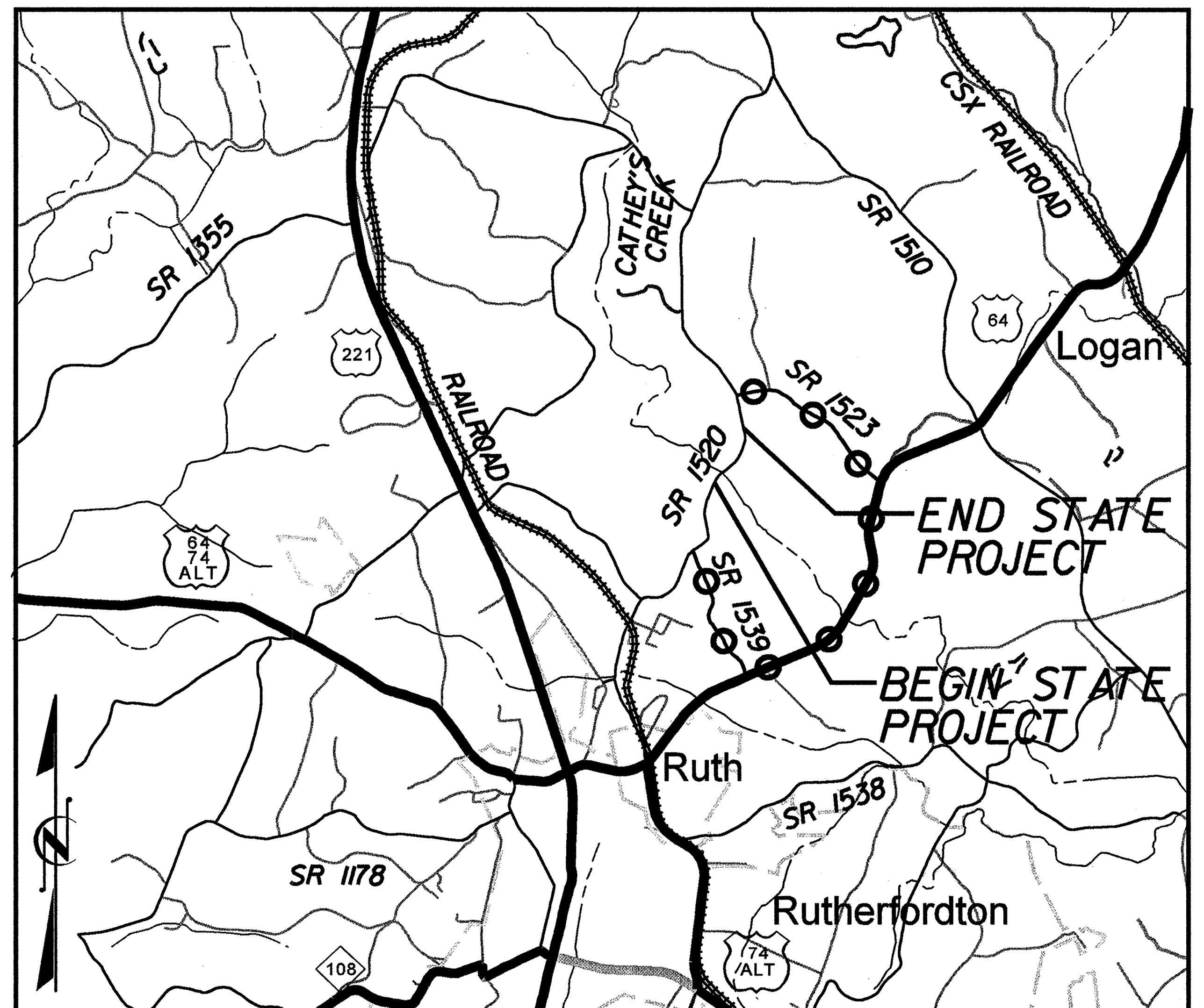
TIP PROJECT: B-4261

CONTRACT: C202233

SEE SHEET 1-A FOR INDEX OF SHEETS
SEE SHEET 1-B FOR CONVENTIONAL PLAN SHEET SYMBOLS



VICINITY MAP

OFF-SITE DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

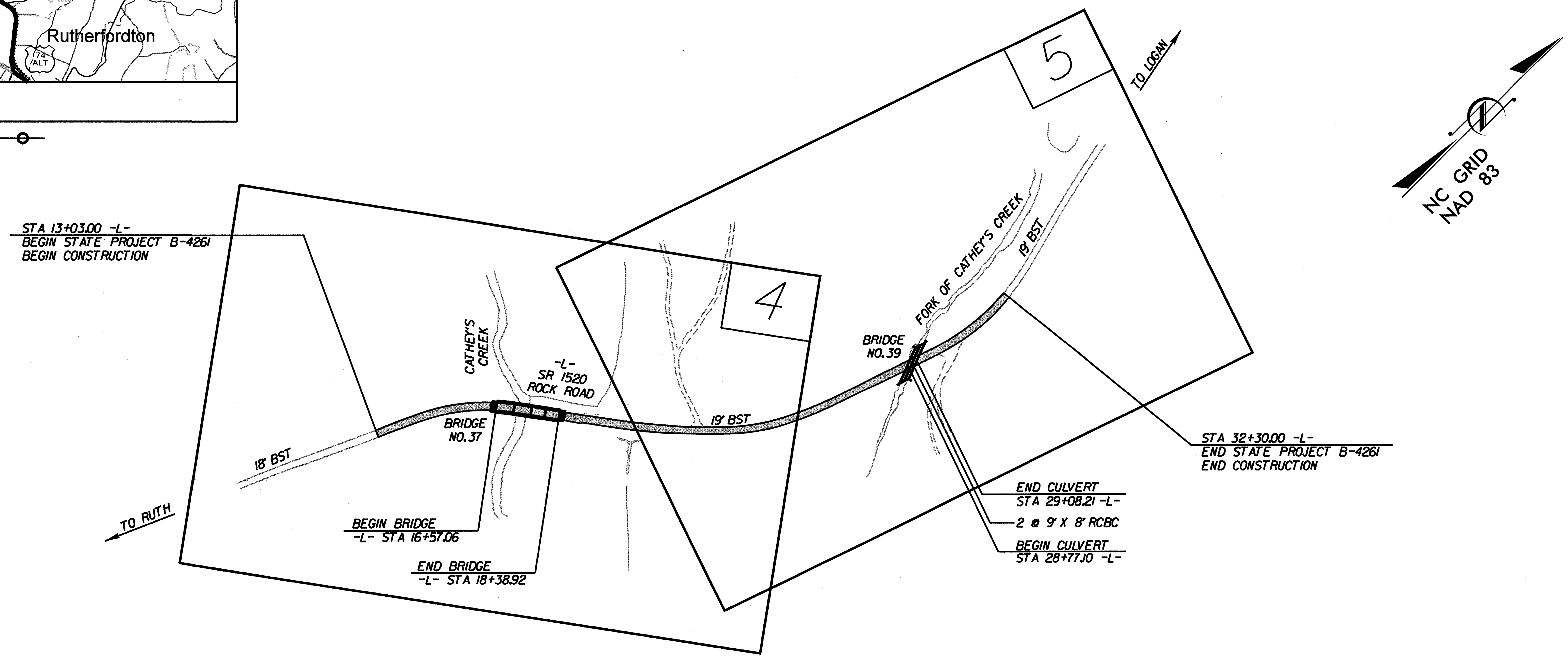
RUTHERFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–4261	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33603.1.1	BRZ–1520(4)	P.E.
33603.2.1	BRZ–1520(4)	RIGHT–OF–WAY
33603.2.1	BRZ–1520(4)	UTILITY
33603.3.1	BRZ–1520(11)	CONSTRUCTION

LOCATION: BRIDGE NO. 37 OVER CATHEY'S CREEK AND BRIDGE NO. 39 OVER THE FORK OF CATHEY'S CREEK ON SR 1520

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



NCDOT CONTACT: B.D. TAYLOR, P.E.
PROJECT ENGINEER
ROADWAY DESIGN UNIT

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2009 = 1,700 VPD
ADT 2030 = 2,800 VPD
DHV = 10%
D = 60%
T = 3% *
V = 60 mph

DESIGN EXCEPTION:
HORIZONTAL RADIUS
HORIZONTAL SSD
VERTICAL CURVE K
VERTICAL SSD
FUNCTIONAL CLASSIFICATION:
LOCAL RURAL

* (TTST 1% + DUAL 2%)

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B–4261 = 0.325 MILES
LENGTH OF STRUCTURE TIP PROJECT B–4261 = 0.040 MILES
TOTAL LENGTH OF TIP PROJECT B–4261 = 0.365 MILES

PLANS PREPARED FOR THE NCDOT BY:

Kimley-Horn and Associates, Inc.
© 2009 Post Office Box 33068
Raleigh, North Carolina 27636
PE NO. F-0102

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: NOVEMBER 21, 2008

LETTING DATE: DECEMBER 15, 2009

JEFFREY W. MOORE, P.E.
PROJECT ENGINEER

R. ERSKINE BROOKS, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026480 ENGINEER LARRY D. ROBINSON, JR.
11-3-09
[illegible]
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024436 ENGINEER JEFFREY W. MOORE
11-3-09
[illegible]
SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

[illegible]
P.E.
STATE HIGHWAY DESIGN ENGINEER

K:\RAL_Roadway\011036123\Roadway\Proj\b4261_rdy_tsh.dgn

11/2/2009

PROJECT REFERENCE NO.	SHEET NO.
B-4261	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024436 11-3-09 ENGINEER JEFFREY W. MOORE

33603.3.1 (B-4261)
RUTHERFORD COUNTY

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEET
2 AND 2-A	TYPICAL SECTIONS, PAVEMENT SCHEDULE, AND MISCELLANEOUS DETAILS
2-B	ANCHORAGE FOR FRAMES
2-C AND 2-D	METHOD OF PIPE INSTALLATION DETAIL
3	SUMMARY OF QUANTITIES
3-A	SUMMARY OF DRAINAGE QUANTITIES
3-B	SUMMARY OF GUARDRAIL, SUMMARY OF PAVEMENT REMOVAL, AND EARTHWORK SUMMARY
3-C	PARCEL INDEX SHEET
4 AND 5	PLAN SHEET
6	PROFILE SHEET
TCP-1 THRU TCP-4	TRAFFIC CONTROL PLANS
PM-1 AND PM-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-8	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
UO-1 AND UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS SECTION SUMMARY SHEET
X-1 THRU X-16	CROSS SECTIONS
C-1 THRU C-7	CULVERT PLANS
S-1 THRU S-36	STRUCTURE 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 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:

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

AT&T - TELEPHONE

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
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
310.10	Driveway Pipe Construction
422.10	Reinforced Bridge Approach Fills
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
654.01	Pavement Repairs
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
840.00	Concrete Base Pad for Drainage Structures
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation In Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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11/2/2009

PROJECT REFERENCE NO.	SHEET NO.
B-4261	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

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
- 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 — 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 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 — 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 — HH
- 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
- 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 — G
- 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
- 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.

