09/08/99

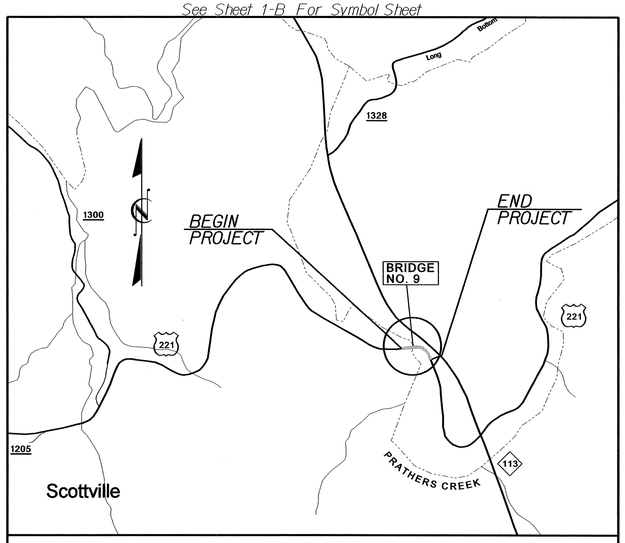
TIP PROJECT: B-4406

CONTRACT: C202811

$$$$$$SYSTIME$$$$$$

$$$$$$USERNAME$$$$$$ $$$$$$DGN$$$$$$

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Symbol Sheet



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

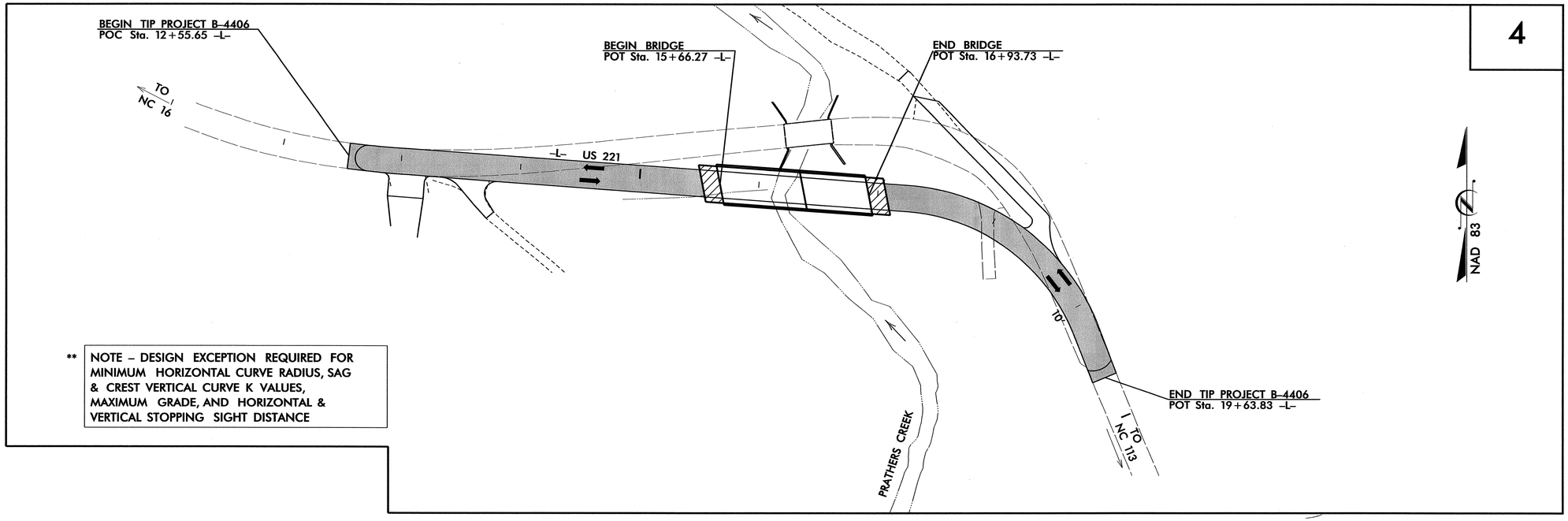
ALLEGHANY COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4406	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33685.1.1	BRSTP-221(16)	PE
33685.2.1	BRSTP-221(16)	R/W /UTIL
33685.3.1	BRSTP-221(16)	CONST.

LOCATION: BRIDGE NO. 9 OVER PRATHERS CREEK ON US 221

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



** NOTE – DESIGN EXCEPTION REQUIRED FOR MINIMUM HORIZONTAL CURVE RADIUS, SAG & CREST VERTICAL CURVE K VALUES, MAXIMUM GRADE, AND HORIZONTAL & VERTICAL STOPPING SIGHT DISTANCE

NCDOT CONTACT: BRENDA MOORE, P.E., PROJECT ENGINEER – ROADWAY DESIGN

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2012 = 990
ADT 2032 = 1450
DHV = 9 %
D = 55 %
T = 5 % *
** V = 60 MPH
* TTST 1 % + DUAL 4 %
FUNC CLASS = RURAL MAJOR COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4406	=	0.110 mi.
LENGTH STRUCTURE TIP PROJECT B-4406	=	0.024 mi.
TOTAL LENGTH TIP PROJECT B-4406	=	0.134 mi.

Prepared in the Office of:
WANG ENGINEERING COMPANY, INC.
CARY, N.C.
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MARCH 16, 2011

LETTING DATE: APRIL 17, 2012

JOSEPH OGDEN, P.E.
PROJECT ENGINEER

JAMES S. WANG, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
SUNGATE DESIGN GROUP, PA
NORTH CAROLINA PROFESSIONAL SEAL 028392 ENGINEER JEFFREY T. REGISTERED P.E.
1/27/12
SIGNATURE:

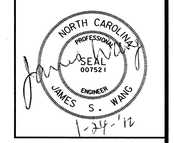
ROADWAY DESIGN ENGINEER
WANG ENGINEERING
NORTH CAROLINA PROFESSIONAL SEAL 007521 ENGINEER JAMES S. WANG P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •
P.E.
STATE HIGHWAY DESIGN ENGINEER

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4406	1-A

ROADWAY DESIGN ENGINEER



INDEX OF SHEETS

GENERAL NOTES:

2012 SPECIFICATIONS
EFFECTIVE: 01-17-12
REVISED: 08/31/11

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.

UNDERDRAINS:

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

GUARDRAIL:

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

TEMPORARY SHORING:

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

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE Haywood EMC

Comporium (Phone & Cable)

RIGHT-OF-WAY MARKERS:

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

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 4 - MAJOR STRUCTURES	
422.11	Reinforced Bridge Approach Fills - Sub Regional Tier
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
815.03	Pipe Underdrain and Blind Drain
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorage for Frames - Brick or Concrete
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

04/16/11

PROJECT REFERENCE NO.	SHEET NO.
B-4406	1-B

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-4406	1C
Location and Surveys	

