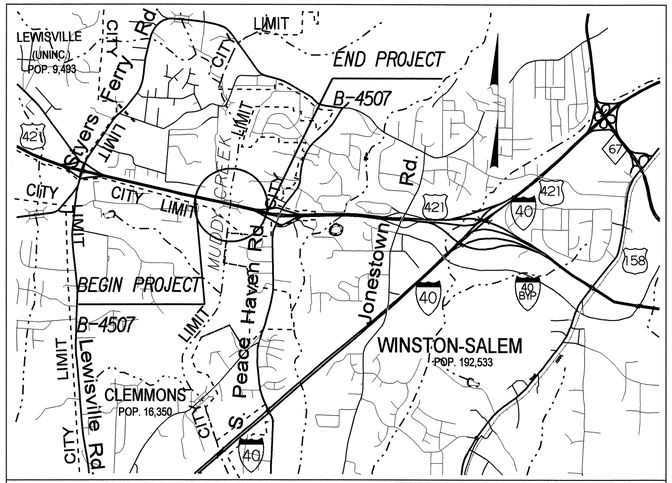
09/08/99

TIP PROJECT: B-4507

CONTRACT: C202258

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

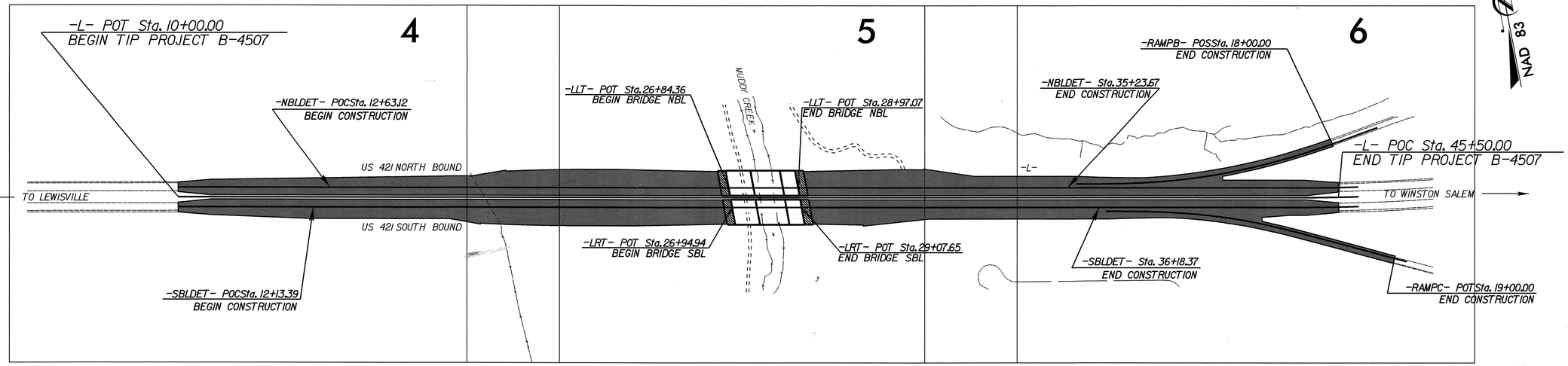
FORSYTH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4507	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38396.1.1	BRNHS-421(33)	P.E.
38396.2.1	BRNHS-421(33)	RW/UTL.
38396.3.1	BRNHS-421(33)	CONST.

LOCATION: BRIDGES 221 AND 222 OVER MUDDY CREEK ON US 421

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



*****A DESIGN EXCEPTION IS REQUIRED FOR THE CREST AND SAG K VALUES AND VERTICAL STOPPING SIGHT DISTANCE. THERE IS CONTROL OF ACCESS ON THIS PROJECT.***

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	=	46,100
ADT 2025	=	58,600
DHV	=	10 %
D	=	60 %
T	=	13 % *
**V	=	70 MPH
FUNC CLASS	=	FREEWAY

* TTST 7% DUAL 6%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4507 = 0.632 MILE
LENGTH STRUCTURE TIP PROJECT B-4507 = 0.040 MILE
TOTAL LENGTH TIP PROJECT B-4507 = 0.672 MILE

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: April 24, 2008

LETTING DATE: November 17, 2009

TONY HOUSER, PE
PROJECT ENGINEER

JASON TALLEY, PE
PROJECT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEVEN R. MORGAN

HYDRAULICS ENGINEER

SIGNATURE: 8-21-09

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M TALLEY

ROADWAY DESIGN ENGINEER

SIGNATURE: 8-19-09

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY DESIGN ENGINEER

18-AUG-2009 16:03
r:\roadway\proj\b4507_rdy_tsh.dgn
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4507	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

8-19-09

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C	SURVEY CONTROL SHEET
2	PAVEMENT SCHEDULE, WEDGING DETAILS, LIMITS OF PAVEMENT DESIGN DETAIL, PAVED SHOULDER IN RELATION TO GUARDRAIL AND SHOULDER BERM GUTTER DETAILS
2-A THRU 2-C	TYPICAL SECTIONS
2-D	RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS SKETCH
2-E	BRIDGE CONSTRUCTION PHASING
2-F	DRAINAGE DITCH DETAILS, EMBANKMENT STABILIZATION DETAIL, PREFORMED SCOUR HOLE DETAIL, AND ROCK PLATING DETAIL
2-G THRU 2-I	DETOUR PLAN SHEETS
2-J	SHEAR POINT DIAGRAM
2-K	ANCHORAGE FOR FRAMES DETAIL
2-L	CONVERT DROP INLET TO JUNCTION BOX DETAIL
2-M	CONVERT OPEN THROAT CATCH BASIN TO DROP INLET DETAIL
2-N	OPEN THROAT CATCH BASIN DETAIL
2-O THRU 2-Z	TEMPORARY SHORING DETAIL
2-AA THRU 2-AB	METHOD OF PIPE INSTALLATION
3	SUMMARY OF QUANTITIES
3-A	GUARDRAIL SUMMARY, EARTHWORK SUMMARY, REMOVAL OF ASPHALT PAVEMENT SUMMARY, TEMPORARY ASPHALT SHOULDER BERM GUTTER SUMMARY, AND SHOULDER BERM GUTTER SUMMARY
3-B THRU 3-C	SUMMARY OF DRAINAGE QUANTITIES
3-D	PARCEL INDEX SHEET
4 THRU 6	PLAN SHEETS
7 THRU 12	PROFILE SHEETS
TCP-1 THRU TCP- 11	TRAFFIC CONTROL PLANS
PCB-1	TEMPORARY ANCHOR UNIT DETAIL
PMP-1 THRU PMP- 4	PAVEMENT MARKING PLANS
SIGN-1 THRU SIGN-12	SIGNING PLANS
UC-1 THRU UC-3	UTILITIES PLANS
EC-1 THRU EC-15	EROSION CONTROL PLANS
X-O	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-40	CROSS-SECTIONS
S-1 THRU S-99	STRUCTURE PLANS

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	
200.03	Method of Clearing - Method III
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.03	Deceleration and Acceleration Lanes
225.05	Method of Obtaining Superelevation - Divided Highways
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
310.02	Parallel Pipe End Section - Precast Concrete Section for 15" to 24" Pipe
310.03	Cross Pipe End Section - Precast Concrete Section for 18" to 30" Pipe
310.04	Parallel Pipe End Section - Prefabricated Steel Section for 15" to 24" Pipe
310.05	Cross Pipe End Section - Prefabricated Steel Section for 18" to 30" Pipe
DIVISION 4 - MAJOR STRUCTURES	
422.10	Reinforced Bridge Approach Fills
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
665.01	Milled Rumble Strips - Asphalt Pavements
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
816.01	Concrete Pads - for Shoulder Drain Installation
816.02	Aggregate Shoulder Drain
816.04	Markers for Drainage Structure and Concrete Pad
840.00	Concrete Base Pad for Drainage Structures
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.19	Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.28	Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.36	Traffic Bearing Grated Drop Inlet - for Steel (840.37) Double Frame and Grates
840.37	Steel Grate and Frame
840.41	Spring Box - Concrete or Brick
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
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
866.02	Woven Wire Fence - with Wood Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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 III.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.05 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. 560.02.

BERM DITCHES:

BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

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 NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

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 CITY OF WINSTON-SALEM WATER LINE

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

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

3/15/06

PROJECT REFERENCE NO.	SHEET NO.
B-4507	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 — 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
- 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.

PROJECT REFERENCE NO.	SHEET NO.
B-4507	1C
Location and Surveys	

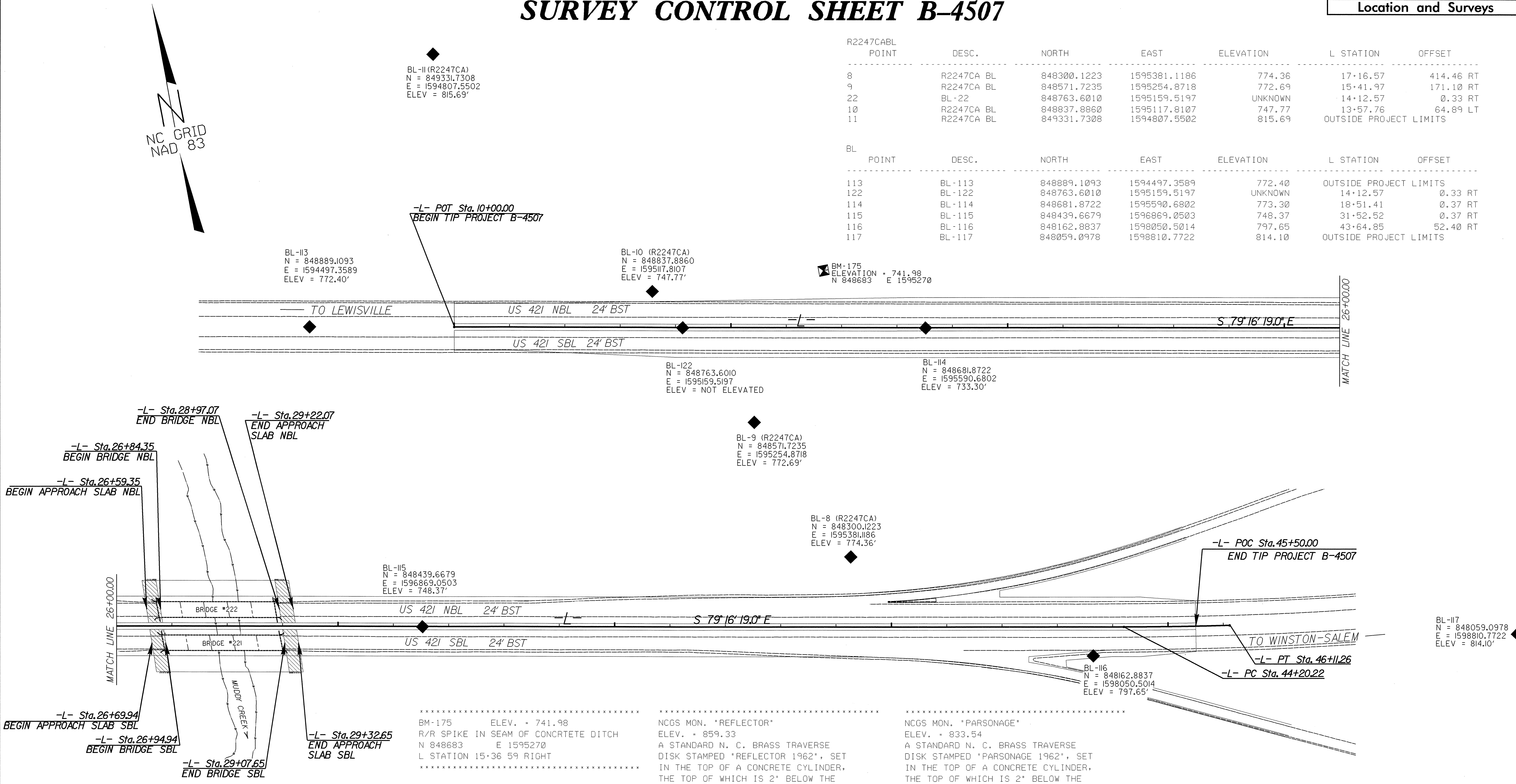
SURVEY CONTROL SHEET B-4507

R2247CABL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
8	R2247CA BL	848300.1223	1595381.1186	774.36	17+16.57	414.46 RT
9	R2247CA BL	848571.7235	1595254.8718	772.69	15+41.97	171.10 RT
22	BL-22	848763.6010	1595159.5197	UNKNOWN	14+12.57	0.33 RT
10	R2247CA BL	848837.8860	1595117.8107	747.77	13+57.76	64.89 LT
11	R2247CA BL	849331.7308	1594807.5502	815.69	OUTSIDE PROJECT LIMITS	

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
113	BL-113	848889.1093	1594497.3589	772.40	OUTSIDE PROJECT LIMITS	
122	BL-122	848763.6010	1595159.5197	UNKNOWN	14+12.57	0.33 RT
114	BL-114	848681.8722	1595590.6802	773.30	18+51.41	0.37 RT
115	BL-115	848439.6679	1596869.0503	748.37	31+52.52	0.37 RT
116	BL-116	848162.8837	1598050.5014	797.65	43+64.85	52.40 RT
117	BL-117	848059.0978	1598810.7722	814.10	OUTSIDE PROJECT LIMITS	



BM-175 ELEV. = 741.98
R/R SPIKE IN SEAM OF CONCRTETE DITCH
N 848683 E 1595270
L STATION 15+36 59 RIGHT

BM-176 ELEV. = 813.65
R/R SPIKE IN THE SEAM WHERE CONCRETE
MEETS ASPHALT SHOULDER ON THE SE
SIDE OF R2247CE Y-25 BRIDGE
N 848069 E 1598747
L STATION 46+11
S 77° 00' 48.7" E DIST 455.97

NCGS MON. "REFLECTOR"
ELEV. = 859.33
A STANDARD N. C. BRASS TRAVERSE
DISK STAMPED "REFLECTOR 1962", SET
IN THE TOP OF A CONCRETE CYLINDER,
THE TOP OF WHICH IS 2" BELOW THE
SURFACE OF THE GROUND.

NCGS MON. "GOUGH"
ELEV. = 843.97
A STANDARD N. C. BRASS TRAVERSE
DISK STAMPED "GOUGH 1970", SET IN
THE TOP OF A CONCRETE CYLINDER ,
THE TOP OF WHICH IS 2" BELOW THE
SURFACE OF THE GROUND.

NCGS MON. "PARSONAGE"
ELEV. = 833.54
A STANDARD N. C. BRASS TRAVERSE
DISK STAMPED "PARSONAGE 1962", SET
IN THE TOP OF A CONCRETE CYLINDER,
THE TOP OF WHICH IS 2" BELOW THE
SURFACE OF THE GROUND.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2247CA-1"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 845150.3566(ft) EASTING: 1590540.0463(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999946001
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2247CA-1" TO -L- STATION 10+00.00 IS
N 48°47'29" E 5601.61
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

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.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/***

   THE FILES TO BE FOUND ARE AS FOLLOWS: R2247CC_LS_CONTROL_DATE.HTML

   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 GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM EXISTING NCGS MONUMENTATION

5/14/09

PROJECT REFERENCE NO.	SHEET NO.
B-4507	2
R/W SHEET NO.	

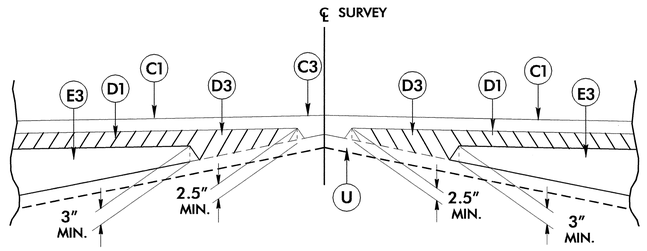
ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY — Jason M Talley — 8-25-09

PAVEMENT DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 13708 ENGINEER CHI CHEN — 8/25/09

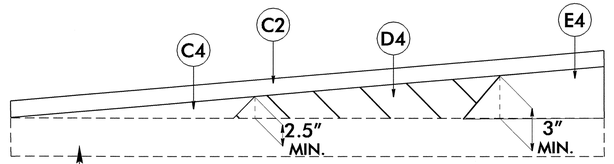
PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

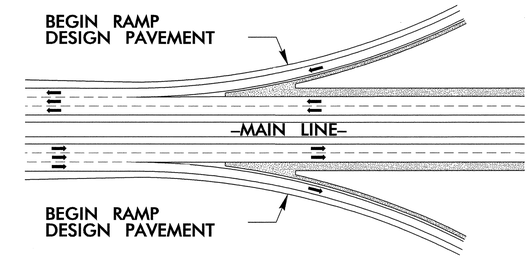
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.
C4	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 LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
D3	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
D4	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. 10½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 599 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
E4	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.
R1	CONCRETE SHOULDER BERM GUTTER
R2	TEMPORARY ASPHALT SHOULDER BERM GUTTER (TO BE USED DURING DETOUR STAGE OF PROJECT AND THEN REMOVED AND REPLACED WITH CONCRETE SHOULDER BERM GUTTER-SEE PAVEMENT SCHEDULE SECTION R1. CONSTRUCT TEMPORARY ASPHALT SHOULDER BERM GUTTER USING S9.5C)
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILL ASPHALT PAVEMENT (VAR. DEPTH) *MILL OUT TEMPORARY ASPHALT SHOULDER BERM GUTTER DURING FINAL CONSTRUCTION PHASE.
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING-1 DETAIL)
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING-2 DETAIL)



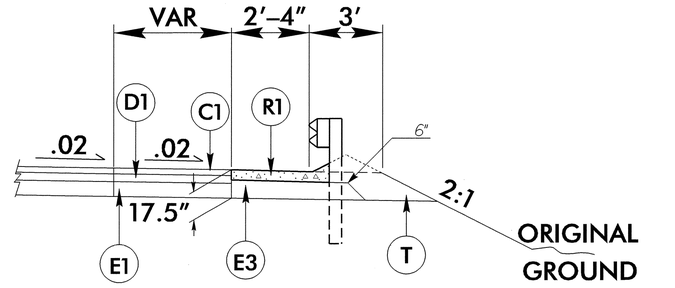
Detail Showing Method of Wedging–1



Wedging–2 Detail For Resurfacing



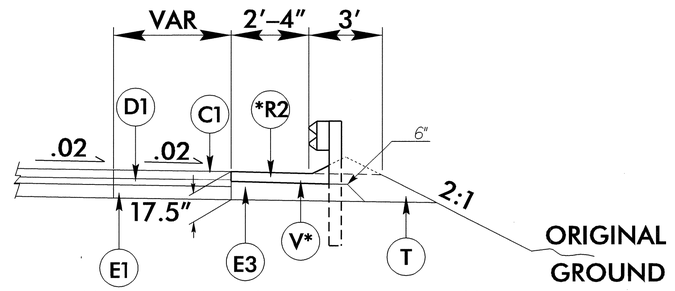
DETAIL SHOWING LIMITS OF PAVEMENT DESIGN, See Typical Sections



Detail Showing Paved Shoulder in Relation to Guardrail

USE SHOULDER BERM GUTTER FOR THE FOLLOWING:

–L– STA 18+47.63 TO –L– STA 26+79.90 (RT.)
–L– STA 29+41.67 TO –L– STA 31+23.29 (RT.)
–L– STA 19+80.93 TO –L– STA 26+50.40 (LT.)
–L– STA 29+13.11 TO –L– STA 33+55.67 (LT.)



USE TEMPORARY ASPHALT SHOULDER BERM GUTTER FOR THE FOLLOWING:

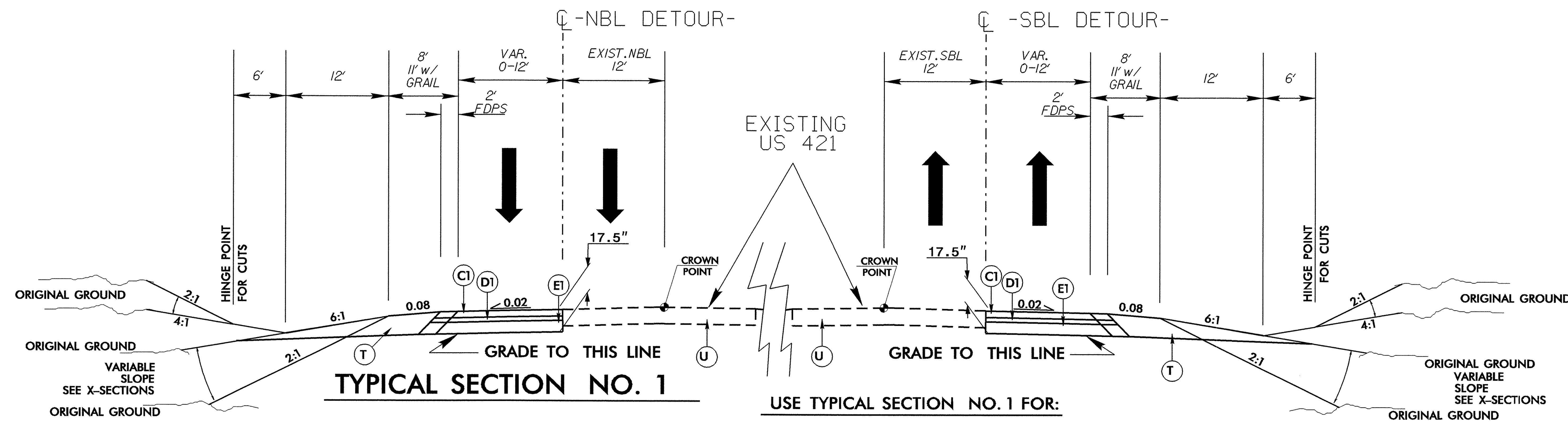
–SBLDET– STA 16+49.53 TO –SBLDET– STA 24+79.94
–SBLDET– STA 27+42.72 TO –SBLDET– STA 29+23.84
–NBLDET– STA 17+82.71 TO –NBLDET– STA 24+51.45
–NBLDET– STA 27+14.16 TO –NBLDET– STA 31+54.97

*NOTE: MILL OFF TEMPORARY ASPHALT SBG WHEN REPLACING W/CONCRETE SBG

PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-A
RW SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY — 8-19-09

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 13368 ENGINEER DON CHI CHEN — 8/21/09

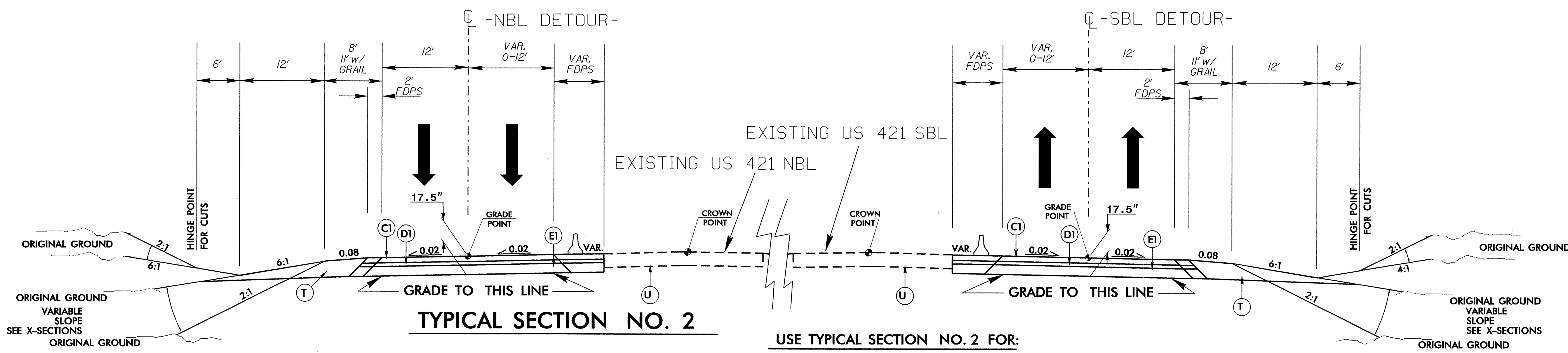


TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 FOR:

-NBLDET- STA 12+63.12 TO STA 14+88.37
-SBLDET- STA 12+13.39 TO STA 14+22.03

-NBLDET- STA 32+47.74 TO STA 35+23.67
-SBLDET- STA 33+31.58 TO STA 36+18.37

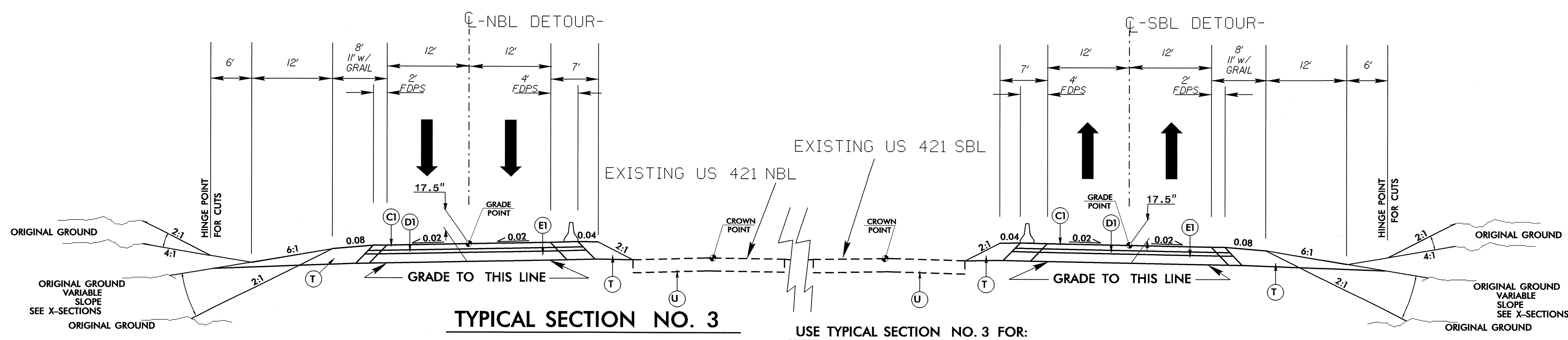


TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 FOR:

-NBLDET- STA 14+88.37 TO STA 19+00.96
-SBLDET- STA 14+22.03 TO STA 18+00.94

-NBLDET- STA 30+57.16 TO STA 32+47.74
-SBLDET- STA 29+51.01 TO STA 33+31.58



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3 FOR:

-NBLDET- STA 19+00.96 TO STA 24+78.53 (BEGIN BRIDGE)
-SBLDET- STA 18+00.94 TO STA 25+02.86 (BEGIN BRIDGE)

-NBLDET- STA 26+91.24 (END BRIDGE) TO STA 30+57.16
-SBLDET- STA 27+15.57 (END BRIDGE) TO STA 29+51.01

NOTE: SEE PHASES 1 & 2 OF THE STAGED CONSTRUCTION ON SHEET 2-E, FOR NBL & SBL DETOUR BRIDGE TYPICAL SECTIONS

SEE SHEET 2 FOR FULL PAVEMENT SCHEDULE WITH PLACEMENT INSTRUCTIONS

PAVEMENT SCHEDULE

(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 3" ASPHALT SURFACE COURSE TYPE S9.5C
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0C
E1	PROP. APPROX. 10½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C
T	EARTH MATERIAL
U	EXIST. PAVEMENT

5/14/99

18-AUG-2009 14:54
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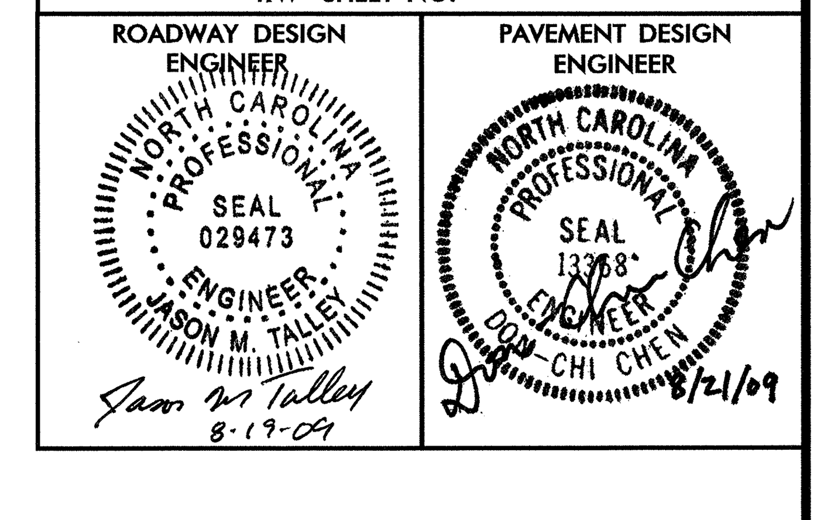
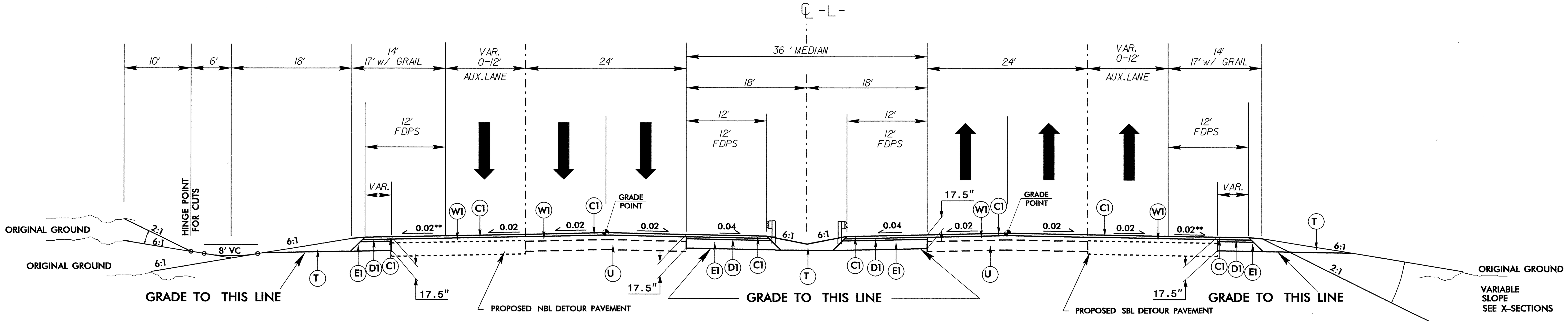
PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER





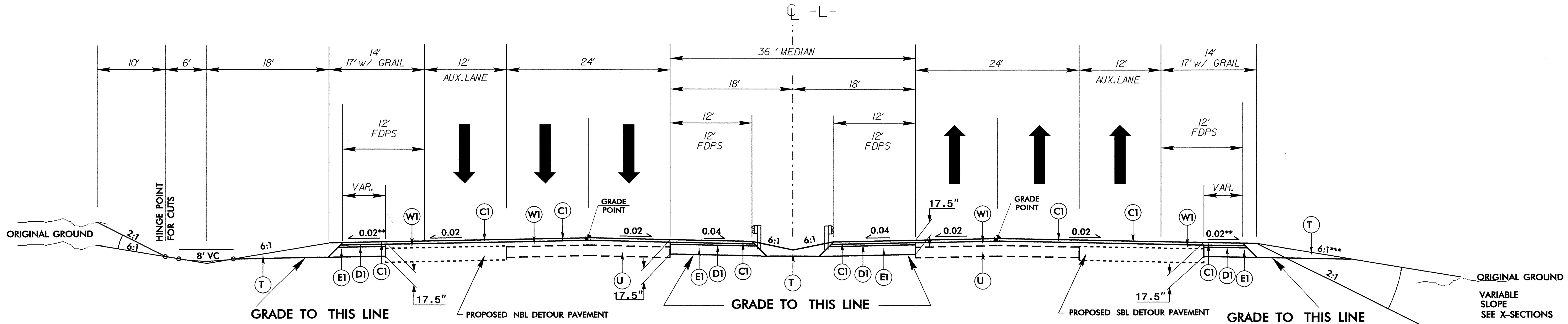
TYPICAL SECTION NO. 4

**NOTE: NON-STANDARD SHOULDER CROSS SLOPES

**NOTE: NON-STANDARD SHOULDER CROSS SLOPES

USE TYPICAL SECTION NO. 4 FOR:

L-LT: -L- STA. 10+00.00 TO STA. 18+20.00 L-LT: -L- STA. 39+60.00 TO STA. 45+50.00
L-RT: -L- STA. 10+00.00 TO STA. 14+00.00 L-RT: -L- STA. 40+50.00 TO STA. 45+50.00



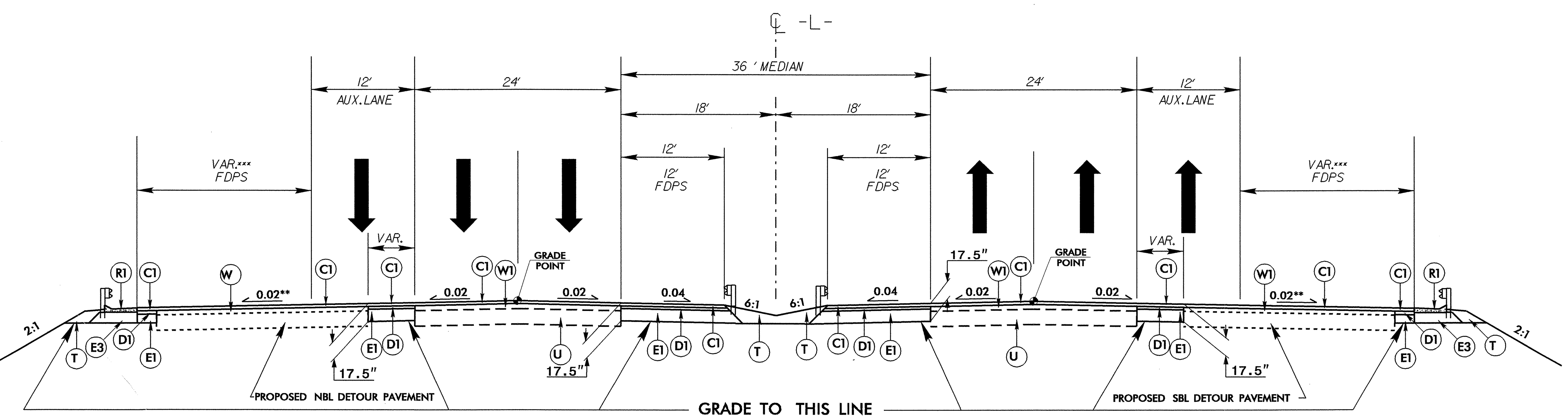
TYPICAL SECTION NO. 5

**NOTE: NON-STANDARD SHOULDER CROSS SLOPES

**NOTE: NON-STANDARD SHOULDER CROSS SLOPES
***NOTE: SLOPES MAY BE FLATTER THAN 6:1 WHEN GRADING TO EXISTING DETOUR EOP AND TO EXISTING SHOULDER BREAK POINTS.

