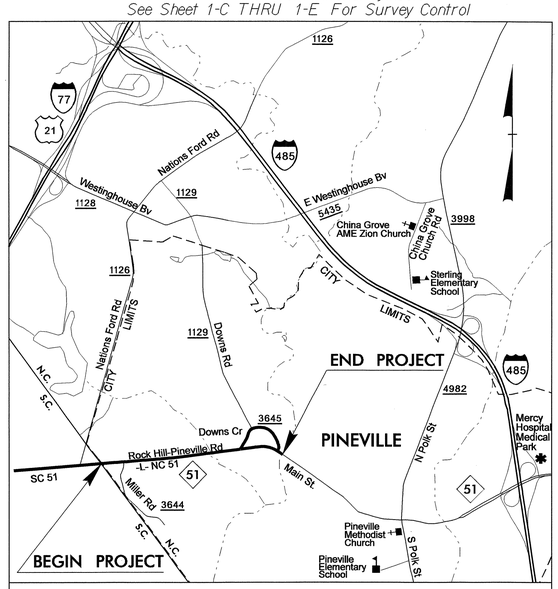
09/30/08

TIP PROJECT: U-3447

CONTRACT: C201829

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols
See Sheet 1-C THRU 1-E For Survey Control



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

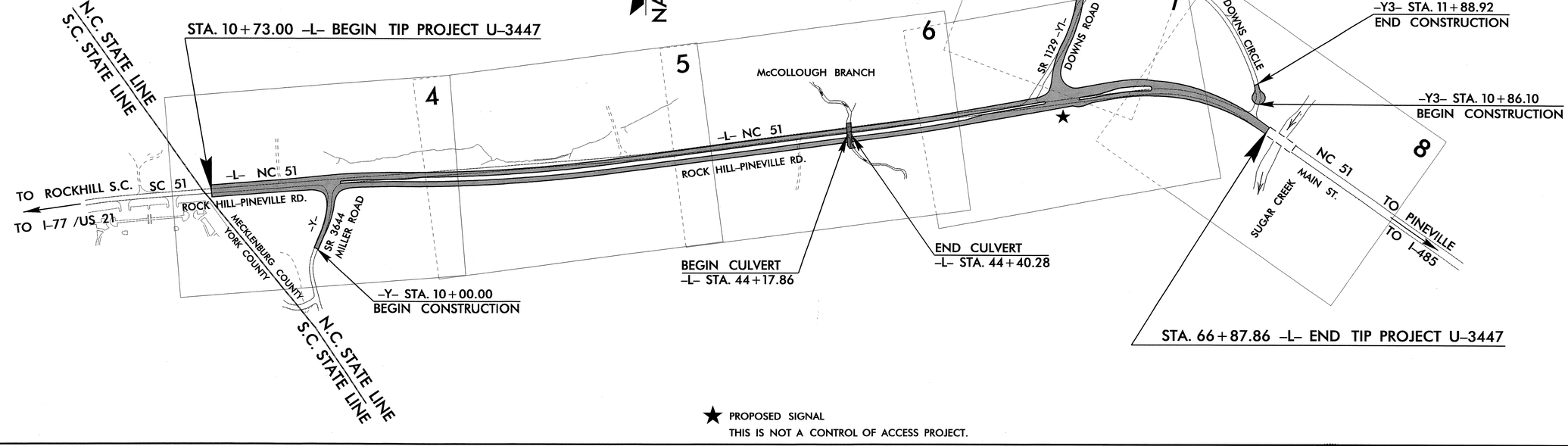
MECKLENBURG COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3447	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34948.1.1	STP-51(2)	PE
34948.2.1	STP-51(2)	R/W, UTIL
34948.3.1.ST1	STP-51(27)	CONSTR.

LOCATION: NC 51, ROCK HILL – PINEVILLE RD. FROM THE SC STATE LINE TO SR 3645 (DOWNS CIRCLE)

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



★ PROPOSED SIGNAL
THIS IS NOT A CONTROL OF ACCESS PROJECT.

GRAPHIC SCALES

PLANS: 50 25 0 50 100
PROFILE (HORIZONTAL): 50 25 0 50 100
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2004 =	19300
ADT 2025 =	35900
DHV =	9 %
D =	60 %
T =	3 % *
V =	50 MPH
CLASS =	COLLECTOR
* TTST 1%	DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY T.I.P. PROJECT U-3447 = 1.059 MI
LENGTH STRUCTURE T.I.P. PROJECT U-3447 = 0.004 MI
TOTAL LENGTH OF T.I.P. PROJECT U-3447 = 1.063 MI

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 16, 2005
LETTING DATE: March 17, 2009

JASON MOORE, PE
PROJECT ENGINEER

KEVIN E. MOORE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 19776 ENGINEER GARY D. LOVINGGOOD
SIGNATURE: Gary D. Lovinggood P.E. 10 NOV 08

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 24912 ENGINEER KEVIN E. MOORE
SIGNATURE: Kevin E. Moore P.E. 11-12-08

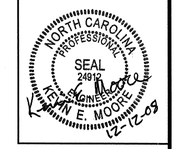
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3447	1-A

ROADWAY DESIGN ENGINEER



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
1-C THRU 1-E	SURVEY CONTROL SHEETS
2 THRU 2-A	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2-B	FLAP GATE DETAIL
2-C	ANCHOR UNIT DETAIL
2-E THRU 2-P	STANDARD TEMPORARY SHORING AND TEMPORARY WALL DETAILS
3	SUMMARY OF QUANTITIES
3-A THRU 3-F	SUMMARY OF DRAINAGE QUANTITIES
3-G	SUMMARY OF GUARDRAIL
3-H	SUMMARY OF EARTHWORK, ETC.
3-I	PARCEL INDEX SHEET
4 THRU 9	PLAN SHEETS
10 THRU 13	PROFILE SHEETS
TCP-1 THRU TCP-24	TRAFFIC CONTROL PLANS
PM-1 THRU PM-4	PAVEMENT MARKING PLANS
EC-1 THRU EC-16	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-9	SIGNING PLANS
SIG-1 THRU SIG-7	SIGNAL PLANS
UC-1 THRU UC-8	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-7	UTILITIES BY OTHERS PLANS
X-1 THRU X-36	CROSS-SECTIONS
C-1 THRU C-11	STRUCTURE PLANS

GENERAL NOTES:

EFFECTIVE: 07-18-06
2006 SPECIFICATIONS
REVISED: 09-12-2008

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. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

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.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

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".

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE CHARLOTTE-MECKLENBURG UTILITY DEPARTMENT, DUKE ENERGY CO., PINEVILLE ELECTRIC CO., AT&T TEL. CO., PINEVILLE TEL. CO., WINDSTREAM COMMUNICATIONS, PIEDMONT NATURAL GAS, AND TIME WARNER CABLE/TELECOM.
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 OTHERS.

WHEELCHAIR RAMPS:

WHEELCHAIR RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. THE CONSTRUCTION OF ALL WHEELCHAIR RAMPS SHALL BE IN ACCORDANCE WITH STD. NO. 848.06.

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

2006 ROADWAY STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation - Method 'A'
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.03	Pipe Underdrain and Blind Drain
838.27	Reinforced Concrete Endwall - for Single 60" Pipe 90 skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.57	Reinforced Brick Endwall - for Single 60" Pipe 90 skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.41	Spring Box - 12" thru 66" Pipe
840.45	Precast Drainage Structure
840.51	Brick Manhole - 12" thru 36" Pipe
840.53	Precast Manhole with Masonry Base - 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.03	Driveway Turnout - Drop Curb Type
848.04	Street Turnout
848.05	Wheelchair Ramp - Curb Cut
850.01	Concrete Paved Ditches
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
852.05	Median Curb for Catch Basin - for Use with 1'-6" Curb and Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

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3/15/06

PROJECT REFERENCE NO.	SHEET NO.
U-3447	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 — 23
- 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 — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

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
- Proposed Wheel Chair Ramp Curb Cut — WCC
- Curb Cut for Future Wheel Chair Ramp — CCFR
- 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

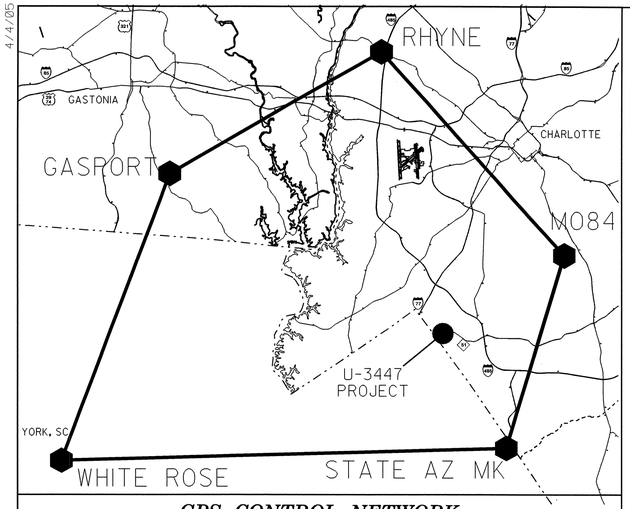
MISCELLANEOUS:

- 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.

4/4/05

PROJECT REFERENCE NO.	SHEET NO.
U-3447	1 - C
Location and Surveys	

SURVEY CONTROL SHEET U-3447



GPS CONTROL NETWORK
NOT TO SCALE

N
NC GRID
NAD 83/95

NCDOT GPS STATION U3447-2
LOCALIZED PROJECT COORDINATES
N= 493148.251
E= 1425200.846
ELEV.= 616.71

NATIONS FORD RD.

N.C. S.C.

BEGIN TIP PROJECT U-3447

-L- NC 51

McCOLLOUGH BRANCH

SR 1729 -YT-
DOWNS ROAD
-Y2-
SR 3645
SR 3645
DOWNS CIRCLE

SUGAR CREEK

TO PINEVILLE

FRANKLIN ST.

CRANFORD DR.

REID LN.

YANDELL ST.

SOUTHERN RR

END TIP PROJECT U-3447

-Y-
SR 3644
MILLER ROAD

TO ROCKHILL

N.C. S.C.

FLINT HILL RD.

MILLER RD.

NCDOT GPS STATION U3447-1
LOCALIZED PROJECT COORDINATES
N= 490321.391
E= 1423242.934
ELEV.= 680.54

NCDOT GPS STATION U3447-5
LOCALIZED PROJECT COORDINATES
N= 491398.381
E= 1428065.757
ELEV.= 612.41

NCDOT GPS STATION U3447-3
LOCALIZED PROJECT COORDINATES
N= 492892.942
E= 1432606.670
ELEV.= 540.99

NCDOT GPS STATION U3447-4
LOCALIZED PROJECT COORDINATES
N= 491817.657
E= 1434026.512
ELEV.= 554.18

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U3447-5" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 491398.381(ft) EASTING: 1428065.757(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99985300
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U3447-5" TO -L- STATION 10+00.00 IS N48°00'17.97"W 2501.630
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

NOTES:

- ⊙ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
- 1 THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:

  HTTP:\WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT

  THE FILES TO BE FOUND ARE AS FOLLOWS:

  U3447_LS_GPSCALIB_050404.HTML
  U3447_LS_WGS84_050404.TXT
  U3447_LS_LOCAL_050404.TXT
  U3447_LS_BASELINE_050404.TXT

  THE WGS84 AND LOCAL FILES ARE COMMA DELIMINATED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT.
- 2 IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- 3 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
- 4 NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION.
- 5 SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

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4/4/05

SURVEY CONTROL SHEET U-3447

PROJECT REFERENCE NO.	SHEET NO.
U-3447	1 - D
Location and Surveys	

BL

POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
6	BL-6	492946.5870	1425500.2730	619.80	OUTSIDE PROJECT LIMITS	
7	BL-7	493074.5370	1425857.9240	625.16	OUTSIDE PROJECT LIMITS	
8	45EQB	493048.4960	1426255.0350	620.48	10+46.47	27.42 RT
9	BL-9	493095.8010	1426944.4310	607.88	17+37.89	34.57 RT
10	BL-10	493185.4730	1427404.9690	595.29	22+01.44	43.74 LT
11	BL-11	493231.8900	1428440.3200	560.08	32+41.55	12.01 LT
12	BL-12	493430.8030	1429690.1910	544.25	45+06.69	46.13 LT
13	BL-13	493506.8900	1430131.3330	541.61	49+56.65	55.83 LT
14	BL-14	493512.4200	1430599.8280	542.68	54+18.80	22.03 RT
15	BL-15	493633.4060	1431252.8840	543.73	60+82.40	12.97 LT
16	BL-16	493496.1890	1431794.6460	539.95	66+23.75	68.59 LT
37	NOT SET	493351.1898	1431912.9177	UNKNOWN	68+03.78	17.58 LT
17	BL-17	493206.0120	1432031.3350	544.36	69+84.04	33.49 RT
3	U3447-3	492892.9420	1432606.6700	540.99	OUTSIDE PROJECT LIMITS	
18	BL-18	492589.7000	1433012.5700	538.40	OUTSIDE PROJECT LIMITS	

BY

POINT	DESC.	NORTH	EAST	ELEVATION	Y STATION	OFFSET
EQ9	BL-9	493095.8010	1426944.4310	607.88	13+32.24	38.14 RT
19	BY-19	492769.9000	1426794.3100	618.81	OUTSIDE PROJECT LIMITS	
20	BY-20	492450.9270	1426817.8840	621.96	OUTSIDE PROJECT LIMITS	

BY1

POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
EQ14	BL-14	493512.4200	1430599.8280	542.68	OUTSIDE PROJECT LIMITS	
21	BY1-21	494194.4030	1430863.1190	537.33	16+62.79	32.89 RT
22	BY1-22	494207.4160	1431312.8310	540.64	16+60.08	482.78 RT
23	BY1-23	493974.6510	1431656.9750	542.92	15+51.80	838.63 RT
EQ16	BL-16	493496.1890	1431794.6460	539.95	13+78.21	1097.04 RT

BY2

POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
25	BY2-25	494971.8650	1430522.1270	535.72	OUTSIDE PROJECT LIMITS	
24	BY2-24	494624.7620	1430702.8190	539.75	OUTSIDE PROJECT LIMITS	
EQ21	BY1-21	494194.4030	1430863.1190	537.33	10+37.06	28.72 LT

****
BM1 ELEVATION = 617.52
N 493206 E 1425163
L STATION 6+27 5975 RIGHT
RR SPIKE IN BASE OF 24IN OAK
****
****
BM2 ELEVATION = 621.45
N 492685 E 1426822
Y STATION 10+00
S 3° 46' 09.8" W DIST 94.94
RR SPIKE IN ROOT OF 32IN OAK
****
****
BM3 ELEVATION = 549.94
N 493433 E 1428474
L STATION 33+01 207 LEFT
RR SPIKE IN BASE OF 24IN CRACK WILLOW
****
****
BM4 ELEVATION = 539.10
N 493621 E 1429691
L STATION 45+32 235 LEFT
RR SPIKE IN BASE OF 20IN WHITE OAK
****
****
BM5 ELEVATION = 554.07
N 493755 E 1430566
Y1 STATION 11+75 144 LEFT
RR SPIKE IN BASE OF 38IN DOUBLE WHITE
OAK
****
****
BM6 ELEVATION = 537.48
N 493091 E 1431920
L STATION 69+59 192 RIGHT
RR SPIKE IN BASE OF 26IN WINGED ELM
****
****
BM29 ELEVATION = 544.53
N 493287 E 1431929
L STATION 68+53 26 RIGHT
NCGS ME29
****

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U3447-5" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 491398.381(ft) EASTING: 1428065.757(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99985300
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U3447-5" TO -L- STATION 10+00.00 IS N48°00'17.97"W 2501.630
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

1 *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*

HTTP:\WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT

THE FILES TO BE FOUND ARE AS FOLLOWS:

U3447_LS_GPSCALIB_050404.HTML
U3447_LS_WGS84_050404.TXT
U3447_LS_LOCAL_050404.TXT
U3447_LS_BASELINE_050404.TXT

THE WGS84 AND LOCAL FILES ARE COMMA DELIMINATED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT.

2 *IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.*

3 *PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.*

4 *NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION.*

5 *SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.*

28-OCT-2008 15:07
r:\roadway\prj\u3447_ls_ld_050404.dgn
$$$$USERNAME$$$$

4/4/05

PROJECT REFERENCE NO.	SHEET NO.
U-3447	1 – E
Location and Surveys	

SURVEY CONTROL SHEET U-3447

GPS CALIBRATION REPORT

PROJECT : U3447

TIP NUMBER	U-3447		
USER NAME	JJEFFREYS	DATE & TIME	9:27:08 AM 4/4/2005
COORDINATE SYSTEM	US STATE PLANE 1983(AT GROUND)	ZONE	NORTH CAROLINA 3200
HORIZONTAL DATUM	CALIBRATION		
VERTICAL DATUM	NAVD-88	GEOID MODEL	GEOID99 (CONUS)
COORDINATE UNITS	US SURVEY FEET		
DISTANCE UNITS	US SURVEY FEET		
HEIGHT UNITS	US SURVEY FEET		

LOCAL SITE INFORMATION

LOCALIZED AROUND	U3447-5
LATITUDE	35°05'06.26580"N
LONGITUDE	80°54'43.04328"W
SITE SCALE FACTOR	1.0001470216
HEIGHT	?

DATUM TRANSFORMATION PARAMETERS

METHOD	THREE PARAMETER
TRANSLATION ALONG X AXIS	12.908SFT
TRANSLATION ALONG Y AXIS	-80.687SFT
TRANSLATION ALONG Z AXIS	57.402SFT

UPDATED DEFAULT PROJECTION (TRANSVERSE MERCATOR) DEFINITION

UPDATED DEFAULT PROJECTION NOT REQUESTED

HORIZONTAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ROTATION CENTER	491915.725SFT
EASTING COORDINATE OF ROTATION CENTER	1428628.544SFT
ROTATION ABOUT THE CENTER POINT	0°00'00"
TRANSLATION NORTH	0.000SFT
TRANSLATION EAST	0.000SFT
SCALE FACTOR	1.00000467

VERTICAL ADJUSTMENT PARAMETERS

NORTHING COORDINATE OF ORIGIN POINT	490321.392SFT
EASTING COORDINATE OF ORIGIN POINT	1423242.935SFT
VERTICAL SEPARATION AT ORIGIN	-0.011SFT
SLOPE NORTH	0.655PPM
SLOPE EAST	3.560PPM

GEOID MODEL DEFINITION

GEOID99 (CONUS)

RESIDUAL DIFFERENCES BETWEEN GPS (WGS84) AND LOCAL COORDINATES

SUMMARY

	MAXIMUM ERROR	ROOT MEAN SQUARE ERROR	POINT
HORIZONTAL	0.003SFT	0.001	U3447-3 - WGS84
VERTICAL	0.001SFT	0.000	U3447-5 - WGS84
THREE-DIMENSIONAL	0.003SFT	0.001	U3447-3 - WGS84

POINT RESIDUALS

WGS84 COORDINATES		CALCULATED POINT FOR DISPLAY ONLY		LOCAL COORDINATES	
POINT	U3447-1 - WGS84	NORTHING	490321.392SFT	POINT	U3447-1 - LOCAL
LATITUDE	35°04'54.69349"N	EASTING	1423242.935SFT	NORTHING	490321.391SFT
LONGITUDE	80°55'40.80966"W	ELEVATION	680.541SFT	EASTING	1423242.934SFT
HEIGHT	580.606SFT	HORZ ERROR	0.001SFT	ELEVATION	680.540SFT
		VERT ERROR	0.001SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.001SFT	QUALITY	SURVEY QUALITY
POINT	U3447-2 - WGS84	NORTHING	493148.251SFT	POINT	U3447-2 - LOCAL
LATITUDE	35°05'23.02230"N	EASTING	1425200.846SFT	NORTHING	493148.251SFT
LONGITUDE	80°55'17.91544"W	ELEVATION	616.709SFT	EASTING	1425200.846SFT
HEIGHT	516.820SFT	HORZ ERROR	0.000SFT	ELEVATION	616.709SFT
		VERT ERROR	0.000SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.000SFT	QUALITY	SURVEY QUALITY
POINT	U3447-3 - WGS84	NORTHING	492892.940SFT	POINT	U3447-3 - LOCAL
LATITUDE	35°05'21.90630"N	EASTING	1432606.673SFT	NORTHING	492892.942SFT
LONGITUDE	80°53'48.75980"W	ELEVATION	540.991SFT	EASTING	1432606.670SFT
HEIGHT	441.184SFT	HORZ ERROR	0.003SFT	ELEVATION	540.990SFT
		VERT ERROR	0.001SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.003SFT	QUALITY	SURVEY QUALITY
POINT	U3447-4 - WGS84	NORTHING	491817.659SFT	POINT	U3447-4 - LOCAL
LATITUDE	35°05'11.54131"N	EASTING	1434026.511SFT	NORTHING	491817.657SFT
LONGITUDE	80°53'31.43168"W	ELEVATION	554.179SFT	EASTING	1434026.512SFT
HEIGHT	454.379SFT	HORZ ERROR	0.003SFT	ELEVATION	554.179SFT
		VERT ERROR	0.000SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.003SFT	QUALITY	SURVEY QUALITY
POINT	U3447-5 - WGS84	NORTHING	491398.379SFT	POINT	U3447-5 - LOCAL
LATITUDE	35°05'06.26577"N	EASTING	1428065.756SFT	NORTHING	491398.381SFT
LONGITUDE	80°54'43.04329"W	ELEVATION	612.410SFT	EASTING	1428065.757SFT
HEIGHT	512.542SFT	HORZ ERROR	0.002SFT	ELEVATION	612.411SFT
		VERT ERROR	0.001SFT	UTILIZED	HORZ AND VERT
		3D ERROR	0.003SFT	QUALITY	SURVEY QUALITY

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U3447-5" WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 491398.381(ft) EASTING: 1428065.757(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99985300 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U3447-5" TO -L- STATION 10+00.00 IS N48°00'17.97"W 2501.630 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES:

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   HTTP:\WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT

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   U3447_LS_GPSCALIB_050404.HTML
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   U3447_LS_LOCAL_050404.TXT
   U3447_LS_BASELINE_050404.TXT

   THE WGS84 AND LOCAL FILES ARE COMMA DELIMINATED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT.
2. *IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.*
3. *PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.*
4. *NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION.*
5. *THE SITE CALIBRATION SHOWN IS BASED OPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.*

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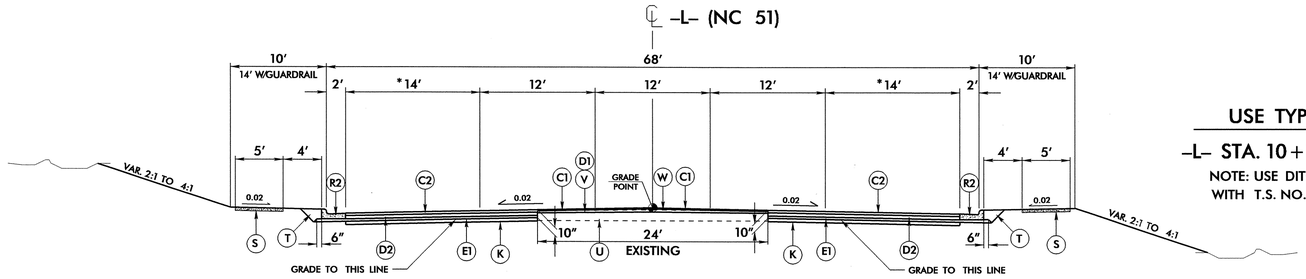
$$$$USERNAME$$$$

5/14/99

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD	K	SUBBASE TO BE TREATED WITH LIME TO A DEPTH OF 8" AT A RATE OF 20LBS. PER SQ. YD., AS DIRECTED BY THE ENGINEER. OR SUBBASE TO BE TREATED WITH CEMENT TO A DEPTH OF 7" AT A RATE OF 55 LBS. PER SQ. YD., AS DIRECTED TBY THE ENGINEER.
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 S9.5B, AT AN AVERAGE RATE OF 112 LBS PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.	R1	1' - 6" CONCRETE CURB AND GUTTER
D1	PROP. APROX. 2½" DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.	R2	2' - 6" CONCRETE CURB AND GUTTER
D2	PROP. APROX. 4" DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R3	5" MONOLITHIC CONCRETE ISLAND
D3	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.	S	4" CONCRETE SIDEWALK
E1	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.	T	EARTH MATERIAL.
E2	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
E3	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.	V	MILLING EXISTING PAVEMENT TO A DEPTH OF 2½"
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 3.0 " IN DEPTH OR GREATER THAN 5.5" IN DEPTH.	W	SEE WEDGING DETAIL

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



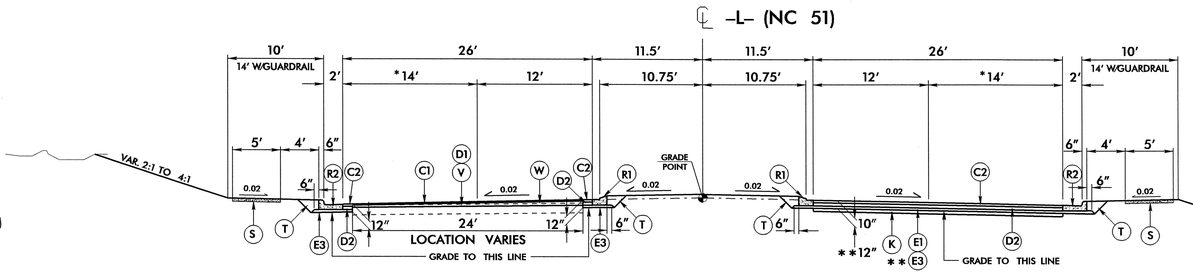
TYPICAL SECTION NO. 1

* WIDENED FOR SHARED VEHICLE/BICYCLE USAGE

USE TYPICAL SECTION NO. 1

–L– STA. 10+73.00 TO STA. 17+50.00

NOTE: USE DITCH DETAIL 'C' IN CONJUNCTION WITH T.S. NO. 1 –L– STA. 16+20 TO 17+36 LT.