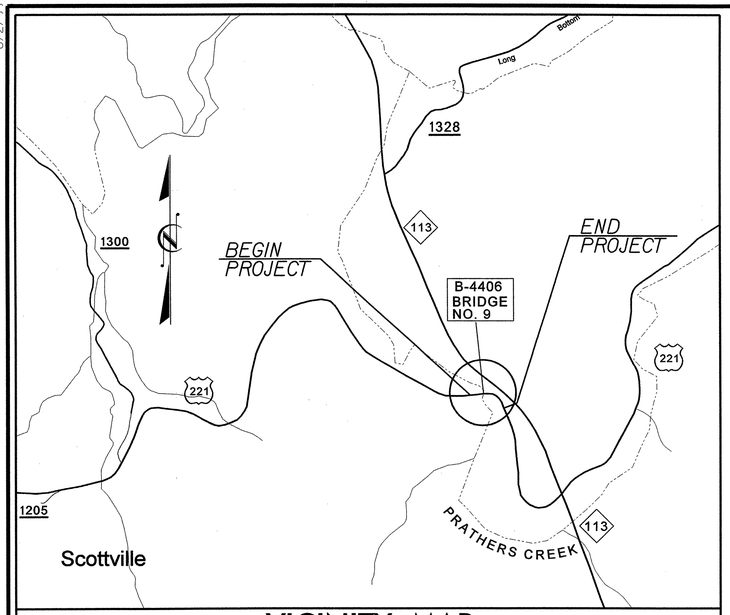
SURVEY CONTROL SHEET B-4406

BL POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
B44061	(GPS B4406-1)	1003560.0530	1326556.2300	2804.97'	OUTSIDE PROJECT LIMITS	
B44062	(GPS B4406-2)	1003140.6870	1327271.9320	2757.43'	10+18.84	17.98' RT
BL3	BL-3	1003058.2636	1327624.7732	2739.16'	13+79.31	10.62' RT
BL4	BL-4	1003114.0881	1327912.6540	2738.62'	16+62.36	66.03' LT
BL5	BL-5	1003062.0543	1328073.6591	2747.91'	18+06.96	50.26' LT
BL6	BL-6	1002617.5633	1328254.1027	2766.19'	OUTSIDE PROJECT LIMITS	

****

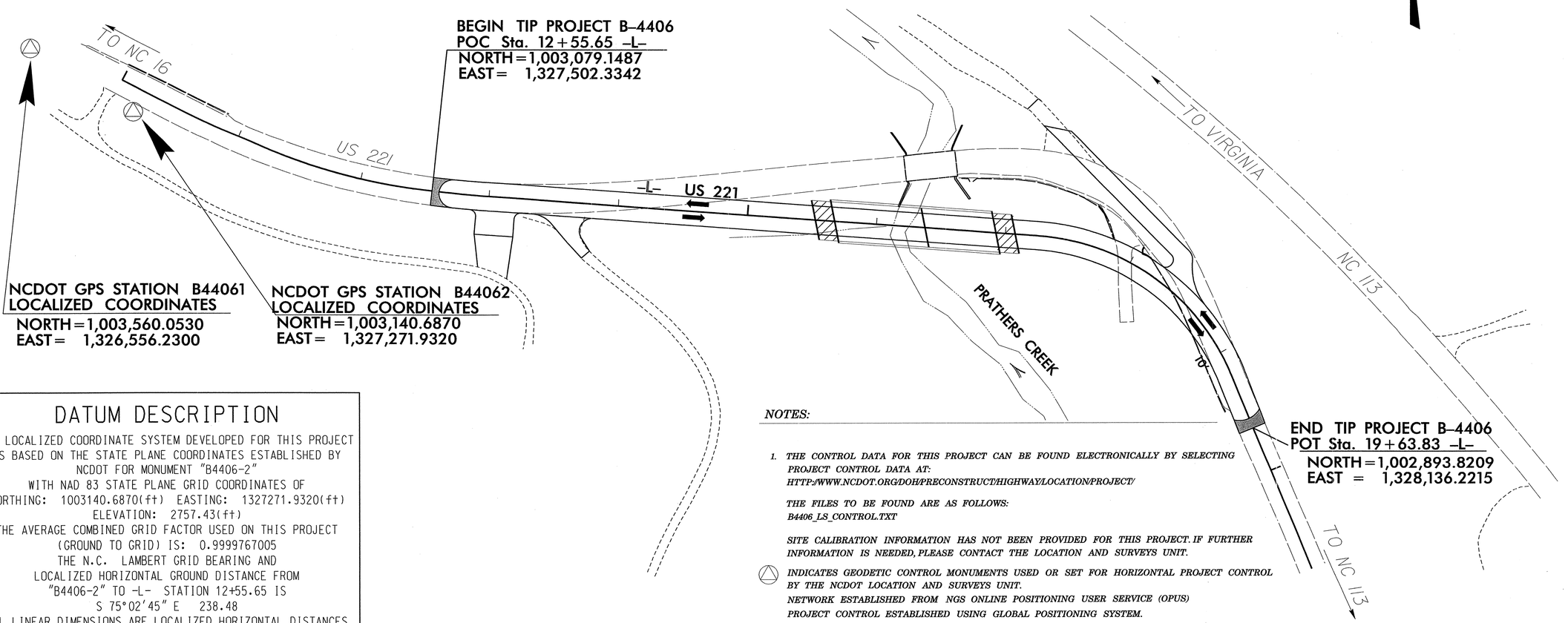
BM #1 ELEVATION = 2724.83'
N 1003182 E 1327876
-L- STATION 16+21 131' LEFT
8" SPIKE IN ROOT OF 8" WILD CHERRY

****



VICINITY MAP

NC GRID NAD 83



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4406-2" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 1003140.6870(ft) EASTING: 1327271.9320(ft) ELEVATION: 2757.43(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999767005
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4406-2" TO -L- STATION 12+55.65 IS S 75°02'45" E 238.48
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.NCDOT.ORG/DOH/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/*

THE FILES TO BE FOUND ARE AS FOLLOWS: B4406_LS_CONTROL.TXT

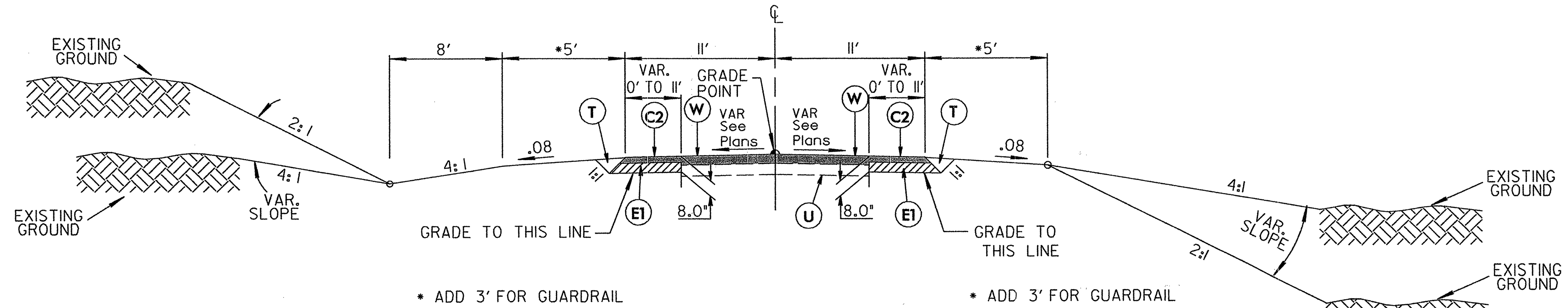
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

△ *INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT. NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING USER SERVICE (OPUS) PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.*

NOTE: DRAWING NOT TO SCALE

$$$$USERNAME $$$$DGN $$$$FILENAME $$$$CELL $$$$SCALE $$$$TIME $$$$

PROJECT REFERENCE NO.	SHEET NO.
B-4406	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER



