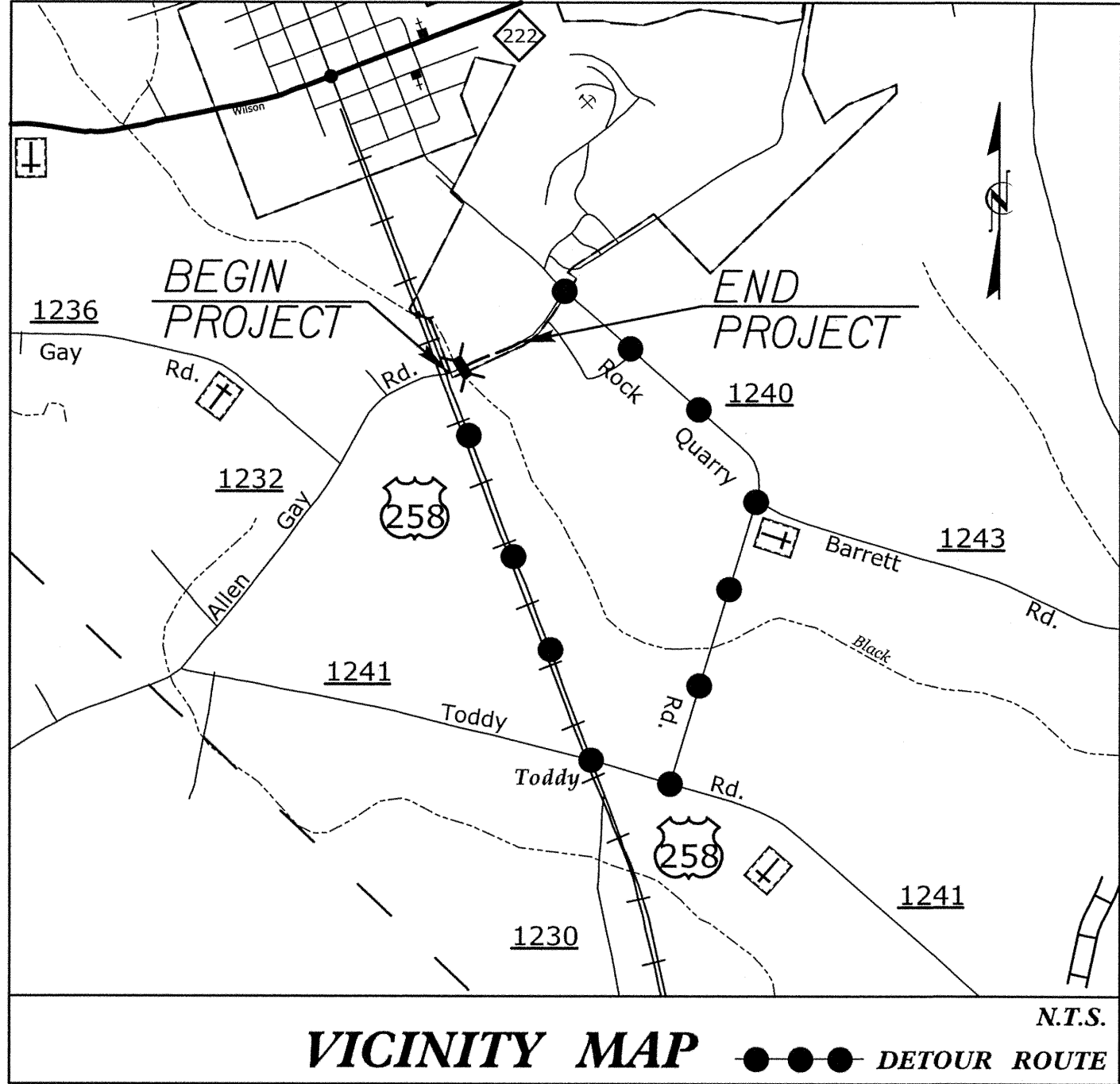


TIP PROJECT: 41665.5A

CONTRACT:

See Sheet 1-A For Index of Sheets



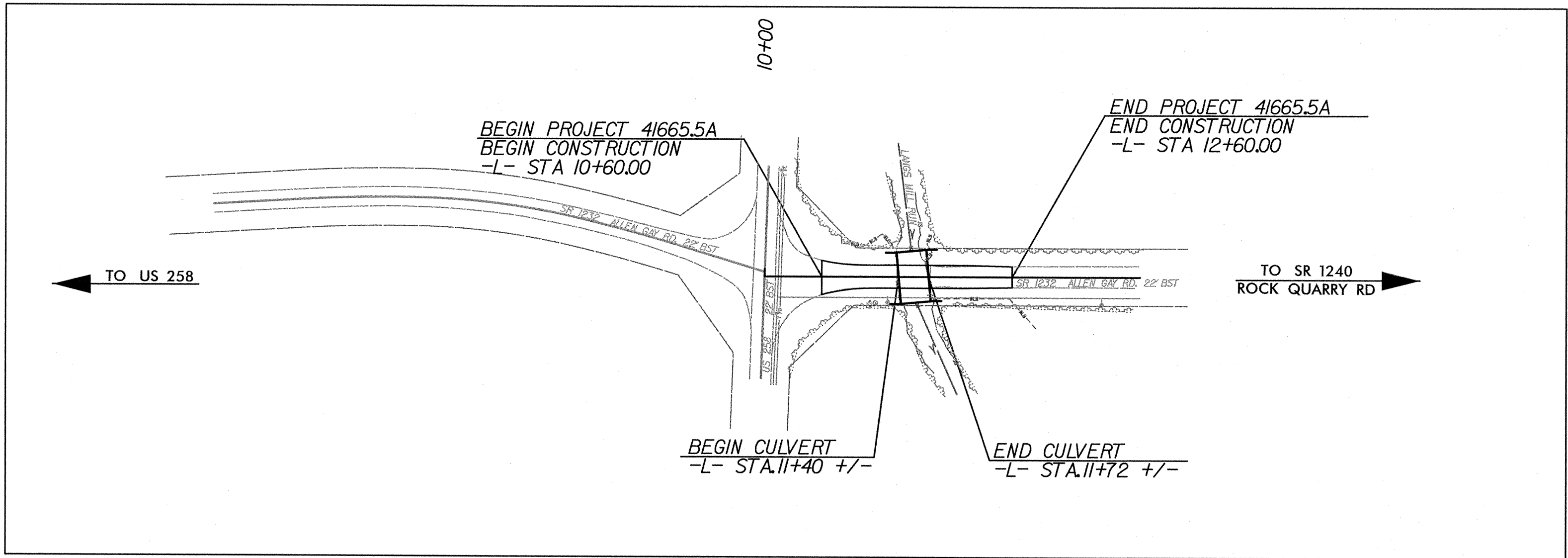
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PITT COUNTY

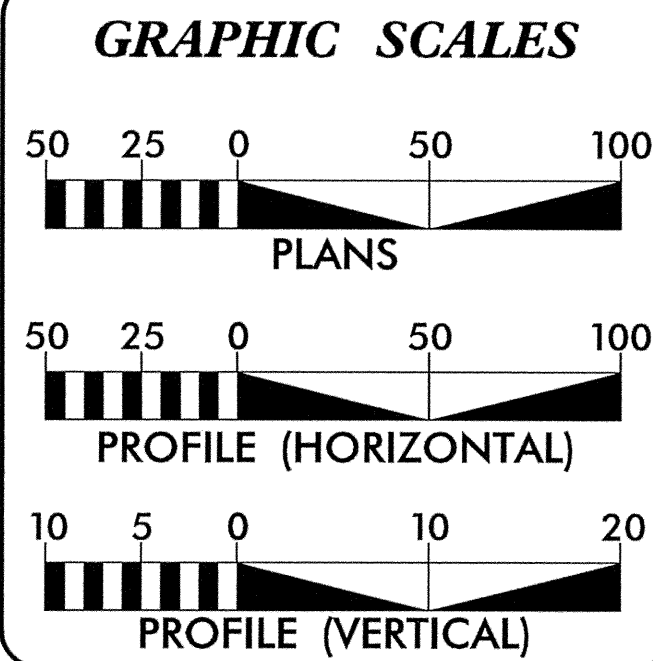
LOCATION: BRIDGE NO. 223 OVER LANGS MILL RUN
ON SR 1232 (ALLEN GAY RD.)

TYPE OF WORK: GRADING, PAVING, DRAINAGE & CULVERT

STATE	PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
NC	41665.5A	1	X
STATE PROJ. NO.		DESCRIPTION	
41665.5A		CONST	



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



DESIGN DATA	
ADT 2005 = 900	
ADT 2035 = 1800	
DHV = 10%	
D = 60%	
T = 6% *	
V = 60 MPH	
* TTST 2%	DUAL 4%

PROJECT LENGTH	
LENGTH OF ROADWAY TIP PROJECT 41665.5A =	0.032 MI.
LENGTH OF STRUCTURE TIP PROJECT 41665.5A =	0.006 MI.
TOTAL LENGTH OF TIP PROJECT 41665.5A =	0.038 MI.

Prepared In the Office of:

HNTB

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
APRIL 25, 2013

LETTING DATE:
JULY 24, 2013

ENRICO A. ROQUE, P.E.
PROJECT ENGINEER

ANTHONY THOMPSON, P.E.
PROJECT DESIGNER

MARIA ROGERSON, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

ROADWAY DESIGN ENGINEER

SEAL 15764

SEAL 19824

7-2-13

7/2/13

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

P.E.

REVISIONS

7/1/2013 4:59:57 PM
...\\Proj\\T30223_rdy_gen.dgn

INDEX OF SHEETS

SHEET NUMBER	SHEET
I	TITLE SHEET
I-A	INDEX OF SHEETS, GENERAL NOTES & LIST OF STANDARDS
I-B	SYMBOLGY SHEET
2	TYPICAL SECTION SHEET
3	EARTHWORK, PAVEMENT REMOVAL, & ROW SUMMARY
4	PLAN & PROFILE SHEET
TMP-1 THRU TMP-2	TRAFFIC CONTROL PLANS
EC-1	EROSION CONTROL TITLE SHEET
EC-2	EROSION CONTROL - COIR FIBER WATTLE DETAIL
EC-3	EROSION CONTROL - SOIL STABILIZATION TIME FRAMES
EC-4	EROSION CONTROL - PLAN SHEET
EC-5	EROSION CONTROL SHEETS - CULVERT PHASING
P-1	PERMIT DRAWING
X-1 THRU X-3	-L- CROSS SECTION SHEETS
UO-1 THRU UO-2	UTILITIES BY OTHERS
UC-1 THRU UC-4	UTILITY CONSTRUCTION PLANS

GENERAL NOTES:

2012 SPECIFICATIONS
EFFECTIVE: 01-17-2012
REVISED: 07-30-2012

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04
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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

Power - Town of Farmville

Water - Town of Fountain

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.
UTILITIES BY OTHERS PLANS INCLUDED IN THE PROJECT.)
RIGHT-OF-WAY MARKERS:

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

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	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I

DIVISION 8 - INCIDENTALS
876.01 Rip Rap in Channels

EFF. 01-17-2012
REV. 10-30-2012

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

PROJECT REFERENCE NO.	SHEET NO.
41665.5A	1-B

BOUNDARIES AND PROPERTY:

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin	
Property Corner	
Property Monument	
Parcel/Sequence Number	
Existing Fence Line	
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Barbed Wire Fence	
Existing Wetland Boundary	
Proposed Wetland Boundary	
Existing Endangered Animal Boundary	
Existing Endangered Plant Boundary	

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY:

Baseline Control Point	
Existing Right of Way Marker	
Existing Right of Way Line	
Proposed Right of Way Line	
Proposed Right of Way Line with Iron Pin and Cap Marker	
Proposed Right of Way Line with Concrete or Granite Marker	
Existing Control of Access	
Proposed Control of Access	
Existing Easement Line	
Proposed Temporary Construction Easement	
Proposed Temporary Drainage Easement	
Proposed Permanent Drainage Easement	
Proposed Permanent Utility Easement	

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
Proposed Slope Stakes Fill	
Proposed Wheel Chair Ramp	
Proposed Wheel Chair Ramp Curb Cut	
Curb Cut for Future Wheel Chair Ramp	
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	

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	
MINOR:	
Head and End Wall	
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	
Paved Ditch Gutter	
Storm Sewer Manhole	
Storm Sewer	

UTILITIES:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

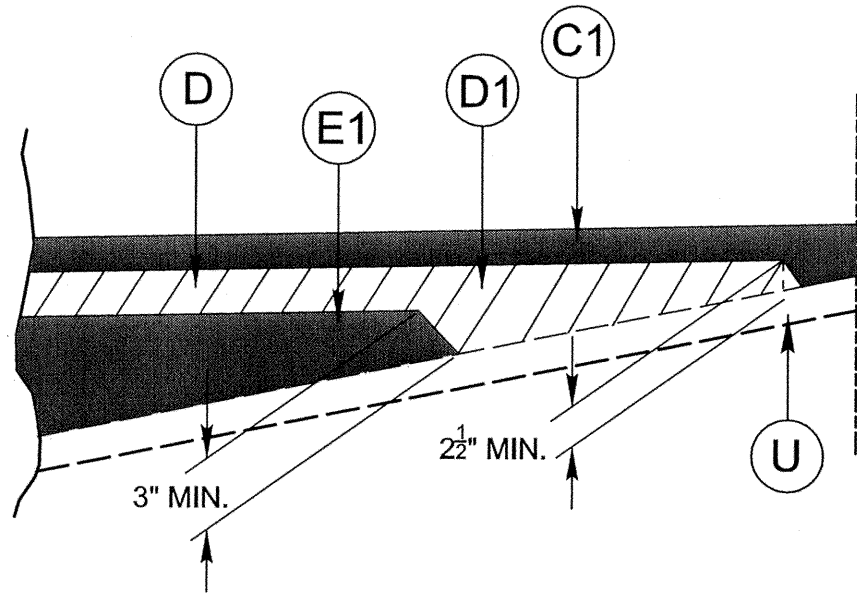
Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
Recorded SS Forced Main Line	
Designated SS Forced Main Line (S.U.E.*)	

MISCELLANEOUS:

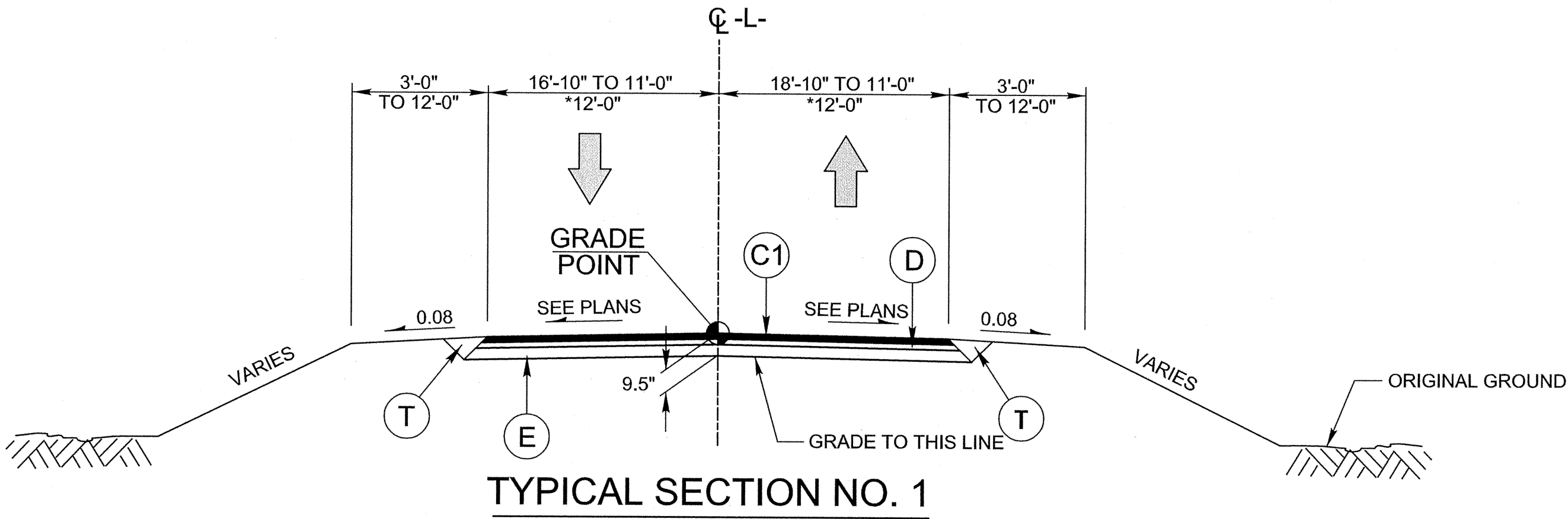
Utility Pole	
Utility Pole with Base	
Utility Located Object	
Utility Traffic Signal Box	
Utility Unknown U/G Line	
U/G Tank; Water, Gas, Oil	
A/G Tank; Water, Gas, Oil	
U/G Test Hole (S.U.E.*)	
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.
D	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D1	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 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YARD.
E1	PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER INCH DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING (SEE DETAIL)

ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE



DETAIL SHOWING METHOD OF WEDGING
SEE TYPICAL SECTIONS



USE TYPICAL SECTION NO. 1 FROM:
-L- STA. 10+60.00 TO -L- STA. 11+10.00
* -L- STA. 11+10.00 TO -L- STA. 12+10.00
-L- STA. 12+10.00 TO -L- STA. 12+60.00

[Not to Scale]

DETAIL A

CULVERT CHANNEL IMPROVEMENTS (UPSTREAM)

D

Culvert Bed (Existing)

2.1 Meters

1.0 Meter

Natural Ground

Gravel

Coir Fiber Matting w/ Seed Mix

EST. 50 CY EXCAVATION

D= Varies (To Top of Bank)

DETAIL B

**CULVERT CHANNEL IMPROVEMENTS
(DOWNSTREAM)**

(Not to Scale)

Natural Ground

2:1 Max.