TYPICAL SECTION NO. 2

* WIDENED FOR SHARED VEHICLE/BICYCLE USAGE

** USE 5" B25.0B, –L– STA. 63+50.00 TO 66+87.86 WITHOUT SUBGRADE STABILIZATION

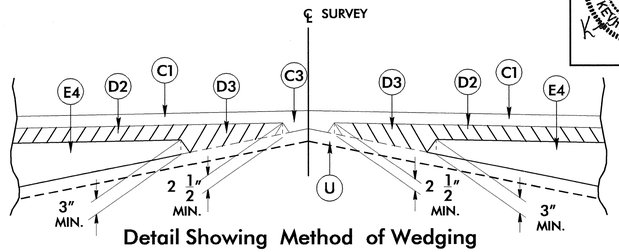
USE TYPICAL SECTION NO. 2

–L– STA. 17+50.00 TO STA. 60+45.00

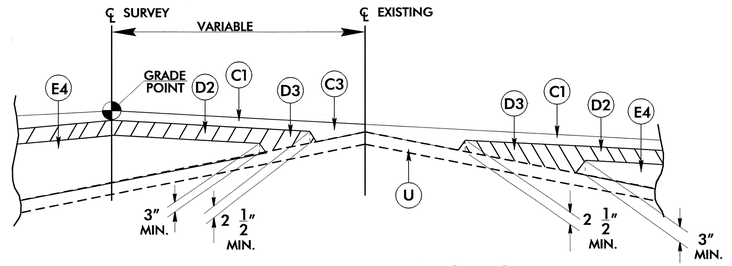
TRANSITION FROM T.S. NO. 2 TO EXISTING

–L– STA. 60+45.00 TO STA. 66+87.86

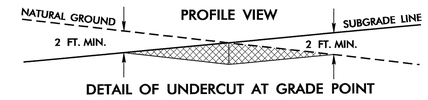
NOTE: USE DITCH DETAIL 'E', 'F', AND 'I' IN CONJUNCTION WITH T.S. NO. 2 AS FOLLOWS:
–L– STA. 22+25 TO 24+00 RT.
–L– STA. 23+15 TO 24+90 LT.
–L– STA. 29+25 TO 33+75 RT.
–L– STA. 43+75 TO 44+30 RT.
–L– STA. 44+65 TO 46+80 RT.



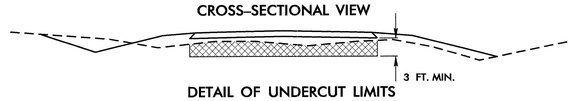
Detail Showing Method of Wedging



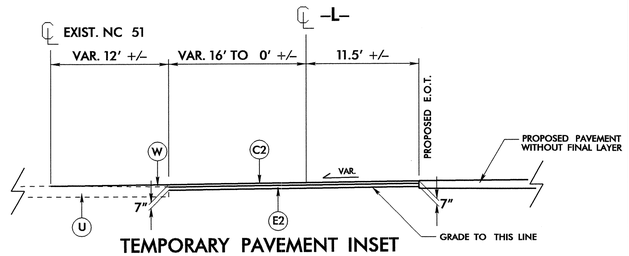
Detail Showing Method Of Wedging



DETAIL OF UNDERCUT AT GRADE POINT



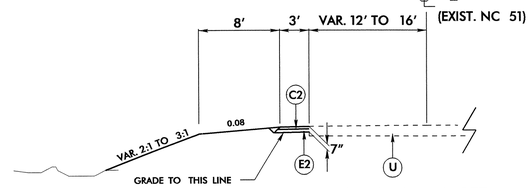
DETAIL OF UNDERCUT LIMITS



TEMPORARY PAVEMENT INSET

–L– STA. 46+87+/– TO STA. 51+35+/–

SEE SHEETS TCP–8 AND TCP–9



TEMPORARY PAVEMENT INSET

–L– STA. 63+50+/– TO STA. 65+42+/–

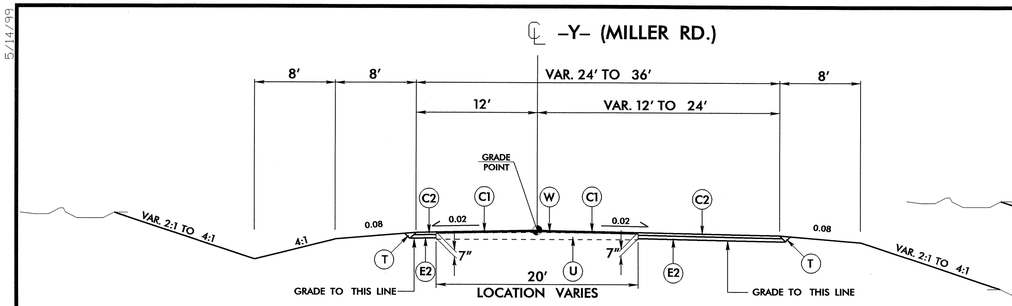
SEE SHEET TCP–10

PROJECT REFERENCE NO.	SHEET NO.
U-3447	2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 24912 ENGINEER KEVIN E. MOORE — 11-7-08

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON — 10/31/08

5/14/99

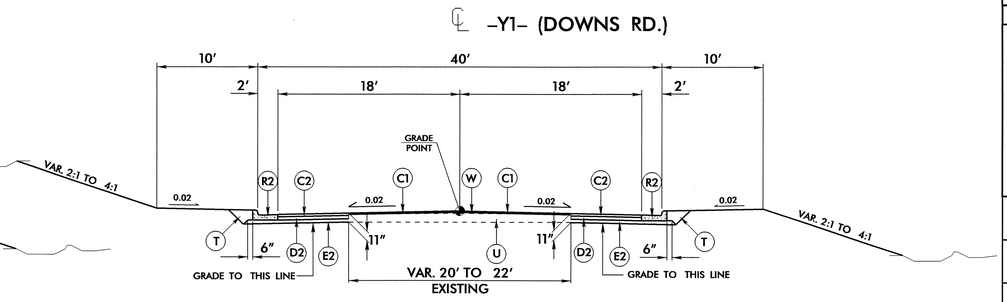


TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

–Y– STA. 10+00.00 TO STA. 12+26.66

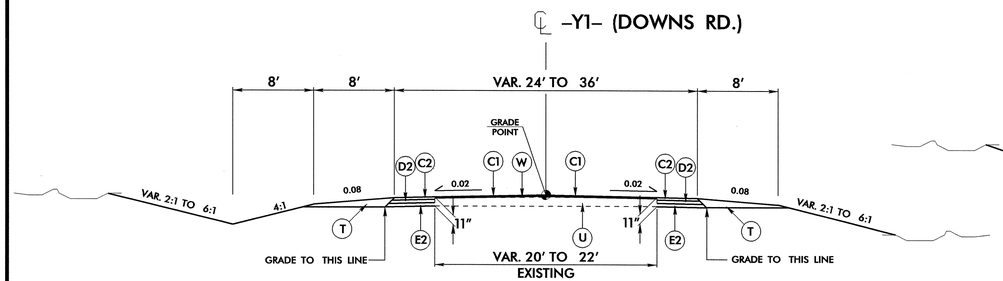
NOTE: USE DITCH DETAIL 'B' IN CONJUNCTION WITH T.S. NO. 3 AS FOLLOWS:
–Y– STA. 12+00 TO 12+83 LT.
–Y– STA. 12+00 TO 18+00 RT.(–L–)



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4

–Y1– STA. 11+72.18 TO STA. 19+18.64 LT.
–Y1– STA. 11+72.18 TO STA. 18+96.96 RT.

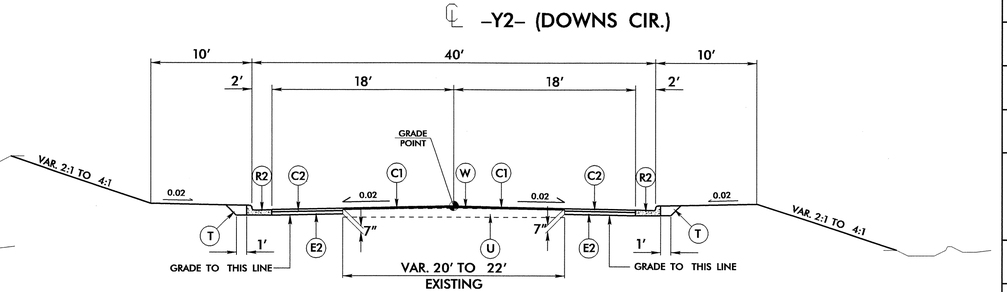


TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5

–Y1– STA. 19+18.64 TO STA. 21+21.12 LT.
–Y1– STA. 18+96.96 TO STA. 21+21.12 RT.

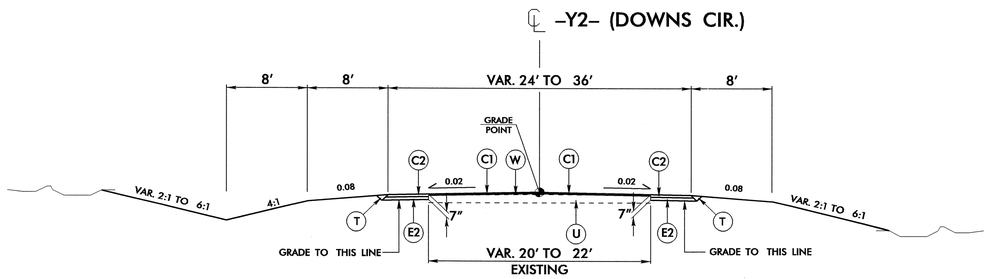
NOTE: USE DITCH DETAIL 'K' IN CONJUNCTION WITH T.S. NO. 6 AS FOLLOWS:
–Y1– STA. 20+50 TO 21+21.20 RT.
–Y1– STA. 19+70 TO 21+21.20 LT.



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6

–Y2– STA. 11+29.52 TO STA. 12+13.00

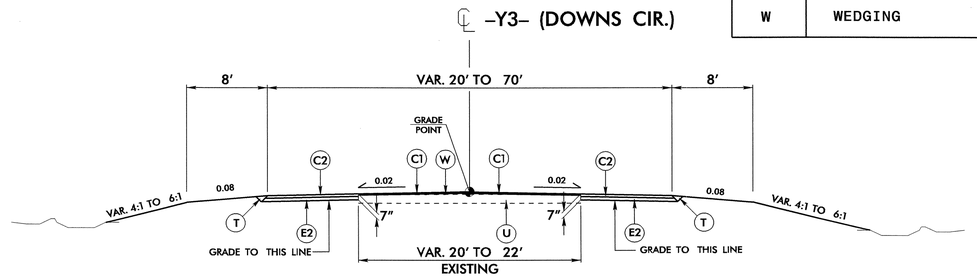


TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7

–Y2– STA. 12+13.00 TO STA. 13+23.00

NOTE: USE DITCH DETAIL 'K' IN CONJUNCTION WITH T.S. NO. 7 AS FOLLOWS:
–Y2– STA. 12+75 TO 13+00 LT.



TYPICAL SECTION NO. 8

USE TYPICAL SECTION NO. 8

–Y3– STA. 10+86.10 TO 11+88.92

PROJECT REFERENCE NO.	SHEET NO.
U-3447	2-A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24912 ENGINEER KEVIN E. MOORE

11-7-08

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 22896 ENGINEER CLARK S. MORRISON

10/31/08

PAVEMENT SCHEDULE

C1	1.5 ″ S9.5B
C2	3″ S9.5B
C3	VAR. DEPTH S9.5B
D1	2 1/2 ″ I19.0B
D2	4″ I19.0B
D3	VAR. DEPTH I19.0B
E1	3″ B25.0B
E2	4″ B25.0B
E3	5″ B25.0B
E4	VAR. DEPTH B25.0B
K	LIME STABILIZATION OR CEMENT STABILIZATION
R1	1′ - 6″ CONC. C&G
R2	2′ - 6″ CONC. C&G
R3	5″ MOMO. CONC. ISL.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING
W	WEDGING

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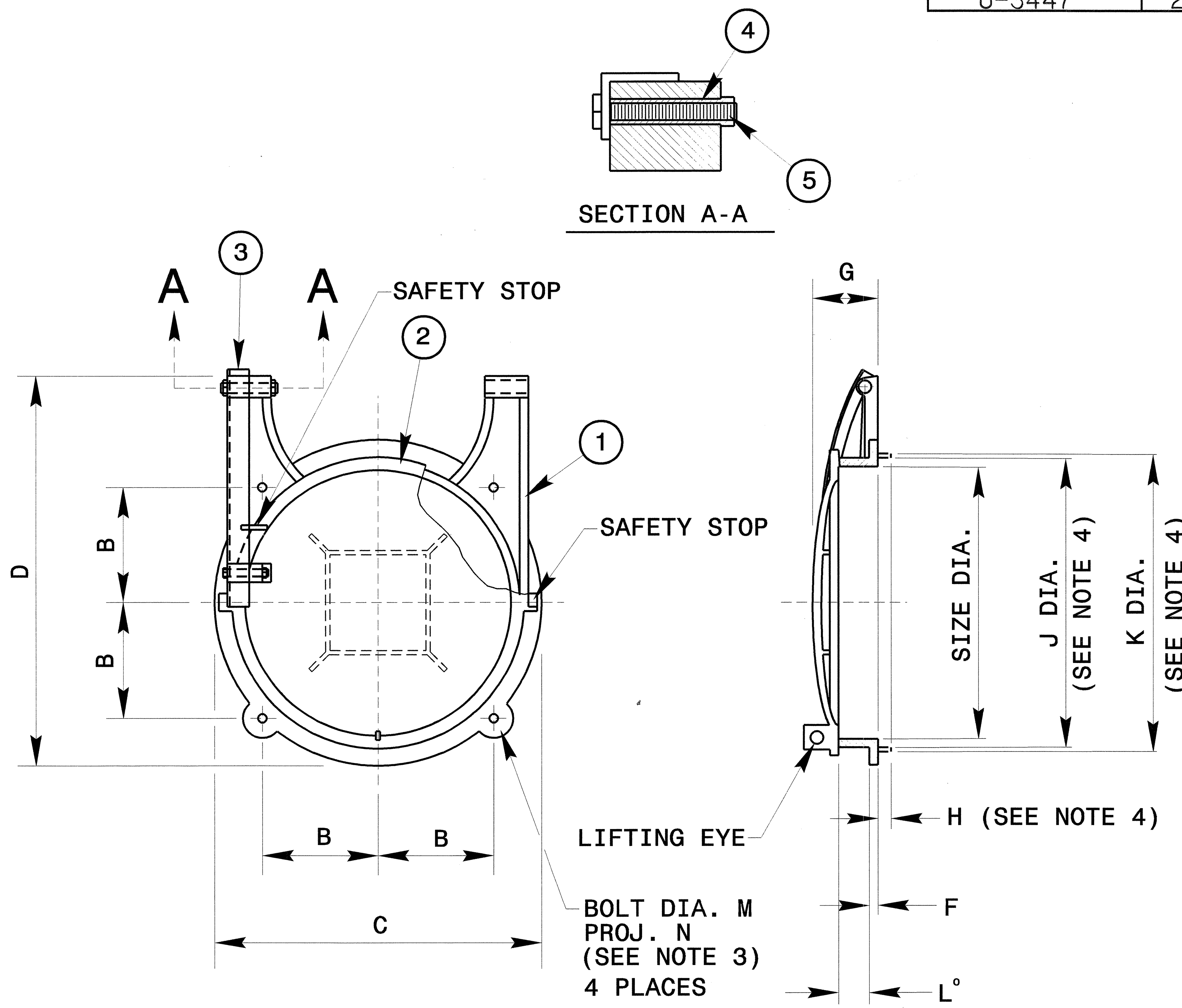
PROJECT REFERENCE NO.	SHEET NO.
U-3447	2-B

GATE DIMENSIONS IN INCHES

SIZE DIA.	B	C	D	F	G	H	J	K	L°	M	N
4	2 1/4	6 5/16	8 1/2	3/8	4 1/8	2 1/4	5 1/8	5 5/8	5	1/2	1 3/8
6	2 13/16	8 1/16	10	3/8	4 1/8	2 1/4	7 1/8	7 9/16	5	1/2	1 3/8
8	3 1/2	10	12	3/8	4 1/4	2 3/16	9 1/8	9 5/8	5	1/2	1 3/8
10	4 3/4	12 1/4	14 1/2	3/8	4 1/2	2 1/4	11 3/16	11 5/8	5	1/2	1 3/8
12	5 1/8	15	17 1/8	3/8	4 1/2	2 1/8	13 1/8	13 5/8	5	1/2	1 3/8
14	5 15/16	16 7/8	19 5/8	3/8	4 3/4	2 1/8	15 1/16	15 5/8	5	1/2	1 3/8
15	6 1/4	18 1/8	20	3/8	5	2 1/4	16	16 3/4	5	1/2	1 3/8
16	6 5/8	18 11/16	21 5/8	7/16	5	2 3/8	17	17 3/4	5	1/2	1 3/8
18	7 7/16	21	24 3/8	7/16	5 3/8	2 1/8	19	19 3/4	5	1/2	1 3/8
20	8 1/4	23 9/16	26 1/2	1/2	6	2 1/4	21 1/8	21 3/4	5	5/8	1 5/8
21	8 9/16	24 1/8	27 1/2	1/2	7	2 1/4	22	22 3/4	5	5/8	1 5/8
24	9 11/16	27 1/2	32	1/2	7 5/8	2 1/4	25	26 1/2	5	5/8	1 5/8
30	12	34	39 5/8	3/4	6 1/2	2 3/16	31	32	2 1/2	3/4	2
36	14 3/8	40 5/8	46	3/4	8	2 1/8	37	38	2 1/2	3/4	2
42	16 11/16	47 3/8	55 3/4	3/4	8	2 1/2	43 1/8	44 1/8	2 1/2	3/4	2
48	19 5/16	54 1/2	63 3/8	3/4	9 1/8	3	49 7/8	51	2 1/2	3/4	2
54	22 1/8	60 1/4	71	7/8	9 3/4	3	55 1/4	57	2 1/2	1	2 3/4
60	24 13/16	72	80 5/8	1	10 3/4	3	61 1/4	62 3/4	2 1/2	1	2 3/4
72	29	83	95 1/2	1 1/8	11 1/2	3 1/8	74 3/4	76 1/2	2 1/2	1	2 3/4



NOTES:

1. FOR USE WITH SEATING HEADS TO 10 FEET.
2. NOT RECOMMENDED FOR PUMP DISCHARGE USE.
3. ADD GROUT PAD THICKNESS TO ANCHOR BOLT PROJECTION.
4. APPLIES TO SPIGOT BACK GATE ONLY. SPIGOT, SHOWN IN PHANTOM, IS OPTIONAL.
5. INSTALL AS DIRECTED BY THE ENGINEER.

(1) FRAME

(2) COVER

(3) HINGE LINK

(4) HINGE BUSHING

(5) HINGE BOLT & NUT

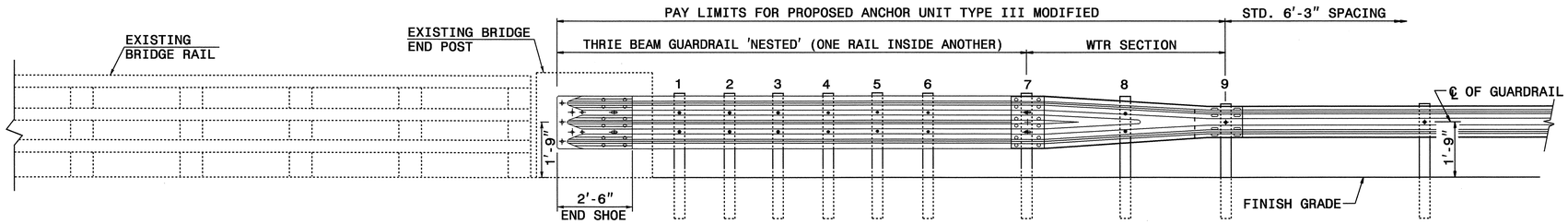
NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON 12/2/08

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

FLAP GATE DETAIL

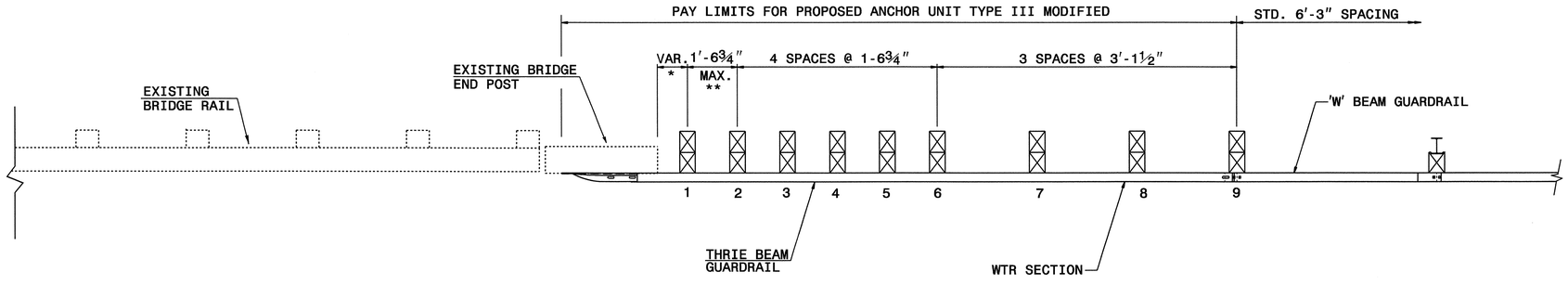
ORIGINAL BY: DATE:
MODIFIED BY: rnbritt DATE: 2-17-04
CHECKED BY: DATE: 7/18/05
FILE SPEC.: details\nbritt\english\b3685flapgate.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3447	2-C



ELEVATION VIEW

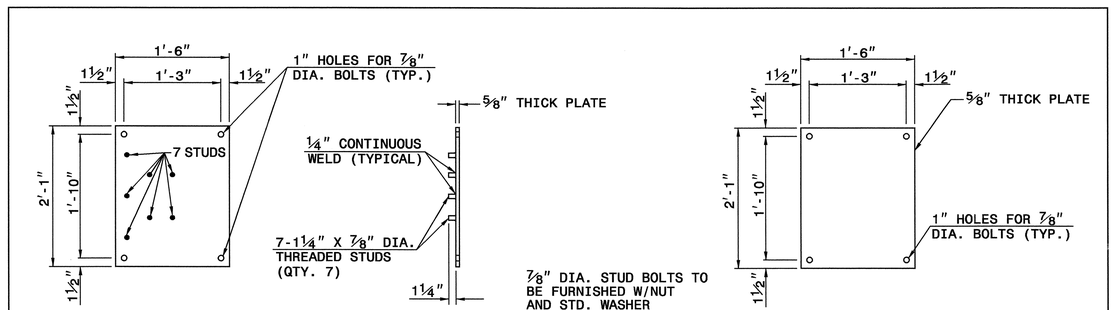
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.



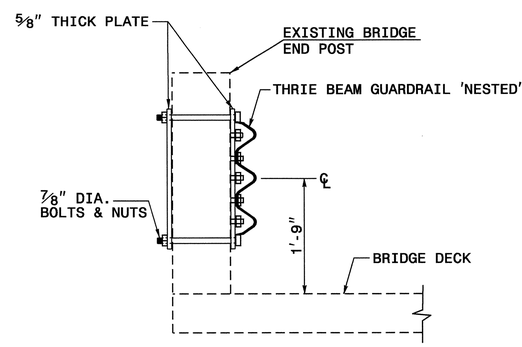
PLAN VIEW

NOTES FOR ANCHORING END OF GUARDRAIL WITH BRIDGE PLATES:
1. USE NUTS, BOLTS, AND WASHERS CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-307 AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
2. TAP NUTS FOR THE ⅞" DIA. STUDS AND BOLTS AFTER GALVANIZING SEE A.S.T.M. A-563.
3. USE PLATES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 1076 OF STAND. SPECS.
4. ADDITIONAL FIELD HOLES MAY BE DRILLED IN STEEL RAIL AS DIRECTED BY THE ENGINEER.
5. ATTACH THREADED STUDS TO PLATE WITH ¼" WELDS ALL AROUND.
6. AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.
7. THE 1" DIA. HOLES SHALL BE DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

GENERAL NOTES:
1 SEE ROADWAY STANDARD 862.03 SHEET 1 FOR ADDITIONAL INFORMATION ON THE TYPE III ANCHOR UNIT
2. MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
3. USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
4. LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
5. REFEER TO STANDARD SPECIFICATION SECTION 862 FOR GUARDRAIL.
6. ALL WORK AND MATERIALS USED SHALL MEET THE APPROVAL OF THE ENGINEER.



BRIDGE PLATES



SECTION VIEW

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

GUARDRAIL ANCHOR UNIT TYPE III MODIFIED FOR CLASSIC BRIDGE RAIL

ORIGINAL BY:	E.E. WARD	DATE:	2-17-04
MODIFIED BY:	K.A. KEMPF	DATE:	7-09-07
CHECKED BY:		DATE:	7/9/07
FILE SPEC.:	\english\anchorunit u3447.dgn		

09-JUL-2007 12:18
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kkempf AT PS222293

PROJECT REFERENCE NO.	SHEET
U-3447	2-E

GEOTECHNICAL ENGINEER

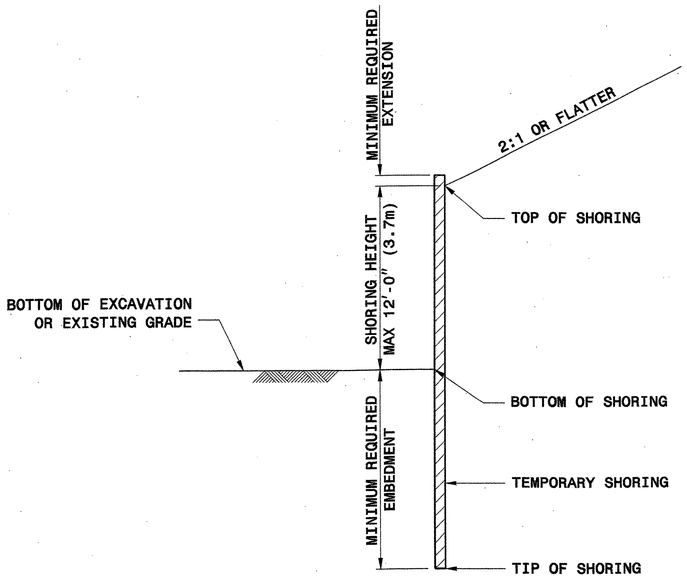
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

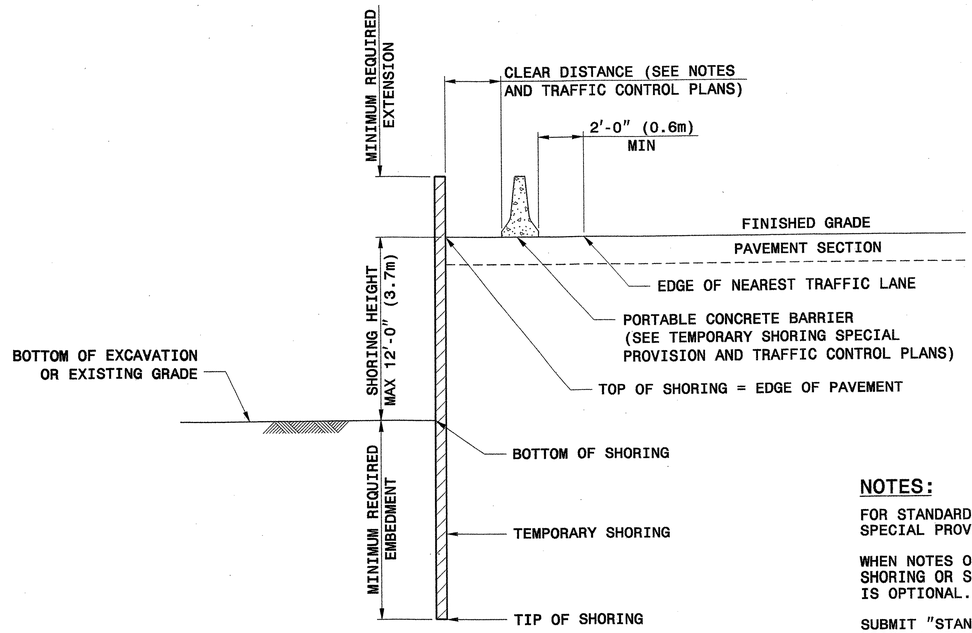
SIGNATURE DATE

ENGINEER

SIGNATURE DATE



SLOPE CASE



SURCHARGE CASE

GROUNDWATER CONDITION	SHORING HEIGHT FT (m)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H PILES WITH TIMBER LAGGING			SHEET PILES		H PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN^3/FT (cm^3/m)	MINIMUM REQUIRED EMBEDMENT FT (m)			MINIMUM REQUIRED EMBEDMENT FT (m)	MINIMUM REQUIRED SECTION MODULUS IN^3/FT (cm^3/m)	MINIMUM REQUIRED EMBEDMENT FT (m)		
				HP 10x42 (HP 250x62)	HP 12x53 (HP 310x79)	HP 14x73 (HP 360x108)			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
U-3447	2-F

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.