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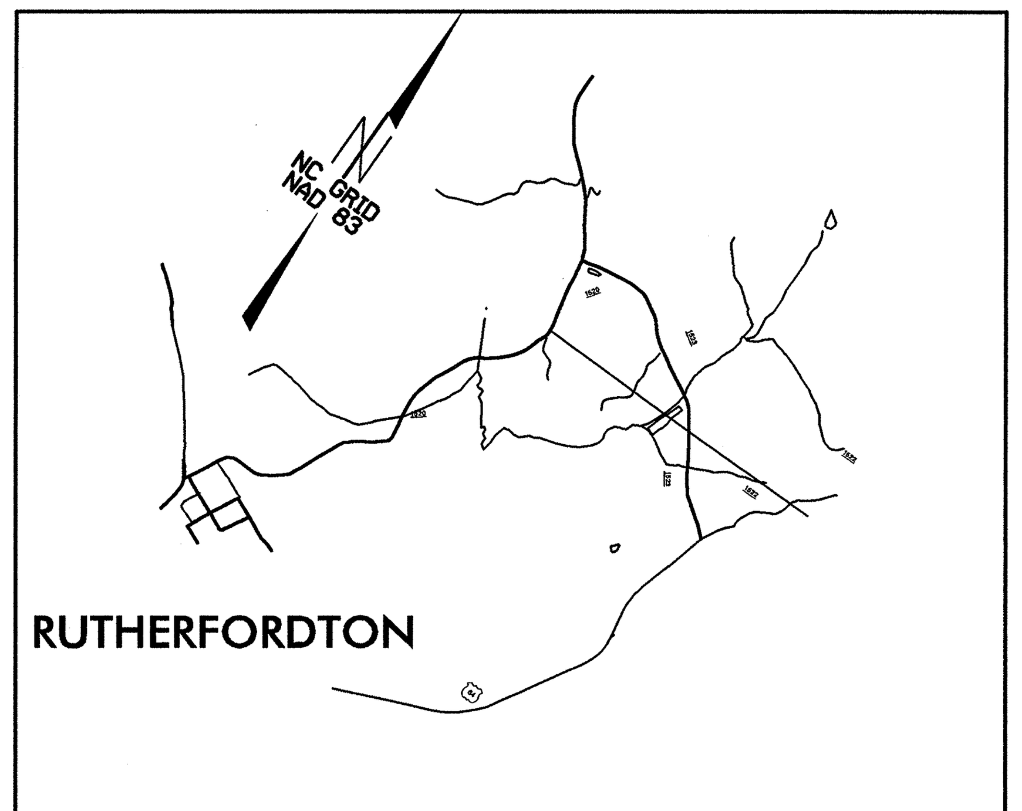
9/24/2009

SURVEY CONTROL SHEET B-4261



BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
100	B4261-1	615058.3520	1123474.3390	908.57	OUTSIDE PROJECT LIMITS	
5	BL-5	615924.1770	1123336.4920	892.53	OUTSIDE PROJECT LIMITS	
200	B4261-2	616374.2000	1123467.4500	891.56	OUTSIDE PROJECT LIMITS	
1	BL-1	616982.1830	1123806.4450	878.00	15+81.41	11.22 RT
10	T-10	617030.2430	1123916.1760	869.61	17+01.43	51.31 RT
2	BL-2	617555.5170	1124460.0200	880.82	24+52.04	15.98 RT
6	T-6	618028.8280	1124611.2200	884.85	29+46.51	13.00 LT
3	BL-3	618238.5100	1124674.2760	896.86	31+64.73	13.39 RT
4	BL-4	618910.6370	1124510.9640	921.43	OUTSIDE PROJECT LIMITS	

****

BM2 ELEVATION = 869.25
N 617031 E 1124126
L STATION 18+71 175 RIGHT
RR SPIKE IN 36 INCH ELM

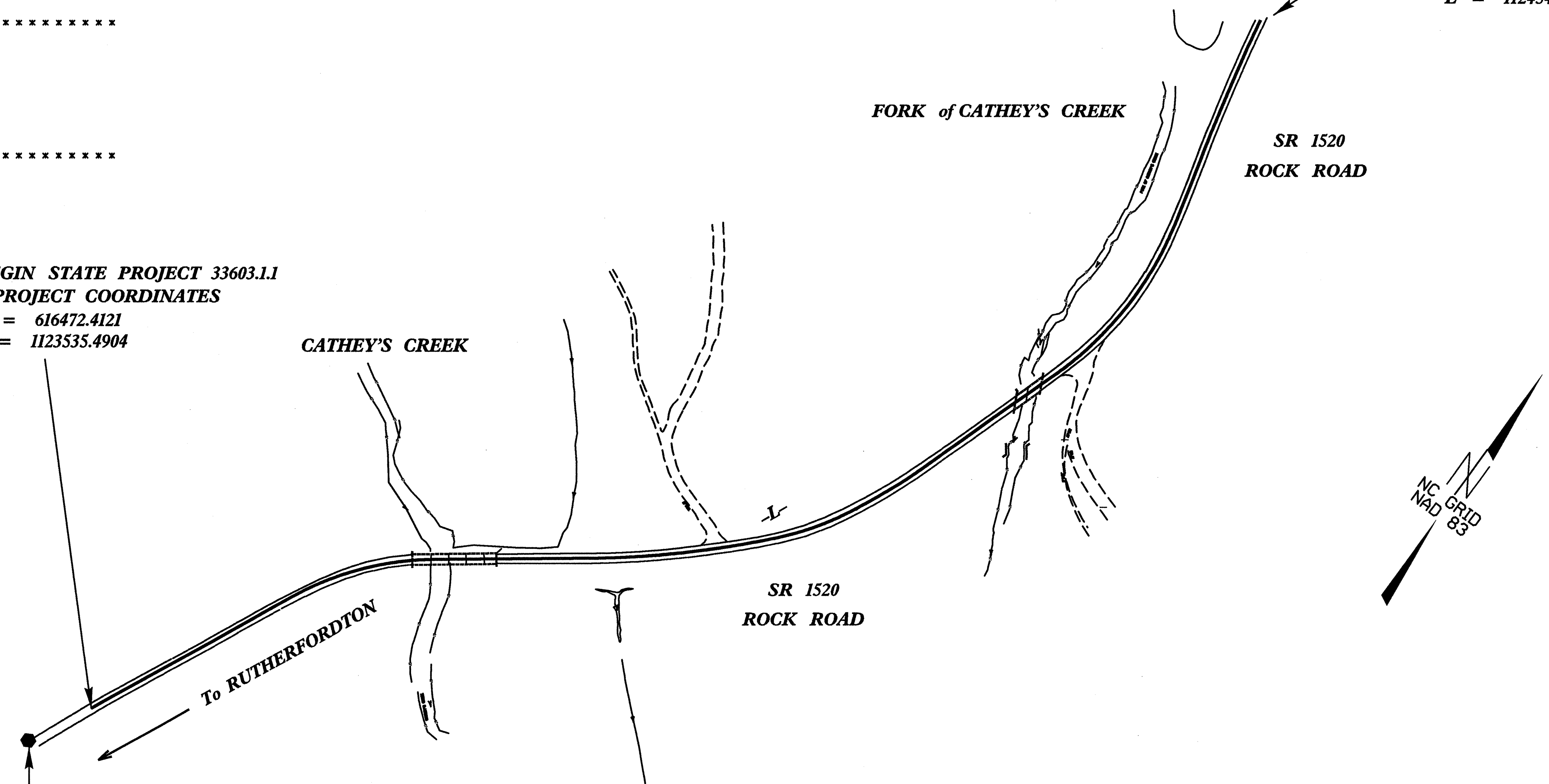
****

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4261-2"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 616374.2000(ft) EASTING: 1123467.4500(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999824482
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4261-2" TO -L- STATION 10+00 IS
N 34 42 50 E, 119.48'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

-L- STA. 37+37.00 END STATE PROJECT 33603.1.1
LOCALIZED PROJECT COORDINATES
N = 618797.9208
E = 1124546.0648

-L- STA. 10+00.00 BEGIN STATE PROJECT 33603.1.1
LOCALIZED PROJECT COORDINATES
N = 616472.4121
E = 1123535.4904



NCDOT GPS STA. "B4261-2"
LOCALIZED PROJECT COORDINATES
N = 616374.2000
E = 1123467.4500

NCDOT GPS STA. "B4261-1"
LOCALIZED PROJECT COORDINATES
N = 615058.3520
E = 1123474.3390

NOTE: DRAWING NOT TO SCALE

NOTES:

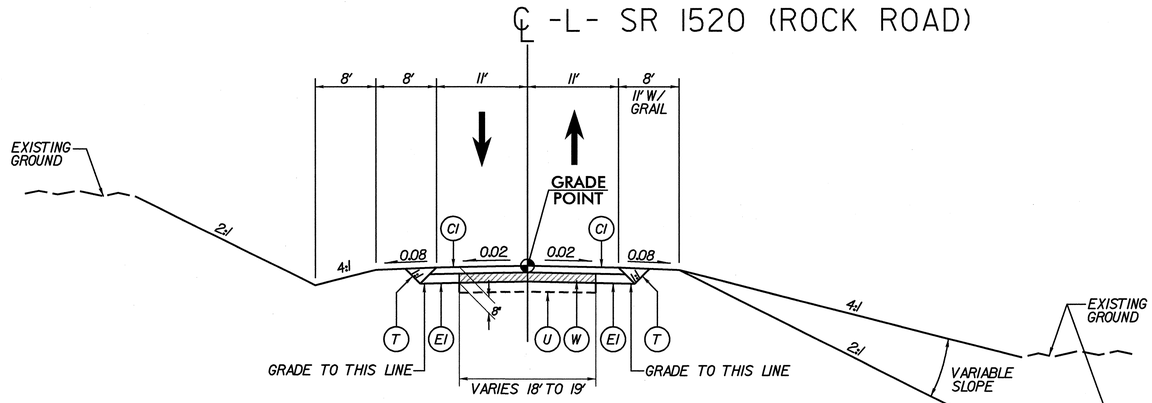
1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/*