D

2:1 Min.

Class I Riprap

1.5' Min.

Natural Ground

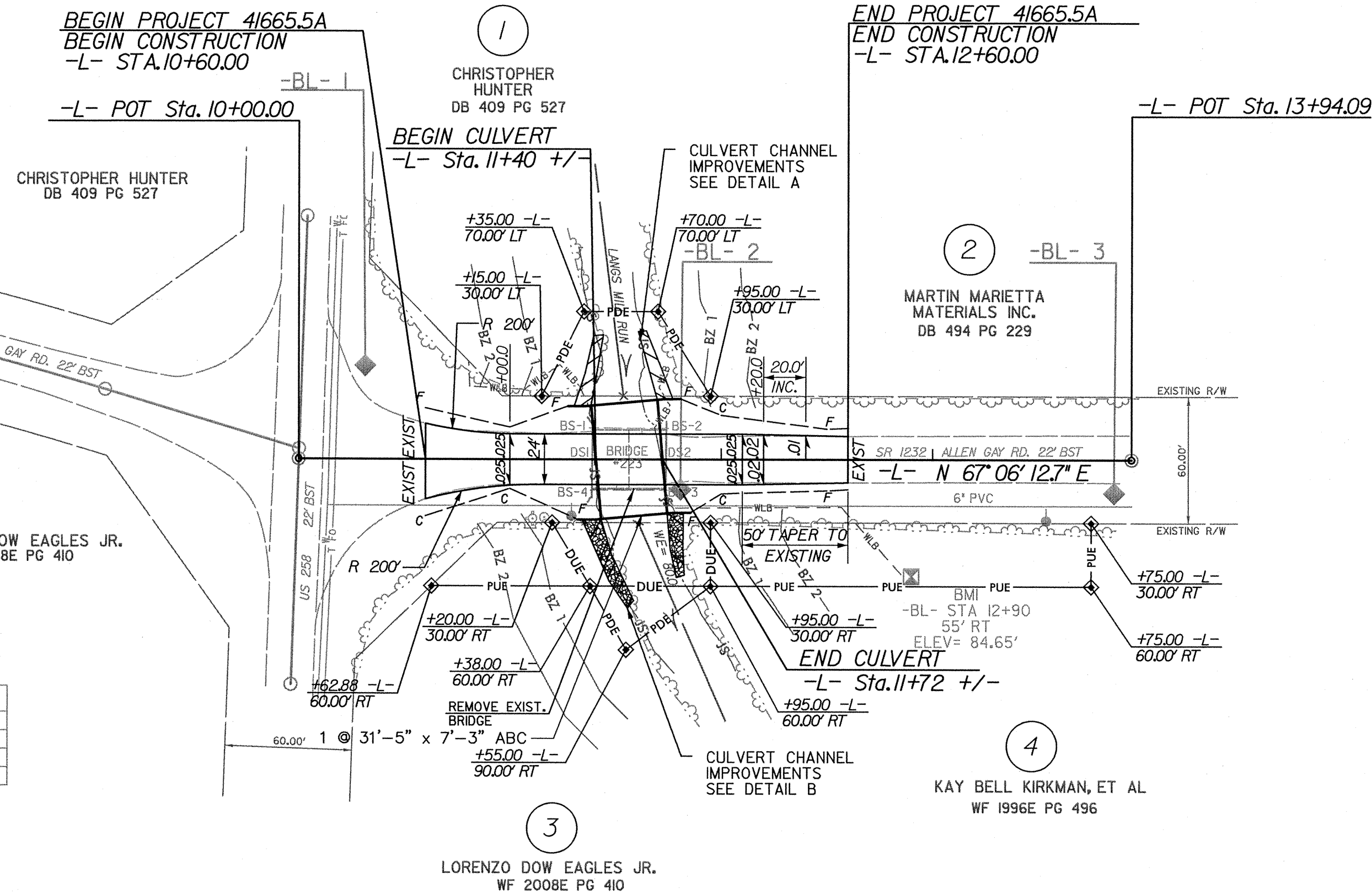
Channel Bed (Variable)

EST. 80 CY EXCAVATION
EST. 40 TONS CLASS I RIPRAP
EST. 85 SY GEOTEXTILE FABRIC

(D = Varies (To Top of Bank))

Point	North	East	Elevation	Description
1	699133.29	2405509.75	82.87	BL-1
2	699137.36	2405670.08	83.73	BL-2
3	699215.72	2405859.56	84.43	BL-3
BMI	699142.17	2405786.65	84.65	RR SPIKE IN 24' PINE TREE

Point	North	East	Elevation	Description
B51	699148.36	2405620.98	82.65	BRIDGE SEAT #1
B52	699161.40	2405651.69	82.63	BRIDGE SEAT #2
B53	699133.83	2405663.31	82.63	BRIDGE SEAT #3
B54	699120.74	2405632.52	82.66	BRIDGE SEAT #4
D51	699134.38	2405626.07	84.06	CL SHOT & DECK END
D52	699147.94	2405658.19	84.06	CL SHOT & DECK END



THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
NCDOT FOR MONUMENT "AZ1"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 699584.671(±ft) EASTING: 2406624.901(±ft)
ELEVATION: 93.666(±ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.999899550
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"AZ1" TO -L- STATION 10+00.00 IS
S 65° 53' 14.77" W 1,234.6092 (FT)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

PROFILE

BEGIN GRADE
L= STA. 10+60.00
EL. 83.67'

END GRADE
L= STA. 12+60.00
EL. 83.89'

WS. EL.= 79.90'
08/17/12 SURVEY

(+).01100%

(+).01100%

1 @ 3'-5" x 7'-3"
ALUMINUM BOX CULVERT

DESIGN DISCHARGE	= 600	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 82.0	FT
BASE DISCHARGE	= 1031	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 84.14	FT
OVERTOPPING DISCHARGE	= 830	CFS
OVERTOPPING FREQUENCY	= 100 (-)	YRS
OVERTOPPING ELEVATION	= 83.67	FT
DATE OF SURVEY	= 8/17/12	
W.S.ELEVATION AT DATE OF SURVEY	= 79.90	FT

DESIGN DISCHARGE	=	600	CFS
DESIGN FREQUENCY	=	25	YRS
DESIGN HW ELEVATION	=	82.0	FT
BASE DISCHARGE	=	1031	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	84.4	FT
OVERTOPPING DISCHARGE	=	830	CFS
OVERTOPPING FREQUENCY	=	100 (-)	YRS
OVERTOPPING ELEVATION	=	83.67	FT

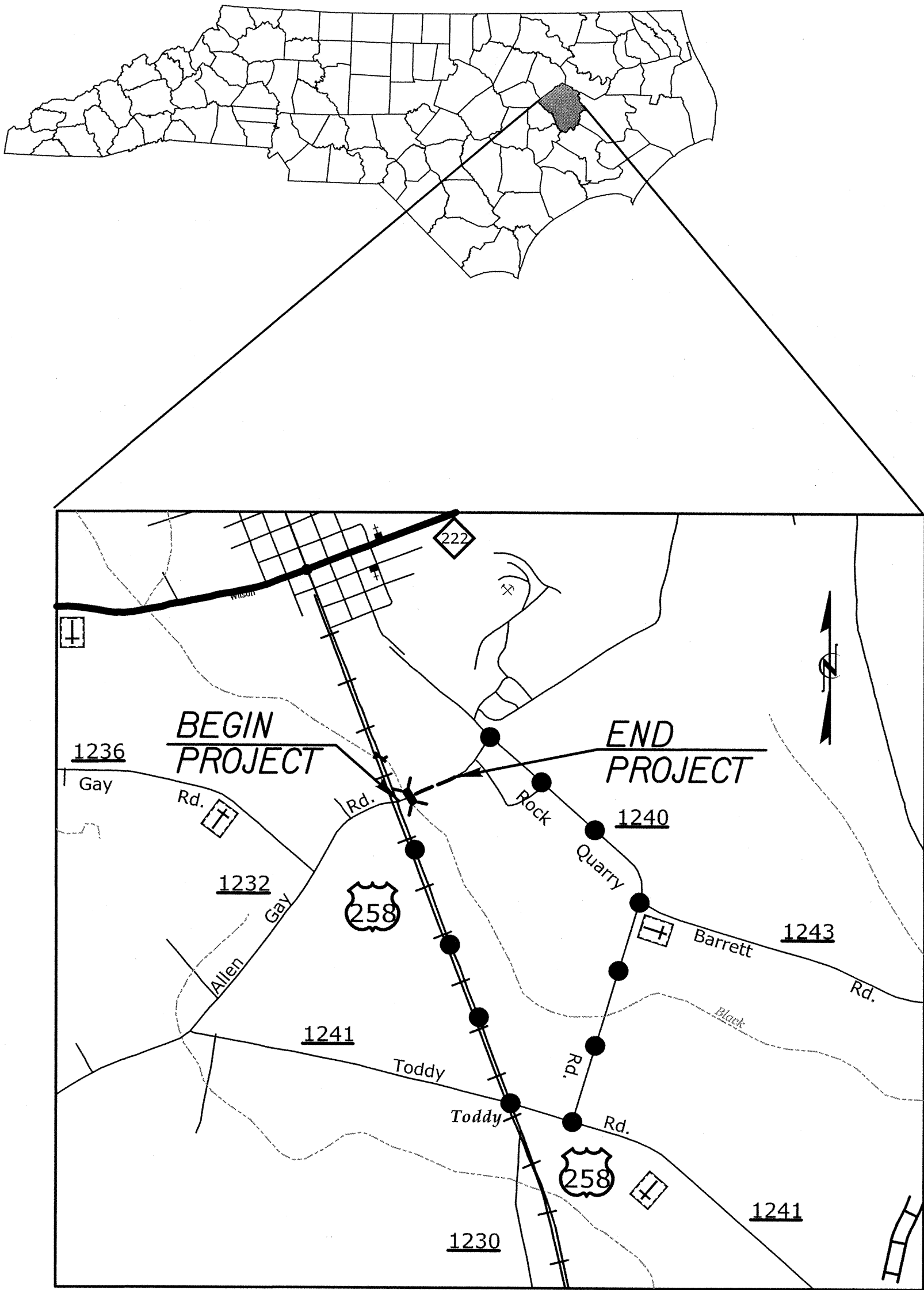
DATE OF SURVEY	= 8/17/12	
W.S.ELEVATION AT DATE OF SURVEY	= 79.90	FT

REVISIONS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

PITT COUNTY



INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET WITH VICINTY MAP, INDEX OF SHEETS, LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-2	GENERAL NOTES, DETOUR AND PLAN.

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C. DATED JAN 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

TITLE	
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.11	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES

LEGEND

- GENERAL
- DIRECTION OF TRAFFIC FLOW
 - DIRECTION OF PEDESTRIAN TRAFFIC FLOW
 - EXIST. PVMT.
 - NORTH ARROW
 - PROPOSED PVMT.
 - WORK AREA
- TRAFFIC CONTROL DEVICES
- BARRICADE (TYPE III)

HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

R. B. EARLY, PE TRAFFIC CONTROL PROJECT ENGINEER
J. A. PHILLIPS TRAFFIC CONTROL DESIGN ENGINEER

APPROVED: *[Signature]*
DATE: 7-1-13

SEAL

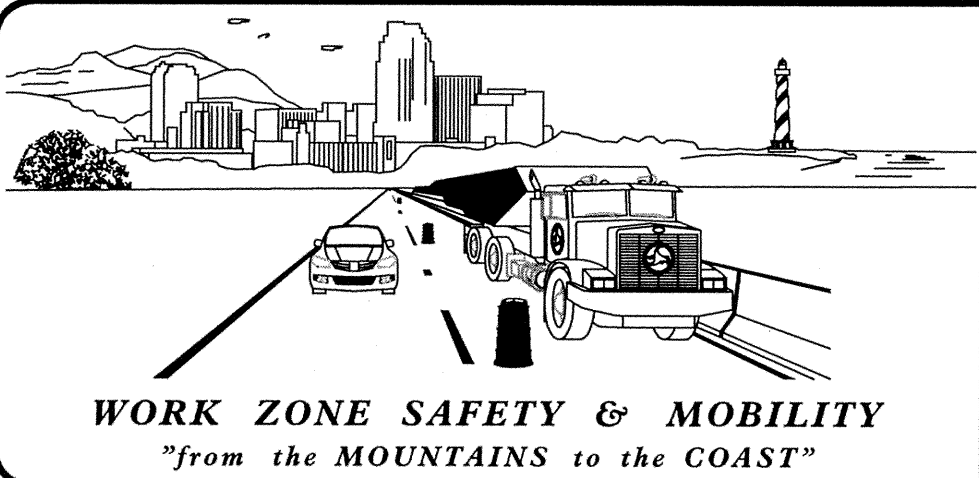


SHEET NO.
TMP-1

41665.5A

TIP PROJECT:

3:01:30 PM
\\p01nc\BR223-TC-TCP-01-title.dgn
\$\$\$\$\$USERNAME\$\$\$\$\$



N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 773-2800 FAX: (919) 771-2745