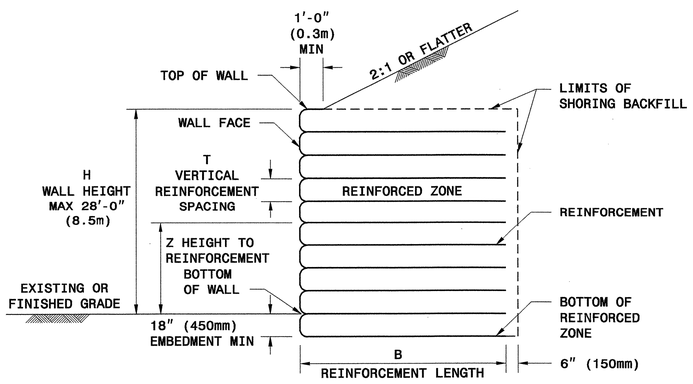
PLACE SHORING BACKFILL IN 8″ TO 10″ (200mm to 250mm) THICK LIFTS AND COMPACT IN ACCORDANCE WITH SUBARTICLE 235-4(C) OF THE STANDARD SPECIFICATIONS. USE ONLY HAND OPERATED COMPACTION EQUIPMENT WITHIN 3′-0″ (1m) OF THE WALL FACE.

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.

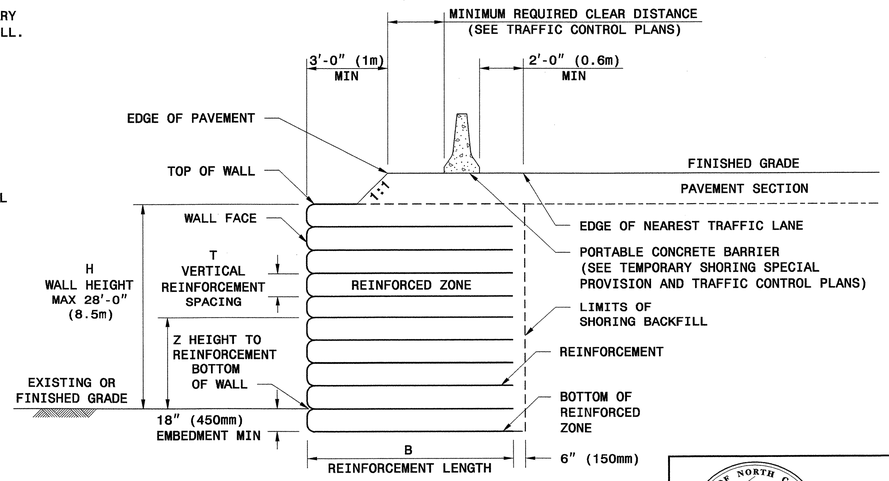
COVER REINFORCING AND RETENTION FABRIC WITH AT LEAST 3″ (75mm) OF SHORING BACKFILL. PLACE TOP REINFORCEMENT LAYER BETWEEN 4″ AND 24″ (100mm and 600mm) BELOW TOP OF WALL DEPENDING ON WALL OPTION.

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

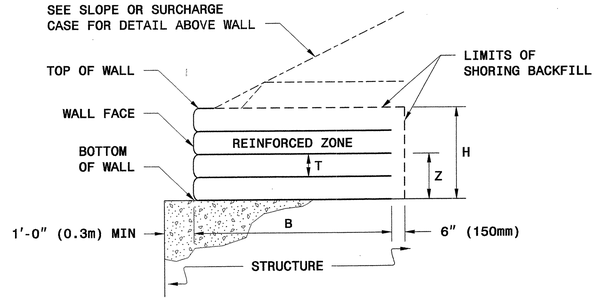
IF THE TOP OF WALL IS WITHIN 5′-0″ (1.5m) OF FINISHED GRADE, REMOVE TOP FORM OR FACING AND INCORPORATE THE TOP REINFORCEMENT LAYER INTO THE FILL WHEN PLACING FILL IN FRONT OF THE WALL. STANDARD TEMPORARY MSE WALLS REMAIN IN PLACE PERMANENTLY UNLESS REQUIRED OTHERWISE.



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
U-3447	2-G

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

SIGNATURE DATE 3/29/07

ENGINEER

SIGNATURE DATE

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

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

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	11	14	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	15	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	11	15	15	15	13.5
					11	11	11	11	15	15	15	15	12
				11	11	11	11	15	15	15	15	15	10.5
			11	11	11	11	15	15	15	15	15	15	9
		11	11	11	11	15	15	15	15	15	15	16	7.5
		11	11	11	11	14	15	15	15	15	15	16	6
	11	11	11	11	14	14	15	15	15	15	16	16	4.5
11	11	11	11	11	14	15	15	15	15	16	16	16	3
11	11	11	11	15	15	15	15	15	16	16	16	17	1.5
11	11	11	14	15	15	15	15	15	16	16	17	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	7.0	14
					4.5	7.0	7.0	7.0	7.0	7.0	7.0	9.5	12
				4.5	7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	10
			4.5	7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	8
		4.5	7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	6
	4.5	7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	4
4.5	7.0	7.0	7.0	7.0	7.0	7.0	9.5	9.5	9.5	9.5	9.5	9.5	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	7.0	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	7.0	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	3X1	3X2	3X2	3X2	3X2	3X2	16 -10
					3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	15 - 2
				3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	13 - 6
			3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	11 -10
		3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	10 - 2
	3X1	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	8 - 6
	3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	6 -10
3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	5 - 2
3X1	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3X2	3 - 6
3X1	3X2	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	3X2	0 - 2
3X2	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

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

PROJECT REFERENCE NO.	SHEET
U-3447	2-H

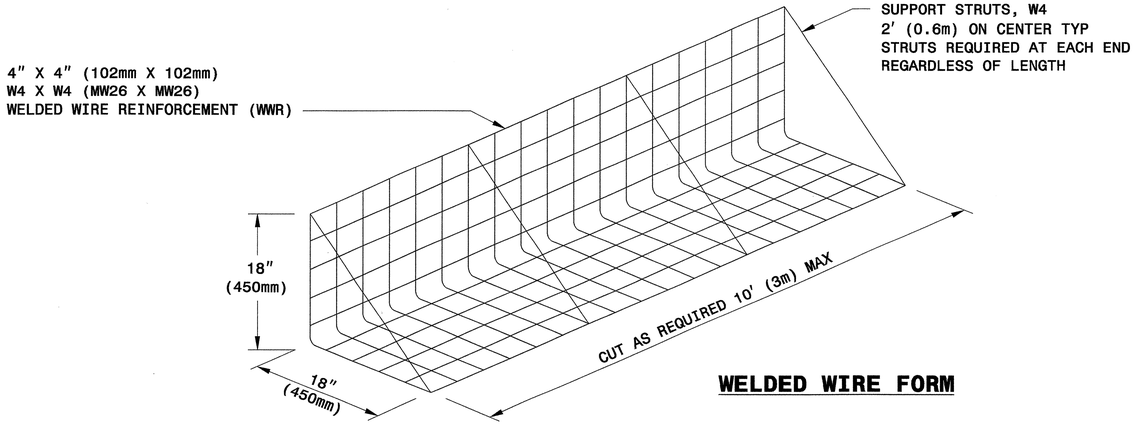
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

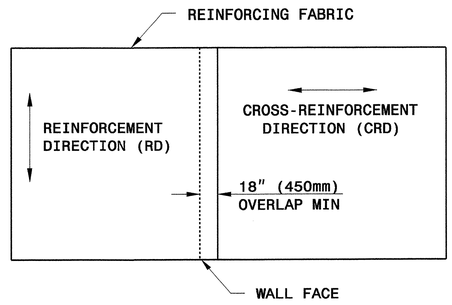
Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

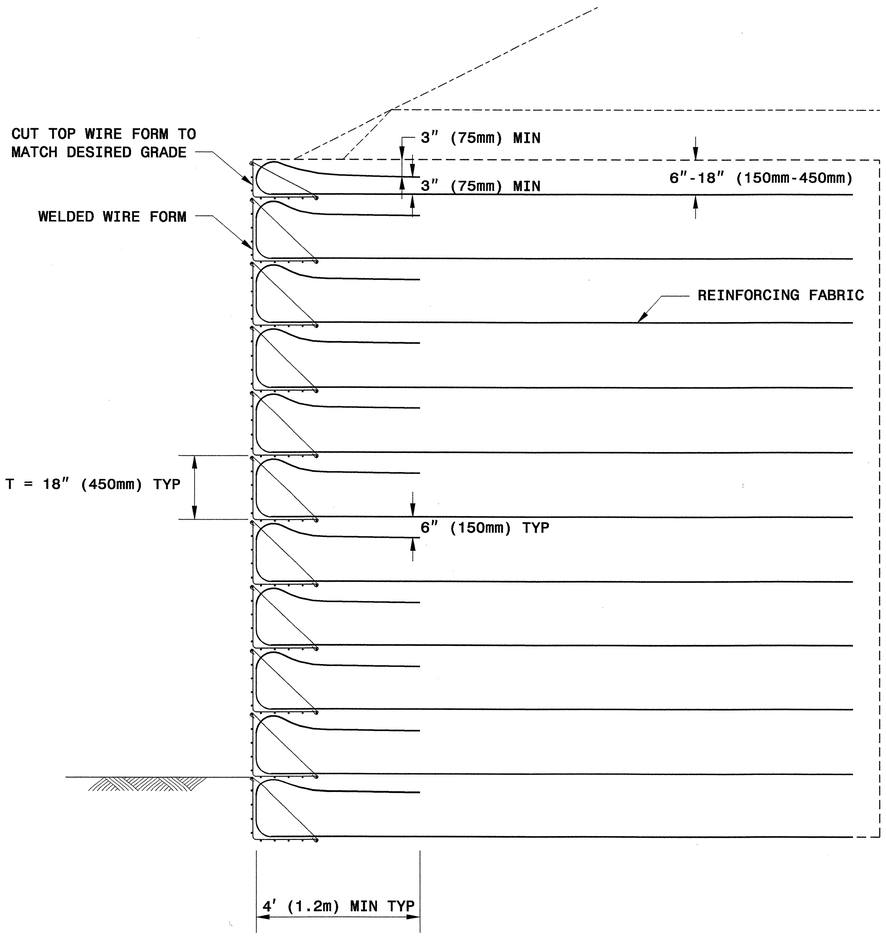
SIGNATURE DATE



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

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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
U-3447	2-I

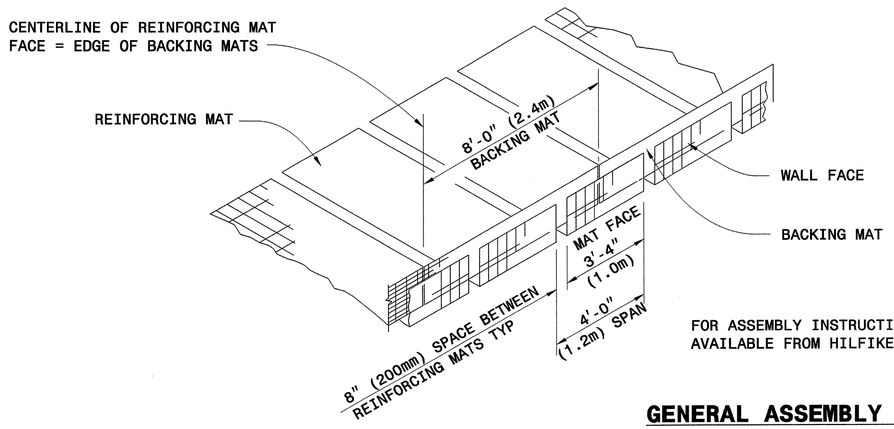
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

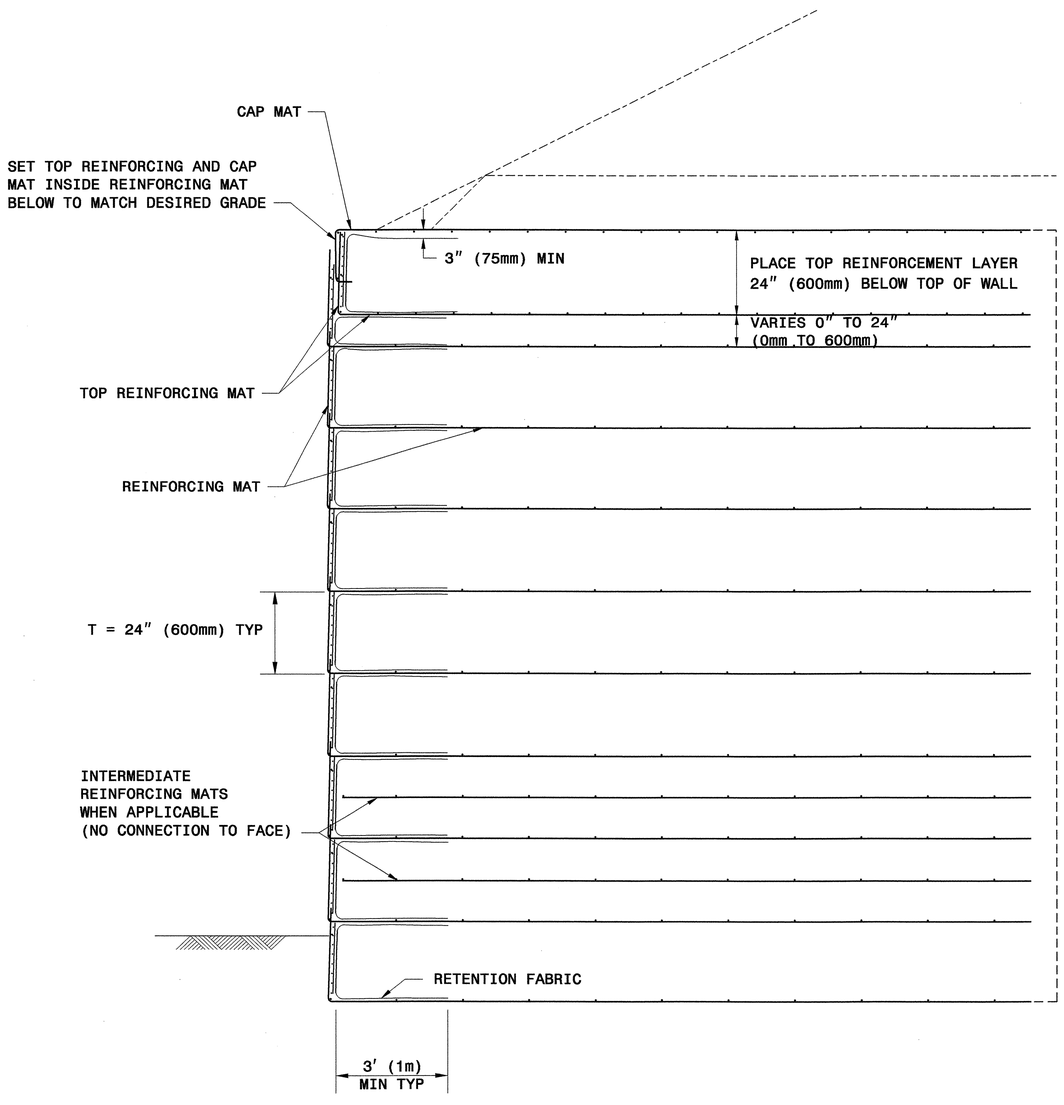
ENGINEER

SIGNATURE DATE

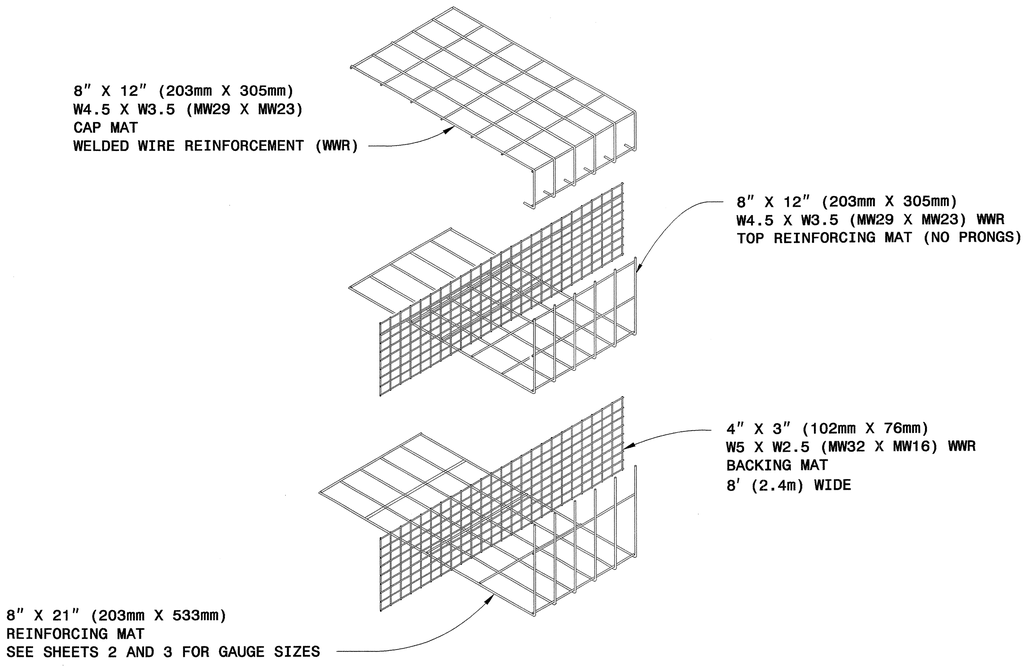


FOR ASSEMBLY INSTRUCTIONS, SEE WELDED WIRE WALL CONSTRUCTION GUIDE AVAILABLE FROM HILFIKER WEBSITE AT WWW.HILFIKER.COM/WWW

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
U-3447	2-J

GEOTECHNICAL ENGINEER

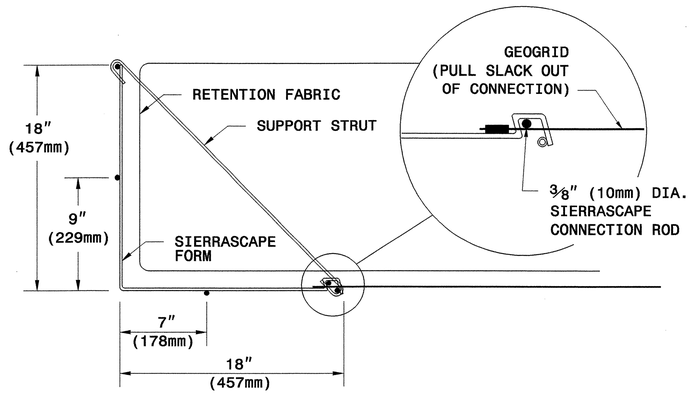
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07

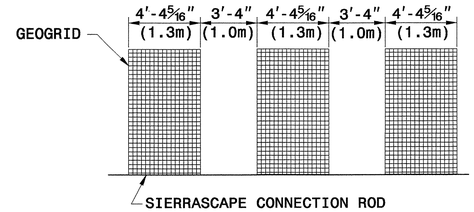
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

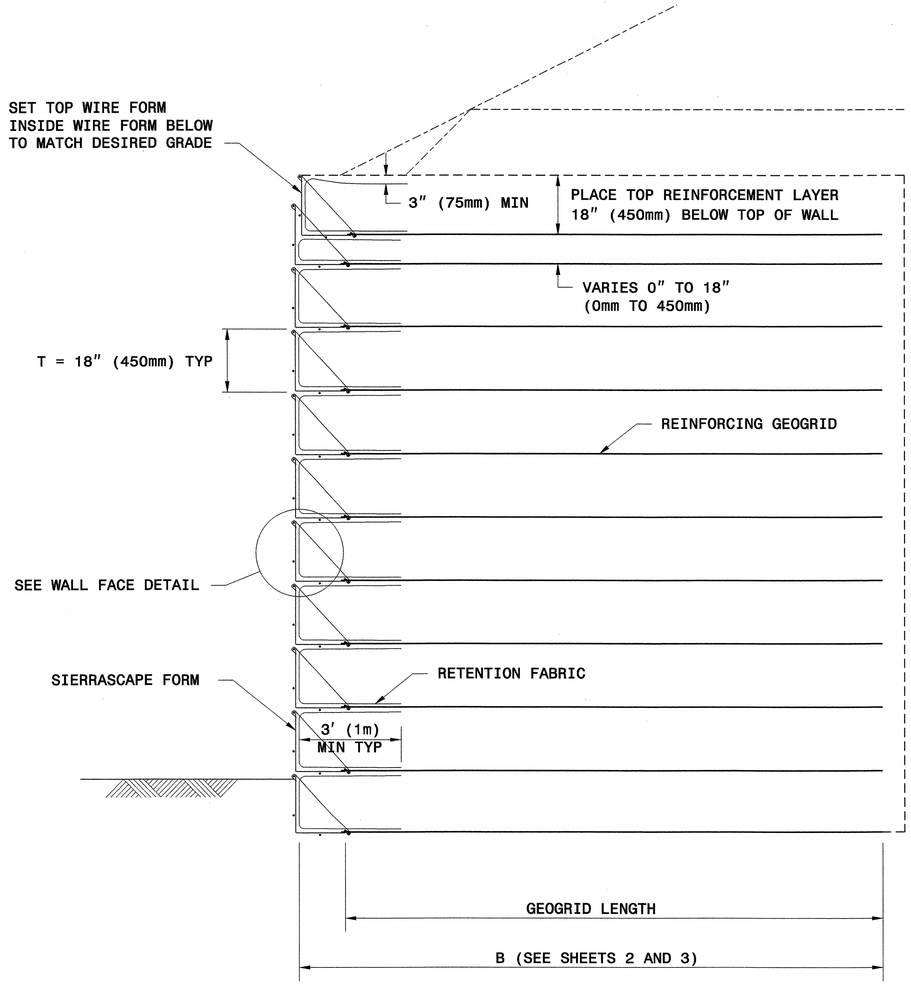


WALL FACE DETAIL

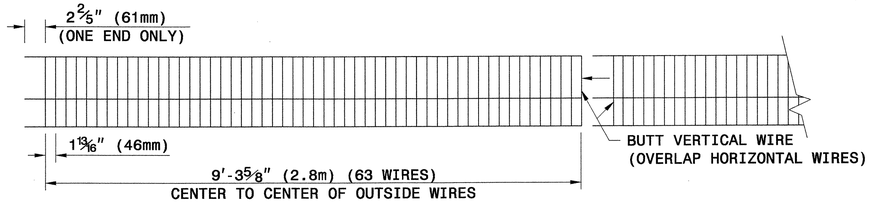


PLACE ALTERNATE LAYERS OF GEOGRID IN STAGGERED PATTERN
SUCH THAT THE LAYER ABOVE IS CENTERED OVER SPACE BELOW

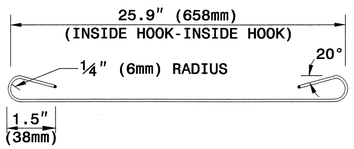
TYPICAL GEOGRID COVERAGE



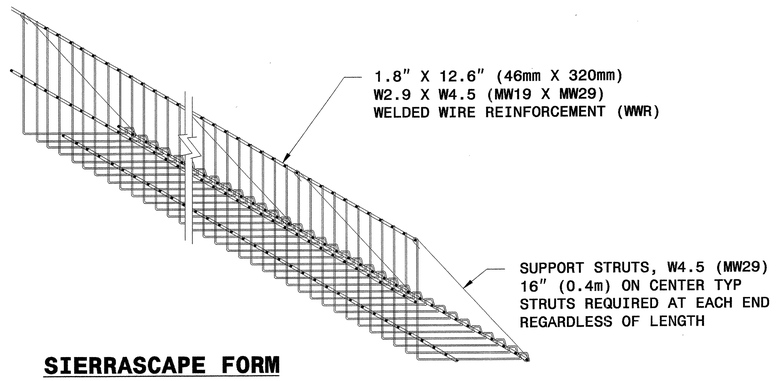
TYPICAL SECTION



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
U-3447	2-K

GEOTECHNICAL ENGINEER

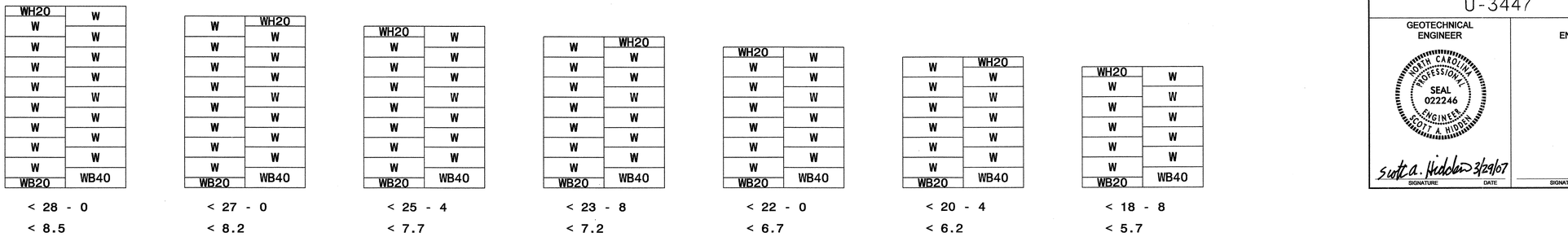
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