THE FILES TO BE FOUND ARE AS FOLLOWS:
B4261_LS_CONTROL_061018.TXT

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

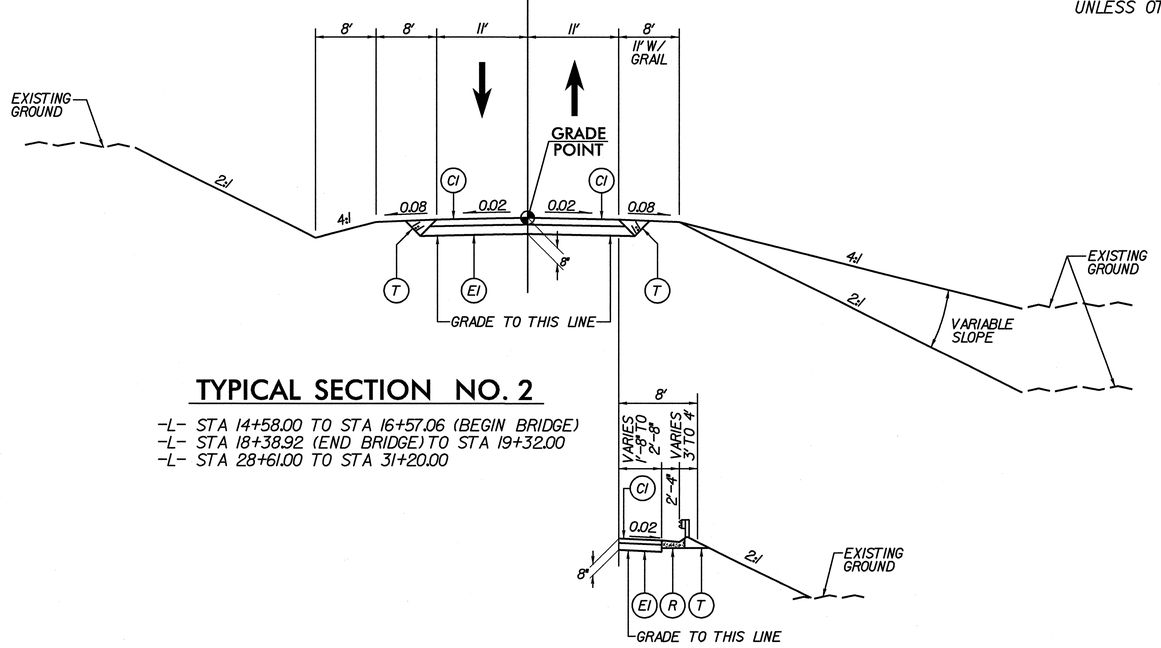
INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.

NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)



TYPICAL SECTION NO. 1

-L- STA 13+03.00 TO STA 14+58.00
-L- STA 19+32.00 TO STA 22+00.00
-L- STA 27+26.00 TO STA 28+61.00
-L- STA 31+20.00 TO STA 32+30.00



TYPICAL SECTION NO. 2

-L- STA 14+58.00 TO STA 16+57.06 (BEGIN BRIDGE)
-L- STA 18+38.92 (END BRIDGE) TO STA 19+32.00
-L- STA 28+61.00 TO STA 31+20.00

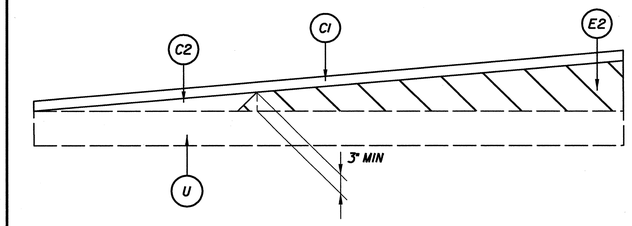
TYPICAL SECTION NO. 2A

-L- STA 18+53.00 TO STA 19+05.00 (RT)

NOTE 1: SAWCUT AND REMOVE EXISTING ASPHALT PAVEMENT TO PROVIDE 1' MINIMUM WIDTH FULL DEPTH PAVEMENT

NOTE 2: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE INDICATED

PAVEMENT SCHEDULE	
CI	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE TYPE SF9.5A, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1" IN DEPTH OR GREATER THAN 1½" IN DEPTH.
EI	PROP. APPROX. 5½" ASPHALT CONCRETE BASE COURSE TYPE B25.0B, AT AN AVERAGE RATE OF 627 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" OR GREATER THAN 5½" DEPTH.
J	PROPOSED 6" AGGREGATE BASE COURSE
R	PROPOSED SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL W)



DETAIL W SHOWING METHOD OF WEDGING

Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068
PE NO. F-0102

PROJECT REFERENCE NO.	SHEET NO.
B-4261	2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024436 ENGINEER JEFFREY W. MOORE
11-2-09

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON
11/4/09

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11/2/2009

Kimley-Horn
and Associates, Inc.

P.O. BOX 33068
RALEIGH, N.C. 27636-3068

PE NO. F-0102

PROJECT REFERENCE NO.	SHEET NO.
B-4261	2-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024436 ENGINEER JEFFREY W. MOORE

PAVEMENT DESIGN ENGINEER

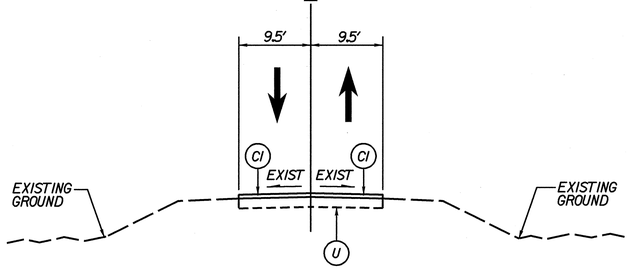
NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DON-CHI CHANG

10/2/09

PAVEMENT SCHEDULE

CI	2½" SF9.5A
EI	5½" B25.0B
J	6" AGGREGATE BASE COURSE
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE DETAIL W)

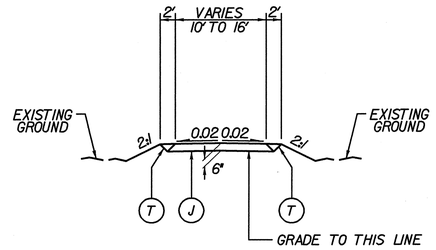
℄ -L- SR 1520 (ROCK ROAD)



TYPICAL SECTION NO. 3

-L- STA 22+00.00 TO STA 27+26.00

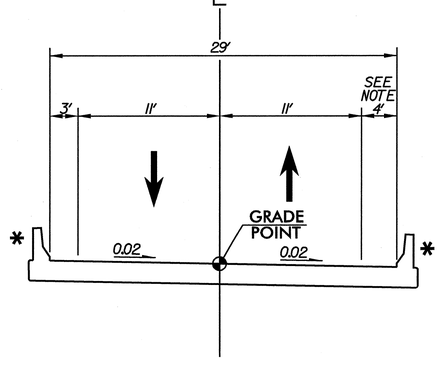
DRIVEWAYS



TYPICAL SECTION NO. 4

-L- STA 15+00 (LT)
-L- STA 28+10 (LT)
-L- STA 29+85 (RT)

℄ -L- SR 1520 (ROCK ROAD)