USE TYPICAL SECTION NO. 5 FOR:

L-LT: -L- STA. 18+20.00 TO STA. 20+00.88 L-LT: -L- STA. 32+77.88 TO STA. 39+60.00
L-RT: -L- STA. 14+00.00 TO STA. 19+25.15 L-RT: -L- STA. 30+97.22 TO STA. 40+50.00



TYPICAL SECTION NO. 6

**NOTE: NON-STANDARD SHOULDER CROSS SLOPES
***NOTE: PAVED SHOULDER WIDTH VARIES IN BRIDGE TAPER AREA. (SEE DETAIL SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT-SHEET 2-D)

**NOTE: NON-STANDARD SHOULDER CROSS SLOPES
***NOTE: PAVED SHOULDER WIDTH VARIES IN BRIDGE TAPER AREA. (SEE DETAIL SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT-SHEET 2-D)

USE TYPICAL SECTION NO. 6 FOR:

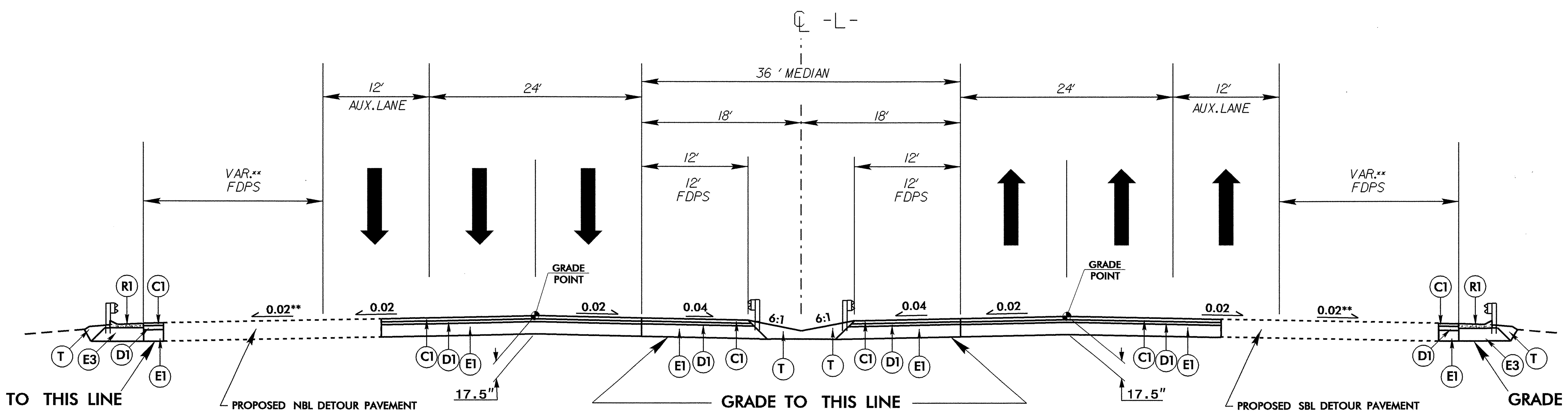
L-LT : -L- STA. 20+00.88 TO STA. 25+29.24 L-LT: -L- STA. 30+50 TO STA. 32+77.88
L-RT: -L- STA. 19+25.15 TO STA. 25+38.76 L-RT: -L- STA. 30+55 TO STA. 30+97.22

SEE SHEET 2 FOR FULL PAVEMENT SCHEDULE WITH PLACEMENT INSTRUCTIONS

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 3" ASPHALT SURFACE COURSE TYPE S9.5C
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0C
E1	PROP. APPROX. 10½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE TYPE B25.0C
R1	CONCRETE SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W1	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING-1 DETAIL-SHT 2)

PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-C
RW SHEET NO.	

ROADWAY DESIGN ENGINEER — PAVEMENT DESIGN ENGINEER



**NOTE: NON-STANDARD SHOULDER CROSS SLOPES
**NOTE: PAVED SHOULDER WIDTH VARIES IN BRIDGE TAPER AREA.
(SEE DETAIL SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT-SHEET 2-D)

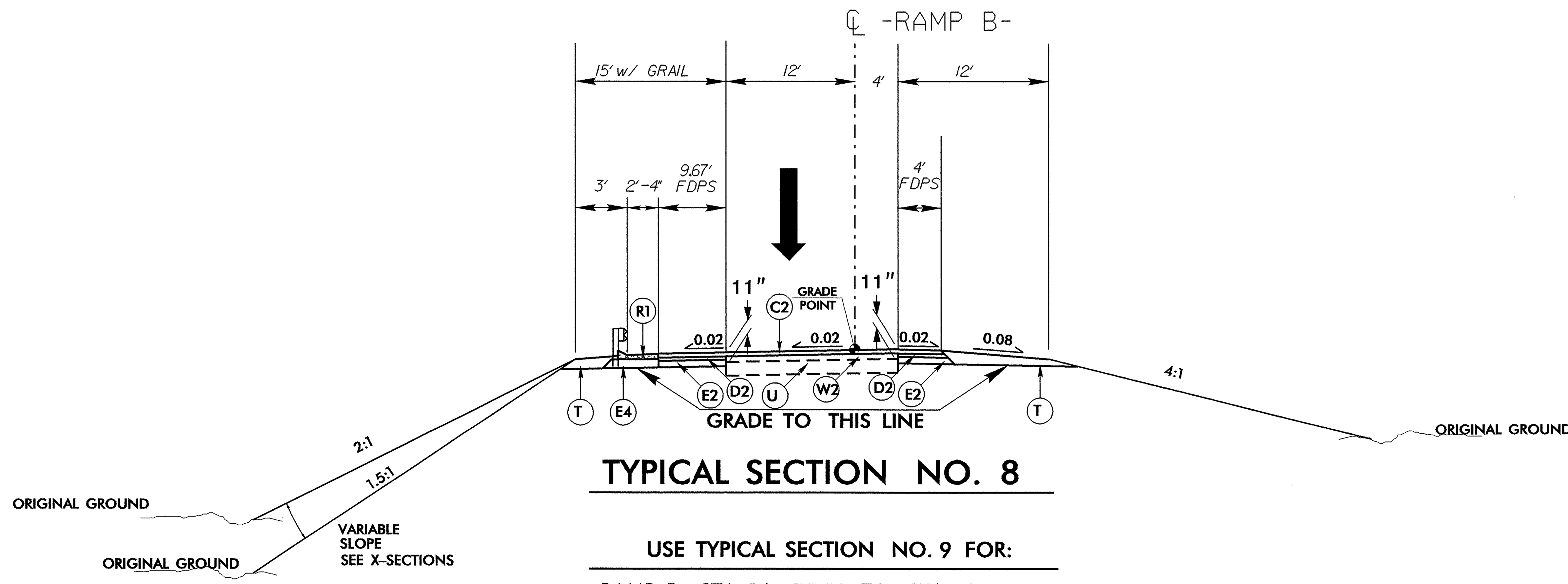
**NOTE: NON-STANDARD SHOULDER CROSS SLOPES
**NOTE: PAVED SHOULDER WIDTH VARIES IN BRIDGE TAPER AREA.
(SEE DETAIL SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT-SHEET 2-D)

TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7 FOR:

L-LT : -L- STA. 25+29.24 TO STA. 26+84.35 (BEGIN BRIDGE)
L-RT: -L- STA. 25+38.76 TO STA. 26+94.94 (BEGIN BRIDGE)

L-LT: -L- STA. 28+97.07 (END BRIDGE) TO STA. 30+50
L-RT: -L- STA. 29+07.65 (END BRIDGE) TO STA. 30+55

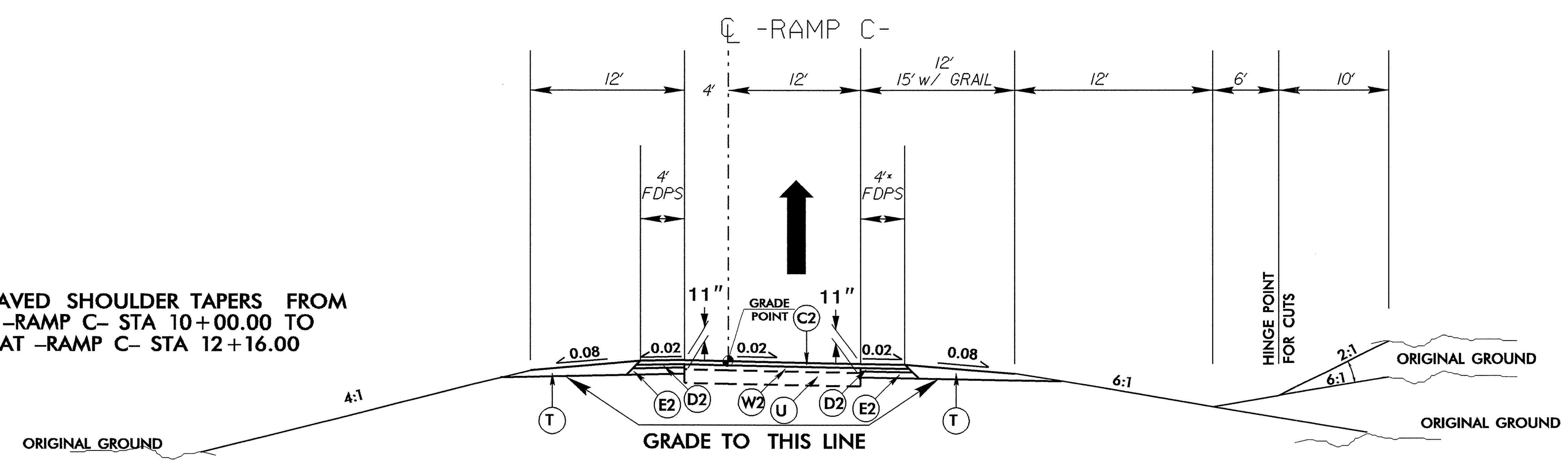


TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 9 FOR:

-RAMP B- STA. 14+50.00 TO STA. 18+00.00

*NOTE: PAVED SHOULDER TAPERS FROM
12' AT -RAMP C- STA 10+00.00 TO
4' AT -RAMP C- STA 12+16.00



TYPICAL SECTION NO. 9

USE TYPICAL SECTION NO. 10 FOR:

-RAMP C- STA. 14+85.00 TO STA. 19+00.00

SEE SHEET 2 FOR FULL PAVEMENT SCHEDULE WITH PLACEMENT INSTRUCTIONS

PAVEMENT SCHEDULE
(FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 3" ASPHALT SURFACE COURSE TYPE S9.5C
C2	PROP. APPROX. 3" ASPHALT SURFACE COURSE TYPE S9.5B
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0C
D2	PROP. APPROX. 3" ASPHALT CONCRETE INTERMEDIATE COURSE TYPE I19.0B
E1	PROP. APPROX. 10½" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C
E2	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE TYPE B25.0C
E4	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE TYPE B25.0B
R1	CONCRETE SHOULDER BERM GUTTER
T	EARTH MATERIAL
U	EXIST. PAVEMENT
W2	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING-2 DETAIL-SHT 2)

5/14/99

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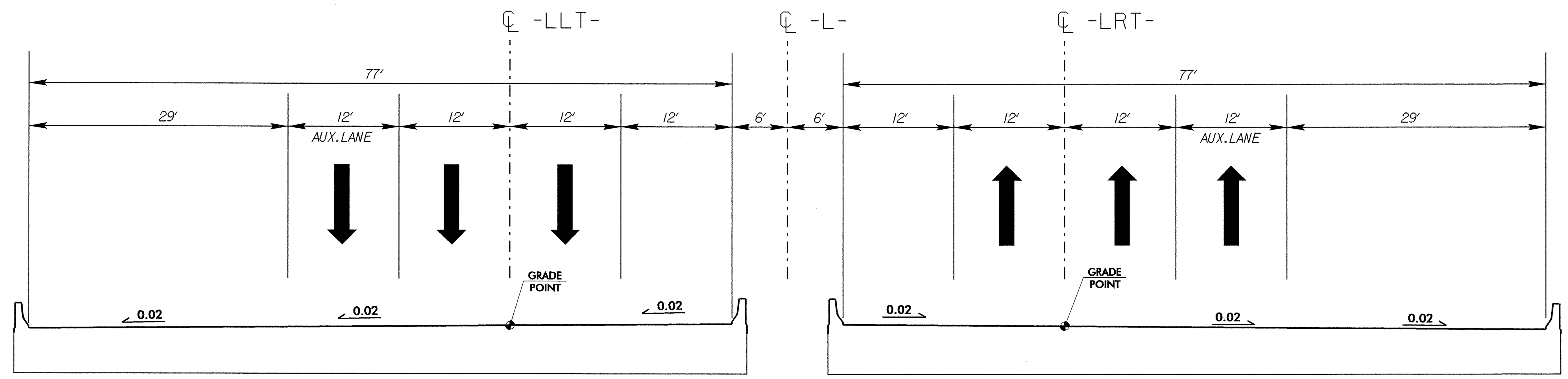
PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY — Jason M. Talley 8-19-09	NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN R. MORGAN — 8-21-09

5/14/99

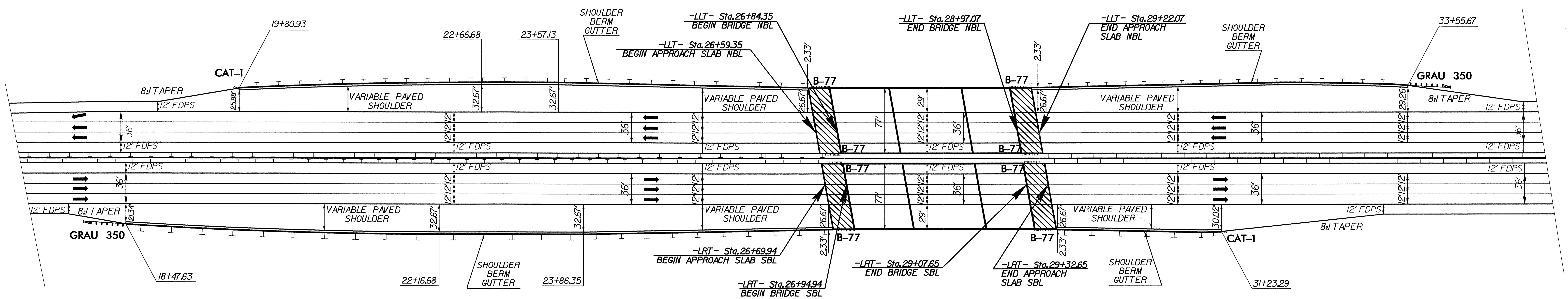


TYPICAL SECTION ON BRIDGE

TYPICAL SECTION NO. 10

USE TYPICAL SECTION ON BRIDGE FOR:

L-LT: -L- STA 26+84.35 TO STA 28+97.07
L-RT: -L- STA 26+94.94 TO STA 29+07.65



SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND SHOULDERS

DETAIL OF PAVED SHOULDER AND SHOULDER BERM GUTTER

18-AUG-2009 11:59
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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-E
R/W SHEET NO.	

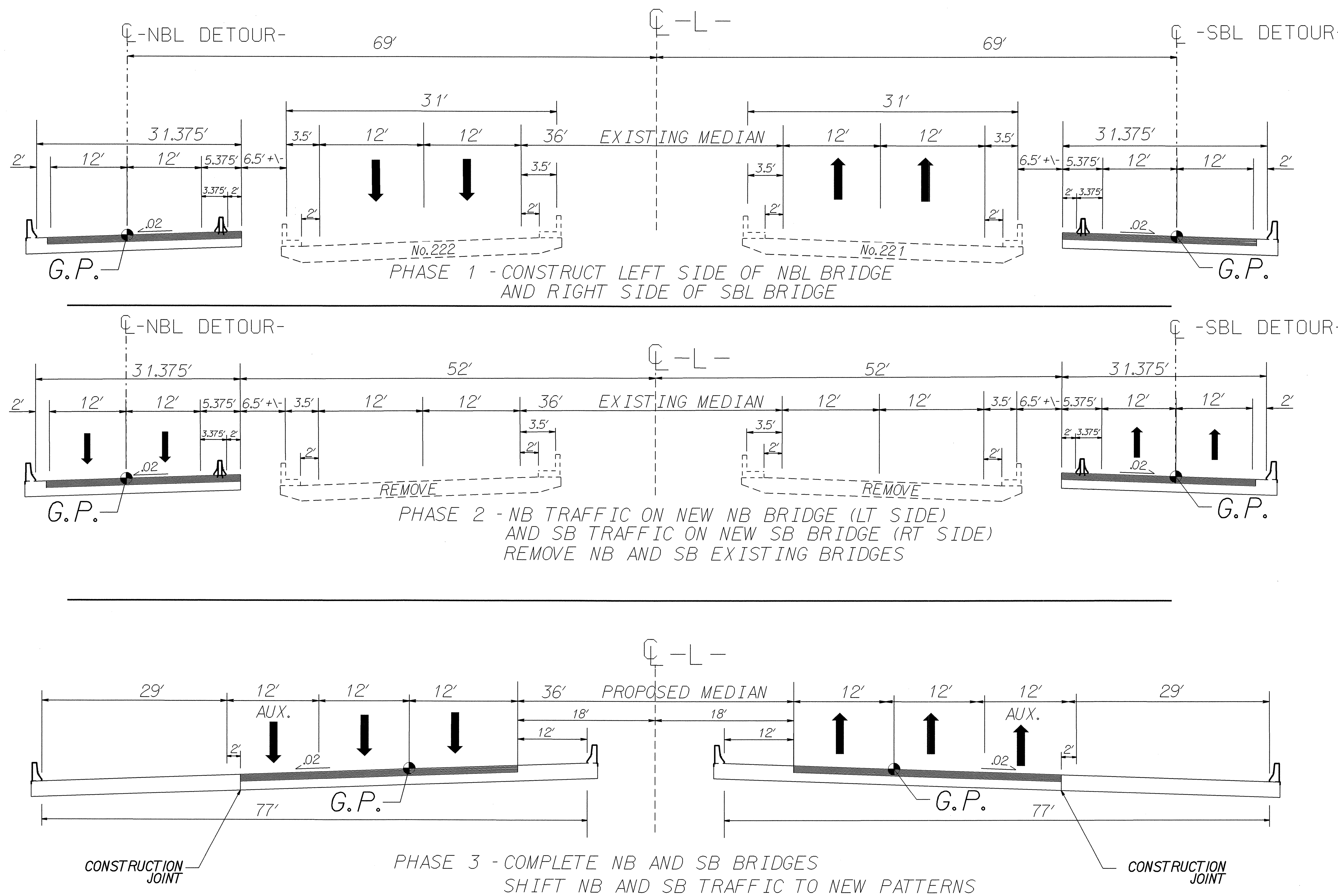
ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

8-19-09

TYPICAL SECTION AND CONSTRUCTION PHASING

FOR BRIDGES No.221 AND No.222 ON US421, OVER MUDDY CREEK



5/14/99

18-AUG-2009 11:59
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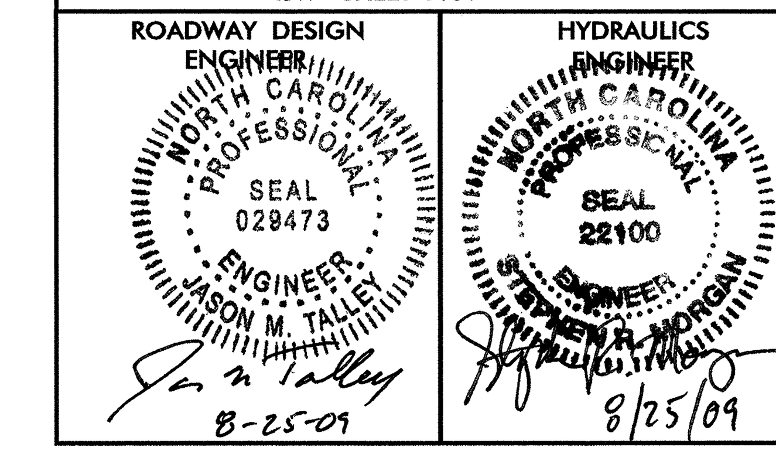
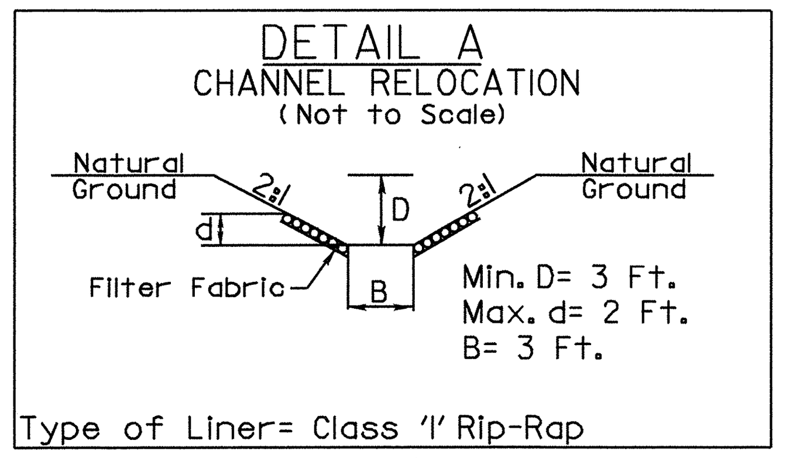
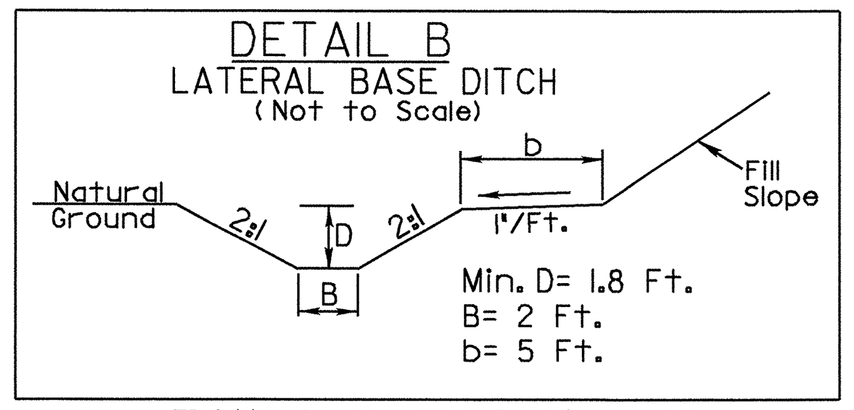
PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-F

R/W SHEET NO.

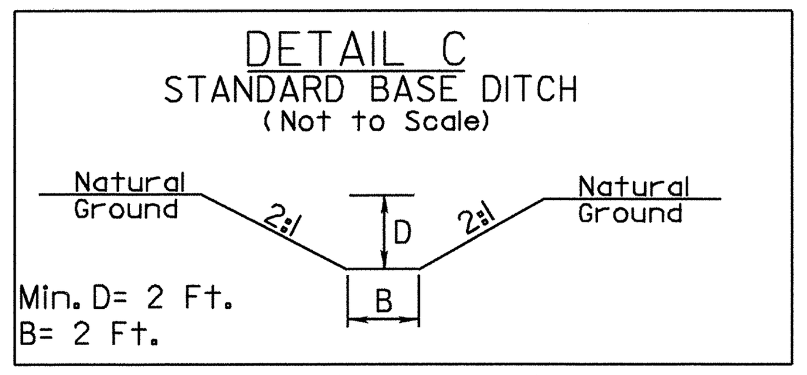




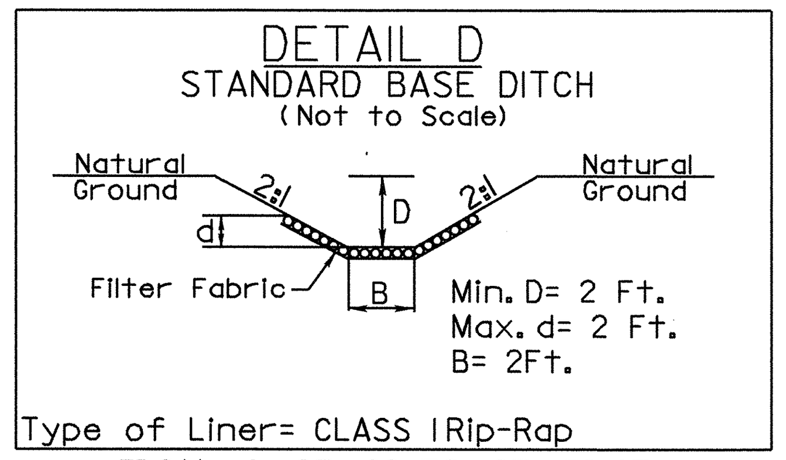
RT OF -L- STA 20+00



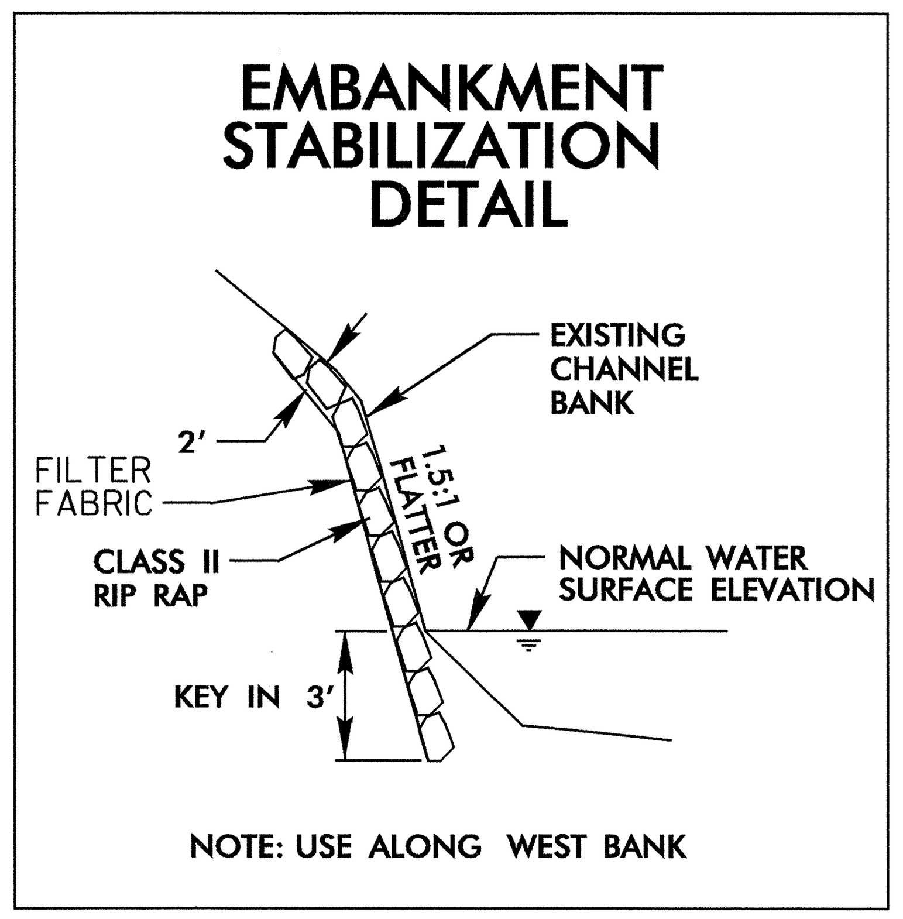
FROM -L- 21+00 TO 26+50 LT.



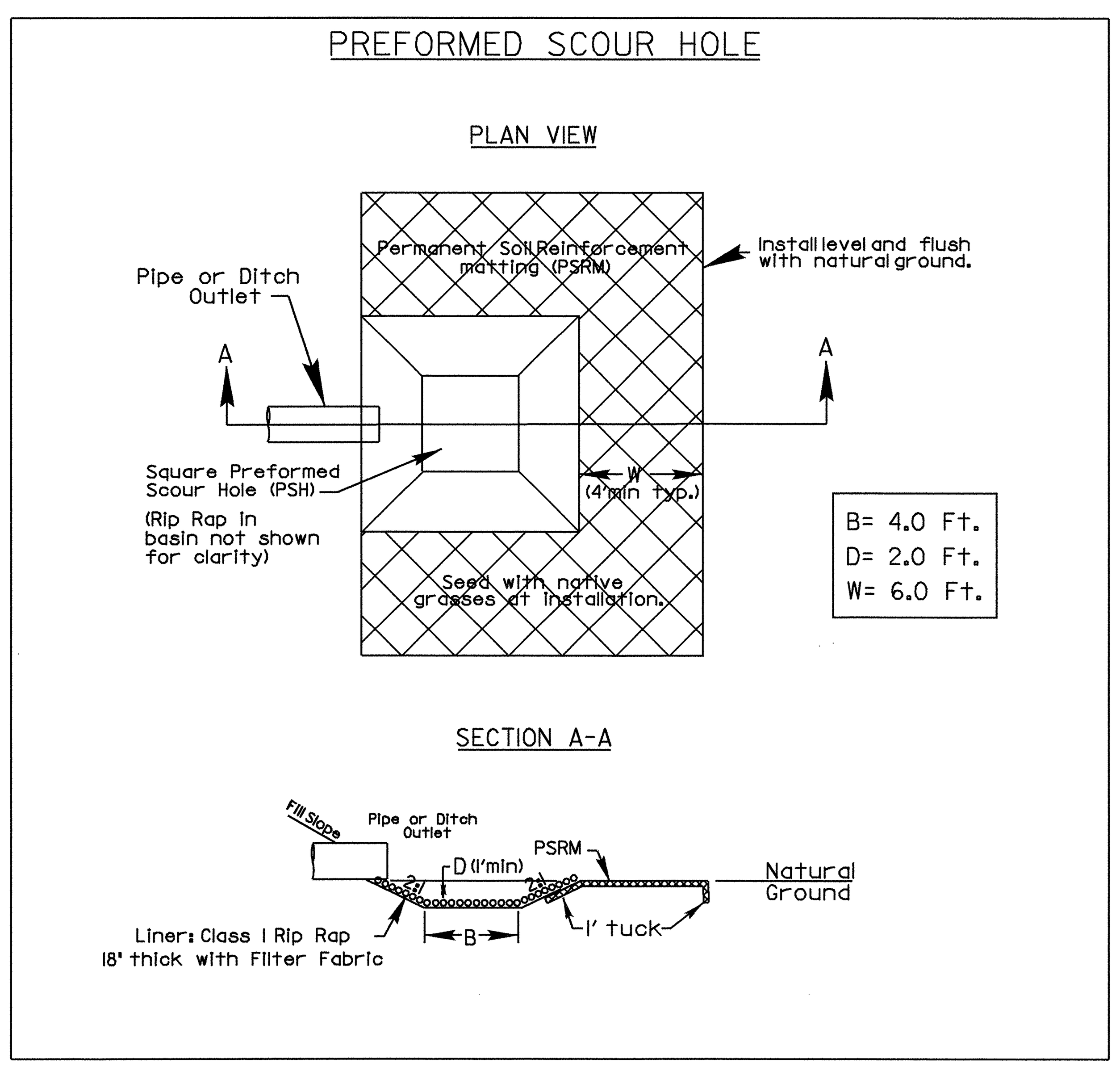
FROM -L- 26+50 TO 26+92 LT.



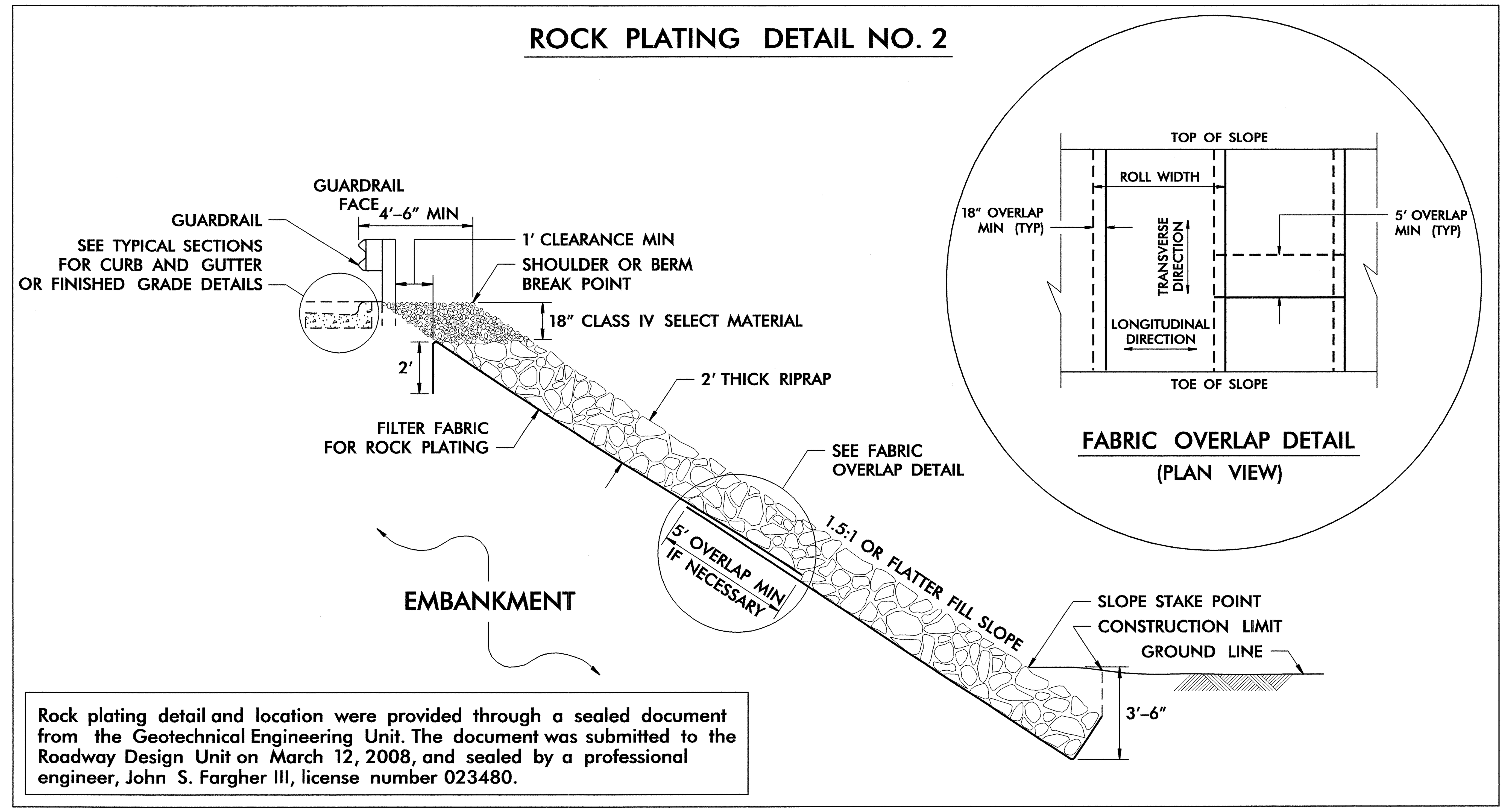
FROM -L- 27+22 TO 27+50 LT.



FROM -L- STA. 27+54 TO -L- STA. 27+79



RT. of -L- 30+43
LT. of -L- 31+00



USE ROCK PLATING DETAIL NO. 2
AT THE FOLLOWING LOCATIONS:

RAMPB STA 14+50.00 ± TO RAMPB STA 17+00.00 ±
EXTEND ROCK PLATING LIMITS TO 3:1 SLOPES.