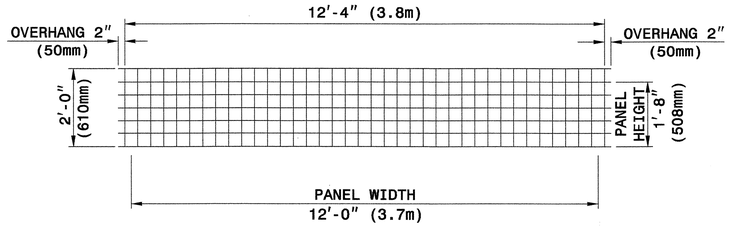
Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

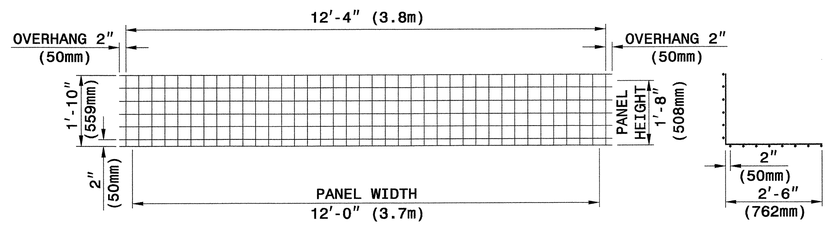
SIGNATURE DATE

PANEL LAYOUTS

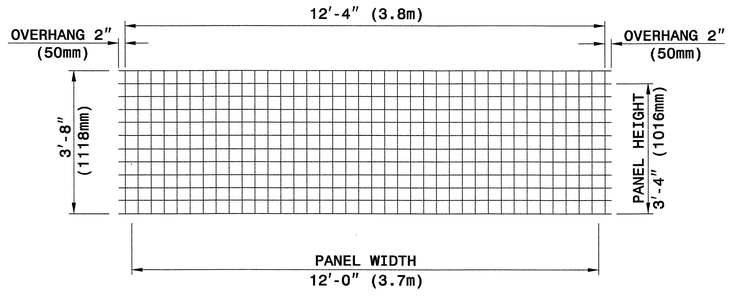




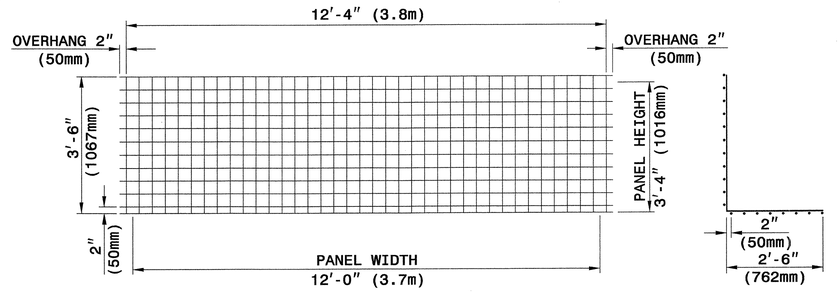
TYPE WH20



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
U-3447	2-L

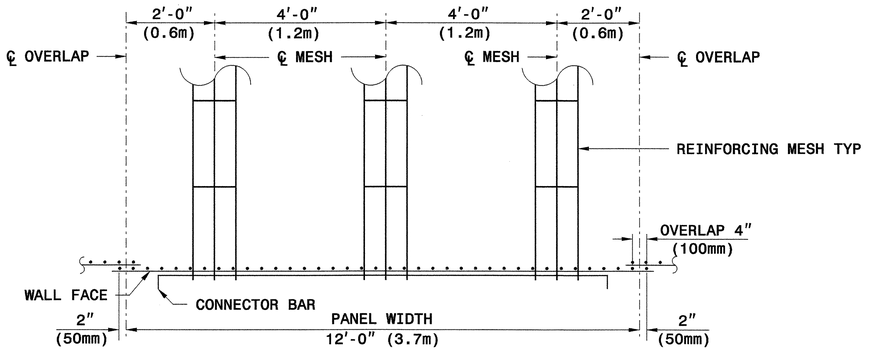
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

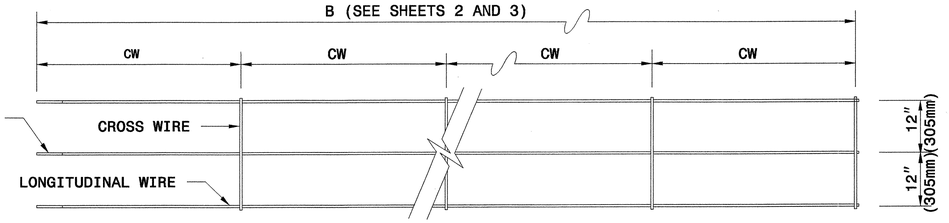
SIGNATURE DATE



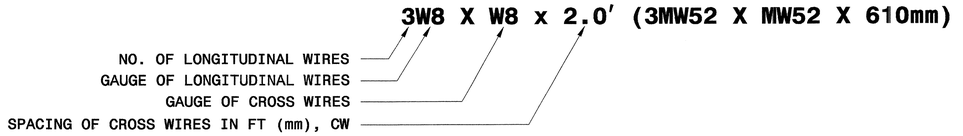
REINFORCING MESH PLACEMENT DETAIL
(PLAN VIEW)

½" (13mm) DIA. BAR

CONNECTOR BAR

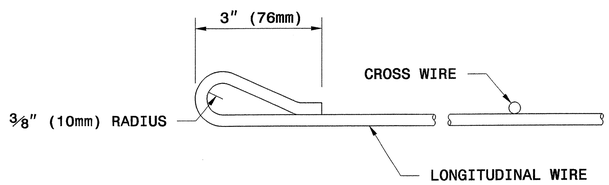


IF REINFORCEMENT LENGTH IS NOT AN INCREMENT OF 2'-0" (610mm) MAKE CW EQUAL TO 12" (305mm) AT THE END OF THE REINFORCING MESH OPPOSITE THE LOOPED END

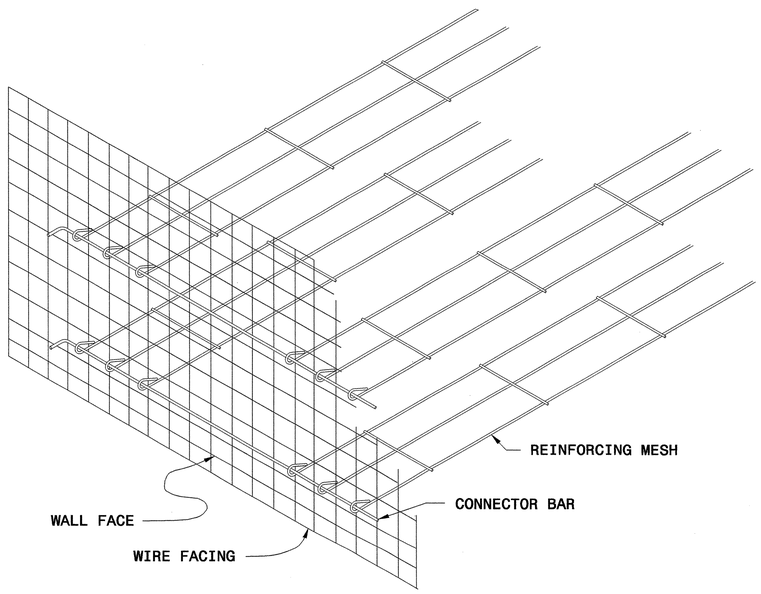


REINFORCING MESH DESIGNATION

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

PROJECT REFERENCE NO.	SHEET
U-3447	2-M

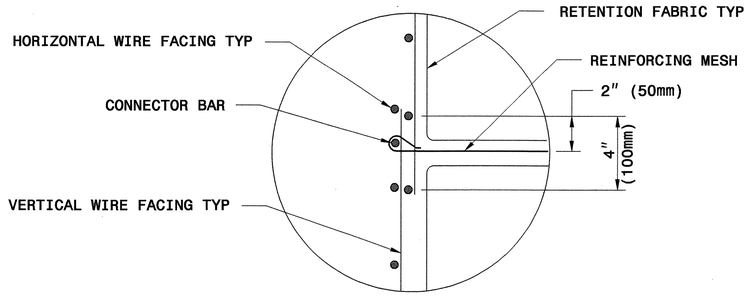
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

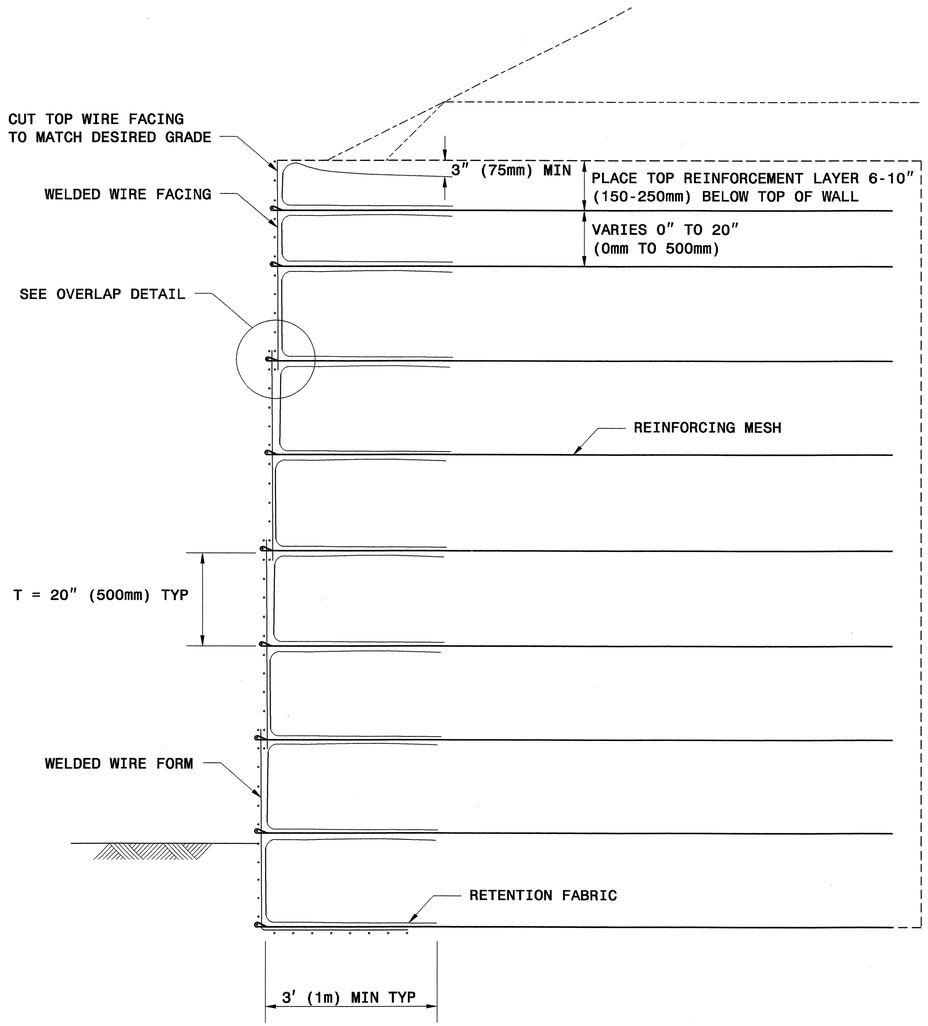
Scott A. Hidden 3/29/07
SIGNATURE DATE

ENGINEER

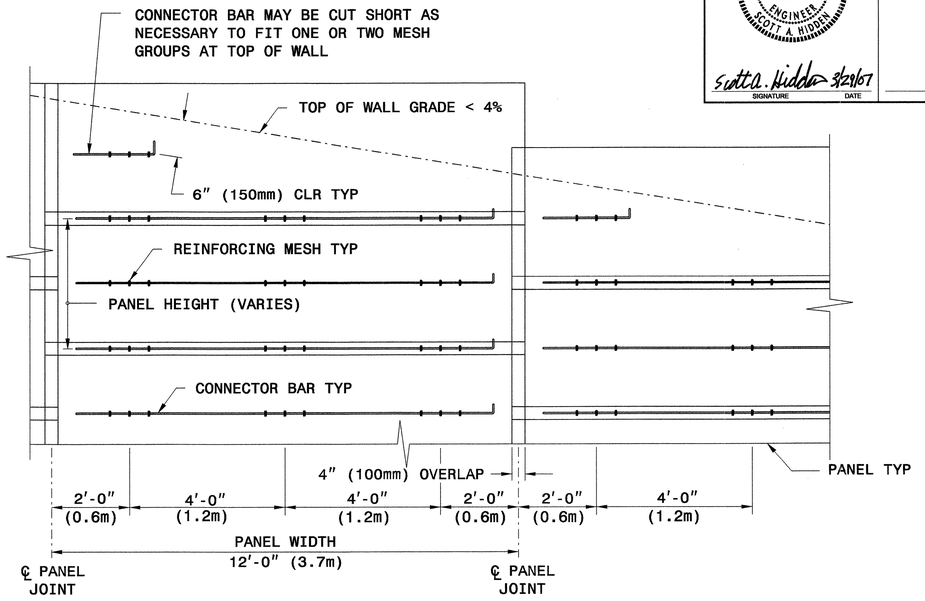
SIGNATURE DATE



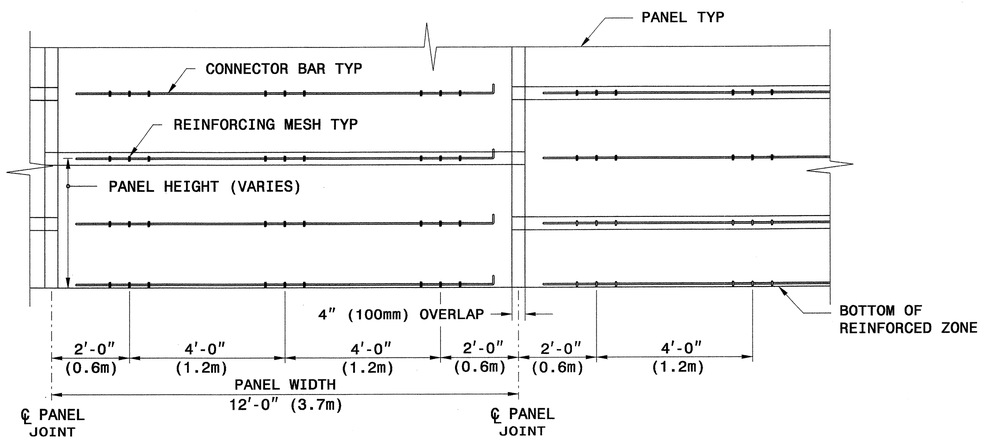
OVERLAP DETAIL



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
U-3447	2-N

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

scott a. hidden 3/29/07

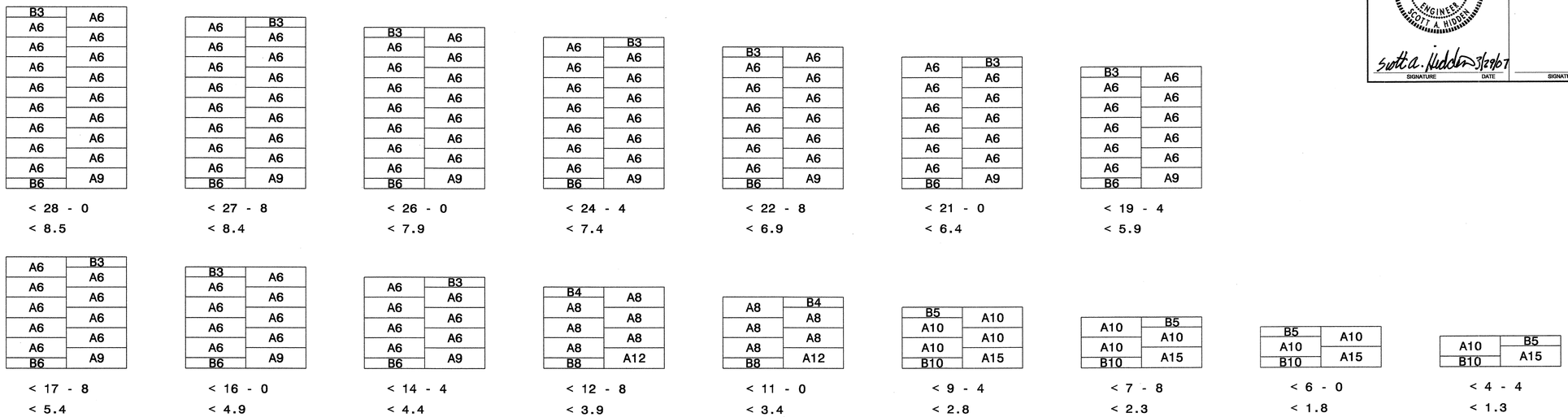
SIGNATURE DATE

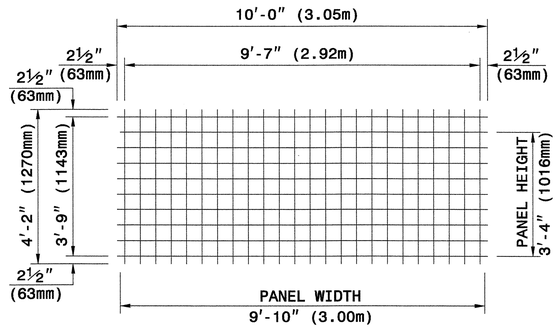
ENGINEER

SIGNATURE DATE

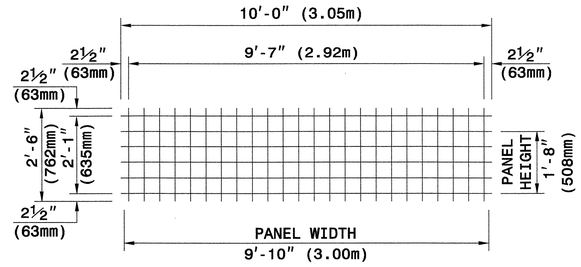
PANEL LAYOUTS

H - WALL HEIGHT

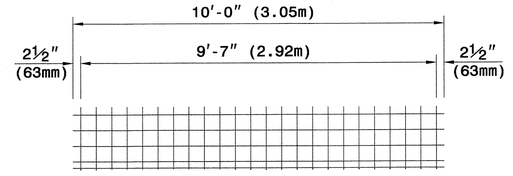




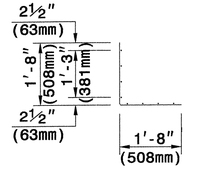
TYPE A



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

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

PROJECT REFERENCE NO.	SHEET
U-3447	2-0

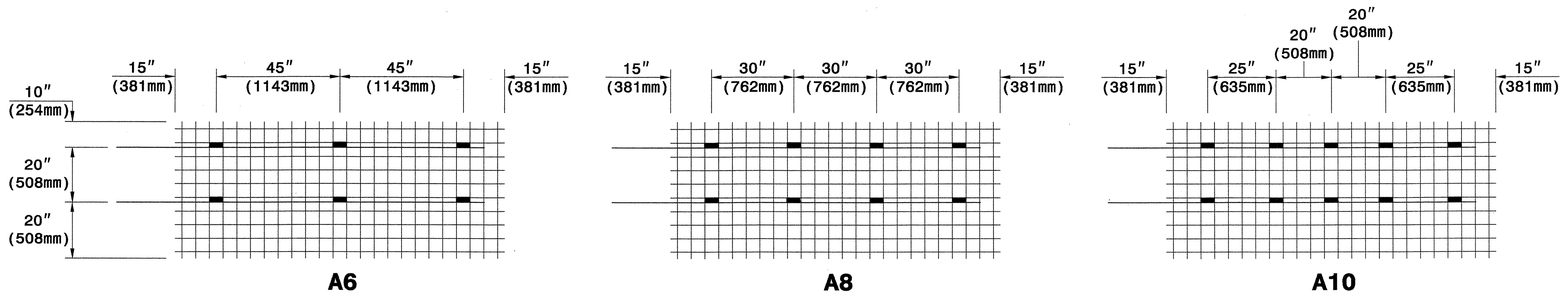
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. HIDDEN

Scott A. Hidden 3/27/07
SIGNATURE DATE

ENGINEER

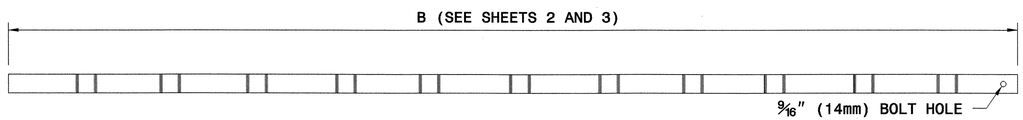
SIGNATURE DATE



KEY: A8

- A8 → NUMBER OF REINFORCING STRIPS
- A8 → PANEL TYPE

CONNECTOR ROD AND REINFORCING STRIP PLACEMENT DIAGRAMS



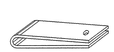
REINFORCING STRIP - 2" X 5/32" (50mm X 4mm)

½" (13mm) DIA. ROD

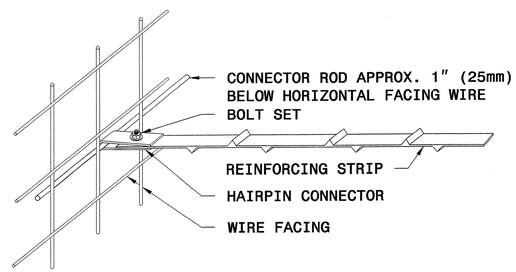
CONNECTOR ROD

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
U-3447	2-P

GEOTECHNICAL ENGINEER

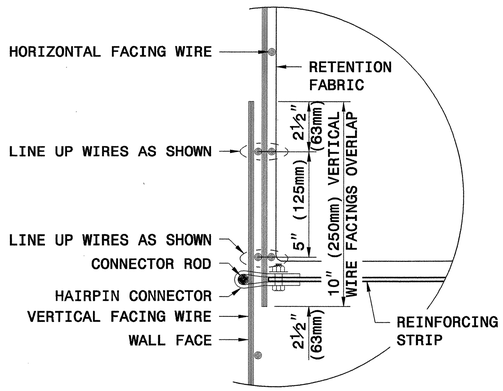
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A. SHIDDEN

Scott A. Shidden 3/29/07

SIGNATURE DATE

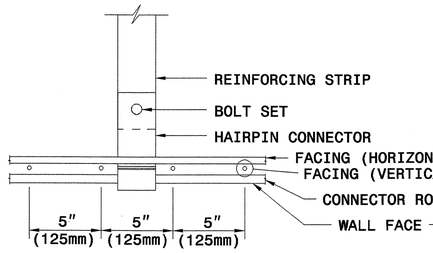
ENGINEER

SIGNATURE DATE

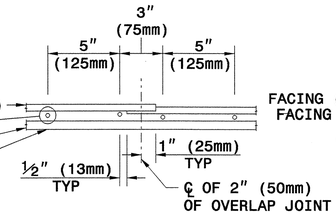


OVERLAP FACINGS VERTICALLY ONE FULL 5" (125mm) WIRE SQUARE DISREGARDING HALF SQUARES AT EDGES

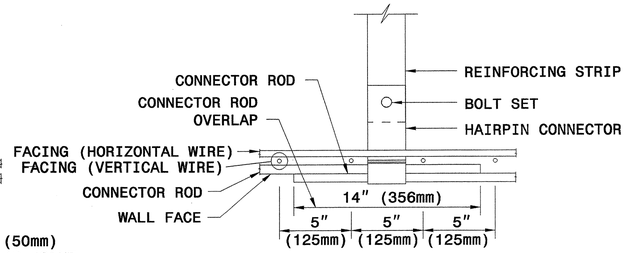
VERTICAL OVERLAP DETAIL



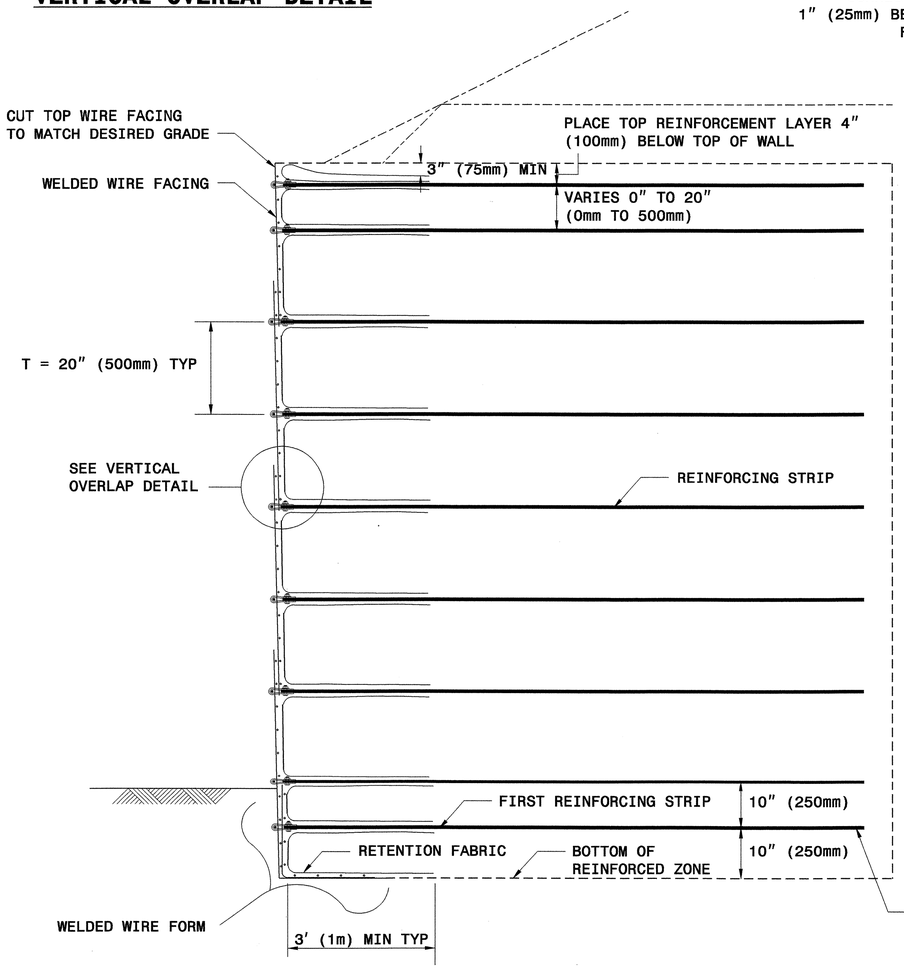
PLAN DETAIL 'A'
STRIP CONNECTION



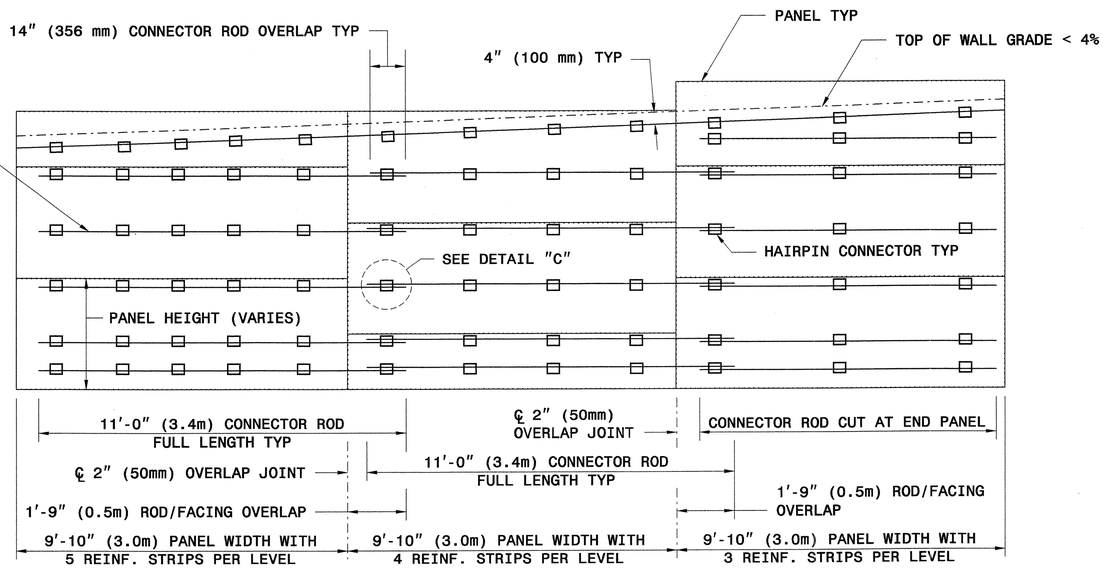
PLAN DETAIL 'B'
HORIZONTAL OVERLAP DETAIL



