STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5525	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
43761.3.FD1	APD-1103(29)	PE
43761.3.1	APD-1103(29)	CONST.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WATAUGA COUNTY

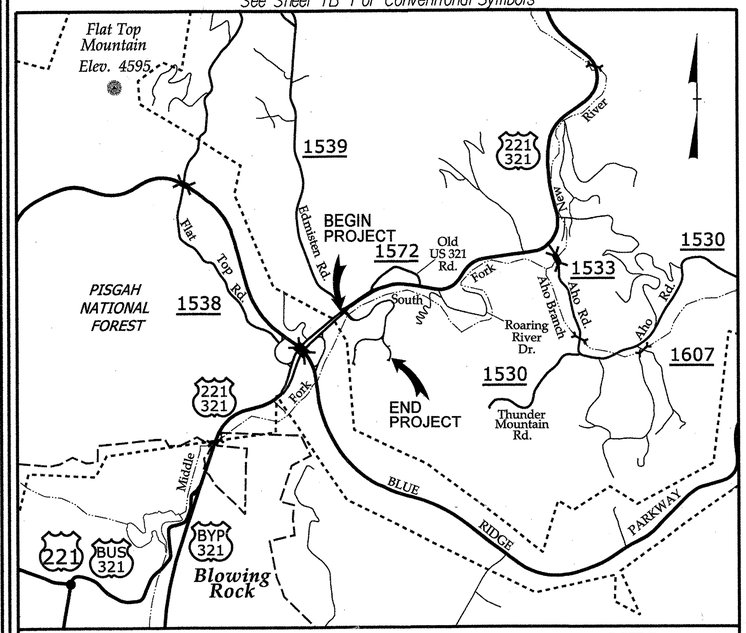
LOCATION: CONSTRUCTION ACCESS ROAD TO BLOWING ROCK POST-ACUTE CARE FACILITY

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

TIP PROJECT: R-5525

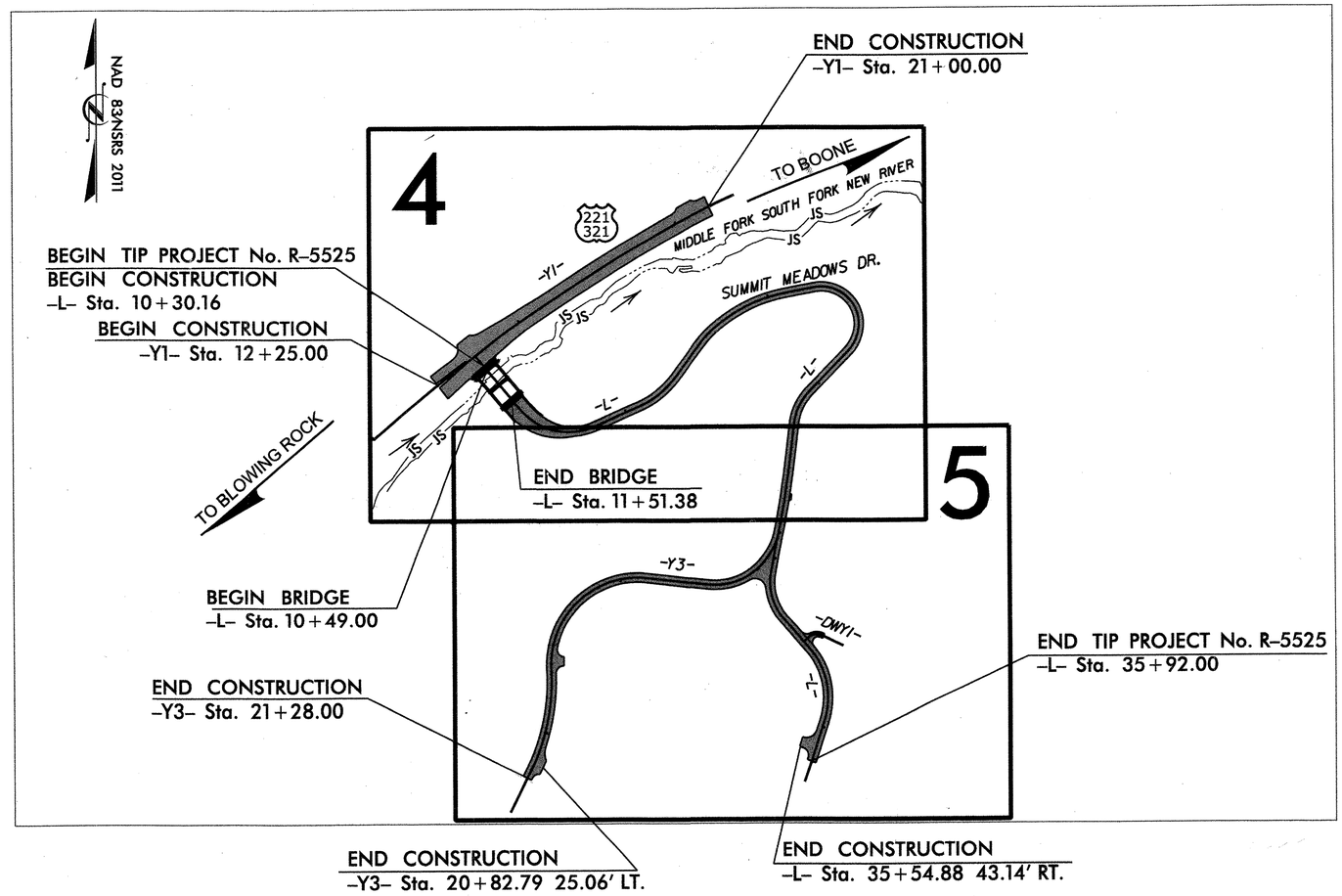
CONTRACT: C203598

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



VICINITY MAP NTS

NCDOT CONTACT:
JOE L. LAWS, PE
HIGHWAY DIVISION 11
DIVISION PROJECT MANAGER
336-903-9138



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 = N/A
ADT = N/A
DHV = N/A %
D = N/A %
T = N/A % *
V = 25 MPH
* TTST = DUAL
FUNC CLASS =
LOCAL RURAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT	=	0.466 MILES
LENGTH STRUCTURES PROJECT	=	0.019 MILES
TOTAL LENGTH PROJECT	=	0.485 MILES

Prepared In the Office of:
THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605
License No.: F-0840

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 1, 2013

LETTING DATE:
JULY 15, 2014

DEAN D. HATFIELD, PE
PROJECT ENGINEER

WILLIAM E. TILLITT, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 032134 ENGINEER WALTER ROBERTS
SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD
SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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PROJECT REFERENCE NO.	SHEET NO.
R-5525	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 24603 ENGINEER DEAN J. CHAMPION

REGISTERED ENGINEER

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

INDEX OF SHEETS

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	SURVEY CONTROL SHEET
2	PAVEMENT SCHEDULE & TYPICAL SECTIONS
2-A	DITCH DETAILS
2-B	INTERSECTION DETAILS
2-C	TEMPORARY GRADING DETAILS
2-D THRU 2-H	SPECIAL DETAILS
3-A	SUMMARIES OF EARTHWORK, GUARDRAIL & SHOULDER BERM GUTTER
3-B THRU 3-D	SUMMARY OF DRAINAGE
3-E	PARCEL INDEX SHEET
4 & 5	PLAN SHEET
6 THRU 8	PROFILE SHEET
TMP-1 THRU TMP-7	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-3	PAVEMENT MARKING PLANS
EC-1 THRU EC-8	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-5	SIGNING PLANS
SIG-1 THRU SIG-5	SIGNAL PLANS
UC-1 THRU UC-9	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-2	UTLITIES BY OTHERS PLANS
X-1 THRU X-49	CROSS-SECTIONS
S-1 THRU S-18	STRUCTURE PLANS

GENERAL NOTES

GENERAL NOTES: 2012 SPECIFICATIONS
EFFECTIVE: 01-17-12
REVISED: 11/01/11

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 II.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

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.

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 WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

AT&T (TELICS), CHARTER COMMUNICATIONS, BLUE RIDGE EMC &

TOWN OF BLOWING ROCK

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

RIGHT-OF-WAY MARKERS:

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

CURB RAMPS

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.

ROADWAY ENGLISH STANDARD DRAWINGS

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
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
240.01	Guide for Berm Ditch Construction
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 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
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
840.14	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
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
846.02	Drop Inlet Installation in Expressway Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.01	Concrete Sidewalk
848.03	Driveway Turnout - Drop Curb Type
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
850.11	Guide for Berm Drainage Outlet - 24" and 30" Pipe
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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PROJECT REFERENCE NO.	SHEET NO.
R-5525	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 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 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.

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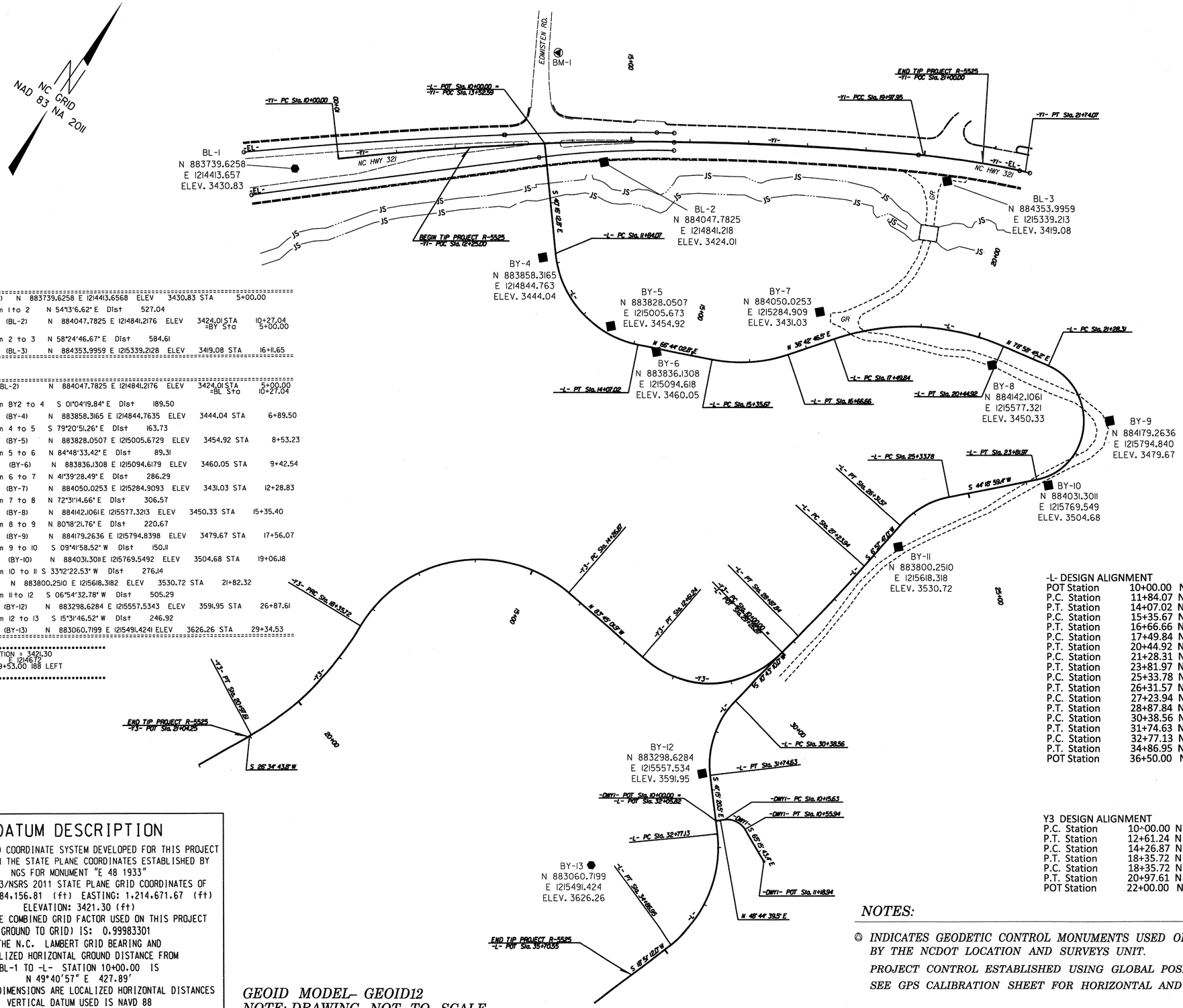
PROJECT REFERENCE NO.	SHEET NO.
R-5525	1-C
Location and Surveys	

SURVEY CONTROL SHEET R-5525



-BL-

1	(R5525-1)	N 883739.6258	E 1214413.6568	ELEV	3430.83	STA	5+00.00
Course from 1 to 2		N 54°13'6.62" E	Dist	527.04			
2	(BL-2)	N 884047.7825	E 1214841.2176	ELEV	3424.01	STA	10+27.04 =BY Sta 5+00.00
Course from 2 to 3		N 58°24'46.67" E	Dist	584.61			
3	(BL-3)	N 884353.9959	E 1215339.2128	ELEV	3419.08	STA	16+11.65

-BY-

2	(BL-2)	N 884047.7825	E 1214841.2176	ELEV	3424.01	STA	5+00.00 =BL Sta 10+27.04
Course from BY2 to 4		S 01°04'19.84" E	Dist	189.50			
4	(BY-4)	N 883858.3165	E 1214844.7635	ELEV	3444.04	STA	6+89.50
Course from 4 to 5		S 79°20'51.26" E	Dist	163.73			
5	(BY-5)	N 883828.0507	E 1215005.6729	ELEV	3454.92	STA	8+53.23
Course from 5 to 6		N 84°48'33.42" E	Dist	89.31			
6	(BY-6)	N 883836.1308	E 1215094.6179	ELEV	3460.05	STA	9+42.54
Course from 6 to 7		N 41°39'28.49" E	Dist	286.29			
7	(BY-7)	N 884050.0253	E 1215284.9093	ELEV	3431.03	STA	12+28.83
Course from 7 to 8		N 72°31'14.66" E	Dist	306.57			
8	(BY-8)	N 884142.1061	E 1215577.3213	ELEV	3450.33	STA	15+35.40
Course from 8 to 9		N 80°18'21.76" E	Dist	220.67			
9	(BY-9)	N 884179.2636	E 1215794.8398	ELEV	3479.67	STA	17+56.07
Course from 9 to 10		S 09°41'58.52" W	Dist	150.11			
10	(BY-10)	N 884031.3011	E 1215769.5492	ELEV	3504.68	STA	19+06.18
Course from 10 to 11		S 33°12'22.53" W	Dist	276.14			
11	(BY-11)	N 883800.2510	E 1215618.3182	ELEV	3530.72	STA	21+82.32
Course from 11 to 12		S 06°54'32.78" W	Dist	505.29			
12	(BY-12)	N 883298.6284	E 1215557.5343	ELEV	3591.95	STA	26+87.61
Course from 12 to 13		S 15°31'46.52" W	Dist	246.92			
13	(BY-13)	N 883060.7199	E 1215491.4241	ELEV	3626.26	STA	29+34.53

BM-1 ELEVATION = 3421.30
N 88815.7 E 1214672
BL STATION 9+53.00 188 LEFT
NGS E 48

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NGS FOR MONUMENT "E 48 1933"
WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 884,156.81 (ft) EASTING: 1,214,671.67 (ft)
ELEVATION: 3421.30 (ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99983301
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM
BL-1 TO -L- STATION 10+00.00 IS
N 49°40'57" E 427.89'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

-L- DESIGN ALIGNMENT

POT Station	10+00.00	N	884,016.4794	E	1,214,739.9099
P.C. Station	11+84.07	N	883,876.0367	E	1,214,858.8885
P.T. Station	14+07.02	N	883,828.3863	E	1,215,061.5390
P.C. Station	15+35.67	N	883,879.2043	E	1,215,179.7309
P.T. Station	16+66.66	N	883,959.4233	E	1,215,281.3915
P.C. Station	17+49.84	N	884,026.1043	E	1,215,331.1174
P.T. Station	20+44.92	N	884,179.6052	E	1,215,575.3078
P.C. Station	21+28.31	N	884,195.5466	E	1,215,657.1608
P.T. Station	23+81.97	N	884,027.5286	E	1,215,747.8264
P.C. Station	25+33.78	N	883,918.9121	E	1,215,641.7709
P.T. Station	26+31.57	N	883,832.3033	E	1,215,600.2009
P.C. Station	27+23.94	N	883,740.6169	E	1,215,589.0033
P.T. Station	28+87.84	N	883,578.6893	E	1,215,563.8162
P.C. Station	30+38.56	N	883,430.5968	E	1,215,535.7817
P.T. Station	31+74.63	N	883,303.7837	E	1,215,570.3980
P.C. Station	32+77.13	N	883,226.7314	E	1,215,637.9846
P.T. Station	34+86.95	N	883,030.2180	E	1,215,676.8995
POT Station	36+50.00	N	882,875.9143	E	1,215,624.2099

Y3 DESIGN ALIGNMENT

P.C. Station	10+00.00	N	883,540.3427	E	1,215,556.5570
P.T. Station	12+61.24	N	883,398.9327	E	1,215,365.5607
P.C. Station	14+26.87	N	883,416.9635	E	1,215,200.9087
P.T. Station	18+35.72	N	883,169.2940	E	1,214,940.7484
P.C. Station	18+35.72	N	883,169.2940	E	1,214,940.7484
P.T. Station	20+97.61	N	882,915.6521	E	1,214,888.8047
POT Station	22+00.00	N	882,824.0795	E	1,214,842.9909

GEOID MODEL- GEOID12
NOTE: DRAWING NOT TO SCALE

NOTES:

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

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

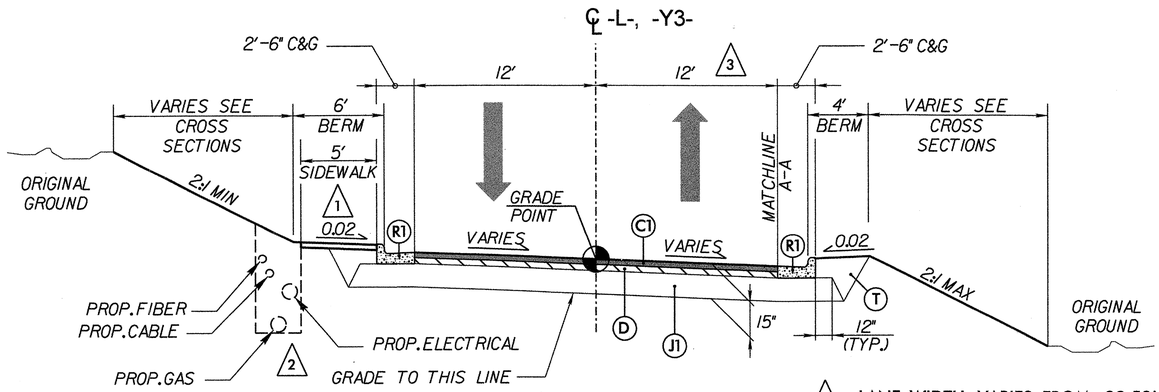
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

N.T.S

PROJECT REFERENCE NO.	SHEET NO.
R-5525	2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER — 2/3/2014 — DIAN DAI — REGISTERED ENGINEER

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER — 2/3/2014 — DIAN DAI — REGISTERED ENGINEER



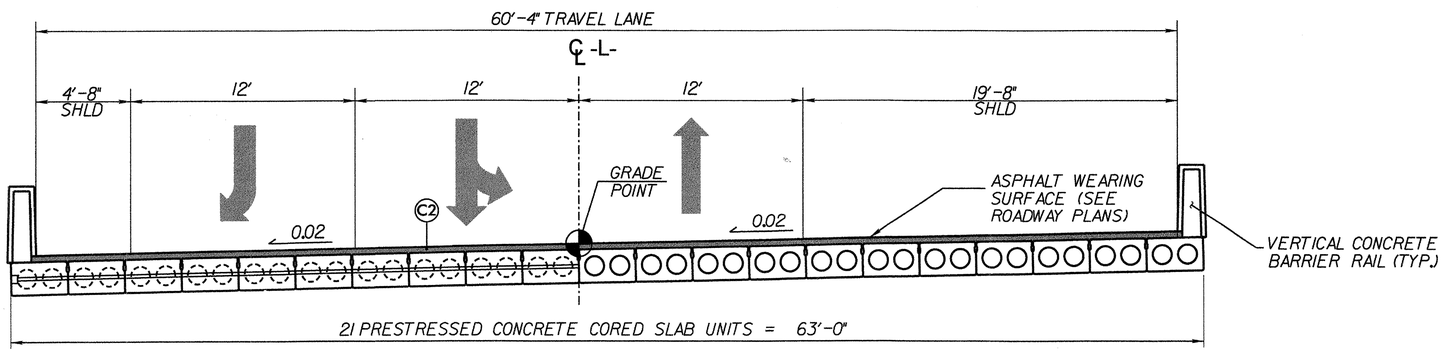
1 PROP. SIDEWALK FOR -L- ONLY BEGIN SIDEWALK AT STA. 12+00.00

2 FUTURE UTILITY TRENCHES ARE FOR -L- ONLY (BY OTHERS)

3 LANE WIDTH VARIES FROM 29.58' TO 12.00' -L- STA. 11+51.38 TO STA. 13+50.00

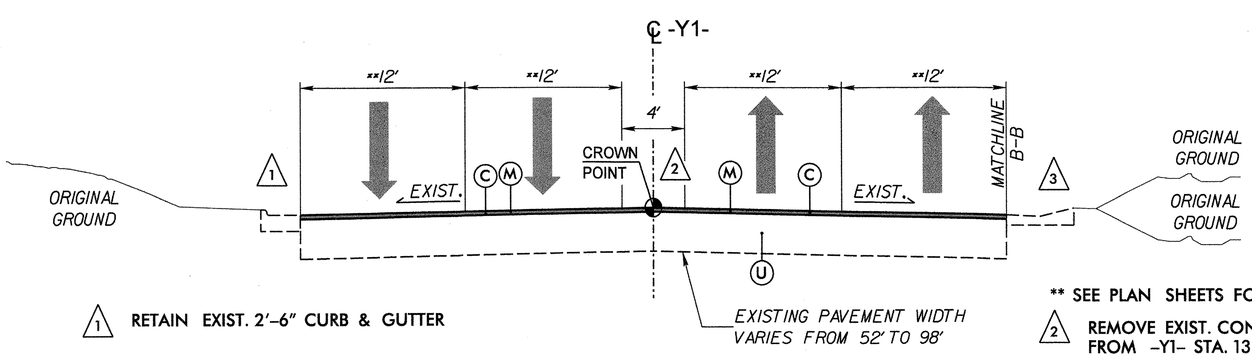
TYPICAL SECTION No. 1

-L- STA. 10+30.16 TO STA. 10+49.00 (BEGIN BRIDGE)
-L- STA. 11+51.38 (END BRIDGE) TO STA. 35+92.00
-Y3- STA. 10+65.18 TO STA. 21+28.00



TYPICAL SECTION No. 2

-L- STA. 10+49.00 TO STA. 11+51.38



1 RETAIN EXIST. 2'-6" CURB & GUTTER

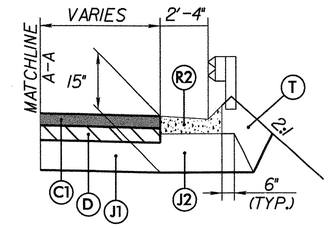
TYPICAL SECTION No. 3

(US321/221)
-Y1- STA. 12+25.00 TO STA. 21+00.00

** SEE PLAN SHEETS FOR ACTUAL LANE WIDTHS

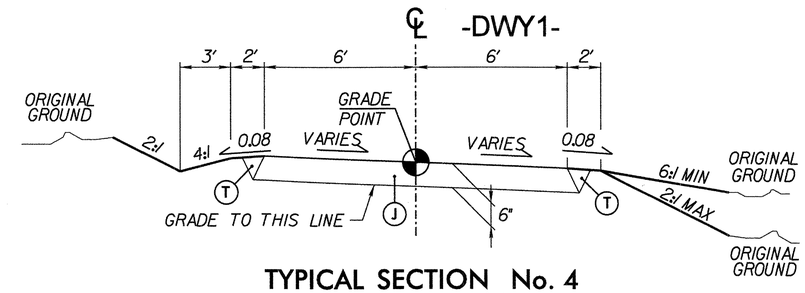
2 REMOVE EXIST. CONC. ISLAND FROM MEDIAN FROM -Y1- STA. 13+80 TO 15+05 REPLACE w/3.0" S9.5B (C1), 4" I19.0B (D) & 5.5" B25.0B (E)

3 RETAIN EXIST. EXPRESSWAY GUTTER



INSET A-A

USE IN CONJUNCTION WITH TYPICAL No. 1
-L- STA. 11+51.38 (END BRIDGE) TO STA. 12+00.00 BOTH SIDES



TYPICAL SECTION No. 4

-DWY1- STA 10+12.00 TO -DWY1- STA 10+60.00

Note: Pavement edge slopes are 1:1 unless shown otherwise.

PAVEMENT SCHEDULE

ITEM	DESCRIPTION
C	Prop. Approx 1.5" Asphalt Concrete Surface Course, Type S9.5B, at an Average Rate of 168 lbs. Per sq. yard.
C1	Prop. Approx 3.0" Asphalt Concrete Surface Course, Type S9.5B, at an Average Rate of 168 lbs. Per sq. yard in each of two layers.
C2	Prop. Var. Depth Asphalt Concrete Surface Course, Type S9.5B, at an Average Rate of 112 lbs. Per sq. yard Per 1" Depth, to be placed in layers not less than 1.5" or greater than 2" in depth.
D	Prop. Approx 4.0" Asphalt Concrete Intermediate Course, Type I19.0B, at an Average Rate of 456 lbs. Per sq. yard.
D1	Prop. Var. Depth Asphalt Concrete Intermediate Course, Type I19.0B, at an Average Rate of 114 lbs. Per sq. yard Per 1" Depth, to be placed in layers not less than 2.5" or greater than 4.0" in depth.
E	Prop. Approx 5.5" Asphalt Concrete Base Course, Type B25.0B, at an Average rate of 627 lbs. Per sq. yard.
J	Prop. Approx 6.0" Aggregate Base Course
J1	Prop. Approx 8.0" Aggregate Base Course
J2	Var. Depth Aggregate Base Course
M	1.5" Depth Milling
R1	2'-6" Curb & Gutter
R2	Shoulder Berm Gutter
T	Earth Material
U	Existing Pavement
W	Var. Depth Asphalt Pavement (See Wedging Detail)

REVISIONS

2/4/2014 10:06:38 AM
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G:\CADD\Plot\CKE21004\CKE21004_rdy.tbl

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

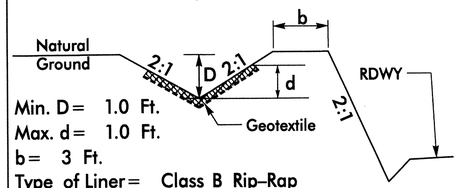
N.T.S

PROJECT REFERENCE NO.	SHEET NO.
R-5525	2-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DUNCAN B. WHITAKER	NORTH CAROLINA PROFESSIONAL SEAL 032134 ENGINEER WILLIAM H. ROBERTS
REGISTERED ENGINEER 2-26-14	REGISTERED ENGINEER 2-26-14

DETAIL A

BERM 'V' DITCH

(Not to Scale)



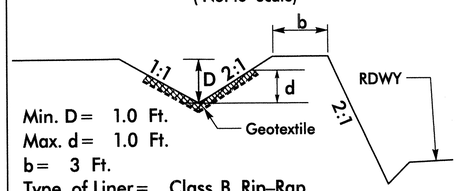
Min. D= 1.0 Ft.
Max. d= 1.0 Ft.
b= 3 Ft.
Type of Liner= Class B Rip-Rap

FROM -L- STA. 12+25 TO STA. 14+00 RT
FROM -L- STA. 16+00 TO STA. 16+25 RT
FROM -L- STA. 16+25 TO STA. 18+50 RT
FROM -L- STA. 18+50 TO STA. 21+50 RT
FROM -L- STA. 22+50 TO STA. 24+00 LT
FROM -L- STA. 30+50 TO STA. 31+50 LT
FROM -Y3- STA. 11+50 TO STA. 15+00 LT

DETAIL B

BERM 'V' DITCH

(Not to Scale)



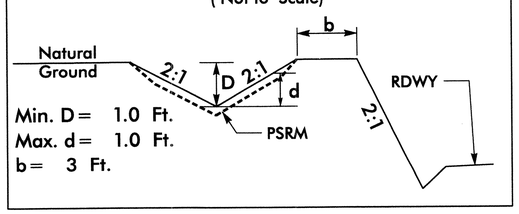
Min. D= 1.0 Ft.
Max. d= 1.0 Ft.
b= 3 Ft.
Type of Liner= Class B Rip-Rap

FROM -L- STA. 14+00 TO STA. 16+00 RT

DETAIL C

BERM 'V' DITCH

(Not to Scale)



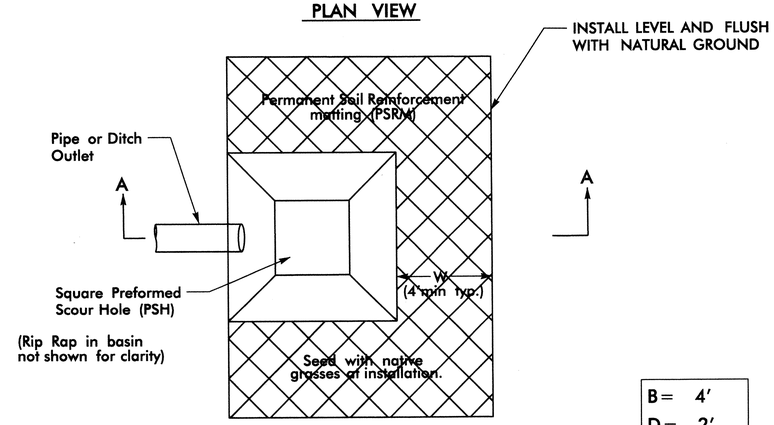
Min. D= 1.0 Ft.
Max. d= 1.0 Ft.
b= 3 Ft.

FROM -L- STA. 24+00 TO STA. 25+00 LT
FROM -L- STA. 30+75 TO STA. 31+30 RT
FROM -L- STA. 33+00 TO STA. 35+00 LT
FROM -L- STA. 33+00 TO STA. 34+50 RT

PREFORMED SCOUR HOLE

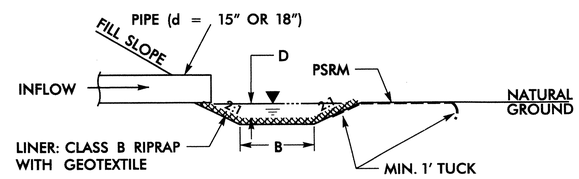
*NOT TO SCALE

PLAN VIEW



B= 4'
D= 2'
W= 5'

SECTION A-A



3/08

FROM -L- STA. 11+52 LT

REVISIONS

2/26/2014 3:27:43 PM
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G:\CADD\Plots\CKE21004\CKE21004_rdy.tbl

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

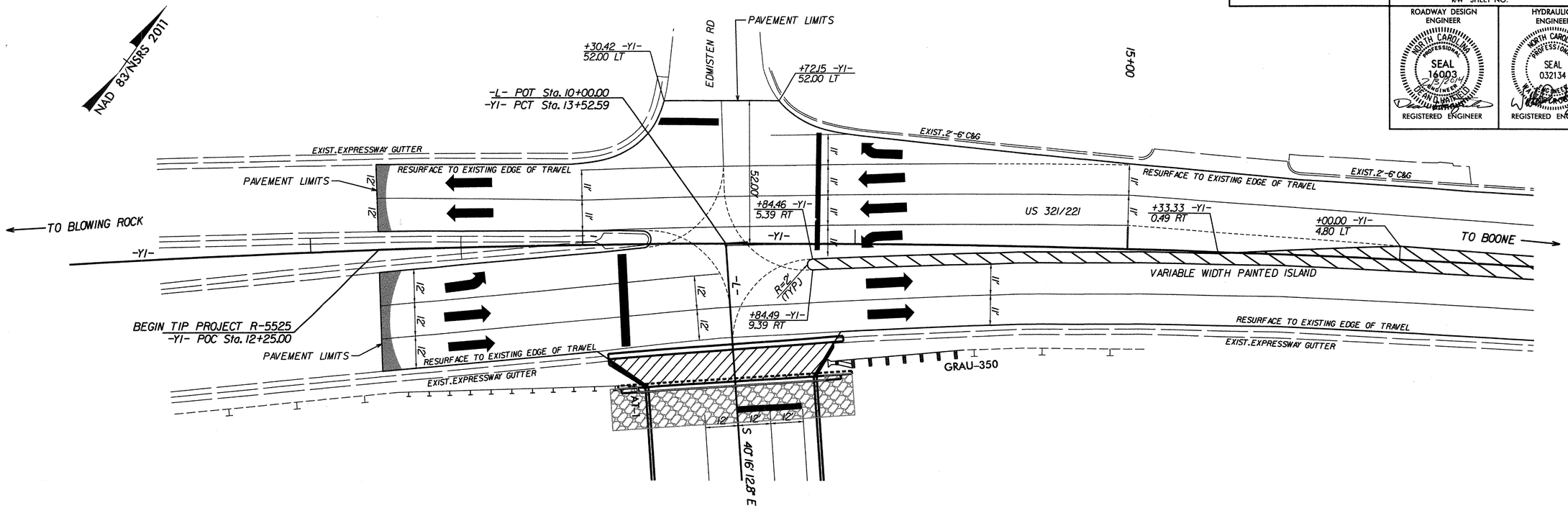
ROADWAY PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-5525	2-B
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER — REGISTERED ENGINEER

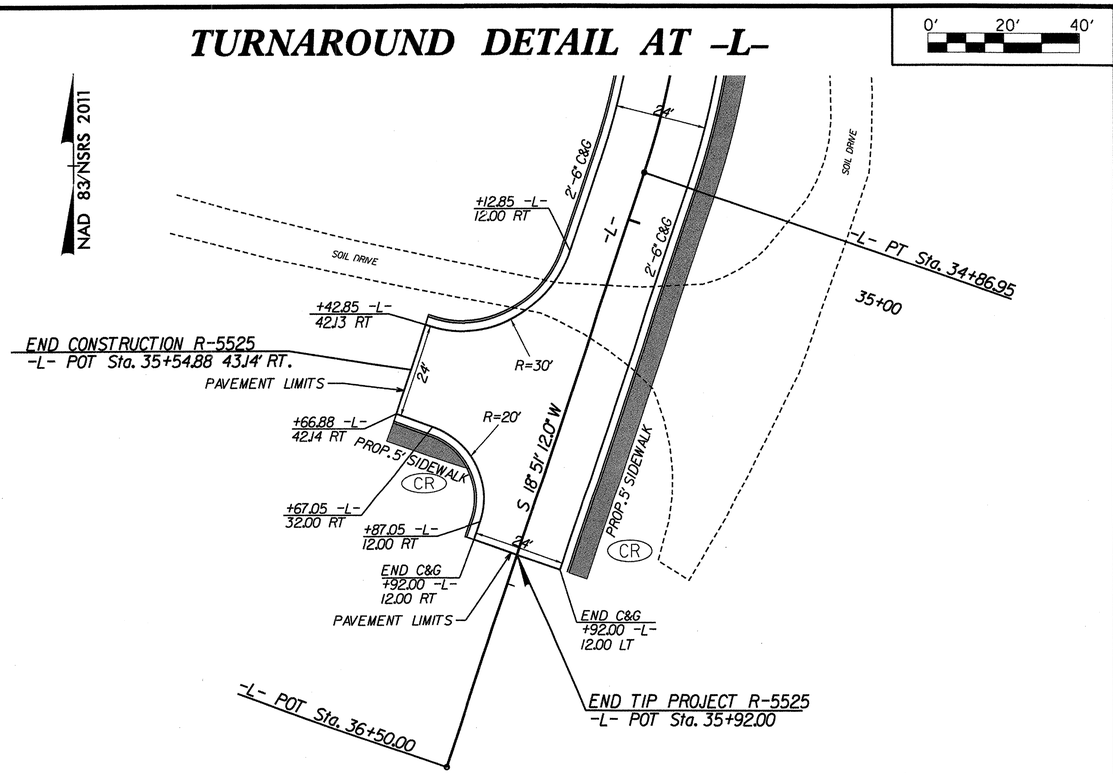
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 032134 ENGINEER — REGISTERED ENGINEER

INTERSECTION DETAIL AT -Y1- & -L-



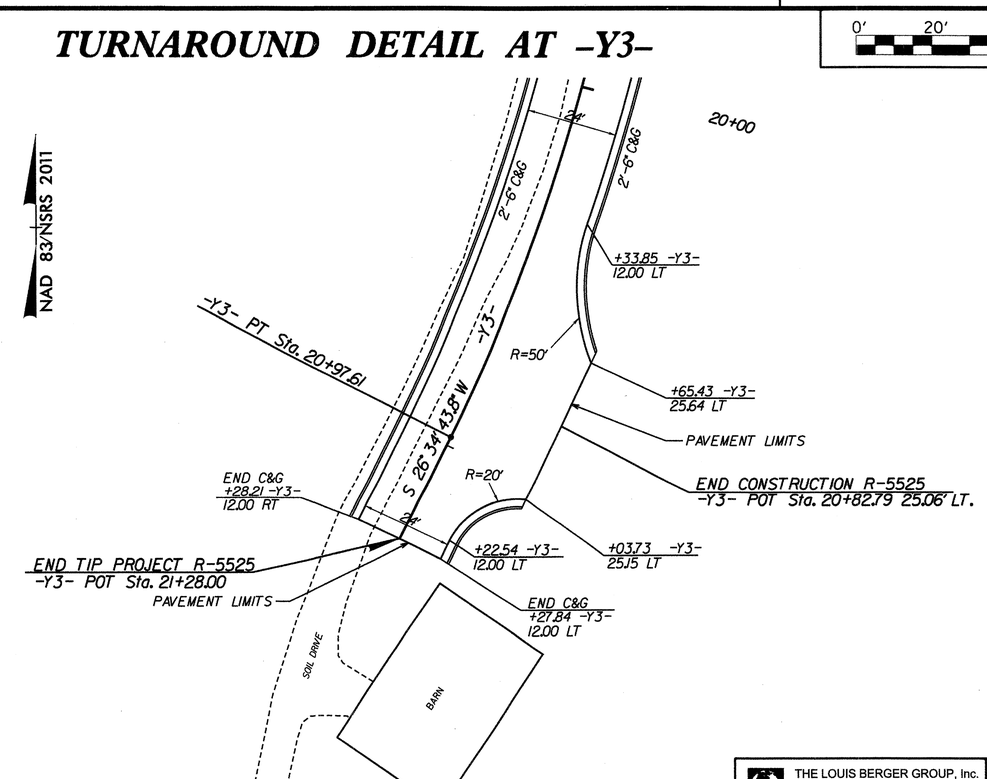
SEE SHEET 4 FOR PLAN

TURNAROUND DETAIL AT -L-



SEE SHEET 5 FOR PLAN

TURNAROUND DETAIL AT -Y3-



SEE SHEET 5 FOR PLAN

REVISIONS

2/3/2014 2:15:21 PM
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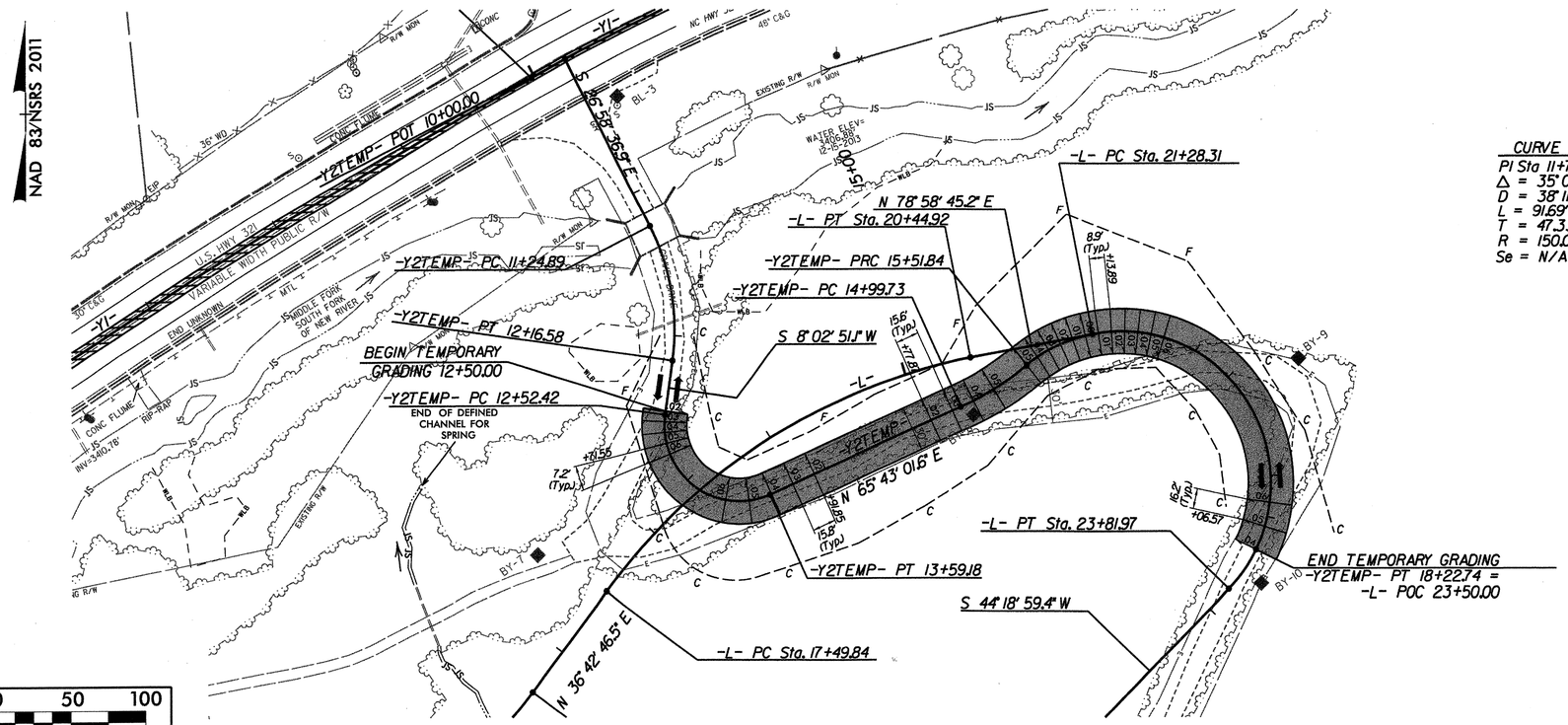
G:\CADD\Plot\CKE21004\CKE21004_rdy.tbl