KATHERINE HITE, PE DIVISION TRAFFIC ENGINEER



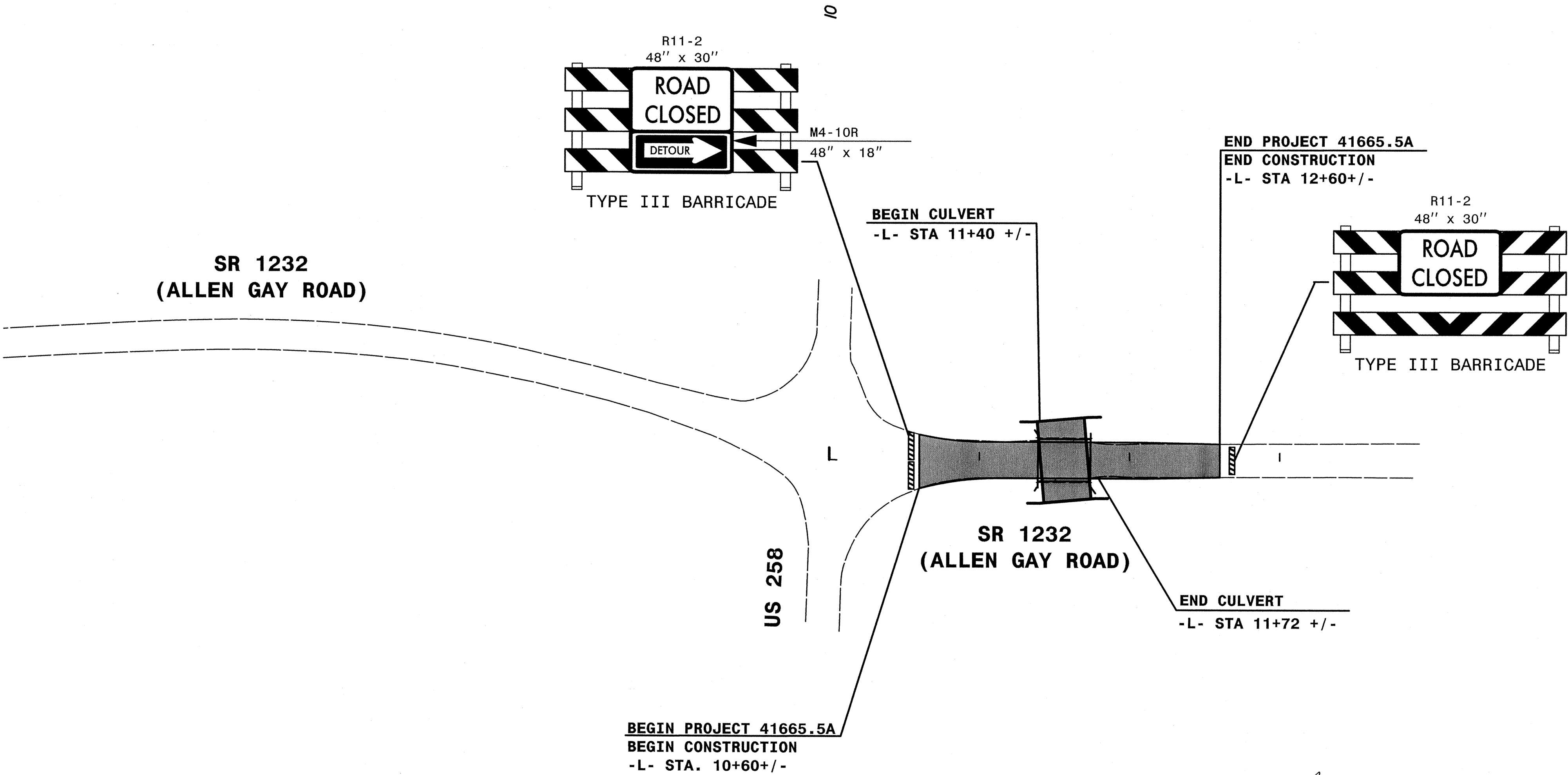
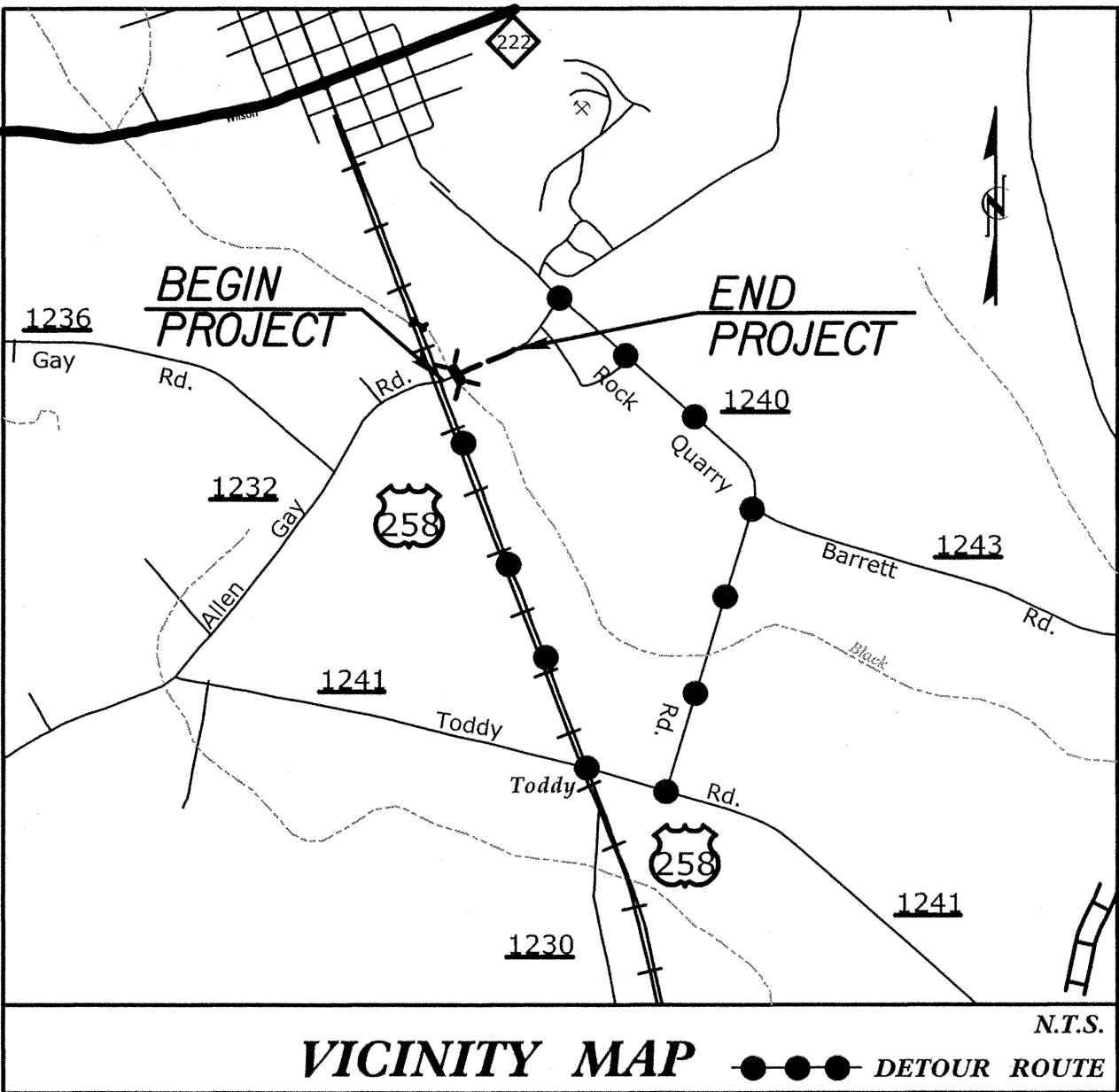
GENERAL NOTES

IMPLEMENT TRAFFIC CONTROL IN ACCORDANCE WITH THE ROADWAY STANDARD DRAWINGS LISTED ON TMP-1.

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS, OR RESULT IN DUPLICATE, OR UNDESIRED OVERLAPPING, OF DEVICES. MODIFICATIONS MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING OR REMOVAL OF DEVICES, AS DIRECTED BY THE ENGINEER.

STATE FORCES WILL INSTALL AND MAINTAIN THE PROJECT DETOUR AND THE TYPE III BARRICADES AT THE PROJECT LIMITS.

STATE FORCES WILL INSTALL MARKINGS AND MARKERS ON THE FINISHED PROJECT. CALL JIM EVANS AT 252-830-3493 FOR COORDINATION.



3:0146 PM 8/17/99
C:\PROJECTS\41665.5A\TOD\TOD.dgn
\$\$\$\$\$US\$EN\$E\$\$\$\$\$

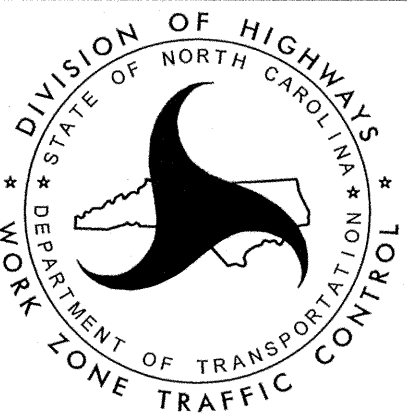
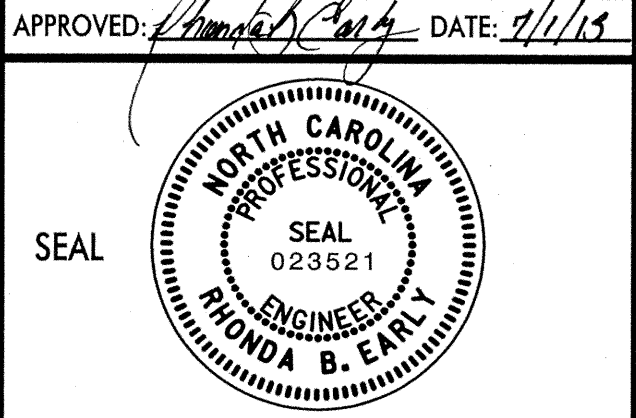
REVISIONS

QA/QC STAGE:

REVIEW: _____
CONCUR: _____
REVISE: _____
VERIFY: _____

HNTB

HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
RALEIGH, NORTH CAROLINA 27609
NC License No: C-1554



TRANSPORTATION
MANAGEMENT PLAN

GENERAL NOTES,
DETOUR
AND DETAIL

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	41665.5A	EC-1	5
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

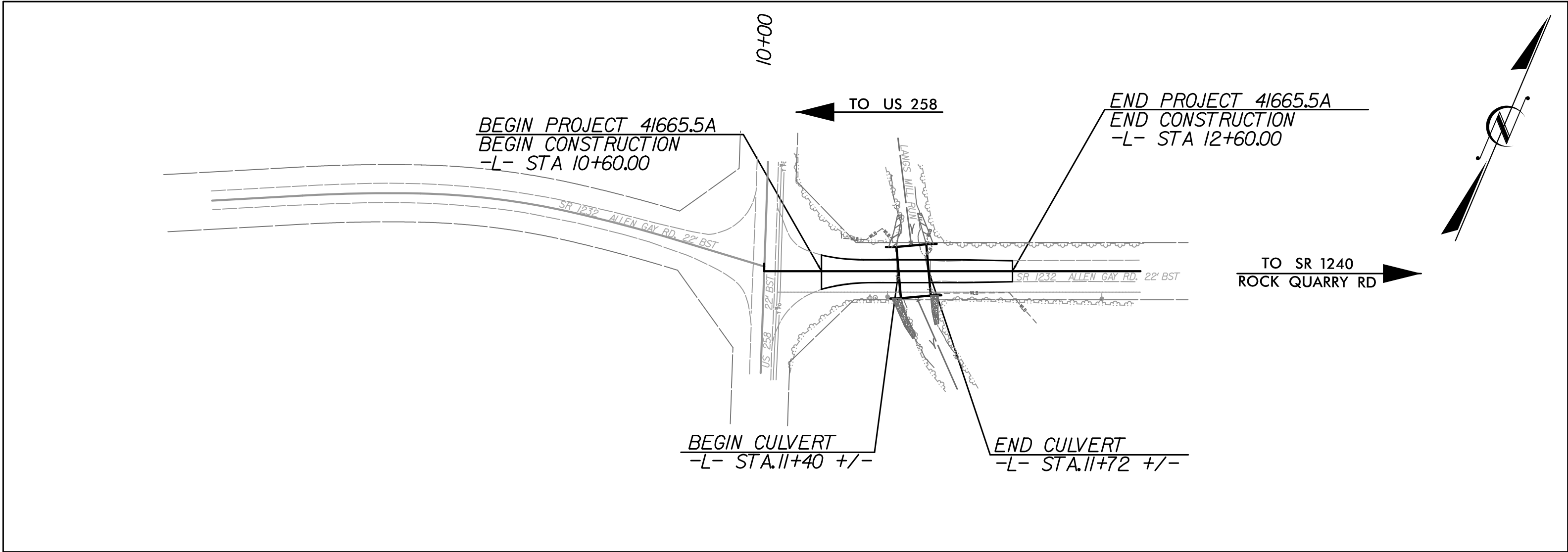
EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch.....	TD
1630.05	Temporary Diversion.....	TD
1605.01	Temporary Silt Fence.....	III III III
1606.01	Special Sediment Control Fence.....	△△△△△△△△△△
1622.01	Temporary Berms and Slope Drains.....	△△△△△△△△△△
1633.01	Temporary Rock Silt Check Type-A.....	▨
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM).....	▨
	Temporary Rock Silt Check Type-B.....	▨
	Wattle / Coir Fiber Wattle.....	⤴
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM).....	⤴
1634.01	Temporary Rock Sediment Dam Type-A.....	▨
1634.02	Temporary Rock Sediment Dam Type-B.....	▨
1635.01	Rock Pipe Inlet Sediment Trap Type-A.....	⤴
1635.02	Rock Pipe Inlet Sediment Trap Type-B.....	⤴
1630.04	Stilling Basin.....	▨
1630.06	Special Stilling Basin.....	▨
	Rock Inlet Sediment Trap:	
1632.01	Type A.....	A
1632.02	Type B.....	B
1632.03	Type C.....	C
	Skimmer Basin.....	▨
	Tiered Skimmer Basin.....	▨
	Infiltration Basin.....	▨

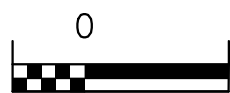
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

LOCATION: PITT COUNTY BRIDGE NO. 223 OVER LANGS MILL RUN
ON SR 1232 (ALLEN GAY RD.)

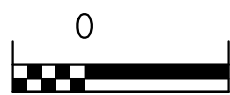
TYPE OF WORK: GRADING, PAVING, DRAINAGE, & CULVERT



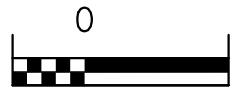
GRAPHIC SCALE



PLANS



PROFILE (HORIZONTAL)



PROFILE (VERTICAL)

ROADSIDE ENVIRONMENTAL UNIT
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared In the Office of:

HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

2012 STANDARD SPECIFICATIONS

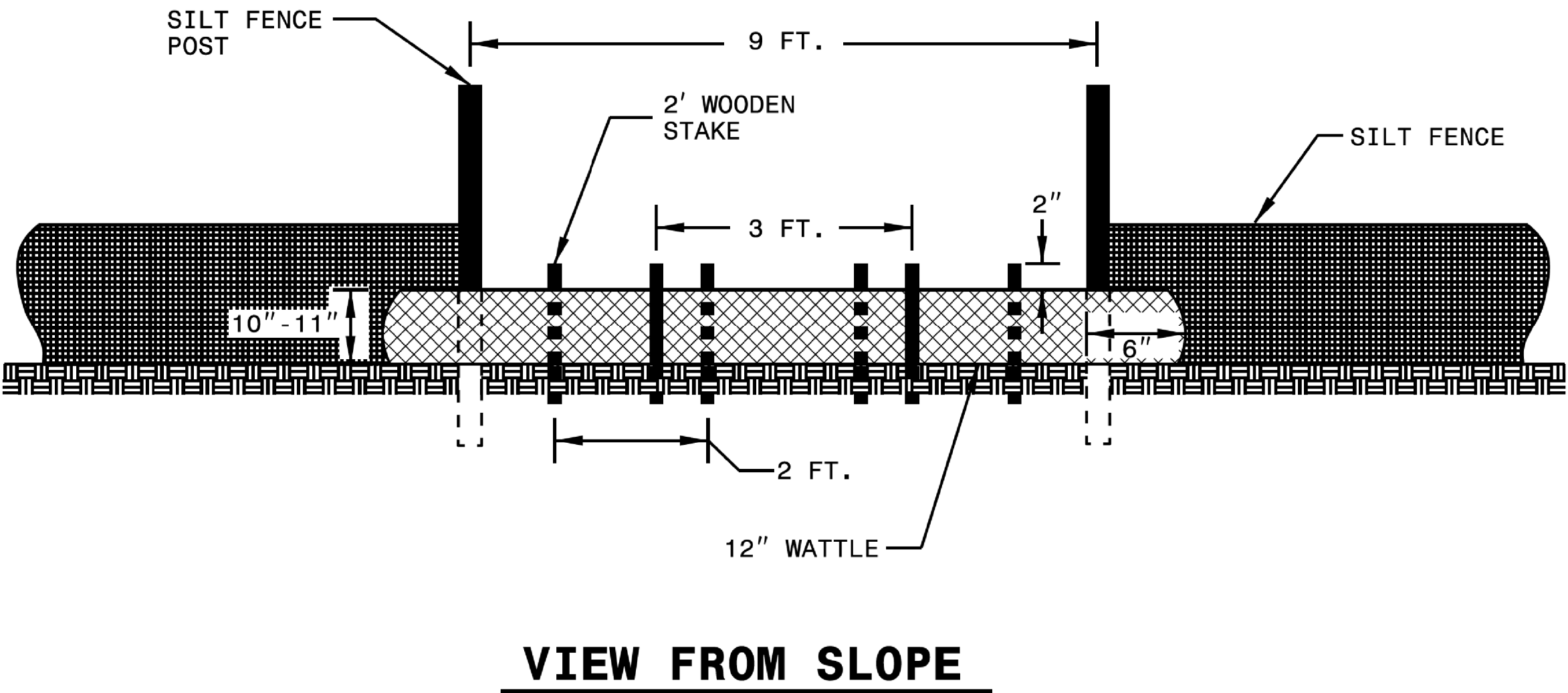
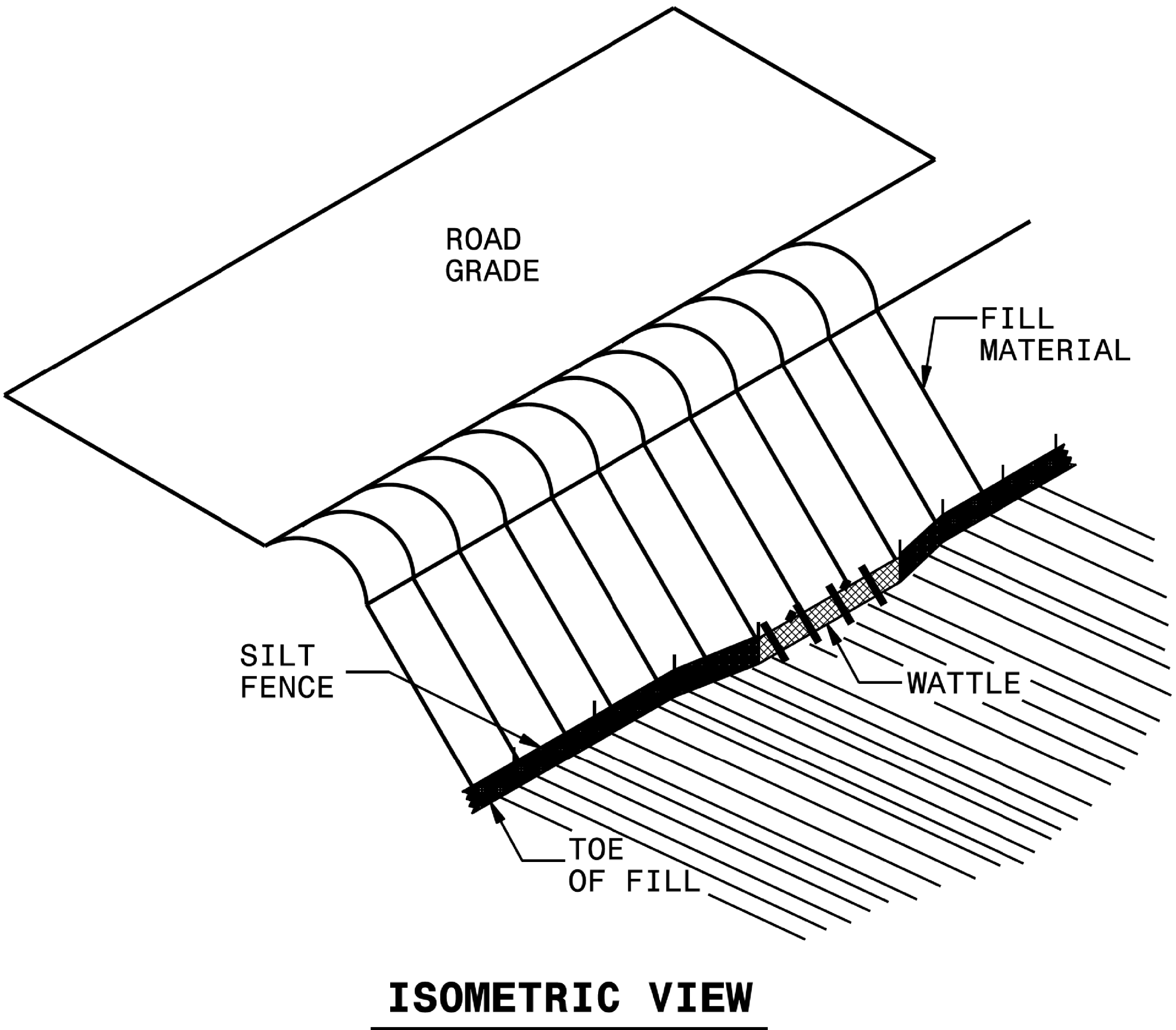
BENTON R. CARROLL, E.I.
EROSION CONTROL
LEVEL III-A
CERTIFICATION #3180

