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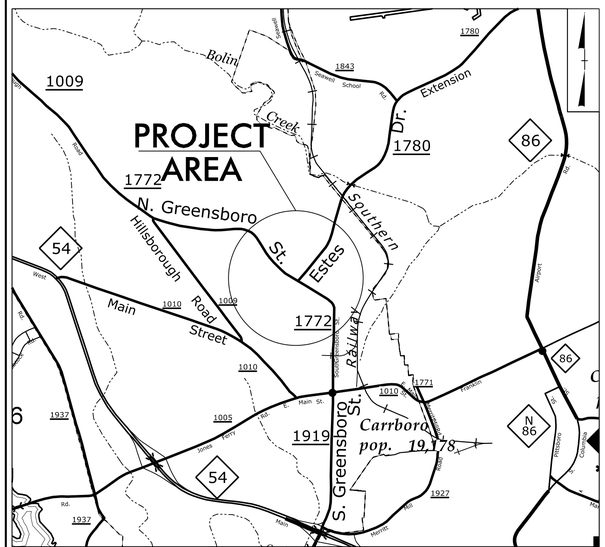
09/08/99

TIP PROJECT: U-5846

CONTRACT: DG00458

See Sheet 1-A For Index of Sheets
See Sheet 1B For Conventional symbols
See Sheet 1C For Survey Control Sheet



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ORANGE COUNTY

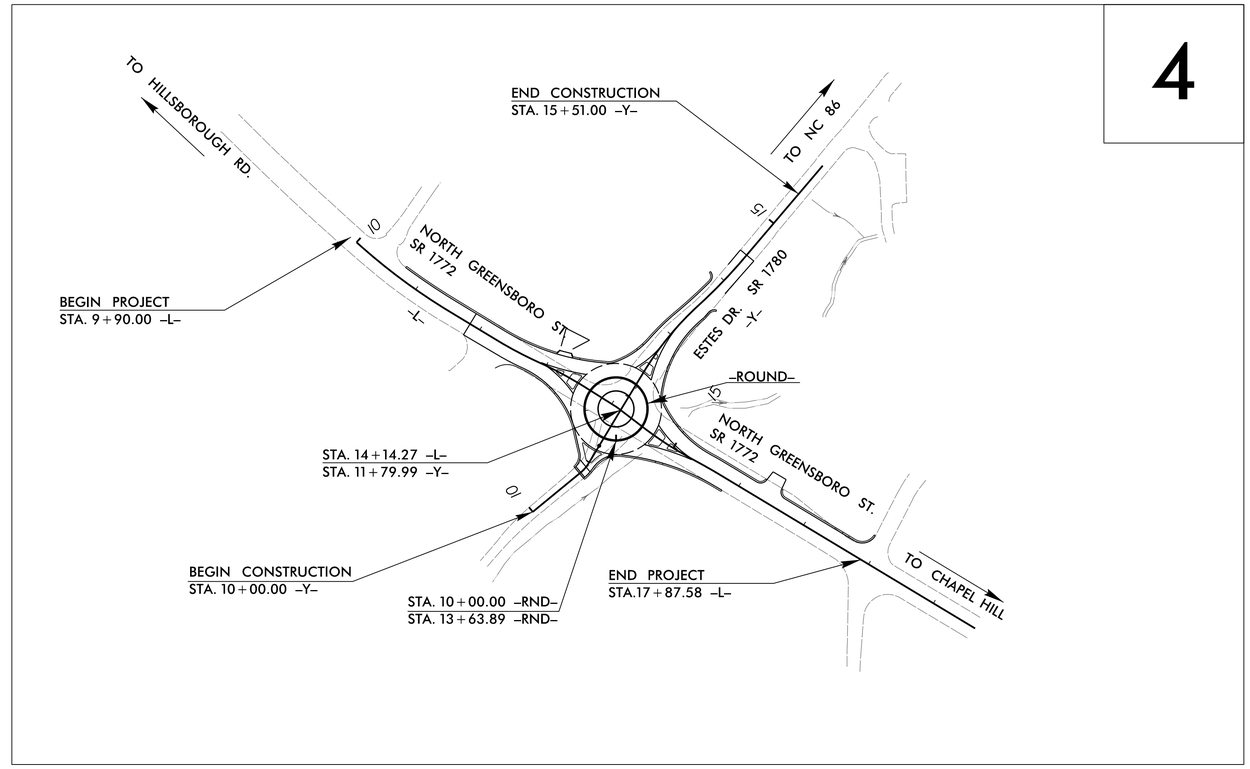
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5846	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
50236.1.1		PE
50236.2.1		R/W
50236.3.1		CONST.

LOCATION: SR 1772 (GREENSBORO STREET) AT SR 1780 (ESTES DRIVE) IN CARRBORO. CONSTRUCT ROUNDABOUT.

TYPE OF WORK: GRADING, DRAINAGE, AND PAVING

4



NAD 83/2011

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GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

20 10 0 20 40
PROFILE (VERTICAL)

DESIGN DATA

ADT 2015 = 11,700
ADT 2040 = 15,300
K = 60 %
D = 10 %
T = 5 % *
V = 40 MPH
* TTST =1 DUAL 4
FUNC CLASS =
MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5846 = 0.151 Miles
TOTAL LENGTH TIP PROJECT U-5846 = 0.151 Miles

Prepared In the Office of:
SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JUNE 30, 2017

LETTING DATE:
SEPTEMBER 6, 2018

BEN CRAWFORD, PE
PROJECT ENGINEER

MATTHEW COPPLE, PE
PROJECT DESIGN ENGINEER

CHRIS SMITHERMAN, PE
NCDOT CONTACT

HYDRAULICS ENGINEER
8/14/2018
DocuSigned by: Andrew Howell
SIGNATURE P.E.
NORTH CAROLINA PROFESSIONAL SEAL 35621 ENGINEER ANDREW M. HOWELL

ROADWAY DESIGN ENGINEER
8/14/2018
DocuSigned by: Matthew Copple
SIGNATURE P.E.
NORTH CAROLINA PROFESSIONAL SEAL 27771 ENGINEER MATTHEW B. COPPLE

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

8/6/2018
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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-5846	1A

ROADWAY DESIGN ENGINEER
5/31/2018
NORTH CAROLINA PROFESSIONAL SEAL 27771 ENGINEER MATTHEW B. COPPLE
DocuSigned by: Matthew Copple

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INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1 THRU 1C-2	SURVEY CONTROL SHEETS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2B-1	ROADWAY DETAILS
2B-2	CURB RAMP DETAILS
2D-1 THRU 2D-4	DRAINAGE DETAILS
3B-1	ROADWAY SUMMARIES
3D-1 THRU 3D-2	DRAINAGE SUMMARIES
4 THRU 5	PLAN AND PROFILE SHEETS
TMP-1 THRU TMP-5	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-8	EROSION CONTROL PLANS
RF-1 THRU RF-3	REFORESTATION PLANS
SIGN-1 THRU SIGN-3	SIGNING PLANS
SIG-1 THRU SIG-6.1	SIGNAL PLANS
UC-1 THRU UC-6	UTILITIES CONSTRUCTION PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1	CROSS-SECTION INDEX SHEET
X-2 THRU X-11	CROSS-SECTIONS

EFF. 01-16-2018
REV.

2018 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, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.02	Parallel Pipe End Section - Precast Concrete Section for 15" to 24" Pipe
310.03	Cross Pipe End Section - Precast Concrete Section for 18" to 30" Pipe
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
838.28	Reinforced Concrete Endwall - for Double and Triple 60" Pipes 90 Skew
840.00	Concrete Base Pad For Drainage Structures
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.45	Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.03	Driveway Turnout - Drop Curb Type
848.05	Curb Ramp - Proposed Curb & Gutter
848.06	Curb Ramp - Existing Curb & Gutter
852.01	Concrete Islands
852.02	Concrete Mountable Median - for Use with Rigid or Flexible Pavement
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

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

DRIVEWAYS:

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

SUBSURFACE PLANS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE Orange Water and Sewer

Authority, Duke Energy, PSNC, AT&T, Charter Communication, Google,Town of Chapel

Hill.

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. CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
U-5846	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

S.U.E. = *Subsurface Utility Engineering

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed 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
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

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 & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

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
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole
- U/G Telephone Cable LOS B (S.U.E.*) — T
- U/G Telephone Cable LOS C (S.U.E.*) — T
- U/G Telephone Cable LOS D (S.U.E.*) — T
- U/G Telephone Conduit LOS B (S.U.E.*) — TC
- U/G Telephone Conduit LOS C (S.U.E.*) — TC
- U/G Telephone Conduit LOS D (S.U.E.*) — TC
- U/G Fiber Optics Cable LOS B (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS C (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS D (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*)
- U/G Water Line LOS C (S.U.E*)
- U/G Water Line LOS D (S.U.E*)
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (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
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?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 LOS A (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

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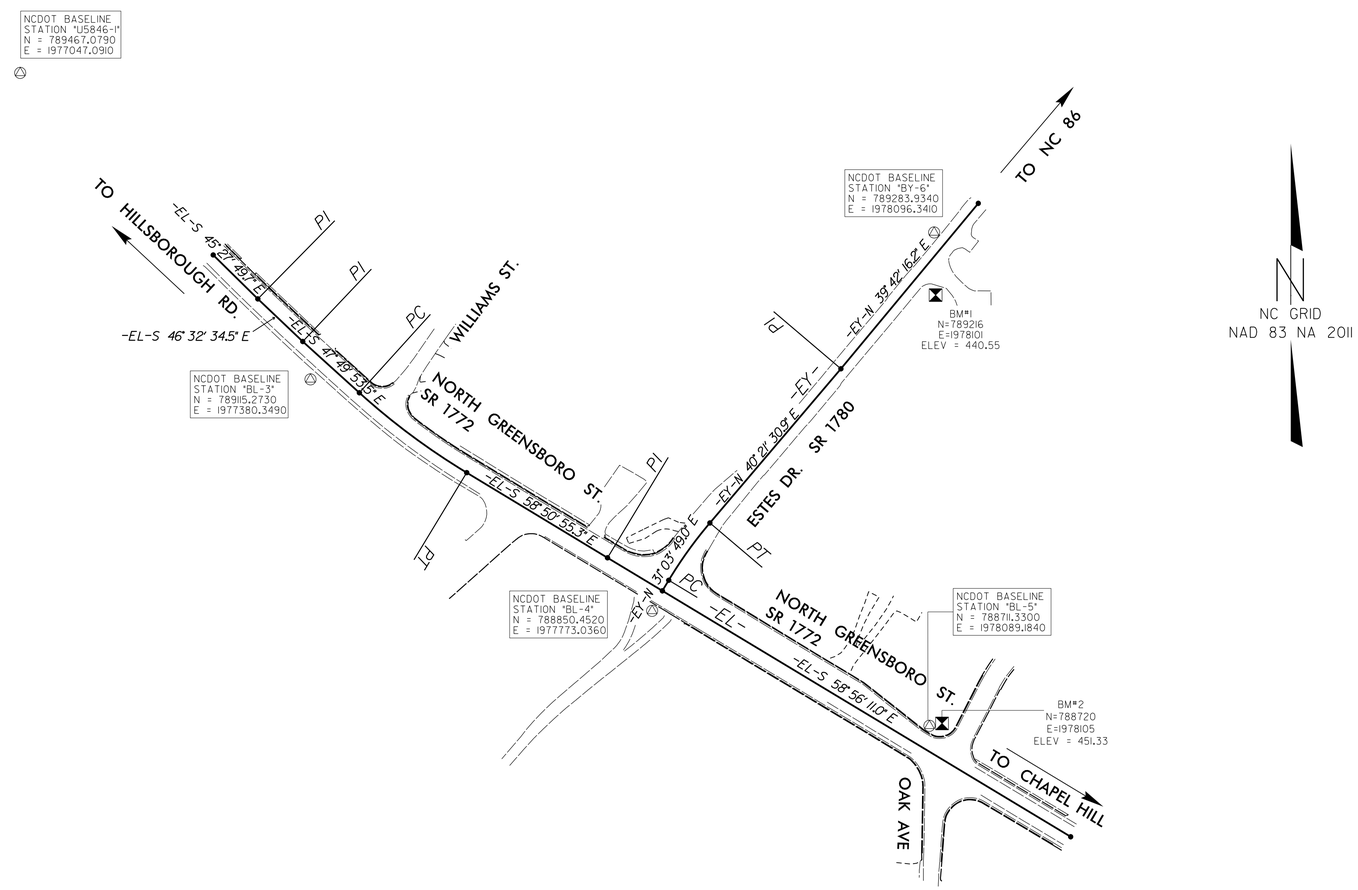
PROJECT REFERENCE NO.	SHEET NO.
U-5846	1C-1
Location and Surveys	

U-5846 SURVEY CONTROL SHEET



NOTES

1. *THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:*
   HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/

   THE FILES TO BE FOUND ARE AS FOLLOWS:
   u5846_ls_control.txt

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

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

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U5846-1"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 789467.0790(ft) EASTING: 1977047.0910(ft)
ELEVATION: 467.33'(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999228455
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U5846-1" TO -L- EL STATION 10+00.00 IS
S 46°40'15" E 304.58'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

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PROJECT REFERENCE NO.	SHEET NO.
U-5846	1C-2
Location and Surveys	

U-5846 SURVEY CONTROL SHEET

BASELINE DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION
2	U5846-2	789975.7260	1976773.7520	471.27
1	U5846-1	789467.0790	1977047.0910	467.33
3	BL-3	789115.2730	1977380.3490	456.74
4	BL-4	788850.4520	1977773.0360	439.30
5	BL-5	788711.3300	1978089.1840	446.40

BY

POINT	DESC.	NORTH	EAST	ELEVATION
4	BL-4	788850.4520	1977773.0360	439.30
6	BY-6	789283.9340	1978096.3410	440.63

BENCHMARK DATA

****

BM1 ELEVATION = 440.55

N 789216 E 1978101

NUT-ON-HYD-SEE-LEVEL-NOTES

****

****

BM2 ELEVATION = 451.33

N 788720 E 1978105

NUT-ON-HYD-SEE-LEVEL-NOTES

****

L

TYPE	STATION	NORTH	EAST
PC	10+00.00	789099.9100	1977436.4720
PT	11+53.83	789008.2059	1977559.6825
PC	12+28.23	788969.7173	1977623.3567
PRC	12+88.42	788941.7551	1977676.6100
PT	13+57.63	788909.0543	1977737.5454
POT	14+08.24	788882.0964	1977780.3776
PC	14+51.89	788855.6052	1977815.0714
PRC	15+33.25	788811.6938	1977883.4641
PT	15+70.19	788793.4795	1977915.5897
POT	19+64.21	788590.1656	1978253.1115

Y

TYPE	STATION	NORTH	EAST
POT	10+00.00	788744.0559	1977669.1491
PC	10+81.34	788795.6868	1977732.0061
PT	10+98.41	788808.5424	1977743.1104
POT	11+74.49	788873.7284	1977782.3388
PC	12+38.44	788928.4323	1977815.4499
PRC	13+53.40	789016.9388	1977888.2001
PT	14+40.10	789079.2573	1977948.3925
POT	15+03.29	789127.4082	1977989.3122

-L- NEW PRELIMINARY R/W MONUMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
L	12+67.00	-30.36	788978.0917	1977670.9257
L	12+67.00	-33.27	788980.6892	1977672.2327
L	12+61.75	33.54	788923.5503	1977637.2113
L	15+90.00	33.19	788754.8281	1977915.4367
L	15+90.00	30.26	788757.3342	1977916.9463
L	12+40.59	48.87	788921.0147	1977609.7728
L	11+93.60	48.67	788945.9740	1977568.5440
L	11+80.20	30.02	788968.8743	1977566.7280
L	14+65.00	-50.00	788888.3067	1977854.8878
L	13+60.11	61.95	788855.2976	1977706.6499
L	13+78.47	72.95	788836.2098	1977716.3226
L	13+73.26	113.00	788805.0935	1977690.5830
L	14+55.79	116.65	788759.9917	1977748.1117
L	14+64.83	56.78	788801.8808	1977792.1769

-L- NEW PRELIMINARY DRAINAGE UTILITY EASEMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
L	16+34.00	41.00	788725.4324	1977949.0957
L	16+32.63	30.34	788735.2747	1977953.4209
L	15+22.00	-51.30	788861.8186	1977898.7206
L	15+42.21	-74.00	788872.2950	1977926.9640
L	14+96.00	67.00	788773.7878	1977815.4555
L	13+32.00	63.00	788867.1752	1977684.7344
L	12+99.00	44.00	788897.5810	1977667.2931
L	12+75.00	45.00	788906.9127	1977644.8739
L	14+53.00	149.99	788735.5156	1977725.1940
L	14+52.17	-74.02	788914.2889	1977860.1854

-L- NEW PRELIMINARY PERMANENT UTILITY EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	13+46.00	-50.40	788958.3977	1977753.4802

-Y- NEW PRELIMINARY R/W MONUMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
Y	12+60.00	-37.00	788967.4060	1977796.5321
Y	12+83.01	-35.56	788986.8829	1977812.4258
Y	13+41.25	-27.52	789028.3888	1977860.1982
Y	14+05.16	-34.00	789076.5386	1977900.3455
Y	14+08.11	-15.20	789065.7551	1977916.0049
Y	13+00.00	24.55	788962.6642	1977870.0488

-Y- NEW PRELIMINARY PERMANENT DRAINAGE EASEMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
Y	14+25.03	144.00	788972.2248	1978046.1437
Y	14+63.00	136.00	789008.6370	1978066.8541
Y	14+63.00	14.26	789087.4725	1977974.0867
Y	14+02.28	15.92	789040.1682	1977934.6548

-Y- NEW PRELIMINARY PERMANENT UTILITY EASEMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
Y	13+41.00	-41.00	789037.8759	1977850.6211
Y	13+40.00	-52.00	789044.9845	1977842.1527
Y	13+35.00	-51.00	789040.3083	1977838.8384
Y	13+36.00	-42.00	789034.7225	1977845.9830
Y	14+40.89	-42.00	789034.7225	1977845.9830
Y	15+41.00	13.52	789147.3893	1978024.0321
Y	15+40.00	43.50	789127.2116	1978046.2312
Y	15+45.00	43.50	789131.0217	1978049.4691
Y	15+46.00	13.47	789151.2301	1978027.2337
Y	15+51.00	-17.79	789175.2860	1978006.6478
Y	15+51.00	-35.00	789186.4279	1977993.5370

NOTE: DRAWING NOT TO SCALE

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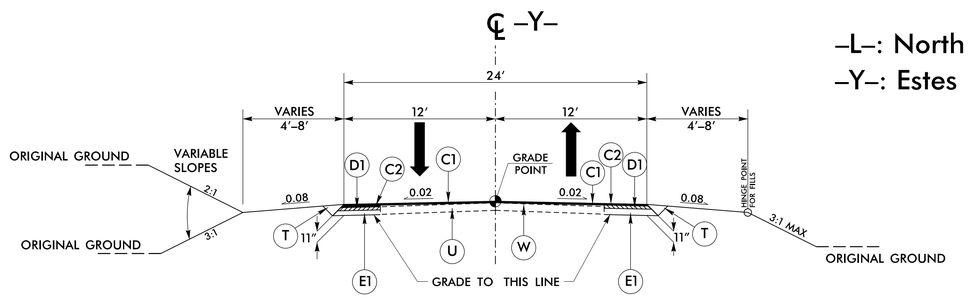
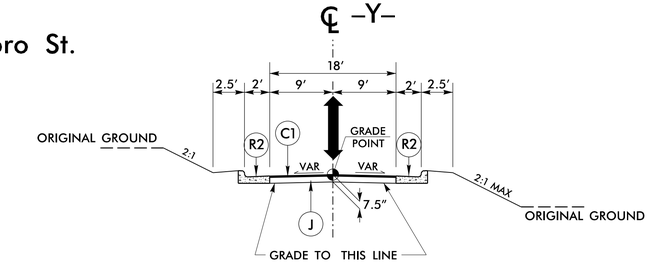
8/17/99

–L–: North Greensboro St.
–Y–: Estes Dr.



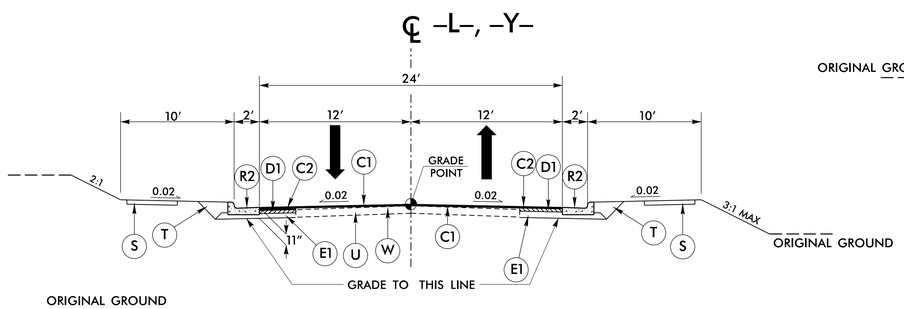
ROADWAY TYPICAL SECTION NO. 1

–Y– STA. 13+65.96 TO 14+45.00 RT
–Y– STA. 13+96.15 TO 14+45.00 LT



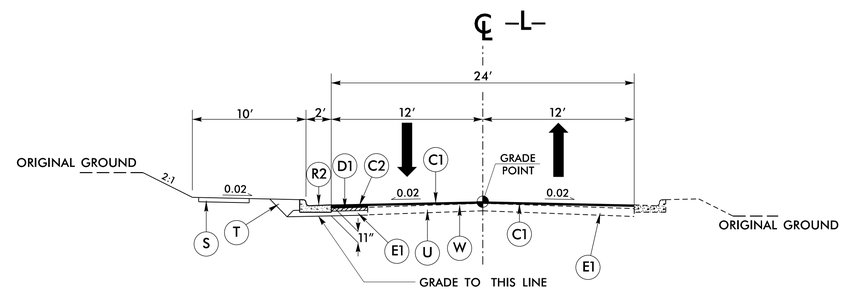
ROADWAY TYPICAL SECTION NO. 2

–Y– STA. 10+80.00 TO 11+18.00



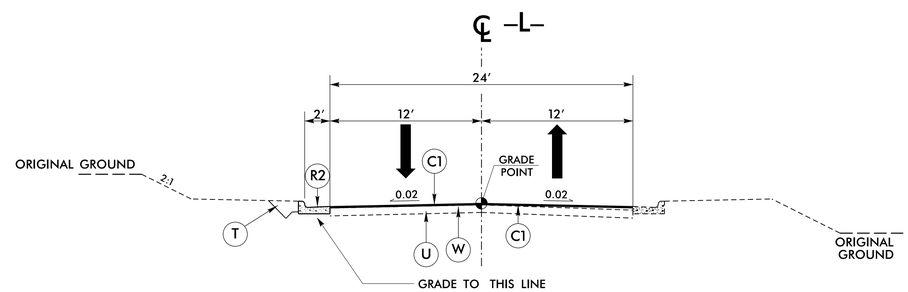
ROADWAY TYPICAL SECTION NO. 3

–L– STA. 12+42.62 TO 13+48.28
–L– STA. 14+68.40 TO 15+83.72
–Y– STA. 12+37.85 TO 13+65.96 RT
–Y– STA. 12+37.85 TO 13+96.15 LT



ROADWAY TYPICAL SECTION NO. 4

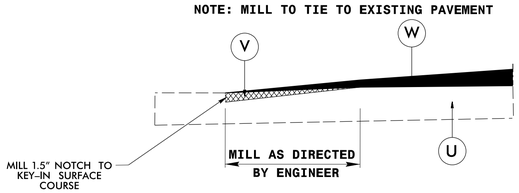
–L– STA. 11+85.00 TO 12+42.62



ROADWAY TYPICAL SECTION NO. 5

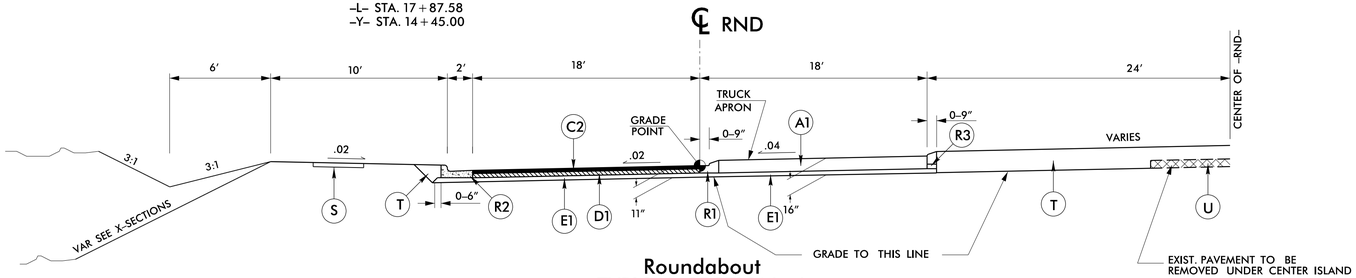
–L– STA. 10+71.85 TO 11+85.00
–L– STA. 15+83.72 TO 17+87.58

NOTE: MILL TO TIE TO EXISTING PAVEMENT



INCIDENTAL MILLING DETAIL

–L– STA. 10+71.85
–L– STA. 17+87.58
–Y– STA. 14+45.00



Roundabout TYPICAL SECTION 6

–RND– STA. 10+00.00 TO 12+63.89

PROJECT REFERENCE NO.	SHEET NO.
U-5846	2A-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
5/31/2018
NORTH CAROLINA PROFESSIONAL SEAL 27771 ENGINEER MATTHEW B. COPPLE
DocuSigned by: Matthew Copple
23BAB8C6F43F41E...