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

TEMPORARY GRADING DETAILS -Y2TEMP-

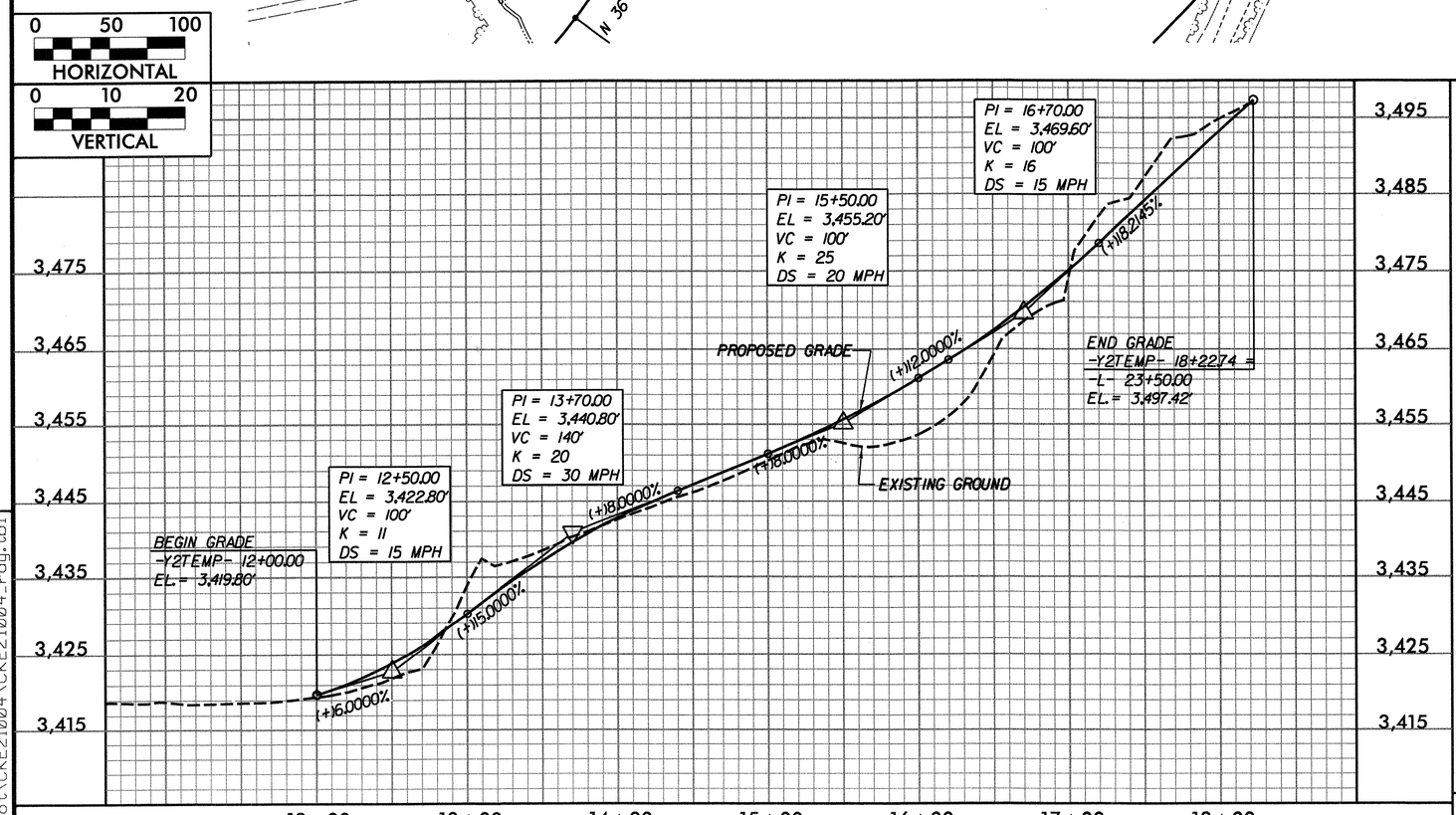
PROJECT REFERENCE NO.	SHEET NO.
R5525	2-C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER JEFFREY D. PAUL 10/9/2014	NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER JEFFREY D. PAUL 10/9/2014
REGISTERED ENGINEER	REGISTERED ENGINEER



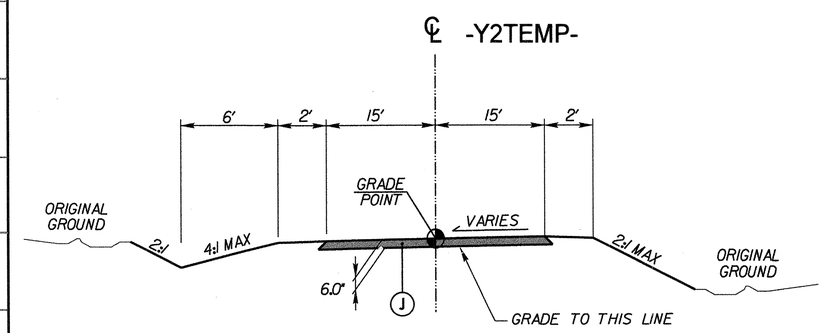
CURVE DATA FOR -Y2TEMP-

PI Sta 11+72.22	PI Sta 13+43.24	PI Sta 15+25.93	PI Sta 20+06.88
Δ = 35° 01' 28.0" (RT)	Δ = 122° 19' 49.5" (LT)	Δ = 14° 55' 48.2" (LT)	Δ = 155° 12' 40.2" (RT)
D = 38° 11' 49.9"	D = 114° 35' 29.6"	D = 28° 38' 52.4"	D = 57° 17' 44.8"
L = 91.69'	L = 106.75'	L = 52.12'	L = 270.89'
T = 47.33'	T = 90.82'	T = 26.21'	T = 455.04'
R = 150.00'	R = 50.00'	R = 200.00'	R = 100.00'
Se = N/A	Se = 0.06	Se = 0.005	Se = 0.06

SEE SHEET 4 FOR PLAN DETAILS
SEE SHEETS EC-02 THRU EC-08 FOR EROSION CONTROL
SEE SHEETS TMP-4 FOR TRAFFIC CONTROL DETAILS



N.T.S



TYPICAL SECTION -Y2TEMP-

-Y2TEMP- STA. 12+50.00 TO STA. 18+22.74

SEE SHEET 2 FOR FULL PAVEMENT SCHEDULE

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

10:06:43 AM
Projects\CKE21004 Limited Services Division Offices\R-5525\Roadway\Proj\R5525_RDY_02C_TEMP_GRADE.dgn
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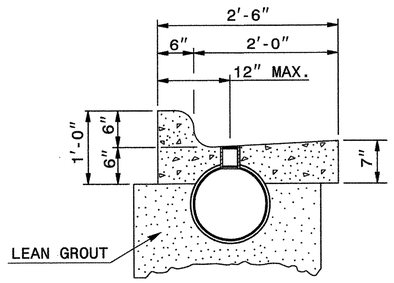
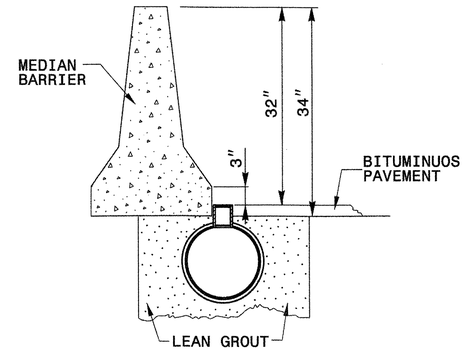
N.T.S

PROJECT REFERENCE NO.	SHEET NO.
R-5525	2-D



ALTERNATE NO.1



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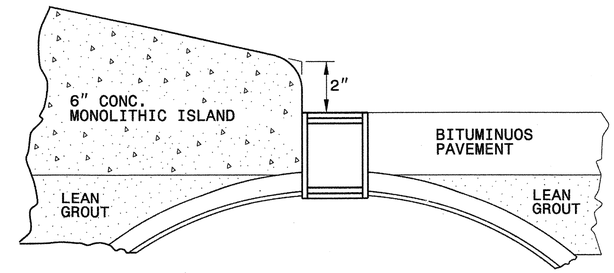
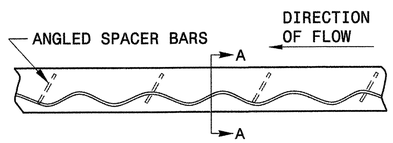
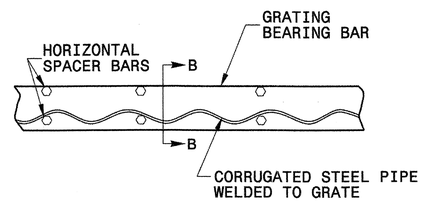
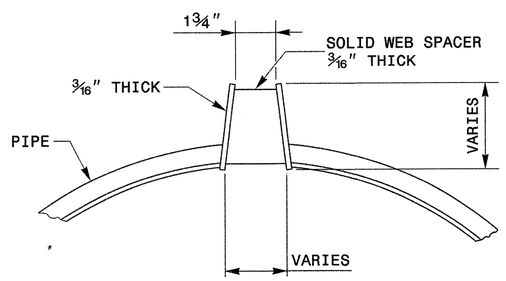


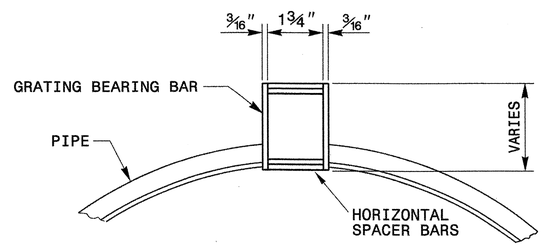
ALTERNATE NO.3







SECTION A-A



SECTION B-B

NOTES:

USE GRATE ASSEMBLIES FABRICATED FROM STRUCTURAL STEEL MEETING THE REQUIREMENTS OF ASTM A 570, GRADE 36 OR ASTM A 36.

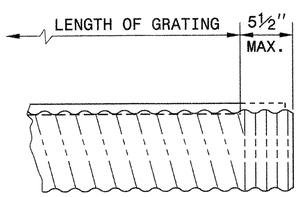
HOT-DIP GALVANIZE GRATES AFTER FABRICATION TO MEET ASTM A123.

USE SLOTTED DRAIN PIPE THAT IS ADEQUATE FOR AASHTO H20 LOADING WHEN INSTALLED AS SHOWN.

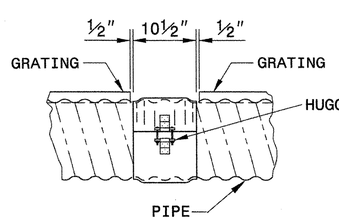
USE SLOTTED DRAIN PIPE FABRICATED FROM ALUMINIZED CORRUGATED STEEL PIPE MEETING THE REQUIREMENTS OF AASHTO M274 TYPE 2.

NCDOT ALLOWS THE USE OF SIMILAR GRATE CONFIGURATIONS MEETING THE REQUIREMENTS OF THIS DETAIL, THE REQUIREMENTS OF THE SPECIAL PROVISIONS, AND THE APPROVAL OF THE ENGINEER.

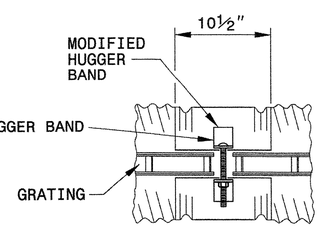
TYPICAL GRATE DETAILS



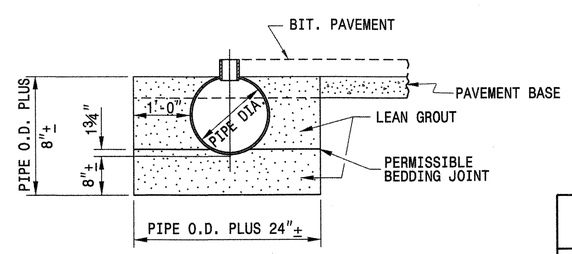
DETAIL AT END OF PIPE



TYPICAL COUPLING BAND



MODIFIED COUPLING BAND



SLOTTED DRAIN PIPE INSTALLATION

NORTH CAROLINA PROFESSIONAL SEAL 19761 ENGINEER CYNTHIA B. PERRY
2/11/14

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

DETAILS OF SLOTTED DRAIN 12" THRU 36" DIAMETER PIPE

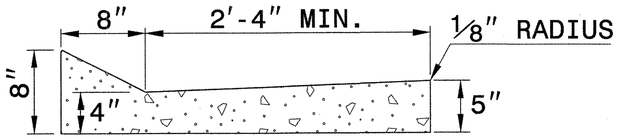
ORIGINAL BY: T.Spell DATE: 2-28-99
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: w:details\stand\slottdrain.dgn

REVISIONS

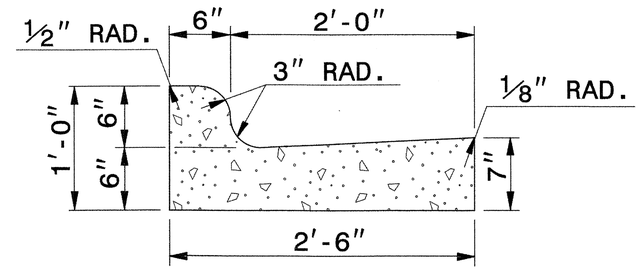
2/3/2014 2:51:28 PM
G:\CKE Projects\CKE21004 Limited Services Division Offices\R-5525\Roadway\Proj\R5525_RDY_020.dgn
G:\CADD\Plot\CKE21004\CKE21004_rdy.tbl

PROJECT REFERENCE NO.	SHEET NO.
R-5525	2-E

0' 50' 100' N.T.S

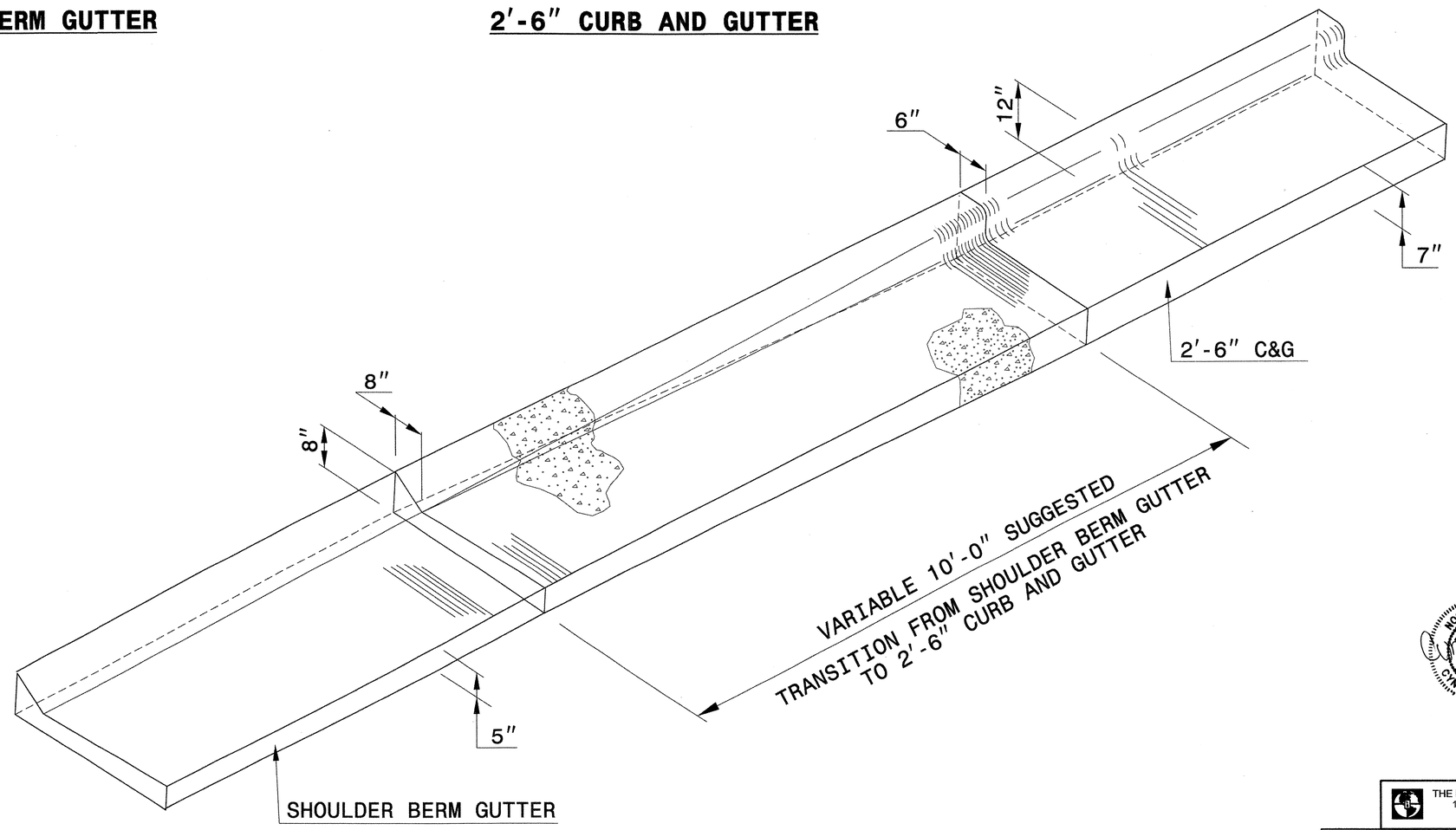


SHOULDER BERM GUTTER



2'-6" CURB AND GUTTER

*NOTE: SEE STD. DWG. 846.01
FOR GENERAL NOTES



ISOMETRIC VIEW OF TRANSITION

NORTH CAROLINA PROFESSIONAL SEAL 19761 ENGINEER CYNTHIA B. PERRY
2/11/14

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

DETAIL OF SHOULDER BERM GUTTER TO 2'-6" CURB & GUTTER TRANSITION SECTION

ORIGINAL BY: E.E. WARD DATE: 5-29-02
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: /usr/details/stand/cgtransit.dgn

REVISIONS

2/3/2014 2:51:53 PM
G:\CKE Projects\CKE21004 Limited Services Division Offices\R-5525\Roadway\Proj\R5525_RDY_02E.dgn
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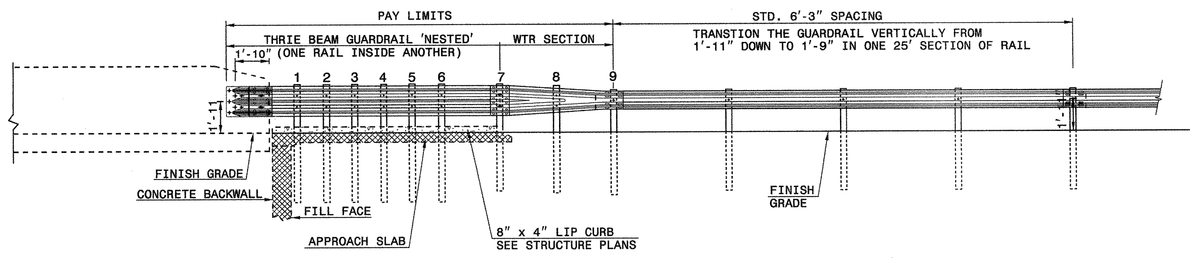
5/14/99

REVISIONS

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

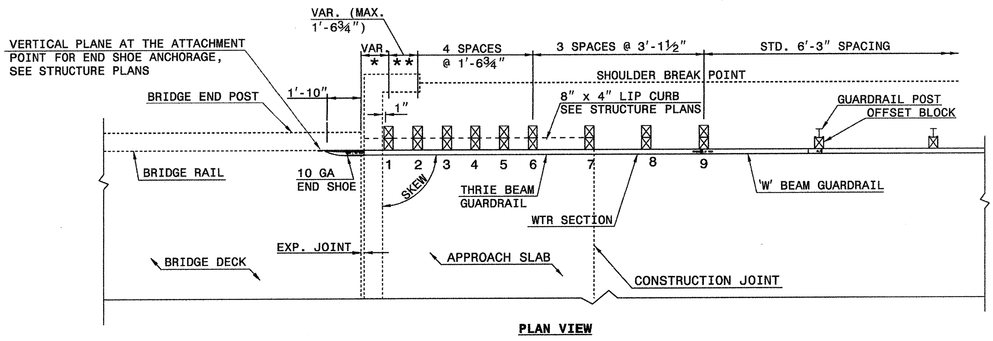
ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862d03



ELEVATION

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 5 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

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

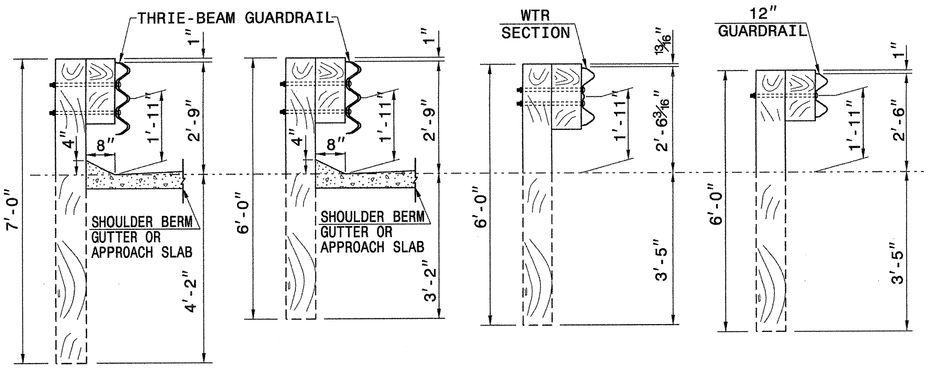
ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO
RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7
862d03

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

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 3 OF 7
862d03

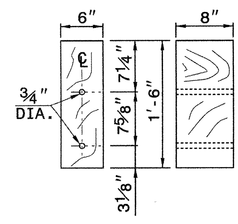


SECTION OF THRIE BEAM POSTS 1 THRU 6

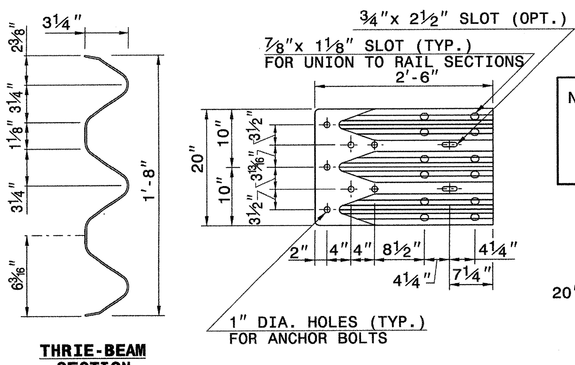
SECTION OF THRIE BEAM POST 7

SECTION OF WTR BEAM POST 8

SECTION OF 'W' BEAM POST 9



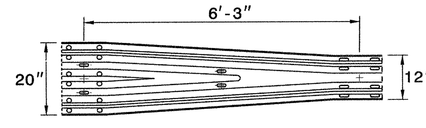
THRIE BEAM OFFSET BLOCK



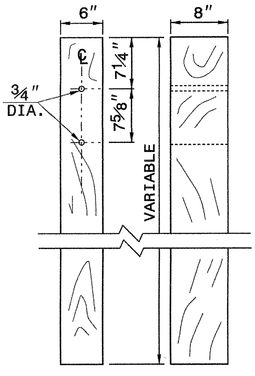
THRIE-BEAM SECTION

END SHOE

NOTE: THE MID POST AND OFFSET BLOCK OF THE WTR SECTION WILL REQUIRE SPECIAL BOLT HOLE DRILLING IN THE THRIE BEAM OFFSET BLOCK AND LINE POST.



WTR SECTION
ELEVATION VIEW



THRIE BEAM LINE POST

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

ENGLISH DETAIL DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 3 OF 7
862d03

N.T.S

PROJECT REFERENCE NO. R-5525
SHEET NO. 2-F

SEE TITLE BLOCK

ORIGINAL BY: J. HOMERTON DATE: 06-22-12
MODIFIED BY:
CHECKED BY:
FILE SPEC.:

CONTRACT STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

THE LOUIS BERGER GROUP, Inc.
1101 Haynes Manor Way, Suite 100
Raleigh, NC 27615-3322

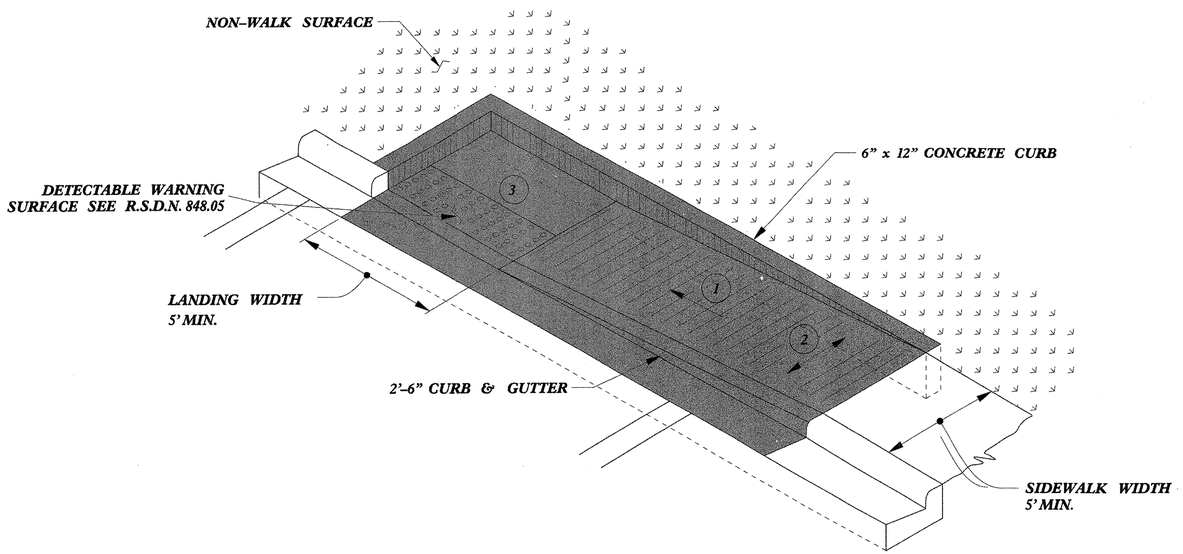
ROADWAY PLANS

NORTH CAROLINA PROFESSIONAL SEAL 19761 ENGINEER
CLAYTON B. PERRY

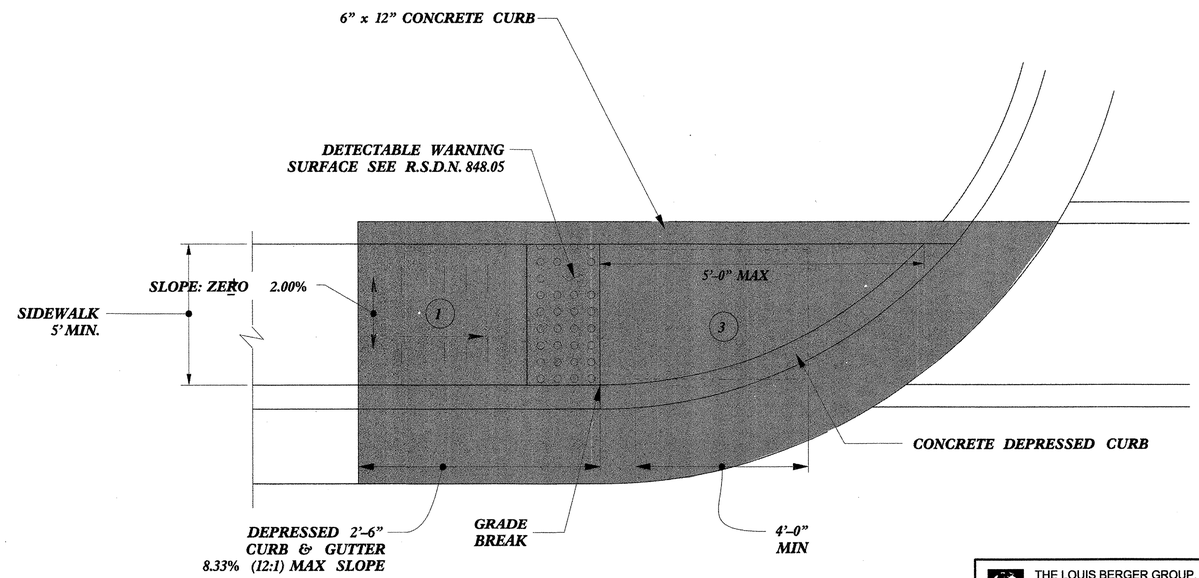
N.T.S

PROJECT REFERENCE NO.	SHEET NO.
R-5525	2-G

PAY LIMITS FOR 1 CURB RAMP



TYPE 1A



TYPE 1

1. 8.33% (12:1) MAX RAMP SLOPE
2. CROSS SLOPE: 2.00%
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

NORTH CAROLINA PROFESSIONAL SEAL 19761 ENGINEER CYNTHIA B. PERRY 2/11/14

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

CONTRACT STANDARDS AND DEVELOPMENT UNIT

Office 919-707-6950 FAX 919-250-4119

CURB RAMPS

Directional Ramps

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

REVISIONS

5/14/99

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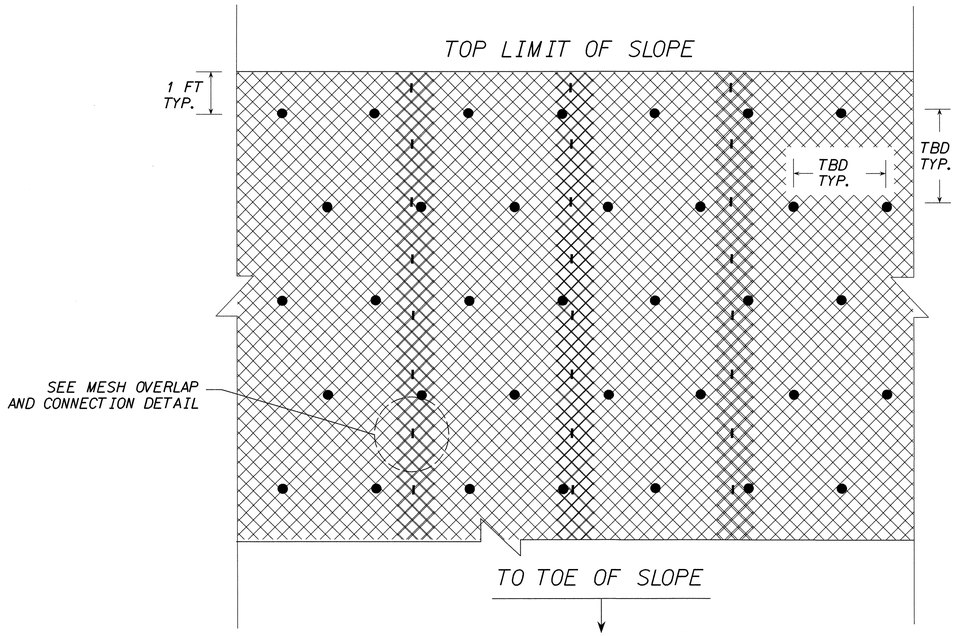
GEOTECHNICAL ENGINEER

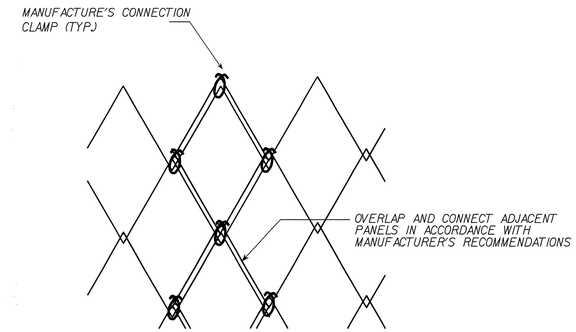
NORTH CAROLINA PROFESSIONAL SEAL 039779 ENGINEER JEREMY R. HAMM

2/18/14

SIGNATURE DATE SIGNATURE DATE



FACE DETAIL

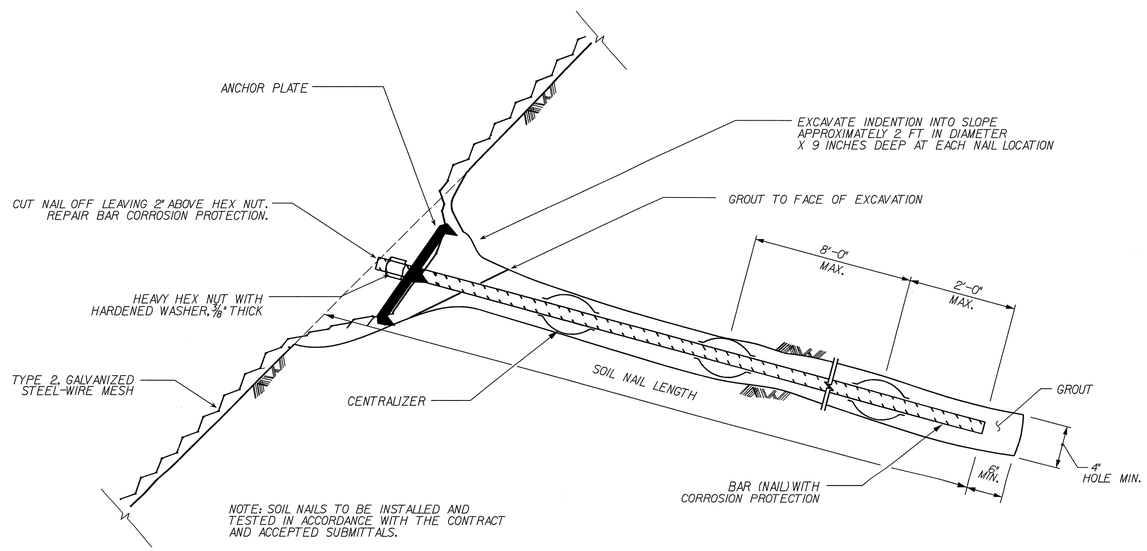


MESH OVERLAP & CONNECTION DETAIL

NOTES:

1) WIRE MESH SHALL BE INSTALLED ON 1.5:1 (H:V) SOIL CUT SLOPES AND AS DIRECTED BY THE ENGINEER.

2) SOIL NAIL LENGTH, SPACING, BAR SIZE, NUT TORQUE AND INCLINATION TO BE DETERMINED BY CONTRACTOR DESIGN.



TYPICAL SECTION

TOTAL BILL OF MATERIAL	
SOIL NAIL SLOPE STABILIZATION	2500 SY

PROJECT NO.: 43761.1.1 (R-5525)

WATAUGA **COUNTY**

STATION: 12+50 - 16+00 -L-

SHEET 1 OF 1

GEOTECHNICAL ENGINEERING UNIT

☐ EASTERN REGIONAL OFFICE

☐ WESTERN REGIONAL OFFICE

☒ CONTRACTS

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

SOIL NAIL SLOPE STABILIZATION

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	2H
1			3			TOTAL SHEETS
2			4			

PREPARED BY: JRH	DATE: 10/16/13
REVIEWED BY: CVN	DATE: 10/16/13

PROJECT REFERENCE NO.	SHEET NO.
R-5525	3-A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS								IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	XI MOD	XI	GRAU 350 TL-2	GRAU 350	TYPE-III	CAT-1	VI MOD	B-77	AT-1	EA	G	NG				
-L-	11+48.73	11+92.48	LT	43.75'	-	-	11+48.73	N/A	4.9'	7.9'	25'	N/A	0.5'	N/A	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-
-L-	11+48.73	11+92.48	RT	43.75'	-	-	11+48.73	N/A	19.9'	22.9'	25'	N/A	0.5'	N/A	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-
-Y1-	12+30.00	13+23.75	RT	93.75'	-	-	-	-	8.2'	11.2'	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	208'	-	-
-Y1-	13+90.00	14+40.00	RT	50'	-	-	-	-	8.9'	11.9'	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
															DEDUCTIONS FOR GUARDRAIL ANCHOR UNITS															
															TYPE TL-2		2 @ .25' =		50'											
			SUB-TOTAL	231.25'											TYPE III		2 @ 18.75' =		37.5'											
	DEDUCTIONS FOR GUARDRAIL ANCHOR UNITS			143.75'											TYPE AT-1		1 @ 6.25' =		6.25'											
			TOTAL	87.5'											TYPE GRAU 350		1 @ 50' =		50'											
			SAY	100'													TOTAL =		143.75'											

ADDITIONAL GUARDRAIL POSTS = 5 EACH

SUMMARY OF EARTHWORK (IN CUBIC YARDS)

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-Y2TEMP- 12+00.00	18+22.74	2,300	3,049	749	0
-L- 11+51.38	18+00.00	14,978	895	-	14,083
-L- 18+00.00	29+50.00	8,250	4,545	-	3,705
-L- 29+50.00	35+92.00	5,281	13	-	5,268
-Y1- 18+50.00	21+00.00	0	0	-	0
-Y3- 10+00.00	21+28.00	7,640	553	-	7,087
PROJECT TOTALS:		38,449	9,055	749	30,143
ROCK WASTE TO REPLACE BORROW		-	-	-651	-651
ADJUST FOR ROCK WASTE		-	-98	-98	-
ADJUST FOR ROCK WASTE		-	-44	-	44
GRAND TOTALS:		38,449	8,913	0	29,536
SAY:		39,000	-	-	-

-L- & -Y3- PAVEMENT STRUCTURE VOLUME = 4,719 CY

CONTINGENCY ITEMS
UNDERCUT EXCAVATION 100 CY
SELECT GRANULAR MATERIAL 200 CY
INCIDENTAL STONE BASE 200 TON

Note: Approximate quantities only. Unclassified Excavation, Fine Grading, and Clearing and Grubbing will be paid for at the contract lump sum price for "Grading."

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	LENGTH FT
-L-	11+62.38	12+50.00	LT	87.6'
-L-	11+62.38	12+50.00	RT	87.6'
-	-	-	-	-
			TOTAL:	175.2'
			SAY:	180'

2'-6" CURB & GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	LENGTH FT
-L-	12+50.00	35+92.00	LT	2,342'
-L-	12+50.00	35+12.85	RT	2,253'
-Y3-	11+51.51	20+34.10	LT	930'
-Y3-	10+00.00	21+28.00	RT	1,128'
			TOTAL:	6,653'
			SAY:	6,655'

SUMMARY OF SOIL NAIL SLOPE STABILIZATION

LINE	BEGINNING SLOPE	APPROX. STATION	ENDING SLOPE	APPROX. STATION	LOCATION LT/RT	SY
-L-		12+50		16+00	RT	2500
					TOTAL SY:	2500

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	STATION	STATION	AGGREGATE TYPE* ASU/AST	AGGREGATE THICKNESS INCHES	SHALLOW UNDERCUT CY	CLASS IV SUBGRADE STABILIZATION TONS	GEOTEXTILE FOR SOIL STABILIZATION SY	STABILIZER AGGREGATE TONS	CLASS IV AGGREGATE STABILIZATION TONS
CONTINGENCY			ASU	N/A	250	500	250		
			TOTAL CY/TONS/SY:		250	500	250	0	0

* ASU = AGGREGATE SUBGRADE
* AST = AGGREGATE STABILIZATION

REVISIONS

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THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

COMPUTED BY: FS DATE: 1/22/2014

CHECKED BY: WR DATE: 1/22/2014

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE No.	SHEET
R-5525	3-B

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.

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

STATION	LOCATION (LT, RT, OR CL)'	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL
L 21+50	RT	401		3459.36			
		401	426		3455.11	3444.19	
L 22+00	RT	402		3465.77			
		402	401		3461.52	3455.11	
L 23+25	RT	403		3484.23			
		403	410		3479.98	3468.71	
L 25+75	LT	404		3515.21			
		404	413		3510.96	3503.01	
L 19+50	RT	405		3439.64			
		405	446		3435.39	3431.08	
L 18+50	RT	408		3434.92			
		408	437		3430.50	3417.50	
L 22+50	RT	410		3472.96			
		410	402		3468.71	3461.52	
L 24+10	RT	411		3496.60			
		411	403		3492.35	3479.98	
L 24+30	LT	412		3499.03			
		412	411		3494.78	3492.35	
L 25+00	LT	413		3507.26			
		413	412		3503.01	3494.78	
L 25+00	LT	414		3516.75			
		414	413		3515.50	3504.26	
L 27+25	LT	416		3532.27			
		416	404		3528.52	3511.46	
L 27+25	RT	417		3532.41			
		417	416		3529.41	3529.27	
L 22+50	LT	418		3478.75			
		418	410		3475.75	3469.96	
L 12+25	LT	420		3431.62			
		420	421		3428.62	3425.26	
L 11+72	LT	421		3428.43			
		421	422		3425.26	3414.00	
L 16+00	RT	423		3464.20			
		423	424		3461.70	3438.83	
L 16+15	RT	424		3443.73			
		424	419		3438.83	3438.56	
L 20+50	RT	426		3448.44			
		426	405		3444.19	3435.39	
Y1 14+87	RT	427		3423.75			
		427	439		3416.41	3413.86	
L 16+80	LT	428		3438.86			
		428	429		3435.69	3434.46	
SHEET TOTALS							

SIZE / THICKNESS OR GAUGE

STRUCTURE	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) 12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109
402–401																	40			
403–410																	64			
410–402																	40			
411–403																	76			
414–413														32						
418–410														52						
421–422														52						
423–424																	44			
SHEET TOTALS														136			264			

STRUCTURE	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
401–426					96											
404–413					68											
405–446					92											
408–437					72											
412–411					32											
413–412					68											
416–404				144												
417–416		24														
420–421		48														
424–419					52											
426–405					96											
428–429		44														
SHEET TOTALS		116		144	576											

STRUCTURE	15" C.S. SLOTTED DRAIN, 0.064" THICK (LF)	*** RC PIPE CULVERTS, CONTRACTOR DESIGN	*** RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (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. 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
401								1			1			1
402								1			1			1
403								1			1			1
404								1			1		1	
405								1			1		1	
408								1			1			1
410								1			1			1
411								1			1			1
412								1			1		1	
413								1			1		1	
416								1			1		1	
417								1			1			1
418								1						
420								1			1		1	
421								1						
424								1						
426								1			1			1
427								1	2.3					
428								1			1			1
SHEET TOTALS								19	2.3		15		6	9

STRUCTURE	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	T.B.D.I. STD. 840.35	FRAMES AND WIDE SLOT FLAT GRATES STD. 840.20	G.D.I. TYPE "B" STD. 840.18 OR 840.27	D.I. STD. FRAME WITH GRATE STD. 840.16	G.D.I. FRAME WITH GRATE STD. 840.22	15" & 18" BDO STD. 850.10	24" & 30" BDO STD. 850.11	T.B.J.B. W/ SLAB LID STD. 840.34	CONC. J.B. STD. 840.31 OR BRICK J.B. STD. 840.32	MANHOLE FRAME AND COVER STD. 840.54				C.S. PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71		PIPE REMOVAL LIN. FT.	REMARKS
413																				20	
414									1												
414–413																	1 @ 15"				
416																				22	ROD & LUG CONN. W/ SLEEVE GASKETS
418						1		1													
418–410																	2 @ 15"				ROD & LUG CONN. W/ SLEEVE GASKETS
421				1	1																
423										1											
423–424																	1 @ 30"				ROD & LUG CONN. W/ SLEEVE GASKETS
424												1	1								
426																				22	
427				1	1													0.058			
427–439																					EX. PIPE
																	3 @ 15"				
SHEET TOTALS				2	2	1		1	1	1		1	1				1 @ 30"	0.058		64	

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.)	(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

REVISIONS

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THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

COMPUTED BY: FS DATE: 1/22/2014

CHECKED BY: WR DATE: 1/22/2014

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE No.	SHEET
R-5525	3-C

REVISIONS

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.

LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & 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"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	C.S. PIPE 12" .064	C.S. PIPE 15" .064	C.S. PIPE 18" .064	C.S. PIPE 24" .064	C.S. PIPE 30" .079	C.S. PIPE 36" .079	C.S. PIPE 42" .109	C.S. PIPE 48" .109
L 16+95	LT	429		3437.46																							
		429	438		3434.46	331.83																					
Y1 14+05	RT	431		3424.15																							
		431	432		3420.98	3415.00															24						
L 18+20	RT	438		3434.83																							
		438	446		3431.83	3431.25																					
Y1 13+09	RT	440		3424.90																							
		440	441		3419.69	3419.61																					
Y1 12+98	RT	441		3424.70																							
		441	442		3419.61	3413.80																24					
L 12+25	RT	443		3463.00																							
		443	444		3459.00	3432.42															56						
L 12+25	RT	444		3435.42																							
		444	420		3432.42	3428.62																					
L 18+50	RT	445		3434.50																							
	RT	445	446		3433.00	3431.25																					
L 18+55	RT	446		3435.50																							
		446	447		3430.00	3418.00																		80			
Y3 14+00	LT	501		3588.98																							
		501	502		3585.98	3580.76																					
Y3 13+45	LT	502		3583.76																							
		502	503		3580.76	3577.77																					
Y3 13+15	RT	503		3580.77																							
		503	516		3577.77	3571.72																					
Y3 11+50	RT	504		3570.27																							
		504	505		3567.27	3565.94																					
Y3 11+38	LT	505		3568.94																							
		505	506		3565.69	3564.39																					
L 30+50	LT	506		3567.64																							
		506	517		3563.89	3542.27																					
L 32+00	LT	507		3585.75																							
		507	519		3582.00	3572.36																	68				
L 32+33	RT	508		3589.81																							
		508	507		3586.06	3582.00																					
L 33+00	RT	509		3596.40																							
		509	508		3592.65	3586.06																					
L 33+00	RT	510		3601.75																							
		510	509		3599.25	3593.15																24					
L 33+00	LT	512		3597.70																							
		512	509		3594.70	3593.40																					
L 33+00	LT	513		3599.10																							
		513	512		3597.85	3594.70															16						
L 30+50	LT	514		3570.25																							
		514	506		3569.00	3564.64															20						
Y3 11+47	LT	515		3572.25																							
SHEET TOTALS																					116	48	68	80			

STATION	FROM	TO	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"	15" C.S. SLOTTED DRAIN, 0.064" THICK (LF)	*** RC PIPE CULVERTS, CONTRACTOR DESIGN	*** RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YARDS R.C.P.	C.S.P.
L 16+95	429																								
	429	438		88																					
Y1 14+05	431																		96						
	431	432																							
L 18+20	438																								
	438	446		32																					
Y1 13+09	440																								
	440	441			16																				
Y1 12+98	441																								
	441	442																							
L 12+25	443																								
	443	444																							
L 12+25	444																								
	444	420		56																					
L 18+50	445																								
	445	446			16																				
L 18+55	446																								
	446	447																							
Y3 14+00	501																								
	501	502		52																					
Y3 13+45	502																								
	502	503		40																					
Y3 13+15	503																								
	503	516		64																					
Y3 11+50	504																								
	504	505		60																					
Y3 11+38	505																								
	505	506			52																				
L 30+50	506																								
	506	517				196																			
L 32+00	507																								
	507	519																							
L 32+33	508																								
	508	507				40																			
L 33+00	509																								
	509	508				64																			
L 33+00	510																								
	510	509																							
L 33+00	512																								
	512	509		24																					
L 33+00	513																								
	513	512																							
L 30+50	514																								
	514	506																							
Y3 11+47	515																								
SHEET TOTALS				416	84	300													96						

STATION	FROM	TO	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	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	T.B.D.I. STD. 840.35	FRAMES AND WIDE SLOT FLAT GRATES STD. 840.20	G.D.I. TYPE "B" STD. 840.18 OR 840.27	D.I. STD. FRAME WITH GRATE STD. 840.16	G.D.I. FRAME WITH TWO GRATES STD. 840.22	15" & 18" BDO STD. 850.10	24" & 30" BDO STD. 850.11	T.B.J.B. W/ SLAB LID STD. 840.34	CONC. J.B. STD. 840.31 OR BRICK J.B. STD. 840.32	MANHOLE FRAME AND COVER STD. 840.54			C.S. PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71		PIPE REMOVAL LIN. FT.	REMARKS
L 16+95	429		1			1		1																					
	429	438																											
Y1 14+05	431		1										1	1												0.045			
	431	432																							1 @ 15"				ROD & LUG CONN. W/ SLEEVE GASKETS
L 18+20	438		1			1	1																						
	438	446																										42	
Y1 13+09	440		1	0.2																	1								
	440	441																											
Y1 12+98	441		1	0.1									1	1															
	441	442																							1 @ 18"				ROD & LUG CONN. W/ SLEEVE GASKETS
L 12+25	443		1												1		1												
	443	444																							2 @ 15"				ROD & LUG CONN. W/ SLEEVE GASKETS
L 12+25	444		1			1			1																				
	444	420																											
L 18+50	445																												
	445	446																											
L 18+55	446		1	0.5		1		1																					
	446	447																											
Y3 14+00	501		1			1		1																					
	501	502																											
Y3 13+45	502		1			1		1																					
	502	503																											
Y3 13+15	503		1			1			1																				
	503	516																											
Y3 11+50	504		1			1			1																				
	504	505																											
Y3 11+38	505		1			1		1																					
	505	506																											
L 30+50	506		1			1		1																					
	506	517																											
L 32+00	507		1			1		1																					
	507	519																											
L 32+33	508		1			1			1																				
	508	507																											
L 33+00	509		1			1			1																				
	509	508																											
L 33+00	510		1									1				1													
	510	509																							1 @ 18"				ROD & LUG CONN. W/ SLEEVE GASKETS
L 33+00	512		1			1		1																					
	512	509																											
L 33+00	513																	1											
	513	512																							1 @ 15"				ROD & LUG CONN. W/ SLEEVE GASKETS
L 30+50	514																	1											
	514	506																							1 @ 15"				ROD & LUG CONN. W/ SLEEVE GASKETS
Y3 11+47	515																	1											
																									5 @ 15"				
SHEET TOTALS			19	0.8		14	1	8	5			1	2	2	1	1	1	3		1					2 @ 18"	0.045		42	

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.)	(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

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THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

COMPUTED BY:	FS	DATE:	1/22/2014
CHECKED BY:	WR	DATE:	1/22/2014

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT REFERENCE No.	SHEET
R-5525	3-D

RAL-FSIKES7

Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

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

STATION / SIZE / THICKNESS OR GAUGE	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"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
		515	505		3570.75	3565.69													
Y3 12+50	RT	516		3574.72															
		516	504		3571.72	3567.27													
L 28+50	LT	517		3546.02															
		517	416		3542.13	3528.52													
L 28+50	RT	518		3546.02															
		518	517		3543.02	3542.88													
L 31+25	LT	519		3576.11															
		519	506		3572.36	3563.89													
L 28+50	LT	520		3551.75															
		520	517		3550.50	3543.02													
Y3 15+50	LT	521		3603.98															
		521	501		3600.98	3585.98													
Y3 16+50	LT	522		3612.63															
		522	521		3607.28	3600.98													
Y3 17+50	LT	523		3616.63															
		523	522		3607.75	3607.28													
Y3 18+50	LT	524		3616.12															
		524	523		3608.22	3607.75													
Y3 20+00	LT	525		3613.12															
		525	524		3608.99	3608.22													
Y3 20+45	LT	526		3612.22															
		526	525		3609.22	3608.99													
SHEET TOTALS																			
PROJECT TOTALS																			

STATION	FROM	TO	C.S. PIPE 12" .064	15" .064	18" .064	24" .064	30" .079	36" .079	42" .109	48" .109	R.C. PIPE CLASS III 12"	15"	18"	24"	30"	36"	42"	48"	R.C. PIPE CLASS IV 12"	15"	18"	24"	30"	36"	42"	48"
	515	505			20																					
	516	504										52														
	517	416												124												
	518	517										28														
	519	506				68																				
	520	517		16																						
	521	501										140														
	522	521										92														
	523	522										92														
	524	523										92														
	525	524										152														
	526	525										44														
SHEET TOTALS				16	20	68						640		124												
PROJECT TOTALS				268	68	136	344					1172	84	568	576											

STATION	FROM	TO	15" C.S. SLOTTED DRAIN, 0.064" THICK (LF)	***RC PIPE CULVERTS, CONTRACTOR DESIGN	***RC PIPE CULVERTS, CONTRACTOR DESIGN	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01 838.11 OR STD. 838.80 (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
Y3 12+50	516									1			1			1
L 28+50	517									1			1		1	
L 28+50	518									1			1			1
L 31+25	519									1			1		1	
Y3 15+50	521									1			1		1	
Y3 16+50	522									1	0.4		1		1	
Y3 17+50	523									1	3.9		1		1	
Y3 18+50	524									1	2.9		1			1
Y3 20+00	525									1			1			1
Y3 20+45	526									1			1			1
SHEET TOTALS										8	7.2		8		4	4
PROJECT TOTALS			96							46	10.3		37	1	18	18

STATION	FROM	TO	CONCRETE TRANSITIONAL SECTION DROP INLET	CATCH BASIN	D.I. STD. 840.14 OR STD. 840.15	T.B.D.I. STD. 840.35	FRAMES AND WIDE SLOT FLAT GRATES STD. 840.20	G.D.I. TYPE "B" STD. 840.18 OR 840.27	D.I. STD. FRAME WITH GRATE STD. 840.16	G.D.I. FRAME WITH TWO GRATES STD. 840.22	15" & 18" BDO STD. 850.10	24" & 30" BDO STD. 850.11	T.B.J.B. W/ SLAB LID STD. 840.34	CONC. J.B. STD. 840.31 OR BRICK J.B. STD. 840.32	MANHOLE FRAME AND COVER STD. 840.54				C.S. PIPE ELBOWS NO. & SIZE	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71		PIPE REMOVAL LIN. FT.	REMARKS
	515	505																	1 @ 18"				ROD & LUG CONN. W/ SLEEVE GASKETS
L 28+50	517																					20	
L 28+50	520										1												
	520	517																	1 @ 15"				ROD & LUG CONN. W/ SLEEVE GASKETS
																			1 @ 15"				
SHEET TOTALS											1								1 @ 18"			20	
																			9 @ 15"				
																			3 @ 18"				
PROJECT TOTALS					1	4	4	2	1	2	5	1	1	1	1				1 @ 30"	0.103		126	

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.)	(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

REVISIONS

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THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-5525	3E
R/W SHEET NO.	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL NO.	SHEET NO.	PROPERTY OWNER NAME
1	4	APPALACHIAN REGIONAL HEALTHCARE SYSTEM
2	4 & 5	WATAUGA MEDICAL CENTER, INC.
3	4 & 5	BARBARA LENTZ WRIGHT
4	5	KENNETH WRIGHT

REVISIONS

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THE LOUIS BERGER GROUP, Inc.
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Raleigh, NC 27605-3322

ROADWAY PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-5525	4
R/W SHEET NO.	

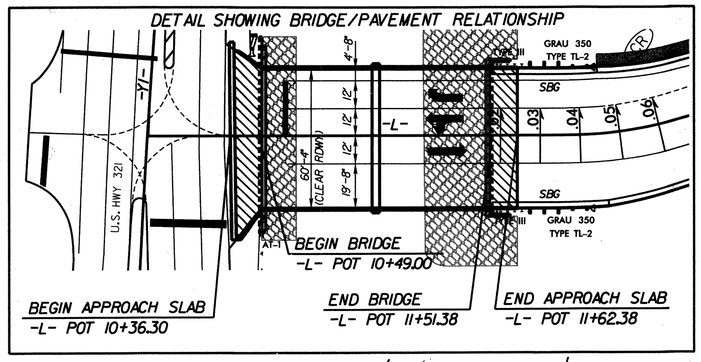
ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 19002 ENGINEER DAVID H. HAYFIELD — REGISTERED ENGINEER 2-26-14

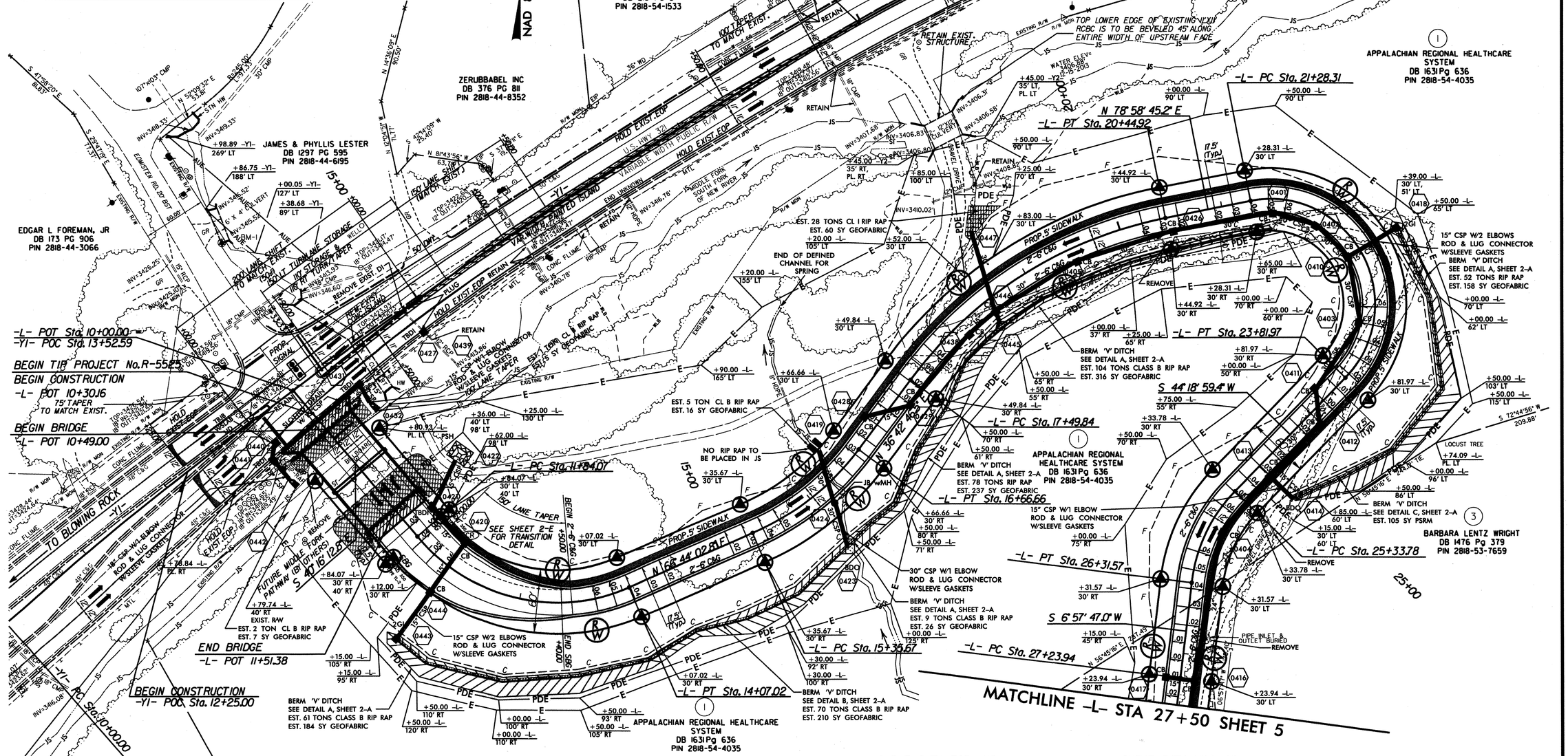
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 032131 ENGINEER WALTER ROBERTS — REGISTERED ENGINEER 2-26-14

0' 50' 100'

NOTE: ALL DRAINAGE PIPES, UNLESS SPECIFIED, ARE ASSUMED TO BE RCP CLASS III.

NAD 83/NSRS 2011





CURVE DATA FOR -L-					CURVE DATA FOR -Y2-		CURVE DATA FOR -Y1-	
PI Sta 13+09.06	PI Sta 15+98.22	PI Sta 18+99.97	PI Sta 23+56.66	PI Sta 25+95.29	PI Sta 11+80.93	PI Sta 13+26.75	PI Sta 15+00.82	PI Sta 20+86.11
Δ = 72° 59' 44.4" (LT)	Δ = 30° 01' 16.3" (LT)	Δ = 42° 15' 58.7" (RT)	Δ = 133° 30' 47.9" (RT)	Δ = 25° 52' 53.4" (LT)	Δ = 56° 37' 30.9" (RT)	Δ = 88° 09' 04.2" (LT)	Δ = 12° 01' 50.3" (RT)	Δ = 6° 41' 45.8" (RT)
D = 32° 44' 25.6"	D = 22° 55' 05.9"	D = 14° 19' 26.2"	D = 11° 27' 33.0"	D = 11° 27' 33.0"	D = 57° 17' 44.8"	D = 114° 35' 29.6"	D = 1° 12' 19.9"	D = 3° 48' 07.1"
L = 222.95'	L = 130.99'	L = 295.07'	L = 233.02'	L = 225.86'	L = 98.83'	L = 76.93'	L = 997.95'	L = 176.12'
T = 129.48'	T = 67.04'	T = 154.61'	T = 232.83'	T = 114.89'	T = 53.87'	T = 48.41'	T = 500.82'	T = 88.16'
R = 175.00'	R = 250.00'	R = 400.00'	R = 100.00'	R = 500.00'	R = 100.00'	R = 50.00'	R = 4,752.75'	R = 1,507.00'
Se = 0.06	Se = 0.05	Se = 0.04	Se = 0.06	Se = 0.06	Se = 0.02	Se = 0.02	Se = EXIST.	Se = EXIST.

SEE SHEETS 6 THRU 8 FOR PROFILES
SEE SHEETS S-1 THRU S-18 FOR STRUCTURE PLANS

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ROADWAY PLANS

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PROJECT REFERENCE NO.	SHEET NO.
R-5525	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER — REGISTERED ENGINEER

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 032134 ENGINEER — REGISTERED ENGINEER

0' 50' 100'

NOTE: ALL DRAINAGE PIPES, UNLESS SPECIFIED, ARE ASSUMED TO BE RCP CLASS III.

CURVE DATA FOR -L-

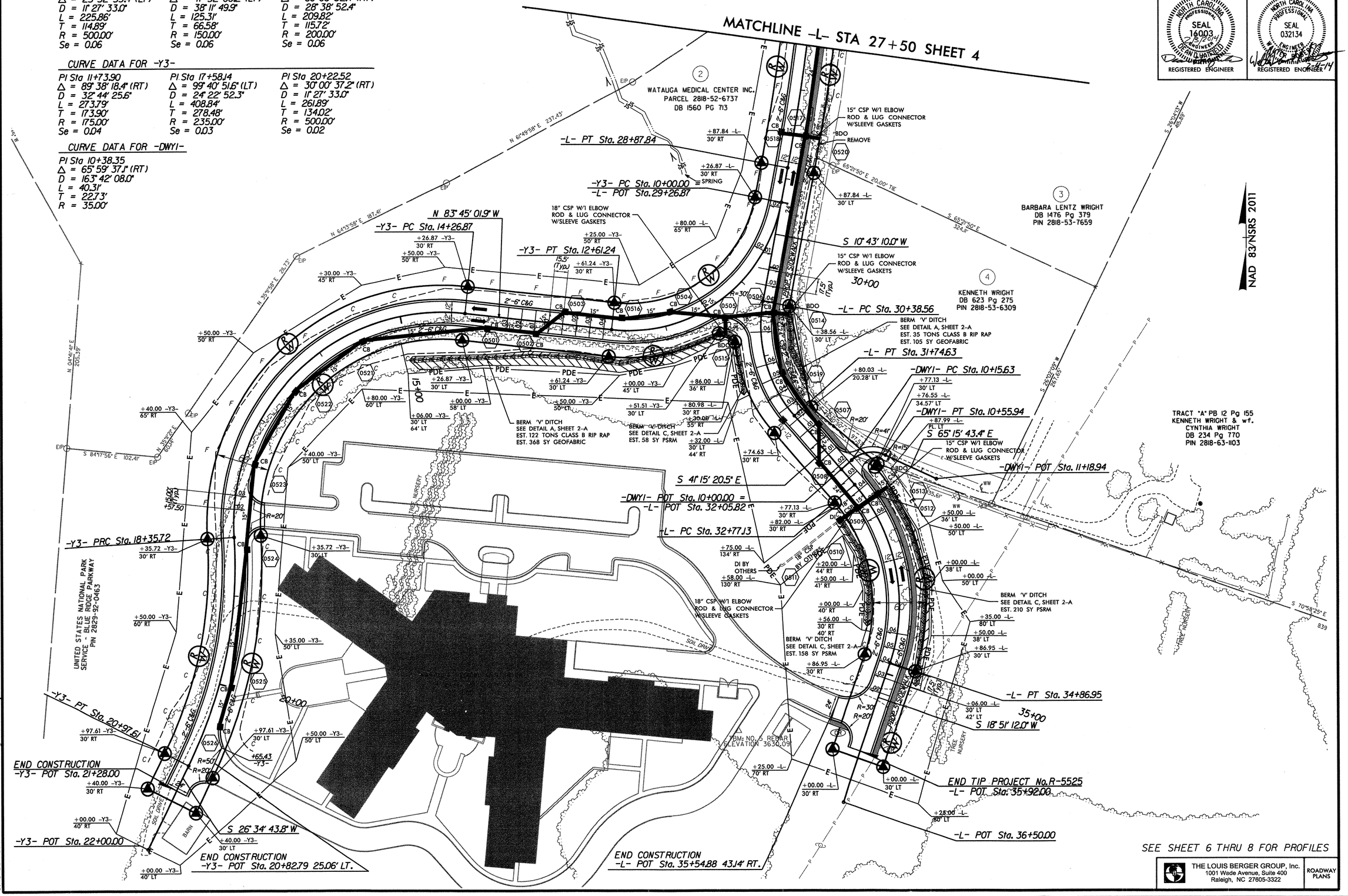
PI Sta 25+95.29	PI Sta 31+33.44	PI Sta 33+44.23
Δ = 25° 52' 53.4" (LT)	Δ = 47° 52' 00.2" (LT)	Δ = 60° 06' 32.4" (RT)
D = 11° 27' 33.0"	D = 38° 11' 49.9"	D = 28° 38' 52.4"
L = 225.86'	L = 125.31'	L = 209.82'
T = 114.89'	T = 66.58'	T = 115.72'
R = 500.00'	R = 150.00'	R = 200.00'
Se = 0.06	Se = 0.06	Se = 0.06

CURVE DATA FOR -Y3-

PI Sta 11+73.90	PI Sta 17+58.14	PI Sta 20+22.52
Δ = 89° 38' 18.4" (RT)	Δ = 99° 40' 51.6" (LT)	Δ = 30° 00' 37.2" (RT)
D = 32° 44' 25.6"	D = 24° 22' 52.3"	D = 11° 27' 33.0"
L = 273.79'	L = 408.84'	L = 261.89'
T = 173.90'	T = 278.48'	T = 134.02'
R = 175.00'	R = 235.00'	R = 500.00'
Se = 0.04	Se = 0.03	Se = 0.02

CURVE DATA FOR -DWY1-

PI Sta 10+38.35
Δ = 65° 59' 37.1" (RT)
D = 163° 42' 08.0"
L = 40.31'
T = 22.73'
R = 35.00'



SEE SHEET 6 THRU 8 FOR PROFILES

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

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THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605

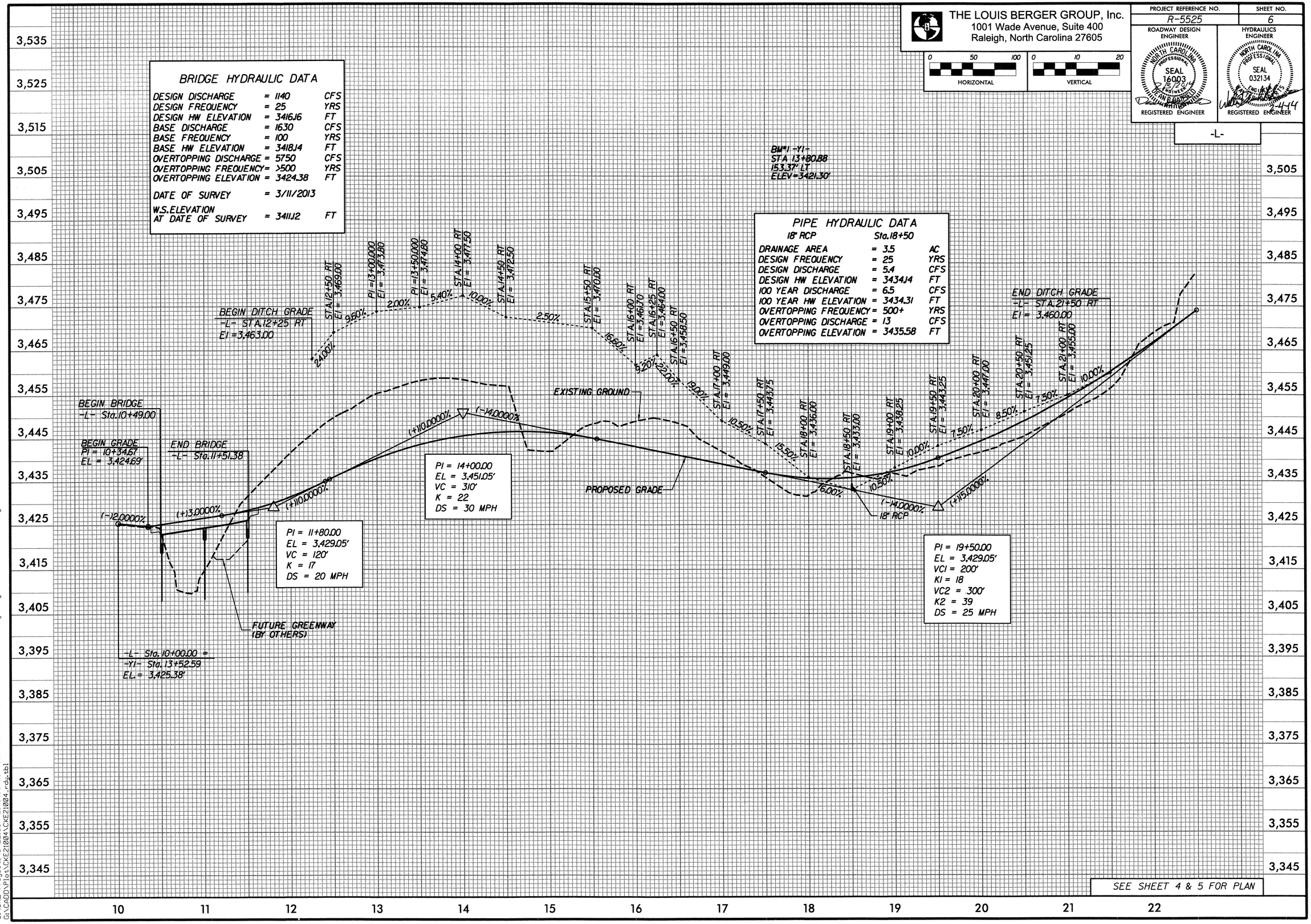
PROJECT REFERENCE NO.	SHEET NO.
R-5525	6

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER — REGISTERED ENGINEER

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 032134 ENGINEER — REGISTERED ENGINEER

-L-

HORIZONTAL 0 50 100 — VERTICAL 0 10 20



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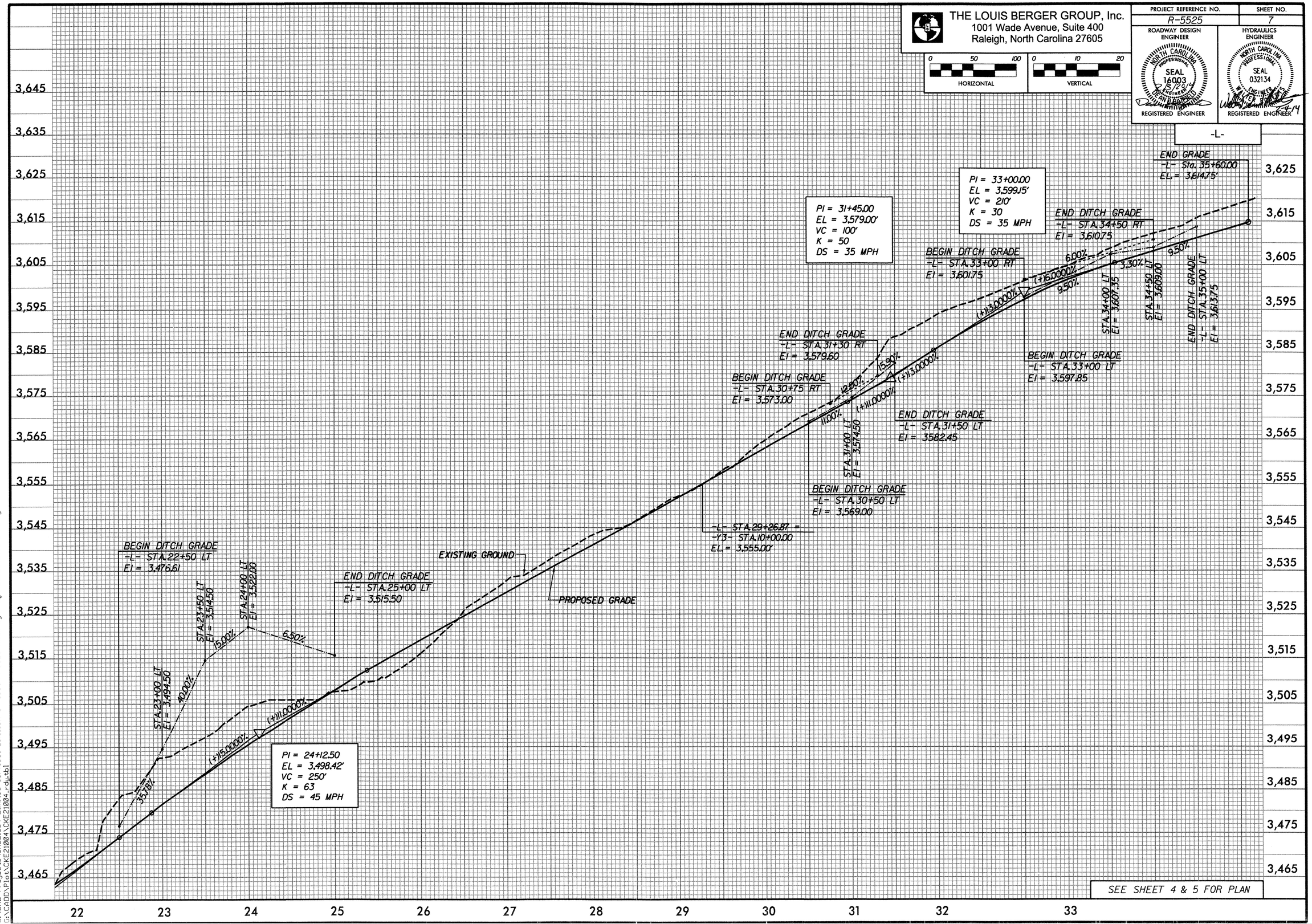
THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605

PROJECT REFERENCE NO.	SHEET NO.
R-5525	7

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER — REGISTERED ENGINEER

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 032134 ENGINEER — REGISTERED ENGINEER



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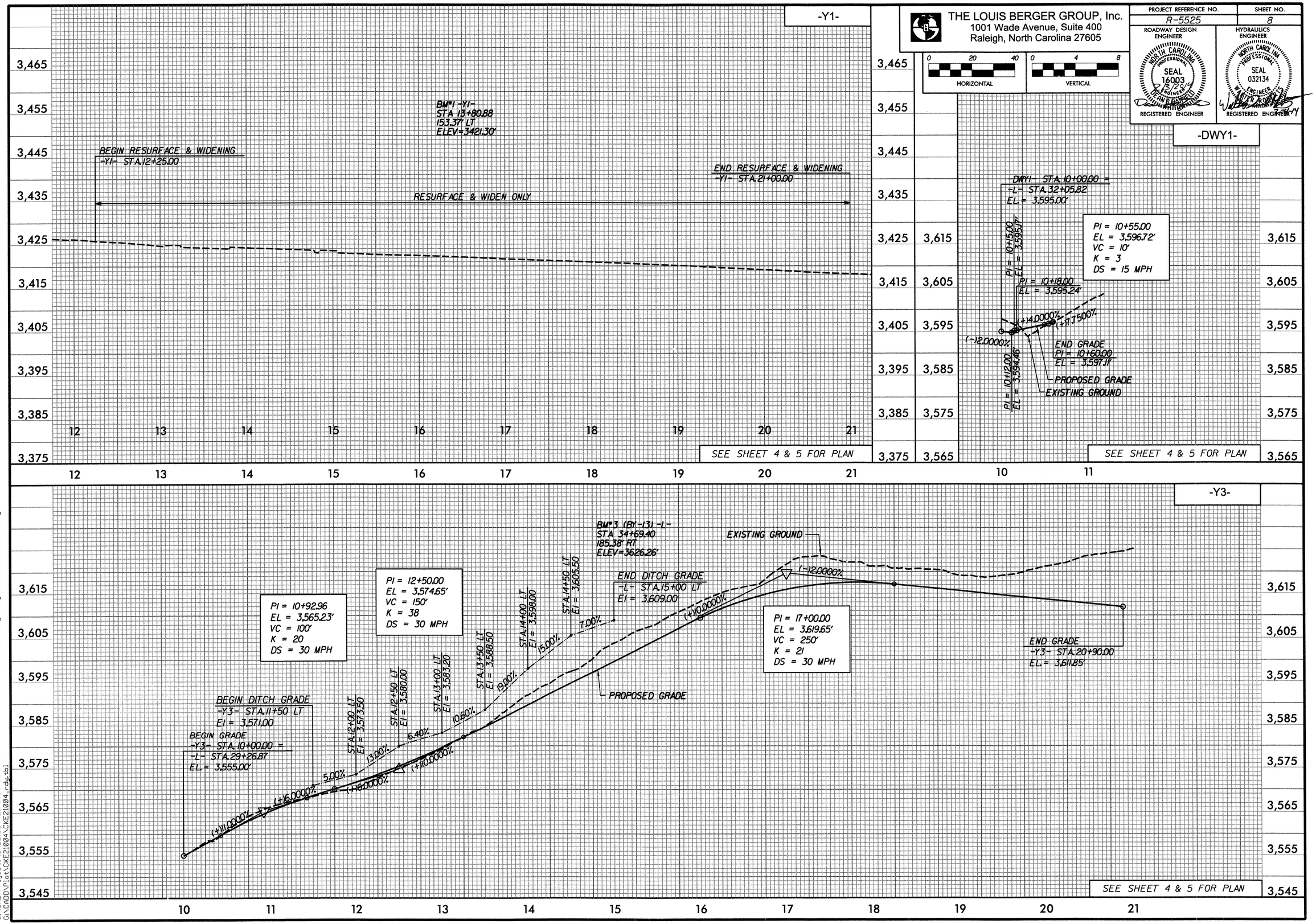
-Y1-
THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605
PROJECT REFERENCE NO.
R-5525
SHEET NO.
8
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
SEAL 16003
SEAL 032134
REGISTERED ENGINEER
HORIZONTAL
VERTICAL
BM#1 -Y1-
STA 13+80.88
153.37' LT
ELEV=3421.30'
BEGIN RESURFACE & WIDENING
-Y1- STA.12+25.00
END RESURFACE & WIDENING
-Y1- STA.21+00.00
RESURFACE & WIDEN ONLY
SEE SHEET 4 & 5 FOR PLAN
-DWY1-
DWY1- STA. 10+00.00 =
-L- STA. 32+05.82
EL = 3,595.00'
PI = 10+55.00
EL = 3,596.72'
VC = 10'
K = 3
DS = 15 MPH
PI = 10+15.00
EL = 3,595.17'
PI = 10+18.00
EL = 3,595.24'
(+14.0000%)
(+17.5000%)
(-12.00000%)
END GRADE
PI = 10+60.00
EL = 3,597.11'
PROPOSED GRADE
EXISTING GROUND
PI = 10+12.00
EL = 3,594.46'
-Y3-
BM#3 (BY-13) -L-
STA. 34+69.40
185.38' RT
ELEV=3626.26'
EXISTING GROUND
END DITCH GRADE
-L- STA.15+00 LT
El = 3,609.00
PI = 10+92.96
EL = 3,565.23'
VC = 100'
K = 20
DS = 30 MPH
PI = 12+50.00
EL = 3,574.65'
VC = 150'
K = 38
DS = 30 MPH
PI = 17+00.00
EL = 3,619.65'
VC = 250'
K = 21
DS = 30 MPH
END GRADE
-Y3- STA.20+90.00
EL = 3,611.85'
BEGIN DITCH GRADE
-Y3- STA.11+50 LT
El = 3,571.00
BEGIN GRADE
-Y3- STA. 10+00.00 =
-L- STA.29+26.87
EL = 3,555.00'
STA.12+00 LT
El = 3,573.50
STA.12+50 LT
El = 3,580.00
STA.13+00 LT
El = 3,583.20
STA.13+50 LT
El = 3,588.50
STA.14+00 LT
El = 3,598.00
STA.14+50 LT
El = 3,605.50
(+11.0000%)
(+16.0000%)
(+16.0000%)
(+110.0000%)
(-12.0000%)
(+10.0000%)
5.00%
13.00%
6.40%
10.60%
19.00%
15.00%
7.00%
PROPOSED GRADE
SEE SHEET 4 & 5 FOR PLAN
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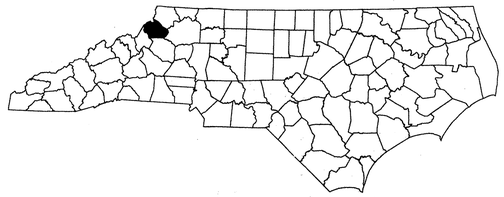
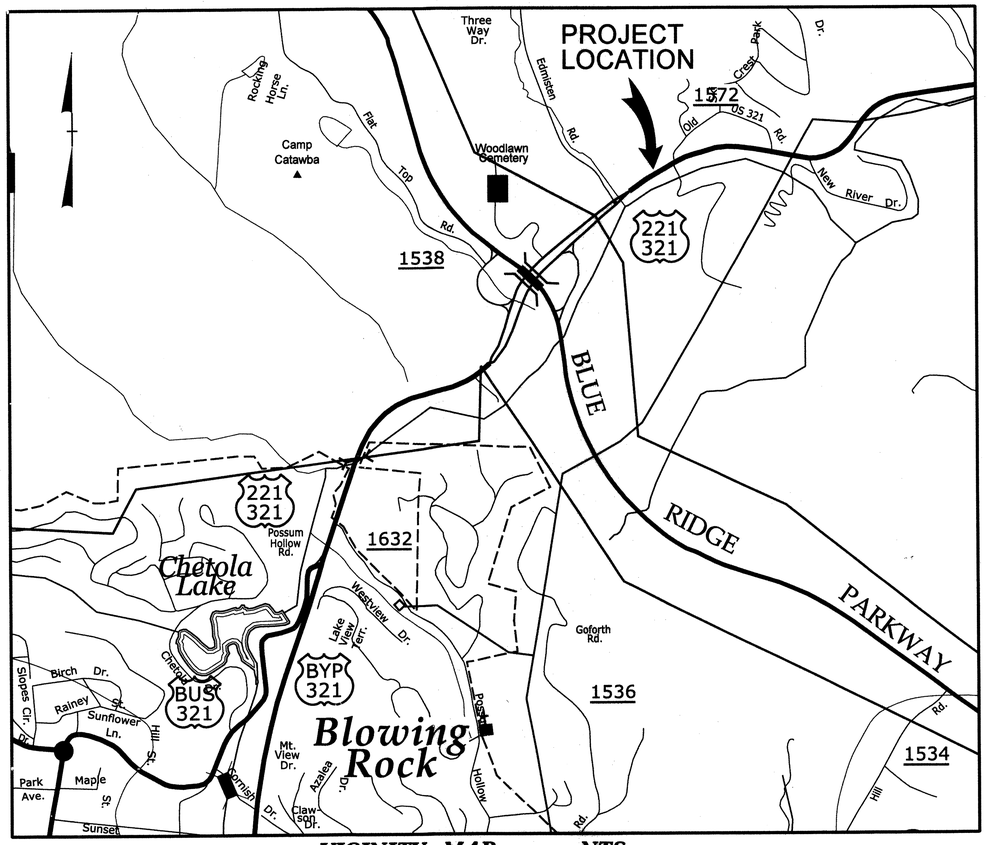
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

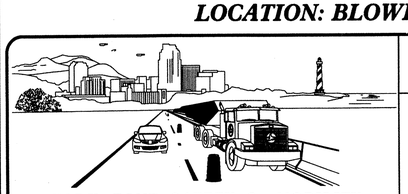
WATAUGA COUNTY





VICINITY MAP NTS

LOCATION: BLOWING ROCK POST ACUTE CARE FACILITY CONSTRUCTION ACCESS ROAD



WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

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

J. S. BOURNE, P.E. — *STATE TRAFFIC MANAGEMENT ENGINEER*

G. L. GETTIER, P.E. — *TRAFFIC CONTROL PROJECT ENGINEER*

J.W. GILSTRAP — *TRAFFIC CONTROL PROJECT DESIGN ENGINEER*

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, AND INDEX OF SHEETS
TMP-1A	ROADWAY STANDARD DRAWINGS & LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES & GENERAL NOTES)
TMP-2	N/A
TMP-3	PHASING
TMP-4-5	PHASE I DETAILS
TMP-6-7	PHASE II DETAILS

Prepared In the Office of:
THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, North Carolina 27605
License No.: F-0840

DEAN D. HATFIELD, PE
PROJECT ENGINEER

WILLIAM E. TILLITT, PE
PROJECT DESIGN ENGINEER

APPROVED: Dean Hatfield
DATE: 2-26-14

SEAL

SHEET NO.
TMP-1

PROJECT: R-5525

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PROJ. REFERENCE NO.	SHEET NO.
R-5525	TMP-1A

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 JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1165.01	WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION
1170.01	PORTABLE CONCRETE BARRIER
1180.01	SKINNY - DRUM
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA
- REMOVAL

SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM
- SKINNY DRUM
- IMPACT ATTENUATOR
- FLASHING ARROW BOARD
- FLAGGER
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

APPROVED: DATE: 2-26-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

DIVISION OF HIGHWAYS * STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION * WORK ZONE TRAFFIC CONTROL

ROADWAY STANDARD DRAWINGS & LEGEND

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GENERAL NOTES / LOCAL NOTES

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. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
1. US-321	FRIDAY 3:00 P.M. THRU MONDAY 8:00 A.M.