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2012 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

SILT FENCE COIR FIBER WATTLE BREAK DETAIL



NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

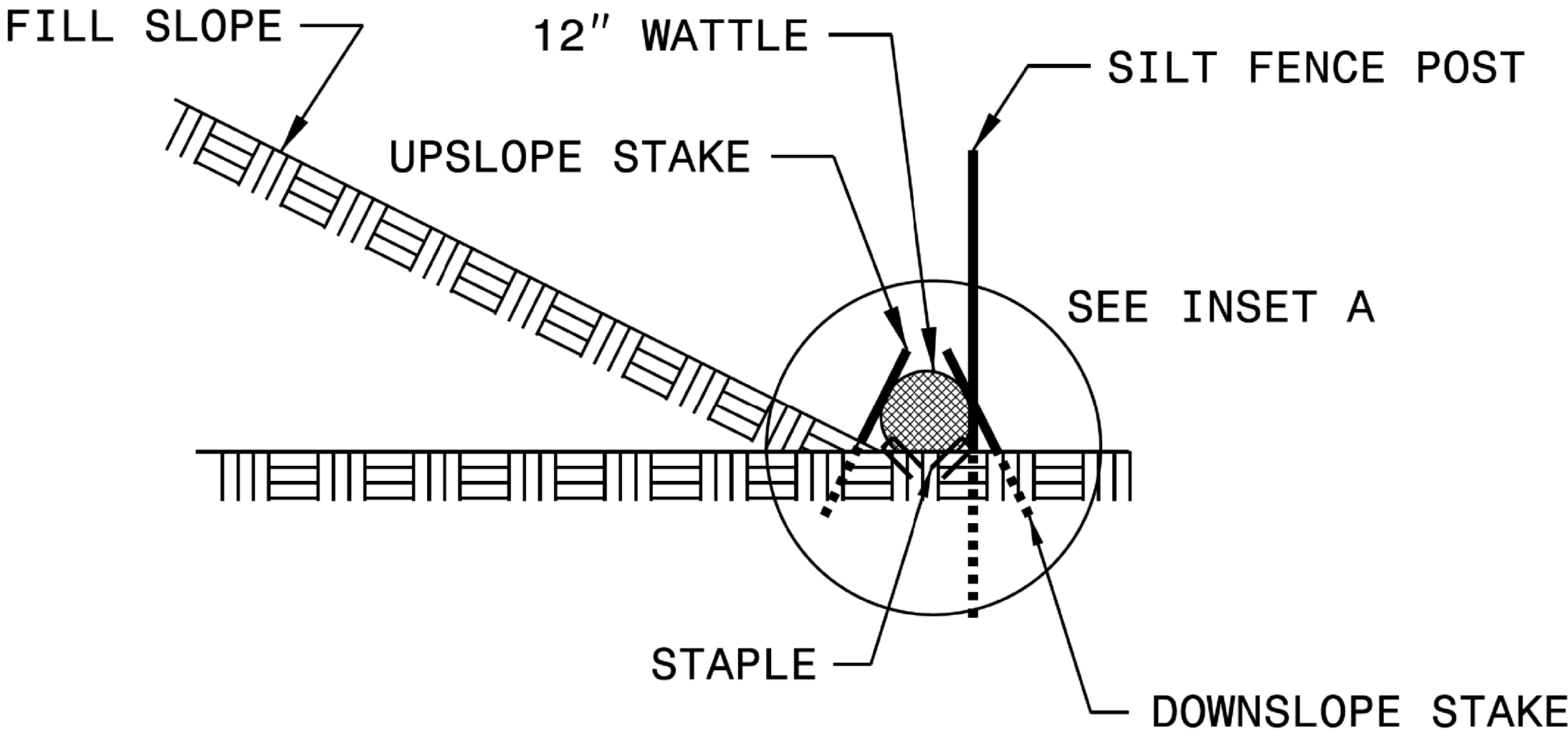
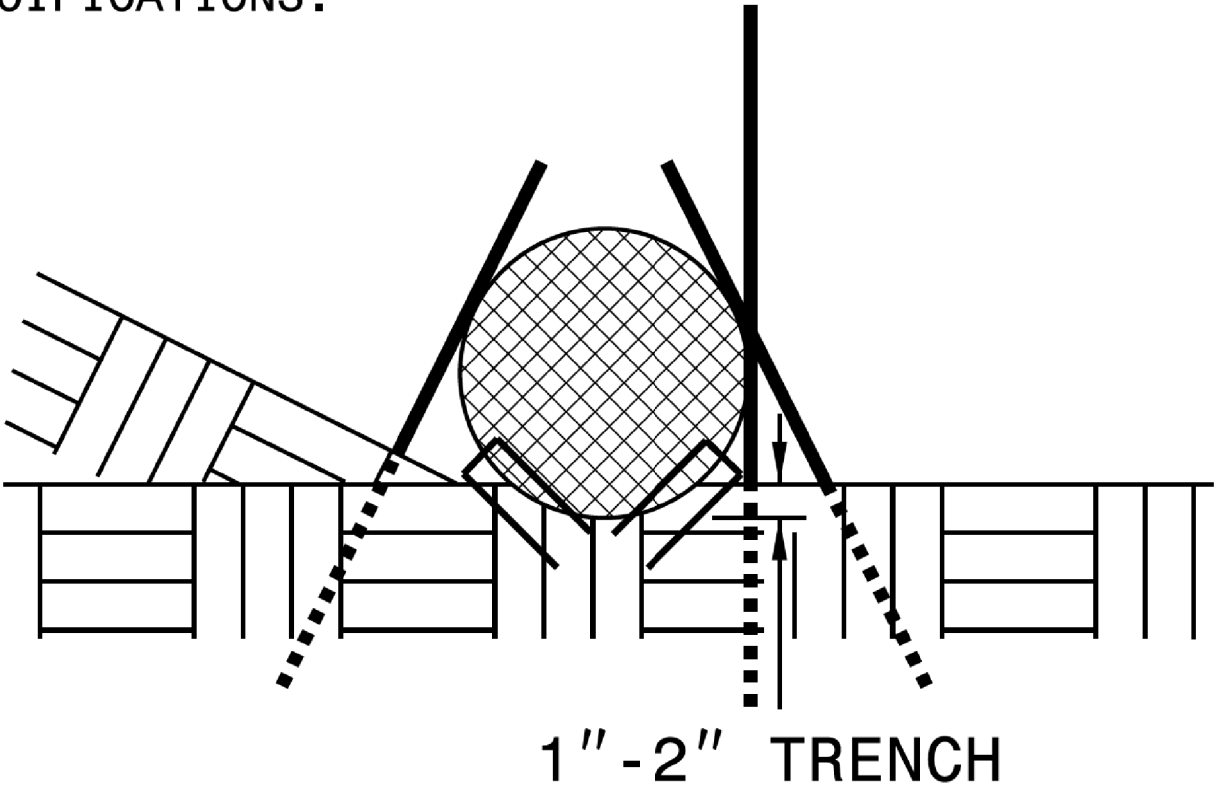
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A



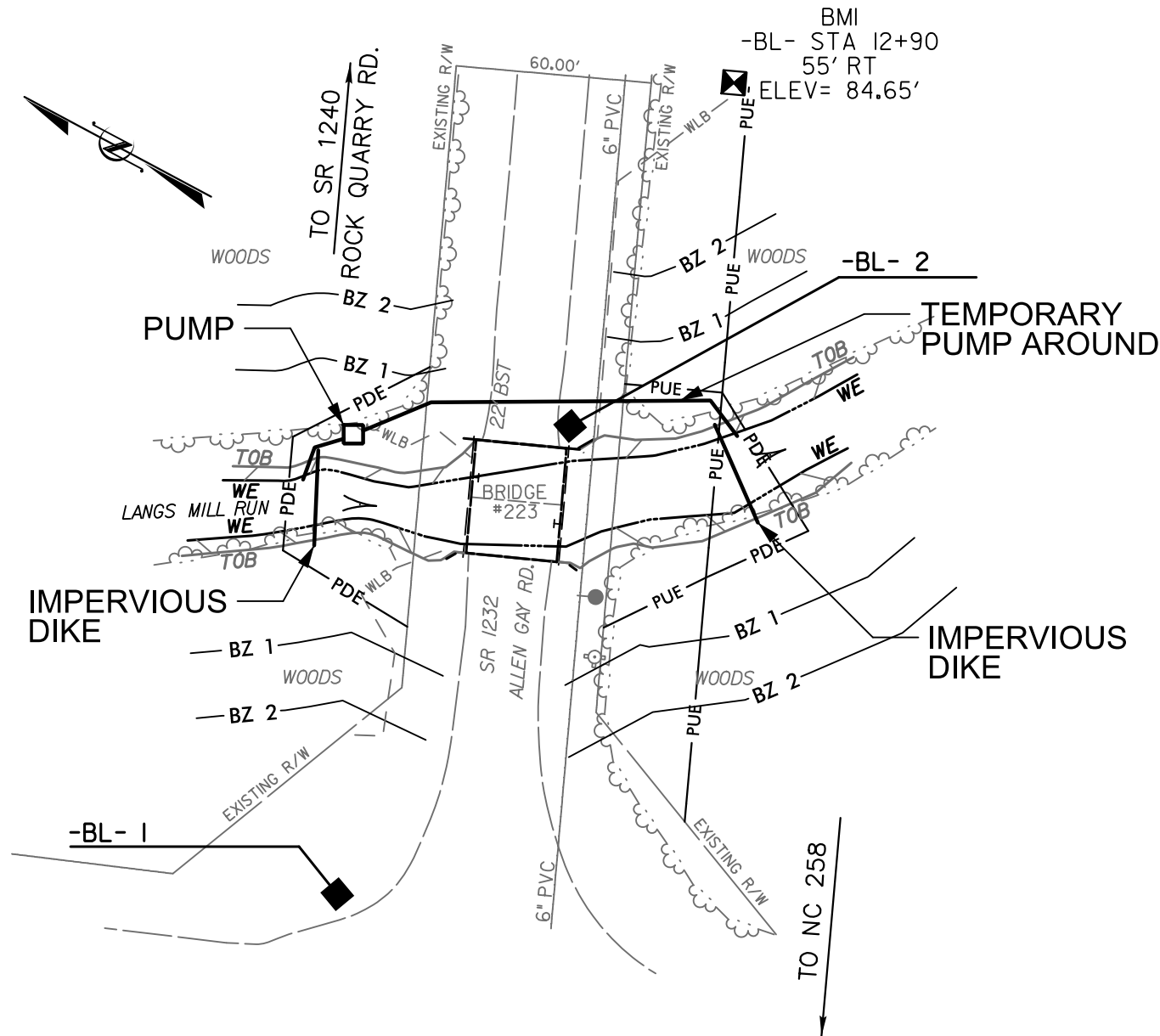
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

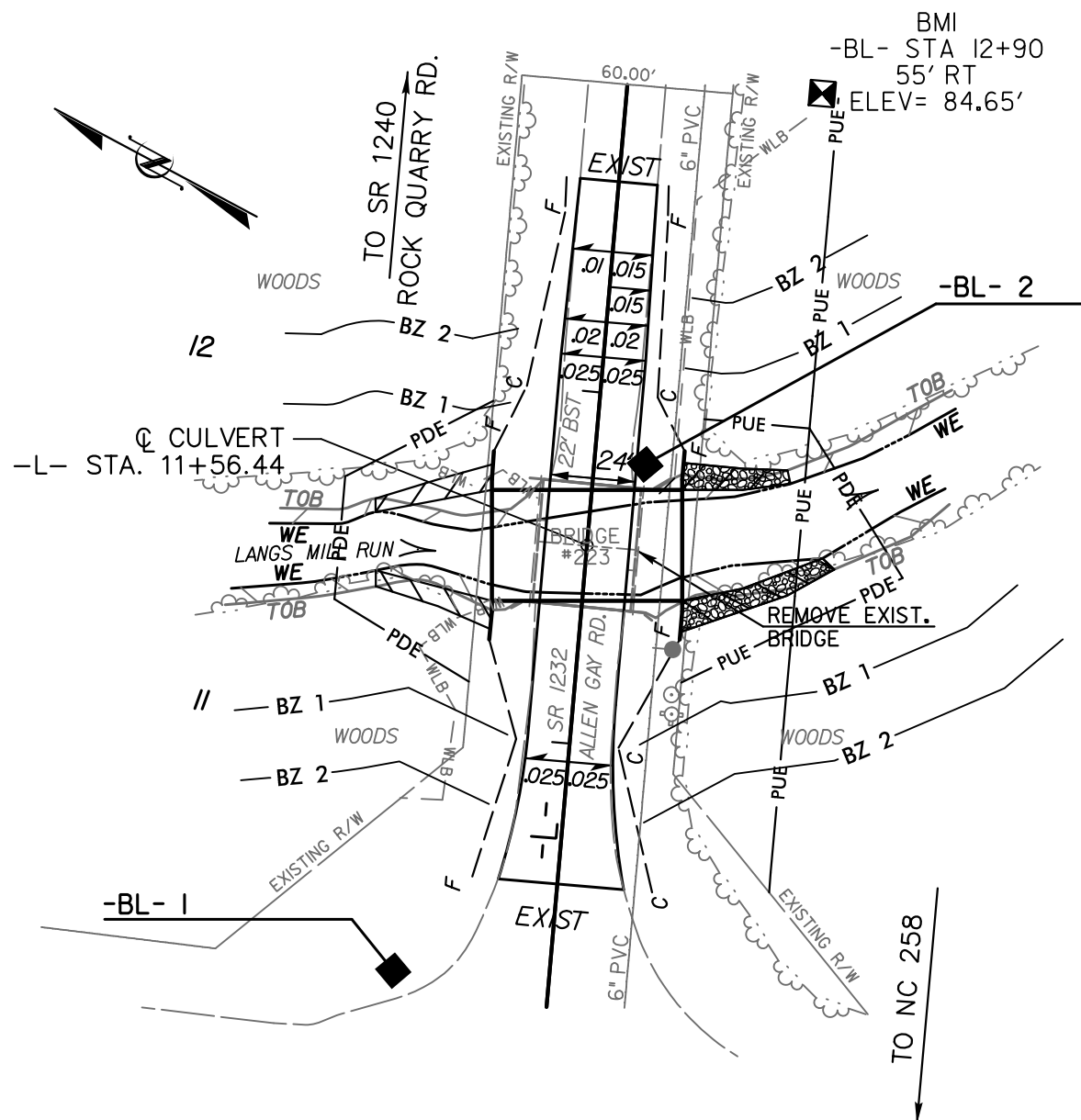
SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (Hqw) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND Hqw ZONES.