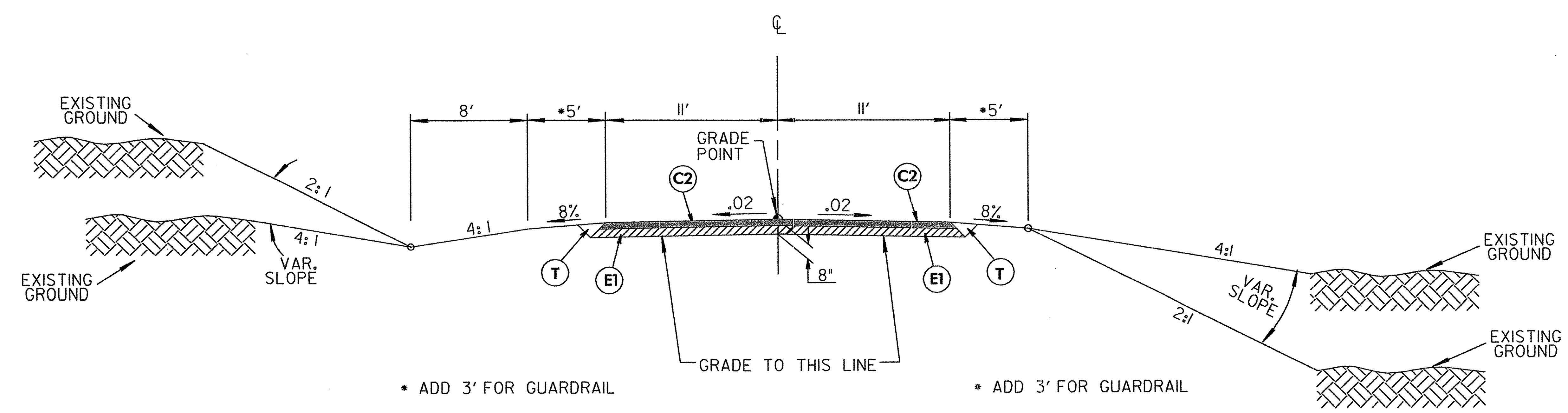
TRANSITION FROM EXIST. TO T.S. NO. 1

-L- Sta. 12+55.65 to Sta. 12+80.65
-L- Sta. 19+38.83 to Sta. 19+63.83

TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 AS FOLLOWS

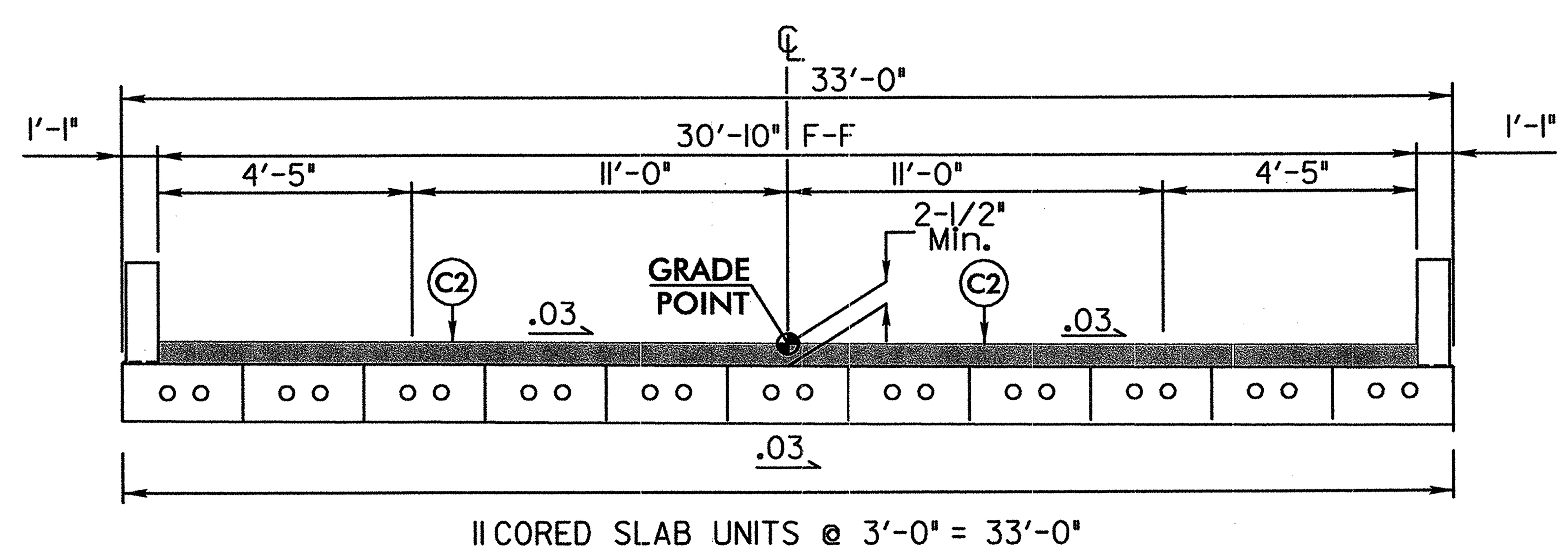
-L- Sta. 12+80.65 to Sta. 14+22.39
-L- Sta. 18+54.86 to Sta. 19+38.83



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 1 AS FOLLOWS

-L- Sta. 14+22.39 to Sta. 15+66.27 (BEGIN BRIDGE)
-L- Sta. 16+93.73 (END BRIDGE) to Sta. 18+54.86



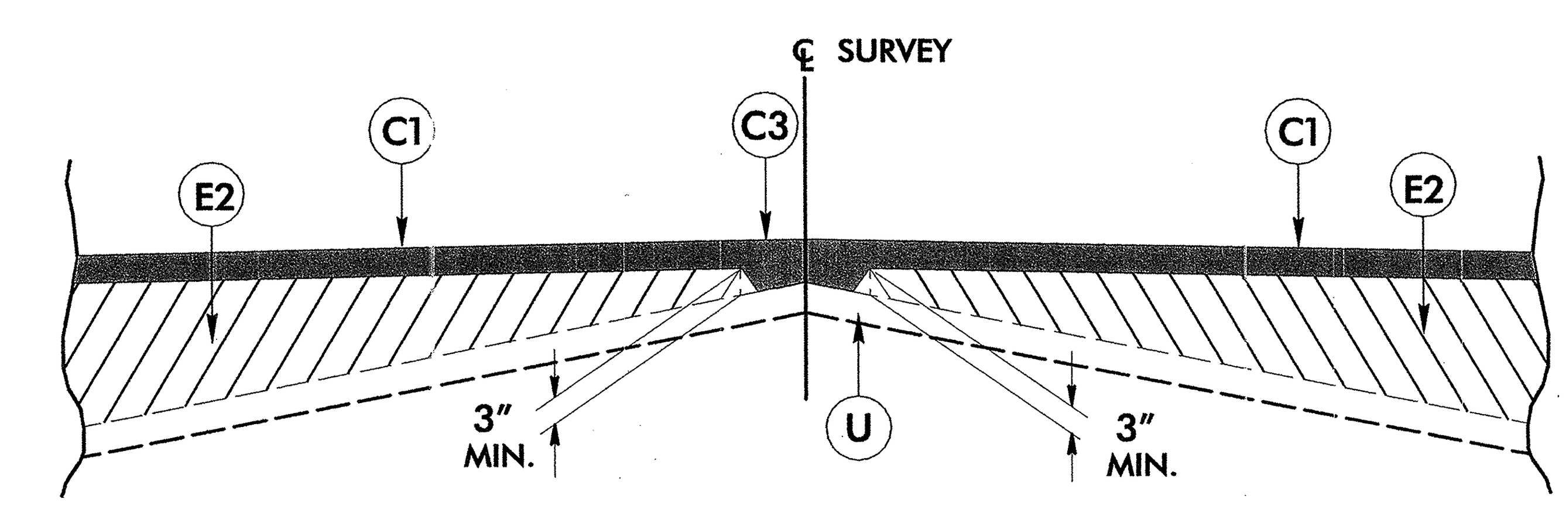
TYPICAL BRIDGE SECTION

-L- Sta. 15+66.27 to Sta. 16+93.73

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1.25" ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS PER SQ. YD.
C2	PROP. APPROX. 2.5" ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1" OR GREATER THAN 1.5" IN DEPTH.
E1	PROP. APPROX. 5.5" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5.5" IN DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	VARIABLE DEPTH PAVEMENT (SEE: Detail Showing Method of Wedging)

