STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MADISON COUNTY

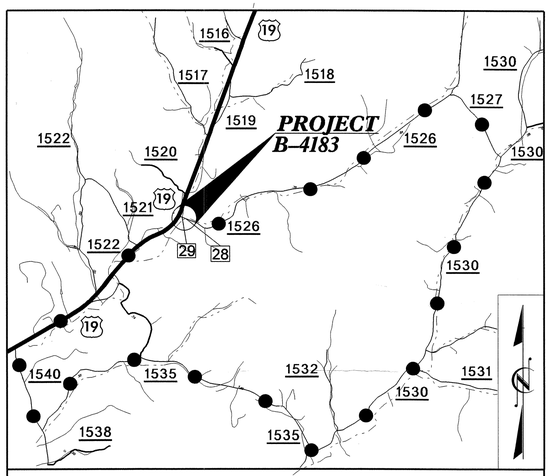
LOCATION: BRIDGE NO. 29 OVER MIDDLE FORK CREEK ON SR 1526 AND BRIDGE NO. 28 OVER CROOKED CREEK ON SR 1526

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND CULVERTS

ALL DIMENSIONS IN THESE PLANS ARE IN METERS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4183	1	

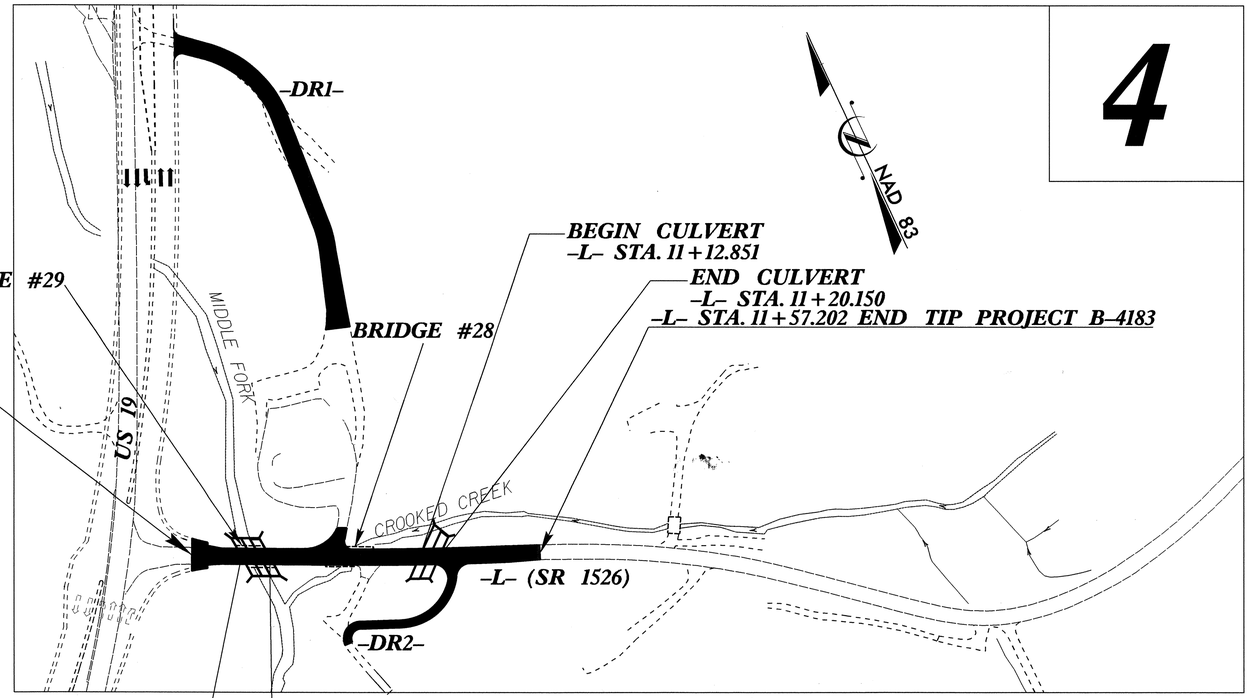
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33530.1.1	BRZ-1526(2)	PE
33530.2.1	BRZ-1526(2)	R/W & UTIL
33530.3.1	BRZ-1526(2)	CONST.



VICINITY MAP

DETOUR ROUTE

4



THERE IS NO CONTROL OF ACCESS ON SR 1526
THERE IS PARTIAL CONTROL OF ACCESS ALONG US 19
SUB-REGIONAL DESIGN GUIDELINES WERE USED ON THIS PROJECT

CONTRACT: C202623 TIP PROJECT: B-4183

GRAPHIC SCALES

5 2 0 5 10 — PLANS

5 2 0 5 10 — PROFILE (HORIZONTAL)

10 5 0 10 20 — PROFILE (VERTICAL)

DESIGN DATA

ADT 2011	=	1,192
ADT 2031	=	1,775
DHV	=	12 %
D	=	70 %
T	=	4 % *
V	=	50 km/h

* TTST 1% DUAL 3%

FUNC. CLASS = LOCAL

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4183 = 0.110 km

LENGTH STRUCTURES TIP PROJECT B-4183 = 0.018 km

TOTAL LENGTH ROADWAY TIP PROJECT B-4183 = 0.128 km

Prepared In the Office of:

DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh, NC 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 8, 2010

LETTING DATE: DECEMBER 20, 2011

JIMMY GOODNIGHT, PE
PROJECT ENGINEER

MARK HUSSEY
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 20870 ENGINEER MARC T SHOWN

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 14493 ENGINEER JAMES STAFFORD GOODNIGHT JR.

SIGNATURE: 11/1/2011

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

art McMillan P.E.

STATE HIGHWAY DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
B-4183	1-A

METRIC

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 14493 ENGINEER JAMES STAFFORD GOODNIGHT, JR.

2/21/11

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
2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2A	DETAIL FOR TEMPORARY CONTAINMENT OF PETROLEUM CONTAMINATED SOIL
2-B	METHOD OF PIPE INSTALLATION FOR SUBREGIONAL DESIGNS
3	SUMMARY OF QUANTITIES
3A	SUMMARY OF DRAINAGE QUANTITIES SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
TMP-1 THRU TMP-3	TRANPORTATION MANAGEMENT PLANS
PM-1 THRU PM-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-8	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-3	SIGNING PLANS
UO-1 THRU U-02	UTILITIES PLANS
X-1	EARTHWORK VOLUMES
X-1 THRU X-16	CROSS-SECTIONS
C-1 THRU C-15	STRUCTURE CULVERT PLANS

GENERAL NOTES: 2006 SPECIFICATIONS

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

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

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC 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: FRONTIER COMMUNICATIONS CORPORATION
COUNTRY CABLEVISION

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 CONTRACT.

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

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	
200.02	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	
310.10	Driveway Pipe Construction
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	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide For Rip Rap At Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

04/16/11

PROJECT REFERENCE NO.	SHEET NO.
B-4183	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- 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 — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- 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 — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- 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 — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- 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 — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- 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 — W
- 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 — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- 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:

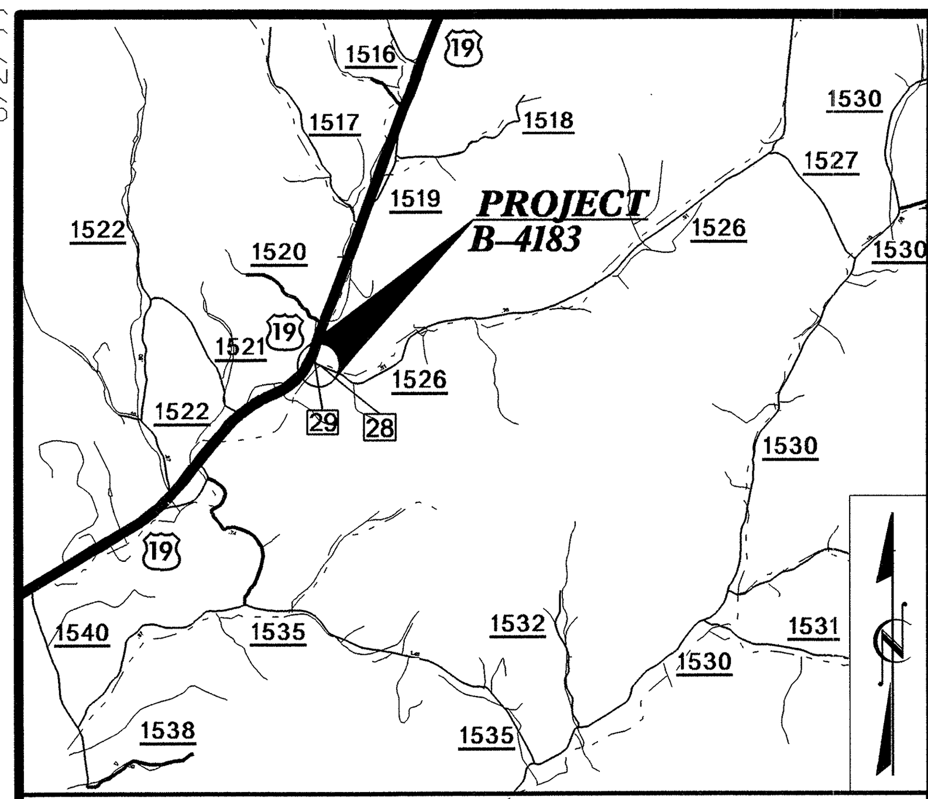
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole (S.U.E.*)
- Abandoned According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