PAVEMENT DESIGN ENGINEER
5/31/2018
NORTH CAROLINA PROFESSIONAL SEAL 30995 ENGINEER CHRISTOPHER B. SMITHERMAN
DocuSigned by: Chris Smitherman
EA7026E3CDA465A...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

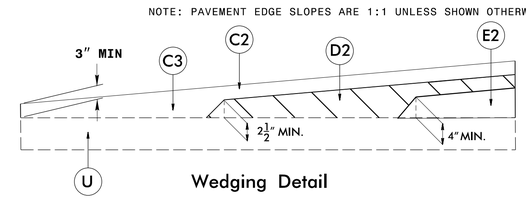
SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

PAVEMENT SCHEDULE

(PROPOSED PAVEMENT DESIGN)

A1	12″ PORTLAND CEMENT CONCRETE TRUCK APRON.
C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1.5″ IN DEPTH.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½″ IN DEPTH OR GREATER THAN 4″ IN DEPTH.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5½″ IN DEPTH.
J	PROP 6″ AGGREGATE BASE COURSE
R1	1′-6″ CONCRETE CURB AND GUTTER.
R2	2′-6″ CONCRETE CURB AND GUTTER.
R3	9″X18″ CONCRETE CURB.
S	4″ CONCRETE SIDEWALK
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	VARIABLE MILLING.
W	WEDGING (SEE STANDARD WEDGING DETAIL)

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



Wedging Detail

5/31/2018
U-5846_Rdy_typ_2A-1.dgn
mcsmithermanpe

DocuSign Envelope ID: 26A61E9A-5830-4C6B-8FB8-C9AF45B749C8

PROJECT REFERENCE NO.	SHEET NO.
U-5846	2B-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
5/24/2018
NORTH CAROLINA PROFESSIONAL SEAL 27771 ENGINEER MATTHEW B. COPPLE
DocuSigned by: Matthew Copple
2B8A8B8C9F4BA1E...

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1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
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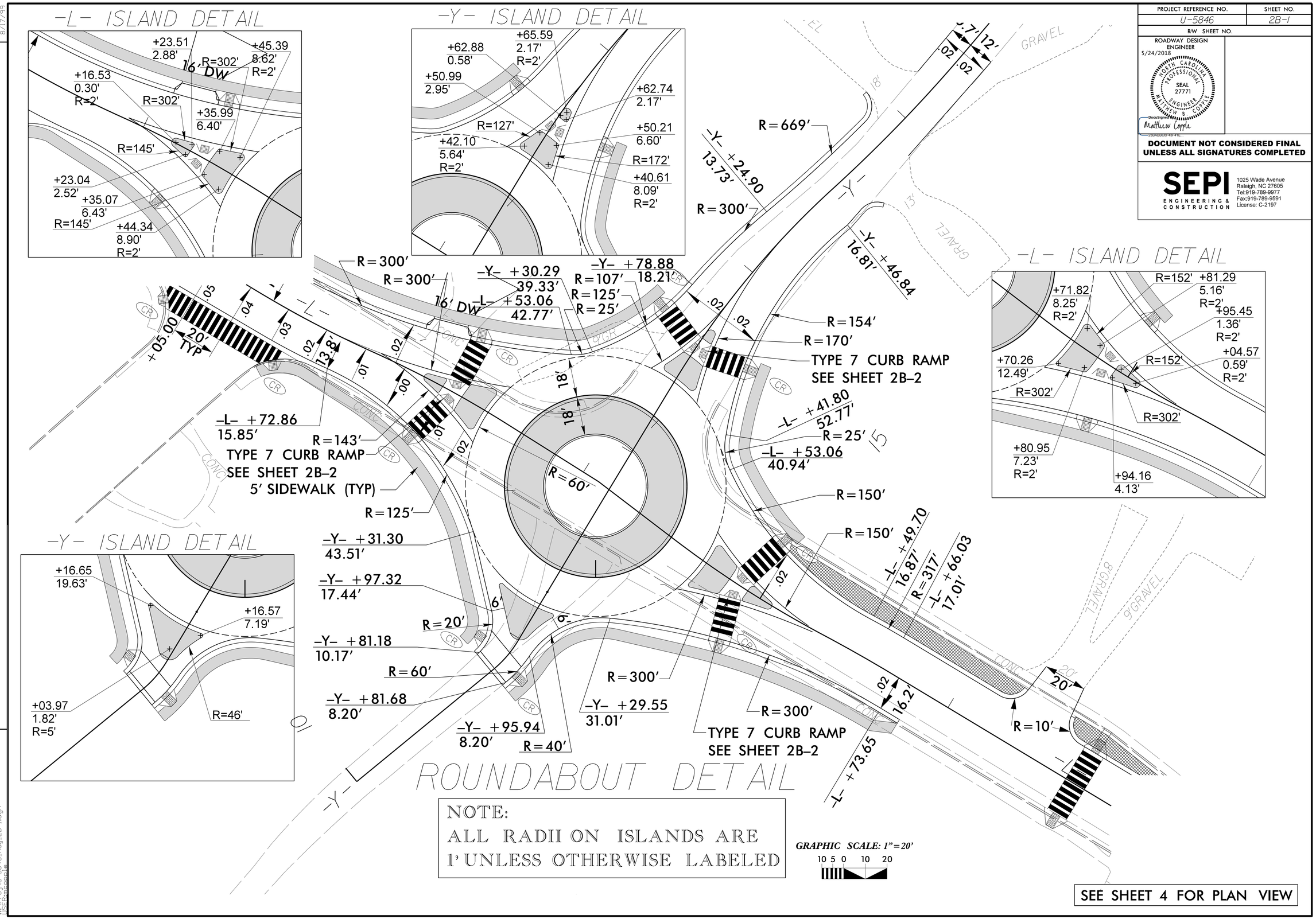


NOTE:
ALL RADII ON ISLANDS ARE 1' UNLESS OTHERWISE LABELED

SEE SHEET 4 FOR PLAN VIEW

REVISIONS

8/17/99

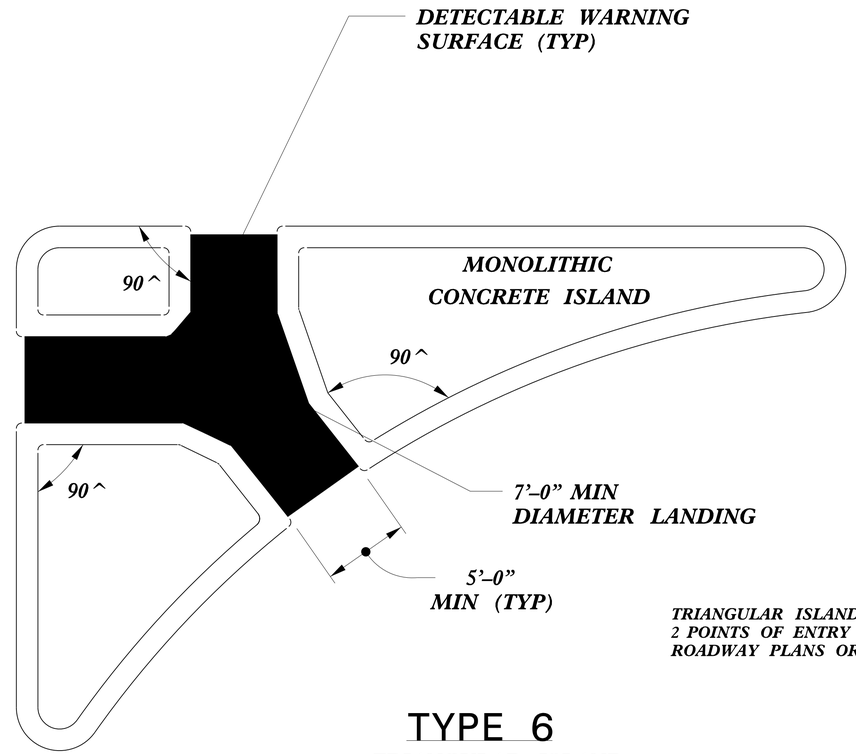
5/24/2018
U-5846_Rdy_2B-1.dgn
USER:mcopple

DocuSign Envelope ID: 26A61E9A-5830-4C6B-8FB8-C9AF45B749C8

PROJECT REFERENCE NO.	SHEET NO.
U-5846	2B-2

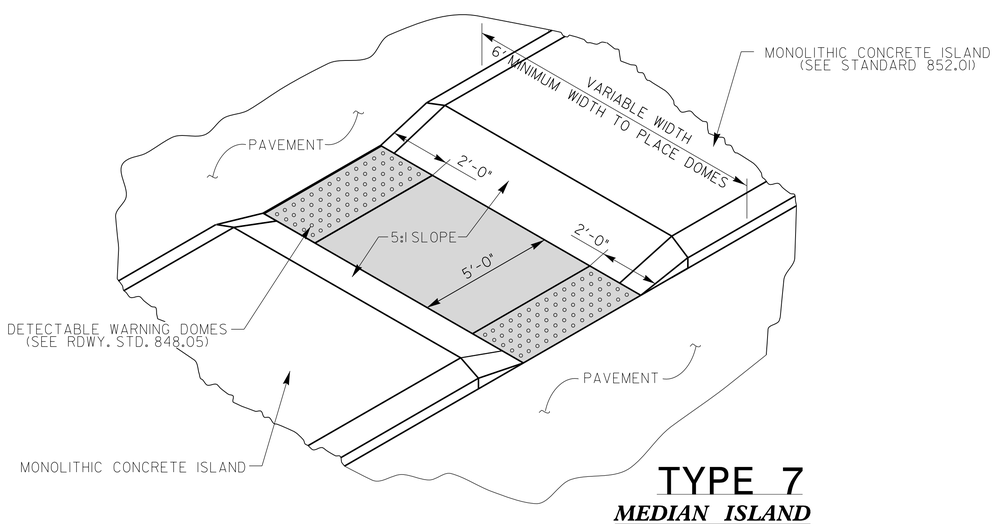
U-5846 50236.3.1

PAY LIMITS FOR 2 OR 3 CURB RAMPS (CALCULATE BASED ON NUMBER OF SETS OF TRUNCATED DOMES)

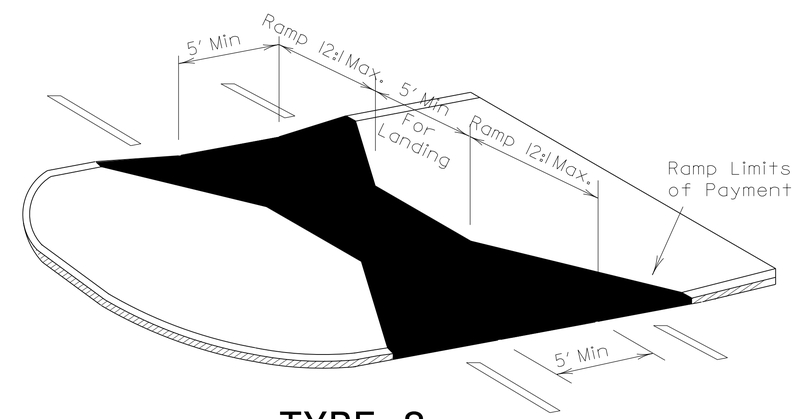


TRIANGULAR ISLANDS MAY BE CONSTRUCTED WITH ONLY 2 POINTS OF ENTRY AND EXIT AS SHOWN IN THE ROADWAY PLANS OR AS DIRECTED BY THE ENGINEER.

TYPE 6
TRIANGULAR ISLAND WITH CUT THROUGH



TYPE 7
MEDIAN ISLAND WITH CUT THROUGH



TYPE 8
MEDIAN ISLAND CURB RAMPS

5/25/2018

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

DocuSigned by: 873F3D17DCDC45F...

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

CURB RAMPS
Median or Turn Lane Islands

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

DocuSign Envelope ID: 26A61E9A-5830-4C6B-8FB8-C9AF45B749C8

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-5846	2D-1
R/W SHEET NO.	

HYDRAULICS ENGINEER
5/24/2018
NORTH CAROLINA PROFESSIONAL SEAL 35621 ENGINEER ANDREW M. HOWELL
DocuSigned by: Andrew M. Howell
18A3B965B46F4DD...

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Raleigh, NC 27605
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Fax:919-789-9591
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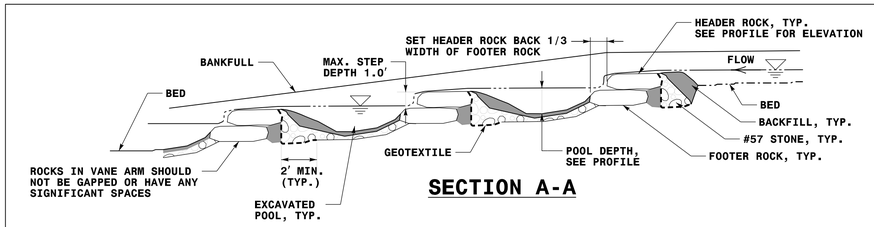
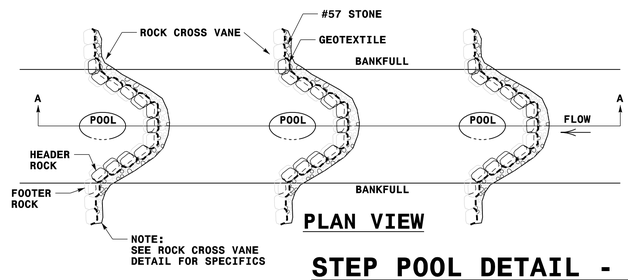


SECTION A-A

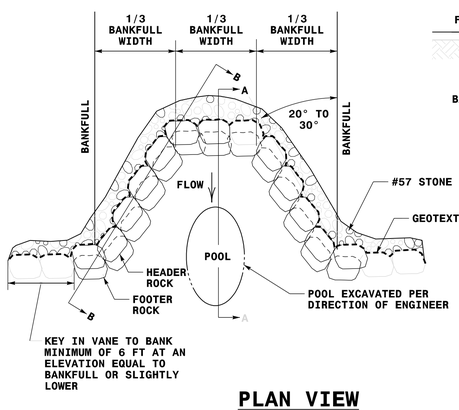


PLAN VIEW

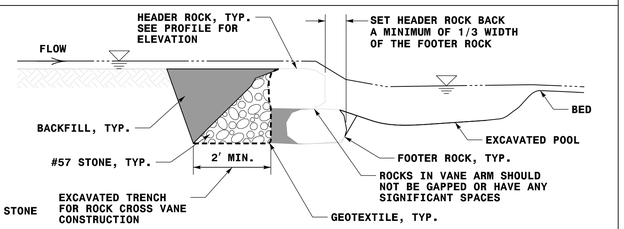
STEP POOL DETAIL - 1A

NOT TO SCALE

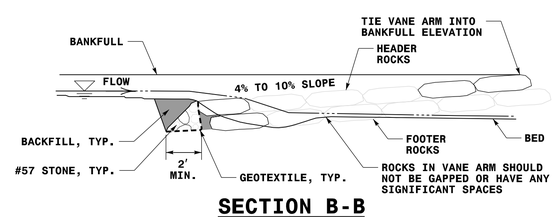
NOTES:
1) STEPS TO BE SHORT, FREQUENT, AND CLOSELY SPACED.
2) POOL SPACING SHALL BE INVERSELY PROPORTIONAL TO STREAM SLOPE, AND DIRECTLY PROPORTIONAL TO BANKFULL WIDTH.
3) POOL DEPTHS AT BANKFULL ELEVATION SHALL BE TYPICALLY 2 TO 3 TIMES DEEPER THAN STEP DEPTHS AT BANKFULL ELEVATION.
4) ADEQUATE NUMBER OF FOOTER BOULDERS TO BE USED IN ORDER TO HOLD UP THE BOULDERS AT HEAD OF STEPS DURING HIGH ENERGY/HIGH FLOW EVENTS.
5) STEP POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.



PLAN VIEW



SECTION A-A



SECTION B-B

	BOULDER DIMENSIONS (FT)		
STATION	HEIGHT	LENGTH	WIDTH
10+46 Y	3.0	4.0	3.0
10+59 Y	3.0	4.0	3.0
10+72 Y	3.0	4.0	3.0
10+85 Y	3.0	4.0	3.0
10+98 Y	3.0	4.0	3.0

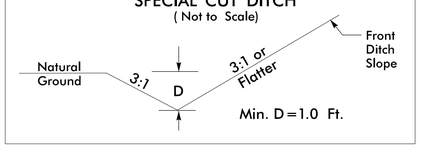
ROCK CROSS VANE DETAIL FOR STEP POOLS - 1B

NOT TO SCALE

NOTES:
1) DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2) DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3) CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4) COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5) POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

DETAIL 2

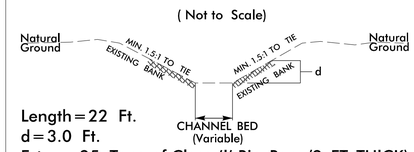
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 15 + 25 TO STA. 16 + 50 –L– RT

DETAIL 3

BANK STABILIZATION
(Not to Scale)



Length = 22 Ft.
d = 3.0 Ft.
Est. = 25 Tons of Class 'I' Rip–Rap (2–FT THICK)
Est. = 30 SY Geotextile

STA. 14 + 86 –L– LT

5/24/2018
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USER:Howell

DocuSign Envelope ID: 26A61E9A-5830-4C6B-8FB8-C9AF45B749C8

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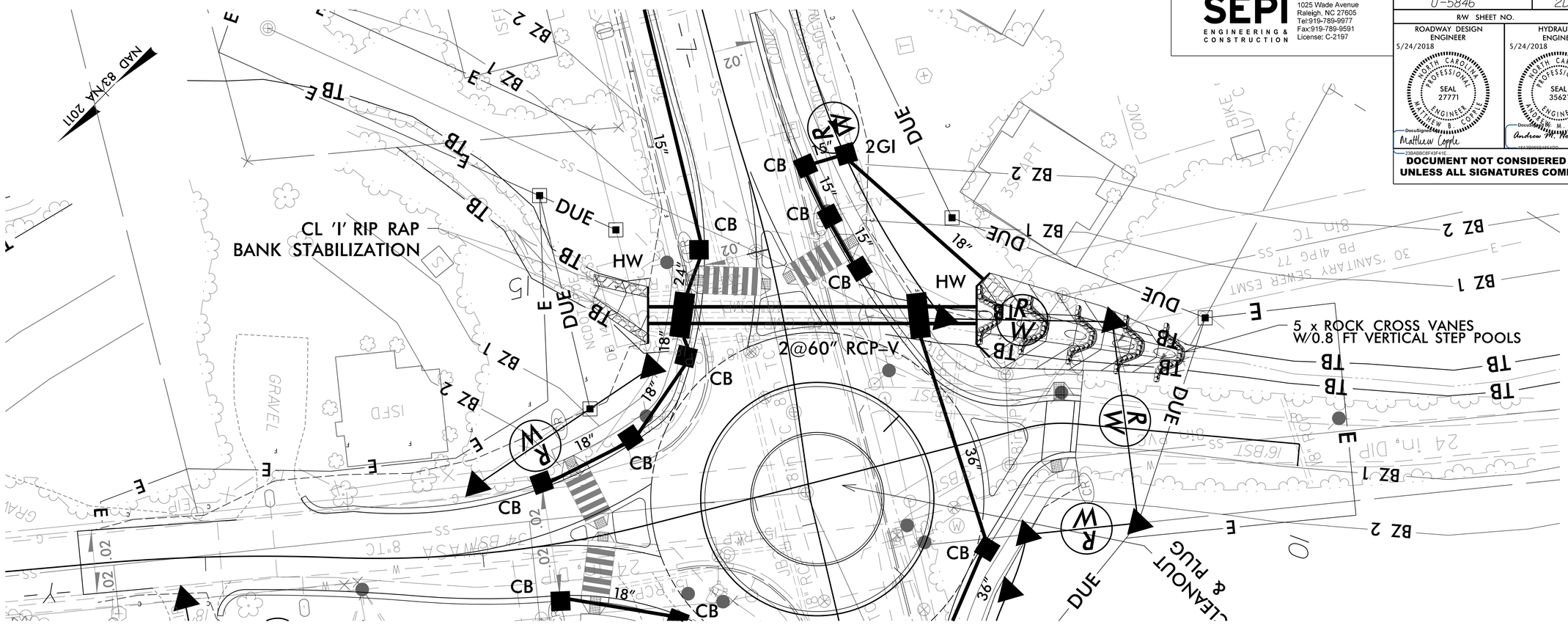
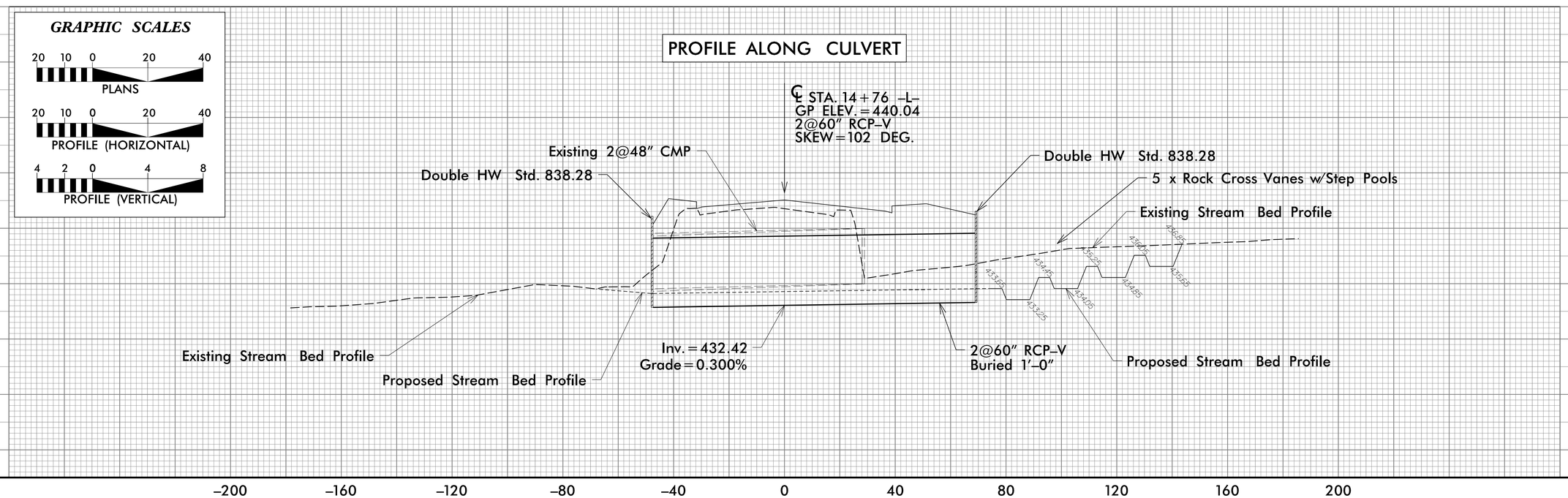
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

PROJECT REFERENCE NO.	SHEET NO.
U-5846	2D-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER 5/24/2018	HYDRAULICS ENGINEER 5/24/2018
NORTH CAROLINA PROFESSIONAL SEAL 27771 ENGINEER MATTHEW B. COPPLE	NORTH CAROLINA PROFESSIONAL SEAL 35621 ENGINEER ANDREW M. HOWELL
DocuSigned by: Matthew Copple 23BABBC6F43F41E...	DocuSigned by: Andrew M. Howell 18A1B9E6F8AE4DD...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





REVISIONS

8/17/99

5/24/2018
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USER:mcopple

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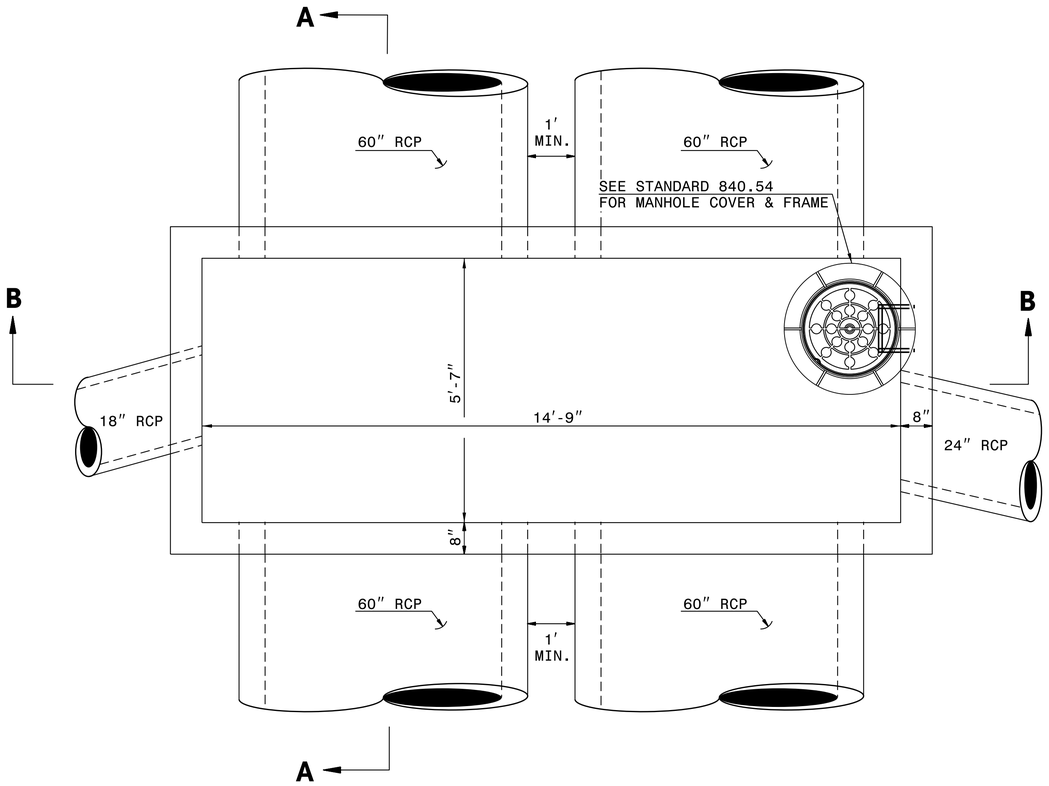
PROJECT REFERENCE NO.	SHEET NO.
U-5846	2D-3



