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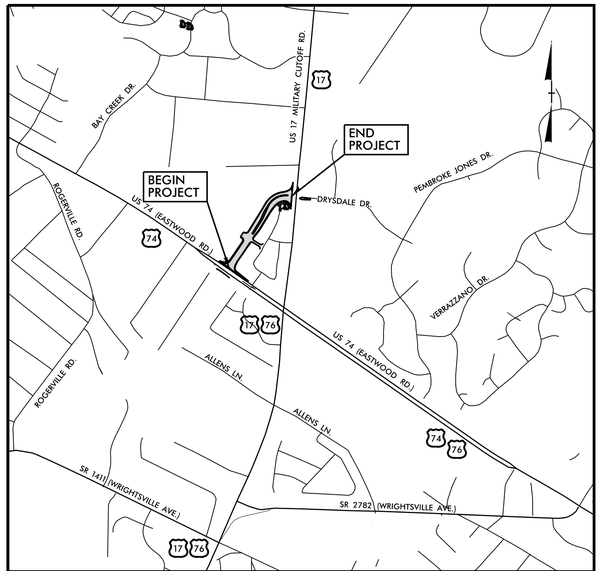
09/08/99

TIP PROJECT: U-5710A

CONTRACT: DC00277

See Sheet 1B For Conventional Symbols



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

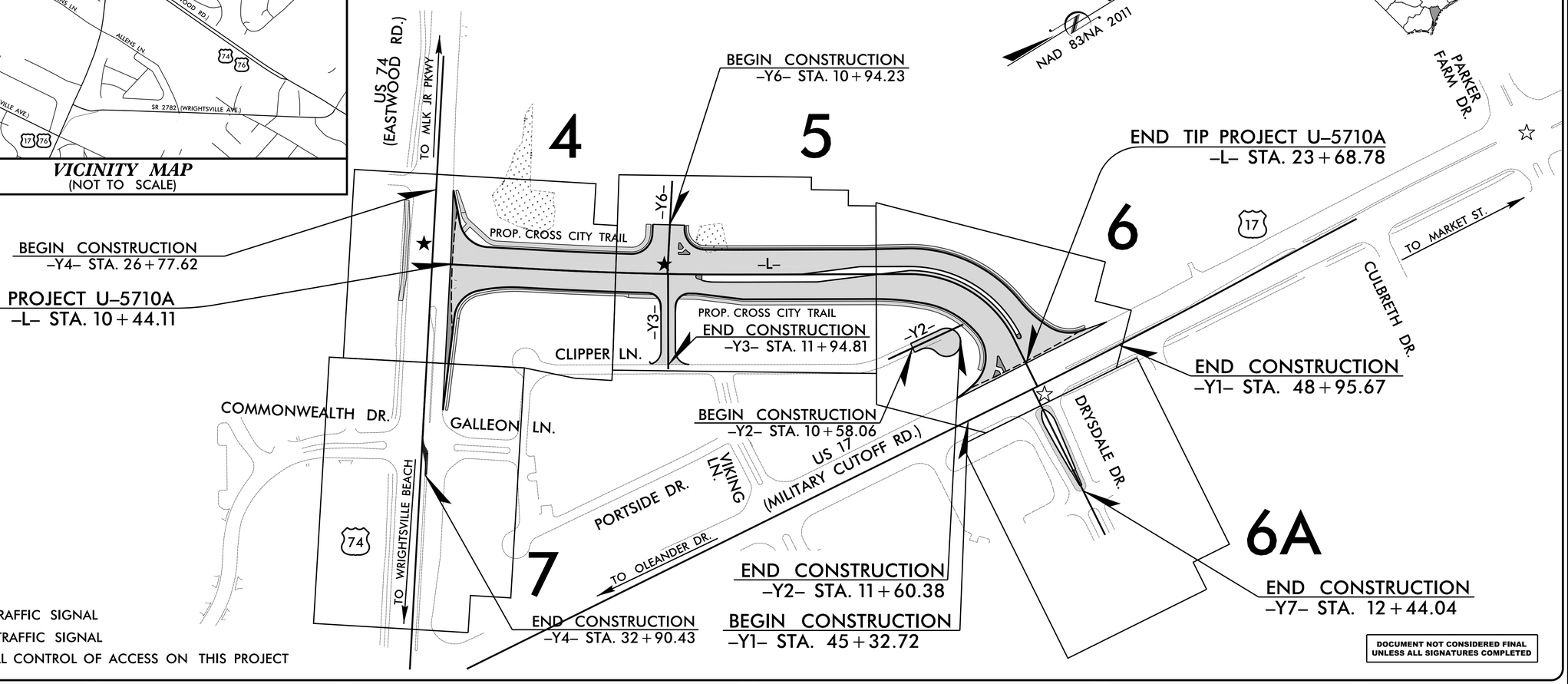
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5710A	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
50115.1.2	N/A	P.E.
50115.2.2	N/A	ROW & UTIL.
50115.3.3	0074232	CONSTR.

LOCATION: ***FROM US-17 (MILITARY CUTOFF ROAD) AT DRYSDALE DRIVE TO US-74 (EASTWOOD ROAD). CONSTRUCT ROADWAY ON NEW LOCATION (DRYSDALE DRIVE EXT).***

TYPE OF WORK: ***GRADING, PAVING, DRAINAGE AND SIGNALS***

NAD 83/NA 2011



☆ MODIFIED TRAFFIC SIGNAL
★ PROPOSED TRAFFIC SIGNAL
THERE IS PARTIAL CONTROL OF ACCESS ON THIS PROJECT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

20 10 0 20 40
PLANS

20 10 0 20 40
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

DESIGN DATA

ADT 2020 = 4,800
ADT 2040 = 24,000
V = 40 MPH
FUNC CLASS = URBAN COLLECTOR
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5710A = 0.251 MILES

TOTAL LENGTH TIP PROJECT U-5710A = 0.251 MILES

Prepared by the Office of:
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
DECEMBER 11, 2018

LETTING DATE:
FEBRUARY 24, 2022

PHILLIP E. ROGERS, PE
PROJECT ENGINEER

CASEY E. HARRIS, PE
PROJECT DESIGN ENGINEER

MICHAEL BASS
NCDOT CONTACT

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER JOSHUA J. MASSROCK
1/11/2022
SIGNATURE: Joshua J. Massrock P.E.

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS
1/11/2022
SIGNATURE: Casey Harris P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS

12/15/2021

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HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

2018 ROADWAY ENGLISH STANDARD DRAWINGS

EFF. 01-16-2018
REV.

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	
200.03	Method of Clearing - Modified Method III (Use detail in Lieu of Standard)
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
806.02	Granite Right-of-Way Marker
815.02	Subsurface Drain
838.27	Reinforced Concrete Endwall - for Single 60" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.57	Reinforced Brick Endwall - for Single 60" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
848.01	Concrete Sidewalk
848.05	Curb Ramp - Proposed Curb & Gutter
848.06	Curb Ramp - Existing Curb & Gutter
852.01	Concrete Islands
852.05	Median Curb for Catch Basin - for Use with 1'-6" Curb and Gutter
866.01	Chain Link Fence - 4', 5' and 6' High Fence
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1	CENTERLINE COORDINATE LIST
2A-1 THRU 2A-4	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAIL
2C-1	SPECIAL VALLEY GUTTER DETAIL
2C-2	TRUNCATED DOMES ON CURVED SURFACES
2C-3	MODIFIED METHOD OF CLEARING III DETAIL
2D-1 THRU 2D-5	STORMWATER POND DETAILS
3B-1	EARTHWORK AND PAVEMENT REMOVAL SUMMARIES
3D-1 THRU 3D-3	DRAINAGE SUMMARY
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
4 THRU 7	PLAN SHEETS
8 THRU 10	PROFILE SHEETS
RW01 THRU RW06-REV	RIGHT OF WAY TITLE SHEET, SURVEY CONTROL SHEETS PROPOSED ALIGNMENT CONTROL SHEETS, RIGHT OF WAY & EASEMENT CONTROL SHEETS, RIGHT OF WAY SHEETS
TMP-1 THRU TMP-7	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-9	PAVEMENT MARKING PLANS
EC-1 THRU EC-13	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-5	SIGNING PLANS
SIG-1.0 THRU SIG-7.1	SIGNAL PLANS
SIG.M1 THRU SIG.M8	STANDARD DRAWINGS FOR ALL METAL POLES
SCP-1 THRU SCP-6	SIGNAL COMMUNICATION PLANS
UC-1 THRU UC-7	UTILITY CONSTRUCTION PLANS
UO-1 THRU UO-5	UTILITIES BY OTHERS PLANS
X-0	CROSS-SECTION EARTHWORK VOLUME SUMMARY
X-1 THRU X-10	CROSS-SECTIONS
W-1	RETAINING WALL PLANS

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 MODIFIED METHOD III.

SUPERELEVATION:

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

SIDE ROADS:

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

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY DISTRIBUTION, AT&T, PIEDMONT NATURAL GAS, SPECTRUM, CENTURYLINK & CAPE FEAR PUBLIC UTILITY AUTHORITY.

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.

REVISIONS

8/17/99

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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*) — W
- U/G Water Line LOS C (S.U.E*) — W
- U/G Water Line LOS D (S.U.E*) — W
- 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.

12/2/2016

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PROJ. REFERENCE NO.	SHEET NO.
U-5710A	1C-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CENTERLINE COORDINATE LIST

Point #	Chain	Station	Northing (Y)	Easting (X)
1	L	10+50.00	176539.9723	2353057.4657
2	L	11+00.00	176580.9846	2353086.0662
3	L	11+50.00	176621.9969	2353114.6668
4	L	12+00.00	176663.0092	2353143.2673
5	L	12+50.00	176704.0262	2353171.8612
6	L	13+00.00	176745.1755	2353200.2640
7	L	13+50.00	176786.5133	2353228.3920
8	L	14+00.00	176828.0377	2353256.2437
9	L	14+50.00	176869.7468	2353283.8179
10	L	15+00.00	176911.6388	2353311.1135
11	L	15+50.00	176953.7119	2353338.1292
12	L	16+00.00	176995.9641	2353364.8639
13	L	16+50.00	177038.3936	2353391.3162
14	L	17+00.00	177080.9686	2353417.5339
15	L	17+50.00	177123.5587	2353443.7272
16	L	18+00.00	177166.1487	2353469.9205
17	L	18+50.00	177208.7387	2353496.1138
18	L	19+00.00	177251.3288	2353522.3071
19	L	19+50.00	177293.9188	2353548.5004
20	L	20+00.00	177336.5088	2353574.6937
21	L	20+50.00	177378.7231	2353601.4654
22	L	21+00.00	177416.0634	2353634.5921
23	L	21+50.00	177446.0781	2353674.4769
24	L	22+00.00	177467.5707	2353719.5296
25	L	22+50.00	177479.6842	2353767.9542
26	L	23+00.00	177481.9359	2353817.8201
27	L	23+50.00	177477.3438	2353867.6063
28	L	24+00.00	177472.5386	2353917.3748

Point #	Chain	Station	Northing (Y)	Easting (X)

Point #	Chain	Station	Northing (Y)	Easting (X)

Point #	Chain	Station	Northing (Y)	Easting (X)

Point #	Chain	Station	Northing (Y)	Easting (X)

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6/2/99

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	2A-1

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS

12/9/2021

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044590 ENGINEER ANDREW D. WARGO

12/9/2021

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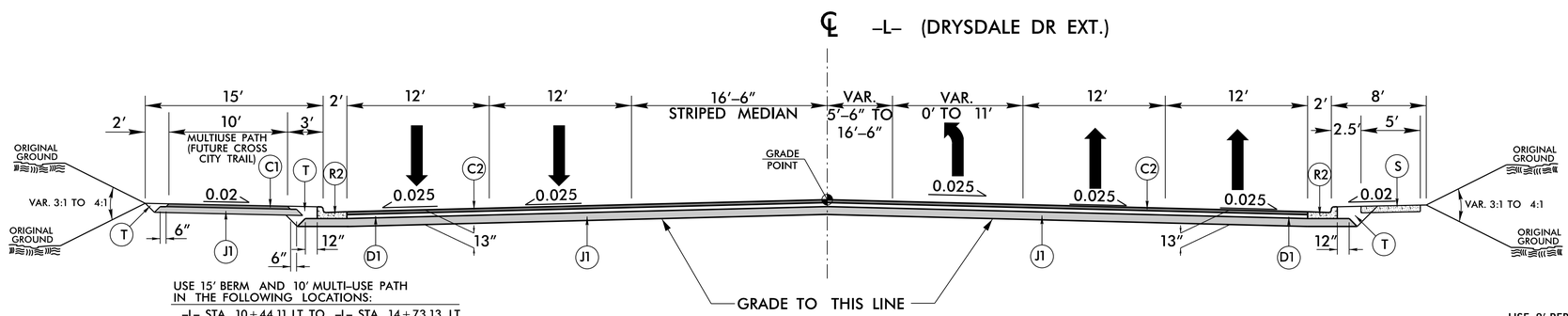
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

P A V E M E N T S C H E D U L E

C1	PROP. APPROX. 1½″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	R1	1′-6″ CONCRETE CURB AND GUTTER.
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	R2	2′-6″ CONCRETE CURB AND GUTTER.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1″ IN DEPTH OR GREATER THAN 1½″ IN DEPTH.	R3	SPECIAL VALLEY GUTTER (SEE DETAIL 2C-1).
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	R4	5″ MONOLITHIC CONCRETE ISLAND (KEYED IN).
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.	S	4″ CONCRETE SIDEWALK.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL.
J1	PROP. 6″ AGGREGATE BASE COURSE.	U	EXISTING PAVEMENT.
J2	PROP. 8″ AGGREGATE BASE COURSE.	V1	VARIABLE DEPTH MILLING 0″ TO 1½″
		W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL).

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

NOTE: CLEAN UP AND RE-GRADE EXISTING PAVEMENT SHOULDER EDGE FROM -Y1- STA. 48+95.67 LT TO -Y1- STA. 58+31.52 LT.



USE 15′ BERM AND 10′ MULTI-USE PATH IN THE FOLLOWING LOCATIONS:

-L- STA. 10+44.11 LT TO -L- STA. 14+73.13 LT
-L- STA. 14+29.09 RT TO -L- STA. 15+12.47 RT

TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

-L- STA. 10+44.11 TO -L- STA. 15+12.47

USE 8′ BERM AND 5′ SIDEWALK IN THE FOLLOWING LOCATIONS:

-L- STA. 10+44.11 TO -L- STA. 14+29.09 RT

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	2A-2

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS
12/9/2021

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 044590 ENGINEER ANDREW D. WARGO
12/9/2021

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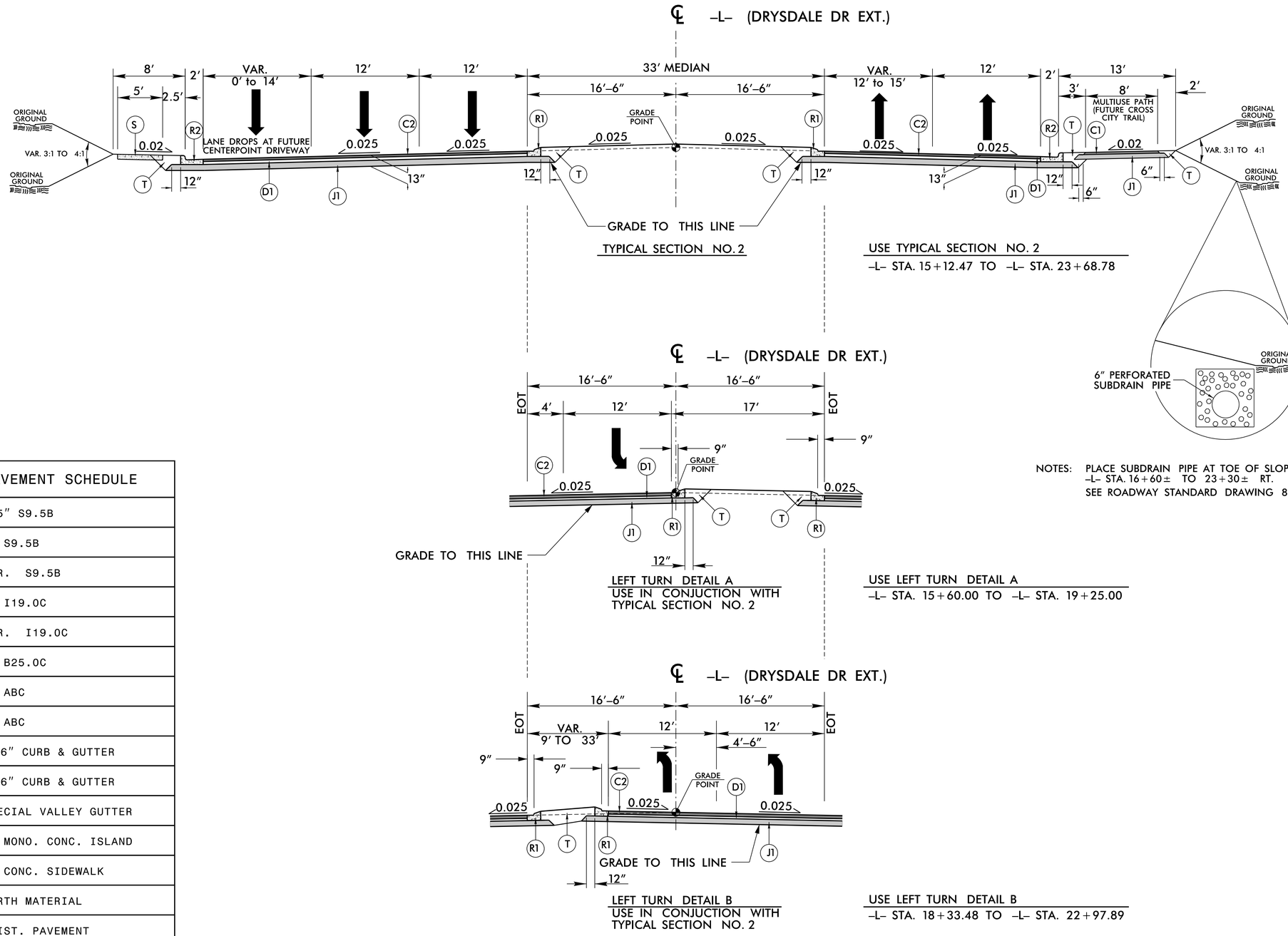
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116



NOTES: PLACE SUBDRAIN PIPE AT TOE OF SLOPE FROM -L- STA. 16+60± TO 23+30± RT.
SEE ROADWAY STANDARD DRAWING 815.02 FOR ADDITIONAL DETAILS.

PAVEMENT SCHEDULE	
C1	1.5″ S9.5B
C2	3″ S9.5B
C3	VAR. S9.5B
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
J1	6″ ABC
J2	8″ ABC
R1	1′-6″ CURB & GUTTER
R2	2′-6″ CURB & GUTTER
R3	SPECIAL VALLEY GUTTER
R4	5″ MONO. CONC. ISLAND
S	4″ CONC. SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	VAR. DEPTH MILLING
W	VAR. DEPTH ASPHALT

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	2A-3

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS — 12/9/2021

PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 044590 ENGINEER ANDREW D. WIRCO — 12/9/2021

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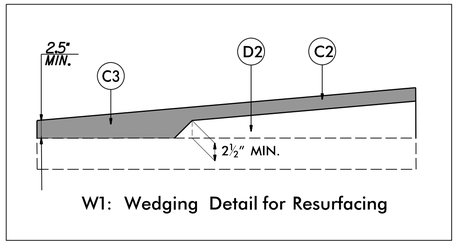
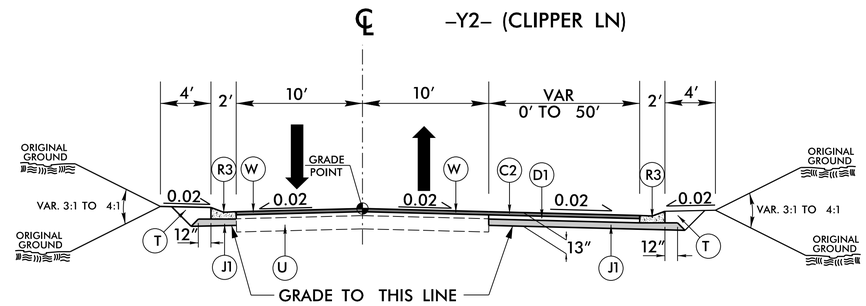
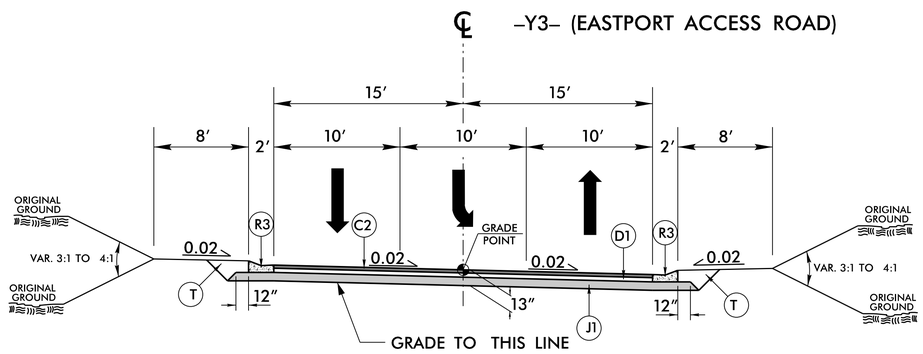


W1: Wedging Detail for Resurfacing



TYPICAL SECTION NO. 3
CLIPPER LANE CUL-DE-SAC

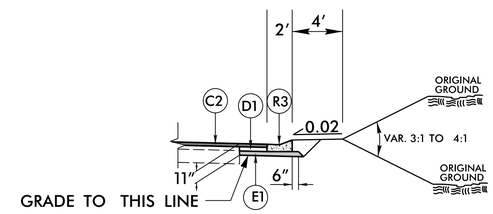
USE TYPICAL SECTION NO. 3
–Y2– STA. 10+58.06 TO –Y2– STA. 11+59.38



TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
–Y3– STA. 10+40.51 TO –Y3– STA. 11+94.81

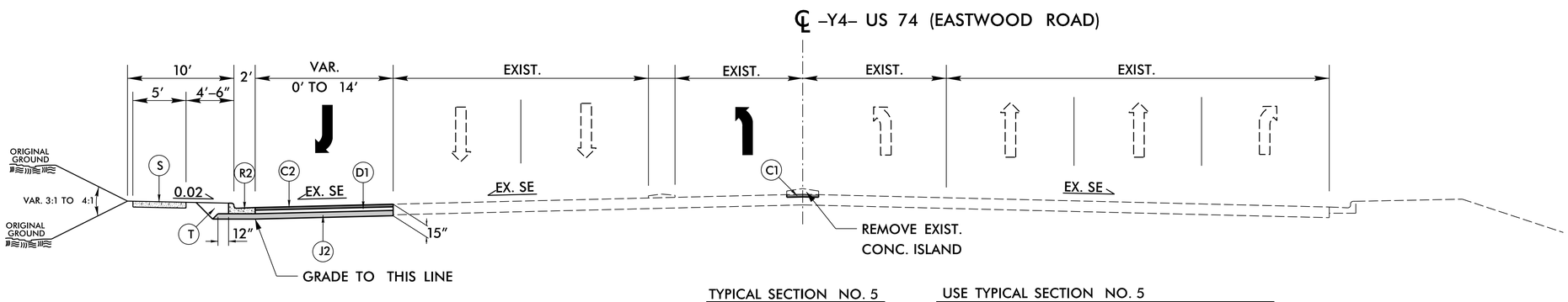
NOTE: TRANSITION 2′-6″ C&G TO SPECIAL VALLEY GUTTER FROM –Y3– STA. 10+72.00 TO 10+82.00 LT&RT.



ALTERNATE NARROW WIDENING DETAIL

OPTIONAL 4″ B25.0C TO BE USED IN LIEU OF ABC AT THE DISCRETION OF THE ENGINEER.

PAVEMENT SCHEDULE	
C1	1.5″ S9.5B
C2	3″ S9.5B
C3	VAR. S9.5B
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
J1	6″ ABC
J2	8″ ABC
R1	1′-6″ CURB & GUTTER
R2	2′-6″ CURB & GUTTER
R3	SPECIAL VALLEY GUTTER
R4	5″ MONO. CONC. ISLAND
S	4″ CONC. SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	VAR. DEPTH MILLING
W	VAR. DEPTH ASPHALT



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5
–Y4– STA. 29+50.83 TO –Y4– STA. 32+90.43

REVISIONS

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PAVEMENT DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 044590 ENGINEER ANDREW D. WARGO — 12/9/2021

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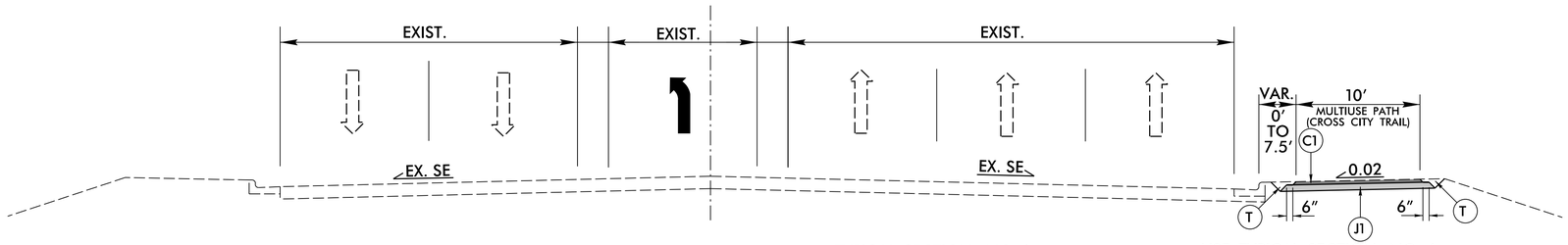
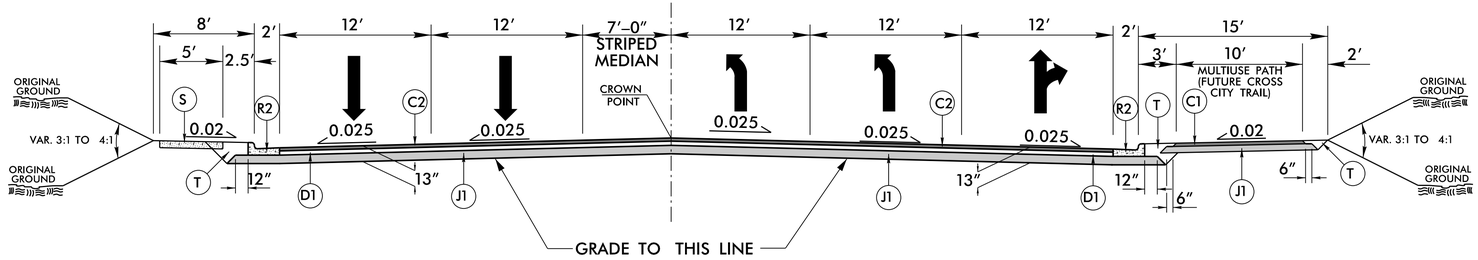
℄ –Y4– US 74 (EASTWOOD ROAD)



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6
–Y4– STA. 27+03.55 TO –Y4– STA. 29+20.00

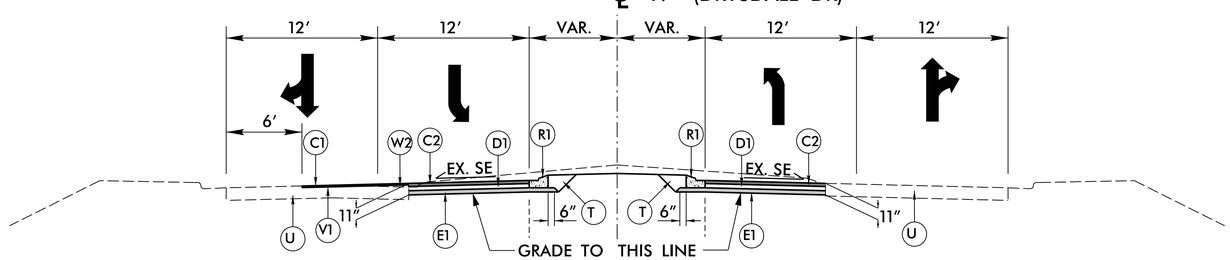
℄ –Y6– (CENTERPOINTE DRIVEWAY)



TYPICAL SECTION NO. 7

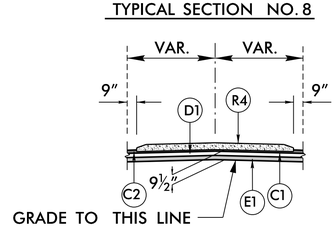
USE TYPICAL SECTION NO. 7
–Y6– STA. 10+94.23 TO –Y6– STA. 11+52.97

℄ –Y7– (DRYSDALE DR)



TYPICAL SECTION NO. 8

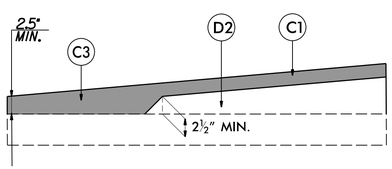
USE TYPICAL SECTION NO. 8
–Y7– STA. 10+44.49 TO –Y7– STA. 12+44.04



CONCRETE ISLAND DETAIL
USE IN CONJUCTION WITH TYPICAL SECTION NO. 8

USE CONCRETE ISLAND DETAIL
–Y7– STA. 11+95.77 TO –Y7– STA. 12+33.55

PAVEMENT SCHEDULE	
C1	1.5″ S9.5B
C2	3″ S9.5B
C3	VAR. S9.5B
D1	4″ I19.0C
D2	VAR. I19.0C
E1	4″ B25.0C
J1	6″ ABC
J2	8″ ABC
R1	1′-6″ CURB & GUTTER
R2	2′-6″ CURB & GUTTER
R3	SPECIAL VALLEY GUTTER
R4	5″ MONO. CONC. ISLAND
S	4″ CONC. SIDEWALK
T	EARTH MATERIAL
U	EXIST. PAVEMENT
V1	VAR. DEPTH MILLING
W	VAR. DEPTH ASPHALT



W2: Wedging Detail for Resurfacing

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	2C-1

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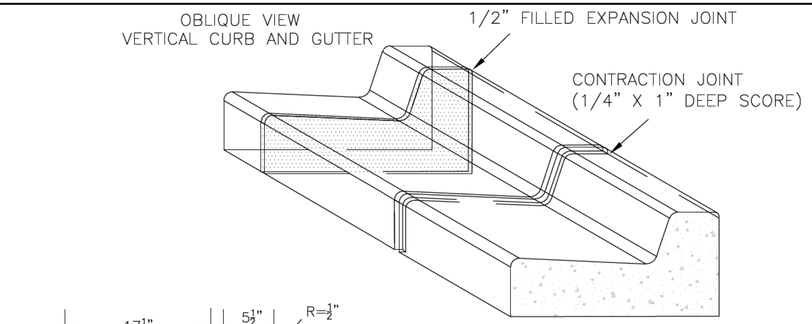
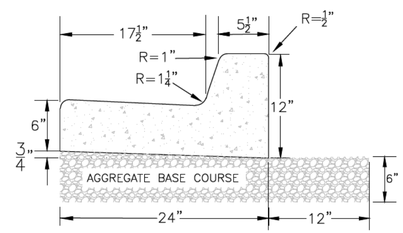
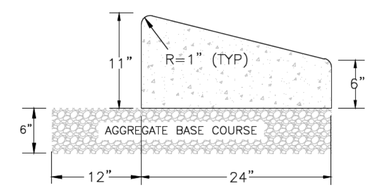
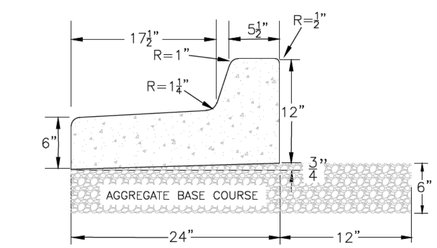




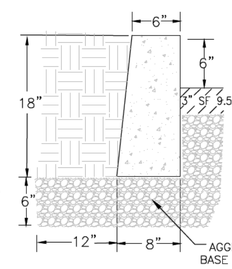
VERTICAL CURB AND GUTTER



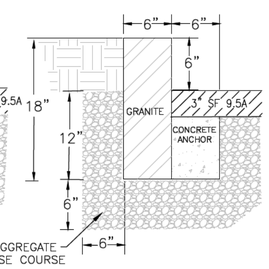
SLOPE CURB



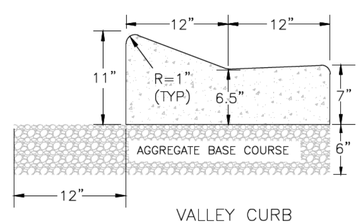
MEDIAN VERTICAL CURB AND GUTTER



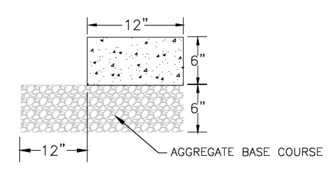
VERTICAL CURB



GRANITE CURB



VALLEY CURB



HEADER CURB

NOTES:
1. EXPANSION JOINT MATERIAL TO COMPLY WITH CURRENT NCDOT STANDARDS
2. 50' MAX EXPANSION JOINT SPACING, 10' MAX CONTRACTION JOINT SPACING
3. MINIMUM INSTALLATION LENGTH IS 5 FT.
4. CONCRETE TO BE 3000 PSI MIN
5. VERTICAL CURB AND GUTTER BASE CAN BE SLOPED 3/4" OR USE A FLAT BASE

STANDARD DETAIL

DATE: AUGUST, 2011

DRAWN: PB/JSR

CHECKED: DEC

SCALE NOT TO SCALE

CURBING

CITY OF WILMINGTON NORTH CAROLINA
CITY OF WILMINGTON ENGINEERING
PO BOX 1810
WILMINGTON N.C. 28402
(910) 341-7807

SD 3-11

NOTE: ONLY USE VALLEY CURB DIMENSIONS FOR PLACEMENT OF SPECIAL VALLEY GUTTER. ALL OTHER CURBS SHALL BE PLACED BY NCDOT STD. 846.01.

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
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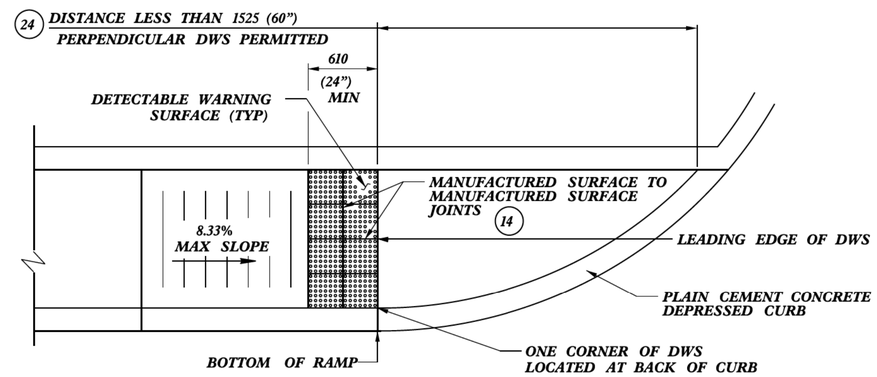

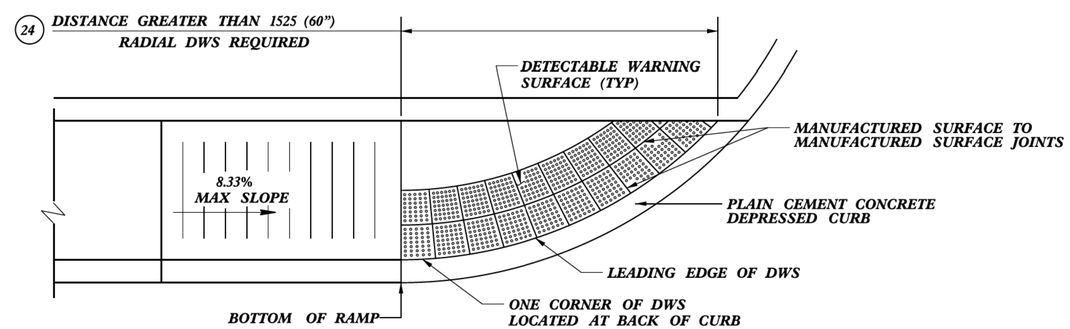

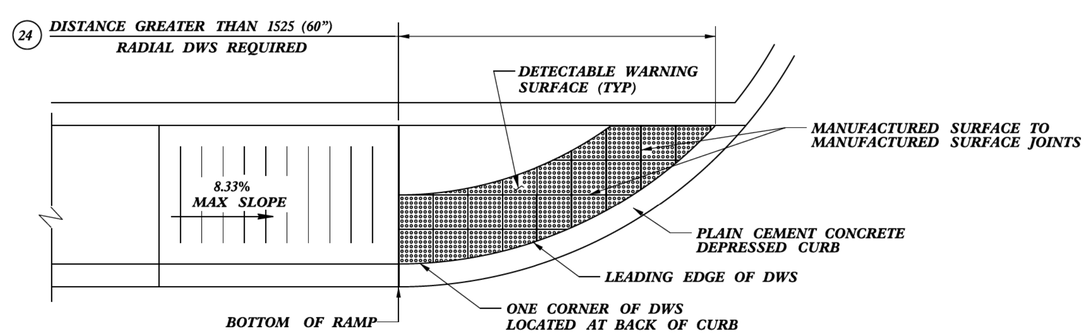

DETECTABLE WARNING SURFACE (DWS) ON CURVED SURFACES

REVISIONS

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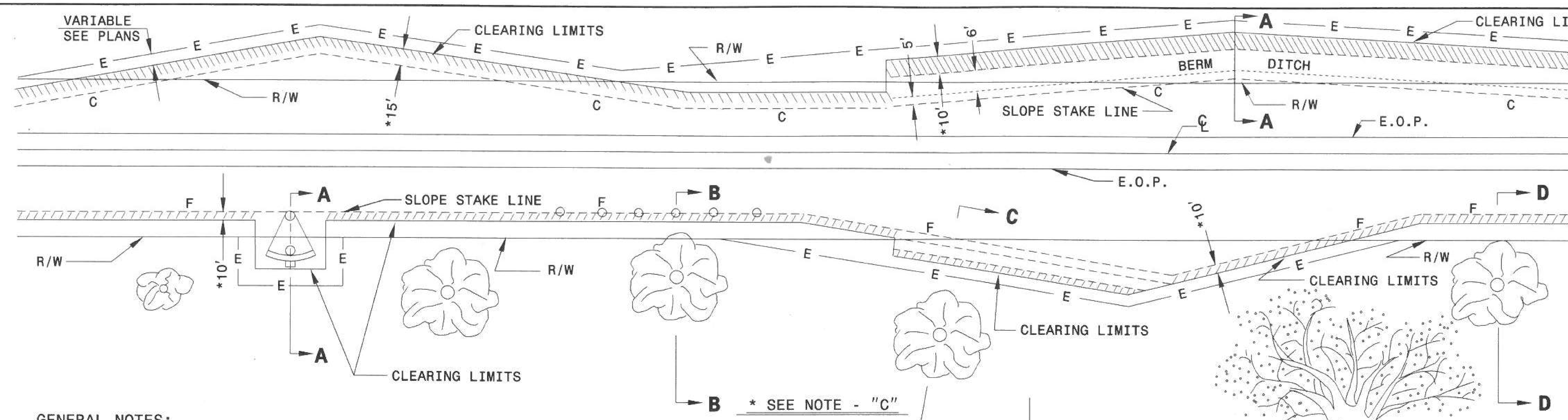
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	2C-3

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

ENGLISH DETAIL DRAWING FOR
METHOD OF CLEARING
MODIFIED METHOD - III

SHEET 1 OF 1
200D03



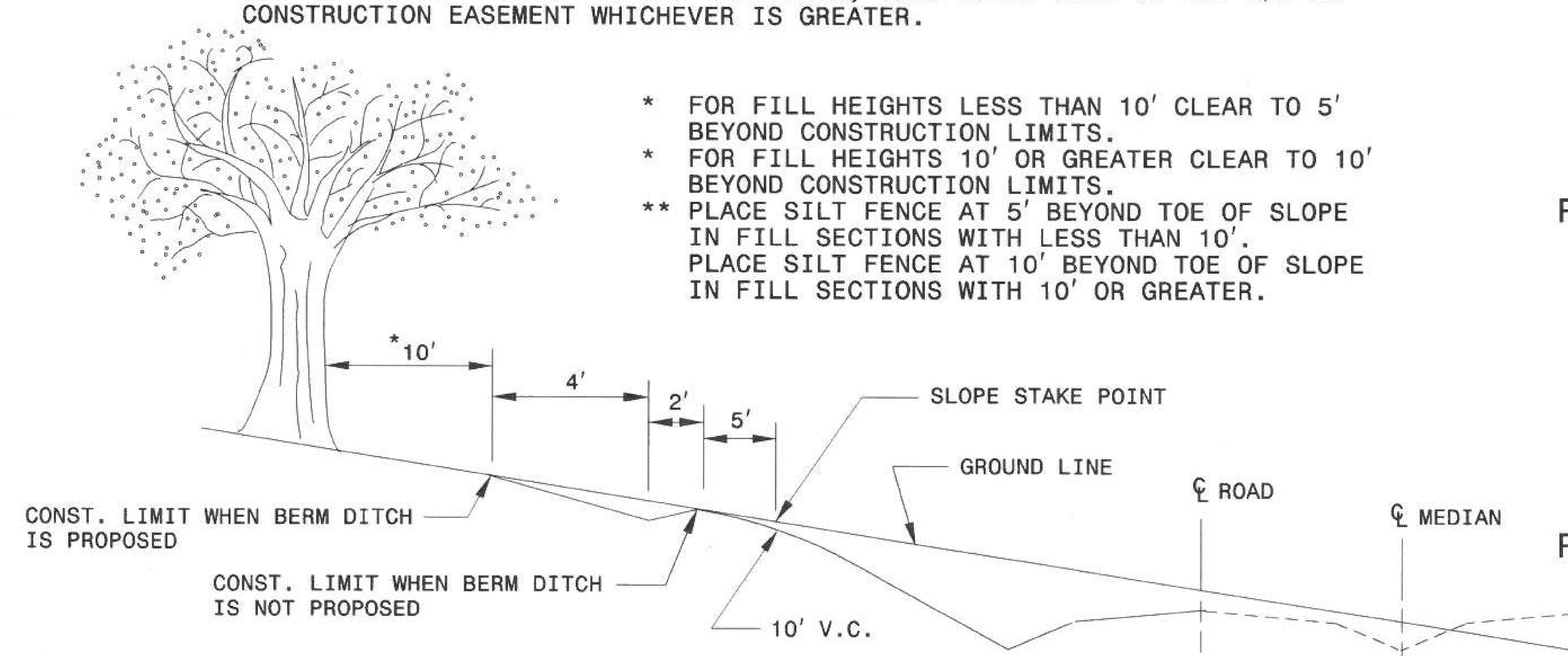
GENERAL NOTES:

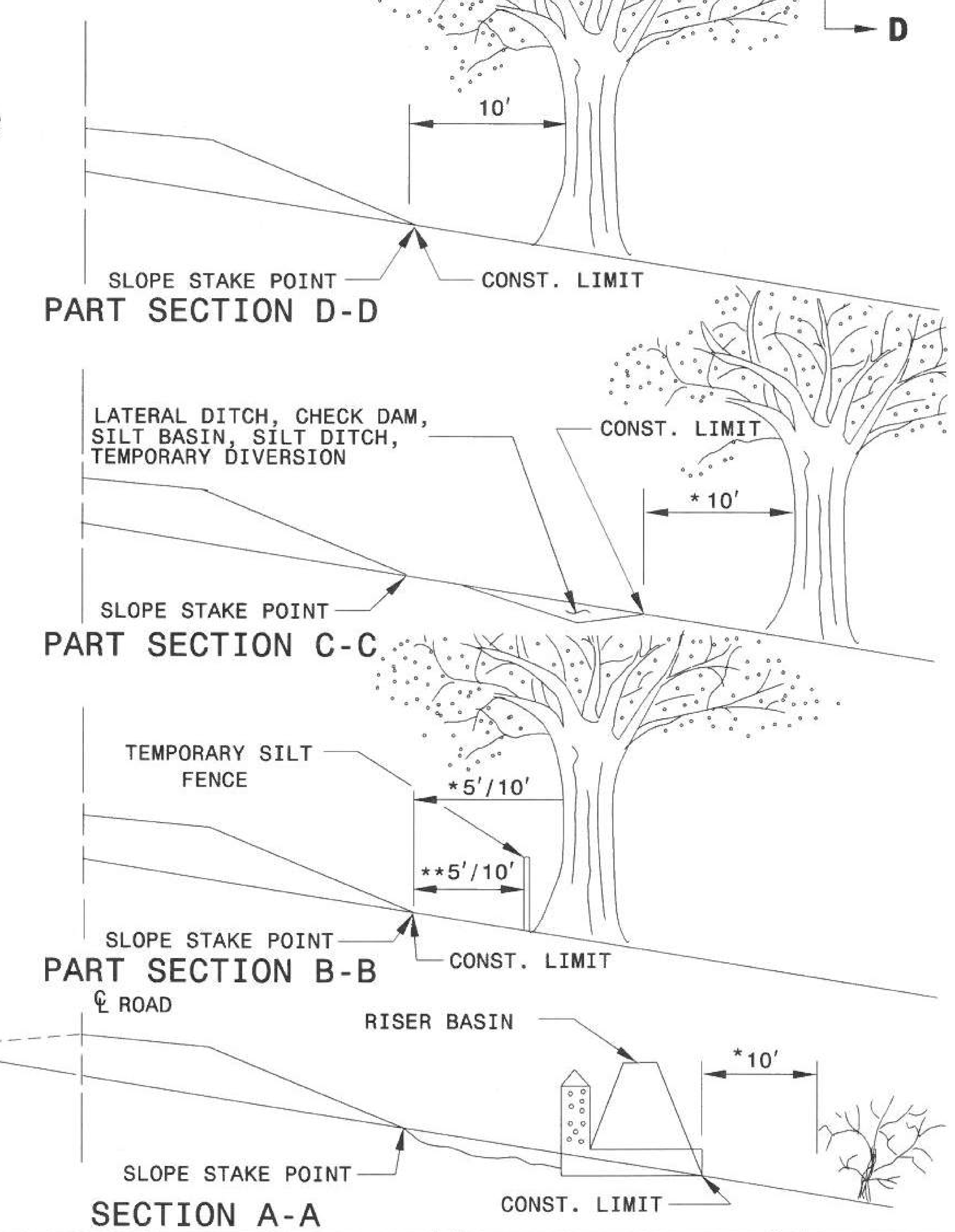
1. REMOVE TREES OUTSIDE THE CLEARING LIMIT WHEN, IN THE OPINION OF THE ENGINEER, THE UTILITY OF A TREE WILL BE DESTROYED BY THE CONSTRUCTION OR THE CLEARING OPERATION.
2. CLEAR IN ACCORDANCE WITH THIS STANDARD EXCEPT WHERE ADDITIONAL CLEARING IS REQUIRED FOR SAFETY AS SHOWN ON THE PLANS.

