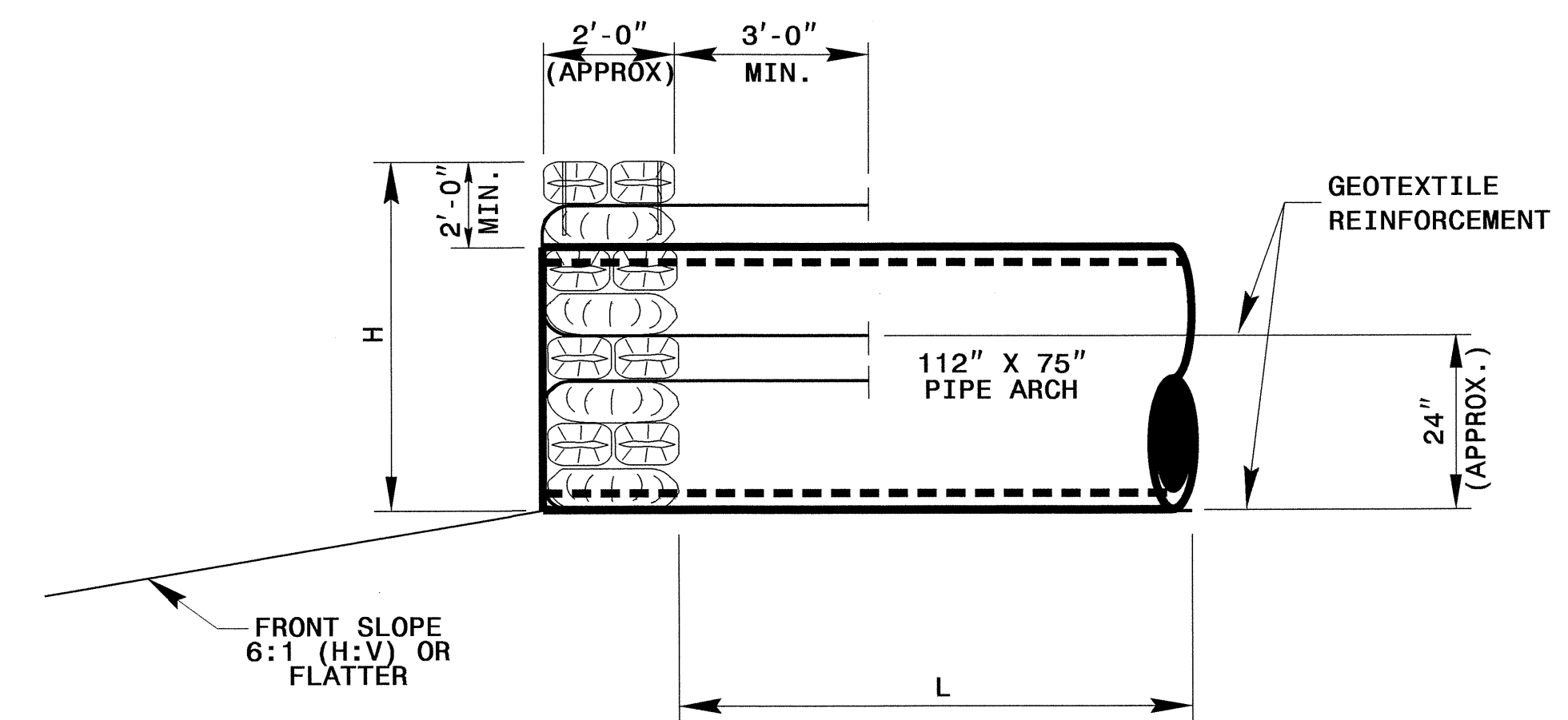
**GENERAL NOTES:**

- FOR REINFORCED SANDBAG HEADWALLS, SEE SANDBAG HEADWALLS PROVISION.
- REINFORCED SANDBAG HEADWALLS ARE BASED ON A TRAFFIC SURCHARGE OF 250 LB/SF OR LESS AND A BACK SLOPE OF 2:1 (H:V) OR FLATTER.
- REINFORCED SANDBAG HEADWALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
 UNIT WEIGHT,  $\gamma = 120$  LB/CF  
 FRICTION ANGLE,  $\phi = 30$  DEGREES  
 COHESION,  $c = 0$  LB/SF
- DO NOT USE REINFORCED SANDBAG HEADWALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE REINFORCED SANDBAG HEADWALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW SANDBAGS OR PIPES.
- DO NOT PLACE GEOTEXTILE REINFORCEMENT OR SANDBAGS UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
- 24" LONG #4 REINFORCING STEEL BARS MAY BE SUBSTITUTED FOR 8" LONG STEEL SPIKES. DRIVE #4 BAR THROUGH NO MORE THAN 5 SANDBAGS.
- DO NOT SPLICE OR OVERLAP GEOTEXTILE REINFORCEMENT SO SEAMS ARE PARALLEL TO THE HEADWALL FACE.
- HEADWALL DIMENSIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