PROJECT REFERENCE NO.	SHEET NO.
B-4183	1-C

Location and Surveys

METRIC

SURVEY CONTROL SHEET B-4183



VICINITY MAP

DATUM DESCRIPTION

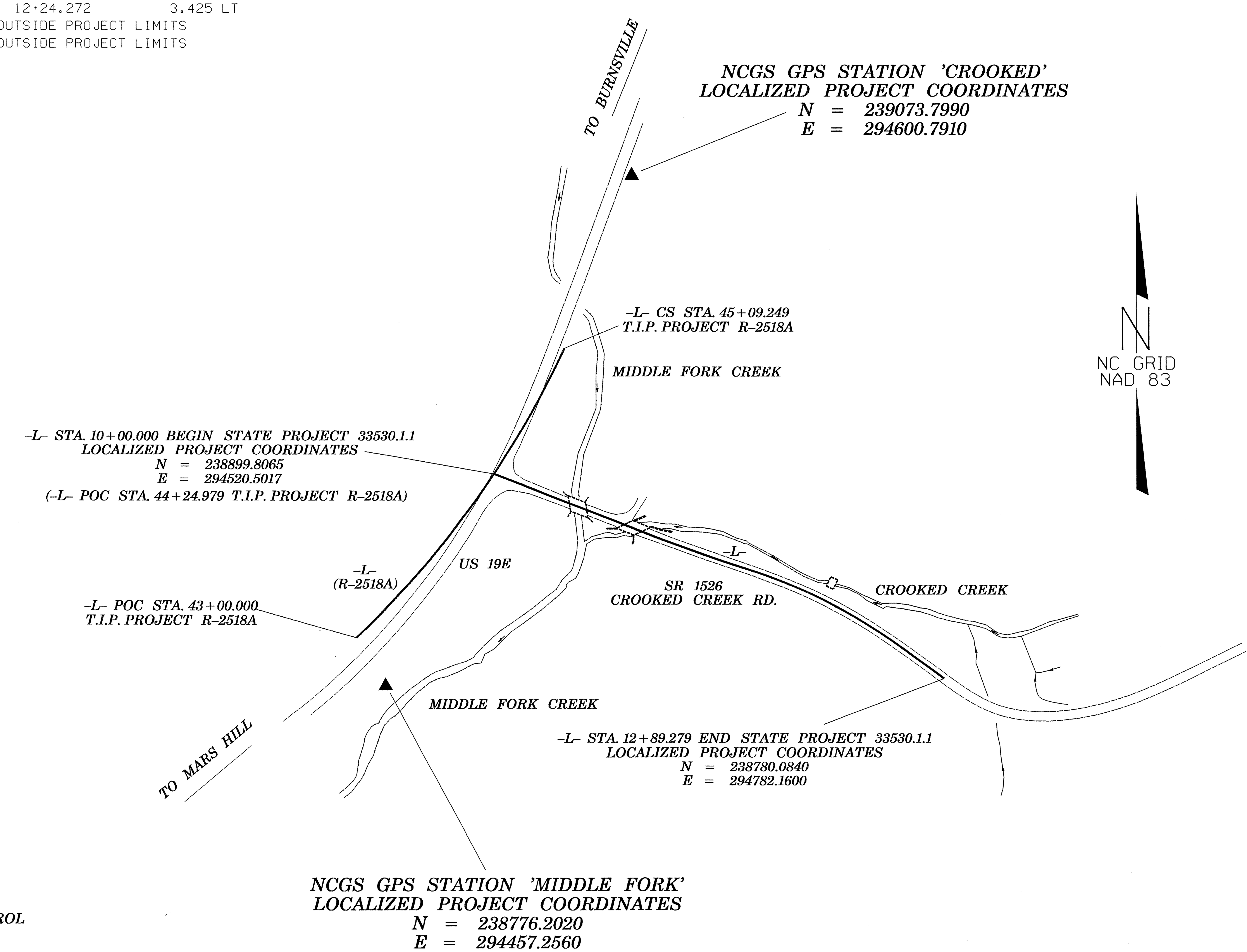
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2519A-1"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 244860.7310(m) EASTING: 307037.9040(m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99982200
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2519A-1" TO -L- STATION 10+00.000 IS
S 64°32'09" W 13864.270
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
34	BL-34 (R-2518A)	238901.5560	294535.0840	681.293	10+12.922	6.980 LT
35	BY10-35 (R-2518A)	238859.7260	294611.3060	679.718	10+99.126	4.052 RT
1	BL-1	238819.8907	294730.3630	680.503	12+24.272	3.425 LT
2	BL-2	238752.2390	294832.4100	684.208	OUTSIDE PROJECT LIMITS	
3	BL-3	238784.8335	294937.2365	684.568	OUTSIDE PROJECT LIMITS	

BM5 ELEVATION = 682.835
N 238890 E 294614
L STATION 10+91 25 LEFT
RR SPIKE IN BASE OF POWER POLE (R2518A)

BM1 ELEVATION = 682.735
N 238776 E 294803
L STATION 12+89
S 79° 36' 51.9" E DIST 21.536
SPIKE IN BASE OF 600MM HEMLOCK



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/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   B4183_LS_CONTROL_080520.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 EXISTING CONTROL FROM TIP PROJECT R-2518A

NOTE: DRAWING NOT TO SCALE

6/2/99

19-SEP-2011 09:20
B4183_ls_1c_080513.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-4183	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

METRIC

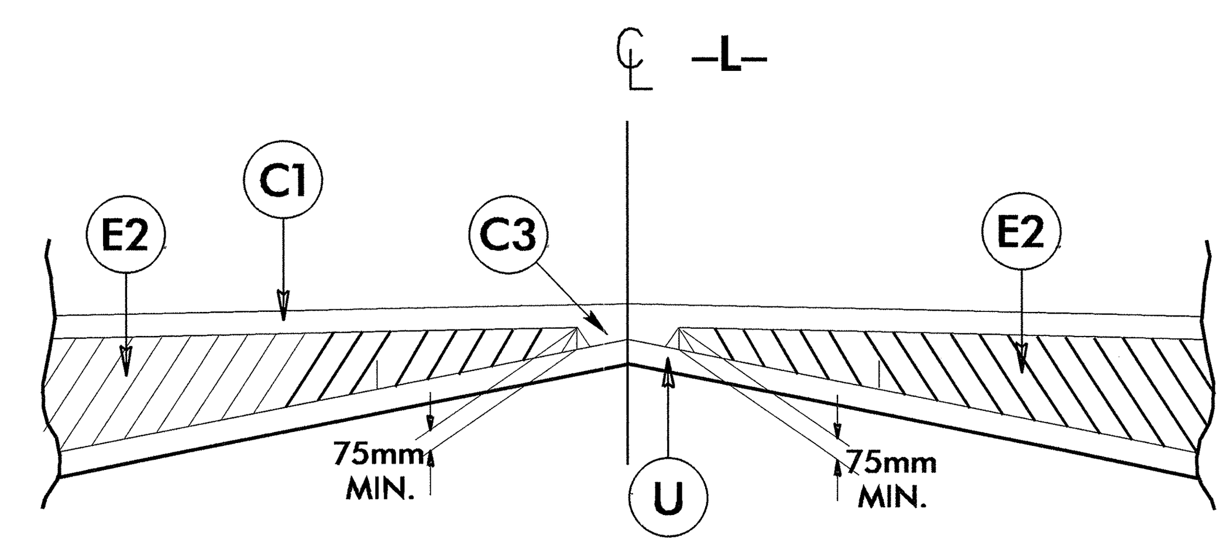
NORTH CAROLINA PROFESSIONAL SEAL 14493 ENGINEER JAMES STAFFORD GOODNIGHT, JR. 9/21/11

NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON 9/21/11

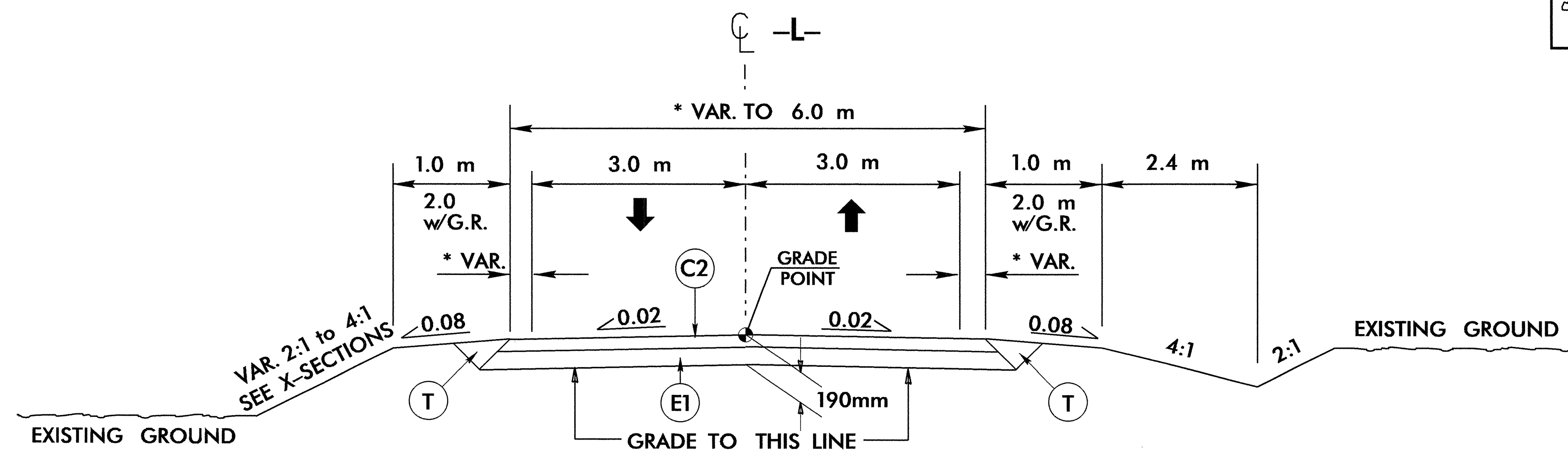
PAVEMENT SCHEDULE

C1	PROP. APPROX. 40 mm ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 94 kg PER SQ. METER.
C2	PROP. APPROX. 80 mm ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 94 kg PER SQ. METER IN EACH OF TWO LAYERS
C3	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 2.35 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 40 mm IN DEPTH.
E1	PROP. APPROX. 110 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 269.5 kg PER SQ. METER.
E2	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 2.45 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 75 mm IN DEPTH OR GREATER THAN 140 mm IN DEPTH.
J	PROP. 200 mm AGGREGATE BASE COURSE.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT

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



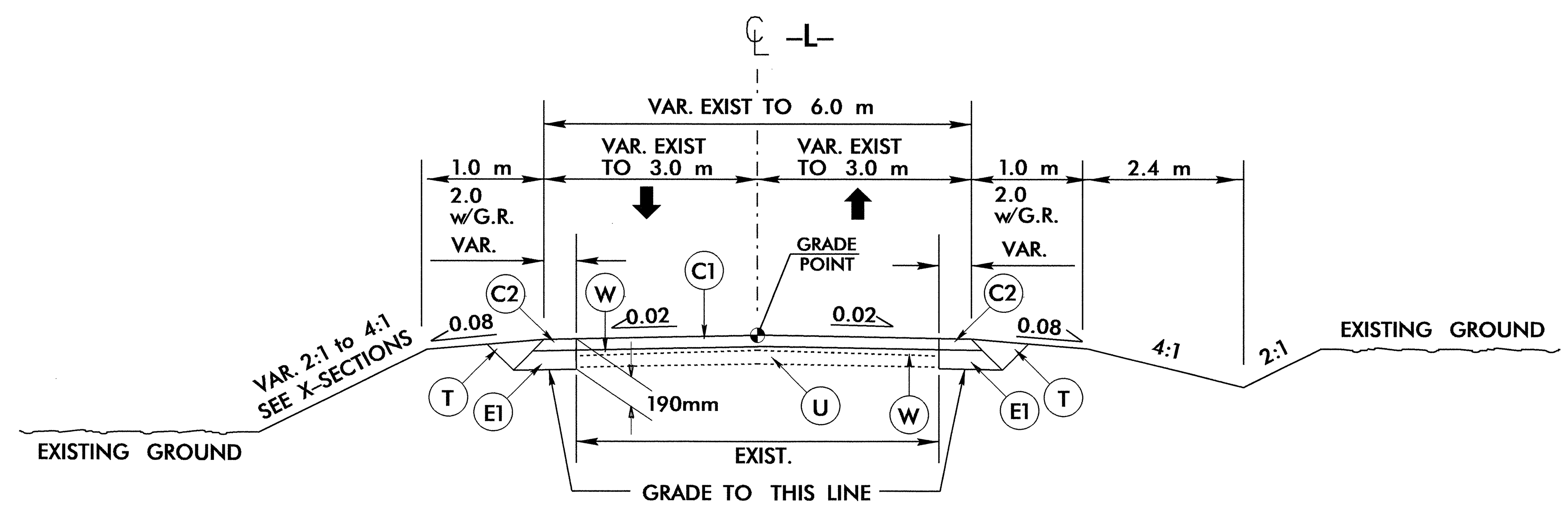
Detail Showing Method of Wedging



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

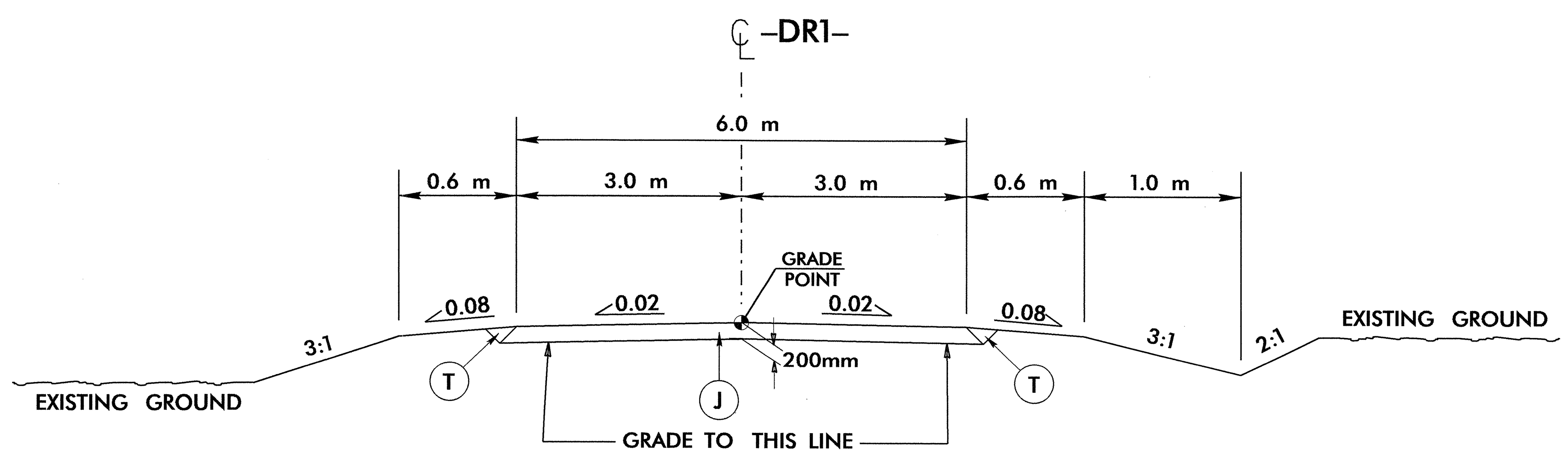
* -L- STA. 10+29.000 TO 10+40.864
-L- STA. 10+40.864 TO 11+45.000



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

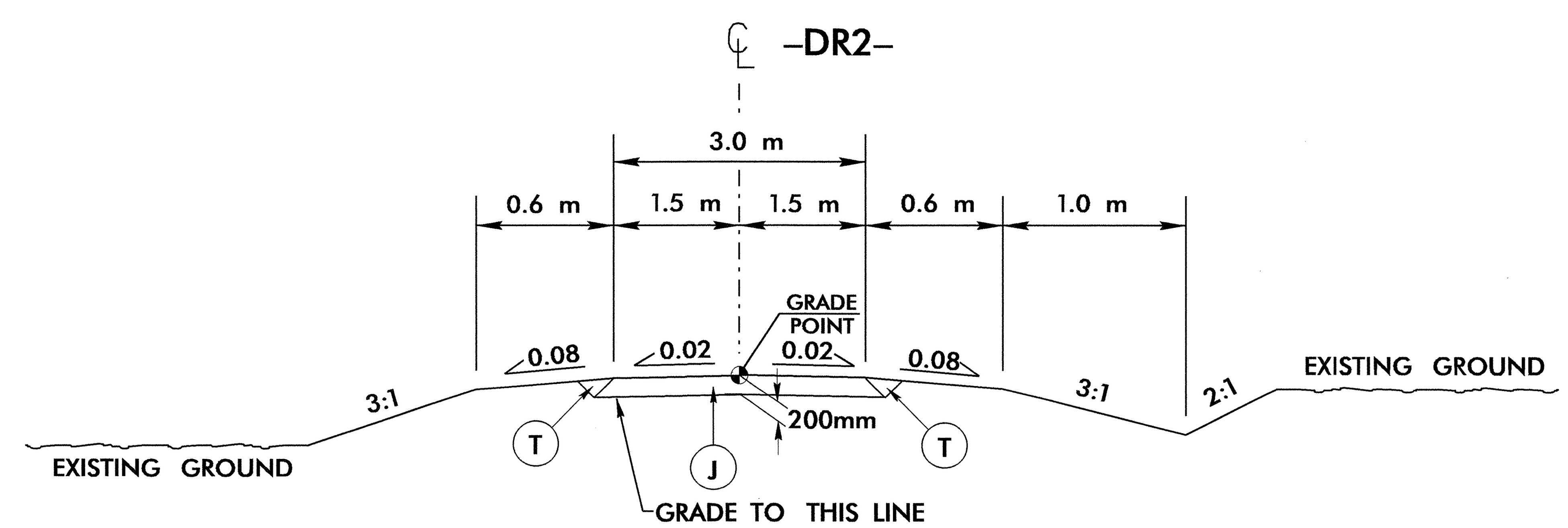
-L- STA. 11+45.000 TO STA. 11+57.202



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-DR1- STA. 10+11.44 TO STA. 11+41.00