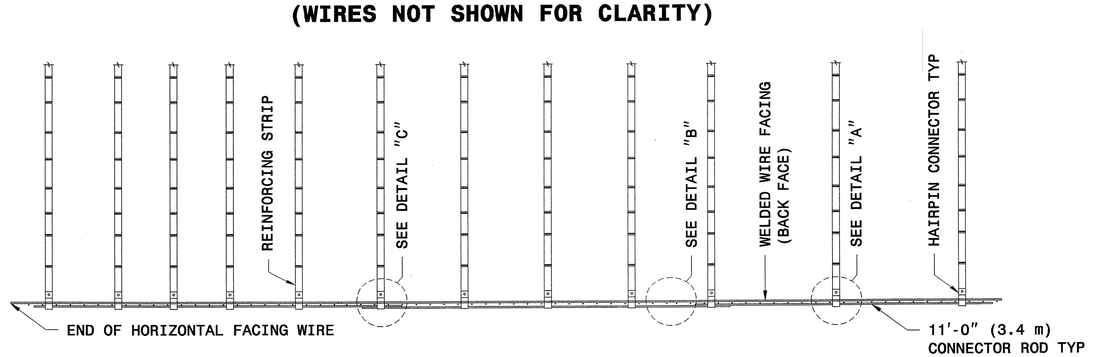
PLAN DETAIL 'C'
STRIP CONNECTION WITH HORIZONTAL OVERLAP DETAIL



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

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-3447	3

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201829

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0000400000-N	801	Lump Sum		CONSTRUCTION SURVEYING
0036000000-E	225	12,900	CY	UNDERCUT EXCAVATION
0050000000-E	226	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0063000000-N	SP	Lump Sum		GRADING
0080000000-E	SP	3,150	TON	CLASS IV SUBGRADE STABILIZATION
0106000000-E	230	65,100	CY	BORROW EXCAVATION
0134000000-E	240	600	CY	DRAINAGE DITCH EXCAVATION
0141000000-E	240	1,220	LF	BERM DITCH CONSTRUCTION
0192000000-N	260	10	HR	PROOF ROLLING
0195000000-E	265	5,000	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	5,000	SY	FABRIC FOR SOIL STABILIZATION
0199000000-E	SP	200	SF	TEMPORARY SHORING
0255000000-E	SP	300	TON	GENERIC GRADING ITEM EXCAVATION, HAULING, AND DISPOSAL OF CONTAMINATED SOIL
0318000000-E	300	1,079	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRS
0343000000-E	310	76	LF	15" SIDE DRAIN PIPE
0366000000-E	310	5,376	LF	15" RC PIPE CULVERTS, CLASS III
0372000000-E	310	1,740	LF	18" RC PIPE CULVERTS, CLASS III
0378000000-E	310	1,562	LF	24" RC PIPE CULVERTS, CLASS III
0384000000-E	310	556	LF	30" RC PIPE CULVERTS, CLASS III
0390000000-E	310	48	LF	36" RC PIPE CULVERTS, CLASS III
0414000000-E	310	72	LF	60" RC PIPE CULVERTS, CLASS III
0570000000-E	310	84	LF	6" CS PIPE CULVERTS, 0.064" THICK (SPRING BOX)
0708000000-E	310	252	LF	15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK
0806000000-E	310	10	EA	15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK
0973100000-E	330	40	LF	*** WELDED STEEL PIPE IN SOIL (60")
0973300000-E	330	40	LF	*** WELDED STEEL PIPE NOT IN SOIL (60")
0986000000-E	SP	44	LF	GENERIC PIPE ITEM 60" WS PIPE
0986000000-E	SP	8	LF	GENERIC PIPE ITEM 8" DI PIPE
0995000000-E	340	545	LF	PIPE REMOVAL
1044000000-E	501	17,340	SY	LIME TREATED SOIL (SLURRY METHOD)
1066000000-E	501	180	TON	LIME FOR LIME TREATED SOIL
1110000000-E	510	1,000	TON	STABILIZER AGGREGATE
1176000000-E	542	7,430	SY	SOIL CEMENT BASE
1187000000-E	542	205	TON	PORTLAND CEMENT FOR SOIL CEMENT BASE
1220000000-E	545	500	TON	INCIDENTAL STONE BASE
1297000000-E	607	9,700	SY	MILLING ASPHALT PAVEMENT, *** DEPTH (2-1/2")
1330000000-E	607	610	SY	INCIDENTAL MILLING
1489000000-E	610	7,570	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1498000000-E	610	9,170	TON	ASPHALT CONC INTERMEDIATE COURSE, TYPE I19.0B
1519000000-E	610	7,540	TON	ASPHALT CONC SURFACE COURSE, TYPE S9.5B
1560000000-E	620	1,209	TON	ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22
1693000000-E	654	461	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2022000000-E	815	336	CY	SUBDRAIN EXCAVATION
2033000000-E	815	168	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	1,000	LF	6" PERFORATED SUBDRAIN PIPE
2055000000-E	815	30	EA	6" SUBDRAIN PIPE WYES, TEES, & ELBOWS
2066000000-N	815	2	EA	CONCRETE PAD FOR SUBDRAIN PIPE OUTLET
2077000000-E	815	12	LF	6" OUTLET PIPE (SUBDRAINS)
2143000000-E	818	10	TON	BLOTTING SAND
2220000000-E	838	9	CY	REINFORCED ENDWALLS
2264000000-E	840	1.5	CY	PIPE PLUGS
2275000000-E	SP	55	CY	FLOWABLE FILL
2286000000-N	840	94	EA	MASONRY DRAINAGE STRUCTURES
2297000000-E	840	11	CY	MASONRY DRAINAGE STRUCTURES
2308000000-E	840	86.2	LF	MASONRY DRAINAGE STRUCTURES
2364000000-N	840	13	EA	FRAME WITH TWO GRATES, STD 840.16
2374000000-N	840	4	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (E)
2374000000-N	840	34	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (F)
2374000000-N	840	34	EA	FRAME WITH GRATE & HOOD, STD 840.03, TYPE ** (G)
2396000000-N	840	4	EA	FRAME WITH COVER, STD 840.54
2535000000-E	846	60	LF	**'X **" CONCRETE CURB (6" X 18")
2542000000-E	846	8,415	LF	1'-6" CONCRETE CURB & GUTTER
2549000000-E	846	12,820	LF	2'-6" CONCRETE CURB & GUTTER
2591000000-E	848	6,110	SY	4" CONCRETE SIDEWALK
2605000000-N	848	9	EA	CONCRETE WHEELCHAIR RAMPS
2612000000-E	848	170	SY	6" CONCRETE DRIVEWAY
2619000000-E	850	30	SY	4" CONCRETE PAVED DITCH
2830000000-N	858	5	EA	ADJUSTMENT OF MANHOLES
2995000000-N	SP	1	EA	GENERIC DRAINAGE ITEM 60" FLAP GATE
3030000000-E	862	3,225	LF	STEEL BM GUARDRAIL
3150000000-N	862	10	EA	ADDITIONAL GUARDRAIL POSTS
3210000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE CAT-1
3215000000-N	862	2	EA	GUARDRAIL ANCHOR UNITS, TYPE III
3270000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3360000000-E	863	290	LF	REMOVE EXISTING GUARDRAIL
3380000000-E	862	300	LF	TEMPORARY STEEL BM GUARDRAIL
3389100000-N	SP	2	EA	GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY
3566000000-E	867	450	LF	WOVEN WIRE FENCE RESET
3569000000-E	867	3,800	LF	BARBED WIRE FENCE RESET
3572000000-E	867	1,600	LF	CHAIN LINK FENCE RESET
3649000000-E	876	120	TON	RIP RAP, CLASS B
3656000000-E	876	1,960	SY	FILTER FABRIC FOR DRAINAGE
3659000000-N	SP	4	EA	PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON
4072000000-E	903	586	LF	SUPPORTS, 3-LB STEEL U-CHANNEL
4096000000-N	904	2	EA	SIGN ERECTION, TYPE D
4102000000-N	904	31	EA	SIGN ERECTION, TYPE E
4108000000-N	904	1	EA	SIGN ERECTION, TYPE F
4155000000-N	907	23	EA	DISPOSAL OF SIGN SYSTEM, U-CHANNEL
4400000000-E	1110	695	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	410	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	88	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4415000000-N	1115	1	EA	FLASHING ARROW PANELS, TYPE C
4420000000-N	1120	2	EA	CHANGEABLE MESSAGE SIGN
4430000000-N	1130	275	EA	DRUMS
4435000000-N	1135	50	EA	CONES
4445000000-E	1145	336	LF	BARRICADES (TYPE III)
4455000000-N	1150	300	MD	FLAGGER
4480000000-N	1165	2	EA	TMIA
4507000000-E	SP	942	LF	WATER FILLED BARRIER
4508000000-E	SP	592	LF	RESET WATER FILLED BARRIER
4510000000-N	SP	80	HR	POLICE
4650000000-N	1251	379	EA	TEMPORARY RAISED PAVEMENT MARKERS
4685000000-E	1205	1,796	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)
4686000000-E	1205	12,387	LF	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)
4695000000-E	1205	506	LF	THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS)
4710000000-E	1205	188	LF	THERMOPLASTIC PAVEMENT MARKING LINES (24", 120 MILS)
4725000000-E	1205	36	EA	THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS)
4770000000-E	1205	8,121	LF	COLD APPLIED PLASTIC PAVEMENT MARKING LINES, TYPE ** (4") (IV)
4810000000-E	1205	102,382	LF	PAINT PAVEMENT MARKING LINES (4")
4820000000-E	1205	670	LF	PAINT PAVEMENT MARKING LINES (8")
4835000000-E	1205	306	LF	PAINT PAVEMENT MARKING LINES (24")
4845000000-N	1205	78	EA	PAINT PAVEMENT MARKING SYMBOL
4850000000-E	1205	14,361	LF	REMOVAL OF PAVEMENT MARKING LINES (4")
4870000000-E	1205	36	LF	REMOVAL OF PAVEMENT MARKING LINES (24")
4875000000-N	1205	12	EA	REMOVAL OF PAVEMENT MARKING SYMBOLS & CHARACTERS
4900000000-N	1251	289	EA	PERMANENT RAISED PAVEMENT MARKERS
5255000000-N	1413	Lump Sum		PORTABLE LIGHTING
5326200000-E	1510	353	LF	12" WATER LINE
5648000000-N	1515	5	EA	RELOCATE WATER METER
5691300000-E	1520	113	LF	8" SANITARY GRAVITY SEWER
5691400000-E	1520	254	LF	10" SANITARY GRAVITY SEWER
5775000000-E	1525	3	EA	4' DIA UTILITY MANHOLE
5781000000-E	1525	24	LF	UTILITY MANHOLE WALL, 4' DIA
5816000000-N	1530	2	EA	ABANDON UTILITY MANHOLE
5835900000-E	1540	40	LF	20" ENCASEMENT PIPE
5872100000-E	1550	20	LF	TRENCHLESS INSTALLATION OF 20" IN SOIL
5872110000-E	1550	20	LF	TRENCHLESS INSTALLATION OF 20" NOT IN SOIL
6000000000-E	1605	8,700	LF	TEMPORARY SILT FENCE
6006000000-E	1610	565	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	775	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	825	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	20.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	650	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	4.5	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	400	LF	TEMPORARY SLOPE DRAINS
6027000000-N	1622	10	EA	INLET PROTECTION AT TEMPORARY SLOPE DRAINS
6029000000-E	SP	500	LF	SAFETY FENCE
6030000000-E	1630	4,200	CY	SILT EXCAVATION
6036000000-E	1631	8,800	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	50	SY	COIR FIBER MAT
6038000000-E	SP	2,375	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	2,300	LF	1/4" HARDWARE CLOTH
6045000000-E	SP	125	LF	**" TEMPORARY PIPE (36")
6069000000-E	1638	100	CY	STILLING BASINS
6071030000-E	SP	550	LF	COIR FIBER BAFFLES
6071050000-E	SP	8	EA	**" SKIMMER (1-1/2")
6084000000-E	1660	28	ACR	SEEDING & MULCHING
6087000000-E	1660	16.5	ACR	MOWING
6090000000-E	1661	200	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.75	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	550	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	16	TON	FERTILIZER TOPDRESSING
6111000000-E	SP	300	LF	IMPERVIOUS DIKE
6114000000-N	SP	5	HR	SPECIALIZED HAND MOWING
6117000000-N	SP	27	EA	RESPONSE FOR EROSION CONTROL
7060000000-E	1705	690	LF	SIGNAL CABLE
7120000000-E	1705	7	EA	VEHICLE SIGNAL HEAD (12", 3 SECTION)
7144000000-E	1705	1	EA	VEHICLE SIGNAL HEAD (12", 5 SECTION)
7264000000-E	1710	520	LF	MESSENGER CABLE (3/8")
7288000000-E	1715	30	LF	PAVED TRENCHING (**********) (2, 2")
7300000000-E	1715	600	LF	UNPAVED TRENCHING (**********) (2, 2")
7324000000-N	1716	5	EA	JUNCTION BOX (STANDARD SIZE)
7360000000-N	1720	4	EA	WOOD POLE
7372000000-N	1721	8	EA	GUY ASSEMBLY
7408000000-E	1722	1	EA	1" RISER WITH WEATHERHEAD
7420000000-E	1722	3	EA	2" RISER WITH WEATHERHEAD
7444000000-E	1725	1,250	LF	INDUCTIVE LOOP SAWCUT
7456000000-E	1726	1,220	LF	LEAD-IN CABLE (**********) (18-2)
7636000000-N	1745	3	EA	SIGN FOR SIGNALS
7684000000-N	1750	1	EA	SIGNAL CABINET FOUNDATION
7688000000-N	1753	1	EA	CABINET BASE ADAPTER
7756000000-N	1751	1	EA	CONTROLLER WITH CABINET (TYPE 2070L, BASE MOUNTED)
7780000000-N	1751	5	EA	DETECTOR CARD (TYPE 2070L)

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RD238343

COMPUTED BY: TRM DATE: 5/31/2007

CHECKED BY: PJT DATE: 10/9/2008

PROJECT NO.	SHEET NO.
U-3447	3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO.		FOR BIDDING PURPOSES ONLY			SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE)								BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE)													CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D								15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS		QUANITIES FOR DRAINAGE STRUCTURES	*TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. FT.		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE			D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32				M.H. FRAME AND COVER STD. 840.54		T.B.D.I. STD. 840.35	FRAME AND N.S. FLAT GRATES STD. 840.29	O.T.C.B. STD. 840.04		CONC. APRON FOR C.B.	CONC. APRON FOR D.I.		PERFORM SCOUR HOLE		BERM DRAINAGE OUTLET STD. 850.10	SPRING BOX STD. 840.41	6" CS PIPE CULV., 0.064" THICK (SPRING BOX)	8" DUCTILE IRON PIPE				FLOWABLE FILL C.Y.	BIT. COATED 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
SIZE				TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION		12"	15"	18"	24"	30"	36"	42"	48"	12"	15"	18"	24"		30"		36"		42"		48"		12"	15"	18"	24"	30"	36"	42"	48"				R.C.P.	C.S.P.	PER EACH (0' THRU 5.0')	A: 5.0' THRU 10.0'	B: 10.0' AND ABOVE		E	F	G																																							
THICKNESS OR GAUGE		FROM	TO													.064	.064	.064	.064		.079		.079		.109		.109																																																													
-L-																																																																																					
11+00.00	RT	1		619.4																																						1			1		1																																							CB
	CL	1	2		616.2	616.0			64																																																																												
11+00.00	LT	2		619.4																																						1			1			1																																						CB
	LT	2	3		616.0	612.0			300																																																																										
14+00.00	LT	3		615.2																																						1			1			1																																						CB
	LT	3	4		612.0	609.0			148																																																																										
15+50.00	LT	4		612.2																																						1			1			1																																						CB
	LT	4	5		609.0	608.2			48																																																																											
16+00.00	LT	5		611.4																																						1	2.5		1			1																																						CB
	LT	5	6		603.9	603.7			40																																																																										OUTLET
14+00.00	RT	7		615.2																																						1			1		1																																							CB
	RT	7	8		612.1	609.0			148																																																																											
15+50.00	RT	8		612.2																																						1			1		1																																							CB
	RT	8	9		609.0	607.0			100																																																																										
16+50.50	RT	9		610.2																																						1			1		1																																							CB
	RT	9	10		607.0	603.9			152																																																																								93.5	REMOVE 15" RCP
18+00.00	RT	10		607.1																																						1	3.3		1		1																																							CB
	RT	10	11		598.8	596.4			188																																																																									
19+90.00	RT	11		603.3																																						1	2.1		1		1																																							CB
	RT	11	12		596.2	596.0	X			48																																																																								
20+39.87	RT	12		602.5																																						1	1.5		1		1																																							CB
	CL	12	15		596.0	595.8				36																																																																							
19+30.00	CL	13		605.1																																						1			1		1																				1																	CB
	CL	13	14		601.9	600.6			60																																																																									
19+90.00	CL	14		603.8																																						1			1		1																				1																	CB
	CL	14	15		600.6	596.0			48																																																																									
20+39.87	CL	15		602.7																																						1	1.9		1		1																				1																	CB
	CL	15	16		595.8	589.3				260																																																																							
23+00.00	CL	16		592.7																																						1			1			1																			1																	CB
	CL	16	17		589.3	588.4				48																																																																							
23+00.00	LT	17		591.8																																						1			1			1																																						CB
	LT	17	18		587.1	587.0					28																																																																					OUTLET
16+25.00	RT	19		609.5																																						1							1	1																																				DI
	RT	19	20		606.1	604.1				172																																																																							
18+00.00	RT	20		606.5																																						1							1	1																																				DI
	CL	20	21		602.6	602.2	X					136																																																																					
18+88.00	LT	21		607.6																																						1	5.0	5.4														1				1																							JB w/ MH
	LT	21	22		592.2	592.0	X					52																																																																					OUTLET
24+00.00	RT	23		586.9																																						1																								1																			O.T.C.B.
	CL	23	24		583.0	582.2	X				128																																																																						
24+78.00	LT	24		582.5																																						1	5.0	0.4														1				1																							JB w/ MH
	LT	24	25		572.1	571.9	X				28																																																																					OUTLET
SHEET TOTALS								0	1296	564	184	188	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	21.3	5.8	16	0	10	6	2	2	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0.0	0	0	0	93.5	

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: TRM DATE: 5/31/2007

CHECKED BY: PJT DATE: 10/9/2008

PROJECT NO.	SHEET NO.
U-3447	3-B

RD238343

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 | FOR BIDDING PURPOSES ONLY: TOP ELEVATION | FOR BIDDING PURPOSES ONLY: INVERT ELEVATION | FOR BIDDING PURPOSES ONLY: INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE): SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE): THICKNESS OR GAUGE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE): SIZE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE): THICKNESS OR GAUGE 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | 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" | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | 24" SIDE DRAIN PIPE | ENDWALLS: STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE): CU. YDS. R.C.P. | C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES: *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B'): PER EACH (0' THRU 5.0') | LIN. FT. A (5.0' THRU 10.0') | LIN. FT. 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 | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME AND GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH GRATE STD. 840.20 | G.D.I. FRAME WITH TWO GRATES STD. 840.22 | G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | J.B. STD. 840.31 OR 840.32 | M.H. FRAME AND COVER STD. 840.54 | T.B.D.I. STD. 840.35 | FRAME AND N.S. FLAT GRATES STD. 840.29 | O.T.C.B. STD. 840.04 | CONC. APRON FOR C.B. | CONC. APRON FOR D.I. | PERFORM SCOUR HOLE | BERM DRAINAGE OUTLET STD. 850.10 | SPRING BOX STD. 840.41 | 6" CS PIPE CULV., 0.064" THICK (SPRING BOX) | 8" DUCTILE IRON PIPE | FLOWABLE FILL C.Y. | BIT. COATED 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 |
|---|---|---

COMPUTED BY: TRM DATE: 5/31/2007

CHECKED BY: PJT DATE: 10/9/2008

PROJECT NO.	SHEET NO.
U-3447	3-C

RD238343

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	FOR BIDDING PURPOSES ONLY: TOP ELEVATION	FOR BIDDING PURPOSES ONLY: INVERT ELEVATION	FOR BIDDING PURPOSES ONLY: INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE): SIZE 12"	15"	18"	24"	30"	36"	42"	48"
-L-															
42+14.12	LT	52													
42+50.00	RT	53		545.1											
	RT	53	54		542.0	541.6			124						
43+75.00	RT	54		544.7											
	RT	54	55		541.6	541.5	X								
47+00.00	LT	56		543.1											
	LT	56	63		535.8	533.3			128						
53+45.00	LT	57		545.6											
	LT	57	58		544.4	539.8									
53+45.00	LT	58		543.0											
	LT	58	59		539.8	539.3			168						
51+75.00	LT	59		542.5											
	LT	59	61		539.3	539.0			100						
50+75.00	LT	60		546.1											
	LT	60	61		544.8	539.0									
50+75.00	LT	61		542.2											
	LT	61	62		539.0	538.6			128						
49+46.96	LT	62		541.9											
	LT	62	63		538.4	538.0				116					
48+30.00	LT	63		542.3											
	CL	63	67		533.0	532.7				76					
51+75.00	RT	64		542.5											
	RT	64	65		539.3	539.0			100						
50+75.00	RT	65		542.2											
	RT	65	66		539.0	538.6			128						
49+47.00	RT	66		541.9											
	RT	66	67		538.6	538.3			116						
48+30.00	RT	67		542.3											
	RT	67	68		532.5	531.0				148					
46+80.00	RT	68		543.3											
	RT	68	69		530.9	530.8					40				
49+55.00	LT	70		541.5											
	LT	70	71		539.0	536.5				132					
48+20.50	CL	72													
	CL	71	72		536.2	535.1					132				
52+75.00	RT	73		542.6											
	RT	73	74		539.6	539.3			100						
53+75.00	RT	74		542.9											
	RT	74	75		539.3	539.0			100						
54+75.00	RT	75		543.1											
	RT	75	76		539.0	538.7			100						
55+75.00	RT	76		543.1											
	RT	76	78		538.7	538.2	X		184						
57+58.00	CL	77		544.1											
SHEET TOTALS								0	1476	472	172	0	0	0	0

STATION	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D (UNLESS NOTED OTHERWISE): SIZE 12"	15"	18"	24"	30"	36"	42"	48"
-L-								
42+14.12								
42+50.00								
43+75.00								
47+00.00								
53+45.00								
53+45.00								
51+75.00								
50+75.00								
50+75.00								
49+46.96								
48+30.00								
51+75.00								
50+75.00								
49+47.00								
48+30.00								
46+80.00								
49+55.00								
48+20.50								
52+75.00								
53+75.00								
54+75.00								
55+75.00								
57+58.00								
SHEET TOTALS	0	80	0	0	0	0	0	0

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS: STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE): CU. YARDS R.C.P.	CU. YARDS C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES: PER EACH (0' THRU 5.0')	LIN. FT. A: 5.0' THRU 10.0'	LIN. FT. B: 10.0' AND ABOVE
-L-								
42+14.12								
42+50.00						1		
43+75.00						1		
47+00.00						1	2.3	
53+45.00								
53+45.00						1		
51+75.00						1		
50+75.00								
50+75.00						1		
50+75.00						1		
49+46.96						1		
48+30.00						1	4.3	
51+75.00						1		
50+75.00						1		
49+47.00						1		
48+30.00						1	4.8	
46+80.00						1	5	2.4
49+55.00						1		
48+20.50								
52+75.00						1		
53+75.00						1		
54+75.00						1		
55+75.00						1		
57+58.00						1		
SHEET TOTALS	0	0	0	0	0	19	16.4	2.4

STATION	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03: TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	
-L-															
42+14.12					1										
42+50.00	1		1												
43+75.00	1		1												
47+00.00	1			1											
53+45.00															
53+45.00	1		1												
51+75.00	1		1												
50+75.00															
50+75.00	1		1												
50+75.00	1		1												
49+46.96	1	1													
48+30.00	1		1												
51+75.00	1		1												
50+75.00	1		1												
49+47.00	1	1													
48+30.00	1		1												
46+80.00	1		1												
49+55.00	1			1	1	1									
48+20.50															
52+75.00	1		1												
53+75.00	1		1												
54+75.00	1		1												
55+75.00	1		1												
57+58.00	1		1												
SHEET TOTALS	18	2	8	8	1	1	0	0	0	0	0	0	0	0	0