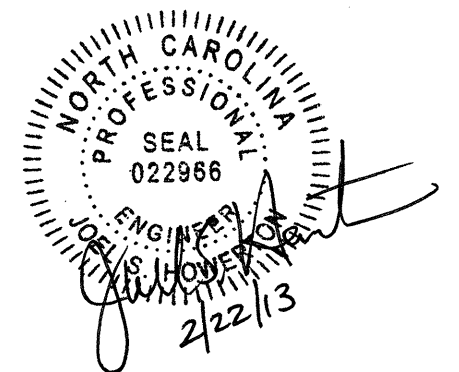


EACH BAG CONNECTED WITH 4 - 8" SPIKES

**SANDBAG PLAN VIEW**



**SIDE ELEVATION**



CONTRACT STANDARDS AND DEVELOPMENT UNIT  
 PLANS AND STANDARDS SECTION  
 Office 919-707-6950 FAX 919-250-4119

**DETAIL OF 112" X 75" ARCH  
 REINFORCED SANDBAG HEADWALL**

ORIGINAL BY: *rbritt* DATE: 08-22-2012  
 MODIFIED BY: *rbritt* DATE: 08-22-2012  
 CHECKED BY: *rbritt* DATE: 2/22/13  
 FILE SPEC.: *details/rnbritt/english/hydro/b4547archsbhw.dgn*

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# SUMMARY OF QUANTITIES

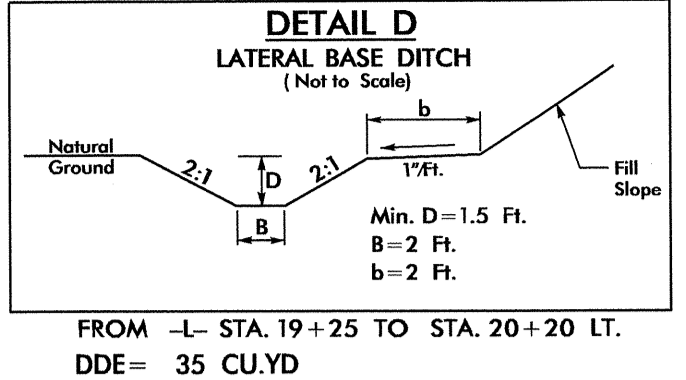
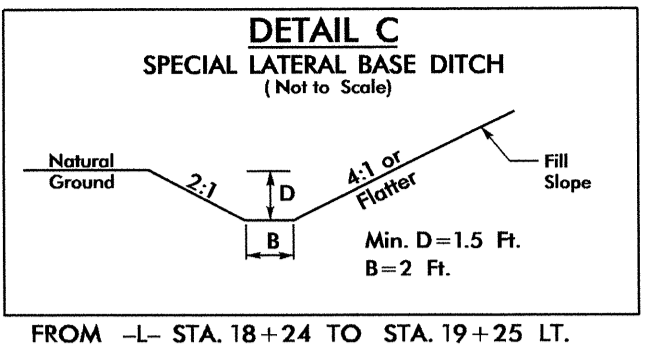
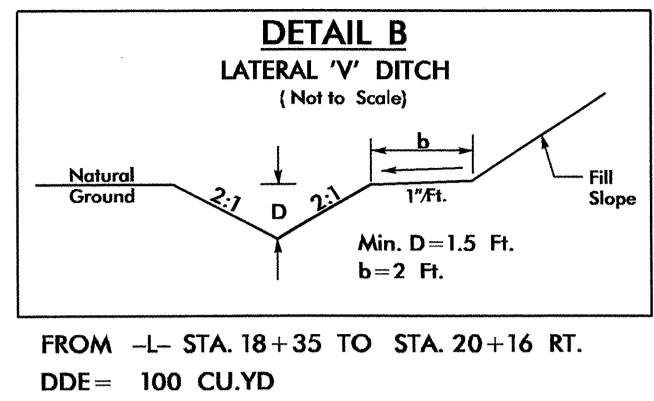
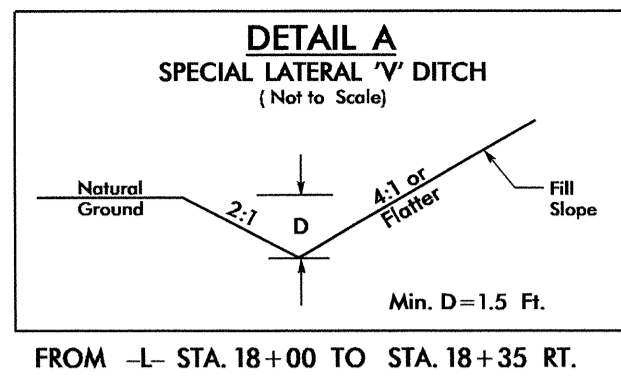
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C203150