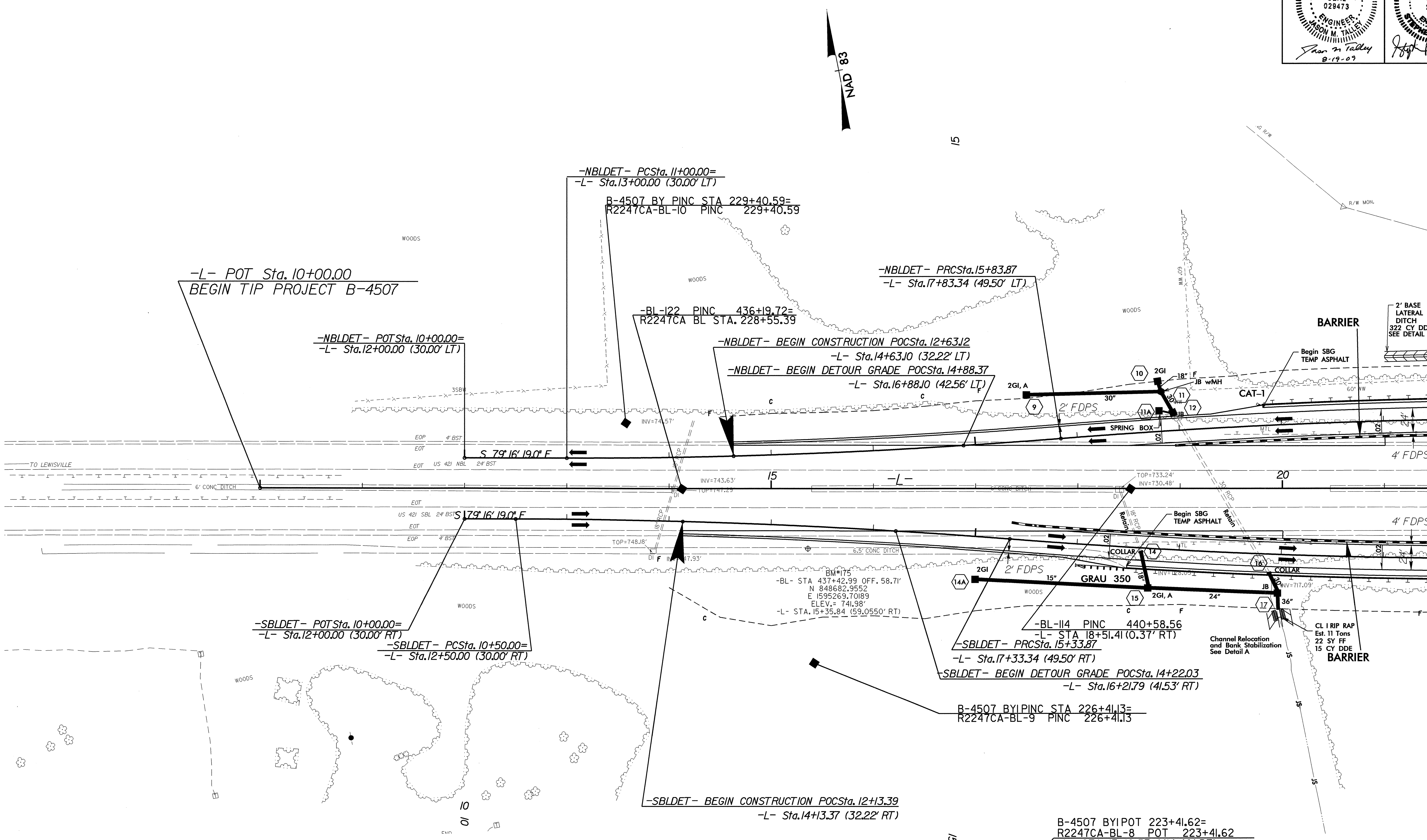
5/14/99

25-AUG-2009 11:30 r:\hydraulics\b4507_rdy_typ.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-G
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 029473 JASON M. TALLEY 8-19-09	SEAL 22100 STEPHEN R. MORGAN 8-21-09

**DETAIL OF ON-SITE DETOURS

SEE TRAFFIC CONTROL PLANS FOR PORTABLE CONCRETE BARRIER LOCATIONS



NAD 83
-NBLDET- PCSta. 11+00.00=
-L- Sta.13+00.00 (30.00' LT)
B-4507 BY PINC STA 229+40.59=
R2247CA-BL-10 PINC 229+40.59
-L- POT Sta. 10+00.00
BEGIN TIP PROJECT B-4507
-NBLDET- PRCSta.15+83.87
-L- Sta.17+83.34 (49.50' LT)
-BL-122 PINC 436+19.72=
R2247CA BL STA. 228+55.39
-NBLDET- POTSta. 10+00.00=
-L- Sta.12+00.00 (30.00' LT)
-NBLDET- BEGIN CONSTRUCTION POCSta. 12+63.12
-L- Sta.14+63.10 (32.22' LT)
-NBLDET- BEGIN DETOUR GRADE POCSta. 14+88.37
-L- Sta.16+88.10 (42.56' LT)
BARRIER
2' BASE LATERAL DITCH 322 CY DDE SEE DETAIL B
Begin SBG TEMP ASPHALT
2GI, A
2GI
JB wMH
CAT-1
2' FDPS
SPRING BOX
4' FDPS
S 79° 16' 19.0" E
TO LEWISVILLE
US 421 NBL
US 421 SBL
6' CONC DITCH
-L-
15
20
S 79° 16' 19.0" E
Begin SBG TEMP ASPHALT
COLLAR
GRAU 350
2GI, A
WOODS
BM#175
-BL- STA 437+42.99 OFF. 58.71'
N 848682.9552
E 1595269.70189
ELEV.= 741.98'
-L- STA. 15+35.84 (59.0550' RT)
-SBLDET- POTSta. 10+00.00=
-L- Sta.12+00.00 (30.00' RT)
-SBLDET- PCSta. 10+50.00=
-L- Sta.12+50.00 (30.00' RT)
-BL-114 PINC 440+58.56
-L- STA 18+51.41 (0.37' RT)
-SBLDET- PRCSta. 15+33.87
-L- Sta.17+33.34 (49.50' RT)
-SBLDET- BEGIN DETOUR GRADE POCSta. 14+22.03
-L- Sta.16+21.79 (41.53' RT)
Channel Relocation and Bank Stabilization See Detail A
CL I RIP RAP Est. 11 Tons 22 SY FF 15 CY DDE
BARRIER
B-4507 BY1 PINC STA 226+41.13=
R2247CA-BL-9 PINC 226+41.13
-SBLDET- BEGIN CONSTRUCTION POCSta. 12+13.39
-L- Sta.14+13.37 (32.22' RT)
B-4507 BY1 POT 223+41.62=
R2247CA-BL-8 POT 223+41.62
-L- STA. 17+16.57 (414.46' RT)
MATCH LINE SHEET 2-H -L- STA 21+50

-NBLDET-

PI Sta 13+42.06	PI Sta 18+25.93
Δ = 4° 37' 14.1" (LT)	Δ = 4° 37' 14.1" (RT)
D = 0° 57' 17.7"	D = 0° 57' 17.7"
L = 483.87'	L = 483.87'
T = 242.06'	T = 242.06'
R = 6,000.00'	R = 6,000.00'
SE = .02	SE = .02 (REVERSED)

-SBLDET-

PI Sta 12+92.06	PI Sta 17+75.93
Δ = 4° 37' 14.1" (RT)	Δ = 4° 37' 14.1" (LT)
D = 0° 57' 17.7"	D = 0° 57' 17.7"
L = 483.87'	L = 483.87'
T = 242.06'	T = 242.06'
R = 6,000.00'	R = 6,000.00'
SE = .02	SE = .02 (REVERSED)

NOTES:

FOR -L- PLANS, SEE SHEETS NO. 4 THRU NO. 6

FOR DETOUR PROFILES, SEE SHEETS NO. 11 & NO. 12

SEE SHEET 2-F FOR DITCH DETAILS

REVISIONS

8/17/99

18-AUG-2009 11:58 b4507_rdy_psh_det 2-g.dgn

**DETAIL OF ON-SITE DETOURS

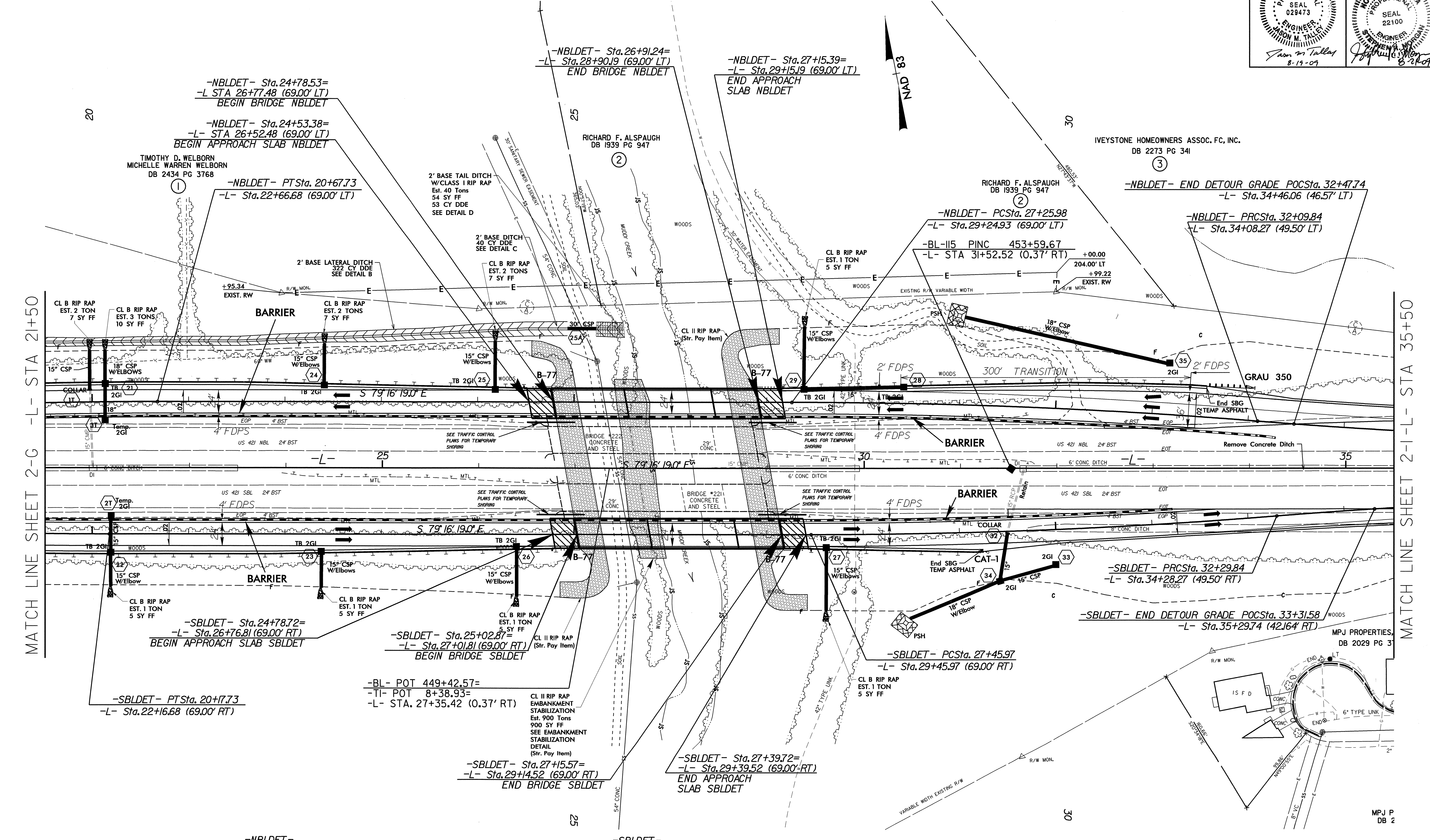
SEE TRAFFIC CONTROL PLANS FOR PORTABLE CONCRETE BARRIER LOCATIONS

SEE DETAIL SHEET PCB-1 FOR TEMPORARY ANCHOR UNITS FOR THE PORTABLE CONCRETE BARRIER AND EXISTING BRIDGE

PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-H
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029473 JASON M. TALLEY 8-19-09	NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22100 STEPHEN R. MORGAN 8-20-09

8/17/99

REVISIONS



-NBLDET-		
PI Sta 18+25.93	PI Sta 29+68.04	PI Sta 34+51.91
Δ = 4° 37' 14.1" (RT)	Δ = 4° 37' 14.1" (RT)	Δ = 4° 37' 14.1" (LT)
D = 0° 57' 17.7"	D = 0° 57' 17.7"	D = 0° 57' 17.7"
L = 483.87'	L = 483.87'	L = 483.87'
T = 242.06'	T = 242.06'	T = 242.06'
R = 6,000.00'	R = 6,000.00'	R = 6,000.00'
SE = .02 (REVERSE)	SE = .02 (REVERSE)	SE = .02

-SBLDET-		
PI Sta 17+75.93	PI Sta 29+88.04	PI Sta 34+71.91
Δ = 4° 37' 14.1" (LT)	Δ = 4° 37' 14.1" (LT)	Δ = 4° 37' 14.1" (RT)
D = 0° 57' 17.7"	D = 0° 57' 17.7"	D = 0° 57' 17.7"
L = 483.87'	L = 483.87'	L = 483.87'
T = 242.06'	T = 242.06'	T = 242.06'
R = 6,000.00'	R = 6,000.00'	R = 6,000.00'
SE = .02 (REVERSE)	SE = .02 (REVERSE)	SE = .02

NOTES:

FOR -L- PLANS, SEE SHEETS NO. 4 THRU NO. 6
FOR DETOUR PROFILES, SEE SHEETS NO. 11 & NO. 12
BRIDGE APPROACH SLAB
FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-99
SEE SHEET 2-F FOR DITCH DETAILS

18-AUG-2009 11:57
b4507_rdy_psh_det 2-h.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY — Jason M Talley — 8-19-09

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN G. MORTON — 8-21-09

REVISIONS

8/17/99

**DETAIL OF ON-SITE DETOURS

SEE TRAFFIC CONTROL PLANS FOR PORTABLE CONCRETE BARRIER LOCATIONS

NAD 83

-NBLDET- END CONSTRUCTION Sta. 35+23.67
-L- Sta. 37+21.75 (32.40' LT)

-NBLDET- PT Sta. 36+93.71=
-L- Sta. 38+91.61 (30.00' LT)

-NBLDET- POT Sta. 38+52.10=
-L- Sta. 40+50.00 (30.00' LT)

IVEYSTONE HOMEOWNERS ASSOC. FC, INC.
DB 2273 PG 341
(3)

NOTE: ACQUIRED UNDER R2247CA

MATCH LINE SHEET 2-H -L- STA 35+50

-L- POC Sta. 45+50.00
END TIP PROJECT B-4507

-SBLDET- POT Sta. 38+53.71
-L- Sta. 40+51.61 (30.00 RT)

-SBLDET- PT Sta. 37+13.71
-L- Sta. 39+11.61 (30.00' RT)

-SBLDET- END CONSTRUCTION Sta. 36+18.37
-L- Sta. 38+16.43 (30.47' RT)

-L- PT Sta. 46+11.26

-L- PC Sta. 44+20.22

-BL-116 PINC 465+73.11
-L- STA 43+64.85 (52.40' RT)

RICHARD SCOTT WHEELING DB 434 PG
ANDREW S. PATTON JULIA B. PATTON DB 2601 PG 127
MPJ PROPERTIES, LLC DB 2029 PG 3745
THOMAS MCKIERNAN AND WIFE ANNE MCKIERNAN DB 2206 PG 1023
MPJ PROPERTIES, LLC DB 2029 PG 3745

ABANDONED NCDOT DYNAMIC TRAFFIC SIGN

NCDOT TRAFFIC CAMERA MOUNTED ON UTILITY POLE

TO WINSTON SALEM

CHARLOTTE COURT

CAMERON WAY COURT

-NBLDET-	-SBLDET-	-L-
PI Sta 34+51.91	PI Sta 34+71.91	PI Sta 45+15.74
Δ = 4° 37' 14.1" (LT)	Δ = 4° 37' 14.1" (RT)	Δ = 1° 44' 14.7" (LT)
D = 0° 57' 17.7"	D = 0° 57' 17.7"	D = 0° 54' 34.0"
L = 483.87'	L = 483.87'	L = 191.04'
T = 242.06'	T = 242.06'	T = 95.53'
R = 6,000.00'	R = 6,000.00'	R = 6,300.00'
SE = .02	SE = .02	SE = .02
		INC = 40'
		RO = 80'

NOTES:

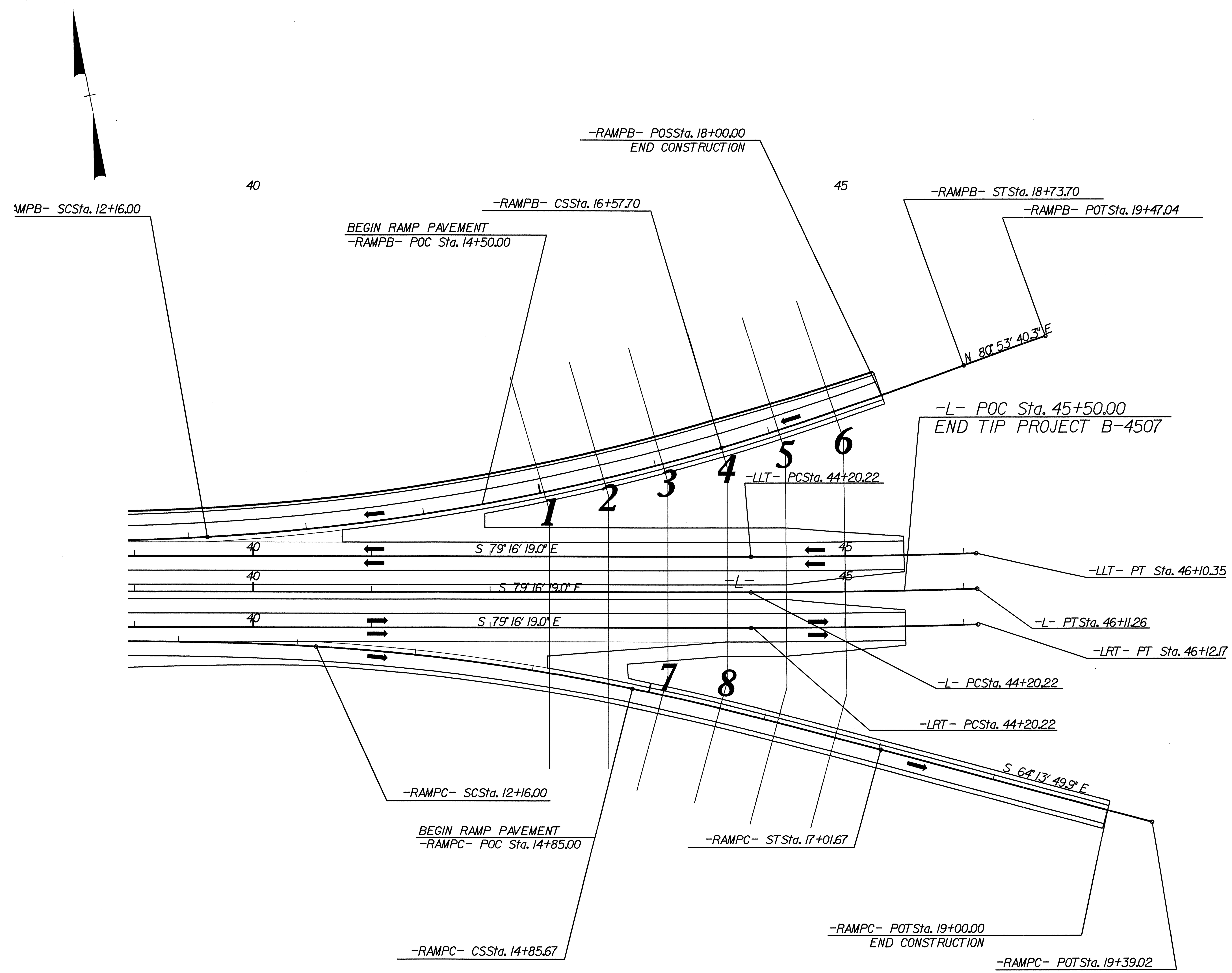
FOR -L- PLANS, SEE SHEETS NO. 4 THRU NO. 6

FOR DETOUR PROFILES, SEE SHEETS NO. 11 & NO. 12

18-AUG-2009 11:57
c:\projects\4507\4507_rdy_psh_det 2-1.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-J
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 029473 NORTH CAROLINA PROFESSIONAL ENGINEER JASON M. TALLEY — 8-19-09	N/A

SHEAR POINT DIAGRAM



5/14/99

18-AUG-2009 11:56

PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-K

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

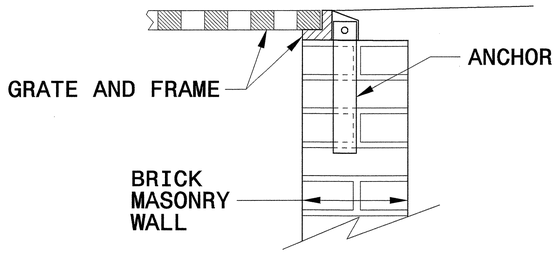
ENGLISH DETAIL DRAWING FOR

ANCHORAGE FOR FRAMES

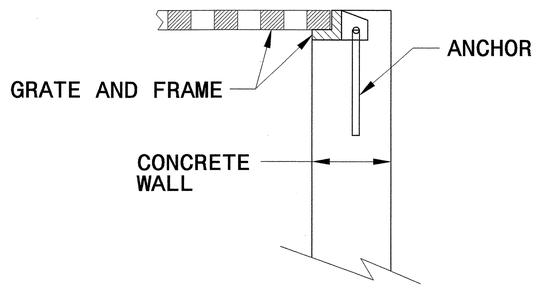
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1

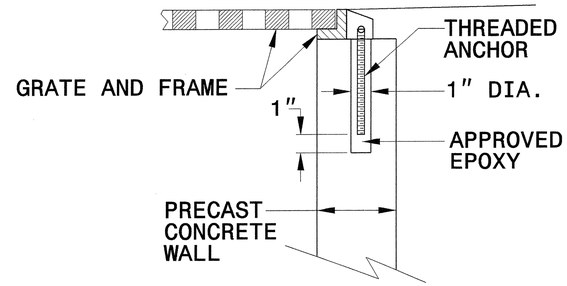
840D25



BRICK MASONRY CONSTRUCTION



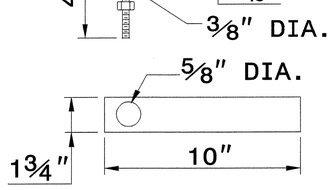
CONCRETE CONSTRUCTION



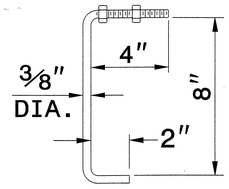
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

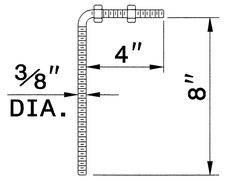
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



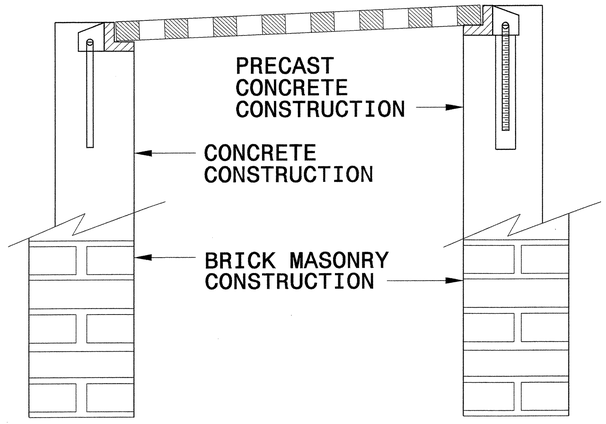
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



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

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

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL C. HOWERTON
9/25/09

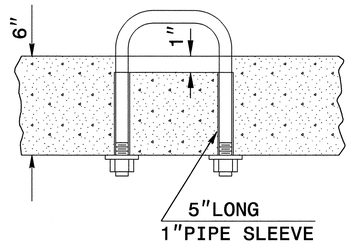
PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

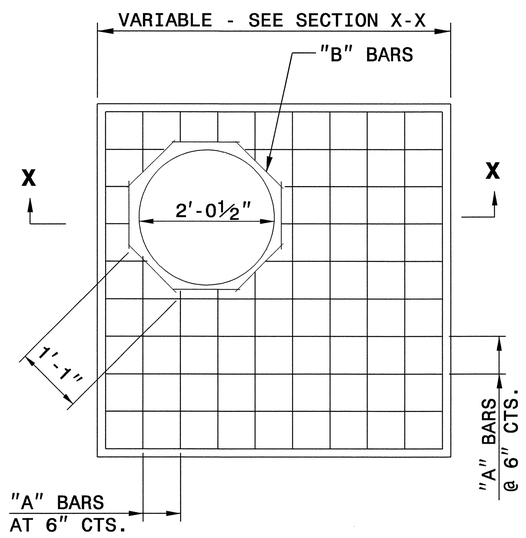
ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06
MODIFIED BY: E.E. WARD DATE: 9/25/06
CHECKED BY: DATE: 11/1/06
FILE SPEC.:

$$$$USERNAME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$
$$$$TIME$$$$

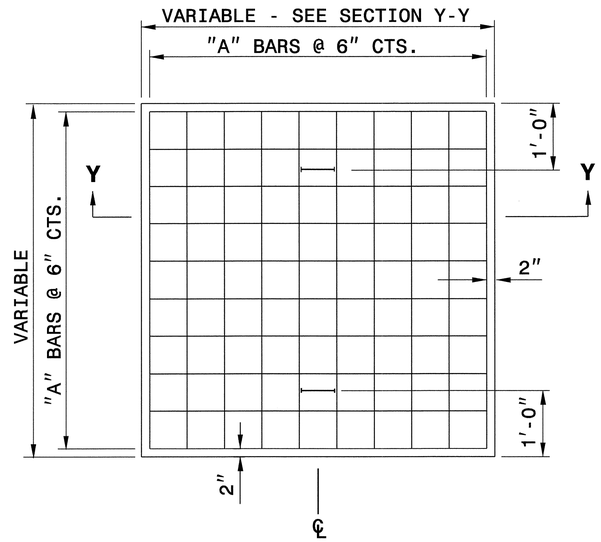
PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-L



PARTIAL SECTION



PLAN



PLAN

GENERAL NOTES:

CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

FIELD VERIFY THE DIMENSIONS FOR THE EXISTING BOXES

DETAIL INTENDED FOR NON-TRAFFIC BEARING DRAINAGE STRUCTURES.

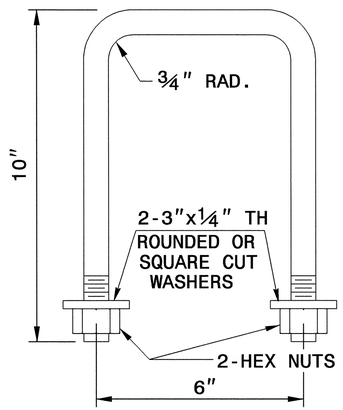
BILL OF MATERIALS

REINFORCING STEEL

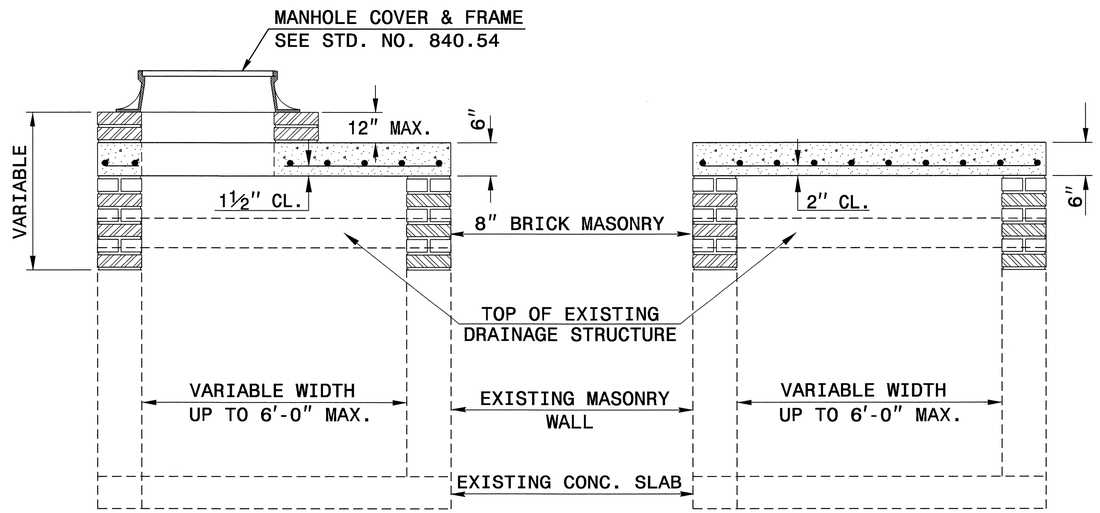
CODE	SIZE	QTY.	LENGTH	REINF. STEEL LBS.
A	#4	20	4'-6"	60.12
B	#4	8	1'-1"	5.79
TOTAL				65.91 *

MASONRY	CU YDS
TOP SLAB CONCRETE CLASS "B"	.433 *
BRICK MASONRY PER FT HT (MIN)	.4111

* NOTE:
QUANTITIES BASED ON 3'-6" X 3'-6" DRAINAGE STRUCTURE. ADJUST QUANTITIES FOR LARGER STRUCTURES AND MANHOLE CONSTRUCTION.



DETAIL OF HANDLE



SECTION X-X **SECTION Y-Y**

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
6/25/09

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

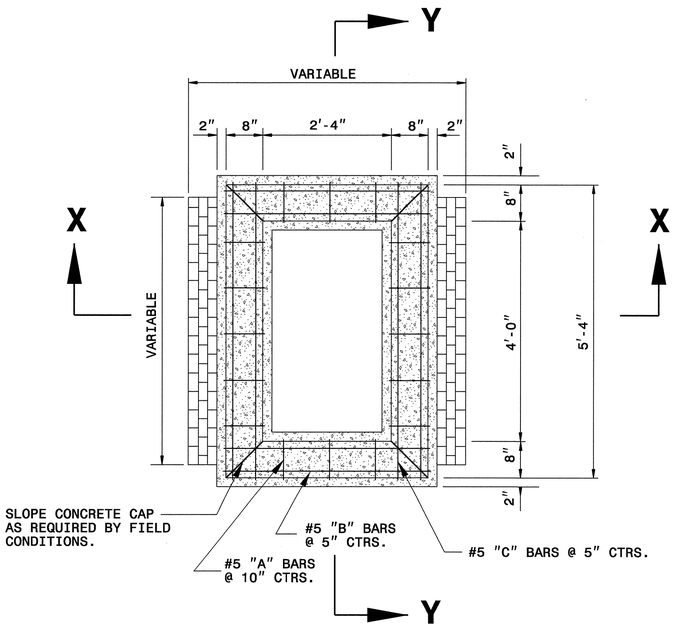
DETAIL TO CONVERT EXISTING DROP INLET OR CATCH BASIN TO JUNCTION BOX (MANHOLE OPTIONAL)

ORIGINAL BY: T.S.S. DATE: NOV.1997
MODIFIED BY: E.E.W DATE: 8-28-02
CHECKED BY: DATE: 7/16/09
FILE SPEC.: /usr/details/stand/boxtoibe.dgn

13-JUL-2009 11:41
s:\Contracts\Contracts\special details\ericward\usr\details\stand\cbtojbe.dgn
jhowerton AT PS237501

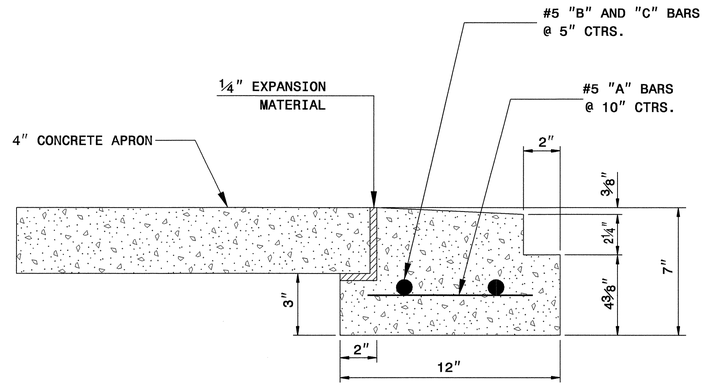
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-M



PLAN VIEW
APRON NOT SHOWN

NOTES:
- USE CLASS 'B' CONCRETE.
- DIMENSIONS MAY BE ADJUSTED TO SUIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
- CONSTRUCT IN ACCORDANCE WITH SECTION 859 OF THE STANDARD SPECIFICATIONS.

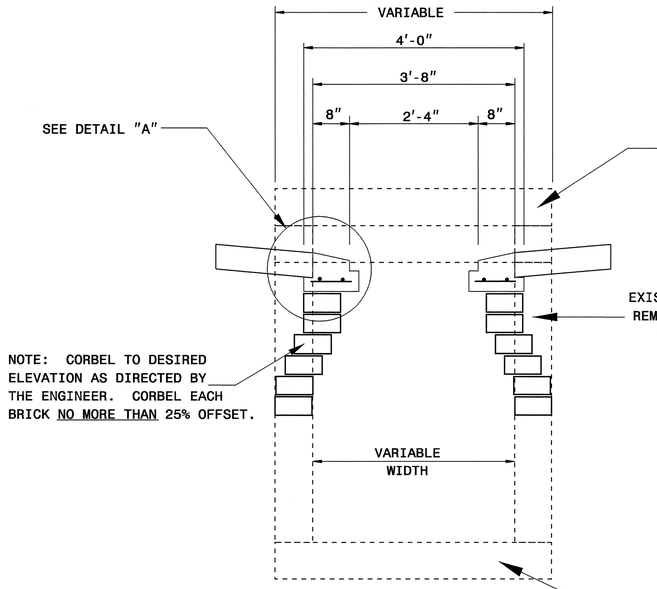


DETAIL "A"
CONCRETE CAP WITH APRON

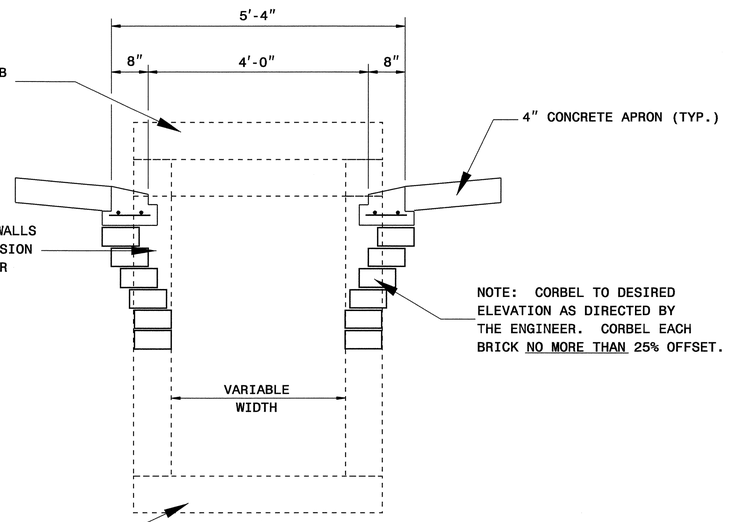
BILL OF MATERIAL

BAR	NO.	SIZE	LENGTH	WEIGHT
A	16	5	9"	13
B	4	5	3'-5"	14
C	4	5	5'-1"	21
TOTAL REINF. STEEL (lbs.)				48
BRICK MASONRY (per ft. ht.) (cu. yds.)				0.38
CLASS "B" CONC. (cu. yds.)				0.23

FRAME AND GRATES	STD. NO.
PREFERRED:	840.22
	840.24
ACCEPTABLE:	840.20
	840.29
	840.33



SECTION X-X



SECTION Y-Y

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
8/25/09

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

CONVERT EXISTING OPEN THROAT CATCH BASIN TO GRATED DROP INLET

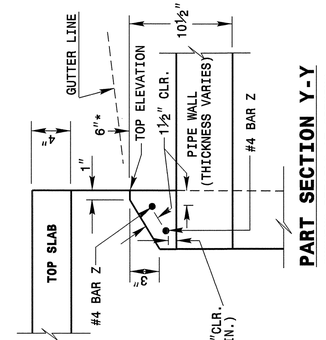
ORIGINAL BY: L.M.LEWIS DATE: 3/97
MODIFIED BY: E.E.WARD DATE: 1/00
CHECKED BY: [signature] DATE: 7/2/09
FILE SPEC.: s:\usr\details\stand\cbto2gi.dgn

13-JUL-2009 10:01
si\contracts\contracts\special details\ericward\usr\details\stand\otcbto2gi.dgn
jhowerton AT PS237501

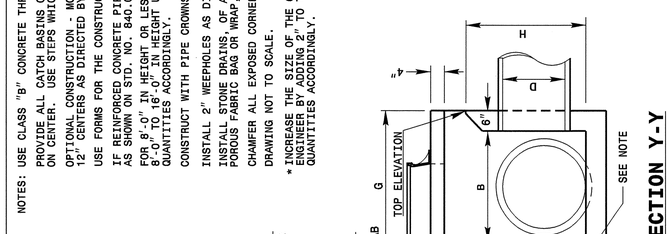
PS2244552 7/15/2009 08404040l tspell PS-Oce860-34dtbond

PROJECT REFERENCE NO.	SHEET NO.
B-4507	2 - N

NOTES: USE CLASS "B" CONCRETE THROUGHOUT.
PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
OPTIONAL CONSTRUCTION - MONOLITHIC POUR. 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.
FOR 8'-0" IN HEIGHT OR LESS USE 8" WALLS AND BOTTOM SLAB. OVER 8'-0" TO 16'-0" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. ADJUST QUANTITIES ACCORDINGLY.
CONSTRUCT WITH PIPE CROWNS MATCHING.
INSTALL 2" WEEPHOLES AS DIRECTED BY THE ENGINEER.
INSTALL STONE DRAINS, OF A MINIMUM OF 1 CUBIC FOOT OF NO. 78M STONE IN A POROUS FABRIC BAG OR WRAP, AT EACH WEEP HOLE OR AS DIRECTED BY THE ENGINEER.
CHAMFER ALL EXPOSED CORNERS 1".
DRAWING NOT TO SCALE.
* INCREASE THE SIZE OF THE 6" OPENING TO 8" MAX., AS DIRECTED BY THE ENGINEER BY ADDING 2" TO THE WALL HIEGHT ABOVE THE TOP ELEVATION. ADJUST QUANTITIES ACCORDINGLY.