B) DO NOT CLOSE OR NARROW TRAVEL LANES DURING HOLIDAYS AND SPECIAL EVENTS AS FOLLOWS:

ROAD NAME

1. US-321

HOLIDAY

1. FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.
2. FOR NEW YEAR'S, BETWEEN THE HOURS OF 6:00 A.M. DECEMBER 31st TO 6:00 P.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 6:00 P.M. THE FOLLOWING TUESDAY.
3. FOR EASTER, BETWEEN THE HOURS OF 6:00 A.M. THURSDAY AND 6:00 P.M. MONDAY.
4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY TO 6:00 P.M. TUESDAY.
5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 6:00 P.M. THE DAY AFTER INDEPENDENCE DAY.

   IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY THEN BETWEEN THE HOURS OF 6:00 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 6:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.
6. FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY AND 6:00 P.M. TUESDAY.
7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6:00 A.M. TUESDAY TO 6:00 P.M. MONDAY.
8. FOR CHRISTMAS, BETWEEN THE HOURS OF 6:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 6:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.
9. FOR APPALACHIAN STATE UNIVERSITY HOME FOOTBALL GAMES, BETWEEN THE HOURS OF 12:00 P.M. THE DAY BEFORE THE APPALACHIAN STATE UNIVERSITY HOME FOOTBALL GAMES AND 9:00 A.M.THE MONDAY AFTER THE GAME.
10. FOR THE FALL FOILAGE SEASON, OCCURRING ALL WEEKENDS IN OCTOBER, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY AND 9:00 A.M. MONDAY.
11. AS DIRECTED BY THE ENGINEER FOR ANY SPECIAL EVENT OCCURING IN THE TOWN OF BLOWING ROCK, BETWEEN 6:00 A.M. THE DAY BEFORE THE SPECIAL EVENT AND 9:00 A.M. THE DAY AFTER THE SPECIAL EVENT.

LANE AND SHOULDER CLOSURE REQUIREMENTS

C) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

   WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

F) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

G) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

H) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

   BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

   BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

   BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

I) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 200 IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

J) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

K) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

L) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC BARRIER

M) INSTALL TEMPORARY BARRIER ACCORDING TO THE TRAFFIC CONTROL PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRAFFIC CONTROL PLANS OR AS DIRECTED BY THE ENGINEER.

   DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

   ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE/RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRAFFIC CONTROL PLANS. TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.

   INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.

   INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER CAN BE PLACED OR AFTER THE TEMPORARY BARRIER IS REMOVED.

N) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED IMPACT ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

   PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS:

POSTED SPEED LIMIT	MINIMUM OFFSET
40 OR LESS	15 FT
45 - 50	20 FT
55	25 FT
60 MPH or HIGHER	30 FT

TRAFFIC CONTROL DEVICES

O) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

P) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

Q) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
ALL ROADS	PAINT	NONE

R) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

S) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

T) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

MISCELLANEOUS

U) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 200 FT AND 400 FT RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS. BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

   BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

   BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

MANAGEMENT STRATEGIES

- SEE ICT #1. DURING PHASE I, THE CONTRACTOR WILL HAVE 30 CALENDAR DAYS FROM DATE OF AVAILABILITY TO COMPLETE THE FOLLOWING WORK:
  - ROUGH GRADE -Y2TEMP- FROM STA. 12+50 TO STA. 18+22.
  - TIE INTO EXISTING GRAVEL LANE AT -Y2TEMP- STA. 18+22.
  - GRADE THE EXISTING SUMMIT MEADOWS LANE GRAVEL DRIVE TO THE END OF PROJECT LIMITS.

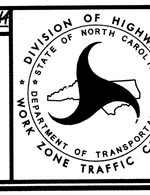
- SEE ICT #2. DURING PHASE II, THE CONTRACTOR WILL HAVE 90 CALENDAR DAYS TO START AND COMPLETE THE FOLLOWING WORK:
  - USE PCB TO CLOSE THE RIGHT LANE OF NB US-321.
  - CONSTRUCT END BENT 1, INSTALL RIP RIP. ERECT CONCRETE CORED SLAB UNITS A AND APPROACH SLAB AT END BENT A. CONSTRUCT CONCRETE BARRIER WALLS.
  - COMPLETE TIE-IN WORK BETWEEN -L- AND US-321.
  - REMOVE PCB AND ALL OTHER LANE CLOSURE DEVICES AND OPEN US-321 TO TWO LANES OF TRAFFIC.

- FLAGGERS, TEMPORARY LANE CLOSURES, AND INCIDENTAL STONE OR ABC WILL BE REQUIRED TO MAINTAIN ACCESS FOR RESIDENCES WITHIN THE PROJECT AREA OF SUMMIT MEADOWS LANE AT ALL TIMES.

- CONTRACTOR WILL COORDINATE WITH ONGOING R-2237 PROJECT.

APPROVED [signature] DATE: 2-26-14

SEAL



TRANSPORTATION OPERATIONS PLAN

(MANAGEMENT STRATEGIES & GENERAL NOTES)

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PROJ. REFERENCE NO.	SHEET NO.
R-5525	TMP-3

PROJECT PHASING

NOTE: PHASE I STEPS 1, 2, 3, 4 AND PHASE II SHALL BE CONSTRUCTED SIMULTANEOUSLY.

USE FLAGGERS, TEMPORARY LANE CLOSURES, AND INCIDENTAL STONE OR ABC AS NEEDED ALONG SUMMIT MEADOWS LANE TO MAINTAIN ACCESS FOR RESIDENCES WITHIN THE PROJECT AREA.

PHASE I

STEP 1: USING ROADWAY STANDARD DRAWING 1101.01, SHEET 2 OF 3, INSTALL ADVANCE WORK ZONE WARNING SIGNS. CLOSE ALL SOIL ROADS IN THE VICINITY OF -L- AND -Y3- EXCEPT SUMMIT MEADOWS LANE USING TYPE III BARRICADES. USE SUMMIT MEADOWS LANE TO MAINTAIN ACCESS TO -DWY1- AT ALL TIMES.

CONTRACTOR SHALL WORK IN A CONTINUOUS MANNER TO COMPLETE THE FOLLOWING WORK IN PHASE 1 STEP 2. (SEE INTERMEDIATE CONTRACT TIME #1 AND SPECIAL PROVISIONS.)

STEP 2: THE CONTRACTOR USING ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 15, (SEE CONSTRUCTION SHEETS AND SHEETS TMP -4 THRU TMP-5) COMPLETE:

-ROUGH GRADE -Y2TEMP - FROM STA. 12+50 TO STA. 18+22.
-TIE INTO THE EXISTING GRAVEL LANE DRIVE AT -Y2TEMP- STA. 18+22.
-GRADE THE EXISTING SUMMIT MEADOWS LANE GRAVEL DRIVE TO THE END OF PROJECT LIMITS.

STEP 3: USING ROADWAY STANDARD DRAWING 1101.02, SHEET 3 OF 15, BEGIN REMOVAL OF THE EXISTING CONCRETE MEDIAN FROM STA 13+80 TO STA 15+06 ALONG -Y1- AT THE END OF EACH WORK DAY, PLACE TRAFFIC ALONG -Y1- INTO ITS EXISTING TRAFFIC PATTERN USING DRUMS. SEE CONSTRUCTION PLANS AND SHEET TMP-6.

STEP 4: BEGIN INSTALLATION OF PROPOSED SIGNAL AT THE INTERSECTION OF -L- AND -Y1-. COVER SIGNAL UNTIL -L- IS OPEN TO TRAFFIC. SEE SIGNAL PLANS AND SHEET TMP-4.

PHASE II

STEP 1: USING ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 15, BEGIN CONSTRUCTION OF -L- AND -Y3- UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE PAVEMENT. MAINTAIN ACCESS FOR TRAFFIC ALONG -Y2TEMP- FOR RESIDENCES.

NOTE: PHASE II, STEPS 2, 3, & 4 MAY BE CONSTRUCTED SIMULTANEOUSLY.

STEP 2: CONSTRUCT BENT 1 AND END BENT 2. INSTALL RIP RAP AT END BENT 2. ERECT CONCRETE CORED SLAB UNITS B AND APPROACH SLAB AT END BENT 2. (SEE CONSTRUCTION PLANS AND SHEETS TMP-6 AND TMP-7.)

CONTRACTOR SHALL WORK IN A CONTINUOUS MANNER TO COMPLETE THE FOLLOWING WORK IN PHASE II STEPS 3A THRU 3D IN 90 CONSECUTIVE CALENDAR DAYS. (SEE INTERMEDIATE CONTRACT TIME #2 AND SPECIAL PROVISIONS.) SEE SHEETS TMP-6 THRU TMP-7.

STEP 3: SEE STRUCTURE PLANS AND SHEET TMP-6.

A. USING ROADWAY STANDARD DRAWING 1101.02 SHEET 3 OF 15, USE PORTABLE CONCRETE BARRIER (PCB) TO CLOSE THE RIGHT LANE OF NB US-321.
B. CONSTRUCT END BENT 1 AND INSTALL RIP RAP AT END BENT 1. ERECT CONCRETE CORED SLAB UNITS A AND APPROACH SLAB AT END BENT A. CONSTRUCT CONCRETE BARRIER RAILS. COMPLETE ALL TIE-IN WORK BETWEEN -L- AND US-321.
C. REMOVE PCB AND ALL OTHER LANE CLOSURE DEVICES AND OPEN US-321 TO TWO LANES OF TRAFFIC.

STEP 4: COMPLETE CONSTRUCTION OF CONCRETE MEDIAN AND PROPOSED SIGNAL BEGUN IN PHASE I, STEP 3 & 4.

STEP 5: UPON COMPLETION OF STRUCTURE, COMPLETE TIE IN OF -L- AND -Y2TEMP-. ACTIVATE TRAFFIC SIGNAL. REMOVE ALL TRAFFIC CONTROL DEVICES AND CLOSE THE EXISTING ENTRANCE OF SUMMIT MEADOWS LANE AND US-321 TO TRAFFIC. AT THE END OF THE WORK PERIOD, ALL TRAFFIC SHOULD BE IN ITS FINAL PATTERN.

CONTRACTOR SHALL WORK IN A CONTINUOUS MANNER TO COMPLETE THE FOLLOWING WORK IN PHASE II STEP 6.)

STEP 6: USING ROADWAY STANDARD DRAWING 1101.02, SHEET 1 AND 3 OF 15, PLACE FINAL SURFACE LAYER AND PAVEMENT MARKINGS ON -L-, -Y1-, AND -Y3-. SEE CONSTRUCTION PLANS AND FINAL PAVEMENT MARKING PLANS.

APPROVED: Dean Hatfield DATE: 2-26-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PHASING

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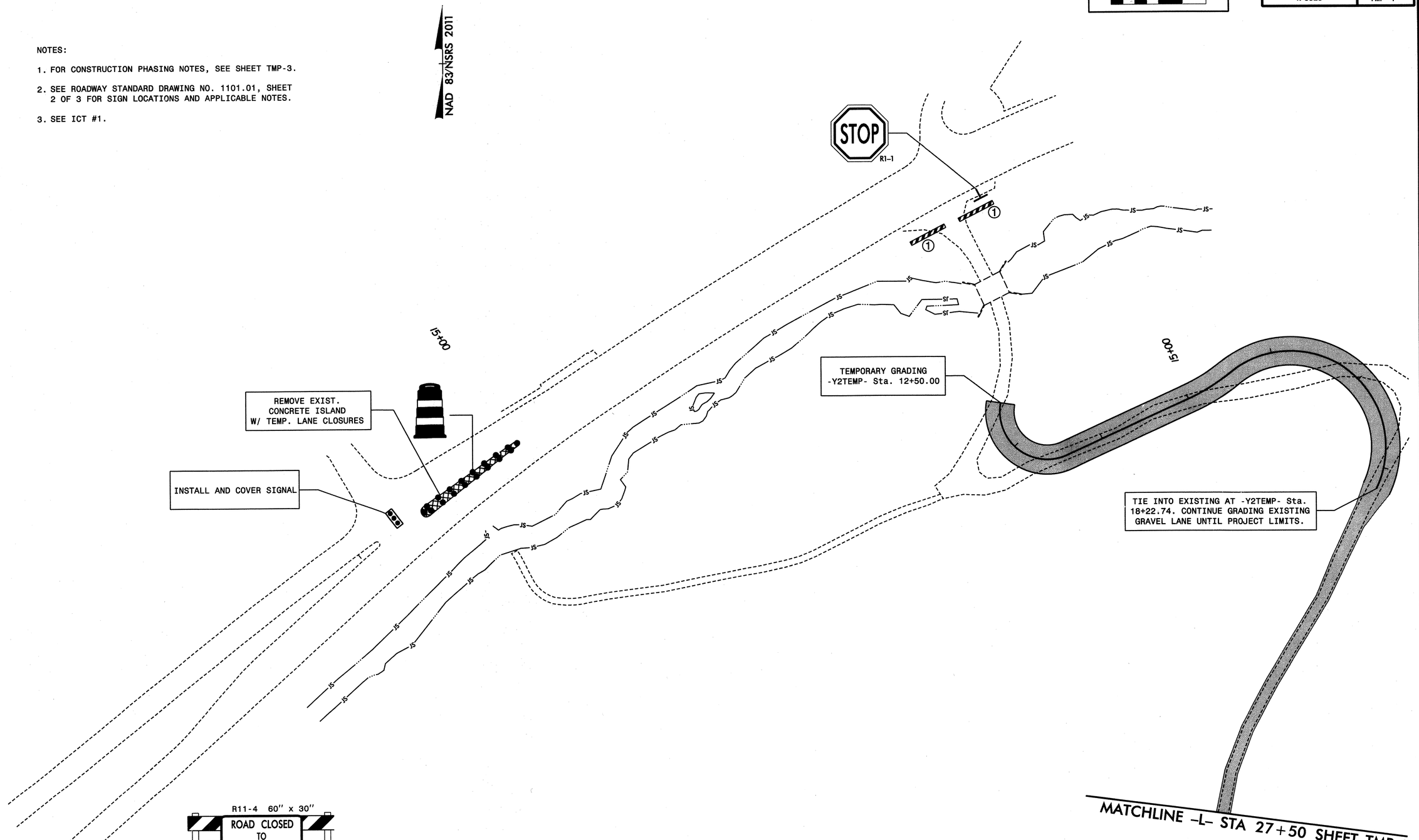
PROJ. REFERENCE NO.	SHEET NO.
R-5525	TMP-4

NOTES:

1. FOR CONSTRUCTION PHASING NOTES, SEE SHEET TMP-3.
2. SEE ROADWAY STANDARD DRAWING NO. 1101.01, SHEET 2 OF 3 FOR SIGN LOCATIONS AND APPLICABLE NOTES.
3. SEE ICT #1.



APPROVED: DATE: 2-26-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PHASE I DETAILS

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

REVISIONS

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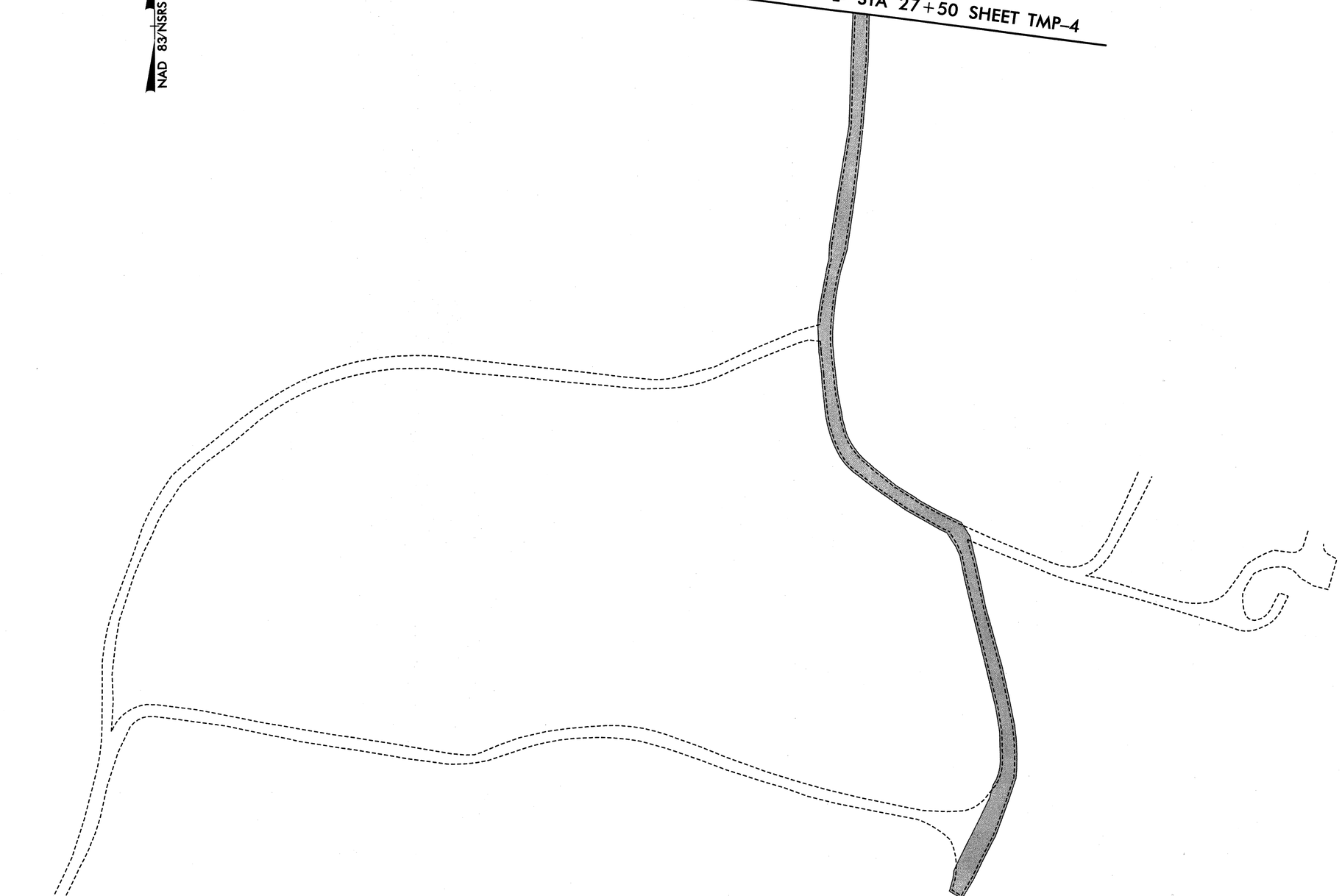
PROJ. REFERENCE NO.	SHEET NO.
R-5525	TMP-5

0' 50' 100'

NAD 83/NSRS 2011

MATCHLINE -L- STA 27+50 SHEET TMP-4



APPROVED: DATE: 2-26-14

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NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PHASE I DETAILS

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1001 Wade Avenue, Suite 400
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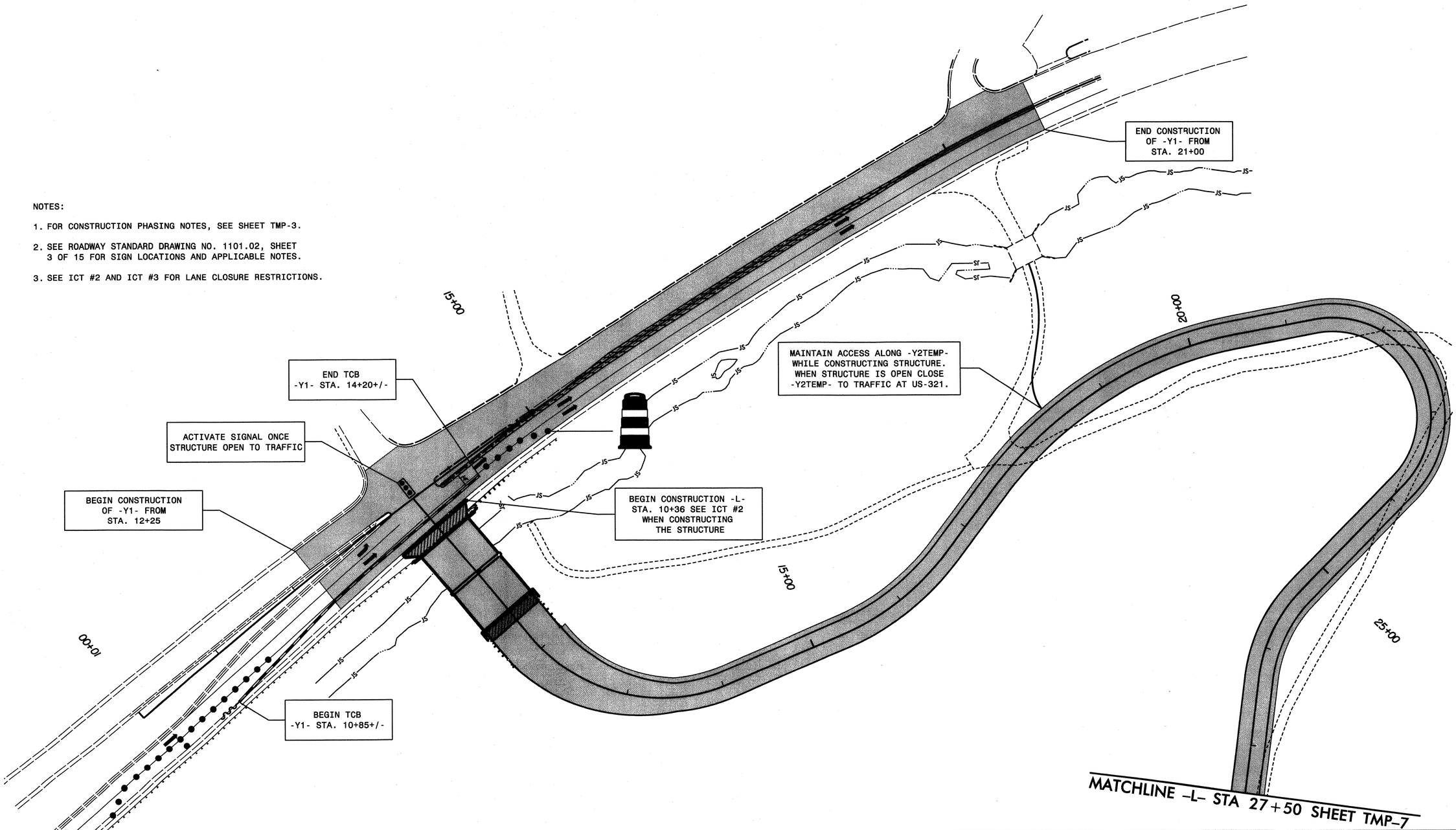
PROJ. REFERENCE NO.	SHEET NO.
R-5525	TMP-6

0' 50' 100'

NOTES:

1. FOR CONSTRUCTION PHASING NOTES, SEE SHEET TMP-3.
2. SEE ROADWAY STANDARD DRAWING NO. 1101.02, SHEET 3 OF 15 FOR SIGN LOCATIONS AND APPLICABLE NOTES.
3. SEE ICT #2 AND ICT #3 FOR LANE CLOSURE RESTRICTIONS.



APPROVED: DATE: 2-26-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HAIFIELD

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PHASE II DETAILS

THE LOUIS BERGER GROUP, Inc.
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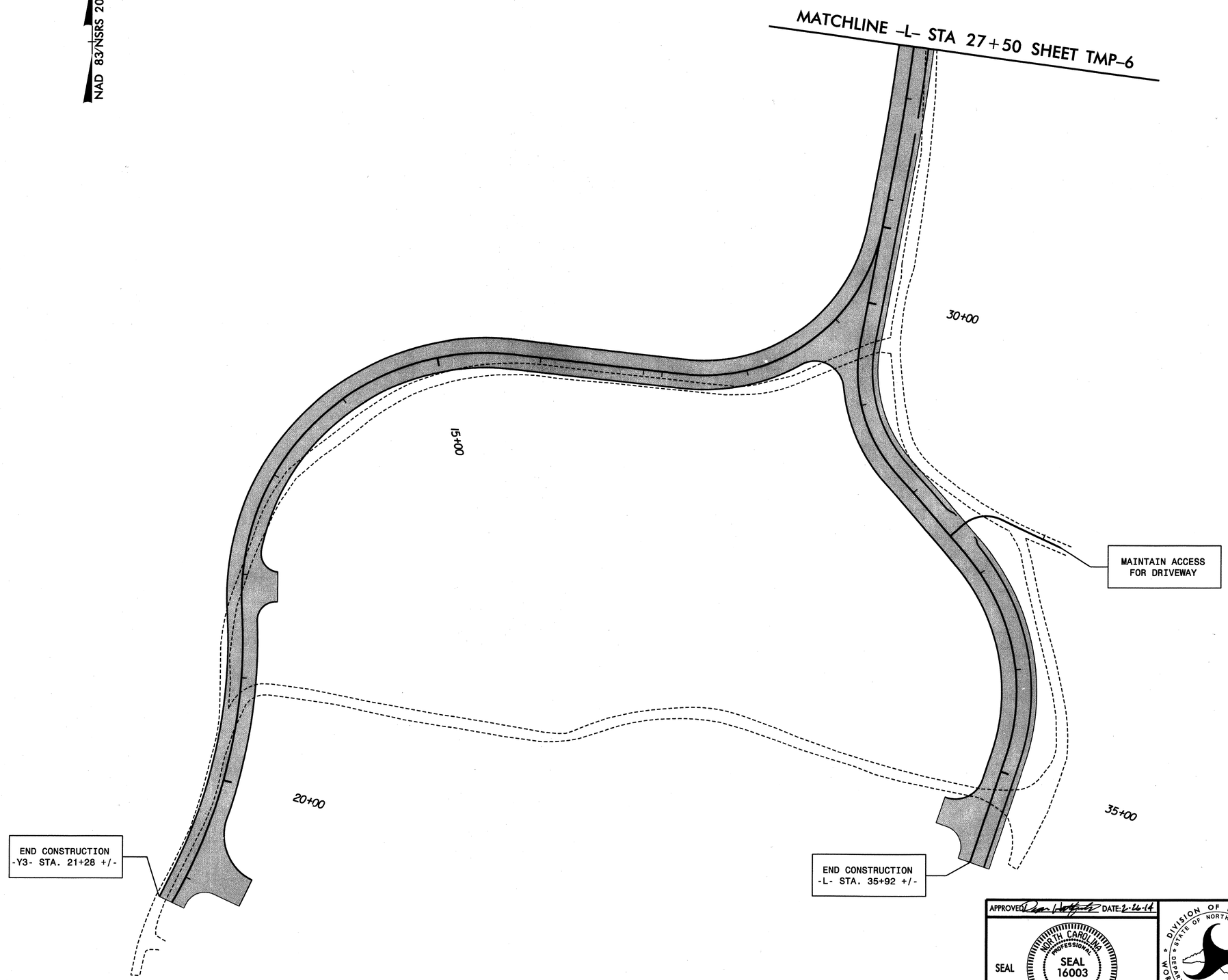
PROJ. REFERENCE NO.	SHEET NO.
R-5525	TMP-7

0' 50' 100'

NAD 83/NSRS 2011



APPROVED: DATE: 2-26-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PHASE II DETAILS

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1001 Wade Avenue, Suite 400
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STATE	PROJECT NO.	SHEET NO.	TOTAL SHTS.
N.C.	R-5525	PMP-1	3

APPROVED: Dean D. Hatfield
DATE: 2-26-14
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLANS
WATAUGA COUNTY

LOCATION: BLOWING ROCK POST ACUTE CARE FACILITY CONSTRUCTION ACCESS ROAD

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS"-ROADWAY DESIGN UNIT-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
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1253.01	RAISED PAVEMENT MARKERS - SNOWPLOWABLE
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINATION

PAVEMENT MARKING SCHEDULE

ASPHALT PAVEMENT DESIGN
(AS SHOWN)

PAVEMENT MARKING LINES

P2 - PAINT - WHITE STOPBAR (24")
PQ - PAINT - WHITE CROSSWALK LINE (8")
TP - THERMOPLASTIC - YELLOW DIAGONAL LINE (8", 90 MILS)
T2 - THERMOPLASTIC - WHITE STOPBAR (24", 120 MILS)
VA - POLYUREA - WHITE EDGELINE (4")
VB - POLYUREA - YELLOW EDGELINE (4")
VC - POLYUREA - 10 FT. WHITE SKIP (4")
VD - POLYUREA - 3 FT. WHITE MINISKIP (4")
VE - POLYUREA - WHITE SOLID LANE LINE (4")
VI - POLYUREA - YELLOW DOUBLE CENTER LINE (4")
V8 - POLYUREA - 2 FT. - 6 FT./SP WHITE MINISKIP (4")

PAVEMENT MARKING SYMBOLS

QB - PAINT - RIGHT TURN ARROW
QD - PAINT - COMBO STRAIGHT/COMBO
UA - THERMOPLASTIC - LEFT TURN ARROW (90 MILS)
UB - THERMOPLASTIC - RIGHT TURN ARROW (90 MILS)
UC - THERMOPLASTIC - STRAIGHT ARROW (90 MILS)
UD - THERMOPLASTIC - COMBO STRAIGHT/LEFT (90 MILS)
UE - THERMOPLASTIC - COMBO STRAIGHT/RIGHT (90 MILS)

GENERAL NOTES

THE FOLLOWING NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ASPHALT PAVEMENT DESIGN:

ROAD NAME	MARKING	MARKER
-L-	POLYUREA (W/ HIGHLY REFLECTIVE ELEMENTS)	NONE
-Y1-	POLYUREA (W/ HIGHLY REFLECTIVE ELEMENTS)	SNOWPLOWABLE
-Y2-	POLYUREA (W/ HIGHLY REFLECTIVE ELEMENTS)	NONE
-Y3-	POLYUREA (W/ HIGHLY REFLECTIVE ELEMENTS)	NONE
BRIDGE	POLYUREA (W/ HIGHLY REFLECTIVE ELEMENTS)	NONE

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

D) STOPBAR LOCATION AT NON-SIGNALIZED INTERSECTIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

E) REMOVE ALL RESIDUE AND SURFACE LAITANCE BY ACCEPTABLE METHODS ON CONCRETE BRIDGE DECKS PRIOR TO PLACING POLYUREA PAVEMENT MARKING MATERIAL.

F) UNLESS OTHERWISE SPECIFIED, HEATED-IN-PLACE THERMOPLASTIC MAY BE USED IN LIEU OF EXTRUDED THERMOPLASTIC FOR STOP BARS, SYMBOLS, CHARACTERS AND DIAGONALS. IF HEATED-IN-PLACE IS USED, IT SHALL BE PAID FOR USING THE EXTRUDED THERMOPLASTIC PAY ITEM.

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN COVER SHEET
PMP-2-3	PAVEMENT MARKING DETAIL

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

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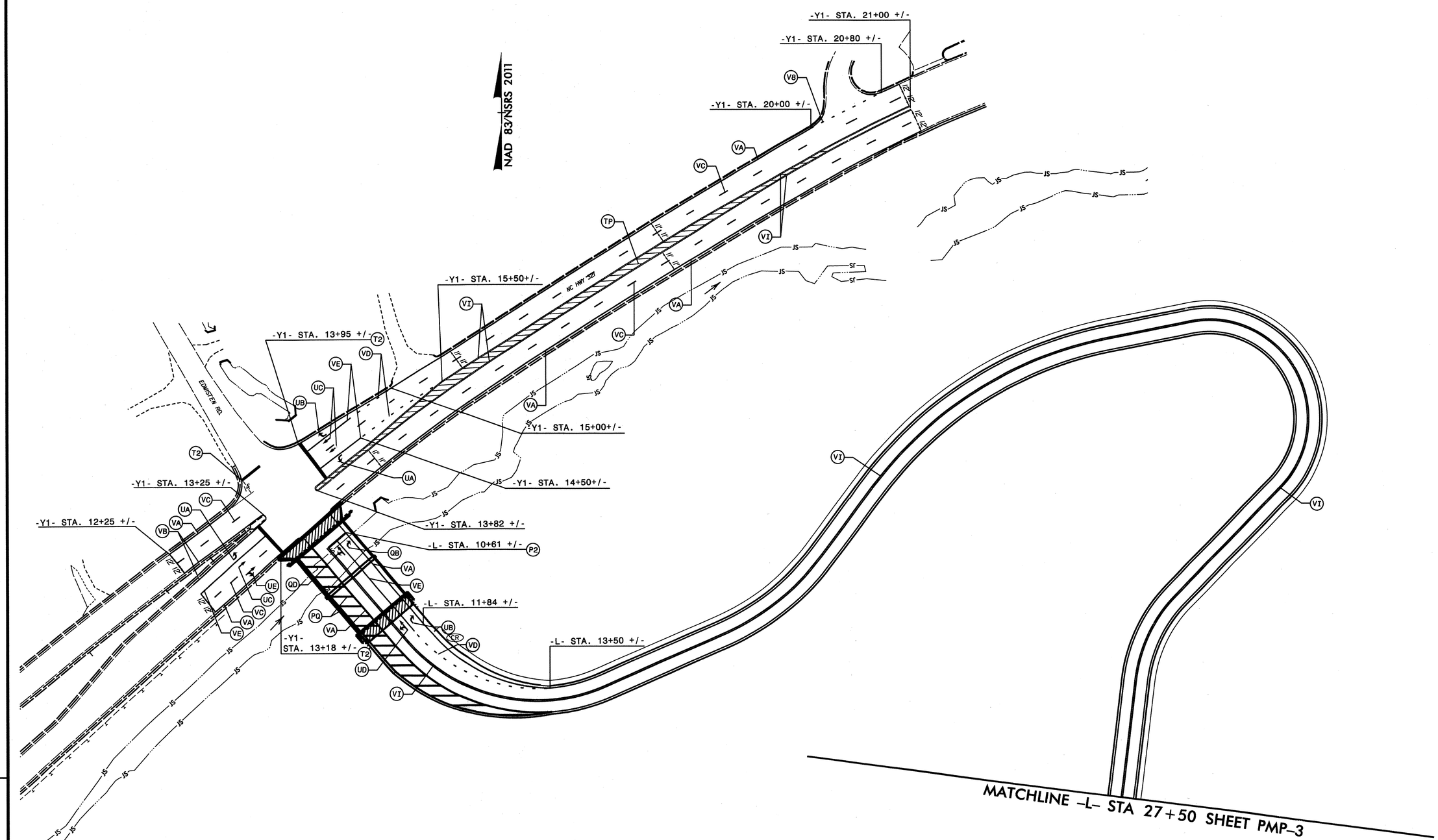
PROJ. REFERENCE NO.	SHEET NO.
R-5525	PMP-2

0' 50' 100'



NOTE: ALL LANE WIDTHS ARE 12' UNLESS OTHERWISE SHOWN.

APPROVED: Dean Hatfield DATE: 2-26-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PAVEMENT MARKING DETAIL

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

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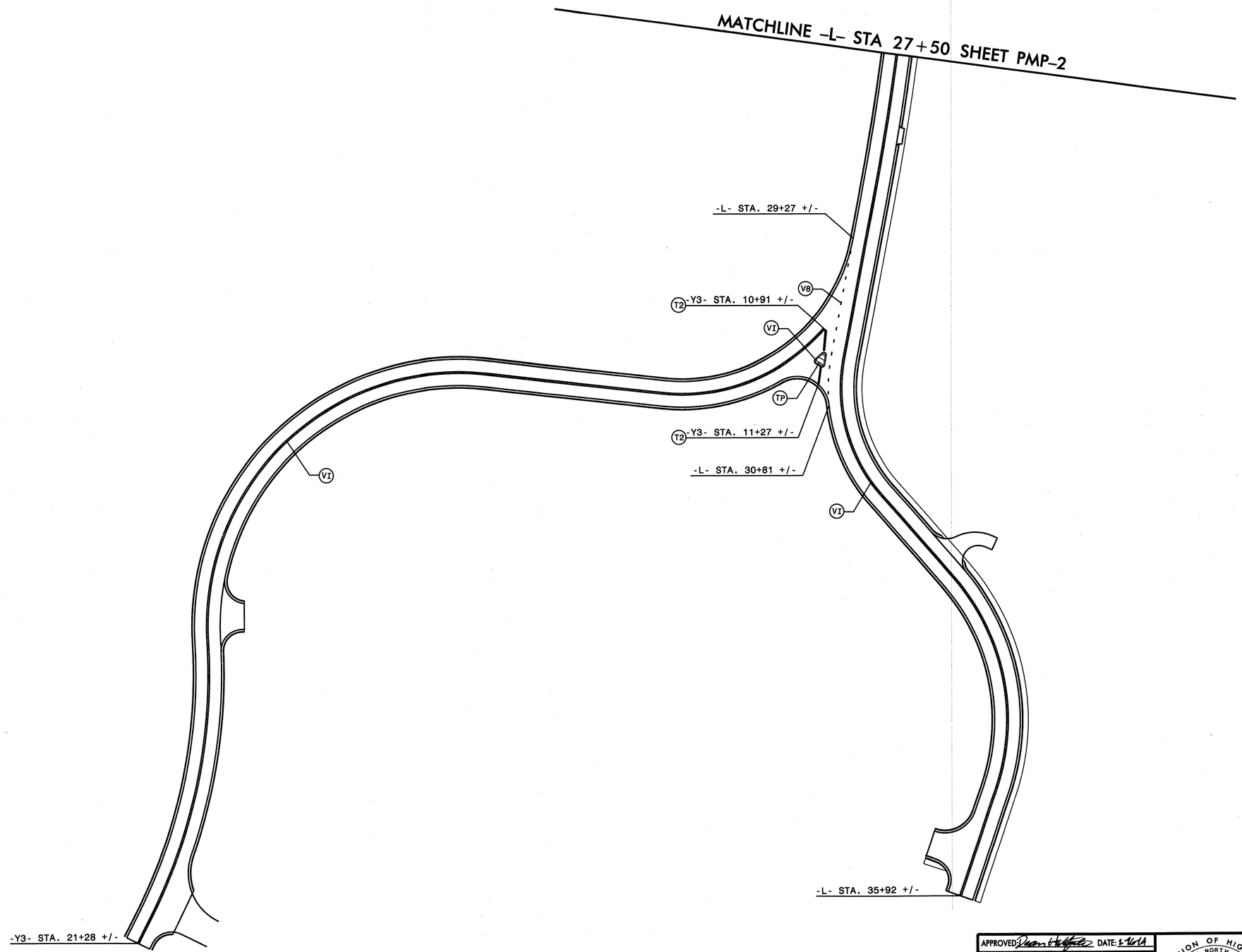
PROJ. REFERENCE NO.	SHEET NO.
R-5525	PMP-3

0' 50' 100'



NAD 83/NSRS 2011

NOTE: ALL LANE WIDTHS ARE 12' UNLESS OTHERWISE SHOWN.