METHOD III CLEARING LIMITS

(A) CUTS -- CLEAR TO CONSTRUCTION LIMITS.
(B) FILLS - CLEAR TO 5'/10' * BEYOND CONSTRUCTION LIMITS, UNLESS SPECIFIED OTHERWISE BY WETLAND PERMIT.
(C) CUTS AND FILLS - WHEN THE CLEARING LIMITS (A AND B) EXCEED THE PROPOSED R/W OR PROPOSED CONSTRUCTION EASEMENTS, THEN CLEAR ONLY TO THE R/W OR CONSTRUCTION EASEMENT WHICHEVER IS GREATER.

* FOR FILL HEIGHTS LESS THAN 10' CLEAR TO 5' BEYOND CONSTRUCTION LIMITS.
* FOR FILL HEIGHTS 10' OR GREATER CLEAR TO 10' BEYOND CONSTRUCTION LIMITS.
** PLACE SILT FENCE AT 5' BEYOND TOE OF SLOPE IN FILL SECTIONS WITH LESS THAN 10'. PLACE SILT FENCE AT 10' BEYOND TOE OF SLOPE IN FILL SECTIONS WITH 10' OR GREATER.





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

ENGLISH DETAIL DRAWING FOR
METHOD OF CLEARING
MODIFIED METHOD - III

SHEET 1 OF 1
200D03

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

SEE TITLE BLOCK

ORIGINAL BY: T.S.S. DATE: FEB.2000
MODIFIED BY: K.A.K. DATE: AUG.2016
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U-5710A	2D-1

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER JOSHUA J. MASSEY

12/9/2021

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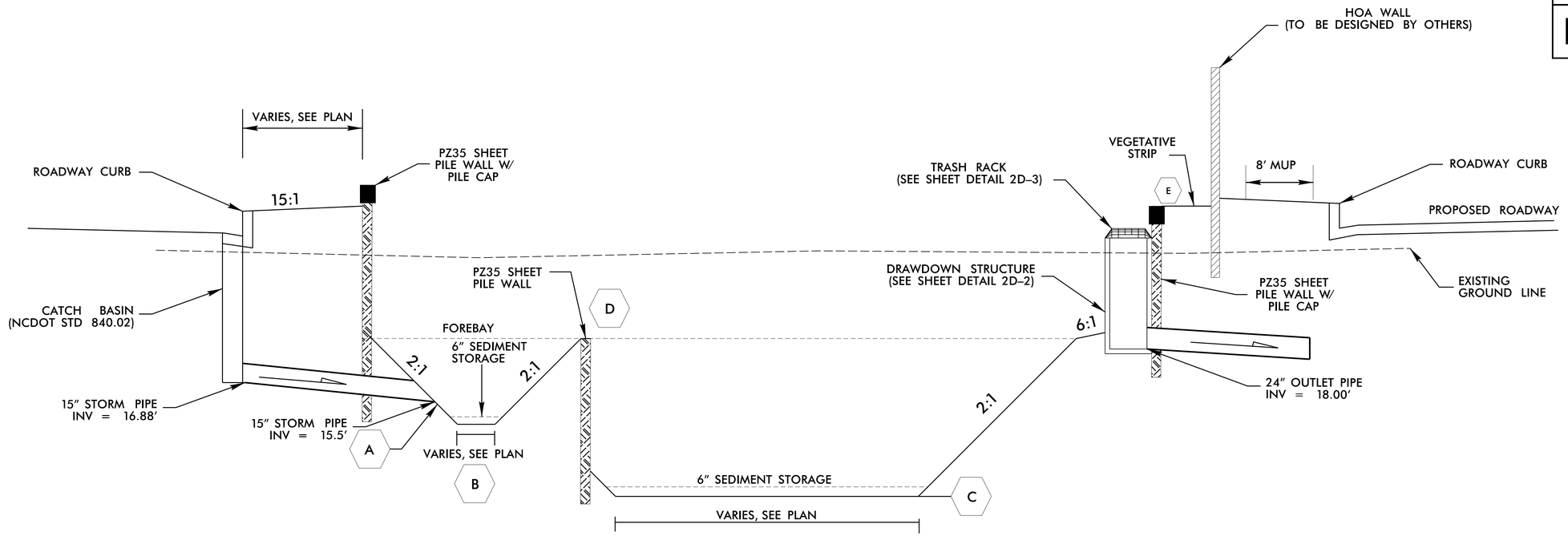
STORMWATER POND DETAIL

NOT TO SCALE



TYPICAL SECTION
NTS

TABLE 1

ELEVATIONS FOR STORMWATER POND					
STATION	A (FOREBAY PIPE INVERT)	B (FOREBAY BOTTOM)	C (BOTTOM OF BASIN)	D (FOREBAY WALL)	E (TOP OF BERM)
-Y2- 11+70 RT	15.5'	14.0'	11.0'	18.5'	24.0'

NOTES:

1. SEE PLANS FOR LOCATION AND BASIN DIMENSIONS.
2. ALL DISTURBED BASIN SLOPES DRAINING INTO THE FILTRATION BASIN SHALL BE SODDED WITH BERMUDA SOD.
3. ACCESS BERM SHALL BE PROVIDED TO ACCESS CONTROL STRUCTURE ON BASIN AS SHOWN IN DETAIL.
4. FILL EMBANKMENT MATERIAL SHOULD CONSIST OF A-4, A-5, OR A-6 SOILS COMPACTED TO 95% OF AASHTO T-99 (STANDARD PROCTOR)

6/2/99
REVISIONS
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HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER SHUJA J. MASSOUD

12/9/2021

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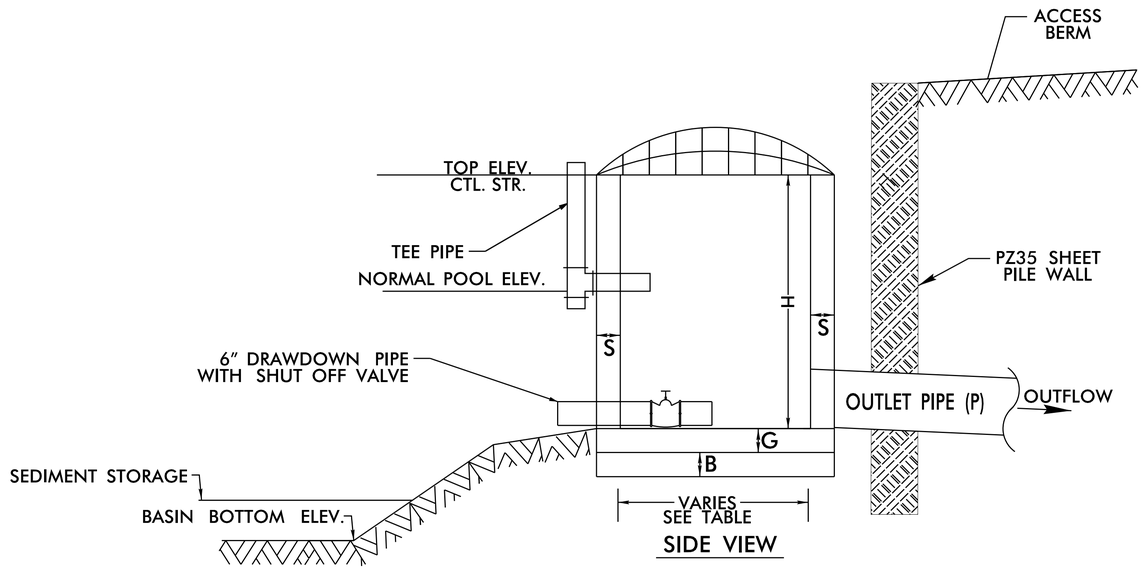
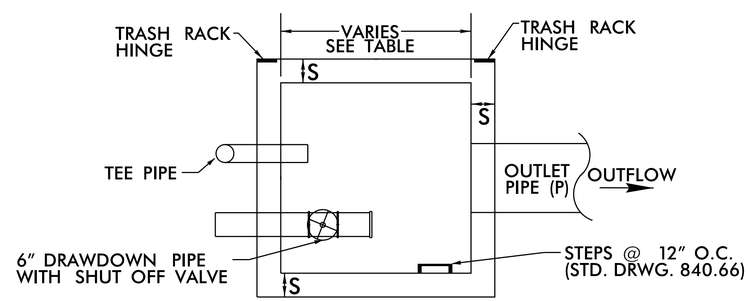
N.C.B.E.L.S. License Number: F-0116

DRAWDOWN STRUCTURE DETAIL

NOT TO SCALE



SIDE VIEW



PLAN VIEW

TRASH RACK NOT SHOWN FOR CLARITY

NOTES

1) NO BEDDING MATERIAL TO BE USED. THERFORE, DO NOT FOLLOW STANDARD DRAWINGS FOR METHOD OF PIPE INSTALLATION FOR OUTLET PIPE THROUGH EMBANKMENT.
2) ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE.
3) SHUT OFF VALVE MAY BE A GATE VALVE, BALL VALVE, SHEAR GATE, ETC. SHUT OFF VALVE IS TO REMAIN CLOSED DURING NORMAL OPERATON.

MINIMUM DIMENSIONS FOR WET DETENTION BASIN DRAWDOWN STRUCTURE

STATION	OFFSET	STRUCTURE NUMBER	SIDE WALLS (INCHES)	BASE B (INCHES)	BASE G (INCHES)	CTL. STR. DIMENSIONS			TOP ELEVATION CONTROL STRUCTURE	BASIN BOTTOM ELEV.	TEE PIPE DIAMETER INCHES	TEE PIPE INV. ELEV. (NORMAL POOL)	DRAWDOWN PIPE INVERT	OUTLET PIPE INVERT	OUTLET PIPE DIAMETER(P) INCHES	OUTLET PIPE MATERIAL
						W	L	H								
11+72.78 -Y2-	46.14' RT	0617	10	10	12	3.5'	3.5'	3.75'	21.75'	11.00'	1.5	18.50'	18.00'	18.00'	24	CONCRETE

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REVISIONS

6/2/99

DocuSign Envelope ID: 6CB25FF2-87BA-4A44-9984-70541EBAED01

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	2D-3

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER JOSHUA J. MASSEY

12/9/2021

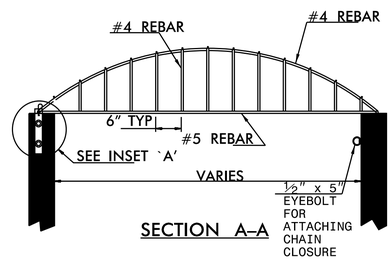
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

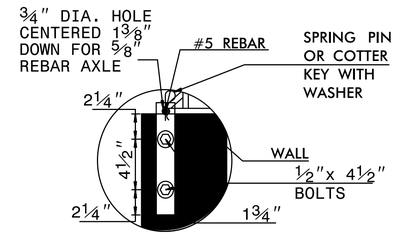
TRASH RACK DETAIL

NOT TO SCALE

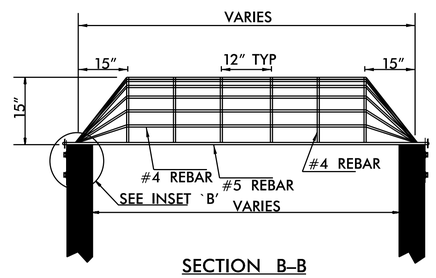
RISER TRASH RACK NOTES:
1) ALL JOINTS SHALL BE FULLY WELDED.
2) IF BOLTS ARE ANCHORED IN CONCRETE, FOLLOW STD. DWG. 862.03 AND 862.04 FOR ANCHORING PROCEDURE.
3) EYEBOLT FOR CHAIN CLOSURE SHALL BE INSTALLED BY THE SAME METHOD AS THE HINGE PLATE BOLTS.
4) RACK AND HARDWARE SHALL BE ALUMINUM OR REBAR AND GALVANIZED IN ACCORDANCE WITH ASTM A-153.
5) PROVIDE OPENING IN TRASH RACK TO ACCOMODATE SLUICE GATE, IF APPLICABLE, ON THE OUTLET PIPE. ENSURE TRASH RACK OPENS FREELY AND WITHOUT INTERFERENCE WITH SLUICE GATES.



SECTION A-A



INSET `A'



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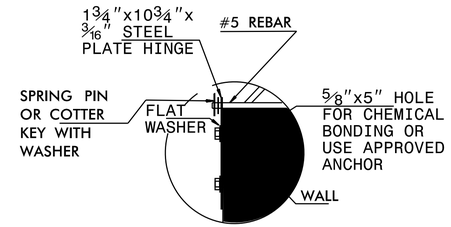

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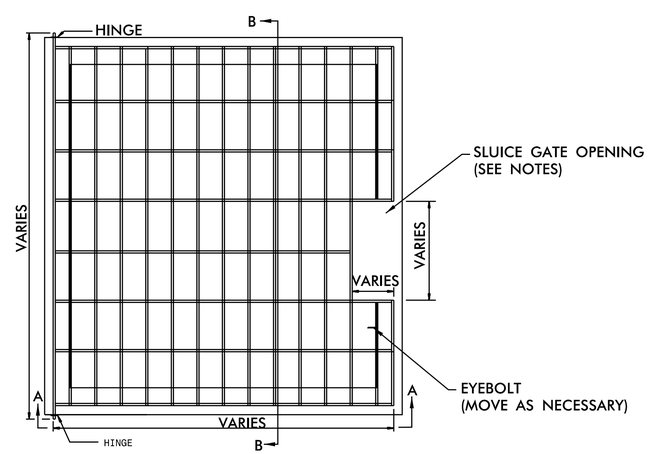

PLAN

REVISIONS

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6/2/99

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	2D-4

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER JULIA J. MASSICK

12/9/2021

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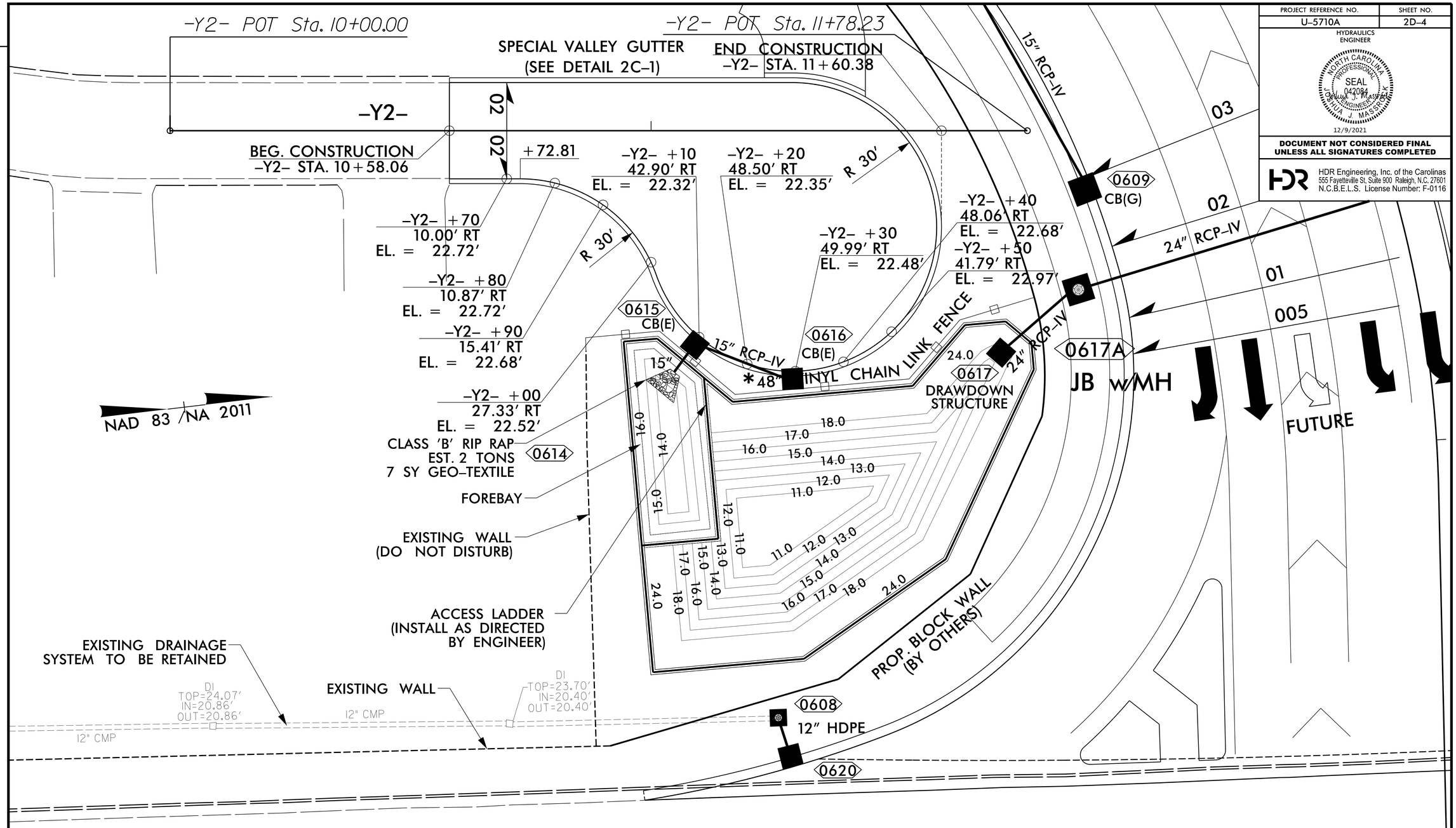

DETAIL SHOWING ELEVATIONS ON CUL-DE-SAC

SCALE 1" = 10'

SEE SHEET 6 FOR PLAN VIEW
SEE SHEET 10 FOR Y2 PROFILE
SEE SHEET BASIN_W FOR WALL ENVELOPE

* NOTE: FENCE NOT TO BE PLACED UNTIL DIRECTED BY THE ENGINEER. REFER TO CONTRACT DOCUMENTS FOR ADDITIONAL INFORMATION. FENCE SHALL HAVE (2) 10' WIDE ACCESS GATES: (1) ADJACENT TO THE OUTLET STRUCTURE AND (1) ADJACENT TO THE FOREBAY. INSTALL ACCESS LADDER AS DIRECTED BY ENGINEER.

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt PENTABLE: NCDOT_pshpfl_conventional.tbl
USER: CHARRIS DATE: 12/9/2021 TIME: 10:27:21 AM
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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	2D-5

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER JOSHUA J. MASSICK

12/9/2021

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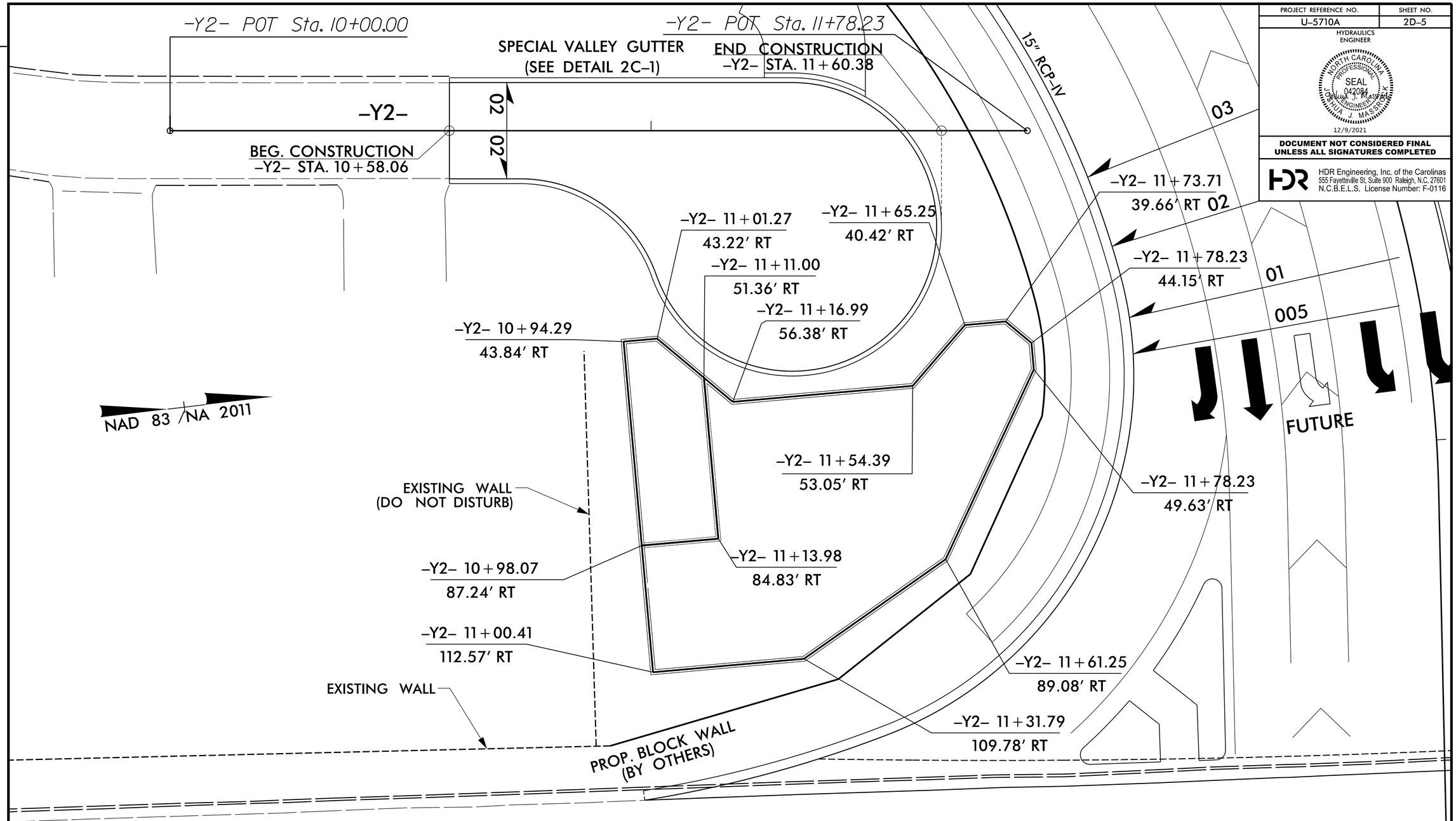
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116



DETAIL SHOWING STORMWATER POND LAYOUT

SCALE 1" = 10'

SEE SHEET 6 FOR PLAN VIEW
SEE SHEET 10 FOR Y2 PROFILE
SEE SHEET BASIN_W FOR WALL ENVELOPE

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt PENTABLE: NCDOT_pshpfl_conventional.tbl
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COMPUTED BY: _CEH_____ DATE: _8/28/19___
CHECKED BY: _____ DATE: _____

PROJECT NO.	SHEET NO.
U-5710A	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

Station	Station	Uncl. Excav.	Undercut	Embank. +%	Borrow	Waste
L Sta. 10+44.11	L Sta. 23+68.78	3,323	632	8,701	5,378	632
Y2 Sta. 10+58.06	Y2 Sta. 11+60.88	135	0	16	0	119
Y3 Sta. 10+40.51	Y3 Sta. 11+94.81	310	0	8	0	301
Y4 Sta. 29+50.83	Y4 Sta. 31+50.00	105	0	0	0	105
Y7 Sta. 10+44.49	Y7 Sta. 12+44.04	398	0	0	0	398
SUBTOTALS:		4,271	632	8,725	5,378	1,555
TOTALS:		4,271	632	8,725	5,378	1,555
Additional Undercut :			400	500	500	400
Waste In Lieu of Borrow :					-923	-923
PROJECT TOTALS:		4,271	1,032	9,225	4,955	1,032
Est. 5% To Replace Top Soil on Borrow Pit					248	
GRAND TOTALS:		4,271	1,032	9,225	5,203	1,032
SAY:		**4,500**	**1,100**		**5,500**	

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

EST. DDE = 510 CY
EST. SHALLOW UNDERCUT = 100 CY
CLASS IV SUBGRADE STABILIZATION = 190 TONS

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-Y2-	11+53.06	11+78.23	CL	241.11			
		TOTAL:	241.11				
		SAY:	250				

RAL-2TK94TQGVW

COMPUTED BY:	KMS	DATE:	12/11/2021
CHECKED BY:	JJM	DATE:	12/11/2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROJECT NO.	SHEET NO.
U-5710A	3D-1

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

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

LINE & STATION (SIZE / THICKNESS OR GAUGE)	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A: 5' THRU 10' LIN. FT.	B: 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G		CONCRETE TRANSITIONAL SECTION: D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING C.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.		ADJUST C.B.	ADJUST D.I.	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 11+41	47 RT	0401		21.6																																				1			1		1																																						
		0401	0402		18.2	18.2																								8																																																							
L 11+50	46 RT	0402		21.7																																				1			1	1																																							
		0402	0404		18.2	17.3																									84																																																					
L 11+41	42 LT	0403		21.5																																				1			1			1																																					
		0403	0410		17.3	17.1																										92																																																				
L 11+50	42 LT	0404		21.5																																				1			1	1																																							
		0404	0403		17.3	17.3																										8																																																			
L 10+45	25 LT	0405		22.4																																				1	0.4																													1						1										
L 13+50	42 RT	0406		22.6																																				1			1			1																																					
		0406	0408		19.4	18.9																									84																																																					
L 13+50	43 LT	0408		22.6																																				1			1		1																																						
		0408	0404		18.9	17.3																									196																																																					
L 10+58	26 LT	0410		21.9																																				1																														1						1										Box is deeper than pipe inverts to accommodate U-5710 design
		0410	0405		17.1	17.1																										12																																																				
L 14+76	98 LT	0501		22.5																																				1			1			1																																					
		0501	0502		19.5	19.5																								68																																																						
L 15+48	100 LT	0502		22.5																																				1			1		1																																						
		0502	0503		19.4	19.2																								64																																																					
L 15+93	54 LT	0503		23.8																																				1			1		1																																						
		0503	0506		19.2	18.6																								204																																																					
L 15+65	42 RT	0504		24.0																																				1			1			1																																					
		0504	0511		21.0	20.2																								108																																																					
L 19+00	54 RT	0505		23.2																																				1			1		1																																						
		0505	0509		20.3	18.6																								40																																																					
L 18+00	55 LT	0506		23.7																																				1			1			1																																					
		0506	0507		18.6	18.1	0.5																							100																																																						
L 19+00	55 LT	0507		23.9																																				1	1.4		1			1																																					
		0507	0510		17.3	17.1																										40																																																			
L 19+40	54 RT	0509		23.1																																				1	0.3		1		1																																						
		0509	0510		17.8	17.1																										108																																																			
L 19+40	55 LT	0510		24.3																																				1	2.5		1			1																																					
		0510	0508		16.6	16.5																											28																																																	
L 14+58	42 RT	0511		23.3																																				1			1			1																																					
		0511	0406		20.2	19.6																								108																																																					
L 19+40	69 RT	0512	0509		22.5	18.6																								16																																																				OEP
L 20+50	61 RT	0601		22.5																																				1	0.5		1		1																																						
		0601	0509		18.0	17.8																										104																																																			
L 20+50	14 LT	0602		24.5																																				1			1		1				1																																				
		0602	0604		21.5	21.0																								88																																																						
L 21+35	62 RT	0603		21.9																																				1			1	1																																							
		0603	0601		18.1	18.0																										64																																																				
L 21+35	15 LT	0604		24.3																																				1			1	1					1																																				
		0604	0603		21.0	18.1																									76																																																					
L 21+50	62 RT	0606		21.9																																				1			1			1																																					
		0606	0603		18.9	18.8																								12																																																					
L 21+50	14 LT	0607		24.3																																				1			1			1			1																																				
		0607	0604		21.3	21.0	0.3																							16																																																					
SHEET TOTALS																														832	440	428	28							24	5.1		22	4	8	10			3																				2						2										

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

RAL-2TK9470GVW

COMPUTED BY: KMS DATE: 11/01/2021

CHECKED BY: JJM DATE: 11/01/2021

PROJECT NO.	SHEET NO.
U-5710A	3D-2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION / SIZE / THICKNESS OR GAUGE	OFFSET		STRUCTURE NUMBER FROM	TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
			0608	0620		20.3	20.3		8								X	X	X		
L 22+24	62	RT	0609		22.3																
			0609	0606		19.3	18.9														
L 22+25	15	LT	0610		24.5																
			0610	0607		21.5	21.3														
L 23+68	57	RT	0613		24.2																
Y2 11+10	43	RT	0615		22.2																
			0615	0614		16.9	15.5			24								X			
Y2 11+30	50	RT	0616		22.5																
			0616	0615		19.5	16.9														
L 22+71	92	RT	0617		21.8																
			0617	0617A		18.0	17.9	0.4													
L 22+50	69	RT	0617A		24.0																
			0617A	0619		17.9	17.3	0.4													
L 23+63	136	RT	0620		24.6																
			0620	0613		20.3	20.2														
Y4 30+59	41	LT	0701		23.5																
Y4 30+59	48	LT	0702		23.1																
SHEET TOTALS									8	24											
PROJECT TOTALS									8	24											

FROM	TO	R. C. PIPE CLASS III 12	15	18	24	30	36	42	48	R. C. PIPE CLASS IV 12	15	18	24	30	36	42	48
0608	0620																
0609																	
0609	0606										56						
0610																	
0610	0607										76						
0613																	
0615																	
0615	0614																
0616																	
0616	0615										20						
0617																	
0617	0617A												28				
0617A																	
0617A	0619												132				
0620																	
0620	0613										76						
0701																	
0702																	
SHEET TOTALS											228		160				
PROJECT TOTALS											1060	440	588	28			

FROM	TO	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A: 5' THRU 10' LIN. FT.	B: 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28
0608	0620																			
0609					1			1			1									
0609	0606																			
0610					1			1			1		1							
0610	0607																			
0613																				
0615					1	0.4		1	1											
0615	0614																			
0616					1			1	1											
0616	0615																			
0617																				
0617	0617A																			
0617A					1	1.1														
0617A	0619																			
0620					1			1		1										
0620	0613																			
0701					1	0.8														
0702					1			1		1										
SHEET TOTALS					8	2.3		6	2	2	2		1							
PROJECT TOTALS					33	7.4		28	6	10	12		4							

FROM	TO	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING C.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.	ADJUST C.B.	ADJUST D.I.	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
0608	0620																											182	Remove 12" CMP
0609																													
0609	0606																												
0610																													
0610	0607																												
0613																				1	1								
0615																													
0615	0614																												
0616																												75	Remove 12" CMP
0616	0615																												
0617																												42	Remove 24" RCP. Str. 0617 Quantities Included w/ BMP
0617	0617A																											126	Remove 12" CMP
0617A												1							1	1									
0617A	0619																												
0620																													
0620	0613																												
0701														1						1									
																													Ex. 36" Pipe
0702																													
																													Ex. 24" Pipe
SHEET TOTALS												1		1					1	3	1							425	
PROJECT TOTALS												2		3					1	6	1							425	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

WIL-5CD01670T3

COMPUTED BY: KMS DATE: 4/22/2021

CHECKED BY: JJM DATE: 4/22/2021

PROJECT NO.	SHEET NO.
U-5710A	3D-3

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	Drainage Pipe (RCP, CSP, CAAP, HDPE, or PVC) 54	60	66	72	78	84	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PVC
L 22+81	97 LT	0618		21.5														
		0618	0619		17.0	16.8												
L 22+40	62 LT	0619		26.0														
		0619	0621		16.8	16.6												
L 21+25	61 LT	0621		26.2														
		0621	0622		16.6	16.3												
L 20+03	62 LT	0622		25.7														
		0622	0623		16.3	16.0												
L 19+81	89 LT	0623		21.0	16.0													
SIZE / THICKNESS OR GAUGE																		

STRUCTURE FROM	TO	R. C. PIPE CLASS III 54	60	66	72	78	84	R. C. PIPE CLASS IV 54	60	66	72	78	84	ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE) CY	REINFORCED ENDWALLS CY	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES (NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)) 0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE E	F	G
0618															5.900								
0618	0619								60														
0619																5.377							
0619	0621								140														
0621																5.741							
0621	0622								140														
0622																5.553							
0622	0623								36														
0623															5.900								
SHEET TOTALS									376						11.800	16.671							
PROJECT TOTALS									376						11.800	16.671							

STRUCTURE FROM	TO	CONCRETE TRANSITIONAL SECTION D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05	OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.2	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.2	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.2	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.2	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32	ANGLED VANE GRATES AND FRAMES STD. 840.33	T.B.J.B. STD. 840.34	T.B.D.I. STD. 840.35	T.B.D.I. FOR STEEL GRATES STD. 840.36	STEEL FRAME WITH TWO GRATES STD. 840.37	TEMP STEEL PLATE COVER MASONRY DRAINAGE	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	CONVERT EXISTING C.B. TO J.B.	CONVERT EXISTING C.B. TO D.I.	CONVERT EXISTING D.I. TO J.B.	CONVERT EXISTING J.B. TO D.I.	ADJUST C.B.	ADJUST D.I.	FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	PIPE REMOVAL LIN. FT.	REMARKS
0618																																						14	Remove 24" RCP
0618	0619																																						
0619																					1								1										
0619	0621																																						
0621																					1								1										
0621	0622																																						
0622																					1								1										
0622	0623																																						
0623																																							
SHEET TOTALS																					3								3									14	
PROJECT TOTALS																					3								3									14	

ABBREVIATIONS

C.A.A.	CORRUGATED ALUMINIUM ALLOY
C.B.	CATCH BASIN
C.S.	CORRUGATED STEEL
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
H.D.P.E.	HIGH DENSITY POLYETHYLENE
J.B.	JUNCTION BOX
M.H.	MANHOLE
N.S.	NARROW SLOT
P.V.C.	POLYVINYL CHLORIDE
R.C.	REINFORCED CONCRETE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX
W.S.	WIDE SLOT

COMPUTED BY: Steven V. Hudson, LG	DATE: 10/30/2018
CHECKED BY: J. Lee Stone, LG	DATE: 10/30/2018

(5-15-18)

PROJECT NO.	SHEET NO.
U-5710A	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
-L-	10+44	23+68	LT/RT	SD	2700
-Y3-	10+00	11+94	LT/RT	SD	400
CONTINGENCY				SD	200
				TOTAL LF:	3300

*UD = Underdrain
*BD = Blind Drain
*SD = Subsurface Drain

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
-L-	Varies						600		
CONTINGENCY			ASU (1)	12"	100	190	700		
			TOTAL CY/TONS/SY:		100	190**	1300**		

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
*AST = Aggregate Stabilization
**Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

PROJ. REFERENCE NO.	SHEET NO.
U-5710A	3P-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PARCEL INDEX SHEET

PARCEL No.	SHEET No.	PROPERTY OWNER NAME
1	4,5,6	THOMAS G. WETHERILL, WETHERILL FAMILY LAND LLC
4	5	STEPHANIE ROGERS & S. ARGUTO WILLIAM
6	5	ELOISE N. ELLER
7	5	EUGENE R. STRADER, JR
8	5	DIANE M. WALSTON, ETAL
10	6	BROOKE P. RUSSELL, REVOCABLE TRUST
11	6	MICHAEL S. ADAMS & ANGELA J.
12	6	D. SCOTT MCCONNELL & MARILYN
13	6	THOMAS HERGA
14	6	ETHEL L. REYNOLDS
15	4,5,6	EASTPORT HOA INC
16	4	SUSAN M. LENNON
21	6	EVENTIDE PROPERTIES LLC
22	6	NEW HANOVER COUNTY
23	6A	LANDFALL HOA

PARCEL No.	SHEET No.	PROPERTY OWNER NAME

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS — 12/9/2021

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER JOSHUA J. MASSREY — 12/9/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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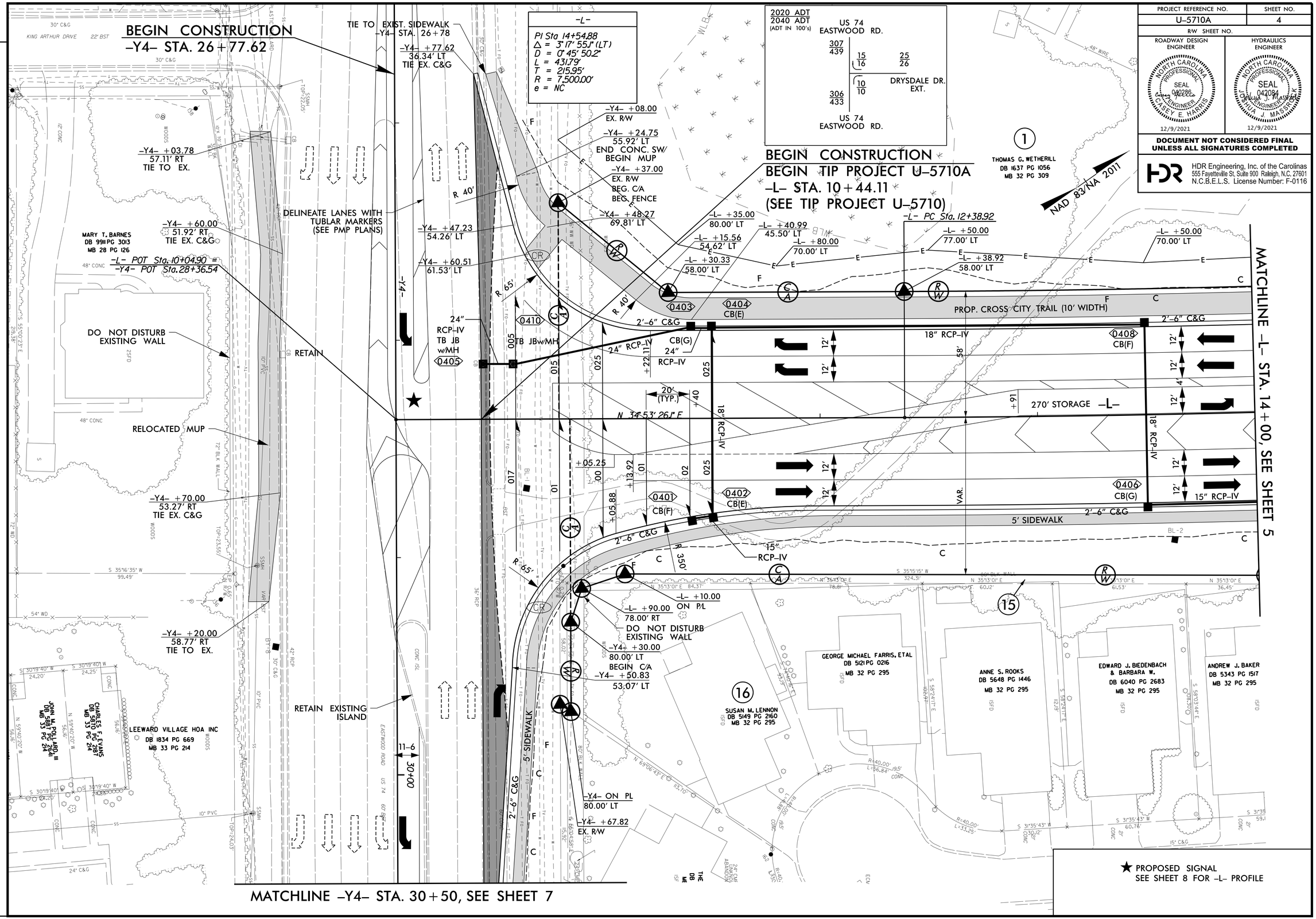
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116



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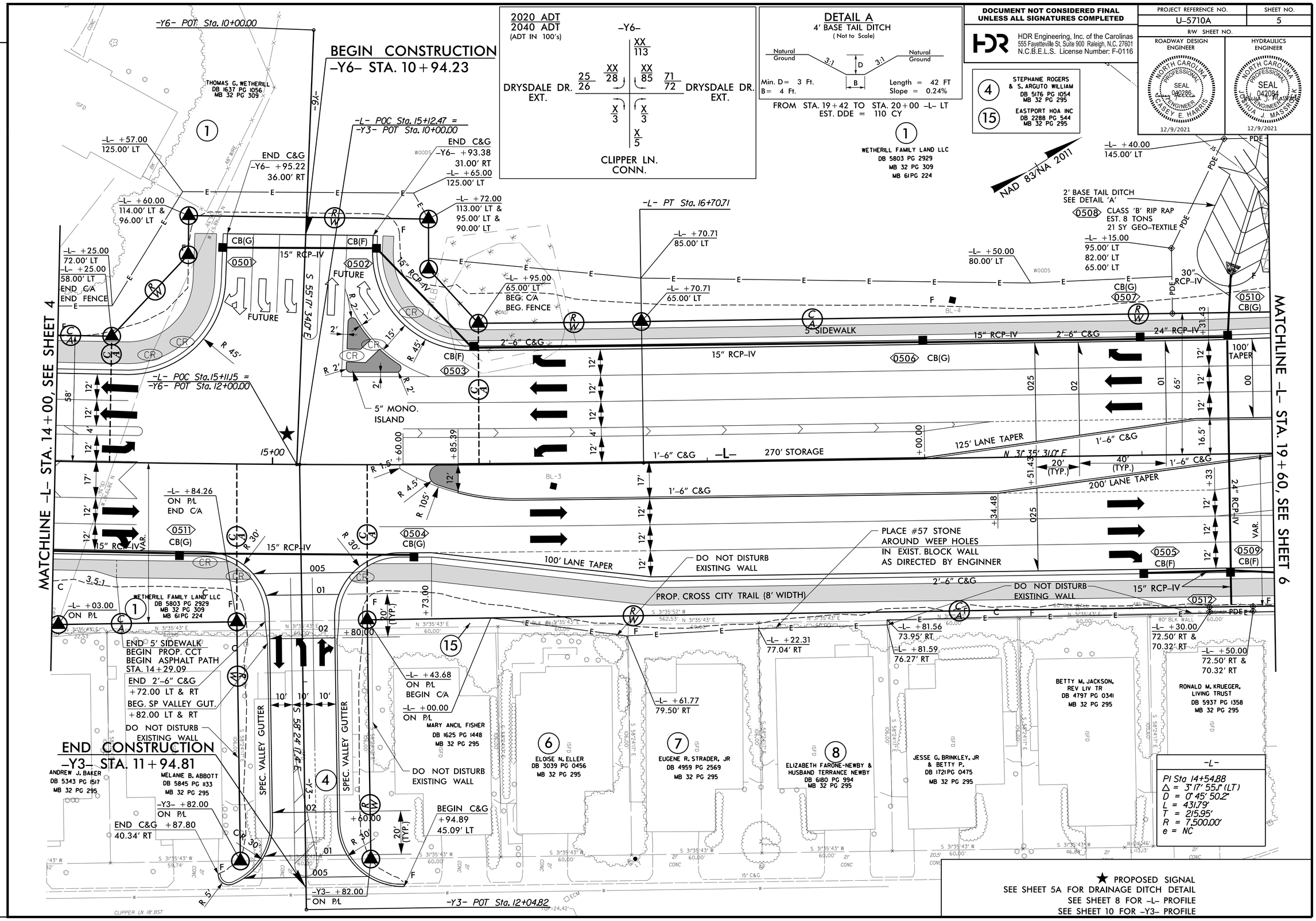

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	5A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS 12/9/2021	NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER JOSHUA J. MASSEY 12/9/2021

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DRAINAGE DITCH DETAIL

SCALE

10′ 5′ 0′ 10′ 20′

DETAIL A
2′ BASE TAIL DITCH
(Not to Scale)