ItemNumber	Sec #	Quantity	Unit	Description
000010000-N	800	Lump Sum		MOBILIZATION
004300000-N	226	Lump Sum		GRADING
005000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUB-BING
005700000-E	226	100	CY	UNDERCUT EXCAVATION
013400000-E	240	141	CY	DRAINAGE DITCH EXCAVATION
019500000-E	265	100	CY	SELECT GRANULAR MATERIAL
019600000-E	270	200	SY	GEOTEXTILE FOR SOIL STABILIZATION
031800000-E	300	10	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES
032000000-E	300	20	SY	FOUNDATION CONDITIONING GEOTEXTILE
065400000-E	310	56	LF	*** X *** CS PIPE ARCH CULVERTS, ***** THICK (112" X 75", 0.109")
109950000-E	505	250	CY	SHALLOW UNDERCUT
109970000-E	505	125	TON	CLASS IV SUBGRADE STABILIZATION
112100000-E	520	772	TON	AGGREGATE BASE COURSE
122000000-E	545	200	TON	INCIDENTAL STONE BASE
133000000-E	607	100	SY	INCIDENTAL MILLING
148900000-E	610	250	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
149800000-E	610	240	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
151900000-E	610	890	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
157500000-E	620	80	TON	ASPHALT BINDER FOR PLANT MIX
202200000-E	815	44.8	CY	SUBDRAIN EXCAVATION
203300000-E	815	33.6	CY	SUBDRAIN FINE AGGREGATE
204400000-E	815	200	LF	6" PERFORATED SUBDRAIN PIPE
207000000-N	815	1	EA	SUBDRAIN PIPE OUTLET
207700000-E	815	6	LF	6" OUTLET PIPE
219900000-E	SP	384	SF	SANDBAG HEADWALLS