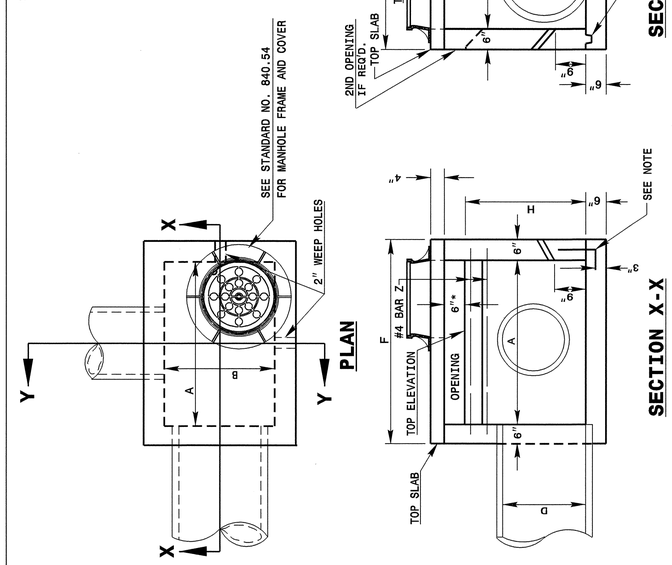


PART SECTION Y-Y
SHOWING DETAILS AT OPENING

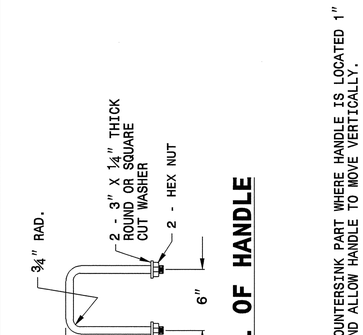


SECTION Y-Y

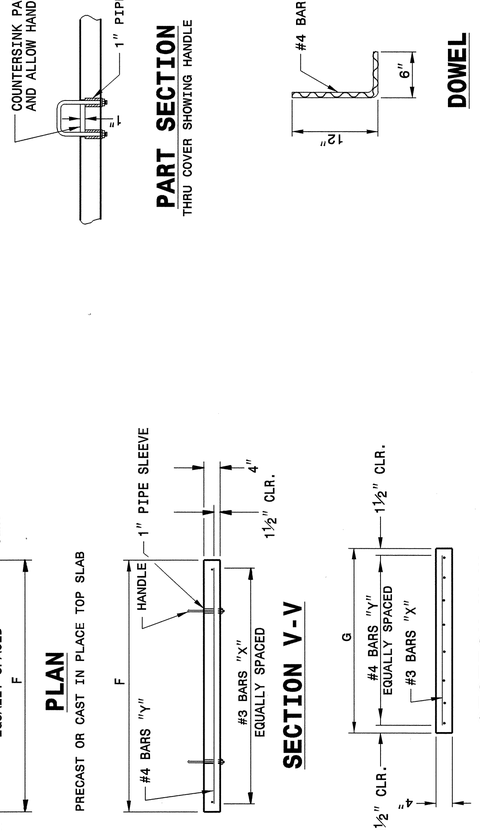
DIM'S OF BOX & PIPE				REINFORCING				TOP & BOT. SLAB DIMENSIONS		CU. YDS. CONC. IN BOX		TOTAL QUANTITIES BOX & SLABS		DEDUCTION ONE PIPE		DED. ONE 6" THROAT OPENING
PIPE	SPAN	WIDTH	HEIGHT	BARS - X			BARS - Y									
D	A	B	H	NO.	LENGTH	NO.	LENGTH	F	G	TOP SLAB	BOT. SLAB	WALL FT. HT.	LBS. REINF.	YD³ (MIN H)	C.S.	R.C.	YD³
12"	3'-6"	2'-3"	1'-10"	4	3'-0"	2	4'-3"	3'-3"	4'-6"	0.181	0.271	0.250	27	1.046	0.015	0.032	0.046
15"	3'-6"	2'-3"	2'-1"	4	3'-0"	2	4'-3"	3'-3"	4'-6"	0.181	0.271	0.250	27	1.108	0.023	0.036	0.046
18"	4'-0"	2'-8"	2'-4"	5	3'-5"	2	4'-9"	3'-8"	5'-0"	0.226	0.340	0.284	35	1.379	0.033	0.049	0.053
24"	4'-0"	2'-8"	2'-10"	5	3'-5"	2	4'-9"	3'-8"	5'-0"	0.226	0.340	0.284	35	1.521	0.059	0.085	0.053
30"	4'-0"	3'-6"	3'-4"	5	4'-3"	2	5'-3"	4'-8"	5'-0"	0.278	0.417	0.315	43	1.916	0.092	0.127	0.053
36"	4'-8"	4'-0"	3'-10"	5	4'-9"	2	5'-9"	5'-0"	5'-6"	0.340	0.510	0.352	51	2.390	0.132	0.178	0.059
42"	5'-0"	4'-6"	4'-4"	5	5'-3"	2	5'-9"	5'-6"	6'-0"	0.407	0.611	0.389	64	2.914	0.180	0.243	0.066
48"	5'-0"	5'-0"	4'-10"	5	5'-9"	2	5'-9"	6'-0"	6'-0"	0.444	0.666	0.407	68	3.298	0.235	0.317	0.066



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	7-06	ENGLISH STANDARD DRAWING FOR **CONCRETE OPEN THROAT CATCH BASIN** 12" THRU 48" PIPE	SHEET 1 OF 2 **840.04**



DETAIL OF HANDLE



COUNTERSINK PART WHERE HANDLE IS LOCATED 1" AND ALLOW HANDLE TO MOVE VERTICALLY.

1" PIPE SLEEVE X 3" LONG.

PART SECTION
THRU COVER SHOWING HANDLE

DOWEL

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	7-06	ENGLISH STANDARD DRAWING FOR **CONCRETE OPEN THROAT CATCH BASIN** 12" THRU 48" PIPE	SHEET 2 OF 2 **840.04**

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

SEE PLATE FOR TITLE

ORIGINAL BY: STD.840.04 DATE:
MODIFIED BY: Tspell DATE: 7-15-09
CHECKED BY: DATE: 7/16/09
FILE SPEC.: s:\tspell\stand\details\840dd0401.dgn

PROJECT REFERENCE NO.	SHEET
B-4507	2-0

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

STANDARD TEMPORARY MSE WALL OPTIONS

TEMPORARY MSE WALL OPTION	VENDOR	CONTACT INFORMATION	REINFORCEMENT TYPE	SHEETS
TEMPORARY FABRIC WALL	N/A	N/A	POLYESTER OR POLYPROPYLENE FABRIC	3
HILFIKER TEMPORARY WALL	HILFIKER RETAINING WALLS	1902 HILFIKER LANE, EUREKA, CA 95503-5711 707-443-5093 WWW.HILFIKER.COM	WELDED WIRE MAT	4
SIERRASCAPE TEMPORARY WALL	TENSAR EARTH TECHNOLOGIES, INC	5883 GLENRIDGE DRIVE, SUITE 200 ATLANTA, GA 30328-5363 404-250-1290 WWW.TENSARCORP.COM	GEOGRID	5
RETAINED EARTH TEMPORARY WALL	THE REINFORCED EARTH COMPANY	8614 WESTWOOD CENTER DRIVE, SUITE 1100 VIENNA, VA 22182-2233 703-749-4325 WWW.REINFORCEDEARTH.COM	WELDED WIRE MESH	6-8
TERRATREL TEMPORARY WALL	THE REINFORCED EARTH COMPANY	8614 WESTWOOD CENTER DRIVE, SUITE 1100 VIENNA, VA 22182-2233 703-749-4325 WWW.REINFORCEDEARTH.COM	RIBBED STEEL STRIPS	9-11

FOR STANDARD TEMPORARY MSE WALLS, SEE TEMPORARY SHORING SPECIAL PROVISION.

WHEN NOTES ON PLANS DO NOT PROHIBIT TEMPORARY MSE WALLS OR STANDARD SHORING, STANDARD TEMPORARY MSE WALLS ARE OPTIONAL.

WHEN NOTES ON PLANS REQUIRE TEMPORARY MSE WALLS, USE STANDARD TEMPORARY MSE WALLS OR CONTRACTOR DESIGNED TEMPORARY MSE WALLS.

WHEN THE ALIGNMENT OF STANDARD TEMPORARY MSE WALLS RESULTS IN AN INTERIOR ANGLE LESS THAN 90 DEGREES, SUBMIT AN ACUTE CORNER DETAIL FOR THE SPECIFIC SITUATION IN ACCORDANCE WITH THE WALL VENDOR RECOMMENDATIONS. ALSO, SUBMIT A "STANDARD TEMPORARY MSE WALL SELECTION FORM" FOR EACH TEMPORARY MSE WALL LOCATION. SUBMIT THESE ITEMS AT LEAST 14 DAYS BEFORE BEGINNING WALL CONSTRUCTION.

STANDARD TEMPORARY MSE WALLS ARE BASED ON THE FOLLOWING CONDITIONS:
1) MAXIMUM WALL HEIGHT IS 28'-0" (8.5m).
2) TRAFFIC SURCHARGE IS 240 PSF (11.5 KPA) MAXIMUM OR BACKSLOPE IS 2:1 (H:V) OR FLATTER.
3) EXISTING OR FINISHED GRADE IN FRONT OF WALL IS 6:1 (H:V) SLOPE OR FLATTER.
4) THE GRADE OF THE TOP OF WALL IS LESS THAN 4% FOR RETAINED EARTH AND TERRATREL TEMPORARY WALLS.
5) DESIGN SERVICE LIFE IS 3 YEARS.
6) MATERIAL IN REINFORCED ZONE IS SHORING BACKFILL.
7) MAXIMUM APPLIED BEARING PRESSURE IS 1 TSF (100 KPA) FOR WALL HEIGHTS UP TO 8'-0" (2.4m), 2 TSF (195 KPA) FOR WALL HEIGHTS BETWEEN 8'-0" AND 18'-0" (2.4m AND 5.5m) AND 3 TSF (290 KPA) FOR WALL HEIGHTS OVER 18'-0" (5.5m).

STANDARD TEMPORARY MSE WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMMED SOIL PARAMETERS:
TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/M^3)
FRICTION ANGLE = 30 DEGREES
COHESION = 0 PSF (0 KPA)
GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF REINFORCED ZONE.

DO NOT USE STANDARD TEMPORARY MSE WALLS WHEN THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT BELOW THE BOTTOM OF REINFORCED ZONE.

CONTROL DRAINAGE DURING CONSTRUCTION IN THE VICINITY OF STANDARD TEMPORARY MSE WALLS. COLLECT AND DIRECT RUNOFF AWAY FROM WALLS AND SHORING BACKFILL.

EXCAVATE AS NECESSARY FOR STANDARD TEMPORARY MSE WALLS IN ACCORDANCE WITH THE FOLLOWING FOR THE WALL OPTION CHOSEN:
1) MINIMUM EMBEDMENT OF 18" (450mm) UNLESS WALL BEARS ON ROCK, CONCRETE OR PAVEMENT AS DETERMINED BY THE ENGINEER
2) VERTICAL STEPS IN INCREMENTS EQUAL TO THE VERTICAL REINFORCEMENT SPACING
3) WITH THE EXCEPTION OF EITHER THE FIRST OR LAST SECTION OF WALL, HORIZONTAL SECTION LENGTHS IN INCREMENTS EQUAL TO THE FOLLOWING:

STANDARD TEMPORARY MSE WALL OPTION	INCREMENT
TEMPORARY FABRIC WALL	9'-0" (2.7m) MIN (VARIES)
HILFIKER TEMPORARY WALL	10'-0" (3.0m) MIN (VARIES)
SIERRASCAPE TEMPORARY WALL	18'-7¼" (5.7m)
RETAINED EARTH TEMPORARY WALL	24'-0" (7.3m)
TERRATREL TEMPORARY WALL	19'-8" (6.0m)

DO NOT PLACE SHORING BACKFILL OR FIRST REINFORCEMENT LAYER UNTIL OBTAINING APPROVAL OF THE EXCAVATION DEPTH AND FOUNDATION MATERIAL.

IF APPLICABLE, INSTALL FOUNDATIONS LOCATED WITHIN THE REINFORCED ZONE BEFORE BEGINNING WALL CONSTRUCTION UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

ERECT AND MAINTAIN FACINGS AND FORMS AS SHOWN ON THE STANDARD TEMPORARY MSE WALL DETAILS. STAGGER VERTICAL JOINTS OF FACINGS AND FORMS TO CREATE A RUNNING BOND WHEN POSSIBLE UNLESS SHOWN OTHERWISE ON THESE DETAILS.

PLACE FACINGS AND FORMS AS NEAR TO VERTICAL AS POSSIBLE WITH NO NEGATIVE BATTER. CONSTRUCT STANDARD TEMPORARY MSE WALLS WITH A VERTICAL AND HORIZONTAL TOLERANCE OF 3" (75mm) WHEN MEASURED WITH A 10'-0" (3m) STRAIGHT EDGE AND AN OVERALL VERTICAL PLUMBNESS (BATTER) AND HORIZONTAL ALIGNMENT OF LESS THAN 6" (150mm).

PLACE REINFORCEMENT AT LOCATIONS AND ELEVATIONS SHOWN ON THE STANDARD TEMPORARY MSE WALL DETAILS AND IN SLIGHT TENSION FREE OF KINKS, FOLDS, WRINKLES OR CREASES.

DO NOT SPLICE REINFORCEMENT IN THE REINFORCEMENT DIRECTION (RD), i.e., PARALLEL TO THE WALL FACE. SEAMS ARE ALLOWED IN THE CROSS-REINFORCEMENT DIRECTION (CRD).

CONTACT THE ENGINEER WHEN EXISTING OR FUTURE STRUCTURES SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT. TO AVOID STRUCTURES, DELFECT, SKEW AND MODIFY REINFORCEMENT.

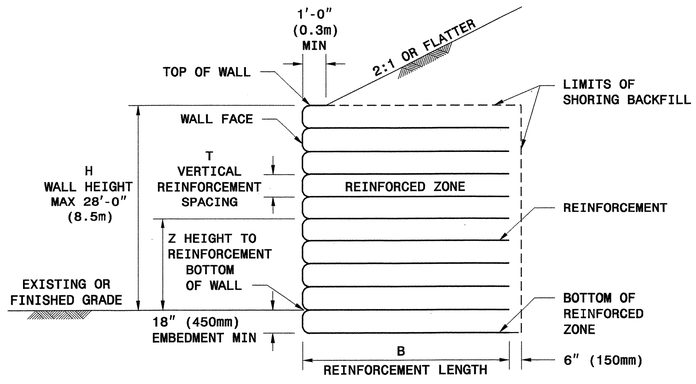
PLACE SHORING BACKFILL IN 8" TO 10" (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3'-0" (1m) OF THE WALL FACE.

DO NOT DAMAGE REINFORCEMENT WHEN PLACING AND COMPACTING SHORING BACKFILL. DO NOT OPERATE HEAVY EQUIPMENT ON REINFORCEMENT UNTIL IT IS COVERED WITH AT LEAST 10" (250mm) OF SHORING BACKFILL. DO NOT USE SHEEPSFOOT, GRID ROLLERS OR OTHER TYPES OF COMPACTION EQUIPMENT WITH FEET.

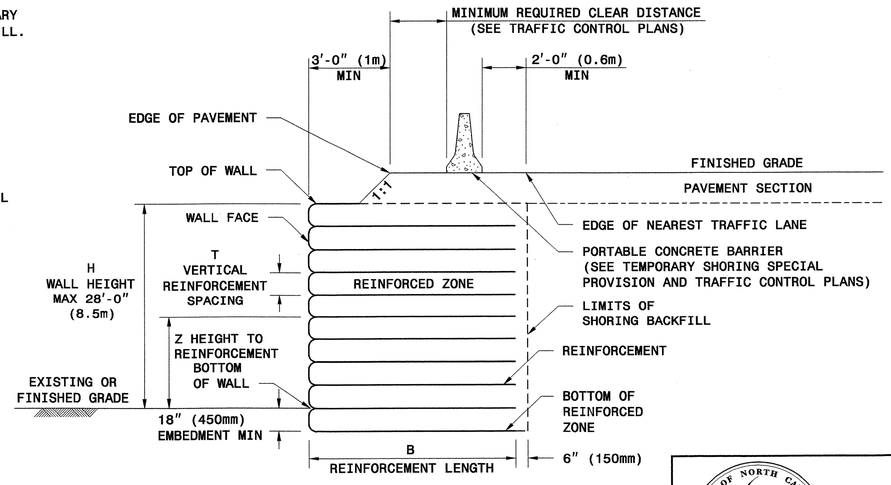
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3" (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4" AND 24" (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

BENCH STANDARD TEMPORARY MSE WALLS INTO THE SIDES OF EXCAVATIONS WHERE APPLICABLE.

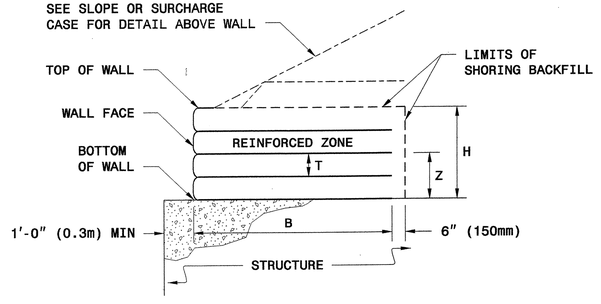
IF THE TOP OF WALL IS WITHIN 5'-0" (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



SLOPE CASE



SURCHARGE CASE



TEMPORARY MSE WALL ON STRUCTURE

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS

SHEET 1 OF 11 DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET
B-4507	2-P

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

MINIMUM REQUIRED REINFORCEMENT LENGTH B (FT)

(FOR ALL WALL OPTIONS)

WALL HEIGHT H (FT)	<8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28
SLOPE CASE	8	11	13	14	16	18	20	22	24	25	27
SURCHARGE CASE	8	9	11	12	14	15	16	18	19	21	22

HOW TO USE THIS SHEET:

- FOR ALL WALL OPTIONS, DETERMINE MINIMUM REQUIRED REINFORCEMENT LENGTH (B) FROM TABLE AT RIGHT BASED ON WALL HEIGHT (H) AND SLOPE OR SURCHARGE CASE
- FOR STANDARD TEMPORARY FABRIC WALL, SEE SHEET 3 FOR FABRIC STRENGTH REQUIREMENTS BASED ON WALL HEIGHT (H)
- FOR ALL OTHER WALL OPTIONS, DETERMINE REINFORCEMENT TYPE FROM TABLES BELOW FOR EACH HEIGHT TO REINFORCEMENT (Z) BASED ON WALL HEIGHT (H) AND SLOPE OR SURCHARGE CASE

TERRATREL TEMPORARY WALL
(STRIPS PER LEVEL PER PANEL)

H (FT)

<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT-INCHES)
												3	27 - 8
											3	3	26 -10
											3	3	25 - 2
										3	3	3	23 - 6
									3	3	3	3	21 -10
								3	3	3	3	3	20 - 2
							3	3	3	3	3	3	18 - 6
						3	3	3	3	3	3	3	16 -10
						3	3	3	3	3	3	3	15 - 2
					4	3	3	3	3	3	3	3	13 - 6
				4	4	3	3	3	3	3	3	3	11 -10
			5	4	4	3	3	3	3	3	3	3	10 - 2
		5	5	4	4	3	3	3	3	3	3	3	8 - 6
	5	5	5	4	4	3	3	3	3	3	3	3	6 -10
	5	5	5	4	4	3	3	3	3	3	3	3	5 - 2
5	5	5	5	4	4	3	3	3	3	3	3	3	3 - 6
5	5	5	5	4	4	3	3	3	3	3	3	3	1 -10
5	5	5	5	4	4	3	3	3	3	3	3	3	0 - 2
5	5	5	5	4	4	3	3	3	3	3	3	3	-0 - 8

SLOPE AND SURCHARGE CASES

SIERRASCAPE TEMPORARY WALL
(GEOGRID TYPE)

11 = UX1100MSE
14 = UX1400MSE
15 = UX1500MSE
16 = UX1600MSE
17 = UX1700MSE

H (FT)

<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												11	26.5
											11	11	25.5
											11	11	24
										11	11	11	22.5
									11	11	11	15	21
								11	11	11	14	15	19.5
							11	11	11	14	15	15	18
						11	11	11	11	14	15	15	16.5
						11	11	11	11	14	15	15	15
					11	11	11	11	15	15	15	15	13.5
					11	11	11	15	15	15	15	15	12
				11	11	11	11	15	15	15	15	16	10.5
			11	11	11	11	15	15	15	15	15	16	9
		11	11	11	11	14	15	15	15	15	16	16	7.5
		11	11	11	11	14	15	15	15	16	16	16	6
	11	11	11	11	15	15	15	15	16	16	16	17	4.5
11	11	11	11	14	15	15	15	15	16	16	16	17	3
11	11	11	11	14	15	15	15	16	16	16	17	17	1.5
11	11	11	14	15	15	15	15	16	16	17	17	17	0
11	11	11	14	15	15	15	16	16	17	17	17	17	-1.5

SLOPE CASE

H (FT)

<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												11	26.5
												11	25.5
											11	11	24
											11	11	22.5
										11	11	11	21
									11	11	11	11	19.5
								11	11	11	11	15	18
							11	11	11	11	15	15	16.5
						11	11	11	11	11	15	15	15
						11	11	11	11	15	15	15	13.5
					11	11	11	11	15	15	15	15	12
					11	11	11	15	15	15	15	15	10.5
				11	11	11	11	15	15	15	15	15	9
			11	11	11	11	15	15	15	15	15	16	7.5
			11	11	11	11	15	15	15	15	16	16	6
		11	11	11	11	15	15	15	15	16	16	16	4.5
	11	11	11	11	14	15	15	15	15	16	16	16	3
11	11	11	11	11	14	15	15	15	15	16	16	16	1.5
11	11	11	11	15	15	15	15	15	15	16	16	17	0
11	11	11	14	15	15	15	15	15	16	16	17	17	-1.5

SURCHARGE CASE

HILFIKER TEMPORARY WALL
(WELDED WIRE MAT TYPE)

4.5 = W4.5 x W3.5
7.0 = W7.0 x W3.5
9.5 = W9.5 x W4.0

H (FT)

<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												4.5	26
											4.5	7.0	24
										4.5	7.0	7.0	22
									4.5	7.0	7.0	7.0	20
								4.5	7.0	7.0	7.0	7.0	18
							4.5	7.0	7.0	7.0	7.0	7.0	16
						4.5	7.0	7.0	7.0	7.0	7.0	9.5	14
					4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	12
				4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	10
			4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	8
		4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	6
	4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	4
	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.0	3
4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	7.0	2
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.0	7.0	1
7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	7.0	7.0	0
7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	-1.5

SLOPE CASE

H (FT)

<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT)
												4.5	26
											4.5	7.0	24
										4.5	7.0	7.0	22
									4.5	7.0	7.0	7.0	20
								4.5	7.0	7.0	7.0	7.0	18
							4.5	7.0	7.0	7.0	7.0	7.0	16
						4.5	7.0	7.0	7.0	7.0	7.0	9.5	14
					4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	12
				4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	10
			4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	8
		4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	6
	4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	4
4.5	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	7.0	2
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.0	1
7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	7.0	0
7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	-1.5

SURCHARGE CASE

RETAINED EARTH TEMPORARY WALL
(WELDED WIRE MESH TYPE)

3X1 = 3W8 x W8 x 1.0′
3X2 = 3W8 x W8 x 2.0′

H (FT)

<4	4 TO 6	6 TO 8	8 TO 10	10 TO 12	12 TO 14	14 TO 16	16 TO 18	18 TO 20	20 TO 22	22 TO 24	24 TO 26	26 TO 28	Z (FT-INCHES)
												3X1	27 - 6
												3X1	26 -10
											3X1	3X2	25 - 2
										3X1	3X1	3X2	23 - 6
									3X1	3X1	3X2	3X2	21 -10
								3X1	3X1	3X2	3X2	3X2	20 - 2
							3X1	3X1	3X2	3X2	3X2	3X2	18 - 6
							3X1	3X2	3X2	3X2	3X2	3X2	16 -10
						3X1	3X1	3X2	3X2	3X2	3X2	3X2	15 - 2
						3X1	3X1	3X2	3X2	3X2	3X2	3X2	13 - 6
					3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	11 -10
				3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	10 - 2
			3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	8 - 6
			3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	6 -10
		3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	5 - 2
	3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3 - 6
	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	1 -10
	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	0 - 2
	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	-1 - 6

SLOPE AND SURCHARGE CASES

NOTES FOR HILFIKER TEMPORARY WALL

1) CAP MAT AT TOP OF WALL IS NOT INCLUDED IN TABLES.
2) REINFORCEMENT IS NOT REQUIRED AT 1′ LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 24′.
3) REINFORCEMENT IS NOT REQUIRED AT 3′ LEVEL FOR SLOPE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 26′.
4) REINFORCEMENT IS NOT REQUIRED AT 1′ LEVEL FOR SURCHARGE CASE UNTIL WALL HEIGHT (H) IS GREATER THAN 26′.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY MSE WALL REINFORCEMENT TABLES - ENGLISH UNITS

SHEET 2 OF 11 DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET
B-4507	2-Q

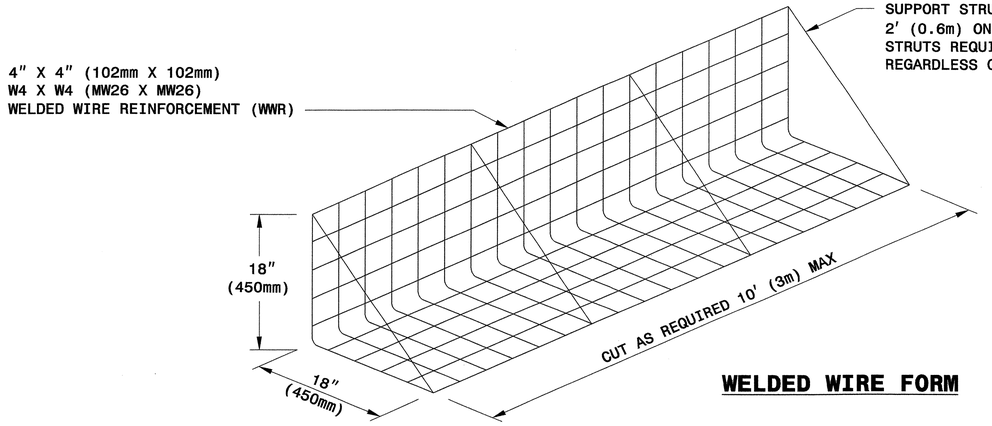
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

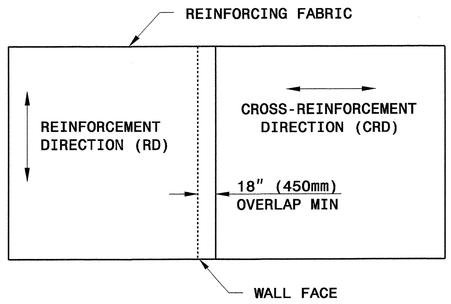
Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

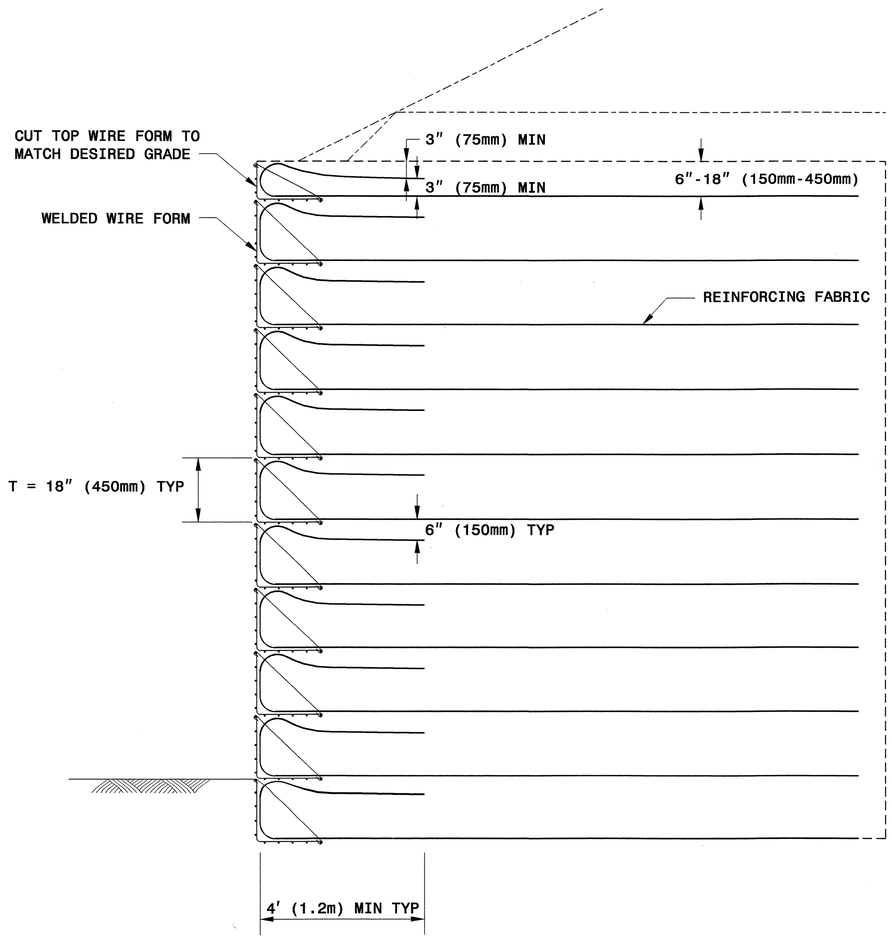
SIGNATURE DATE



WELDED WIRE FORM



PLAN VIEW OF FABRIC OVERLAP



TYPICAL SECTION

MINIMUM REQUIRED REINFORCING FABRIC STRENGTH FOR RD*
(SLOPE AND SURCHARGE CASES)

WALL HEIGHT H FEET (M)	POLYESTER WIDE WIDTH TENSILE STRENGTH @ ULTIMATE LB/INCH (KN/M)	POLYPROPYLENE WIDE WIDTH TENSILE STRENGTH @ ULTIMATE LB/INCH (KN/M)
4 (1.2)	200 (35)	200 (35)
6 (1.8)	200 (35)	200 (35)
8 (2.4)	200 (35)	200 (35)
10 (3.0)	200 (35)	230 (40)
12 (3.7)	220 (39)	264 (46)
14 (4.3)	248 (43)	297 (52)
16 (4.9)	276 (48)	330 (58)
18 (5.5)	304 (53)	364 (64)
20 (6.1)	332 (58)	397 (70)
22 (6.7)	359 (63)	431 (76)
24 (7.3)	387 (68)	464 (81)
26 (7.9)	415 (73)	497 (87)
28 (8.5)	443 (78)	531 (93)

*RD = REINFORCEMENT DIRECTION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

TEMPORARY FABRIC WALL

SHEET 3 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
B-4507	2-R

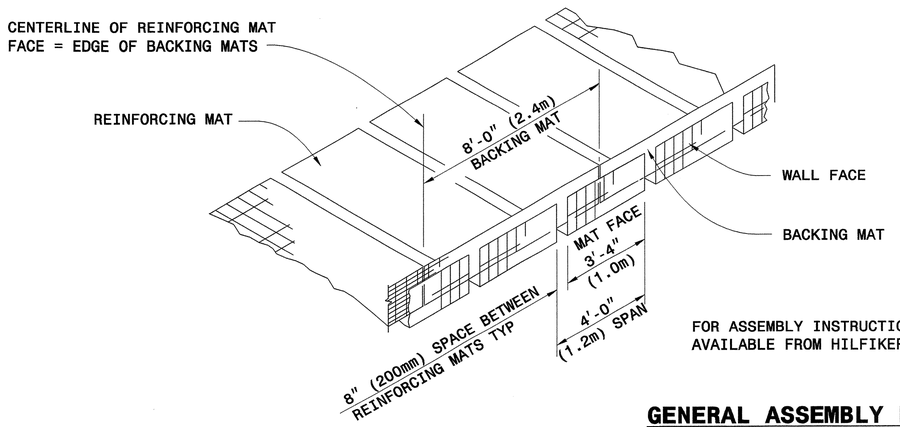
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