PLAN

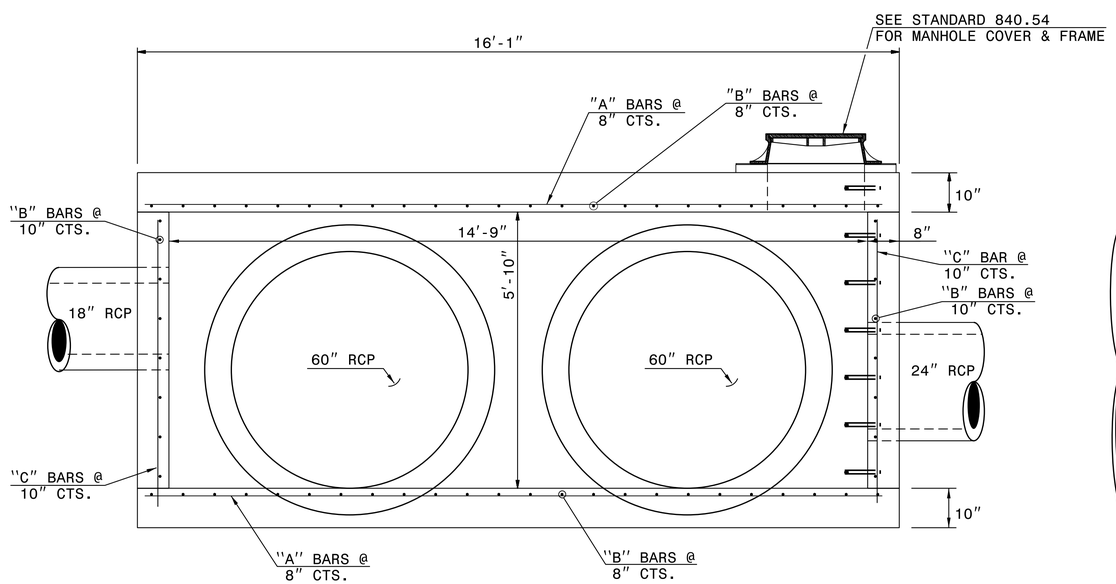
GENERAL NOTES:

1. USE CLASS "B" CONCRETE THROUGHOUT.
2. CONSTRUCT CONCRETE BOX IN ACCORDANCE WITH SECTION 825 OF THE STANDARD SPECIFICATIONS.
3. USE FORMS TO CONSTRUCT THE BOTTOM SLAB.
4. ADJUST LENGTH OF STEEL BARS AS NEEDED TO COMPENSATE FOR PIPES AND FRAME AND GRATE OPENINGS.
5. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 400.
6. CUT OR BEND STEEL BARS AS NEEDED TO PROVIDE 2″ CLEARANCE.
7. HEIGHT OF JUNCTION BOX MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
8. PROVIDE ALL JUNCTION BOXES OVER 3′-6″ IN DEPTH WITH STEPS 12″ ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
9. IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

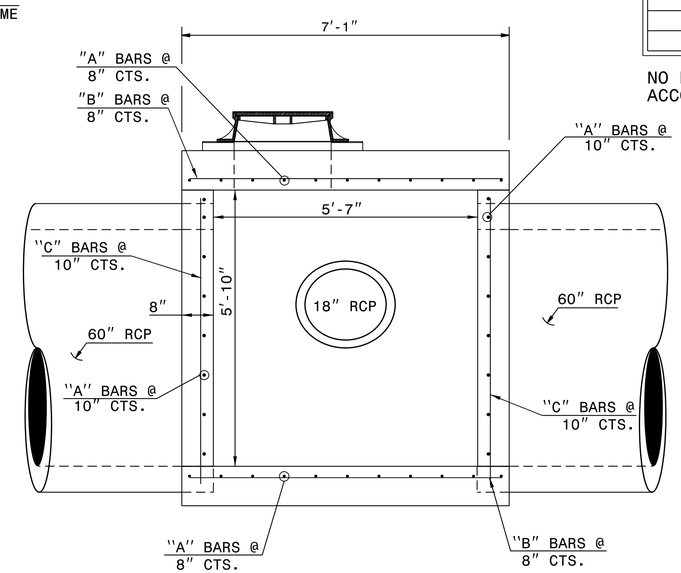
BILL OF MATERIALS

BAR	QTY	SIZE	LENGTH	WEIGHT
A	38	#5	15′-9″	624
B	66	#5	6′-7″	453
C	52	#5	6′-4″	344
TOTAL REINF. STEEL (lbs.)				1389
TOTAL CONC. CU. YDS.				13.3

NO DEDUCTIONS HAVE BEEN MADE TO ACCOMMODATE PIPES.



SECTION B-B



SECTION A-A

5/25/2018
NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL HOWERTON
DocuSigned by: 873F3D17DCDC45F...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

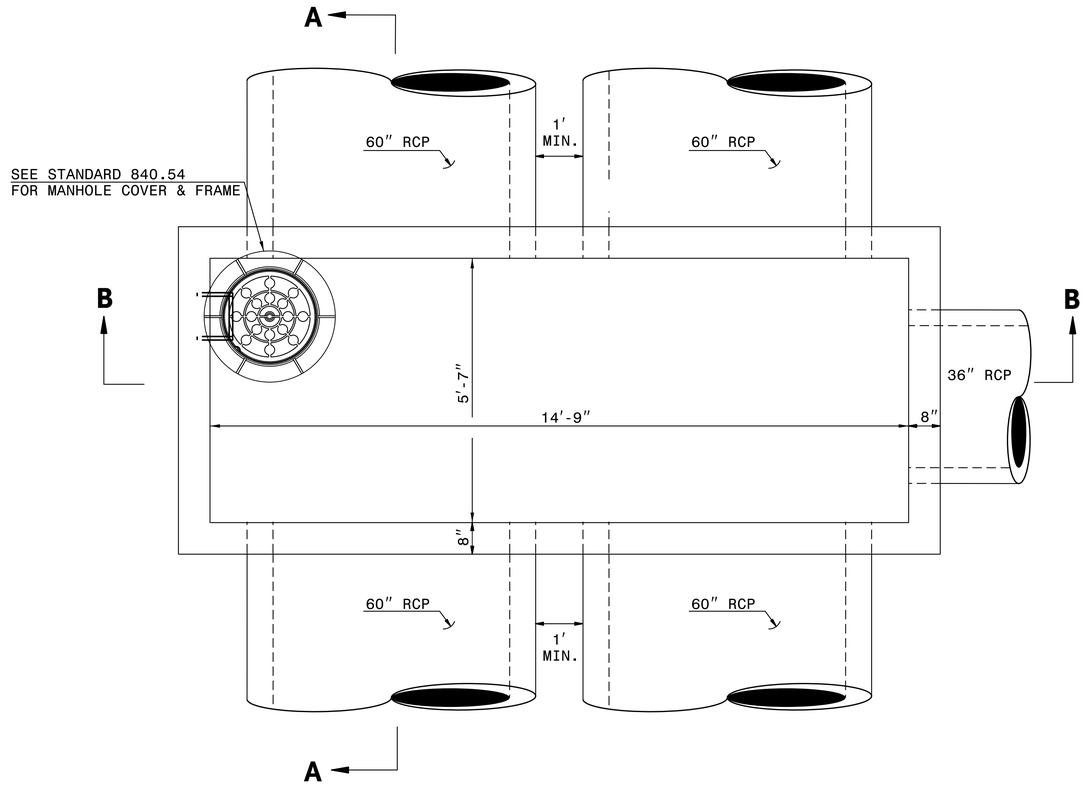
DETAIL OF SPECIAL JUNCTION BOX

ORIGINAL BY: K.A. Kempf DATE: March 26, 2014
MODIFIED BY: K.A. Kempf DATE: March 21, 2018
CHECKED BY: DATE:
FILE SPEC.: ../details/kkempf/english/2-60_u5846 jb.dgn

26-APR-2018 07:50
S:\Contracts\Contracts\Special Details\kkempf\english\2-60_u5846 jb.dgn
jhowerton AT CSD-292595

DocuSign Envelope ID: 26A61E9A-5830-4C6B-8FB8-C9AF45B749C8

PROJECT REFERENCE NO.	SHEET NO.
U-5846	2D-4



PLAN

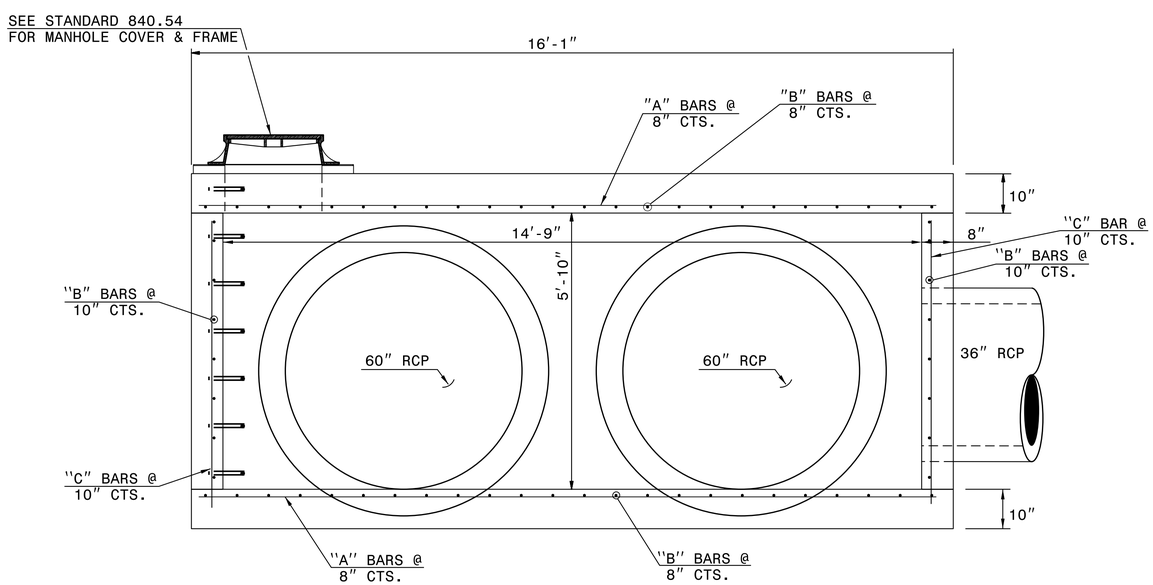
GENERAL NOTES:

1. USE CLASS "B" CONCRETE THROUGHOUT.
2. CONSTRUCT CONCRETE BOX IN ACCORDANCE WITH SECTION 825 OF THE STANDARD SPECIFICATIONS.
3. USE FORMS TO CONSTRUCT THE BOTTOM SLAB.
4. ADJUST LENGTH OF STEEL BARS AS NEEDED TO COMPENSATE FOR PIPES AND FRAME AND GRATE OPENINGS.
5. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 400.
6. CUT OR BEND STEEL BARS AS NEEDED TO PROVIDE 2" CLEARANCE.
7. HEIGHT OF JUNCTION BOX MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
8. PROVIDE ALL JUNCTION BOXES OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.
9. IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

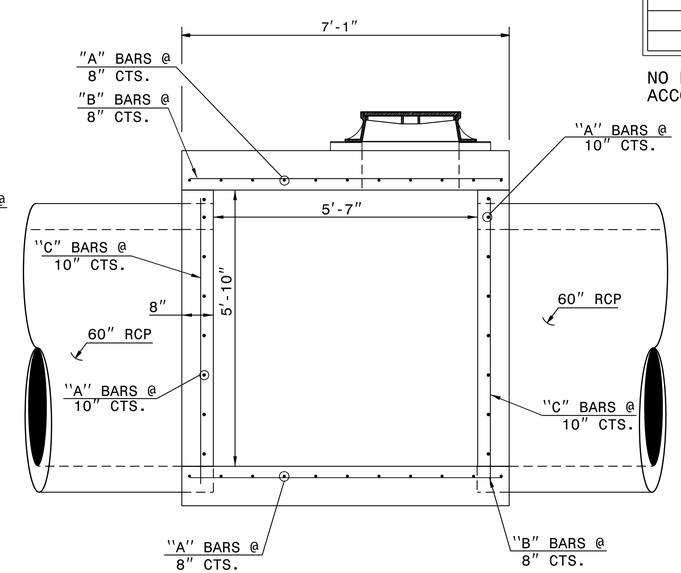
BILL OF MATERIALS

BAR	QTY	SIZE	LENGTH	WEIGHT
A	38	#5	15'-9"	624
B	66	#5	6'-7"	453
C	52	#5	6'-4"	344
TOTAL REINF. STEEL (lbs.)				1389
TOTAL CONC. CU. YDS.				13.3

NO DEDUCTIONS HAVE BEEN MADE TO ACCOMMODATE PIPES.



SECTION B-B



SECTION A-A

5/25/2018

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOHN B. HOWERTON

DocuSigned by: 873F3D17DCDC45F...

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

DETAIL OF SPECIAL JUNCTION BOX

ORIGINAL BY: K. A. Kempf DATE: March 26, 2014
MODIFIED BY: K. A. Kempf DATE: March 21, 2018
CHECKED BY: DATE:
FILE SPEC.: _/details/kkempf/english/2-60_u5846 jb.dgn

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S:\Contracts\Contracts\Special Details\kkempf\english\2-60_u5846 jb.dgn
jhowerton AT CSD-292595

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8/17/99

COMPUTED BY: MBC DATE: 5/23/17
CHECKED BY: DATE:

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

PROJECT REFERENCE NO.	SHEET NO.
U-5846	3B-1

SUMMARY OF EARTHWORK

IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
SUMMARY NO. 1					
-L- STA. 11+85.00	-L- STA. 13+25.00	389	20		369
-L- STA. 14+75.00	-L- STA. 16+50.00	482	156		326
TOTAL SUMMARY NO. 1		871	176		695
SUMMARY NO. 2					
-Y- STA. 10+00.00	-L- STA. 14+40.10	348	113		235
TOTAL SUMMARY NO. 2		348	113		235
SUMMARY NO. 3					
-RND- STA. 10+00.00	-RND- STA. 12+50.00	129	1067	938	
TOTAL SUMMARY NO. 3		129	1067	938	
SUMMARY TOTALS		1348	1356	938	930
SUMMARY TOTALS		1348	1356	938	930
WASTE IN LIEU OF BORROW				-930	
PROJECT TOTALS		1348	1356	8	
EST. 5% TO REPLACE BORROW PIT				0	
GRAND TOTALS		1348	1356	8	
SAY		1400		20	

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

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

ASPHALT PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	SQUARE YARDS
-L-	14+84.00	16+28.00	LT	137.93
-L-	16+50.00	17+47.00	LT	60.14
-L-	12+68.00	13+16.00	RT	13.20
-Y-	12+70.00	13+61.00	RT	25.23
			TOTALS	236.50
			SAY	250

5/24/2018
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COMPUTED BY: Andrew M Howell DATE: 8 May 2018
CHECKED BY: DATE:

PROJECT REFERENCE NO.	SHEET NO.
U-5846	3D-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

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

ABBREVIATIONS

- C.B. CATCH BASIN
- N.D.I. NARROW DROP INLET
- D.I. DROP INLET
- G.D.I. GRATED DROP INLET
- G.D.I. (N.S.) GRATED DROP INLET (NARROW SLOT)
- J.B. JUNCTION BOX
- M.H. MANHOLE
- T.B.D.I. TRAFFIC BEARING DROP INLET
- T.B.J.B. TRAFFIC BEARING JUNCTION BOX

Station / Size	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) 10"	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"	15"	18"	24"	36"	42"	48"	R.C. Pipe (Class III) 15"	18"	24"	30"	36"	42"	48"	R.C. Pipe (Class IV) 12"	15"	18"	24"	30"	36"	42"	48"	15" R. C. Pipe (Class V)	18" R. C. Pipe (Class V)	24" R. C. Pipe (Class V)	36" R. C. Pipe (Class V)	18" Side Drain Pipe	Endwalls Std. 838.01, Std. 838.11 or Std. 838.80 (Unless Noted Otherwise) Cu. Yds. R.C.P.	Endwalls 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	Concrete Transitional Section Catch Basin	Concrete Transitional Section Drop Inlet	G.D.I. Type "B" Std. 840.18 or 840.27	G.D.I. Frame with Grate Std. 840.22	G.D.I. Frame with Two Grates Std. 840.22	G.D.I. (N.S.) Frame with Grate Std. 840.24	G.D.I. (N.S.) Frame with Two Grates Std. 840.24	J.B. Std. 840.31 or 840.32	Corr. Steel Elbows No. & Size	Conc. Collars Cl. "B" C.Y. Std 840.72	10" PVC Cleanout with Plug	Pipe Removal Lin. Ft.	Remarks
Thickness or Gauge																				.064	.064	.064	.064	.079	.109	.109																																										
10+70 -L-	LT	0402		451.3	446.3																																												1			1			1													REMOVE AND REPLACE EXISTING CB
		0402	0422		446.3	440.5	X																														116																															165	REMOVE EXISTING 18" RCP
11+88 -L-	RT	0403		447.3	442.0																																												1	0.8		1		1														
		0403	0422		442.0	441.5																														36																																62	REMOVE EXISTING 18" RCP
11+89 -L-	LT	0422		445.8	440.5																																												1	0.3		1			1													
		0422	0404		440.5	438.2	X																														52																																
12+42 -L-	LT	0404		443.4	438.2																																												1	0.3		1			1													
		0404	0426		438.2	436.1	X																														56																															120	REMOVE EXISTING 18" RCP
13+00 -L-	LT	0426		441.4	436.1																																												1	0.3		1			1													
		0426	0405		436.1	434.6	X																														52																																
12+75 -Y-	LT	0407		440.6	436.6																																												1			1		1														
		0407	0406		436.6	435.4																														40																																40	REMOVE EXISTING 15" RCP
12+38 -Y-	LT	0406		439.4	435.4																																												1			1	1															
		0406	0405		435.4	434.6																														36																																	
13+48 -L-	LT	0405		439.8	434.6																																												1	0.2		1	1															
		0405	0412		434.6	434.3																																						72																							63	REMOVE EXISTING 15" RCP
13+48 -L-	RT	0412		439.7	434.3																																												1	0.4		1	1															
		0412	0427		434.3	434.1																																						32																							29	REMOVE EXISTING 15" RCP
12+19 -RND-	RT	0427		439.5	434.1																																												1	0.4		1	1															
		0427	0423		434.1	433.6																																						80																								
12+75 -Y-	RT	0408		440.5	436.5																																												1			1			1													
		0408	0409		436.5	435.5																														36																																	
12+38 -Y-	RT	0409		439.5	435.5																																												1			1	1															
		0409	0410		435.5	435.0																														36																																109	REMOVE EXISTING 18" RCP
14+67 -L-	LT	0410		439.2	435.0																																												1			1	1															
		0410	0421		435.0	434.8																														8																																	
17+61 -L-	LT	0415		445.7	440.0																																												1	0.8		1		1														
		0415	0416		440.0	436.9	X																																				252																								267	REMOVE EXISTING 18" RCP
15+06 -L-	LT	0416		439.7	433.4																																												1	1.3		1		1														
		0416	0421		433.4	433.3																															16																																
14+86 -L-	RT	0411		439.0	436.0																																												1			1	1															
		0411	0417		436.0	435.7																																				20																									26	REMOVE EXISTING 15" RCP
15+06 -L-	RT	0417		439.7	435.7																																												1			1			1													
		0417	0418		435.7	435.5																																				20																										
15+25 -L-	RT	0418		440.0	435.5																																												1			1			1													
		0418	0429		435.5	435.2																																					16																									
15+25 -L-	RT	0429		439.2	435.2																																												1									1				1						
		0429	0431		435.2	434.9				68																																																											INSTALL PIPE OUTFALL THROUGH PROPOSED HW
12+52 -ROUND-	LT	0432		440.6	436.6																																																													1		PROVIDE PVC DRAIN WITH CLEANOUT TO
		0432	0427		436.6	435.5		60								X	X	X	X																																																		CENTER OF ROUNDABOUT FOR FUTURE USE
SHEET TOTALS								60		68																										192	292					40	268		184				19	4.8		18	7	4	7			1				1				1		

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6/21/00

COMPUTED BY: Andrew M Howell DATE: 8 May 2018
CHECKED BY: DATE:

PROJECT REFERENCE NO.	SHEET NO.
U-5846	3D-2

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NOTE: Invert Elevations 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 54" & OVER)

STATION / SIZE / THICKNESS OR GAUGE	LOCATION (LT, RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) 54"	60"	66"	72"	78"	84"	60" R. C. PIPE (CLASS V)	C.S. PIPE 54" .109	54" .138	54" .168	SHOP ELON-GATED .138	SHOP ELON-GATED .168	60" .138	60" .168	66" .138	66" .168	72" .138	72" .168	STRUCTURAL PLATE PIPE 60" 12	60" 10	66" 12	66" 10	72" 12	72" 10	REINFORCED ENDWALLS WITH R.C. - C.Y. STD. 838.28 OR 838.58	REINFORCED ENDWALLS WITH C.S. - C.Y.	MASONARY DRAINAGE STRUCTURES CUBIC YARDS	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 CATCH BASIN	DROP INLET	SPECIAL DETAIL J.B.	M.H. FRAME & COVER STD. 840.54	REINF. CONC. FLARED END SECTIONS NO. & SIZE	CORR. STEEL FLARED END SECTIONS NO. & SIZE	REINF. CONC. ELBOWS NO. & SIZE	CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL. "B" C.Y. STD 840.72	PIPE REMOVAL LIN.FT.	REMARKS
14+76 -L-	CL																																																152	REMOVE 2 LINES EX. 48" CMP
14+64 -L-	RT	0430	0423		432.6	432.6	X							48																		16																		INSTALL 2 LINES PRO. 60" RCP-V, BURIED 1'-0" MINIMUM PIPE GRADE=0.300%
14+68 -L-	RT	0423		439.9	432.6																																					1	1								SPECIAL DETAIL JUNCTION BOX FOR 2-60", 36" (IN) ; 2-60" (OUT)
		0423	0421		432.6	432.3	X							176																																				INSTALL 2 LINES PRO. 60" RCP-V, BURIED 1'-0" MINIMUM PIPE GRADE = 0.300%
14+83 -L-	LT	0421		439.6	432.3																																					1	1								SPECIAL DETAIL JUNCTION BOX FOR 2-60", 24", 18" (IN) ; 2-60" (OUT)
		0421	0433		432.3	432.3	X							24																																				INSTALL 2 LINES PRO. 60" RCP-V, BURIED 1'-0" MINIMUM PIPE GRADE = 0.300%
14+86 -L-	LT	0430			432.3																											16																		
SHEET TOTALS														248																		32										2	2							152	

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

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8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-5846	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
5/24/2018
NORTH CAROLINA PROFESSIONAL SEAL 27771 ENGINEER MATTHEW B. COPPLE
DocuSign envelope ID: 23BA8B0C9F43F41E-A6A9B0B0BA8F4BD
Matthew Copple

HYDRAULICS ENGINEER
5/24/2018
NORTH CAROLINA PROFESSIONAL SEAL 35621 ENGINEER ANDREW M. HOWELL
DocuSign envelope ID: 4A9A9B0B0BA8F4BD-23BA8B0C9F43F41E
Andrew M. Howell

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SEPI ENGINEERING & CONSTRUCTION
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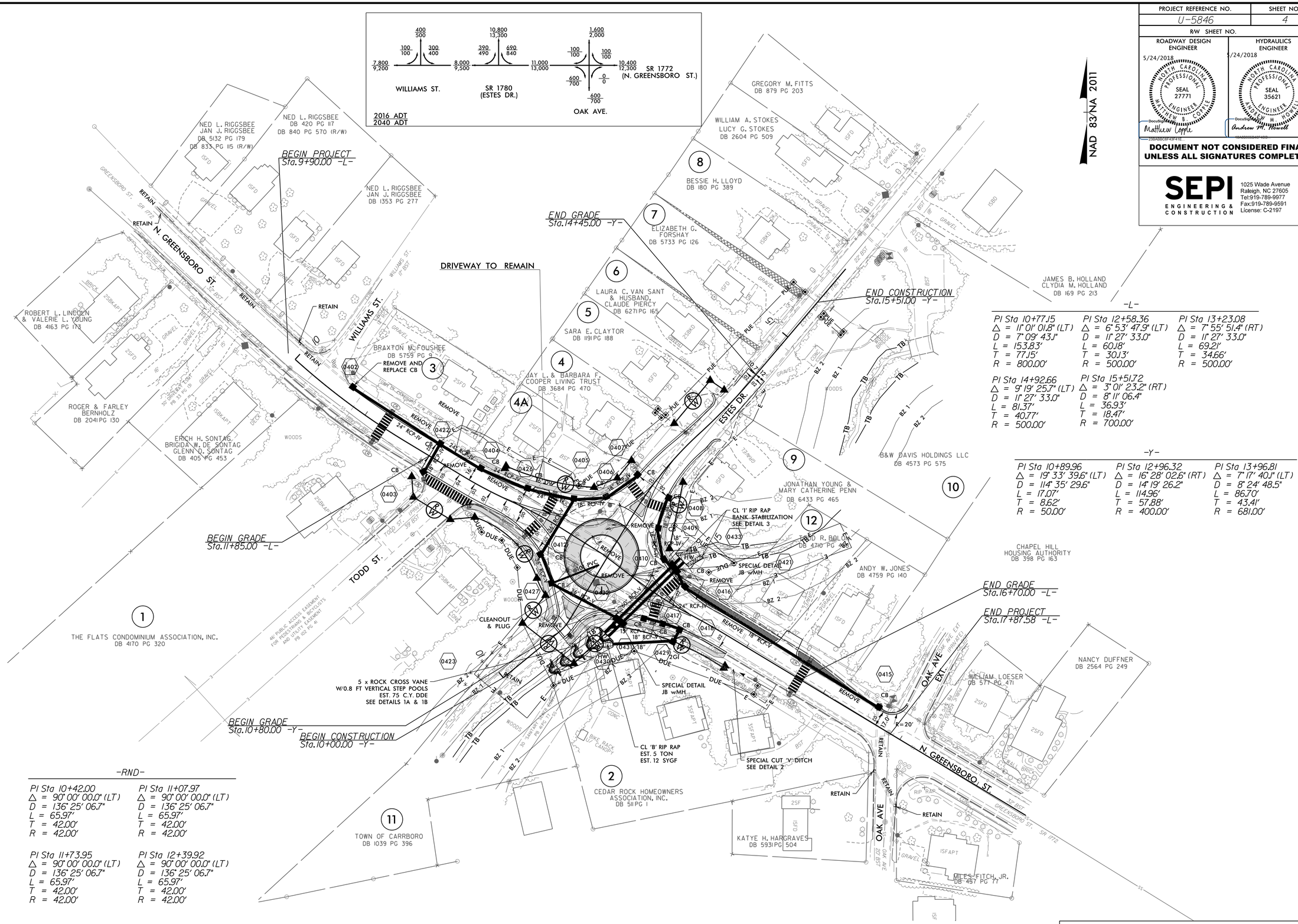