REVISIONS

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APPROVED: DATE:

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PAVEMENT MARKING DETAIL

THE LOUIS BERGER GROUP, Inc.
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Raleigh, NC 27605-3322

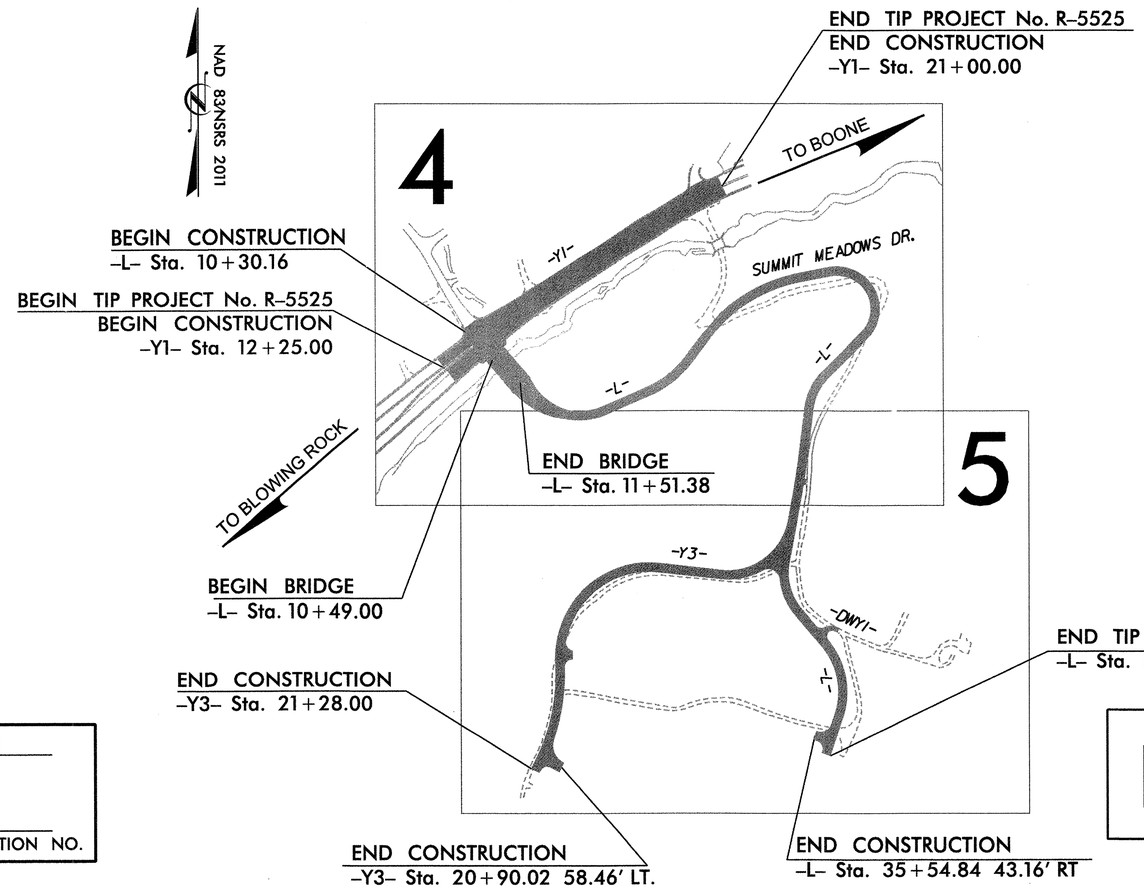
TIP PROJECT: R-5525

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5525	EC-1	8

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL



EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1607.01	Gravel Construction Entrance	
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	SW CFW
	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	

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

ENVIRONMENTALLY SENSITIVE AREA SEE PROJECT SPECIAL PROVISIONS

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

RONALD FERGUSON
LEVEL IIIA NAME

3381
LEVEL IIIA CERTIFICATION NO.

GRAPHIC SCALE

0 50
PLANS

0 50
PROFILE (HORIZONTAL)

0 10
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:

ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St.
Raleigh, NC 27611

2012 STANDARD SPECIFICATIONS

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 revison 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		

SYSTIME: 8/8/2012
USERNAME: DLNC8888

PROJECT REFERENCE NO.	SHEET NO.
R-5525	EC-02/CONST.04
R/W SHEET NO.	

0' 50' 100'

SPECIAL STILLING BASIN:

Description

This work consists of furnishing, placing, and removing special stilling basin(s) as directed. The special stilling basin shall be used to filter pumped water during construction of drilled piers, footing excavation, and/or culvert construction. The special stilling basin shall also be used for sediment storage at the outlet of temporary slope drain pipe(s).

Materials

Refer to Division 10

Item	Section
Filter Fabric for Drainage, Type 2	1056
Sediment Control Stone	1005

The filter fabric and sediment control stone shall be clean and shall not contain debris.

The special stilling basin shall be a water permeable fabric bag that traps sand, silt, and fines as sediment-laden water is pumped into it, or as runoff flows into it through the temporary slope drain pipe(s).

The special stilling basin shall be a bag constructed to a minimum size of 10' x 15' made from a nonwoven fabric. It shall have a sewn-in 8" (maximum) spout for receiving pump discharge. The bag seams shall be sewn with a double needle machine using a high strength thread. The seams shall have a minimum wide width strength as follows:

Test Method	Minimum Specifications
ASTM D-4884	60 lb/in

The fabric used to construct the bag shall be stabilized to provide resistance to ultra-violet degradation and meet the following specifications for flow rates, strength, and permeability:

Property	Test Method	Minimum Specifications
Weight	ASTM D-3776	8.0 oz/yd
Grab tensile	ASTM D-4632	200.0 lb
Puncture	ASTM D-4833	130.0 lb
Flow rate	ASTM D-4491	80.0 gal/min/sf
Permittivity	ASTM D-4491	1.2 1/sec
UV Resistance	ASTM D-4355	70.0%

Construction Methods

The Contractor shall install the special stilling basin(s), filter fabric, and stone in accordance with Standard Drawing No. 1630.06 and at locations on the plans and as directed.

The special stilling basin(s) shall be constructed such that it is portable and can be used adjacent to each drilled pier, footing, and/or culvert. Temporary slope drain pipe(s) shall be attached to the special stilling basin(s) so that the runoff in the slope drain pipe(s) flows directly into the special stilling basin(s). The special stilling basin(s) shall be placed so the incoming water flows into and through the bag without causing erosion. The neck or spout of the bag shall be tied off tightly to stop the water from flowing out of the bag without going through the walls. If applicable, the neck or spout of the silt bag shall be cut to allow for a slope drain pipe to be inserted into the special stilling basin, and tied off tightly to stop the water from flowing out of the bag.

The special stilling basin(s) shall be replaced and disposed of when it is " full of sediment or when it is impractical for the bag to filter the sediment out at a reasonable flow rate. Prior approval from the Engineer shall be received before removal and replacement.

The Contractor shall be responsible for providing a sufficient quantity of bags to contain silt from pumped effluent during construction of drilled piers, footing excavation, and/or culvert construction. A sufficient quantity of special stilling basins shall be provided to contain sediment from temporary slope drain runoff.

The quantity of sediment control stone, filter fabric for drainage, and special stilling basin(s) as measured above will be paid for at contract price for "Lump Sum for Erosion Control". Such price and payment will be full compensation for all work covered by this provision, including but not limited to, furnishing all materials, placing and maintaining the special stilling basin(s), and removal and disposal of silt accumulations and bag.

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 04

NOTE: PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

NOTE: PLACE TEMPORARY ROCK SILT CHECK TYPE-B IN STEEP DITCHES AND TEMPORARY ROCK SILT CHECKS TYPE-A AT DRAINAGE OUTLETS.

INSTALL PIPE(S) IN JURISDICTIONAL AREAS WITHOUT IMPACTING STREAM UNTIL AREA STABILIZED AND ACCORDING TO NCDOT BEST MANAGEMENT PRACTICES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES MANUAL.

Place Matting for Erosion Control on Slope as Work Allows in Accordance with Extreme Terrain Erosion Control Special Provisions. -L- Sta. 11+50 to Sta. 27+50 LT & RT

NAD 83/NSRS 2011

END CONSTRUCTION
-Y1- POC Sta. 21+00.00

SCOTT P MCINTOSH
DB 1079 PG 444
PIN 2818-54-3497

-Y1- PT Sta. 21+74.07

-Y1- PCC Sta. 19+97.95

TO BOONE

ALPEN MOTEL PROPERTIES
DB 210 PG 5
PIN 2818-54-1533

ZERUBBABEL INC
DB 376 PG 811
PIN 2818-44-8352

JAMES & PHYLLIS LESTER
DB 1297 PG 595
PIN 2818-44-6195

U.S. HWY 321
VARIABLE WIDTH PUBLIC R/W

END UNKNOWN

SINGLE FORK
SOUTH FORK
OF NEW RIVER

END OF DEFINED CHANNEL FOR SPRING

TOP LOWER EDGE OF EXISTING 1'X1' RCBC IS TO BE BEVELED 45° ALONG ENTIRE WIDTH OF UPSTREAM FACE

APPALACHIAN REGIONAL HEALTHCARE SYSTEM
DB 1631 PG 636
PIN 2818-54-4035

-L- PC Sta. 21+28.31

N 76° 58' 45.2" E

-L- PT Sta. 20+44.92

-L- PT Sta. 23+81.97

S 44° 18' 59.4" W

-L- PC Sta. 17+49.84

APPALACHIAN REGIONAL HEALTHCARE SYSTEM
DB 1631 PG 636
PIN 2818-54-4035

-L- PT Sta. 16+66.66

-L- PC Sta. 25+33.78

-L- PT Sta. 26+31.57

S 6° 57' 47.0" W

-L- PC Sta. 27+23.94

-L- PC Sta. 15+33.67

-L- PT Sta. 14+07.02

-L- POT Sta. 10+00.00
-Y1- POC Sta. 13+52.59

BEGIN TIP PROJECT No. R-5525
BEGIN CONSTRUCTION
-L- POT 10+30.16

BEGIN BRIDGE
-L- POT 10+49.00

TO BLOWING ROCK

END BRIDGE
-L- POT 11+51.38

BEGIN CONSTRUCTION
-Y1- POC Sta. 12+25.00

Contractor to install a special stilling basin at appropriate location for construction of the bridge

Construct Proposed Ditch according to Detail A from Sta. 22+88 to Sta. 24+00 during C&G Phase

Construct Proposed Ditch according to Detail A during C&G Phase

Construct Proposed Ditch according to Detail A during C&G Phase

Construct Proposed Ditch according to Detail B during C&G Phase

MATCHLINE -L- STA 27+50 SHEET EC-03

DETAIL A
BERM 'V' DITCH
(Not to Scale)

Natural Ground; 2:1; D; 2:1; b; d; 2:1; RDWY; Geotextile

Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
b = 3 Ft.
Type of Liner = Class B Rip-Rap

FROM -L- STA. 12+25 TO STA. 14+00 RT
FROM -L- STA. 16+00 TO STA. 16+25 RT
FROM -L- STA. 16+25 TO STA. 18+50 RT
FROM -L- STA. 22+50 TO STA. 24+00 LT

DETAIL B
BERM 'V' DITCH
(Not to Scale)

1:1; D; 2:1; b; d; 2:1; RDWY; Geotextile

Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
b = 3 Ft.
Type of Liner = Class B Rip-Rap

FROM -L- STA. 14+00 TO STA. 16+00 RT

CLEAN WATER DIVERSION
(Not to Scale)

CWD CWD CWD CWD

STABILIZE EXCAVATED MATERIAL
SOIL STABILIZATION GEOTEXTILE
OFFSITE CLEAN WATER
MIN
1' MIN

FROM -L- STA. 18+75 LT
FROM -L- STA. 18+50 TO STA. 21+80 RT

REVISIONS

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Raleigh, NC 27605-3322

ROADWAY PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-5525	EC-03/CONST.05
R/W SHEET NO.	

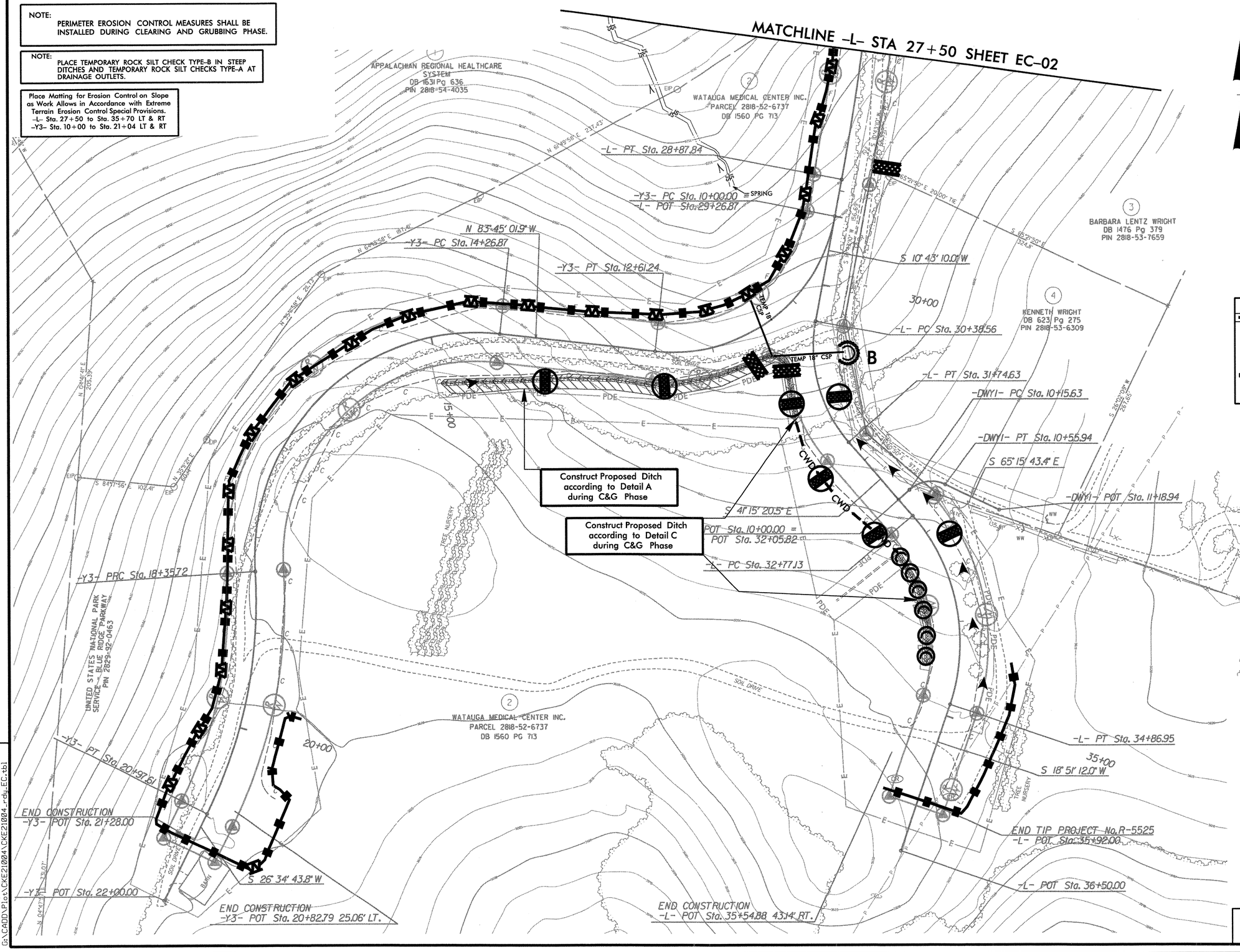
0' 50' 100'

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 05

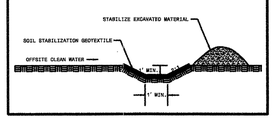
NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

NOTE:
PLACE TEMPORARY ROCK SILT CHECK TYPE-B IN STEEP DITCHES AND TEMPORARY ROCK SILT CHECKS TYPE-A AT DRAINAGE OUTLETS.

Place Matting for Erosion Control on Slope as Work Allows in Accordance with Extreme Terrain Erosion Control Special Provisions.
-L- Sta. 27+50 to Sta. 35+70 LT & RT
-Y3- Sta. 10+00 to Sta. 21+04 LT & RT

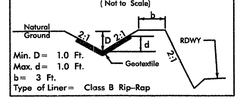


CLEAN WATER DIVERSION
CWD CWD CWD CWD
(Not to Scale)



FROM -L- 31+30 TO 33+00 RT

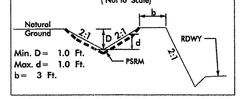
DETAIL A
BERM 'V' DITCH
(Not to Scale)



Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
b = 3 Ft.
Type of Liner = Class B Rip-Rap

FROM -Y3- STA. 11+50 TO STA. 15+00 LT

DETAIL C
BERM 'V' DITCH
(Not to Scale)



Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
b = 3 Ft.

FROM -L- STA. 30+75 TO STA. 31+30 RT
FROM -L- STA. 33+00 TO STA. 34+50 RT

REVISIONS

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THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-5525	EC-04/CONST.04
R/W SHEET NO.	

0' 50' 100'

SPECIAL STILLING BASIN:

Description

This work consists of furnishing, placing, and removing special stilling basin(s) as directed. The special stilling basin shall be used to filter pumped water during construction of drilled piers, footing excavation, and/or culvert construction. The special stilling basin shall also be used for sediment storage at the outlet of temporary slope drain pipe(s).

Materials

Refer to Division 10

Item	Section
Filter Fabric for Drainage, Type 2	1056
Sediment Control Stone	1005

The filter fabric and sediment control stone shall be clean and shall not contain debris.

The special stilling basin shall be a water permeable fabric bag that traps sand, silt, and fines as sediment-laden water is pumped into it, or as runoff flows into it through the temporary slope drain pipe(s).

The special stilling basin shall be a bag constructed to a minimum size of 10' x 15' made from a nonwoven fabric. It shall have a sewn-in 8" (maximum) spout for receiving pump discharge. The bag seams shall be sewn with a double needle machine using a high strength thread. The seams shall have a minimum wide width strength as follows:

Test Method	Minimum Specifications
ASTM D-4884	60 lb/in

The fabric used to construct the bag shall be stabilized to provide resistance to ultra-violet degradation and meet the following specifications for flow rates, strength, and permeability:

Property	Test Method	Minimum Specifications
Weight	ASTM D-3776	8.0 oz/yd
Grab tensile	ASTM D-4632	200.0 lb
Puncture	ASTM D-4833	130.0 lb
Flow rate	ASTM D-4491	80.0 gal/min/sf
Permittivity	ASTM D-4491	1.2 1/sec
UV Resistance	ASTM D-4355	70.0%

Construction Methods

The Contractor shall install the special stilling basin(s), filter fabric, and stone in accordance with Standard Drawing No. 1630.06 and at locations on the plans and as directed.

The special stilling basin(s) shall be constructed such that it is portable and can be used adjacent to each drilled pier, footing, and/or culvert. Temporary slope drain pipe(s) shall be attached to the special stilling basin(s) so that the runoff in the slope drain pipe(s) flows directly into the special stilling basin(s). The special stilling basin(s) shall be placed so the incoming water flows into and through the bag without causing erosion. The neck or spout of the bag shall be tied off tightly to stop the water from flowing out of the bag without going through the walls. If applicable; the neck or spout of the silt bag shall be cut to allow for a slope drain pipe to be inserted into the special stilling basin, and tied off tightly to stop the water from flowing out of the bag.

The special stilling basin(s) shall be replaced and disposed of when it is * full of sediment or when it is impractical for the bag to filter the sediment out at a reasonable flow rate. Prior approval from the Engineer shall be received before removal and replacement.

The Contractor shall be responsible for providing a sufficient quantity of bags to contain silt from pumped effluent during construction of drilled piers, footing excavation, and/or culvert construction. A sufficient quantity of special stilling basins shall be provided to contain sediment from temporary slope drain runoff.

The quantity of sediment control stone, filter fabric for drainage, and special stilling basin(s) as measured above will be paid for at contract price for "Lump Sum for Erosion Control". Such price and payment will be full compensation for all work covered by this provision, including but not limited to, furnishing all materials, placing and maintaining the special stilling basin(s), and removal and disposal of silt accumulations and bag.

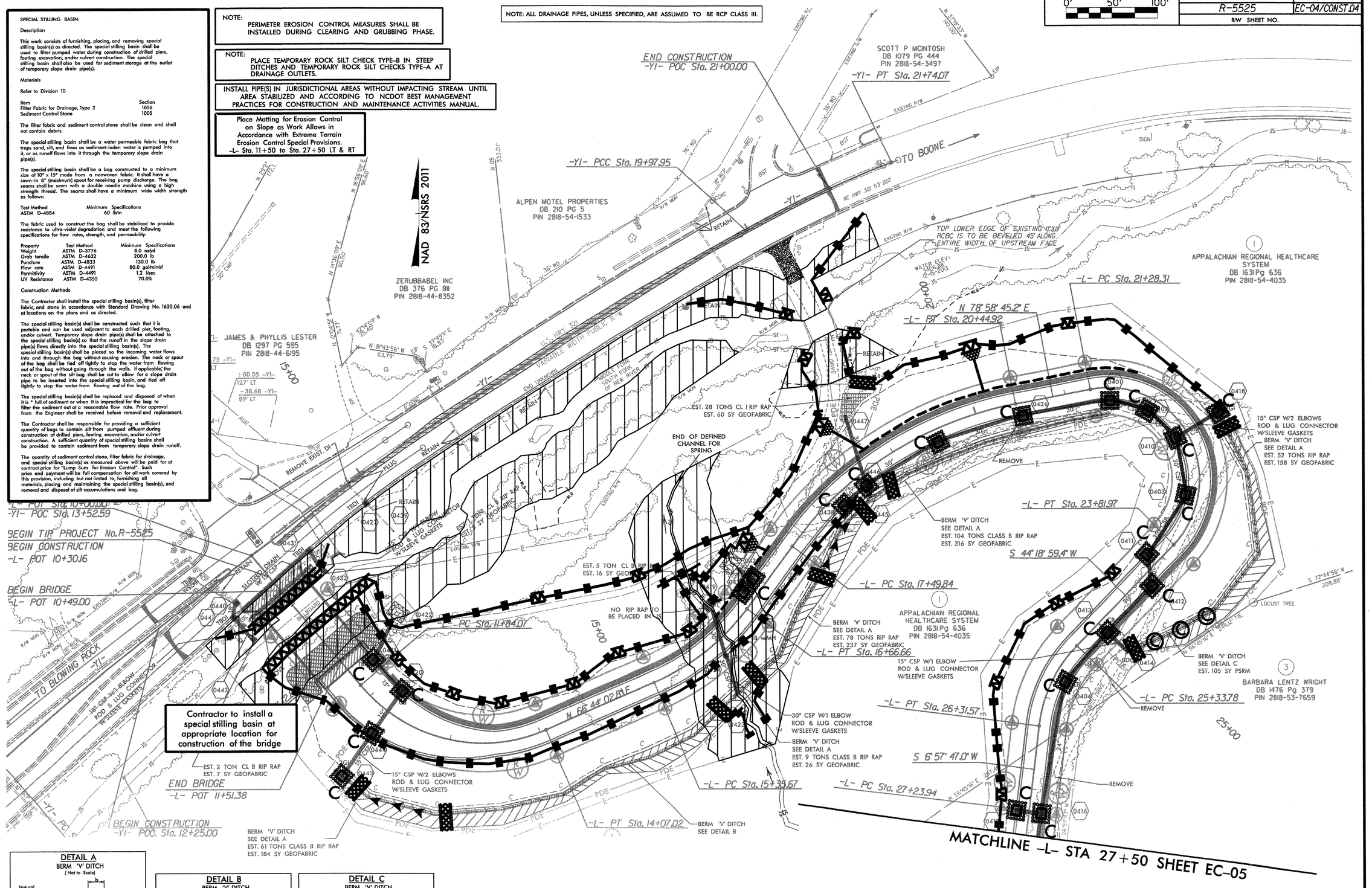
NOTE: PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

NOTE: PLACE TEMPORARY ROCK SILT CHECK TYPE-B IN STEEP DITCHES AND TEMPORARY ROCK SILT CHECKS TYPE-A AT DRAINAGE OUTLETS.

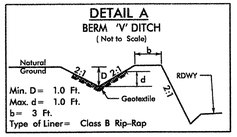
INSTALL PIPE(S) IN JURISDICTIONAL AREAS WITHOUT IMPACTING STREAM UNTIL AREA STABILIZED AND ACCORDING TO NCDOT BEST MANAGEMENT PRACTICES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES MANUAL.

Place Matting for Erosion Control on Slope as Work Allows in Accordance with Extreme Terrain Erosion Control Special Provisions. -L- Sta. 11+50 to Sta. 27+50 LT & RT

NOTE: ALL DRAINAGE PIPES, UNLESS SPECIFIED, ARE ASSUMED TO BE RCP CLASS III.



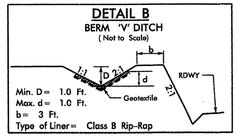
DETAIL A
BERM 'V' DITCH
(Not to Scale)



Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
b = 3 Ft.
Type of Liner = Class B Rip-Rap

FROM -L- STA. 12+25 TO STA. 14+00 RT
FROM -L- STA. 16+00 TO STA. 16+25 RT
FROM -L- STA. 16+25 TO STA. 18+50 RT
FROM -L- STA. 18+50 TO STA. 21+50 RT
FROM -L- STA. 22+50 TO STA. 24+00 LT

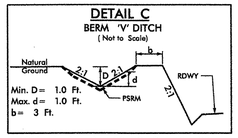
DETAIL B
BERM 'V' DITCH
(Not to Scale)



Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
b = 3 Ft.
Type of Liner = Class B Rip-Rap

FROM -L- STA. 14+00 TO STA. 16+00 RT

DETAIL C
BERM 'V' DITCH
(Not to Scale)



Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
b = 3 Ft.

FROM -L- STA. 24+00 TO STA. 25+00 LT

REVISIONS

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THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-5525	EC-05/CONST.05
R/W SHEET NO.	

0' 50' 100'

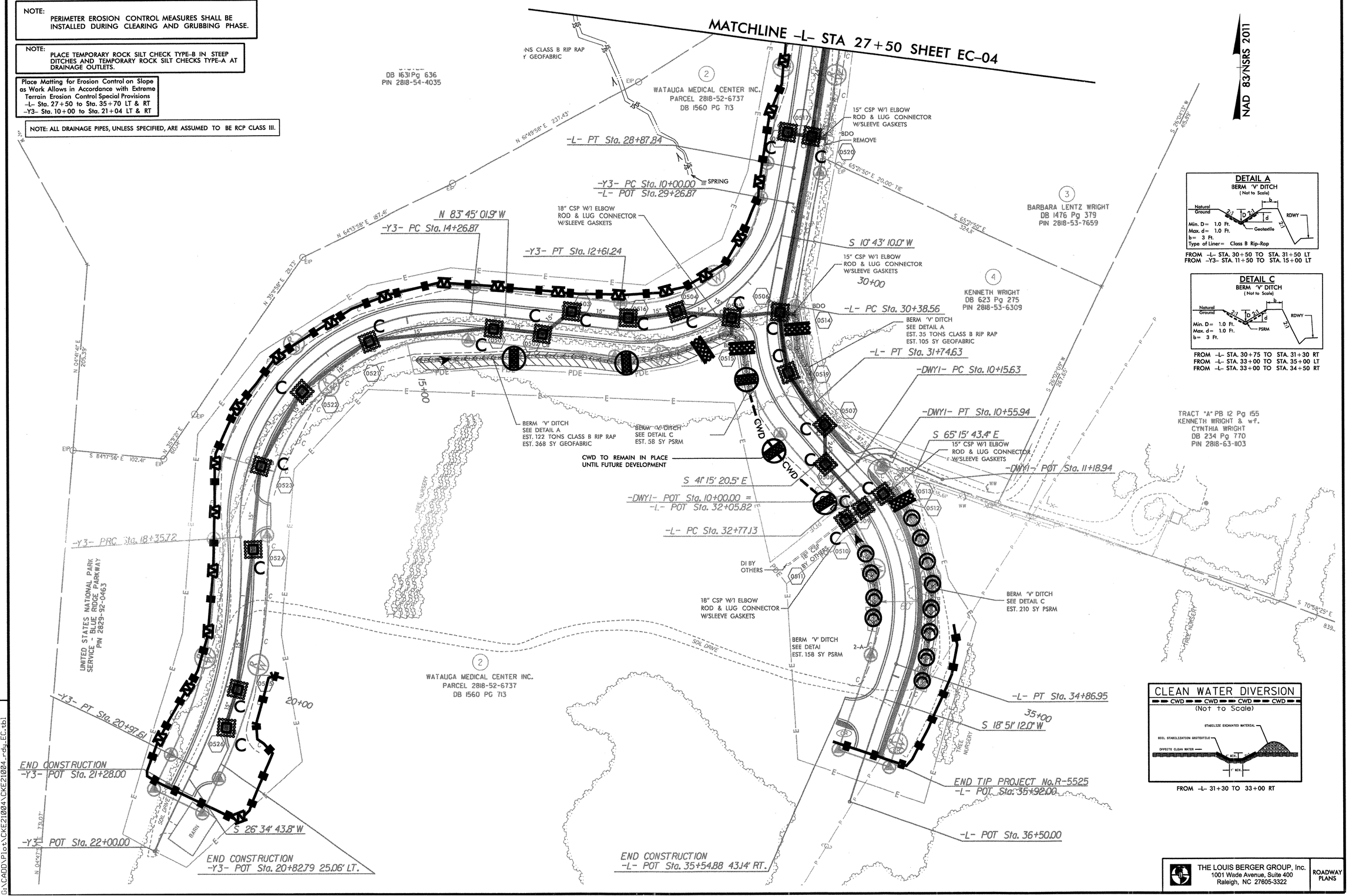
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 05

NOTE:
PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

NOTE:
PLACE TEMPORARY ROCK SILT CHECK TYPE-B IN STEEP DITCHES AND TEMPORARY ROCK SILT CHECKS TYPE-A AT DRAINAGE OUTLETS.

Place Matting for Erosion Control on Slope as Work Allows in Accordance with Extreme Terrain Erosion Control Special Provisions
-L- Sta. 27+50 to Sta. 35+70 LT & RT
-Y3- Sta. 10+00 to Sta. 21+04 LT & RT

NOTE: ALL DRAINAGE PIPES, UNLESS SPECIFIED, ARE ASSUMED TO BE RCP CLASS III.



DETAIL A
BERM 'V' DITCH
(Not to Scale)

FROM -L- STA. 30+50 TO STA. 31+50 LT
FROM -Y3- STA. 11+50 TO STA. 15+00 LT

DETAIL C
BERM 'V' DITCH
(Not to Scale)

FROM -L- STA. 30+75 TO STA. 31+30 RT
FROM -L- STA. 33+00 TO STA. 35+00 LT
FROM -L- STA. 33+00 TO STA. 34+50 RT

CLEAN WATER DIVERSION
(Not to Scale)

FROM -L- 31+30 TO 33+00 RT

REVISIONS

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THE LOUIS BERGER GROUP, Inc.
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ROADWAY PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HOW) 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 HOW ZONES.

REVISIONS

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1001 Wade Avenue, Suite 400
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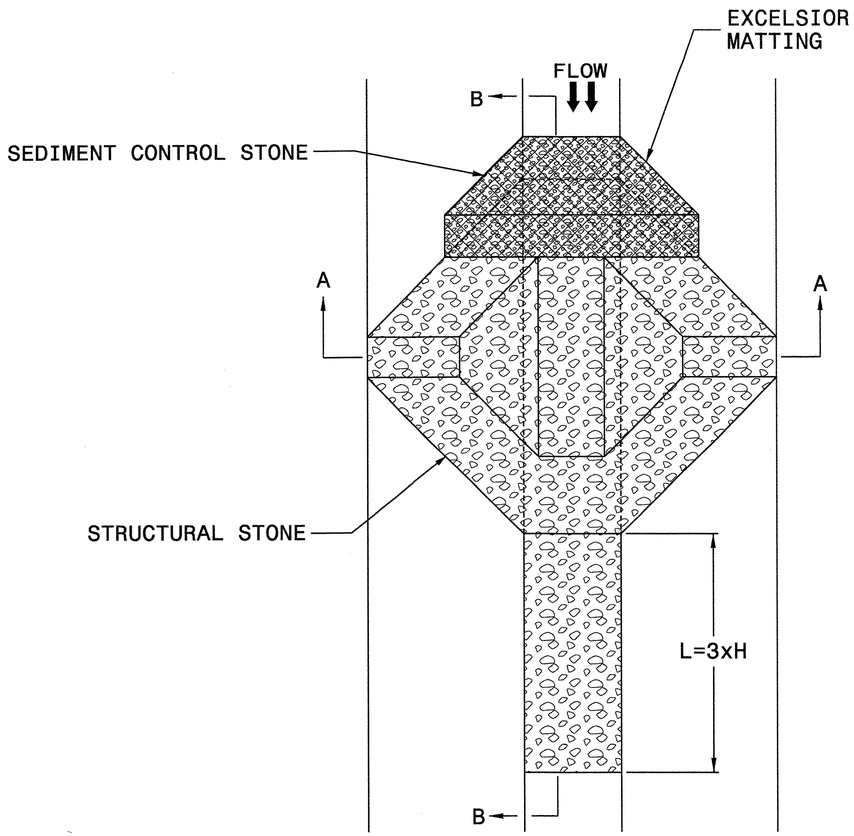
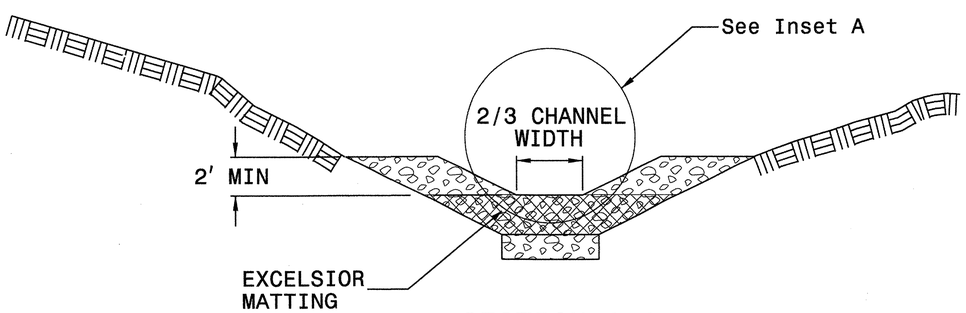
ROADWAY PLANS

PROJECT REFERENCE NO.	SHEET NO.
R-5525	EC-07

TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



PLAN



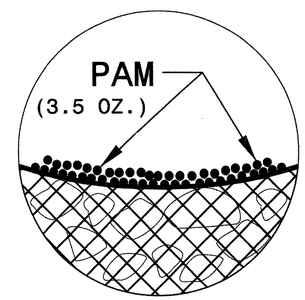
SECTION A-A

NOTES

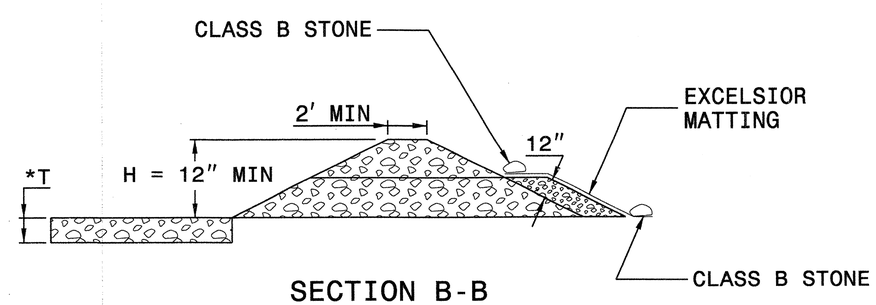
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

INITIALLY APPLY 3.5 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION B-B

*T = 12" MIN., 18" MAX.

NOT TO SCALE

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ROADWAY PLANS

REVISIONS

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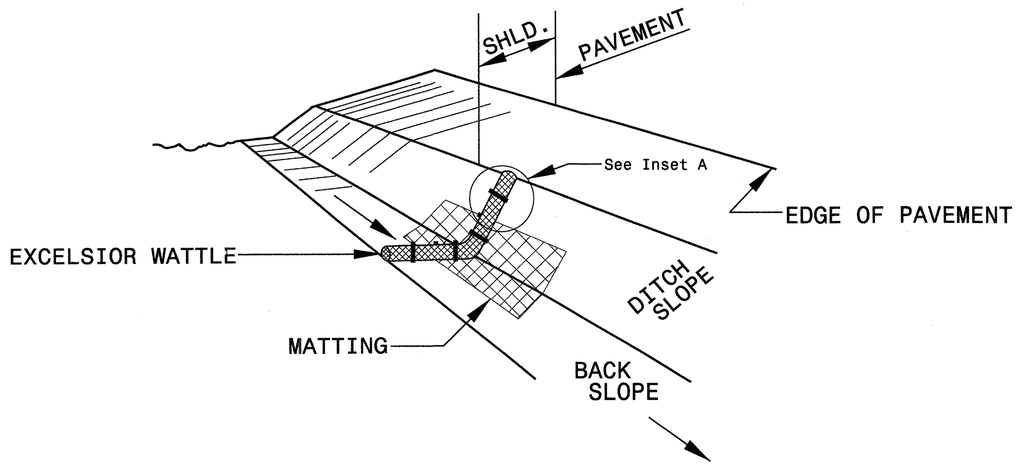
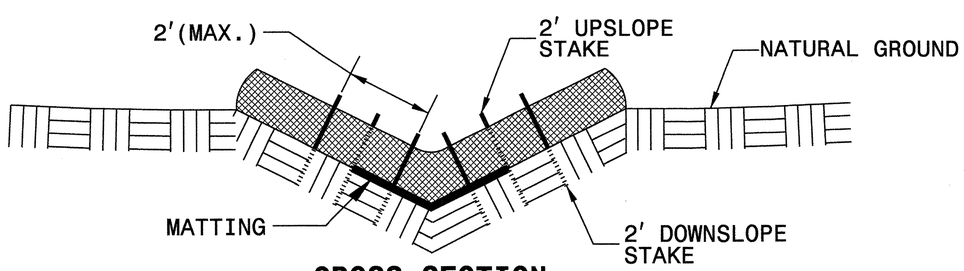
PROJECT REFERENCE NO.	SHEET NO.
R-5525	EC-08

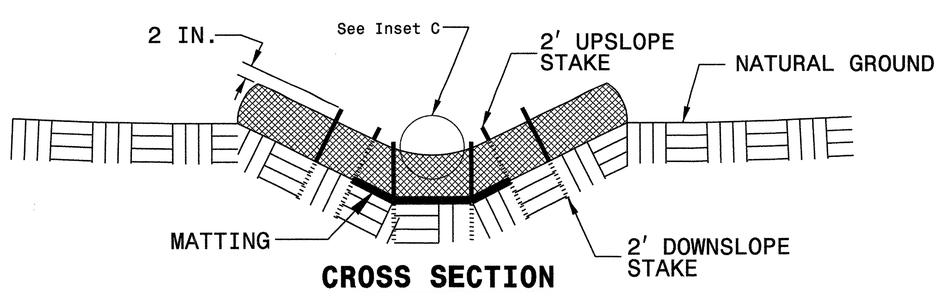
WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

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

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

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

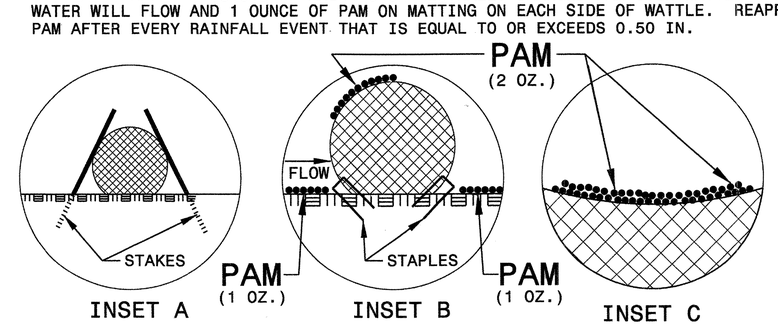
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

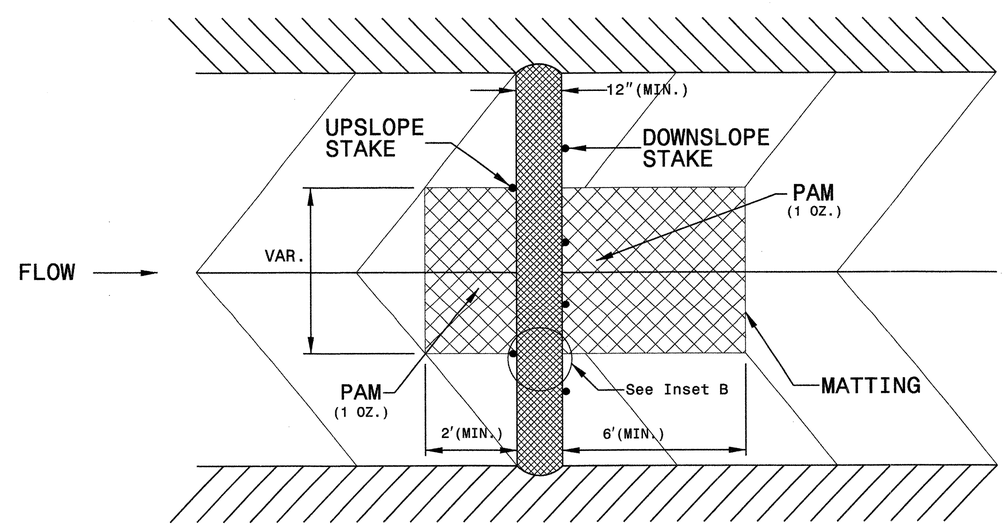
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.