Natural Ground — 3:1 — D — 3:1 — Natural Ground; B

Min. D = 3 Ft.
B = 2 Ft.
Length = 42 FT
Slope = 0.6%

FROM STA. 19+42 TO STA. 20+00 –L– LT

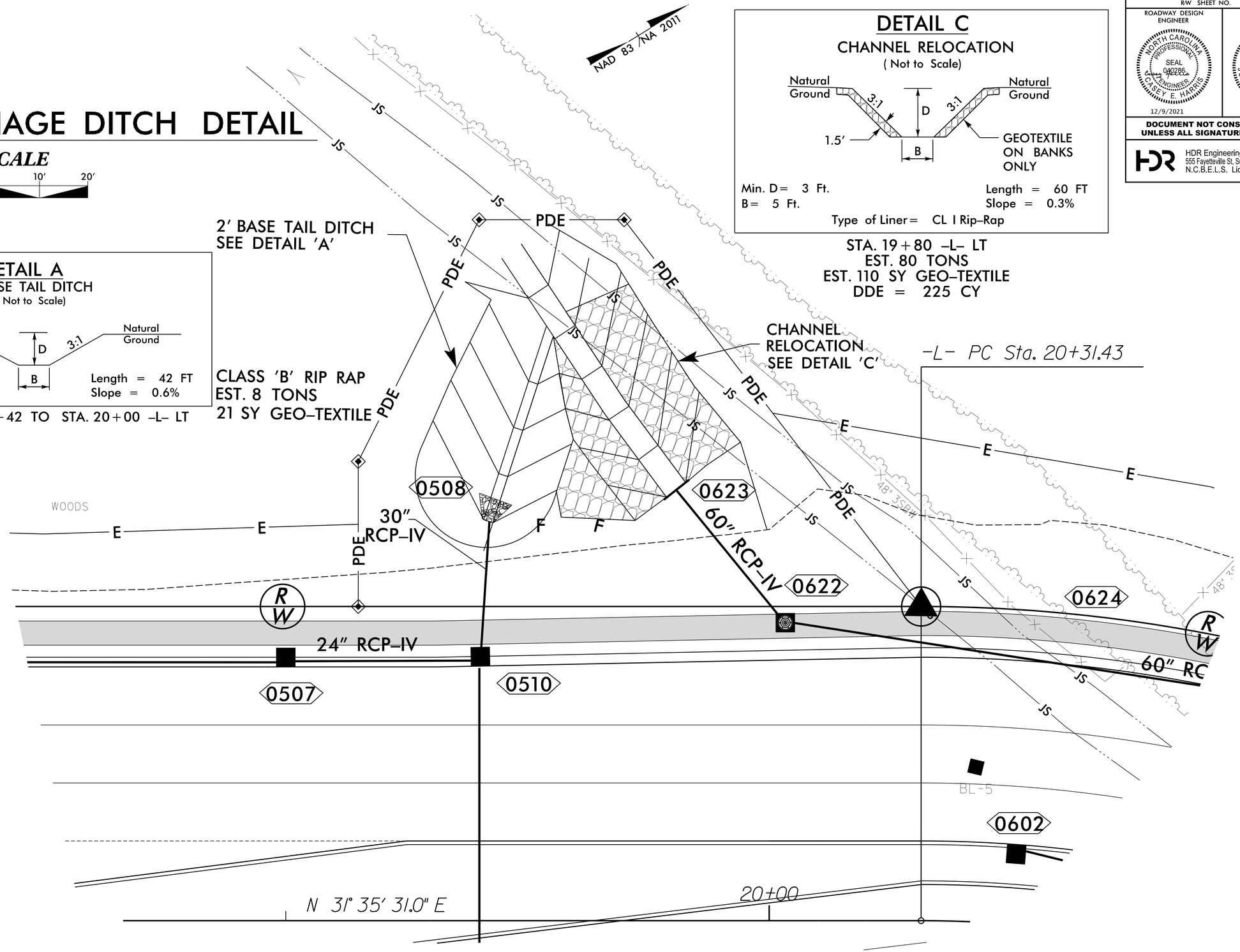
DETAIL C
CHANNEL RELOCATION
(Not to Scale)

Natural Ground — 3:1 — D — 3:1 — Natural Ground; 1.5′; B; GEOTEXTILE ON BANKS ONLY

Min. D = 3 Ft.
B = 5 Ft.
Length = 60 FT
Slope = 0.3%

Type of Liner = CL I Rip-Rap

STA. 19+80 –L– LT
EST. 80 TONS
EST. 110 SY GEO-TEXTILE
DDE = 225 CY



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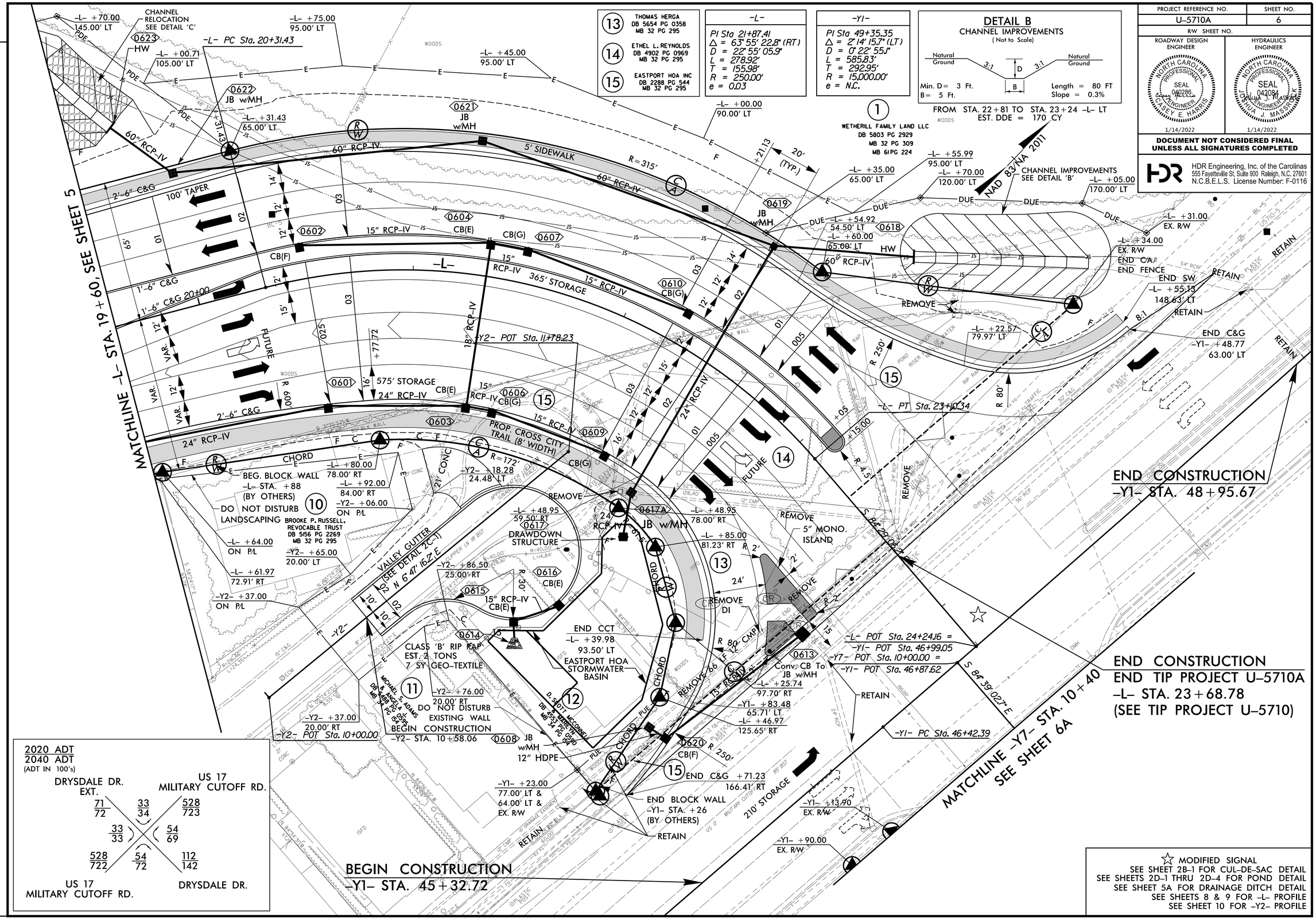

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U-5710A	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER KASEY E. HARRIS — 1/14/2022

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER JOSHUA J. MASSEY — 1/14/2022

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REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	6A
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS
12/9/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER JOSHUA J. MASSRY
12/9/2021

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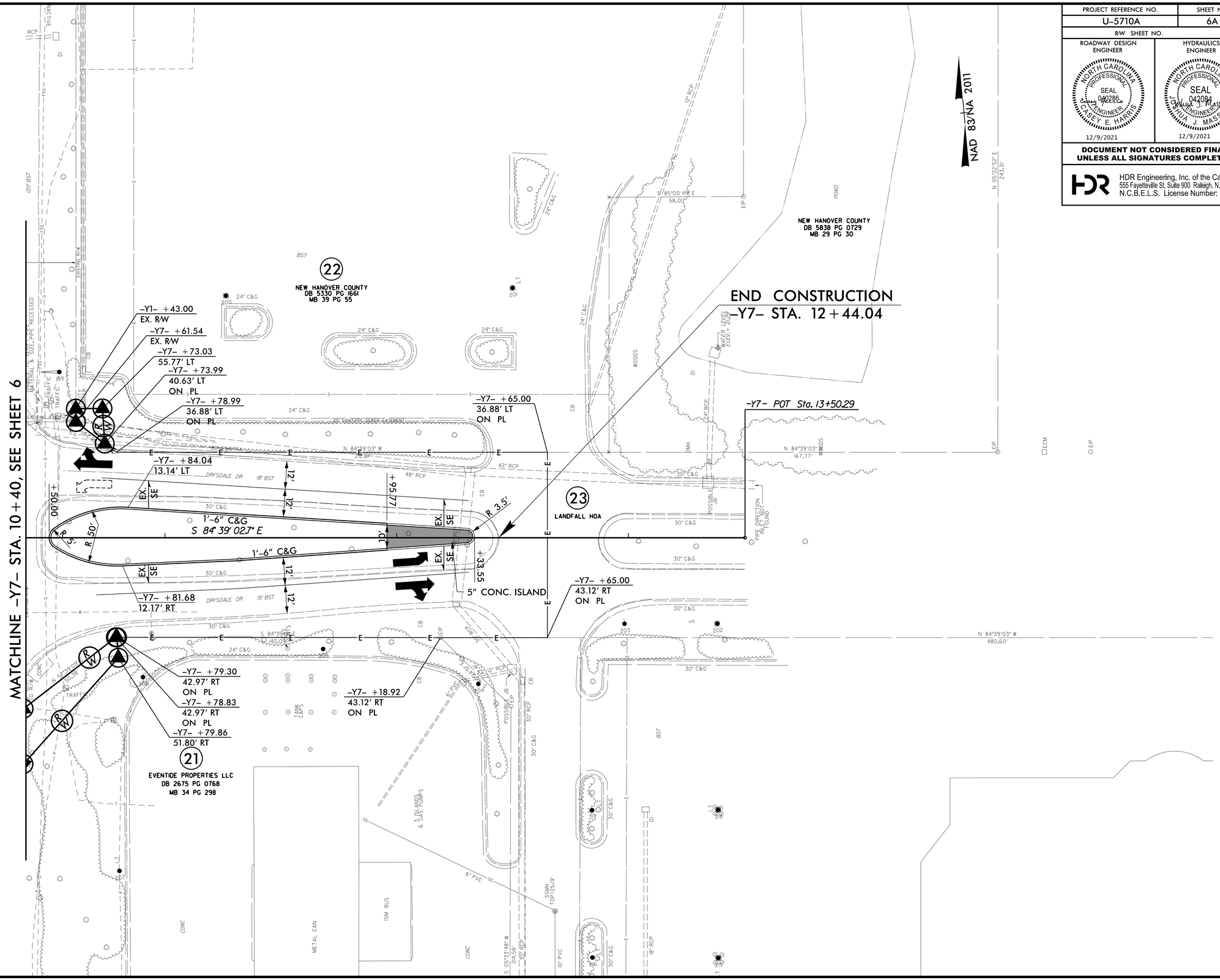

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS
12/9/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER JULIA J. MASTERSON
12/9/2021

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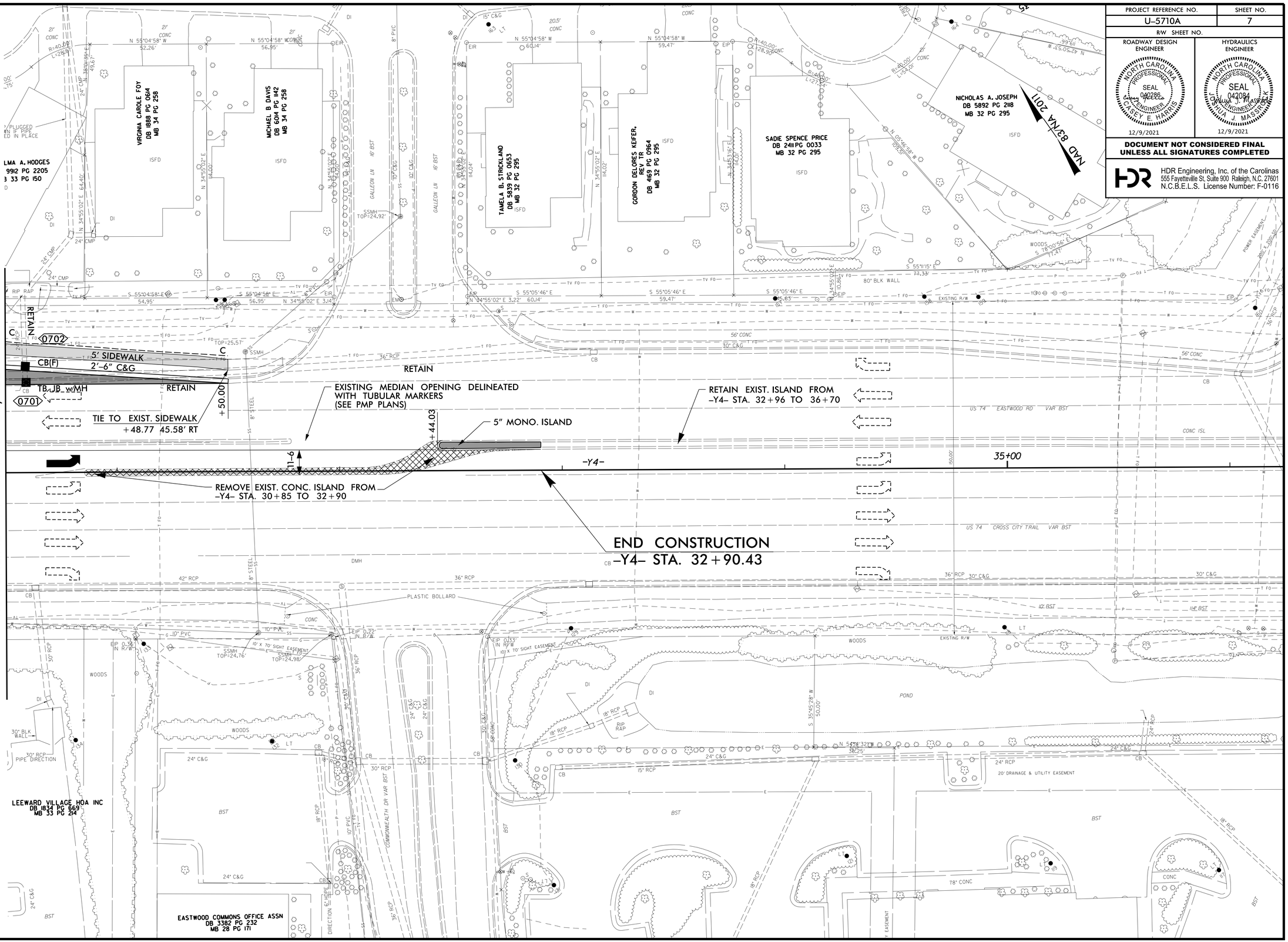

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N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	8

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS
12/9/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER JOSHUA J. MASSREK
12/9/2021

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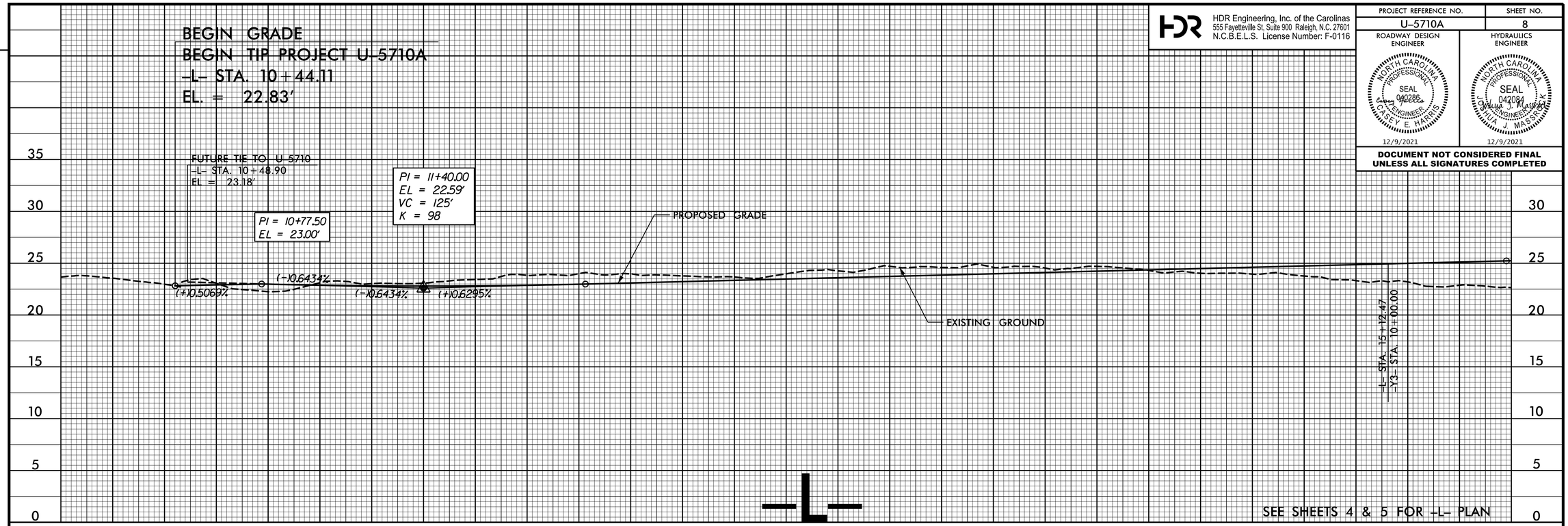

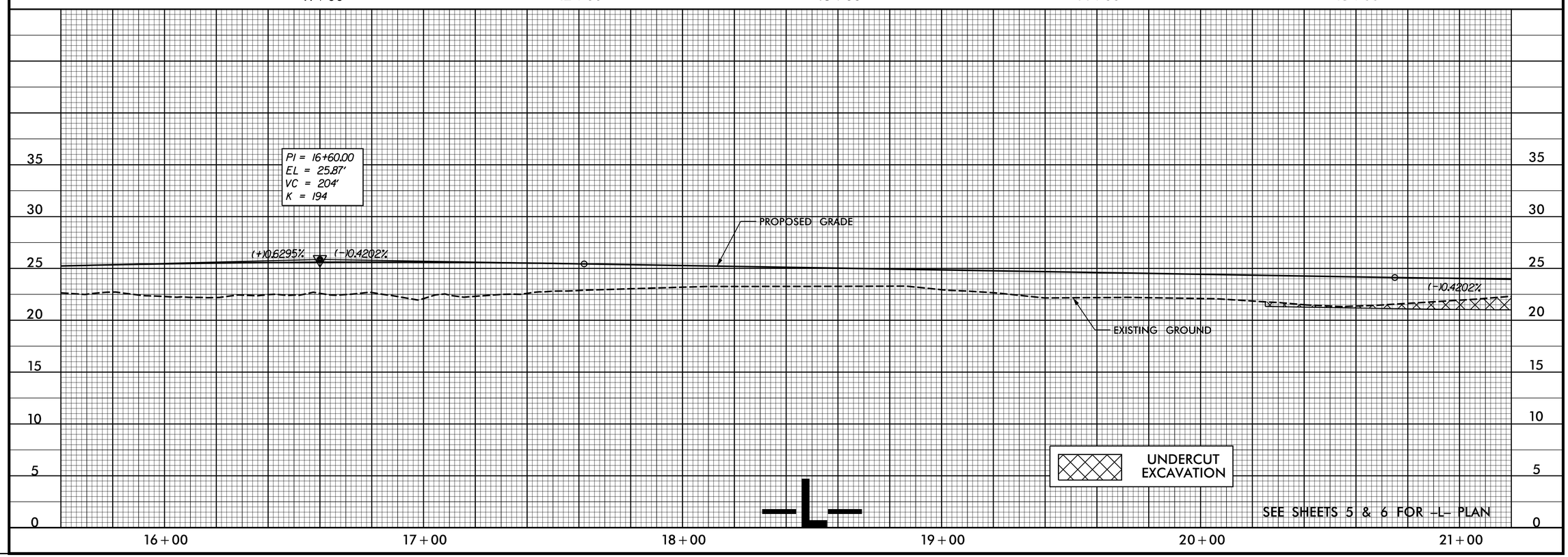

REVISIONS

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HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	9

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS
12/9/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER JOSHUA J. MASSEY
12/9/2021

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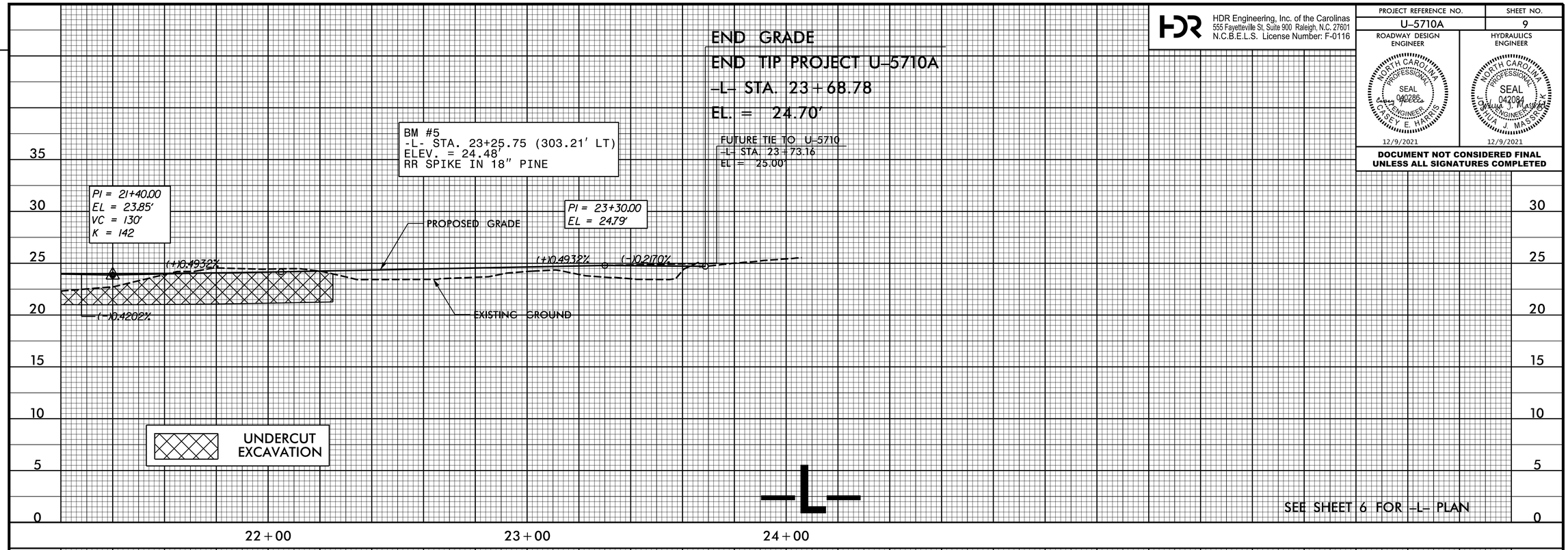

SEE SHEET 6 FOR -L- PLAN

REVISIONS

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DocuSign Envelope ID: 6CB25FF2-87BA-4A44-9984-70541EBAED01

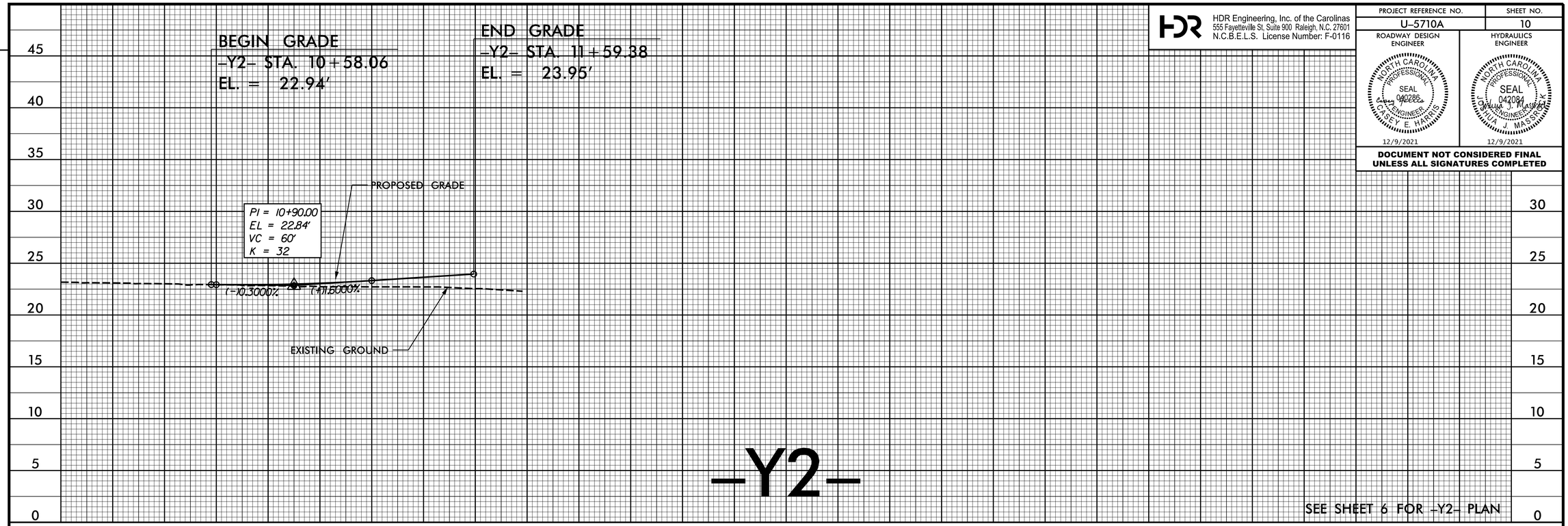
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

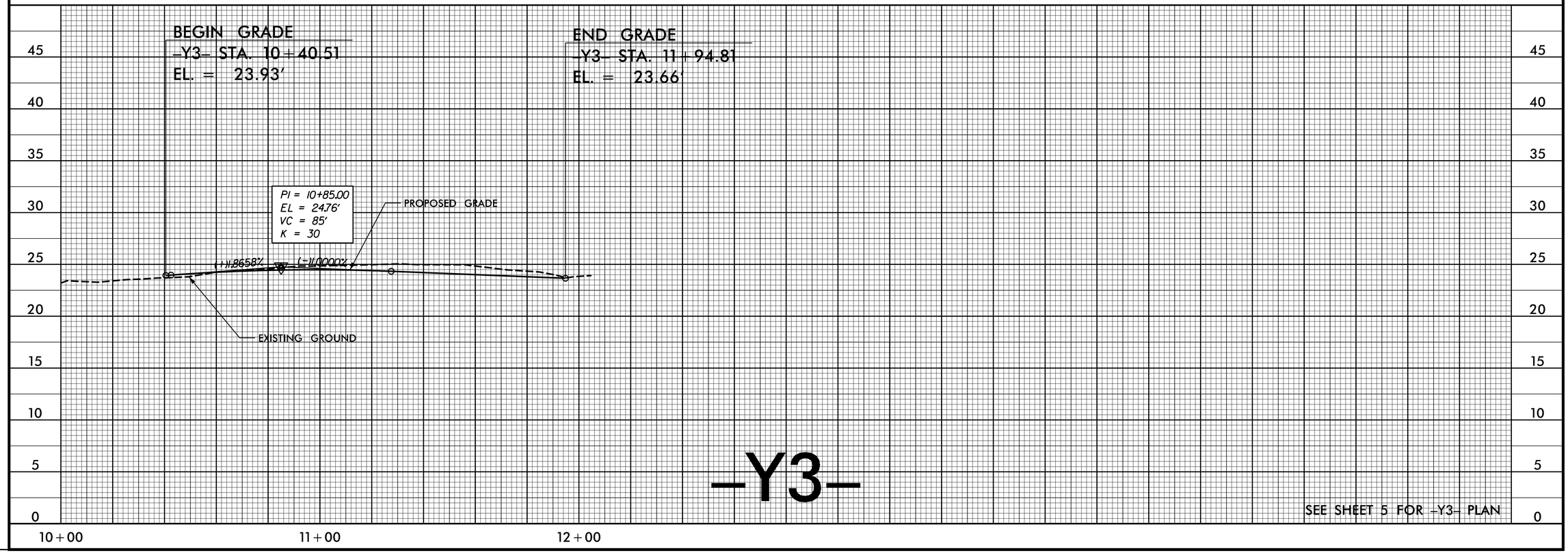
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	10

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 040286 ENGINEER CASEY E. HARRIS
12/9/2021

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 042084 ENGINEER JOSHUA J. MASSREY
12/9/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_50.plt PENTABLE: NCDOT_pshpfl_conventional.tbl
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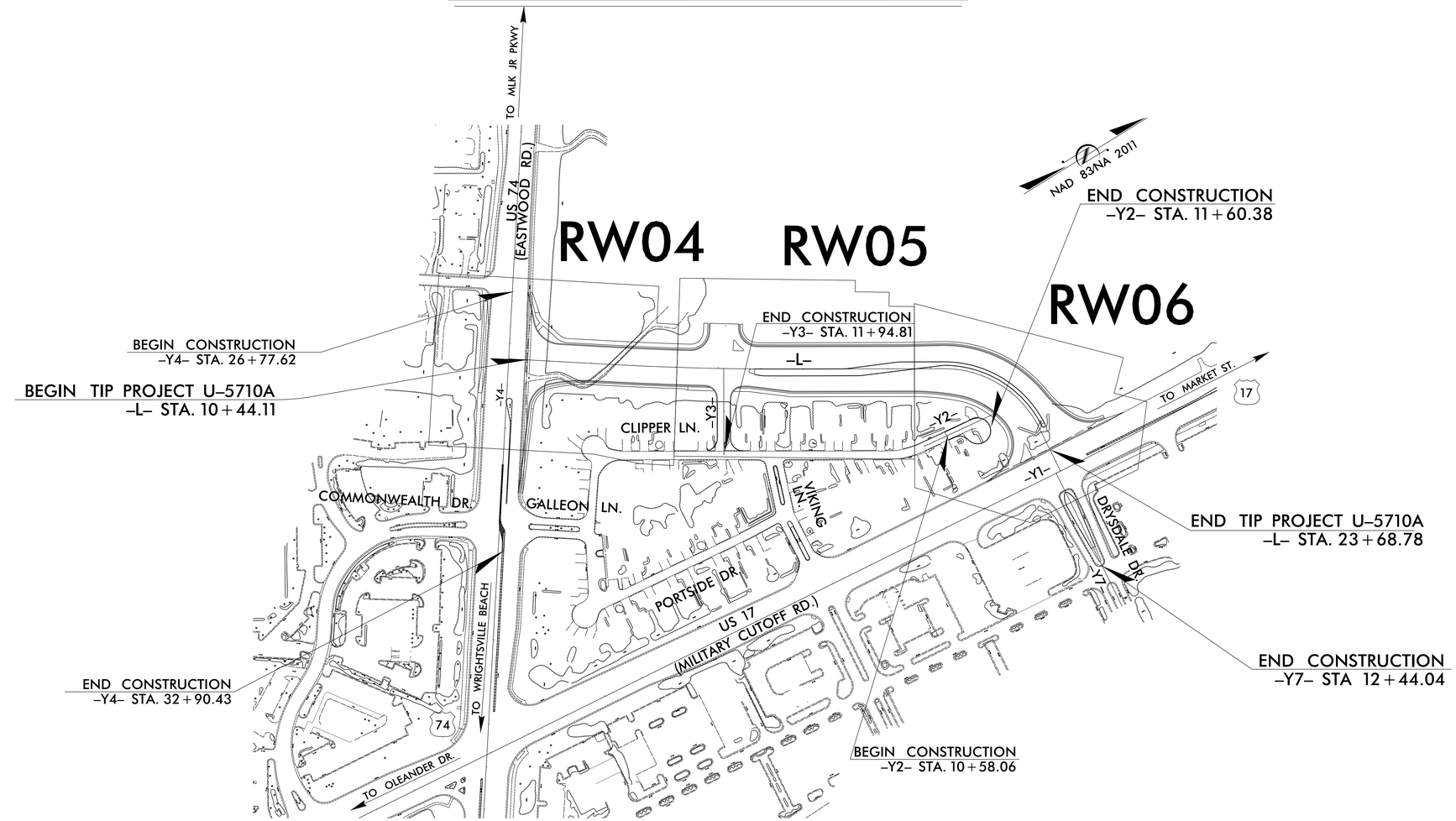
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U5710A	RW01-REV	14

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

NEW HANOVER COUNTY



TIP PROJECT: U-5710A

09/08/99

05-JAN-2022 07:54
S:\Units\Div03\Projects\URBAN\New Hanover Co\U5710A\Working\CONTROL SHEETS\220104 second title sheet revision\U5710A_LS_RW01_rev2.dgn
mjduval AT LS-293896

GRAPHIC SCALE

PLAN SCALE
1" = 20'

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR GPS MONUMENT "U5710-6" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 177314.900(ft) EASTING: 2351770.796(ft) ELEVATION: 19.026(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0000366380 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U5710-6" TO -L- STATION 10+04.90 IS S 57-15.82" E 1499.67(ft) ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD88 (GEOID 12)

Prepared in the Office of:

LOCATION AND SURVEY'S UNIT
DIVISION 3
5310 BARBADOS BLVD, SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 21, 2019

LETTING DATE:
FEBRUARY 24, 2022

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

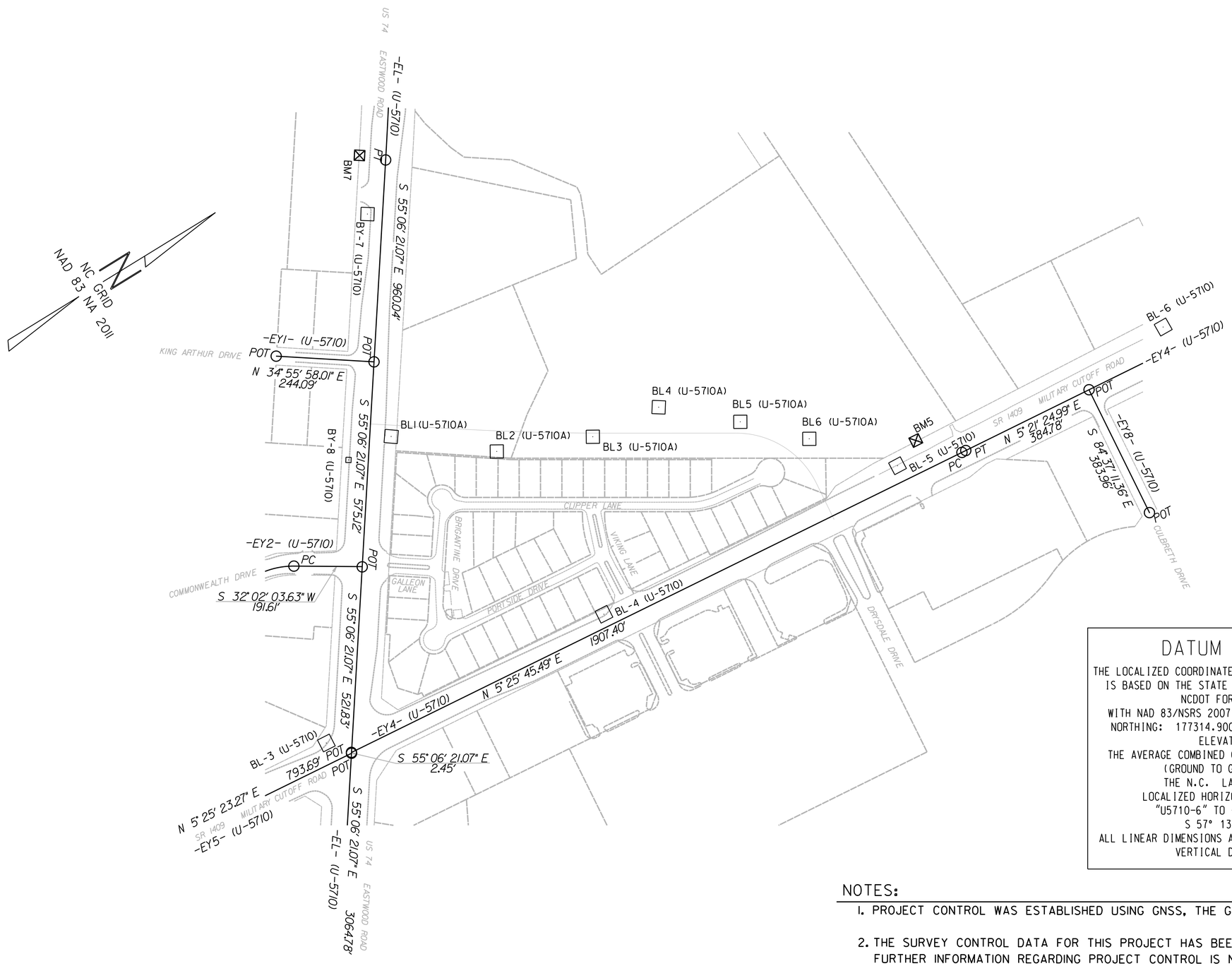
DocuSigned by:
01/05/2022
SIGNATURE: ***Date:***

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	RW02C-1
Location and Surveys	

SURVEY CONTROL SHEET U-5710A

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U5710-6"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 177314.900(ft) EASTING: 2351770.796(ft)
ELEVATION: 19.026(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0000366380
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U5710-6" TO -L- STATION 10+04.90 IS
S 57° 13' 15.82 E 1499.67'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

19-DEC-2019 10:37
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c:lsawyer AT LS-299904

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	RW02C-2
Location and Surveys	

SURVEY CONTROL SHEET U-5710A

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

BL (U5710A)

POINT	DESC.	NORTH	EAST	ELEVATION	BL STATION	OFFSET
BL7 (U-5710)	TRV CAP AND REBAR	176804.1540	2352525.9470	20.77	5+00.00	0.00
BL1	TRV CAP AND REBAR	176533.9530	2353092.0450	22.68	11+27.28	0.00
BL2	TRV CAP AND REBAR	176764.2690	2353282.9880	24.59	14+26.45	0.00
BL3	TRV CAP AND REBAR	177015.3050	2353388.9420	22.22	16+98.93	0.00
BL4	TRV CAP AND REBAR	177216.0650	2353415.2570	22.55	19+01.41	0.00
BL5	TRV CAP AND REBAR	177389.5770	2353570.0000	21.18	21+33.90	0.00
BL6	TRV CAP AND REBAR	177529.3890	2353711.9700	23.22	23+33.15	0.00
BL5 (U-5710)	TRV CAP AND REBAR	177700.4950	2353905.9180	25.25	25+91.79	0.00

BL (U-5710 PROJECT)

POINT	DESC.	NORTH	EAST	ELEVATION	BL STATION	OFFSET
U57101	GPS CAP & REBAR	172668.6910	2352777.9470	25.38	5+00.00	0.00
U57102	GPS CAP & REBAR	173732.1760	2353246.3140	27.41	16+62.05	0.00
BL1	TRV CAP & REBAR	174428.0600	2353525.0450	27.69	24+11.68	0.00
BL2	TRV CAP & REBAR	175077.0640	2353659.9820	27.83	30+74.57	0.00
BL3	TRV CAP & REBAR	175928.8120	2353728.7670	26.30	39+29.09	0.00
BL4	TRV CAP & REBAR	176781.0640	2353829.2470	25.44	47+87.24	0.00
BL5	TRV CAP & REBAR	177700.4950	2353905.9180	25.25	57+09.86	0.00
BL6	TRV CAP & REBAR	178538.9540	2353965.1110	25.78	65+50.41	0.00
U57103	GPS CAP & REBAR	179415.8970	2354051.5760	23.84	74+31.61	0.00
U57104	GPS CAP & REBAR	180602.4920	2354170.8080	20.41	86+24.18	0.00

BY (U-5710 PROJECT)

POINT	DESC.	NORTH	EAST	ELEVATION	BY STATION	OFFSET
U57105	GPS CAP & REBAR	177896.6860	2350729.3310	17.74	5+00.00	0.00
U57106	GPS CAP & REBAR	177314.9000	2351770.7960	19.03	16+92.95	0.00
BY7	TRV CAP & REBAR	176804.1540	2352525.9470	20.77	26+04.60	0.00
BY8	TRV CAP & REBAR	176397.5830	2353085.3310	23.04	32+96.13	0.00
BL3	TRV CAP & REBAR	175928.8120	2353728.7670	26.30	40+92.22	0.00
BY9	TRV CAP & REBAR	175438.5050	2354472.1250	25.37	49+82.71	0.00
BY10	TRV CAP & REBAR	175016.4230	2355077.8360	21.77	57+20.98	0.00
U57107	GPS CAP & REBAR	174592.5710	2355685.0740	22.79	64+61.51	0.00
U57108	GPS CAP & REBAR	173831.8930	2356835.8870	18.09	78+41.01	0.00

****

BM7 ELEVATION = 20.92
N 176871 E 2352374
BY STATION 24+41.00 29 RIGHT
R/R SPIKE SET IN BASE OF 17" PINE

****

****

BM5 ELEVATION = 24.48
N 177781 E 2353873
BL STATION 57+88.00 39 LEFT
R/R SPIKE SET IN BASE OF 18" PINE

****

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

6/2/99

19-DEC-2019 10:49
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c:\sawyer AT LS-293904

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	RW02C-3
Location and Surveys	

SURVEY CONTROL SHEET U-5710A

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	177381.064	2351730.640							
CURVE			S 56°46'12.2" E	828.28	03°19'42.2"(RT)	00°24'06.4"	828.40	414.32	14260.30
PT	176927.165	2352423.480							
LINE			S 55°06'21.1" E	4164.17					
POT	174545.003	2355838.972							

EY1 (U-5710 PROJECT)

POINT	N	E	BEARING	DIST
POT	176378.014	2352731.714		
LINE			N 34°55'58.0" E	274.09
POT	176602.720	2352888.662		

EY2 (U-5710 PROJECT)

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	176273.717	2353360.380							
LINE			S 32°02'03.6" W	191.60					
PC	176111.288	2353258.747							
CURVE			S 11°28'21.8" E	302.30	87°00'50.8"(LT)	26°05'48.9"	333.43	208.40	219.55
PT	175815.032	2353318.874							
LINE			S 54°58'47.2" E	43.93					
PC	175789.820	2353354.853							
CURVE			S 40°20'38.7" E	116.23	29°16'17.0"(RT)	24°54'40.4"	117.50	60.06	230.00
PT	175701.234	2353430.097							
LINE			S 25°42'30.2" E	43.32					
PC	175662.204	2353448.888							
CURVE			S 55°04'56.7" E	195.06	58°44'53.0"(LT)	28°48'59.3"	203.87	111.92	198.83
PT	175550.554	2353608.829							
LINE			S 84°27'23.2" E	140.75					
POT	175536.957	2353748.922							

EY4 (U-5710 PROJECT)

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	175975.199	2353788.388							
LINE			N 05°25'45.5" E	1907.40					
PC	177874.042	2353968.862							
CURVE			N 05°23'35.2" E	12.63	00°04'20.5"(LT)	00°34'22.6"	12.63	6.31	10000.00
PT	177886.616	2353970.049							
LINE			N 05°21'25.0" E	1067.58					
POT	178949.536	2354069.718							

EY8 (U-5710 PROJECT)

POINT	N	E	BEARING	DIST
POT	178269.648	2354005.966		
LINE			S 84°37'11.4" E	383.96
POT	178233.647	2354388.230		

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

6/2/99

19-DEC-2019 14:04
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c:sawier AT LS-299904

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6/2/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	RW02D-1

Location and Surveys

CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TEL. (919) 788-0224 FAX (919) 788-0232
CORPORATE LICENSE # P-0189

PROPOSED ALIGNMENT CONTROL SHEET

L

TYPE	STATION	NORTH	EAST
POT	10·04.90	176502.9792	2353031.6680
PC	12·38.92	176694.9346	2353165.5310
PT	16·70.71	177056.0208	2353402.1907
PC	20·31.43	177363.2787	2353591.1575
PT	23·10.34	177481.1550	2353828.1340
POT	24·24.16	177470.2167	2353941.4227

Y1

TYPE	STATION	NORTH	EAST
POT	4·00.00	173293.5527	2353094.0765
PC	11·73.33	174000.9104	2353406.6215
PCC	19·21.89	174710.7877	2353640.3464
PT	25·40.98	175321.8260	2353737.3388
PC	46·42.39	177413.8083	2353936.1689
PRC	52·28.22	177997.9444	2353980.1975
PT	57·95.11	178563.2199	2354022.4455
POT	61·84.15	178950.5628	2354058.7665

Y2

TYPE	STATION	NORTH	EAST
POT	10·00.00	177228.0852	2353722.8765
POT	11·78.23	177405.0698	2353743.9425

Y3

TYPE	STATION	NORTH	EAST
POT	12·00.00	176922.1137	2353317.8767
EQB	14·04.82	176814.8077	2353492.3330
EQA	12·04.82	176814.8077	2353492.3330

Y4

TYPE	STATION	NORTH	EAST
PC	10·00.00	177519.0699	2351502.7582
PT	19·12.84	177031.3914	2352274.0420
POT	62·59.20	174545.0031	2355838.9721

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATINO REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	RW02E-1

Location and Surveys

CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TEL. (919) 788-0224 FAX (919) 788-0232
CORPORATE LICENSE # P-0189

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3468 LAND SURVEYOR WATTS B. FEARRINGTON JR.

DocuSigned by: WBF 5551B08187AD491...