STATION	M.H. FRAME AND COVER STD. 840.54	T.B.D.I. STD. 840.35	FRAME AND N.S. FLAT GRATES STD. 840.29	O.T.C.B. STD. 840.04	CONC. APRON FOR C.B.	CONC. APRON FOR D.I.	PERFORM SCOUR HOLE	BERM DRAINAGE OUTLET STD. 850.10	SPRING BOX STD. 840.41	6" CS PIPE CULV., 0.064" THICK (SPRING BOX)	8" DUCTILE IRON PIPE				FLOWABLE FILL C.Y.
-L-															
42+14.12							1								
42+50.00															
43+75.00															
47+00.00															
53+45.00								1							
53+45.00															
51+75.00															
50+75.00								1							
50+75.00															
49+46.96															
48+30.00															
51+75.00															
50+75.00															
49+47.00															
48+30.00															
46+80.00															
49+55.00															
48+20.50															
52+75.00															
53+75.00															
54+75.00															
55+75.00															
57+58.00						1									
SHEET TOTALS	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0

STATION	BIT. COATED 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-					
42+14.12					PREFORM SCOUR HOLE
42+50.00					CB
43+75.00					CB
	2 @ 15"				OUTLET
47+00.00					CB
53+45.00					BERM DRAINAGE OUTLET
	1 @ 15"				
53+45.00					CB
51+75.00					CB
50+75.00					BERM DRAINAGE OUTLET
	1 @ 15"				
50+75.00					CB
49+46.96					CB
48+30.00					CB
51+75.00					CB
50+75.00					CB
49+47.00					CB
48+30.00					CB
46+80.00					CB
					OUTLET
49+55.00					DI
				148.4	REMOVE EXIST. 15" RCP
48+20.50					
52+75.00					CB
53+75.00					CB
54+75.00					CB
55+75.00					CB
57+58.00					CB
SHEET TOTALS	4 @ 15"	0	0	148.4	

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: TRM DATE: 5/31/2007

CHECKED BY: PJT DATE: 10/9/2008

PROJECT NO.	SHEET NO.
U-3447	3-D

RD238343

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	FOR BIDDING PURPOSES ONLY: TOP ELEVATION	FOR BIDDING PURPOSES ONLY: INVERT ELEVATION	FOR BIDDING PURPOSES ONLY: INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE): SIZE 12"	15"	18"	24"	30"	36"	42"	48"
								THICKNESS OR GAUGE							
-L-															
	RT	77	78		541.1	540.3			40						
57+58.00	RT	78		543.3											
	RT	78	79		538.2	537.4	X		112						
58+70.00	RT	79		542.7											
	RT	79	80		537.4	528.8									
58+70.00	RT	80													
	LT	81	82									24			
60+93.34	LT	82													
	LT	82	84									184			
59+20.33	LT	84		SEE SHEET 3-F											
60+14.93	CL	87		544.2											
	RT	87	88		541.0	539.1			68						
60+65.00	RT	88		542.3											
	RT	88	89		539.1	528.6									
60+65.00	RT	89													
62+00.00	RT	90		541.9											
	RT	90	91		538.9	528.2									
62+00.00	RT	91													
63+12.00	RT	92		542.1											
	RT	92	94		538.9	538.6			84						
66+00.00	RT	93		543.5											
	RT	93	94		540.3	538.6			192						
64+00.00	RT	94		542.3											
	RT	94	95		538.6	529.0									
-Y1-															
11+00.00	LT	96		540.8											
	CL	96	97		537.6	537.3			104						
11+73.00	RT	97		540.5											
	RT	97	98		537.3	536.9	X		96						
12+77.00	RT	98		539.8											
	CL	98	100		536.9	536.6	X		44						
11+90.00	LT	99		539.7											
	LT	99	100		537.5	536.6			96						
12+77.00	LT	100		540.5											
	LT	100	102		536.3	534.9				108					
13+88.00	LT	101		537.5											
	LT	101	102		535.0	534.9				20					
13+88.00	LT	102		538.5											
	LT	102	104		534.4	534.0	X				120				
15+15.00	LT	103		537.4											
	LT	103	104		535.2	535.1			16						
15+15.00	LT	104		537.7											
	LT	104	111		534.0	533.4	X				96				
SHEET TOTALS								0	852	128	216	208	0	0	0

STATION	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE): SIZE 12"	15"	18"	24"	30"	36"	42"	48"
	THICKNESS OR GAUGE	.064	.064	.064	.064	.079	.079	.109	.109
-L-									
57+58.00									
58+70.00									
			44						
58+70.00									
60+93.34									
59+20.33									
60+14.93									
60+65.00									
			44						
60+65.00									
62+00.00									
			44						
62+00.00									
63+12.00									
66+00.00									
64+00.00									
			40						
-Y1-									
11+00.00									
11+73.00									
12+77.00									
11+90.00									
12+77.00									
13+88.00									
13+88.00									
15+15.00									
15+15.00									
SHEET TOTALS	0	172	0	0	0	0	0	0	0

STATION	CLASS III R.C. PIPE OR ALUMINIZED C.S. PIPE, TYPE IR OR HDPE PIPE, TYPE S OR D: SIZE 12"	15"	18"	24"	30"	36"	42"	48"
	THICKNESS OR GAUGE								
-L-									
57+58.00									
58+70.00									
58+70.00									
60+93.34									
59+20.33									
60+14.93									
60+65.00									
60+65.00									
62+00.00									
62+00.00									
63+12.00									
66+00.00									
64+00.00									
-Y1-									
11+00.00									
11+73.00									
12+77.00									
11+90.00									
12+77.00									
13+88.00									
13+88.00									
15+15.00									
15+15.00									
SHEET TOTALS	0	0	0	0	0	0	0	0	0

STATION	ENDWALLS: STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE): CU. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES: *TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B'): PER EACH (0' THRU 5.0')	LIN. FT. 5.0' THRU 10.0' A	10.0' AND ABOVE B	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03: TYPE OF GRATE E	F	G
-L-									
57+58.00			1	0.1		1		1	
58+70.00			1	0.3		1		1	
58+70.00									
60+93.34			1						
59+20.33									
60+14.93			1			1		1	
60+65.00			1			1		1	
60+65.00									
62+00.00			1			1		1	
62+00.00									
63+12.00			1			1	1		
66+00.00			1			1			1
64+00.00			1			1			1
-Y1-									
11+00.00			1						
11+73.00			1			1		1	
12+77.00			1			1		1	
11+90.00			1						
12+77.00			1			1			1
13+88.00			1						
13+88.00			1			1			1
15+15.00			1						
15+15.00			1			1			1
SHEET TOTALS	0	0	18	0.4	0	13	1	7	5

STATION	FRAME, GRATES, AND HOOD STANDARD 840.03: TYPE OF GRATE E	F	G	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	J.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.D.I. STD. 840.35	FRAME AND N.S. FLAT GRATES STD. 840.29	O.T.C.B. STD. 840.04	CONC. APRON FOR C.B.	CONC. APRON FOR D.I.	PERFORM SCOUR HOLE	BERM DRAINAGE OUTLET STD. 850.10	SPRING BOX STD. 840.41.	6" CS PIPE CULV., 0.064" THICK (SPRING BOX)	8" DUCTILE IRON PIPE	FLOWABLE FILL C.Y.	BIT. COATED 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-																													
57+58.00		1																											CB
58+70.00		1																											CB
58+70.00																			1										PREFORM SCOUR HOLE
																													INLET
60+93.34													1		1														MANHOLE
																											26.26		0.364		REMOVE EX. JB / PLUG EX. 30" RCP
59+20.33																															
60+14.93		1															1												CB
60+65.00		1																											CB
																											2 @ 15"			
60+65.00																			1										PREFORM SCOUR HOLE
62+00.00		1																											CB
																											2 @ 15"			
62+00.00																			1										PREFORM SCOUR HOLE
63+12.00		1	1																										CB
66+00.00			1																										CB
64+00.00			1																										CB
																											2 @ 15"		OUTLET
-Y1-																													
11+00.00				1	1																								DI
11+73.00		1																											CB
12+77.00		1																											CB
11+90.00				1	1																								DI
12+77.00			1																										CB
13+88.00				1	1																								DI
13+88.00			1																										CB
15+15.00				1	1																								DI
15+15.00			1																										CB
SHEET TOTALS	0	7	5	4	4	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	26.26	6 @ 15"	0	0.364	0	

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: TRM DATE: 5/31/2007

CHECKED BY: PJT DATE: 10/9/2008

PROJECT NO.	SHEET NO.
U-3447	3-E

RD238343

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	FOR BIDDING PURPOSES ONLY TOP ELEVATION	FOR BIDDING PURPOSES ONLY INVERT ELEVATION	FOR BIDDING PURPOSES ONLY INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) SIZE 12"	15"	18"	24"	30"	36"	42"	48"
								THICKNESS OR GAUGE							
-Y1-															
18+55.00	LT	105		540.8											
	LT	105	107		537.8	536.6			52						
18+13.17	LT	106		537.5											
	LT	106	107		537.5	536.6			36						
18+00.00	LT	107		539.6											
	LT	107	109		536.6	534.4			96						
17+00.00	LT	108		538.2											
	LT	108	109		535.0	534.4			16						
17+00.00	LT	109		537.7											
	LT	109	111		534.4	533.9	X			80					
16+15.87	LT	110		537.6											
	LT	110	111		535.4	535.3			16						
16+15.87	LT	111		537.2											
	CL	111	117		532.9	532.1	X					160			
-Y2-															
12+75.00	LT	112		535.9											
	LT	112	114		535.9	534.2	X			144					
11+28.76	LT	113		538.1											
	LT	113	114		534.7	534.4				20					
	LT	114		538.1											
	CL	114	117		534.2	533.9	X				40				
12+35.00	RT	115		535.0											
	RT	115	116		534.4	534.3			40						
11+95.00	RT	116		537.1											
	RT	116	117		534.1	533.4			56						
11+39.00	RT	117		537.3											
	RT	117	118		532.1	532.0	X					24			
-Y1-															
21+40.96	LT	119													
19+09.66	RT														
18+29.23	RT	120													
-L-															
24+90.00	CL	121													
29+53.31	CL	122													
44+08.16	CL	123													
SHEET TOTALS								0	312	244	40	160	24	0	0
SHEET 3A TOTALS								0	1296	564	184	188	0	0	0
SHEET 3B TOTALS								0	1440	332	950	0	24	0	0
SHEET 3C TOTALS								0	1476	472	172	0	0	0	0
SHEET 3F TOTALS															
SHEET 3D TOTALS								0	852	128	216	208	0	0	0
SUB TOTAL															
GRAND TOTALS								0	5376	1740	1562	556	48	0	0
UTILITYCONSTRUCTION															
SAY									5376	1740	1562	556	48		

STATION	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"	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE) 12"	15"	18"	24"	30"	36"	42"	48"
									.064	.064	.064	.064	.079	.079	.109	.109
-Y1-																
18+55.00																
18+13.17																
18+00.00																
17+00.00																
17+00.00																
16+15.87																
16+15.87																
-Y2-																
12+75.00																
11+28.76																
12+35.00																
11+95.00																
11+39.00																
-Y1-																
21+40.96																
19+09.66																
18+29.23																
-L-																
24+90.00																
29+53.31																
44+08.16																
SHEET TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SHEET 3A TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SHEET 3B TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SHEET 3C TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SHEET 3F TOTALS																
SHEET 3D TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUB TOTAL																
GRAND TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UTILITYCONSTRUCTION																
SAY																

STATION	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	ENDWALLS CU. YARDS 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'	LIN. FT. 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
-Y1-												
18+55.00						1			1		1	
18+13.17												
18+00.00						1			1		1	
17+00.00						1						1
17+00.00						1			1		1	
16+15.87						1						1
16+15.87						1			1	1		
-Y2-												
12+75.00												
11+28.76						1						1
12+35.00												
11+95.00						1			1		1	
11+39.00						1	0.2		1		1	
-Y1-												
21+40.96			40									
19+09.66												
18+29.23			36									
-L-												
24+90.00						1						
29+53.31						1						
44+08.16						1						
SHEET TOTALS	0	0	76	0	0	13	0.2	0	7	1	4	2
SHEET 3A TOTALS	0	0	0	0	0	21	21.3	5.8	16	0	10	6
SHEET 3B TOTALS	0	0	0	0	0	23	15.7	0	18	0	4	14
SHEET 3C TOTALS	0	0	0	0	0	19	16.4	2.4	18	2	8	8
SHEET 3F TOTALS												
SHEET 3D TOTALS	0	0	0	0	0	18	0.4	0	13	1	7	5
SUB TOTAL							54.0	8.2				
GRAND TOTALS	0	0	76	0	0	94	64.7		72	4	33	35
UTILITYCONSTRUCTION							**21.2**					
SAY			76			94	**86.2**		72	4	33	35

STATION	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATE STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR 840.26	G.D.I. TYPE "B" STD. 840.18 OR 840.27	G.D.I. TYPE "D" STD. 840.19 OR 840.28	G.D.I. FRAME WITH GRATE STD. 840.20	G.D.I. FRAME WITH TWO GRATES STD. 840.22	G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24	I.B. STD. 840.31 OR 840.32	M.H. FRAME AND COVER STD. 840.54	T.B.D.I. STD. 840.35	FRAME AND N.S. FLAT GRATES STD. 840.29	O.T.C.B. STD. 840.04	CONC. APRON FOR C.B.	CONC. APRON FOR D.I.	PERFORM SCOUR HOLE	BERM DRAINAGE OUTLET STD. 850.10	SPRING BOX STD. 840.41	6" CS PIPE CULV., 0.064" THICK (SPRING BOX)	8" DUCTILE IRON PIPE	FLOWABLE FILL C.Y.	BIT. COATED 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.
-Y1-																									
18+55.00																									
																									70.0
18+13.17																									
																									28.8
18+00.00																									
																									21.9
17+00.00	1	1																							
17+00.00																									
16+15.87	1	1																							
16+15.87																									
																							2.02		0.09	
-Y2-																									
12+75.00																									
11+28.76	1	1																							
12+35.00																									
																									32.3
11+95.00	1	1																							
11+39.00																									
-Y1-																									
21+40.96																									
19+09.66																									43.5
18+29.23																									
-L-																									
24+90.00																			1	52					50.3
29+53.31																			1	32					51.6
44+08.16																			1	8					
SHEET TOTALS	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	84	8	0	0	0	298.4
SHEET 3A TOTALS	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93.5
SHEET 3B TOTALS	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SHEET 3C TOTALS	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	148.4
SHEET 3F TOTALS																							22.7	0.712	
SHEET 3D TOTALS	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26.26	0.364	0
SUB TOTAL																									
GRAND TOTALS	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	84	8	0	51.0	1.166	540.3
UTILITYCONSTRUCTION																									
SAY	13	13																	4	84	8		55.0	1.5	545

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

REMARKS
CB
REMOVE EXIST. 15" RCP
INLET
REMOVE EXIST. 12" RCP
CB
REMOVE EXIST. 15" CMP
DI
CB
DI
CB
PLUG AND FILL EX. 15" RCP w/FLOWABLE FILL
INLET
REMOVE EXIST. 15" RCP (46.6')
DI
CB
REMOVE EXIST. 18" RCP (33.1')
INLET
REMOVE EXIST. 12" RCP
CB
OUTLET
REMOVE EXIST. 12" RCP (80.8')
REMOVE EXIST. 12" RCP
REMOVE EXIST 15" CMP (24.5')
REMOVE 18" RCP
REMOVE 18" RCP

RD238343

COMPUTED BY:	TRM	DATE:	5/31/2007
CHECKED BY:	PJT	DATE:	10/9/2008

PROJECT NO.	SHEET NO.
U-3447	3-F

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 54" & OVER)

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	FOR BIDDING PURPOSES ONLY: TOP ELEVATION	FOR BIDDING PURPOSES ONLY: INVERT ELEVATION	FOR BIDDING PURPOSES ONLY: INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE)							
SIZE								54"	60"	66"	72"	78"	84"		
THICKNESS OR GAUGE															
-L-															
59+12.92	LT	83													
	LT	83	84		528.0	527.8			40						
59+20.33	LT	84		534.5											
	CL	84	85		527.8	527.0									
59+46.90	RT	85		533.8											
	RT	85	86		527.0	526.8			32						
59+63.53	RT	86													
SHEET TOTALS								0	72	0	0	0	0	0	0
SAY									72						

STATION	LOCATION	FROM	TO	BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHERWISE)												STRUCTURAL PLATE PIPE											
SIZE				54"					60"		66"		72"			60"			66"			72"			60" WELDED STEEL		
THICKNESS OR GAUGE				.109	.138	.168	.138	.168	.138	.168	.138	.168	.139	.168		12	10		12	10		12	10				
-L-																											
59+12.92	LT	83																									
	LT	83	84																								
59+20.33	LT	84																									
	CL	84	85																						124		
59+46.90	RT	85																									
	RT	85	86																								
59+63.53	RT	86																									
SHEET TOTALS				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	124	0	0
SAY																									124		

STATION	LOCATION	FROM	TO	REINFORCED ENDWALLS WITH R.C. - C.Y.	REINFORCED ENDWALLS WITH C.S. - C.Y.	MASONRY DRAINAGE STRUCTURES CUBIC YARDS	C.B. STD. 840.01 OR 840.02	FRAMES, GRATES & HOOD STANDARD 840.03 TYPE OF GRATE E	F	G		J.B STD. 840.31 OR 840.32									CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	FLOWABLE FILL C.Y.	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD. 840.72	FLAP GATE SEE DETAIL SHEET 2-B	PIPE REMOVAL LIN. FT.	REMARKS
-L-																											
59+12.92	LT	83		4.302																							HEADWALL / REMOVE EXIST. 15" RCP
	LT	83	84																								
59+20.33	LT	84				5.065						1															JB
	CL	84	85																		0.712	22.7					SEE NOTE
59+46.90	RT	85				5.065						1															JB
	RT	85	86																								
59+63.53	RT	86		4.302																					1		HEADWALL w/ FLAP GATE
SHEET TOTALS				8.60		10.13	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0.712	22.7	0	0	1	0	
SAY				9		11						2									SHT. 3-E	SHT. 3-E			1		

NOTE:
PLUG AND FILL WITH FLOWABLE FILL 3'x3' BOX CULVERT. BORE AND JACK 80' OF WELDED STEEL PIPE

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: *TRM* DATE: *6/4/08*
CHECKED BY: *HLE* DATE: *10/8/08*

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
GUARDRAIL SUMMARY

PROJECT REFERENCE NO.	SHEET NO.
U-3447	*3-G*

RD238346

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL
W = TOTAL WIDTH OF FLARE FROM BEGIN

G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

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 CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GRAU 350	M-350	XIII	CAT-1	VI MOD	BIC	TYPE III	G	NG				
L	24+00.00	30+50.00	LT	646.18			29+50.00	24+00.00	14.0	16.0	50.0		1.0				1			1									
L	42+50.00	45+50.00	LT	300.00			44+44.81		14.0	16.0	50.0		1.0				1			1									
L	42+50.00	47+00.00	RT	450.65			44+13.33		14.0	16.0	50.0		1.0				1			1									
L	56+50.00	66+87.86	RT	1004.76			66+87.86		14.0	16.0	50.0		1.0				1						1						
L	56+50.00	66+87.86	LT	1073.76			57+50.00		14.0	16.0										1			1						
L	66+02.87	66+87.00	LT																							88.3		REMOVE EXIST GUARDRAIL
L	64+83.11	66+86.23	RT																							199.9		REMOVE EXIST GUARDRAIL
	SUB-TOTAL			3475.35																								
	LESS ANCHOR DEDUCTIONS			-262.50																								
	PROJECT TOTALS			3212.85													4			4			2				288.2		
	SAY TOTALS			3225.00																							290.0		
	ADDITIONAL GUARDRAIL POST			10	EACH												GRAU-350: 4 @ 50.00 =				200.00								
																	CAT-1: 4 @ 6.25 =				25.00								
																	TYPE III: 2 @ 18.75 =				37.5								
																					262.50								

TEMPORARY GUARDRAIL SUMMARY

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 CONCRETE BARRIER	REMOVE EXISTING GUARDRAIL	REMOVE & STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GRAU 350	M-350	XIII	CAT-1	VI MOD	BIC	TYPE III	G	NG				
L	42+00.00	46+00.00	LT	400.00			44+22.88	44+46.60	4.0	7.0	50.0	50.0	1.0	1.0			2												
	SUB-TOTAL			400.00													2												
	LESS ANCHOR DEDUCTIONS			-100.00																									
	PROJECT TOTALS			300.00											GRAU-350: 2 @ 50.00 =		100.00												
	SAY TOTALS			300.00																									

COMPUTED BY: TRM	DATE: 6/19/08
CHECKED BY: KEM	DATE: 7/06/08

PROJECT REFERENCE NO.	SHEET NO.
U-3447	3-H

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF PAVEMENT REMOVAL

IN SQUARE YARDS

SURVEY LINE	LOCATION	QUANTITY
-L- STA. 17+50.00 TO 20+10.00	CL	186.8
-L- STA. 21+97.30 TO 47+99.62	LT	2,445.6
-L- STA. 48+66.50 TO 54+80.94	CL /LT	1,241.9
-L- STA. 55+71.00 TO 60+32.66	CL	450.8
-L- STA. 63+50.00 TO 66+87.00	CL	1,260.9
-Y1- STA. 10+12.78 TO 12+50.00	LT	737.9
-Y1- STA. 14+00.00 TO 15+50.00	RT	103.3
-Y1- STA. 15+27.08 TO 18+53.12	RT	961.5
-L- TEMP. STA. 46+87+/- TO 51+35+/-	CL	982.3
-L- TEMP. STA. 63+50+/- TO 65+42+/-	LT	75.9
GRAND TOTAL		8,446.90
SAY		8,500 SY

SUMMARY OF MILLING ASPHALT PAVEMENT

SURVEY LINE	LOCATION	INCIDENTAL	2.5" DEPTH
-L- STA. 10+73.00 TO 25+00.00	CL		3,270.5
-Y- STA. 10+00.00 TO 10+50.00	CL	130.6	
-L- STA. 30+50.00 TO 51+00.00	CL		4,547.2
-L- STA. 54+50.00 TO 55+71.00	CL		285.1
-Y1- STA. 13+44.90 TO 15+34.21	CL	249.4	
-Y1- STA. 20+71.23 TO 21+21.13	CL	116.1	
-L- STA. 57+000.00 TO 63+50.00	CL		1,587.5
-Y2- STA. 12+73.00 TO 13+23.00	CL	111.1	
GRAND TOTAL		607.20	9,690.30
SAY		610 SQ. YDS.	9,700 SQ. YDS.

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
-L LT- STA. 10+50.00 TO 40+50.00	697	468	8,525	7,861	501
-L RT- STA. 10+50.00 TO 40+50.00	8,341	1,859	6,289		3,947
-Y- STA. 10+00.00 TO 13+23.37	387		397	10	
SUBTOTAL NO. 1	9,425	2,327	15,211	7,871	4,448
-L LT- STA. 40+50.00 TO 44+33.00	24	266	1,218	1,204	276
-L LT- STA. 44+33.00 TO 66+87.86	2,537		21,067	18,530	
-L RT- STA. 40+50.00 TO 44+33.00	2	801	6,382	6,382	803
-L RT- STA. 44+33.00 TO 66+87.86	2,803		22,966	20,163	
-Y1- STA. 10+38.12 TO 21+21.12	434		4,799	4,365	
-Y2- STA. 10+18.13 TO 13+23.00	71		686	615	
-Y3- STA. 10+86.10 TO 11+88.92			157	157	
SUBTOTAL NO. 2	5,871	1,067	57,275	51,416	1,079
PROJECT SUBTOTALS	15,296	3,394	72,486	59,287	5,527
LOSS DUE TO CLEAR. & GRUB.	-800			800	
ADDITIONAL UNDERCUT EXCAV.		9,450	11,340	11,340	9,450
WASTE IN LIEU OF BORROW				-9,816	-9,816
SHOULDER CONSTRUCTION			384	384	
PROJECT TOTALS	14,496	12,844	84,210	61,995	5,125
REPLACE TOP SOIL BORROW PITS				3,100	
GRAND TOTALS	14,496	12,844	84,210	65,095	5,125
SAY	14,500	12,900		65,100	

PAVEMENT STRUCTURE VOLUME:	3,662	CU. YDS
DRAINAGE DITCH EXCAVATION:	600	CU. YDS
SELECT GRANULAR MATERIAL:	5,000	CU. YDS
CL. IV SUBGRADE STAB.	3,150	CU. YDS

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

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

SUMMARY OF BARBED WIRE FENCE REMOVAL AND RESET

SURVEY LINE	LOCATION	LINEAR FT
-L- STA. 14+43.99 TO 25+57.72	LT	1,115.7
-L- STA. 32+50.17 TO 43+62.60	LT	1,141.6
-L- STA. 44+50.92 TO 49+19.71	RT	495.0
-L- STA. 54+22.71 TO 64+83.11	RT	1,041.2
GRAND TOTAL		3793.5
SAY		3,800 LF

SUMMARY OF CHAIN LINK FENCE REMOVAL AND RESET

SURVEY LINE	LOCATION	LINEAR FT
-L- STA. 55+88.41 TO 60+00.00	LT	538.2
-L- STA. 62+35.92 TO 64+64.07	LT	220.0
-Y1- STA. 11+50.00 TO 16+03.15	RT	484.2
-Y1- STA. 18+20.00 TO 18+92.50	RT	92.0
-Y2- STA. 10+96.08 TO 13+23.00	RT	225.0
GRAND TOTAL		1559.4
SAY		1,600 LF

SUMMARY OF WOVEN WIRE FENCE REMOVAL AND RESET

SURVEY LINE	LOCATION	LINEAR FT
-L- STA. 10+02.87 TO 14+21.54	LT	444.8
GRAND TOTAL		444.8
SAY		450 LF

5/9/06

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PROJ. REFERENCE NO.	SHEET NO.
U-3447	3-I

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4,5,6	JAMES ROSS MILLER, JR.
2	4	CHARLES STEPHEN MILLER
4	4,5,6	McCULLOUGH LAND, LLC
5	6,7,9	BEBCO, LLC
6	6,7,8	MARIANNA M. RAUGH, ET. AL
7	6,7	INLOC COMPANY
8	7	MARIANNA M. RAUGH
9	7,9	JAMES S. & TULA KLEITCHES
10	7,9	ALL POINTS TRUCKING, INC
11	7,8	TAD ENTERPRISES, INC.
13	8	KARL F. HABERYAN
14	9	OLD STEELE CREEK, LLC
17	9	KEVIN H. KESSELL
19	9	HH DOWNS, LLC
20	9	TRAVIS M. JENKINS
21	9	KHH DOWNS, LLC
22	9	COLLISION PROPERTIES, LLC