NOTE: ALL SLOPES 1:1 UNLESS OTHERWISE SPECIFIED



W – Detail Showing Method of Wedging

PROJECT REFERENCE NO.	SHEET
B-4406	2A

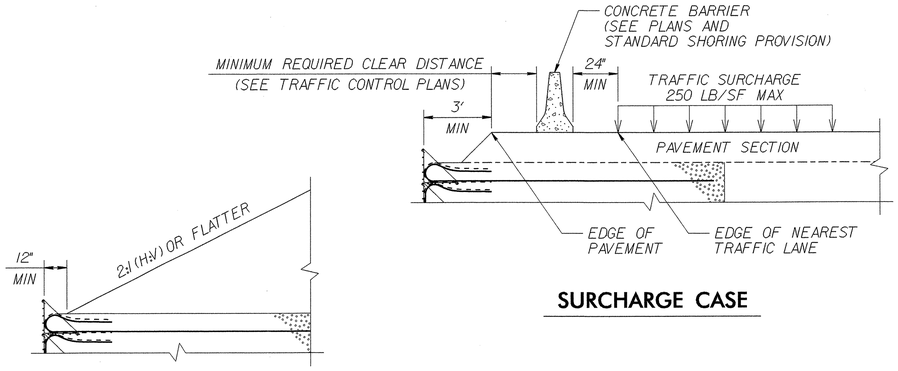
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A HIDDEN