12/20/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

6/2/99

REVISIONS

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST	
L	10+90.00	78.00	176528.1650	2353144.3251	NOT SET (IN WALL)
L	11+10.00	71.44	176548.3245	2353150.3813	12" SPIKE SET IN TREE ROOT
L	11+30.33	-58.00	176639.0430	2353055.8436	
L	12+38.92	-58.00	176728.1112	2353117.9567	
L	14+03.00	75.09	176788.9408	2353320.4246	NOT SET (EXISTING STONE)
L	14+25.00	-58.00	176880.8554	2353221.6829	
L	14+60.00	-96.00	176930.6790	2353208.9715	
L	14+60.00	-114.00	176940.5356	2353193.9101	NOT SET (IN SHED)
L	14+84.26	72.61	176858.8676	2353363.4399	
L	15+43.68	71.37	176909.9725	2353394.8770	NOT SET (EXISTING IRON PIPE)
L	15+72.00	-113.00	177032.7394	2353254.4611	
L	15+72.00	-90.00	177020.4337	2353273.8923	
L	15+95.00	-65.00	177026.3393	2353307.1826	
L	16+70.71	-65.00	177090.0721	2353346.8237	
L	19+64.06	70.32	177269.0520	2353615.7640	
L	20+31.43	-65.00	177397.3300	2353535.7904	
L	20+80.00	78.00	177349.0083	2353677.7509	
L	22+48.95	78.00	177402.3982	2353778.5197	
L	22+60.00	-65.00	177545.5733	2353771.0545	
L	22+85.00	81.23	177401.0786	2353803.2469	PK NAIL SET
L	23+33.31	106.76	177372.6780	2353840.7285	
L	23+34.00	-136.43	177614.6826	2353864.7907	
L	23+46.97	125.65	177352.5674	2353852.5143	

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	45+23.00	-61.00	177300.7209	2353864.1457
Y1	45+23.00	-64.00	177301.0048	2353861.1592
Y1	45+90.00	39.00	177357.9586	2353970.0365
Y1	46+35.94	79.86	177399.8250	2354015.0622
Y1	47+43.00	73.22	177507.5544	2354018.2902
Y1	47+43.00	61.74	177508.5645	2354006.8479

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y3	13+82.00	-30.00	176852.3141	2353488.6164
Y3	13+82.00	30.00	176801.2073	2353457.1806

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y4	27+37.00	-75.00	176621.4363	2352992.9315
Y4	29+30.00	-80.00	176515.1293	2353154.0924
Y4	29+67.82	-75.00	176489.3939	2353182.2511
Y4	29+71.22	-80.00	176491.5497	2353187.9003

I, Watts B. Fearrington, Jr., a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 18th day of December, 2019.

DocuSigned by: WBF 5551B08187AD491...

Professional Land Surveyor L-3468 PLS # Seal

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

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

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	RW03E-1 REV

Location and Surveys

5310 BARBADOS BLVD., SUITE 102
CASTLE HAYNE, NC 28429

PROJECT SURVEYOR

DocuSigned by:
9700CB2E1D21467...

3/6/2020

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	46+13.90	39.00	177381.7544	2353972.2981

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST	
Y7	10+73.99	-40.63	177492.3918	2354017.8359	
Y7	10+78.83	42.97	177408.7076	2354014.8611	NOT SET (EXISTING IRON PIPE)
Y7	10+79.30	42.97	177408.6646	2354015.3271	

I, Christopher J. Sawyer, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 6th day of March, 2020.

DocuSigned by:
9700CB2E1D21467...

Professional Land Surveyor PLS # L-4526

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

REVISIONS

6/2/99

06-MAR-2020 14:22
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RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	RW02E-2

Location and Surveys

CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TEL. (919) 788-0224 FAX (919) 788-0232
CORPORATE LICENSE # P-0189

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3468 LAND SURVEYOR WATTS B. FEARRINGTON, JR.

DocuSigned by: WBF 5551B0B187AD491...

12/20/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	19+15.00	-65.00	177298.1567	2353474.7978
L	19+15.00	-95.00	177313.8727	2353449.2438
L	19+40.00	-145.00	177361.3614	2353419.7506
L	19+70.00	-145.00	177386.9151	2353435.4664
L	22+35.00	-65.00	177540.7084	2353739.9457
L	22+70.00	-120.00	177601.5279	2353780.0287
L	23+05.00	-170.00	177651.1354	2353835.5261
L	23+31.00	-183.46	177661.7784	2353866.3272

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	45+23.00	-77.00	177302.2348	2353848.2175

I, Watts B. Fearrington, Jr., a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 18th day of December, 2019.

DocuSigned by: WBF 5551B0B187AD491...

Professional Land Surveyor — PLS # L-3468 — Seal

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

REVISIONS

6/2/99

SYSTEM FILE NAME U5710_RW02E_01.dgn

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	RW02E-2REV

Location and Surveys

LOCATIONS AND SURVEY'S UNIT
DIVISION 3
5310 BARBADOS BLVD, SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , Christopher J. Sawyer , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed December 1, 2021 and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 3rd day of December, 2021.

DocuSigned by:
Christopher J. Sawyer
C4C0C0C0C0C0C0C0...

Professional Land Surveyor L-4526

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	19+30.00	70.32	177240.0452	2353597.9205
L	19+30.00	72.50	177238.9025	2353599.7786
L	19+50.00	72.50	177255.9385	2353610.2559
L	19+50.00	70.32	177257.0802	2353608.3996

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED _____ TO _____ .

REVISIONS

6/2/99

06-DEC-2021 14:50
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mjduval ATLAS:299896

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	RW04

Location and Surveys

CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TEL. (919) 788-0224 FAX (919) 788-0232
CORPORATE LICENSE # P-0189

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-3468 LAND SURVEYOR WATTS B. FEARRINGTON, JR.

DocuSigned by: WBF 12/20/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

6/2/99

REVISIONS

NOTES:

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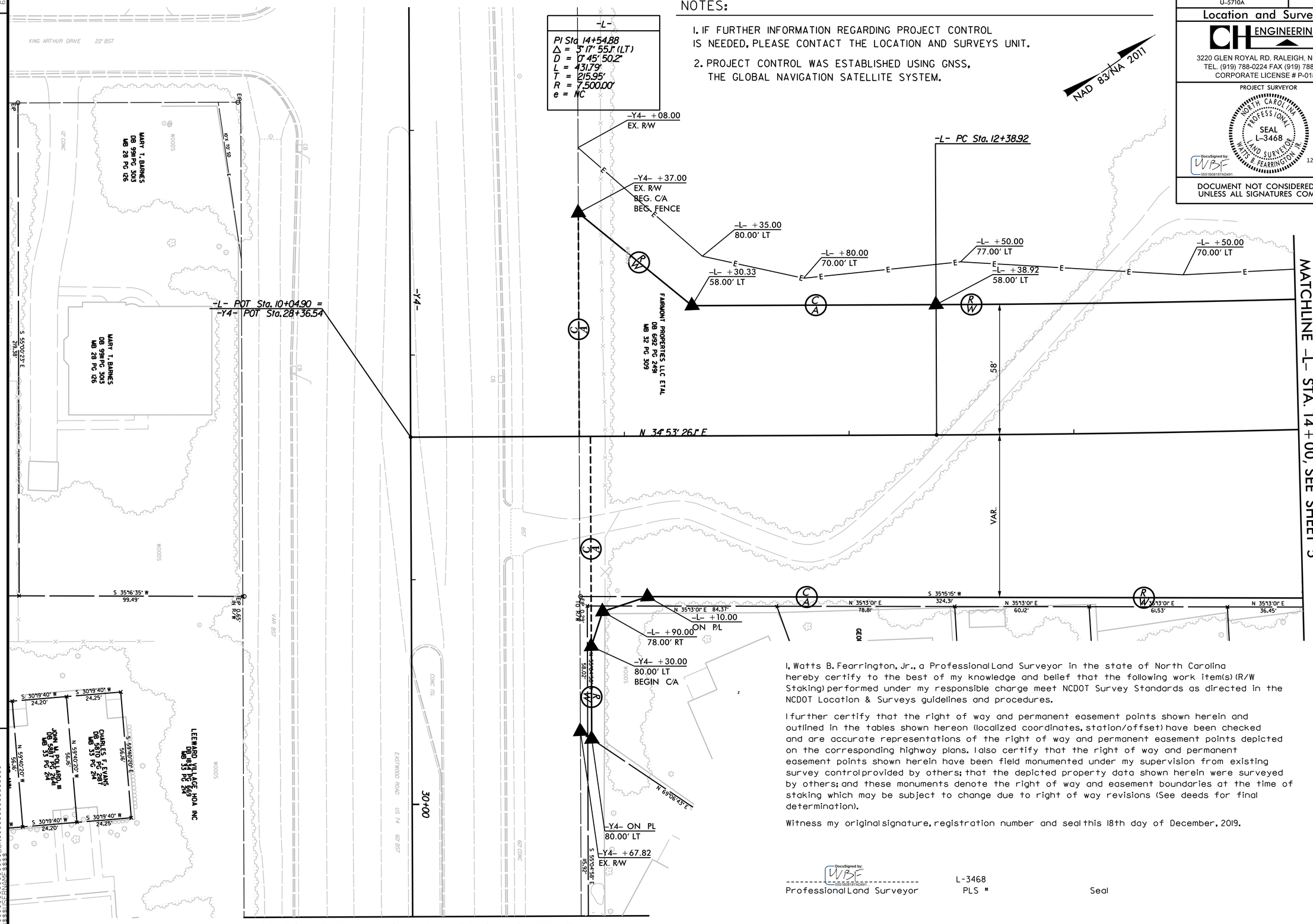
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

NAD 83/NA 2011



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Witness my original signature, registration number and seal this 18th day of December, 2019.

DocuSigned by: WBF

Professional Land Surveyor — L-3468 PLS # — Seal

DocuSign Envelope ID: 774B98CA-D660-4510-8369-BC4069A36360

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	RW05

Location and Surveys

CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TEL. (919) 788-0224 FAX (919) 788-0232
CORPORATE LICENSE # P-0189

NAD 83/NA 2011

NOTES:

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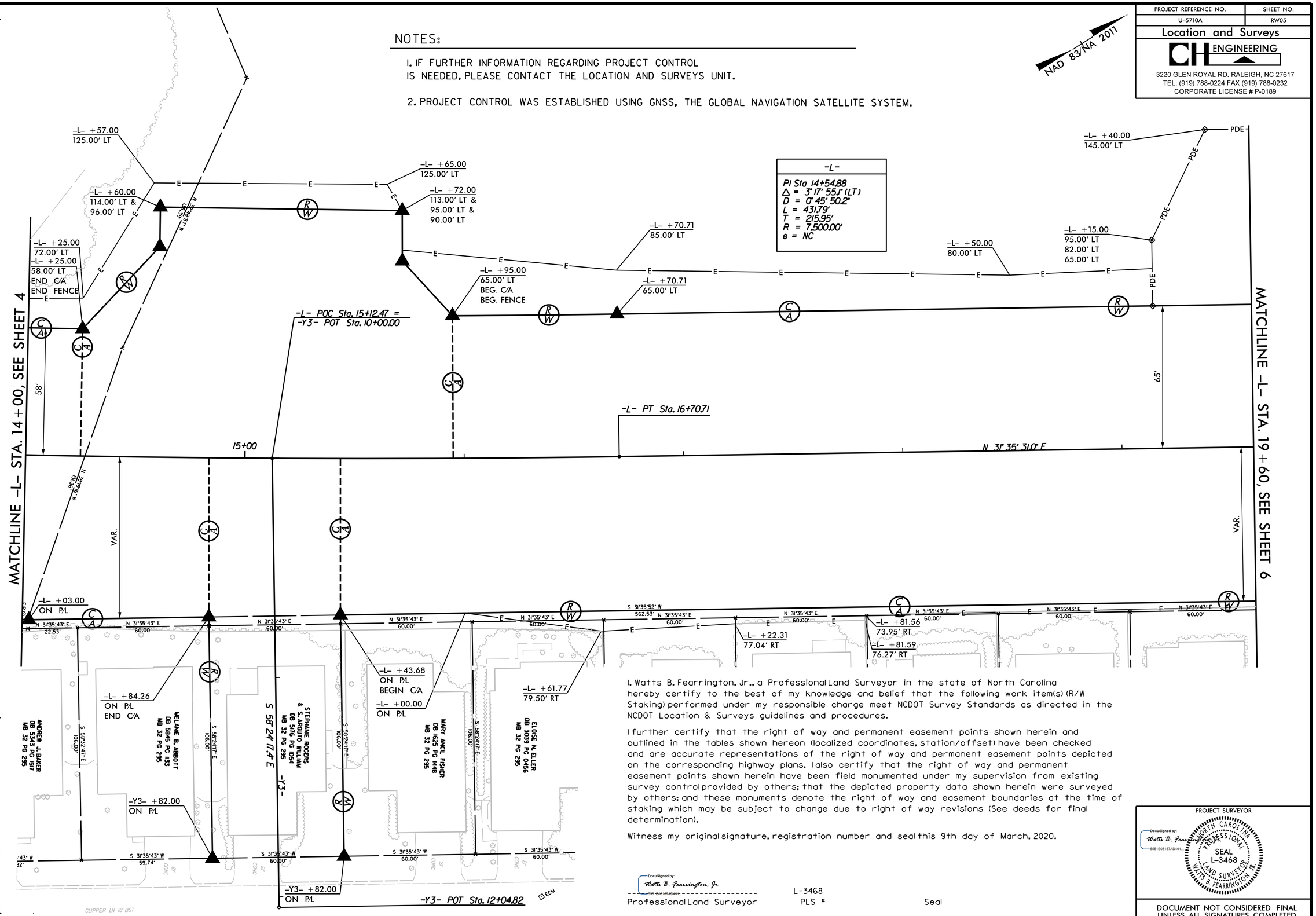

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Witness my original signature, registration number and seal this 9th day of March, 2020.

DocuSigned by:
Watts B. Fearrington, Jr.
5551B0B187AD491...

Professional Land Surveyor — PLS # L-3468 — Seal

PROJECT SURVEYOR

DocuSigned by:
Watts B. Fearrington, Jr.
5551B0B187AD491...

NORTH CAROLINA PROFESSIONAL SEAL L-3468 LAND SURVEYOR WATTS B. FEARRINGTON, JR.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	RW05-REV

Location and Surveys

LOCATION AND SURVEYS UNIT
5310 BARBADOS BLVD. SUITE 102
CASTLE HAYNE, NORTH CAROLINA 28429

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I , Christopher J. Sawyer , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from December 1, 2021 and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 3rd day of December, 2021.

DocuSigned by:
Christopher J. Sawyer
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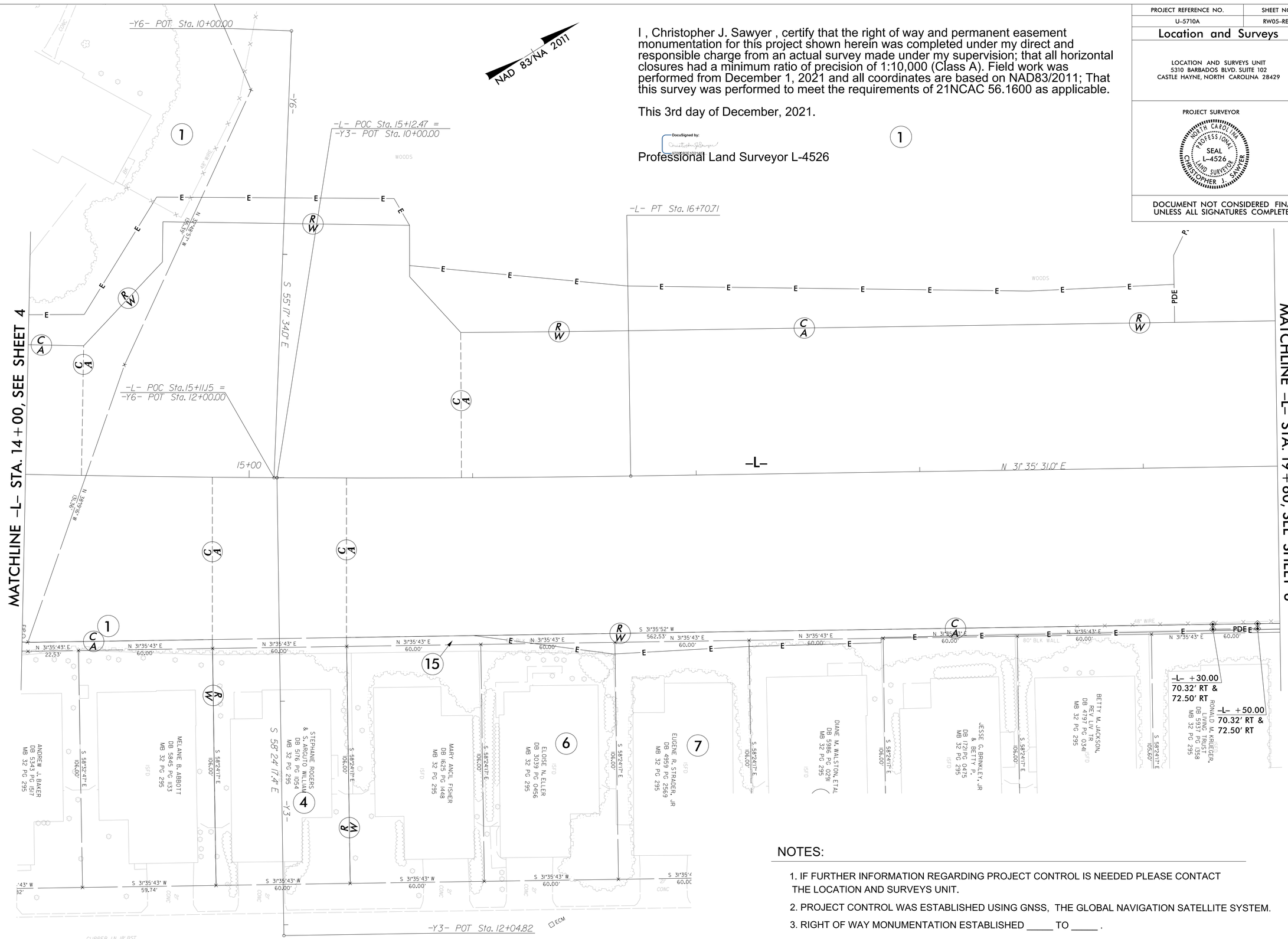
Professional Land Surveyor L-4526



NOTES:

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3. RIGHT OF WAY MONUMENTATION ESTABLISHED _____ TO _____ .

REVISIONS

6/2/99

06-DEC-2021 13:38
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m.duvo
AT FS-299896

Location and Surveys

CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TEL. (919) 788-0224 FAX (919) 788-0232
CORPORATE LICENSE # P-0189

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR
SEAL
L-3468
WATTS B. FEARRINGTON JR.

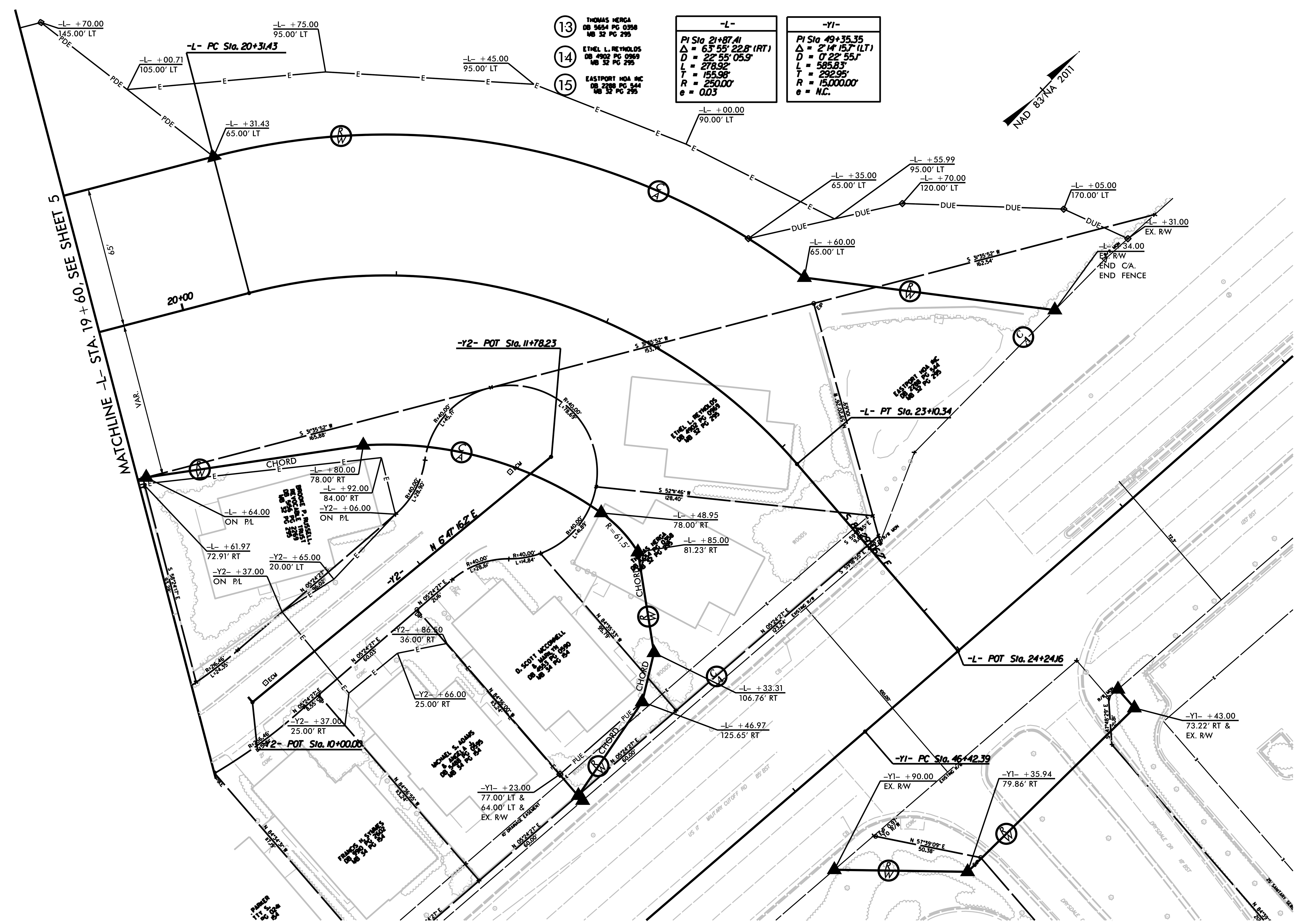
DocuSigned by: WBF

12/20/2019

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

REVISIONS

6/2/99



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DocuSigned by: WBF
5551B08187AD491...

Professional Land Surveyor   L-3468 PLS #   Seal

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

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	RW06-REV

Location and Surveys

5310 BARBADOS BLVD., SUITE 102
CASTLE HAYNE, NC 28429

PROJECT SURVEYOR

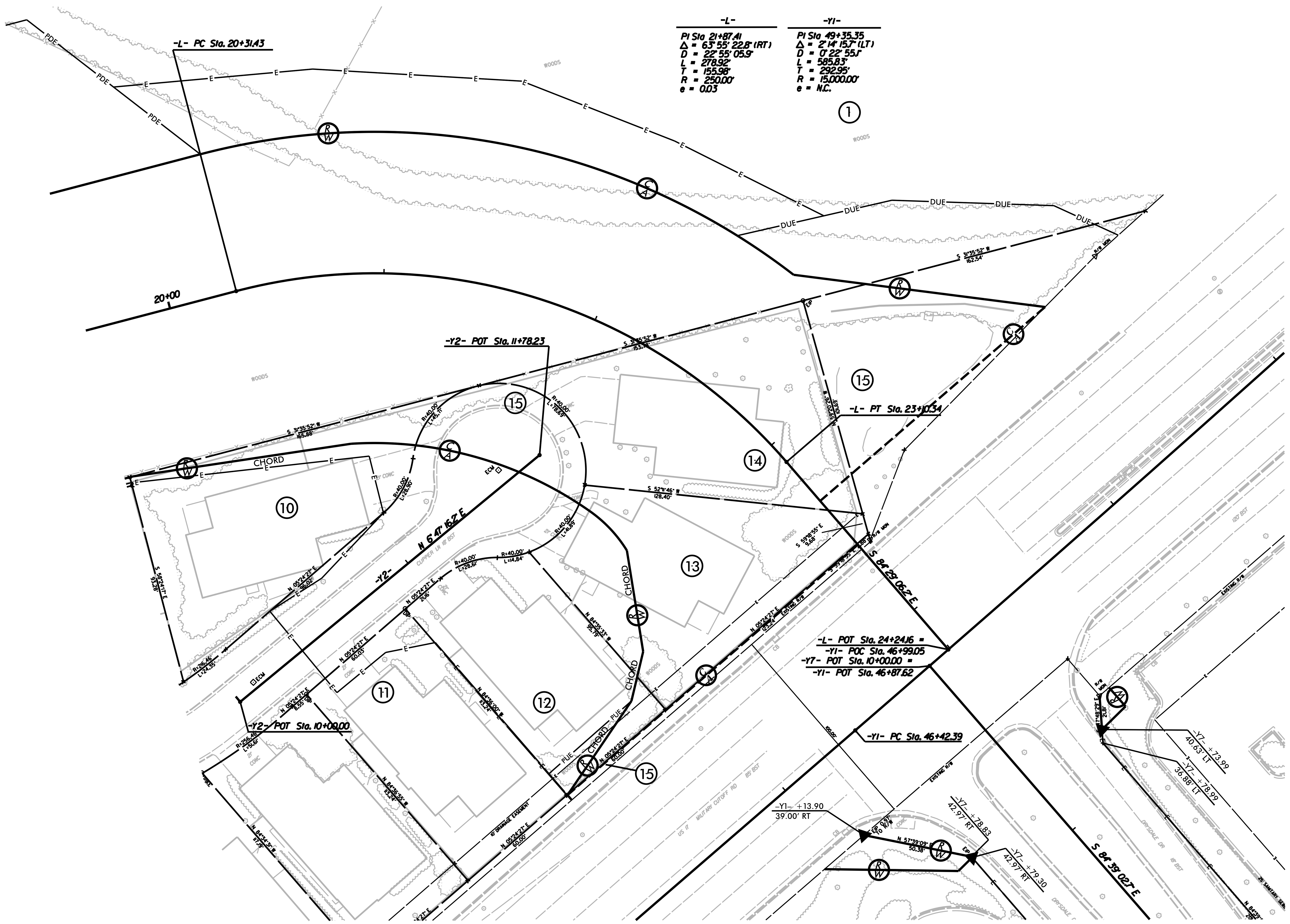
DocuSigned by: Christopher J. Sawyer
9700CB2E1D21467...

NORTH CAROLINA PROFESSIONAL SEAL L-4526 LAND SURVEYOR CHRISTOPHER J. SAWYER

3/9/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS



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9700CB2E1D21467...

Professional Land Surveyor PLS # L-4526

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6/2/99
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cjsawyer AT LS-299904

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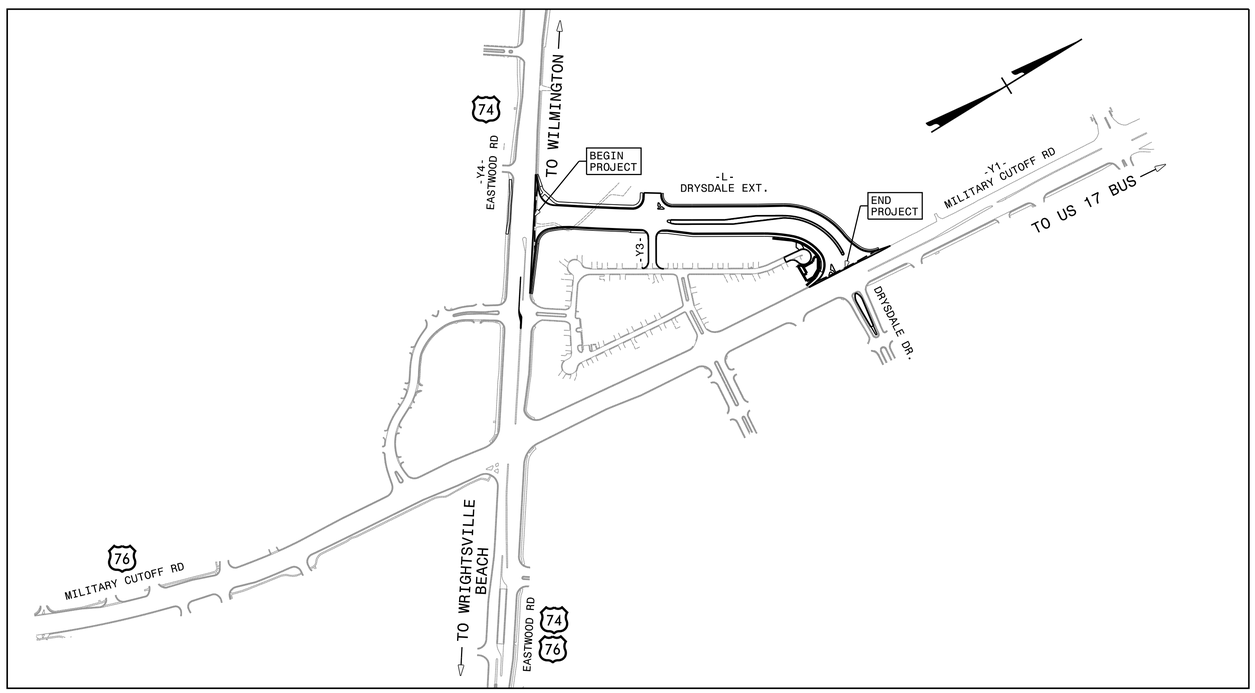
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

NEW HANOVER COUNTY

LOCATION: NEW LOCATION NORTHWESTERN QUADRANT CONNECTION BETWEEN US 74 (EASTWOOD RD.) AND US 17 (MILITARY CUTOFF RD.)



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

PLANS PREPARED BY:

MICHELLE WARD, P.E.
TRAFFIC CONTROL PROJECT ENGINEER

CHRIS HARNDEN
TRAFFIC CONTROL DESIGN ENGINEER

NCDOT CONTACTS:

KENNETH C. THORNEWELL, P.E.
PROJECT ENGINEER

SPENCER JENNINGS
PROJECT DESIGN ENGINEER

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

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-2 AND TMP-2A	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES AND GENERAL NOTES)
TMP-3	TEMPORARY TRAFFIC CONTROL PHASING
TMP-4 AND TMP-5	TEMPORARY TRAFFIC CONTROL PHASE 1 DETAILS
TMP-6 AND TMP-7	TEMPORARY TRAFFIC CONTROL PHASE 2 DETAILS

PLAN PREPARED BY:

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

APPROVED: Michelle Ward

DATE: 12/9/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD

SHEET NO.
TMP-1

TIP PROJECT: U-5710A

CONTRACT: DC00277

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PROJ. REFERENCE NO.	SHEET NO.
U-5710A	TMP-1A

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - 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
1115.01	FLASHING ARROW BOARDS
1130.01	DRUM
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1165.01	TRUCK MOUNTED ATTENUATOR
1180.01	SKINNY-DRUM
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.06	PAVEMENT MARKINGS - LANE DROPS
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
1264.01	OBJECT MARKERS - TYPES
1264.02	OBJECT MARKERS - INSTALLATION

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA
- CONTINUING CONSTRUCTION
- REMOVAL
- WEDGING
- TEMPORARY PAVEMENT

TRAFFIC CONTROL DEVICES

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

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKERS

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

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

APPROVED: Michelle Ward

DATE: 12/9/2021

NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

ROADWAY STANDARD DRAWINGS & LEGEND

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DocuSign Envelope ID: 7AE1BEF1-9948-4A2C-BD00-893D3B153C5B

MANAGEMENT STRATEGIES

DURING PHASE 1, TRAFFIC IS MAINTAINED IN THE EXISTING TRAFFIC PATTERNS. USING SHOULDER CLOSURES OR LANE CLOSURES, -L- IS COMPLETED FROM THE TIE-IN WITH -Y4- (US 74 EASTWOOD RD) TO THE TIE-IN WITH -Y1- (US 17/MILITARY CUTOFF RD), AND -Y7- (EXISTING DRYSALE DR).

A TEMPORARY TRAFFIC SIGNAL WITH BE REQUIRED AT THE INTERSECTION OF -Y1- (US 17/MILITARY CUTOFF RD) AND -L- (DRYSDALE DR. EXT.), TO MOVE POLES AWAY FROM WIDENING AND CONSTRUCTION ACCESS.

DURING PHASE 2, TRAFFIC WILL BE SHIFTED TO THE FINAL PATTERN ON -L- (DRYSDALE DR EXT.), -Y1- (US 17/MILITARY CUTOFF RD), -Y3- (DRYSDALE/CLIPPER CONNECTOR.), -Y4- (US 74/EASTWOOD RD), -Y7- (EXISTING DRYSDALE DR), AND KING ARTHUR DR.

USING LANE CLOSURES, CLOSE LEFT TURN ACCESS TO GALLEON LN, REMOVE EXISTING ISLAND ON -Y4-, THEN PLACE THE FINAL MARKINGS AND TUBULAR MARKERS.

PROPOSED SIGNALS WILL BE REQUIRED AT THE INTERSECTIONS OF:
-L- (DRYSDALE DR. EXT.)/-Y1- (US 17/MILITARY CUTOFF RD)
-L- (DRYSDALE DR. EXT.)/-Y4- (US 74/EASTWOOD RD)
-L- (DRYSDALE DR. EXT.)/-Y3- (DRYSDALE/CLIPPER CONNECTOR)
-Y1- (US 17/MILITARY CUTOFF RD) EMERGENCY SIGNAL AT FIRE STATION

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. MODIFICATIONS 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 PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR AS DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

A) DO NOT CONDUCT ANY WORK AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
-L- (DRYSDALE DR EXT.)	SUNDAY THROUGH SATURDAY
-Y2- (CLIPPER LN)	9:00 P.M. TO 6:00 A.M.
-Y3- (DRYSDALE/CLIPPER CONNECTOR)	

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

ROAD NAME	DAY AND TIME RESTRICTIONS
-Y1- (US 17/MILITARY CUTOFF RD)	SUNDAY THROUGH SATURDAY
-Y4- (US 74/EASTWOOD RD)	6:00 A.M. TO 9:00 P.M.
-Y7- (EXISTING DRYSDALE DR)	

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

ROAD NAME

-Y1- (US 17/MILITARY CUTOFF RD)
-Y4- (US 74/EASTWOOD RD)
-Y7- (EXISTING DRYSDALE DR)

-Y2- (CLIPPER LN)
-Y3- (DRYSDALE/CLIPPER CONNECTOR)

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 9:00 P.M. JANUARY 2ND. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 9:00 P.M. THE FOLLOWING TUESDAY.

3. FOR EASTER, BETWEEN THE HOURS OF 6:00 A.M. THURSDAY AND 9:00 P.M. MONDAY.

4. FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY TO 9:00 P.M. TUESDAY.

5. FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 9:00 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 9:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.

6. FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY AND 9:00 P.M. TUESDAY.

7. FOR THANKSGIVING DAY, BETWEEN THE HOURS OF 6:00 A.M. TUESDAY TO 9:00 P.M. MONDAY.

8. FOR CHRISTMAS, BETWEEN THE HOURS OF 6:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 9:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

9. FOR THE NORTH CAROLINA AZALEA FESTIVAL BETWEEN THE HOURS OF 6:00 A.M. THE DAY BEFORE THE EVENT AND 9:00 P.M. THE DAY AFTER THE EVENT.

10. FOR THE NHRMC WILMINGTON MARATHON MADNESS BETWEEN THREE (3) HOURS BEFORE THE START AND THREE (3) HOURS AFTER THE EVENT.

11. FOR THE IRONMAN 70.3 NORTH CAROLINA BETWEEN THREE (3) HOURS BEFORE THE START AND THREE (3) HOURS AFTER THE EVENT.

12. FOR THE RIVER TO SEA BETWEEN THREE (3) HOURS BEFORE THE START AND THREE (3) HOURS AFTER THE EVENT.

13. FOR THE RACE 13.1 BETWEEN THREE (3) HOURS BEFORE THE START AND THREE (3) HOURS AFTER THE EVENT.

14. FOR THE YMCA TRIATHLON BETWEEN THREE (3) HOURS BEFORE THE START AND THREE (3) HOURS AFTER THE EVENT.

15. FOR THE AZALEA TRIATHLON BETWEEN THREE (3) HOURS BEFORE THE START AND THREE (3) HOURS AFTER THE EVENT.

HAULING RESTRICTIONS

D) DO NOT CONDUCT MULTI-VEHICLE HAULING AS FOLLOWS; INGRESS AND EGRESS FROM ANY OPEN TRAVEL LANE WILL NOT BE ALLOWED:

ROAD NAME	DAY AND TIME RESTRICTIONS
-Y1- (US 17/MILITARY CUTOFF RD)	MONDAY THROUGH FRIDAY
-Y4- (US 74/EASTWOOD RD)	6:00 A.M. TO 9:00 A.M.
	4:00 P.M. TO 7:00 P.M.
	7:00 P.M. FRIDAY THROUGH
	6:00 A.M. MONDAY

E) DO NOT CONDUCT ANY HAULING OPERATIONS AGAINST THE FLOW OF TRAFFIC OF AN OPEN TRAVELWAY UNLESS THE HAULING OPERATION IS PROTECTED BY BARRIER OR GUARDRAIL OR AS DIRECTED BY THE ENGINEER.

F) DO NOT CONDUCT ANY HAULING IN THE EASTPORT SUBDIVISION.

LANE AND SHOULDER CLOSURE REQUIREMENTS

G) 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.

H) 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.

I) 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 BARRIER OR GUARDRAIL.

J) 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.

APPROVED: Michelle Ward

DATE: 12/9/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD

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

TRANSPORTATION OPERATIONS PLAN
(SHEET 1 OF 2)

REVISIONS

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GENERAL NOTES (CONT.)

PAVEMENT EDGE DROP OFF REQUIREMENTS

K) 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.

L) 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) 500 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

M) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

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

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

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

TRAFFIC CONTROL DEVICES

Q) 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.

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

S) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES PERPENDICULAR TO THE EDGE OF TRAVELWAY ON 500 FT CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.

PAVEMENT MARKINGS AND MARKERS

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

ROAD NAME	MARKING	MARKER
ALL ROADS	PAINT	TEMPORARY RAISED

U) 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.

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

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

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

MISCELLANEOUS

Y) LAW ENFORCEMENT SHALL BE USED TO MAINTAIN TRAFFIC THROUGH THE WORK AREA AND/OR INTERSECTIONS AS DIRECTED BY THE ENGINEER.

Z) 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.

AA) CONTRACTOR SHALL MAINTAIN SIDEWALK ACCESS AT ALL TIMES AS STATED IN THE PHASING. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE TEMPORARY SIDEWALKS (CONCRETE, ASPHALT, OR OTHER SUITABLE MATERIAL AS APPROVED BY THE ENGINEER) AT ALL LOCATIONS WHERE THE OPEN PEDESTRIAN TRAVELWAY HAS BEEN REMOVED FOR CONSTRUCTION OPERATIONS (UTILITIES, DRAINAGE, ETC.).

REVISIONS

APPROVED: Michelle Ward

DATE: 12/9/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 033789 ENGINEER MICHELLE WARD

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TRANSPORTATION OPERATIONS PLAN (SHEET 2 OF 2)

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NOTES:

BEFORE BEGINNING ANY CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS AND TRAFFIC CONTROL DEVICES ACCORDING TO RSD 1101.01, SHEETS 2 & 3 OF 3. FIELD VERIFY LOCATIONS WITH THE RESIDENT ENGINEER PRIOR TO INSTALLATION.

MAINTAIN ACCESS TO ALL RESIDENCES AND BUSINESSES DURING THE LIFE OF THE CONTRACT USING INCIDENTAL STONE AS NEED, UNLESS OTHERWISE NOTED IN THE PHASING OR AS DIRECTED BY THE ENGINEER.

COMPLETE ANY PROPOSED OR TEMPORARY WIDENING IN SUCH A MANNER THAT NO PONDING OF WATER WILL OCCUR WITHIN THE TRAVEL LANE.

WHEN PHASING STATES TO USE LANE CLOSURES, REFER TO THE FOLLOWING FOR ALL EXISTING AND PROPOSED ROADS:

- ALL TWO-LANE/TWO-WAY FACILITIES - SEE RSD 1101.02, SHEET 1 OF 14
- ALL 3-LANE OR 5-LANE ROADWAYS - SEE RSD 1101.02, SHEET 2 OF 14
- ALL MULTI-LANE FACILITIES POSTED < 60 MPH - SEE RSD 1101.02, SHEET 3 OF 14

WHEN USING LANE CLOSURES (RSD 1101.02), RETURN TRAFFIC TO EXISTING AND/OR CURRENT TEMPORARY TRAFFIC PATTERN UPON ACTIVITIES COMPLETION, UNLESS OTHERWISE NOTED IN THE PHASING.

WHEN INSTALLING AND ACTIVATING TEMPORARY AND FINAL SIGNALS, USE LANE CLOSURES (RSD 1101.02) AND LAW ENFORCEMENT.

COMPLETE PROPOSED CONSTRUCTION UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE UNTIL STATED TO PLACE FINAL LAYER IN THE PHASING.

PHASE 1 (TMP-4 AND TMP-5)

STEP 1:

NOTES:

1. SEE CONTRACT AND SPECIAL PROVISIONS FOR DATE OF AVAILABILITY AND OTHER REQUIREMENTS TO CONDUCT THE WORK LISTED IN STEP 1 BELOW. NOT ALL WORK IN STEP 1 CAN BEGIN IMMEDIATELY UPON INITIAL DATE OF AVAILABILITY.

2. DURING PHASE 1, STEP 1, THE FOLLOWING TEMPORARY SIGNAL WILL BE NEEDED FOR ROADWAY WIDENING AND CONSTRUCTION ACCESS:

   #03-0752T1 AT THE -L- (DRYSDALE DR EXT.) AND -Y1- (US 17/ MILITARY CUTOFF RD) INTERSECTION

USING SHOULDER CLOSURES AND LANE CLOSURES COMPLETE CONSTRUCTION OF THE FOLLOWING INCLUDING THE FINAL LAYER OF SURFACE COURSE:

- -L- (DRYSDALE DR EXT.) FROM THE TIE-IN WITH -Y4- (US 74/EASTWOOD RD) TO THE TIE-IN WITH -Y1- (US 17/MILITARY CUTOFF RD) (MAINTAIN SIDEWALK ACCESS AT ALL TIMES ALONG NORTH SIDE OF EASTWOOD RD USING TEMPORARY MEASURES, AS NEEDED - SEE GENERAL NOTE AA)
- NEW CROSS CITY TRAIL ALIGNMENT ON THE RIGHT SIDE OF -Y4- (US 74/ EASTWOOD RD) (MAINTAIN TRAIL ACCESS AT ALL TIMES USING TEMPORARY MEASURES - SEE GENERAL NOTE AA)
- -Y3- (DRYSDALE/CLIPPER CONNECTOR)
- -Y6- (CENTER POINT)
- -Y7- (EXISTING DRYSDALE DR)
- CUL-DE-SAC ON -Y2- (CLIPPER LN)

PHASE 2 (TMP-6 THRU TMP-7)

STEP 1:

NOTE: DURING PHASE 2, THE FOLLOWING FINAL SIGNALS WILL BE NEEDED WHEN SHIFTING TO THE PHASE 2 TRAFFIC PATTERN:

#03-1153 AT THE -L- (DRYSDALE DR EXT.) AND -Y4- (US 74/EASTWOOD RD) INTERSECTION

#03-0752 AT THE -L- (DRYSDALE DR EXT.) AND -Y1- (US 17/MILITARY CUTOFF RD) INTERSECTION

#03-1152 AT THE -L- (DRYSDALE DR EXT.) AND -Y3- (DRYSDALE/CLIPPER CONNECTOR) INTERSECTION

ADDITIONAL SIGNAL HEAD AT THE EMERGENCY SIGNAL FOR THE FIRE STATION ON -Y1- (US 17/MILITARY CUTOFF RD) BETWEEN PARKER FARM RD AND -L- (DRYSDALE DR EXT.)

USING LANE CLOSURES, PLACE THE FINAL MARKINGS AND MARKERS ACCORDING TO THE FINAL PAVEMENT MARKING PLAN AND OPEN -L- AND ALL -Y- LINES TO THE FINAL TRAFFIC PATTERN.

STEP 2:

USING LANE CLOSURES, CLOSE LEFT TURN ACCESS FROM -Y4- (US 74/EASTWOOD RD) TO GALLEON LN AND REMOVE EXISTING ISLAND ON -Y4- (US 74/EASTWOOD RD). (SEE TMP-6)

STEP 3:

REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES.