-L-

PI Sta 10+77.15 △ = 11° 01' 01.8" (LT) D = 7° 09' 43.1" L = 153.83' T = 77.15' R = 800.00'	PI Sta 12+58.36 △ = 6° 53' 47.9" (LT) D = 11° 27' 33.0" L = 60.18' T = 30.13' R = 500.00'	PI Sta 13+23.08 △ = 7° 55' 51.4" (RT) D = 11° 27' 33.0" L = 69.21' T = 34.66' R = 500.00'
PI Sta 14+92.66 △ = 9° 19' 25.7" (LT) D = 11° 27' 33.0" L = 81.37' T = 40.77' R = 500.00'	PI Sta 15+51.72 △ = 3° 01' 23.2" (RT) D = 8° 11' 06.4" L = 36.93' T = 18.47' R = 700.00'	

-Y-

PI Sta 10+89.96 △ = 19° 33' 39.6" (LT) D = 114° 35' 29.6" L = 17.07' T = 8.62' R = 50.00'	PI Sta 12+96.32 △ = 16° 28' 02.6" (RT) D = 14° 19' 26.2" L = 114.96' T = 57.88' R = 400.00'	PI Sta 13+96.81 △ = 7° 17' 40.1" (LT) D = 8° 24' 48.5" L = 86.70' T = 43.41' R = 681.00'

-RND-

PI Sta 10+42.00 △ = 90° 00' 00.0" (LT) D = 136° 25' 06.7" L = 65.97' T = 42.00' R = 42.00'	PI Sta 11+07.97 △ = 90° 00' 00.0" (LT) D = 136° 25' 06.7" L = 65.97' T = 42.00' R = 42.00'
PI Sta 11+73.95 △ = 90° 00' 00.0" (LT) D = 136° 25' 06.7" L = 65.97' T = 42.00' R = 42.00'	PI Sta 12+39.92 △ = 90° 00' 00.0" (LT) D = 136° 25' 06.7" L = 65.97' T = 42.00' R = 42.00'

FOR PROFILES, SEE SHEET NO. 5

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ALIGNMENT AND RIGHT OF WAY DETAIL

PROJECT REFERENCE NO.	SHEET NO.
U-5846	4A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: 5/24/2018 — NORTH CAROLINA PROFESSIONAL SEAL 27771 ENGINEER MATTHEW B. COPPLE — Matthew Copple

HYDRAULICS ENGINEER: 5/24/2018 — NORTH CAROLINA PROFESSIONAL SEAL 35621 ENGINEER ANDREW M. HOWELL — Andrew M. Howell

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License: C-2197

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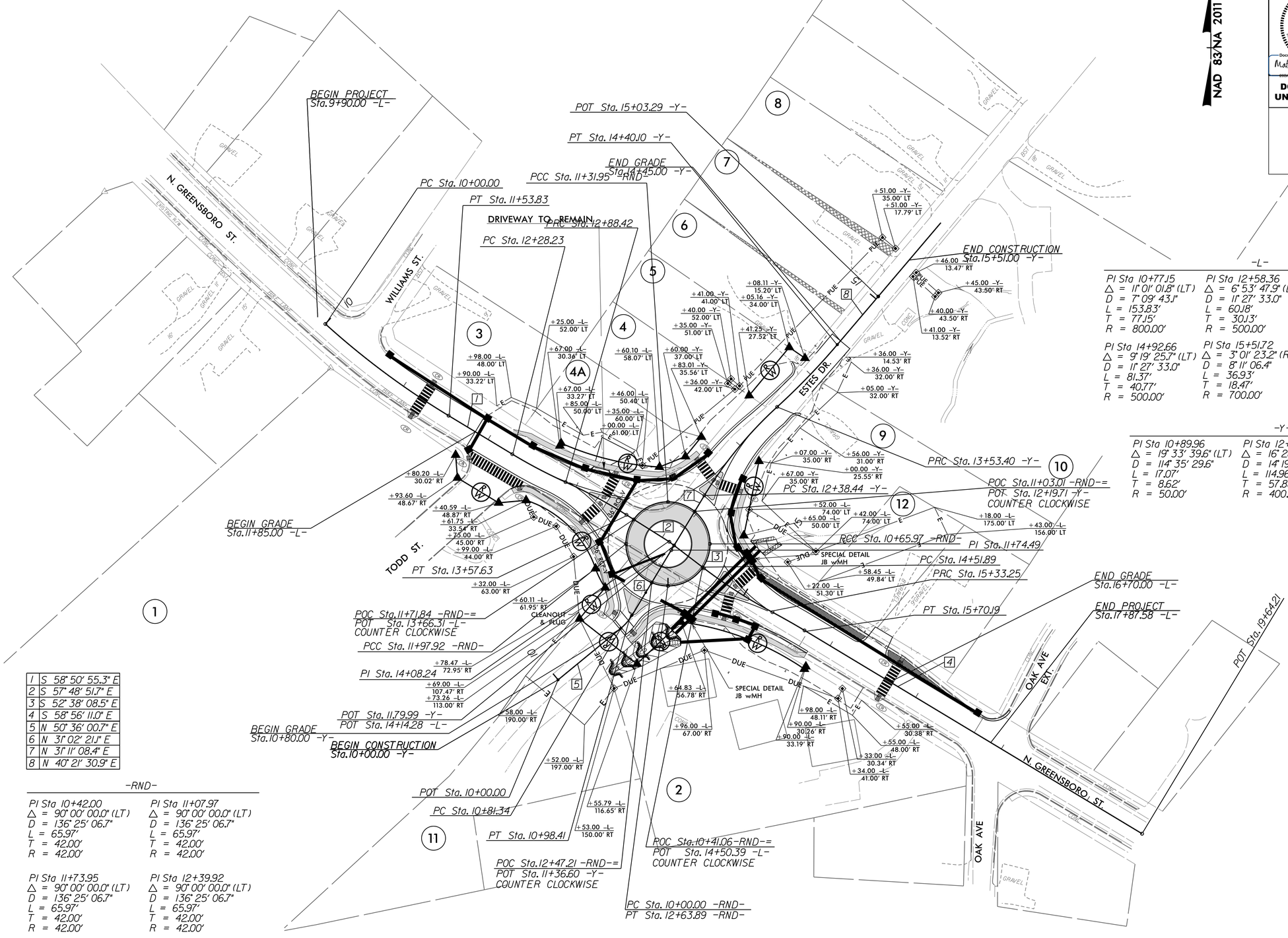

1	S 58° 50' 55.3" E
2	S 57° 48' 51.7" E
3	S 52° 38' 08.5" E
4	S 58° 56' 11.0" E
5	N 50° 36' 00.7" E
6	N 31° 02' 21.1" E
7	N 31° 11' 08.4" E
8	N 40° 21' 30.9" E

-L-

PI Sta 10+77.15
△ = 11° 01' 01.8" (LT)
D = 7° 09' 43.1"
L = 153.83'
T = 77.15'
R = 800.00'

PI Sta 12+58.36
△ = 6° 53' 47.9" (LT)
D = 11° 27' 33.0"
L = 60.18'
T = 30.13'
R = 500.00'

PI Sta 13+23.08
△ = 7° 55' 51.4" (RT)
D = 11° 27' 33.0"
L = 69.21'
T = 34.66'
R = 500.00'

PI Sta 14+92.66
△ = 9° 19' 25.7" (LT)
D = 11° 27' 33.0"
L = 81.37'
T = 40.77'
R = 500.00'

PI Sta 15+51.72
△ = 3° 01' 23.2" (RT)
D = 8° 11' 06.4"
L = 36.93'
T = 18.47'
R = 700.00'

-Y-

PI Sta 10+89.96
△ = 19° 33' 39.6" (LT)
D = 114° 35' 29.6"
L = 17.07'
T = 8.62'
R = 50.00'

PI Sta 12+96.32
△ = 16° 28' 02.6" (RT)
D = 14° 19' 26.2"
L = 114.96'
T = 57.88'
R = 400.00'

PI Sta 13+96.81
△ = 7° 17' 40.1" (LT)
D = 8° 24' 48.5"
L = 86.70'
T = 43.41'
R = 681.00'

-RND-

PI Sta 10+42.00
△ = 90° 00' 00.0" (LT)
D = 136° 25' 06.7"
L = 65.97'
T = 42.00'
R = 42.00'

PI Sta 11+07.97
△ = 90° 00' 00.0" (LT)
D = 136° 25' 06.7"
L = 65.97'
T = 42.00'
R = 42.00'

PI Sta 11+73.95
△ = 90° 00' 00.0" (LT)
D = 136° 25' 06.7"
L = 65.97'
T = 42.00'
R = 42.00'

PI Sta 12+39.92
△ = 90° 00' 00.0" (LT)
D = 136° 25' 06.7"
L = 65.97'
T = 42.00'
R = 42.00'

FOR PROFILES, SEE SHEET NO. 5

REVISIONS

8/17/99

5/24/2018
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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
U-5846	5

ROADWAY DESIGN ENGINEER
5/24/2018
NORTH CAROLINA PROFESSIONAL SEAL 27771 ENGINEER MATTHEW B. LOPPIE
DocuSign envelope ID: 23B1A8C9-E1A1-4B4A-B6B6-B4F4BD
Matthew Loppie

HYDRAULICS ENGINEER
5/24/2018
NORTH CAROLINA PROFESSIONAL SEAL 35621 ENGINEER ANDREW M. HOWELL
DocuSign envelope ID: 4BAB8B6B-B4F4-4BD
Andrew M. Howell

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Fax:919-789-9591
License: C-2197

-L-

PIPE HYDRAULIC DATA
18" RCP-IV Sta. 11+88.5 -L-

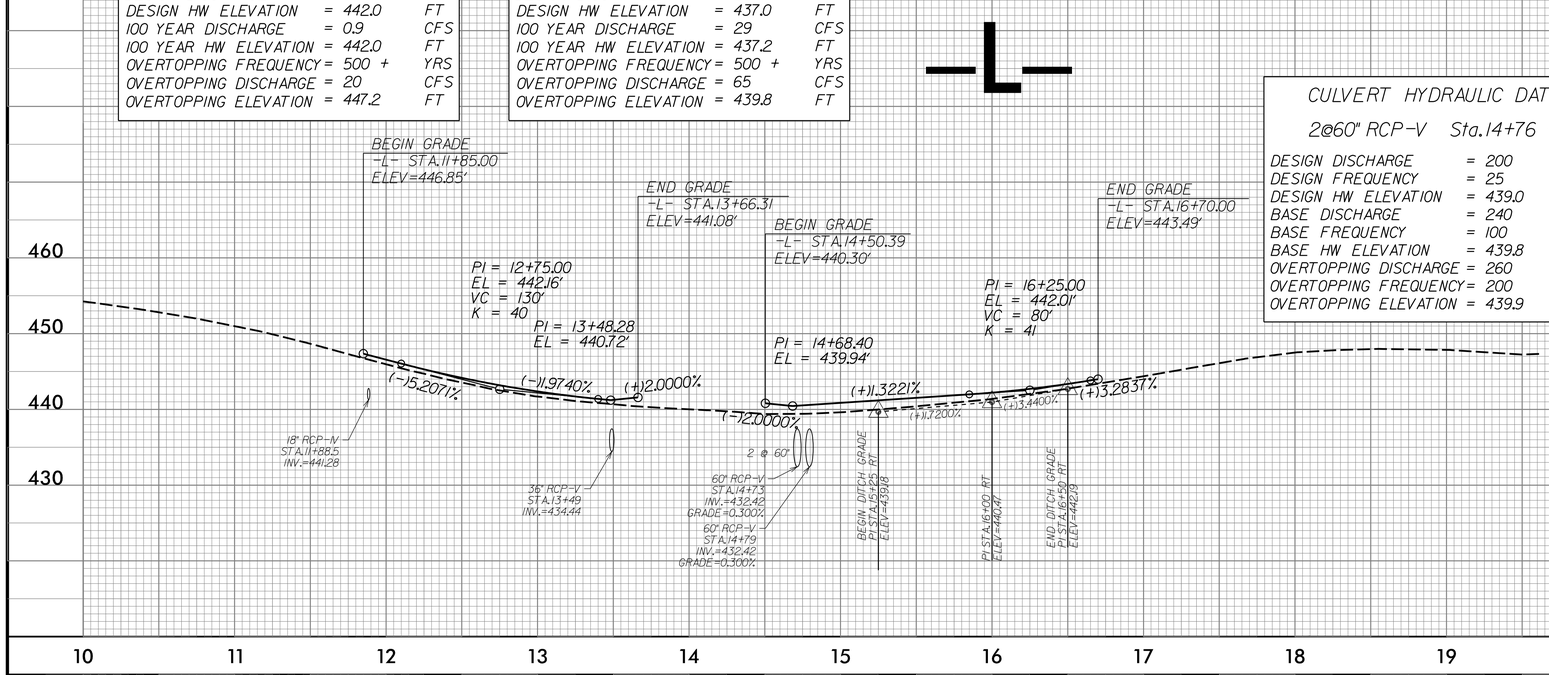
DRAINAGE AREA	= 0.2	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 0.8	CFS
DESIGN HW ELEVATION	= 442.0	FT
100 YEAR DISCHARGE	= 0.9	CFS
100 YEAR HW ELEVATION	= 442.0	FT
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING DISCHARGE	= 20	CFS
OVERTOPPING ELEVATION	= 447.2	FT

PIPE HYDRAULIC DATA
36" RCP-V Sta. 13+49 -L-

DRAINAGE AREA	= 6.4	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 26	CFS
DESIGN HW ELEVATION	= 437.0	FT
100 YEAR DISCHARGE	= 29	CFS
100 YEAR HW ELEVATION	= 437.2	FT
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING DISCHARGE	= 65	CFS
OVERTOPPING ELEVATION	= 439.8	FT

CULVERT HYDRAULIC DATA
2@60" RCP-V Sta. 14+76 -L-

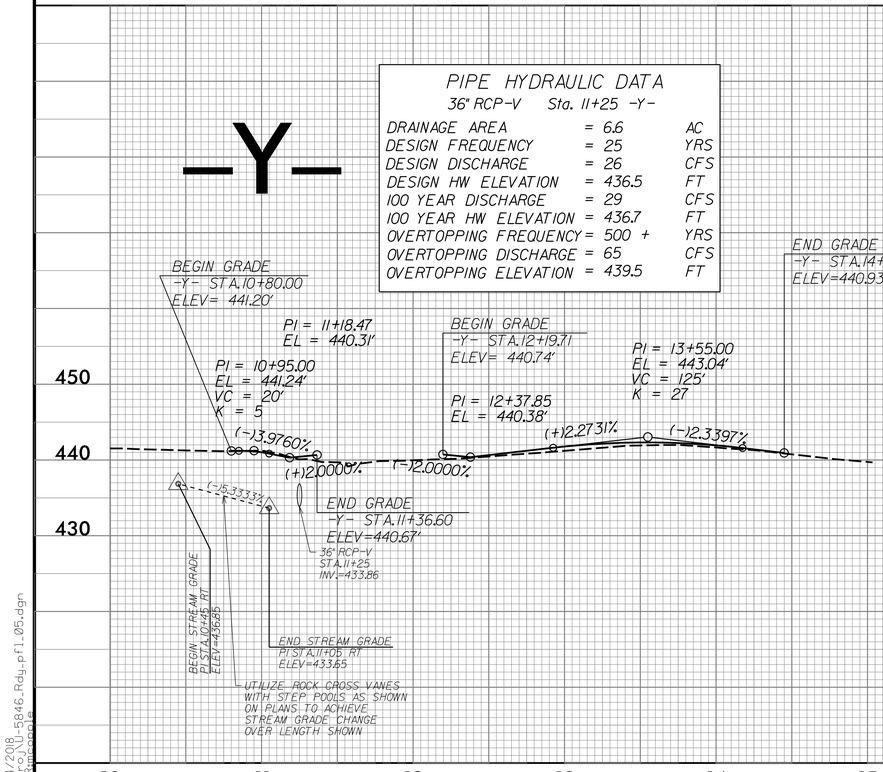
DESIGN DISCHARGE	= 200	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 439.0	FT
BASE DISCHARGE	= 240	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 439.8	FT
OVERTOPPING DISCHARGE	= 260	CFS
OVERTOPPING FREQUENCY	= 200	YRS
OVERTOPPING ELEVATION	= 439.9	FT



-Y-

PIPE HYDRAULIC DATA
36" RCP-V Sta. 11+25 -Y-

DRAINAGE AREA	= 6.6	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 26	CFS
DESIGN HW ELEVATION	= 436.5	FT
100 YEAR DISCHARGE	= 29	CFS
100 YEAR HW ELEVATION	= 436.7	FT
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING DISCHARGE	= 65	CFS
OVERTOPPING ELEVATION	= 439.5	FT



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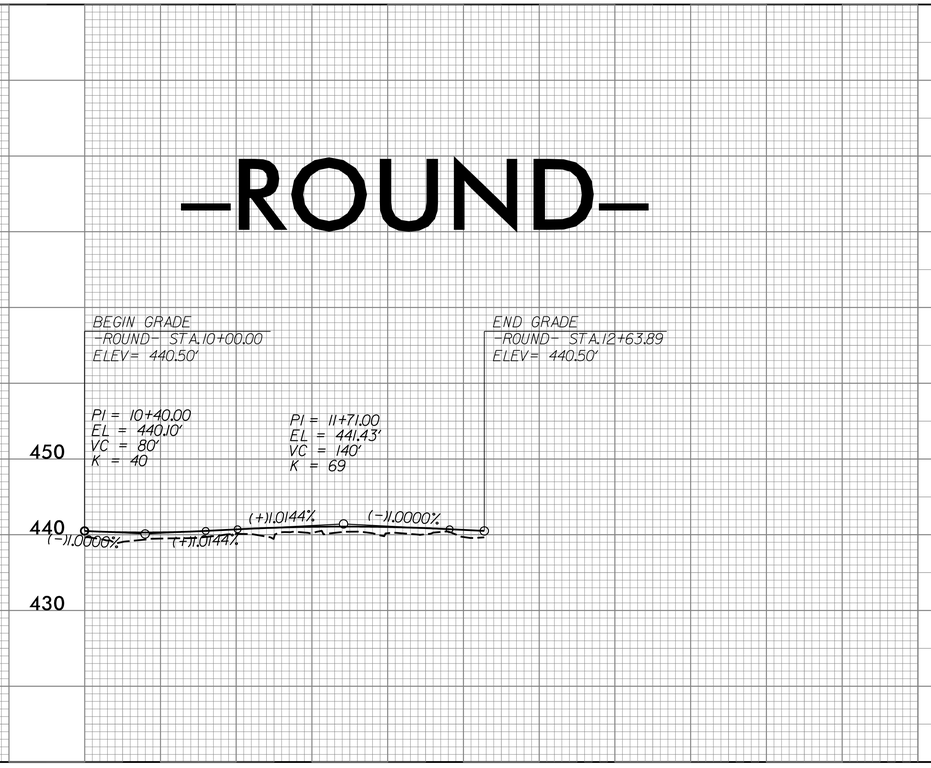

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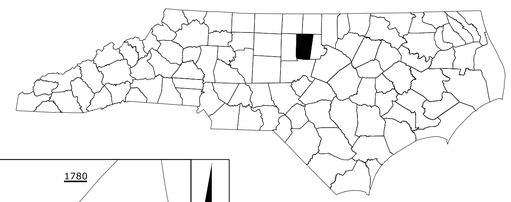
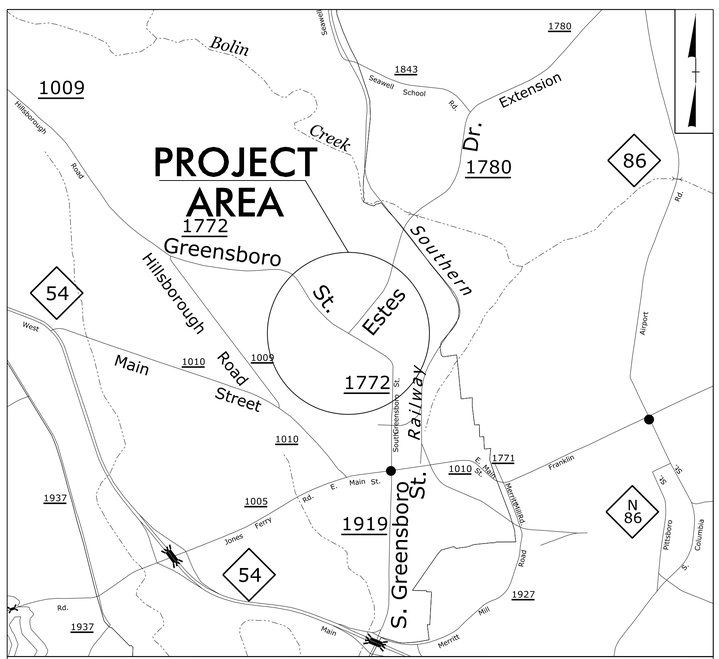
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

ORANGE COUNTY





VICINITY MAP

LOCATION: SR 1772 (GREENSBORO STREET) AT SR 1780 (ESTES DRIVE) IN CARRBORO. CONSTRUCT ROUNDABOUT

TYPE OF WORK: GRADING, DRAINAGE, & PAVING

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, AND TEMPORARY PAVEMENT MARKINGS SCHEDULE
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES AND GENERAL NOTES)
TMP-2	PHASING
TMP-3	PHASE I
TMP-4	PHASE II
TMP-5	PHASE III

SHEET NO.
TMP-1

TIP PROJECT: U-5846

CONTRACT: DG00458

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. E. HUMMER, PHD, PE STATE TRAFFIC MANAGEMENT ENGINEER

_____ TRAFFIC CONTROL PROJECT ENGINEER

_____ TRAFFIC CONTROL PROJECT DESIGN ENGINEER

_____ TRAFFIC CONTROL DESIGN ENGINEER

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

SEPI ENGINEERING & CONSTRUCTION
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Raleigh, NC 27605
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Fax:919-789-9591
License: C-2197

APPROVED: DocuSigned by: Steve Miller 9FBC6C15CEEB486...

DATE: 8/14/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

8/6/2018
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PROJ. REFERENCE NO.	SHEET NO.
U-5846	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 2018 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
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES - TYPE III
1150.01	FLAGGERS
1180.01	SKINNY DRUMS
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
1205.07	PAVEMENT MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1253.01	RAISED PAVEMENT MARKERS - SNOWPLOWABLE

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA
- REMOVAL
- WEDGING
- USER DEFINED (IF NEEDED)

SIGNALS

EXISTING PROPOSED TEMPORARY

PAVEMENT MARKINGS

EXISTING LINES
TEMPORARY LINES

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

TEMPORARY PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
	PAINT(4")
P8	2 FT. - 6 FT./SP WHITE MINISKIP
PA	WHITE EDGELINE
PB	YELLOW EDGELINE
PE	WHITE SOLID LANE LINE
PI	YELLOW DOUBLE CENTER
	PAINT(8")
P17	3 FT. - 3 FT./SP WHITE MINISKIP
PN	WHITE GORELINE
PQ	WHITE CROSSWALK LINE
	PAINT(24")
P2	WHITE STOPBAR
P3	WHITE CROSSWALK LINE

SYMBOL	DESCRIPTION
	PAINT SYMBOLS
QA	LEFT TURN ARROW
QB	RIGHT TURN ARROW
QD	COMBO. LEFT/STRAIGHT ARROW
QE	COMBO. RIGHT/STRAIGHT ARROW
QR	SHARROW
QV	FISH-HOOK LEFT/STRAIGHT ARROW
QW	FISH-HOOK RIGHT/STRAIGHT ARROW
QX	FISH-HOOK LEFT/RIGHT ARROW

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

ROADWAY STANDARD DRAWINGS, LEGEND, AND TEMPORARY PAVEMENT MARKING SCHEDULE

8/6/2018
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MANAGEMENT STRATEGIES

- TRAFFIC WILL BE MAINTAINED THROUGH CONSTRUCTION WITH THE USE OF LANE CLOSURES

- PROVIDE ONE MONTH NOTICE TO THE ENGINEER, ORANGE COUNTY EMERGENCY SERVICES, AND ORANGE COUNTY SCHOOL OFFICIALS PRIOR TO ALTERING THE TRAFFIC PATTERN.