ItemNumber	Sec #	Quantity	Unit	Description
303000000-E	862	450	LF	STEEL BM GUARDRAIL
315000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
327000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
338000000-E	862	362.5	LF	TEMPORARY STEEL BM GUARDRAIL
338910000-N	SP	4	EA	TEMPORARY GUARDRAIL ANCHOR UNITS, TYPE 350
362800000-E	876	55	TON	RIP RAP, CLASS 1
365600000-E	876	725	SY	GEOTEXTILE FOR DRAINAGE
440000000-E	1110	112	SF	WORK ZONE SIGNS (STATIONARY)
440500000-E	1110	96	SF	WORK ZONE SIGNS (PORTABLE)
441000000-E	1110	36	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
443000000-N	1130	24	EA	DRUMS
443500000-N	1135	21	EA	CONES
444500000-E	1145	32	LF	BARRICADES (TYPE III)
445000000-N	1150	1,280	HR	FLAGGER
451600000-N	1180	21	EA	SKINNY DRUM
465000000-N	1251	98	EA	TEMPORARY RAISED PAVEMENT MARKERS
468500000-E	1205	2,100	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
468600000-E	1205	2,100	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
481000000-E	1205	19,664	LF	PAINT PAVEMENT MARKING LINES (4")
485000000-E	1205	781	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
490500000-N	1253	15	EA	SNOWFLOWABLE PAVEMENT MARKERS
600000000-E	1605	2,250	LF	TEMPORARY SILT FENCE
600600000-E	1610	340	TON	STONE FOR EROSION CONTROL, CLASS A
600900000-E	1610	195	TON	STONE FOR EROSION CONTROL, CLASS B
601200000-E	1610	250	TON	SEDIMENT CONTROL STONE
601500000-E	1615	1	ACR	TEMPORARY MULCHING
601800000-E	1620	50	LB	SEED FOR TEMPORARY SEEDING
602100000-E	1620	1.25	TON	FERTILIZER FOR TEMPORARY SEEDING
602400000-E	1622	200	LF	TEMPORARY SLOPE DRAINS
602900000-E	SP	200	LF	SAFETY FENCE
603000000-E	1630	440	CY	SILT EXCAVATION
603600000-E	1631	2,300	SY	MATting FOR EROSION CONTROL
603700000-E	SP	40	SY	COIR FIBER MAT
603800000-E	SP	50	SY	PERMANENT SOIL REINFORCEMENT MAT
604200000-E	1632	300	LF	1/4" HARDWARE CLOTH
607000000-N	1639	6	EA	SPECIAL STILLING BASINS
607101000-E	SP	325	LF	WATTLE
607102000-E	SP	125	LB	POLYACRYLAMIDE (PAM)
607103000-E	1640	345	LF	COIR FIBER BAFFLE
607105000-E	SP	4	EA	*** SKIMMER (1-1/2")
608400000-E	1660	1	ACR	SEEDING & MULCHING
608700000-E	1660	0.5	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	0.75	TON	FERTILIZER TOPDRESSING
611100000-E	SP	220	LF	IMPERVIOUS DIKE
611450000-N	1667	10	MHR	SPECIALIZED HAND MOWING
611700000-N	SP	25	EA	RESPONSE FOR EROSION CONTROL
612300000-E	1670	0.5	ACR	REFORESTATION