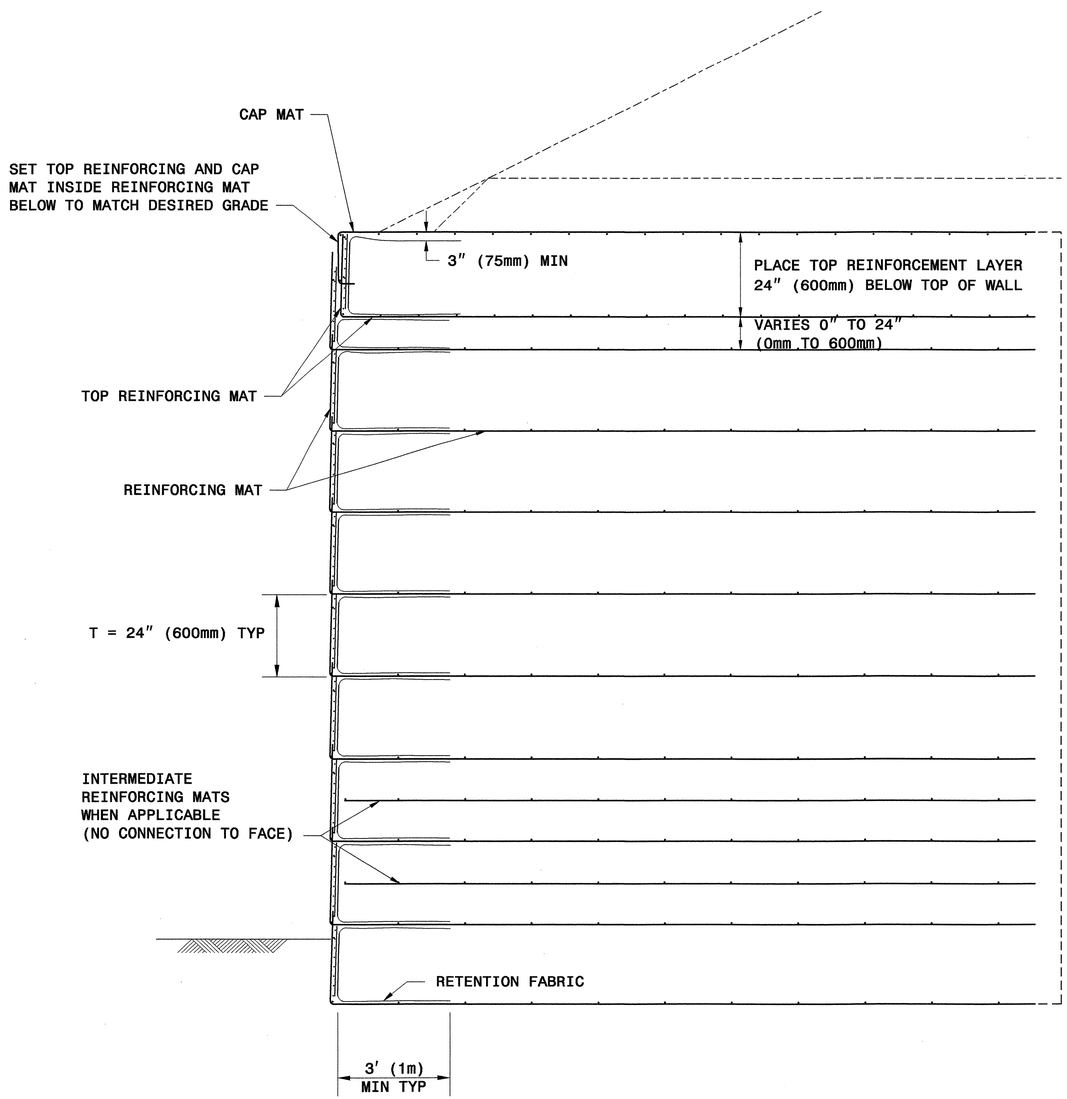
ENGINEER

SIGNATURE DATE

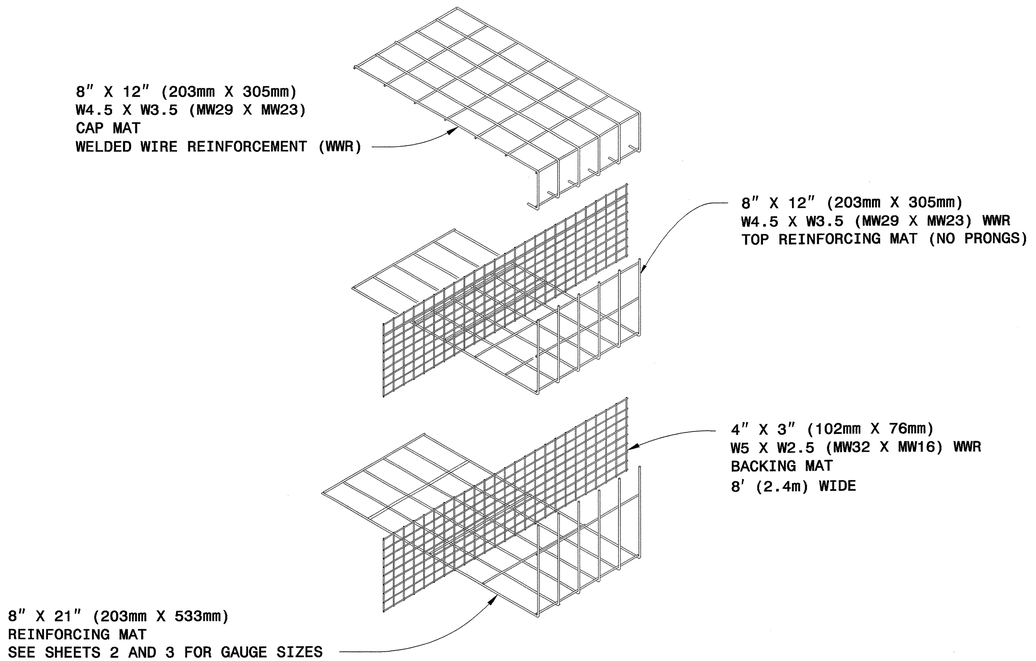


FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

GENERAL ASSEMBLY DETAIL



TYPICAL SECTION



WALL COMPONENTS

HILFIKER RETAINING WALLS

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

HILFIKER
TEMPORARY WALL

SHEET 4 OF 11 DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
B-4507	2-S

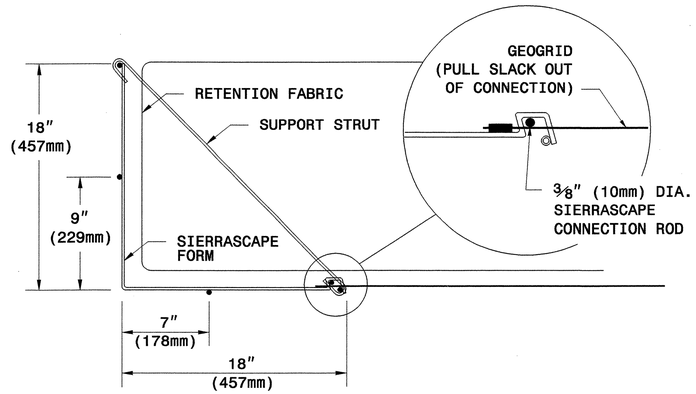
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

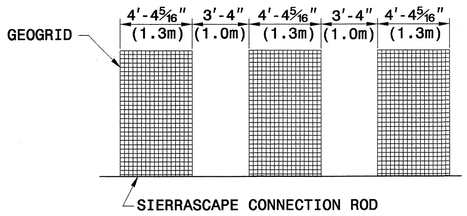
Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

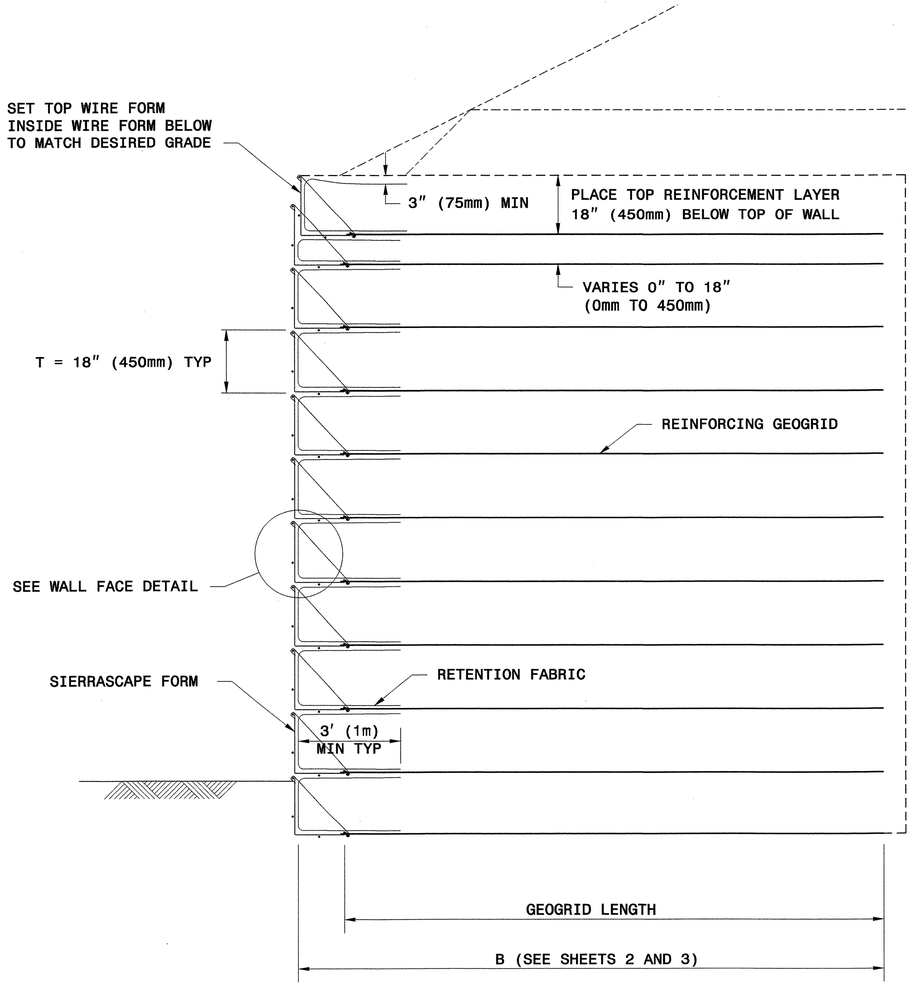


WALL FACE DETAIL

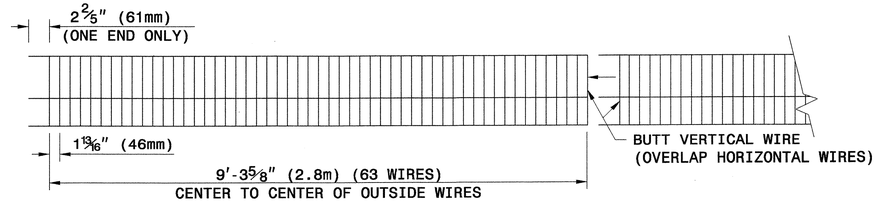


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN
SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

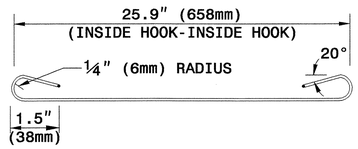
TYPICAL GEOGRID COVERAGE



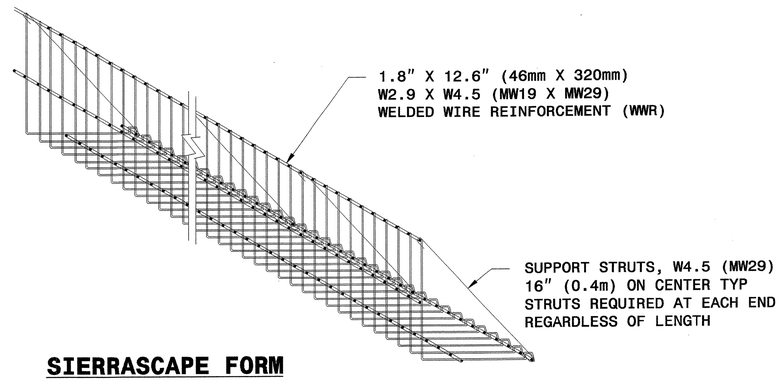
TYPICAL SECTION



ELEVATION VIEW



SUPPORT STRUT



SIERRASCAPE FORM

WALL COMPONENTS

TENSAR®
TENSAR EARTH TECHNOLOGIES, INC.

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

SIERRASCAPE
TEMPORARY WALL

SHEET 5 OF 11 DATE: 12-19-06

C221427 12/5/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
B-4507	2-T

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. SHIDDEN

Scott A. Shidden 3/29/07

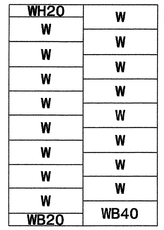
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

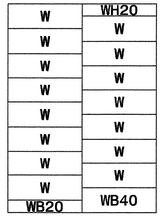
PANEL LAYOUTS

H - WALL HEIGHT



(FEET-INCHES) < 28 - 0

(METER) < 8.5



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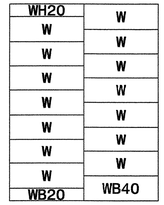
(METER) < 8.2



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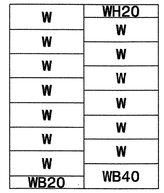
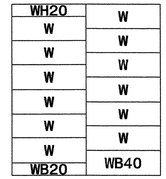
(METER) < 7.7



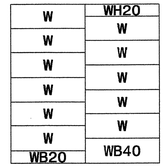
(FEET-INCHES) < 23 - 8

(METER) < 7.2



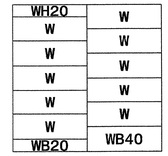
(FEET-INCHES) < 22 - 0

(METER) < 6.2



(FEET-INCHES) < 20 - 4

(METER) < 6.2



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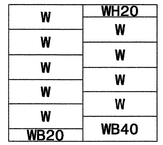
(METER) < 5.7

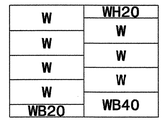


(FEET-INCHES) < 17 - 0

(METER) < 5.2

(FEET-INCHES) < 15 - 4

(METER) < 4.7



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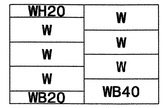
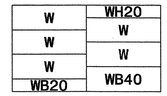
(METER) < 4.2



(FEET-INCHES) < 12 - 0

(METER) < 3.7

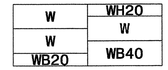


(FEET-INCHES) < 10 - 4

(METER) < 3.2

(FEET-INCHES) < 8 - 8

(METER) < 2.6



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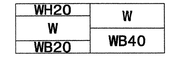
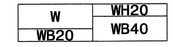
(METER) < 2.1



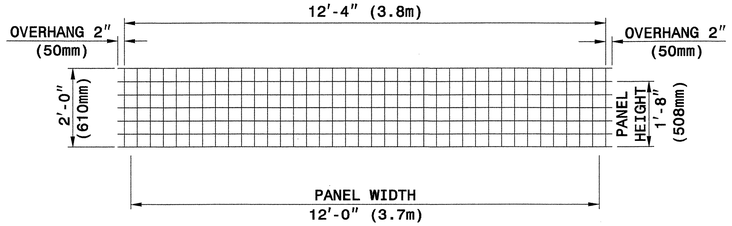
(FEET-INCHES) < 5 - 4

(METER) < 1.6

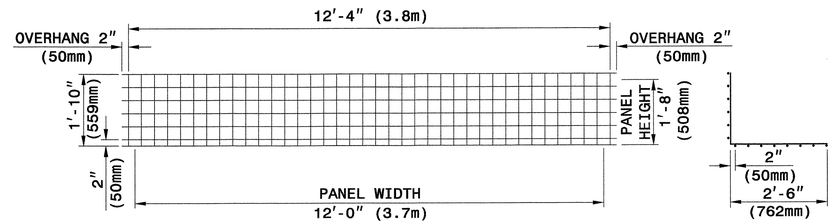


(FEET-INCHES) < 3 - 8

(METER) < 1.1

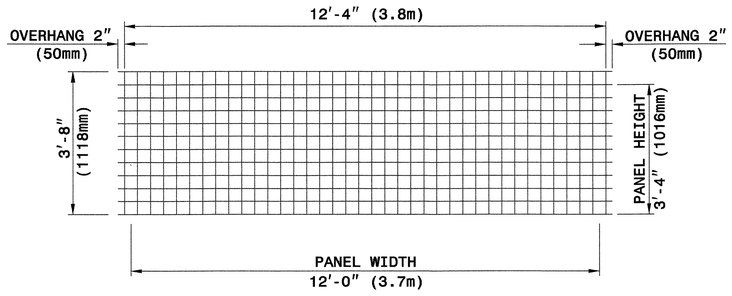


TYPE WH20

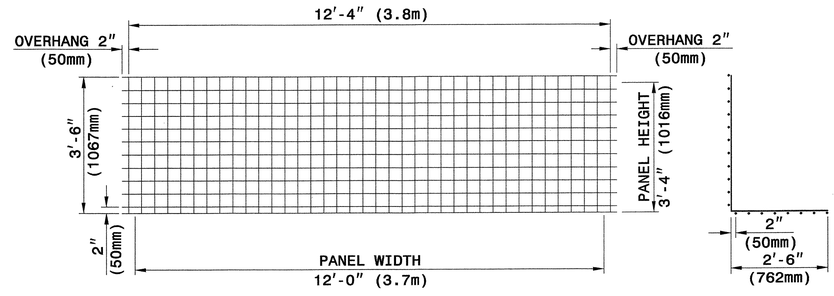


TYPE WB20

SECTION



TYPE W



TYPE WB40

SECTION

WELDED WIRE FACINGS

WELDED WIRE FORMS

PANEL TYPES (WELDED WIRE FACINGS AND FORMS)

4″ X 4″ (100mm X 100mm), W8 X W8 (MW52 X MW52) WELDED WIRE REINFORCEMENT (WWR)

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 6 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
B-4507	2-U

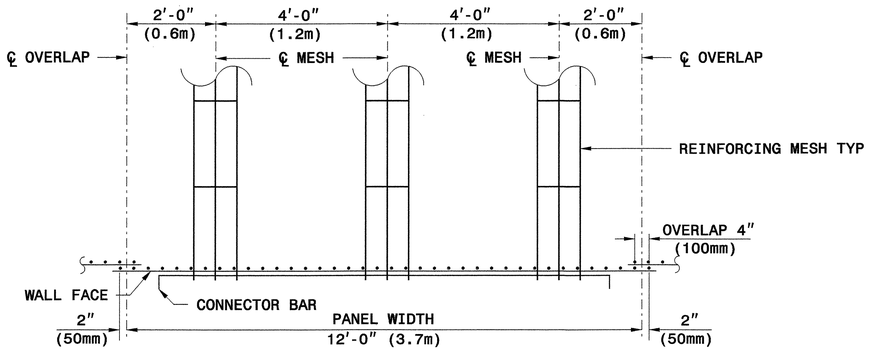
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. SHIDDEN

Scott A. Shidden 3/29/07
SIGNATURE DATE

ENGINEER

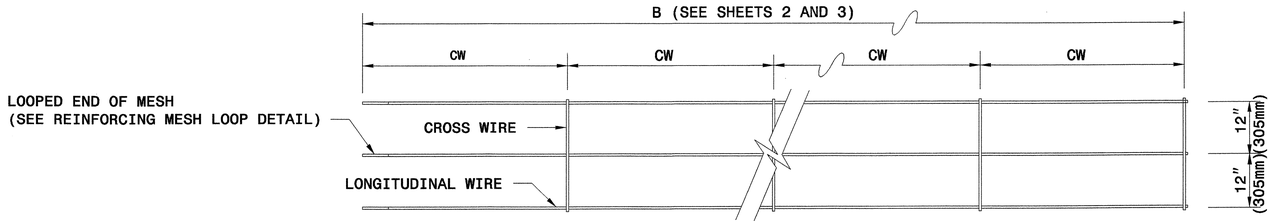
SIGNATURE DATE



REINFORCING MESH PLACEMENT DETAIL (PLAN VIEW)

½" (13mm) DIA. BAR

CONNECTOR BAR



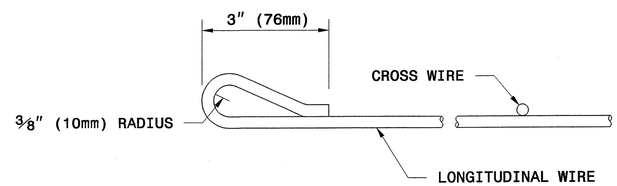
IF REINFORCEMENT LENGTH IS NOT AN INCREMENT OF 2'-0" (610mm) MAKE CW EQUAL TO 12" (305mm) AT THE END OF THE REINFORCING MESH OPPOSITE THE LOOPED END

3W8 X W8 x 2.0' (3MW52 X MW52 X 610mm)

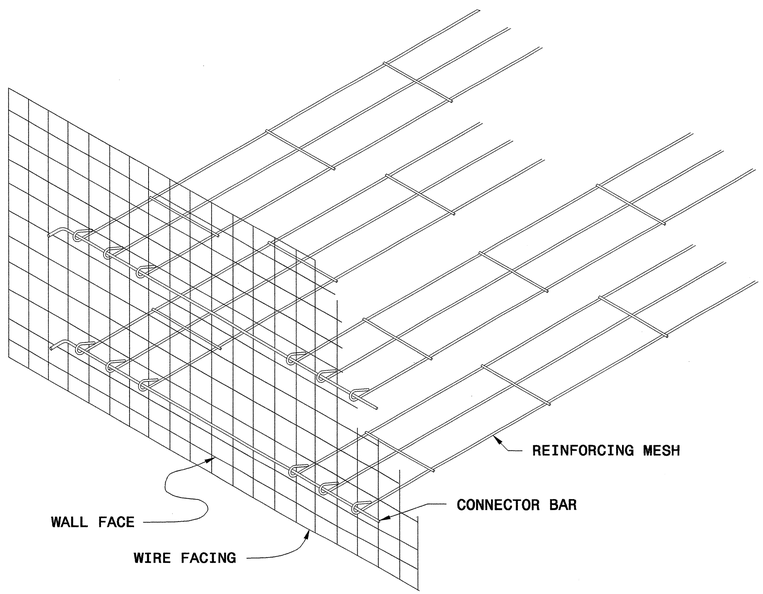
- NO. OF LONGITUDINAL WIRES
- GAUGE OF LONGITUDINAL WIRES
- GAUGE OF CROSS WIRES
- SPACING OF CROSS WIRES IN FT (mm), CW

REINFORCING MESH DESIGNATION

REINFORCING MESH



REINFORCING MESH LOOP DETAIL



GENERAL ASSEMBLY DETAIL

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 7 OF 11 DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
B-4507	2-V

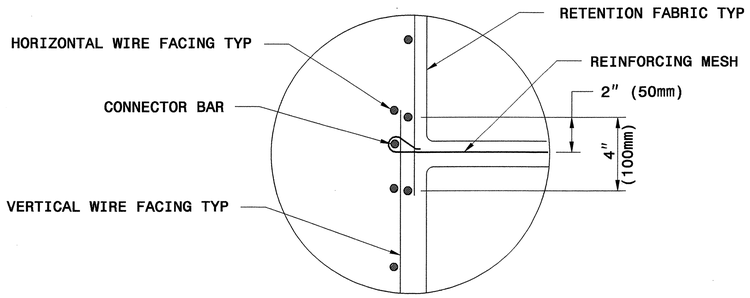
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

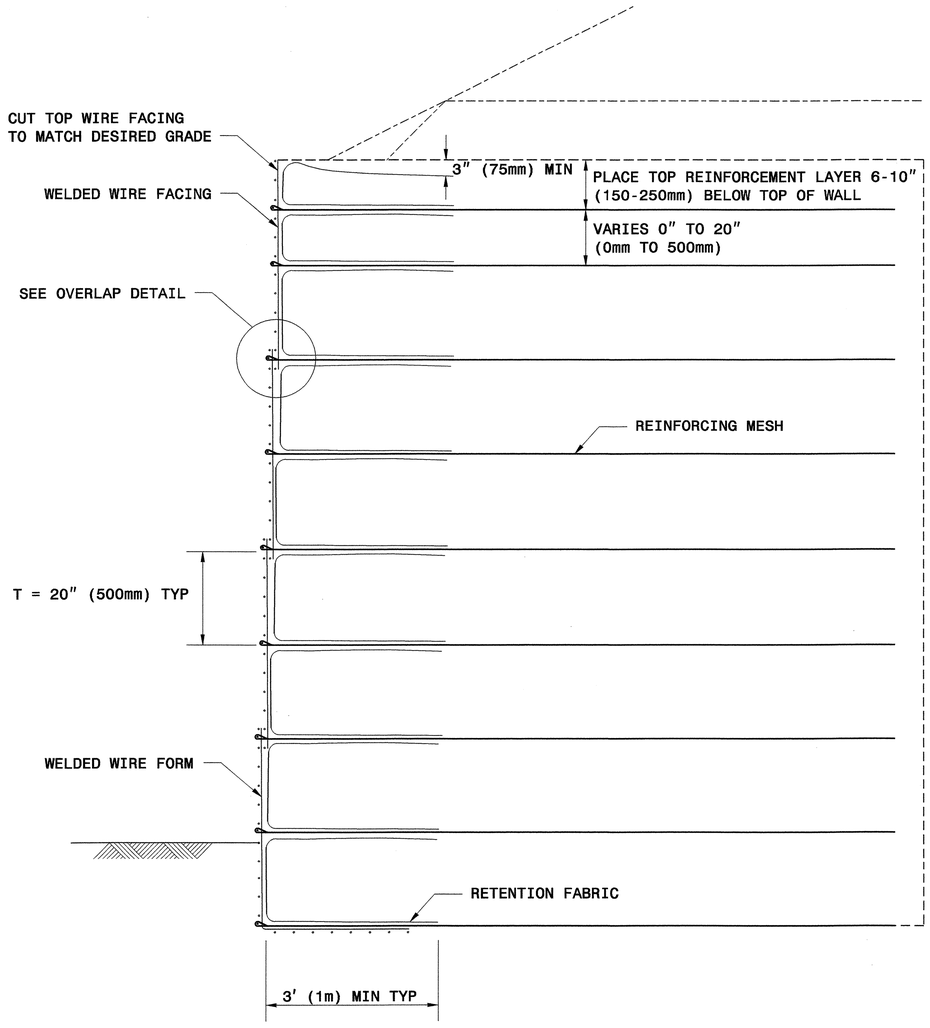
Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

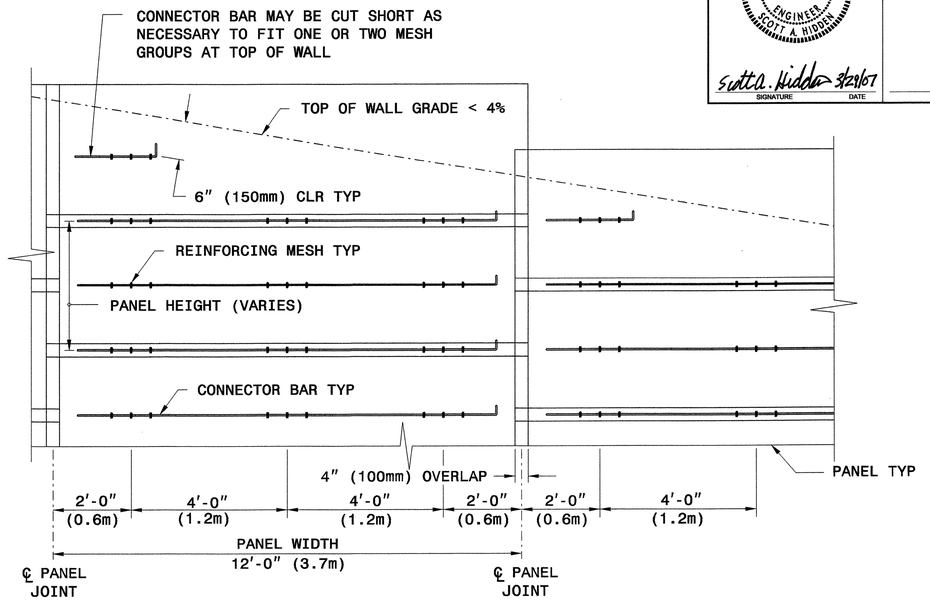
SIGNATURE DATE



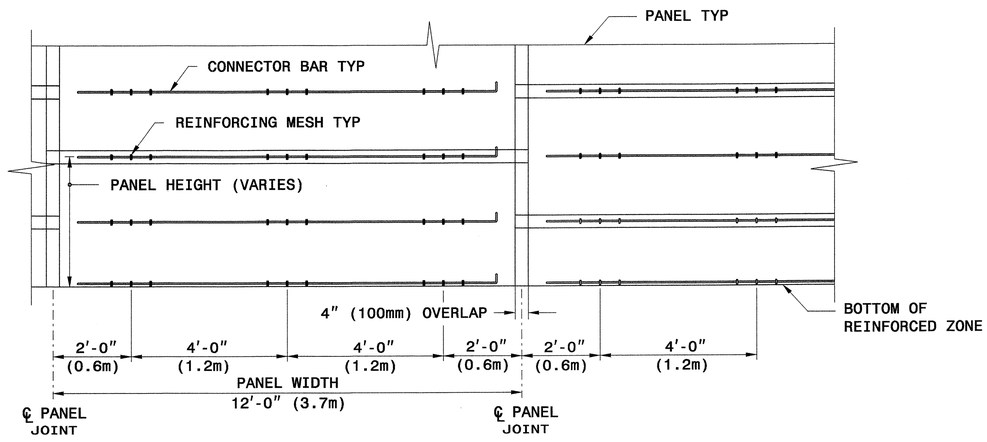
OVERLAP DETAIL



TYPICAL SECTION



TYPICAL ELEVATION @ TOP OF WALL
(WIRES NOT SHOWN FOR CLARITY)



TYPICAL ELEVATION @ BOTTOM OF WALL
(WIRES NOT SHOWN FOR CLARITY)

The Reinforced Earth Company

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

RETAINED EARTH TEMPORARY WALL

SHEET 8 OF 11 DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
B-4507	2-W

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

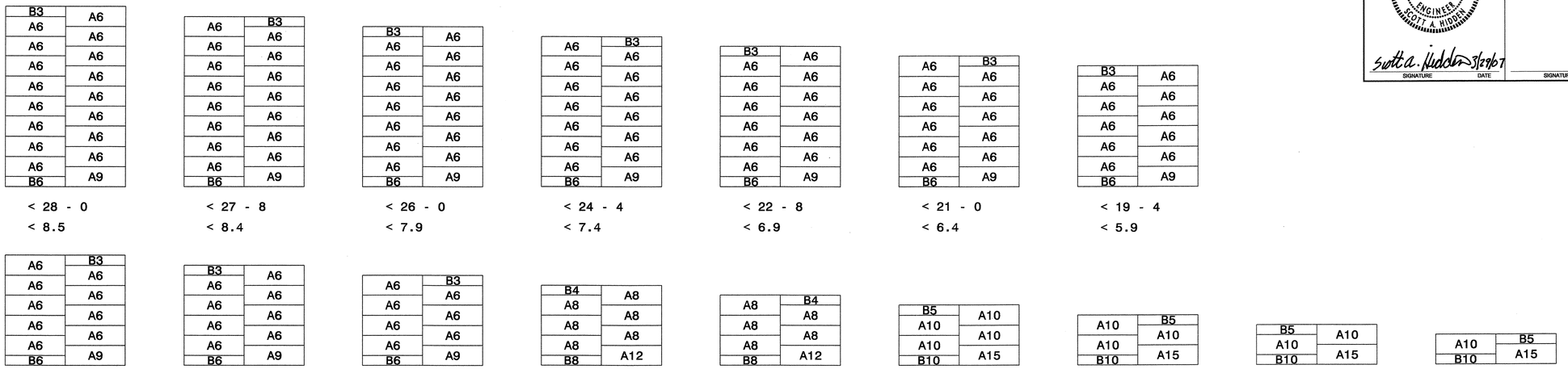
SIGNATURE DATE

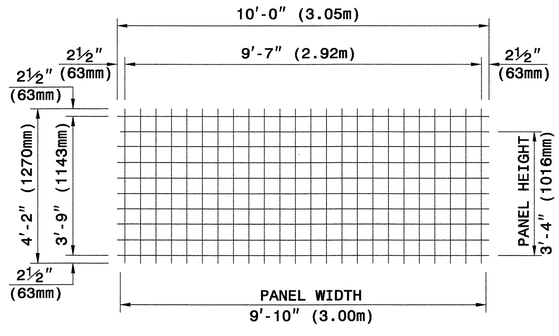
ENGINEER

SIGNATURE DATE

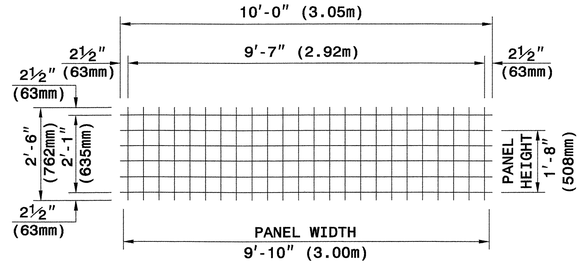
PANEL LAYOUTS

H - WALL HEIGHT

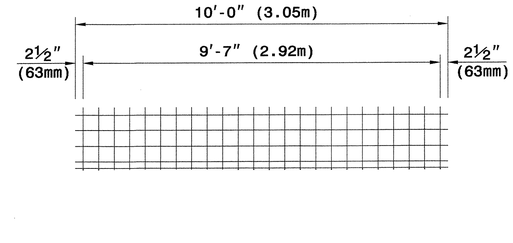




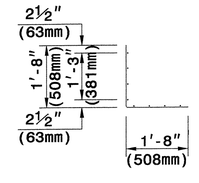
TYPE A



TYPE B



WELDED WIRE FORM



SECTION

WELDED WIRE FACINGS

PANEL TYPES (WELDED WIRE FACINGS AND FORM

5″ X 5″ (125mm X 125mm), W5 X W5 (MW32 X MW32) WELDED WIRE REINFORCEMENT (WWR)

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL TEMPORARY WALL

SHEET 9 OF 11 DATE: 12-19-06

PROJECT REFERENCE NO.	SHEET
B-4507	2-X

GEOTECHNICAL ENGINEER

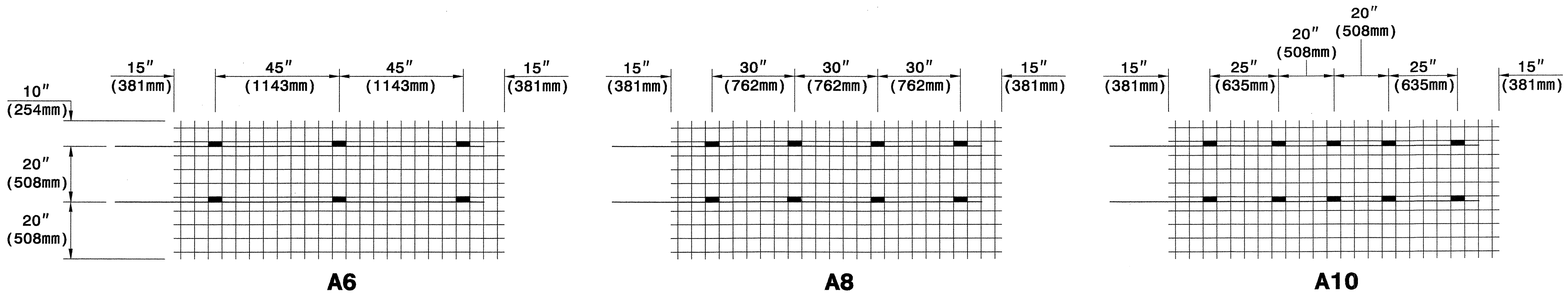
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

SIGNATURE DATE

ENGINEER

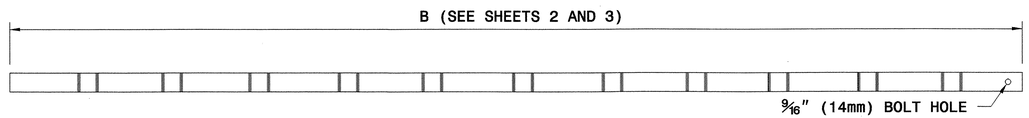
SIGNATURE DATE



KEY: A8

NUMBER OF REINFORCING STRIPS
PANEL TYPE

CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



REINFORCING STRIP - 2" X 5/32" (50mm X 4mm)

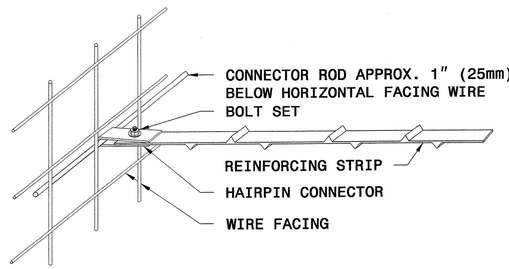
½" (13mm) DIA. ROD

CONNECTOR ROD

½" (13mm) BOLT WITH NUT AND WASHER

BOLT SET

HAIRPIN CONNECTOR



STRIP TO FACING CONNECTION

WALL COMPONENTS

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL
TEMPORARY WALL

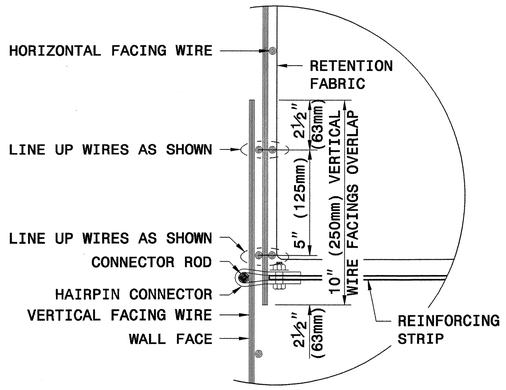
SHEET 10 OF 11 DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
B-4507	2-Y

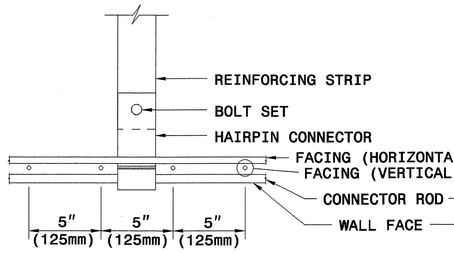
GEOTECHNICAL ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN — Scott A. Hidden 3/29/07 (SIGNATURE / DATE)