GENERAL 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
GREENSBORO ST. & ESTES DR.	MONDAY-FRIDAY SUNSET-9:00 A.M., 4:00 P.M.-6:00 P.M. FRIDAY AT SUNSET-SUNRISE SATURDAY SUNSET SATURDAY-MONDAY 9:00 A.M.-NO SUNDAY WORK

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

ROAD NAME
SR 1772 (GREENSBORO ST.)
SR 1780 (ESTES DR.)

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 7:00 P.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 7:00 P.M. THE FOLLOWING TUESDAY.

3. FOR EASTER, BETWEEN THE HOURS OF 6:00 A.M.-7:00 P.M. THURSDAY AND MONDAY.

4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY TO 7:00 P.M. TUESDAY.

5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 7:00 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 7:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.

6. FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY AND 7:00 P.M. TUESDAY.

7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6:00 A.M. TUESDAY TO 7:00 P.M. MONDAY.

8. FOR CHRISTMAS, BETWEEN THE HOURS OF 6:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 7:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

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) 350 FEET IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

J) NOTIFY THE ENGINEER ONE MONTH PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

K) INSTALL ADVANCE WORK ZONE WARNING SIGNS 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.

M) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 350 FEET IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

N) 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.

PAVEMENT MARKINGS AND MARKERS

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

ROAD NAME	MARKING	MARKER
SR 1772	PAINT	TEMPORARY RAISED
SR 1780	PAINT	TEMPORARY RAISED

P) 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.

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

R) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

S) TRACE THE PROPOSED MONOLITHIC ISLAND LOCATIONS WITH PROPER COLOR PAVEMENT MARKINGS PRIOR TO INSTALLATION. PLACE DRUMS TO DELINEATE ANY PROPOSED MONOLITHIC ISLANDS.

MISCELLANEOUS

T) ALL CURB RAMP LOCATIONS SHALL BE DERIVED FROM STATIONING SHOWN ON PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER IN COORDINATION WITH THE SIGNING AND DELINEATION UNIT.

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NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

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

TRANSPORTATION OPERATIONS PLAN

6/5/2018
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PROJ. REFERENCE NO.	SHEET NO.
U-5846	TMP-2

PHASING

PHASE I

STEP 1: USING ROADWAY STANDARD DRAWING (RSD) 1101.01 SHEET 3 OF 3 INSTALL ADVANCE WARNING SIGNS ON SR 1772 (GREENSBORO ST.) AND SR 1780 (ESTES DR).

STEP 2: USING RSD 1101.02 SHEET 1 OF 15, PERFORM THE FOLLOWING IN A CONTINUOUS MANNER:

- BEGIN CONSTRUCTION AWAY FROM EXISTING TRAFFIC WITH FOCUS ON PEDESTRIAN MOVEMENTS
- PLACE TRAFFIC CONTROL DEVICES AND INSTALL TEMPORARY PAVEMENT MARKINGS AS SHOWN ON TMP-3

STEP 3: USING RSD 1101.02 SHEET 1 OF 15, BEGIN CONSTRUCTION FROM -L- 11+85 TO -L- 17+87.58, AND FROM -Y- 10+80 TO -Y- 14+40.10, UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE.

STEP 4: PLACE TRAFFIC CONTROL DEVICES, TEMPORARY PAINT AS SHOWN ON TMP-4 AND SHIFT TRAFFIC INTO THE PHASE II PATTERN.

PHASE II

STEP 1: OPEN COMPLETED PEDESTRIAN SIDEWALKS AND REFUGES

STEP 2: PERFORM THE FOLLOWING IN A CONTINUOUS MANNER:

- CONTINUE CONSTRUCTION AWAY FROM TRAFFIC
- USE WEDGING TO CONSTRUCT A TIE IN FROM THE EXISTING PATTERN TO THE PROPOSED TEMPORARY ROUNDABOUT PATTERN.
- WITH TRAFFIC IN THE TEMPORARY PATTERN, USE RSD 1101.02 SHEET 1 OF 15 TO COMPLETE CONSTRUCTION UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE.

STEP 3: PLACE TRAFFIC CONTROL DEVICES, TEMPORARY PAINT AS SHOWN ON TMP-5 AND SHIFT TRAFFIC INTO THE FINAL PATTERN.

PHASE III

STEP 1: CONSTRUCT REMAINING MONOLITHIC ISLANDS AND PROPOSED ROADWAY

STEP 2: COMPLETE CONSTRUCTION AND REMOVE ALL DESIGNATED ASPHALT

STEP 3: USING RSD 1101.02 SHEET 1 OF 15, PLACE THE FINAL LAYER OF SURFACE COURSE AND INSTALL THE FINAL PAVEMENT MARKINGS ACCORDING TO THE PAVEMENT MARKING PLANS.

STEP 4: REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES.

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

PHASING

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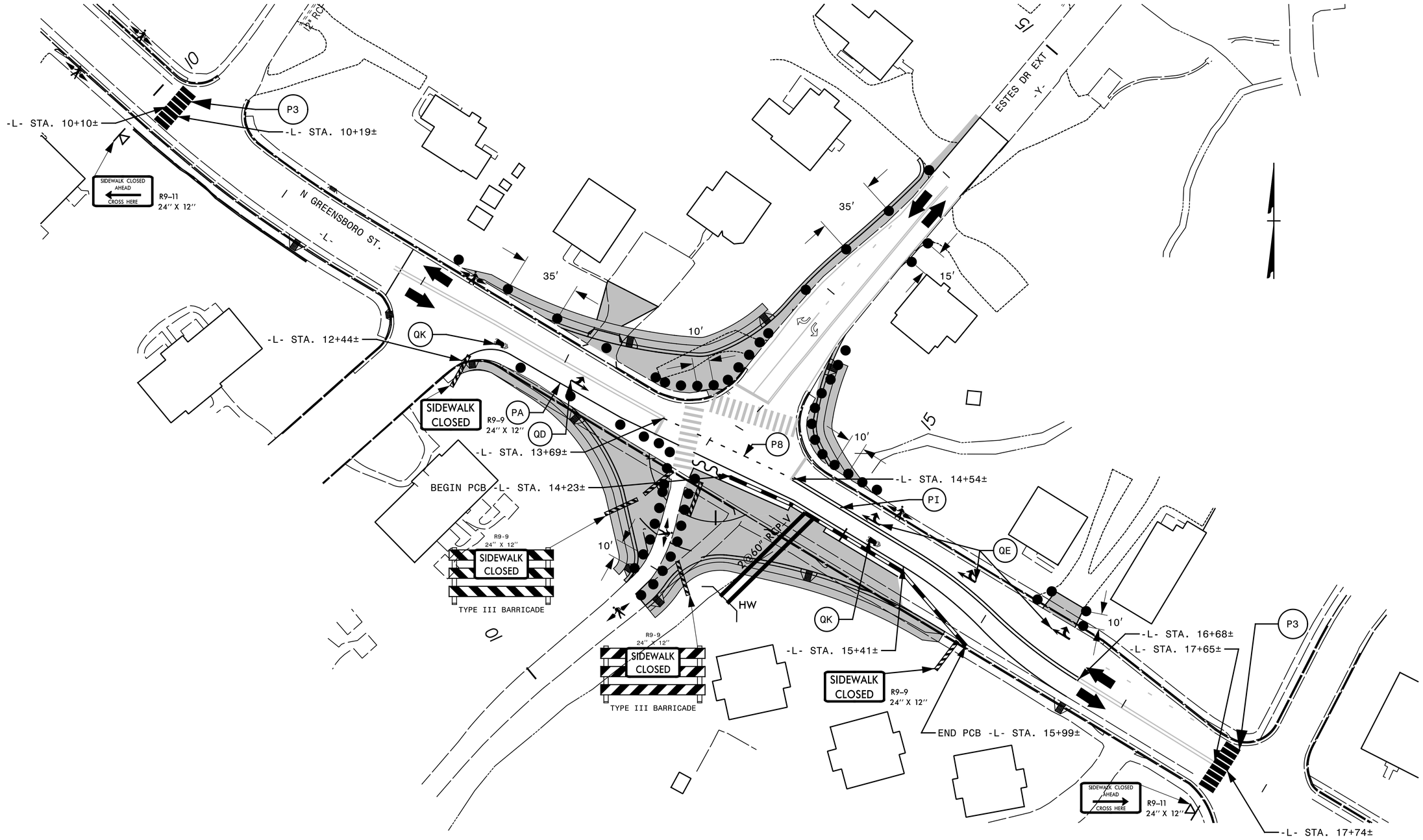
PROJ. REFERENCE NO.	SHEET NO.
U-5846	TMP-3



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DATE: 5/25/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

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

PHASE I

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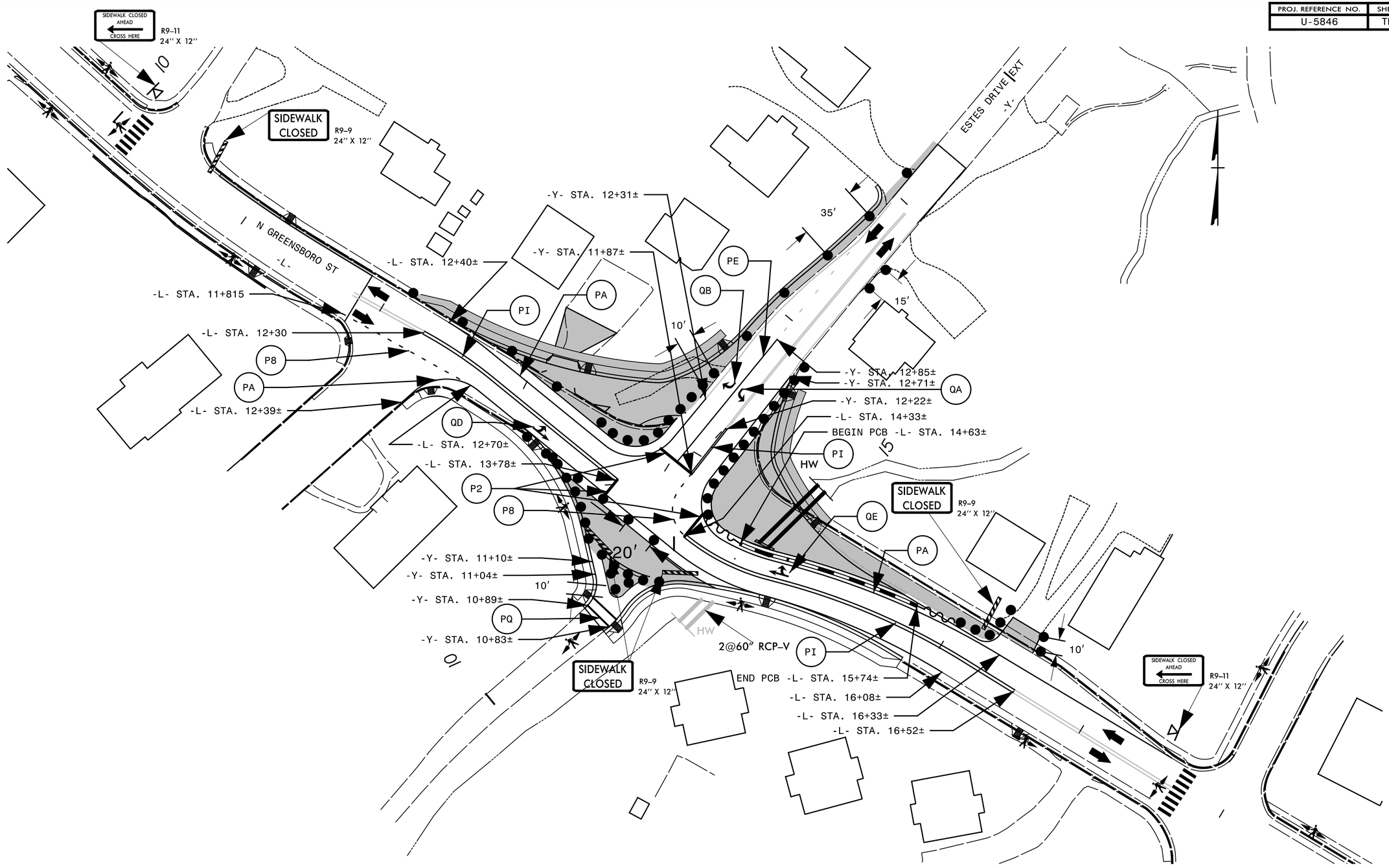
PROJ. REFERENCE NO.	SHEET NO.
U-5846	TMP-4



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DATE: 5/25/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

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

PHASE II

5/21/2018
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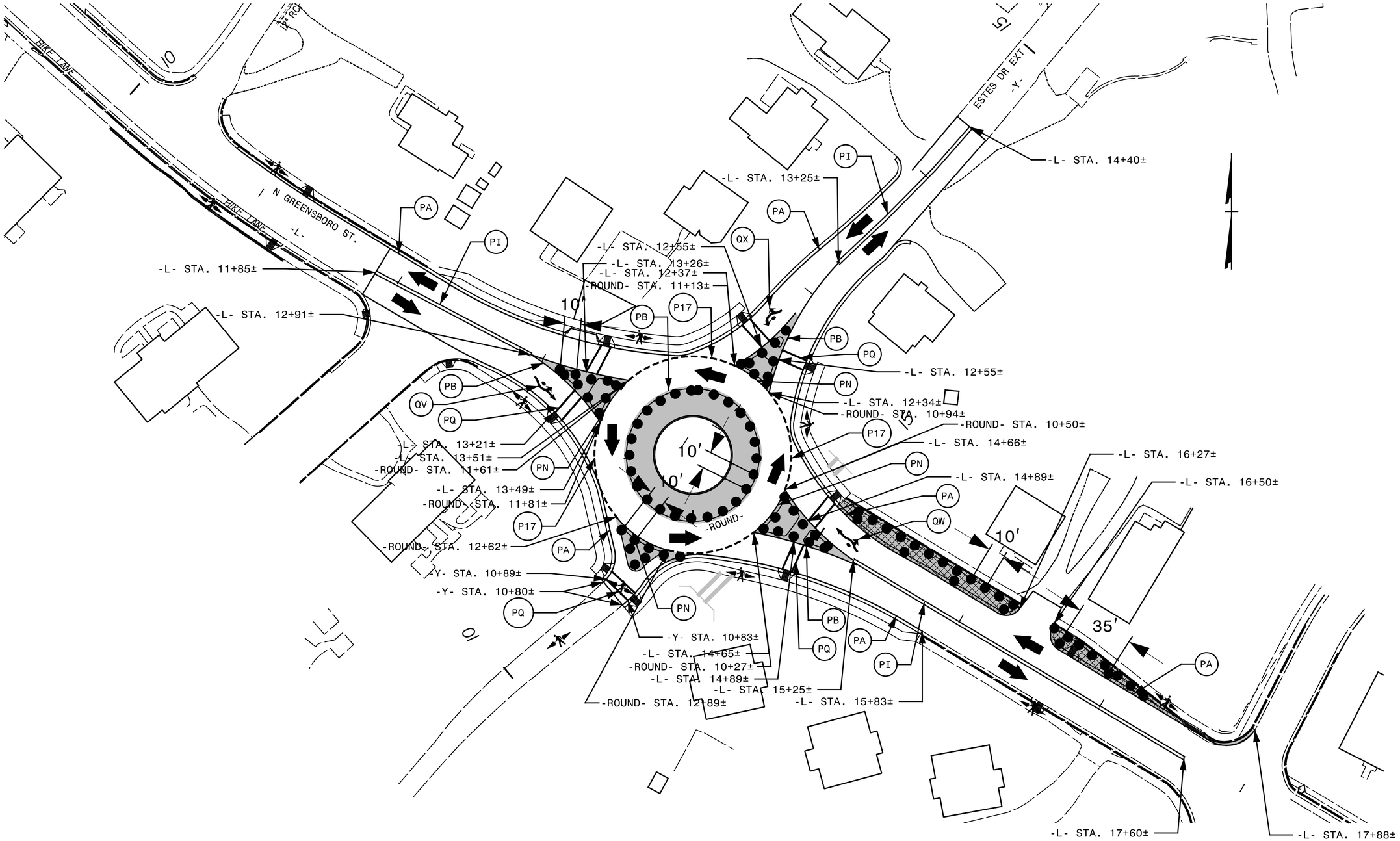
U-5846	TMP-5



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NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

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

PHASE III

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TIP NO.	SHEET NO.
U-5846	PMP-1

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DATE: 8/14/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
ORANGE COUNTY

LOCATION: SR 1772 (GREENSBORO STREET) AT SR 1780 (ESTES DRIVE) IN CARRBORO. CONSTRUCT ROUNDABOUT

PROJECT: U-5846

CONTRACT: DG00458

INDEX

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

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
	THERMOPLASTIC(4", 90 MIL)
TA	WHITE EDGELINE
TB	YELLOW EDGELINE
	THERMOPLASTIC(4", 120 MIL)
TI	YELLOW DOUBLE CENTER
	THERMOPLASTIC(8", 90 MIL)
TN	WHITE GORELINE
	THERMOPLASTIC(8", 120 MIL)
T17	3 FT. - 3 FT./SP WHITE MINISKIP
TQ	WHITE CROSSWALK LINE
	THERMOPLASTIC(24", 120 MIL)
T3	WHITE CROSSWALK LINE
	THERMOPLASTIC(90 MIL)
UN	24" YIELD LINE TRIANGLE
	THERMOPLASTIC(120 MIL)
UI	ALPHANUMERIC CHARACTERS

GENERAL NOTES

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.

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

ROAD NAME	MARKING	MARKER
SR 1772 (GREENSBORO ST.)	THERMOPLASTIC	NONE
SR 1780 (ESTES DR.)	THERMOPLASTIC	NONE

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

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

D) 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.

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 2018 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 AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.07	PAVEMENT MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS

PLAN PREPARED BY: SEPI Engineering

STEVE MILLER, P.E. PROJECT MANAGER

JOHN BAUMAN, E.I. TRAFFIC ENGINEER

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8/6/2018
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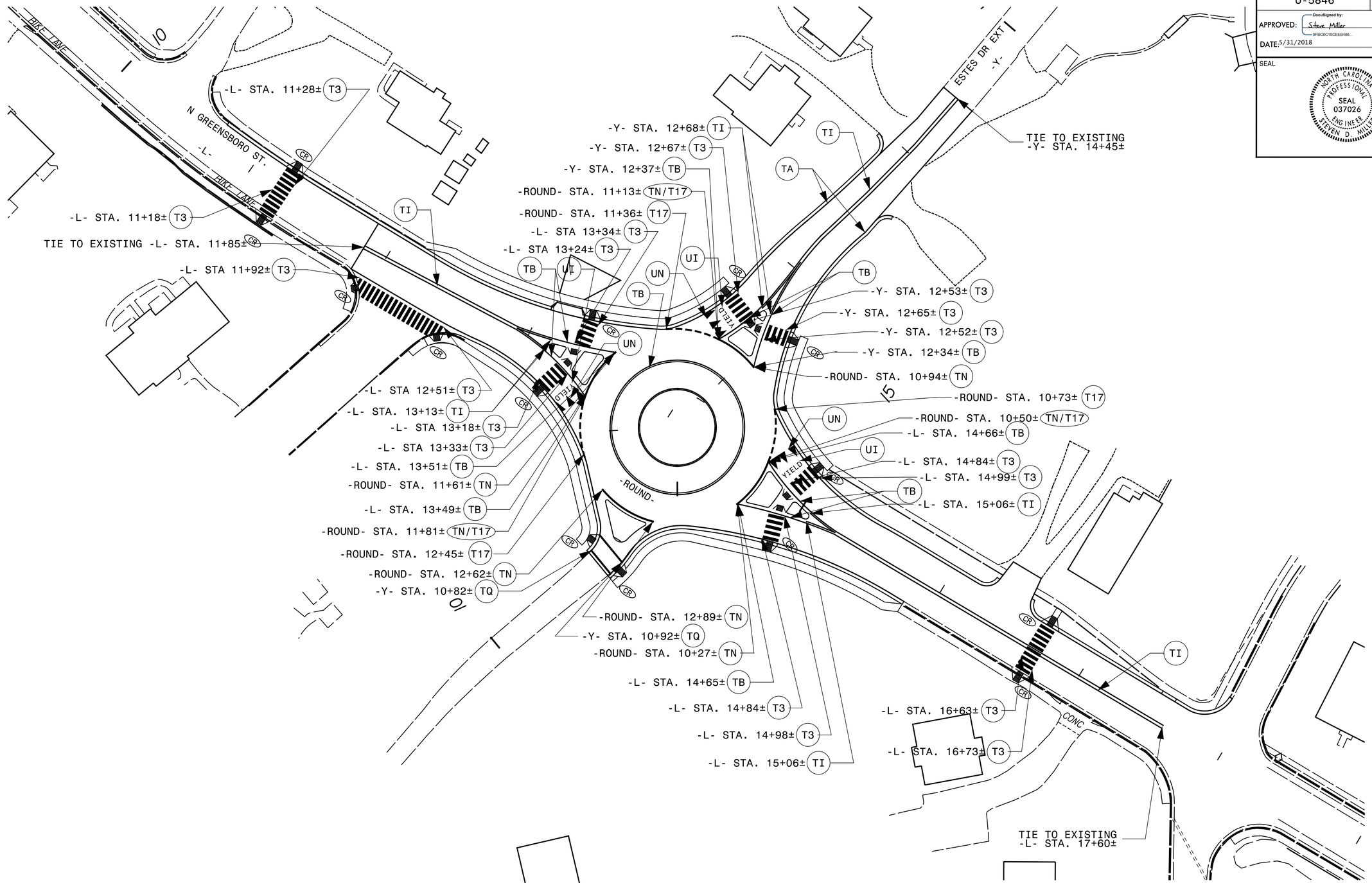
TIP NO.	SHEET NO.
U-5846	PMP-2

APPROVED: DocuSigned by: Steve Miller 9FBC6C15CEEB486...

DATE: 5/31/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER



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PAVEMENT MARKING DETAIL

5/31/2018
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JBaumann

TIP PROJECT: U-5846

CONTRACT: DG00420

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5846	EC-1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
50236.1.1		PE
50236.2.1		R/W
50236.3.1		CONST.

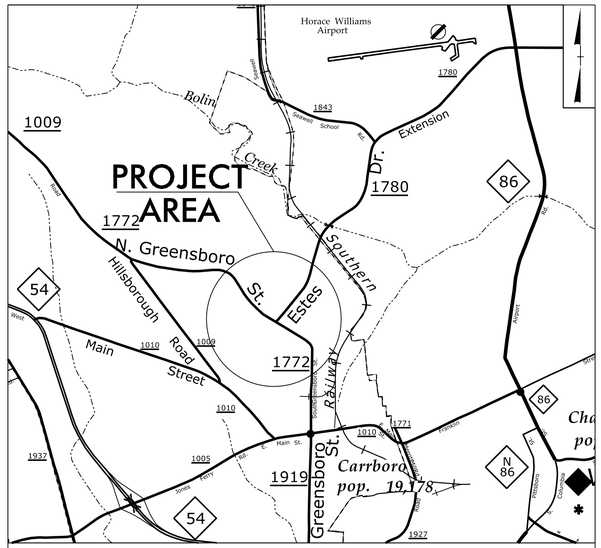
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

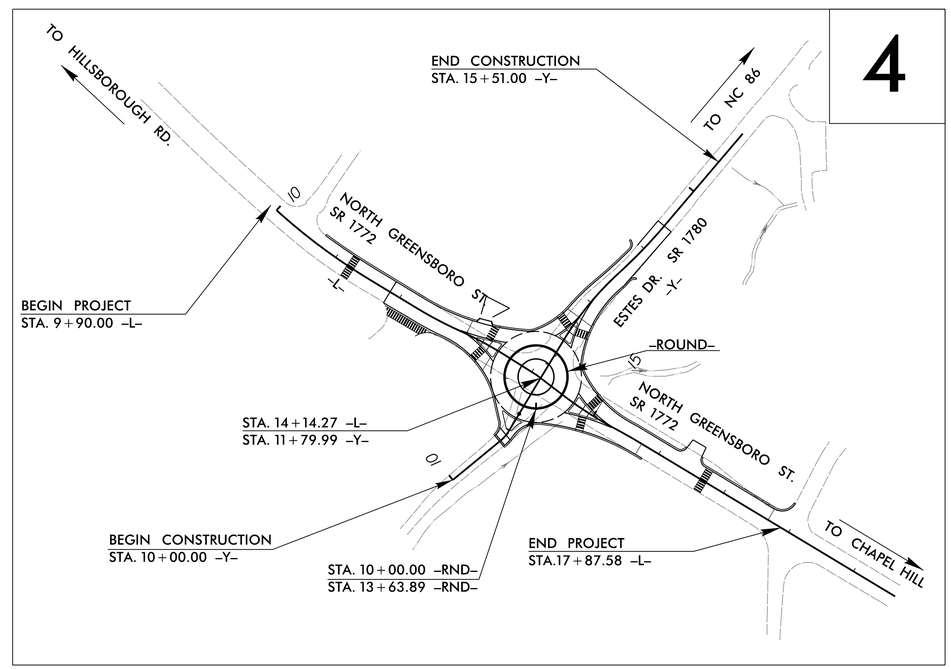
ORANGE COUNTY

LOCATION: SR 1772 (GREENSBORO STREET) AT SR 1780 (ESTES DRIVE) IN CARRBORO. CONSTRUCT ROUNDABOUT.

TYPE OF WORK: GRADING, DRAINAGE, AND PAVING



VICINITY MAP



NAD 83/2011

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
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	EW 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.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

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

GRAPHIC SCALES

50 25 0 50 100

PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 1, 2016 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER RESOURCES.