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

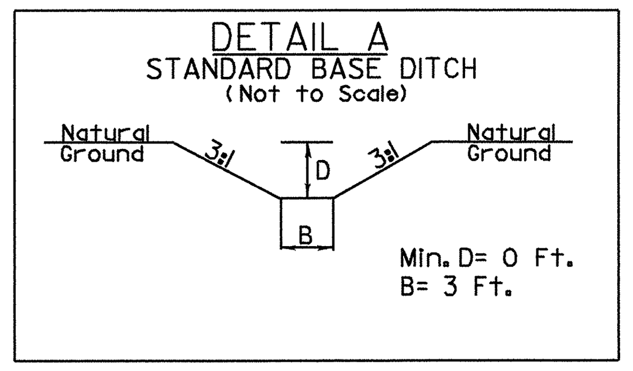
PROJECT REFERENCE NO.	SHEET NO.
U-3447	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24912 ENGINEER KEVIN E. MOORE — 11-7-08

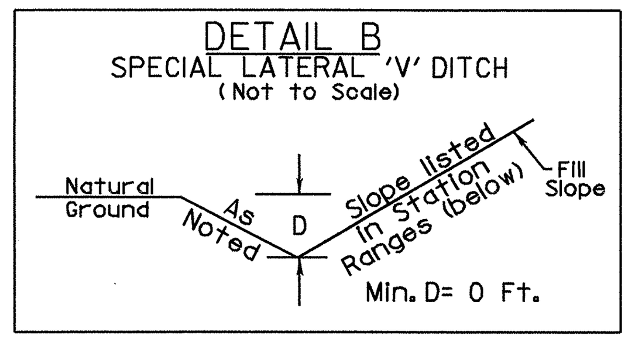
NORTH CAROLINA PROFESSIONAL SEAL 19775 ENGINEER RAY D. LOVINGOOD — 7 NOV 08

8/17/99

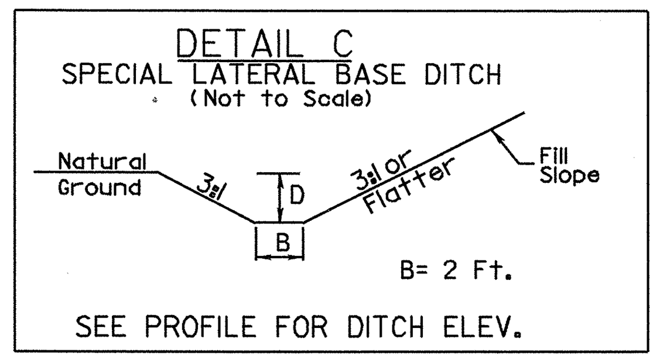
REVISIONS



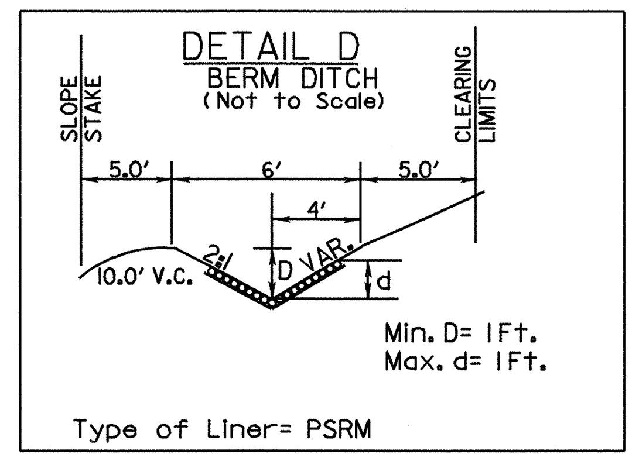
-L- STA 19+28 LT LENGTH = 24 FT. SLOPE = 2.7%



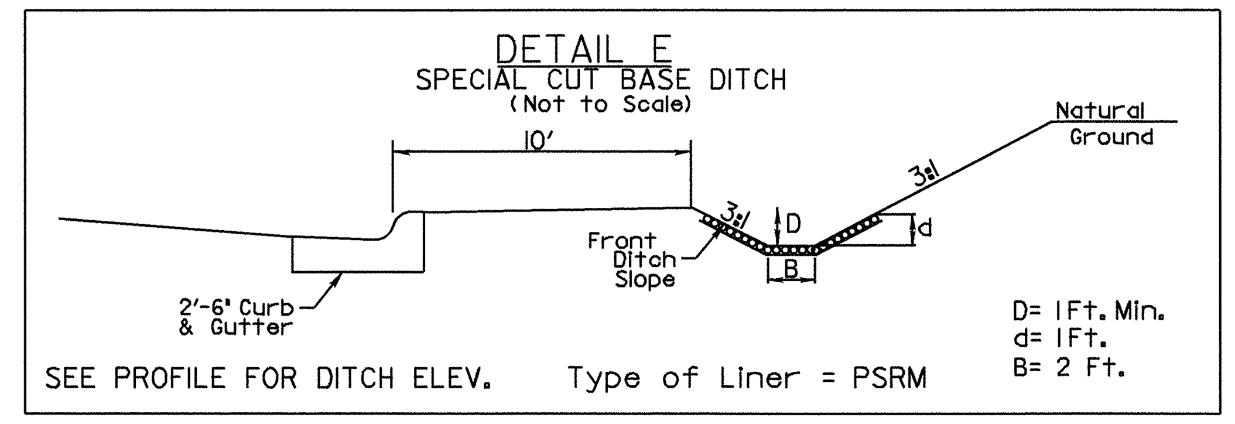
-Y- STA 12+00 LT - 12+83 LT w/ 4:1 BACK SLOPE
-Y- STA 12+00 RT - -L- 18+00 RT w/ 2:1 BACK SLOPE



-L- STA 16+20 LT - STA 17+36 LT

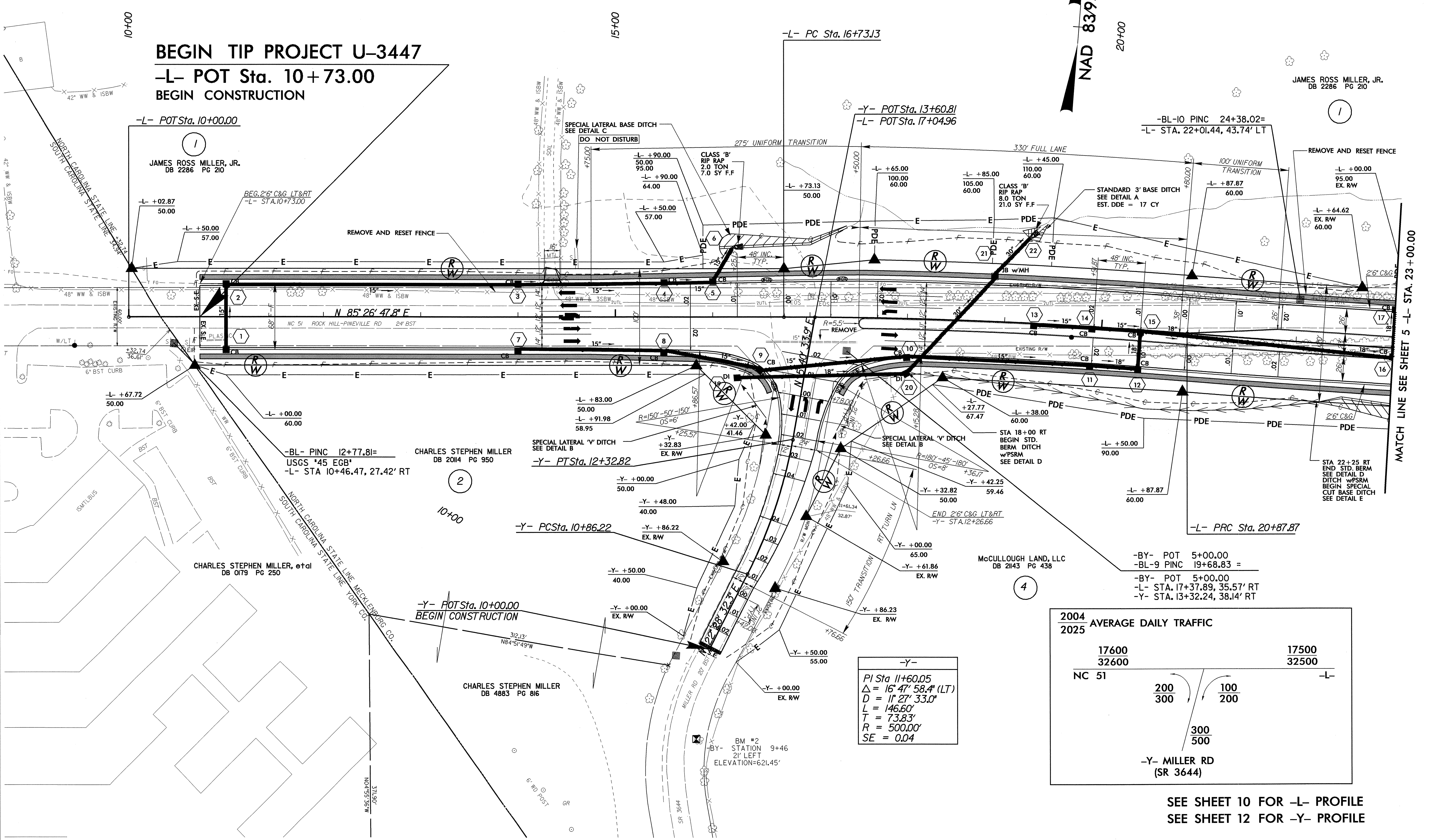


-L- STA 18+00 RT - STA 22+25 RT



-L- STA 22+25 RT - STA 24+00 RT

-L-
PI Sta 18+80.62
Δ = 4° 45' 09.5" (RT)
D = 1° 08' 45.3"
L = 414.75'
T = 207.49'
R = 5,000.00'
SE = 0.02



BEGIN TIP PROJECT U-3447
-L- POT Sta. 10+73.00
BEGIN CONSTRUCTION
NAD 83/95
10+00
15+00
20+00
-L- POT Sta. 10+00.00
-L- PC Sta. 16+73.13
-Y- POT Sta. 13+60.81
-L- POT Sta. 17+04.96
-BL-10 PINC 24+38.02=
-L- STA. 22+01.44, 43.74' LT
JAMES ROSS MILLER, JR.
DB 2286 PG 210
SPECIAL LATERAL BASE DITCH
SEE DETAIL C
DO NOT DISTURB
275' UNIFORM TRANSITION
330' FULL LANE
100' UNIFORM TRANSITION
REMOVE AND RESET FENCE
CLASS 'B' RIP RAP 2.0 TON 7.0 SY F.F
CLASS 'B' RIP RAP 8.0 TON 21.0 SY F.F
STANDARD 3' BASE DITCH
SEE DETAIL A
EST. DDE = 17 CY
BEG. 2'6" C&G LT&RT
-L- STA.10+73.00
N 85° 26' 47.8" E
NC 51 ROCK HILL-PINEVILLE RD 24' BST
R=5.5'
REMOVE
EXISTING R/W
MATCH LINE SEE SHEET 5 -L- STA. 23+00.00
NORTH CAROLINA STATE LINE
SOUTH CAROLINA STATE LINE
-BL- PINC 12+77.81=
USGS '45 EGB'
-L- STA 10+46.47, 27.42' RT
CHARLES STEPHEN MILLER
DB 20114 PG 950
SPECIAL LATERAL 'V' DITCH
SEE DETAIL B
-Y- PT Sta. 12+32.82
-Y- PC Sta. 10+86.22
R=150'-50'-150'
OS=6'
R=180'-45'-180'
OS=8'
STA 18+00 RT
BEGIN STD. BERM DITCH w/PSRM
SEE DETAIL D
STA 22+25 RT
END STD. BERM
SEE DETAIL D
DITCH w/PSRM
BEGIN SPECIAL CUT BASE DITCH
SEE DETAIL E
-L- PRC Sta. 20+87.87
END 2'6" C&G LT&RT
-Y- STA.12+26.66
RT TURN LN
150' TRANSITION
CHARLES STEPHEN MILLER, etal
DB 0179 PG 250
NORTH CAROLINA STATE LINE MECKLENBURG CO.
SOUTH CAROLINA STATE LINE YORK CO.
-Y- POT Sta. 10+00.00
BEGIN CONSTRUCTION
McCULLOUGH LAND, LLC
DB 21143 PG 438
-BY- POT 5+00.00
-BL-9 PINC 19+68.83 =
-BY- POT 5+00.00
-L- STA. 17+37.89, 35.57' RT
-Y- STA. 13+32.24, 38.14' RT
CHARLES STEPHEN MILLER
DB 4883 PG 816
BM #2
-BY- STATION 9+46
21' LEFT
ELEVATION=621.45'
MILLER RD
SR 3644

-Y-
PI Sta 11+60.05
Δ = 16° 47' 58.4" (LT)
D = 11° 27' 33.0"
L = 146.60'
T = 73.83'
R = 500.00'
SE = 0.04

2004 / 2025 AVERAGE DAILY TRAFFIC

17600 / 32600 — 17500 / 32500
NC 51 — -L-
200 / 300 — 100 / 200
300 / 500
-Y- MILLER RD
(SR 3644)

SEE SHEET 10 FOR -L- PROFILE
SEE SHEET 12 FOR -Y- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
U-3447	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

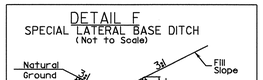
NORTH CAROLINA PROFESSIONAL SEAL 24812 ENGINEER KEVIN E. MOORE
11-7-08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19778 ENGINEER RAY A. LOVINGOOD
11-7-08

REVISIONS

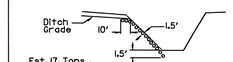
DETAIL F
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Type of Liner = PSRM

-L- STA 23+15 LT - STA 24+90 LT

DETAIL G
RIP RAP AT EMBANKMENT
(Not to Scale)



Est. 17 Tons

Type of Liner= Class B Rip-Rap

-L- STA 24+95 LT

-L-
PI Sta 26+26.04
Δ = 7° 41' 49.3" (LT)
D = 0° 42' 58.3"
L = 1,074.71'
T = 538.16'
R = 8,000.00'
SE = 0.02

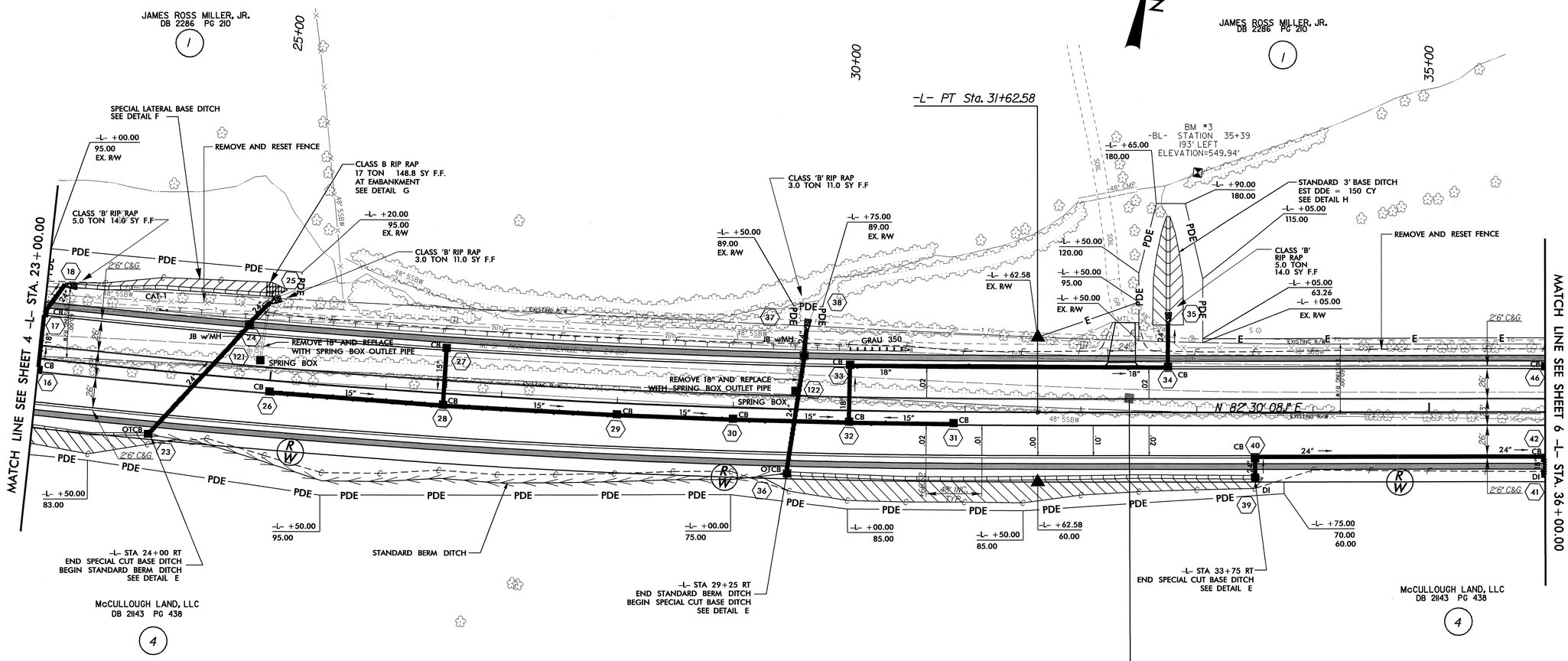
DETAIL H
STANDARD BASE DITCH
(Not to Scale)

Min. D= 0 Ft.
Max. d= 1 Ft.
B= 3 Ft.

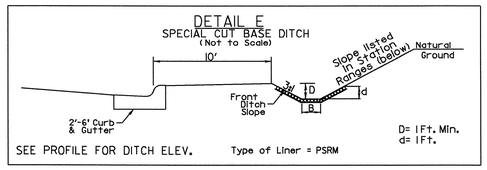
Type of Liner= PSRM

-L- STA 32+75 LT LENGTH = 93 FT.
SLOPE = 3.8%

NAD 83/95



DETAIL E
SPECIAL CUT BASE DITCH
(Not to Scale)



D= 1 Ft. Min.
d= 1 Ft.

SEE PROFILE FOR DITCH ELEV.

Type of Liner = PSRM

STATION LIMITS	FRONT SLOPE	BASE WIDTH	BACKSLOPE
-L- STA 22+25 RT - STA 24+00 RT	3:1	2 FT.	3:1
-L- STA 29+25 RT - STA 33+75 RT	4:1	3 FT.	4:1

SEE SHEET 10 FOR -L- PROFILE

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RD238343 12/12/2008 u3447_rdy_psh_6p kmoore RD-Oce34

PROJECT REFERENCE NO.	SHEET NO.
U-3447	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 24912 ENGINEER KEITH E. MOORE — 11-7-08

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 19778 ENGINEER BRYAN D. LOUNGOOD — 7 NOV 08

REVISIONS

8/17/99

2004/2025 AVERAGE DAILY TRAFFIC

-Y1- DOWNS CIRCLE (SR 3645)

4800/8800

17500/32500 — 1500/2700 — 3300/6100 — 19300/35900

NC 51 — -L-

NAD 83/95

-Y1-
PI Sta 11+97.57
Δ = 27° 43' 16.6" (RT)
D = 11° 27' 33.0"
L = 241.91'
T = 123.37'
R = 500.00'
SE = 0.04

-Y1- PCSta. 10+74.20

-Y1- POTSta. 10+00.00

-L- POTSta. 55+20.86

BM #5 -BYI- STATION 7+14 119' LEFT ELEVATION=554.07'

MATCH LINE SEE SHEET 9 -Y1- STA. 12+00.00

MATCH LINE SEE SHEET 6 -L- STA. 49+00.00

MATCH LINE SEE SHEET 8 -L- STA. 62+00.00

-BL-13 PINC 51+87.66=
-L- STA. 49+56.65, 55.83' LT

-BL-15 PINC 63+20.36=
-L- STA. 60+82.40, 12.97' LT

-BL-14 PINC 56+56.19 =
-BYI- POT 5+00.00
-L- STA. 54+18.80, 22.03' RT

INLOC COMPANY DB 3257 PG 001 (7)

BEBCO, LLC DB 12560 PG 340 (5)

JAMES S. & TULA KLEITCHES DB 3418 PG 441 (9)

ALL POINTS TRUCKING, INC. DB 7330 PG 715 (10)

TAD ENTERPRISES, INC. DB 20102 PG 847 (11)

MARIANNA M. RAUGH, ET. AL DB 4902 PG 051 (6)

MARIANNA M. RAUGH DB 2359 PG 147 DB 1088 PG 258 (8)

REMOVE AND RESET FENCE

GRADE TO DRAIN

DO NOT DISTURB BUILDING

FILL FULL ENTIRE LENGTH w/FLOWABLE FILL

TRENCHLESS INSTALLATION 60" WELDED STEEL PIPE UNDER EXISTING ROADWAY

REMOVE JB PLUG AND FILL 30" RCP WITH FLOWABLE FILL

PLUG 3x3 BOX CULVERT AND FILL FULL WITH FLOWABLE FILL

PREFORMED SCOUR HOLE

HEADWALL W/ FLAP GATE SEE DETAIL SHT. 2-B

STA 50+75 LT BEGIN STD. BERM DITCH wPSRM SEE DETAIL D

STA 53+45 LT END STD. BERM DITCH

BERM DRAINAGE OUTLET

-L- PT Sta. 49+77.34

-L- PC Sta. 58+29.99

-L-
PI Sta 62+46.50
Δ = 45° 13' 25.7" (RT)
D = 5° 43' 46.5"
L = 789.30'
T = 416.50'
R = 1,000.00'
SE = 0.04

DETAIL D
BERM DITCH
(Not to Scale)

Type of Liner= PSRM

-L- STA 50+75 LT - STA 53+45 LT

PREFORMED SCOUR HOLE

PLAN VIEW

Permanent Soil Reinforcement matting (PSRM)

Pipe or Ditch Outlet

Install level and flush with natural ground.

Square Preformed Scour Hole (PSH)

(Rip Rap in basin not shown for clarity)

(4' min typ.)

B= 4 Ft.
D= 1 Ft.
W= 4 Ft.
d= 0.5 Ft.

Seed with native grasses at installation.

SECTION A-A

Fill Slope

D (1' min)

PSRM

d

Natural Ground

Pipe or Ditch Outlet

Liner: Class B Rip Rap 12" thick with Filter Fabric

1' tuck

5/05

-L- STA 58+70 RT
-L- STA 60+65 RT
-L- STA 62+00 RT

★ TRAFFIC SIGNAL
SEE SHEET 13 FOR -Y1- PROFILE
SEE SHEET 11 FOR -L- PROFILE

PAVEMENT REMOVAL

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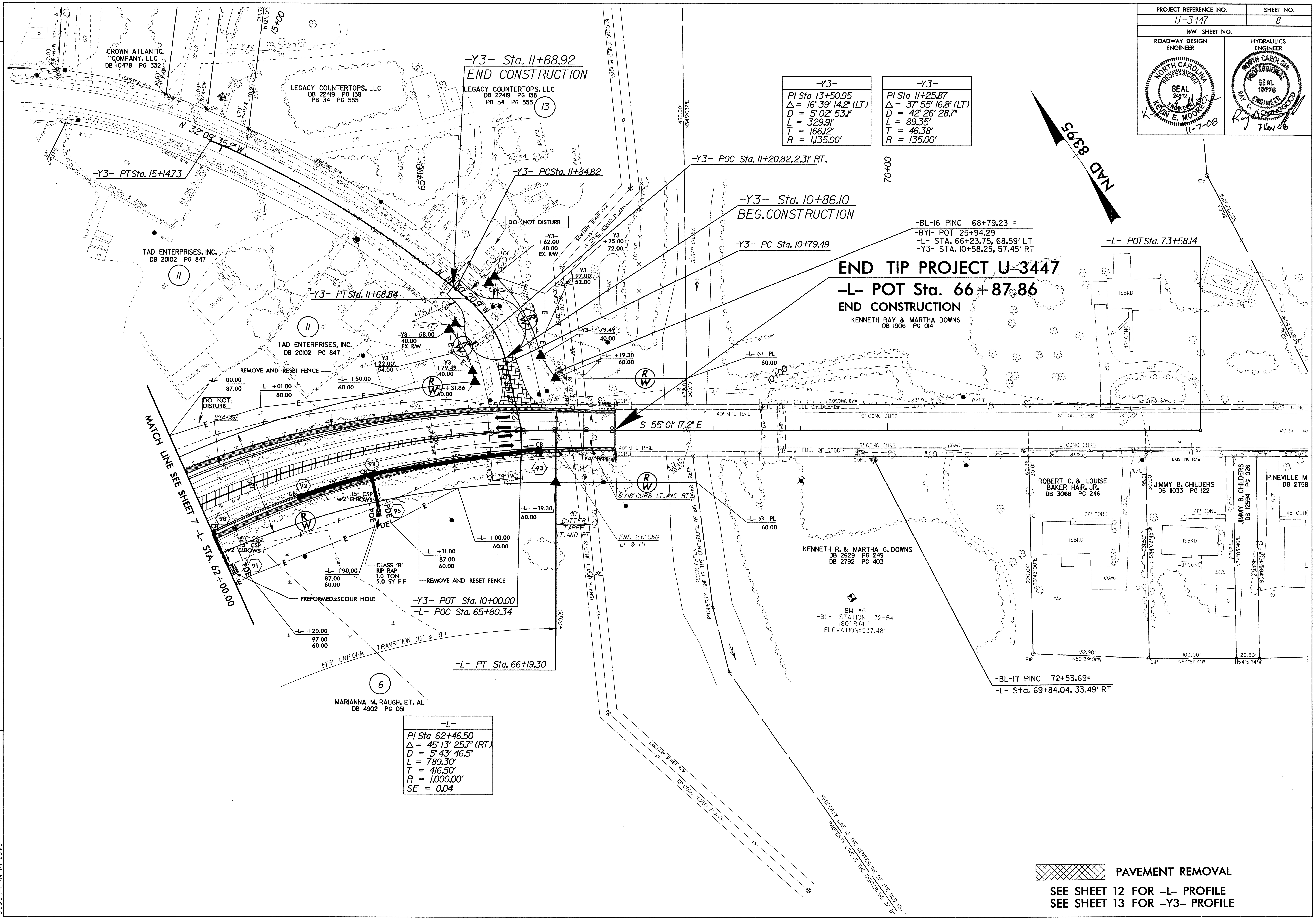
PROJECT REFERENCE NO.	SHEET NO.
U-3447	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



-Y3-
PI Sta 13+50.95
Δ = 16° 39' 14.2" (LT)
D = 5° 02' 53.1"
L = 329.91'
T = 166.12'
R = 1,135.00'

-Y3-
PI Sta 11+25.87
Δ = 37° 55' 16.8" (LT)
D = 42° 26' 28.7"
L = 89.35'
T = 46.38'
R = 135.00'