ENGINEER (SIGNATURE / DATE)

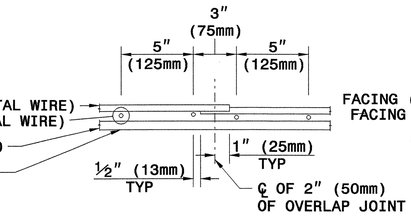


OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

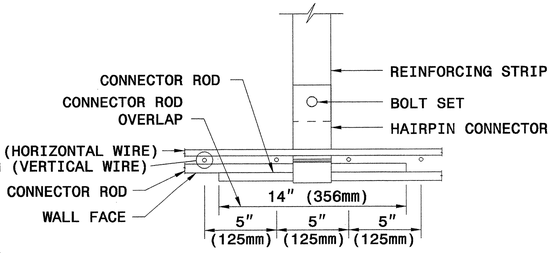
VERTICAL OVERLAP DETAIL



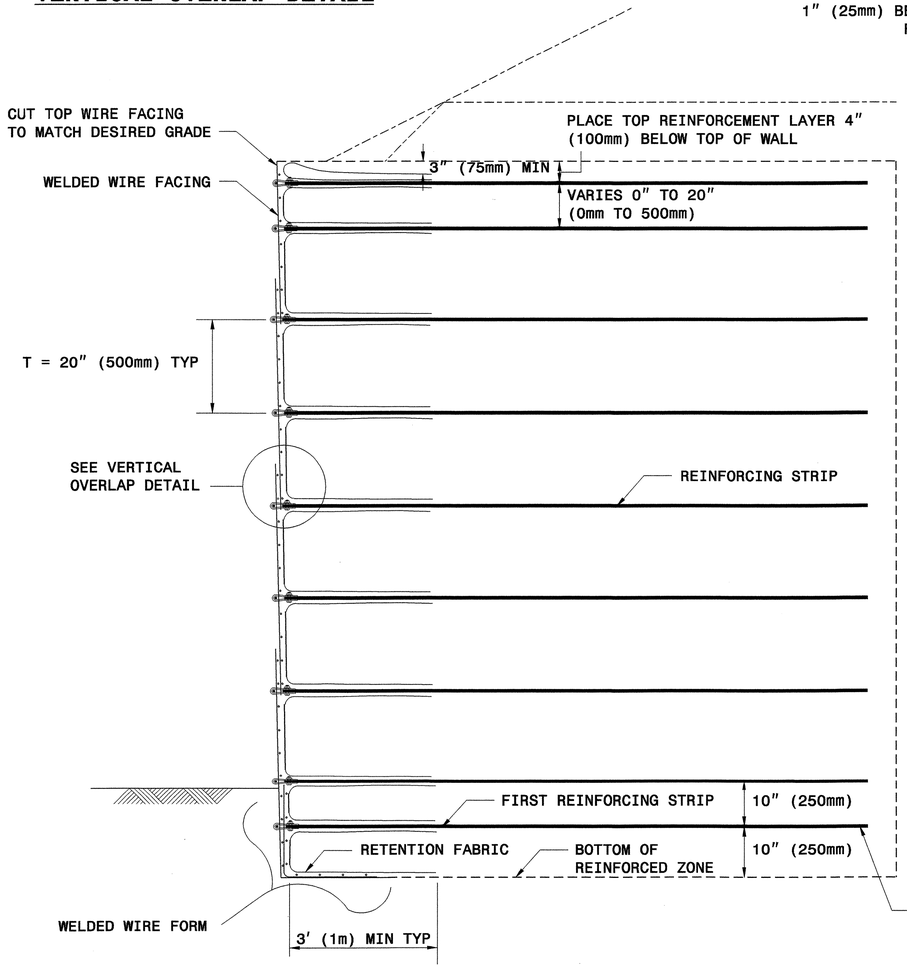
PLAN DETAIL 'A'
STRIP CONNECTION



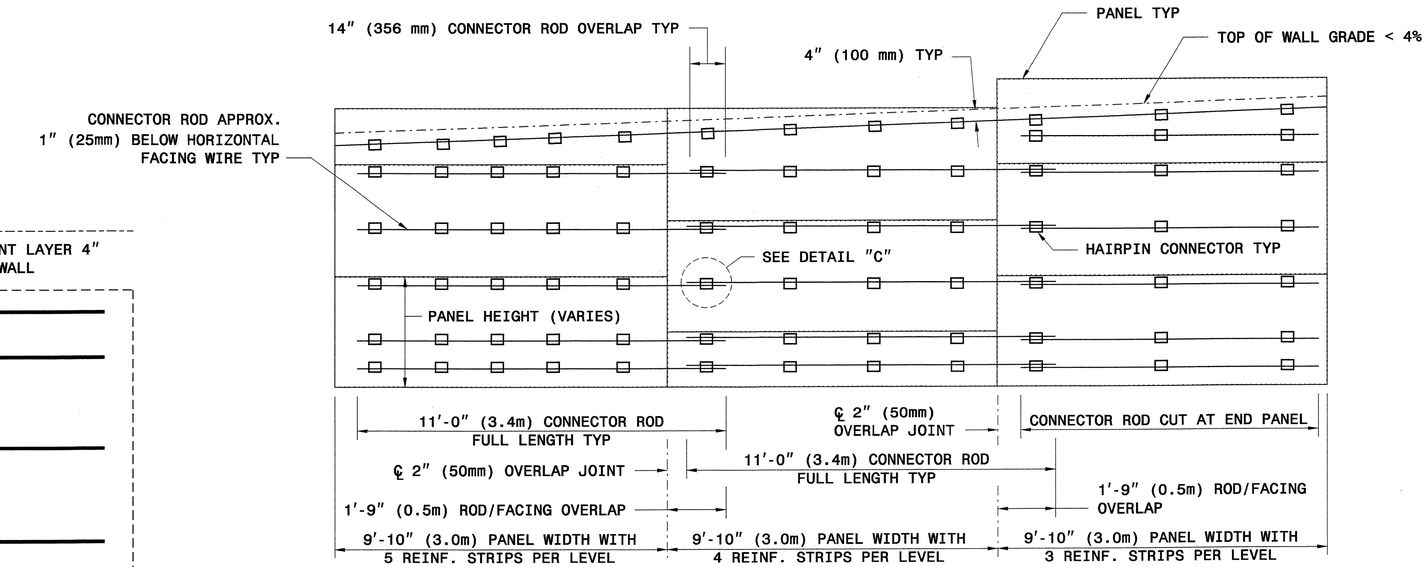
PLAN DETAIL 'B'
HORIZONTAL OVERLAP DETAIL



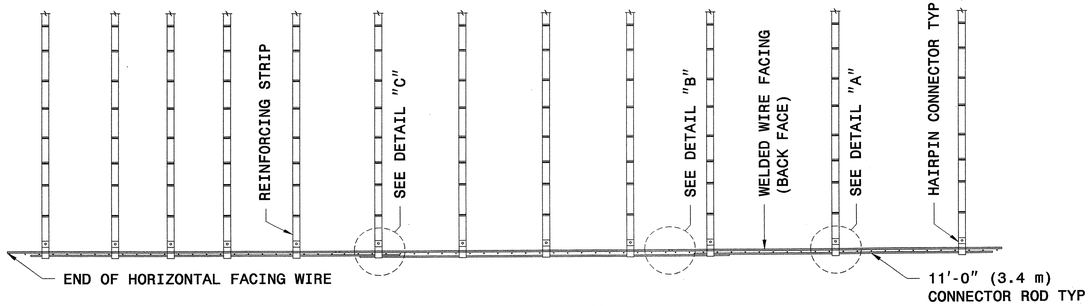
PLAN DETAIL 'C'
STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL



TYPICAL SECTION



TYPICAL ELEVATION
(WIRES NOT SHOWN FOR CLARITY)



TYPICAL PLAN

The Reinforced Earth Company

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.02

TERRATREL
TEMPORARY WALL

SHEET 11 OF 11 — DATE: 12-19-06

C221427 3/29/2007 std no 1801 shidden GE-Oce34bond

PROJECT REFERENCE NO.	SHEET
B-4507	2-Z

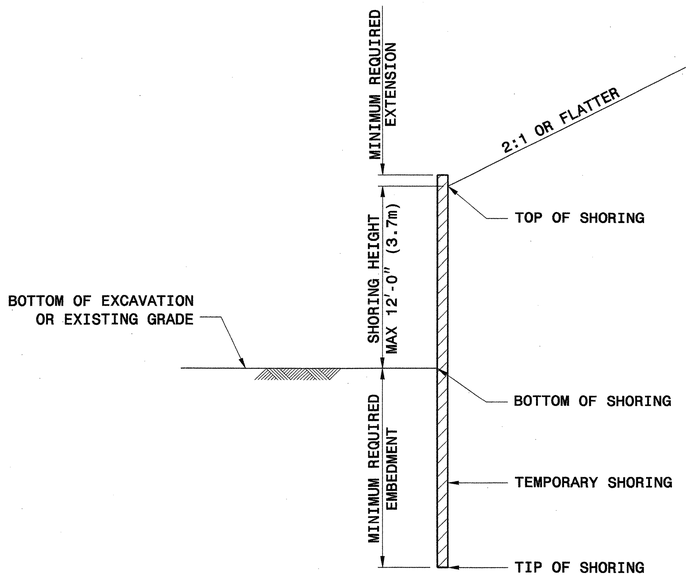
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

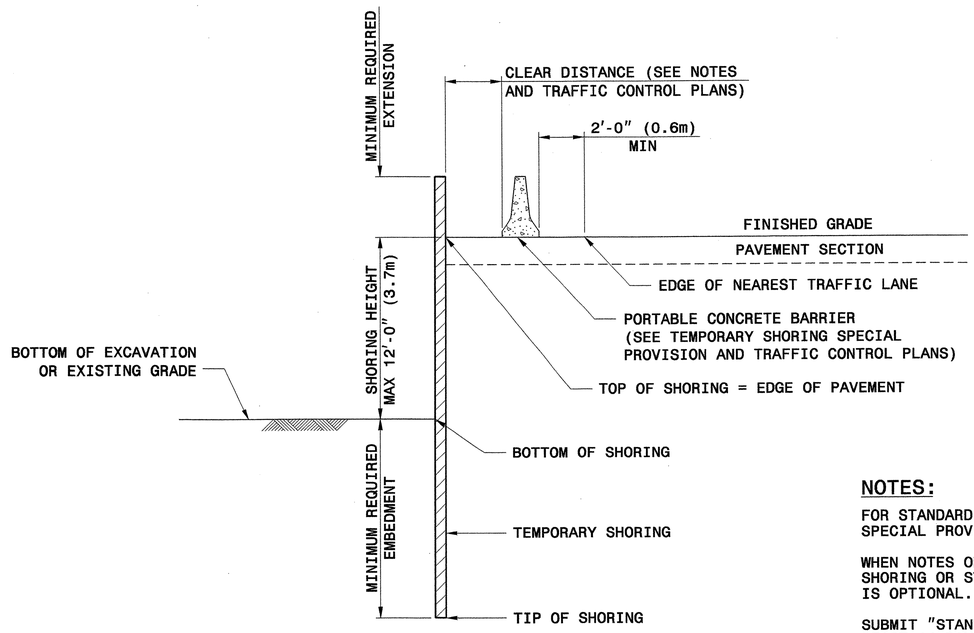
Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

SIGNATURE DATE



SLOPE CASE



SURCHARGE CASE

GROUNDWATER CONDITION	SHORING HEIGHT FT (m)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT: SHEET PILES: MINIMUM REQUIRED EMBEDMENT FT (m)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT: SHEET PILES: MINIMUM REQUIRED SECTION MODULUS IN^3/FT (cm^3/m)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT: H PILES WITH TIMBER LAGGING: MINIMUM REQUIRED EMBEDMENT FT (m) HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)	SURCHARGE CASE WITH TRAFFIC IMPACT: SHEET PILES: MINIMUM REQUIRED EMBEDMENT FT (m)	SURCHARGE CASE WITH TRAFFIC IMPACT: SHEET PILES: MINIMUM REQUIRED SECTION MODULUS IN^3/FT (cm^3/m)	SURCHARGE CASE WITH TRAFFIC IMPACT: H PILES WITH TIMBER LAGGING: MINIMUM REQUIRED EMBEDMENT FT (m) HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)
GROUNDWATER ELEVATION BELOW TIP OF SHORING	< 6 (1.8)	7.5 (2.3)	3.0 (161)	8.0 (2.4)	8.0 (2.4)	8.0 (2.4)	11.0 (3.4)	10.0 (538)	9.5 (2.9)	9.5 (2.9)	9.5 (2.9)
	7 (2.1)	8.5 (2.6)	4.5 (242)	9.5 (2.9)	9.5 (2.9)	9.5 (2.9)	12.0 (3.7)	12.0 (645)	10.5 (3.2)	10.5 (3.2)	10.5 (3.2)
	8 (2.4)	10.0 (3.0)	6.5 (349)	10.5 (3.2)	10.5 (3.2)	10.5 (3.2)	12.5 (3.8)	14.0 (753)	11.5 (3.5)	11.5 (3.5)	11.5 (3.5)
	9 (2.7)	11.0 (3.4)	9.5 (511)	--	12.0 (3.7)	12.0 (3.7)	13.5 (4.1)	16.5 (887)	--	12.5 (3.8)	12.5 (3.8)
	10 (3.0)	12.5 (3.8)	13.0 (699)	--	--	13.5 (4.1)	14.0 (4.3)	19.5 (1048)	--	13.5 (4.1)	13.5 (4.1)
	11 (3.4)	13.5 (4.1)	17.0 (914)	--	--	14.5 (4.4)	15.0 (4.6)	22.5 (1210)	--	--	14.5 (4.4)
	12 (3.7)	15.0 (4.6)	21.5 (1156)	--	--	16.0 (4.9)	16.0 (4.9)	25.5 (1371)	--	--	15.5 (4.7)
GROUNDWATER ELEVATION BEWTEEN BOTTOM OF SHORING AND TIP OF SHORING	< 6 (1.8)	11.5 (3.5)	4.5 (242)	11.5 (3.5)	11.5 (3.5)	11.5 (3.5)	16.0 (4.9)	12.0 (645)	13.0 (4.0)	13.0 (4.0)	13.0 (4.0)
	7 (2.1)	13.0 (4.0)	7.0 (376)	13.0 (4.0)	13.0 (4.0)	13.0 (4.0)	17.0 (5.2)	14.5 (780)	14.5 (4.4)	14.5 (4.4)	14.5 (4.4)
	8 (2.4)	15.0 (4.6)	10.0 (538)	--	15.0 (4.6)	15.0 (4.6)	18.0 (5.5)	17.0 (914)	--	15.5 (4.7)	15.5 (4.7)
	9 (2.7)	17.0 (5.2)	14.0 (753)	--	17.0 (5.2)	17.0 (5.2)	19.0 (5.8)	20.0 (1075)	--	17.0 (5.2)	17.0 (5.2)
	10 (3.0)	18.5 (5.6)	19.5 (1048)	--	--	18.5 (5.6)	20.0 (6.1)	23.5 (1263)	--	--	18.5 (5.6)
	11 (3.4)	20.5 (6.3)	26.0 (1398)	--	--	--	21.0 (6.4)	28.0 (1505)	--	--	20.0 (6.1)
	12 (3.7)	22.5 (6.9)	33.0 (1774)	--	--	--	22.0 (6.7)	33.0 (1774)	--	--	21.5 (6.6)

NOTE: MINIMUM REQUIRED EXTENSION IS 6" (150mm) FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" (800 mm) FOR "SURCHARGE CASE WITH TRAFFFIC IMPACT".

NOTES:

FOR STANDARD TEMPORARY SHORING, SEE TEMPORARY SHORING SPECIAL PROVISION.

WHEN NOTES ON PLANS DO NOT PROHIBIT STANDARD TEMPORARY SHORING OR STANDARD SHORING, STANDARD TEMPORARY SHORING IS OPTIONAL.

SUBMIT "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 14 DAYS BEFORE BEGINNING SHORING CONSTRUCTION. UP TO THREE LOCATIONS MAY BE INCLUDED ON EACH SELECTION FORM.

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING CONDITIONS:
1) MAXIMUM SHORING HEIGHT IS 12'-0" (3.7m).
2) TRAFFIC SURCHARGE IS 240 PSF (11.5 KPA) MAXIMUM OR BACKSLOPE IS 2:1 (H:V) OR FLATTER.
3) BOTTOM OF EXCAVATION OR EXISTING GRADE IN FRONT OF SHORING IS 6:1 (H:V) SLOPE OR FLATTER.
4) H PILE SPACING IS 6'-0" (1.8m).
5) H PILE EMBEDMENT DEPTHS ARE FOR DRIVEN PILES.
6) TIMBER LAGGING IS A MINIMUM OF 3" (75mm) THICK.

STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
TOTAL UNIT WEIGHT = 120 PCF (18.8 KN/M^3)
FRICTION ANGLE = 30 DEGREES
COHESION = 0 PSF (0 KPA)
GROUNDWATER IS ASSUMED TO BE BELOW BOTTOM OF SHORING.

DO NOT USE STANDARD TEMPORARY SHORING WHEN THE ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE THE BOTTOM OF SHORING.

DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS PRESENT WITHIN THE EMBEDMENT DEPTH.

VERIFY GROUNDWATER ELEVATION BEFORE BEGINNING SHORING CONSTRUCTION.

IF THE CLEAR DISTANCE AVAILABLE IS LESS THAN THE MINIMUM REQUIRED IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS, SET THE BARRIER AGAINST THE TRAFFIC SIDE OF THE SHORING AND USE THE "SURCHARGE CASE WITH TRAFFIC IMPACT".

AT THE CONTRACTOR'S OPTION, H PILE EMBEDMENT DEPTHS FOR PILES SET IN DRILLED HOLES MAY BE REDUCED BY 25%. FOR PILE EXCAVATION, SEE TEMPORARY SHORING SPECIAL PROVISION.

CONTROL DRAINAGE DURING CONSTRUCTION IN THE VICINITY OF THE SHORING. COLLECT AND DIRECT RUNOFF AWAY FROM SHORING.

CONTACT THE ENGINEER IF MINIMUM REQUIRED EMBEDMENT IS NOT ACHIEVED.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

GEOTECHNICAL ENGINEERING UNIT

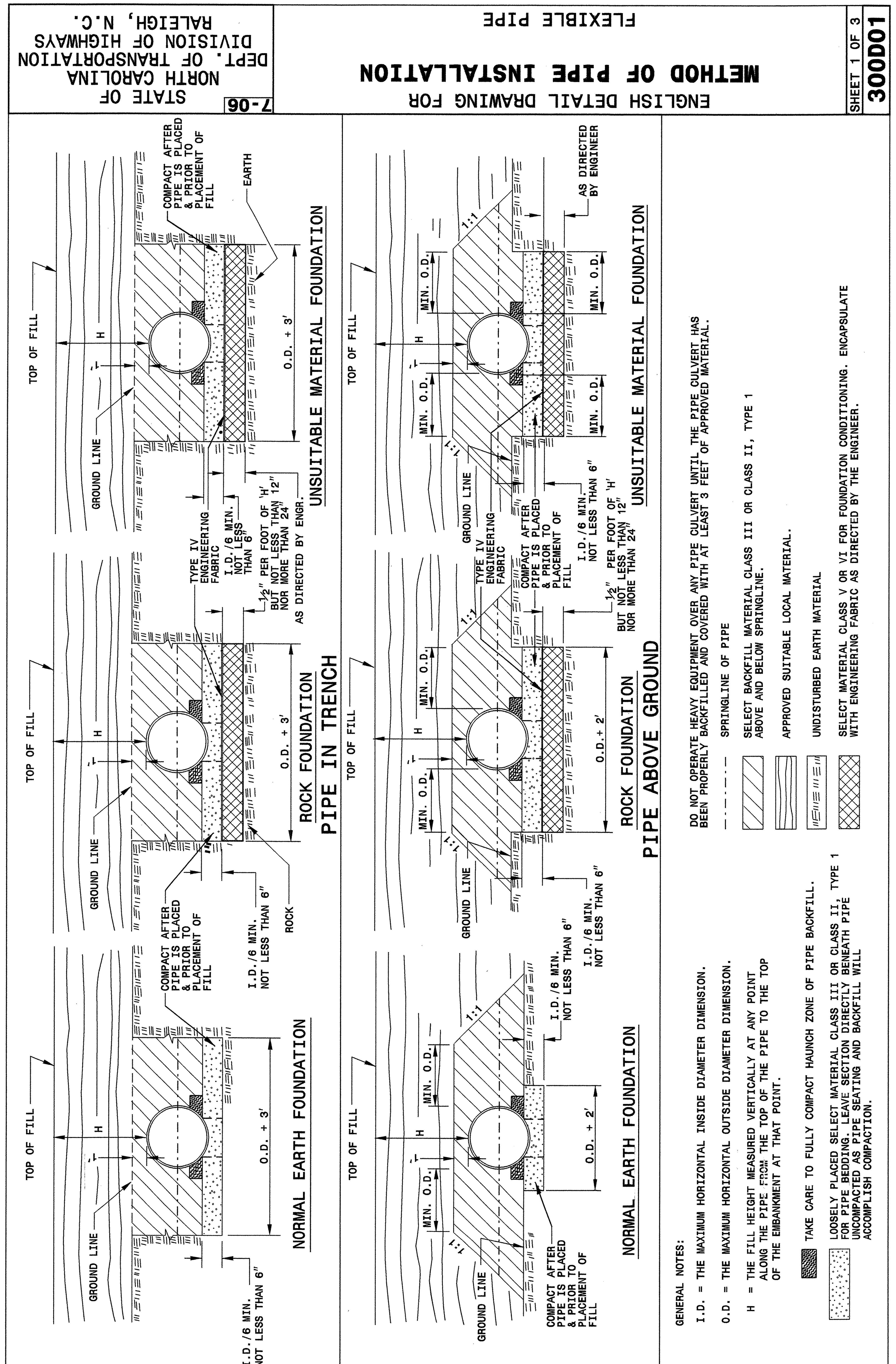
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD DRAWING NO. 1801.01

STANDARD TEMPORARY SHORING

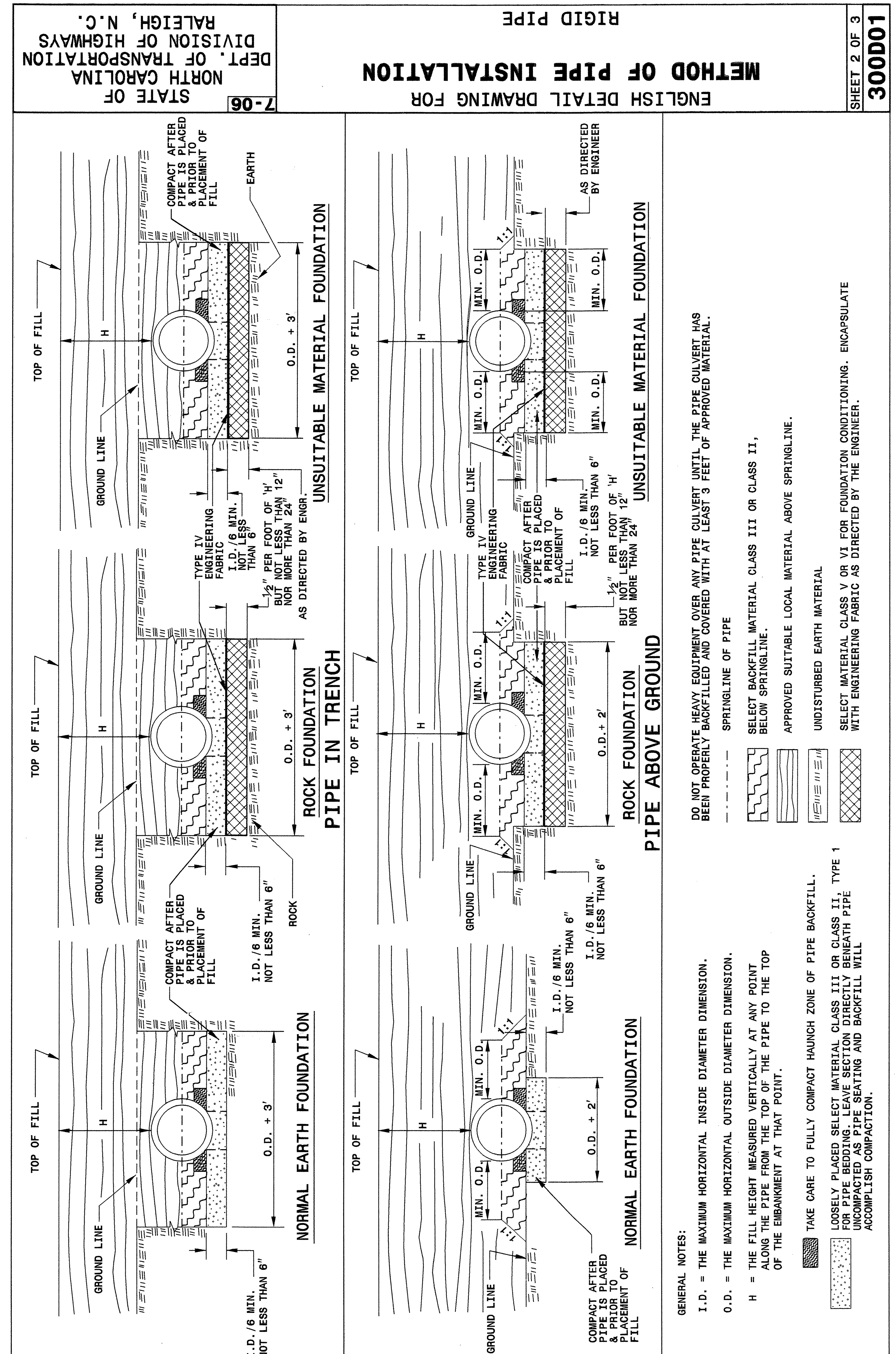
DATE: 2-20-07

PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-AA



NORMAL EARTH FOUNDATION
ROCK FOUNDATION
PIPE IN TRENCH
UNSUITABLE MATERIAL FOUNDATION
ROCK FOUNDATION
PIPE ABOVE GROUND
TOP OF FILL
GROUND LINE
COMPACT AFTER PIPE IS PLACED & PRIOR TO PLACEMENT OF FILL
I.D./6 MIN. NOT LESS THAN 6"
O.D. + 3'
O.D. + 2'
MIN. O.D.
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
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
ROCK FOUNDATION
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 JOEL S. HOWERTON 6/25/09

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

30-JUL-2009 08:48
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jhowerton AT PS237501

5/14/99

30-JUL-2009 08:49
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jhowerton AT PS237501

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

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

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

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 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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022966 JOEL S. HOWERTON 9/25/09

PROJECT REFERENCE NO.	SHEET NO.
B-4507	2-AB

12/06/07

PROJECT REFERENCE NO.	SHEET NO.
B-4507	3

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202258

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (27+90.71 LEFT)
0029000000-N	SP	Lump Sum		REINFORCED BRIDGE APPROACH FILL, STATION ********** (28+01.29 RIGHT)
0043000000-N	226	Lump Sum		GRADING
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0057000000-E	226	3,500	CY	UNDERCUT EXCAVATION
0080000000-E	SP	4,000	TON	CLASS IV SUBGRADE STABILIZATION
0134000000-E	240	450	CY	DRAINAGE DITCH EXCAVATION
0141000000-E	240	410	LF	BERM DITCH CONSTRUCTION
0195000000-E	265	2,000	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	6,000	SY	FABRIC FOR SOIL STABILIZATION
0199000000-E	SP	950	SF	TEMPORARY SHORING
0223000000-E	SP	655	SY	ROCK PLATING
0318000000-E	300	370	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0320000000-E	SP	1,160	SY	FOUNDATION CONDITIONING FABRIC
0372000000-E	310	208	LF	18" RC PIPE CULVERTS, CLASS III
0390000000-E	310	16	LF	36" RC PIPE CULVERTS, CLASS III
0570000000-E	310	8	LF	6" CS PIPE CULVERTS, 0.064" THICK (SPRING BOX)
0708000000-E	310	684	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0714000000-E	310	488	LF	18" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0720000000-E	310	52	LF	24" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0726000000-E	310	32	LF	30" BIT COAT CS PIPE CULVERTS, TYPE B 0.079" THICK
0806000000-E	310	18	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0807000000-E	310	8	EA	18" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0808000000-E	310	2	EA	24" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
1110000000-E	510	500	TON	STABILIZER AGGREGATE
1220000000-E	545	500	TON	INCIDENTAL STONE BASE
1330000000-E	607	5,510	SY	INCIDENTAL MILLING
1489000000-E	610	560	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1491000000-E	610	20,900	TON	ASPHALT CONC BASE COURSE, TYPE B25.0C
1498000000-E	610	400	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1503000000-E	610	12,900	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0C
1519000000-E	610	405	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1523000000-E	610	10,425	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5C
1560000000-E	620	1,573	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1565000000-E	620	626	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 70-22
1693000000-E	654	115	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
1840000000-E	665	13,250	LF	MILLED RUMBLE STRIPS (ASPHALT CEMENT CONCRETE)
2022000000-E	815	672	CY	SUBDRAIN EXCAVATION
2033000000-E	815	336	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	2,000	LF	6" PERFORATED SUBDRAIN PIPE
2055000000-E	815	60	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
2066000000-N	815	4	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
2077000000-E	815	24	LF	6" OUTLET PIPE (SUBDRAINS)
2253000000-E	840	5	CY	PIPE COLLARS
2264000000-E	840	0.2	CY	PIPE PLUGS
2286000000-N	840	39	EA	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	8	LF	MASONRY DRAINAGE STRUCTURES
2354000000-N	840	2	EA	FRAME WITH GRATE, STD 840.22
2364200000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.20
2365000000-N	840	27	EA	FRAME WITH TWO GRATES, STD 840.22
2396000000-N	840	4	EA	FRAME WITH COVER, STD 840.54
2407000000-N	840	11	EA	STEEL FRAME WITH TWO GRATES, STD 840.37
2556000000-E	846	2,900	LF	SHOULDER BERM GUTTER
2619000000-E	850	11	SY	4" CONCRETE PAVED DITCH
2875000000-N	859	6	EA	CONVERT EXISTING CATCH BASIN TO DROP INLET
2905000000-N	859	1	EA	CONVERT EXISTING DROP INLET TO JUNCTION BOX
3030000000-E	862	9,675	LF	STEEL BM GUARDRAIL
3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS
3210000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
3270000000-N	SP	3	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3317000000-N	862	8	EA	GUARDRAIL ANCHOR UNITS, TYPE B-77
3345000000-E	864	2,350	LF	REMOVE & RESET EXISTING GUARDRAIL
3360000000-E	863	9,100	LF	REMOVE EXISTING GUARDRAIL
3387000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE ********** TEMPORARY (W-BEAM)
3503000000-E	866	4,050	LF	WOVEN WIRE FENCE, 47" FABRIC
3509000000-E	866	250	EA	4" TIMBER FENCE POSTS, 7'-6" LONG
3515000000-E	866	90	EA	5" TIMBER FENCE POSTS, 8'-0" LONG
3557000000-E	866	4,050	LF	ADDITIONAL BARBED WIRE
3628000000-E	876	75	TON	RIP RAP, CLASS I
3649000000-E	876	20	TON	RIP RAP, CLASS B
3656000000-E	876	3,265	SY	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	2	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4054000000-E	902	1	CY	PLAIN CONCRETE SIGN FOUNDATIONS
4057000000-E	SP	12	CY	OVERHEAD FOOTING
4060000000-E	903	218	LB	SUPPORTS, BREAKAWAY STEEL BEAM
4072000000-E	903	109	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4082100000-N	SP	Lump Sum		SUPPORTS, OVERHEAD SIGN STRUCTURE AT STA ****** (38+50.00)
4102000000-N	904	3	EA	SIGN ERECTION, TYPE E
4108000000-N	904	1	EA	SIGN ERECTION, TYPE F
4110000000-N	904	1	EA	SIGN ERECTION, TYPE *** (GROUND MOUNTED) (A)
4155000000-N	907	3	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4158000000-N	907	5	EA	DISPOSAL OF SIGN SYSTEM, WOOD
4400000000-E	1110	400	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	650	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	50	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	2	EA	FLASHING ARROW PANELS, TYPE C
4420000000-N	1120	4	EA	CHANGEABLE MESSAGE SIGN
4430000000-N	1130	375	EA	DRUMS
4445000000-E	1145	60	LF	BARRICADES (TYPE III)
4465000000-N	1160	2	EA	TEMPORARY CRASH CUSHIONS
4470000000-N	1160	2	EA	RESET TEMPORARY CRASH CUSHIONS
4480000000-N	1165	2	EA	TMIA
4490000000-E	1170	605	LF	PORTABLE CONCRETE BARRIER (ANCHORED)
4495000000-E	1170	2,600	LF	PORTABLE CONCRETE BARRIER (DRAINAGE)
4506000000-E	1170	1,960	LF	RESET PORTABLE CONCRETE BARRIER (DRAINAGE)
4510000000-N	SP	100	HR	LAW ENFORCEMENT
4650000000-N	1251	225	EA	TEMPORARY RAISED PAVEMENT MARKERS
4685000000-E	1205	9,000	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	3,560	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4688000000-E	1205	15,772	LF	THERMOPLASTIC PAVEMENT MARKING LINES (6", 90 MILS)
4690000000-E	1205	3,050	LF	THERMOPLASTIC PAVEMENT MARKING LINES (6", 120 MILS)
4695000000-E	1205	350	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)
4700000000-E	1205	1,280	LF	THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS)
4721000000-E	1205	8	EA	THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)
4725000000-E	1205	11	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
4770000000-E	1205	2,100	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)
4775000000-E	1205	1,066	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (6") (III)
4805000000-N	1205	1	EA	COLD APPLIED PLASTIC PAVEMENT MARKING SYMBOL, TYPE ** (III)
4810000000-E	1205	11,400	LF	PAINT PAVEMENT MARKING LINES (4")
4845000000-N	1205	3	EA	PAINT PAVEMENT MARKING SYMBOL
4850000000-E	1205	3,500	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4905000000-N	1253	206	EA	SNOWPLOWABLE PAVEMENT MARKERS
5589200000-E	1515	1	EA	2" AIR RELEASE VALVE
5816000000-N	1530	1	EA	ABANDON UTILITY MANHOLE
5888000000-E	SP	220	LF	GENERIC UTILITY ITEM PROTECTIVE STEEL PLATING
6000000000-E	1605	14,200	LF	TEMPORARY SILT FENCE
6006000000-E	1610	1,350	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	2,925	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	2,575	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	33.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	700	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	4.5	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	1,650	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	11	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	2,900	LF	SAFETY FENCE
6030000000-E	1630	9,000	CY	SILT EXCAVATION
6036000000-E	1631	20,200	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	110	SY	COIR FIBER MAT
6038000000-E	SP	4,500	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	3,100	LF	1/4" HARDWARE CLOTH
6070000000-N	SP	20	EA	SPECIAL STILLING BASINS
6071010000-E	SP	500	LF	WATTLE
6071020000-E	SP	125	LB	POLYACRYLAMIDE (PAM)
6071030000-E	SP	7,500	LF	COIR FIBER BAFFLES
6071050000-E	SP	8	EA	** SKIMMER (1-1/2")
6071050000-E	SP	1	EA	** SKIMMER (2")
6084000000-E	1660	25	ACR	SEEDING & MULCHING
6087000000-E	1660	23.5	ACR	MOWING
6090000000-E	1661	300	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.75	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	475	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	14	TON	FERTILIZER TOPDRESSING
6114500000-N	SP	200	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	36	EA	RESPONSE FOR EROSION CONTROL
				******* BEGIN SCHEDULE AA *******
				******* (3 ALTERNATES) *******
0366000000-E AA1	310	1,192	LF	15" RC PIPE CULVERTS, CLASS III
0378000000-E AA1	310	284	LF	24" RC PIPE CULVERTS, CLASS III
0384000000-E AA1	310	488	LF	30" RC PIPE CULVERTS, CLASS III
				*** OR ***
0366000000-E AA2	310	744	LF	15" RC PIPE CULVERTS, CLASS III
0378000000-E AA2	310	32	LF	24" RC PIPE CULVERTS, CLASS III
0384000000-E AA2	310	44	LF	30" RC PIPE CULVERTS, CLASS III
0536000000-E AA2	SP	448	LF	*** HDPE PIPE CULVERTS (15")
0536000000-E AA2	SP	252	LF	*** HDPE PIPE CULVERTS (24")
0536000000-E AA2	SP	444	LF	*** HDPE PIPE CULVERTS (30")
				*** OR ***
0366000000-E AA3	310	744	LF	15" RC PIPE CULVERTS, CLASS III
0378000000-E AA3	310	32	LF	24" RC PIPE CULVERTS, CLASS III
0384000000-E AA3	310	44	LF	30" RC PIPE CULVERTS, CLASS III
0540000000-E AA3	SP	448	LF	*** ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, **** THICK (15", 0.064")
0540000000-E AA3	SP	252	LF	*** ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, **** THICK (24", 0.064")
0540000000-E AA3	SP	444	LF	*** ALUMINIZED CORRUGATED STEEL PIPE CULVERTS, **** THICK (30", 0.079")
				******* END SCHEDULE AA *******

6/21/00

COMPUTED BY: A.J. FOSTER DATE: 06/09
CHECKED BY: RJD DATE: 07/09

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
B-4507	3-A

GUARDRAIL SUMMARY

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

"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.