BRIDGE TYPICAL SECTION NO. 1

* BRIDGE RAIL TO BE DETERMINED BY STRUCTURE DESIGN UNIT

NOTE:
4' SHOULDER WIDTH BASED ON HYDRAULICS

DESIGN DATA

ADT 2009 = 1,700 VPD
ADT 2030 = 2,800 VPD
DHV = 10%
D = 60%
TTST = 1%
DUAL = 2%
V = 60 mph

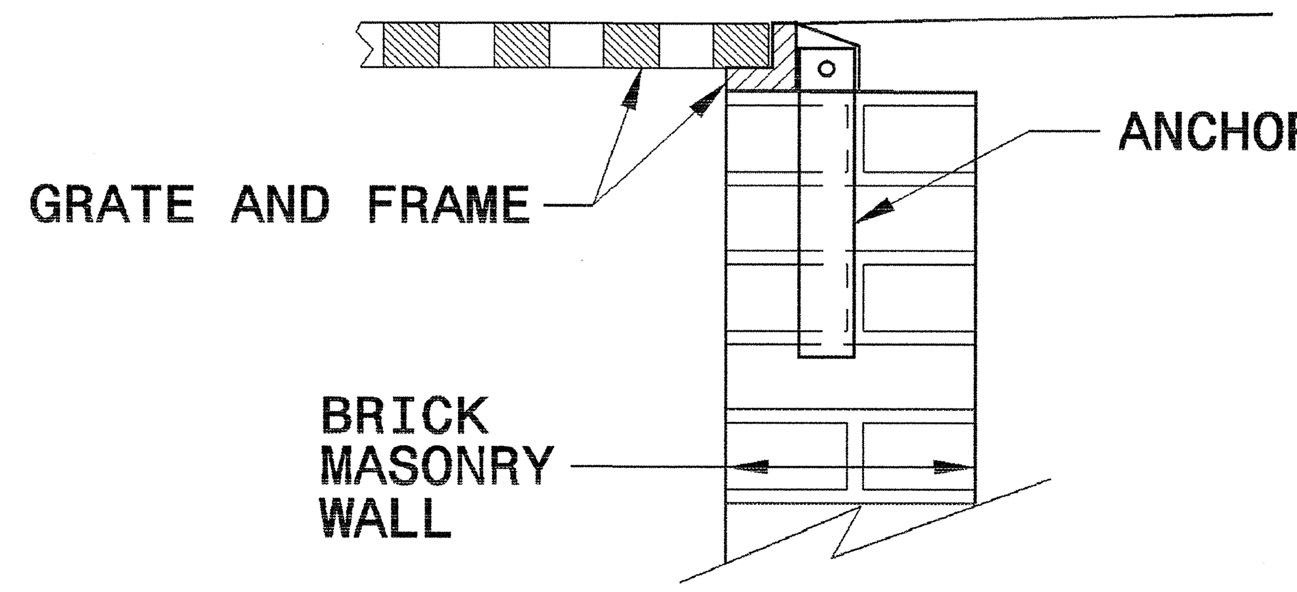
FUNCTIONAL CLASSIFICATION:
LOCAL RURAL

K:\RAL_Roadway\011036123\Roadway\Proj\b4261_rdy_typ.dgn
9/24/2009

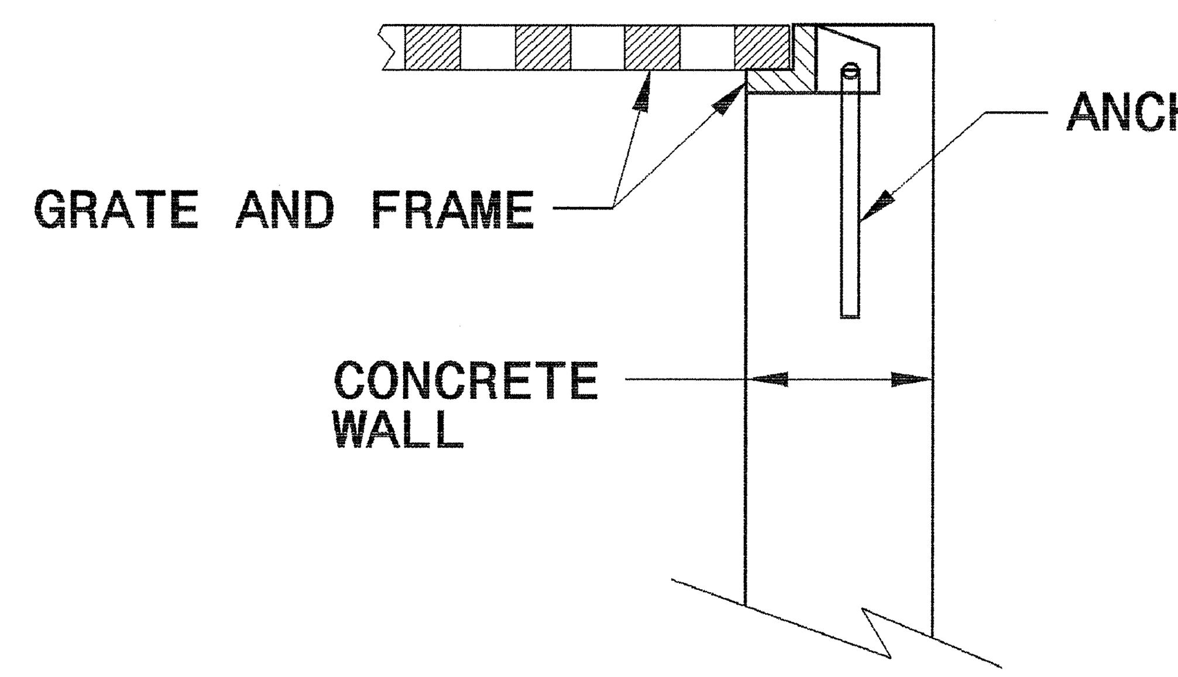
PROJECT REFERENCE NO.	SHEET NO.
B-4261	2-B

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

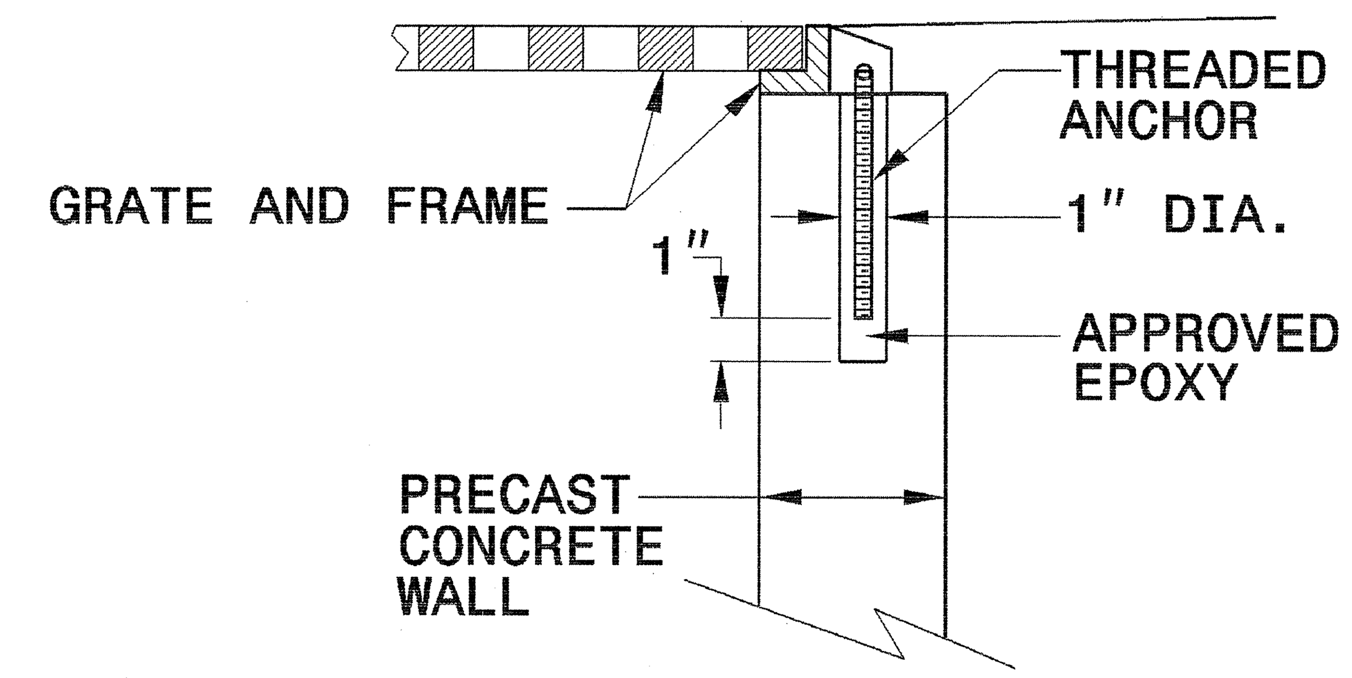
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE



BRICK MASONRY CONSTRUCTION



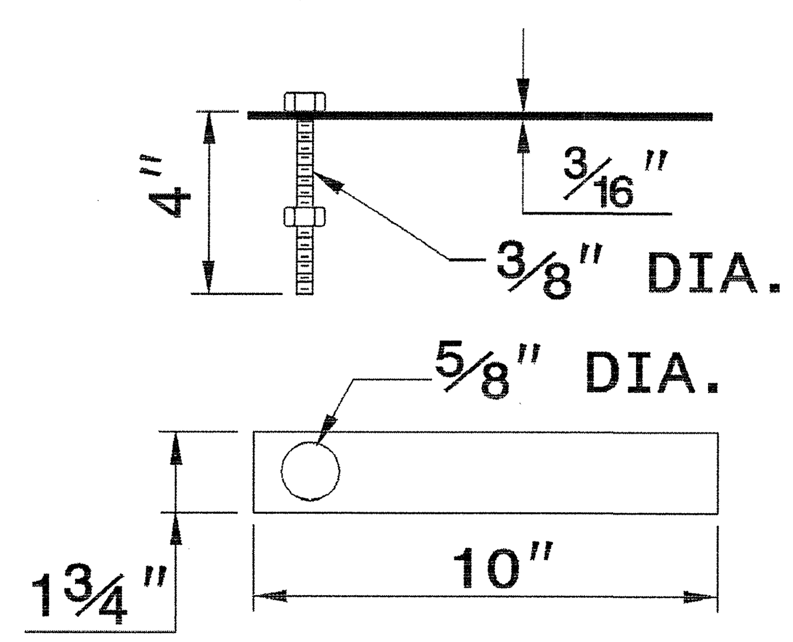
CONCRETE CONSTRUCTION



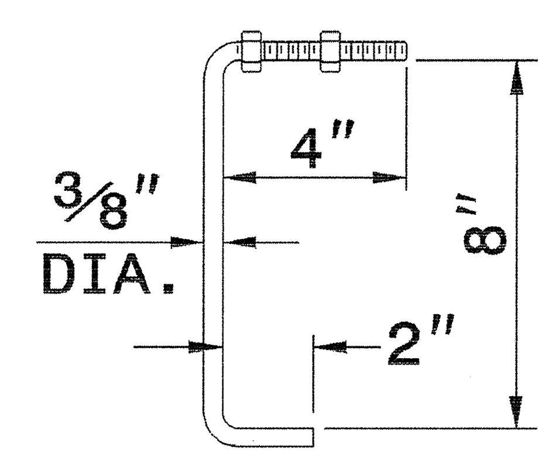
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

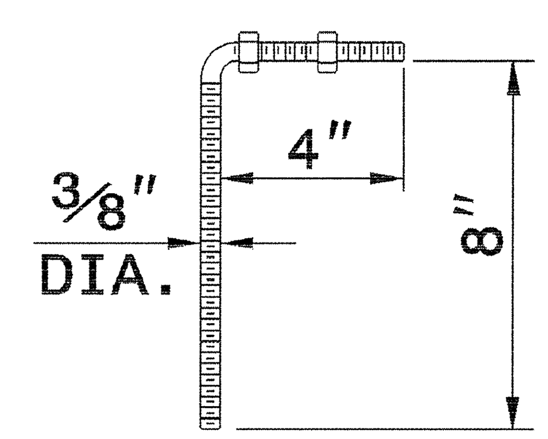
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