TYPICAL SECTION NO. 4

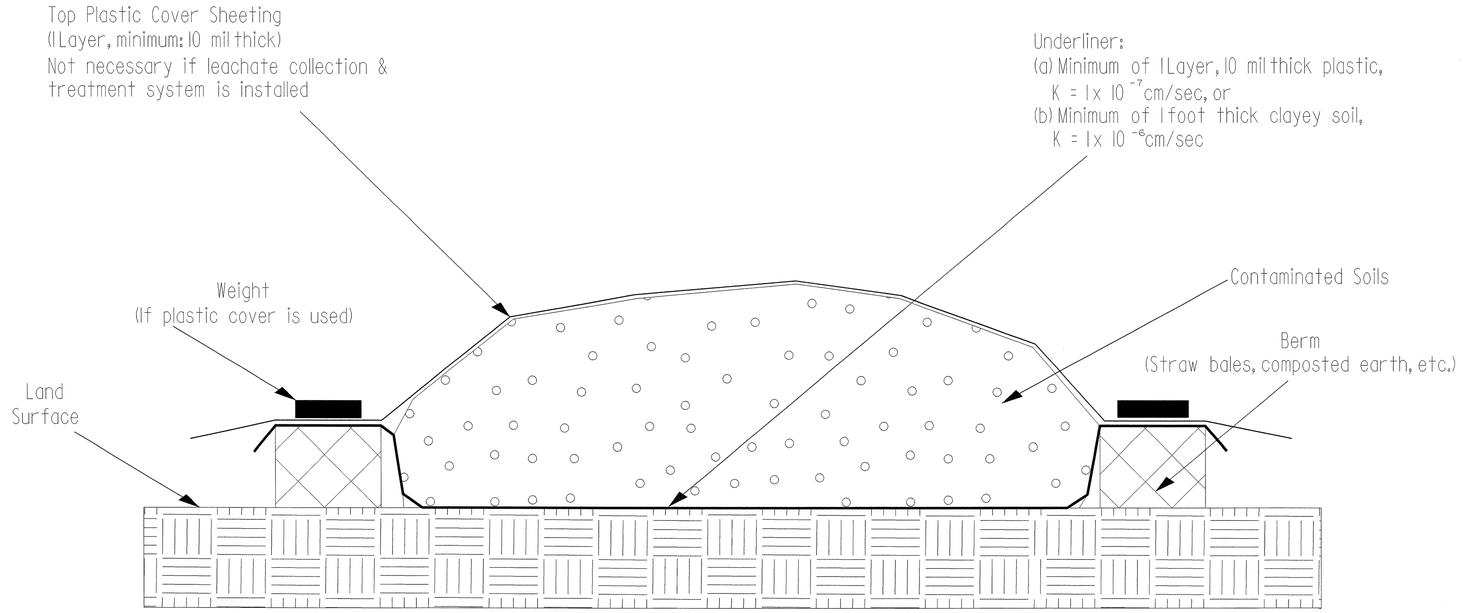
USE TYPICAL SECTION NO. 4

-DR2- STA. 10+03.000 TO STA. 10+60.102

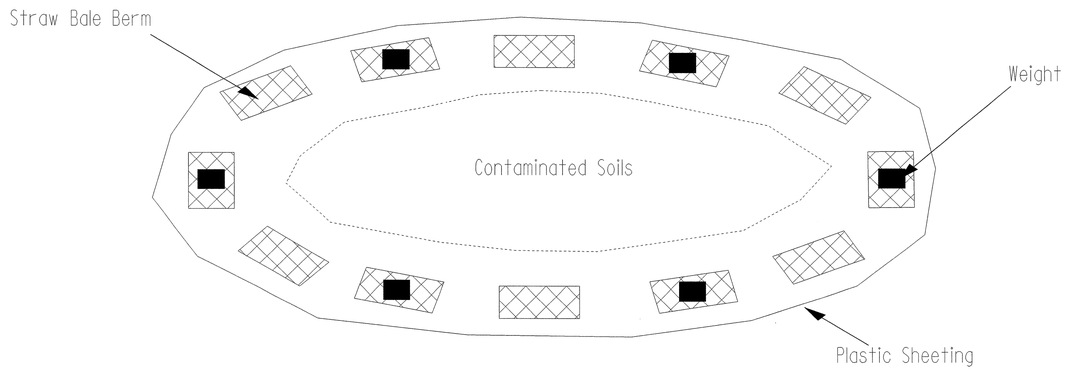
PROJECT REFERENCE NO.	SHEET NO.
B-4183	2-A

Detail for Temporary Containment of Petroleum Contaminated Soil

Cross-Section View



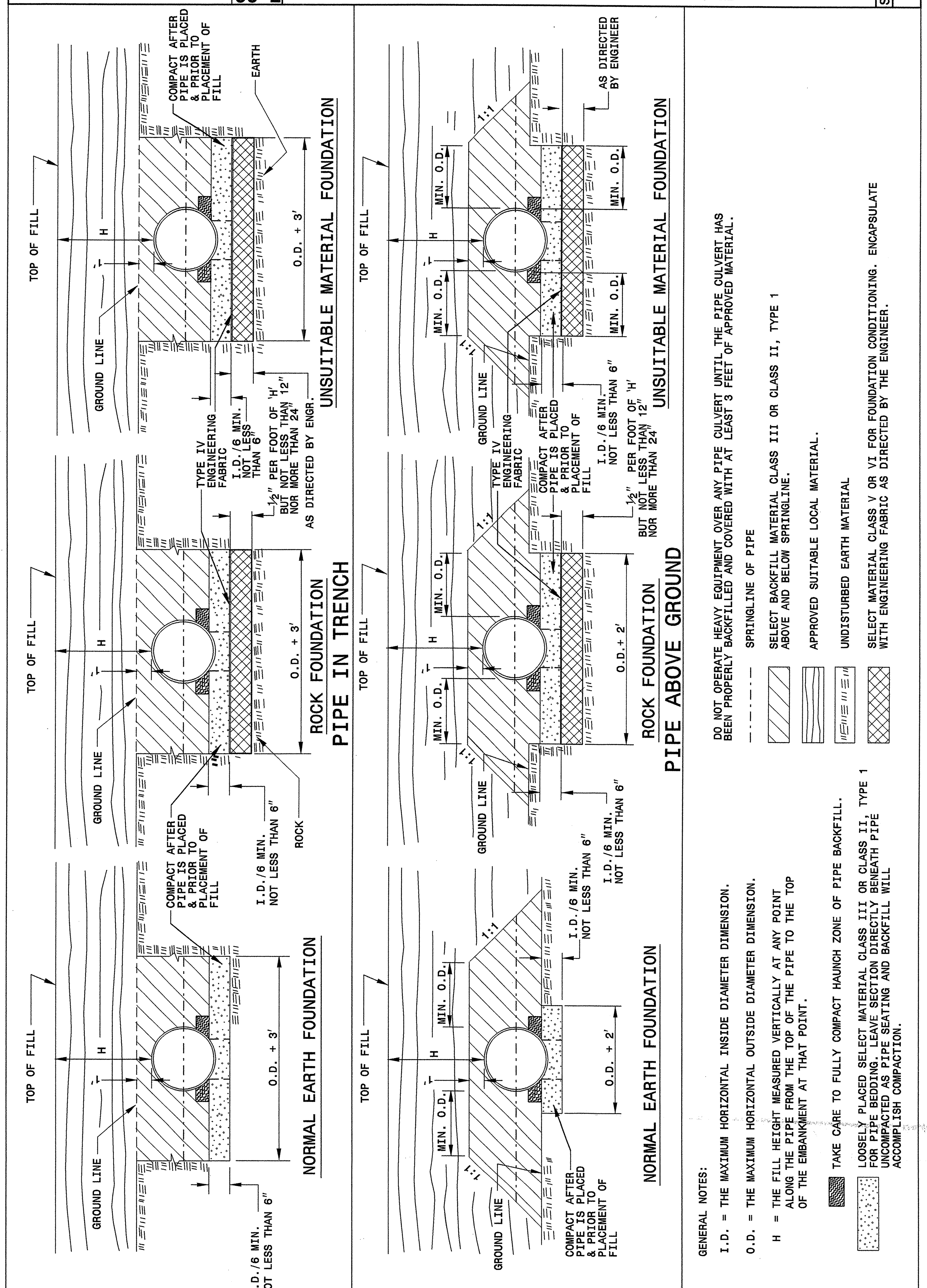
Map View



8/17/99

30-AUG-2011 08:29
R:\Roadway\Proj\Stockpile Containment.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4183	2-B



TOP OF FILL
GROUND LINE
H
O.D. + 3'
COMPACT AFTER PIPE IS PLACED & PRIOR TO PLACEMENT OF FILL
I.D./6 MIN. NOT LESS THAN 6"
NORMAL EARTH FOUNDATION
ROCK
ROCK FOUNDATION
PIPE IN TRENCH
TYPE IV ENGINEERING FABRIC
½" PER FOOT OF 'H' BUT NOT LESS THAN 12" NOR MORE THAN 24"
AS DIRECTED BY ENGR.
EARTH
UNSUITABLE MATERIAL FOUNDATION
MIN. O.D.
O.D. + 2'
1:1
AS DIRECTED BY ENGINEER
PIPE ABOVE GROUND
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.