41665.5A CULVERT PHASING
LANGS MILL RUN
PITT COUNTY

HNTB <i>HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554</i>	PROJECT REFERENCE NO.		SHEET NO.
	41665.5A		EC-5
	RW SHEET NO.		
	BENTON R. CARROLL E.I. EROSION CONTROL LEVEL III-A CERTIFICATION #3180		



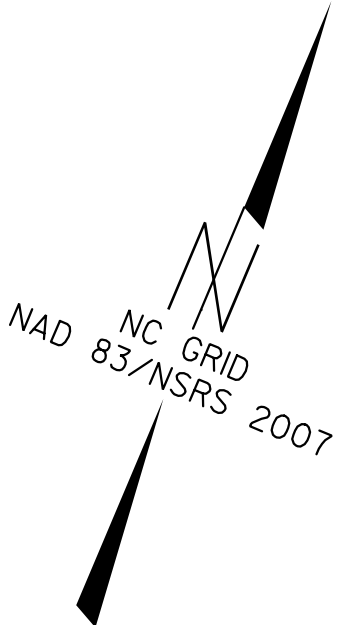
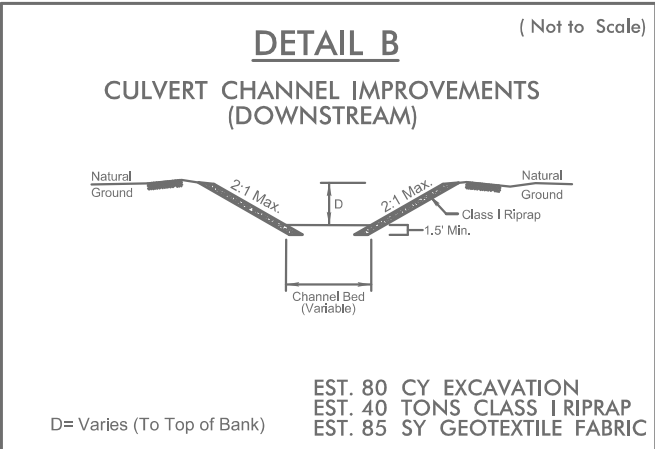
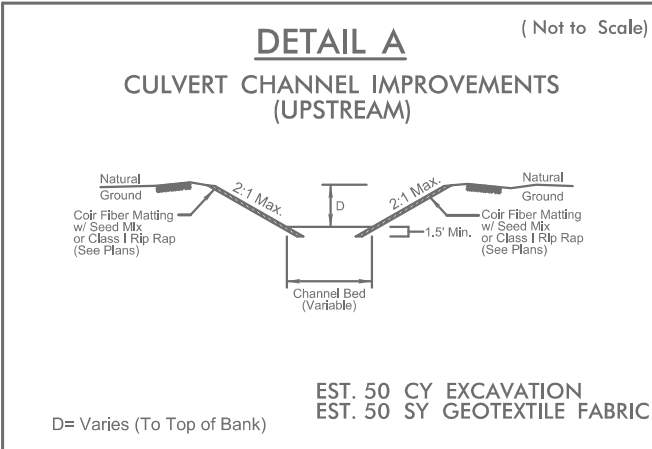
- PHASE I**
1. INSTALL IMPERVIOUS DIKES AS SHOWN.
 2. INSTALL PIPE AND PUMP. THEN PUMP LANGS MILL RUN AROUND CONSTRUCTION AREA.
 3. DEWATER CONSTRUCTION AREA INTO SPECIAL STILLING BASIN(S).



- PHASE II**
1. REMOVE EXISTING BRIDGE IN ITS ENTIRETY.
 2. INSTALL ALUMINUM BOX CULVERT & GRADE CHANNEL. LINE CHANNEL BANKS WITH CLASS I RIP RAP AS SHOWN.
 3. REMOVE IMPERVIOUS DIKES, PUMP AND TEMP. PIPE.

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
41665.5A	P-1
RW SHEET NO.	



10

W1

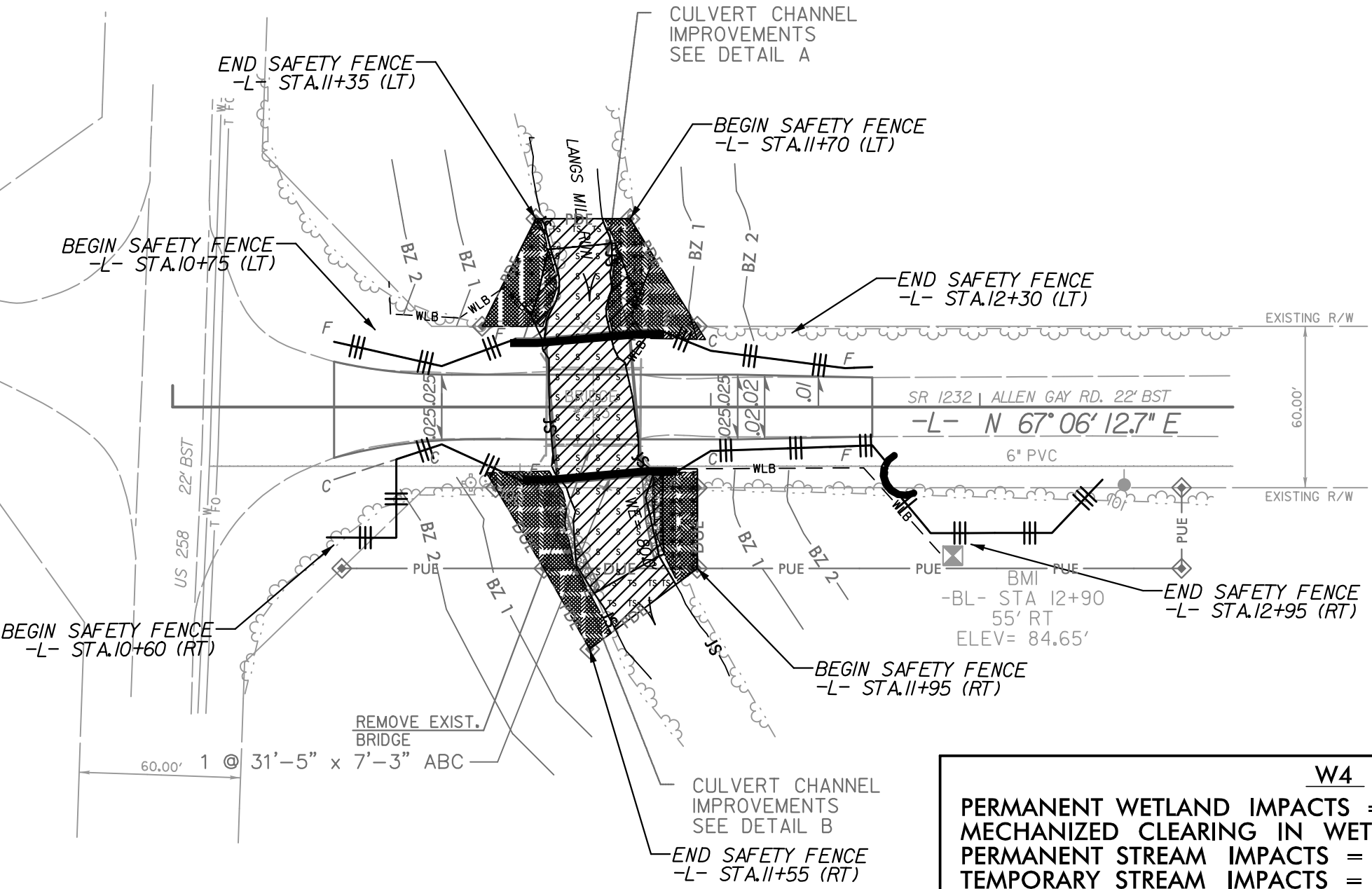
PERMANENT WETLAND IMPACTS = <0.01 Ac /346 SF
MECHANIZED CLEARING IN WETLANDS = <0.01 Ac /263 SF
PERMANENT STREAM IMPACTS = 60 LF
TEMPORARY STREAM IMPACTS = 11 LF
BUFFER ZONE 1 IMPACTS = 911 SF
BUFFER ZONE 2 IMPACTS = 15 SF

W2

PERMANENT WETLAND IMPACTS = 0.01 Ac /170 SF
MECHANIZED CLEARING IN WETLANDS = <0.01 Ac /317 SF
PERMANENT STREAM IMPACTS = 0 LF
TEMPORARY STREAM IMPACTS = 0 LF
BUFFER ZONE 1 IMPACTS = 602 SF
BUFFER ZONE 2 IMPACTS = 0 SF

W3

PERMANENT WETLAND IMPACTS = 0 Ac /0 SF
MECHANIZED CLEARING IN WETLANDS = 0 Ac /0 SF
PERMANENT STREAM IMPACTS = 0 LF
TEMPORARY STREAM IMPACTS = 0 LF
BUFFER ZONE 1 IMPACTS = 993 SF
BUFFER ZONE 2 IMPACTS = 0 SF



W4

PERMANENT WETLAND IMPACTS = <0.01 Ac /144 SF
MECHANIZED CLEARING IN WETLANDS = 0.01 Ac /499 SF
PERMANENT STREAM IMPACTS = 65 LF
TEMPORARY STREAM IMPACTS = 14 LF
BUFFER ZONE 1 IMPACTS = 561 SF
BUFFER ZONE 2 IMPACTS = 0 SF

IMPACT SUMMARY:

404 WETLAND IMPACTS = 0.06 AC
PERMANENT STREAM IMPACTS = 125 LF
TEMPORARY STREAM IMPACT = 25 LF
BUFFER ZONE 1 IMPACT = 3067 SF
BUFFER ZONE 2 IMPACT = 15 SF

LEGEND	
	ALLOWABLE IMPACTS ZONE 1
	ALLOWABLE IMPACTS ZONE 2
	DENOTES EXCAVATION IN WETLAND
	DENOTES MECHANIZED CLEARING
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NCDOT
41665.5A PITT COUNTY
REPLACE BRIDGE NO. 223
SR 1232 (ALLEN GAY RD.)
OVER LANGS MILL RUN
BETWEEN US 258
AND SR 1240

SCALE: 1" = 50'
6/17/13
FOR PERMITTING ONLY:
NOT FOR CONSTRUCTION

02/03/98

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
41665.5A	X-1	3

Note: Approximate quantities only. Unclassified Excavation, Borrow 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."

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY
IN CUBIC YARDS

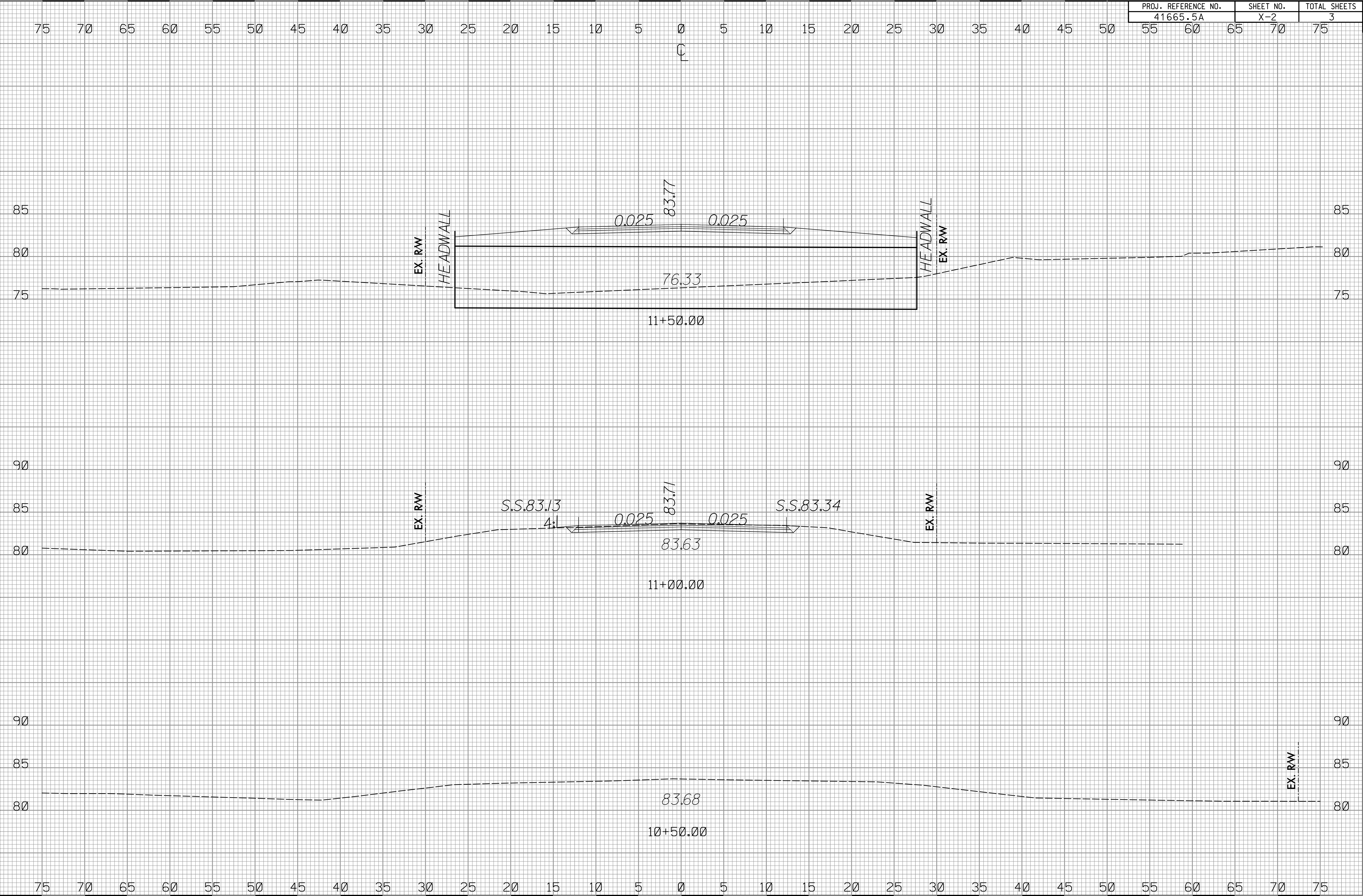
NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

STATION	UNCLASSIFIED EXCAVATION	EMBANK.	UNDERCUT
-L- STA. 10 + 50.00	0	0	0
-L- STA. 11 + 00.00	28	0	0
-L- STA. 11 + 50.00	41	139	0
-L- STA. 12 + 00.00	33	141	0
-L- STA. 12 + 50.00	44	0	0
-L- STA. 13 + 00.00	7	0	0