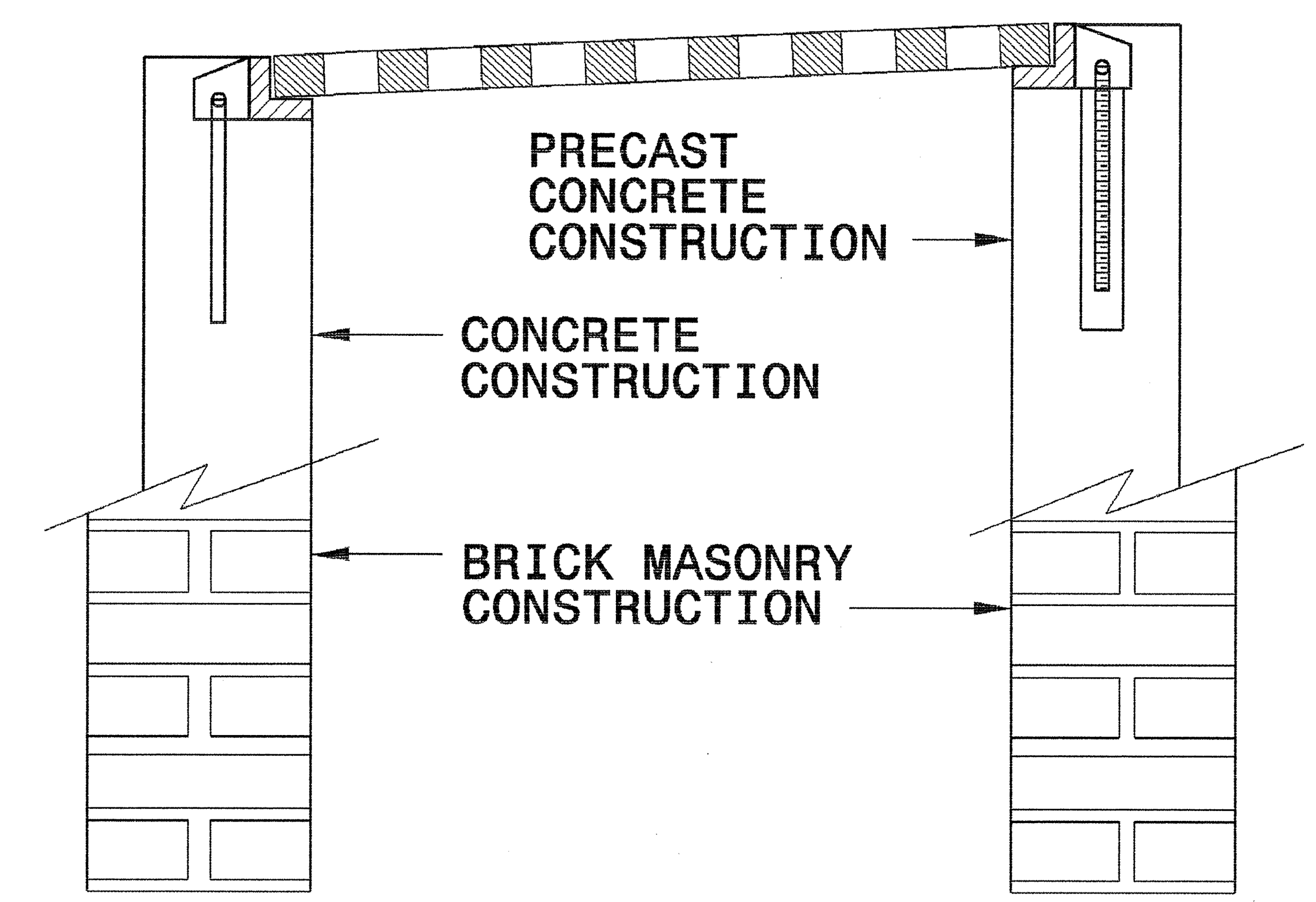
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR



FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

SHEET 1 OF 1
840D25

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

ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1
840D25

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

SEE PLATE FOR TITLE

ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06
MODIFIED BY: E.E. WARD DATE: 9/25/06
CHECKED BY: DATE:
FILE SPEC.:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966
10/2/09

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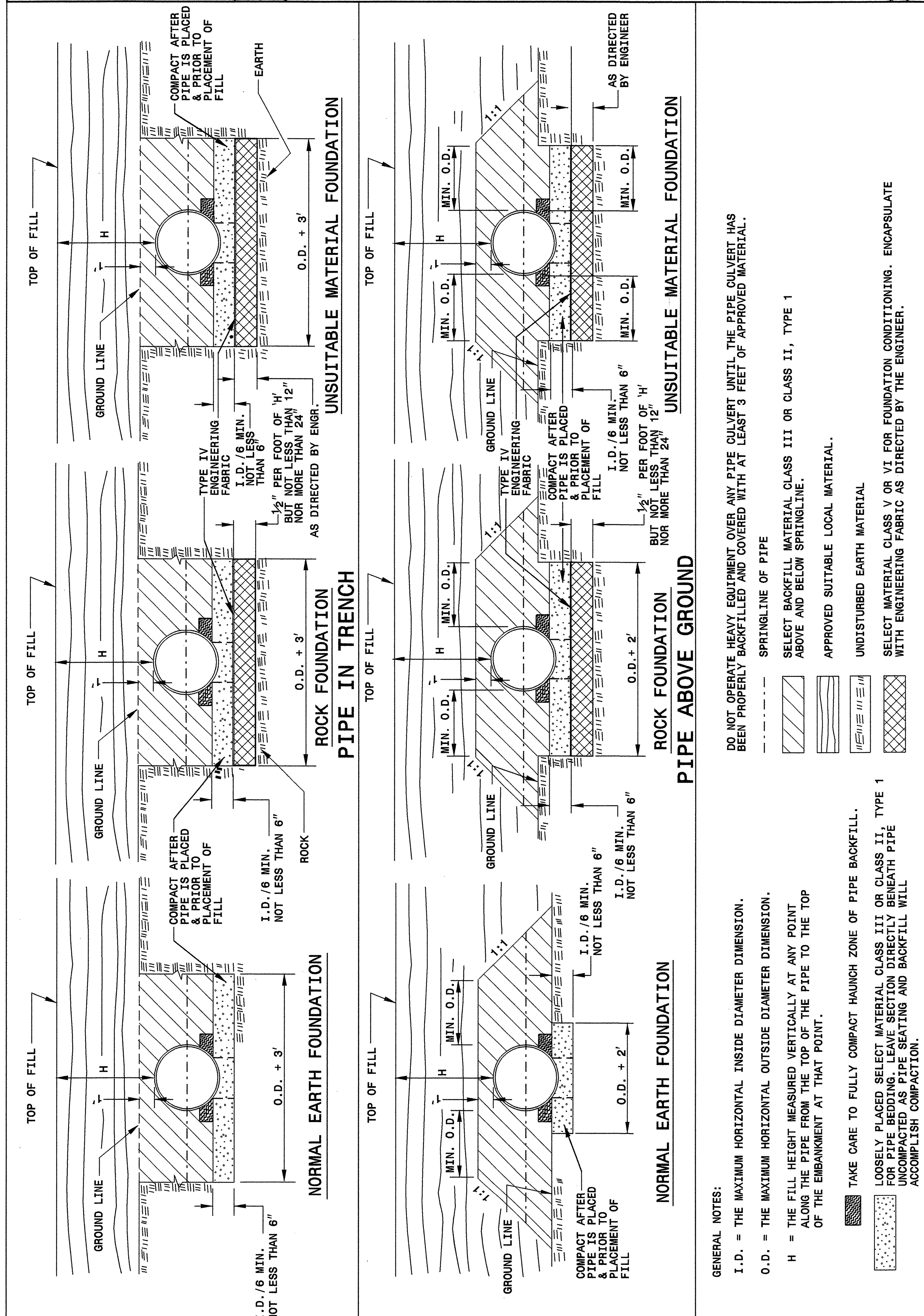
9/24/2009

PROJECT REFERENCE NO.	SHEET NO.
B-4261	2-C



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

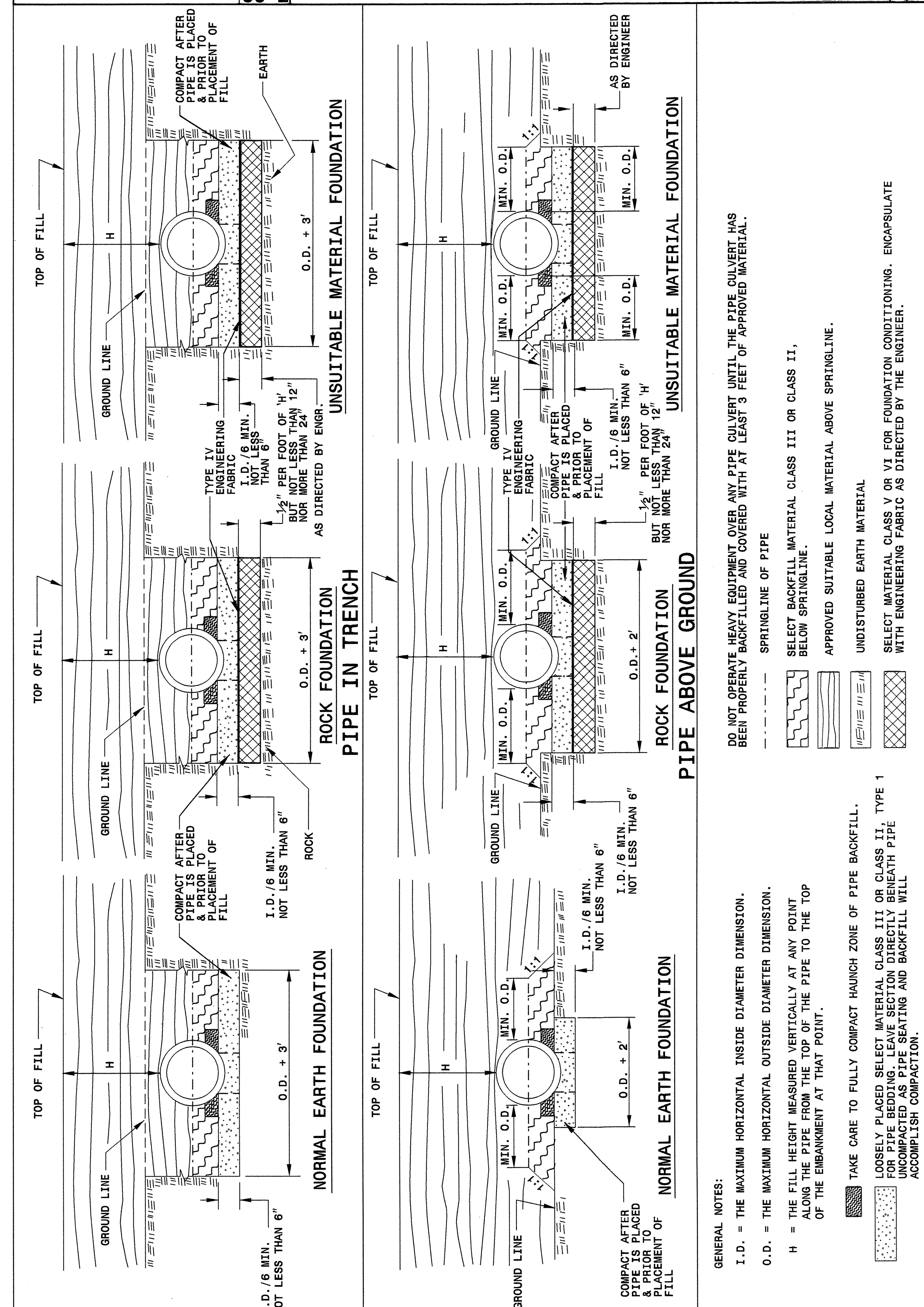
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