TOP VIEW

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1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

ROADWAY PLANS

REVISIONS

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TIP NO.	SHEET NO.
R-5525	SIGN-1

APPROVED: Dean Hatfield

DATE: 2-26-14

SEAL

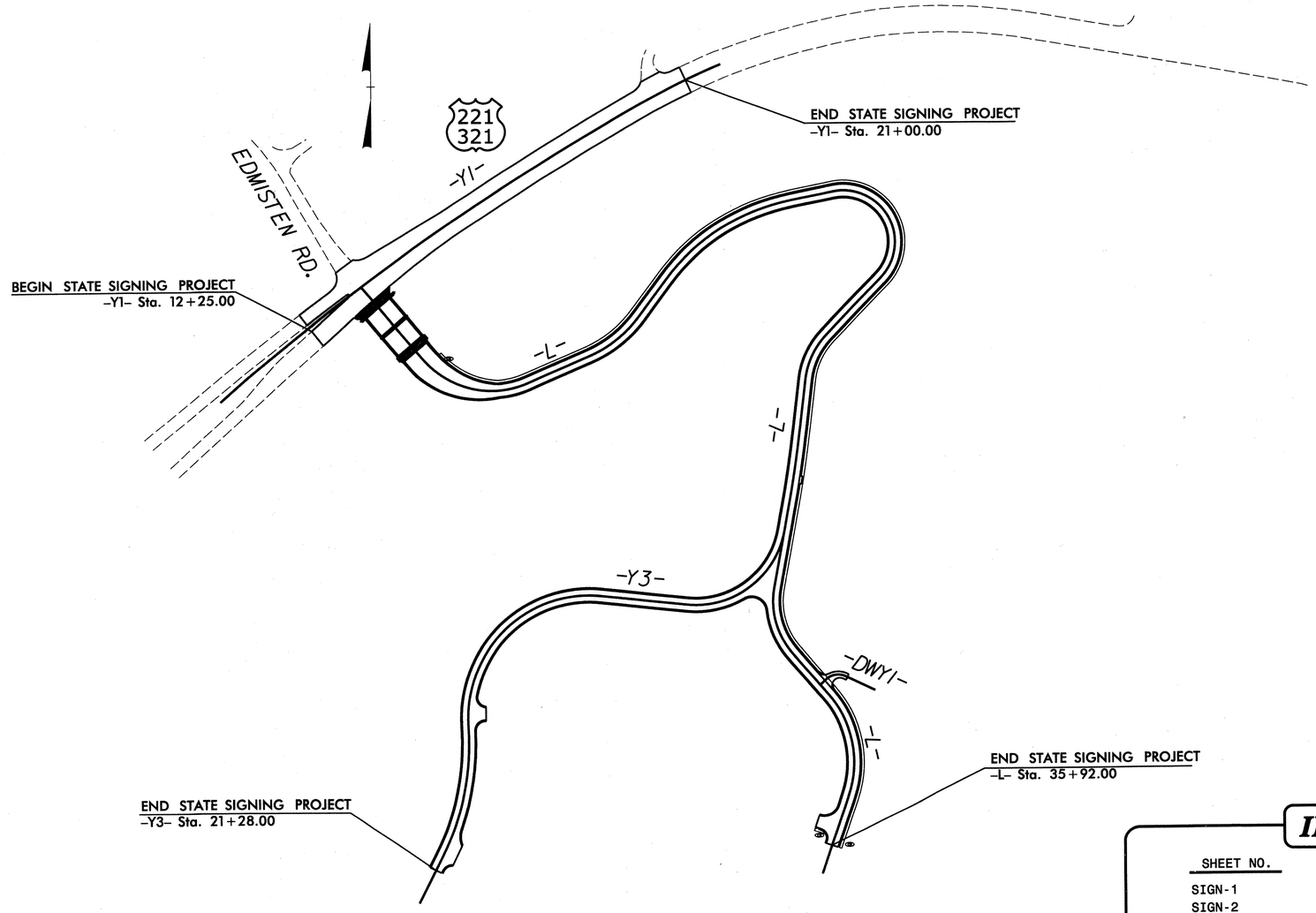
NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING PLAN

WATAUGA COUNTY

LOCATION: BLOWING ROCK POST ACUTE CARE FACILITY CONSTRUCTION ACCESS ROAD



INDEX

SHEET NO.	DESCRIPTION
SIGN-1	TITLE SHEET
SIGN-2	QUANTITIES
SIGN-3	TYPE E SIGNS
SIGN-4-5	SIGNING PLAN SHEETS

PLAN PREPARED BY: THE LOUIS BERGER GROUP

KELVIN JORDAN — SIGNING & DELINEATION REGIONAL ENGINEER

JONROBERT NAVARRETE — SIGNING & DELINEATION PROJECT DESIGN ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

CONTRACT: C203437

T.I.P.: R-5525

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TIP NO.	SHEET NO.
R-5525	SIGN-2

APPROVED: Dean Hatfield

DATE: 2-26-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - 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
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E', & 'F' SIGNS ON 'U' CHANNEL POSTS

PROJECT NOTES

1 SIGN ERECTION, RELOCATE, TYPE D (GROUND MOUNTED)
2 DISPOSAL OF SIGN SYSTEM, WOOD
3 DISPOSAL OF SIGN SYSTEM, U-CHANNEL

SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4025000000	901	CONTRACTOR FURNISHED, TYPE E SIGN	79.5	S.F.
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	146	L.F.
4102000000	904	SIGN ERECTION, TYPE E	12	EA.
4116100000	904	SIGN ERECTION, RELOCATE, TYPE D (GROUND MOUNTED)	2	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	4	EA.
4158000000	907	DISPOSAL OF SIGN SYSTEM, WOOD	1	EA.

GENERAL NOTES

. SIGNS FURNISHED BY CONTRACTOR
. ALL TYPE 'D' SIGNS SHALL BE MOUNTED ON TWO U-CHANNEL POSTS UNLESS OTHERWISE INDICATED ON THE PLANS.
. IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.
. WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER
. ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.
. WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.
. THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.
. SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

QUANTITIES

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TIP NO.	SHEET NO.
R-5525	SIGN-3

APPROVED: Dean D. Hatfield

DATE: 2-26-14

SEAL

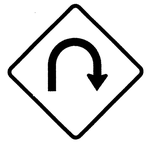
NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD

(401) QUANTITY REQ'D _1_

30 X 30
R1-1

ONE "U" POST PER SIGN

(406) QUANTITY REQ'D _1_



30 X 30
W1-11

ONE "U" POST PER SIGN

(402) QUANTITY REQ'D _1_

24 X 30
R4-7

ONE "U" POST PER SIGN

(407) QUANTITY REQ'D _1_

30 X 30
W1-11

ONE "U" POST PER SIGN

(403) QUANTITY REQ'D _1_

36 X 36
W8-14

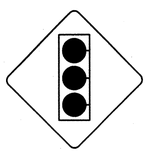
ONE "U" POSTS PER SIGN

(408) QUANTITY REQ'D _2_

18 X 18
W13-1

TO BE MOUNTED ON W1-11 SIGN POST

(404) QUANTITY REQ'D _4_



36 X 36
W3-3

ONE "U" POST PER SIGN

(405) QUANTITY REQ'D _1_

30 X 30
W1-2L

ONE "U" POST PER SIGN

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TYPE E SIGNS

2/25/2014 4:59:17 PM
CKE Projects
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Limited Services Division Offices\R-5525\Roadway\Proj\R5525_RDY_12_SIGN_03.dgn

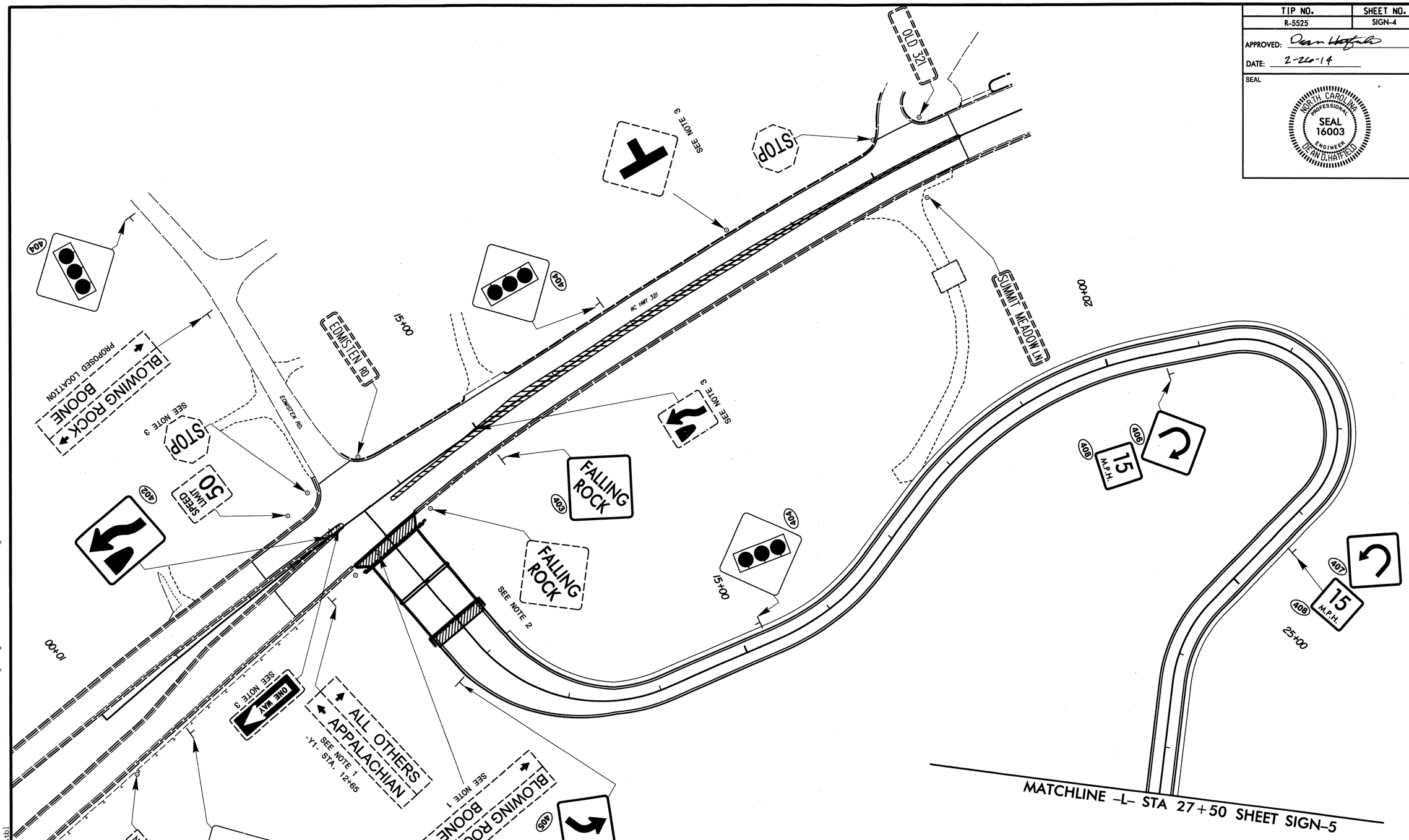
TIP NO.	SHEET NO.
R-5525	SIGN-4

APPROVED: Dean Hatfield

DATE: 2-26-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD



THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

SIGNING PLANS
EXISTING & PROPOSED

2/25/2014 4:59:25 PM
G:\CKE Projects\CKE21004 Limited Services Division Offices\R-5525\Roadway\Proj\R5525_RDY_12_SIGN_04.dgn
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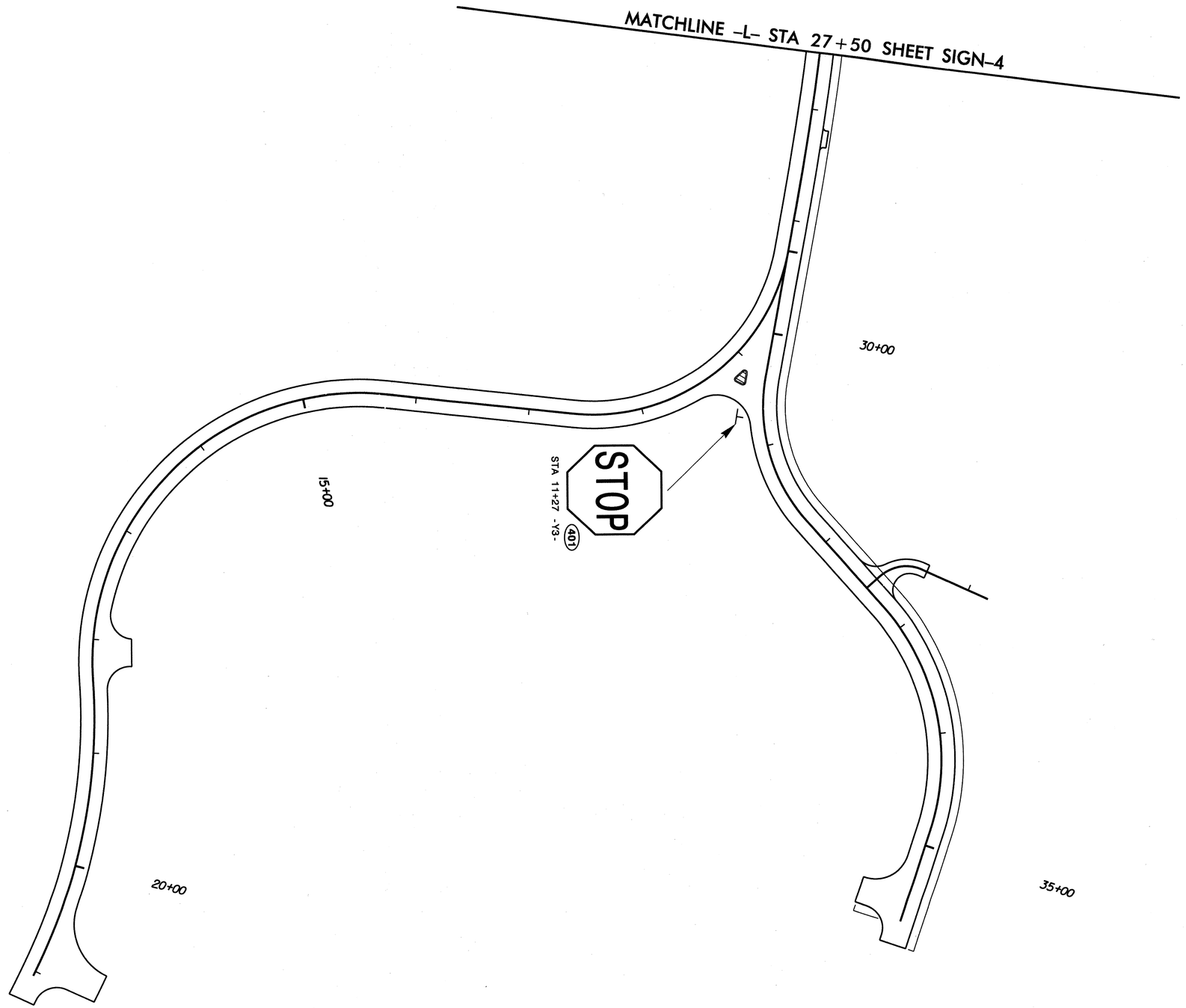
TIP NO.	SHEET NO.
R-5525	SIGN-5

APPROVED: Dean Hatfield

DATE: 2-26-14

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD



THE LOUIS BERGER GROUP, Inc.
1001 Wade Avenue, Suite 400
Raleigh, NC 27605-3322

SIGNING PLANS PROPOSED

2/25/2014 4:59:31 PM
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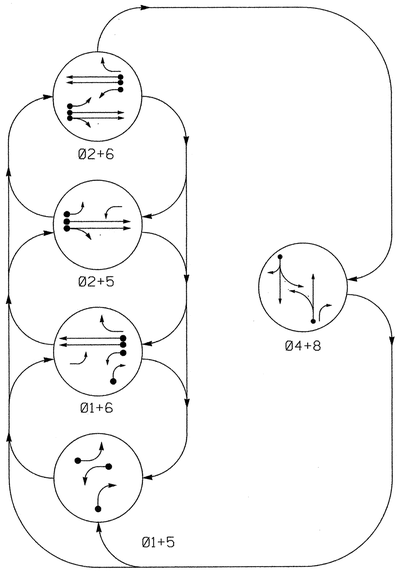
PROJECT REFERENCE NO.	SHEET NO.
TIP# R-5525	Sig.1

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	←	←	F Y	F Y	R	Y
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	←	F Y	←	F Y	R	Y
61,62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R	R	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

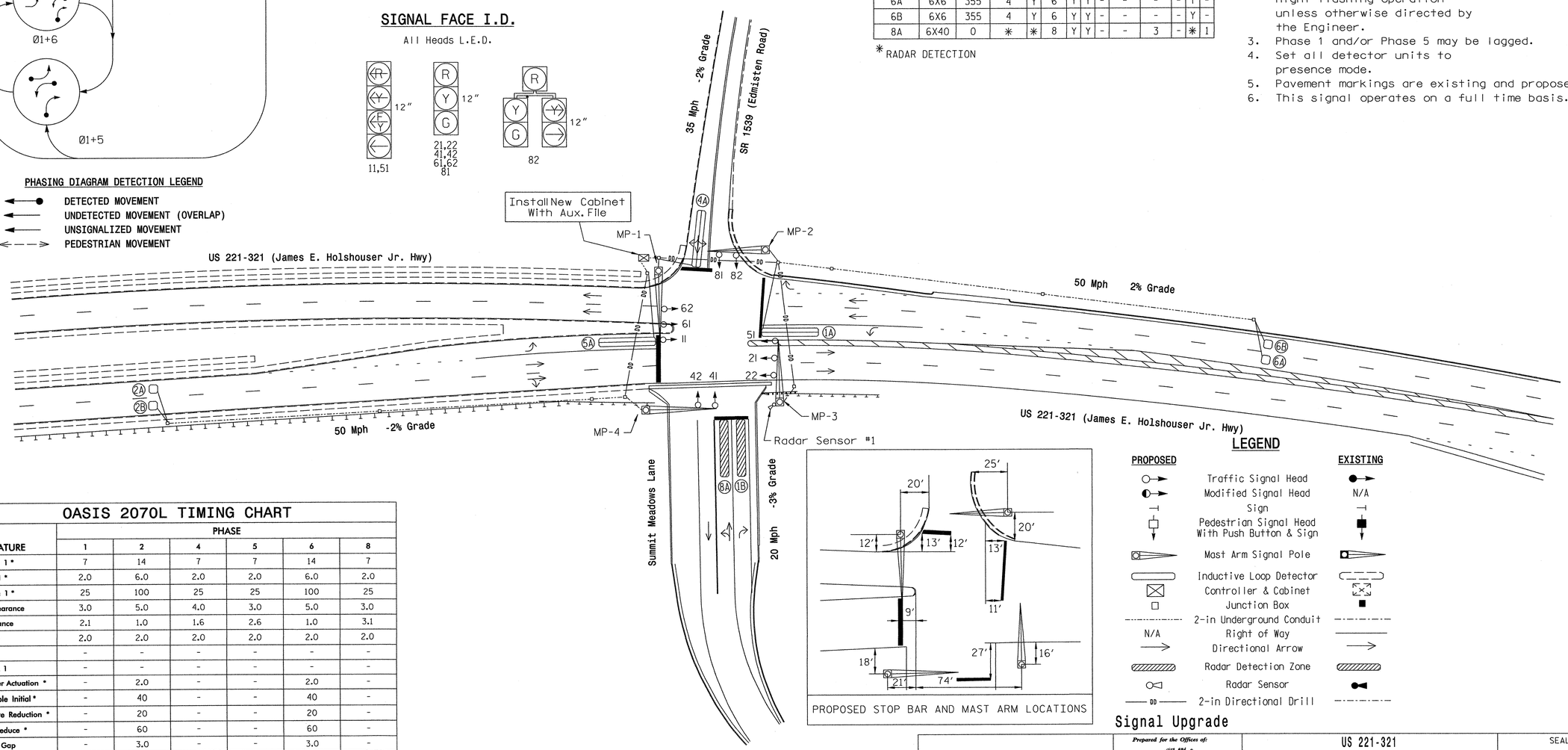
INDUCTIVE LOOPS					DETECTOR PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD	SENSOR NO.
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	Y	-
					6	Y	Y	Y	-	3	-	Y	-
1B	6X40	0	*	*	1	Y	Y	-	-	15	-	*	1
2A	6X6	355	4	Y	2	Y	Y	-	-	-	-	Y	-
2B	6X6	355	4	Y	2	Y	Y	-	-	-	-	Y	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	Y	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y	-
					2	Y	Y	Y	-	3	-	Y	-
6A	6X6	355	4	Y	6	Y	Y	-	-	-	-	Y	-
6B	6X6	355	4	Y	6	Y	Y	-	-	-	-	Y	-
8A	6X40	0	*	*	8	Y	Y	-	-	3	-	*	1

* RADAR DETECTION

5 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Pavement markings are existing and proposed.
6. This signal operates on a full time basis.



PROPOSED STOP BAR AND MAST ARM LOCATIONS

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Mast Arm Signal Pole	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Radar Detection Zone	
	Radar Sensor	
	2-in Directional Drill	

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	14	7	7	14	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	25	100	25	25	100	25
Yellow Clearance	3.0	5.0	4.0	3.0	5.0	3.0
Red Clearance	2.1	1.0	1.6	2.6	1.0	3.1
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	2.0	-	-	2.0	-
Max Variable Initial *	-	40	-	-	40	-
Time Before Reduction *	-	20	-	-	20	-
Time To Reduce *	-	60	-	-	60	-
Minimum Gap	-	3.0	-	-	3.0	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

THIS PLAN SHEET SHALL SUPERSEDE PLAN SHEET ISSUED 2-7-14

AMT
A. MORTON THOMAS AND ASSOCIATES, INC.
CONSULTING ENGINEERS
8412 FALLS OF NEUSE ROAD, SUITE 202, RALEIGH, NC 27615
TEL (919) 855-9989 FAX (919) 855-5687
E-MAIL MSURASKY@AMTENGINEERING.COM
AMT FILE # 113-228.601
NCBELS LICENSE #: F-1046

Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 Greenfield Parkway, Garner, NC 27529

SCALE 0 40 1"=40'

US 221-321
(James E. Holshouser Jr. Hwy)
at
SR 1539 (Edmisten Road)/Summit Meadows Lane
Division 11 Watauga County near Blowing Rock

PLAN DATE: October 2013	REVIEWED BY: Mike Surasky
PREPARED BY: Jack Goode	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 035964 ENGINEER ALEXANDER
2/25/14
SIGNATURE DATE
SIG. INVENTORY NO. 11-1311

Signal Upgrade

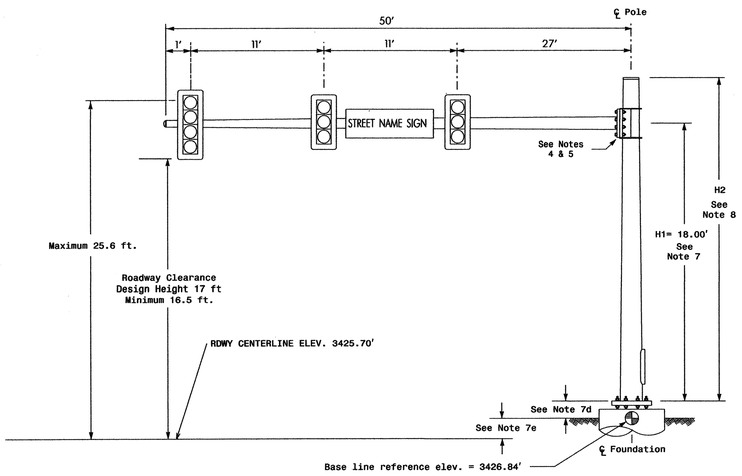
$$$

METAL POLE No. MP-1 and MP-2

PROJECT REFERENCE NO.	SHEET NO.
TIP# R-5525	Sig._2_

Design Loading for METAL POLE NO. MP-1

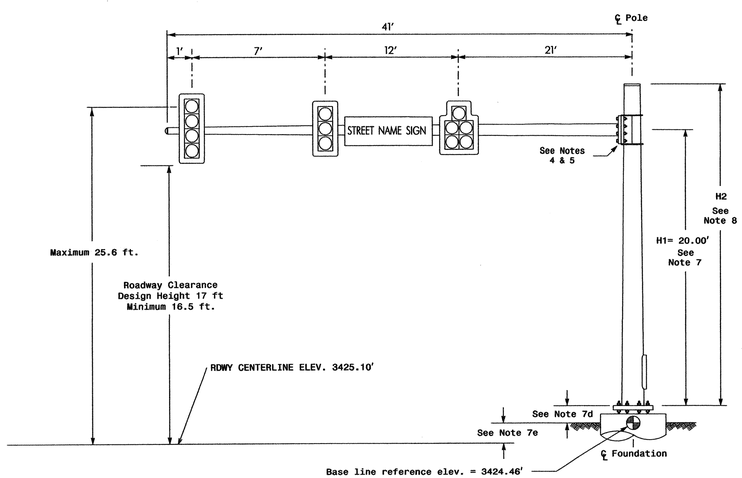
NOTE:
1. LOADING AND TRAFFIC SIGNAL HEADS BASED ON FUTURE INTERSECTION IMPROVEMENT. SEE PLAN SHEET FOR PROPOSED SIGNAL HEAD LAYOUT FOR THIS PROJECT.



Elevation View

Design Loading for METAL POLE NO. MP-2

NOTE:
1. LOADING AND TRAFFIC SIGNAL HEADS BASED ON FUTURE INTERSECTION IMPROVEMENT. SEE PLAN SHEET FOR PROPOSED SIGNAL HEAD LAYOUT FOR THIS PROJECT.



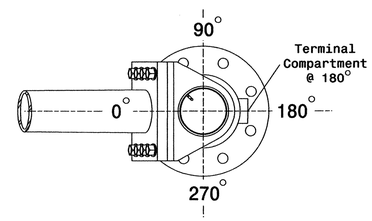
Elevation View

SPECIAL NOTE

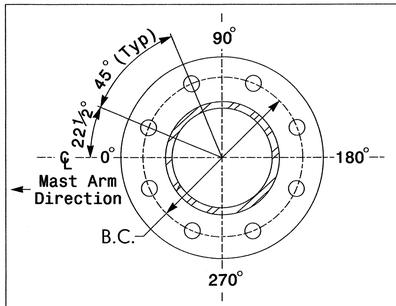
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	MP-1	MP-2
Baseline reference point at ℄ Foundation @ ground level	3426.84 ft.	3424.46 ft.
Elevation difference at High point of roadway surface	-1.14 ft.	+0.64 ft.
Elevation difference at Edge of travelway or face of curb	-0.50 ft.	+1.37 ft.

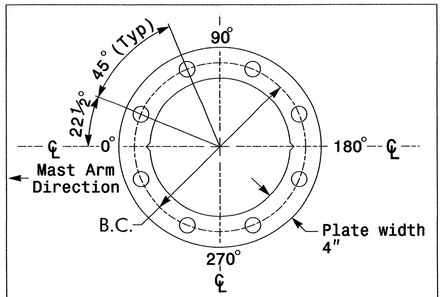


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-5 SECTION-WITH BACKPLATE AND ASTRO-BRAC	16.3 S.F.	42.0" W X 56.0" L	103 LBS
	SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE AND ASTRO-BRAC	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	5.0 S.F.	24.0" W X 30.0" L	11 LBS
STREET NAME SIGN	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS

NOTES

Design Reference Material

1. Design the traffic signal structure and foundation in accordance with:
   - The 5th Edition 2009 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2012 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
   - The 2012 NCDOT Roadway Standard Drawings.
   - The traffic signal project plans and special provisions.
   - The NCDOT "Metal Pole Standards" located at the following NCDOT website: http://www.ncdot.org/doh/preconstruct/traffic/ITSS/ws/mpoles/poles.html

Design Requirements

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Design all signal supports using stress ratios that do not exceed 0.9.
4. The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is .75 feet above the ground elevation.
   e. Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Structural Engineer for assistance at (919) 773-2800.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

WIND ZONE 5 (120 MPH)

PLANS PREPARED BY :

A. MORTON THOMAS AND ASSOCIATES, INC.
CONSULTING ENGINEERS
8412 FALLS OF NEUSE ROAD, SUITE 301, RALEIGH, NC 27615
TEL (919) 855-0909 FAX (919) 855-5487
E-MAIL MGOLASKY@AMTENGINEERING.COM
ASY FILE # 113-228.001
NCBELS LICENSE #: F-1046

Prepared for the Offices of:
Traffic Engineering Branch
Signal Design Section
750 Greenfield Parkway, Garner, NC 27529

SCALE 0 40 1"=40'

US 221-321
(James E. Holshouser Jr. Hwy)
at
SR 1539 (Edmisten Road)/Summit Meadows Lane
Division 11 Watauga County near Blowing Rock

PLAN DATE:	October 2013	REVIEWED BY:	Mike Surasky
PREPARED BY:	Jack Goode	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 035964 ENGINEER JACK ALEXANDER GOODE, II
2/7/14

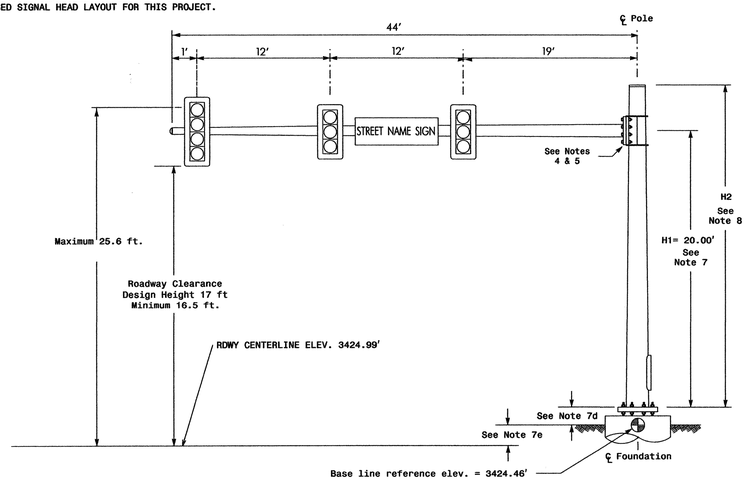
SIGNATURE	DATE
SIG. INVENTORY NO. 11-1311	

$$$$$$SYSTIME$$$$$
$$$$$$SYSLAST$$$$$$
$$$$$$SYSDATE$$$$$$
$$$$$$DGNNAME$$$$$$

METAL POLE No. MP-3 and MP-4

Design Loading for METAL POLE NO. MP-3

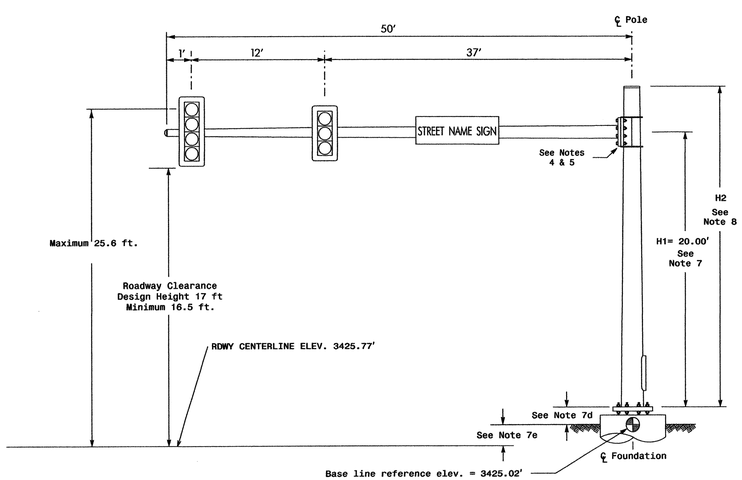
NOTE:
1. LOADING AND TRAFFIC SIGNAL HEADS BASED ON FUTURE INTERSECTION IMPROVEMENT. SEE PLAN SHEET FOR PROPOSED SIGNAL HEAD LAYOUT FOR THIS PROJECT.



Elevation View

Design Loading for METAL POLE NO. MP-4

NOTE:
1. LOADING AND TRAFFIC SIGNAL HEADS BASED ON FUTURE INTERSECTION IMPROVEMENT. SEE PLAN SHEET FOR PROPOSED SIGNAL HEAD LAYOUT FOR THIS PROJECT.



Elevation View

SPECIAL NOTE

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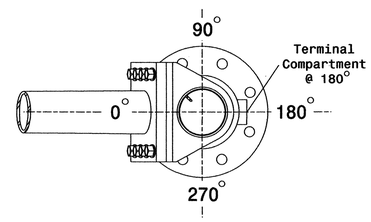
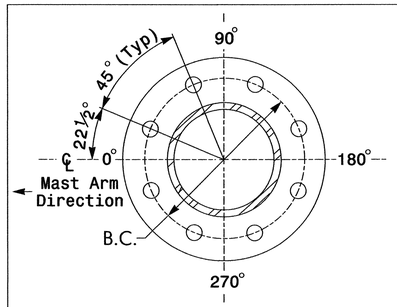
Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	MP-3	MP-4
Baseline reference point at ℄ Foundation @ ground level	3424.46 ft.	3425.02 ft.
Elevation difference at High point of roadway surface	+0.53 ft.	+0.75 ft.
Elevation difference at Edge of travelway or face of curb	-0.09 ft.	0 ft.

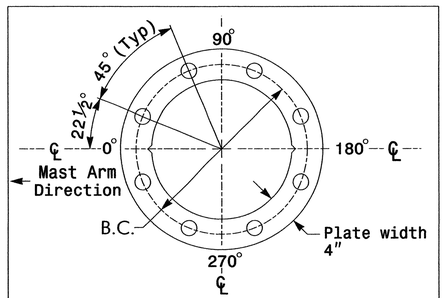


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

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   d. The top of the pole base plate is .75 feet above the ground elevation.
   e. Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
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11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

WIND ZONE 5 (120 MPH)

PLANS PREPARED BY :

A. MORTON THOMAS AND ASSOCIATES, INC.
CONSULTING ENGINEERS
8412 FALLS OF NEUSE ROAD, SUITE 102, RALEIGH, NC 27615
TEL (919) 870-5900 FAX (919) 870-5902
E-MAIL MURASKY@AMTENGINEERING.COM
AMT FILE # 113-22E.001
NCBELS LICENSE #: F-1046

Prepared for the Offices of:
750 Greenfield Parkway, Garner, NC 27529

SCALE 0 40 1"=40'

US 221-321
(James E. Holshouser Jr. Hwy)
at
SR 1539 (Edmisten Road)/Summit Meadows Lane
Division 11 Watauga County near Blowing Rock

PLAN DATE:	October 2013	REVIEWED BY:	Mike Surasky
PREPARED BY:	Jack Goode	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 035964 ENGINEER
2/7/14

SIGNATURE	DATE
SIG. INVENTORY NO.	11-131

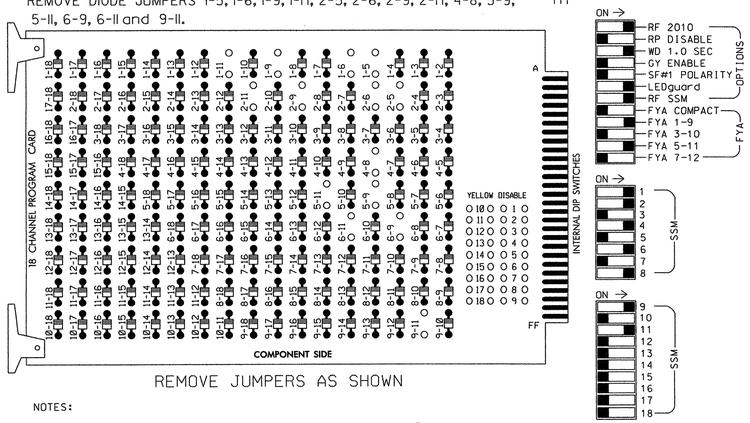
$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-5525	SIG. 4

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS I-5, I-6, I-9, I-11, 2-5, 2-6, 2-9, 2-11, 4-8, 5-9, 5-11, 6-9, 6-11 and 9-11.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2 and 6 for Yellow Flash and overlap 1 as Wag Overlaps.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1		2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1		2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	★ 11	82	21,22	NU	NU	41,42	NU	★ 51	61,62	NU	NU	81,82	NU	★ 11	NU	NU	★ 51	NU	NU
RED		✳	128			101			134			107							
YELLOW			129			102		✳	135			108							
GREEN			130			103			136			109							
RED ARROW														A121			A114		
YELLOW ARROW		126												A122			A115		
YELLOW FLASHING ARROW														A123			A116		
GREEN ARROW	127	127						133											

NU = Not Used

✳ Denotes install load resistor. See load resistor installation detail this sheet.

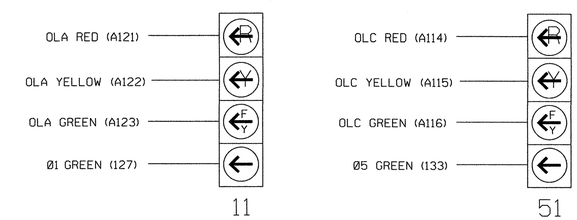
★ See pictorial of head wiring in detail below.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S7,S8,S11,AUX S1,AUX S4
PHASES USED.....1,2,4,5,6,8
OVERLAP "A".....1+2
OVERLAP "B".....NOTE USED
OVERLAP "C".....5+6
OVERLAP "D".....NOT USED

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The sequence display for this signal requires special logic programming. See sheet 2 of 2 for programming instructions.

SEE SHEET 2 FOR FYA-PPLT SIGNAL SEQUENCE PROGRAMMING AND OVERLAP PROGRAMMING

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø2 2A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	Ø2 2B				NOT USED								ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø6 6B												

EX.:1A,2A,ETC.=LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	–	J4U	48	10	26	6	Y	Y	Y		3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	–	I4U	47	9	22	2	Y	Y	Y		3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

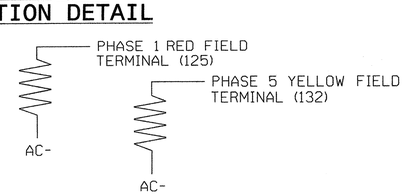
For detection zones (8A) and (1B), install a radar detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting location to accomplish the detection scheme shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-1311
DESIGNED: October 2013
SEALED: February 25, 2014
REVISED:

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



NOTE: The purpose of this resistor is to load the channel red monitor input in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

electrical detail sheet 1 of 2
Signal Upgrade - Final Design

THIS PLAN SHEET SHALL SUPERSEDE PLAN SHEET ISSUED 2-7-14

PLANS PREPARED BY :

AMT

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AMT FILE # 113-228.001
NCBELS LICENSE #: F-1046

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 Greenfield Parkway, Garner, NC 27529

US 221-321
(JAMES E. HOLSHOUSER JR. HWY)
AT
SR 1539 (EDMISTEN ROAD) /
SUMMIT MEADOWS LANE

Division 11 Watauga County near Blowing Rock

PLAN DATE: October 2013		REVIEWED BY:	J.D.Morton
PREPARED BY:	D.W.Morton	M&M PROJECT NO.	1308_001

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 18796 ENGINEER DONALD W. MORTON

2-25-14

SIGNATURE DATE

SIG. INVENTORY NO. 11-1311

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
R-5525	SIG. 5

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5 AND 6.

2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```
LOGICAL I/O COMMAND #1  (+/- COMMAND #)
IF  ACTIVE PHASE        #1  IS ON
AND RED CLEAR ON PHASE  #1  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #50 ON
SET OUTPUT  ASSIGNMENT #51 OFF
```

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/- COMMAND #)
IF  ACTIVE PHASE    #1  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

PRESS '+'

```
LOGICAL I/O COMMAND #3  (+/- COMMAND #)
IF  YELLOW ON PHASE #1  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/- COMMAND #)
IF  ACTIVE PHASE        #5  IS ON
AND RED CLEAR ON PHASE  #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #42 ON
SET OUTPUT  ASSIGNMENT #43 OFF
```

NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51).

PRESS '+'

```
LOGICAL I/O COMMAND #5  (+/- COMMAND #)
IF  ACTIVE PHASE    #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 5 (HEAD 51).