-L-
PI Sta 62+46.50
Δ = 45° 13' 25.7" (RT)
D = 5° 43' 46.5"
L = 789.30'
T = 416.50'
R = 1,000.00'
SE = 0.04

PAVEMENT REMOVAL

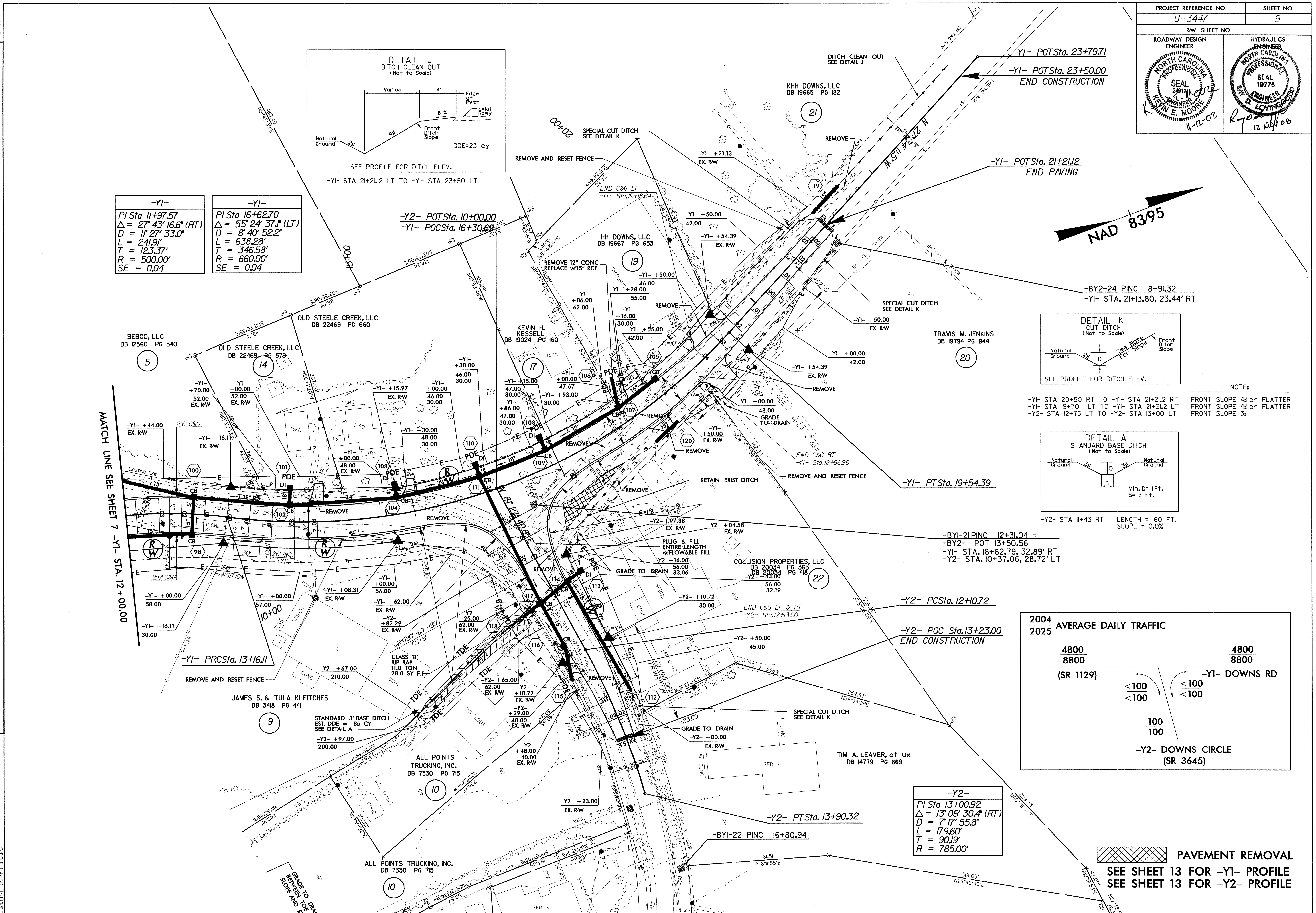
SEE SHEET 12 FOR -L- PROFILE
SEE SHEET 13 FOR -Y3- PROFILE

REVISIONS

28-OCT-2008 15:52

PROJECT REFERENCE NO.	SHEET NO.
U-3447	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SEAL 24912 KEVIN E. MOORE 11-12-08 — SEAL 19775 RAY D. LOVINGOOD 12 NOV 08



-Y1-
PI Sta 11+97.57
Δ = 27° 43' 16.6" (RT)
D = 11° 27' 33.0"
L = 241.91'
T = 123.37'
R = 500.00'
SE = 0.04

-Y1-
PI Sta 16+62.70
Δ = 55° 24' 37.1" (LT)
D = 8° 40' 52.2"
L = 638.28'
T = 346.58'
R = 660.00'
SE = 0.04

-Y2-
PI Sta 13+00.92
Δ = 13° 06' 30.4" (RT)
D = 7° 17' 55.8"
L = 179.60'
T = 90.19'
R = 785.00'

DETAIL K
CUT DITCH
(Not to Scale)
SEE PROFILE FOR DITCH ELEV.

-Y1- STA 20+50 RT TO -Y1- STA 21+21.2 RT
-Y1- STA 19+70 LT TO -Y1- STA 21+21.2 LT
-Y2- STA 12+75 LT TO -Y2- STA 13+00 LT

NOTE:
FRONT SLOPE 4:1 or FLATTER
FRONT SLOPE 4:1 or FLATTER
FRONT SLOPE 3:1

DETAIL A
STANDARD BASE DITCH
(Not to Scale)
Min. D= 1 Ft.
B= 3 Ft.

-Y2- STA 11+43 RT LENGTH = 160 FT. SLOPE = 0.0%

2004 / 2025 AVERAGE DAILY TRAFFIC

(SR 1129) 4800/8800 — -Y1- DOWNS RD 4800/8800; <100/<100; <100/<100; 100/100
-Y2- DOWNS CIRCLE (SR 3645)

PAVEMENT REMOVAL

SEE SHEET 13 FOR -Y1- PROFILE
SEE SHEET 13 FOR -Y2- PROFILE

REVISIONS

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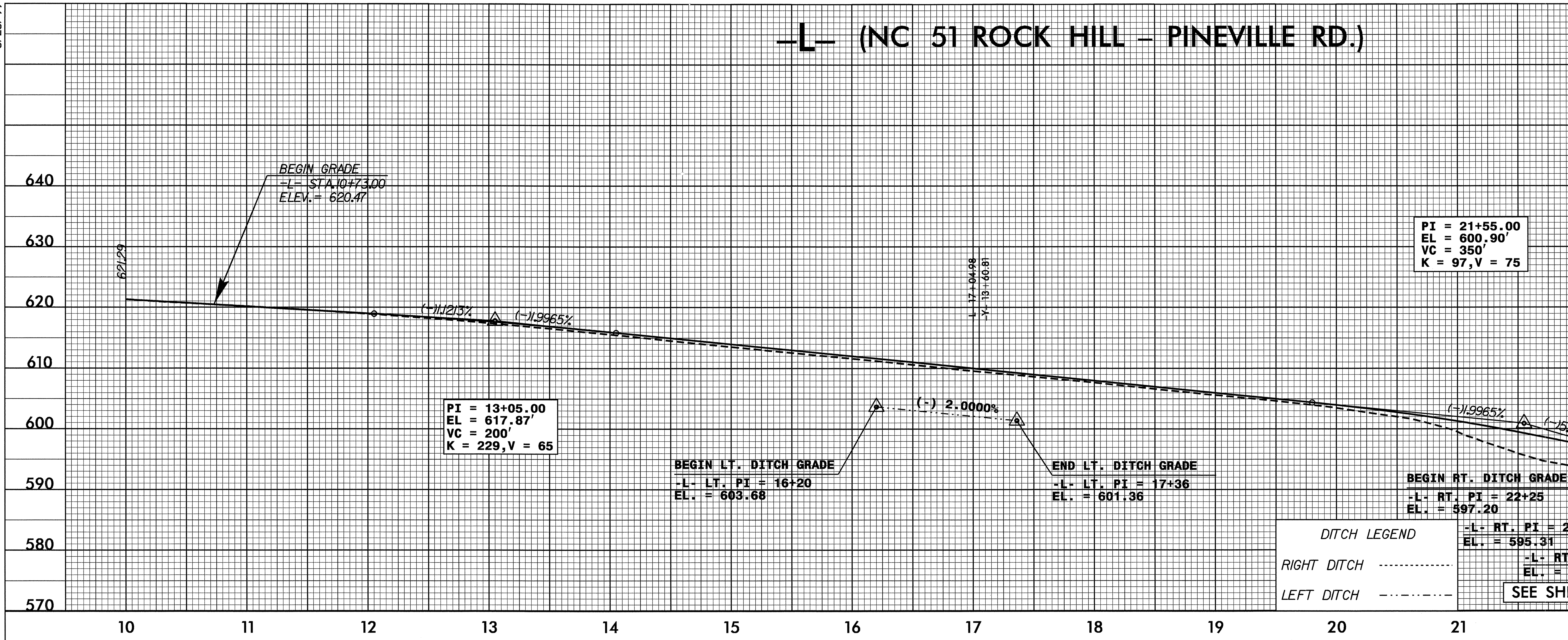
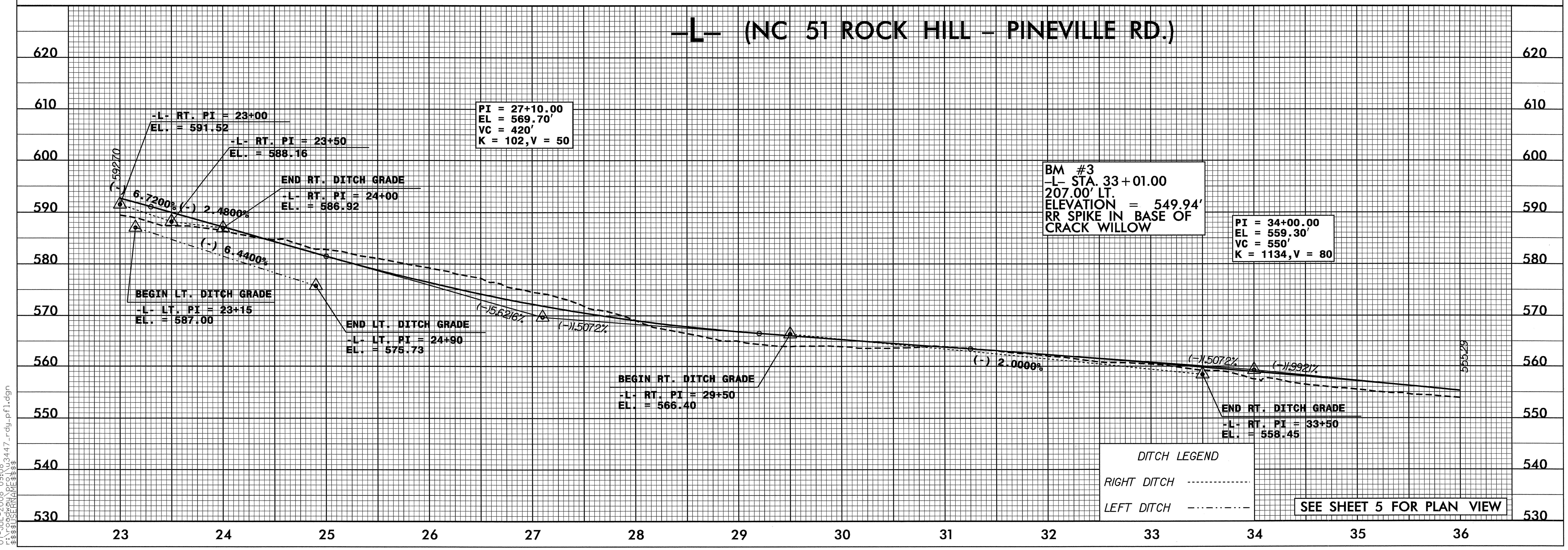
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-3447	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24912 ENGINEER KEVIN E. MOORE
[illegible] 11-7-08

NORTH CAROLINA PROFESSIONAL SEAL 19776 ENGINEER RAY D. LOVINGGOOD
[illegible] 7 NOV 08





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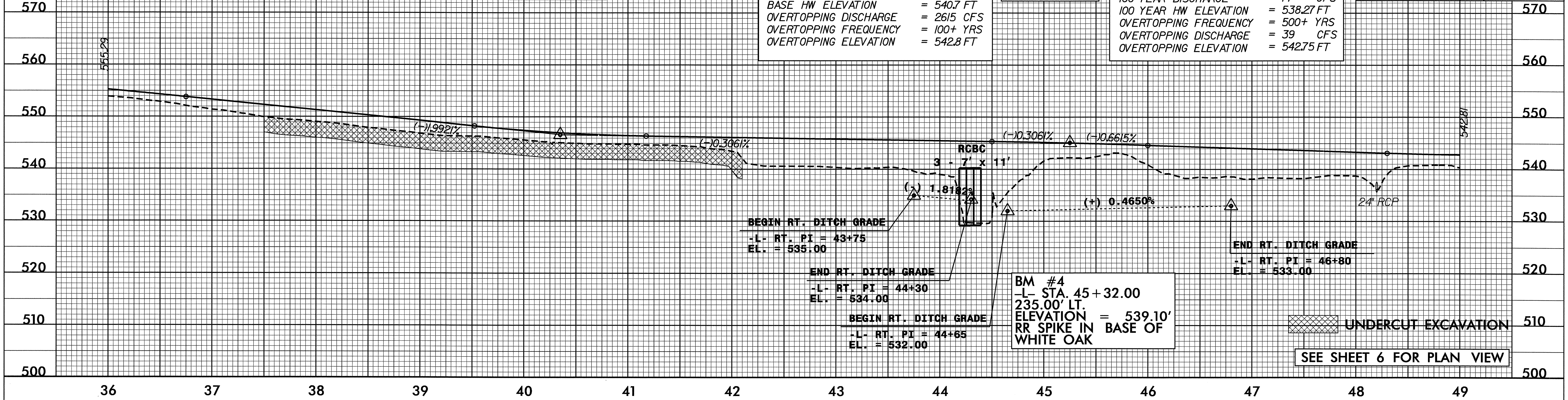
PROJECT REFERENCE NO.	SHEET NO.
U-3447	11

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 24912 ENGINEER KEVIN E. MOORE 11-7-08

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19776 ENGINEER RAY D. LOVINGGOOD 7 NOV 08

5/28/99

–L– (NC 51 ROCK HILL – PINEVILLE RD.)



CULVERT HYDRAULIC DATA

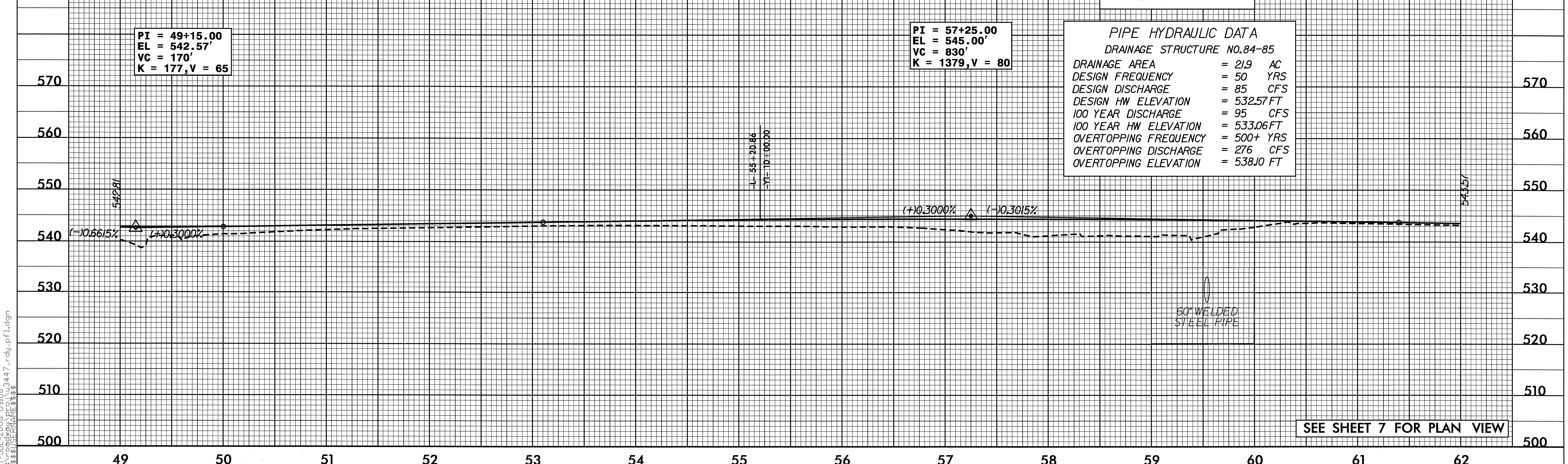
DESIGN DISCHARGE	= 2200 CFS
DESIGN FREQUENCY	= 50 YRS
DESIGN HW ELEVATION	= 540.3 FT
BASE DISCHARGE	= 2300 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 540.7 FT
OVERTOPPING DISCHARGE	= 2615 CFS
OVERTOPPING FREQUENCY	= 100+ YRS
OVERTOPPING ELEVATION	= 542.8 FT

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.72

DRAINAGE AREA	= 2.6 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 12 CFS
DESIGN HW ELEVATION	= 538.06 FT
100 YEAR DISCHARGE	= 14 CFS
100 YEAR HW ELEVATION	= 538.27 FT
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING DISCHARGE	= 39 CFS
OVERTOPPING ELEVATION	= 542.75 FT

–L– (NC 51 ROCK HILL – PINEVILLE RD.)



DITCH LEGEND

RIGHT DITCH ....

LEFT DITCH –·–·–·–·–

PIPE HYDRAULIC DATA

DRAINAGE STRUCTURE NO.84-85

DRAINAGE AREA	= 21.9 AC
DESIGN FREQUENCY	= 50 YRS
DESIGN DISCHARGE	= 85 CFS
DESIGN HW ELEVATION	= 532.57 FT
100 YEAR DISCHARGE	= 95 CFS
100 YEAR HW ELEVATION	= 533.06 FT
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING DISCHARGE	= 276 CFS
OVERTOPPING ELEVATION	= 538.10 FT

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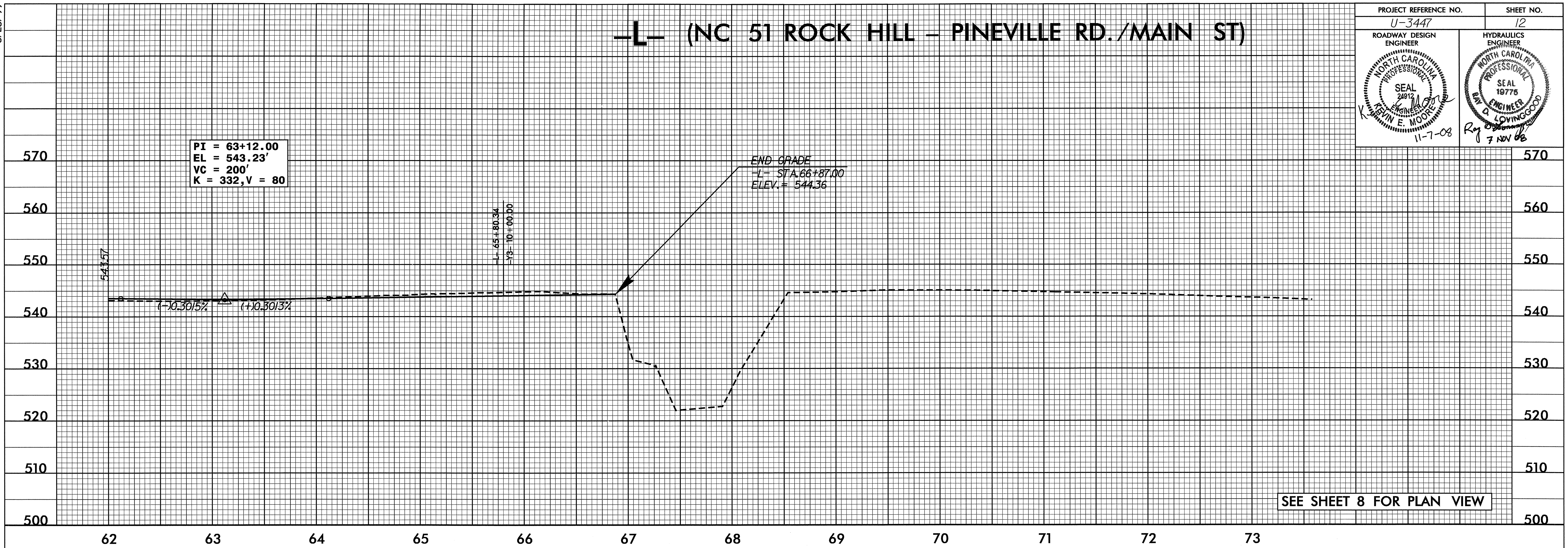
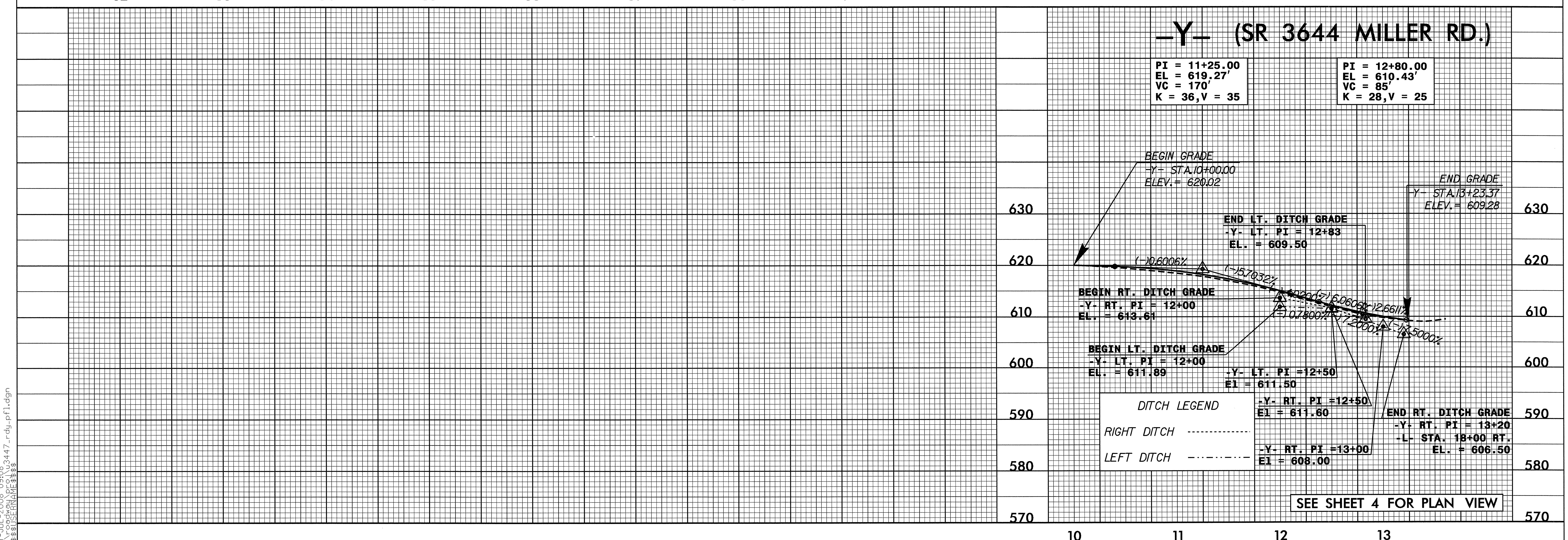
PROJECT REFERENCE NO.	SHEET NO.
U-3447	12

ROADWAY DESIGN ENGINEER — Seal: North Carolina Professional Engineer, Seal 24912, Kevin E. Moore, 11-7-08

HYDRAULICS ENGINEER — Seal: North Carolina Professional Engineer, Seal 19775, Ray D. Lovingood, 7 NOV 08

5/28/99





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PROJECT REFERENCE NO.	SHEET NO.
U-3447	13

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24912 ENGINEER KEVIN E. MOORE
11-12-08

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 19775 ENGINEER RAY D. LOVINGGOOD
10 NOV 08

-Y1- (SR 1129 DOWNS RD.)

BM #5
-Y1- STA. 11+75.00
144.00' LT.
ELEVATION = 554.07'
RR SPIKE IN BASE OF DOUBLE WHITE OAK

PI = 13+70.00
EL = 539.20'
VC = 150'
K = 151,V = 60

BEGIN GRADE
-Y1- STA.10+38.12
ELEV.= 543.41

PI = 16+70.00
EL = 537.70'
VC = 200'
K = 69,V = 40

END GRADE
-Y1- STA.21+21.12
ELEV.= 540.93

BEGIN LT. DITCH GRADE
-Y1- RT. PI = 19+70
EL. = 539.50

END LT. DITCH GRADE
-Y1- RT. PI = 23+50
EL. = 538.36

(+) 0.3000%

BEGIN RT. DITCH GRADE
-Y1- RT. PI = 20+50
EL. = 539.10

END RT. DITCH GRADE
-Y1- RT. PI = 21+21.12
EL. = 538.96

(-)1.2866%
(-)0.2963%
(-)0.6667%
(+)2.2400%
(-)1.1783%
(+) 0.2000%

PI = 15+05.00
EL = 538.80'
VC = 100'
K = 270,V = 70

-Y1- 6+30.17
-Y2- 10+00.00

PI = 19+20.00
EL = 543.30'
VC = 160'
K = 47,V = 40

DITCH LEGEND
RIGHT DITCH
LEFT DITCH

SEE SHEET 7 AND 9 FOR PLAN VIEW

-Y2- (SR 3645 DOWNS CIRCLE)

BEGIN GRADE
-Y2- STA.10+18.13
ELEV.= 538.92

END GRADE
-Y2- STA.13+23.00
ELEV.= 537.98

(-)0.8865%
(+)0.3041%

PI = 11+75.00
EL = 537.53'
VC = 170'
K = 143,V = 60

SEE SHEET 9 FOR PLAN VIEW

-Y3- (SR 3645 DOWNS CIRCLE)

BEGIN MINIMAL RESURFACING
-Y3- STA.10+86.10
ELEV.= 543.33

PI = 11+33.00
EL = 542.25'
VC = 42'
K = 29,V = 25

END MINIMAL RESURFACING
-Y3- STA.11+88.92
ELEV.= 541.77

(-)2.3028%
(-)0.8584%

SEE SHEET 8 FOR PLAN VIEW

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