Scott A. Hidden 11/18/11
SIGNATURE DATE

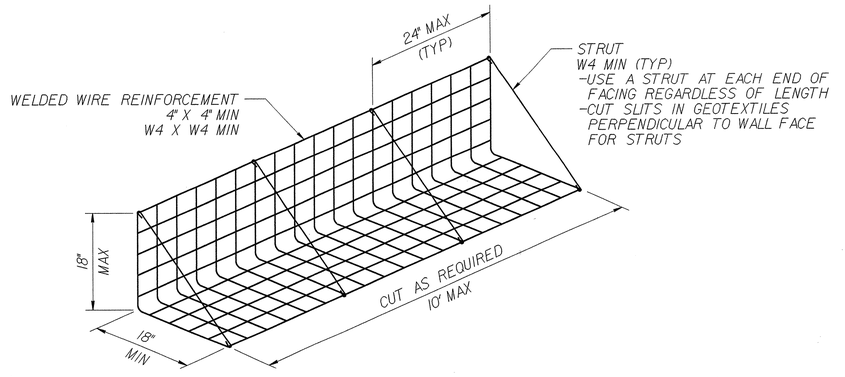
ENGINEER

SIGNATURE DATE

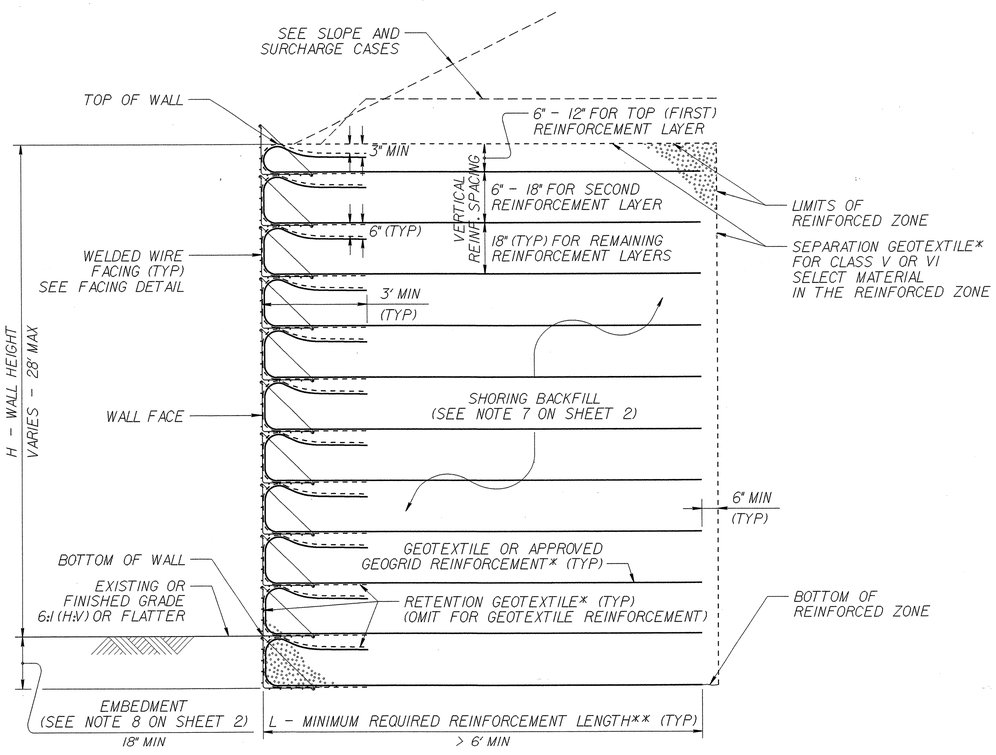


SURCHARGE CASE

SLOPE CASE

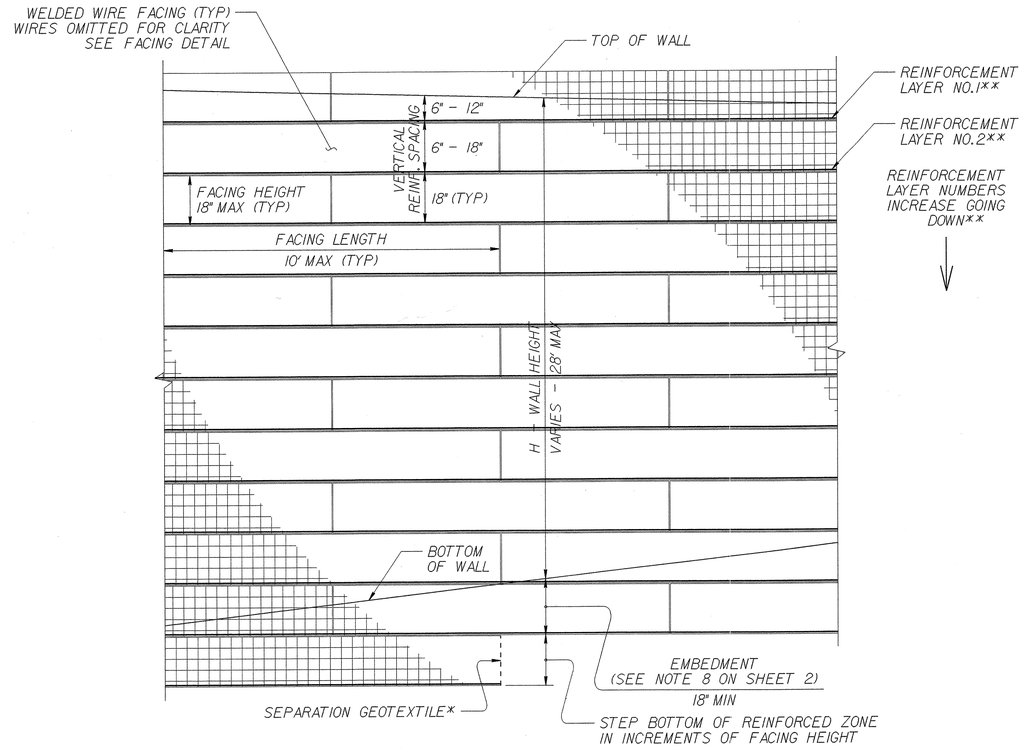


FACING DETAIL



STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.



STANDARD TEMPORARY WALL – PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.

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 WALL
Sheet 1 of 3

DATE: 1-17-12

PROJECT REFERENCE NO.	SHEET
B-4406	2B

GEOTECHNICAL ENGINEER

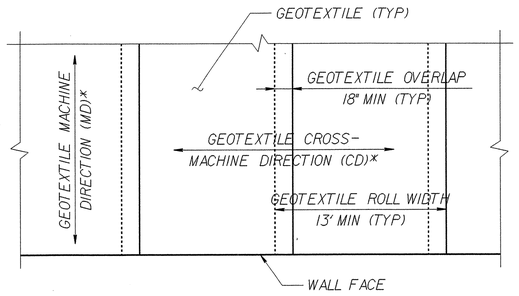
NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A HIDDEN

Scott A. Hidden 11/18/11

SIGNATURE DATE

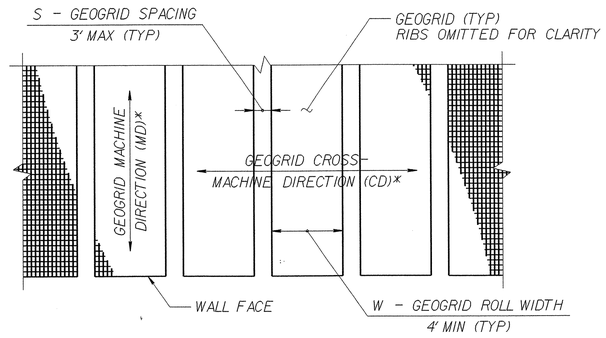
ENGINEER

SIGNATURE DATE



GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)

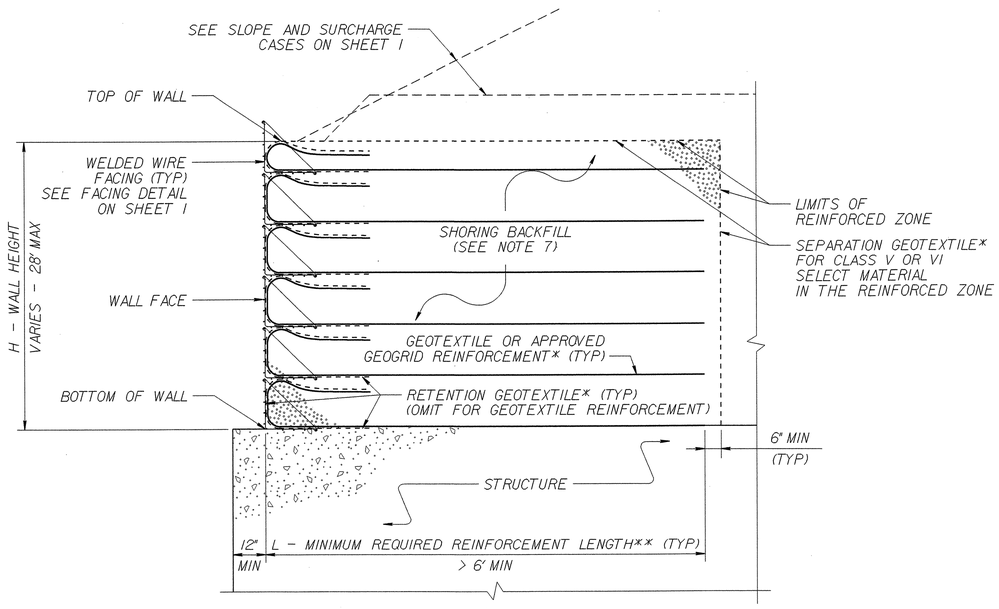


GEOGRID PLACEMENT

(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT – $\frac{W}{W+S}$ x 100 ≥ 80%, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
***SEE NOTE 12.**



TEMPORARY WALL ON STRUCTURE DETAIL

***SEE GEOSYNTHETIC PLACEMENT DETAILS.**
****SEE REINFORCEMENT TABLES ON SHEET 3.**

NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
   UNIT WEIGHT, γ = 120 LB/CF
   FRICTION ANGLE, ϕ = 30 DEGREES
   COHESION, c = 0 LB/SF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS ARE APPROVED FOR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) BASED ON MATERIAL TYPE. FOR DETAILS OF APPROVED GEOGRIDS AND SHORT-TERM DESIGN STRENGTHS, SEE www.ncdot.org/doh/operations/materials/soils/gep.html
    DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE 1 OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH THE FOLLOWING CONDITIONS OCCUR:
    - W (REINFORCEMENT ROLL WIDTH) ≥ L (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
    - REINFORCEMENT STRENGTH IN CD ≥ MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION.
14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.

GEOTECHNICAL ENGINEERING UNIT

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

STANDARD DRAWING NO. 1801.02

STANDARD TEMPORARY WALL
Sheet 2 of 3

DATE: 1-17-12

PROJECT REFERENCE NO.	SHEET
B-4406	2C

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022246 ENGINEER SCOTT A HIDDEN

scott a. hidden 11/18/11
SIGNATURE DATE

ENGINEER

SIGNATURE DATE

SLOPE OR SURCHARGE CASE	GROUNDWATER DEPTH BELOW BOTTOM OF REINFORCED ZONE (SEE NOTE 6 ON SHEET 2) (FT)	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)	H - WALL HEIGHT (FT)																								
			< 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
SLOPE CASE	> 0	CLASS II,TYPE I, CLASS III,CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	8	9	11	12	13	13	14	15	16	17	18	19	20	21	22	23	24	24	25	26	27	27
SURCHARGE CASE	> 0 TO 7 FOR H < 20' > 0 TO 10 FOR H ≥ 20'	ALL SHORING BACKFILL TYPES	6	7	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	18	18	19	20	20	21
	> 7 FOR H < 20' > 10 FOR H ≥ 20'	A-2-4 SOIL	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15	16	16	17	17	18	19	19	20
		CLASS II,TYPE I OR CLASS III SELECT MATERIAL	6	6	7	7	8	8	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17	17	18	19
		CLASS V OR CLASS VI SELECT MATERIAL	6	6	7	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	16	16	17	18	18

L – MINIMUM REQUIRED REINFORCEMENT LENGTH (FT)

(FOR ALL REINFORCEMENT TYPES)

WALL HEIGHT (H) + EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

*BASED ON VERTICAL REINFORCEMENT SPACING SHOWN ON SHEET 1.