7-06

ENGLISH DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 3
300D01



NORMAL EARTH FOUNDATION
ROCK FOUNDATION
PIPE IN TRENCH
UNSUITABLE MATERIAL FOUNDATION
NORMAL EARTH FOUNDATION
ROCK FOUNDATION
PIPE ABOVE GROUND
UNSUITABLE MATERIAL FOUNDATION
TOP OF FILL
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COMPACT AFTER PIPE IS PLACED & PRIOR TO PLACEMENT OF FILL
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TYPE IV ENGINEERING FABRIC
½" PER FOOT OF 'H' BUT NOT LESS THAN 12" NOR MORE THAN 24"
AS DIRECTED BY ENGR.
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EARTH
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I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
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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 10/2/09

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: /ericward/stds/stdstodetails/30001/0300d01.dgn

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5/14/99

5/14/99

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

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

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: /ericward/stds/stdsetodetails/30000/0300d01.dgn

PROJECT REFERENCE NO. B-4241

SHEET NO. 2-D

PROJECT REFERENCE NO.	SHEET NO.
B-4261	3

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202233

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0015000000-N	205	1	EA	SEALING ABANDONED WELLS
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (STA 17+48.00 -L-)
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	30	CY	UNDERCUT EXCAVATION
0080000000-E	SP	500	TON	CLASS IV SUBGRADE STABILIZATION
0134000000-E	240	425	CY	DRAINAGE DITCH EXCAVATION
0195000000-E	265	1,000	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	1,000	SY	FABRIC FOR SOIL STABILIZATION
0318000000-E	300	13	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0320000000-E	SP	16	SY	FOUNDATION CONDITIONING FABRIC
0343000000-E	310	88	LF	15" SIDE DRAIN PIPE
0708000000-E	310	28	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0806000000-E	310	2	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
1121000000-E	520	100	TON	AGGREGATE BASE COURSE
1220000000-E	545	25	TON	INCIDENTAL STONE BASE
1489000000-E	610	520	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1525000000-E	610	580	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1560000000-E	620	65	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1693000000-E	654	10	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	806	32	EA	RIGHT OF WAY MARKERS
2022000000-E	815	112	CY	SUBDRAIN EXCAVATION
2033000000-E	815	84	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	500	LF	6" PERFORATED SUBDRAIN PIPE

ItemNumber	Sec #	Quantity	Unit	Description
2055000000-E	815	15	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
2066000000-N	815	1	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
2077000000-E	815	6	LF	6" OUTLET PIPE (SUBDRAINS)
2286000000-N	840	1	EA	MASONRY DRAINAGE STRUCTURES
2367000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.29
2556000000-E	846	52	LF	SHOULDER BERM GUTTER
3030000000-E	862	1,225	LF	STEEL BM GUARDRAIL
3150000000-N	862	5	EA	ADDITIONAL GUARDRAIL POSTS
3270000000-N	SP	8	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3649000000-E	876	45	TON	RIP RAP, CLASS B
3656000000-E	876	2,750	SY	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	1	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4400000000-E	1110	441	SF	WORK ZONE SIGNS (STATIONARY)
4410000000-E	1110	104	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4430000000-N	1130	34	EA	DRUMS
4435000000-N	1135	34	EA	CONES
4445000000-E	1145	104	LF	BARRICADES (TYPE III)
4810000000-E	1205	19,004	LF	PAINT PAVEMENT MARKING LINES (4")
6000000000-E	1605	3,400	LF	TEMPORARY SILT FENCE
6006000000-E	1610	650	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	350	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	710	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	7.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	200	LB	SEED FOR TEMPORARY SEEDING

ItemNumber	Sec #	Quantity	Unit	Description
6021000000-E	1620	1.75	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	650	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	7	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	1,500	LF	SAFETY FENCE
6030000000-E	1630	980	CY	SILT EXCAVATION
6036000000-E	1631	10,300	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	90	SY	COIR FIBER MAT
6038000000-E	SP	350	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	680	LF	1/4" HARDWARE CLOTH
6045000000-E	SP	160	LF	**" TEMPORARY PIPE (18")
6069000000-E	1638	130	CY	STILLING BASINS
6070000000-N	SP	18	EA	SPECIAL STILLING BASINS
6071010000-E	SP	50	LF	WATTLE
6071020000-E	SP	11	LB	POLYACRYLAMIDE (PAM)
6071030000-E	SP	900	LF	COIR FIBER BAFFLES
6071050000-E	SP	8	EA	**" SKIMMER (1-1/2")
6084000000-E	1660	10	ACR	SEEDING & MULCHING
6087000000-E	1660	5	ACR	MOWING
6090000000-E	1661	100	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	125	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	3.5	TON	FERTILIZER TOPDRESSING
6111000000-E	SP	150	LF	IMPERVIOUS DIKE
6114500000-N	SP	10	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	27	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	0.1	ACR	REFORESTATION

9/24/2009 K:\RAL_Roadway\Oll\036123\Roadway\Proj\B4261_rdy_sum.dgn

COMPUTED BY:	JDL	DATE:	5/1/2006
CHECKED BY:	LDR	DATE:	5/1/2006

NOT FOR STAKEOUT - FOR BID PURPOSES ONLY

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
B-4261	3-A

Kimley-Horn and Associates, Inc. P.O. Box 33068 Raleigh, N.C. 27636-3068

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT IN ELEVATION	INVERT OUT ELEVATION	SLOPE CRITICAL
19+00 -L-	RT	1		878.98	875.00		
19+00 -L-	RT	1	2		875.00	867.79	0.260
15+25 -L-	LT	3					
28+10 -L-	LT	4					
SHEET TOTALS							
SAY							

STATION	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	24"	30" .079	30"	36" .079	36"	42" .109	42"	48" .109	48"
19+00 -L-																					
19+00 -L-										28											
15+25 -L-																					
28+10 -L-																					
SHEET TOTALS										28											
SAY																					

STATION	15" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	36" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.	QUANITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G
19+00 -L-						1						
19+00 -L-												
15+25 -L-	68											
28+10 -L-	20											
SHEET TOTALS	88					1						
SAY												

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	M.D.I. TYPE "A" STD. 840.17 OR 840.26	M.D.I. TYPE "B" STD. 840.18 OR 840.27	M.D.I. TYPE "D" STD. 840.19 OR 840.28	M.D.I. FRAME WITH GRATE STD. 840.22	M.D.I. FRAME WITH TWO GRATES STD. 840.22	M.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	T.B.D.I. STD. 840.35	T.B.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	M.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	ADJUSTMENT OF CATCH BASINS	CONVERT EXIST CB TO TBJB	CONVERT EXIST CB TO DI	TBJB STD. 840.35	M.H. FRAME AND COVER STD. 840.54	J.B. STD. 840.31 OR 840.33	MANHOLE STD. 840.52	M.H. STD. 840.51 OR 840.54	800.00 STD. 850.10	CPES STD. 310.03					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 LIN. FT.	REMARKS
19+00 -L-									1	1																				
19+00 -L-																										2 @ 15"				
15+25 -L-																														
28+10 -L-																														
SHEET TOTALS									1	1																2 @ 15"				
SAY																														

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
M.D.I.	MEDIAN DROP INLET
M.D.I.(N.S.)	MEDIAN 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

COMPUTED BY: J.PACE	DATE: 4/23/08
CHECKED BY: JW.MOORE	DATE: 4/24/08

PROJECT REFERENCE NO.	SHEET NO.
B-4261	3-B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

"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			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL BERM WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GRAU 350	M-350	B-77	CAT-1	VI MOD	BIC	AT-1	EA	G	NG				
-L-	15+19.56	16+57.06	LT	137.50				16+57.06	8	11		50		1			1		1										
-L-	13+57.06	16+57.06	RT	300.00			16+57.06		8	11	50		1				1		1										
-L-	18+38.92	21+51.42	LT	312.50			18+38.92		8	11	50		1				1		1										
-L-	18+38.92	21+88.92	RT	350.00				18+38.92	8	11		50		1			1		1										
-L-	28+22.00	31+72.00	LT	350.00			29+60.00		8	11	50		1				2												
-L-	27+26.00	29+63.50	RT	237.50			28+25.00		8	11	50		1				2												
			SUBTOTAL	1687.50																									
	LESS ANCHOR DEDUCTIONS																												
	GRAU 350	8 @ 50.00'	=	400.00																									
	B-77	4 @ 18.75'	=	75.00																									
			TOTAL	1212.50																									
																	8		4										
			SAY	1225																									

ADDITIONAL GUARDRAIL POSTS = 5 EA

REMOVAL OF EXISTING ASPHALT PAVEMENT			
LINE	STATION TO STATION	LOCATION	SQ. YDS.
-L-	14+58 TO 16+66	LT/RT	420
-L-	18+23 TO 19+32	LT/RT	220
-L-	28+61 TO 28+74	LT/RT	10
-L-	29+15 TO 31+20	LT/RT	400
TOTAL			1050

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L- STA 13+03.00 TO STA 16+57.06	954		1701	747	
-L- STA 18+38.92 TO STA 22+00.00	12		2674	2662	
-L- STA 27+26.00 TO STA 32+30.00	399		3099	2700	
TOTALS	1365		7474	6109	
LOSS DUE TO CLEARING & GRUBBING	-125			125	
PROJECT TOTALS	1240		7474	6234	
EST. FOR REPLACING TOPSOIL ON BORROW PITS				312	
GRAND TOTALS	1240			6546	
SAY	1300			6600	
ESTIMATED UNDERCUT = 30 CY					
DDE = 425 CY					

NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING."