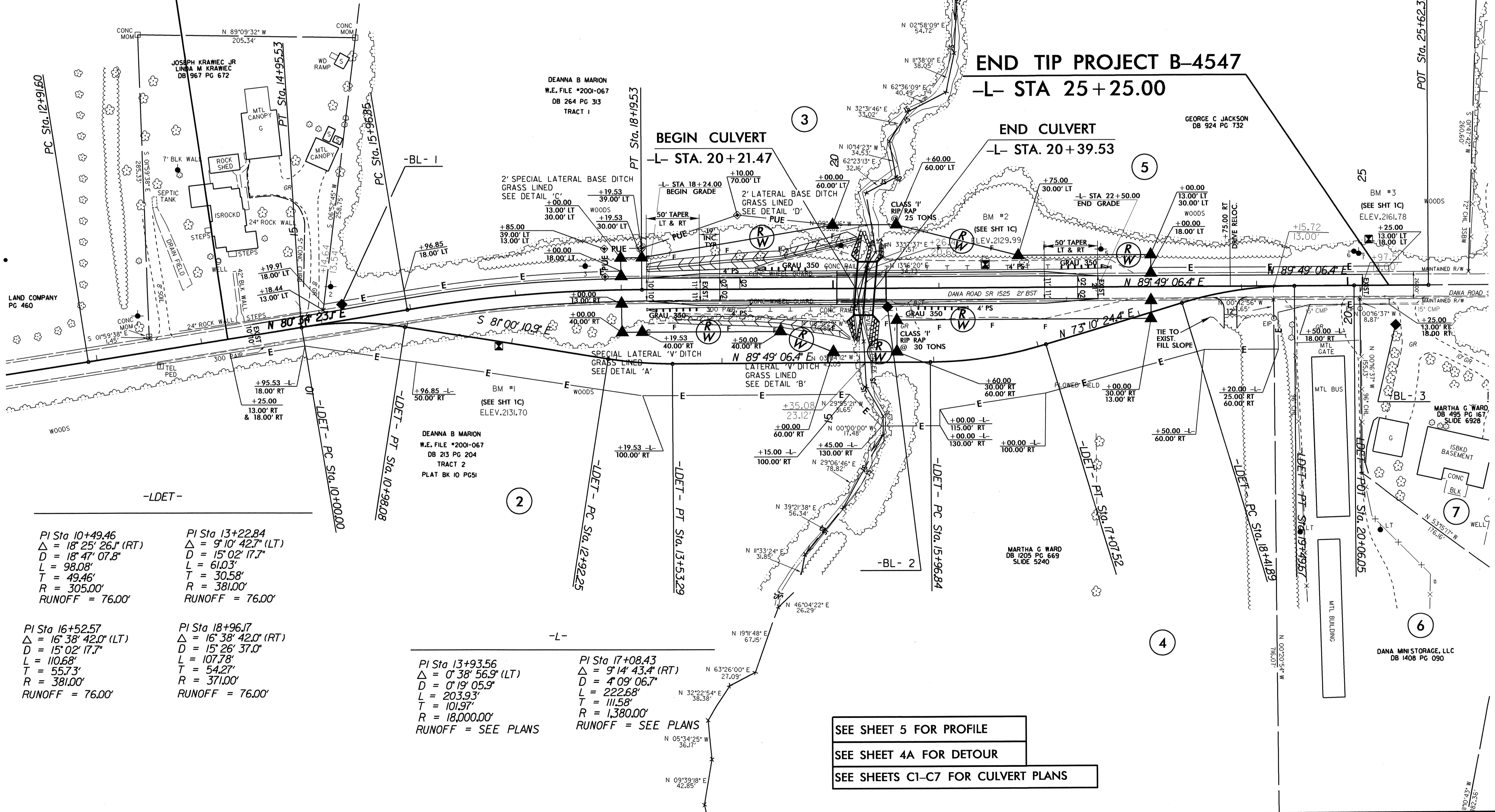
NAD 83

**BEGIN TIP PROJECT B-4547**  
-L- STA 14+25.00

**END TIP PROJECT B-4547**  
-L- STA 25+25.00

**BEGIN CULVERT**  
-L- STA. 20+21.47

**END CULVERT**  
-L- STA. 20+39.53



PI Sta 10+49.46  
Δ = 18° 25' 26.1" (RT)  
D = 18° 47' 07.8"  
L = 98.08'  
T = 49.46'  
R = 305.00'  
RUNOFF = 76.00'

PI Sta 13+22.84  
Δ = 9° 10' 42.7" (LT)  
D = 15° 02' 17.7"  
L = 61.03'  
T = 30.58'  
R = 381.00'  
RUNOFF = 76.00'

PI Sta 16+52.57  
Δ = 16° 38' 42.0" (LT)  
D = 15° 02' 17.7"  
L = 110.68'  
T = 55.73'  
R = 381.00'  
RUNOFF = 76.00'

PI Sta 18+96.17  
Δ = 16° 38' 42.0" (RT)  
D = 15° 26' 37.0"  
L = 107.78'  
T = 54.27'  
R = 371.00'  
RUNOFF = 76.00'

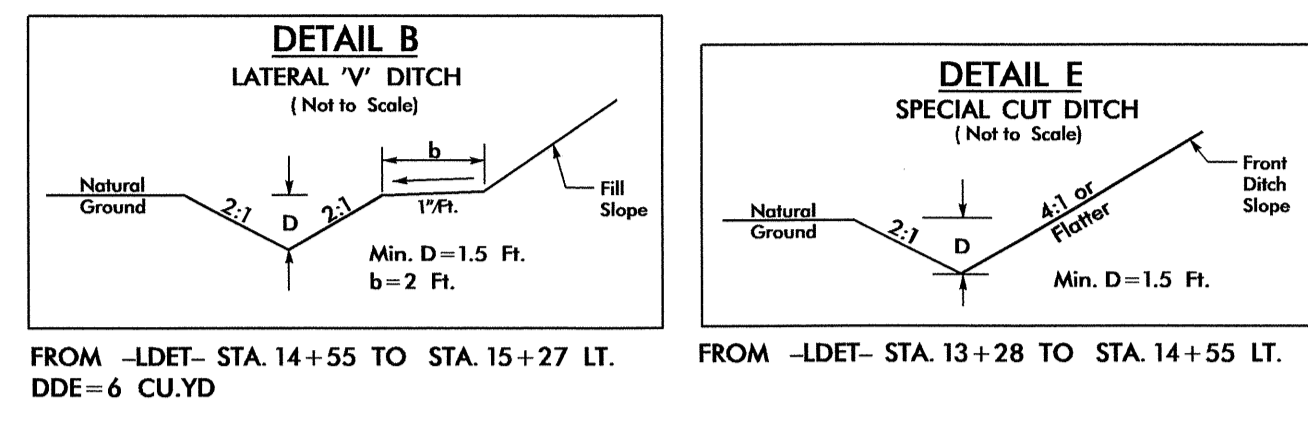
PI Sta 13+93.56  
Δ = 0° 38' 56.9" (LT)  
D = 0° 19' 05.9"  
L = 203.93'  
T = 101.97'  
R = 18,000.00'  
RUNOFF = SEE PLANS