APPROVED: Michelle Ward

DATE: 12/9/2021

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TEMPORARY TRAFFIC CONTROL PHASING

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U-5710A	TMP-4

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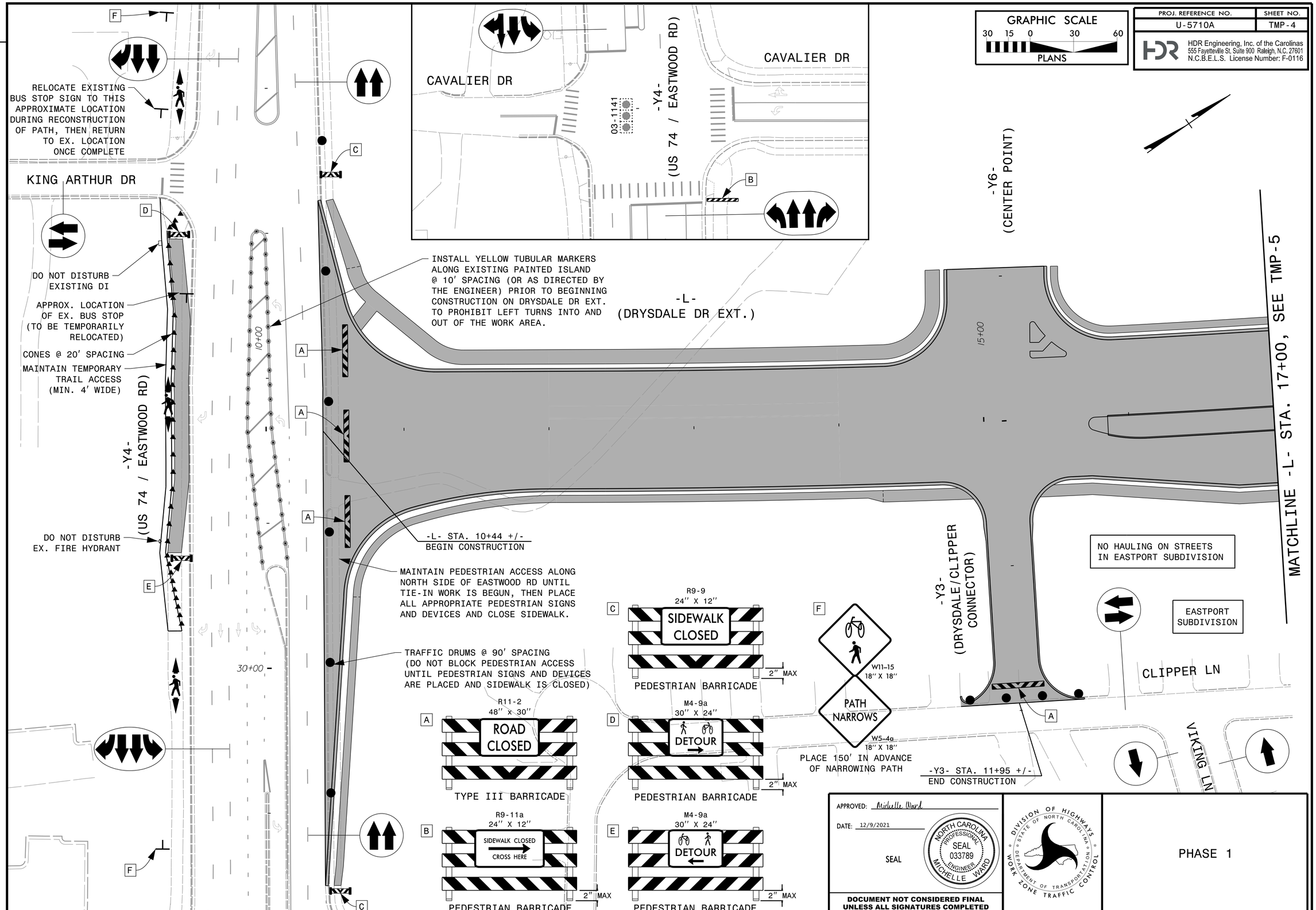

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PHASE 1

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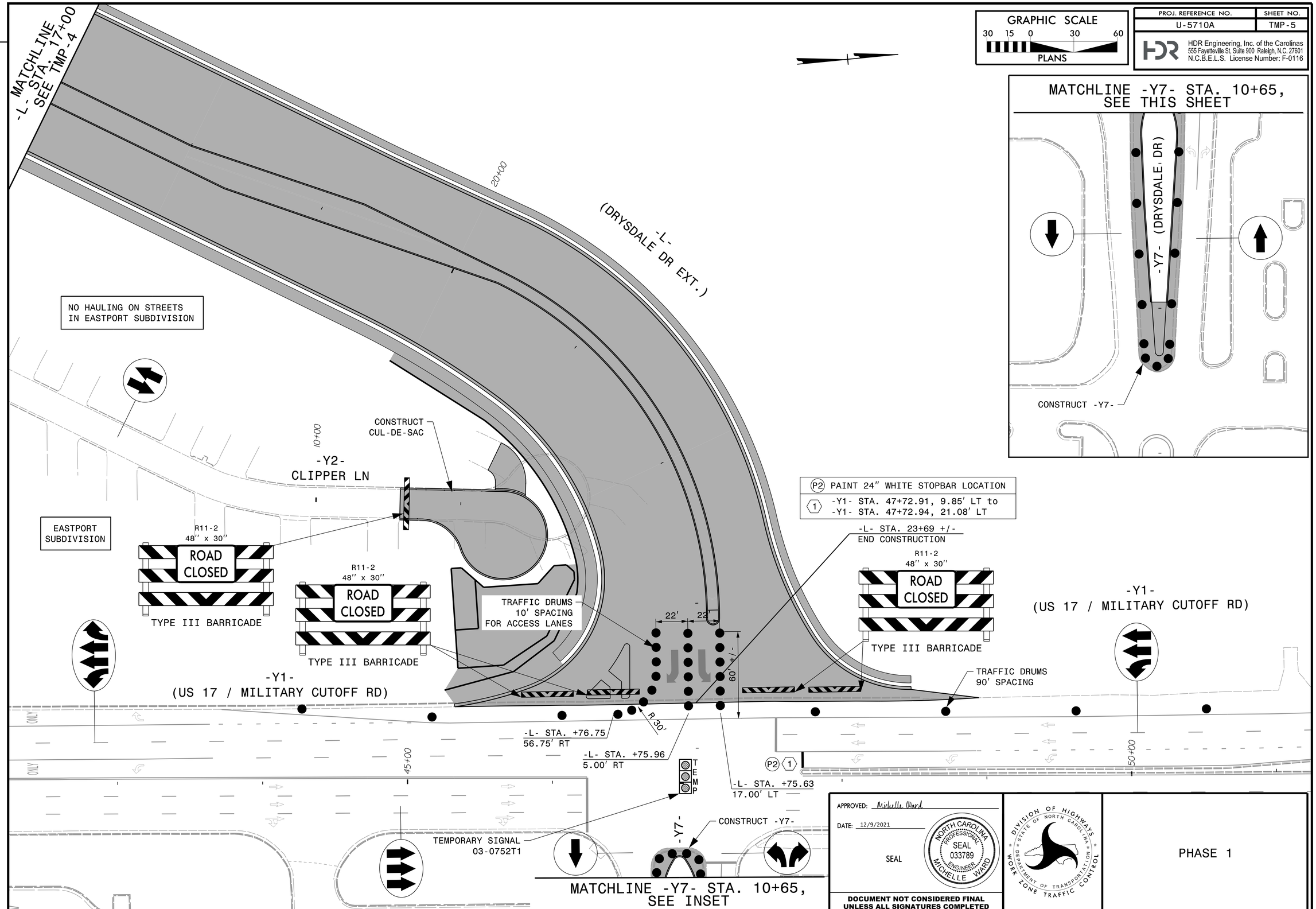

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DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PHASE 1

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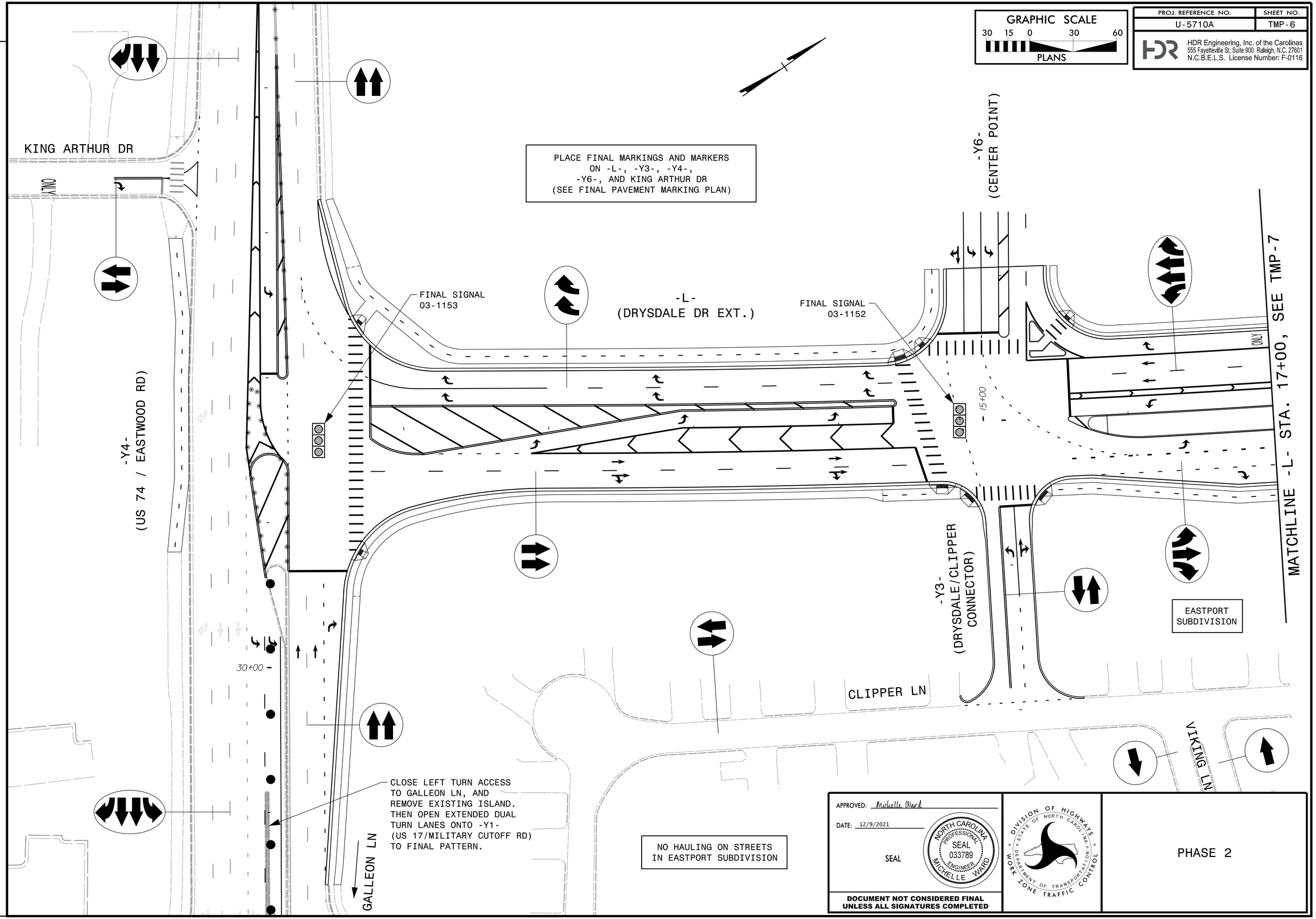

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WORK ZONE TRAFFIC CONTROL

PHASE 2

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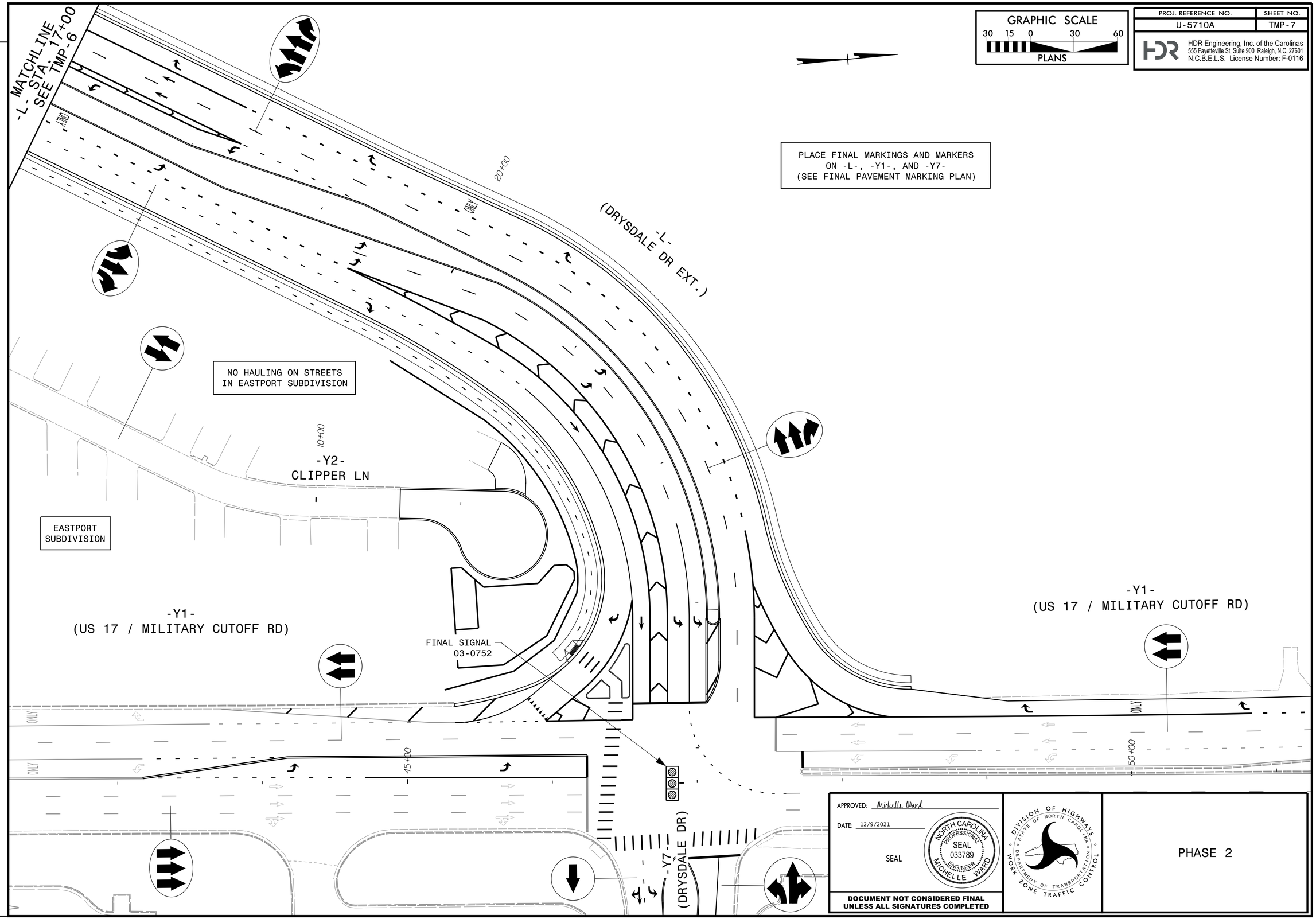

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DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PHASE 2

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T.I.P.: U-5710A

CONTRACT: DC00277

TIP NO.	SHEET NO.
U-5710A	PMP-1

APPROVED: Ron King

DATE: 12/10/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN

NEW HANOVER COUNTY

LOCATION: NEW LOCATION NORTHWESTERN QUADRANT CONNECTION BETWEEN US 74 (EASTWOOD RD.) AND US 17 (MILITARY CUTOFF RD.)

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE, GERERAL NOTES, ROADWAY STANDARD DRAWINGS, INDEX, AND PAVEMENT MARKING SCHEDULE
PMP-1A	ALTERNATE CURB RAMP DESIGNS
PMP-1B	HI-VISIBILITY CROSSWALKS NO-TRACK MARKING GUIDANCE
PMP-2 THRU PMP-9	PAVEMENT MARKING DETAILS

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
ALL ROADS	THERMOPLASTIC	RAISED

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

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

D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

E) 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.

PAVEMENT MARKING SCHEDULE

T2	THERMOPLASTIC 24″ WHITE STOPBAR (90 MIL)
T3	THERMOPLASTIC 24″ WHITE CROSSWALK LINE (90 MIL)
T8	THERMOPLASTIC 4″ 2′-6′/SP. WHITE MINI-SKIP (90 MIL)
T9	THERMOPLASTIC 4″ 2′-6′/SP. YELLOW MINI-SKIP (90 MIL)
T13	THERMOPLASTIC 8″ 3′-9′/SP. WHITE MINI-SKIP (90 MIL)
TA	THERMOPLASTIC 4″ WHITE EDGELINE (90 MIL)
TB	THERMOPLASTIC 4″ YELLOW EDGELINE (90 MIL)
TC	THERMOPLASTIC 4″ 10′-30′/SP. WHITE SKIP (90 MIL)
TD	THERMOPLASTIC 4″ 3′-9′/SP. WHITE MINI-SKIP (90 MIL)
TE	THERMOPLASTIC 4″ WHITE SOLID LANE LINE (90 MIL)
TI	THERMOPLASTIC 4″ YELLOW DOUBLE CENTER (90 MIL)
TN	THERMOPLASTIC 8″ WHITE GORELINE (90 MIL)
TO	THERMOPLASTIC 8″ WHITE DIAGONAL (90 MIL)
TP	THERMOPLASTIC 8″ YELLOW DIAGONAL (90 MIL)
TR	THERMOPLASTIC 8″ WHITE SOLID LANE LINE (90 MIL)
TU	THERMOPLASTIC 12″ WHITE DIAGONAL (90 MIL)
TV	THERMOPLASTIC 12″ YELLOW DIAGONAL (90 MIL)
TX	THERMOPLASTIC 4″ 3′-9′/SP. YELLOW MINI-SKIP (90 MIL)
UA	THERMOPLASTIC LEFT TURN ARROW (90 MIL)
UB	THERMOPLASTIC RIGHT TURN ARROW (90 MIL)
UC	THERMOPLASTIC STRAIGHT ARROW (90 MIL)
UE	THERMOPLASTIC COMBO RIGHT-STRAIGHT ARROW (90 MIL)
UI	THERMOPLASTIC ALPHANUMERIC CHARACTER (90 MIL)
UN	THERMOPLASTIC 24″ YIELD LINE TRIANGLE (90 MIL)
MA	YELLOW & YELLOW RAISED MARKER
MB	CRYSTAL & RED RAISED MARKER

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
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.06	PAVEMENT MARKINGS - LANE DROPS
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
1264.01	OBJECT MARKERS - TYPES
1264.02	OBJECT MARKERS - INSTALLATION

PLAN REVIEWED BY: N.C.D.O.T. SIGNING AND DELINEATION UNIT

AYMAN ALQUDWAH, P.E. SIGNING & DELINEATION REGIONAL ENGINEER

MATTHEW TRACEY, P.E. SIGNING & DELINEATION PROJECT DESIGN ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY: HDR ENGINEERING, INC. OF THE CAROLINAS

RON KING, P.E. SIGNING & DELINEATION PROJECT DESIGN ENGINEER

CHRIS HARNDEN SIGNING & DELINEATION PROJECT DESIGN TECHNICIAN

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

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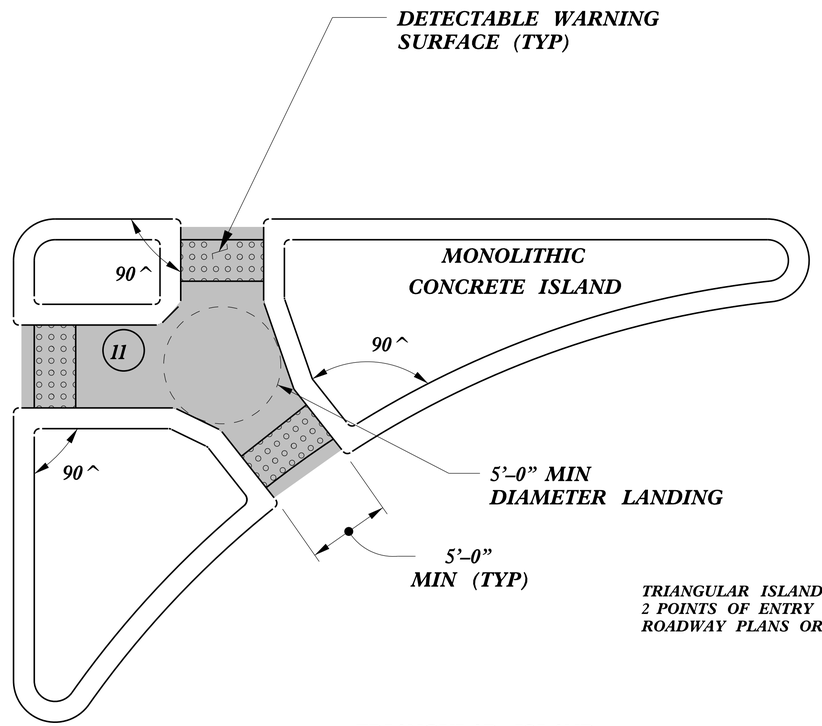
DocuSign Envelope ID: 96E53BD6-4642-42E1-ABCC-427B13ABD3D1

5/14/99

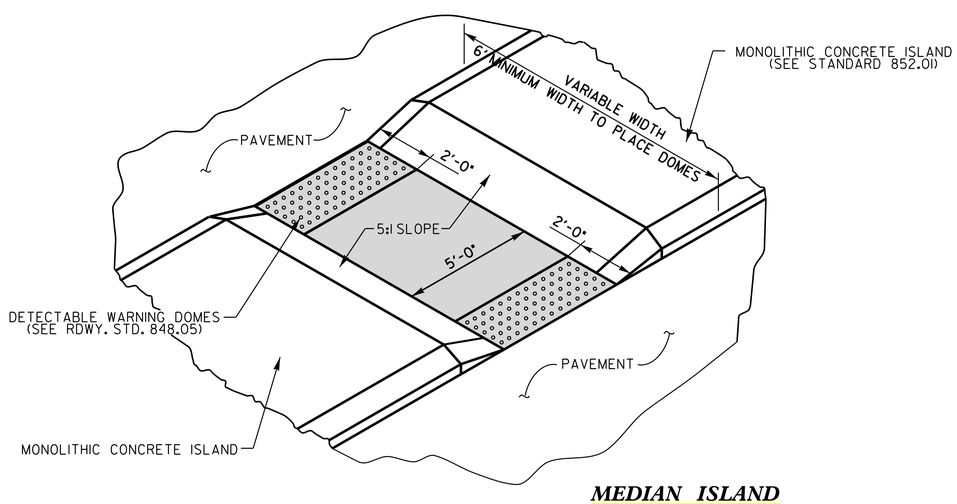
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	PMP-1A

PAY LIMITS FOR 1 CURB RAMP

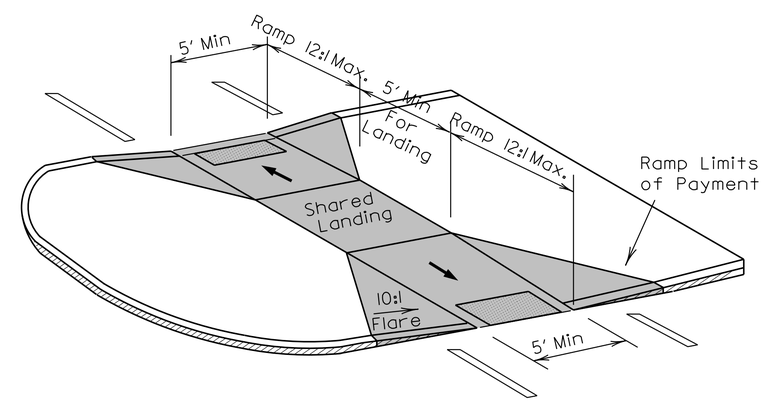


TRIANGULAR ISLANDS MAY BE CONSTRUCTED WITH ONLY 2 POINTS OF ENTRY AND EXIT AS SHOWN IN THE ROADWAY PLANS OR AS DIRECTED BY THE ENGINEER.

TRIANGULAR ISLAND WITH CUT THROUGH



MEDIAN ISLAND WITH CUT THROUGH



MEDIAN ISLAND CURB RAMPS

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

$$$$SYSTIME$$$$
$$$$DGNFILE$$$$
$$$$USERNAME$$$$

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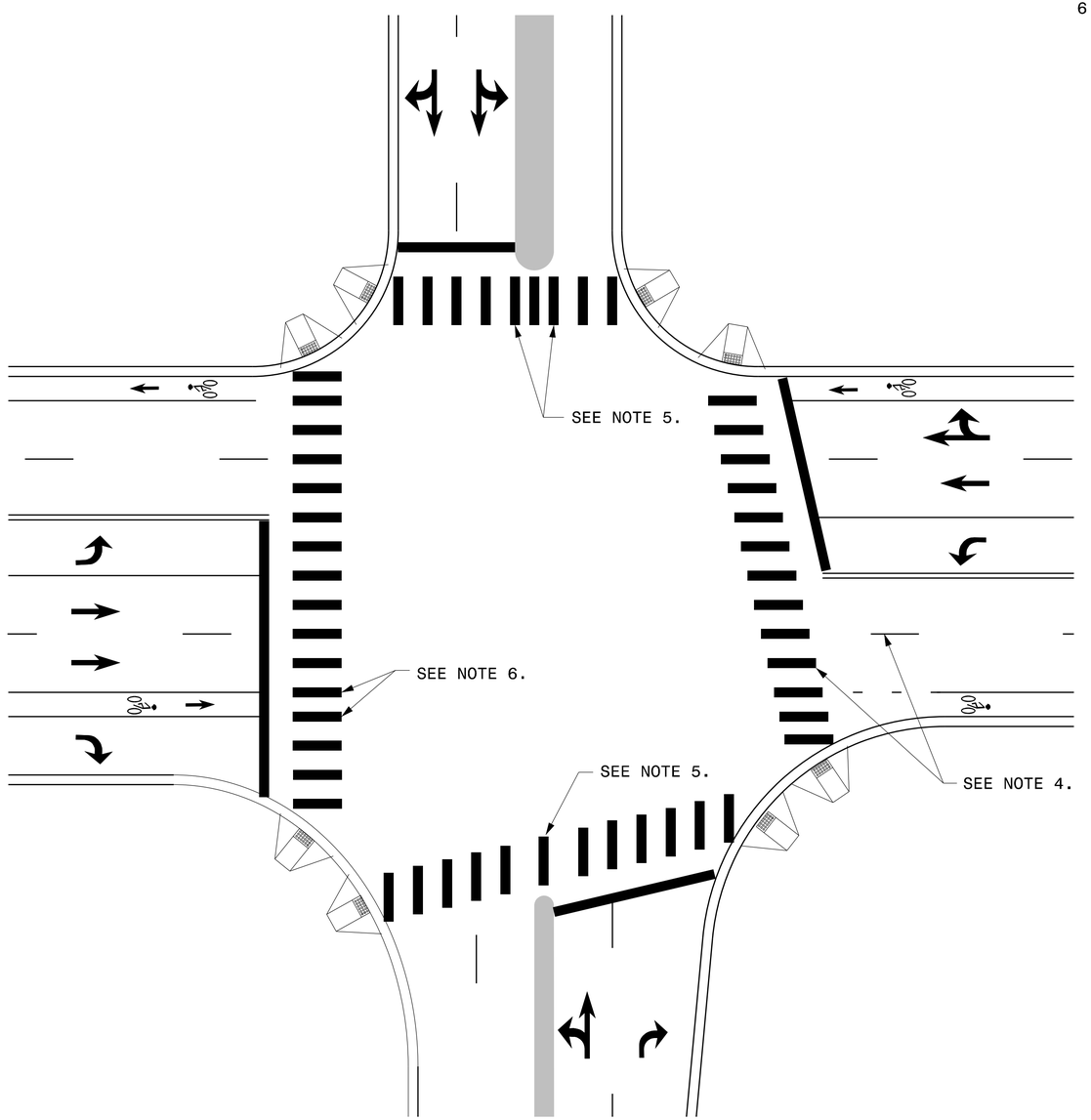
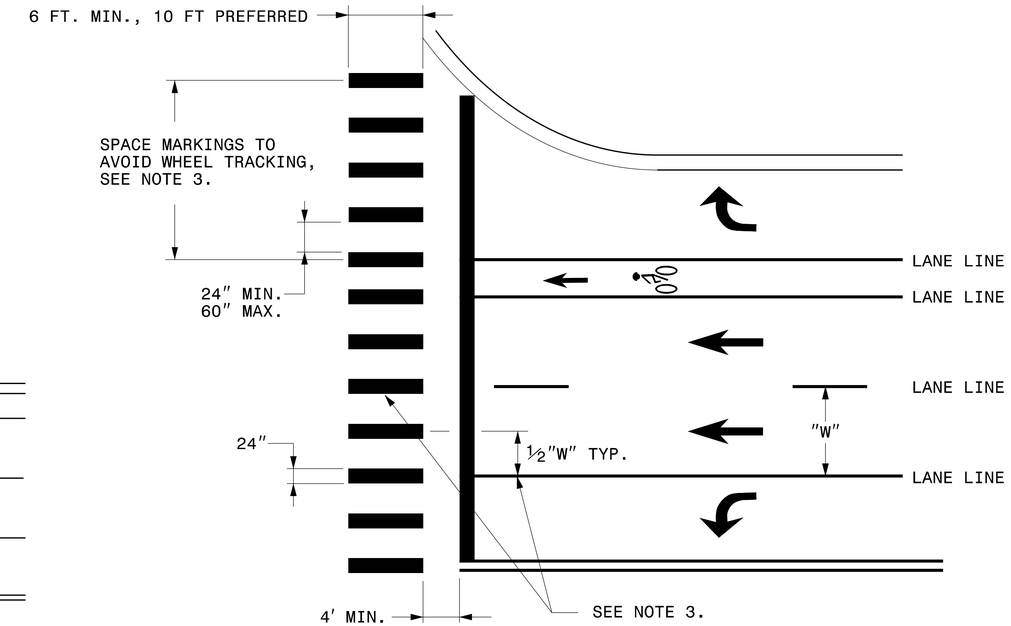
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2-19

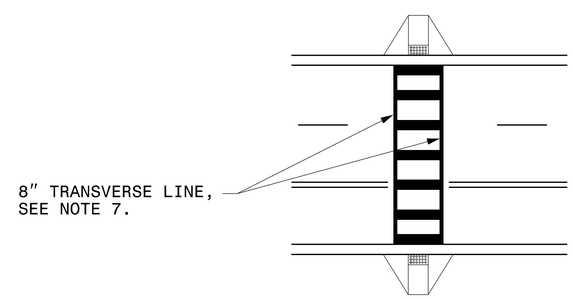
ENGLISH TYPICAL DRAWING FOR
PAVEMENT MARKINGS
HI-VISIBILITY CROSSWALKS
NO-TRACK MARKING GUIDANCE



CROSSWALK INTERSECTION DETAIL



CROSSWALK MARKING DETAIL



MID-BLOCK CROSSWALK DETAIL

GENERAL NOTES:

1- THE GUIDANCE IN THIS DETAIL IS TO BE USED WHEN NO-TRACK SPACING OF HI-VISIBILITY MARKINGS IS REQUESTED.

2- USE THE GUIDANCE SHOWN ON THE ABOVE DETAILS IN CONJUNCTION WITH PAVEMENT MARKING GUIDANCE SHOWN ON ROADWAY STANDARD DRAWINGS 1205.01 AND 1205.07.

3- PLACE MARKINGS TO AVOID WHEELPATH OF VEHICLES. MARKINGS TYPICALLY WILL BE LOCATED CENTERED AT THE LANE LINES AND EDGE LINES WITH ONE ADDITIONAL MARKING CENTERED IN THE MIDDLE OF THE LANE. AT WIDE LANE WIDTHS DUE TO TAPERS AND LARGE RADII, LOCATE MARKINGS AT BEST SPACING TO AVOID WHEEL TRACKING. THE SPACE BETWEEN MARKINGS SHALL NOT BE LESS THAN 24 INCHES OR GREATER THAN 60 INCHES.

4- WHERE THE CROSSWALK IS SKEWED TO THE LANE LINES, THE MARKINGS SHOULD BE PARALLEL TO THE LANE LINES.

5- PLACE MARKINGS ON BOTH EDGES OF THE NOSE OF A MEDIAN. FOR NARROW MEDIANS LESS THAN 4 FEET, A SINGLE MARKING MAY BE USED. FOR WIDE MEDIANS, INSTALL ADDITIONAL MARKINGS IN THE MEDIAN AREA. THE SPACE BETWEEN THE MARKINGS SHALL NOT TO BE LESS THAN 24 INCHES OR GREATER THAN 60 INCHES.

6- LOCATE MARKINGS CENTERED ON BICYCLE LANE LINES. MARKINGS SHALL NOT BE LOCATED IN THE CENTER OF THE BICYCLE PATH.

7- INCLUDE 8″ TRANSVERSE LINES WITH 24″ LONGITUDINAL MARKINGS AT MID-BLOCK CROSSINGS.

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

2-19

ENGLISH TYPICAL DRAWING FOR
PAVEMENT MARKINGS
HI-VISIBILITY CROSSWALKS
NO-TRACK MARKING GUIDANCE

SHEET 1 OF 1
PMP-1B

2-28-19

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555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

TIP NO.	SHEET NO.
U-5710A	PMP-2

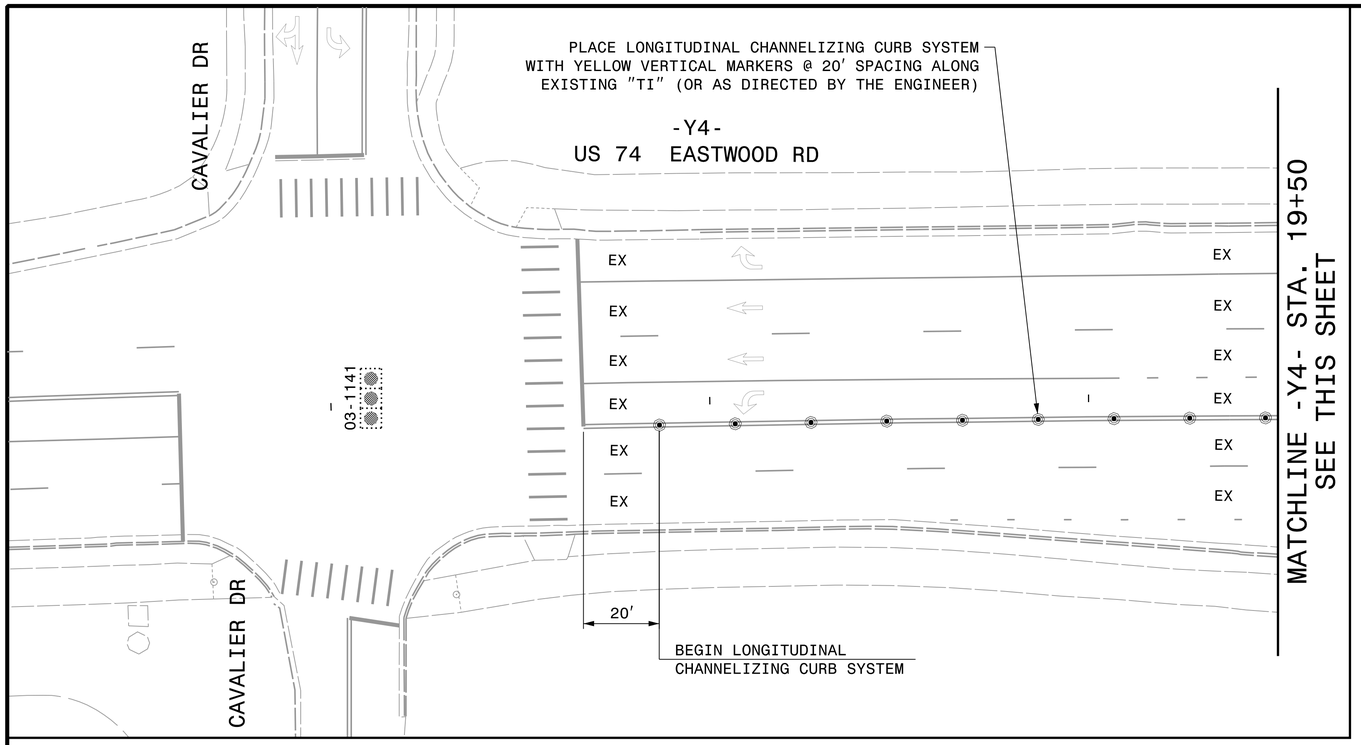
APPROVED: Ron King

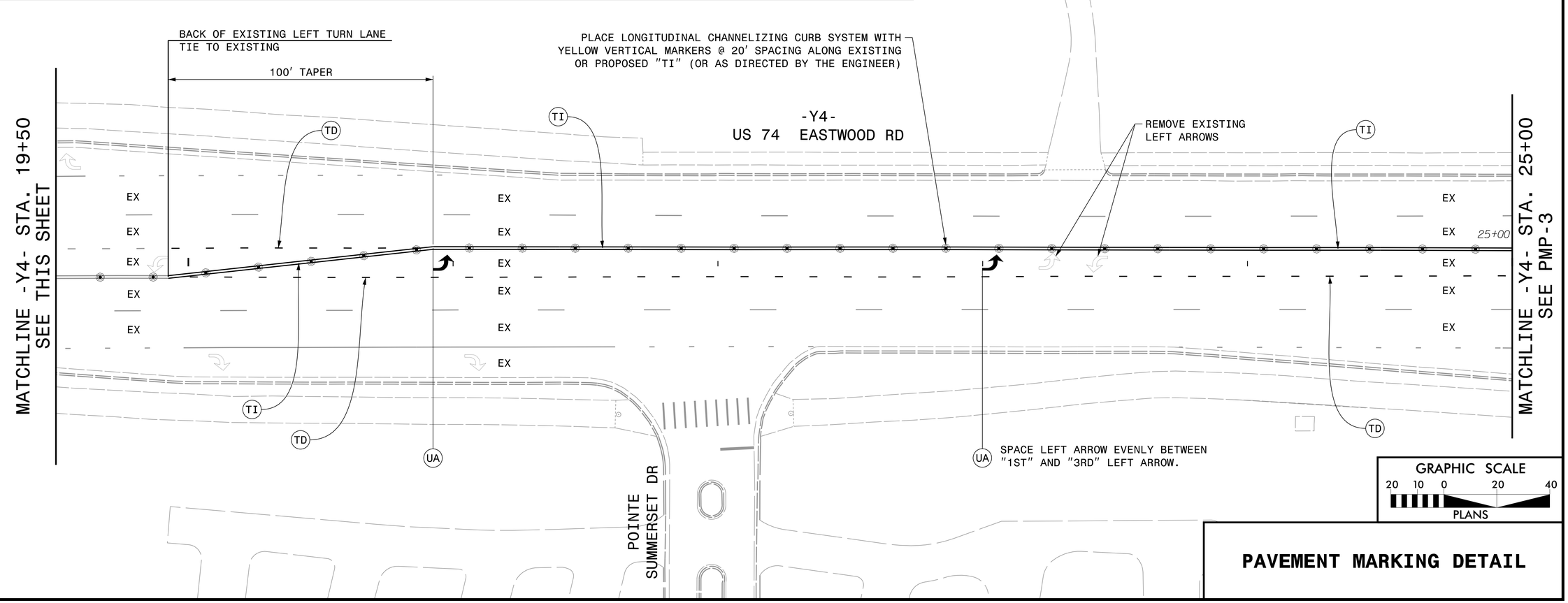
DATE: 12/10/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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TIP NO.	SHEET NO.
U-5710A	PMP-3

APPROVED: Ron King

DATE: 12/10/2021

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NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

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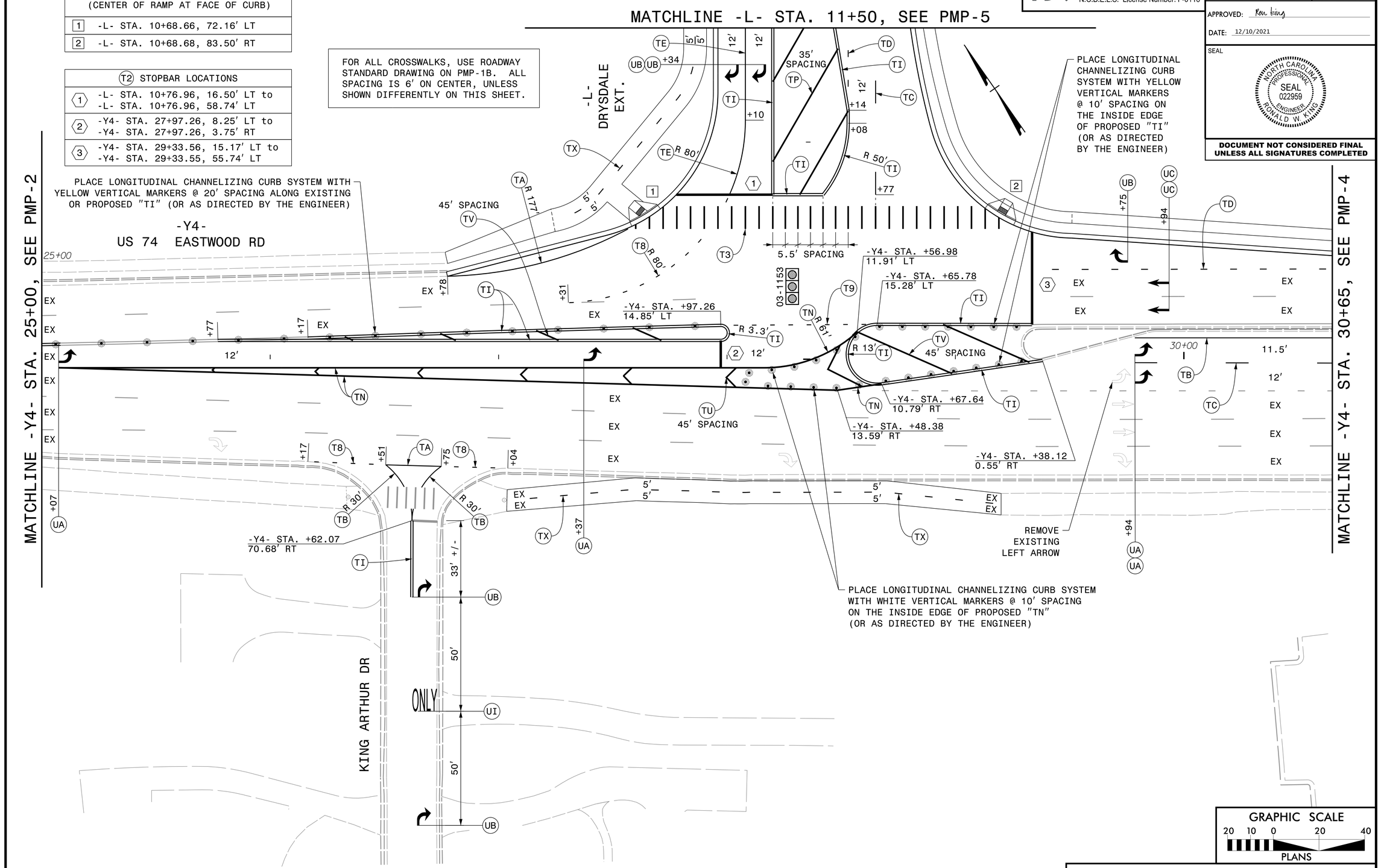
CURB RAMP LOCATIONS (CENTER OF RAMP AT FACE OF CURB)	
1	-L- STA. 10+68.66, 72.16′ LT
2	-L- STA. 10+68.68, 83.50′ RT

T2 STOPBAR LOCATIONS	
1	-L- STA. 10+76.96, 16.50′ LT to -L- STA. 10+76.96, 58.74′ LT
2	-Y4- STA. 27+97.26, 8.25′ LT to -Y4- STA. 27+97.26, 3.75′ RT
3	-Y4- STA. 29+33.56, 15.17′ LT to -Y4- STA. 29+33.55, 55.74′ LT

FOR ALL CROSSWALKS, USE ROADWAY STANDARD DRAWING ON PMP-1B. ALL SPACING IS 6′ ON CENTER, UNLESS SHOWN DIFFERENTLY ON THIS SHEET.