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

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11/2/2009

PROJ. REFERENCE NO.	SHEET NO.
B-4261	3-C
Kimley-Horn and Associates, Inc.	P.O. Box 33068 Raleigh, N.C. 27636-3068

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4-5	GARY W. CAMP & JANELLE D. CAMP
2	4	HARDY H. HUNTLEY & JANET A. HUNTLEY
3	4-5	SCOTT HUGHES & SANDRA HUGHES
4	5	RICHARD L. WARD & JOYCE C. WARD
5	5	RICHARD L. WARD & JOYCE C. WARD

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4261	4
R/W SHEET NO.	

Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068
PE NO. F-0102

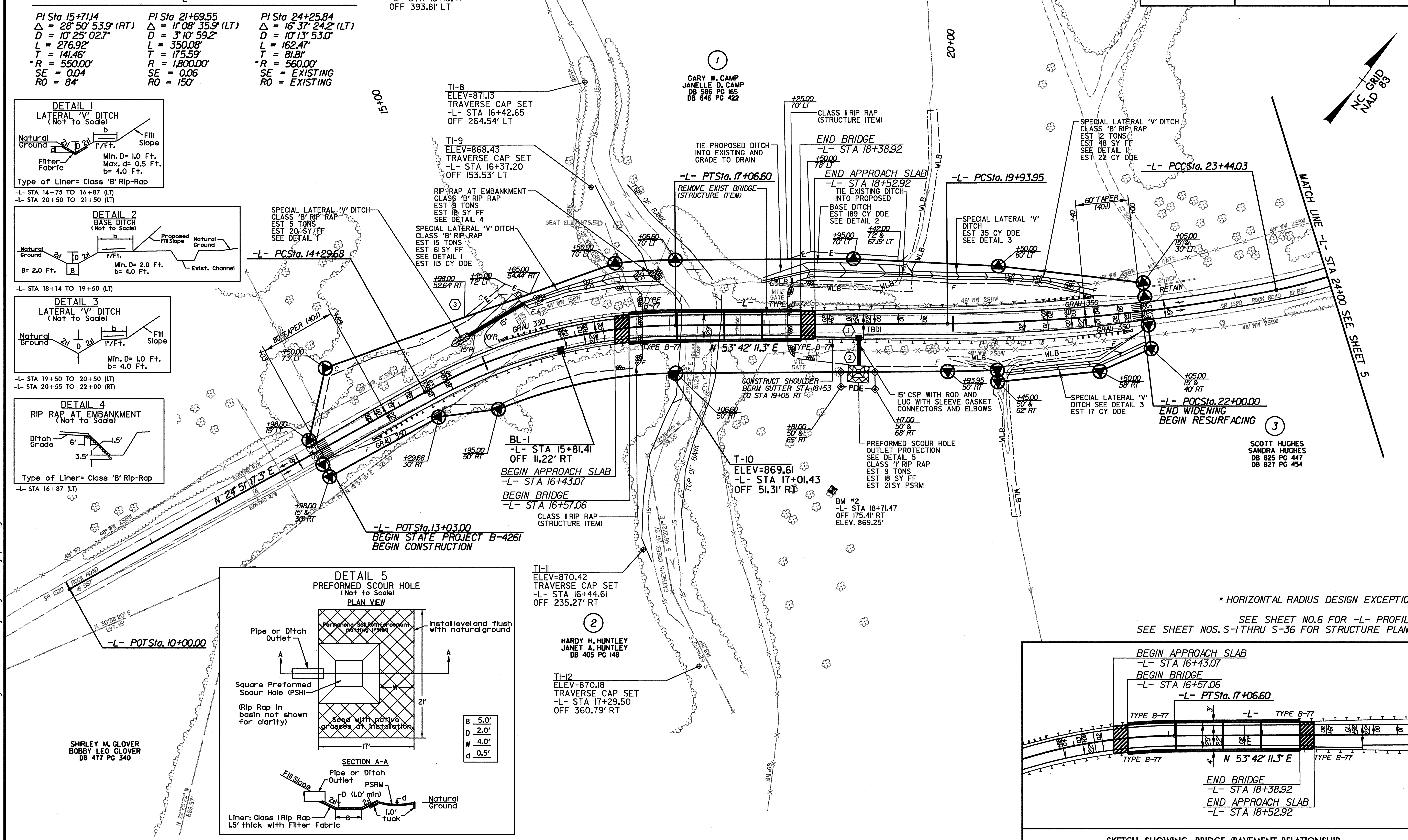
RIGHT-OF-WAY REV.
CONST. REV.

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024436 JEFFREY W. MOORE 11-3-09

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026480 GARY D. ROBINSON, JR. 11-3-09

-L-

PI Sta 15+71.14	PI Sta 21+69.55	PI Sta 24+25.84
Δ = 28° 50′ 53.9″ (RT)	Δ = 11° 08′ 35.9″ (LT)	Δ = 16° 37′ 24.2″ (LT)
D = 10° 25′ 02.7″	D = 3° 10′ 59.2″	D = 10° 13′ 53.0″
L = 276.92′	L = 350.08′	L = 162.47′
T = 141.46′	T = 175.59′	T = 81.81′
*R = 550.00′	R = 1,800.00′	*R = 560.00′
SE = 0.04	SE = 0.06	SE = EXISTING
RO = 84′	RO = 150′	RO = EXISTING



* HORIZONTAL RADIUS DESIGN EXCEPTION

SEE SHEET NO.6 FOR -L- PROFILE
SEE SHEET NOS. S-1 THRU S-36 FOR STRUCTURE PLANS

SKETCH SHOWING BRIDGE /PAVEMENT RELATIONSHIP

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11/2/2009

REVISIONS

-L-

PI Sta 24+25.84	PI Sta 25+80.29
△ = 16° 37' 24.2" (LT)	△ = 7° 02' 13.5" (LT)
D = 10° 13' 53.0"	D = 4° 46' 28.7"
L = 162.47'	L = 147.38'
T = 81.81'	T = 73.78'
*R = 560.00'	*R = 1,200.00'
SE = EXISTING	SE = EXISTING
RO = EXISTING	RO = EXISTING
PI Sta 31+48.12	PI Sta 36+08.95
△ = 33° 31' 18.1" (LT)	△ = 3° 59' 59.1" (RT)
D = 8° 57' 08.9"	D = 1° 33' 40.3"
L = 374.44'	L = 256.20'
T = 192.75'	T = 128.15'
*R = 640.00'	R = 3,670.00'
SE = 0.06	SE = EXISTING
RO = 126'	RO = EXISTING

Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068
PE NO. F-0102

PROJECT REFERENCE NO.	SHEET NO.
B-4261	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

RIGHT-OF-WAY REV.
CONST. REV.

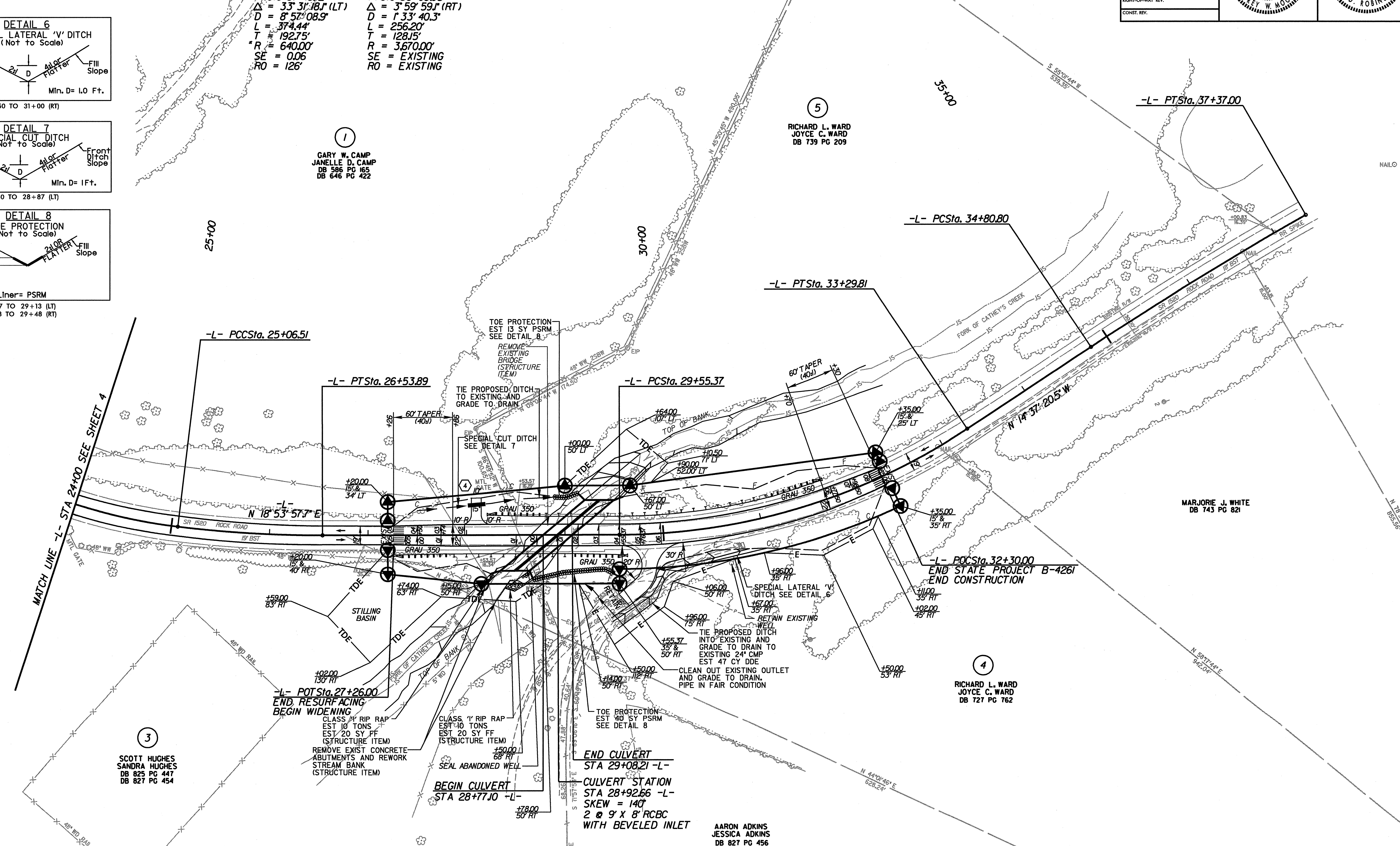
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024436 11-3-09 JEFFREY W. MOORE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026480 11-3-09 JERRY D. ROBINSON