PI Sta 17+08.43  
Δ = 9° 14' 43.4" (RT)  
D = 4° 09' 06.7"  
L = 222.68'  
T = 111.58'  
R = 1,380.00'  
RUNOFF = SEE PLANS

SEE SHEET 5 FOR PROFILE  
SEE SHEET 4A FOR DETOUR  
SEE SHEETS C1-C7 FOR CULVERT PLANS

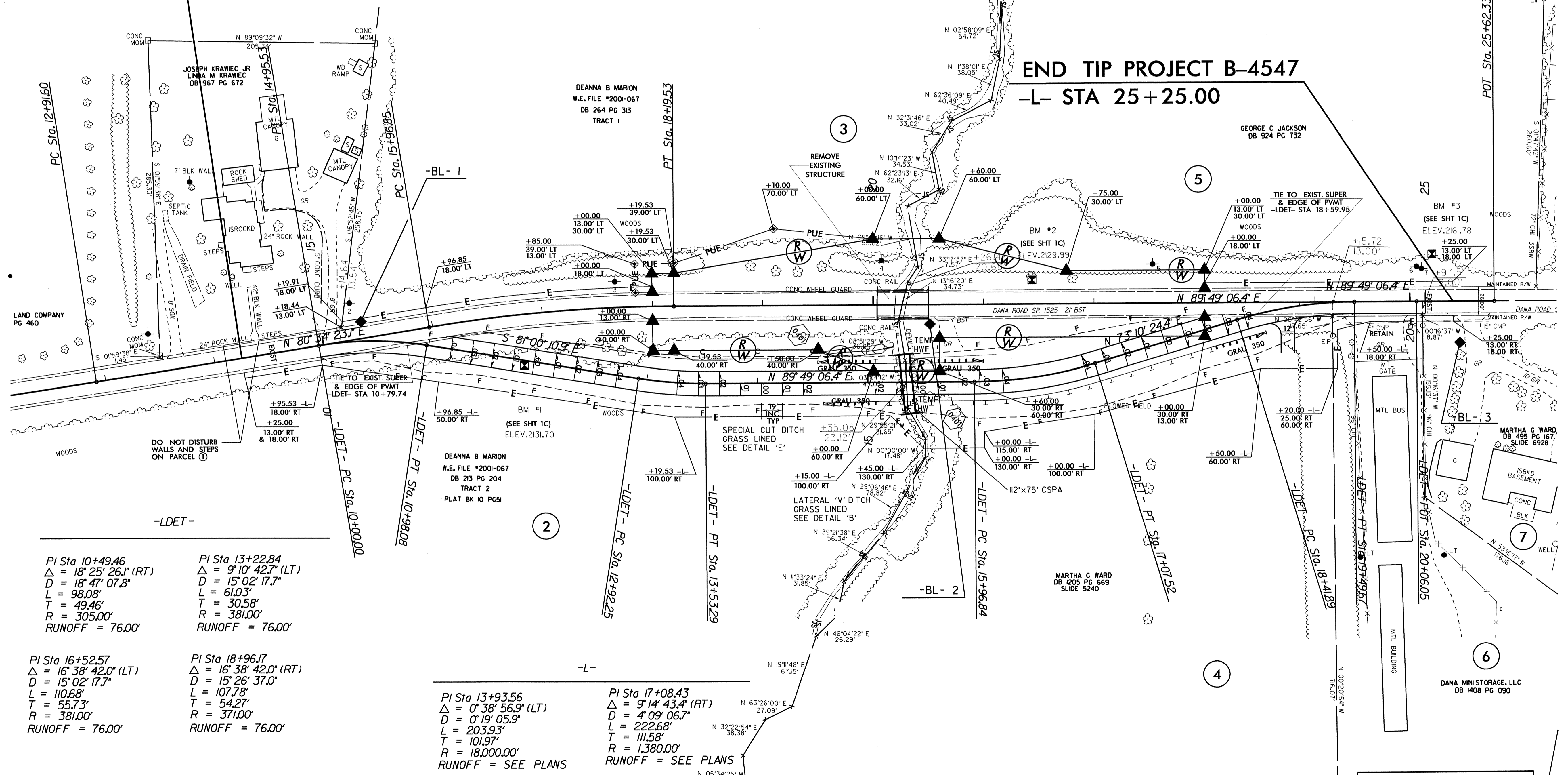
REVISIONS

8/17/99  
19-FEB-2013 08:38  
344303SERVANT.DWG  
B-4547-rdy-psh-4.dgn



**BEGIN TIP PROJECT B-4547**  
-L- STA 14+25.00

**END TIP PROJECT B-4547**  
-L- STA 25+25.00



PI Sta 10+49.46  
 $\Delta = 18^{\circ} 25' 26.1''$  (RT)  
 $D = 18^{\circ} 47' 07.8''$   
 $L = 98.08'$   
 $T = 49.46'$   
 $R = 305.00'$   
 RUNOFF = 76.00'

PI Sta 13+22.84  
 $\Delta = 9^{\circ} 10' 42.7''$  (LT)  
 $D = 15^{\circ} 02' 17.7''$   
 $L = 61.03'$   
 $T = 30.58'$   
 $R = 381.00'$   
 RUNOFF = 76.00'

PI Sta 16+52.57  
 $\Delta = 16^{\circ} 38' 42.0''$  (LT)  
 $D = 15^{\circ} 02' 17.7''$   
 $L = 110.68'$   
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 $\Delta = 16^{\circ} 38' 42.0''$  (RT)  