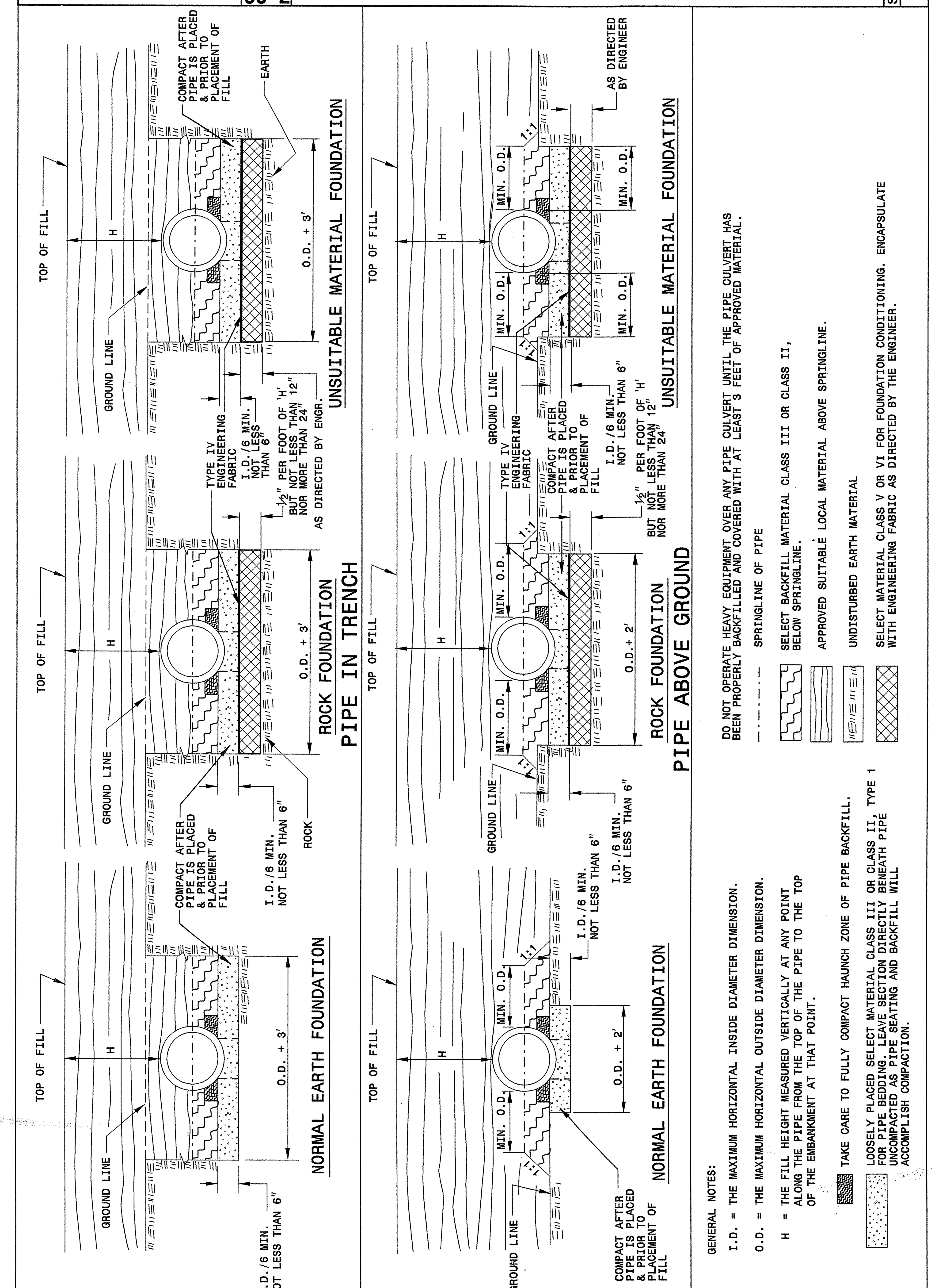
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 3
300D01



TOP OF FILL
GROUND LINE
H
O.D. + 3'
COMPACT AFTER PIPE IS PLACED & PRIOR TO PLACEMENT OF FILL
I.D./6 MIN. NOT LESS THAN 6"
NORMAL EARTH FOUNDATION
ROCK
ROCK FOUNDATION
PIPE IN TRENCH
TYPE IV ENGINEERING FABRIC
½" PER FOOT OF 'H' BUT NOT LESS THAN 12" NOR MORE THAN 24"
AS DIRECTED BY ENGR.
EARTH
UNSUITABLE MATERIAL FOUNDATION
MIN. O.D.
O.D. + 2'
1:1
AS DIRECTED BY ENGINEER
PIPE ABOVE GROUND
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, BELOW SPRINGLINE.
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.

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

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 3
300D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966
9/22/11

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: DATE:
CHECKED BY: DATE: 7/30/09
FILE SPEC: s:/ericward/stds/stdstodetails/30001/0300d01.dgn

30-JUL-2009 08:48
s:\contracts\contracts\special details\ericward\stds\06 stds to special details\30001\0300d01.dgn
jhowerton AT PS23750I

5/14/99

FLEXIBLE PIPE

Round Corrugated Steel Pipe
2 2/3 x ½ corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet) (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	90	111
66	12				81	100
72	12				74	91
78	12					81
84	12					69

Round Corrugated Aluminum Pipe
2 2/3 x ½ corrugation **

Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet) (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	78	96
48	12			52	68	84
54	12			46	50	74
60	12				50	62
66	12					51
72	12					41

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

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

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

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

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

RIGID PIPE

RCP - * (Minimum fill) 1' for Class IV & CLASS V
2' for Class III & Class II

* (Maximum fill) 10' - Class II pipe
20' - Class III pipe
30' - Class IV pipe
40' - Class V pipe

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

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

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

RCP - AASHTO M170

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

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

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

SHEET 3 OF 3
300D01

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

SHEET 3 OF 3
300D01

PROJECT REFERENCE NO. B-4183 | SHEET NO. 2-C

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER
9/22/11

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: DATE:
CHECKED BY: DATE: 7/30/09
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COMPUTED BY: ____________ DATE: ____________
CHECKED BY: ____________ DATE: ____________