DETAIL 6
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground — 2:1 — D — 4:1 or Flatter — Fill Slope
Min. D= 1.0 Ft.
-L- STA 29+50 TO 31+00 (RT)

DETAIL 7
SPECIAL CUT DITCH
(Not to Scale)
Natural Ground — 2:1 — D — 4:1 or Flatter — Front Ditch Slope
Min. D= 1Ft.
-L- STA 27+50 TO 28+87 (LT)

DETAIL 8
TOE PROTECTION
(Not to Scale)
2:1 OR FLATTER — Fill Slope — d — 2:1 OR FLATTER — Fill Slope
d= 1Ft.
Type of Liner= PSRM
-L- STA 28+87 TO 29+13 (LT)
-L- STA 28+68 TO 29+48 (RT)



NC GRID NAD 83
MATCH LINE -L- STA 24+00 SEE SHEET 4
25+00
30+00
35+00
1
GARY W. CAMP
JANELLE D. CAMP
DB 586 PG 165
DB 646 PG 422
5
RICHARD L. WARD
JOYCE C. WARD
DB 739 PG 209
4
RICHARD L. WARD
JOYCE C. WARD
DB 727 PG 762
3
SCOTT HUGHES
SANDRA HUGHES
DB 825 PG 447
DB 827 PG 454
MARJORIE J. WHITE
DB 743 PG 821
AARON ADKINS
JESSICA ADKINS
DB 827 PG 456
-L- PT Sta. 37+37.00
-L- PC Sta. 34+80.80
-L- PT Sta. 33+29.81
-L- PCC Sta. 25+06.51
-L- PT Sta. 26+53.89
-L- PC Sta. 29+55.37
-L- POC Sta. 32+30.00
END STATE PROJECT B-4261
END CONSTRUCTION
-L- POT Sta. 27+26.00
END RESURFACING
BEGIN WIDENING
N 18° 53' 57.7" E
N 14° 37' 20.5" W
SR 1520 ROCK ROAD
FORK OF CATHEY'S CREEK
TOE PROTECTION
EST 13 SY PSRM
SEE DETAIL 8
REMOVE EXISTING BRIDGE (STRUCTURE ITEM)
TIE PROPOSED DITCH TO EXISTING AND GRADE TO DRAIN
SPECIAL CUT DITCH
SEE DETAIL 7
60' TAPER (40:1)
STILLING BASIN
SPECIAL LATERAL 'V' DITCH SEE DETAIL 6
RETAIN EXISTING WELL
TIE PROPOSED DITCH INTO EXISTING AND GRADE TO DRAIN TO EXISTING 24" CMP
EST 47 CY DDE
CLEAN OUT EXISTING OUTLET AND GRADE TO DRAIN. PIPE IN FAIR CONDITION
CLASS 'I' RIP RAP
EST 10 TONS
EST 20 SY FF
(STRUCTURE ITEM)
REMOVE EXIST CONCRETE ABUTMENTS AND REWORK STREAM BANK (STRUCTURE ITEM)
SEAL ABANDONED WELL
TOE PROTECTION
EST 40 SY PSRM
SEE DETAIL 8
BEGIN CULVERT
STA 28+77.10 -L-
END CULVERT
STA 29+08.21 -L-
CULVERT STATION
STA 28+92.66 -L-
SKEW = 140°
2 @ 9' X 8' RCBC
WITH BEVELED INLET

* HORIZONTAL RADIUS DESIGN EXCEPTION

SEE SHEET NO.6 FOR -L- PROFILE
SEE SHEET NOS. C-1 THRU C-7 FOR CULVERT PLANS

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11/2/2009

PROJECT REFERENCE NO.	SHEET NO.
B-4261	6
R/W SHEET NO.	

Kimley-Horn and Associates, Inc.
P.O. BOX 33068
RALEIGH, N.C. 27636-3068
PE NO. F-0102

RIGHT-OF-WAY REV.
CONST. REV.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 024436 ENGINEER KELLEY W. MOORE 11-3-09

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 026480 ENGINEER D. ROBINSON JR. 11-3-09

BM#2
-L- STA 18+71.47 (175.41' RT)
ELEV 869.25'
RR SPIKE SET IN 36" ELM

BEGIN GRADE
-L- STA 13+03.00 ELEV 887.57'
TIE PROPOSED PAVEMENT TO EXISTING

BEGIN BRIDGE
-L- STA 16+57.06
ELEV 880.93'

CL STA 17+48.00 -L-
2 @ 50'-2 @ 40'
36' PRESTRESSED GIRDER
CL ELEV = 880.47'
90° SKEW

EXISTING BRIDGE

END BRIDGE
-L- STA 18+38.92
ELEV 880.02'

END GRADE
BEGIN RESURFACING
-L- STA 22+00.00 ELEV 878.91'

PI = 14+94.00
EL = 881.74'
VC = 350'
K = 137
V = 60 MPH

PI = 21+30.00
EL = 878.56'
VC = 140'
K = 140
V = 60 MPH

(-)13.052%
(-)10.5000%
(-)10.5000%
(+)10.5000%
(-)19.9%
(-)16.00%
(-)11.35%
(+)10.77%
(+)1.50%
(+)6.00%
(+)19.78%
(+)10.30%
(+)3.04%

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 3700 CFS
DESIGN FREQUENCY	= 25 YR
DESIGN HW ELEVATION	= 872.9 FT
BASE DISCHARGE	= 5500 CFS
BASE FREQUENCY	= 100 YR
BASE HW ELEVATION	= 874.3 FT
OVERTOPPING DISCHARGE	= >8000 CFS
OVERTOPPING FREQUENCY	= >500 YR
OVERTOPPING ELEVATION	= >876.1 FT
DATE OF SURVEY	= 01/10/06
W.S.ELEVATION AT DATE OF SURVEY	= 863.15 FT

BEGIN SPECIAL DITCH GRADE LT
-L- STA 14+75.00
ELEV = 879.44

PI = 15+50.00
ELEV = 872.00

2' (TYP)
15' (TYP)
CLASS II RIP RAP (TYP)

PI = 16+50.00
ELEV = 866.00
TOP OF CAUSEWAY 1
ELEV = 868.5'

TOP OF CAUSEWAY 2
ELEV = 868.0'

NORMAL WSEL=863.15'
@ EXISTING BRIDGE
(01/10/06)

END SPECIAL DITCH GRADE LT
-L- STA 16+87.00
ELEV = 865.50

BEGIN SPECIAL DITCH GRADE LT
-L- STA 18+14.00
ELEV = 863.96

PI = 19+50.00
ELEV = 865.00

BEGIN SPECIAL DITCH GRADE RT
-L- STA 20+55.00
ELEV = 865.65

PI = 20+50.00
ELEV = 866.50

PI = 21+00.00
ELEV = 869.50

PI = 21+50.00
ELEV = 865.94

END SPECIAL DITCH GRADE LT
-L- STA 21+50.00
ELEV = 874.39

END SPECIAL DITCH GRADE RT
-L- STA 22+00.00
ELEV = 867.46

UNCLASSIFIED STRUCTURE EXCAVATION

SEE SHEET NO.4 FOR -L- PLAN

-L- SR 1520 (ROCK ROAD)

END RESURFACING
BEGIN GRADE
-L- STA 27+26.00 ELEV 884.12'

END GRADE
-L- STA 32+30.00 ELEV 900.10'
TIE PROPOSED PAVEMENT TO EXISTING

CL STA 28+92.66 -L-
GRADE POINT ELEV = 886.03
SKEW = 140° @ -L-
2 @ 9' x 8' RCBC
W/ BEVELED INLET
OAL = 112'

EXISTING BRIDGE

PI = 29+98.00
EL = 886.00'
VC = 430'
*K = 80
V = 45 MPH

(+)6.07767%
(+)6.05%
(+)6.76%
(+)0.6912%
(-)1.00%

BEGIN SPECIAL DITCH GRADE LT
-L- STA 27+50.00
ELEV = 881.52

END SPECIAL DITCH GRADE LT
-L- STA 28+87.00
ELEV = 880.15

NORMAL WSEL=871.1'
@ EXISTING BRIDGE FACE
(01/10/06)

PI = 30+50.00
ELEV = 888.63

BEGIN SPECIAL DITCH GRADE RT
-L- STA 29+50.00
ELEV = 881.87

END SPECIAL DITCH GRADE RT
-L- STA 31+00.00
ELEV = 891.66

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 460 CFS
DESIGN FREQUENCY	= 25 YR
DESIGN HW ELEVATION	= 876.6 FT
BASE DISCHARGE	= 750 CFS
BASE FREQUENCY	= 100 YR
BASE HW ELEVATION	= 877.9 FT
OVERTOPPING DISCHARGE	= >1100 CFS
OVERTOPPING FREQUENCY	= >500 YR
OVERTOPPING ELEVATION	= >879.2 FT
DATE OF SURVEY	= 01/10/06
W.S.ELEVATION AT DATE OF SURVEY	= 871.1 FT

UNCLASSIFIED STRUCTURE EXCAVATION

* SAG VERTICAL CURVE K DESIGN EXCEPTION

SEE SHEET NO.5 FOR -L- PLAN

-L- SR 1520 (ROCK ROAD)

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