 $D = 15^{\circ} 26' 37.0''$   
 $L = 107.78'$   
 $T = 54.27'$   
 $R = 371.00'$   
 RUNOFF = 76.00'

PI Sta 13+93.56  
 $\Delta = 0^{\circ} 38' 56.9''$  (LT)  
 $D = 0^{\circ} 19' 05.9''$   
 $L = 203.93'$   
 $T = 101.97'$   
 $R = 18,000.00'$   
 RUNOFF = SEE PLANS

PI Sta 17+08.43  
 $\Delta = 9^{\circ} 14' 43.4''$  (RT)  
 $D = 4^{\circ} 09' 06.7''$   
 $L = 222.68'$   
 $T = 111.58'$   
 $R = 1,380.00'$   
 RUNOFF = SEE PLANS

VDETOUR = 35 mph

SEE SHEET 5 FOR PROFILE

8/17/99  
 REVISIONS  
 22-FEB-2013 08:42  
 R:\Roadway\Projects\B-4547\_rdy\_psh\_4A.dgn  
 22-FEB-2013 08:42  
 R:\Roadway\Projects\B-4547\_rdy\_psh\_4A.dgn

5/28/99

PROJECT REFERENCE NO. B-4547	SHEET NO. 5
ROADWAY DESIGN ENGINEER JAMES A. SPEER	HYDRAULICS ENGINEER MARC T. SHOWN
2/22/2013	2/22/13

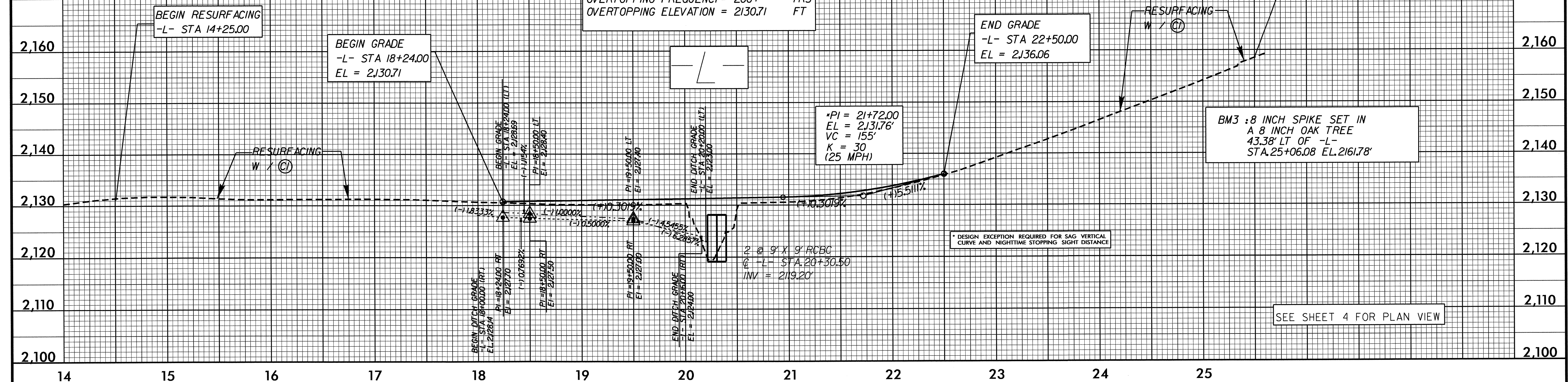
**DITCH LEGEND**  
 RIGHT DITCH - - - - -  
 LEFT DITCH - - - - -