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V SELECT MATERIAL
1	2400	2400	2400	2400	2400
2	2400	2400	2400	2400	2400
3	2400	2400	2400	2400	2400
4	2400	2400	2500	2400	2400
5	2500	2400	3000	2400	2400
6	3000	2400	3500	2800	2400
7	3500	2700	4000	3200	2600
8	4000	3100	4500	3600	2900
9	4500	3500	5000	4000	3200
10	5000	3900	5500	4400	3500
11	5500	4300	6000	4800	3800
12	6000	4700	6500	5200	4100
13	6500	5100	7000	5600	4400
14	7000	5400	7500	6000	4700
15	7500	5800	8000	6400	5000
16	8000	6200	8500	6800	5300
17	8500	6600	9000	7200	5600
18	9000	7000	9500	7600	5900
19	9500	7400	10000	8000	6200
20	10000	7800	10500	8400	6500

GEOTEXTILE REINFORCEMENT
ULTIMATE TENSILE STRENGTH (LB/FT)

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II,TYPE I OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

GEOGRID REINFORCEMENT
SHORT-TERM DESIGN STRENGTH (LB/FT)
(SEE NOTE 10 ON SHEET 2.)

MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD
(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1 FOR REINFORCEMENT LAYER NUMBERING.

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 WALL
Sheet 3 of 3

DATE: 1-17-12

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4406	3

STATE OF NORTH CAROLINA
SUMMARY OF QUANTITIES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C202811

ItemNumber	Sec #	Quantity	Unit	Description
0000100000-N	800	Lump Sum		MOBILIZATION
0008000000-E	200	1	ACR	SUPPLEMENTARY CLEARING & GRUBBING
0015000000-N	205	1	EA	SEALING ABANDONED WELLS
0030000000-N	SP	Lump Sum		BRIDGE APPROACH FILL - SUB REGIONAL TIER, STATION ******* (16+30.00)
0057000000-E	226	50	CY	UNDERCUT EXCAVATION
0063000000-N	SP	Lump Sum		GRADING
0106000000-E	230	4,200	CY	BORROW EXCAVATION
0134000000-E	240	40	CY	DRAINAGE DITCH EXCAVATION
0195000000-E	265	200	CY	SELECT GRANULAR MATERIAL
0196000000-E	270	100	SY	GEOTEXTILE FOR SOIL STABILIZATION
0199000000-E	SP	78.2	SF	TEMPORARY SHORING
0318000000-E	300	20	TON	FOUNDATION CONDITIONING MATERIAL, MINOR STRUCTURES
0320000000-E	300	60	SY	FOUNDATION CONDITIONING GEOTEXTILE
0378000000-E	310	128	LF	24" RC PIPE CULVERTS, CLASS III
0582000000-E	310	32	LF	15" CS PIPE CULVERTS, 0.064" THICK
0636000000-E	310	2	EA	**" CS PIPE ELBOWS, *****" THICK (15", 0.064")
0995000000-E	340	58	LF	PIPE REMOVAL
1099500000-E	505	100	CY	SHALLOW UNDERCUT
1099700000-E	505	100	TON	CLASS IV SUBGRADE STABILIZATION
1121000000-E	520	141	TON	AGGREGATE BASE COURSE
1220000000-E	545	75	TON	INCIDENTAL STONE BASE
1489000000-E	610	260	TON	ASPHALT CONC BASE COURSE, TYPE B25.0B
1525000000-E	610	290	TON	ASPHALT CONC SURFACE COURSE, TYPE SF9.5A
1575000000-E	620	35	TON	ASPHALT BINDER FOR PLANT MIX
1693000000-E	654	10	TON	ASPHALT PLANT MIX, PAVEMENT REPAIR
2000000000-N	806	15	EA	RIGHT OF WAY MARKERS
2022000000-E	815	36	CY	SUBDRAIN EXCAVATION
2033000000-E	815	27	CY	SUBDRAIN FINE AGGREGATE
2044000000-E	815	200	LF	6" PERFORATED SUBDRAIN PIPE
2077000000-E	815	6	LF	6" OUTLET PIPE
2132000000-N	816	1	EA	CONCRETE PAD FOR SHOULDER DRAIN PIPE OUTLET
2286000000-N	840	1	EA	MASONRY DRAINAGE STRUCTURES
2367000000-N	840	1	EA	FRAME WITH TWO GRATES, STD 840.29
2556000000-E	846	40	LF	SHOULDER BERM GUTTER
3030000000-E	862	287.5	LF	STEEL BM GUARDRAIL
3150000000-N	862	3	EA	ADDITIONAL GUARDRAIL POSTS
3215000000-N	862	4	EA	GUARDRAIL ANCHOR UNITS, TYPE III
3270000000-N	SP	4	EA	GUARDRAIL ANCHOR UNITS, TYPE 350
3360000000-E	863	687	LF	REMOVE EXISTING GUARDRAIL
3580000000-E	866	200	LF	GENERIC FENCING ITEM TEMP 3 STRAND BARBED WIRE FENCE WITH POSTS (TEMPORARY)
3649000000-E	876	140	TON	RIP RAP, CLASS B
3656000000-E	876	1,135	SY	GEOTEXTILE FOR DRAINAGE
4400000000-E	1110	48	SF	WORK ZONE SIGNS (STATIONARY)
4405000000-E	1110	96	SF	WORK ZONE SIGNS (PORTABLE)
4410000000-E	1110	20	SF	WORK ZONE SIGNS (BARRICADE MOUNTED)
4430000000-N	1130	51	EA	DRUMS
4445000000-E	1145	32	LF	BARRICADES (TYPE III)
4455000000-N	1150	720	DAY	FLAGGER
4465000000-N	1160	1	EA	TEMPORARY CRASH CUSHIONS
4480000000-N	1165	1	EA	TMA
4485000000-E	1170	200	LF	PORTABLE CONCRETE BARRIER
4650000000-N	1251	12	EA	TEMPORARY RAISED PAVEMENT MARKERS
4810000000-E	1205	11,944	LF	PAINT PAVEMENT MARKING LINES (4")
4905000000-N	1253	10	EA	SNOWPLOWABLE PAVEMENT MARKERS
6000000000-E	1605	1,450	LF	TEMPORARY SILT FENCE
6006000000-E	1610	270	TON	STONE FOR EROSION CONTROL, CLASS A
6009000000-E	1610	250	TON	STONE FOR EROSION CONTROL, CLASS B
6012000000-E	1610	225	TON	SEDIMENT CONTROL STONE
6015000000-E	1615	1.5	ACR	TEMPORARY MULCHING
6018000000-E	1620	100	LB	SEED FOR TEMPORARY SEEDING
6021000000-E	1620	1.25	TON	FERTILIZER FOR TEMPORARY SEEDING
6024000000-E	1622	270	LF	TEMPORARY SLOPE DRAINS
6029000000-E	SP	200	LF	SAFETY FENCE
6030000000-E	1630	400	CY	SILT EXCAVATION
6036000000-E	1631	3,000	SY	MATTING FOR EROSION CONTROL
6037000000-E	SP	350	SY	COIR FIBER MAT
6038000000-E	SP	150	SY	PERMANENT SOIL REINFORCEMENT MAT
6042000000-E	1632	250	LF	1/4" HARDWARE CLOTH
6070000000-N	1639	4	EA	SPECIAL STILLING BASINS
6071010000-E	SP	260	LF	WATTLE
6071020000-E	SP	100	LB	POLYACRYLAMIDE (PAM)
6071030000-E	1640	115	LF	COIR FIBER BAFFLE
6071050000-E	SP	2	EA	**" SKIMMER (1-1/2")
6084000000-E	1660	2	ACR	SEEDING & MULCHING
6087000000-E	1660	1	ACR	MOWING
6090000000-E	1661	50	LB	SEED FOR REPAIR SEEDING
6093000000-E	1661	0.25	TON	FERTILIZER FOR REPAIR SEEDING
6096000000-E	1662	50	LB	SEED FOR SUPPLEMENTAL SEEDING
6108000000-E	1665	1.25	TON	FERTILIZER TOPDRESSING
6114500000-N	1667	20	MHR	SPECIALIZED HAND MOWING
6117000000-N	SP	25	EA	RESPONSE FOR EROSION CONTROL
6123000000-E	1670	0.2	ACR	REFORESTATION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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.