6/15/99

PROJECT REFERENCE NO.	SHEET NO.
B-4183	3

METRIC

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202623

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0038000000-M	SP	38	M3	SHALLOW UNDERCUT
0043000000-N	226	Lump Sum		GRADING
0050000000-M	226	0.4	HA	SUPPLEMENTARY CLEARING & GRUB-BING
0057000000-M	226	100	M3	UNDERCUT EXCAVATION
0080000000-M	SP	91	MTN	CLASS IV SUBGRADE STABILIZA-TION
0134000000-M	240	680	M3	DRAINAGE DITCH EXCAVATION
0195000000-M	SP	84	M3	SELECT GRANULAR MATERIAL
0196000000-M	270	134	M2	FABRIC FOR SOIL STABILIZATION
0255000000-M	SP	10	MTN	GENERIC GRADING ITEM EXCAVATING AND STOCKPILING CONTAMINATED SOIL
0318000000-M	SP	20	MTN	FOUNDATION CONDITIONING MATE-RIAL, MINOR STRS
0320000000-M	SP	40	M2	FOUNDATION CONDITIONING FABRIC
0342000000-M	SP	12	M	****MM SIDE DRAIN PIPE (750MM)
0343000000-M	SP	8.4	M	375MM SIDE DRAIN PIPE
0594000000-M	SP	13.2	M	600MM CS PIPE CULVERTS, 1.63MM THICK
0995000000-M	340	26.2	M	PIPE REMOVAL
1121000000-M	520	550	MTN	AGGREGATE BASE COURSE
1220000000-M	545	50	MTN	INCIDENTAL STONE BASE
1489000000-M	610	210	MTN	ASPHALT CONC BASE COURSE, TYPE B25.0B
1525000000-M	610	150	MTN	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1575000000-M	SP	20	MTN	ASPHALT BINDER FOR PLANT MIX
1693000000-M	654	25	MTN	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	806	7	EA	RIGHT OF WAY MARKERS
2022000000-M	SP	100	M3	SUBDRAIN EXCAVATION
2033000000-M	SP	41.4	M3	SUBDRAIN FINE AGGREGATE
2044000000-M	SP	100	M	150MM PERFORATED SUBDRAIN PIPE
2070000000-N	SP	1	EA	SUBDRAIN PIPE OUTLETS
2077000000-M	SP	2	M	150MM OUTLET PIPE (SUBDRAINS)
3030000000-M	862	144.78	M	STEEL BM GUARDRAIL
3045000000-M	862	80.01	M	STEEL BM GUARDRAIL, SHOP CURVED
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3195000000-N	862	3	EA	GUARDRAIL ANCHOR UNITS, TYPE AT-1
3270000000-N	SP	1	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3345000000-M	864	3.81	M	REMOVE & RESET EXISTING GUARD-RAIL
3360000000-M	863	28.5	M	REMOVE EXISTING GUARDRAIL
3628000000-M	876	100	MTN	RIP RAP, CLASS I
3649000000-M	876	10	MTN	RIP RAP, CLASS B
3656000000-M	876	1,300	M2	FILTER FABRIC FOR DRAINAGE
4072000000-M	903	9	M	SUPPORTS, 4.5-KG STEEL U-CHANN EL
4102000000-N	904	2	EA	SIGN ERECTION, TYPE E
4155000000-N	907	2	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4158000000-N	907	10	EA	DISPOSAL OF SIGN SYSTEM, WOOD
4400000000-M	1110	42	M2	WORK ZONE SIGNS (STATIONARY)
4405000000-M	1110	9	M2	WORK ZONE SIGNS (PORTABLE)
4410000000-M	1110	7	M2	WORK ZONE SIGNS (BARRICADE MOUNTED)
4430000000-N	1130	15	EA	DRUMS
4435000000-N	1135	15	EA	CONES
4445000000-M	1145	25	M	BARRICADES (TYPE III)
4450000000-N	1150	160	HR	FLAGGER
4810000000-M	1205	1,026	M	PAINT PAVEMENT MARKING LINES (100MM)
6000000000-M	1605	600	M	TEMPORARY SILT FENCE
6006000000-M	1610	320	MTN	STONE FOR EROSION CONTROL, CLASS A
6009000000-M	1610	175	MTN	STONE FOR EROSION CONTROL, CLASS B
6012000000-M	1610	350	MTN	SEDIMENT CONTROL STONE
6015000000-M	1615	1.5	HA	TEMPORARY MULCHING
6018000000-M	1620	50	KG	SEED FOR TEMPORARY SEEDING
6021000000-M	1620	1.25	MTN	FERTILIZER FOR TEMPORARY SEED-ING
6024000000-M	1622	65	M	TEMPORARY SLOPE DRAINS
6027000000-N	1622	4	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-M	SP	250	M	SAFETY FENCE
6030000000-M	1630	330	M3	SILT EXCAVATION
6036000000-M	1631	3,000	M2	MATTING FOR EROSION CONTROL
6037000000-M	SP	685	M2	COIR FIBER MAT
6038000000-M	SP	250	M2	PERMANENT SOIL REINFORCEMENT MAT
6042000000-M	1632	150	M	6.4MM HARDWARE CLOTH
6070000000-N	SP	10	EA	SPECIAL STILLING BASINS
6071010000-M	SP	85	M	WATTLE
6071020000-M	SP	45	KG	POLYACRYLAMIDE (PAM)
6071030000-M	SP	45	M	COIR FIBER BAFFLE
6071050000-E	SP	2	EA	**" SKIMMER (38MM)
6084000000-M	1660	1	HA	SEEDING & MULCHING
6087000000-M	1660	1	HA	MOWING
6090000000-M	1661	25	KG	SEED FOR REPAIR SEEDING
6093000000-M	1661	0.25	MTN	FERTILIZER FOR REPAIR SEEDING
6096000000-M	1662	25	KG	SEED FOR SUPPLEMENTAL SEEDING
6108000000-M	1665	1.25	MTN	FERTILIZER TOPDRESSING
6111000000-M	SP	90	M	IMPERVIOUS DIKE
6114500000-N	SP	10	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	25	EA	RESPONSE FOR EROSION CONTROL
6141000000-M	SP	325	M2	GENERIC EROSION CONTROL ITEM LIVE STAKING

COMPUTED BY: J JOHNSON	DATE: 7/26/2011
CHECKED BY: GJL	DATE: 08/04/2011

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

METRIC

PROJECT REFERENCE NO.	SHEET NO.
B-4183	3-A

NOTE: Invert Elevations are for Bid Purposes only and shall not be used for project construction stakeout.
See "Standard Specifications For Roads and Structures, Section 300-5".

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

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 300	375	450	600	750	900	1050	1200	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C.S. PIPE 300 (1.63)	375 (1.63)	450 (1.63)	600 (1.63)	750 (2.01)	900 (2.01)	1000 (2.01)	1200	R.C. PIPE (CLASS III) 300	375	450	600	750	900	1050	R.C. PIPE (CLASS IV) 300	375	450	600	750	900	1050	1200	**mm R. C. PIPE (CLASS V)	**mm R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	**mm R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	375mm SIDE DRAIN PIPE	750mm SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. METERS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') PER EACH (0 THRU 1.50)	METERS A 1.5 THRU 3.0	METERS B 3.0 AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME & GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL (METERS)	REMARKS
10+80 -DR1-	CL	1																					13.2																																											13.2	TEMPORARY
10+11 -DR2-	CL	2																																													12																				
10+46 -DR2-	CL	3																																												8.4																				6	REMOVE 200mm PLASTIC PIPE
10+50 -DR2-	RT	3																																																																7	REMOVE 450mm CMP
TOTALS																							13.2																							8.4	12																			26.2	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS GRAU 350	ANCHORS AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	REMOVE EXISTING GUARDRAIL	REMARKS
-L-	10+24.140	10+81.290	LT	25.290	31.860		10+41.110	10+60.000	1	2						1				12	BEG. TIE IN TO EX. GRDRL FROM R2518A SHOPCURVE=30m R REMOVE EX. AT-1
-L-	10+87.215	11+43.911	LT	53.340	7.220		11+26.000	11+19.000	1	2					1	1					SHOPCURVE = 4.1m R
-L- /-DR2-	10+21.570	10+16.425	RT	77.330	36.970		10+55.717	11+20.000	1	2						1					BEG. TIE IN TO EX. GRDRL FROM R2518A SHOPCURVE=45m R REMOVE EX. AT-1
																					SHOPCURVE=4.0m R
-DR1-	10+13		LT & RT																	16.5	BEG. TIE IN TO EX. GRDRL FROM R2518A REMOVE /RESET EXISTING CAT-1
			TOTALS	155.960	76.050										1	3					
ANCHOR DEDUCTIONS: 1 GRAU-350 @ 15.240m EA =				-15.240																	
	3 AT-1 @ 1.905m EA =			-5.715																	
			GRAND TOTAL	135.005	76.050																
			SAY	144.780	80.010		ADDITIONAL GUARDRAIL POSTS = 5								1	3				28.5	

SUMMARY OF PAVEMENT REMOVAL
IN CUBIC METERS

STATION TO STATION	PAVEMENT REMOVAL LENGTH	WIDTH	SQUARE METERS
-L- STA 10+29.000 TO 10+48.000			111.230
-L- STA 10+56.000 TO 10+85.000			184.87
-L- STA 10+89.000 TO 11+45.000			305.36
TOTAL			601.46
SAY			610.000

SUMMARY OF EARTHWORK
IN CUBIC METERS

LOCATION	UNCL. EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-DR1- 10+11.440 TO 11+41.000	878		348	0	530
-DR2- 10+03.000 TO 10+60.102	0		143	143	0
-L- 10+29.000 TO 11+45.000	77		1462	1385	0
TOTALS	955		1953	1527	530
USE WASTE IN LIEU OF BORROW				-530	-530
LOSS DUE TO CLEAR. & GRUB.	-15			15	
PROJECT TOTALS	940		1953	1012	
5% TO REPLACE TOPSOIL ON					
BORROW PIT				51	
GRAND TOTALS	940			1063	
SAY	950			1070	

GEOTECH. REC'S: APR. 15, 2011
FABRIC FOR SOIL STABILIZATION = 84 SM
SELECT GRANULAR MATERIAL II & III = 84 CM
SHALLOW UNDERCUT = 38 CM
CLASS IV SOIL STABILIZATION = 91 MTN
[illegible]
PER CFI : APR. 15, 2009
UNDERCUT = 100 CM
UNDERDRAINS = 100 LM   EST. DDE = 680 CM

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

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

PROJECT REFERENCE NO.	SHEET NO.
B-4183	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14493 JAMES STAFFORD GOODNIGHT, JR. 9/22/11

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 20870 MARC T. SHOWN 9/22/11

METRIC

CONST. REV.