BMI : 8 INCH SPIKE SET IN  
 A 30 INCH WHITE PINE  
 45.93' RT OF -L-  
 STA.16+79.03 EL.2131.70'

**CULVERT HYDRAULIC DATA**  
 DESIGN DISCHARGE = 720 CFS  
 DESIGN FREQUENCY = 25 YRS  
 DESIGN HW ELEVATION = 2127.8 FT  
 BASE DISCHARGE = 1100 CFS  
 BASE FREQUENCY = 100 YRS  
 BASE HW ELEVATION = 2129.2 FT  
 OVERTOPPING DISCHARGE = 1500 CFS  
 OVERTOPPING FREQUENCY = 200+ YRS  
 OVERTOPPING ELEVATION = 2130.71 FT

BM2 : 8 INCH SPIKE SET IN  
 A 24 INCH POPLAR TREE  
 21.86' LT OF -L-  
 STA.21+43.87 EL.2129.99'

END RESURFACING  
 -L- STA 25+25.00

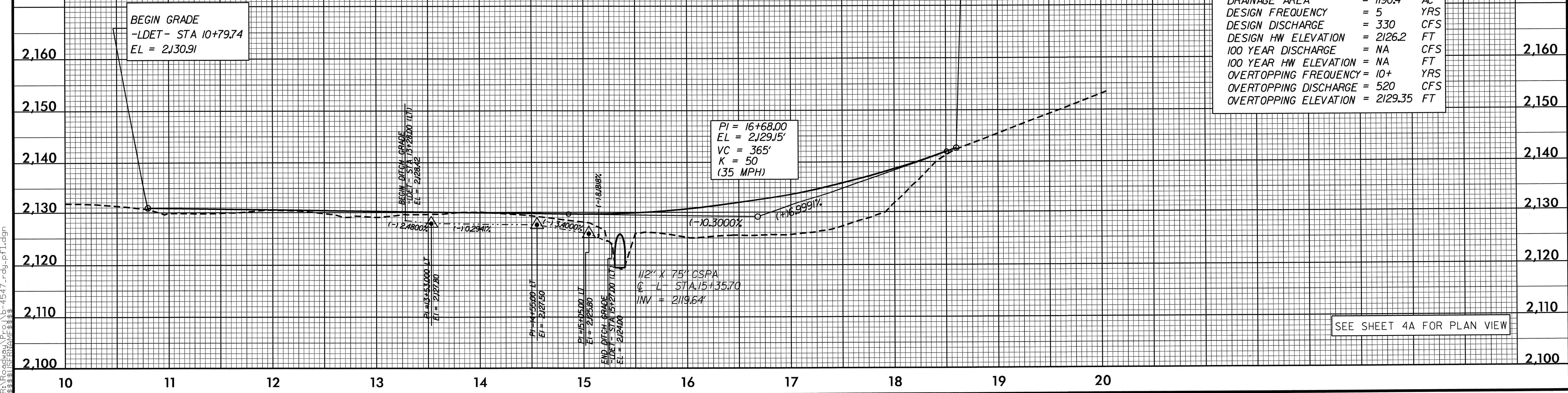


**DITCH LEGEND**  
 LEFT DITCH - - - - -

-LDET-

END GRADE  
 -LDET- STA 18+59.95  
 EL = 2142.58

**PIPE HYDRAULIC DATA**  
 -L- Sta. 15+35.70  
 DRAINAGE AREA = 1190.4 AC  
 DESIGN FREQUENCY = 5 YRS  
 DESIGN DISCHARGE = 330 CFS  
 DESIGN HW ELEVATION = 2126.2 FT  
 100 YEAR DISCHARGE = NA CFS  
 100 YEAR HW ELEVATION = NA FT  
 OVERTOPPING FREQUENCY = 10+ YRS  
 OVERTOPPING DISCHARGE = 520 CFS  
 OVERTOPPING ELEVATION = 2129.35 FT



19-FEB-2013 08:38  
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