PRESS '+'

```
LOGICAL I/O COMMAND #6  (+/- COMMAND #)
IF  YELLOW ON PHASE #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green
OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-1311
DESIGNED: October 2013
SEALED: February 25, 2014
REVISED:

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:          |123456789101112131415 16
VEH OVL PARENTS:|XX
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

NOTICE GREEN FLASH

PRESS ' + ' TWICE

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE:          |123456789101112131415 16
VEH OVL PARENTS:|    XX
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS PLAN SHEET SHALL SUPERSEDE PLAN SHEET ISSUED 2-7-14

electrical detail sheet 2 of 2
Signal Upgrade - Final Design

PLANS PREPARED BY :

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AMT FILE # 113-228.001
NCBELS LICENSE #: F-1046

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

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STATE OF NORTH CAROLINA
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750 Greenfield Parkway, Garner, NC 27529

US 221-321
(JAMES E. HOLSHOUSER JR. HWY)
AT
SR 1539 (EDMISTEN ROAD)/
SUMMIT MEADOWS LANE

Division 11 Watauga County near Blowing Rock

PLAN DATE: October 2013		REVIEWED BY:	J.D.Morton
PREPARED BY:	D.W.Morton	M&M PROJECT NO.	1308_001

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 19798 ENGINEER DONALD W. MORTON

2-25-14

SIGNATURE DATE

SIG. INVENTORY NO. 11-1311

$$$$$SYSTIME$$$$$
$$$$$USERNAME$$$$$
$$$$$SCREENSIZE$$$$$

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5525	UC-1

DESIGNED BY: TP/CL
DRAWN BY: CL
CHECKED BY: LR
APPROVED BY: DH
REVISED:NOVEMBER 2013
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
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NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD 2/3/2014

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE BASE PLAN FOR THIS PROJECT WAS DEVELOPED BY INDEPENDENT MAPPING CONSULTANTS, INC.

2. UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORD DRAWINGS, AND THEREFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. CONTRACTOR SHOULD ANTICIPATE THAT THE LOCATION OF UTILITIES SHOWN ON THE DRAWINGS COULD VARY UP TO 3 FEET IN ANY DIRECTION FROM THEIR ACTUAL LOCATION. IT IS POSSIBLE THERE MAY BE OTHER FACILITIES, STRUCTURES, AND UTILITIES, THE EXISTENCE OF WHICH ARE PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERETO. REQUIRED TEST PITS ARE SHOWN ON THE DRAWING; ADDITIONAL TEST PITS ARE TO BE PERFORMED AT THE CONTRACTOR'S DISCRETION.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE OWNER FOR TEMPORARY PLACEMENT/STORAGE/PARKING OF STOCKPILING MATERIALS, EQUIPMENT, AND VEHICLES TO BE USED FOR THE CONSTRUCTION.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING PROPOSED WORK WITH THE OWNER, PROVIDING ADEQUATE CONTROLS FOR SITE SAFETY, AND MINIMIZING IMPACTS. UNDER NO CIRCUMSTANCES WILL THE CONTRACTOR INITIATE ACTIVITIES THAT WILL RESTRICT ACCESS OF EMERGENCY VEHICLES.

5. ALL AREAS DISTURBED BY THE CONTRACTOR OUTSIDE THE LIMITS OF DISTURBANCE SHALL BE RESTORED TO THE ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER. ALL ORIGINAL GRADES SHALL BE RESTORED.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HEALTH AND SAFETY OF ALL ITS EMPLOYEES, SUBCONTRACTORS, VENDORS, AND VISTORS WORKING ON THE PROJECT.

7. THE CONTRACTOR SHALL MAINTAIN AT ALL TIMES A SET OF RECORD DRAWINGS AND SPECIFICATIONS DURING THE PROGRESSION OF THE PROJECT. RECORD DRAWINGS AND SPECIFICATIONS SHALL BE UPDATED ON A DAILY BASIS AND SHALL BE SUBMITTED TO THE ENGINEER AT THE COMPLETION OF THE CONSTRUCTION. RECORD DRAWINGS SHALL INCLUDE THE LOCATIONS OF ALL BURIED AND RELOCATED UTILITIES.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE OWNER IN DETERMINING MATERIAL STORAGE AND EQUIPMENT AREAS, AS APPLICABLE.

9. THE CONTRACTOR SHALL PERFORM ALL CONSTRUCTION ACTIVITIES WITHIN THE LIMIT OF WORK AREAS INDICATED ON THE PLANS. CONSTRUCTION ACTIVITIES OUTSIDE OF THE DEFINED LIMIT OF WORK AREA SHALL BE SUBJECT TO REVIEW BY THE TOWN OF BLOWING ROCK.

10. THE CONTRACTOR SHALL SECURE THE WORK SITE FROM UNAUTHORIZED PERSONNEL WITH FENCING AND/OR CONCRETE MEDIAN BARRIER OR OTHER METHODS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE THE SITE WITH NIGHT LIGHTING TO PROVIDE A SAFE AND SECURE WORK ENVIRONMENT, AS NECESSARY.

11. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE EXISTING CONDITIONS ARE NOT OBLITERATED BEFORE CONTROL POINTS ARE LOCATED AND CONSTRUCTION LAYOUT IS ESTABLISHED. THE CONSTRUCTION LAYOUT SHALL BE PROVIDED IN SUFFICIENT DETAIL. THEREBY ENABLING THE CONTRACTOR TO CONSTRUCT THE PROJECT IN CONFORMITY WITH THE PLANS AND SPECIFICATIONS. SURVEY WILL BE PROVIDED BY THE CONTRACTOR. THE OWNER WILL NOT AUTHORIZE CONSTRUCTION ACTIVITIES TO BEGIN UNTIL THE CONTRACTOR SATISFIES THAT ALL GROUND CONTROL HAS BEEN ESTABLISHED, TIED DOWN, AND DULY RECORDED IN STANDARD FIELD BOOKS.

12. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO OBTAIN ALL WORK PERMITS PRIOR TO CONSTRUCTION BEFORE PROCEEDING WITH ANY WORK.

13. THE CONTRACTOR SHALL NOT LEAVE ANY TRENCHES OR OTHER EXCAVATIONS OPEN DURING NON-WORK HOURS WITHOUT PRIOR APPROVAL FROM THE OWNER.

14. ALL SPECIFICATIONS SHALL BE NCDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE DESIGN UNLESS OTHERWISE SPECIFIED BY THE OWNER'S REPRESENTATIVE.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROVIDING TEMPORARY ELECTRIC, TELEPHONE WATER SERVICES, GAS AND SANITARY FACILITIES AS REQUIRED.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND DESIGNING AS NECESSARY ALL PERMANENT AND TEMPORARY UTILITY RELOCATIONS, UNDERGROUND AND OVERHEAD.

UTILITY NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION AND DESIGN AS NECESSARY OF ALL PERMANENT AND TEMPORARY UTILITY RELOCATIONS, INTERIOR, UNDER GROUND AND OVERHEAD.

2. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING APPROVAL FROM THE TOWN AND PERTINENT UTILITY COMPANIES PRIOR TO DISCONNECTING AND/OR RELOCATING ANY UTILITY.

3. THE UTILITIES ARE SHOWN AT APPROXIMATE LOCATIONS. CONTRACTOR TO FIELD VERIFY AND RECORD EXACT LOCATION OF ALL ABOVE AND BELOW GROUND UTILITIES WITHIN PROJECT LIMITS.

4. THE CONTRACTOR SHALL NOTIFY NORTH CAROLINA DIG SAFE 811 (800) 632-4949 AND THE TOWN AT A MINIMUM OF 72 HOURS PRIOR TO COMMENCING WORK.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROVIDING TEMPORARY ELECTRIC, WATER SERVICES, AND SANITARY FACILITIES AS REQUIRED. PORTABLE RESTROOMS SHALL BE PROVIDED IN THE VICINITY OF AND IN SUFFICIENT QUANTITY TO MATCH THE CAPACITY OF THE RESTROOM BEING TAKEN OUT OF SERVICE.

6. TOWN-OWNED FIRE HYDRANTS SHALL NOT BE REMOVED FROM SERVICE.

7. UTILITY SERVICES SHALL BE MAINTAINED TO ALL EXISTING CUSTOMERS DURING CONSTRUCTION UNLESS AUTORIZED IN WRITING BY THE UTILITY OWNER. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE MAXIMUM PROTECTION FOR ALL EXISTING UTILITIES.

8. ALL TRENCHING, PIPE LAYING, AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL OSHA REGULATIONS.

9. ALL CONNECTIONS TO EXISTING UTILITIES (I.E. WATER, GAS, SANITARY, DRAINAGE, ELECTRICAL, TELEPHONE, ETC) SHALL BE PERFORMED IN THE PRESENCE OF THE APPLICABLE UTILITY COMPANY AND ALL WORK SHALL BE IN ACCORDANCE WITH THE UTILITY COMPANY'S REGULATIONS.

10. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND FOR THE PROPOSED WORK INDICATED ON THE DRAWINGS.

11. THE PIPING LAYOUT INDICATED IS DIAGRAMMATIC ONLY AND DOES NOT NECESSARILY SHOW ALL THE REQUIRED FITTINGS FOR PROPER HORIZONTAL OR VERTICAL ALIGNMENT. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED FITTINGS TO OBTAIN PROPER ALIGNMENT BASED UPON FIELD CONDITIONS.

12. THE CONTRACTOR SHALL MAINTAIN A MINIMUM HORIZONTAL CLEARANCE BETWEEN NEW PIPING AND ALL OTHER EXISTING UTILITIES OF AT LEAST 12 INCHES AND COMPLY WITH OTHER PROVISIONS.

13. THE CONTRACTOR SHALL MAINTAIN A MINIMUM VERTICAL CLEARANCE OF 18 INCHES BETWEEN NEW FITTINGS AND ALL OTHER EXISTING UTILITIES.

14. ALL NEW PRESSURIZED PIPELINES, INCLUDING WATER MAINS, FIRE PROTECTION MAINS, AND WATER SERVICE LINES, WILL HAVE A MINIMUM DEPTH OF COVER EQUAL TO 3.0 FEET. ALL BENDS, TEES, AND END CAP JOINTS WILL BE MECHANICALLY RESTRAINED, INCLUDING ADJACENT PIPE SECTION JOINTS AS REQUIRED FOR THE TEST PRESSURE OF THE PIPELINE. THRUST BLOCKS WILL ALSO BE USED, EXCEPT WHERE DIRECTED OTHERWISE BY THE TOWN.

15. WATER MAINS, FIRE PROTECTION MAINS, WATER SERVICE LINES, AND SANITARY SEWER MAINS SHALL CONTINUOUSLY SLOPE TO THE INDICATED POINT AS SHOWN ON THE PROFILES.

16. ALL PIPING, UTILITIES AND STRUCTURES SHALL BE TESTED IN ACCORDANCE WITH THE APPLICABLE STANDARDS AND THE TOWN OF BLOWING ROCK.

17. THE WATER SYSTEM SUBCONTRACTOR SHALL HAVE A MINIMUM OF FIVE YEARS EXPERIENCE IN THE INSTALLATION OF 12-INCH WATER LINES IN PUBLIC WATER SUPPLY SYSTEMS. THE WATER SYSTEM SUBCONTRACTOR SHALL ALSO HAVE EXPERIENCE IN THE INSTALLATION OF 12-INCH AND LARGER GATE VALVES IN PUBLIC WATER SUPPLY SYSTEMS.

18. THE LENGTHS OF WATER AND SEWER PIPE SHOWN ARE APPROXIMATE. ACTUAL LENGTHS MAY VARY DURING CONSTRUCTION. INVERTS SHOULD BE DETERMINED BY THE ACTUAL LENGTH OF PIPE BETWEEN STRUCTURES, MANHOLES/CATCH BASINS AND THE REQUIRED SLOPE.

19. THE CONTRACTOR SHALL PROVIDE TEST PITS TO VERIFY THE LOCATIONS OF ANY UNDERGROUND UTILITIES WITHIN THE LIMITS OF WORK. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CONTRACTING OFFICER OF RECORD OF ANY CONFLICTS.

20. WHERE A NEW UTILITY LINE CROSSES AN EXISTING UTILITY, THE CONTRACTOR SHALL DETERMINE BY EXCAVATION OR TEST PITS THE EXACT LOCATION AND ELEVATION OF THE EXISTING UTILITY PRIOR TO EXCAVATION.

UTILITY NOTES (CONTINUED):

21. NO GUARANTEE TO THE LOCATION OF UNDERGROUND UTILITIES SHOWN HEREON IS IMPLIED. THE CONTRACTOR IS REQUIRED TO VERIFY THE EXISTING CONDITIONS OF THE SITE AND UTILITIES PRIOR TO THE START OF CONSTRUCTION. HORIZONTAL AND VERTICAL LOCATION OF EXISTING UNDERGROUND UTILITIES SHOWN ON THE DRAWINGS IS APPROXIMATE AND REQUIRES CONFIRMATION BY THE CONTRACTOR.

22. THE CONTRACTOR SHALL SET ALL MANHOLE COVERS, ACCESS HATCHES, GRATES, AND VALVE BOXES TO MATCH FINAL GRADE ELEVATIONS. TOP ELEVATIONS OF NEW STRUCTURES ARE TO BE FIELD VERIFIED BY THE CONTRACTOR WITH THE SITE PLANS. ALL TOP OF CASTINGS IN PAVEMENTS SHALL BE SET FLUSH WITH AND SHALL SLOPE WITH FINISH GRADE.

23. WATER AND SEWER SEPARATION