R/W REV.

REVISIONS

NOTE: SEE SHEET 5 FOR PROFILE

NOTE: SEE SHEETS C-1 – C-15 FOR CULVERT PLANS

-L-

PI Sta 11+20.512	PI Sta 12+07.936
Δ = 3° 30′ 17.1″ (LT)	Δ = 18° 04′ 23.1″ (RT)
L = 73.404	L = 100.624
T = 36.713	T = 50.733
R = 1,200.000	R = 319.000

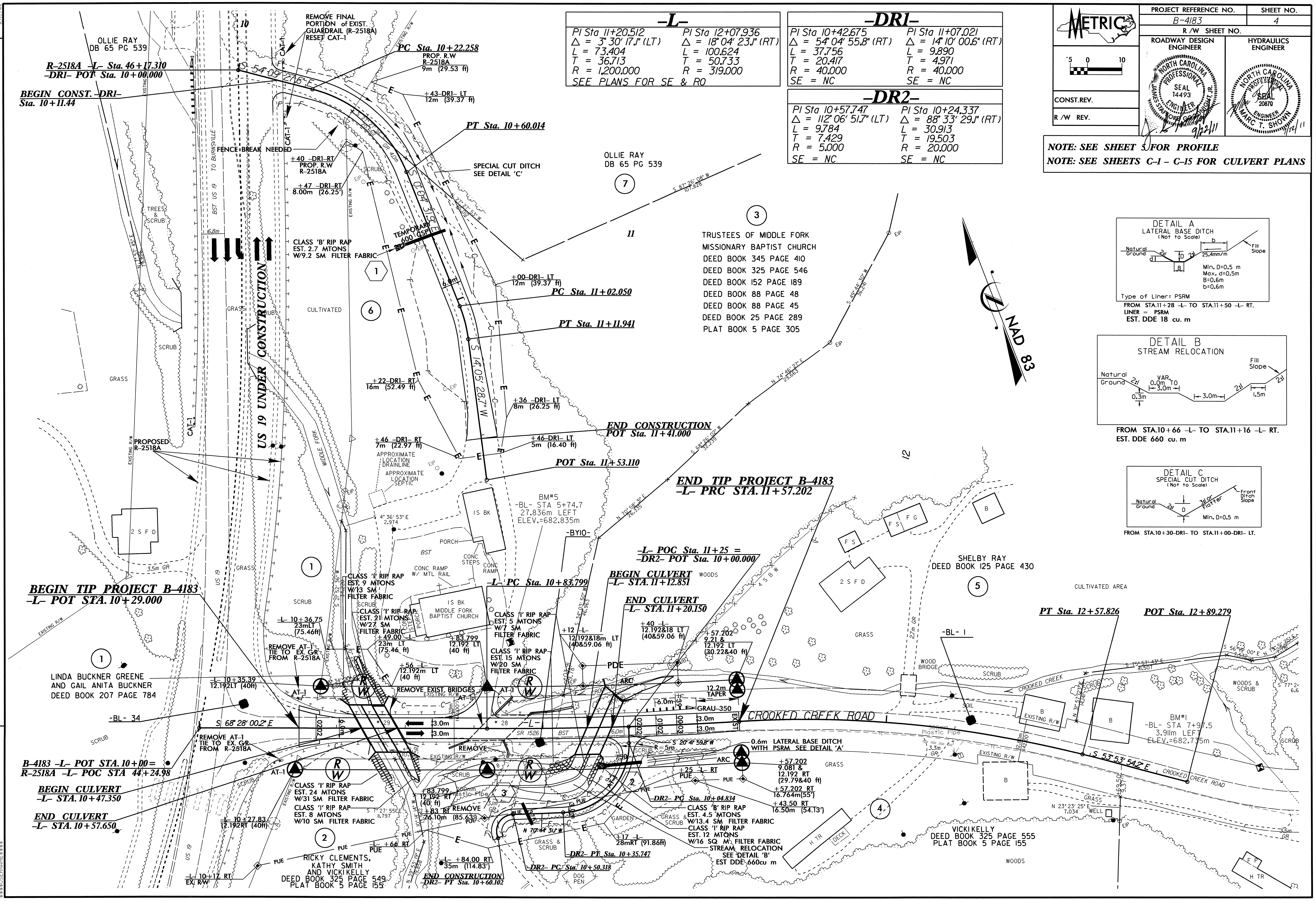
SEE PLANS FOR SE & RO

-DR1-

PI Sta 10+42.675	PI Sta 11+07.021
Δ = 54° 04′ 55.8″ (RT)	Δ = 14° 10′ 00.6″ (RT)
L = 37.756	L = 9.890
T = 20.417	T = 4.971
R = 40.000	R = 40.000
SE = NC	SE = NC

-DR2-

PI Sta 10+57.747	PI Sta 10+24.337
Δ = 112° 06′ 51.7″ (LT)	Δ = 88° 33′ 29.1″ (RT)
L = 9.784	L = 30.913
T = 7.429	T = 19.503
R = 5.000	R = 20.000
SE = NC	SE = NC



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PROJECT REFERENCE NO.	SHEET NO.
B-4183	5

METRIC

R/W SHEET NO.

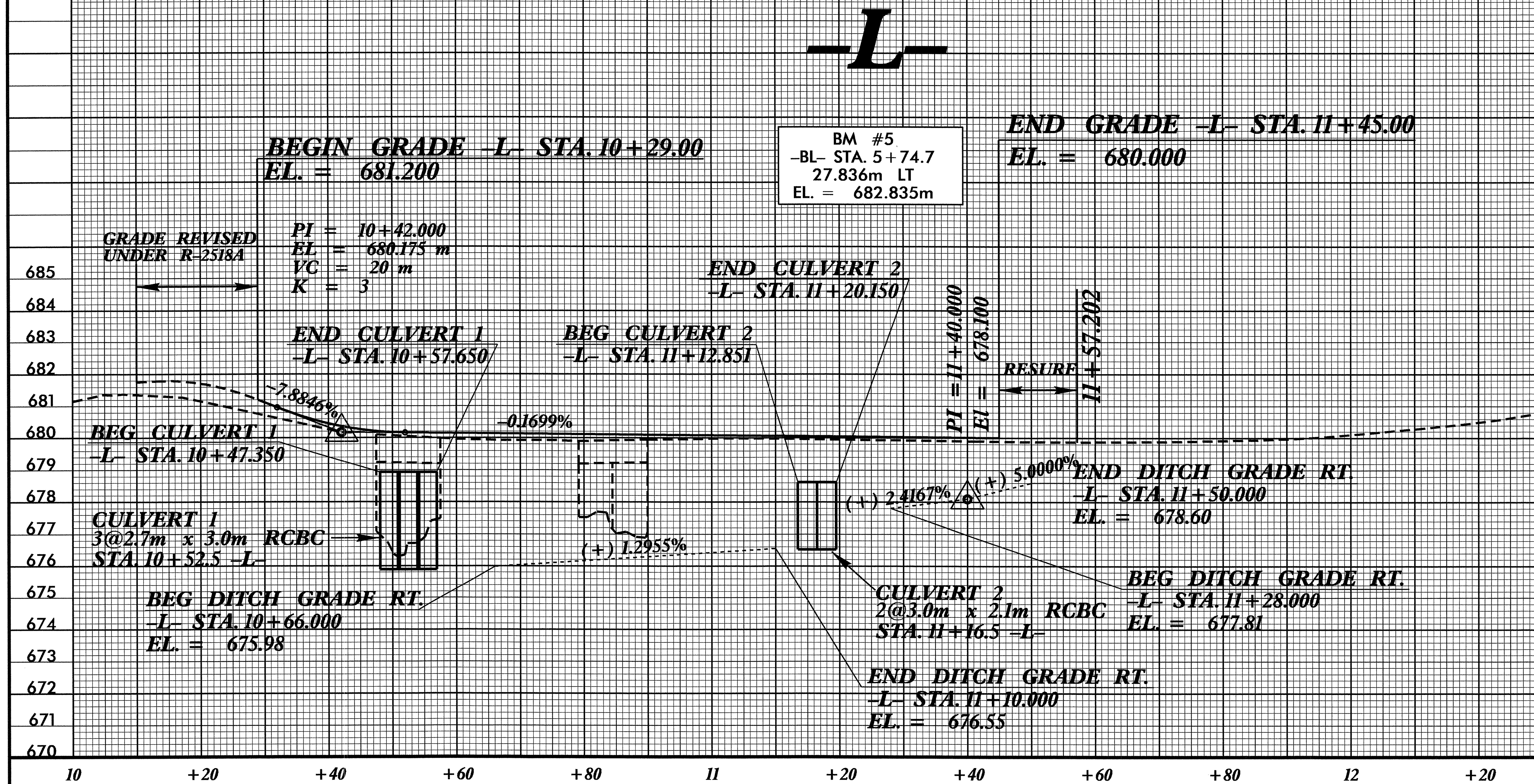
ROADWAY DESIGN ENGINEER — SEAL 14493, James Stafford Goodnight, Jr. — 9/21/11

HYDRAULICS ENGINEER — SEAL 20820, Marc T. Shown — 9-21-11

CONST. REV.