Prepared in the Office of:

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Designed by:

Andrew M. Howell — *NAME*

3105 — *LEVEL III CERTIFICATION NO.*

Reviewed in the Office of:

ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St.
Raleigh, NC 27611

2018 STANDARD SPECIFICATIONS

Reviewed by:

Aaron Harper

Roadway Standard Drawings

The following roadway <u>english</u> standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2018 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		

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PROJECT REFERENCE NO.	SHEET NO.
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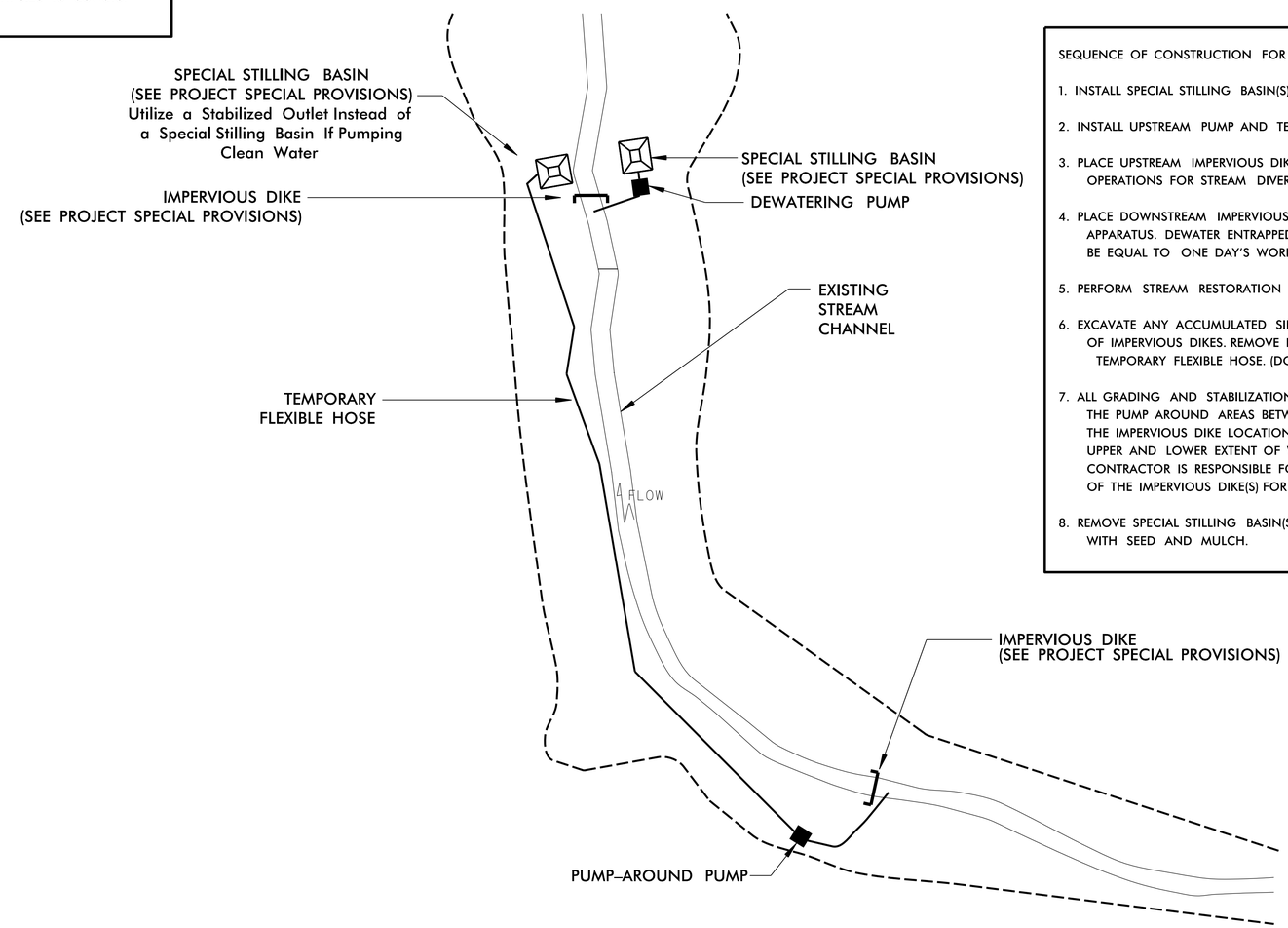
EXAMPLE OF PUMP–AROUND OPERATION

NOTES:
1) All excavation shall be performed in only dry or isolated sections of channel.
2) Impervious dikes are to be used to isolate work from stream flow when necessary.
3) All graded areas shall be stabilized within 24 hours.
4) Maintenance of stream flow operations shall be incidental to the work. This includes polyethylene sheeting, diversion pipes, pumps and hoses.
5) Pumps and hoses shall be of sufficicient size to dewater the work area.



SEQUENCE OF CONSTRUCTION FOR TYPICAL WORK AREA

1. INSTALL SPECIAL STILLING BASIN(S).
2. INSTALL UPSTREAM PUMP AND TEMPORARY FLEXIBLE HOSE.
3. PLACE UPSTREAM IMPERVIOUS DIKE AND BEGIN PUMPING OPERATIONS FOR STREAM DIVERSION.
4. PLACE DOWNSTREAM IMPERVIOUS DIKE AND PUMPING APPARATUS. DEWATER ENTRAPPED AREA. AREA TO BE DEWATERED SHALL BE EQUAL TO ONE DAY'S WORK.
5. PERFORM STREAM RESTORATION WORK IN ACCORDANCE WITH THE PLANS.
6. EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES. REMOVE IMPERVIOUS DIKES, PUMPS, AND TEMPORARY FLEXIBLE HOSE. (DOWNSTREAM IMPERVIOUS DIKES FIRST).
7. ALL GRADING AND STABILIZATION MUST BE COMPLETED IN ONE DAY WITHIN THE PUMP AROUND AREAS BETWEEN THE IMPERVIOUS DIKES. THE IMPERVIOUS DIKE LOCATIONS AS SHOWN ON THIS SHEET ONLY SHOW THE UPPER AND LOWER EXTENT OF WORK FOR EACH STREAM SEGMENT. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE LOCATION OF THE IMPERVIOUS DIKE(S) FOR EACH DAY'S WORK.
8. REMOVE SPECIAL STILLING BASIN(S) AND BACKFILL. STABILIZE DISTURBED AREA WITH SEED AND MULCH.

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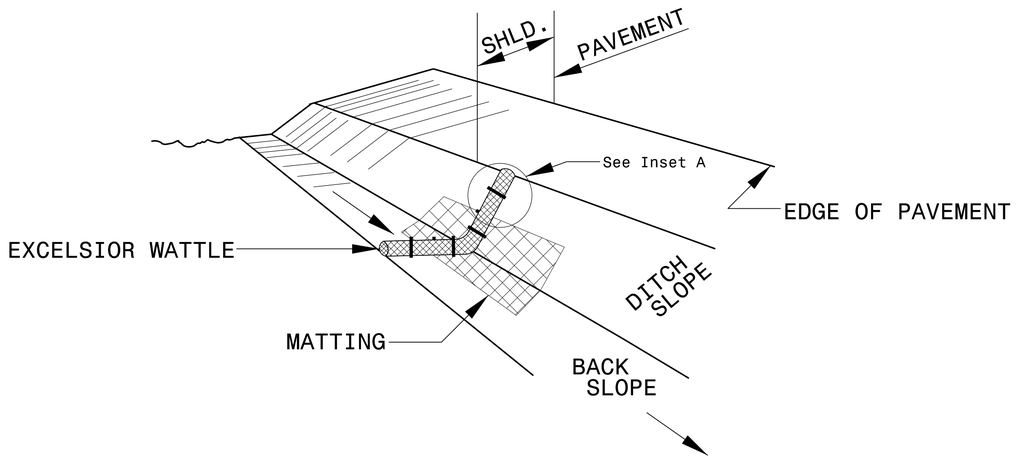
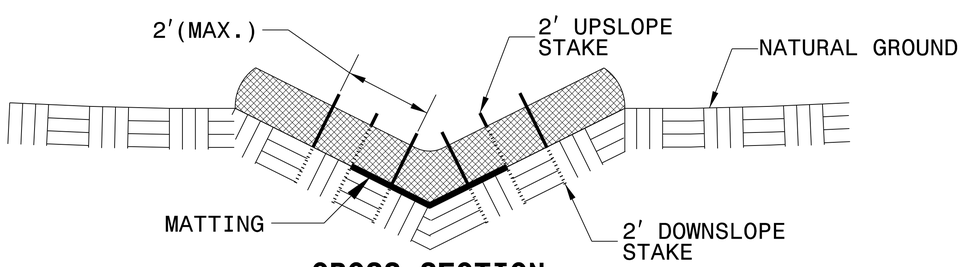
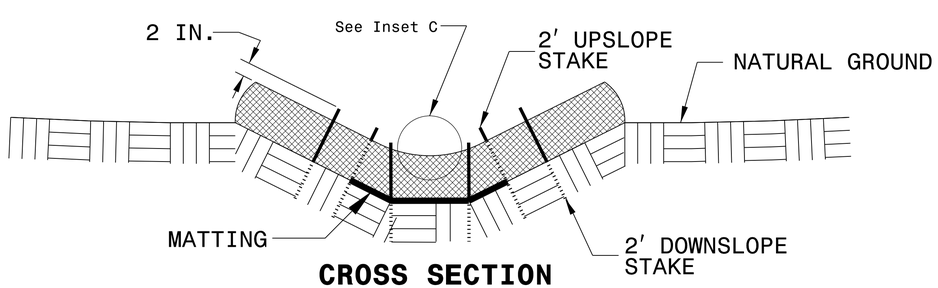
WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



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.

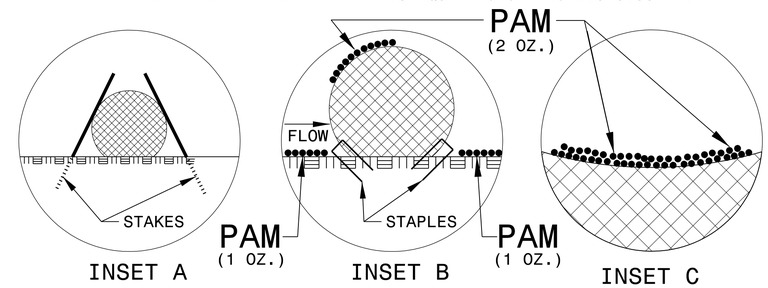
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

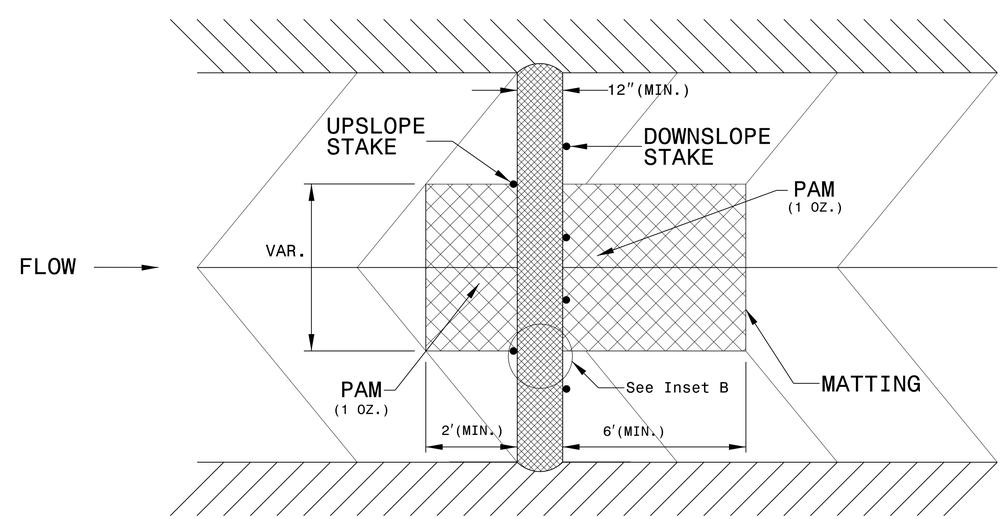
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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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PROJECT REFERENCE NO.	SHEET NO.
U-5846	EC-3

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DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	15+25	16+50	RT	90
				SUBTOTAL	90
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					6,250
				TOTAL	6,340
				SAY	6,500

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)

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PROJECT REFERENCE NO.	SHEET NO.
U-5846	EC-3A

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DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

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

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5/5/2017
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PROJECT REFERENCE NO.	SHEET NO.
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PROPOSED ROADWAY WORK AND DRAINAGE NOT SHOWN IN CLEARING AND GRUBBING PHASE PLAN FOR CLARITY

NAD 83/NA 2011

GRAPHIC SCALES
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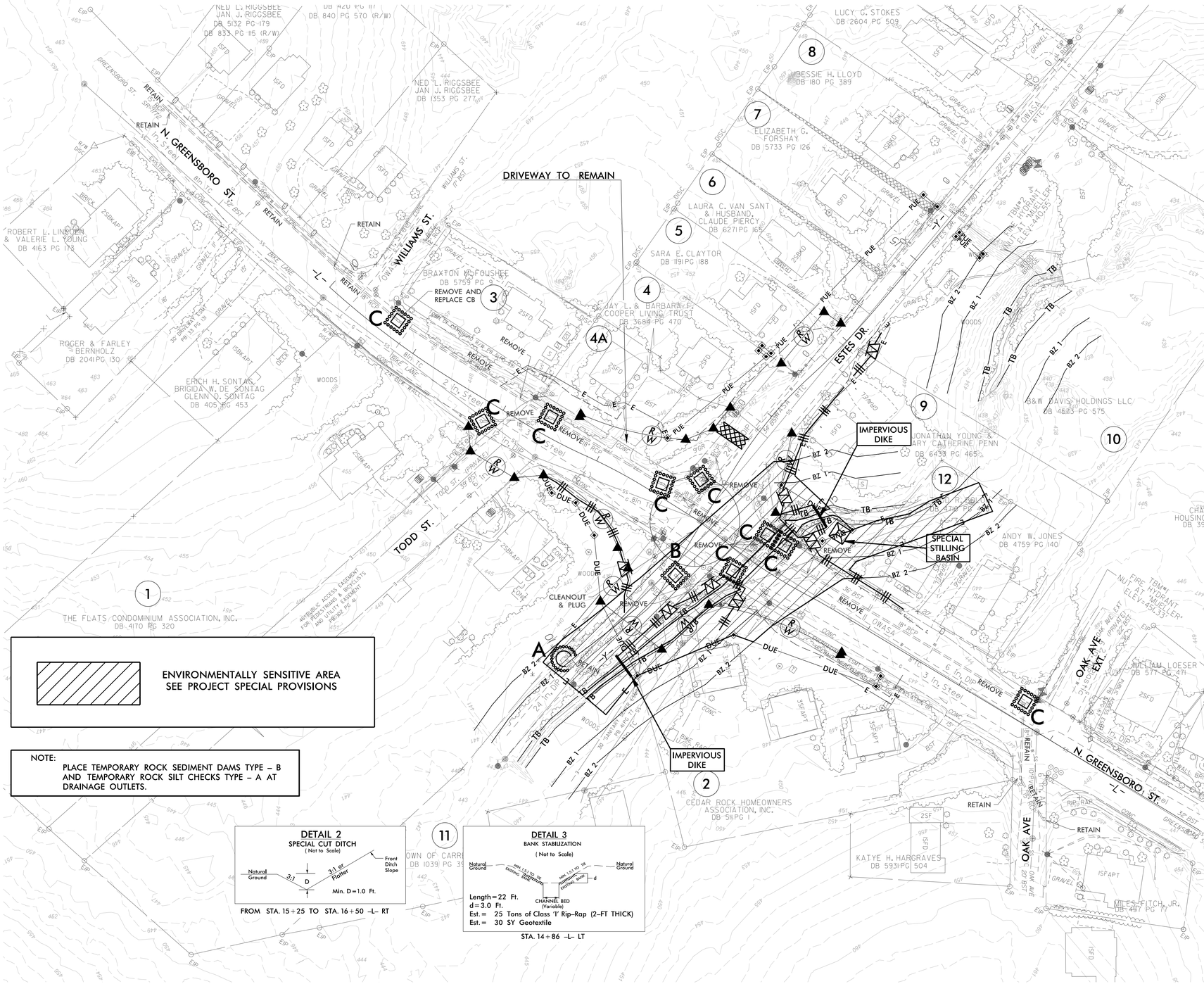
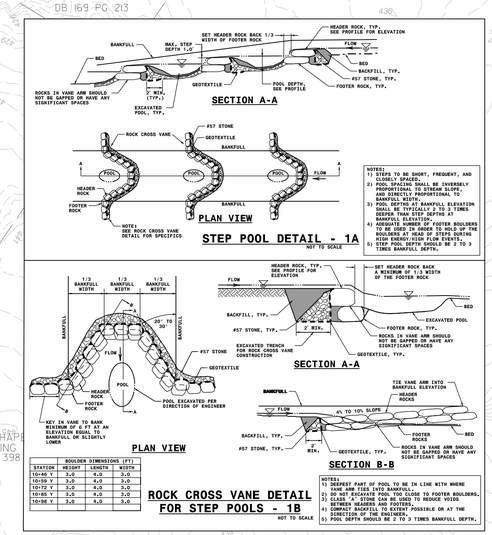
PLANS





BOULDER DIMENSIONS (FT)			
STATION	HEIGHT	LENGTH	WIDTH
10+46 Y	3.0	4.0	3.0
10+59 Y	3.0	4.0	3.0
10+72 Y	3.0	4.0	3.0
10+85 Y	3.0	4.0	3.0
10+98 Y	3.0	4.0	3.0

FROM STA. 15+25 TO STA. 16+50 –L– RT

Length=22 Ft.
d=3.0 Ft.
Est.= 25 Tons of Class 'I' Rip-Rap (2-FT THICK)
Est.= 30 SY Geotextile

STA. 14+86 –L– LT

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

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

FOR PROFILES, SEE SHEET NO. 5

REVISIONS

8/17/99

DGN: CRAMER
CELL: SYTIME

PROJECT REFERENCE NO.	SHEET NO.
U-5846	EC-5/CONST.4

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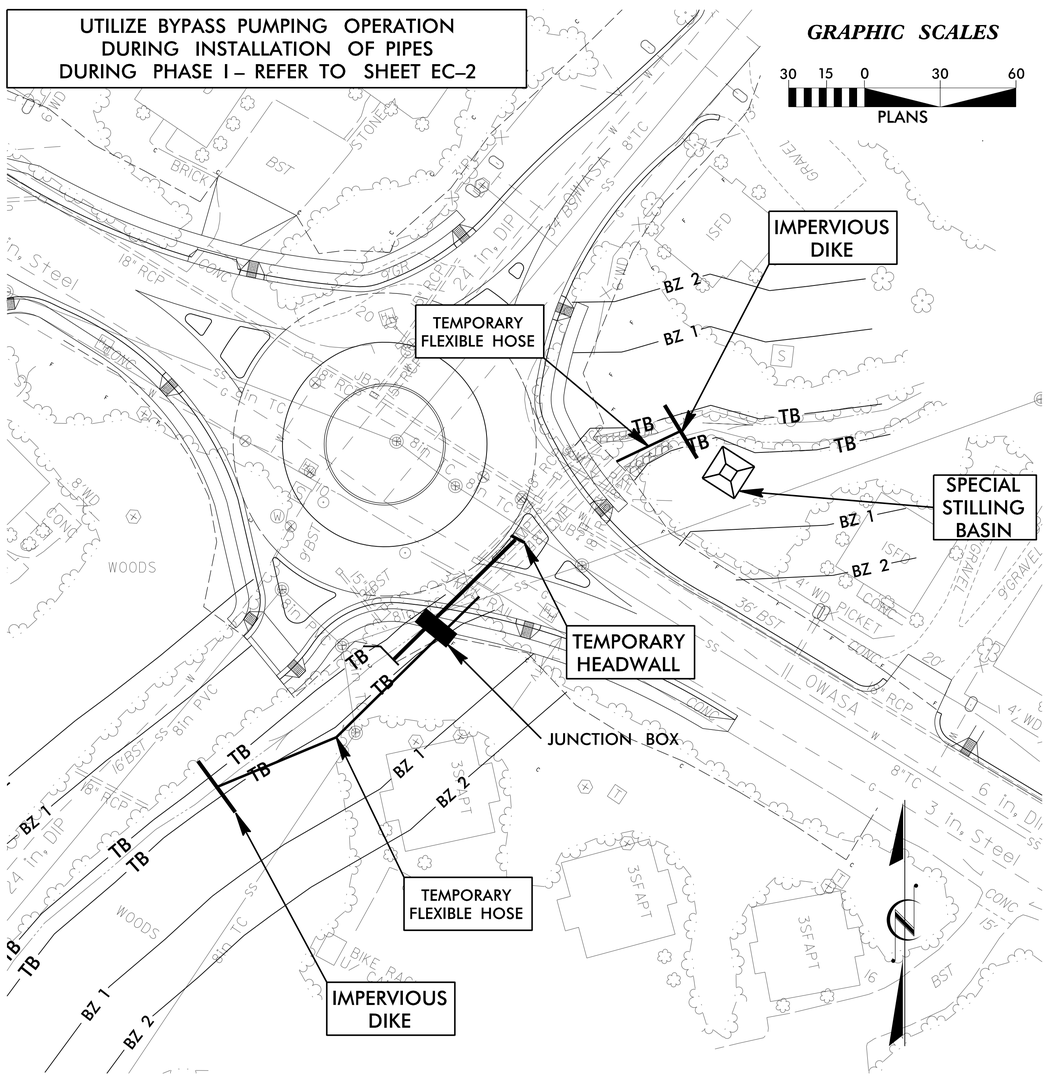
CULVERT CONSTRUCTION SEQUENCE STA. 14+76 –L–

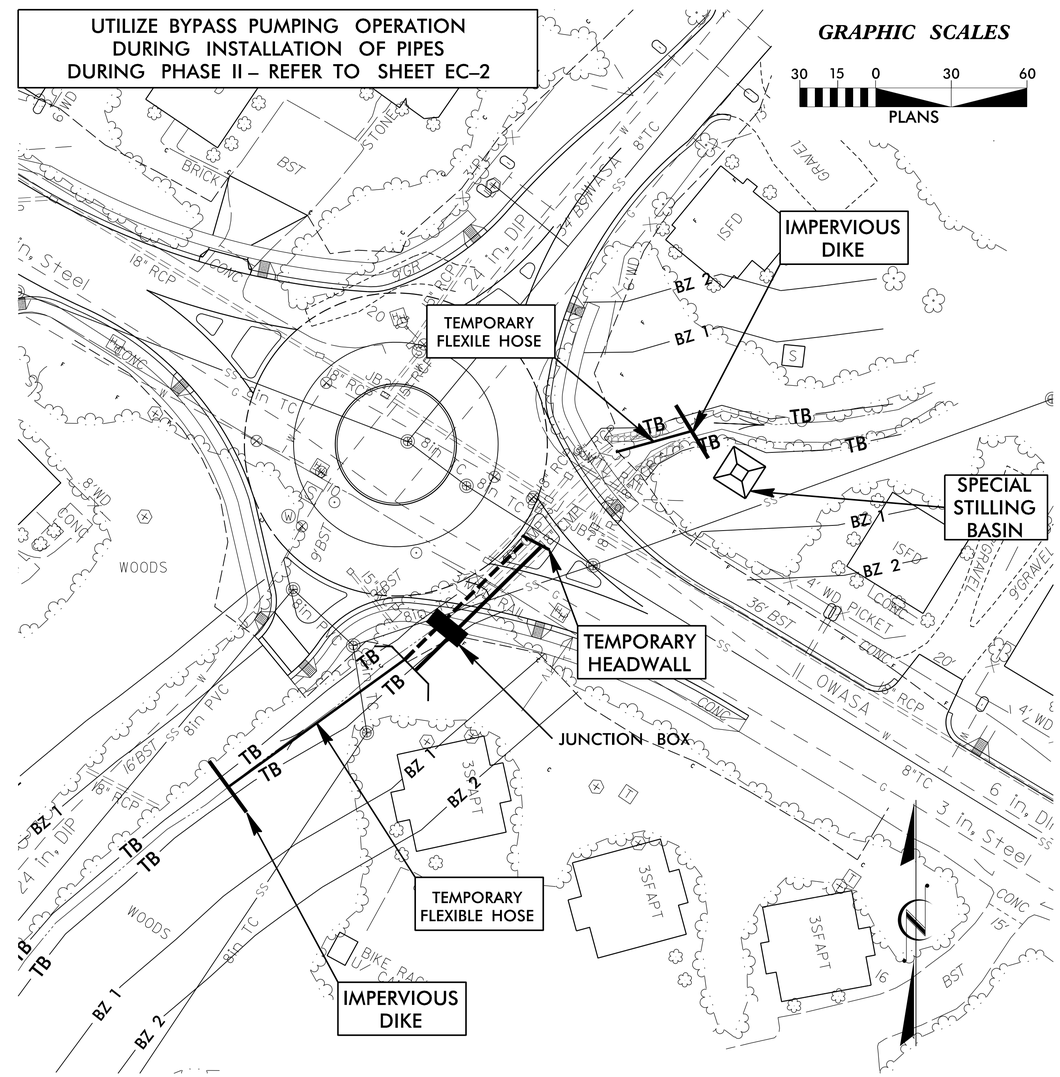
PHASE I

1. INSTALL PERIMETER EROSION CONTROL MEASURES AS SHOWN ON SHEET EC–4.
2. INSTALL IMPERVIOUS DIKES, SPECIAL STILLING BASIN, BYPASS PUMP AND TEMPORARY FLEXIBLE HOSE DIVERTING FLOW THROUGH THE RIGHT BARREL (FACING DOWNSTREAM) OF EXISTING CROSSING. BYPASS PUMP SHOULD BE DIRECTED TO EITHER A STABILIZED OUTLET OR SPECIAL STILLING BASIN DOWNSTREAM OF THE DOWNSTREAM IMPERVIOUS DIKE.
3. REMOVE HEADWALL AND APPROXIMATELY 27 LF OF EXISTING 48" CMP TO THE CONSTRUCTION JOINT PROVIDED IN THE PHASED TRAFFIC CONTROL PLAN.
4. INSTALL TEMPORARY HEADWALL AND OTHER TEMPORARY SHORING AS NEEDED (DESIGN BY OTHERS).
5. INSTALL SPECIAL JUNCTION BOX AND 68 LF OF THE PROPOSED 60" RCP–V, LEFT BARREL FACING DOWNSTREAM.