02/03/98

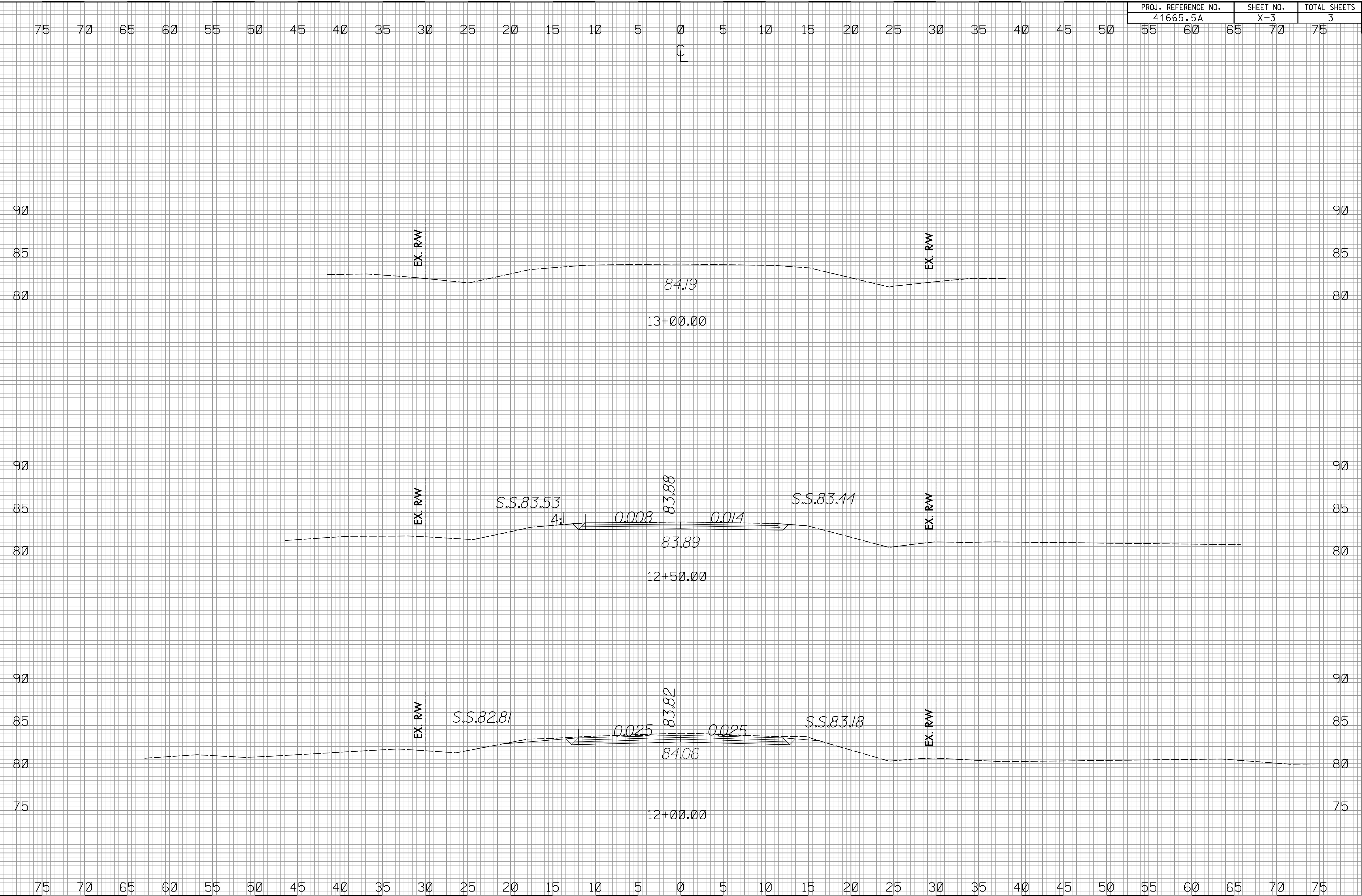
02/03/98

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
41665.5A	X-2	3

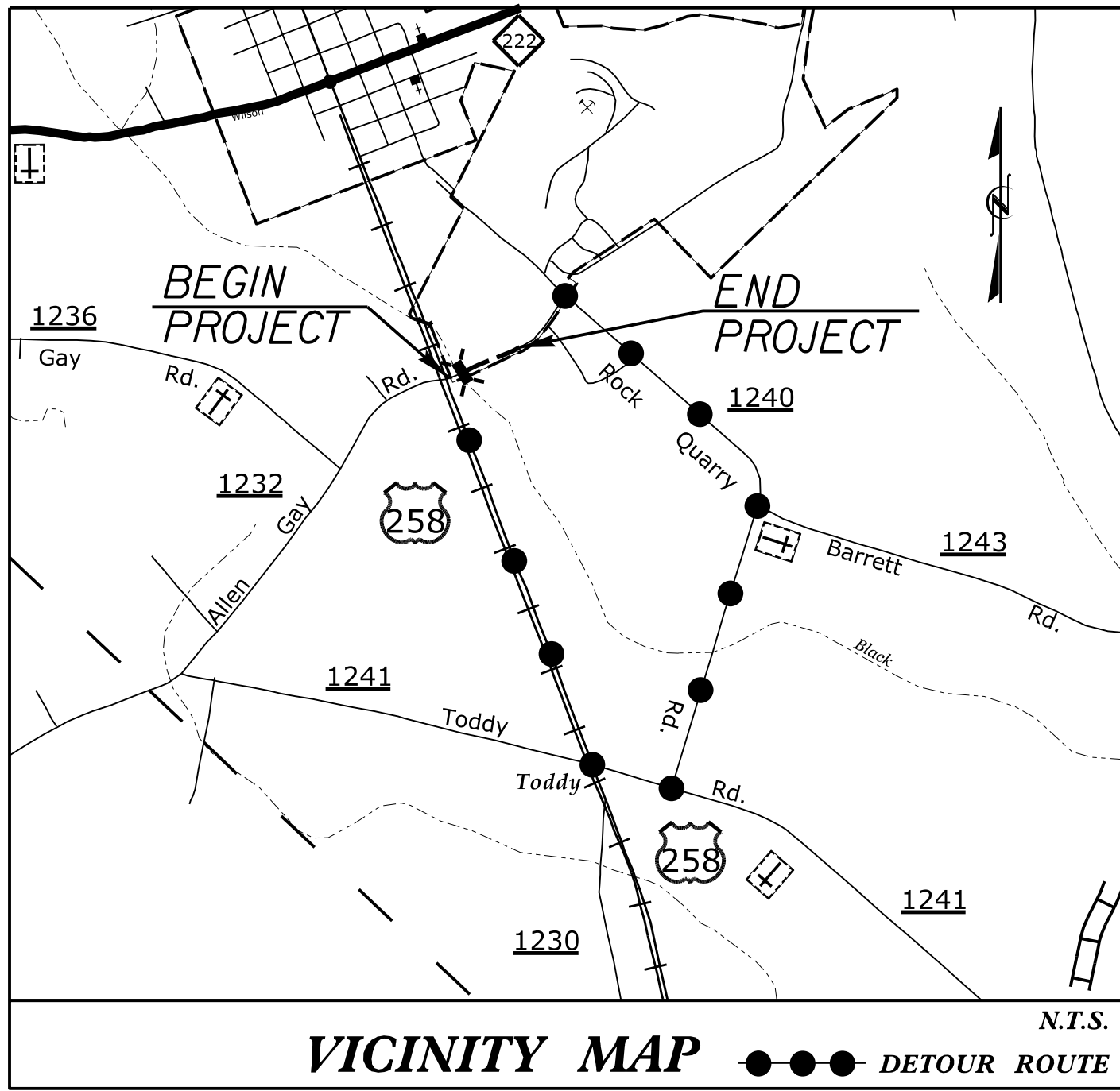


02/03/98

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
41665.5A	X-3	3



TIP PROJECT: 41665.5A



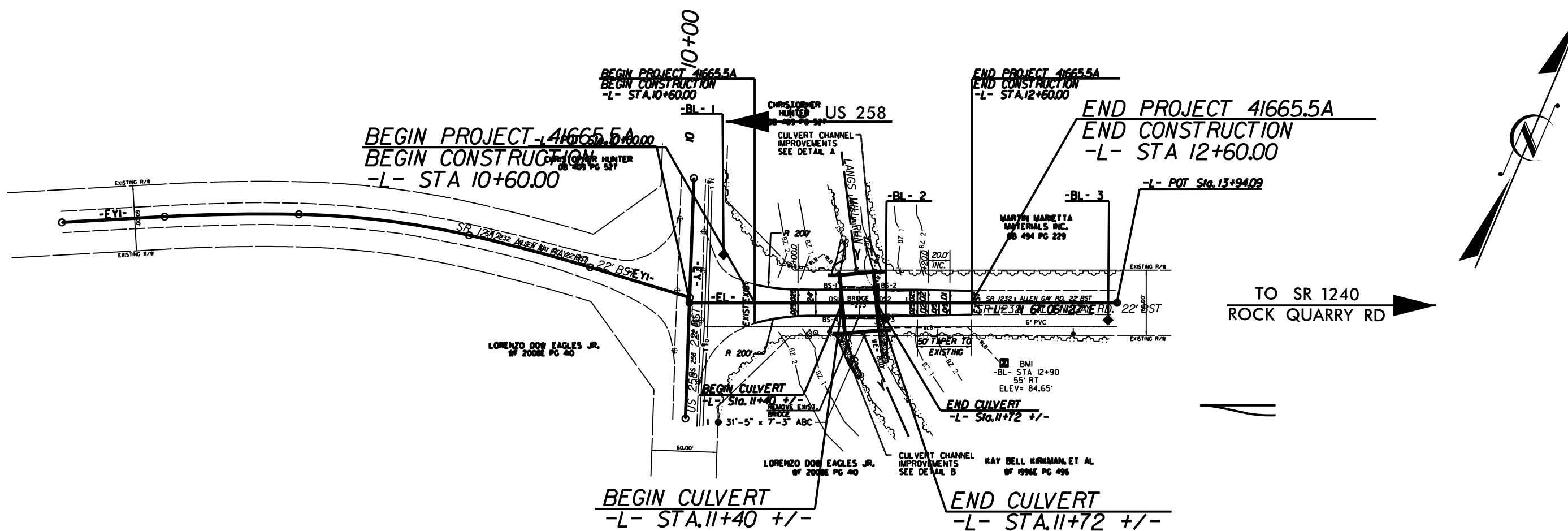
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
PITT COUNTY

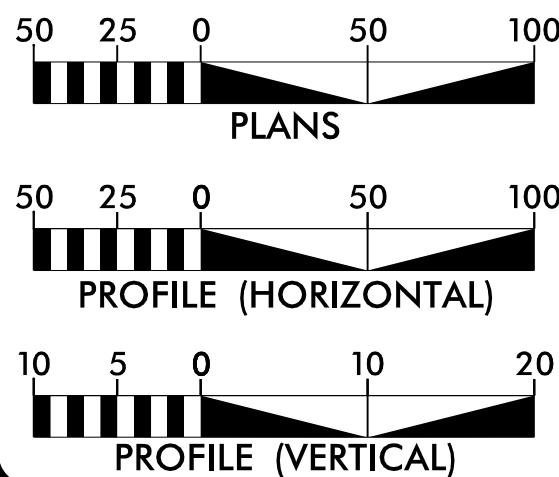
LOCATION: BRIDGE NO. 223 ON SR 1232 (ALLEN GAY RD.)
OVER LANGS MILL RUN

TYPE OF WORK: UTILITY BY OTHERS RELOCATION

T.I.P. NO.	SHEET NO.
41665.5A	UO-1



GRAPHIC SCALES



INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2	PLAN SHEET

UTILITY OWNERS ON PROJECT

(1) POWER - TOWN OF FARMVILLE

UTILITY DESIGN BY:

MA Engineering
CONSULTANTS, INC.
598 East Chatham Street Suite 137 Cary, NC 27511
Phone: 919 297 0220 Fax: 919 297 0221

NCDOT PROJECT ENGINEER:
MARIA ROGERSON, P.E.

PREPARED FOR:
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION BRIDGE PROGRAM

8/17/99

7/3/2015
P:\05\0696\014\13800\Plt 223\SF-730223 (Plt BR223)\UB0 Plans\730223.U0-02.pshpfl.dgn
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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
41665.5A	U0-2
R/W SHEET NO.	

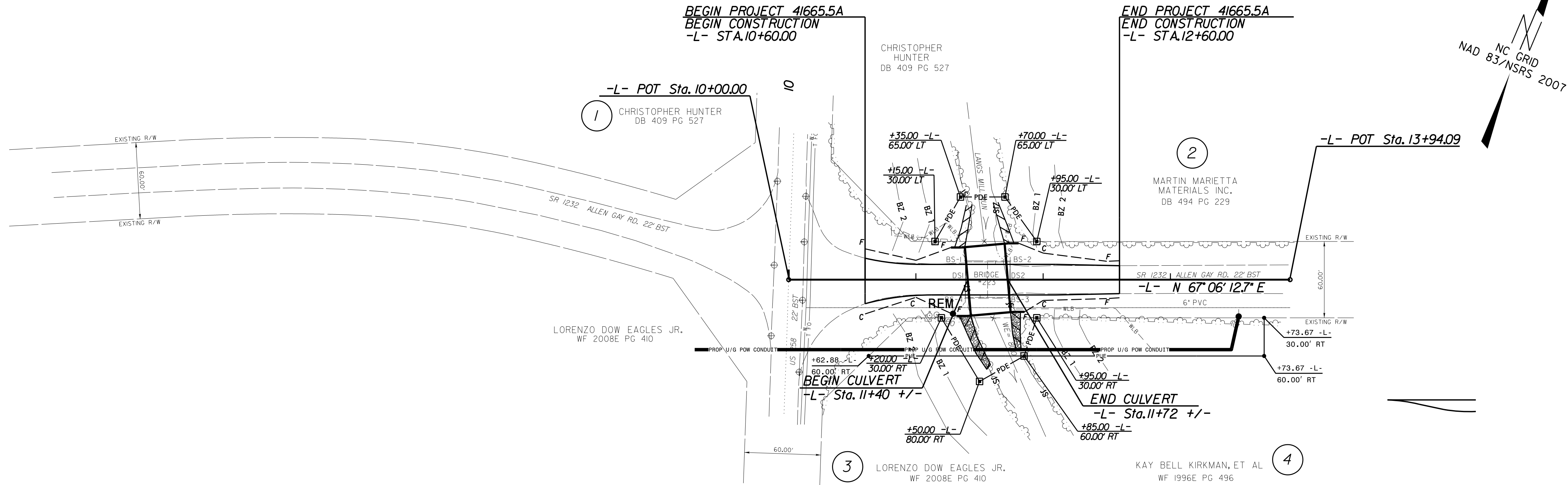
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK
SHOWN ON THIS SHEET WILL
BE DONE BY OTHERS

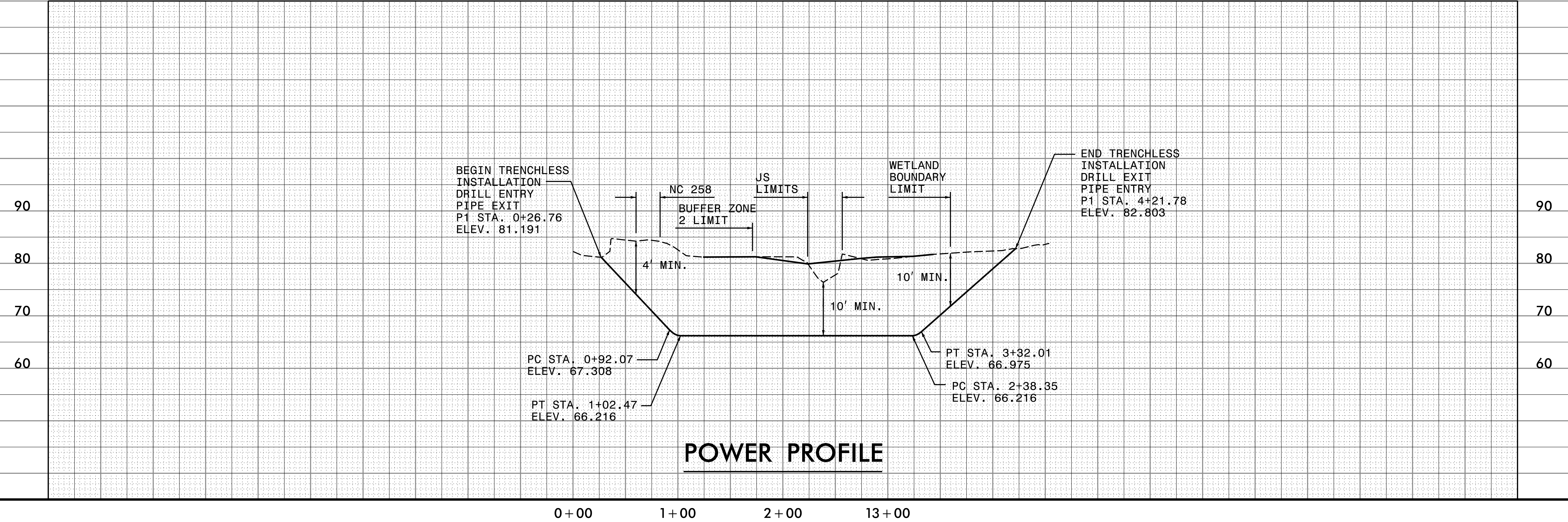
MA Engineering
CONSULTANTS, INC.

598 E. Chatham Street,
Suite 137
Cary, N. C. 27511



PLAN

SCALE:
1" = 50' PLAN
1" = 50' HORIZ. PFL
1" = 10' VERT. PFL

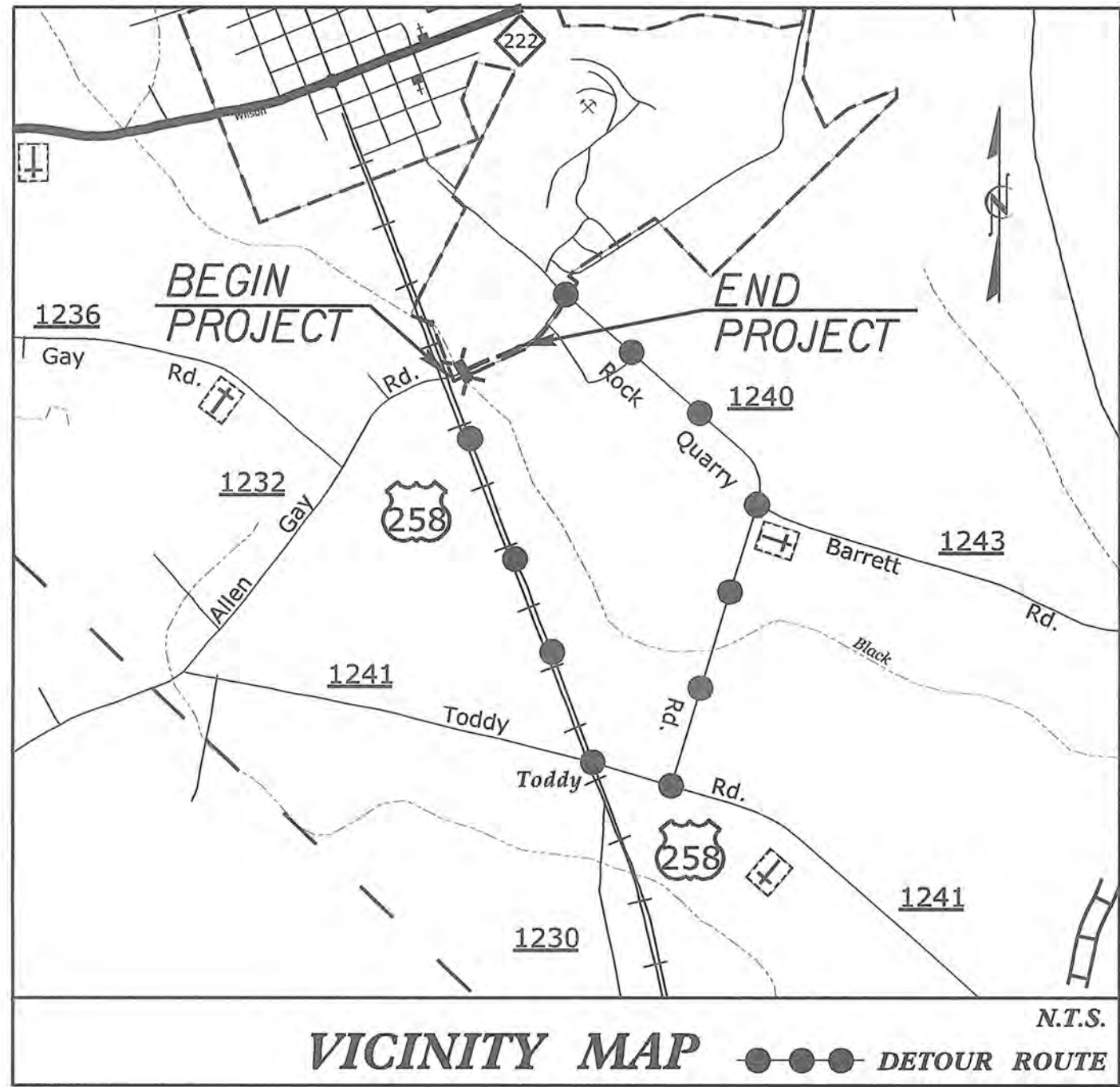


POWER PROFILE

7/8/2013 2:53:15 PM P:\JOBS\0696\04\13600\PI\1+ 223\SF-730223 (PI)+ BR223\730223_UC-01.tsh.dgn

CONTRACT:

TIP PROJECT: 41665.5A



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PITT COUNTY

LOCATION: BRIDGE NO. 223 OVER LANGS MILL RUN
ON SR 1232 (ALLEN GAY RD.)