R/W REV.

-L-



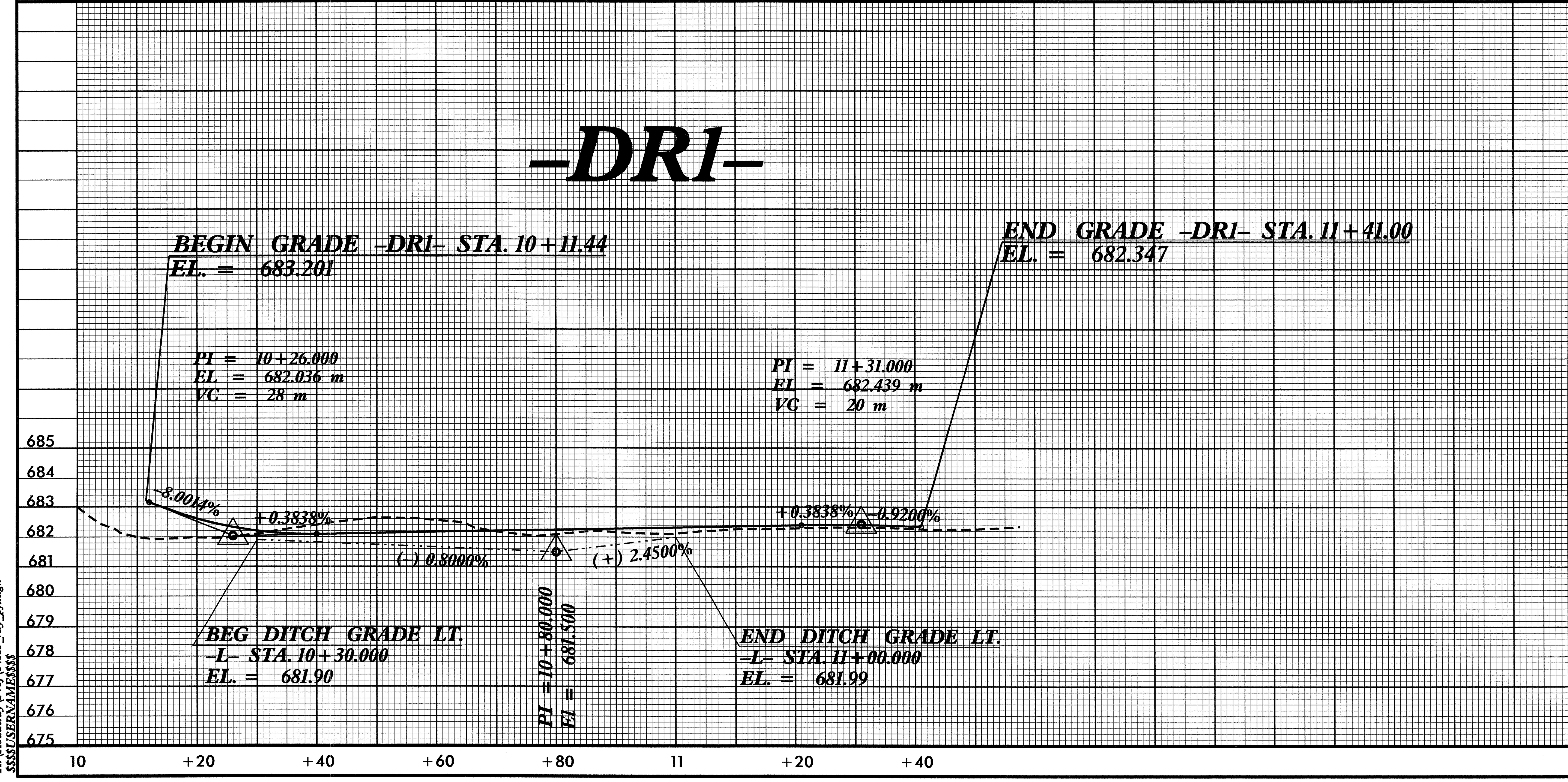
CULVERT #1 HYDRAULIC DATA		
DESIGN DISCHARGE	= 49.80	CMS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 678.69	M
BASE DISCHARGE	= 74.90	CMS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 679.42	M
OVERTOPPING DISCHARGE	= 86.6	CMS
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING ELEVATION	= 680.00	M

CULVERT #2 HYDRAULIC DATA		
DESIGN DISCHARGE	= 25	CMS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 679.08	M
BASE DISCHARGE	= 38.5	CMS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 679.83	M
OVERTOPPING DISCHARGE	= 41J	CMS
OVERTOPPING FREQUENCY	= 100+	YRS
OVERTOPPING ELEVATION	= 680.00	M

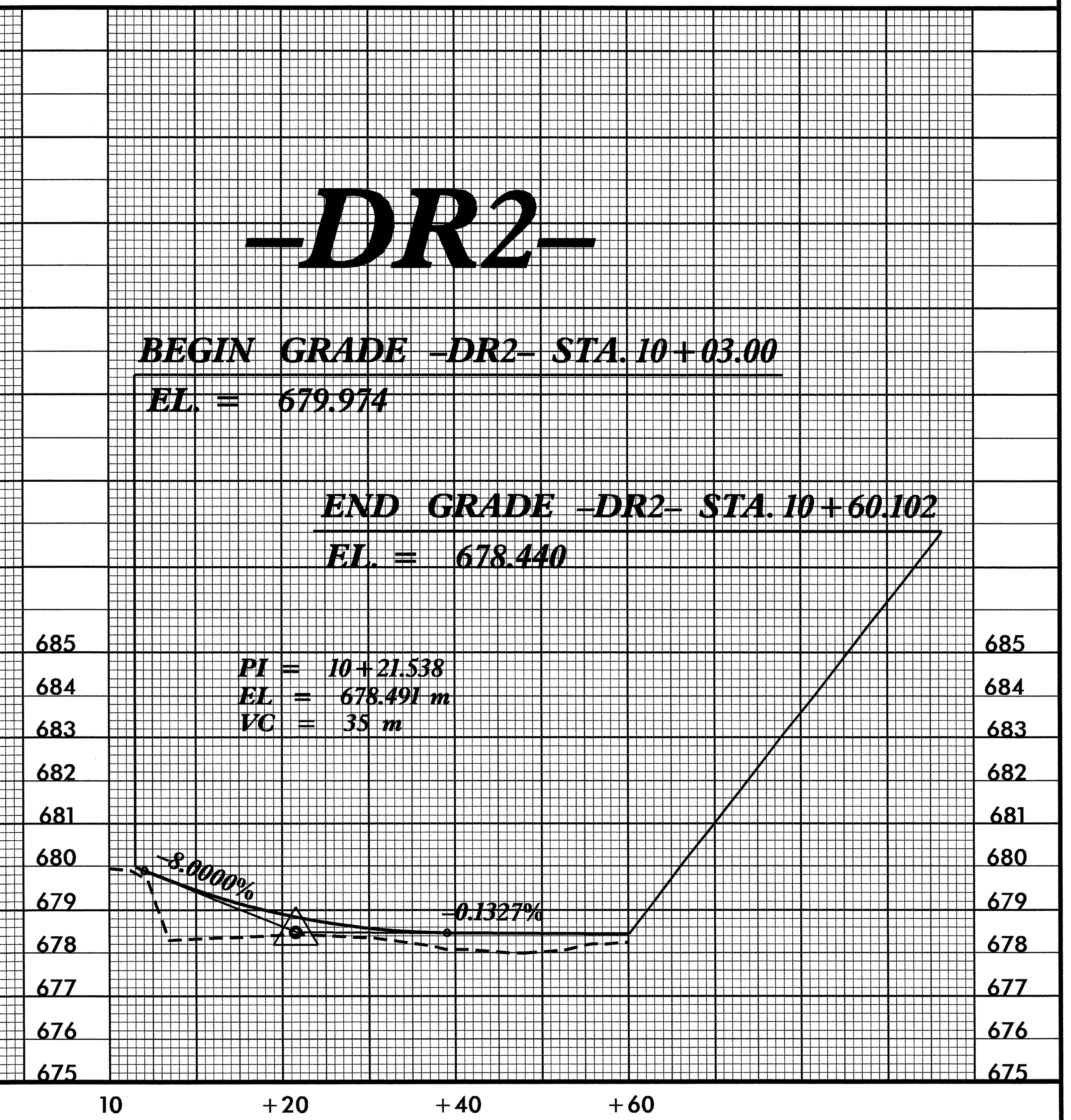
DITCH LEGEND	
LEFT DITCH	-·-·-·-·-
RIGHT DITCH	-----------

NOTE: SEE SHEET 4 FOR PLAN VIEW

-DR1-



-DR2-



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