PHASE II

1. PROVIDE TEMPORARY CONNECTION FROM NEWLY INSTALLED 60" RCP–V TO EXISTING 48" CMP (LEFT BARREL FACING DOWNSTREAM).
2. MODIFY TEMPORARY FLEXIBLE HOSE TO DIVERT FLOW THROUGH THE LEFT BARREL (FACING DOWNSTREAM).
3. REMOVE APPROXIMATELY 28 LF OF EXISTING 48" CMP TO THE CONSTRUCTION JOINT PROVIDED IN THE PHASED TRAFFIC CONTROL PLAN.
4. MODIFY TEMPORARY HEADWALL AND OTHER TEMPORARY SHORING AS NEEDED (DESIGN BY OTHERS).
5. INSTALL 72 LF OF THE PROPOSED 60" RCP–V, RIGHT BARREL FACING DOWNSTREAM.
6. INSTALL UPSTREAM HEADWALL.



INDICATES PIPE INSTALLED IN PREVIOUS PHASE

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
U-5846	EC-6/CONST.4

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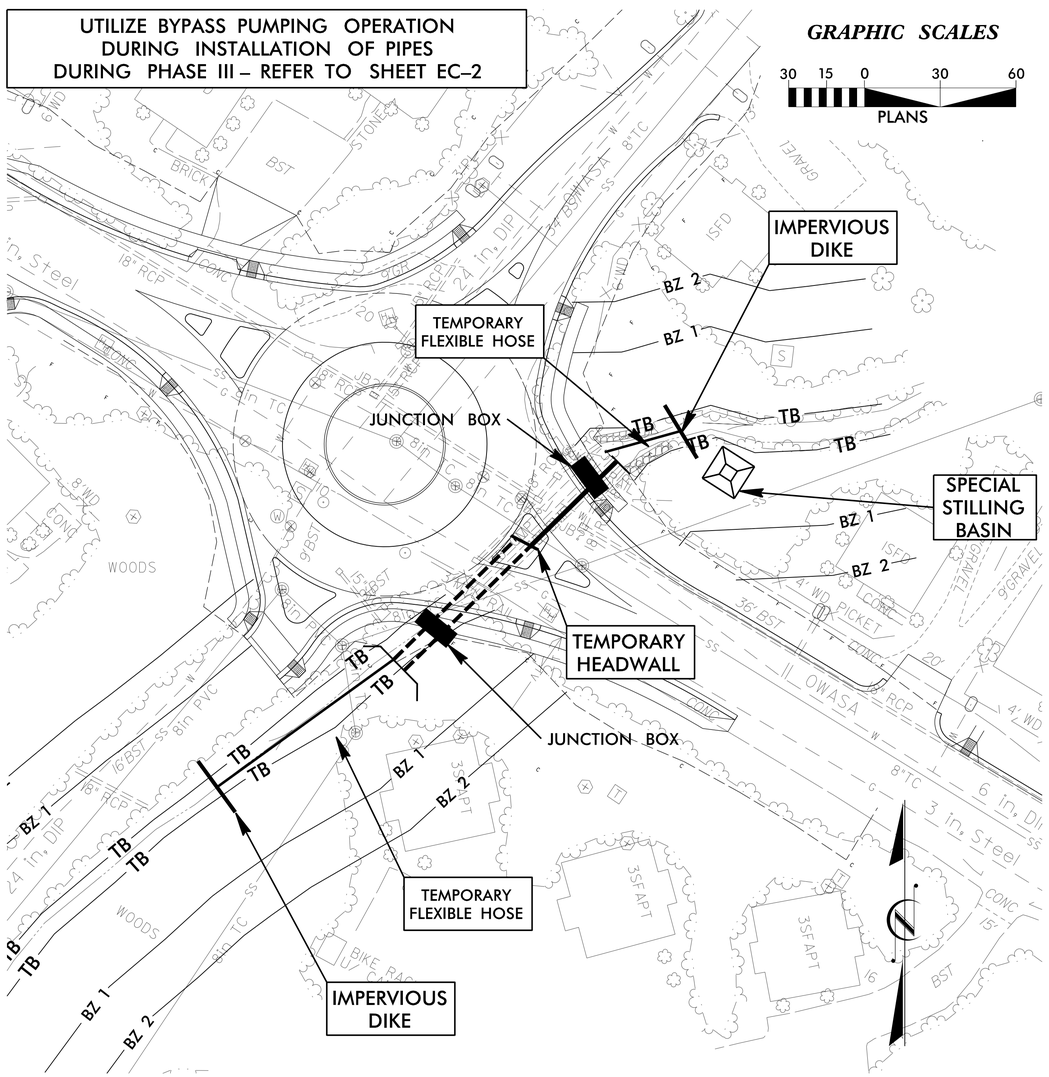
CULVERT CONSTRUCTION SEQUENCE STA. 14 + 76 –L–

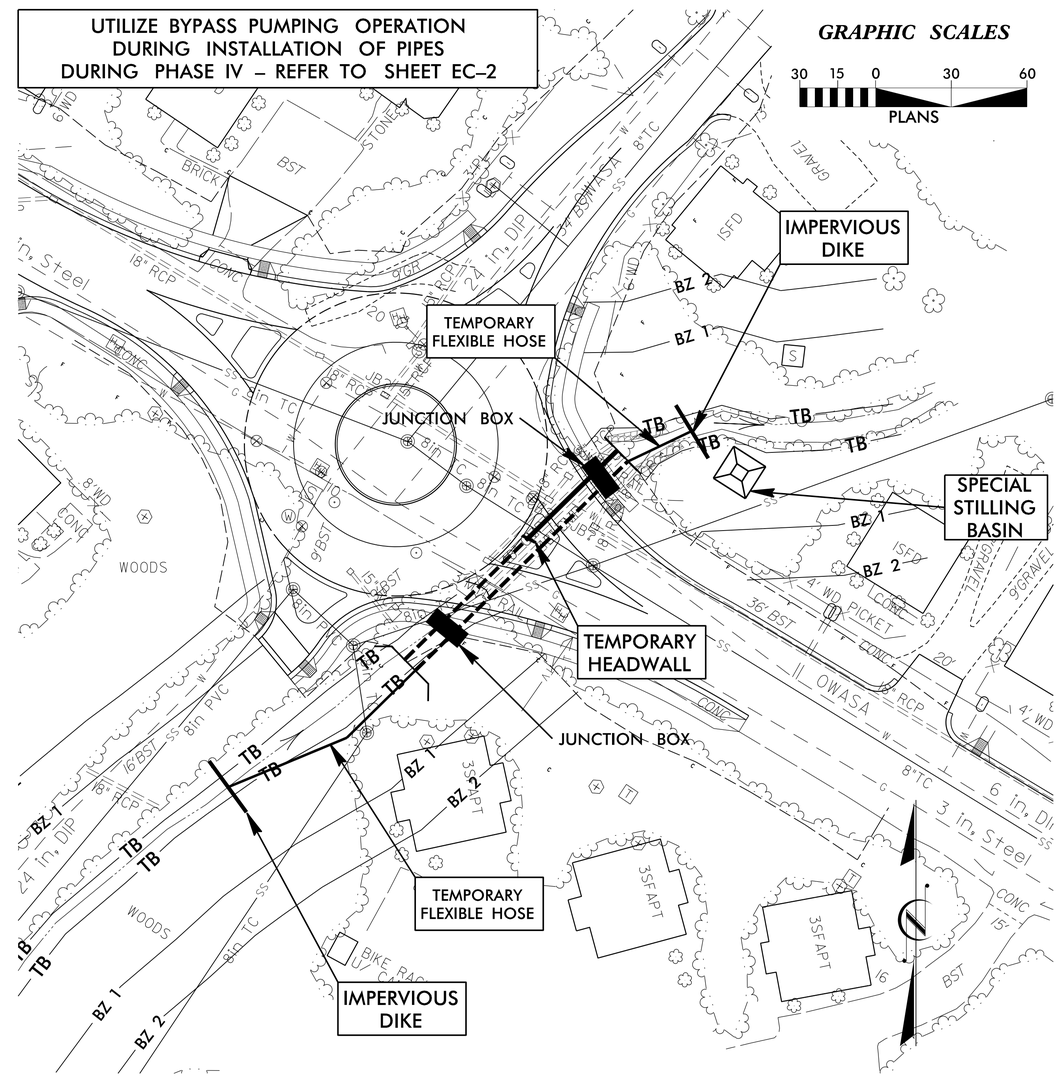
PHASE III

1. PHASES III & IV ARE TO BE COMPLETED DURING TRAFFIC CONTROL PHASE II.
2. UPON COMPLETION OF THE PROPOSED ROADWAY OVER THE PIPES INSTALLED DURING PHASES I & II, MODIFY TEMPORARY HEADWALL AND TEMPORARY SHORING AS NEEDED (DESIGN BY OTHERS), AND REMOVE THE REMAINDER OF EXISTING 48" CMP, RIGHT BARREL (FACING DOWNSTREAM).
3. COMPLETE INSTALLATION OF THE 60" RCP–V AND SPECIAL DESIGN JUNCTION BOX, RIGHT BARREL FACING DOWNSTREAM.
4. STUB OUT ADJOINING PIPES AS NECESSARY.



PHASE IV

1. MODIFY TEMPORARY FLEXIBLE HOSE TO DIVERT FLOW THROUGH THE RIGHT BARREL (FACING DOWNSTREAM).
2. REMOVE THE REMAINDER OF EXISTING 48" CMP, LEFT BARREL (FACING DOWNSTREAM).
3. MODIFY TEMPORARY HEADWALL AND OTHER TEMPORARY SHORING AS NEEDED (DESIGN BY OTHERS).
4. COMPLETE INSTALLATION OF THE 60" RCP–V AND SPECIAL DESIGN JUNCTION BOX, LEFT BARREL FACING DOWNSTREAM.
5. STUB OUT ADJOINING PIPES AS NECESSARY.
6. CONSTRUCT AND STABILIZE DOWNSTREAM HEADWALL AND CHANNEL IMPROVEMENTS AS SHOWN ON THE PLANS.



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PROJECT REFERENCE NO.	SHEET NO.
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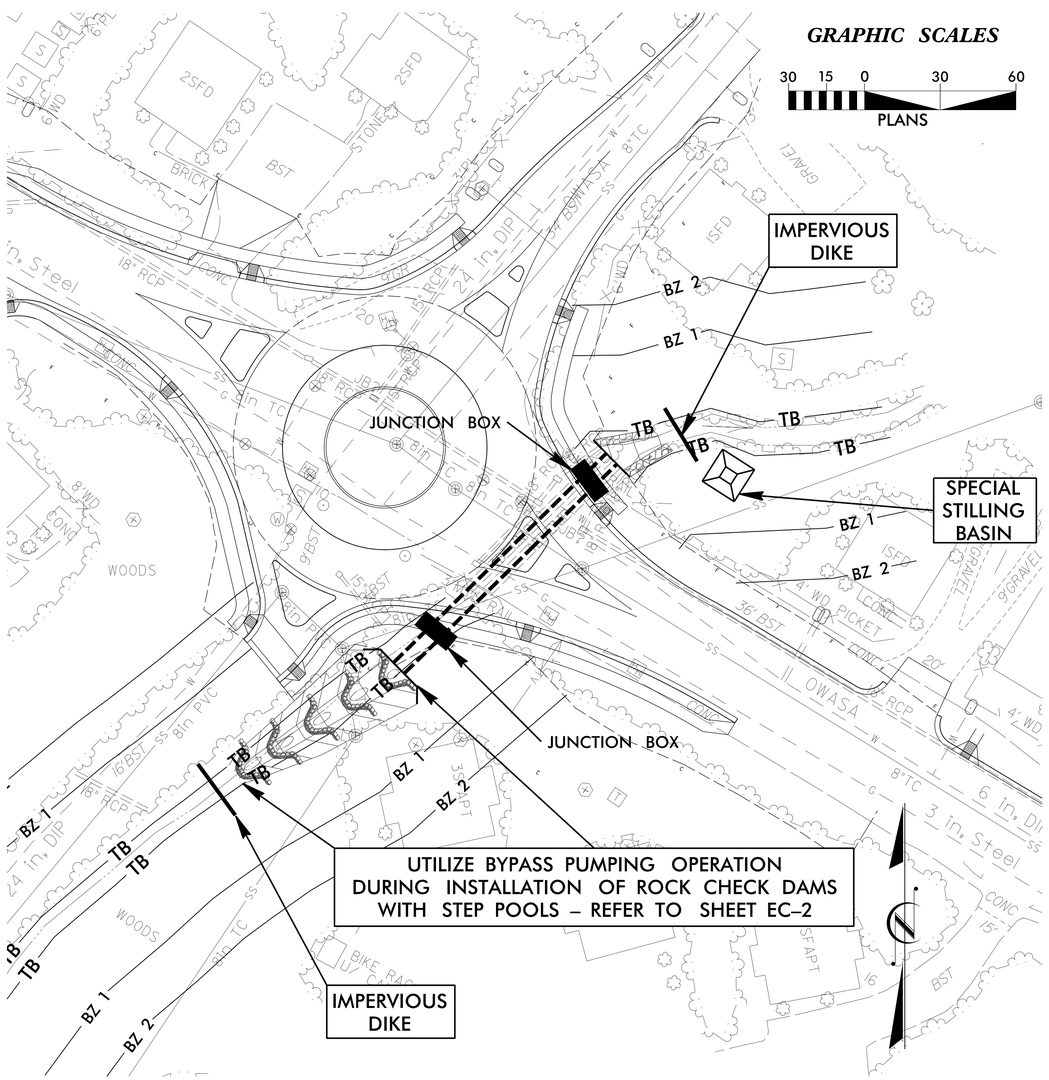
CULVERT CONSTRUCTION SEQUENCE STA. 14+76 –L–

PHASE V

1. INSTALL BYPASS PUMP UPSTREAM OF THE UPSTREAM IMPERVIOUS DIKE. DIRECT FLEXIBLE HOSE THROUGH ONE OF THE NEWLY INSTALLED 60" RCP–V PIPES AND TO EITHER A STABILIZED OUTLET OR A SPECIAL STILLING BASIN DOWNSTREAM OF THE DOWNSTREAM IMPERVIOUS DIKE. REFER TO SHEET EC–2.
2. CONSTRUCT UPSTREAM CHANNEL CHANGE AND ROCK CROSS VANES WITH STEP POOLS AS SHOWN ON THE PLANS.
3. REMOVE BYPASS PUMP AND IMPERVIOUS DIKES WHEN WORK IS COMPLETE AND SITE HAS BEEN STABILIZED. MAKE REPARS WITHIN THE PERMIT LIMITS AS NECESSARY.



INDICATES PIPE INSTALLED IN PREVIOUS PHASE

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PROJECT REFERENCE NO.	SHEET NO.
U-5846	EC-8/CONST.4

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NAD 83/NA 2011

GRAPHIC SCALES
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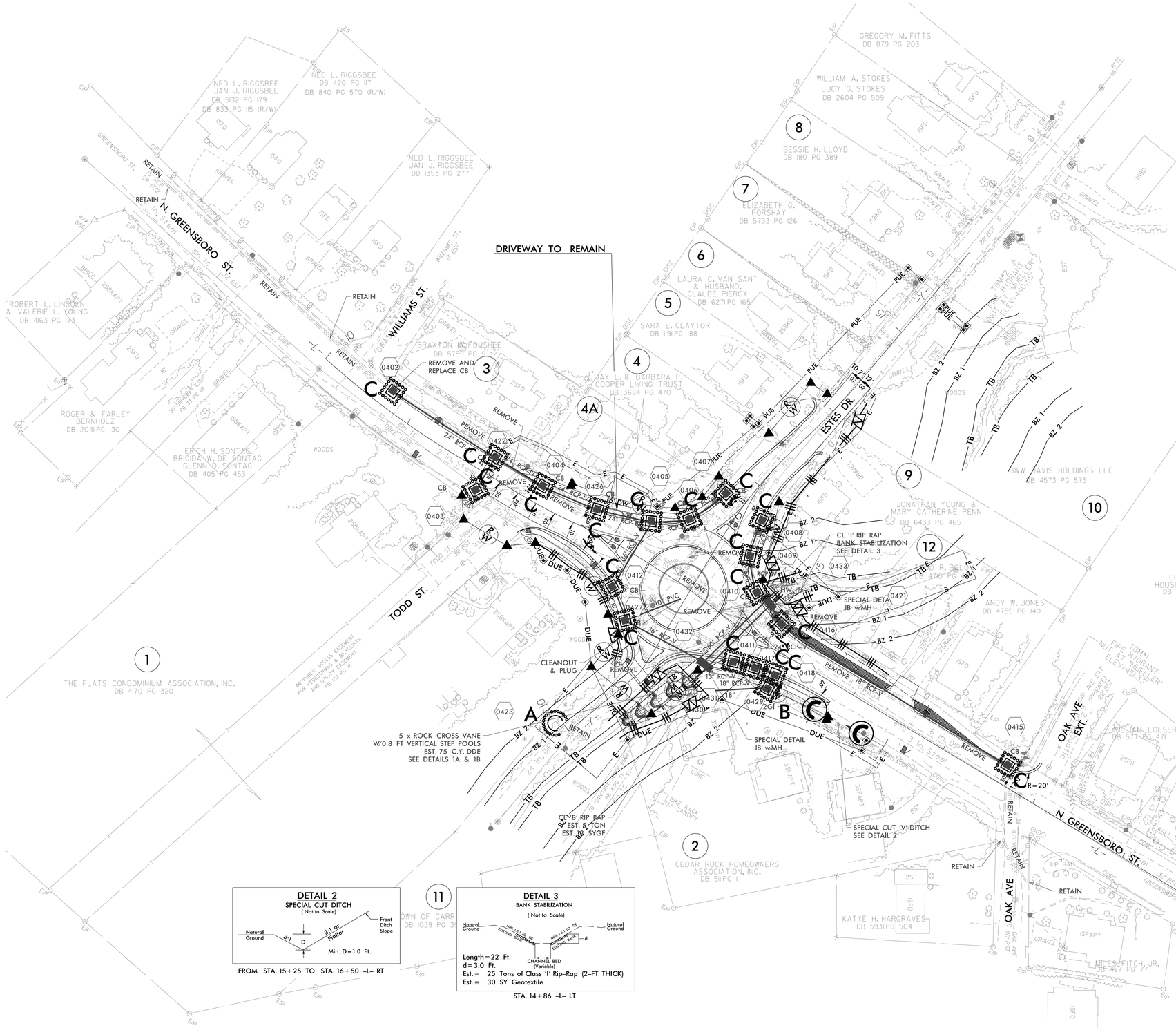
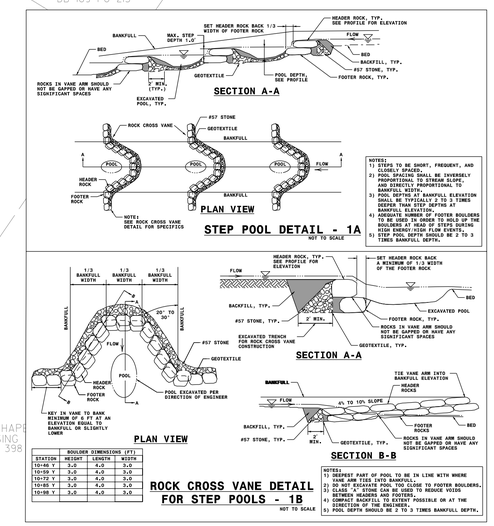
PLANS

REVISIONS

8/17/99





STATION	BOULDER DIMENSIONS (FT) HEIGHT	LENGTH	WIDTH
10+46 Y	3.0	4.0	3.0
10+59 Y	3.0	4.0	3.0
10+72 Y	3.0	4.0	3.0
10+85 Y	3.0	4.0	3.0
10+98 Y	3.0	4.0	3.0

FROM STA. 15+25 TO STA. 16+50 –L– RT

STA. 14+86 –L– LT

FINAL GRADE
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

FOR PROFILES, SEE SHEET NO. 5

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5846	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

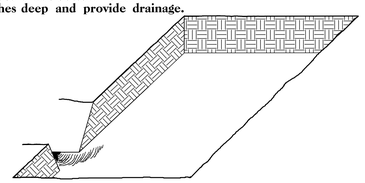
SEPI
ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

PLANTING DETAILS

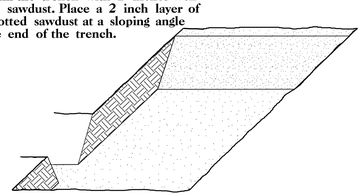
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

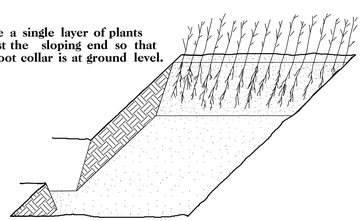
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



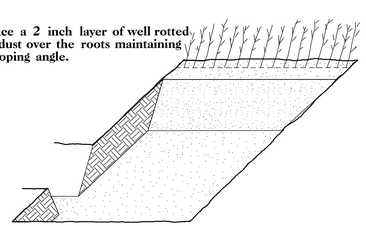
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

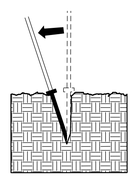


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

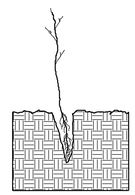


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

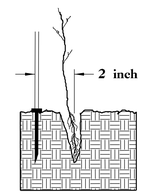
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



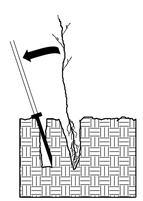
1. Insert planting bar as shown and pull handle toward planter.



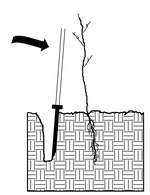
2. Remove planting bar and place seedling at correct depth.