SUMMARY OF EARTHWORK

LINE	Station	Station	Uncl. Excav. YD^3	Undercut YD3	Embank. + % YD^3	Borrow YD^3	Waste YD^3
PHASE 1							
-L-	12+55.65	15+67.50	272		2000	1728	
-L-	16+92.50	19+00.00	77		2276	2199	
		SUB TOTAL	349		4276	3927	
Phase 2 (Remove Ex. Road Bed)							
-L-	14+50.00	16+00.00	1333				1333
-L-	17+00.00	17+50.00	405				405
-L-	19+00.00	19+63.83	294		73		221
		SUB TOTAL	2032		73	0	1959
		PROJECT SUBTOTAL	**2381**		**4349**	**3927**	**1959**
Lost due to Clearing and Grubbing			-50			50	
		PROJECT TOTAL	**2331**		**4349**	**3977**	**1959**
Estimate 5% for topsoil repl.						199	
GRAND TOTALS:			**2331**		**4349**	**4176**	**1959**
SAY:			**2400**			**4200**	

Select Granular Material	200	CY
Additional Undercut	50	CY
Geotextile for Soil Stabilization	100	SY
Shallow Undercut	50	CY
CL IV Stabilization	100	Tons

Approximate quantities only. Unclassified excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".

SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

LINE	Station	Station	LT/RT/CL	SY
- L -	15+19.58	16+20.62	LT	200.22
- L -	16+56.18	18+45.50	LT	373.67
			TOTAL:	573.89
			SAY:	580

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

GUARDRAIL SUMMARY

LINE	BEG. STA.	END STA.	LOC.	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPR. END	WARRANT POINT TRAIL. END	"N" DIST. FROM E.O.L.	TOTAL SHOULDER WIDTH	FLARE LENGTH APPR. END	FLARE LENGTH TRAIL. END	W APPR. END	W TRAIL. END	ANCHORS XI MOD	ANCHORS TYPE III	ANCHORS GRAU 350	ANCHORS TEMP. GRAU-350	ANCHORS AT-1	ANCHORS CAT-1	ANCHORS VI MOD	IMP. ATTEN. TYPE 350 EA	IMP. ATTEN. TYPE 350 G	IMP. ATTEN. TYPE 350 NG	REMOVE EXISTING GUARDRAIL	REMARKS
-L-	14+25.98	15+63.08	LT	137.10				15+63.08	5	8	68.35		1.000			1	1								278	
-L-	13+96.52	15+71.92	RT	175.40			15+71.52		5	8		106.65		1.000		1	1								247	
-L-	16+88.08	18+00.98	LT	112.90			16+88.08		5	8		44.15		1.000		1	1								61	
-L-	16+96.92	18+33.02	RT	136.10				18+33.02	5	8	67.35		1.000			1	1								101	
		SUBTOTAL		561.50												4	4								687	
		B-77 4 @ 18.75		-75.00																						
		GRAU 350 4 @ 50.00		-200.00																						
		TOTAL		286.50																						
		SAY		**287.50**												4	4									
ADDITIONAL GUARDRAIL POSTS = 3																										

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

STATION	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	C.S. PIPE (UNLESS NOTED OTHERWISE) 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	CLASS III R.C. PIPE (UNLESS OTHERWISE NOTED) 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. YARDS R.C.P.	C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0' THRU 5.0')	"TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B')" LIN. FT. A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29	T.B.D.I. STD. 840.35	15" CS Pipe Elbows	REMOVAL (LF)	REMARKS
13+55.20	RT	1																									28																					
15+19.34	RT	2		2736.65																																	1							1	1			TBDI W/ N.S. Flat Grate
15+19.34	RT	2	3		2733.90	2725.59											32																													2		
17+97.37	CL	4			2744.00	2735.00																					100																				58	18' CMP
TOTAL																	32										128										1							1	1	2	58	

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

11/17/11

PROJECT REFERENCE NO.	SHEET NO.
B-4406	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 007521 ENGINEER JAMES S. WANG — 1-27-12

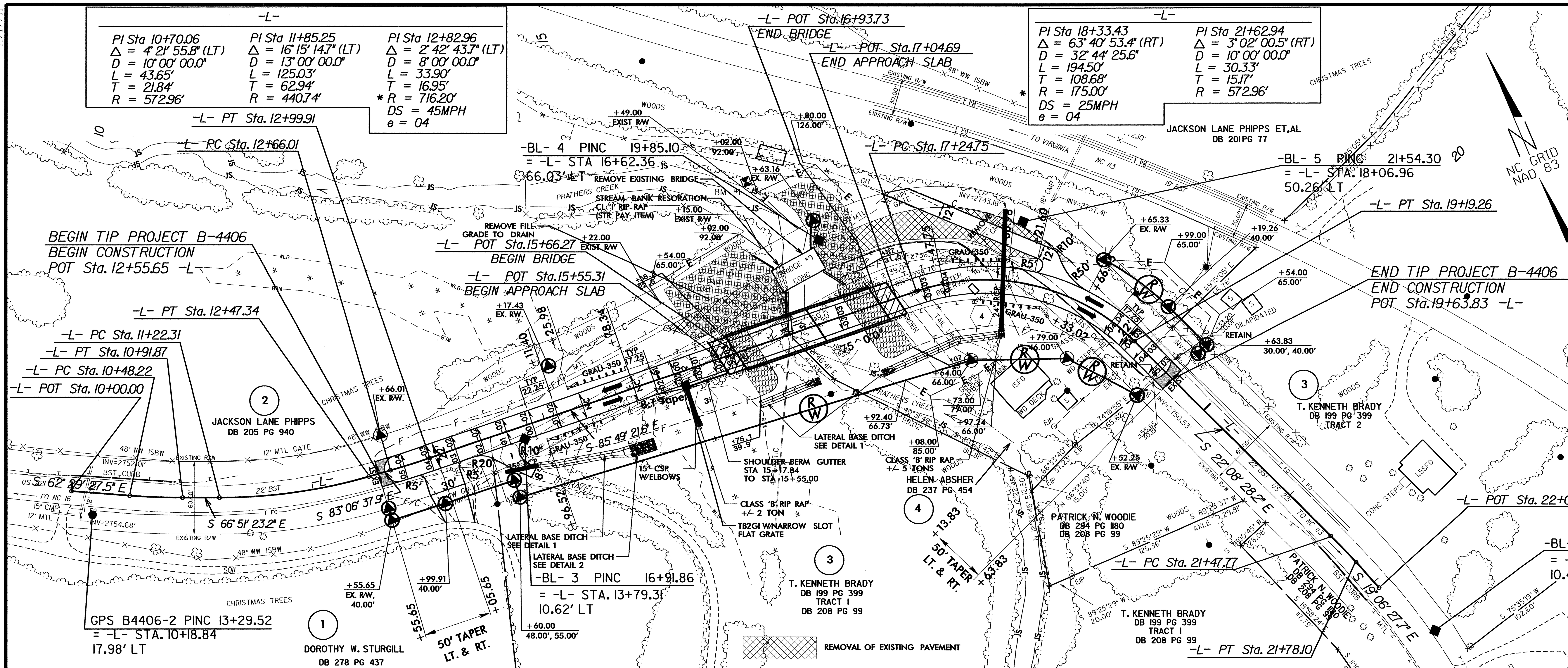
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 028392 ENGINEER — 1/27/12