GRAPHIC SCALE
20 10 0 20 40
PLANS

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N.C.B.E.L.S. License Number: F-0116

TIP NO.	SHEET NO.
U-5710A	PMP-4

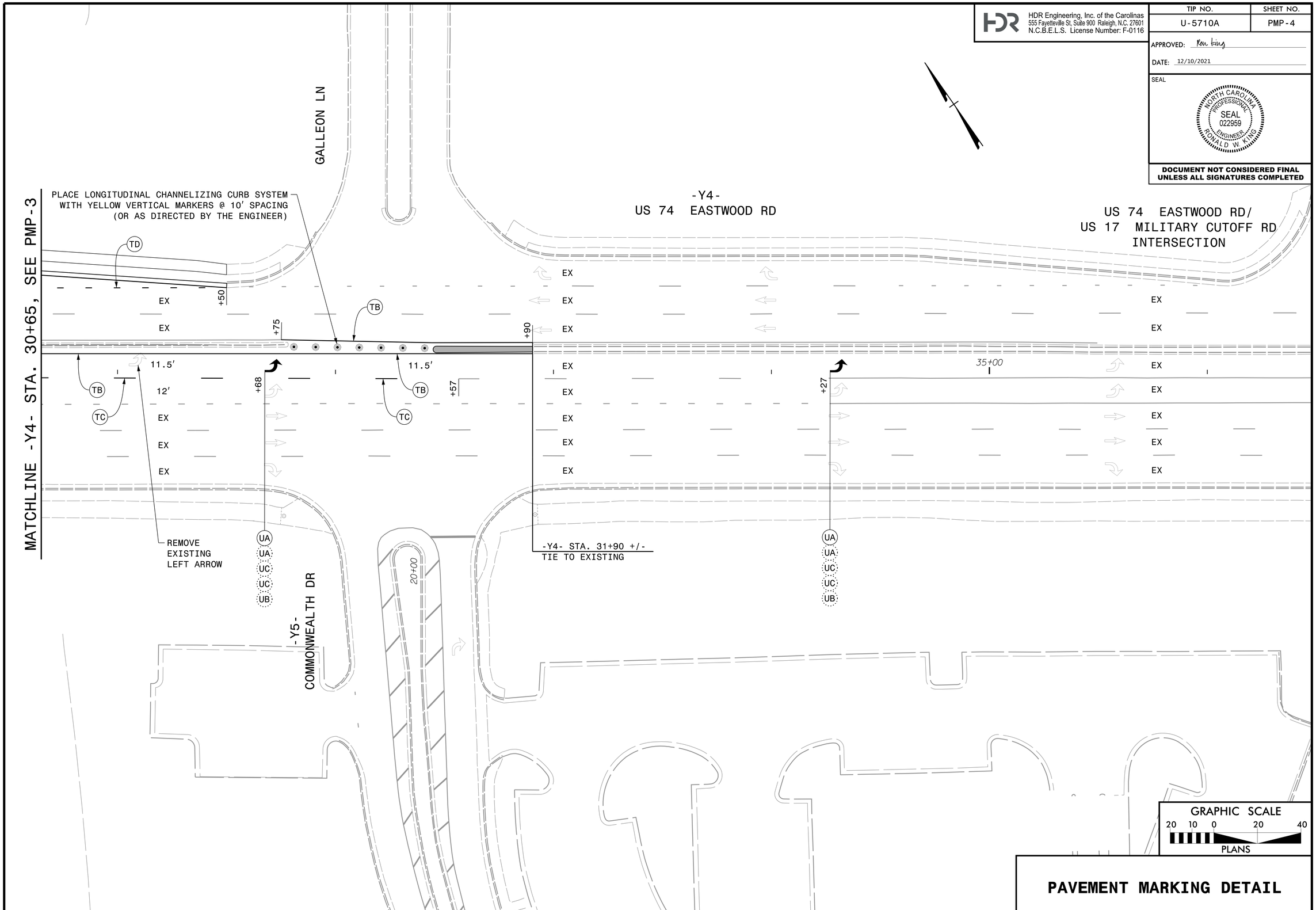
APPROVED: Ron King

DATE: 12/10/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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N.C.B.E.L.S. License Number: F-0116

TIP NO.	SHEET NO.
U-5710A	PMP-5

APPROVED: Ron King

DATE: 12/10/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

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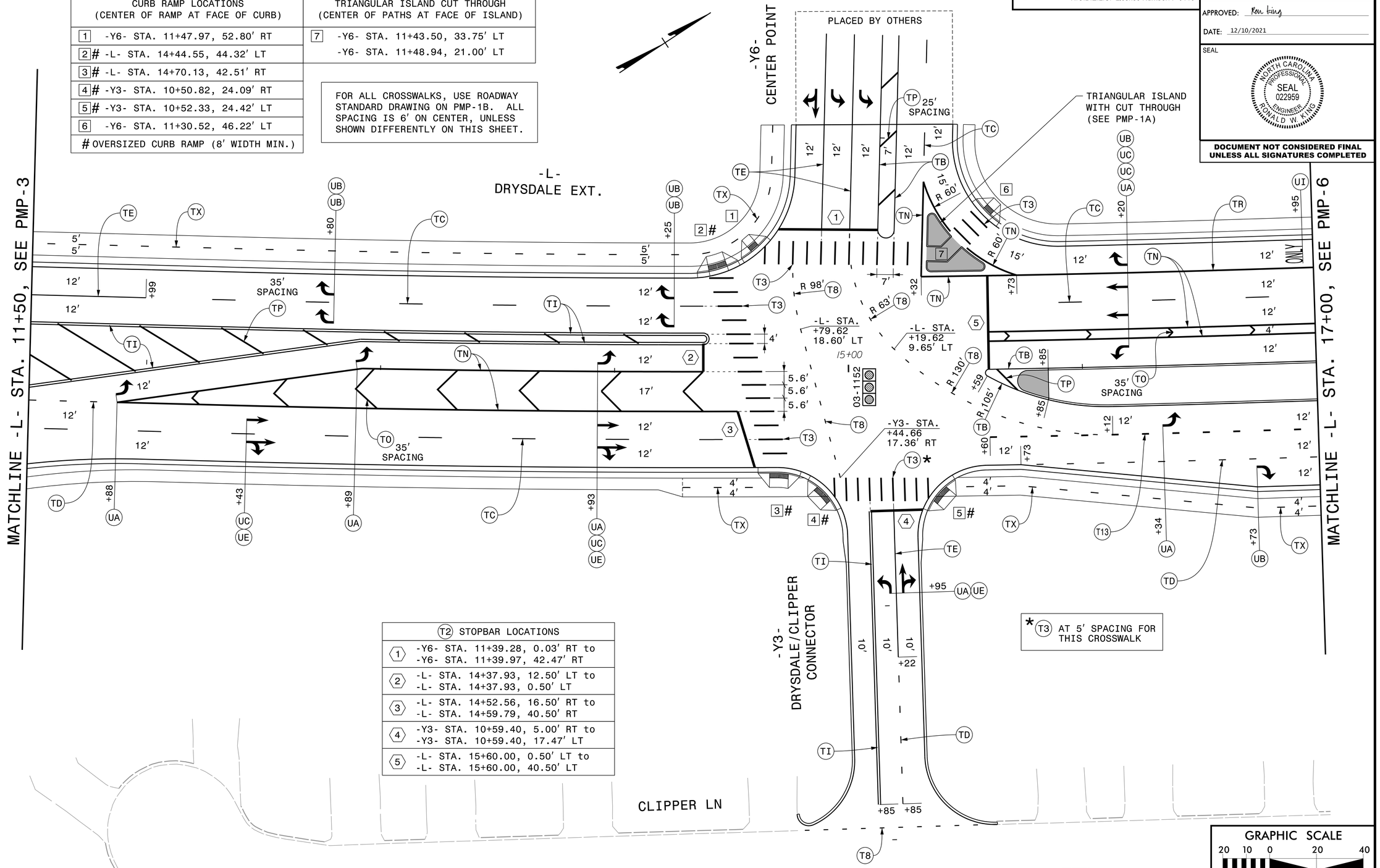
CURB RAMP LOCATIONS (CENTER OF RAMP AT FACE OF CURB)
1 -Y6- STA. 11+47.97, 52.80′ RT
2# -L- STA. 14+44.55, 44.32′ LT
3# -L- STA. 14+70.13, 42.51′ RT
4# -Y3- STA. 10+50.82, 24.09′ RT
5# -Y3- STA. 10+52.33, 24.42′ LT
6 -Y6- STA. 11+30.52, 46.22′ LT
OVERSIZED CURB RAMP (8′ WIDTH MIN.)

TRIANGULAR ISLAND CUT THROUGH (CENTER OF PATHS AT FACE OF ISLAND)
7 -Y6- STA. 11+43.50, 33.75′ LT
-Y6- STA. 11+48.94, 21.00′ LT

FOR ALL CROSSWALKS, USE ROADWAY STANDARD DRAWING ON PMP-1B. ALL SPACING IS 6′ ON CENTER, UNLESS SHOWN DIFFERENTLY ON THIS SHEET.



T2 STOPBAR LOCATIONS
1 -Y6- STA. 11+39.28, 0.03′ RT to -Y6- STA. 11+39.97, 42.47′ RT
2 -L- STA. 14+37.93, 12.50′ LT to -L- STA. 14+37.93, 0.50′ LT
3 -L- STA. 14+52.56, 16.50′ RT to -L- STA. 14+59.79, 40.50′ RT
4 -Y3- STA. 10+59.40, 5.00′ RT to -Y3- STA. 10+59.40, 17.47′ LT
5 -L- STA. 15+60.00, 0.50′ LT to -L- STA. 15+60.00, 40.50′ LT

GRAPHIC SCALE
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PLANS

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TIP NO.	SHEET NO.
U-5710A	PMP-6

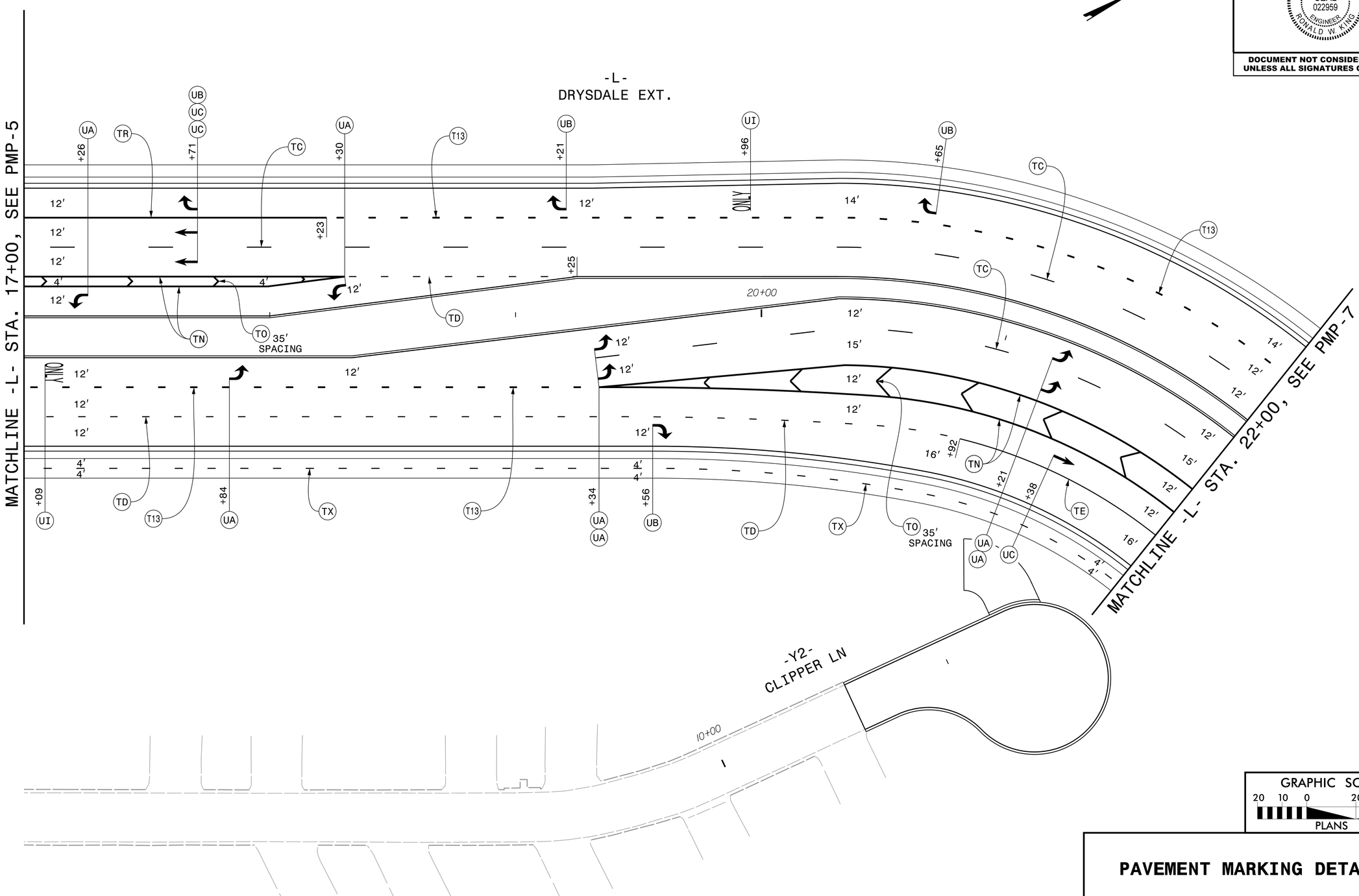
APPROVED: Ron King

DATE: 12/10/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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PLANS

PAVEMENT MARKING DETAIL

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N.C.B.E.L.S. License Number: F-0116

TIP NO.	SHEET NO.
U-5710A	PMP-7

APPROVED: Ron King

DATE: 12/10/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

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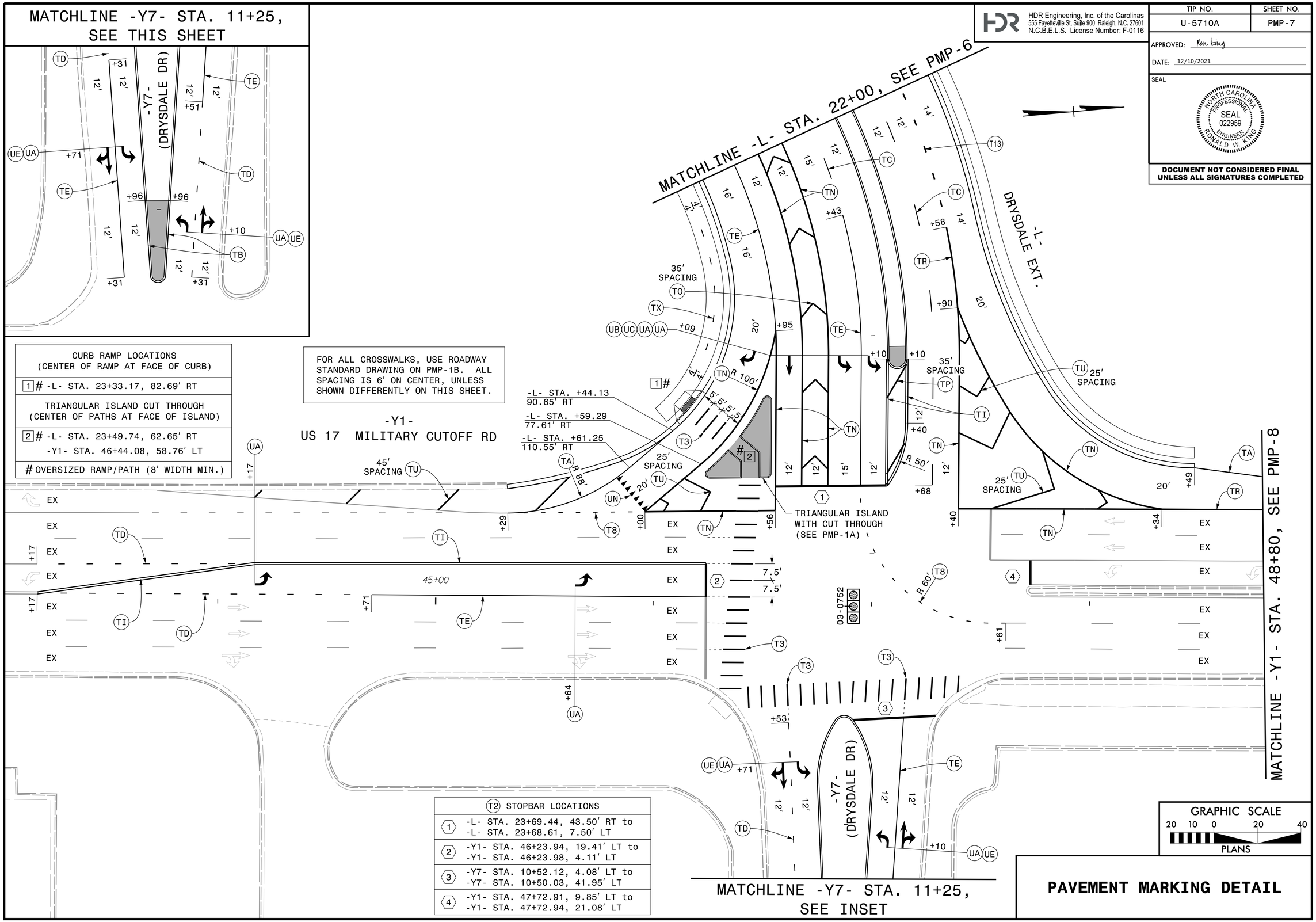

CURB RAMP LOCATIONS (CENTER OF RAMP AT FACE OF CURB)
1 # -L- STA. 23+33.17, 82.69' RT
TRIANGULAR ISLAND CUT THROUGH (CENTER OF PATHS AT FACE OF ISLAND)
2 # -L- STA. 23+49.74, 62.65' RT -Y1- STA. 46+44.08, 58.76' LT
OVERSIZED RAMP/PATH (8' WIDTH MIN.)

FOR ALL CROSSWALKS, USE ROADWAY STANDARD DRAWING ON PMP-1B. ALL SPACING IS 6' ON CENTER, UNLESS SHOWN DIFFERENTLY ON THIS SHEET.

(T2) STOPBAR LOCATIONS	
1	-L- STA. 23+69.44, 43.50' RT to -L- STA. 23+68.61, 7.50' LT
2	-Y1- STA. 46+23.94, 19.41' LT to -Y1- STA. 46+23.98, 4.11' LT
3	-Y7- STA. 10+52.12, 4.08' LT to -Y7- STA. 10+50.03, 41.95' LT
4	-Y1- STA. 47+72.91, 9.85' LT to -Y1- STA. 47+72.94, 21.08' LT

PAVEMENT MARKING DETAIL

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N.C.B.E.L.S. License Number: F-0116

TIP NO.	SHEET NO.
U-5710A	PMP-8

APPROVED: Ron King

DATE: 12/10/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

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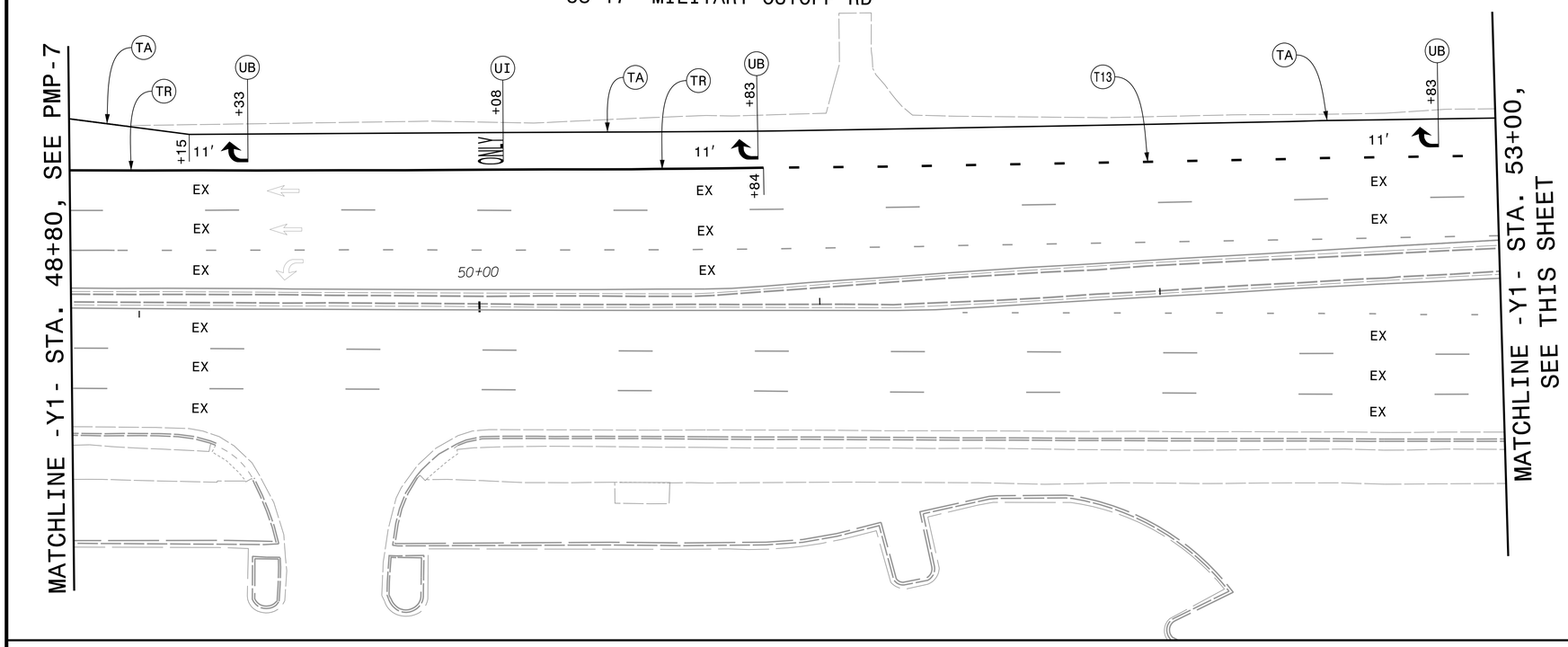

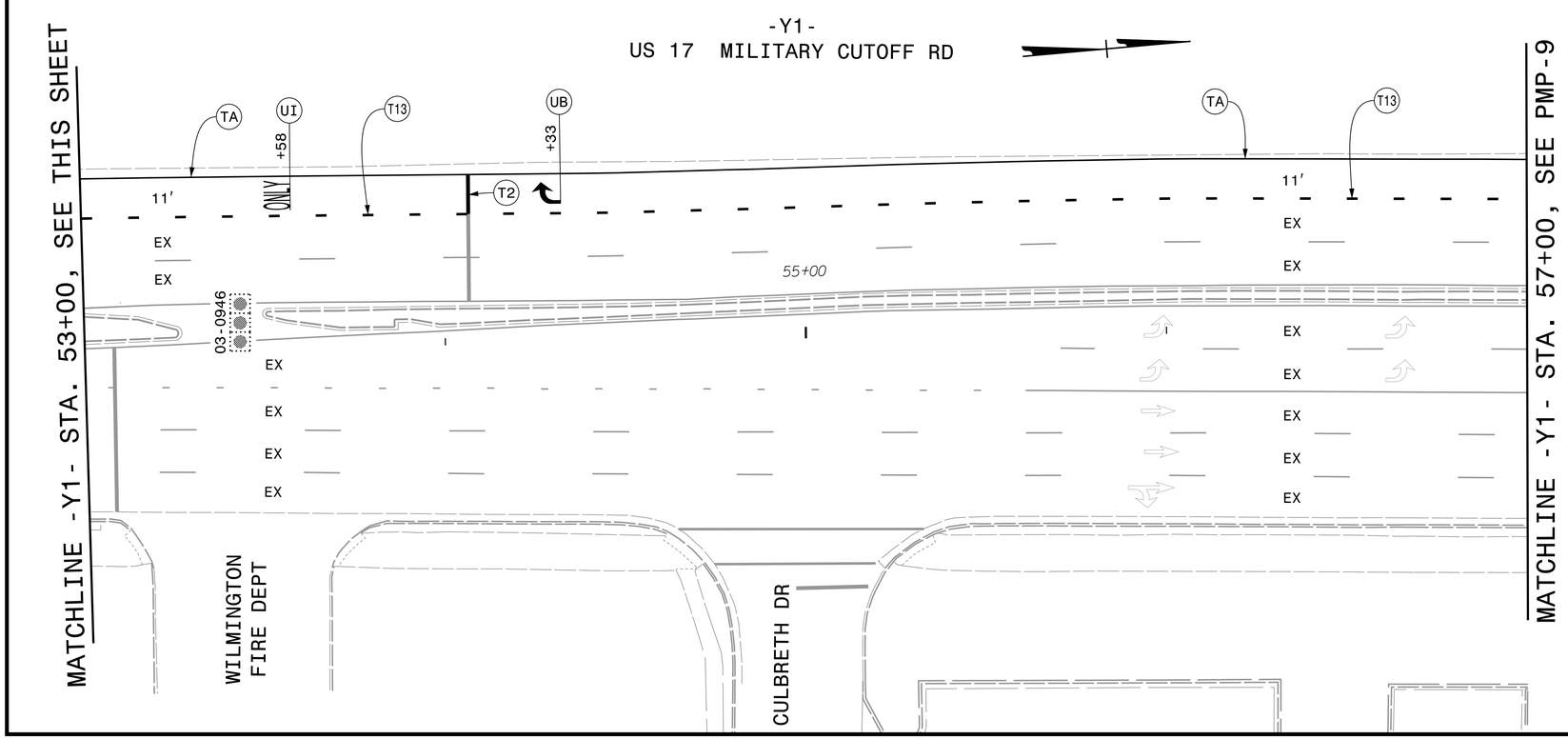

GRAPHIC SCALE
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PLANS

PAVEMENT MARKING DETAIL

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N.C.B.E.L.S. License Number: F-0116

TIP NO.	SHEET NO.
U-5710A	PMP-9

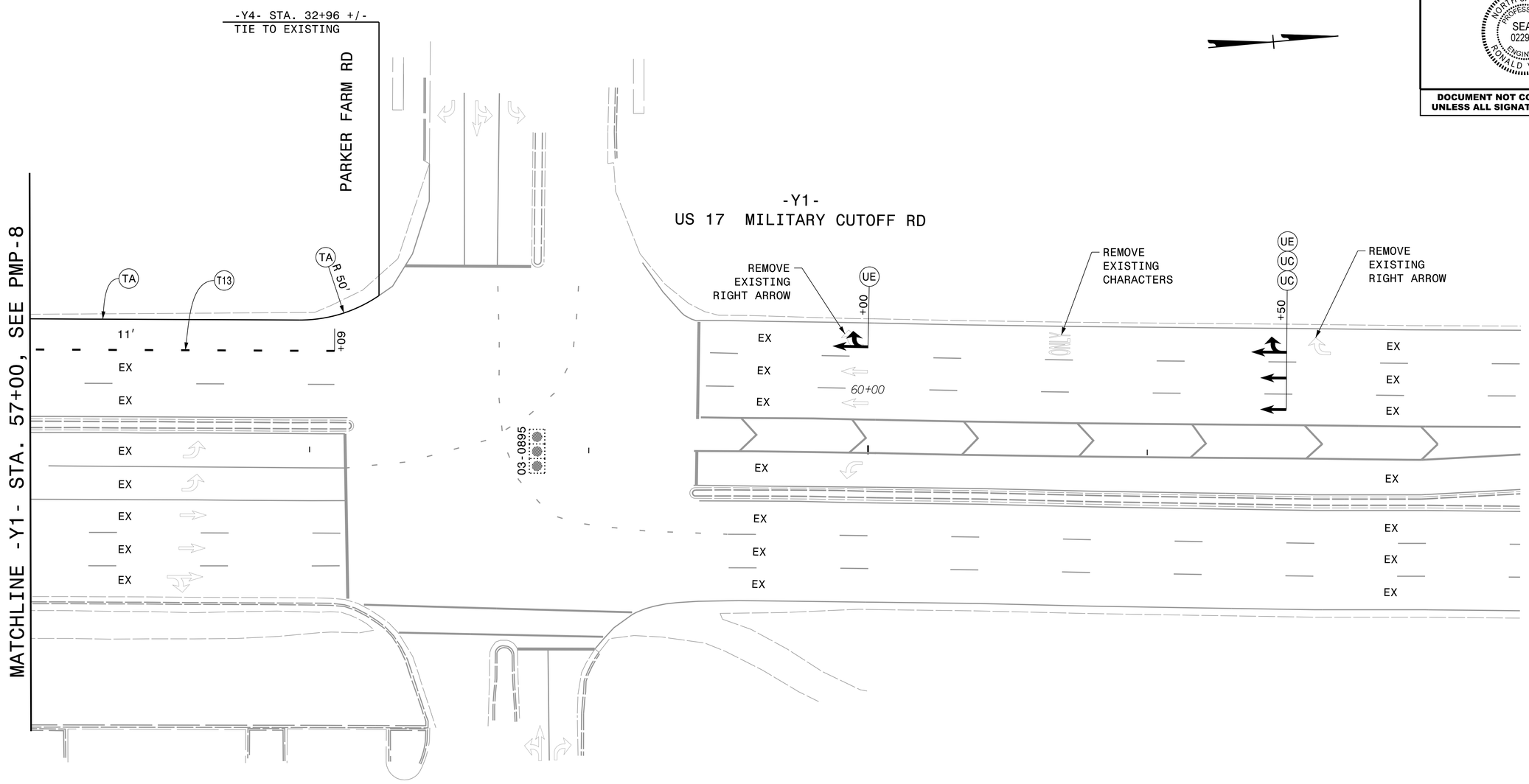
APPROVED: Ron King

DATE: 12/10/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



GRAPHIC SCALE
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PLANS

PAVEMENT MARKING DETAIL

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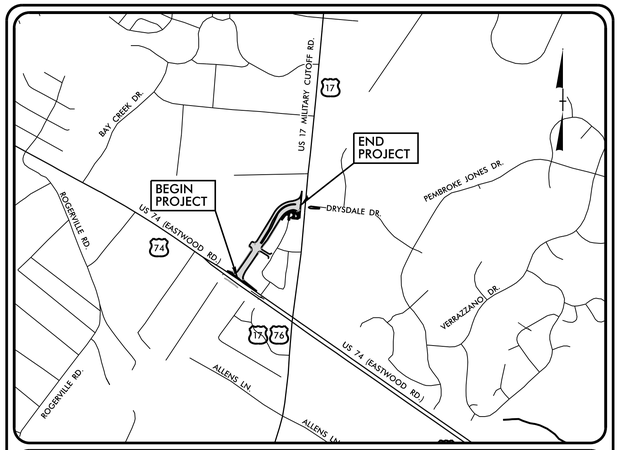
CONTRACT: DC00277



VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

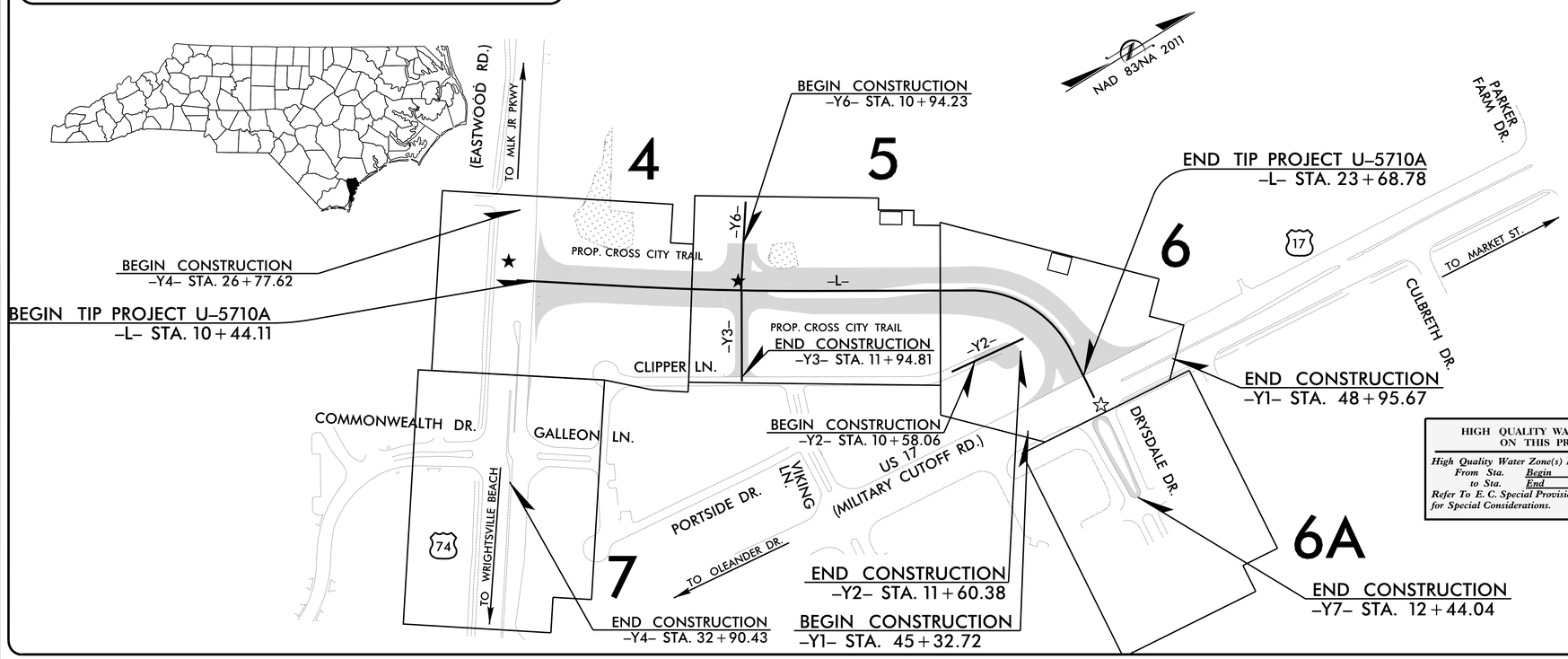
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL
NEW HANOVER COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5710A	EC-1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
50115.1.2	N/A	P.E.
50115.2.2	N/A	ROW & UTIL.
50115.3.2	0074228	CONSTR.

LOCATION: NEW LOCATION NORTHWESTERN QUADRANT CONNECTION BETWEEN US 74 (EASTWOOD RD.) AND US 17 (MILITARY CUTOFF RD.)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND SIGNALS



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.

HIGH QUALITY WATER(S) EXIST ON THIS PROJECT

High Quality Water Zone(s) Exist
From Sta. Begin
to Sta. End
Refer To E. C. Special Provisions for Special Considerations.

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 SCALE

50 25 0 50 100
PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE APPLICABLE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

Prepared in the Office of:

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

Designed by:

Wyatt D. Yelverton PE, CPESC 3609
NAME *LEVEL III CERTIFICATION NO.*

Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 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		

2/13/2020
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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
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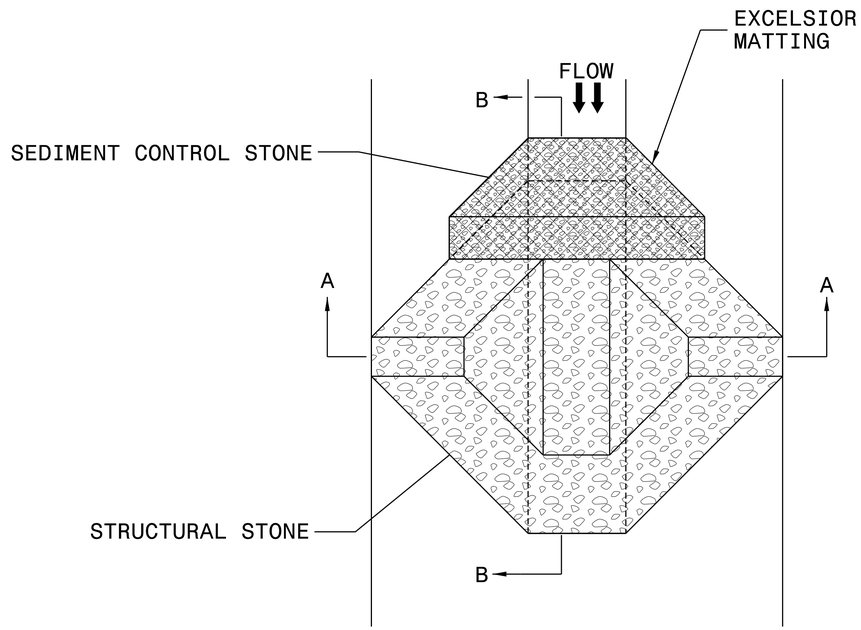
TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



PLAN

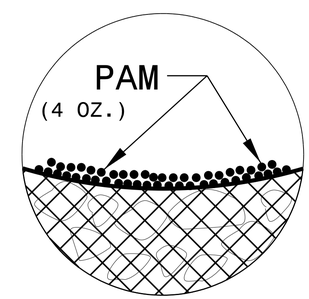
NOTES:

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

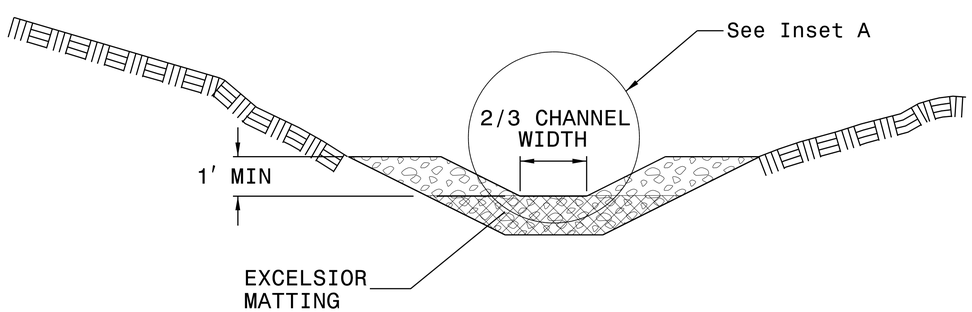
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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

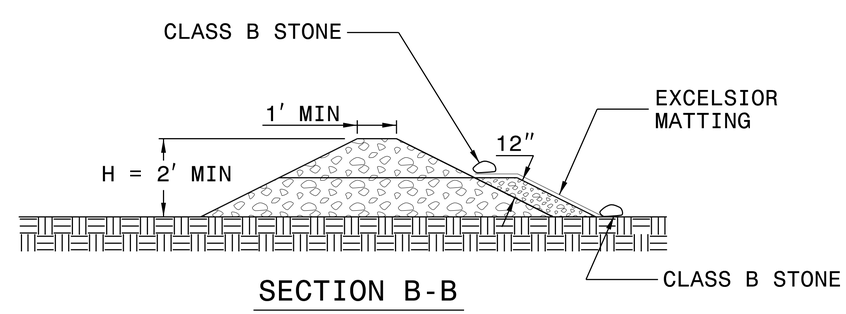
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A

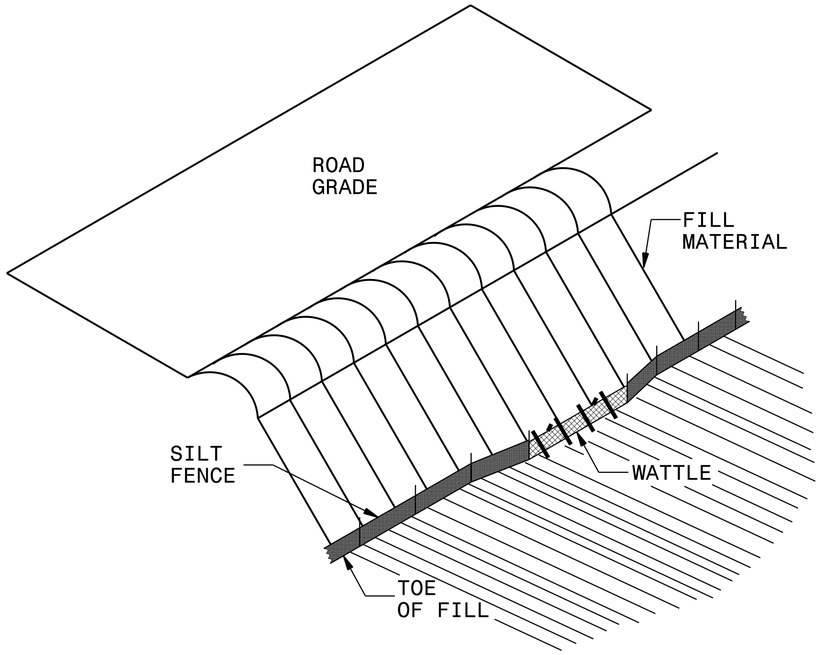


SECTION B-B

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SILT FENCE COIR FIBER WATTLE BREAK DETAIL



ISOMETRIC VIEW

NOTES:

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

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

DO NOT PLACE WATTLE ON TOE OF SLOPE.

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

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

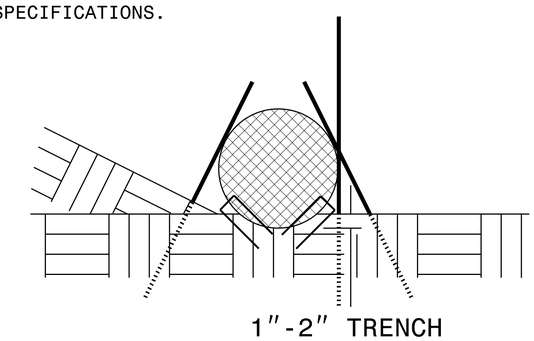
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

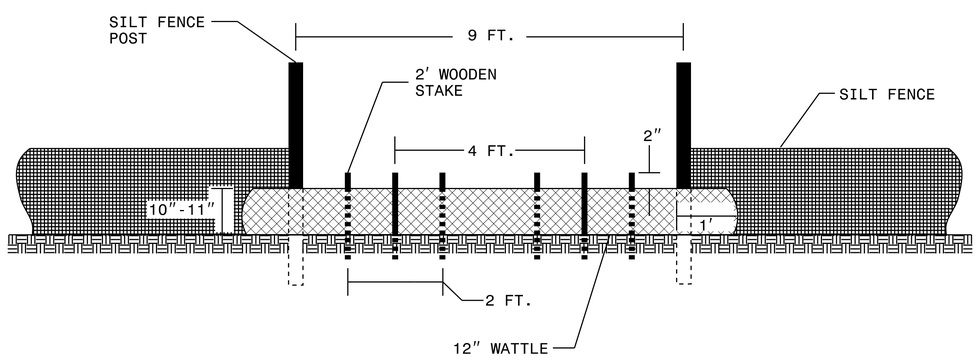
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

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

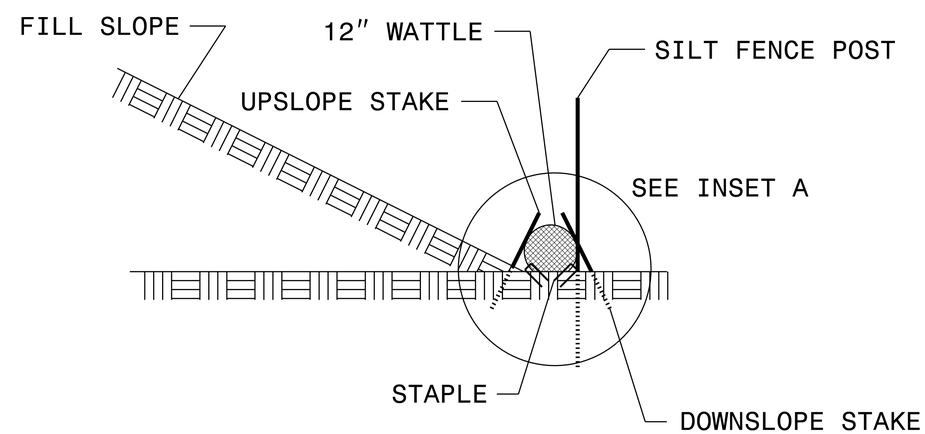
INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A





VIEW FROM SLOPE



SIDE VIEW

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-2B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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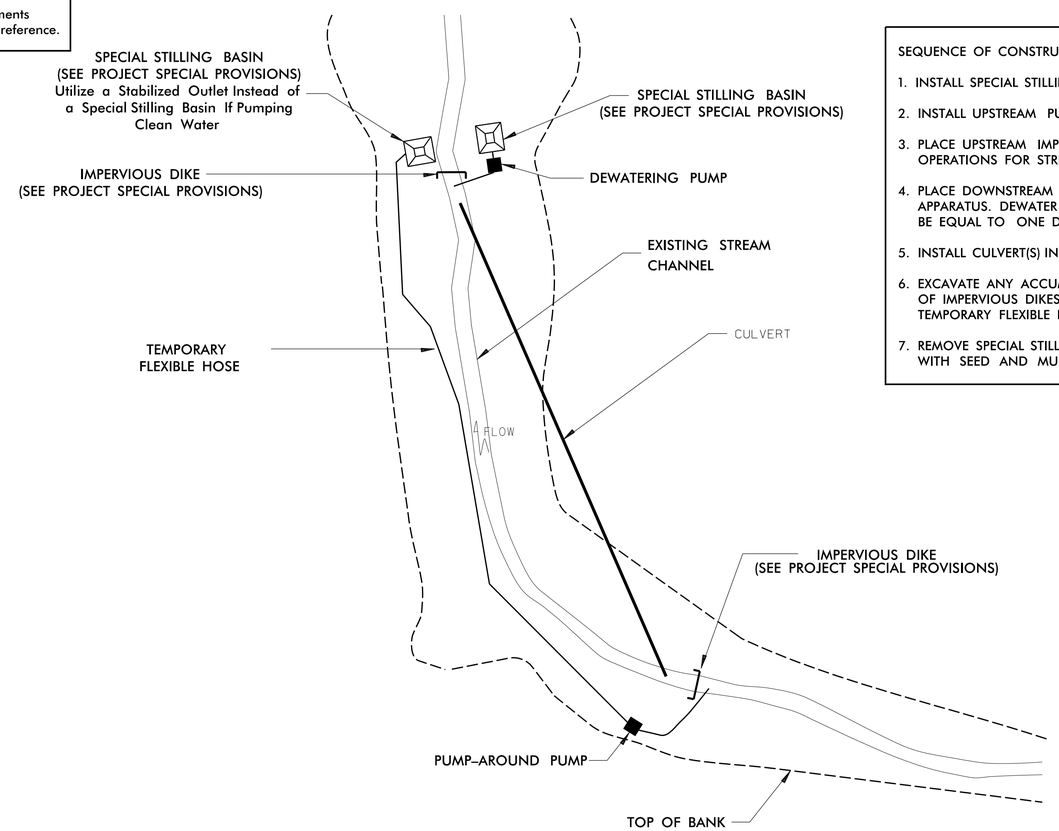
PUMP–AROUND OPERATION

NOTES:
1) All excavation shall be performed in only dry or isolated areas of the work zone.
2) Impervious dikes are to be used to isolate work from stream flow when necessary.
3) Maintenance of stream flow operations shall be incidental to the work. This includes polyethylene sheeting, diversion pipes, pumps and hoses.
4) Pumps and hoses shall be of sufficient size to dewater the work area.
5) Special Stilling Basins shall be located within all easements and permitted impacts. See Permit Drawings for reference.



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. INSTALL CULVERT(S) 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. REMOVE SPECIAL STILLING BASIN(S) AND BACKFILL. STABILIZE DISTURBED AREA WITH SEED AND MULCH.