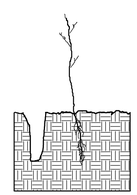
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

REFORESTATION

☐ TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

33%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
33%	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in – 18 in BR
34%	BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR

REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

5/17/2018
U5846_rev_RF-1.dgn
USER:bowell

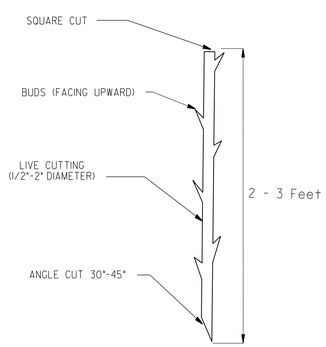
PROJECT REFERENCE NO.	SHEET NO.
U-5846	RF-2

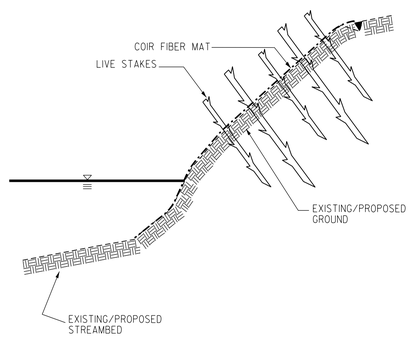
SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

PLANTING DETAILS

LIVE STAKES PLANTING DETAIL

LIVE STAKE

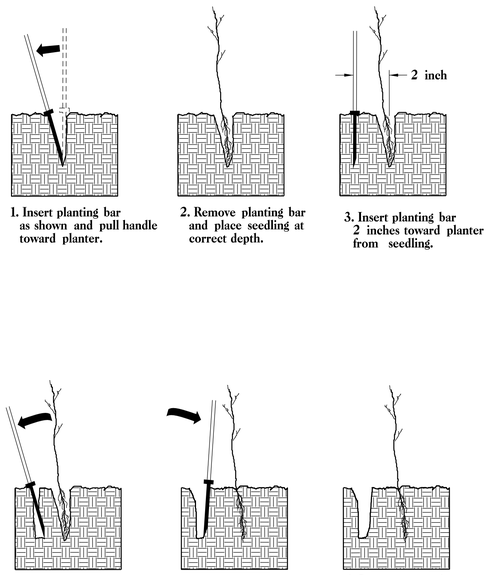




BANK STABILIZATION WITH LIVE STAKES

NOTE:
LIVE STAKES SHALL BE SPACED APPROXIMATELY 4 FEET ON CENTER
LIVE STAKES SHALL BE DRIVEN UNTIL APPROXIMATELY 3/4 OF LIVE STAKE IS WITHIN GROUND

BAREROOT PLANTING DETAIL
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



1. Insert planting bar as shown and pull handle toward planter.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches toward planter from seedling.
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

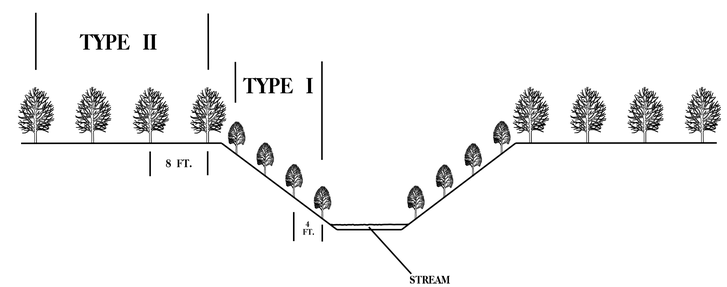
PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

- ☐ TYPE 1 STREAMBANK REFORESTATION SHALL BE PLANTED 3 FT. TO 5 FT. ON CENTER, RANDOM SPACING, AVERAGING 4 FT. ON CENTER, APPROXIMATELY 2724 PLANTS PER ACRE.
- ☐ TYPE 2 STREAMBANK REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.
- ☐ NOTE: TYPE 1 AND TYPE 2 STREAMBANK REFORESTATION SHALL BE PAID FOR AS "STREAMBANK REFORESTATION"

STREAMBANK REFORESTATION TYPICAL



STREAMBANK REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

TYPE 1			
50%	SALIX NIGRA	BLACK WILLOW	2 ft – 3 ft LIVE STAKES
50%	CORNUS AMOMUM	SILKY DOGWOOD	2 ft – 3 ft LIVE STAKES
TYPE 2			
25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
25%	PLATANUS OCCIDENTALIS	SYCAMORE	12 in – 18 in BR
25%	PRUNUS SEROTINA	BLACK CHERRY	12 in – 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR

- ☐ SEE PLAN SHEETS FOR AREAS TO BE PLANTED

STREAMBANK REFORESTATION DETAIL SHEET 1 OF 2

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

5/15/2017
U5846_rev_RF-2.3.dgn
USERbrswell

PROJECT REFERENCE NO.	SHEET NO.
U-5846	RF-3

SEPI
ENGINEERING & CONSTRUCTION
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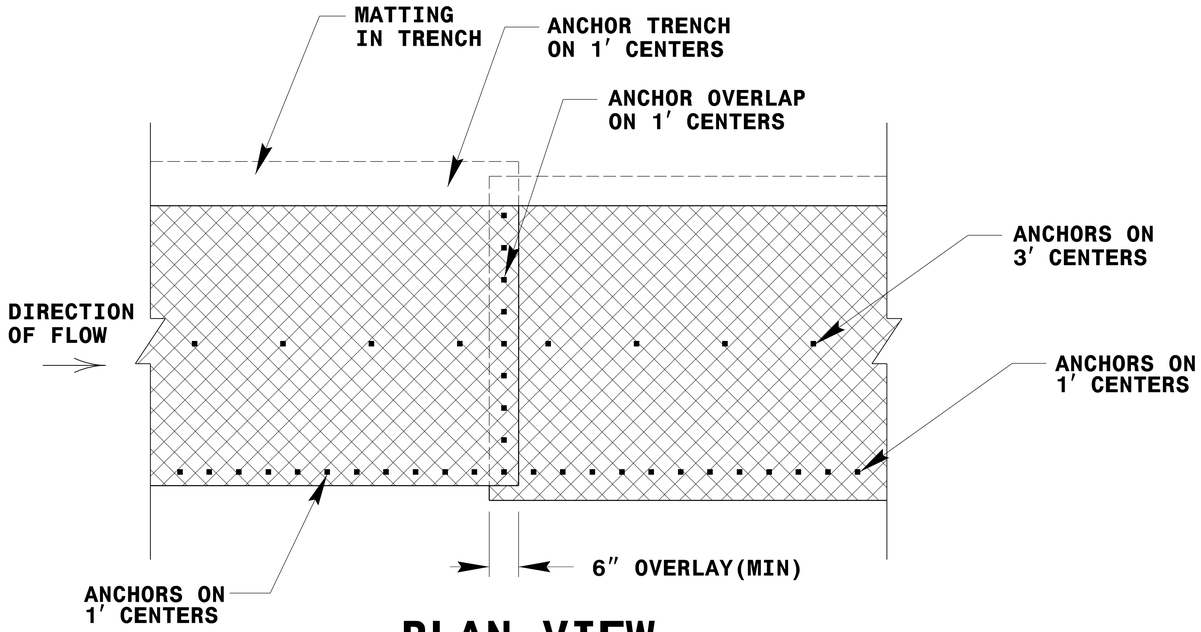
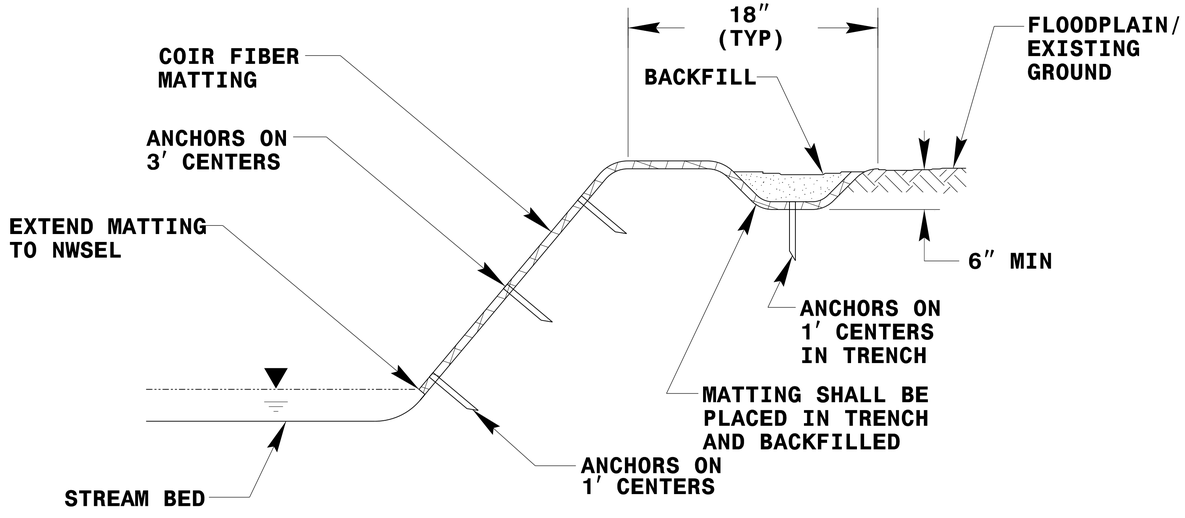
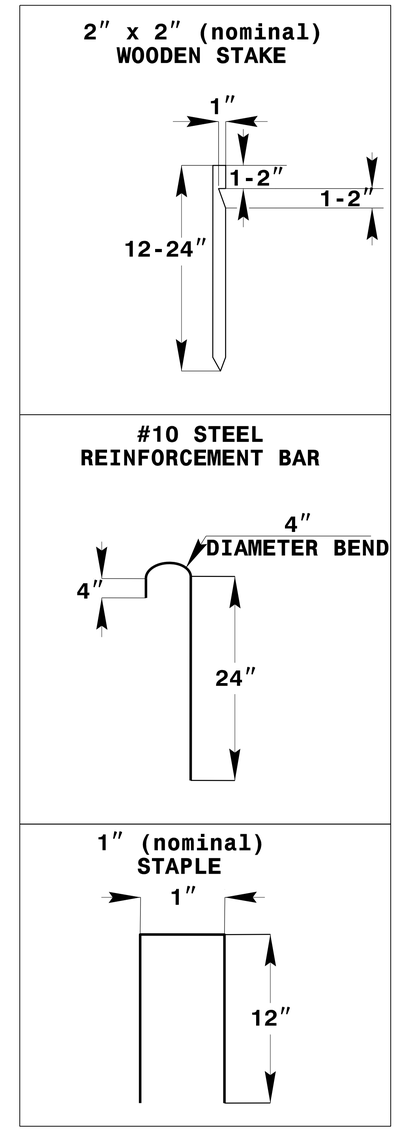
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197



PLAN VIEW



TYPICAL CROSS SECTION



ANCHOR OPTIONS

COIR FIBER MATTING DETAIL

NOT TO SCALE

STREAMBANK REFORESTATION
DETAIL SHEET 2 OF 2
N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

5/15/2017
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USER:ahowell

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TIP NO.	SHEET NO.
U-5846	SIGN-1

APPROVED: DocuSigned by: Steve Miller 9FBC6C15CEEB486...

DATE: 8/14/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
ORANGE COUNTY

LOCATION: SR 1772 (GREENSBORO STREET) AT SR 1780 (ESTES DRIVE) IN CARRBORO. CONSTRUCT ROUNDABOUT

T.I.P.: U-5846

CONTRACT: DG00458

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 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
901.50	ARROWS AND SHIELDS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS
910.40	SINGLE LANE ROUNDABOUT SIGNING, WITH PEDESTRIANS

GENERAL NOTES

. SIGNS FURNISHED BY STATE
. CONFIRM IN WRITING AT LEAST 4 MONTHS IN ADVANCE, THE ACTUAL DATE THE DEPARTMENT FURNISHED SIGNS WILL BE REQUIRED.
. WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER
. ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE RETAINED 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 SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.

SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	712	L.F.
4102000000	904	SIGN ERECTION, TYPE E	39	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	12	EA.

INDEX

SHEET NO.	DESCRIPTION
SIGN-1	TITLE SHEET
SIGN-2	TYPE E SIGNS
SIGN-3	EXISTING & PROPOSED SIGN DETAIL SHEET

PROJECT NOTES

1. DISPOSAL OF SIGN SYSTEM, U-CHANNEL
2. SIGN ERECTION, TYPE E
3. RELOCATE SIGN, TYPE E
4. SIGN ERECTION, RELOCATE SIGN, TYPE E

PLAN SUBMITTED TO:

CHAD REIMAKOSKI DIVISION DESIGN ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY: SEPI ENGINEERING & CONSTRUCTION

STEVE MILLER, P.E. SIGNING & DELINEATION PROJECT ENGINEER

SHEENA GREEN SIGNING & DELINEATION PROJECT DESIGN ENGINEER

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

8/6/2018
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USERrmcopple

DocuSign Envelope ID: 26A61E9A-5830-4C6B-8FB8-C9AF45B749C8

TIP NO.	SHEET NO.
U-5846	SIGN-2

APPROVED: DocuSigned by: Steve Miller 9FBC8C15CEEB486...

DATE: 5/25/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

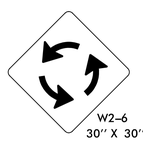
(401) QUANTITY REQ'D 12

ONE "U" POST PER SIGN

(402) QUANTITY REQ'D 2

ONE "U" POST PER SIGN

(403) QUANTITY REQ'D 4



ONE "U" POST PER SIGN

(404) QUANTITY REQ'D 4

ONE "U" POST PER SIGN

(405) QUANTITY REQ'D 4

ONE "U" POST PER SIGN

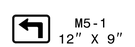
(406) QUANTITY REQ'D 1

MOUNTED ABOVE SIGN 407
IN 1 INSTALLATION

(407) QUANTITY REQ'D 3

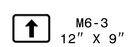
ONE "U" POST PER SIGN

(408) QUANTITY REQ'D 1



MOUNTED BELOW SIGN 407
IN 1 INSTALLATION

(409) QUANTITY REQ'D 1



MOUNTED BELOW SIGN 407
IN 1 INSTALLATION

(410) QUANTITY REQ'D 1

MOUNTED BELOW SIGN 407
IN 1 INSTALLATION

(411) QUANTITY REQ'D 12

MOUNTED BELOW SIGN 401
IN 12 INSTALLATIONS

(412) QUANTITY REQ'D 6

ONE "U" POST PER SIGN

(413) QUANTITY REQ'D 1

ONE "U" POST PER SIGN

(414) QUANTITY REQ'D 1

ONE "U" POSTS PER SIGN

(415) QUANTITY REQ'D 1

ONE "U" POSTS PER SIGN

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

TYPE "E" SIGNS

5/21/2018
X:\2016\R016.006.00_U-5846\Traffic\Signing\SIGN-2.dgn
JBaumen

DocuSign Envelope ID: 26A61E9A-5830-4C6B-8FB8-C9AF45B749C8

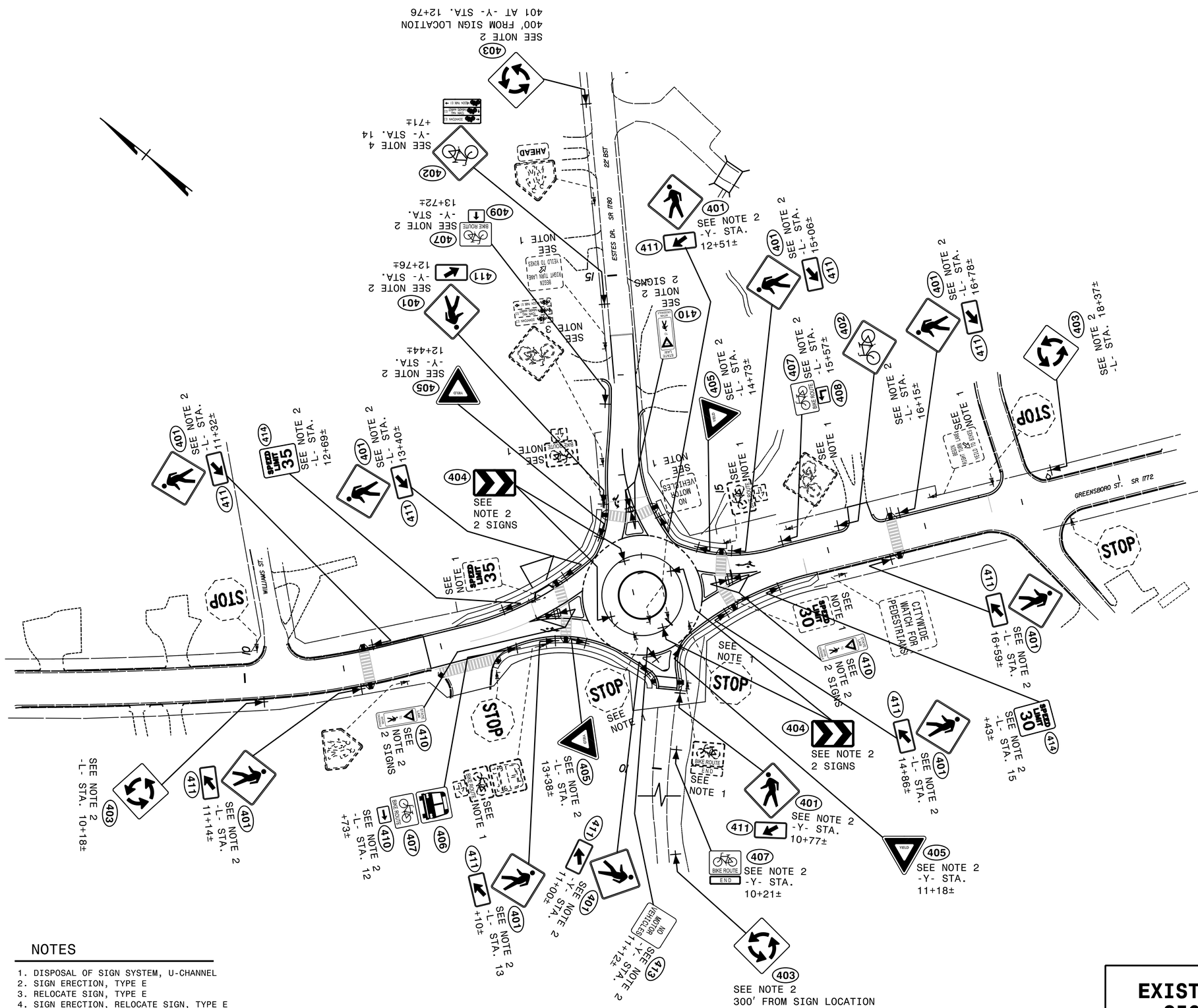
TIP NO.	SHEET NO.
U-5846	SIGN-3

APPROVED: DocuSigned by: Steve Miller 9FBC6C15CEEB486...

DATE: 5/25/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER



NOTES

1. DISPOSAL OF SIGN SYSTEM, U-CHANNEL
2. SIGN ERECTION, TYPE E
3. RELOCATE SIGN, TYPE E
4. SIGN ERECTION, RELOCATE SIGN, TYPE E

EXISTING AND PROPOSED SIGN DETAIL SHEET

5/21/2018
X:\2016\R016.006.00_U-5846\Traffic\Signing\SIGN-3.dgn
JBaumen

PROJECT REFERENCE NO.	SHEET NO.
U-5846	UC-3F

DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

5/30/2018
NORTH CAROLINA PROFESSIONAL SEAL 020160 ENGINEER
KELLY E. WATTS
DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED

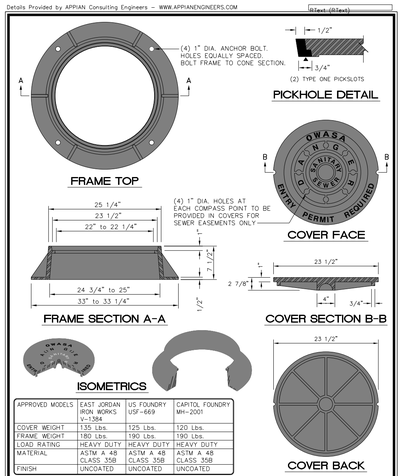
UTILITY CONSTRUCTION PLANS ONLY

SEPI ENGINEERING & CONSTRUCTION
1025 Wade Avenue
Raleigh, NC 27605
Tel:919-789-9977
Fax:919-789-9591
License: C-2197

PROJECT TYPICAL DETAILS

UTILITY CONSTRUCTION

Details Provided by APPIAN Consulting Engineers – WWW.APPIANENGINEERS.COM



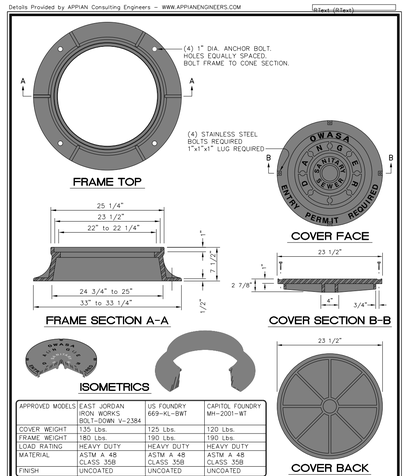
APPROVED MODELS	EAST JORDAN IRON WORKS V=1384	US FOUNDRY USF-669	CAPITOL FOUNDRY MH-2001
COVER WEIGHT	135 Lbs.	125 Lbs.	120 Lbs.
FRAME WEIGHT	180 Lbs.	190 Lbs.	190 Lbs.
LOAD RATING	HEAVY DUTY	HEAVY DUTY	HEAVY DUTY
MATERIAL	ASTM A 48 CLASS 35B	ASTM A 48 CLASS 35B	ASTM A 48 CLASS 35B
FINISH	UNCOATED	UNCOATED	UNCOATED

OWASA Quality Service Since 1977
400 Jones Ferry Road PO Box 366 Carrboro, NC 27510-0366
ORANGE WATER AND SEWER AUTHORITY
USE WITH THE OWASA STANDARD SPECIFICATIONS ONLY
Voice (919) 968-4421 FAX (919) 968-4464 www.owasa.org

SANITARY SEWER MANHOLE FRAME and COVER

SCALE: Not To Scale | DETAIL # 2.5.3.01 | REVISION DATE: April 13, 2007 | SHEET # 1 of 1

Details Provided by APPIAN Consulting Engineers – WWW.APPIANENGINEERS.COM



APPROVED MODELS	EAST JORDAN IRON WORKS BOLT-DOWN V=2384	US FOUNDRY 669-KL-BWT	CAPITOL FOUNDRY MH-2001-WT
COVER WEIGHT	135 Lbs.	125 Lbs.	120 Lbs.
FRAME WEIGHT	180 Lbs.	190 Lbs.	190 Lbs.
LOAD RATING	HEAVY DUTY	HEAVY DUTY	HEAVY DUTY
MATERIAL	ASTM A 48 CLASS 35B	ASTM A 48 CLASS 35B	ASTM A 48 CLASS 35B
FINISH	UNCOATED	UNCOATED	UNCOATED

OWASA Quality Service Since 1977
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ORANGE WATER AND SEWER AUTHORITY
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SANITARY SEWER WATERTIGHT MANHOLE FRAME and COVER

SCALE: Not To Scale | DETAIL # 2.5.3.02 | REVISION DATE: April 13, 2007 | SHEET # 1 of 1

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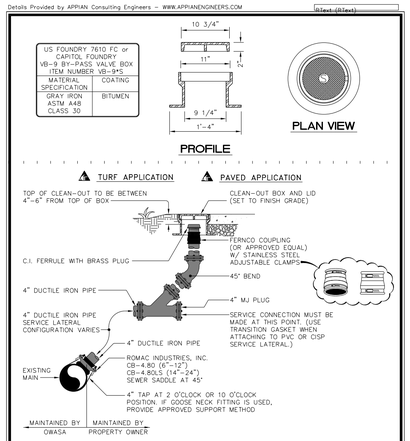

NOTES:
1. This detail depicts a typical layout. Variations may be approved.
2. Service saddles may be used only on existing sewer mains. Tees / Wyes shall be used for new construction.

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4" SEWER TAP and STUB-OUT PAVED APPLICATION CLEAN OUT

SCALE: Not To Scale | DETAIL # 2.5.3.04.01 | REVISION DATE: April 13, 2007 | SHEET # 1 of 1

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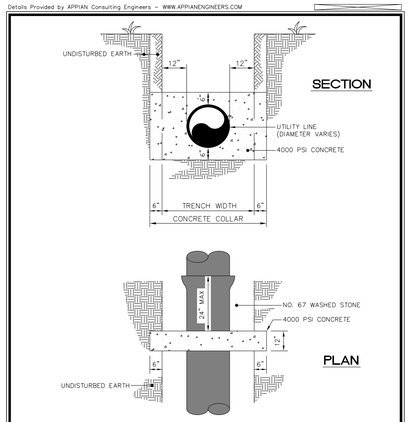

NOTES:
1. Sewer lines on 20% slope or greater shall be anchored securely with concrete collars.
2. Minimum 1 concrete collar per pipe joint. Additional collars may be required by OWASA.

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CONCRETE COLLAR DETAIL

SCALE: Not To Scale | DETAIL # 2.5.6.01 | REVISION DATE: August 15, 2003 | SHEET # 1 of 1

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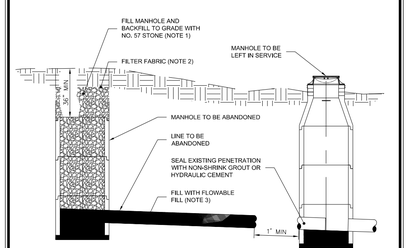

NOTES:
1. BACKFILL WITH NO. 57 STONE COMPACTED IN PLACE OR WITH FLOWABLE FILL CONCRETE (50 PSI MINIMUM/ 150 PSI MAXIMUM).
2. OUTSIDE ROADWAY RIGHT OF WAYS, FILTER FABRIC SHALL BE PLACED OVER THE STONE AND SUITABLE MATERIAL OF A COMPACTABLE NATURE PLACED OVER CONCRETE MANHOLE PAD. FILTER FABRIC SHALL BE EXTENDED 1' BEYOND THE DIAMETER OF THE MANHOLE TO BE ABANDONED.
3. REMOVE OR FILL PIPES WITH FLOWABLE FILL CONCRETE (50 PSI MINIMUM/ 150 PSI MAXIMUM) IN ACCORDANCE WITH THE FOLLOWING CRITERIA:
   a. PIPES LARGER THAN 24-INCHES DIAMETER.
   b. PIPES LOCATED WITHIN ROADWAY SECTION AND MEETING ONE OF THE FOLLOWING CONDITIONS:
      I. PIPES THAT ARE 12-INCHES DIAMETER UP TO AND INCLUDING PIPES THAT ARE 24-INCHES DIAMETER AND ARE BURIED LESS THAN 20 FEET BELOW FINISHED GRADE.
      II. PIPES THAT ARE 6-INCHES DIAMETER UP TO 12-INCHES DIAMETER THAT ARE NOT CAST IRON, DUCTILE IRON, PVC, OR HDPE AND ARE BURIED LESS THAN 12 FEET BELOW FINISHED GRADE.
   c. PIPES LOCATED BELOW GROUNDWATER TABLE THAT COULD BECOME A CONDUIT FOR WATER MOVEMENT.

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SANITARY SEWER LINE AND MANHOLE ABANDONMENT DETAIL

SCALE: Not To Scale | DETAIL # 2.5.6.05 | REVISION DATE: June 15, 2012 | SHEET # 1 of 1

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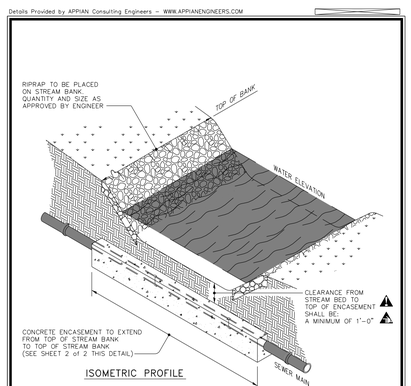

NOTES:
1. Concrete to be 3,000 psi.
2. Encasement to be used only where specified on plans.
3. Pipe shall be ductile iron pipe.
4. Filter fabric to be placed under rip-rap and keyed into embankment.

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SEWER LINE CROSSING BENEATH STREAM BED

SCALE: Not To Scale | DETAIL # 2.5.6.08 | REVISION DATE: August 15, 2003 | SHEET # 1 of 2

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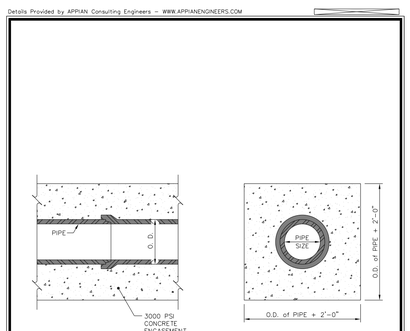

NOTES:
1. Concrete to be 3,000 psi.
2. Encasement to be used only where specified on plans.

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SEWER LINE CROSSING BENEATH STREAM BED

SCALE: Not To Scale | DETAIL # 2.5.6.08 | REVISION DATE: August 15, 2003 | SHEET # 2 of 2

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