TYPE OF WORK: UTILITIES CONSTRUCTION

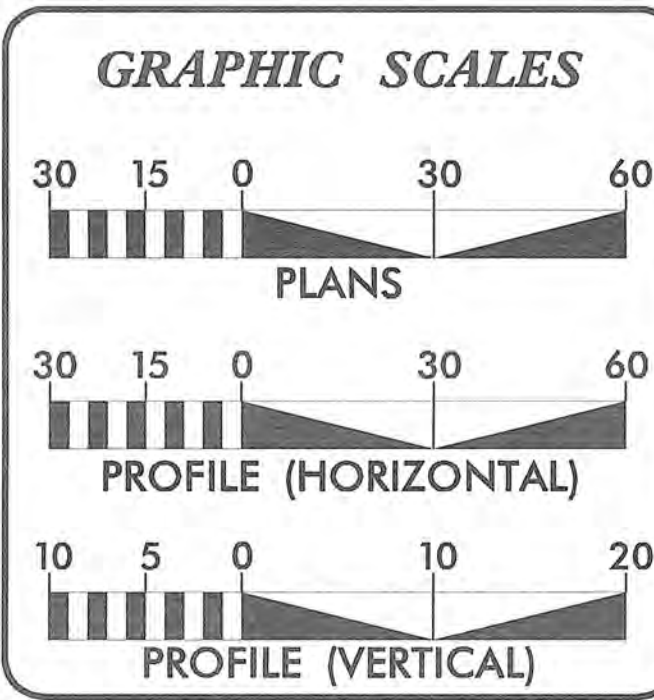
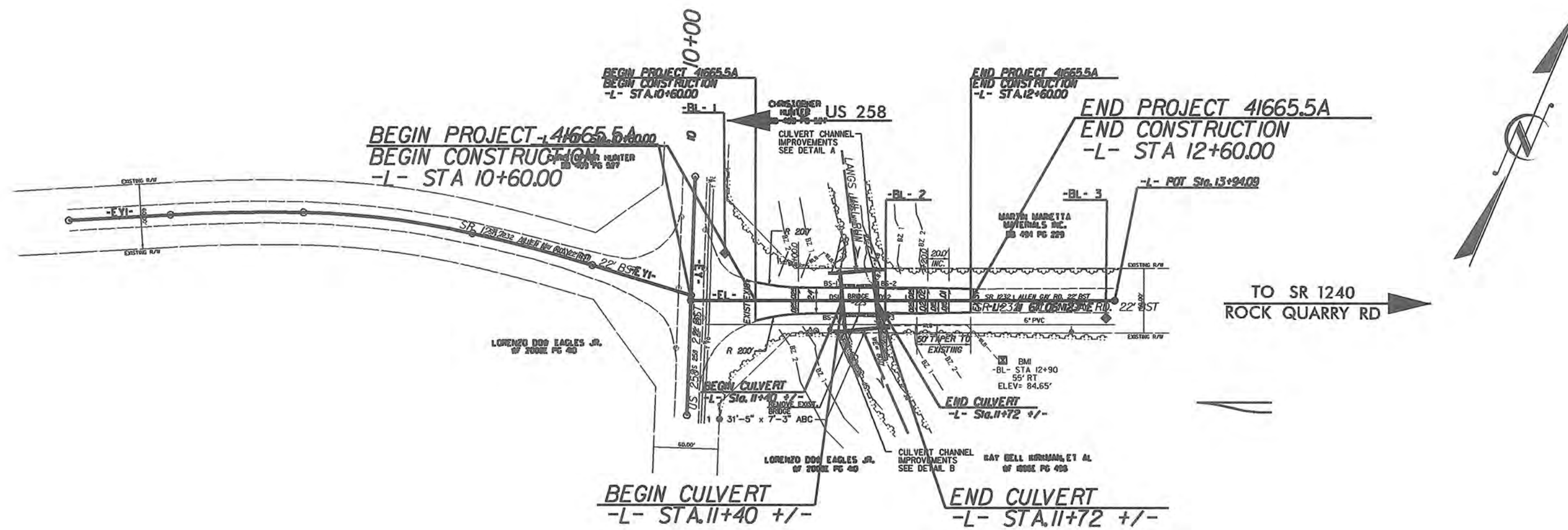
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	41665.5A	UC-01	7

UTILITY DESIGN ENGINEER

2013-JUL-08

HNTB HNTB NORTH CAROLINA, P.C.
343 E. SIX FORKS ROAD, SUITE 200
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO: C-1554

DATE: JULY 8, 2013



PROJECT LENGTH	
LENGTH ROADWAY OF TIP PROJECT 41665.5A =	0.03 MI.
LENGTH OF STRUCTURE TIP PROJECT 41665.5A =	0.01 MI.
TOTAL LENGTH OF TIP PROJECT 41665.5A =	0.04 MI.

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
UC-01	TITLE SHEET
UC-02	SYMBOLOLOGY SHEET
UC-03	GENERAL NOTES SHEET
UC-03A TO UC-03C	DETAIL SHEETS
UC-04	PLAN SHEETS

UTILITY OWNERS ON PROJECT
WATER - TOWN OF FOUNTAIN

UTILITY DESIGN BY:

MA Engineering
CONSULTANTS, INC.
598 East Chatham Street, Suite 137 Cary, NC 27511
Phone: 919.297.0220 Fax: 919.297.0221

NCDOT PROJECT ENGINEER:
MARIA ROGERSON, P.E.

PREPARED FOR:
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION BRIDGE PROGRAM

5/14/09

7/8/2013 14\13802\1414223\SF-730223 UC-02.syd.dgn

REV: 2/1/2012

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROJECT REFERENCE NO.	SHEET NO.
41665.5A	UC-2



PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	12" WL
11¼ Degree Bend	
22½ Degree Bend	
45 Degree Bend	
90 Degree Bend	
Plug	
Tee	
Cross	
Reducer	
Gate Valve	GV
Butterfly Valve	BV
Tapping Valve	TGV
Line Stop	LS
Line Stop with Bypass	LS/BP
Blow Off	BO
Fire Hydrant	FEH
Relocate Fire Hydrant	REH
Remove Fire Hydrant	REM FH
Water Meter	PWM
Relocate Water Meter	RWM
Remove Water Meter	REM WM
Water Pump Station	PS(W)
RPZ Backflow Preventer	PRPZ
DCV Backflow Preventer	PBFP
Relocate RPZ Backflow Preventer	RRPZ
Relocate DCV Backflow Preventer	RBFP

PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	12" GS
Force Main Sewer Line (Sized as Shown)	12" FSS
Manhole (Sized per Note)	
Sewer Pump Station	PS(SS)

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Telephone Pedestal	TEL PED
Utility Line by Others (Type as Shown)	PROP O/H POW LINES
Trenchless Installation	12" TL INSTALL
Encasement by Open Cut	24" ENCAS BY OC
Encasement	24" ENCASUREMENT

Thrust Block	
Air Release Valve	AR
Utility Vault	UV
Concrete Pier	CP
Steel Pier	SP
Plan Note	NOTE
Pay Item Note	PAY ITEM

EXISTING UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Utility Pole	
Utility Pole with Base	
H-Frame Pole	
Power Transmission Line Tower	
Water Manhole	
Power Manhole	
Telephone Manhole	
Sanitary Sewer Manhole	
Hand Hole for Cable	
Power Transformer	
Telephone Pedestal	
CATV Pedestal	
Gas Valve	
Gas Meter	
Located Miscellaneous Utility Object	
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

*Underground Power Line	P
*Underground Telephone Cable	T
*Underground Telephone Conduit	TC
*Underground Fiber Optics Telephone Cable	T FO
*Underground TV Cable	TV
*Underground Fiber Optics TV Cable	TV FO
*Underground Gas Pipeline	G
Aboveground Gas Pipeline	A/G Gas
*Underground Water Line	W
Aboveground Water Line	A/G Water
*Underground Gravity Sanitary Sewer Line	SS
Aboveground Gravity Sanitary Sewer Line	A/G Sanitary Sewer
*Underground SS Forced Main Line	FSS
Underground Unknown Utility Line	UTL
SUE Test Hole	
Water Meter	
Water Valve	
Fire Hydrant	
Sanitary Sewer Cleanout	

*For Existing Utilities
Utility Line Drawn from Record (Type as Shown)
Designated Utility Line (Type as Shown)

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GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. THE EXISTING UTILITIES BELONG TO TOWN OF FOUNTAIN.

CONTACT: BENJI HOLLOMAN
PHONE: (252) 749-2881
3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES, DIVISION OF ENVIRONMENTAL HEALTH. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, DIVISION OF WATER QUALITY. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.
4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPROTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITONAL COST TO THE DEPARTMENT.
7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.
8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.
9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

UTILITY CONSTRUCTION

PROJECT SPECIFIC NOTES:

1. PROPOSED 6" WATER LINE SHALL BE DUCTILE IRON RESTRAINED JOINT (D.I.R.J.) PIPE.
2. ALL WATER LINE PIPE FOR TRENCHLESS CONSTRUCTION SHALL BE INSTALLED IN A STEEL ENCASEMENT PIPE BY JACK AND BORE.
3. ALL FITTINGS (BENDS, TEES, CROSSES, REDUCERS, PLUGS, ETC.) SHALL BE ADEQUATELY RESTRAINED BY USE OF RESTRAINT JOINT CONSTRUCTION.
4. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS CONTRACTOR'S RESPONSIBILITY TO HAVE BORE PATH DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.
5. THE EXISTING 6" LINE SHALL BE RESTRAINED ON THE PORTION TO REMAIN AFTER VALVE INSTALLATION. THE CONTRACTOR SHALL EXCAVATE THE EXISTING PVC LINE AND INSTALL THE BELL RESTRAINT CLAMPS AT EVERY BELL JOINT FOR THE DISTANCE NOTED IN THE DETAILS ON SHEET UC-3B.

PROJECT QUANTITIES

Job Name: 41665.5A		Date: 7/1/2013	
Item Number	Description	Quantity	
5325600000-E	6" WATER LINE	359	LF
5540000000-E	6" VALVE	1	EA
5571600000-E	6" TAPPING VALVE	1	EA
5672000000-N	RELOCATE FIRE HYDRANT	1	EA
5800000000-E	ABANDON 6" UTILITY PIPE	332	LF
5835600000-E	12" ENCASEMENT PIPE	202	LF
5871700000-E	TRENCHLESS INSTALLATION OF 12" IN SOIL	101	LF
5871710000-E	TRENCHLESS INSTALLATION OF 12" NOT IN SOIL	101	LF

PROJECT REFERENCE NO.

41665.5A

SHEET NO.

UC-3

UTILITY DESIGN ENGINEER



2013-JUL-08

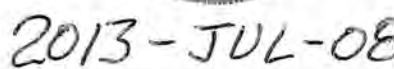
MA Engineering CONSULTANTS, INC.

598 E. Chatham Street, Suite 137, Cary, N. C. 27511

HNTB

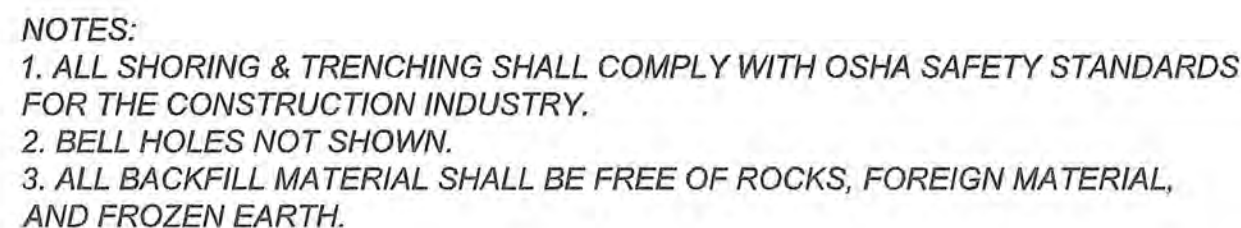
HNTB NORTH CAROLINA, P.C.
348 E. SIX FORKS ROAD, SUITE 200
RALEIGH, NORTH CAROLINA 27608
NC License No. C-1554

DATE: JULY 8, 2013



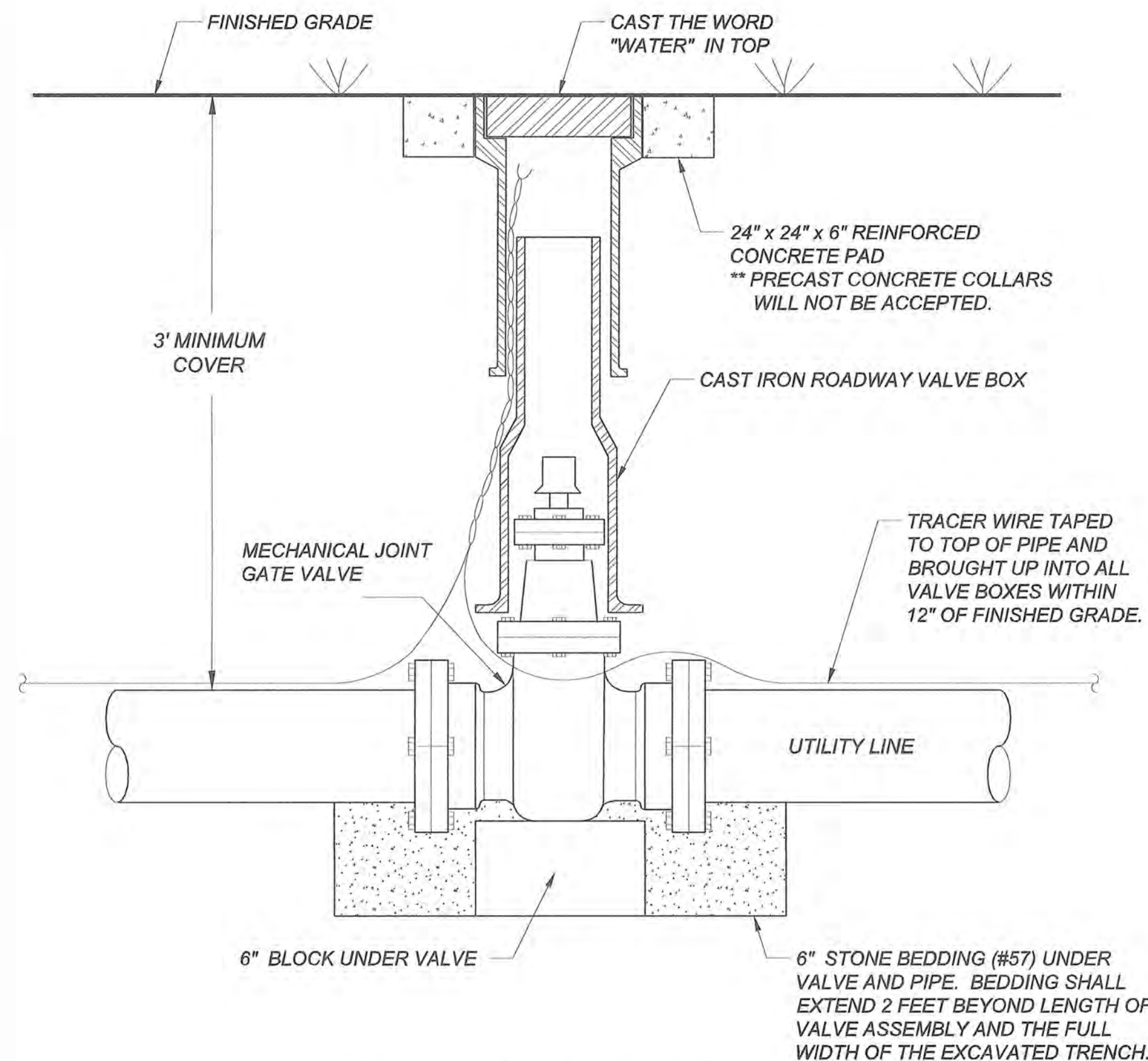
HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

DATE: JULY 8, 2013



GENERAL TRENCH DETAIL

NTS



GATE VALVE DETAIL

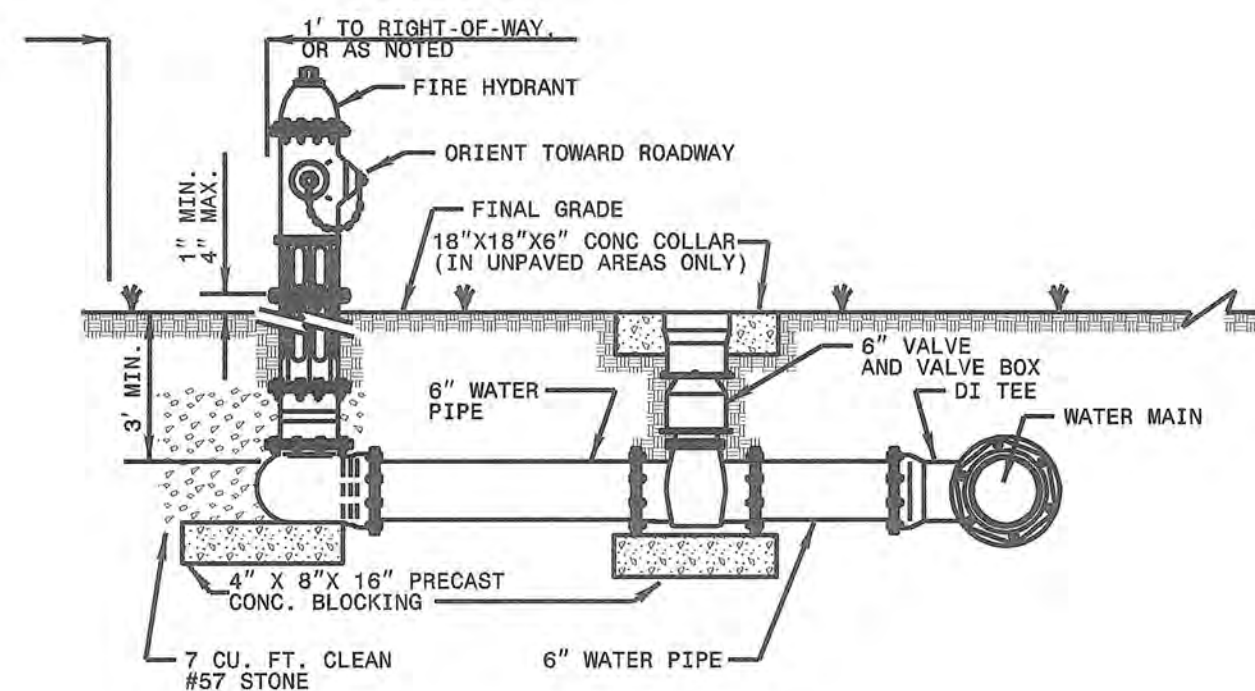
NTS

MAXIMUM TRENCH WIDTH AT TOP OF PIPE			
NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

A cross-sectional diagram of a pipe installation. The diagram shows a central pipe with a bell end. The pipe is surrounded by a layer of 'PIPE BEDDING' (represented by a pattern of small circles). Below the bedding is a layer of 'FOUNDATION CONDITIONING FABRIC AS REQUIRED' (represented by a pattern of small squares). Below the fabric is another layer of 'FOUNDATION CONDITIONING AS REQUIRED' (represented by a pattern of small dots). The entire assembly is surrounded by 'BACKFILL' (represented by a pattern of diagonal lines). Labels with arrows point to each of these components. The pipe bell is labeled 'PIPE BELL' with a dimension of '2"'. The bedding is labeled 'PIPE BEDDING' with a dimension of '2"'. The fabric is labeled 'FOUNDATION CONDITIONING FABRIC AS REQUIRED'. The conditioning layer is labeled 'FOUNDATION CONDITIONING AS REQUIRED'. The backfill is labeled 'BACKFILL'.