    A. WATER LINES CROSSING SEWERS SHALL BE LAID TO PROVIDE A SEPARATION OF AT LEAST 18 INCHES BETWEEN THE BOTTOM OF THE WATER LINE AND THE TOP OF THE SEWER. THE LENGTH OF THE SEWER LINE IS TO BE CENTERED AT THE POINT OF THE CROSSING SO THAT JOINTS SHALL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER.

    B. WHEN CONDITIONS PREVENT A VERTICAL SEPARATION OF AT LEAST 18 INCHES, THE FOLLOWING CONSTRUCTION SHALL BE USED:

        1) SEWERS PASSING OVER OR UNDER WATER LINES SHALL BE CONSTRUCTED OF AWWA APPROVED WATER PIPES, PRESSURE TESTED IN PLACE WITHOUT LEAKAGE PRIOR TO BACKFILLING.

        2) WATER LINES PASSING UNDER SEWERS SHALL, IN ADDITION, BE PROTECTED BY PROVIDING:

            a. A VERTICAL SEPARATION OF AT LEAST 18 INCHES BETWEEN THE BOTTOM OF THE SEWER AND THE CROWN OF THE WATER LINE.

            b. ADEQUATE STRUCTURAL SUPPORT FOR THE SEWERS TO PREVENT EXCESSIVE DEFLECTION OF THE JOINTS AND THE SETTLING ON AND BREAKING OF THE WATER LINE.

            c. THAT THE LENGTH OF THE WATER LINE BE CENTERED AT THE CROSSING SO THAT THE JOINTS SHALL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.

24. CONTRACTOR SHALL RECORD THE EXACT LOCATION OF ALL UTILITIES AND PROVIDE AS-BUILT DRAWINGS. CONTRACTOR SHALL PROVIDE HARD COPIES AND AN ELECTRONIC COPY IN CAD OF ALL AS-BUILT DRAWINGS.

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5525	UC-2

DESIGNED BY: TP/CL
DRAWN BY: CL
CHECKED BY: LR
APPROVED BY: DH
REVISED: NOVEMBER 2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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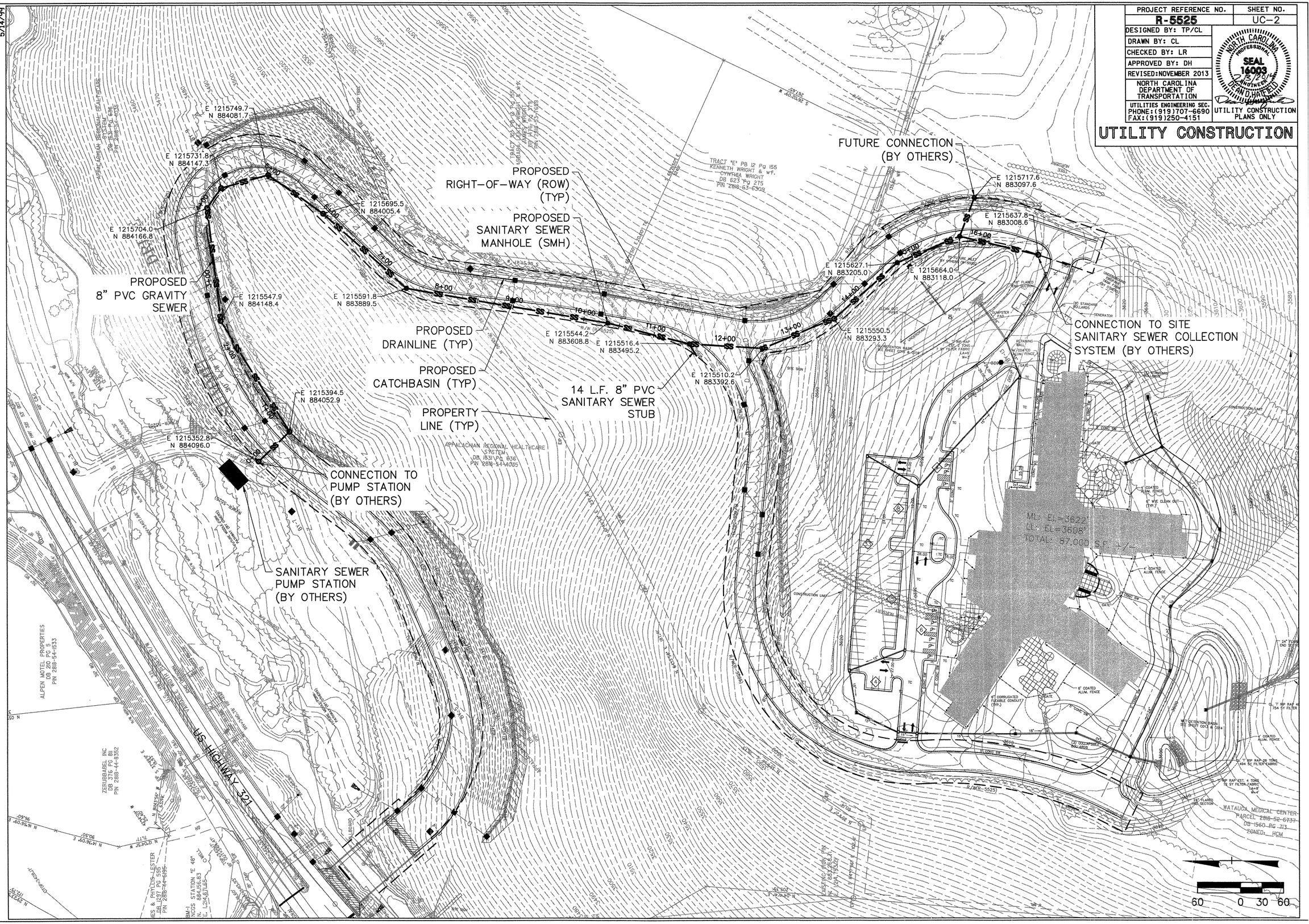
NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD 3/12/14

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

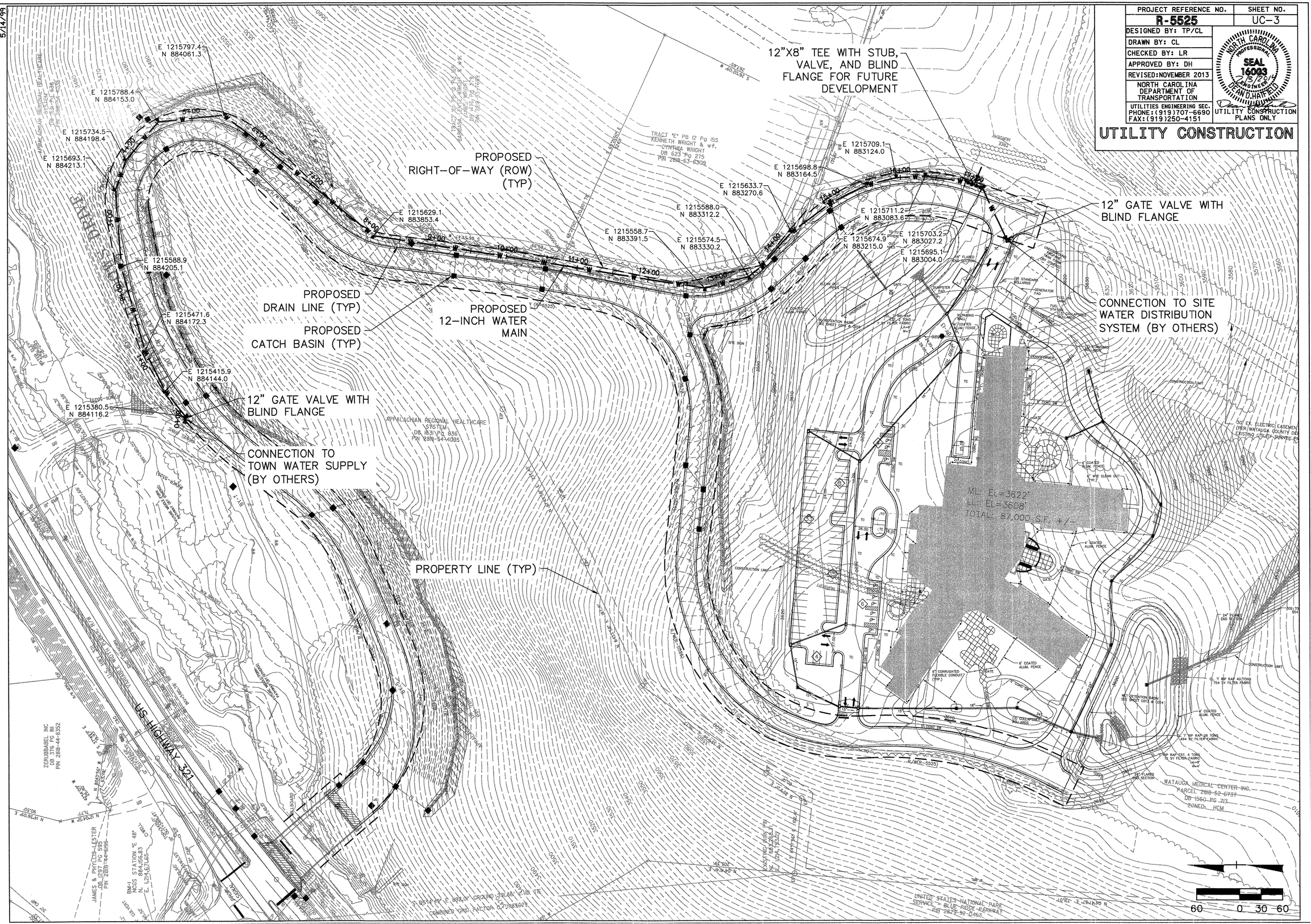


5/14/99

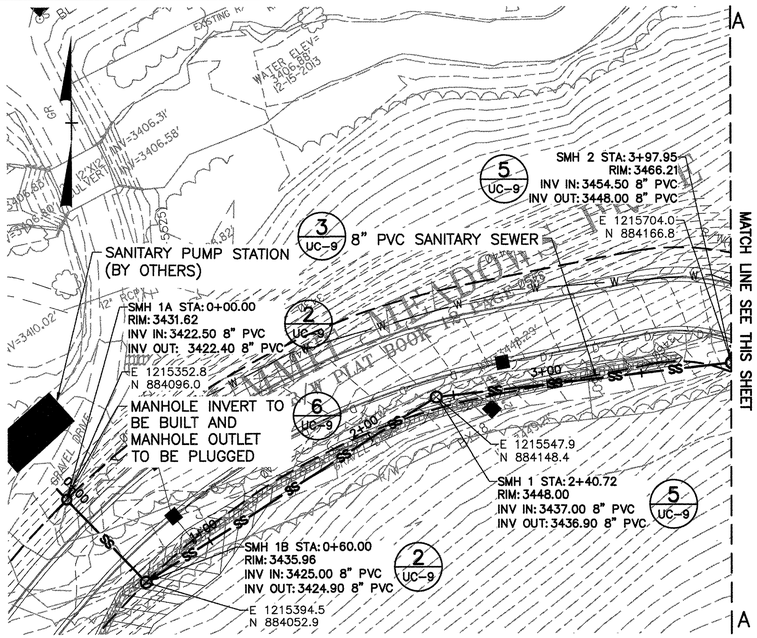
PROJECT REFERENCE NO.	SHEET NO.
R-5525	UC-3
DESIGNED BY: TP/CL	
DRAWN BY: CL	
CHECKED BY: LR	
APPROVED BY: DH	
REVISED: NOVEMBER 2013	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HATFIELD 3/12/14

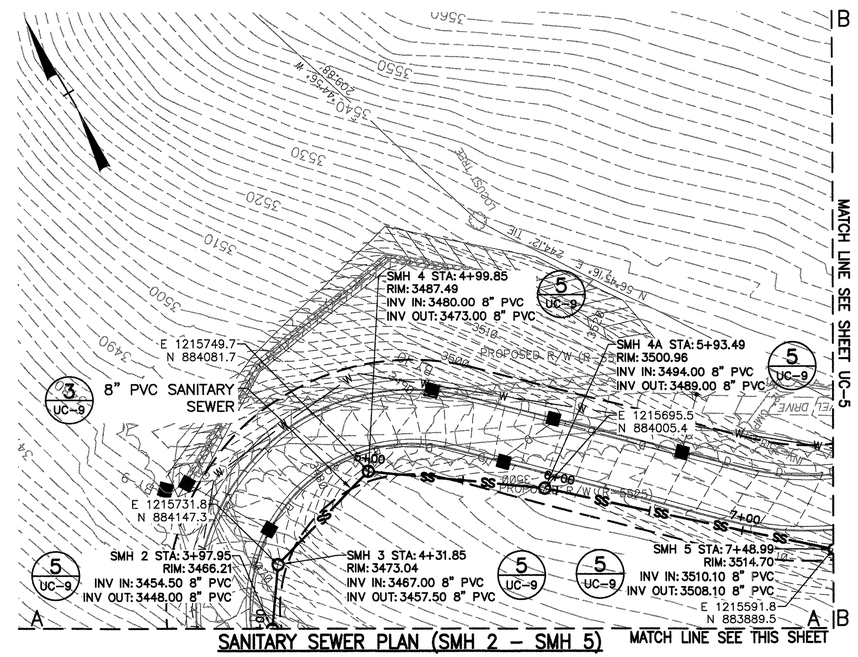
UTILITY CONSTRUCTION



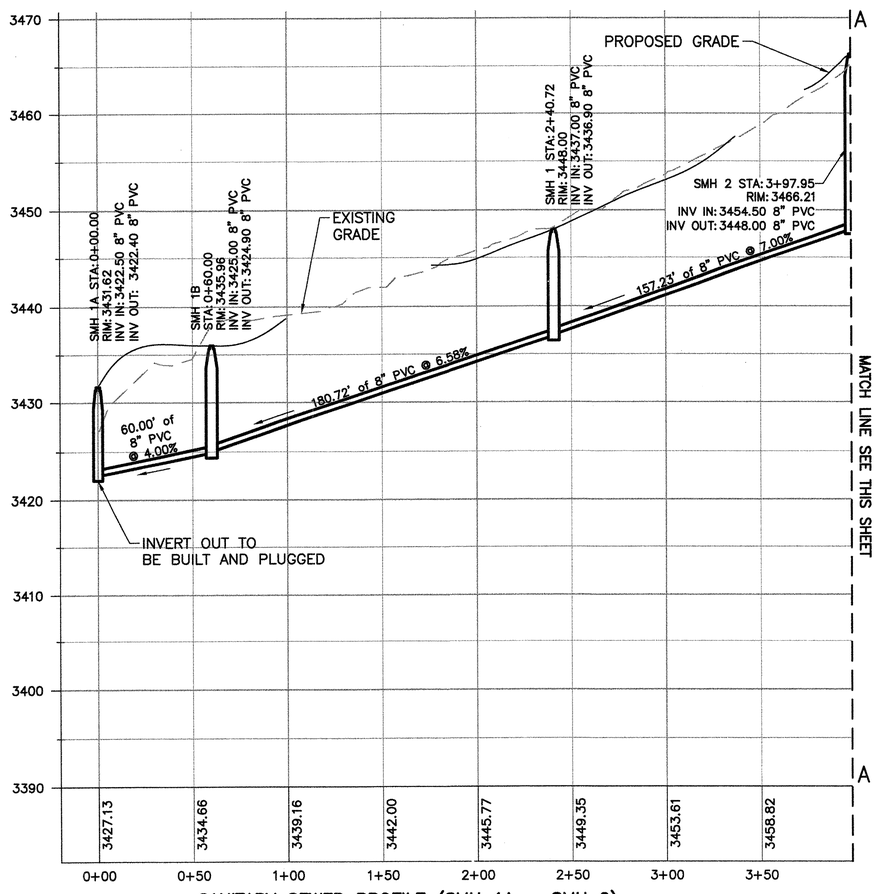
5/14/99



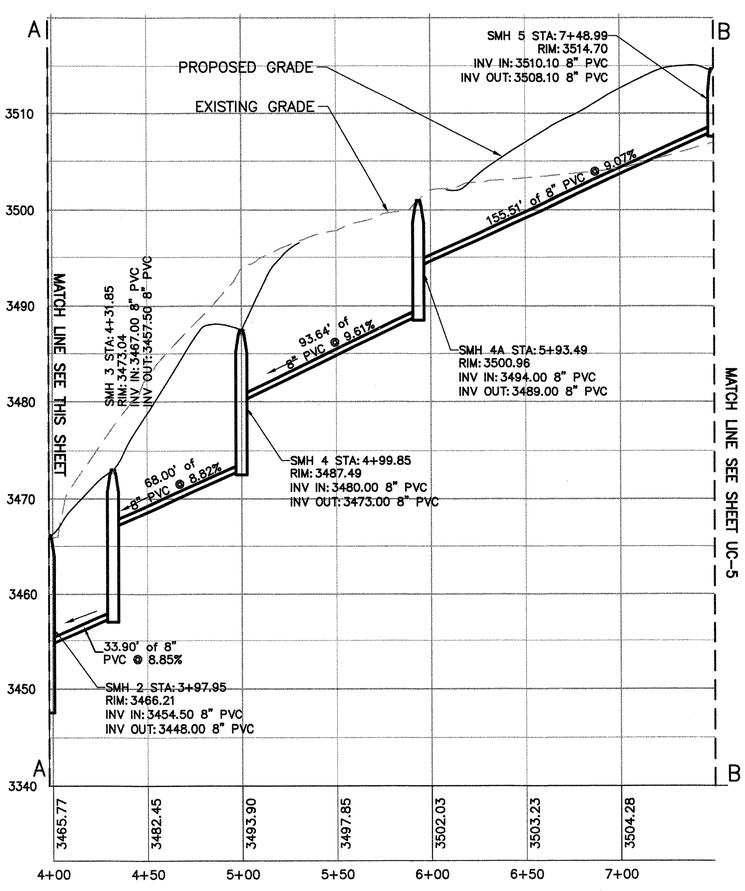
SANITARY SEWER PLAN (SMH 1A – SMH 2)



SANITARY SEWER PLAN (SMH 2 – SMH 5)



SANITARY SEWER PROFILE (SMH 1A – SMH 2)



SANITARY SEWER PROFILE (SMH 2 – SMH 5)

PROJECT REFERENCE NO.	SHEET NO.
R-5525	UC-4
DESIGNED BY: TP/CL	
DRAWN BY: CL	
CHECKED BY: LR	
APPROVED BY: DH	
REVISED: NOVEMBER 2013	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HAYFIELD

UTILITY CONSTRUCTION

40 0 40 80
HORIZONTAL SCALE OF FEET

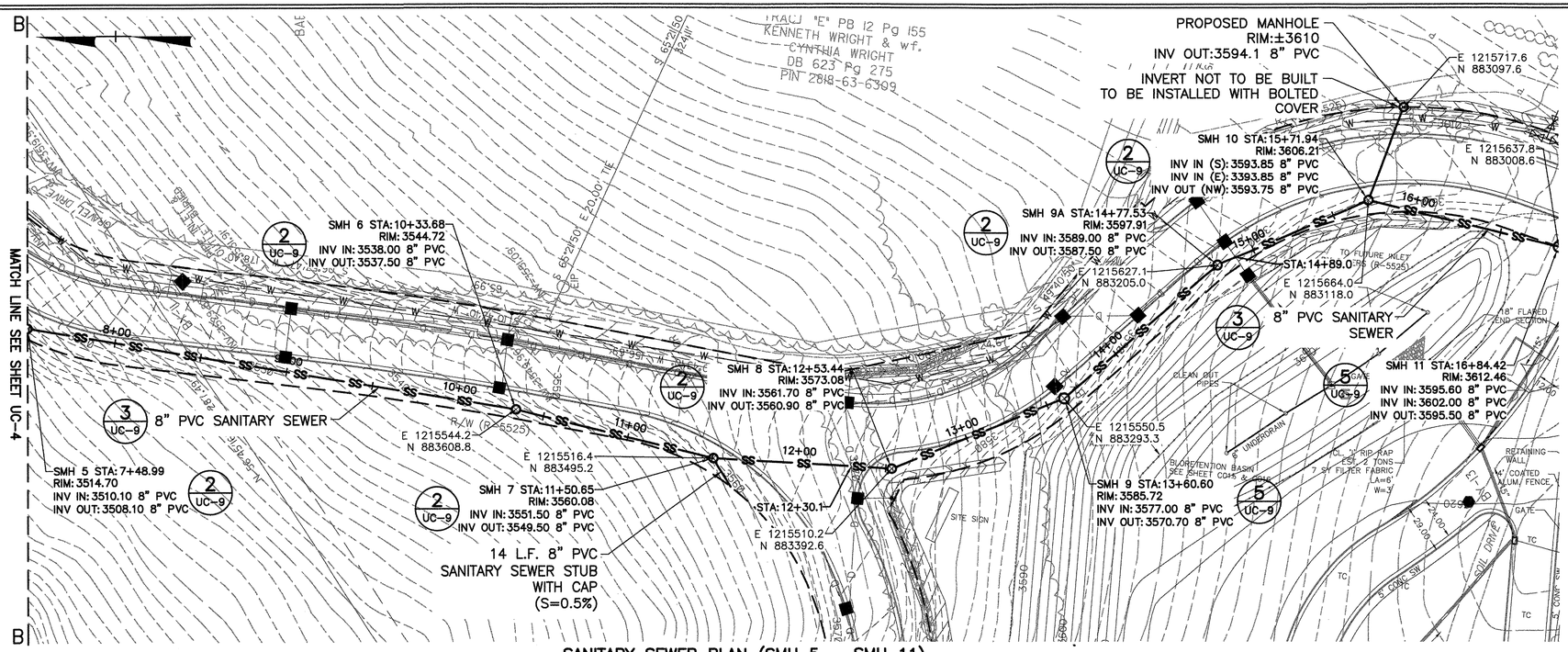
8 0 8 16
VERTICAL SCALE OF FEET

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5525	UC-5
DESIGNED BY: TP/CL	
DRAWN BY: CL	
CHECKED BY: LR	
APPROVED BY: DH	
REVISED: NOVEMBER 2013	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HALLELL

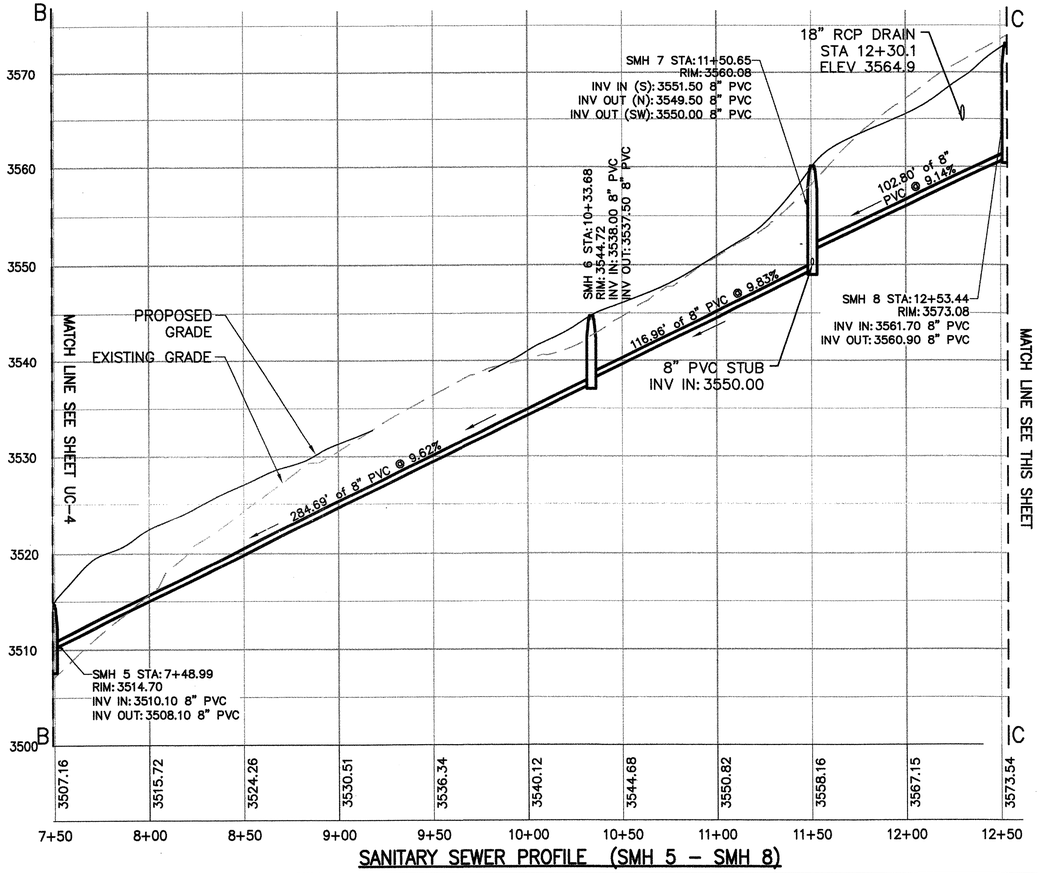
UTILITY CONSTRUCTION



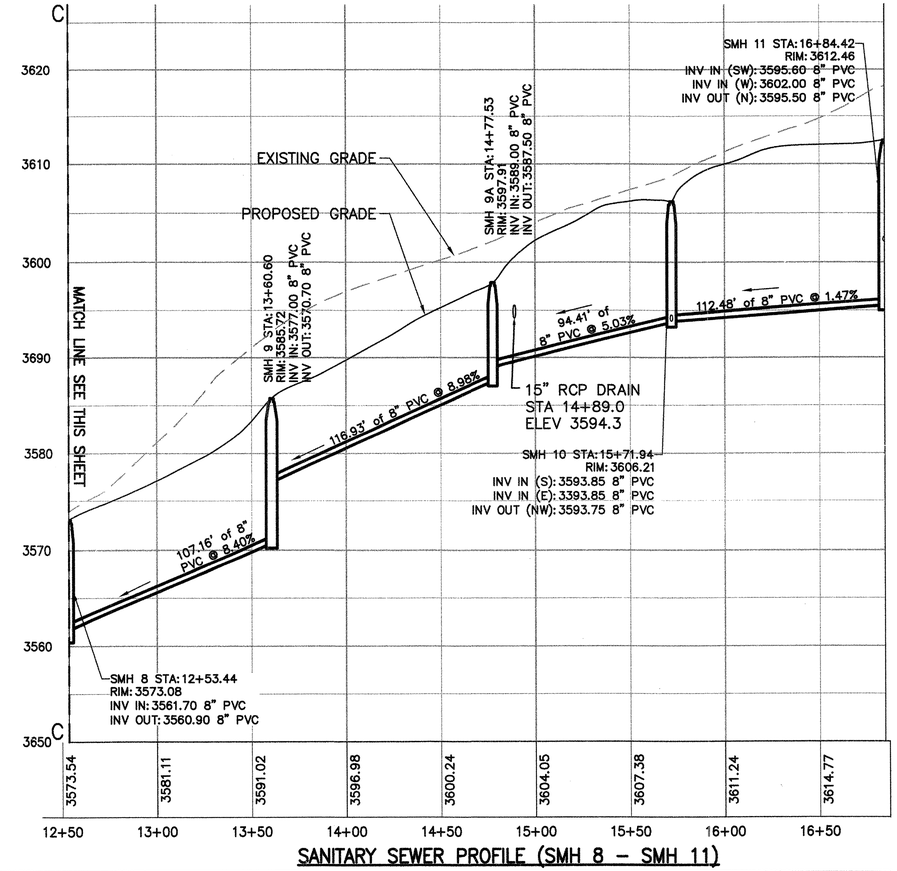
SANITARY SEWER PLAN (SMH 5 – SMH 11)

40 0 40 80
HORIZONTAL SCALE OF FEET

8 0 8 16
VERTICAL SCALE OF FEET

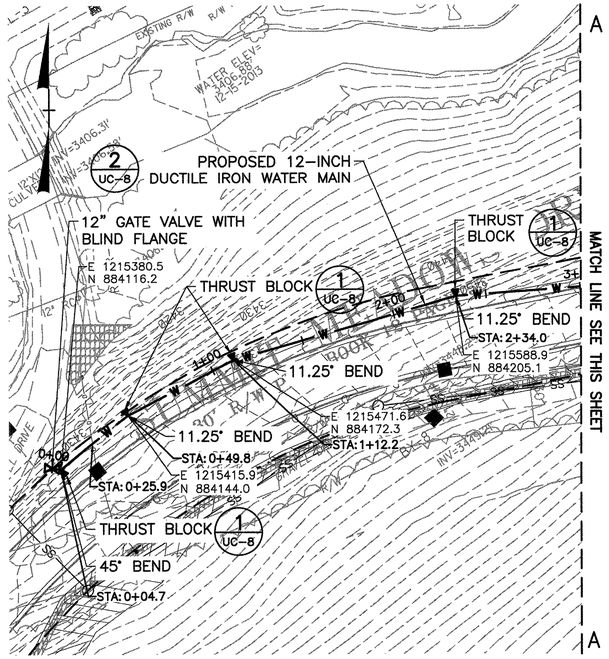


SANITARY SEWER PROFILE (SMH 5 – SMH 8)

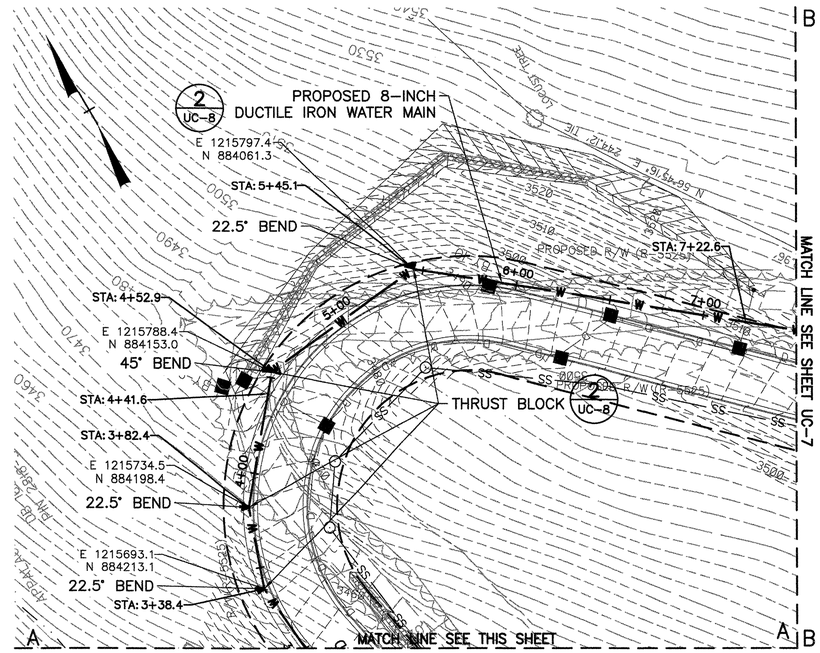


SANITARY SEWER PROFILE (SMH 8 – SMH 11)

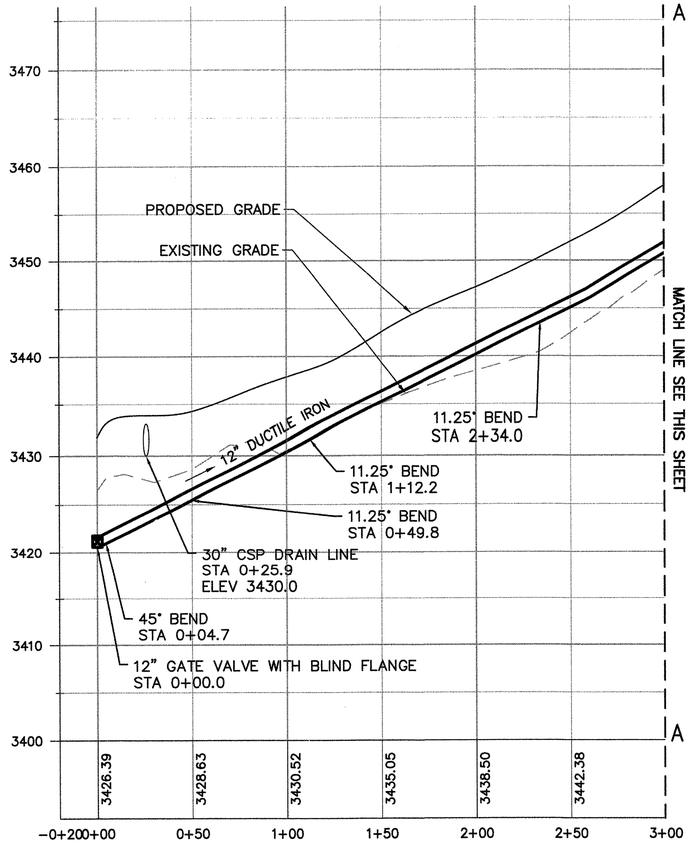
5/14/99



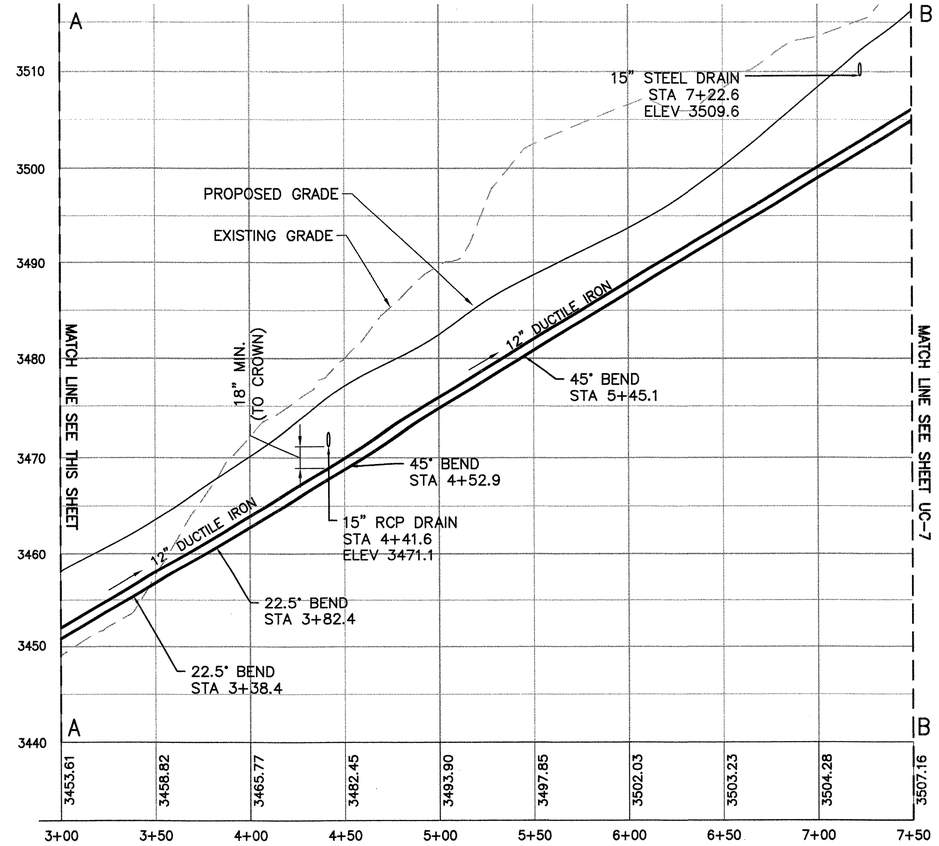
12-INCH WATER MAIN PLAN (STA 0+00 – STA 3+00)



12-INCH WATER MAIN PLAN (STA 3+00 – STA 7+50)



12-INCH WATER MAIN PROFILE (STA 0+00 – STA 3+00)



12-INCH WATER MAIN PROFILE (STA 3+00 – 7+50)

PROJECT REFERENCE NO.	SHEET NO.
R-5525	UC-6
DESIGNED BY: TP/CL	
DRAWN BY: CL	
CHECKED BY: LR	
APPROVED BY: DH	
REVISED: NOVEMBER 2013	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN D. HALFORD 3/12/14

UTILITY CONSTRUCTION

40 0 40 80
HORIZONTAL SCALE OF FEET

8 0 8 16
VERTICAL SCALE OF FEET

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5525	UC-7

DESIGNED BY: TP/CL
DRAWN BY: CL
CHECKED BY: LR
APPROVED BY: DH
REVISED: NOVEMBER 2013

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
PHONE: (919)707-6690
FAX: (919)250-4151

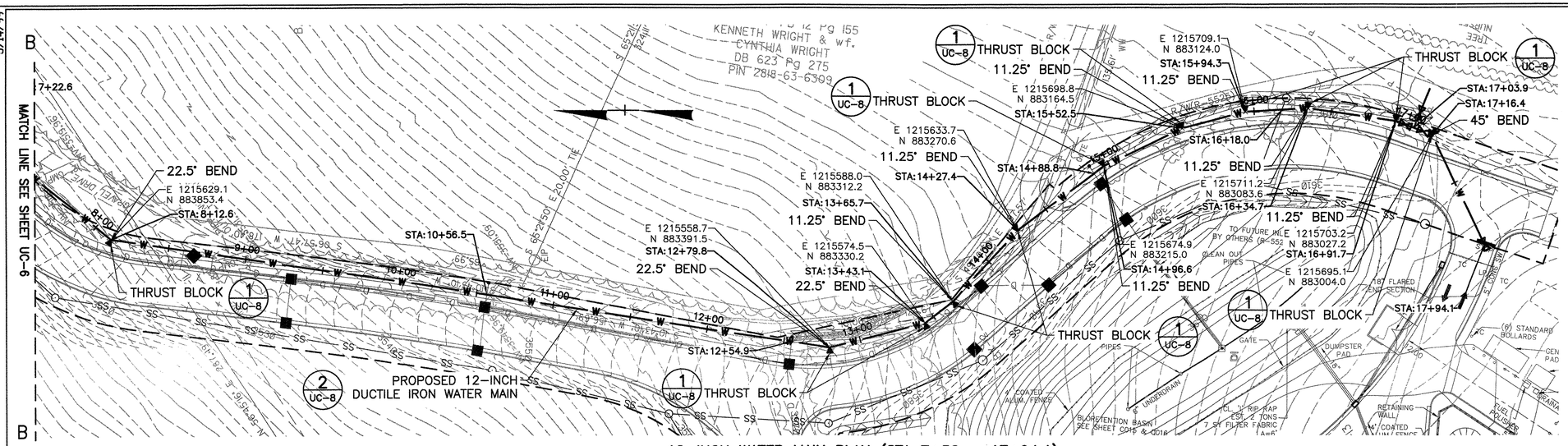
NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DEAN O. HATFIELD 3/20/14

UTILITY CONSTRUCTION PLANS ONLY

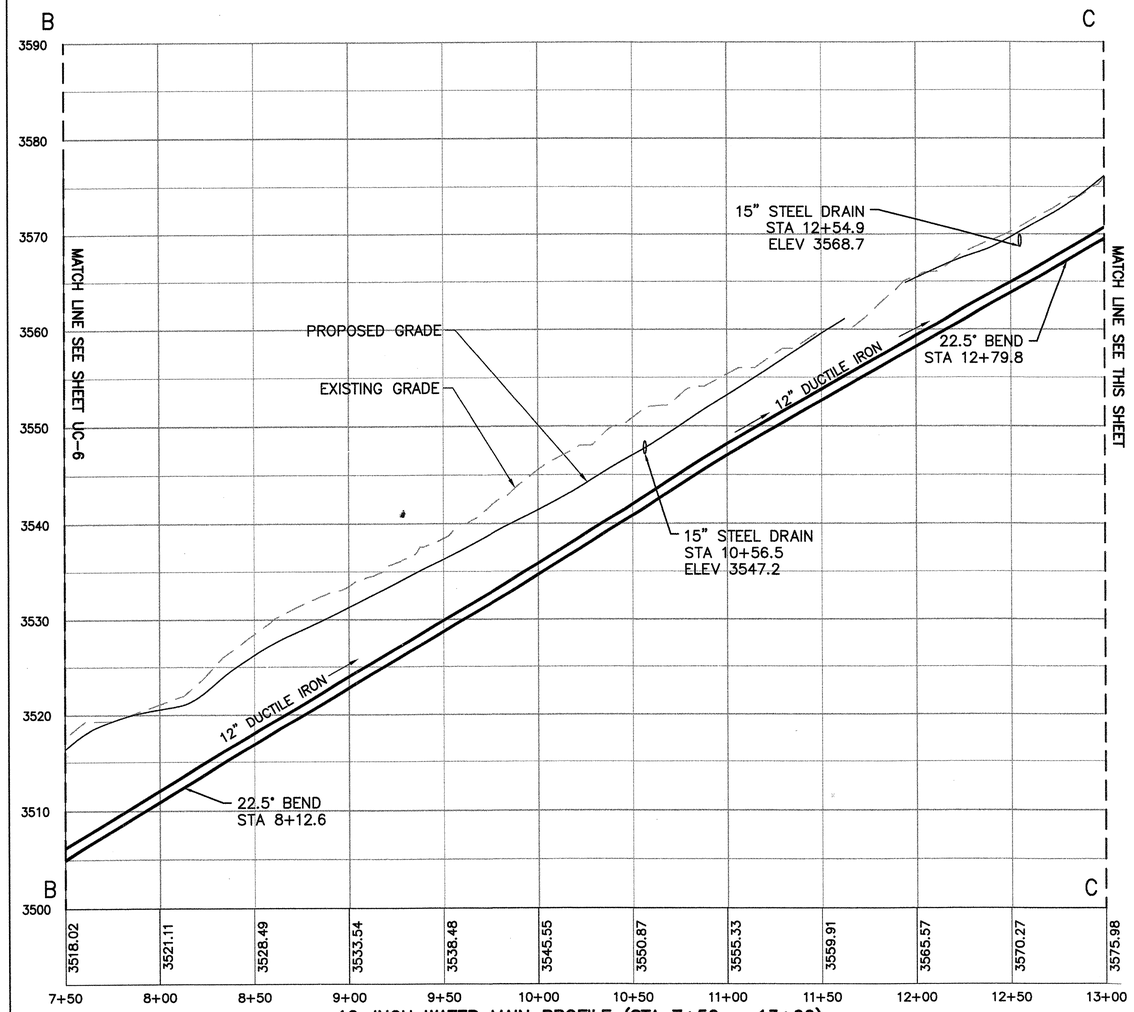
UTILITY CONSTRUCTION

40 0 40 80
HORIZONTAL SCALE OF FEET

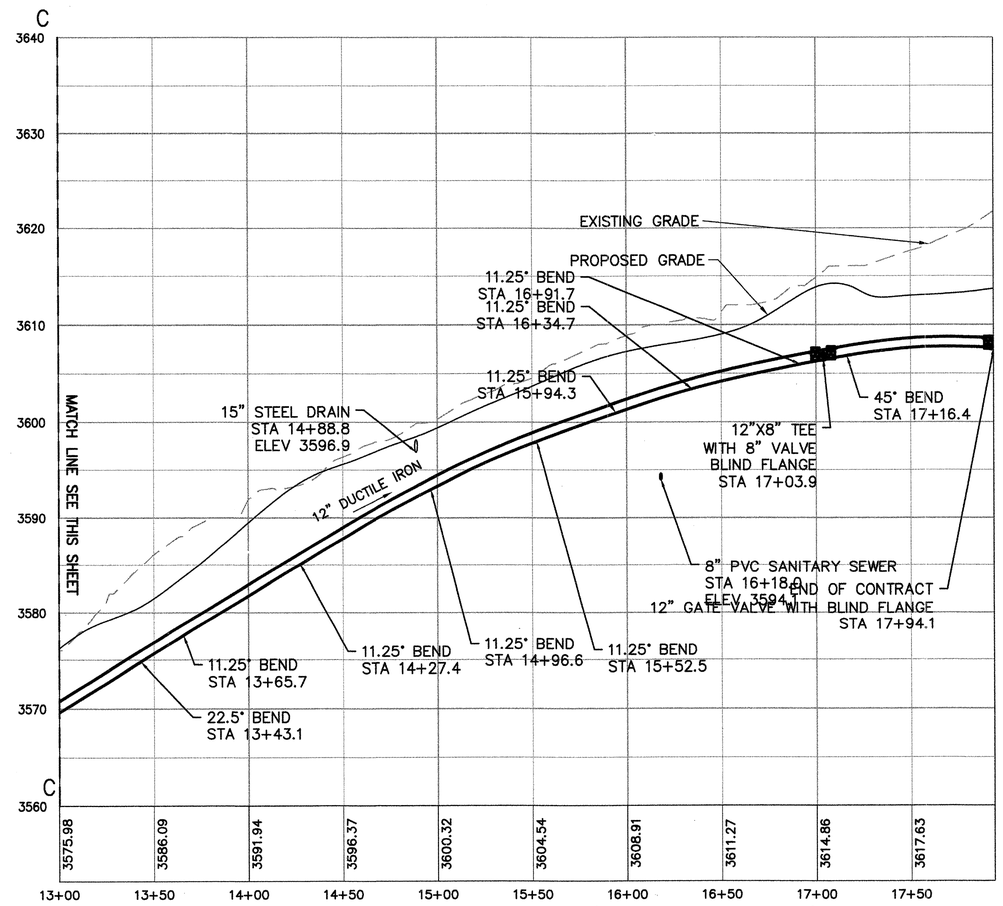
8 0 8 16
VERTICAL SCALE OF FEET



12-INCH WATER MAIN PLAN (STA 7+50 – 17+94.1)



12-INCH WATER MAIN PROFILE (STA 7+50 – 13+00)



12-INCH WATER MAIN PROFILE (STA 13+00 – 17+94.1)

5/14/99

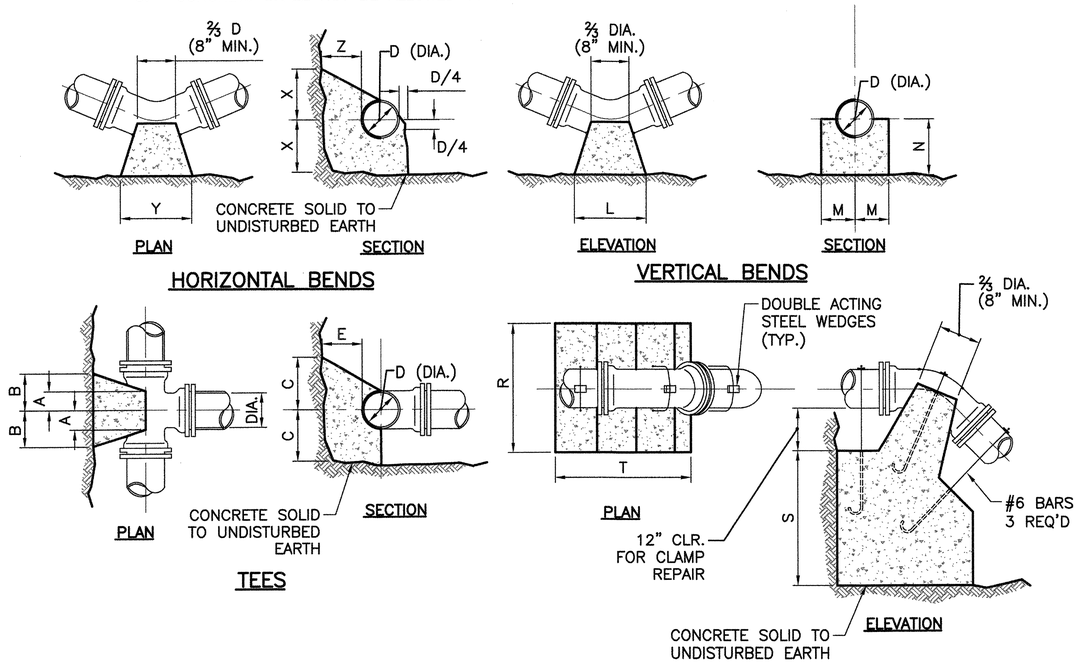
PROJECT REFERENCE NO.	SHEET NO.
R-5525	UC-8
DESIGNED BY: TP/CL	
DRAWN BY: CL	
CHECKED BY: LR	
APPROVED BY: DH	
REVISED: NOVEMBER 2013	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER DAN J. HALTED 12/20/14

UTILITY CONSTRUCTION

NOTES

1. CONCRETE THRUST BLOCKS SHALL BEAR AGAINST UNDISTURBED EARTH. IN AREAS WHERE BEARING SOILS HAVE BEEN DISTURBED, RESTRAINED JOINTS SHALL BE USED.
2. ALL FORCE MAIN BENDS, TEES, MAIN TAPS, AND END CAPS SHALL REQUIRE A CONCRETE THRUST BLOCK.
3. WHERE UNDISTURBED EARTH BACKING IS NOT AVAILABLE THRUST RESTRAINT RODS SHALL BE USED WITH BLOCK.
4. CONCRETE TO HAVE MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
5. CONCRETE SHALL NOT BE ALLOWED TO RUN.

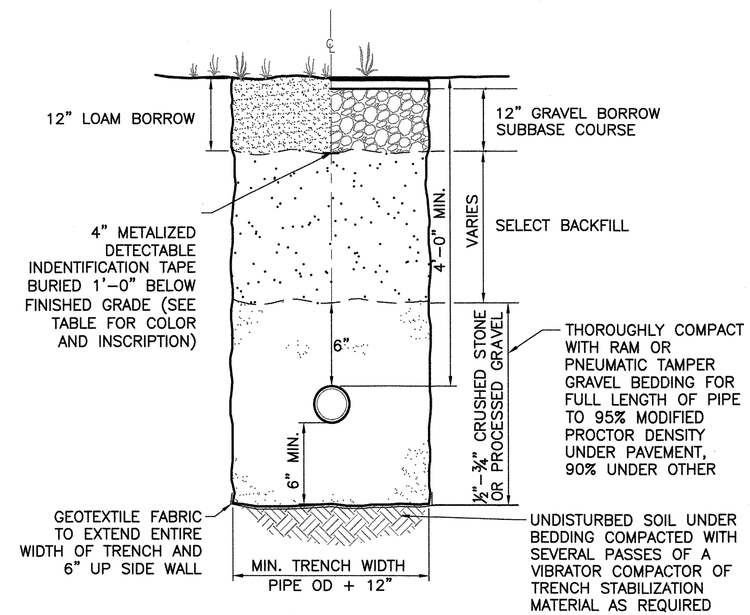


1 UC-8 TYPICAL THRUST BLOCK

NOT TO SCALE

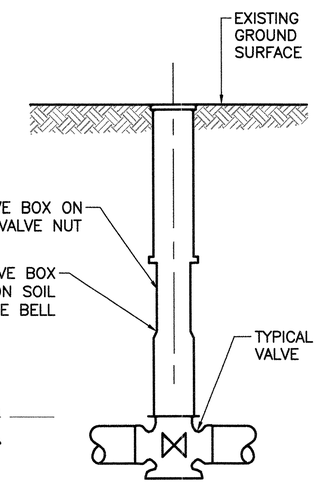
DETECTABLE IDENTIFICATION TAPE TABLE

	TAPE COLOR	INSCRIPTION
SANITARY SEWER	GREEN	'CAUTION SEWER LINE BURIED BELOW'
POTABLE WATER	BLUE	'CAUTION WATER LINE BURIED BELOW'



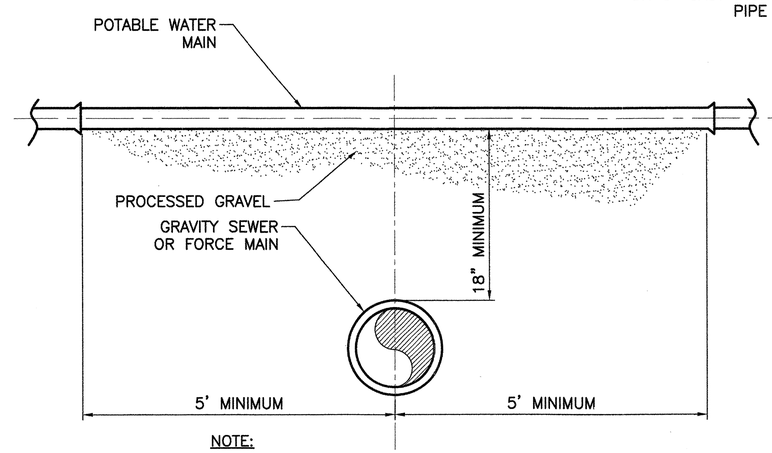
2 UC-8 WATER PIPE TRENCH DETAIL

NOT TO SCALE



3 UC-8 VALVE BOX DETAIL

NOT TO SCALE



NOTE:

WATER MAIN AND SEWER MINIMUM SEPARATION:
18" VERTICAL SEPARATION, 10'-0" HORIZONTAL SEPARATION

4 UC-8 TYPICAL UTILITY PIPE CROSSING

NOT TO SCALE

TEES

	PIPE SIZE-D (DIA.)						
	2"	4"	6"	8"	12"	16"	20"
A	2"	4"	8"	10"	1'-0"	1'-3"	1'-6"
B	4"	6"	8"	10"	1'-2"	1'-4"	1'-6"
C	6"	8"	10"	1'-0"	1'-3"	1'-6"	1'-8"
E	4"	6"	8"	10"	1'-2"	1'-6"	1'-10"

ANCHORAGES PIPE

BEND		PIPE SIZE-D (DIA.)						
		2"	4"	6"	8"	12"	16"	20"
1/8	R	1'-8"	2'-2"	2'-6"	3'-0"	4'-6"	5'-4"	6'-0"
	S	2'-6"	2'-3"	2'-6"	2'-9"	3'-6"	2'-6"	5'-6"
	T	1'-0"	2'-0"	3'-0"	4'-0"	4'-9"	7'-0"	9'-6"
1/16	R	1'-4"	1'-4"	2'-0"	2'-8"	4'-0"	4'-6"	5'-0"
	S	1'-3"	1'-3"	1'-9"	2'-3"	2'-6"	3'-2"	3'-8"
	T	1'-0"	1'-8"	2'-6"	3'-4"	4'-0"	6'-0"	8'-6"
1/32	R	1'-0"	1'-2"	1'-6"	2'-0"	3'-0"	3'-8"	4'-3"
	S	1'-0"	1'-0"	1'-3"	1'-9"	2'-0"	2'-4"	2'-6"
	T	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	4'-6"	5'-9"

HORTIZONTAL BENDS

BEND		PIPE SIZE-D (DIA.)						
		2"	4"	6"	8"	12"	16"	20"
1/4	X	4.5"	9"	1'-0"	1'-4"	1'-11"	2'-8"	3'-4"
	Y	9"	18"	2'-0"	2'-8"	3'-10"	5'-6"	6'-8"
	Z	8"	8"	1'-0"	1'-4"	2'-1"	2'-1"	2'-1"
1/8	X	8"	8"	1'-0"	1'-0"	1'-0"	1'-3"	1'-6"
	Y	8"	10"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"
	Z	4"	6"	8"	10"	1'-2"	1'-4"	1'-6"
1/16	X	8"	8"	1'-0"	1'-0"	1'-0"	1'-3"	1'-6"
	Y	8"	10"	1'-0"	1'-4"	1'-6"	1'-9"	2'-6"
	Z	4"	6"	8"	10"	1'-2"	1'-4"	1'-6"
1/32	X	8"	8"	1'-0"	1'-0"	1'-0"	1'-2"	1'-4"
	Y	8"	10"	1'-0"	1'-0"	1'-2"	1'-4"	1'-6"
	Z	4"	6"	8"	10"	1'-2"	1'-4"	1'-6"

VERTICAL BENDS

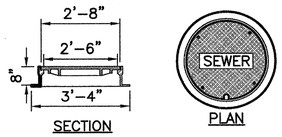
BEND		PIPE SIZE-D (DIA.)						
		2"	4"	6"	8"	12"	16"	20"
1/4	X	2'-9"	2'-9"	2'-9"	3'-0"	3'-4"	4'-7"	6'-1"
	Y	7"	7"	7"	1'-2"	1'-10"	2'-8"	3'-0"
	Z	1'-0"	1'-0"	1'-0"	1'-2"	1'-5"	2'-4"	2'-6"
1/8	L	8"	1'-0"	1'-3"	1'-8"	2'-6"	3'-6"	4'-8"
	M	4"	6"	7"	8"	11"	1'-4"	1'-6"
	N	7"	7"	7"	8"	11"	1'-4"	1'-6"
1/16	L	8"	8"	9"	1'-0"	1'-9"	2'-6"	3'-0"
	M	4"	6"	7"	7"	10"	1'-0"	1'-2"
	N	7"	7"	7"	7"	8"	10"	1'-0"
1/32	L	8"	8"	8"	8"	1'-0"	1'-4"	1'-9"
	M	4"	6"	7"	7"	10"	1'-0"	1'-2"
	N	7"	7"	7"	7"	8"	10"	1'-0"

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-5525	UC-9
DESIGNED BY: TP/CL	
DRAWN BY: CL	
CHECKED BY: LR	
APPROVED BY: DH	
REVISED: NOVEMBER 2013	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

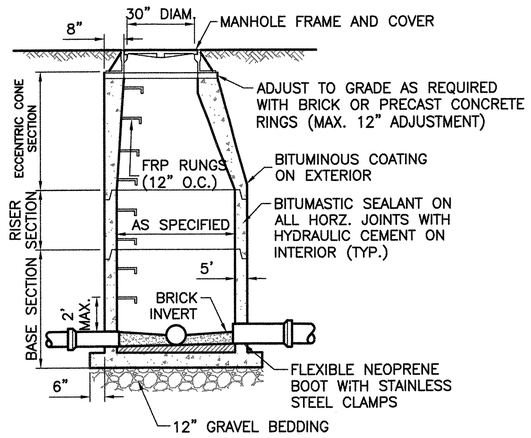
NORTH CAROLINA PROFESSIONAL SEAL 16003 ENGINEER D. HAYNE HILL 12/20/13

UTILITY CONSTRUCTION



1 UC-9 SEWER MANHOLE COVER DETAIL

NOT TO SCALE

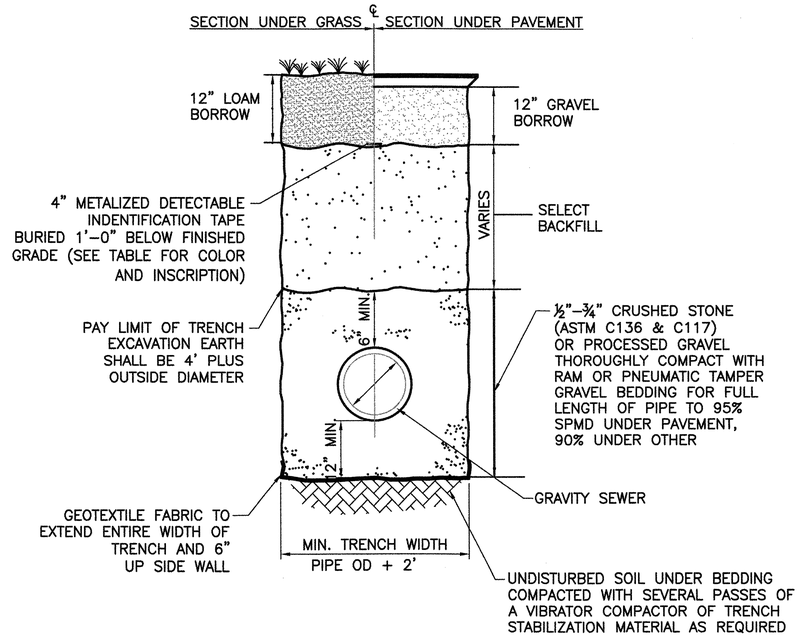


2 UC-9 MANHOLE DETAIL

NOT TO SCALE

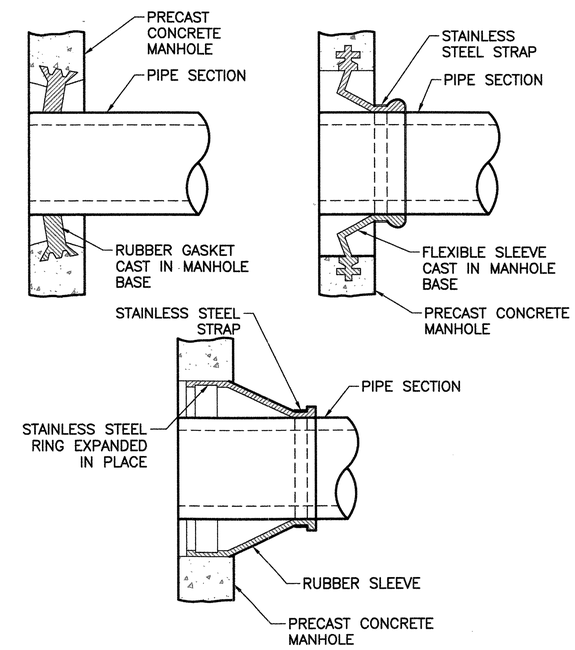
DETECTABLE IDENTIFICATION TAPE TABLE

	TAPE COLOR	INSCRIPTION
SANITARY SEWER	GREEN	'CAUTION SEWER LINE BURIED BELOW'
POTABLE WATER	BLUE	'CAUTION WATER LINE BURIED BELOW'



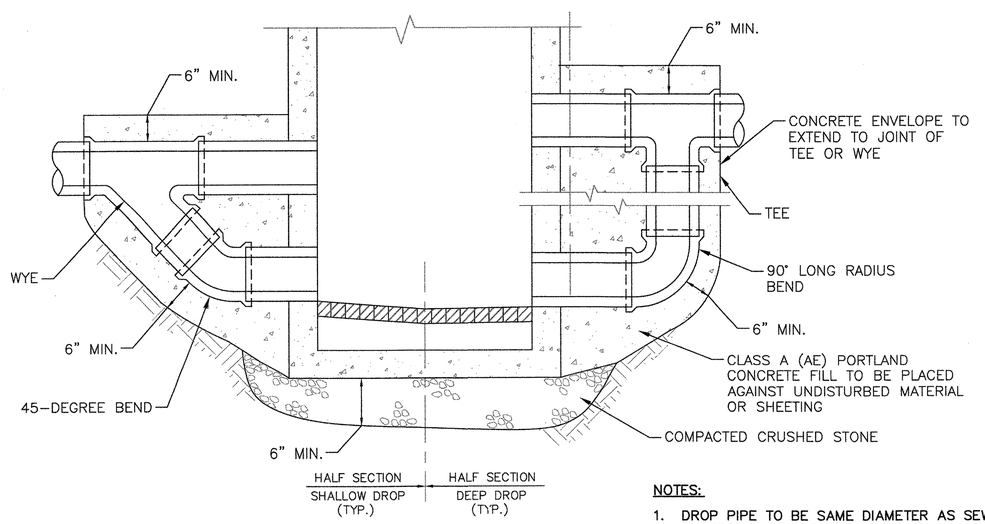
3 UC-9 GRAVITY SEWER TRENCH DETAIL

NOT TO SCALE



4 UC-9 MANHOLE SEAL DETAILS

NOT TO SCALE

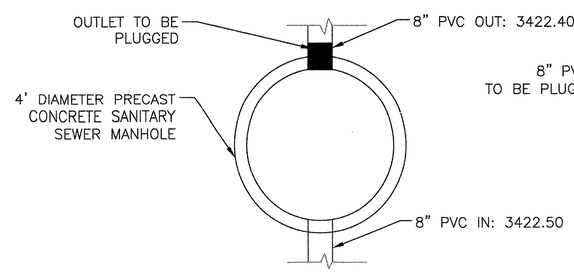


5 UC-9 SANITARY SEWER DROP MANHOLE

NOT TO SCALE

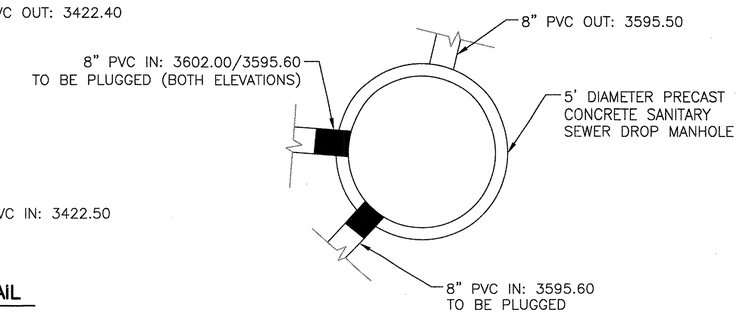
NOTES:

1. DROP PIPE TO BE SAME DIAMETER AS SEWER DISCHARGE INTO MANHOLE UNLESS OTHERWISE SHOWN ON DRAWINGS.
2. DIMENSIONS AND CONSTRUCTION OF DROP MANHOLE TO BE SIMILAR TO TYPICAL MANHOLE EXCEPT AS SHOWN.



6 UC-9 SMH 1A CLOCK DETAIL

NOT TO SCALE



7 UC-9 SMH 11 CLOCK DETAIL

NOT TO SCALE

09/08/99

TIP PROJECT: R-5525

CONTRACT:

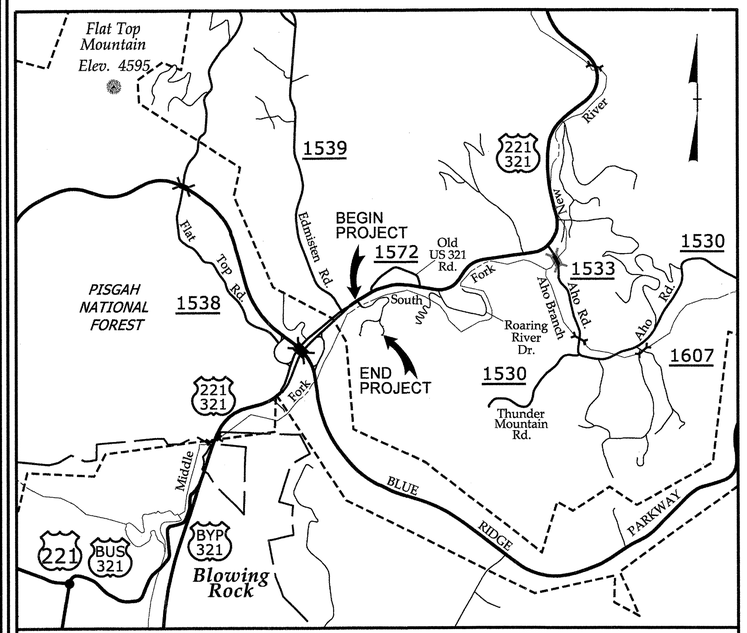
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
R-5525	UO-1

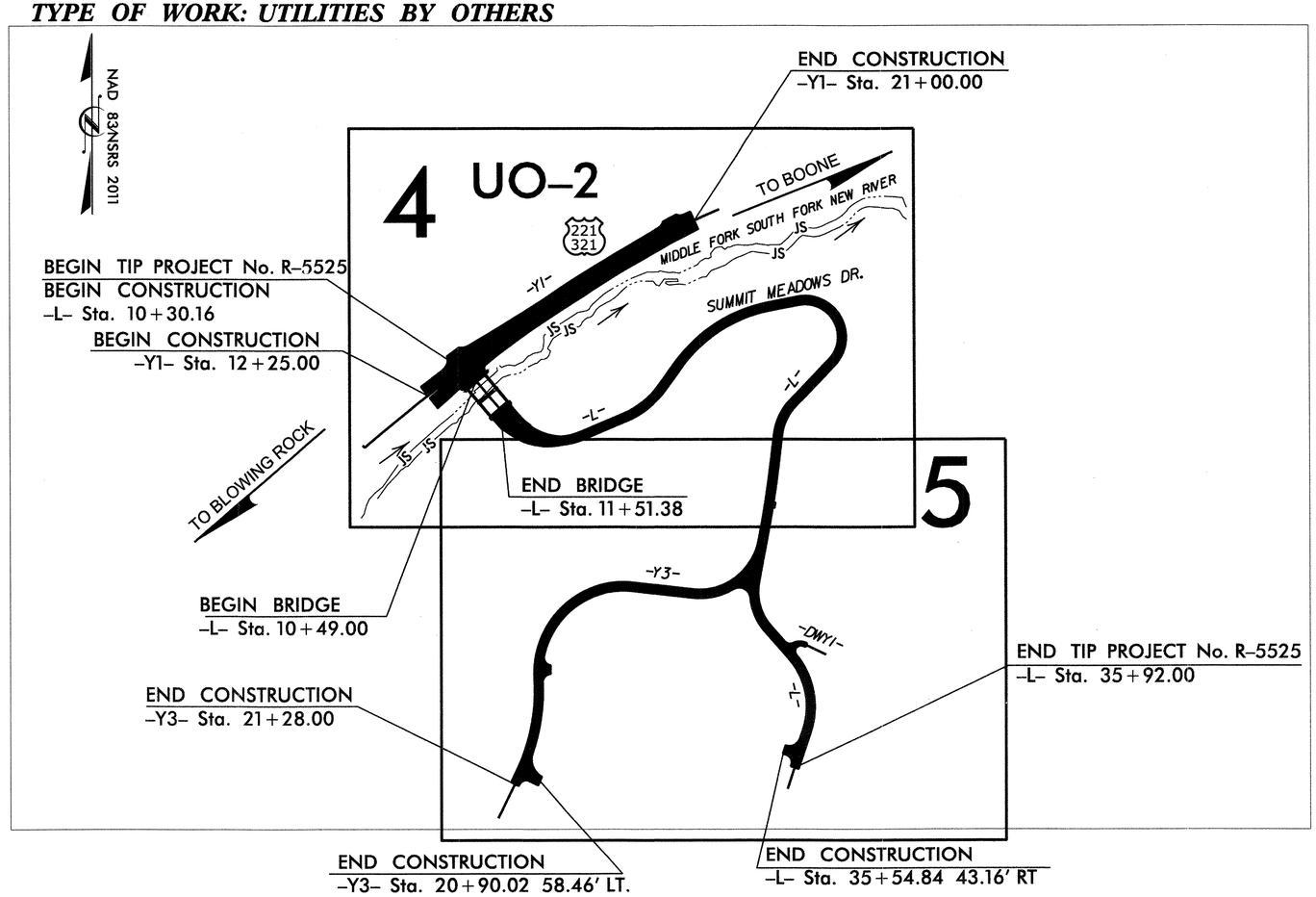
UTILITIES BY OTHERS PLANS
WATAUGA COUNTY

LOCATION: CONSTRUCTION ACCESS ROAD TO BLOWING ROCK POST-ACUTE CARE FACILITY

TYPE OF WORK: UTILITIES BY OTHERS



VICINITY MAP NTS



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2	UTILITIES BY OTHERS PLAN SHEET

UTILITY OWNERS ON PROJECT

(1) POWER - BLUE RIDGE EMC

(2) TELEPHONE & FIBER OPTICS - AT&T (TELICS)

(3) CABLE TV - CHARTER COMMUNICATIONS

(4) WATER - TOWN OF BLOWING ROCK

UTILITIES BY OTHER PLANS PREPARED BY:
DAVIS • MARTIN • POWELL
ENGINEERS & SURVEYORS
6415 OLD PLANK RD, HIGH POINT, NC 27265
PHONE: (336)886-4821 FAX: (336)886-4458
WWW.DMP-INC.COM LICENSE: F-0245

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

$$$$SYSTIME$$$$ $$$$DGN$$$$ $$$$USERNAME$$$$

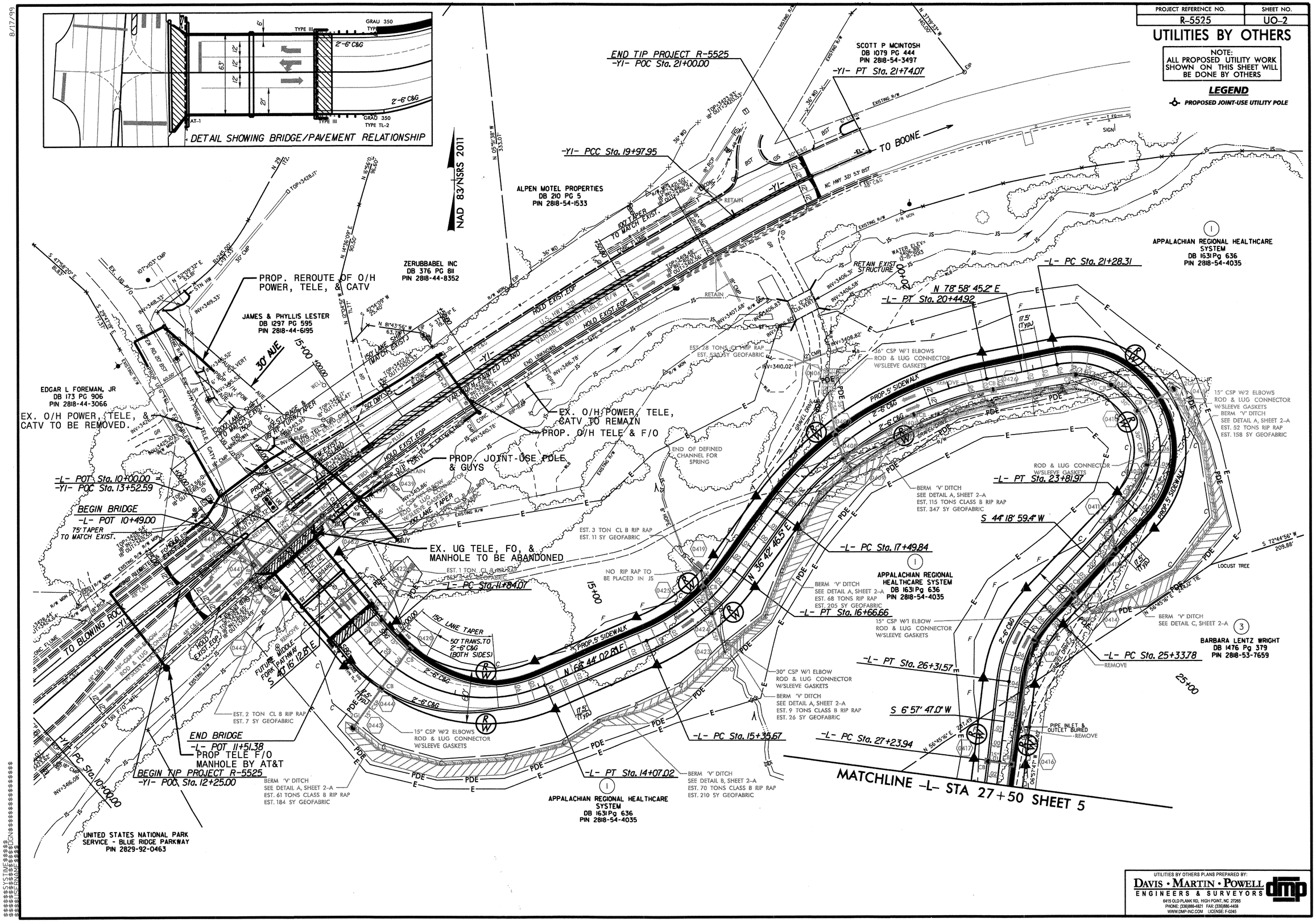
PROJECT REFERENCE NO.	SHEET NO.
R-5525	UO-2

UTILITIES BY OTHERS

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

LEGEND

PROPOSED JOINT-USE UTILITY POLE



UTILITIES BY OTHERS PLANS PREPARED BY:
DAVIS • MARTIN • POWELL
ENGINEERS & SURVEYORS
6415 OLD PLANK RD, HIGH POINT, NC 27265
PHONE: (336)886-4821 FAX: (336)886-4458
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8/17/99