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HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING IN DITCHES

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
5	-L-	19+42	20+00	LT.	165

MATTING ON SLOPES

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
5-6	-L-	19+50	21+50	LT.	394
5-6	-L-	16+00	23+00	RT.	776
			TOTAL		1170 SY
			TOTAL FOR DITCHES		165 SY
			TOTAL FOR SLOPES		1170 SY
			MISC. MATTING TO BE INSTALLED AS DIRECTED BY ENGINEER		1265 SY
			OVERALL TOTAL		2600 SY
			SAY		2600 SY

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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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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-4/Const. 4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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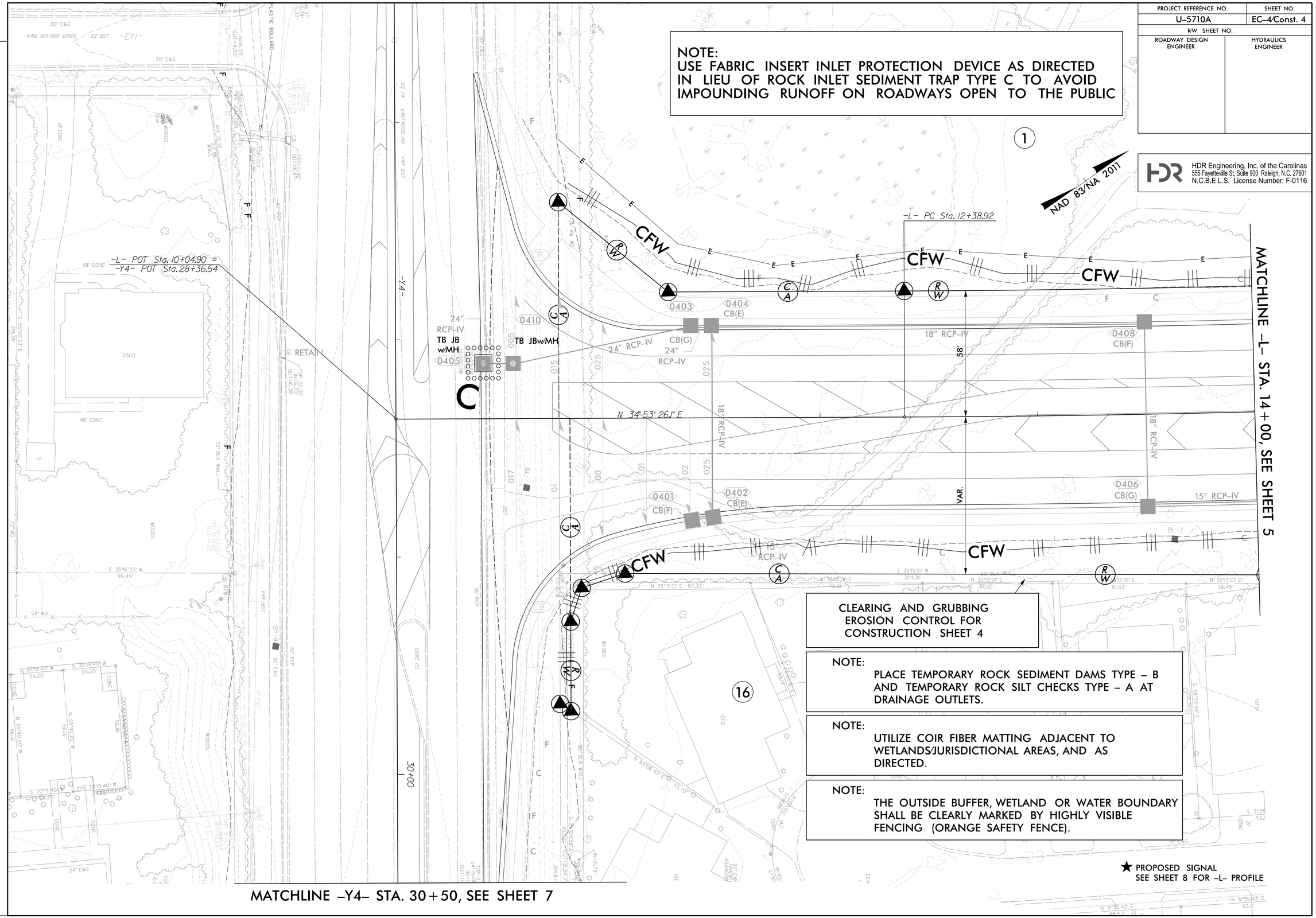
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

NOTE:
USE FABRIC INSERT INLET PROTECTION DEVICE AS DIRECTED IN LIEU OF ROCK INLET SEDIMENT TRAP TYPE C TO AVOID IMPOUNDING RUNOFF ON ROADWAYS OPEN TO THE PUBLIC



REVISIONS

ROW REV. – JUNE 19, 2019 – ADDITION OF PARCEL 16 (ROW AND TCE), ADDITION OF PARCEL 17 (PUE AND TCE), ADDED PUE AND TCE TO PARCEL 1. CEH.
ROW REV. – AUGUST 16, 2019 – REMOVED TEMPORARY CONSTRUCTION EASEMENT (TCE) FROM PARCELS 16 & 17. TCE REDUCED ON PARCEL 1. ADDED PARCEL 15A FOR EASTPORT HOA. CEH.

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-5/Const. 5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

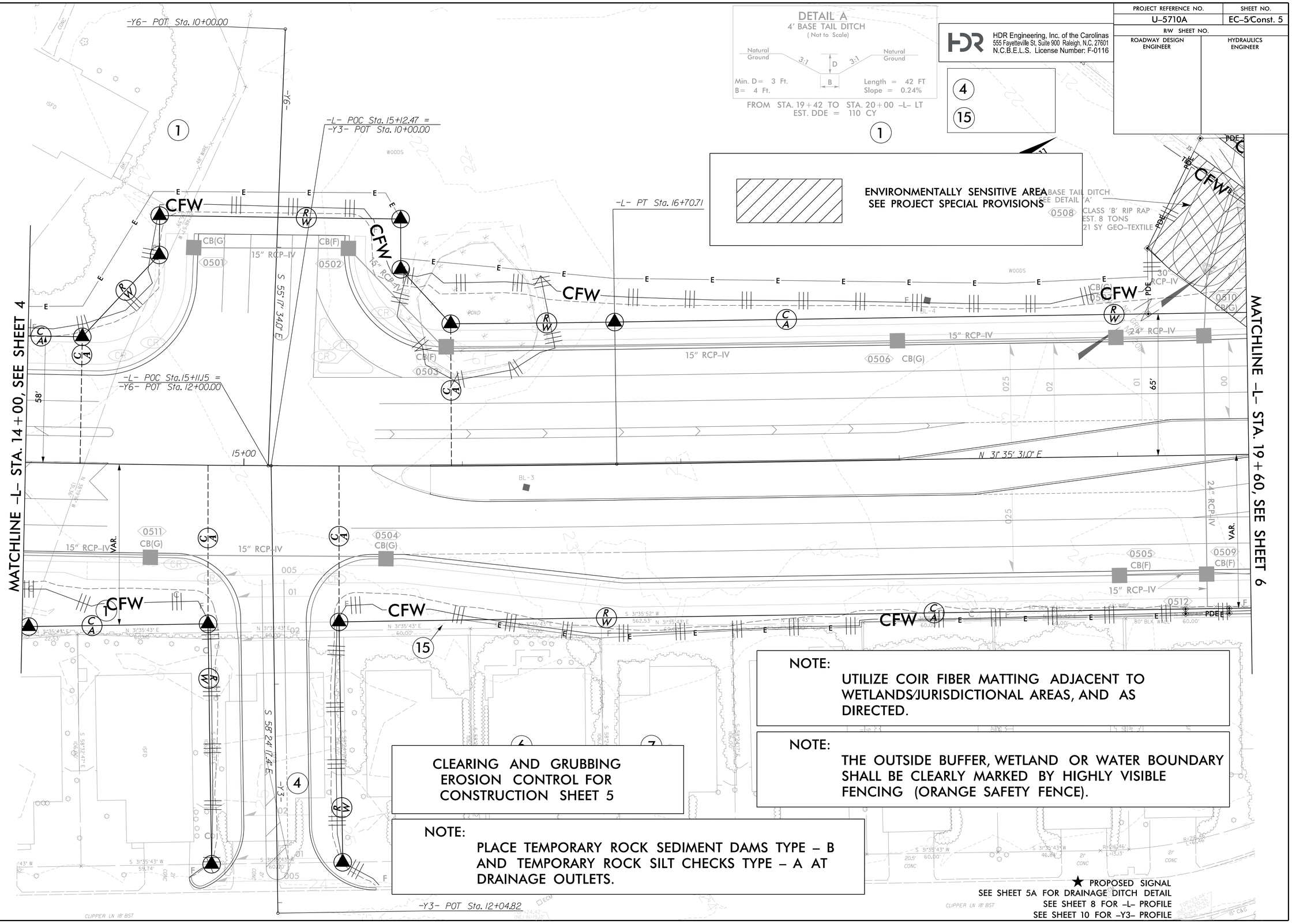
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

DETAIL A
4' BASE TAIL DITCH
(Not to Scale)

Natural Ground — 3:1 — D — 3:1 — Natural Ground
B

Min. D = 3 Ft.
B = 4 Ft.
Length = 42 FT
Slope = 0.24%

FROM STA. 19+42 TO STA. 20+00 -L- LT
EST. DDE = 110 CY



NOTE:
UTILIZE COIR FIBER MATTING ADJACENT TO WETLANDS/JURISDICTIONAL AREAS, AND AS DIRECTED.

NOTE:
THE OUTSIDE BUFFER, WETLAND OR WATER BOUNDARY SHALL BE CLEARLY MARKED BY HIGHLY VISIBLE FENCING (ORANGE SAFETY FENCE).

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 5

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

★ PROPOSED SIGNAL
SEE SHEET 5A FOR DRAINAGE DITCH DETAIL
SEE SHEET 8 FOR -L- PROFILE
SEE SHEET 10 FOR -Y3- PROFILE

REVISIONS

ROW REV. – JUNE 19, 2019 – ADDED TCE TO PARCELS 1 & 2. ADDITIONAL PDE AND TWEAKED ROW ON PARCEL 2. REDUCED TCE ON PARCELS 6, 7, 8 AND 9. CEH.
ROW REV. – AUGUST 16, 2019 – PARCEL 2 RE-NUMBERED TO PARCEL 1. ADDED RIGHT OF WAY AND TCE AROUND CENTERPOINT STUBOUT ON PARCEL 1. REMOVED TCE ON PARCELS 3 & 5 ELIMINATING CLAIMS. PARCEL 15A ADDED FOR EASTPORT HOA. CEH.

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-6/Const. 6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

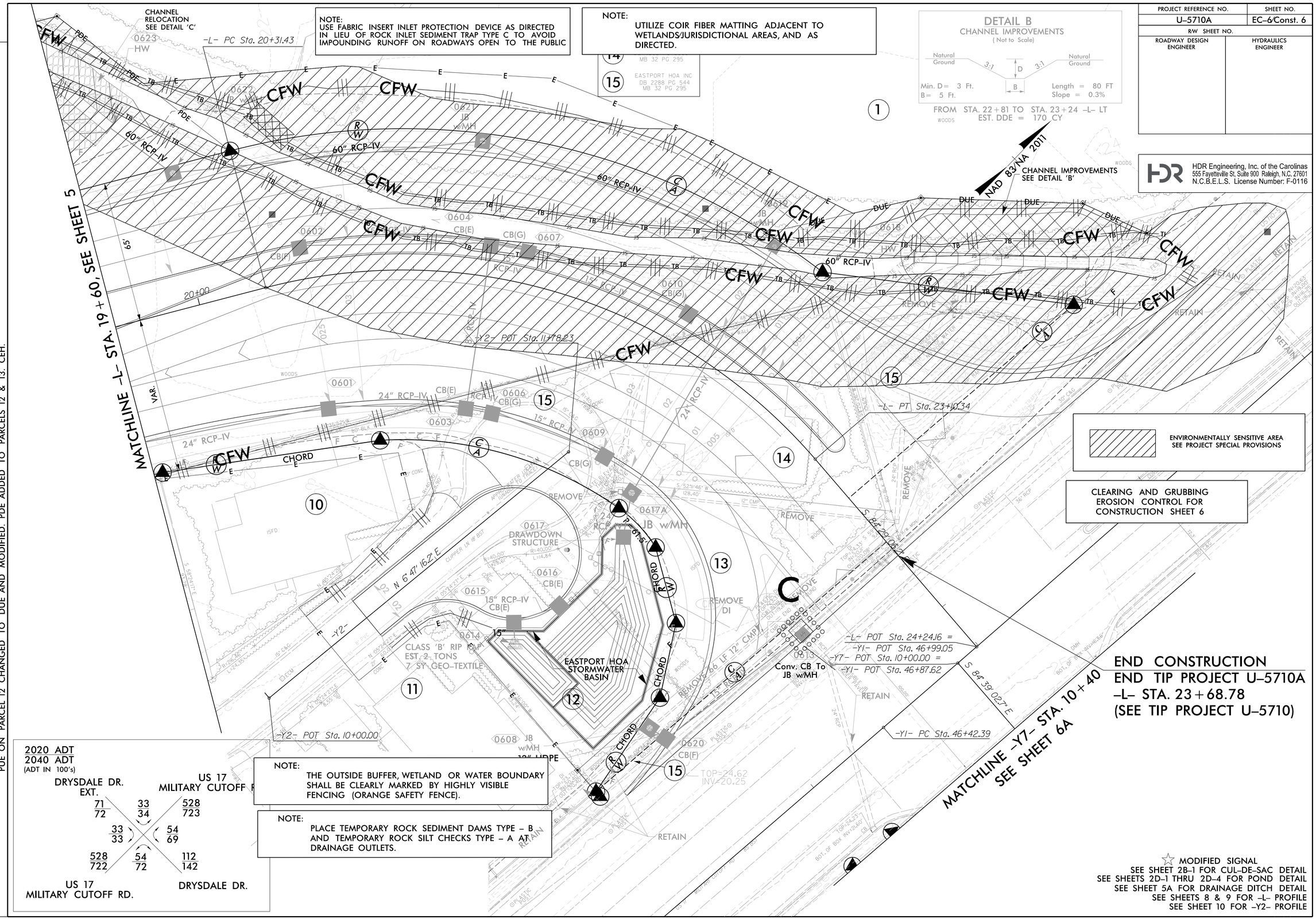
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

NOTE:
USE FABRIC INSERT INLET PROTECTION DEVICE AS DIRECTED IN LIEU OF ROCK INLET SEDIMENT TRAP TYPE C TO AVOID IMPOUNDING RUNOFF ON ROADWAYS OPEN TO THE PUBLIC

NOTE:
UTILIZE COIR FIBER MATTING ADJACENT TO WETLANDS/JURISDICTIONAL AREAS, AND AS DIRECTED.

DETAIL B
CHANNEL IMPROVEMENTS
(Not to Scale)

Natural Ground, 3:1, D, 3:1, Natural Ground
B
Min. D = 3 Ft.
B = 5 Ft.
Length = 80 FT
Slope = 0.3%
FROM STA. 22+81 TO STA. 23+24 -L- LT
EST. DDE = 170 CY



NOTE:
THE OUTSIDE BUFFER, WETLAND OR WATER BOUNDARY SHALL BE CLEARLY MARKED BY HIGHLY VISIBLE FENCING (ORANGE SAFETY FENCE).

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

☆ MODIFIED SIGNAL
SEE SHEET 2B-1 FOR CUL-DE-SAC DETAIL
SEE SHEETS 2D-1 THRU 2D-4 FOR POND DETAIL
SEE SHEET 5A FOR DRAINAGE DITCH DETAIL
SEE SHEETS 8 & 9 FOR -L- PROFILE
SEE SHEET 10 FOR -Y2- PROFILE

REVISIONS
ROW REV. - MAY 28, 2019 - PUE ADDED TO PARCEL 12. CEH
ROW REV. - JUNE 19, 2019 - REVISED PDE AND ADDED TCE TO PARCEL 2. REVISED TCE TO STAY OFF OF HOUSE ON PARCEL 10. CEH.
ROW REV. - AUGUST 16, 2019 - PARCEL 2 RE-NUMBERD TO PARCEL 1. ROW ADDED TO PARCEL 11. ROW ADJUSTED AND REDUCED ON PARCELS 12 & 13. PUE ON PARCEL 12 CHANGED TO DUE AND MODIFIED. PDE ADDED TO PARCELS 12 & 13. CEH.

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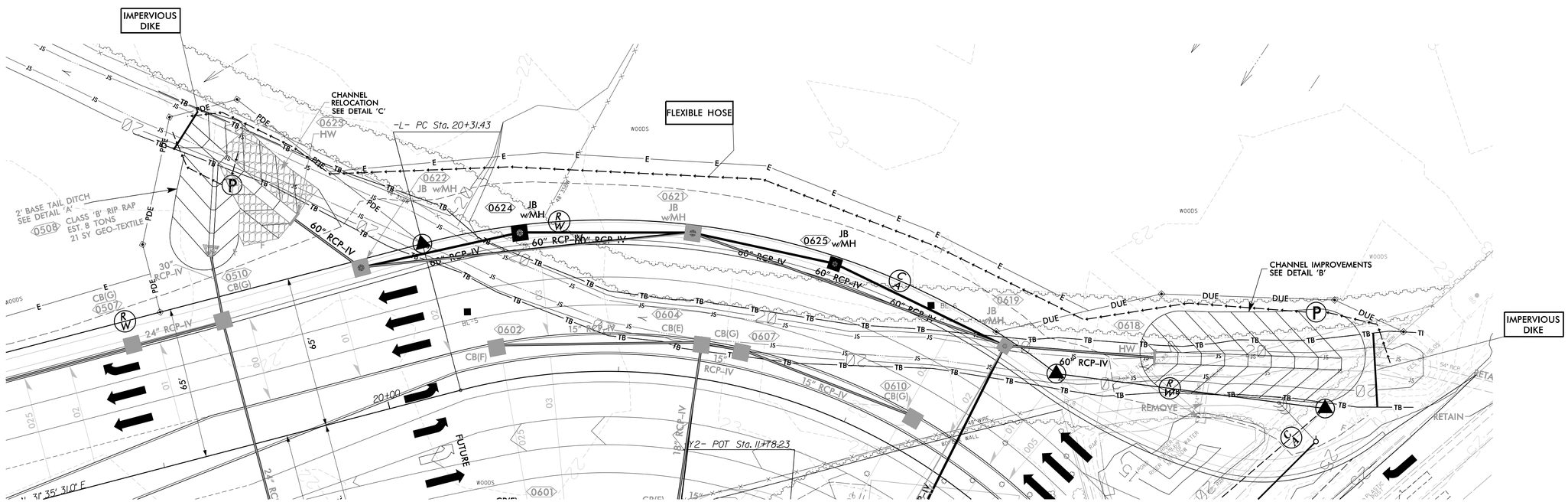
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-6/CONST.6A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

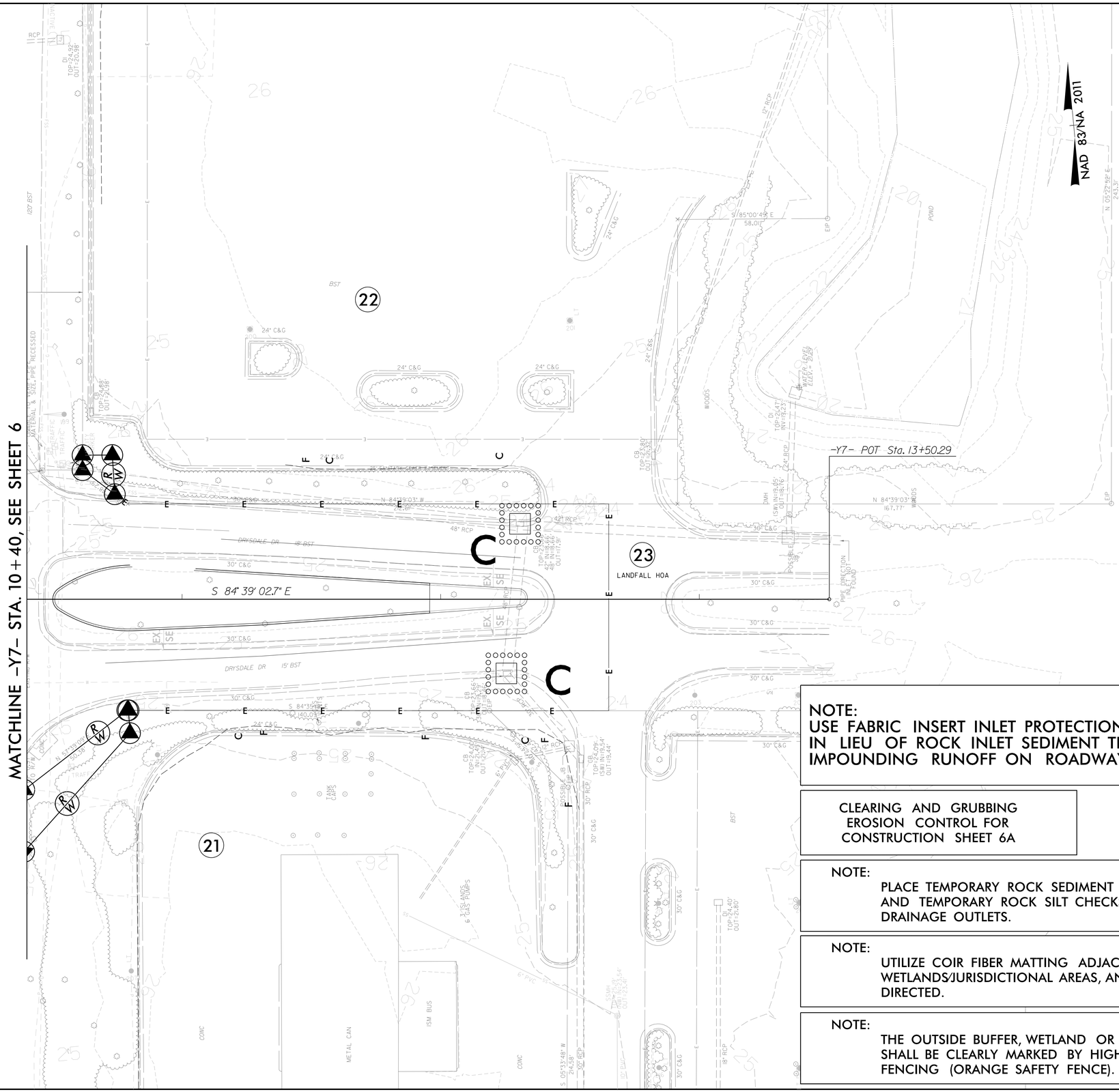
60" RCP CONSTRUCTION SEQUENCE STA. 20+00 -L- LT



1. INSTALL IMPERVIOUS DIKES AT EXISTING 54" CULVERT OUTLET AND DOWNSTREAM OF WORK ZONE.
2. PROVIDE PUMP AND SPECIAL STILLING BASIN FOR DEWATERING OF THE WORK ZONE. USE FILTER FABRIC OR OTHER APPROPRIATE MEASURES TO PROTECT STREAM BANKS AROUND SPECIAL STILLING BASIN. ENSURE SPECIAL STILLING BASINS ARE LOCATED WITHIN EASEMENTS AND WITHIN PERMITTED IMPACT LOCATIONS.
3. UTILIZING PUMP AROUND OPERATION AND FLEXIBLE HOSE, CONSTRUCT 60" PIPES AND CHANNEL IMPROVEMENTS DOWNSTREAM AND UPSTREAM.
4. REMOVE IMPERVIOUS DIKES AND ALLOW STREAM TO FLOW INTO NEWLY CONSTRUCTED PIPES.
5. COMPLETE THE ROADWAY CONSTRUCTION.

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-7/Const. 6A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116



NOTE:
USE FABRIC INSERT INLET PROTECTION DEVICE AS DIRECTED IN LIEU OF ROCK INLET SEDIMENT TRAP TYPE C TO AVOID IMPOUNDING RUNOFF ON ROADWAYS OPEN TO THE PUBLIC

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 6A

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

NOTE:
UTILIZE COIR FIBER MATTING ADJACENT TO WETLANDS/JURISDICTIONAL AREAS, AND AS DIRECTED.

NOTE:
THE OUTSIDE BUFFER, WETLAND OR WATER BOUNDARY SHALL BE CLEARLY MARKED BY HIGHLY VISIBLE FENCING (ORANGE SAFETY FENCE).

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_EC_C&G BW.tbl
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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-8/Const. 7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

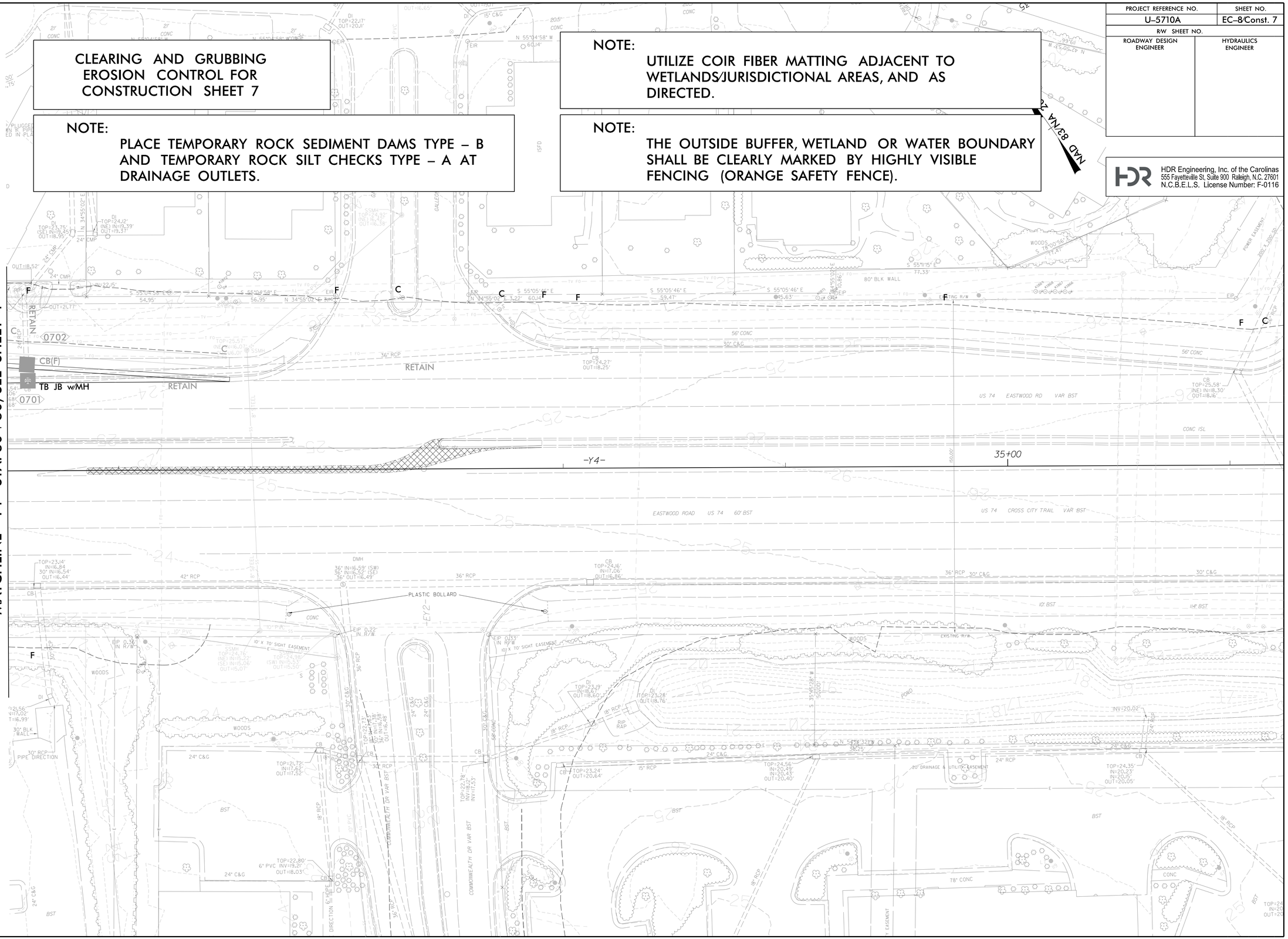
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 7

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

NOTE:
UTILIZE COIR FIBER MATTING ADJACENT TO WETLANDS/JURISDICTIONAL AREAS, AND AS DIRECTED.

NOTE:
THE OUTSIDE BUFFER, WETLAND OR WATER BOUNDARY SHALL BE CLEARLY MARKED BY HIGHLY VISIBLE FENCING (ORANGE SAFETY FENCE).

NAD 83/NA 2



REVISIONS

ROW REV. – JUNE 19, 2019 – ADDITION OF PARCEL 18 (PUE AND DUE). ADDITION OF PARCEL 19 (ROW, DUE AND TCE). CEH.
ROW REV. – AUGUST 16, 2019 – REMOVED TEMPORARY CONSTRUCTION EASEMENT (TCE) FROM PARCELS 19 & 20. CEH.

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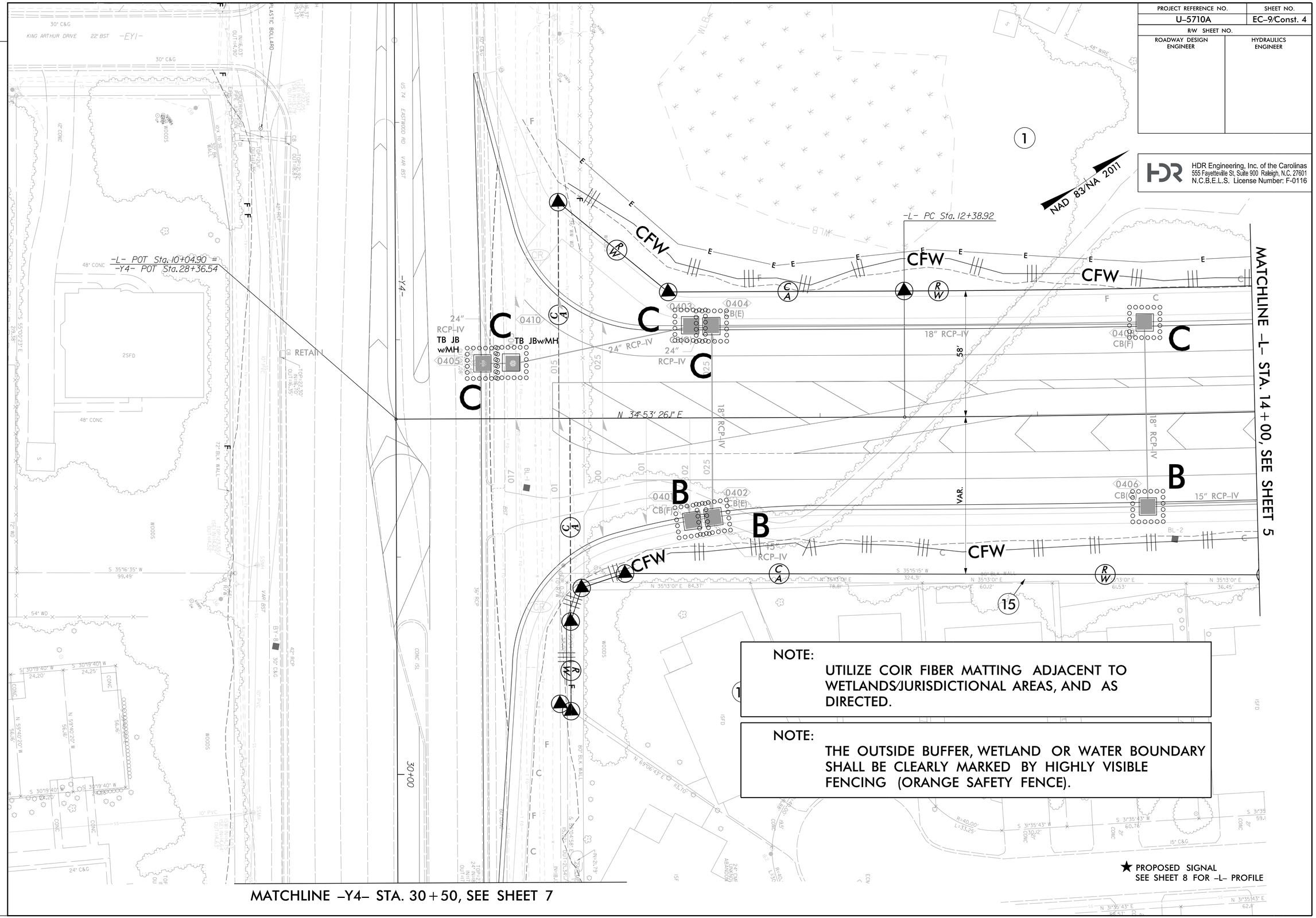
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-9/Const. 4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116



NOTE:
UTILIZE COIR FIBER MATTING ADJACENT TO WETLANDS/JURISDICTIONAL AREAS, AND AS DIRECTED.

NOTE:
THE OUTSIDE BUFFER, WETLAND OR WATER BOUNDARY SHALL BE CLEARLY MARKED BY HIGHLY VISIBLE FENCING (ORANGE SAFETY FENCE).

REVISIONS

ROW REV. - JUNE 19, 2019 - ADDITION OF PARCEL 16 (ROW AND TCE). ADDITION OF PARCEL 17 (PUE AND TCE). ADDED PUE AND TCE TO PARCEL 1. CEH.
ROW REV. - AUGUST 16, 2019 - REMOVED TEMPORARY CONSTRUCTION EASEMENT (TCE) FROM PARCELS 16 & 17. TCE REDUCED ON PARCEL 1. ADDED PARCEL 15A FOR EASTPORT HOA. CEH.

PLOT DRIVER: NCDOT_pdf_color_eng.100.plt PENTABLE: NCDOT_EC_FINAL_BW.tbl
USER: DWAGNER DATE: 12/8/2021 TIME: 3:41:31 PM
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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-10/Const. 5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

DETAIL A
4' BASE TAIL DITCH
(Not to Scale)

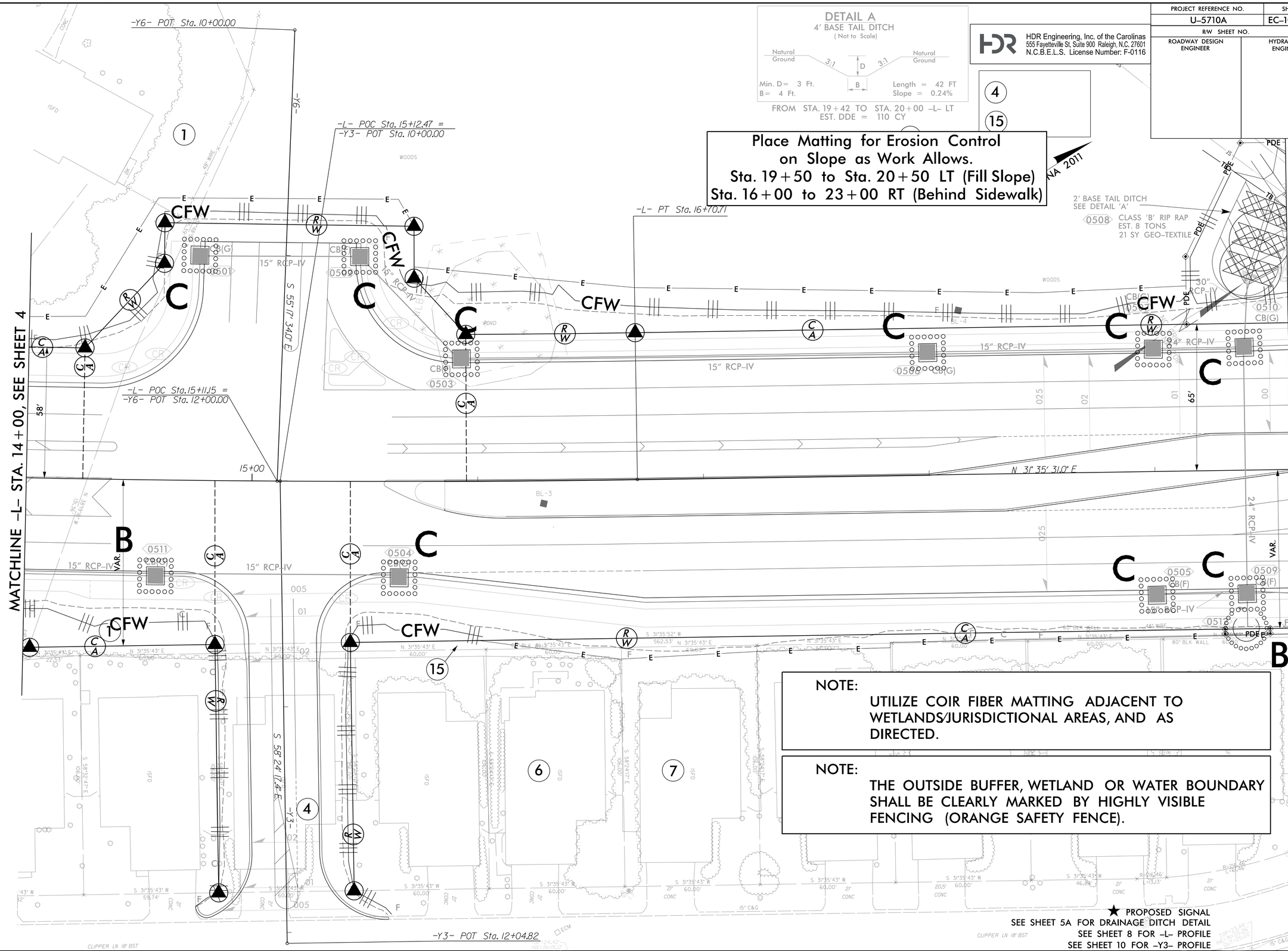
Natural Ground — 3:1 — D — 3:1 — Natural Ground
B

Min. D = 3 Ft.
B = 4 Ft.

Length = 42 FT
Slope = 0.24%

FROM STA. 19+42 TO STA. 20+00 -L- LT
EST. DDE = 110 CY

Place Matting for Erosion Control on Slope as Work Allows.
Sta. 19+50 to Sta. 20+50 LT (Fill Slope)
Sta. 16+00 to 23+00 RT (Behind Sidewalk)



NOTE:
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NOTE:
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★ PROPOSED SIGNAL
SEE SHEET 5A FOR DRAINAGE DITCH DETAIL
SEE SHEET 8 FOR -L- PROFILE
SEE SHEET 10 FOR -Y3- PROFILE

REVISIONS
ROW REV. - JUNE 19, 2019 - ADDED TCE TO PARCELS 1 & 2. ADDITIONAL PDE AND TWEAKED ROW ON PARCEL 2. REDUCED TCE ON PARCELS 6, 7, 8 AND 9. CEH.
ROW REV. - AUGUST 16, 2019 - PARCEL 2 RE-NUMBERED TO PARCEL 1. ADDED RIGHT OF WAY AND TCE AROUND CENTERPOINT STUBOUT ON PARCEL 1. REMOVED TCE ON PARCELS 3 & 5 ELIMINATING CLAIMS. PARCEL 15A ADDED FOR EASTPORT HOA. CEH.

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_EC_FINAL BW.tbl
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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-11/Const. 6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
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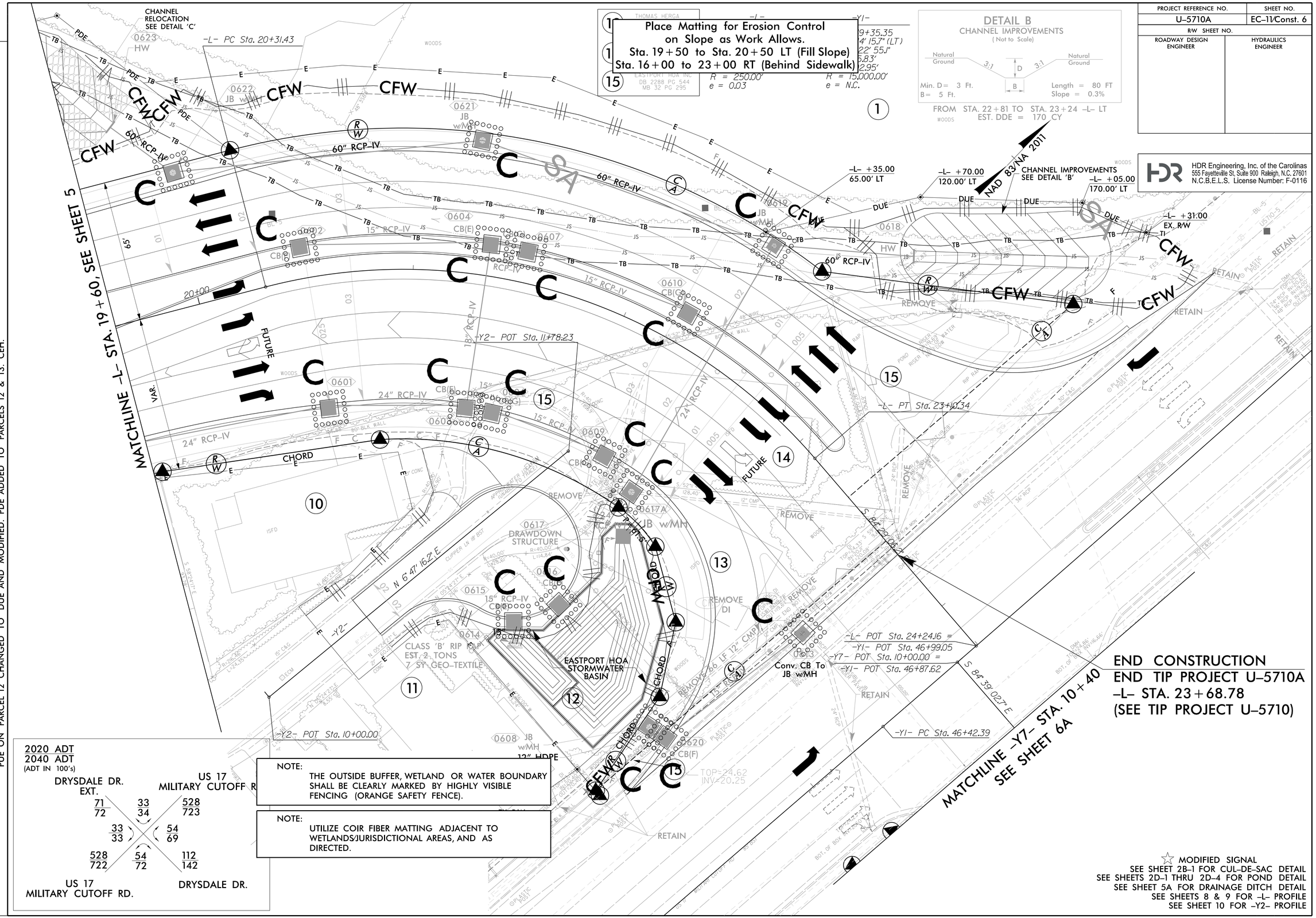
N.C.B.E.L.S. License Number: F-0116



REVISIONS

ROW REV. - MAY 28, 2019 - PUE ADDED TO PARCEL 12. CEH
ROW REV. - JUNE 19, 2019 - REVISED PDE AND ADDED TCE TO PARCEL 2. REVISED TCE TO STAY OFF OF HOUSE ON PARCEL 10. CEH.
ROW REV. - AUGUST 16, 2019 - PARCEL 2 RE-NUMBERD TO PARCEL 1. ROW ADDED TO PARCEL 11. ROW ADJUSTED AND REDUCED ON PARCELS 12 & 13.
PUE ON PARCEL 12 CHANGED TO DUE AND MODIFIED. PDE ADDED TO PARCELS 12 & 13. CEH.

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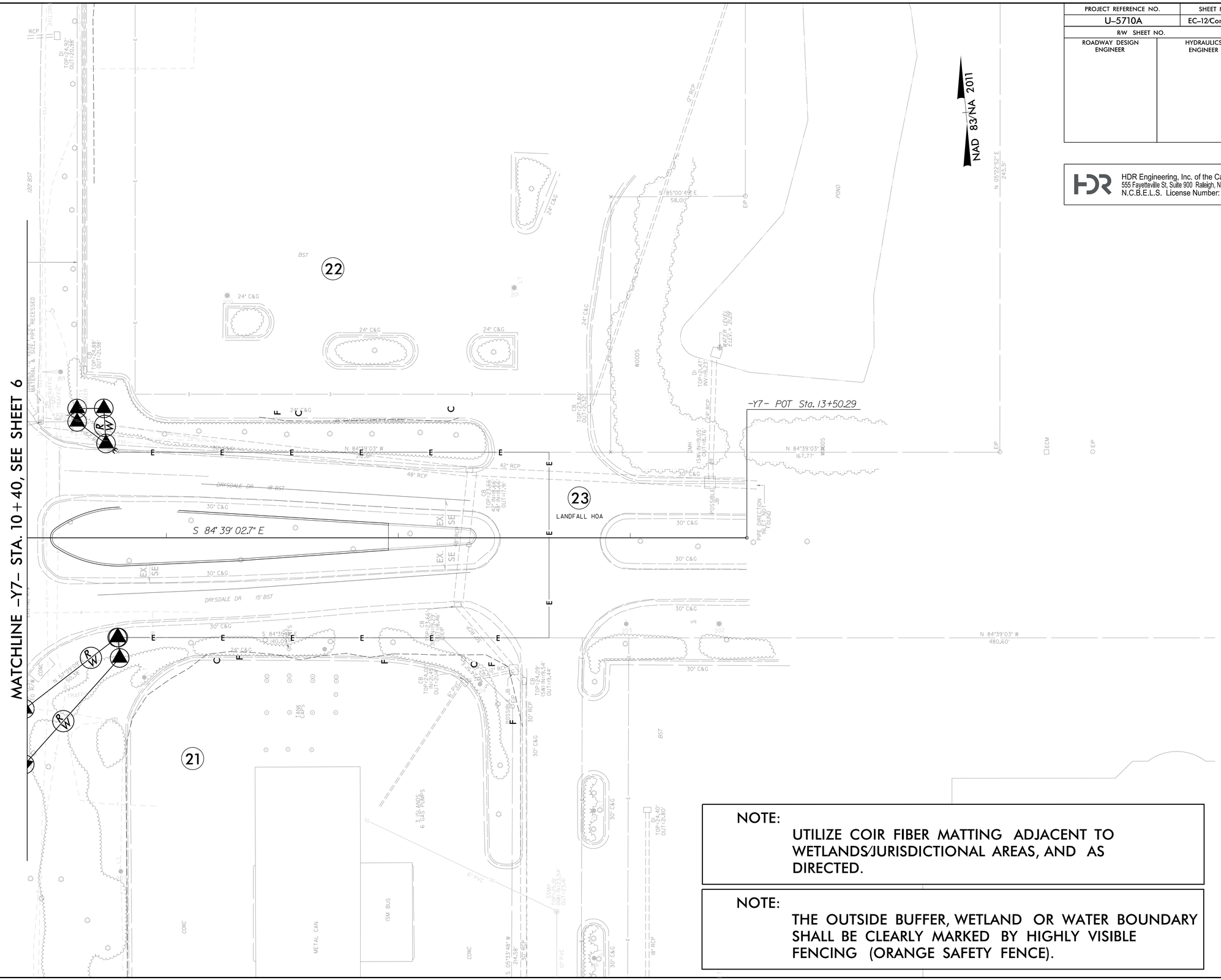
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-12/Const. 6A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116



NOTE:

UTILIZE COIR FIBER MATTING ADJACENT TO WETLANDS/JURISDICTIONAL AREAS, AND AS DIRECTED.