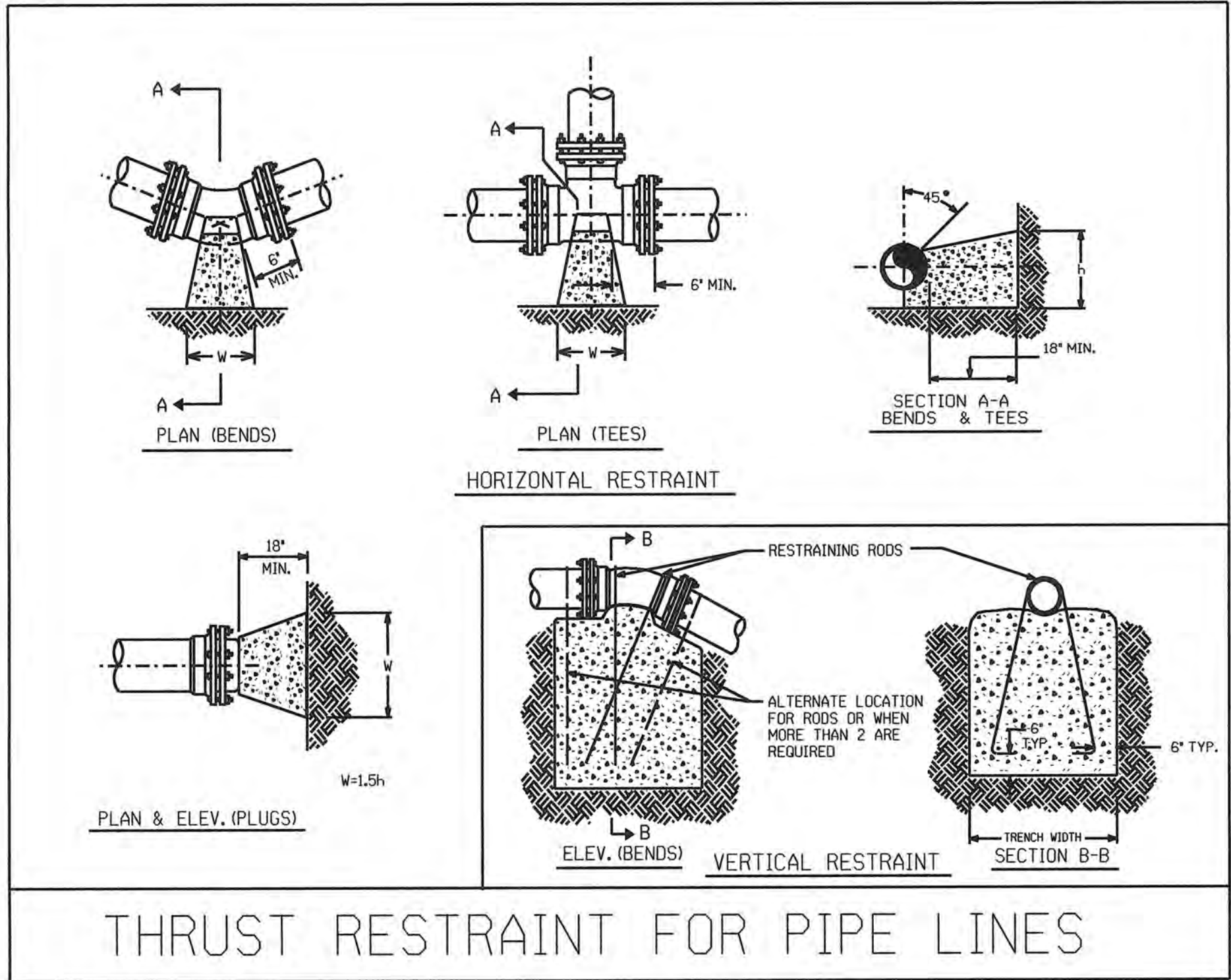
PLACE FOUNDATION CONDITIONING MATERIAL BELOW BEDDING IF REQUIRED, AS DIRECTED BY ENGINEER. PIPE BEDDED IN SELECT MATERIAL, CLASS II (TYPE 1) OR CLASS III. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROXIMATELY 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

- | | |
|--|--|
| 1. THIS DETAIL SHOWS THE TYPICAL FINAL FIRE HYDRANT CONFIGURATION AFTER INSTALLATION OF A PROPOSED FIRE HYDRANT, RELOCATION OF AN EXISTING FIRE HYDRANT, OR RELOCATION OF A FIRE HYDRANT. | 5. HYDRANT LOCATION APPLIES TO PROPOSED AND RELOCATED FIRE HYDRANTS. |
| 2. KEEP DRAIN PORTS FREE FROM OBSTRUCTION. | 6. LOCATE FIRE HYDRANT WITH 3' HORIZONTAL CLEARANCE FROM ABOVE GROUND OBJECTS. |
| 3. RESTRAIN ALL PIPE JOINTS AND FITTINGS. ACCEPTABLE TYPES OF RESTRAINT INCLUDE RESTRAINING GLANDS; RESTRAINED PUSH ON JOINTS; AND 3/4" BITUMINOUS COATED, ALL-THREAD RESTRAINING RODS. THRUST BLOCKS ARE NOT AN ACCEPTABLE TYPE OF RESTRAINT. | 7. PROVIDE A MINIMUM OF 3' COVER OVER ALL SECTIONS OF HORIZONTAL PIPE. USE FITTINGS AS NECESSARY. |
| 4. FOR RELOCATED OR RECONNECTED FIRE HYDRANTS, VERIFY THE VALVE IS RESTRAINED TO THE MAIN. PROVIDE APPROPRIATE RESTRAINT. | 8. TAPPING SLEEVES MAY BE USED ON EXISTING MAINS IN LIEU OF DI TEES. |
| | 9. LOCATE FIRE HYDRANT OUTSIDE OF THE VEHICLE RECOVERY AREA, ADJACENT TO THE R/W LINE, OR IN A PROTECTED AREA. |



FIRE HYDRANT DETAIL
NTS

5/28/99



THRUST RESTRAINT FOR PIPE LINES

RESTRAINED JOINT DESIGN TABLE FOR PVC PIPE

FITTING	REQUIRED RESTRAINED LENGTH (FT) OF PVC PIPE BY DEPTH OF COVER							
	3 FT	4 FT	5 FT	6 FT	7 FT	8 FT	9 FT	10 FT
HORIZONTAL BENDS								
6 INCH DIA - 11.25 DEG	3	3	2	2	2	2	1	1
6 INCH DIA - 22.5 DEG	6	5	4	3	3	3	2	2
6 INCH DIA - 45 DEG	12	9	8	7	6	5	5	4
6 INCH DIA - 90 DEG	29	22	18	15	13	12	10	9
VERTICAL BENDS - DOWN								
6 INCH DIA - 11.25 DEG	8	6	5	4	4	3	3	3
6 INCH DIA - 22.5 DEG	16	12	10	8	7	6	6	5
6 INCH DIA - 45 DEG	32	25	20	17	15	13	12	10
VERTICAL BENDS - UP								
6 INCH DIA - 11.25 DEG	3	3	2	2	2	2	1	1
6 INCH DIA - 22.5 DEG	6	5	4	3	3	3	2	2
6 INCH DIA - 45 DEG	12	9	8	7	6	5	5	4
DEAD ENDS / VALVES								
6 INCH DIA	78	59	48	40	34	30	27	24
TEES								
6x6x6, RL = 1 FT (VALVE ON RUN)	72	54	43	35	29	25	22	19
6x6x6, RL = 5 FT	52	33	22	14	9	5	2	1
6x6x6, RL = 10 FT	25	7	1	1	1	1	1	1
6x6x6, RL = 15 FT	1	1	1	1	1	1	1	1

ASSUMPTIONS

LAYING CONDITION = TYPE 4

SOIL DESIGNATION = ML WITH GRANULAR BACKFILL

DESIGN PRESSURE = 200 PSI (TEST PRESSURE)

SAFETY FACTOR = 1.5

NOTES

- RL = RUN LENGTH BETWEEN FIRST JOINTS OF PIPE ALONG THE RUN LINE OF TEE.
- RESTRAINED LENGTH IS MEASURED AS FOLLOWS:
 - HORIZONTAL/VERTICAL BENDS: ALONG EACH SIDE OF BEND.
 - HORIZONTAL/VERTICAL BENDS - OFFSET: ALONG THE OUTER SIDE OF EACH BEND.
 - ALL PIPE BETWEEN THE TWO BENDS SHALL BE RESTRAINED JOINT.
 - DEAD ENDS: ALONG PIPE FROM THE PLUG.
 - VALVES: ALONG THE PIPE IN EACH DIRECTION FROM THE VALVE.
 - TEES: ALONG THE BRANCH PIPE FROM THE TEE.
- WHEN IT IS NOT POSSIBLE TO INSTALL THE RESTRAINED LENGTHS AS NOTED BY THIS TABLE, CONTRACTOR SHALL INSTALL THE APPROPRIATE CONCRETE THRUST RESTRAINTS AS PER THE DETAILS HEREIN.

BASED ON TEST PRESSURE OF 200 P.S.I.

HORIZONTAL RESTRAINT (ALL AREAS GIVEN ARE IN SQUARE FEET)											VERTICAL RESTRAINT (ALL VOLUMES GIVEN ARE IN CUBIC YARDS)**						
PIPE SIZE	DEGREE OF BEND	LBS. STATIC THRUST *	ALLOWABLE SOIL BEARING (PSF)								PIPE SIZE	RESTRAINING RODS		DEGREE OF BEND			
			1000	2000	3000	4000	5000	6000	7000	8000		NO. REQ'D	DIA.	11/4"	22 1/2"	45"	
4"	11/4"	816	1	1	1	1	1	1	1	1	4"	2	1/2"	0.25	0.50	0.75	
	22 1/2"	1,226	2	2	2	2	2	2	2	2	6"	2	1/2"	0.50	1.0	1.75	
	45°	2,405	4	4	4	4	4	4	4	4	8"	2	5/8"	0.75	1.50	3.0	
	90°	4,444	8	8	8	8	8	8	8	8	10"	2	3/4"	1.25	2.25	4.50	
	TEE/PLUG	3,143	3	3	3	3	3	3	3	3	12"	2	7/8"	1.75	3.25	6.50	
6"	11/4"	1,385	2	2	2	2	2	2	2	2	4"	4	5/8"	2.25	4.50	8.75	
	22 1/2"	2,158	4	4	4	4	4	4	4	4	6"	4	3/4"	3.0	6.0	11.50	
	45°	3,403	8	8	8	8	8	8	8	8	8"	4	3/4"	3.0	6.0	11.50	
	90°	9,999	10	10	10	10	10	10	10	10	10"	4	3/4"	3.0	6.0	11.50	
	TEE/PLUG	7,068	7	7	7	7	7	7	7	7	12"	4	3/4"	3.0	6.0	11.50	
8"	11/4"	2,424	3	3	3	3	3	3	3	3	4"	4	5/8"	2.25	4.50	8.75	
	22 1/2"	3,904	6	6	6	6	6	6	6	6	6"	4	3/4"	3.0	6.0	11.50	
	45°	5,909	10	10	10	10	10	10	10	10	8"	4	3/4"	3.0	6.0	11.50	
	90°	17,773	18	18	18	18	18	18	18	18	10"	4	3/4"	3.0	6.0	11.50	
	TEE/PLUG	12,568	13	13	13	13	13	13	13	13	12"	4	3/4"	3.0	6.0	11.50	
10"	11/4"	3,846	4	4	4	4	4	4	4	4	4"	4	3/4"	3.0	6.0	11.50	
	22 1/2"	6,691	8	8	8	8	8	8	8	8	6"	4	3/4"	3.0	6.0	11.50	
	45°	10,028	16	16	16	16	16	16	16	16	8"	4	3/4"	3.0	6.0	11.50	
	90°	27,768	28	28	28	28	28	28	28	28	10"	4	3/4"	3.0	6.0	11.50	
	TEE/PLUG	19,635	19	19	19	19	19	19	19	19	12"	4	3/4"	3.0	6.0	11.50	
12"	11/4"	5,543	6	6	6	6	6	6	6	6	4"	4	3/4"	3.0	6.0	11.50	
	22 1/2"	9,032	12	12	12	12	12	12	12	12	6"	4	3/4"	3.0	6.0	11.50	
	45°	13,632	22	22	22	22	22	22	22	22	8"	4	3/4"	3.0	6.0	11.50	
	90°	35,987	40	40	40	40	40	40	40	40	10"	4	3/4"	3.0	6.0	11.50	
	TEE/PLUG	26,474	28	28	28	28	28	28	28	28	12"	4	3/4"	3.0	6.0	11.50	
14"	11/4"	7,544	8	8	8	8	8	8	8	8	4"	4	3/4"	3.0	6.0	11.50	
	22 1/2"	12,065	16	16	16	16	16	16	16	16	6"	4	3/4"	3.0	6.0	11.50	
	45°	18,095	30	30	30	30	30	30	30	30	8"	4	3/4"	3.0	6.0	11.50	
	90°	47,426	54	54	54	54	54	54	54	54	10"	4	3/4"	3.0	6.0	11.50	
	TEE/PLUG	35,485	38	38	38	38	38	38	38	38	12"	4	3/4"	3.0	6.0	11.50	
16"	11/4"	9,854	10	10	10	10	10	10	10	10	4"	4	3/4"	3.0	6.0	11.50	
	22 1/2"	16,092	20	20	20	20	20	20	20	20	6"	4	3/4"	3.0	6.0	11.50	
	45°	24,171	38	38	38	38	38	38	38	38	8"	4	3/4"	3.0	6.0	11.50	
	90°	61,085	70	70	70	70	70	70	70	70	10"	4	3/4"	3.0	6.0	11.50	
	TEE/PLUG	46,265	50	50	50	50	50	50	50	50	12"	4	3/4"	3.0	6.0	11.50	
* INCLUDES 1.25 SAFETY FACTOR											**INCLUDES 1.50 SAFETY FACTOR						
GENERAL NOTES:																	
1. CONCRETE SHALL BE CLASS "B".																	
2. CONCRETE SHALL NOT CONTACT BOLTS ENDS OF MECHANICAL JOINT FITTINGS.																	
3. CONSULT WITH ENGINEER FOR CONCRETE REQUIREMENTS ON MAINS LARGER THAN 16 INCHES.																	
(FOR VERTICAL & HORIZONTAL BENDS)																	
4. ALLOWABLE SOIL BEARING SHALL BE DETERMINED BY THE ENGINEER.																	
REVISIONS																	
NO.	DATE	DESCRIPTION															
THRUST RESTRAINT FOR WATER MAINS																	
STATE OF NORTH CAROLINA																	
DIVISION OF HIGHWAYS																	
RALEIGH, N.C.																	

SHEET 2 OF 2

PROJECT REFERENCE NO. SHEET NO.

41665.5A UC-3B

UTILITY DESIGN ENGINEER



2013-JUL-08

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DATE: JULY 8, 2013