-L-

PI Sta 10+70.06	PI Sta 11+85.25	PI Sta 12+82.96
Δ = 4° 21' 55.8" (LT)	Δ = 16° 15' 14.7" (LT)	Δ = 2° 42' 43.7" (LT)
D = 10° 00' 00.0"	D = 13° 00' 00.0"	D = 8° 00' 00.0"
L = 43.65'	L = 125.03'	L = 33.90'
T = 21.84'	T = 62.94'	T = 16.95'
R = 572.96'	R = 440.74'	* R = 716.20'
		DS = 45MPH
		e = .04

-L-

PI Sta 18+33.43	PI Sta 21+62.94
Δ = 63° 40' 53.4" (RT)	Δ = 3° 02' 00.5" (RT)
D = 32° 44' 25.6"	D = 10° 00' 00.0"
L = 194.50'	L = 30.33'
T = 108.68'	T = 15.17'
R = 175.00'	R = 572.96'
DS = 25MPH	
e = .04	



DETAIL 1
LATERAL BASE DITCH
(Not to Scale)

Natural Ground; Filter Fabric; Fill Slope; 1'/Ft.
Min. I= Ft.
Max. I= Ft.
B= 2 Ft.
b= 5 Ft.

Type of Liner= Class B Rip-Rap

FROM -L- STA. 13+80 TO -L- STA. 14+60 Rt
FROM -L- STA. 15+72 TO -L- STA. 16+25 RT
FROM -L- STA. 16+85 TO -L- STA. 18+00 RT

DETAIL 2
LATERAL BASE DITCH
(Not to Scale)

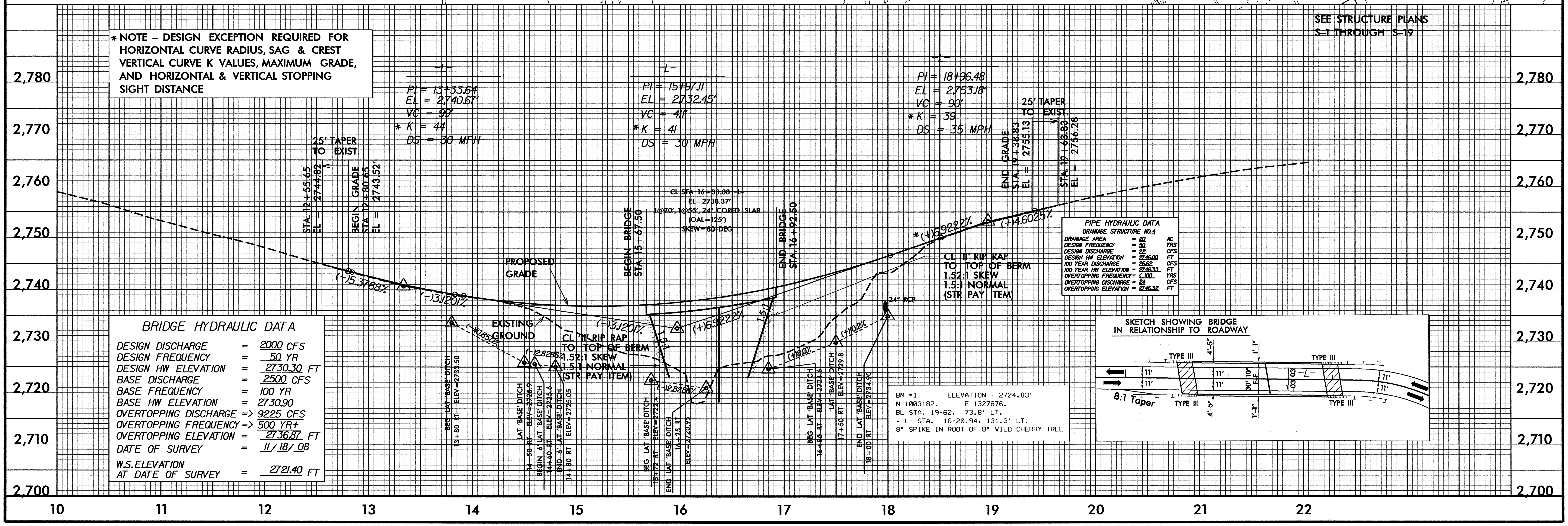
Natural Ground; Filter Fabric; Fill Slope; 1'/Ft.
Min. I= Ft.
Max. I= Ft.
B= 6 Ft.
b= 5 Ft.

Type of Liner= Class B Rip-Rap

FROM -L- STA. 14+60 TO -L- STA. 14+80 RT

* NOTE – DESIGN EXCEPTION REQUIRED FOR HORIZONTAL CURVE RADIUS, SAG & CREST VERTICAL CURVE K VALUES, MAXIMUM GRADE, AND HORIZONTAL & VERTICAL STOPPING SIGHT DISTANCE

SEE STRUCTURE PLANS S-1 THROUGH S-19



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	2000 CFS
DESIGN FREQUENCY	=	50 YR
DESIGN HW ELEVATION	=	2730.30 FT
BASE DISCHARGE	=	2500 CFS
BASE FREQUENCY	=	100 YR
BASE HW ELEVATION	=	2730.90
OVERTOPPING DISCHARGE	=>	9225 CFS
OVERTOPPING FREQUENCY	=>	500 YR+
OVERTOPPING ELEVATION	=	2736.87 FT
DATE OF SURVEY	=	11/18/08
W.S. ELEVATION AT DATE OF SURVEY	=	2721.40 FT

PIPE HYDRAULIC DATA
DRAINAGE STRUCTURE NO. 4

DRAINAGE AREA	=	20	AC
DESIGN FREQUENCY	=	50	YRS
DESIGN DISCHARGE	=	22	CFS
DESIGN HW ELEVATION	=	2746.00	FT
100 YEAR DISCHARGE	=	26.62	CFS
100 YEAR HW ELEVATION	=	2746.33	FT
OVERTOPPING FREQUENCY	=	< 100	YRS
OVERTOPPING DISCHARGE	=	24	CFS
OVERTOPPING ELEVATION	=	2746.32	FT

BM *1 ELEVATION = 2724.83'
N 1003182. E 1327876.
BL STA. 19+62, 73.8' LT.
=-L- STA. 16+20.94, 131.3' LT.
8" SPIKE IN ROOT OF 8" WILD CHERRY TREE