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. 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	TYPE B-77	CAT-1	GRAU 350	GRAU M350		EA	G	NG				
-L-	10+07.34	26+88.59 (BR)	CL,LT	1,681.25			26+88.59 (BR)		12'	12'		92.86		6.5	1									1,676.87'		TIE TO EXIST. GUARDRAIL
-L-	10+09.45	26+90.70 (BR)	CL,RT	1,681.25			26+90.70 (BR)		12'	12'		90.55		5.4	1									1,694.62'		TIE TO EXIST. GUARDRAIL
-L-	17+98.03	27+04.28 (BR)	RT	906.25			19+50.00	27+04.28 (BR)	35'	38'	300		6		1		1							861.47'		TO BE PLACED DURING SBL DETOUR CONSTRUCTION
-L-	19+75.01	26+75.01 (BR)	LT	700			26+75.01 (BR)	19+75.01	35'	38'		300		6	1	1								721.21'		TO BE PLACED DURING NBL DETOUR CONSTRUCTION
-L-	28+87.72 (BR)	34+06.47	LT	518.75			32+50.00	28+87.72 (BR)	35'	38'	300		6		1		1							288.55'		TO BE PLACED DURING NBL DETOUR CONSTRUCTION
-L-	29+01.30 (BR)	45+45.05	CL,LT	1,643.75			29+01.30 (BR)		12'	12'	95.05		9.5		1									1,658.55'		TIE TO EXIST. GUARDRAIL
-L-	29+03.41 (BR)	45+47.16	CL,RT	1,643.75				29+03.41 (BR)	12'	12'		97.16		9.7	1									1,655.21'		TIE TO EXIST. GUARDRAIL
-L-	29+16.99 (BR)	31+29.49	RT	212.5			31+25.00	29+16.99 (BR)	35'	38'		206.25		4.125	1	1								225.20'		TO BE PLACED DURING SBL DETOUR CONSTRUCTION
-L-	36+62.50	38+56.25	RT	193.75			38+50.00		12'	15'	50		1			1	1									
-RAMPB-	10+43.75	18+00.00	LT	756.25			18+00.00	10+50.00	12'	15'	142.3		3.4			1								312.36'		TIE TO EXIST. GUARDRAIL
			SUB-TOTAL	9,937.5															10 ADDITIONAL GUARDRAIL POSTS							
			ANCHOR DEDUCTION	-325																						
			TOTAL	9,612.5																			TOTAL	9,094.04'		
			SAY	9,675											8	4	3						SAY	9,100'		

ANCHOR DEDUCTION
TYPE B-77: 8 @ 18.75' = 150'
TYPE 350: 3 @ 50' = 150'
TYPE CAT-1: 4 @ 6.25' = 25'
GRAND TOTAL = 325'

NOTE: 2,350 FT OF GUARDRAIL PLACED DURING DETOUR CONSTRUCTION WILL BE REMOVED AND RESET DURING FINAL PHASE OF CONSTRUCTION

SUMMARY OF EARTHWORK

(IN CUBIC YARDS)

LOCATION	UNCL TOTAL EXCAVATION	UNDERCUT EXCAVATION TOTAL	EMB. + %	BORROW	WASTE
PHASE 1 CONSTRUCTION					
{DETOURS STATIONED ALONG -L-}					
NBLDET STA 14+63.10 TO 26+77.48 (BEGIN BRIDGE)	409		18,362	17,953	
NBLDET STA (END BRIDGE) 28+90.19 TO 37+21.76	5,473		12,355	6,882	
SBLDET STA 14+13.37 TO 27+01.81 (BEGIN BRIDGE)	6,193		15,905	9,712	
SBLDET STA (END BRIDGE) 29+14.52 TO 38+16.43	10,956		8,194		2,762
SUBTOTAL	23,031	0	54,816	34,547	2,762
PHASE 2 CONSTRUCTION					
{-L-MEDIAN-}					
-L- STA 10+00.00 TO 26+89.64 (BEGIN BRIDGE)	933		1,268	335	
-L- STA (END BRIDGE) 29+02.36 TO 45+50.00	805		1,348	543	
SUBTOTAL	1,738	0	2,616	878	0
PHASE 3 CONSTRUCTION					
{-LLT-, -LRT-, -RAMPB-, & -RAMPC-}					
-L- STA 10+00.00 TO 26+84.35 (BEGIN BRIDGE)	506		904	398	
-L- STA (END BRIDGE) 28+97.07 TO 45+50.00	1,299		570		796
-RAMPB- STA 14+56.77 TO 18+00.00	43		670	627	
-L- STA 10+00.00 TO 26+94.94 (BEGIN BRIDGE)	7,944		468		7,476
-L- STA (END BRIDGE) 29+07.65 TO 45+50.00	2,994		349		2,645
-RAMPC- STA 14+65.22 TO 19+00.00	690		412		318
SUBTOTAL	13,476	0	3,372	1,024	11,128
PROJECT SUBTOTAL	38,245	0	60,804	36,450	13,891
LOSS DUE TO CLEAR AND GRUB	-1,500			1,500	
SHOULDER MATERIAL			9,720	9,720	
WASTE IN LUE OF BORROW				-3,787	-3,787
PROJECT TOTAL	36,745	0	70,524	42,263	10,104
5% TO REPLACE TOPSOIL				2,113	
GRAND TOTAL	36,745			44,376	10,104
SAY	36,800			44,400	
-L-, -RAMPB-, & -RAMPC- PAVEMENT STRUCTURE VOLUME = 14,085 CY					
ESTIMATE DDE = 450 CY					
ESTIMATED UNDERCUT (CONTINGENCY) = 3,500 CY					

REMOVAL OF ASPHALT PAVEMENT

SURVEY LINE	LOCATION LT/RT/CL	BEG. STA.	END STA.	AREA (SQ YDS)
*AREAS OF DETOUR PAVEMENT THAT EXTEND PAST PROPOSED -L- LIMITS				
-L-	LT	18+13.37	19+28.92	31
-L-	LT	34+44.84	35+46.10	19
-L-	RT	17+64.81	17+85.59	1
-L-	RT	32+11.85	34+15.93	64
			SUBTOTAL	115
*EXISTING PAVEMENT TO BE REMOVED				
-L-	LT	25+29.24	26+74.15 (BR)	386
-L-	LT	28+86.64 (BR)	30+50	436
-L-	RT	25+38.76	26+84.29 (BR)	388
-L-	RT	28+97.39 (BR)	30+55	420
			SUBTOTAL	1,630
*-L- EXISTING PAVED SHOULDER REMOVAL: ASSUMED 4' OUTSIDE, 2' MEDIAN				
-L-	LT	10+00.00	26+74.15 (BR)	744
-L-	LT	28+86.64 (BR)	37+45.20	382
-L-	LT	39+93.65	45+50.00	247
-L-	MED, LT	10+00.00	26+74.15	372
-L-	MED, LT	28+86.64 (BR)	45+50.00	370
-L-	RT	10+00.00	26+84.29 (BR)	749
-L-	RT	28+97.39 (BR)	38+37.00	418
-L-	RT	43+80.00	45+50.00	76
-L-	MED, RT	10+00.00	26+84.29 (BR)	374
-L-	MED, RT	28+97.39 (BR)	45+50.00	367
			SUBTOTAL	4,099
*RAMP EXISTING PAVED SHOULDER AND GORE AREA PAVEMENT REMOVAL				
-RAMPB-	LT	10+00.00	18+00.00	356
-L-	LT	39+93.65	40+80.84	43
-RAMPC-	RT	10+00.00	19+00.00	400
-L-	RT	42+48.13	43+80.00	149
			SUBTOTAL	948
			GRAND TOTAL	6,792
			SAY	6,800

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.

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".

TEMPORARY ASPHALT SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	LOCATION LT/CL/RT	STATION	STATION	LENGTH (FT.)
-SBLDET-	RT	16+49.53	24+79.94	830.41
-SBLDET-	RT	27+42.72	29+23.84	181.12
-NBLDET-	LT	17+82.71	24+51.45	668.54
-NBLDET-	LT	27+14.16	31+54.97	440.81
			TOTAL:	2,120.88
			SAY:	2,150

NOTE: CONSTRUCT ASPHALT SHOULDER BERM GUTTER WITH ACSC S9.5C

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	LOCATION LT/CL/RT	STATION	STATION	LENGTH (FT.)
-L-	RT	18+47.63	26+79.90	832.27
-L-	RT	29+41.67	31+23.29	181.62
-L-	LT	19+80.93	26+50.40	669.47
-L-	LT	29+13.11	33+55.67	442.56
-RAMPB-	LT	10+49.00	18+00.00	751
			TOTAL:	2,876.92
			SAY:	2,900

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COMPUTED BY: A.J. FOSTER DATE: 06/09
CHECKED BY: RJD DATE: 07/09

PROJECT REFERENCE NO.: B-4507 | SHEET NO.: 3-B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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	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"
-L- 9+92	CL	1		762.3'	759.6'																							
-L- 9+92	CL	1	2		759.6'	743.6'			408																			
-L- 14+04	CL	2		749.3'	743.6'																							
-L- 13+00	LT	6		750.0'	745.2'																							
-L- 13+00	LT	6	7		745.2'	741.0'																						
-L- 13+81	RT	IN	5		763.8'													40										
-L- 13+81	RT	5		748.6'	746.0'																							
-L- 13+81	RT	5	4		746.0'	745.5'				28																		
-L- 14+28	LT	3	7		741.6'	741.1'				16																		
-L- 14+28	LT	7		745.8'	740.5'																							
-L- 14+28	LT	7	8		740.5'	733.7'																						
-L- 16+24	LT	8		739.0'	733.7'																							
-L- 16+24	LT	8	9		733.7'	728.6'																						
-L- 17+50	LT	9		733.9'	728.6'																							
-L- 17+50	LT	9	11		728.6'	725.6'																						
-L- 18+78	LT	10		728.3'	726.1'																							
-L- 18+78	LT	10	11		726.1'	725.6'				8																		
-L- 18+81	LT	11		730.5'	725.6'																							
-L- 18+81	LT	11	12		725.6'	724.7'						24																
-L- 18+79	LT	11A			733.7'																							
-L- 18+79	LT	11A	12																									
-L- 18+93	LT	12			724.7'																							
-L- 18+41	CL	13		733.2'	730.5'																							
-L- 18+68	RT	14	15		728.1'	727.9'				36																		
-L- 16+99	RT	14A		736.4'	733.6'																							
-L- 16+99	RT	14A	15		733.6'	726.6'																						
-L- 18+68	RT	15		731.4'	726.6'																							
-L- 18+68	RT	15	17		726.6'	716.8'																						
-L- 19+95	RT	16	17		717.1'	716.3'						20																
-L- 19+95	RT	17		721.03'	714.7'																							
-L- 19+95	RT	17	OUT		714.7'	714.5'							16															
-L- 21+96	LT	1T	OUT		715.7'	715.0'											40											
-L- 22+18	RT	2T		731.1'	728.3'																							
-L- 22+18	RT	2T	22		728.3'	728.0'											36											
-L- 22+18	RT	22		731.0'	728.0'																							
-L- 22+18	RT	22	OUT		728.0'	716.1'											36											
-L- 24+37	RT	23		732.6'	729.8'																							
-L- 24+37	RT	23	OUT		729.8'	716.2'											40											
-L- 22+00	CL	18																										
-L- 23+00	CL	19		731.0'	728.2'																							
-L- 23+00	CL	19	20		728.2'	727.9'			84																			
-L- 22+12	CL	20		730.7'	726.4'																							
-L- 22+12	LT	20	3T		726.4'	725.9'				52																		
-L- 22+12	LT	3T		729.8'	725.9'																							
-L- 22+12	LT	3T	21		725.9'	725.4'				36																		
-L- 22+12	LT	21		730.7'	725.4'																							
-L- 22+12	LT	21	OUT		726.7'	716.9'												36										
-L- 24+40	LT	24		732.8'	730.0'																							
-L- 24+40	LT	24	OUT		730.0'	715.7'											44											
3-B TOTALS									492	176		44	16				196	76										

STATION	LOC.	FROM	TO	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	6" BIT. COAT. TYPE B CS PIPE FOR SPRING BOX 0.064"	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES 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
-L- 9+92	CL	1															1						
-L- 9+92	CL	1	2																				
-L- 14+04	CL	2																					
-L- 13+00	LT	6															1						
-L- 13+00	LT	6	7				128																
-L- 13+81	RT	IN	5																				
-L- 13+81	RT	5															1						
-L- 13+81	RT	5	4																				
-L- 14+28	LT	3	7																				
-L- 14+28	LT	7															1	0.3'					
-L- 14+28	LT	7	8					192															
-L- 16+24	LT	8															1	0.3'					
-L- 16+24	LT	8	9					124															
-L- 17+50	LT	9															1	0.3'					
-L- 17+50	LT	9	11					128															
-L- 18+78	LT	10															1						
-L- 18+78	LT	10	11																				
-L- 18+81	LT	11															1						
-L- 18+81	LT	11	12																				
-L- 18+79	LT	11A																					
-L- 18+79	LT	11A	12									8											
-L- 18+93	LT	12															1						
-L- 18+41	CL	13																					
-L- 18+68	RT	14	15																				
-L- 16+99	RT	14A															1						
-L- 16+99	RT	14A	15		168																		
-L- 18+68	RT	15															1						
-L- 18+68	RT	15	17				124																
-L- 19+95	RT	16	17																				
-L- 19+95	RT	17															1	1.3'					
-L- 19+95	RT	17	OUT																				
-L- 21+96	LT	1T	OUT																				
-L- 22+18	RT	2T															1						
-L- 22+18	RT	2T	22																				
-L- 22+18	RT	22															1						
-L- 22+18	RT	22	OUT																				
-L- 24+37	RT	23															1						
-L- 24+37	RT	23	OUT																				
-L- 22+00	CL	18																					
-L- 23+00	CL	19															1						
-L- 23+00	CL	19	20																				
-L- 22+12	CL	20															1						
-L- 22+12	LT	20	3T																				
-L- 22+12	LT	3T															1						
-L- 22+12	LT	3T	21																				
-L- 22+12	LT	21															1	0.3'					
-L- 22+12	LT	21	OUT																				
-L- 24+40	LT	24															1						
-L- 24+40	LT	24	OUT																				
3-B TOTALS					168		252	444				8					20	2.5'					

STATION	LOC.	FROM	TO	SPRING BOX STD. 840.41	O. T. C. B. STD. 840.04 OR 840.05	PREFORMED SCOUR HOLE	M.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	T.B.D.I. FRAME WITH TWO GRATES STD. 840.37	T.B.D.I. STD. 840.36	J.B. STD. 840.31 OR 840.32	T.B.D.I. STD. 840.35	CONV. EXIST. O.T.C.B. TO D.I.	M.H. FRAME & COVER STD. 840.54	CONV. EXIST. D.I. TO J.B.	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
-L- 9+92	CL	1							1			1													
-L- 9+92	CL	1	2																						
-L- 14+04	CL	2										1					1								CONVERT O.T.C.B. TO 2GI, ADJUST TOP ELEV
-L- 13+00	LT	6							1			1													
-L- 13+00	LT	6	7																						
-L- 13+81	RT	IN	5																						BERM DITCH OUTLET
-L- 13+81	RT	5							1			1													
-L- 13+81	RT	5	4																		0.4465				REMOVE EXISTING D.I. AND REPLACE WITH PIPE COLLAR
-L- 14+28	LT	3	7																		0.4465				
-L- 14+28	LT	7						1				1													
-L- 14+28	LT	7	8																						
-L- 16+24	LT	8						1				1													
-L- 16+24	LT	8	9																						
-L- 17+50	LT	9						1				1													
-L- 17+50	LT	9	11																						
-L- 18+78	LT	10							1			1													
-L- 18+78	LT	10	11																						
-L- 18+81	LT	11													1			1							
-L- 18+81	LT	11	12																						
-L- 18+79	LT	11A		1																					
-L- 18+79	LT	11A	12																						
-L- 18+93	LT	12													1										
-L- 18+41	CL	13										1					1								CONVERT O.T.C.B. TO 2GI, ADJUST TOP ELEV
-L- 18+68	RT	14	15																		0.4465				
-L- 16+99	RT	14A							1	1															
-L- 16+99	RT	14A	15																						
-L- 18+68	RT	15						1				1													
-L- 18+68	RT	15	17																						
-L- 19+95	RT	16	17																		0.6560				
-L- 19+95	RT	17													1										
-L- 19+95	RT	17	OUT																						
-L- 21+96	LT	1T	OUT																		0.3990	0.045			PLUG & FILL EXIST. 15" CMP AND PROP. 15" CSP DURING FINAL CONSTRUCTION
-L- 22+18	RT	2T							1			1													REMOVE DURING FINAL CONSTRUCTION
-L- 22+18	RT	2T	22																			0.045			PLUG & FILL DURING FINAL CONSTRUCTION
-L- 22+18	RT	22											1	1											
-L- 22+18	RT	22	OUT																	2@15"					
-L- 24+37	RT	23											1	1											
-L- 24+37	RT	23	OUT																	2@15"					
-L- 22+00	CL	18																				0.045			REMOVE EXISTION D.I. DURING FINAL CONSTRUCTION PLUG & FILL EXISTING CMP CROSS PIPE DURING FINAL CONSTRUCTION
-L- 23+00	CL	19							1			1													
-L- 23+00	CL	19	20																						
-L- 22+12	CL	20						1			1	1													3GI
-L- 22+12	LT	20	3T																						
-L- 22+12	LT	3T							1			1									0.4465				REMOVE AND REPLACE WITH PIPE COLLAR DURING FINAL CONSTRUCTION
-L- 22+12	LT	3T	21																						
-L- 22+12	LT	21											1	1											
-L- 22+12	LT	21	OUT																	2@18"					
-L- 24+40	LT	24											1	1											
-L- 24+40	LT	24	OUT																	2@15"					
3-B TOTALS				1				5	8	1	1	14	4	4	3		2	1		2@18" 6@15"	2.841	0.135			

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

4/04/06
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COMPUTED BY: A.J. FOSTER DATE: 06/09
CHECKED BY: RJD DATE: 07/09

PROJECT REFERENCE NO.	SHEET NO.
B-4507	3-C

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	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	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D 12"	15"	18"	24"	30"	36"	42"	48"	6" BIT. COAT. TYPE B CS PIPE FOR SPRING BOX 0.064"	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	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	SPRING BOX STD. 840.41	O.T.C.B. STD. 840.04 OR 840.05	PREFORMED SCOUR HOLE	M.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. FRAME WITH TWO GRATES STD. 840.20	G.D.I. FRAME WITH GRATE STD. 840.22	G.D.I. FRAME WITH TWO GRATES STD. 840.22	T.B.D.I. FRAME WITH TWO GRATES STD. 840.37	T.B.D.I. STD. 840.36	J.B. STD. 840.31 OR 840.32	T.B.D.I. STD. 840.35	CONV. EXIST. O.T.C.B. TO D.I.	M.H. FRAME & COVER STD. 840.54	CONV. EXIST. D.I. TO J.B.	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
-L- 26+17	LT	25		736.8'	734.0'																																1																1	1											
-L- 26+17	LT	25	OUT		734.0'	717.8'											52																																											2@15"					
-L- 26+17	LT	25A			713.0'	713.0'														32																																													
-L- 26+39	RT	26		737.0'	734.2'																																1																1	1											
-L- 26+39	RT	26	OUT		734.2'	716.5'											52																																											2@15"					
-L- 29+61	RT	27		745.3'	742.5'																																1																1	1											
-L- 29+61	RT	27	OUT		742.5'	716.7'											64																																											2@15"					
-L- 29+14	CL	30A		740.5'	738.6'																																1										1				1															
-L- 29+14	CL	30A	OUT		738.6'	715.0'											72																																											2@15"					
-L- 30+41	LT	28		746.9'	744.1'																																1																1	1											
-L- 30+41	LT	28	29		744.1'	741.6'			100																																																								
-L- 29+38	LT	29		744.4'	741.6'																																1																1	1											
-L- 29+38	LT	29	OUT		741.6'	716.2'											64																																											2@15"					
-L- 31+00	CL	30		748.2'	746.3'																																1										1					1														
-L- 31+00	CL	30	31		746.3'	746.1'			64																																																								
-L- 31+65	CL	31		750.2'	746.1'																																															1					1								CONVERT O.T.C.B. TO 2GI, ADJUST TOP ELEV
-L- 31+41	RT	32	34		742.4'	738.7'			48																																																				0.3990				
-L- 31+99	RT	33		748.6'	745.8'																																1												1			1														
-L- 31+99	RT	33	34		745.8'	738.7'											60																																																
-L- 31+41	RT	34		741.7'	738.7'																																1												1			1														
-L- 31+41	RT	34	OUT		738.7'	717.7'												100																												1															2@18"					SEE SHEET 2-F FOR P.S.H. DETAIL
-L- 33+17	LT	35		751.8'	748.8'																																1												1			1														
-L- 33+17	LT	35	OUT		748.8'	741.7'												216																												1															2@18"					SEE SHEET 2-F FOR P.S.H. DETAIL
-L- 41+00	RT	36A		785.3'	782.5'																																1												1			1														
-L- 41+00	RT	36A	36		782.5'	771.8'																				280																																								
-L- 38+18	RT	36		774.2'	771.8'																																1												1			1														
-L- 38+18	RT	36	37		771.8'	771.2'				20																																																			0.4465				
-L- 37+90	CL	38		774.6'	769.6'																																															1					1								CONVERT O.T.C.B. TO 2GI, ADJUST TOP ELEV
-L- 38+00	LT	39		775.4'	772.6'																																1																1	1											
-L- 38+00	LT	39	40		772.6'	765.0'											28																																																
-L- 37+71	LT	39A		771.9'	768.9'																																1												1			1														
-L- 37+71	LT	39A	40		768.9'	765.0'												32																																															
-L- 38+02	LT	40		768.0'	765.0'																																1									1														1							
-L- 38+02	LT	40	OUT		765.0'	746.1'												64																																										2@18"					
-RAMPC- 15+55	RT	41		797.2'	791.8'																																1	0.4'											1			1														
-RAMPC- 15+55	RT	41	42		791.8'	791.7'				12																																																		0.4465				
-L- 43+70	RT	43		797.4'	794.6'																																1												1			1														
-L- 43+70	RT	43	44		794.6'	791.3'			40																																																								
-L- 43+29	RT	44		797.1'	791.3'																																																					1	1						
-L- 42+91	CL	45		795.3'	789.5'																																															1					1								CONVERT O.T.C.B. TO 2GI, ADJUST TOP ELEV
-L- 42+50	LT	46		793.8'	787.9'																																															1					1								CONVERT O.T.C.B. TO 2GI, ADJUST TOP ELEV
-RAMPB- 14+14	LT	47		789.5'	786.7'																																1																1	1											
-RAMPB- 14+14	LT	47	OUT		786.7'	756.9'											96																																											2@15"					
-RAMPB- 14+33	LT	47A	48		779.5'	776.6'					32																																																		0.5526				
-RAMPB- 14+33	LT	48		781.0'	771.7'																																1	4.3'							1														1							
-RAMPB- 14+33	LT	48	OUT		771.7'	756.9'													52																																									2@24"					
3-C TOTALS									252	32	32						488	412	52	32					280												19	4.7'							2	2	2		8		1	13	7	7			4	3	1	12@15" 6@18" 2@24"	1.8446				
3-B TOTALS									492	176		44	16				196	76							168		252	444				8					20	2.5'						1				5	8	1	1	14	4	4	3		2	1		6@15" 2@18"	2.8410	0.135			
PROJ TOTALS									744	208	32	44	16				684	488	52	32					448		252	444				8					39	7.2'						1	2	2	2	5	16	1	2	27	11	11	3		6	4	1	18@15" 8@18" 2@24"	SAY 5.0	SAY 0.2			

* TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B')

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

COMPUTED BY: A.J. FOSTER	DATE: 06/09
CHECKED BY: RJD	DATE: 07/09

PROJECT REFERENCE NO.	SHEET NO.
B-4507	3-D

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX

PARCEL No.	PROPERTY OWNER	SHEET No.
1	TIMOTHY D. & MICHELLE WARREN WELBORN	5
2	RICHARD F. ALSPAUGH	5
3	IVEYSTONE HOMEOWNERS ASSOC. FC, INC.	5, 6

6/21/00

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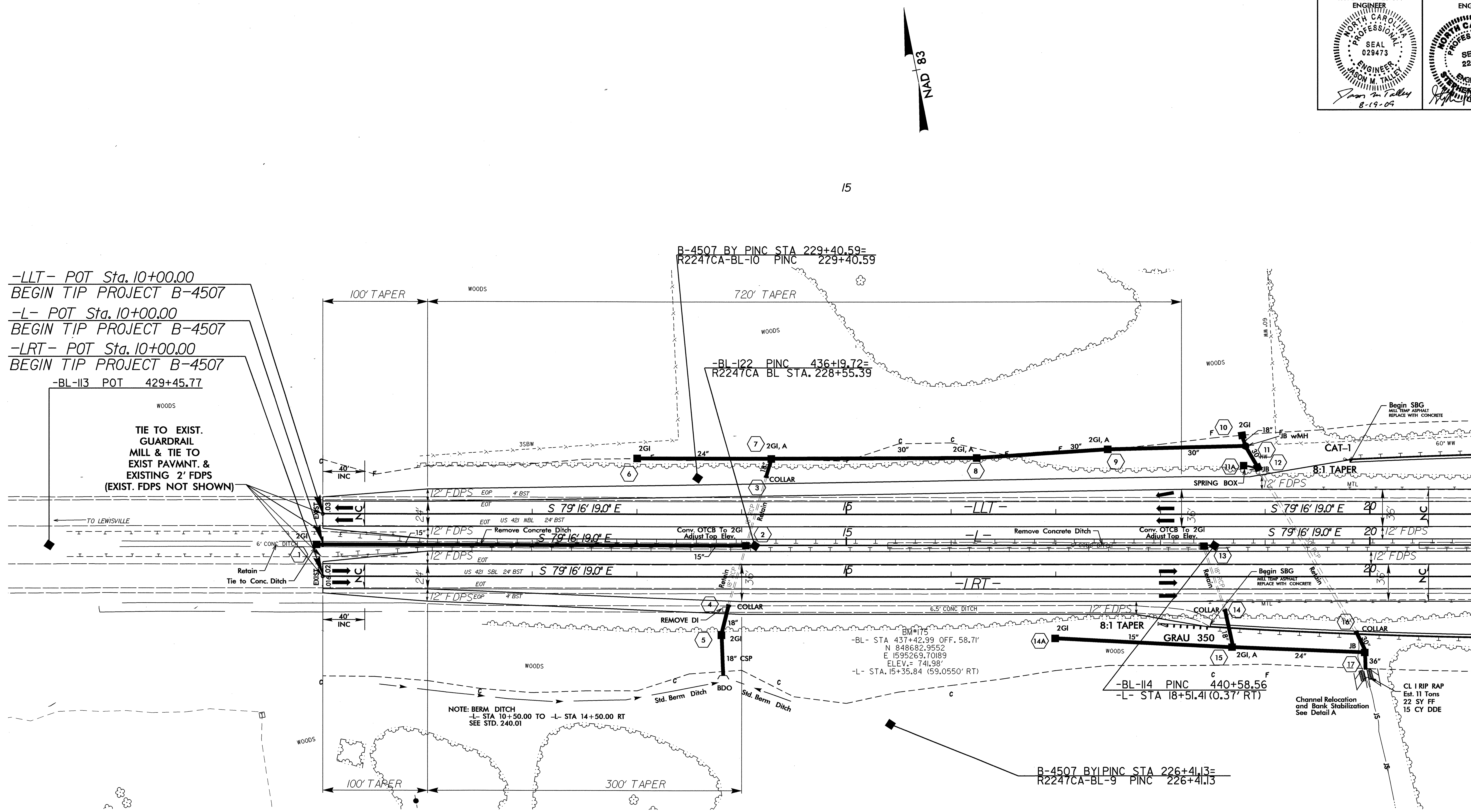
PROJECT REFERENCE NO.	SHEET NO.
B-4507	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



NAD 83
-LLT- POT Sta. 10+00.00
BEGIN TIP PROJECT B-4507
-L- POT Sta. 10+00.00
BEGIN TIP PROJECT B-4507
-LRT- POT Sta. 10+00.00
BEGIN TIP PROJECT B-4507
-BL-113 POT 429+45.77
B-4507 BY PINC STA 229+40.59=
R2247CA-BL-10 PINC 229+40.59
-BL-122 PINC 436+19.72=
R2247CA BL STA. 228+55.39
TIE TO EXIST. GUARDRAIL MILL & TIE TO EXIST PAVMNT. & EXISTING 2' FDPS (EXIST. FDPS NOT SHOWN)
100' TAPER
720' TAPER
300' TAPER
S 79° 16' 19.0" E
-LLT-
-L-
-LRT-
Remove Concrete Ditch
Conv. OTCB To 2GI Adjust Top Elev.
Retain
Tie to Conc. Ditch
COLLAR
REMOVE DI
18" CSP
BDO
Std. Berm Ditch
NOTE: BERM DITCH -L- STA 10+50.00 TO -L- STA 14+50.00 RT SEE STD. 240.01
BM#175
-BL- STA 437+42.99 OFF. 58.71'
N 848682.9552
E 1595269.70189
ELEV.= 741.98'
-L- STA. 15+35.84 (59.0550' RT)
-BL-114 PINC 440+58.56
-L- STA 18+51.41 (0.37' RT)
B-4507 BY1 PINC STA 226+41.13=
R2247CA-BL-9 PINC 226+41.13
8:1 TAPER
GRAU 350
CAT-1
SPRING BOX
Begin SBG
Channel Relocation and Bank Stabilization See Detail A
CL I RIP RAP Est. 11 Tons 22 SY FF 15 CY DDE
MATCH LINE SHEET 5 -L- STA 21+00
TO LEWISVILLE
WOODS

NOTES:

FOR -LLT- & -LRT- PROFILES, SEE SHEETS NO. 7 TO NO. 9
FOR DETOUR PLAN, SEE SHEETS 2-G THRU 2-I
FOR DETOUR PROFILES, SEE SHEETS NO. 11 & NO. 12
SEE SHEET 2-F FOR DITCH DETAILS

REVISIONS

8/17/99

18-AUG-2009 11:55

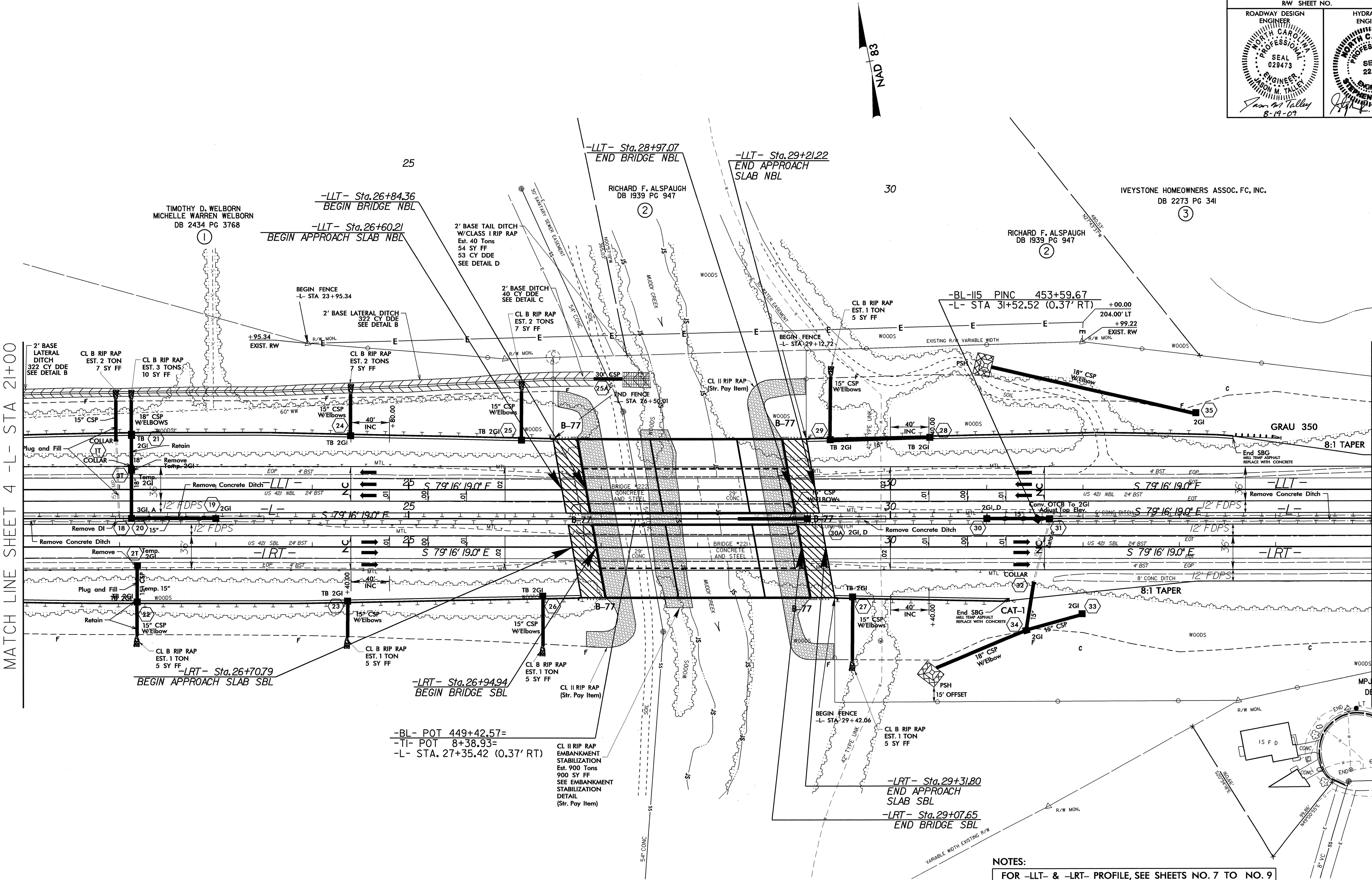
PROJECT REFERENCE NO.	SHEET NO.
B-4507	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029473 JASON M. TALLEY — 8-19-09

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22100 STEPHEN R. MORGAN — 8-21-09

REVISIONS

8/17/99



NAD 83
25
30
TIMOTHY D. WELBORN
MICHELLE WARREN WELBORN
DB 2434 PG 3768
1
RICHARD F. ALSPAUGH
DB 1939 PG 947
2
IVEYSTONE HOMEOWNERS ASSOC. FC, INC.
DB 2273 PG 341
3
-LLT- Sta.26+84.36
BEGIN BRIDGE NBL
-LLT- Sta.26+60.21
BEGIN APPROACH SLAB NBL
-LLT- Sta.28+97.07
END BRIDGE NBL
-LLT- Sta.29+21.22
END APPROACH SLAB NBL
-LRT- Sta.26+70.79
BEGIN APPROACH SLAB SBL
-LRT- Sta.26+94.94
BEGIN BRIDGE SBL
-LRT- Sta.29+31.80
END APPROACH SLAB SBL
-LRT- Sta.29+07.65
END BRIDGE SBL
-BL- POT 449+42.57=
-TI- POT 8+38.93=
-L- STA. 27+35.42 (0.37' RT)
-BL-115 PINC 453+59.67
-L- STA 31+52.52 (0.37' RT)
2' BASE TAIL DITCH
W/CLASS I RIP RAP
Est. 40 Tons
54 SY FF
53 CY DDE
SEE DETAIL D
2' BASE DITCH
40 CY DDE
SEE DETAIL C
2' BASE LATERAL DITCH
322 CY DDE
SEE DETAIL B
BEGIN FENCE
-L- STA 23+95.34
BEGIN FENCE
-L- STA 29+12.72
BEGIN FENCE
-L- STA 29+42.06
END FENCE
-L- STA 26+50.01
CL B RIP RAP
EST. 2 TONS
7 SY FF
CL B RIP RAP
EST. 3 TONS
10 SY FF
CL B RIP RAP
EST. 1 TON
5 SY FF
CL II RIP RAP
(Str. Pay Item)
CL II RIP RAP
EMBANKMENT
STABILIZATION
Est. 900 Tons
900 SY FF
SEE EMBANKMENT
STABILIZATION
DETAIL
(Str. Pay Item)
MUDDY CREEK
BRIDGE #222
CONCRETE AND STEEL
BRIDGE #221
CONCRETE AND STEEL
-LLT-
-L-
-LRT-
S 79° 16' 19.0" E
US 421 NBL
US 421 SBL
12' FDPS
GRAU 350
8:1 TAPER
End SBG
CAT-1
PSH
15' OFFSET
Remove Concrete Ditch
Plug and Fill
Retain
WOODS
R/W MON.
EXIST. RW
MATCH LINE SHEET 4 -L- STA 21+00
MATCH LINE SHEET 6 -L- STA 35+00

NOTES:

FOR -LLT- & -LRT- PROFILE, SEE SHEETS NO. 7 TO NO. 9
FOR DETOUR PLANS, SEE SHEETS 2-G THRU 2-I
FOR DETOUR PROFILES, SEE SHEETS NO. 11 & NO. 12
BRIDGE APPROACH SLAB
SEE SHEET 2-D FOR BRIDGE SKETCH
SEE SHEET 2-F FOR DITCH DETAILS
FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-99

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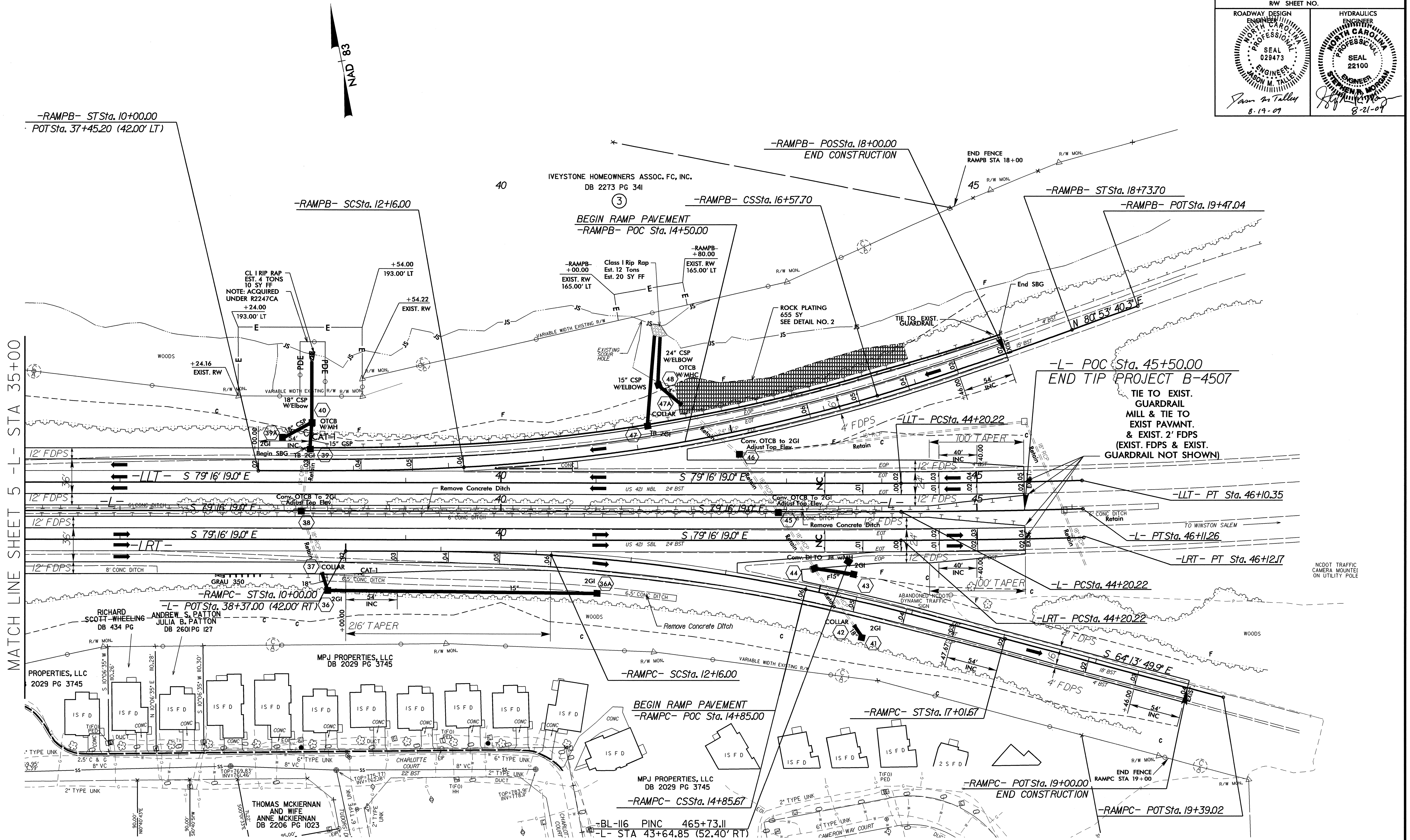
PROJECT REFERENCE NO.	SHEET NO.
B-4507	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — SEAL 029473 — JASON M. TALLEY — 8-19-09

HYDRAULICS ENGINEER — SEAL 22100 — STEPHEN R. MORGAN — 8-21-09

REVISIONS



NAD 83
-RAMPB- STSta. 10+00.00
POTSta. 37+45.20 (42.00' LT)
-RAMPB- SCSta. 12+16.00
IVEYSTONE HOMEOWNERS ASSOC. FC, INC.
DB 2273 PG 341
BEGIN RAMP PAVEMENT
-RAMPB- POC Sta. 14+50.00
-RAMPB- CSSta. 16+57.70
-RAMPB- POSSta. 18+00.00
END CONSTRUCTION
END FENCE
RAMPB STA 18+00
-RAMPB- STSta. 18+73.70
-RAMPB- POTSta. 19+47.04
ROCK PLATING
655 SY
SEE DETAIL NO. 2
TIE TO EXIST. GUARDRAIL
End SBG
-L- POC Sta. 45+50.00
END TIP PROJECT B-4507
TIE TO EXIST. GUARDRAIL
MILL & TIE TO EXIST PAVMNT.
& EXIST. 2' FDPS
(EXIST. FDPS & EXIST. GUARDRAIL NOT SHOWN)
-LLT- PCSta. 44+20.22
100' TAPER
-LLT- PT Sta. 46+10.35
-L- PTSta. 46+11.26
-LRT- PT Sta. 46+12.17
-L- PCSta. 44+20.22
-LRT- PCSta. 44+20.22
NCDOT TRAFFIC CAMERA MOUNTED ON UTILITY POLE
MATCH LINE SHEET 5 -L- STA 35+00
-LLT- S 79° 16' 19.0" E
-L- S 79° 16' 19.0" E
-LRT- S 79° 16' 19.0" E
N 80° 53' 40.3" E
S 64° 13' 49.9" E
Remove Concrete Ditch
-RAMPC- STSta. 10+00.00
-L- POTSta. 38+37.00 (42.00' RT)
216' TAPER
-RAMPC- SCSta. 12+16.00
BEGIN RAMP PAVEMENT
-RAMPC- POC Sta. 14+85.00
-RAMPC- STSta. 17+01.67
-RAMPC- CSSta. 14+85.67
-RAMPC- POTSta. 19+00.00
END CONSTRUCTION
END FENCE
RAMPC STA 19+00
-RAMPC- POTSta. 19+39.02
-BL-116 PINC 465+73.11
-L- STA 43+64.85 (52.40' RT)
RICHARD SCOTT WHEELING
DB 434 PG
ANDREW S. PATTON
JULIA B. PATTON
DB 2601 PG 127
MPJ PROPERTIES, LLC
DB 2029 PG 3745
THOMAS MCKIERNAN AND WIFE ANNE MCKIERNAN
DB 2206 PG 1023
CHARLOTTE COURT
CAMERON WAY COURT
WOODS

-RAMPB-

PIs Sta 11+44.02	PI Sta 14+37.85	PIs Sta 17+29.73
Θs = 3° 15' 24.5"	Δ = 13° 19' 11.6" (LT)	Θs = 3° 15' 24.5"
Ls = 216.00'	D = 3° 00' 56.0"	Ls = 216.00'
LT = 144.02'	L = 441.70'	LT = 144.02'
ST = 72.02'	T = 221.85'	ST = 72.02'
SE = .06	R = 1,900.00'	SE = .06
INC = 54'		INC = 54'

-RAMPC-

PIs Sta 11+44.03	PI Sta 13+51.07	PIs Sta 15+57.69
Θs = 3° 20' 41.4"	Δ = 8° 21' 06.3" (RT)	Θs = 3° 20' 41.4"
Ls = 216.00'	D = 3° 05' 49.4"	Ls = 216.00'
LT = 144.03'	L = 269.67'	LT = 144.03'
ST = 72.02'	T = 135.07'	ST = 72.02'
SE = .06	R = 1,850.00'	SE = .06
INC = 54'		INC = 54'

-L-	-LLT-	-LRT-
PI Sta 45+15.74	PI Sta 45+15.29	PI Sta 45+16.20
Δ = 1° 44' 14.7" (LT)	Δ = 1° 44' 14.7" (LT)	Δ = 1° 44' 14.7" (LT)
D = 0° 54' 34.0"	D = 0° 54' 49.7"	D = 0° 54' 18.5"
L = 191.04'	L = 190.13'	L = 191.95'
T = 95.53'	T = 95.07'	T = 95.98'
R = 6,300.00'	R = 6,270.00'	R = 6,330.00'
SE = .02	SE = .02	SE = .02
INC = 40'	INC = 40'	INC = 40'
RO = 80'	RO = 80'	RO = 80'

NOTES:

FOR -LLT- & -LRT- PROFILE, SEE SHEETS NO. 7 TO NO. 9
FOR DETOUR PLANS, SEE SHEETS 2-G THRU 2-I
FOR RAMP PROFILES, SEE SHEET NO. 10
FOR DETOUR PROFILES, SEE SHEETS NO. 11 & NO. 12
PROPOSED ROCK PLATING-SEE SHEET 2-F

8/17/99

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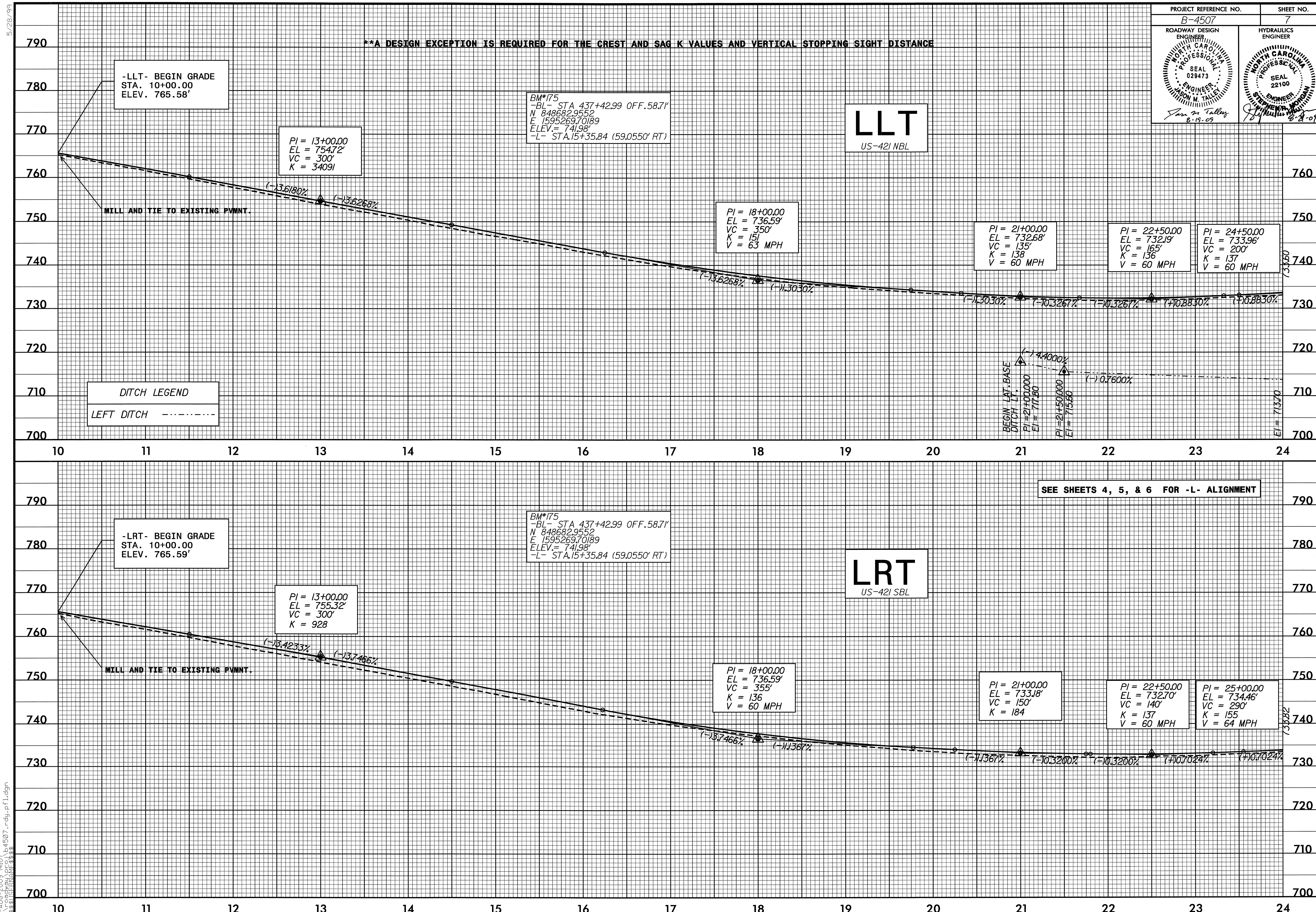
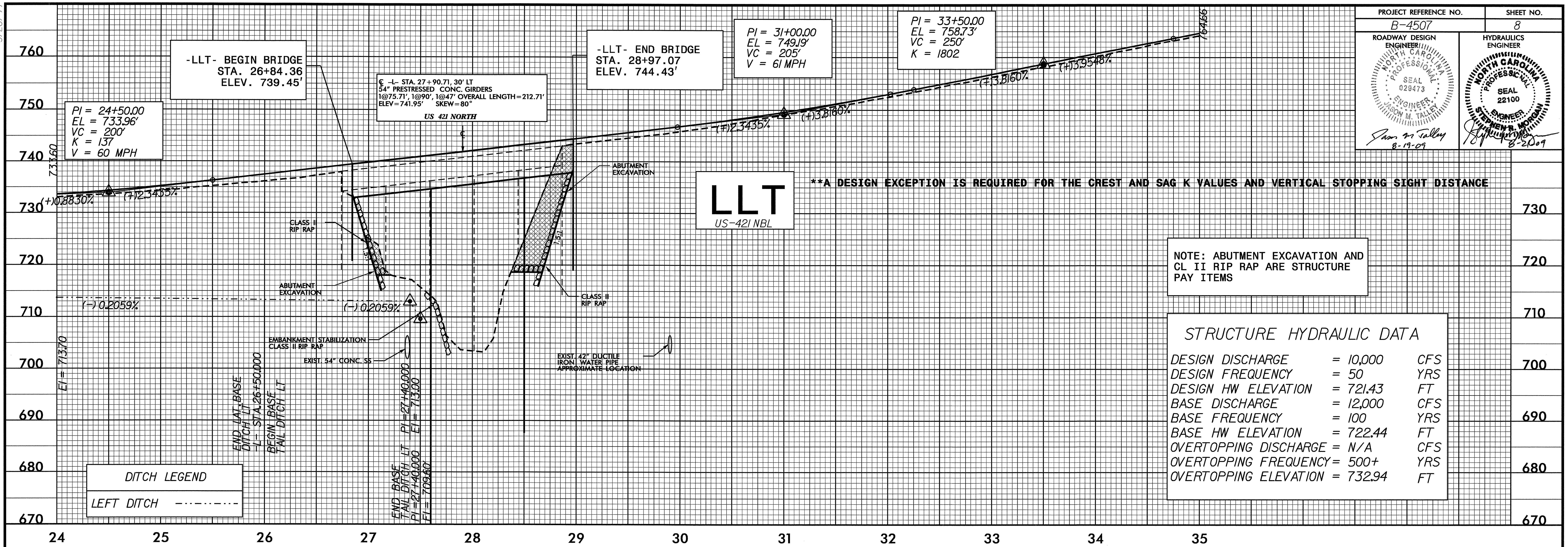

PROJECT REFERENCE NO. B-4507
SHEET NO. 7
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY
NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER
**A DESIGN EXCEPTION IS REQUIRED FOR THE CREST AND SAG K VALUES AND VERTICAL STOPPING SIGHT DISTANCE
-LLT- BEGIN GRADE
STA. 10+00.00
ELEV. 765.58'
MILL AND TIE TO EXISTING PVMNT.
BM#175
-BL- STA 437+42.99 OFF.58.71'
N 848682.9552
E 1595269.70189
ELEV.= 741.98'
-L- STA.15+35.84 (59.0550' RT)
LLT
US-421 NBL
PI = 13+00.00
EL = 754.72'
VC = 300'
K = 3409l
(-)3.6180%
(-)3.6268%
PI = 18+00.00
EL = 736.59'
VC = 350'
K = 151
V = 63 MPH
(-)1.3030%
PI = 21+00.00
EL = 732.68'
VC = 135'
K = 138
V = 60 MPH
(-)0.3267%
PI = 22+50.00
EL = 732.19'
VC = 165'
K = 136
V = 60 MPH
(+)0.8830%
PI = 24+50.00
EL = 733.96'
VC = 200'
K = 137
V = 60 MPH
733.50
(-)4.4000%
(-)0.7600%
BEGIN LAT. BASE DITCH LT.
PI =21+00.000
El = 717.80
PI =21+50.000
El = 715.60
El = 713.70
DITCH LEGEND
LEFT DITCH
SEE SHEETS 4, 5, & 6 FOR -L- ALIGNMENT
-LRT- BEGIN GRADE
STA. 10+00.00
ELEV. 765.59'
LRT
US-421 SBL
PI = 13+00.00
EL = 755.32'
VC = 300'
K = 928
(-)3.4233%
(-)3.7466%
PI = 18+00.00
EL = 736.59'
VC = 355'
K = 136
V = 60 MPH
(-)1.1367%
PI = 21+00.00
EL = 733.18'
VC = 150'
K = 184
(-)0.3200%
PI = 22+50.00
EL = 732.70'
VC = 140'
K = 137
V = 60 MPH
(+)0.7024%
PI = 25+00.00
EL = 734.46'
VC = 290'
K = 155
V = 64 MPH
733.82
790 780 770 760 750 740 730 720 710 700
10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
5/28/99
18-AUG-2009 14:07

PROJECT REFERENCE NO.	SHEET NO.
B-4507	8

ROADWAY DESIGN ENGINEER — SEAL 029473 — NORTH CAROLINA PROFESSIONAL ENGINEER — JASON M. TALLEY — 8-19-09

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22100 — STEPHEN R. MORGAN — 8-21-09

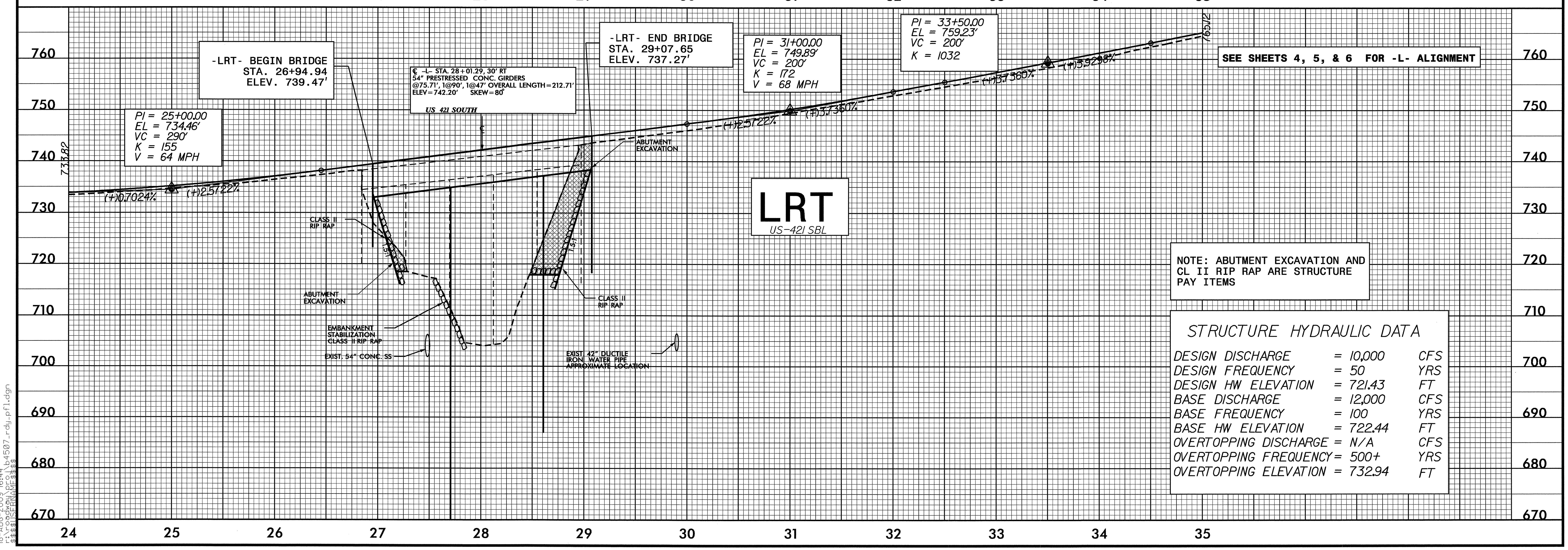
**A DESIGN EXCEPTION IS REQUIRED FOR THE CREST AND SAG K VALUES AND VERTICAL STOPPING SIGHT DISTANCE



LLT
US-421 NBL
PI = 24+50.00
EL = 733.96'
VC = 200'
K = 137
V = 60 MPH
-LLT- BEGIN BRIDGE
STA. 26+84.36
ELEV. 739.45'
℄ -L- STA. 27+90.71, 30' LT
54" PRESTRESSED CONC. GIRDERS
1@75.71', 1@90', 1@47' OVERALL LENGTH=212.71'
ELEV=741.95' SKEW=80°
US 421 NORTH
-LLT- END BRIDGE
STA. 28+97.07
ELEV. 744.43'
PI = 31+00.00
EL = 749.19'
VC = 205'
V = 61 MPH
PI = 33+50.00
EL = 758.73'
VC = 250'
K = 1802
(+)0.8830%
(+)2.3435%
(+)3.8160%
(+)3.9548%
733.60
764.66
ABUTMENT EXCAVATION
CLASS II RIP RAP
1.5:1
(-) 0.2059%
EMBANKMENT STABILIZATION CLASS II RIP RAP
EXIST. 54" CONC. SS
EXIST. 42" DUCTILE IRON WATER PIPE APPROXIMATE LOCATION
EL = 713.70
END LAT. BASE DITCH LT -L- STA. 26+50.000
BEGIN BASE TAIL DITCH LT
END BASE TAIL DITCH LT PI = 27+40.000 FL = 709.60
PI = 27+40.000 EL = 713.00
DITCH LEGEND
LEFT DITCH -·-·-·-·-
NOTE: ABUTMENT EXCAVATION AND CL II RIP RAP ARE STRUCTURE PAY ITEMS
760
750
740
730
720
710
700
690
680
670
24
25
26
27
28
29
30
31
32
33
34
35

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 10,000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 721.43	FT
BASE DISCHARGE	= 12,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 722.44	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 732.94	FT



LRT
US-421 SBL
PI = 25+00.00
EL = 734.46'
VC = 290'
K = 155
V = 64 MPH
-LRT- BEGIN BRIDGE
STA. 26+94.94
ELEV. 739.47'
℄ -L- STA. 28+01.29, 30' RT
54" PRESTRESSED CONC. GIRDERS
1@75.71', 1@90', 1@47' OVERALL LENGTH=212.71'
ELEV=742.20' SKEW=80°
US 421 SOUTH
-LRT- END BRIDGE
STA. 29+07.65
ELEV. 737.27'
PI = 31+00.00
EL = 749.89'
VC = 200'
K = 172
V = 68 MPH
PI = 33+50.00
EL = 759.23'
VC = 200'
K = 1032
(+)0.7024%
(+)2.5722%
(+)3.7360%
(+)3.9298%
733.82
765.12
SEE SHEETS 4, 5, & 6 FOR -L- ALIGNMENT
ABUTMENT EXCAVATION
CLASS II RIP RAP
1.5:1
EMBANKMENT STABILIZATION CLASS II RIP RAP
EXIST. 54" CONC. SS
EXIST. 42" DUCTILE IRON WATER PIPE APPROXIMATE LOCATION
NOTE: ABUTMENT EXCAVATION AND CL II RIP RAP ARE STRUCTURE PAY ITEMS
760
750
740
730
720
710
700
690
680
670
24
25
26
27
28
29
30
31
32
33
34
35

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 10,000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 721.43	FT
BASE DISCHARGE	= 12,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 722.44	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 732.94	FT

5/28/99

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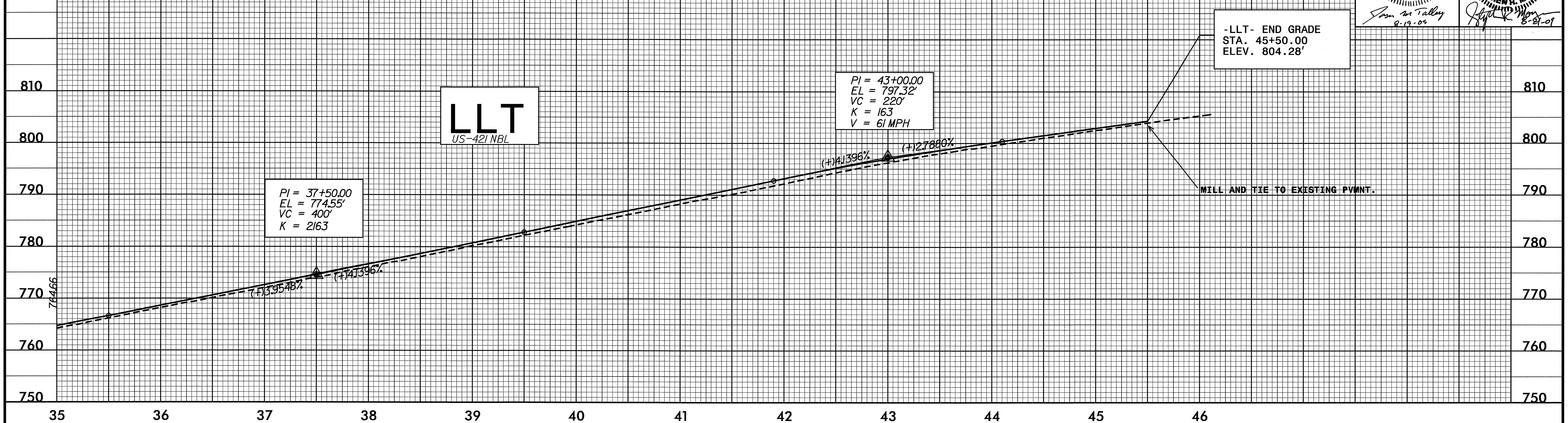
PROJECT REFERENCE NO.	SHEET NO.
B-4507	9

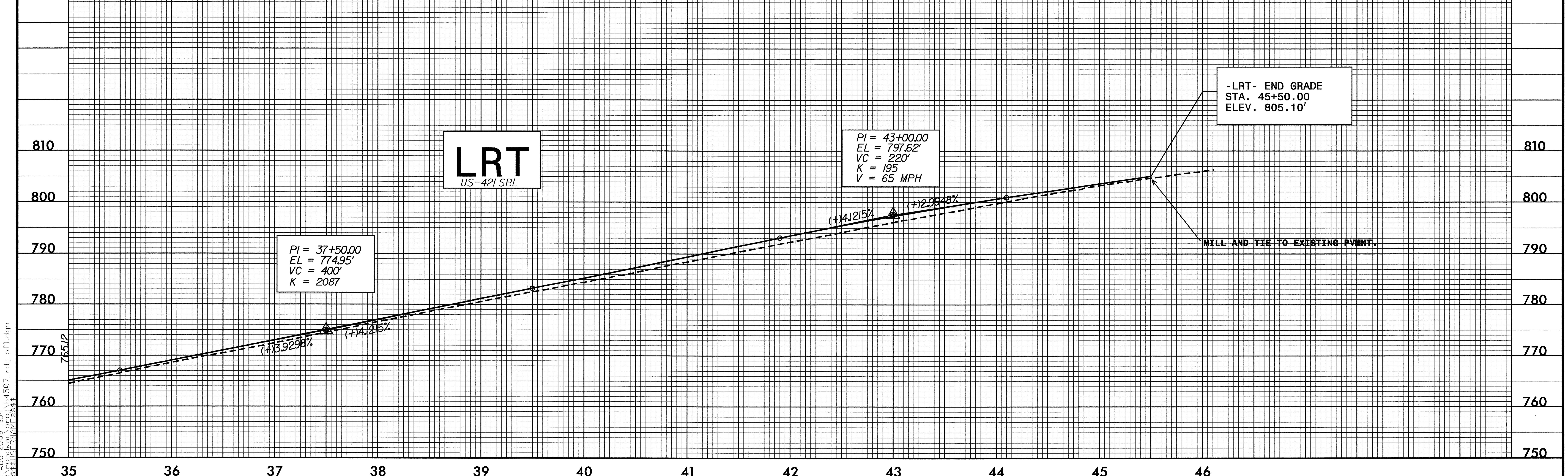
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 028473 ENGINEER JASON M. TALLEY — Jason M Talley 8-19-09	NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN R. MORGAN — Stephen R. Morgan 8-21-09

5/28/99

**A DESIGN EXCEPTION IS REQUIRED FOR THE CREST AND SAG K VALUES AND VERTICAL STOPPING SIGHT DISTANCE



SEE SHEETS 4, 5, & 6 FOR -L- ALIGNMENT



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PROJECT REFERENCE NO.	SHEET NO.
B-4507	10

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY
Jason M Talley 8-19-09

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEVEN R. MCGRATH
8-20-09

RAMPB

-RAMPB- BEGIN GRADE
STA. 10+00.00
ELEV. 774.21'

PI = 11+50.00
EL = 780.28'
VC = 250'
K = 1822

PI = 13+90.00
EL = 789.67'
VC = 200'
K = 176

PI = 16+50.00
EL = 802.80'
VC = 200'
K = 1160

-RAMPB- END GRADE
STA. 18+00.00
ELEV. 810.63'

774.21

(+)4.0500%
(+)3.9128%
(+)3.9128%
(+)5.0484%
(+)5.0484%
(+)5.2209%

820 810 800 790 780 770 760

10 11 12 13 14 15 16 17 18 19

RAMPC

SEE SHEET 6 FOR RAMP ALIGNMENTS

-RAMPC- BEGIN GRADE
STA. 10+00.00
ELEV. 778.32'

PI = 11+75.00
EL = 785.45'
VC = 200'
K = 651

PI = 14+75.00
EL = 796.73'
VC = 200'
K = 228

PI = 17+55.00
EL = 809.72'
VC = 280'
K = 1266

-RAMPC- END GRADE
STA. 19+00.00
ELEV. 816.77'

(+)4.0700%
(+)3.7625%
(+)3.7626%
(+)4.6399%
(+)4.6399%
(+)4.8611%

820 810 800 790 780 770 760

10 11 12 13 14 15 16 17 18 19

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PROJECT REFERENCE NO.	SHEET NO.
B-4507	11

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY

8-19-09

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN B. MORGAN

8-21-09

NBLDET

BM#175
-BL- STA. 437+42.99 OFF. 58.71'
N 848682.9552
E 1595269.70189
ELEV.= 741.98'
-L- STA. 15+35.84 (59.0550' RT)

-NBLDET- BEGIN GRADE
STA. 14+88.37
ELEV. 739.63'

PI = 19+30.00
EL = 725.66'
VC = 835'
K = 152

(-)1.1633%

(+)2.5436%

736.88

-NBLDET- END GRADE
STA. 32+47.74
ELEV. 761.54'

-NBLDET- BEGIN BRIDGE
STA. 24+78.53
ELEV. 738.48'

-NBLDET- END BRIDGE
STA 26+91.24
ELEV. 743.46'

PI = 29+90.00
EL = 750.50'
VC = 510'
K = 263

(+)2.3436%

(+)4.2812%

736.68

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 10,000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 721.43	FT
BASE DISCHARGE	= 12,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 722.44	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 732.94	FT

SEE SHEETS 2-G, 2-H, & 2-I FOR -NBLDET- ALIGNMENT

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PROJECT REFERENCE NO.	SHEET NO.
B-4507	12

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 029473 ENGINEER JASON M. TALLEY
8-21-09

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 22100 ENGINEER STEPHEN R. MORGAN
8-21-09

SBLDET

BM*175
-BL- STA 437+42.99 OFF. 58.71'
N 848682.9552
E 1595269.70189
ELEV.= 741.98'
-L- STA 15+35.84 (59.0550' RT)

-SBLDET- BEGIN GRADE
STA. 14+22.03
ELEV. 741.91'

PI = 19+57.00
EL = 724.80'
VC = 940'
K = 163

(-)3.1993%

(-)2.5721%

(736.2)

-SBLDET- END GRADE
STA. 33+31.58
ELEV. 765.54'

-SBLDET- END BRIDGE
STA. 27+15.57
ELEV. 744.31'

-SBLDET- BEGIN BRIDGE
STA. 25+02.87
ELEV. 738.84'

PI = 30+42.00
EL = 752.70'
VC = 340'
K = 183

(+)2.5721%

(+)2.5721%

(+)1.4430%

(736.2)

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 10,000	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 721.43	FT
BASE DISCHARGE	= 12,000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 722.44	FT
OVERTOPPING DISCHARGE	= N/A	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 732.94	FT

SEE SHEETS 2-G, 2-H, & 2-I FOR -SBLDET- ALIGNMENT

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