NOTE:

THE OUTSIDE BUFFER, WETLAND OR WATER BOUNDARY SHALL BE CLEARLY MARKED BY HIGHLY VISIBLE FENCING (ORANGE SAFETY FENCE).

REVISIONS

PLOT DRIVER: NCDOT_pdf_color_eng_100.plt PENTABLE: NCDOT_EC_FINAL_BW.tbl
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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	EC-13/Const. 7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

NOTE:
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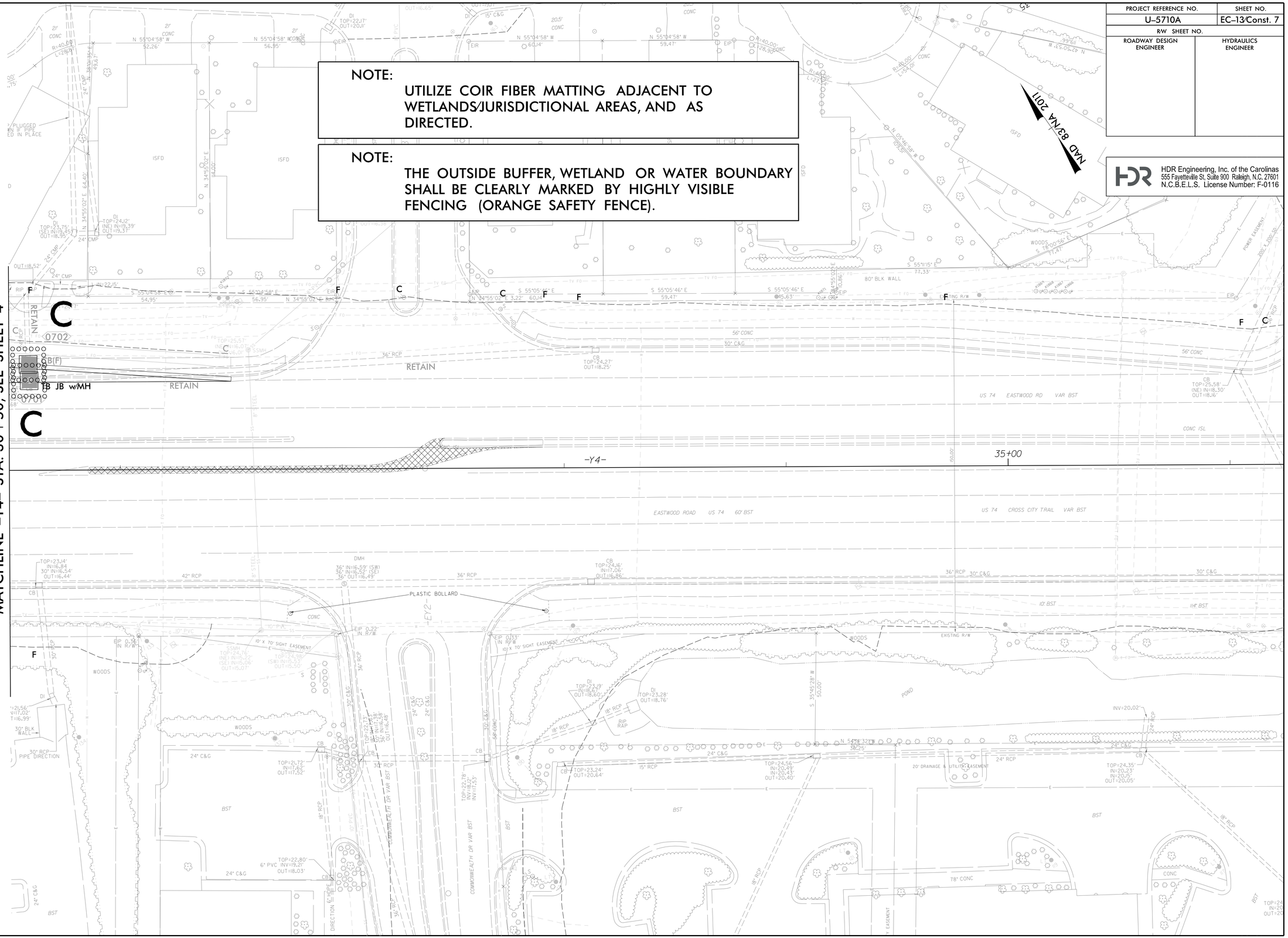

REVISIONS

ROW REV. - JUNE 19, 2019 - ADDITION OF PARCEL 18 (PUE AND DUE). ADDITION OF PARCEL 19 (ROW, DUE AND TCE). ADDITION OF PARCEL 20 (ROW, PUE AND TCE). CEH.
ROW REV. - AUGUST 16, 2019 - REMOVED TEMPORARY CONSTRUCTION EASEMENT (TCE) FROM PARCELS 19 & 20. CEH.

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DocuSign Envelope ID: 118AB4BB-E8A9-4EEC-AEA2-35C83A5BE43E

TIP PROJECT: U-5710A

CONTRACT: DC00277

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	SIGN-1

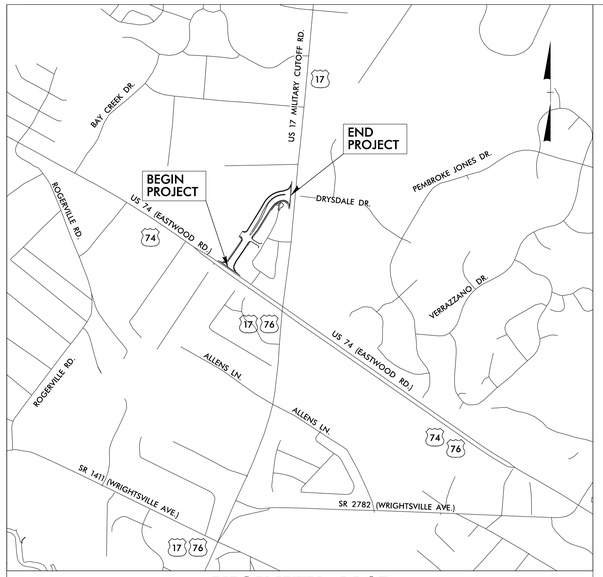
SIGNING ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING
Ron King 12/8/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

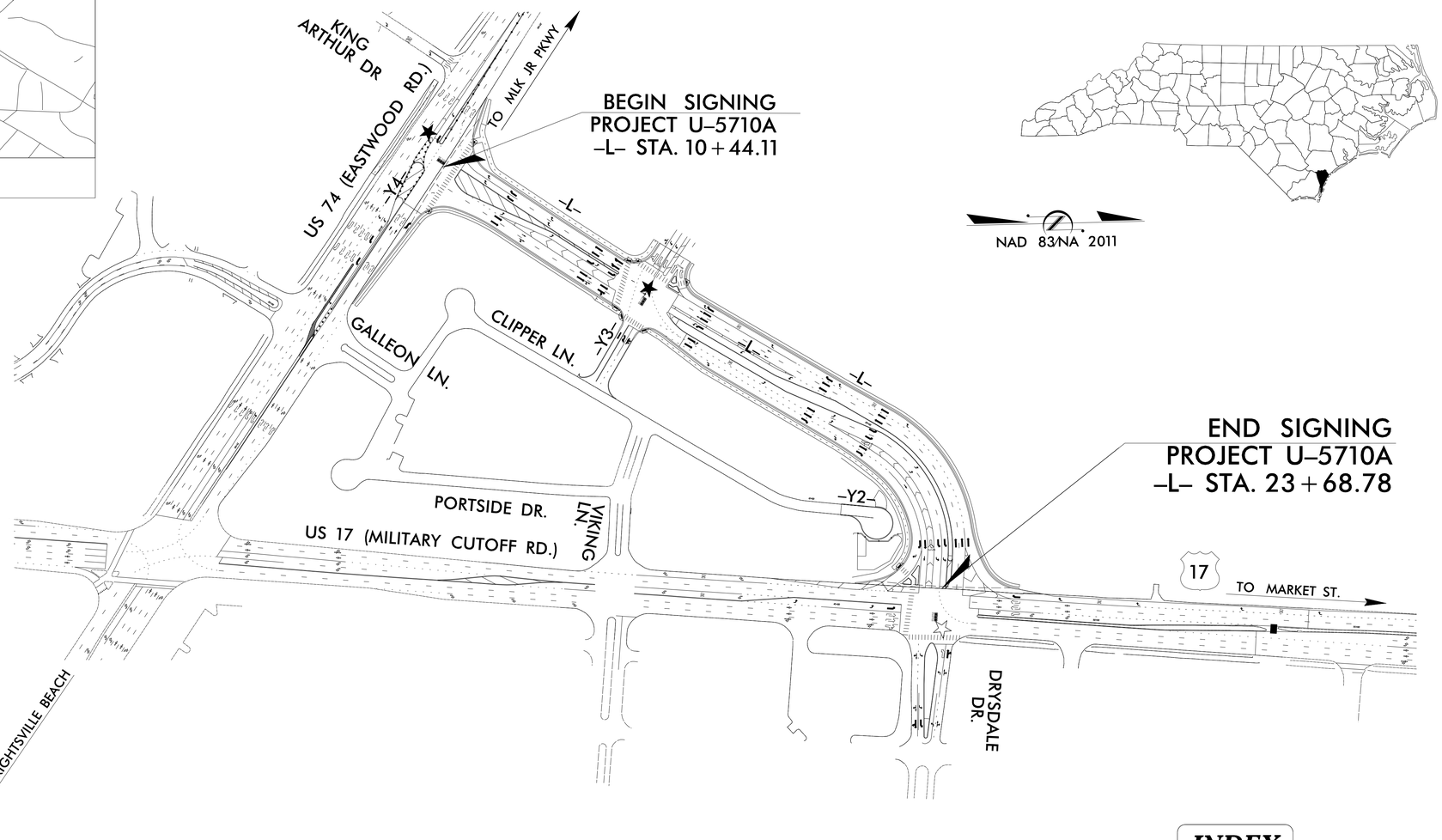
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

SIGNING PLAN
NEW HANOVER COUNTY

NEW LOCATION NORTHWESTERN QUADRANT CONNECTION BETWEEN US 74 (EASTWOOD RD.) AND US 17 (MILITARY CUTOFF RD.)



VICINITY MAP
(NOT TO SCALE)



NAD 83/NA 2011

☆ MODIFIED TRAFFIC SIGNAL
★ PROPOSED TRAFFIC SIGNAL

PLAN SUBMITTED TO: N.C.D.O.T. SIGNING & DELINEATION UNIT

AYMAN ALQUDWAH, P.E. SIGNING & DELINEATION REGIONAL ENGINEER
MATT TRACEY, P.E. SIGNING & DELINEATION PROJECT DESIGN ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY: HDR Engineering, Inc. of the Carolinas

RON KING, PE PROJECT ENGINEER
RICHARD DRAYTON TRAFFIC DESIGN ENGINEER

INDEX

SHEET NO.	DESCRIPTION
SIGN-1	TITLE SHEET
SIGN-2	NOTES
SIGN-2A	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS (RSD SHEET 1 OF 2)
SIGN-3	"E" & "F" SIGNS
SIGN-4 & 5	SIGN DETAIL SHEETS

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TIP NO.	SHEET NO.
U-5710A	SIGN-2

APPROVED: Ron King

DATE: 12/8/2021

SEAL

SIGNING ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

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HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - 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
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS (SHEET 2 OF 2)

GENERAL NOTES

. SIGNS FURNISHED BY CONTRACTOR

. CONFIRM IN WRITING AT LEAST 4 MONTHS IN ADVANCE, THE ACTUAL DATE THE DEPARTMENT FURNISHED SIGNS WILL BE REQUIRED.

. IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.

. WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER

. ALL EXISTING SIGNS ON "U" POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.

. WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.

. THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.

SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	355	L.F.
4025000000	901	CONTRACTOR FURNISHED, TYPE E SIGN	111	S.F.
4025000000	901	CONTRACTOR FURNISHED, TYPE F SIGN	37	S.F.
4102000000	904	SIGN ERECTION, TYPE E	17	EA.
4108000000	904	SIGN ERECTION, TYPE F	4	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	1	EA.
4360000000-N	SP	VERTICAL PANEL TYPE 3 OBJECT MARKER-OM3-L	2	EA.

PROJECT NOTES

1. DISPOSAL OF SIGN SYSTEM, U-CHANNEL

NOTES

DocuSign Envelope ID: 118AB4BB-E8A9-4EEC-AEA2-35C83A5BE43E

TIP NO.	SHEET NO.
U-5710A	SIGN-2A

APPROVED: Matthew V. Springer (DocuSigned by: 5F5B2E0C3184403...)

DATE: 6/23/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 042546 ENGINEER MATTHEW V. SPRINGER

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

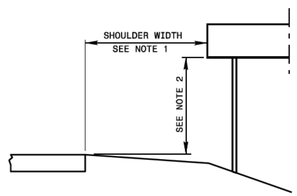
6-21

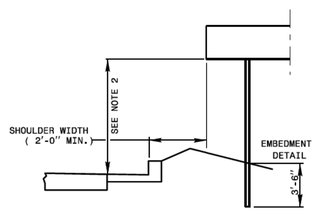
ENGLISH DETAIL DRAWING FOR

MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS

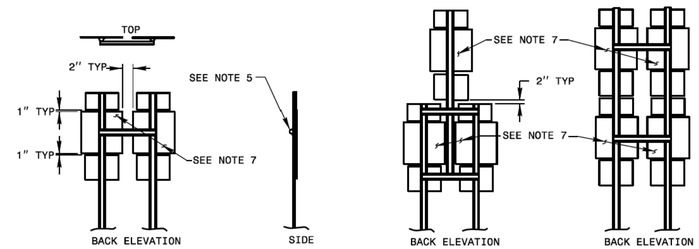
SHEET 1 OF 2

904D50

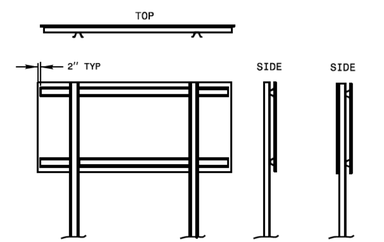




HORIZONTAL AND VERTICAL CLEARANCES



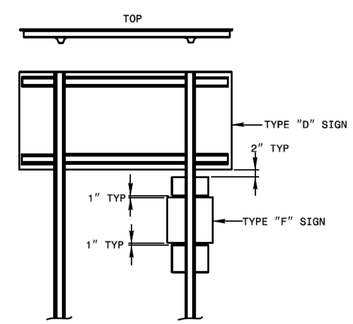
FRAMING AND CROSS-BRACING DETAILS
TYPE "F" SIGNS



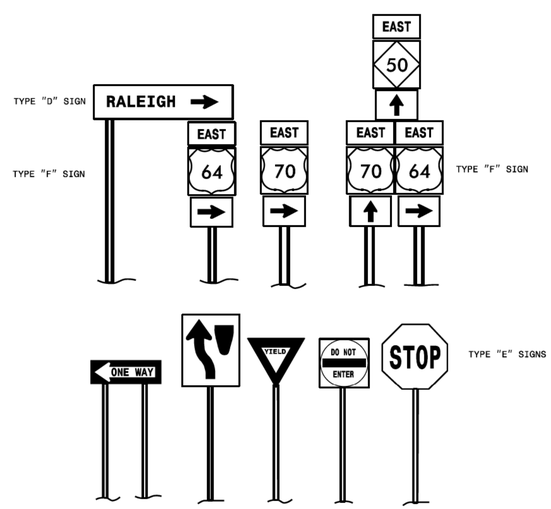
TYPE "D" & "E" SIGN CROSS BRACING

BACK-TO-BACK MOUNT

FRAMING AND CROSS BRACE DETAILS
FOR COMBINATION TYPE "D" & "E" SIGNS
WIDE SIDE OF CROSS BRACE GOES TO BACK OF SIGN



FRAMING AND CROSS BRACE DETAILS
FOR COMBINATION TYPE "D" & "F" SIGNS
WIDE SIDE OF FLANGE TO BACK OF "F" SIGN



TYPICAL SIGN SHAPES AND COMBINATIONS

NOTES:

1. ERECT TYPE "D", "E", AND "F" SIGNS ON FREEWAYS WITH THE NEAR EDGE OF THE SIGN 20 FT. FROM THE TRAVEL LANE. ERECT ALL OTHER "D", "E", AND "F" SIGNS WITH THE NEAR EDGE OF THE SIGN AT THE EDGE OF THE SHOULDER BREAK (6 FT. MINIMUM CLEARANCE, 12 FT. DESIRABLE, FROM THE EDGE OF TRAVEL LANE), OR AS DIMENSIONED ON PLAN SHEETS.
2. ERECT TYPE "D", "E", AND "F" SIGNS WITH THE BOTTOM OF SIGN ASSEMBLY AT LEAST 7 FT. ABOVE THE EDGE OF THE TRAVEL LANE ON ROADS WITH 2 OR MORE LANES IN THE SAME DIRECTION AND AT LEAST 5 FT. ON OTHER ROUTES. THE VERTICAL CLEARANCE IS 7 FT. WHERE REQUIRED FOR PEDESTRIAN TRAFFIC AND/OR PARKED VEHICLES.
3. THE VERTICAL DIMENSION BETWEEN MOUNTING HOLE CENTERS ON ALL TYPES "D", "E", AND "F" SIGNS IS 30" MAXIMUM. THE VERTICAL AND HORIZONTAL DIMENSIONS BETWEEN MOUNTING HOLES IS TO THE WHOLE INCH. EACH SIGN PANEL HAS A MINIMUM OF 2 BOLTS PER SUPPORT.
4. ATTACH SIGN W/ 5/16" HEX HEAD BOLT, NYLON WASHER, SHIM, FLAT WASHER, LOCK WASHER, HEX NUT NO BUCKLING OF THE SIGN WILL BE PERMITTED. SEE ASSEMBLY DETAIL SHEET# 2 OF 904.50.
5. FURNISH AND INSTALL CROSS-BRACING AS SHOWN IN DETAIL. PAINT ENDS OF CROSS BRACES W/ APPROVED. ZINC PAINT
6. INSTALL POST AND CROSS-BRACING WITH THE WIDE SIDE OF THE FLANGE TOWARD THE BACK OF SIGN(S) FOR COMBINATION TYPE "D" AND "F" SIGNS.
7. THE SHIELD HEIGHTS IN THESE ASSEMBLIES CAN NOT BE LARGER THAN 24".
8. IF SIGN ASSEMBLIES REQUIRE MORE THAN TWO U-CHANNEL SUPPORTS, THE SUPPORTS SHALL BE PLACED A MINIMUM OF 4 FT. BETWEEN POSTS. NO MORE THAN TWO POSTS SHALL FALL WITHIN 7 FT. PATH, OR THE SIGN ASSEMBLY MUST BE PLACED BEHIND BARRIER PROTECTION.

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

6-21

ENGLISH DETAIL DRAWING FOR

MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS

SHEET 1 OF 2

904D50

REVISED SIGNING ROADWAY STANDARD DRAWING

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TIP NO.	SHEET NO.
U-5710A	SIGN-3

APPROVED: Ron King
DATE: 12/8/2021

SEAL

SIGNING ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

(401) QUANTITY REQ'D 2

54 X 18
R6-1 (L)

TWO "U" CHANNEL POSTS PER SIGN

(404) QUANTITY REQ'D 2

12 X 36
OM3-L

ONE VERTICAL PANEL POST PER SIGN

(406) QUANTITY REQ'D 4

36 X 36
R3-7R

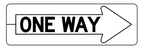
ONE "U" CHANNEL POST PER SIGN

(407) QUANTITY REQ'D 1

30 X 30 X 30
R1-2

ONE "U" CHANNEL POST

(408) QUANTITY REQ'D 1



54 X 18
R6-1 (R)

MOUNT BEHIND SIGN 401
IN 1 INSTALL

(411) QUANTITY REQ'D 1

30 X 30
R1-1

ONE "U" CHANNEL POST

(412) QUANTITY REQ'D 1

30 X 36
R3-5R

MOUNT BELOW SIGN 411
IN 1 INSTALLATION

(413) QUANTITY REQ'D 1

36 X 36
R3-4

MOUNT ON SIGNAL MAST
ARM FACING WB US 74
LEFT TURN TRAFFIC ONTO
CAVALIER DR IN 1 INSTALLATION

(414) QUANTITY REQ'D 2

36 X 36
W11-2

FLUORESCENT YELLOW

ONE "U" CHANNEL POST PER SIGN

(415) QUANTITY REQ'D 2

24 X 12
W16-7P

FLUORESCENT YELLOW

MOUNT BELOW SIGN 414
IN 2 INSTALLATIONS

(501)

2-24" X 12"
2-24" X 24"
2-21" X 15"

TWO "U" CHANNEL POSTS

(503)

1-21" X 15"
1-24" X 24"

ONE "U" CHANNEL POST

(504)

1-24" X 12"
1-24" X 24"
1-21" X 15"

ONE "U" CHANNEL POST

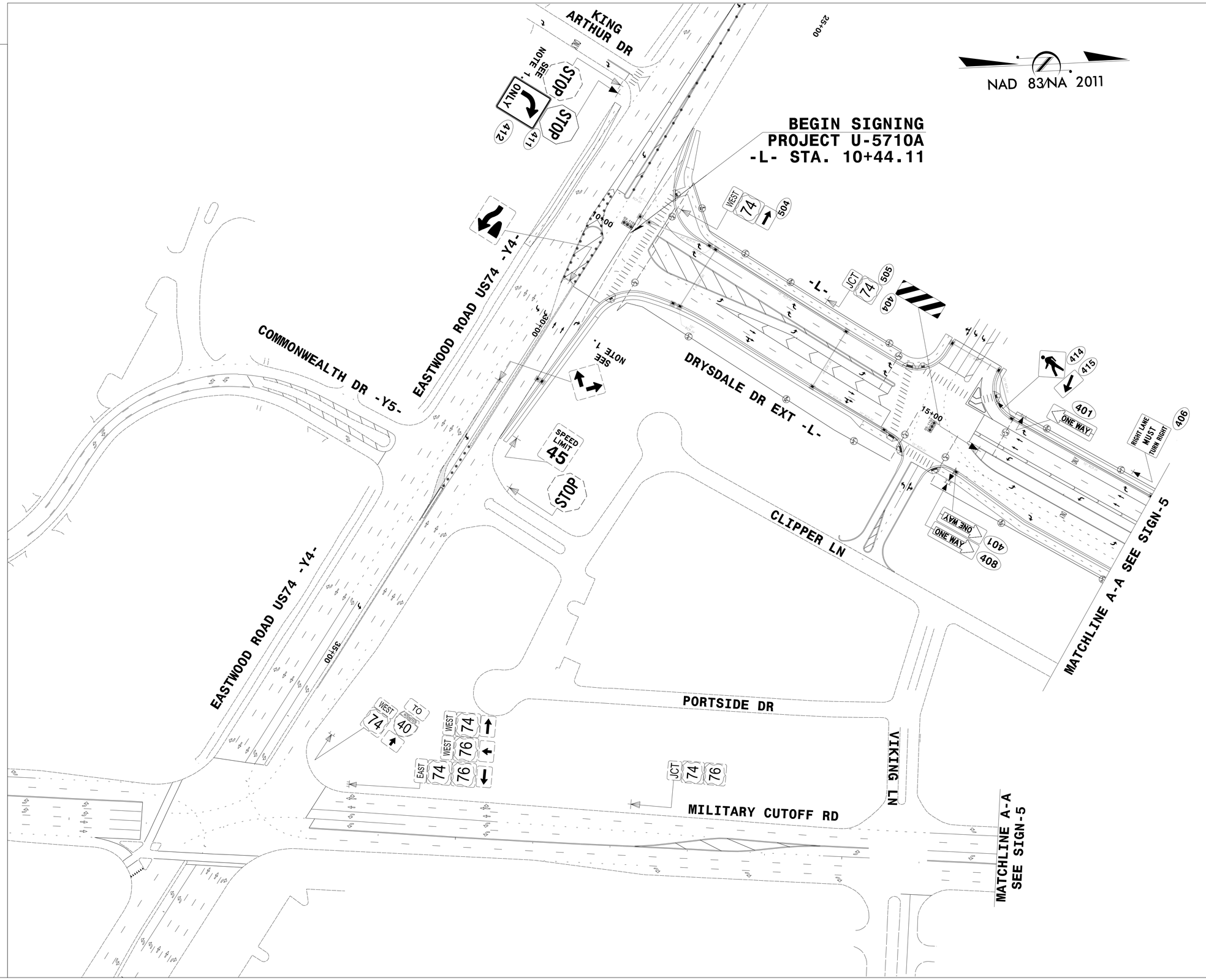
(505)

1-21" X 15"
1-24" X 24"

ONE "U" CHANNEL POST

TYPE "E" & "F" SIGNS

DocuSign Envelope ID: 118AB4BB-E8A9-4EEC-AEA2-35C83A5BE43E



PROJECT REFERENCE NO.	SHEET NO.
U-5710A	SIGN-4

SIGNING ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

Ron King 10/8/2021

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HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	SIGN-5

SIGNING ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 022959 ENGINEER RONALD W. KING

Ron King 12/8/2021

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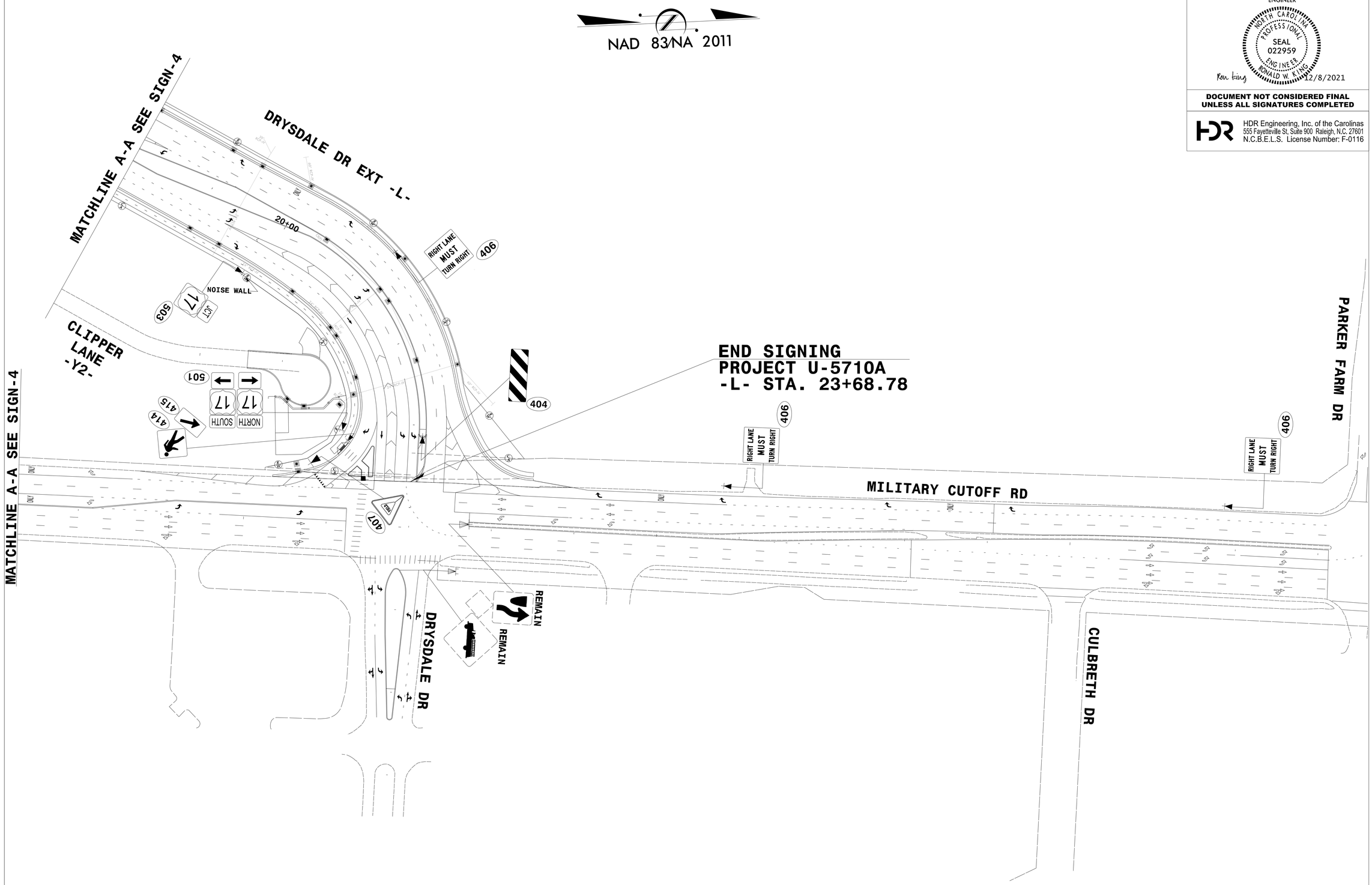

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TIP PROJECT: U-5701A

CONTRACT: DC00277

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-1.0

DocuSigned by:
APPROVED: William J. Hamilton
A0560D704648484...
DATE: 11/08/2021

NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

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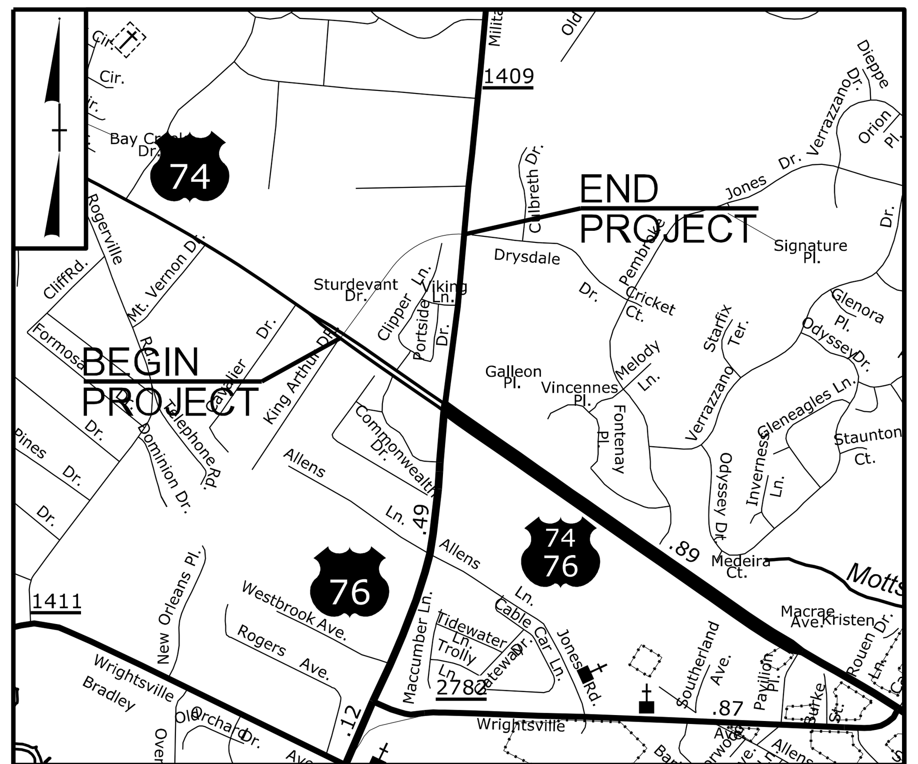
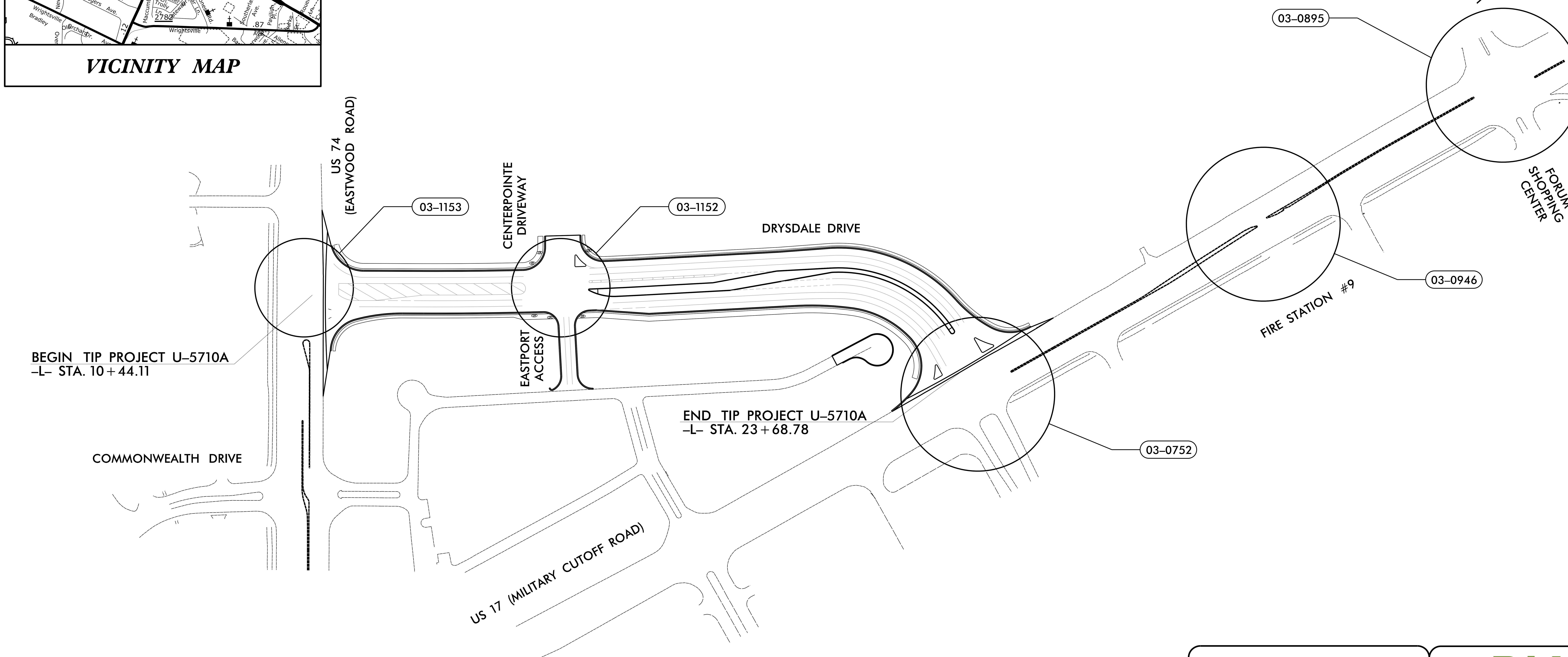


VICINITY MAP

LOCATION: NEW LOCATION NORTHWESTERN QUADRANT CONNECTION BETWEEN US 74 (EASTWOOD RD.) AND US 17 (MILITARY CUTOFF RD.)

TYPE OF WORK: TRAFFIC SIGNAL AND COMMUNICATION DESIGN



Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.

RAMEY KEMP ASSOCIATES
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Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

PLANS PREPARED BY:

W. Jason Hamilton, P.E., PTOE – Project Manager

Alicia D. Andrews, E.I. – Project Engineer

INDEX OF PLANS

Sheet Number	SIN	Location/ Description
Sig. 1.0	–	Title Sheet
Sig. 2.0–2.9	03–0752	US 17 (Military Cutoff Road) at Drysdale Drive
Sig. 3.0–3.4	03–1153	US 74 (Eastwood Road) at Drysdale Drive
Sig. 4.0–4.7	03–1152	Drysdale Drive at Centerpointe/Eastport Access
Sig. 5.0–5.2	03–0946	US 17 (Military Cutoff Road) at Wilmington Fire Station #19
Sig. 6.0–6.1	03–0895	US 17 (Military Cutoff Road) at Forum Shopping Center/Parker Farm Drive
Sig. 7.0–Sig. M8	–	Signal Standard Drawings
SCP 1–6	–	Cable Routing and Splice Details

LEGEND

##–#### SIGNAL INVENTORY NUMBER

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

Contacts:

Zachary Little, P.E. – Eastern Region Signals Engineer

D. Todd Joyce, P.E. – Signal Equipment Design Review Engineer

Neil Avery – ITS Engineer

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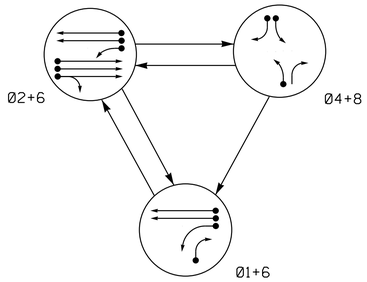
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-2.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

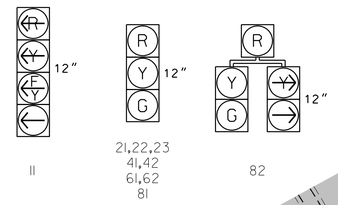
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 0 1 + 6	PHASE 0 2 + 6	PHASE 0 4 + 8	FLASH
11	←	F Y	R	Y
21,22,23	R	G	R	Y
41,42	R	R	G	R
61,62	G	G	R	Y
81	R	R	G	R
82	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



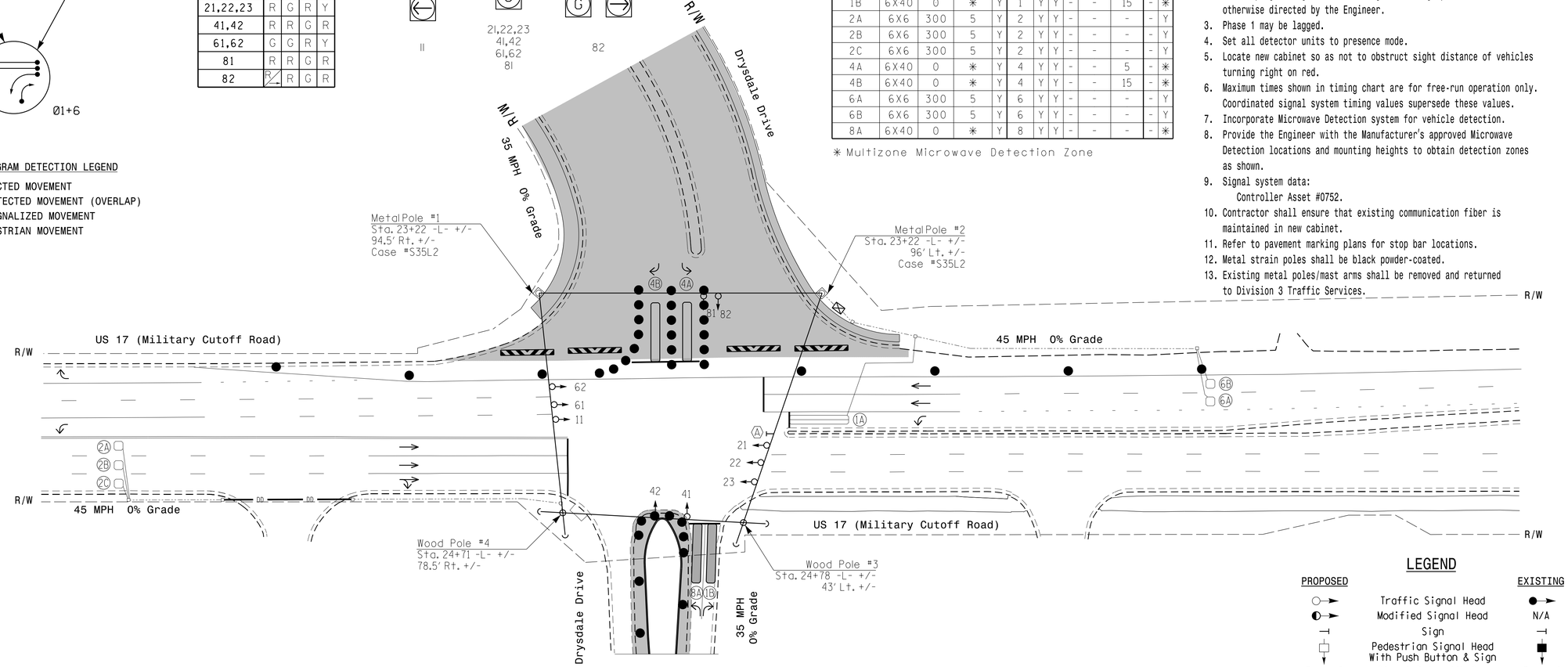
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP/ ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	10	-	Y
					6	Y	Y	Y	-	3	—	Y
1B	6X40	0	*	Y	1	Y	Y	-	-	15	-	*
2A	6X6	300	5	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	300	5	Y	2	Y	Y	-	-	-	-	Y
2C	6X6	300	5	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	*	Y	4	Y	Y	-	-	5	-	*
4B	6X40	0	*	Y	4	Y	Y	-	-	15	-	*
6A	6X6	300	5	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	300	5	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	*	Y	8	Y	Y	-	-	-	-	*

* Multizone Microwave Detection Zone

3 Phase Fully Actuated (Wilmington Signal System)

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018, "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. Incorporate Microwave Detection system for vehicle detection.
8. Provide the Engineer with the Manufacturer's approved Microwave Detection locations and mounting heights to obtain detection zones as shown.
9. Signal system data:
   Controller Asset #0752.
10. Contractor shall ensure that existing communication fiber is maintained in new cabinet.
11. Refer to pavement marking plans for stop bar locations.
12. Metal strain poles shall be black powder-coated.
13. Existing metal poles/mast arms shall be removed and returned to Division 3 Traffic Services.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Strain Pole	
	Video Detection Zone	
	No Left Turn Sign (R3-2)	

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	5	12	5	12	5
Extension 1 *	2.0	6.0	2.0	6.0	2.0
Max Green 1 *	15	100	25	100	25
Yellow Clearance	3.0	4.5	3.0	4.5	3.0
Red Clearance	3.6	2.1	2.1	2.1	3.1
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	1.2	-	1.5	-
Max Variable Initial *	-	34	-	34	-
Time Before Reduction *	-	15	-	15	-
Time To Reduce *	-	30	-	30	-
Minimum Gap	-	3.0	-	3.0	-
Recall Mode	-	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	YELLOW	-
Dual Entry	-	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

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

11/8/2021
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User:jWendt

Signal Upgrade - Temporary Design

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Prepared for: Transportation Mobility and Safety Division, Signal Design Section
750 N.Greenfield Pkwy, Garner, NC 27529

US 17 (Military Cutoff Road) at Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO.:	19258 (040)

SCALE 0 40 1"=40'

REVISIONS | INIT. | DATE

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NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton
SIGNATURE 11/08/2021 DATE

SIG. INVENTORY NO. 03-0752T

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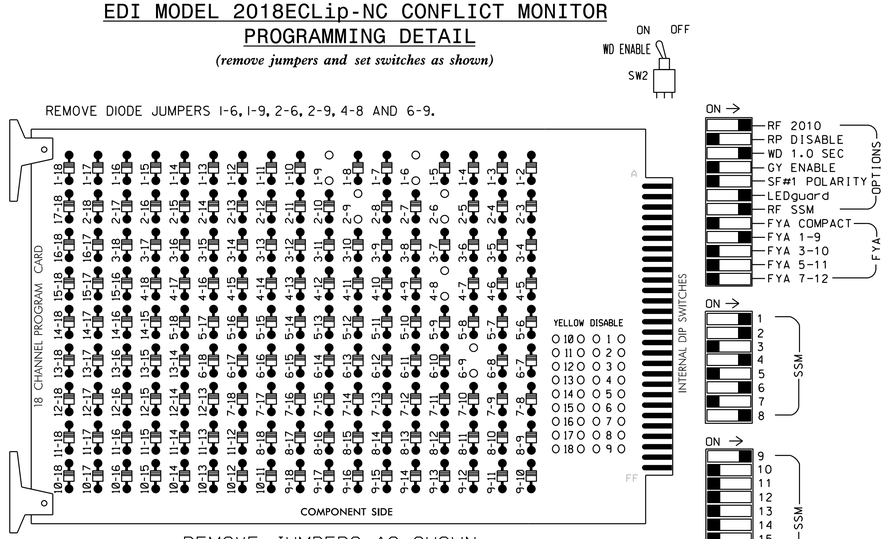
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-2.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

NOTES

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1		2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1		2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	82	21,22, 23	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	11★	NU	NU	NU	NU	NU
RED	✳		128			101			134			107							
YELLOW			129			102			135			108							
GREEN			130			103			136			109							
RED ARROW														A121					
YELLOW ARROW		126												A122					
FLASHING YELLOW ARROW														A123					
GREEN ARROW	127	127																	

NU = Not Used

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

★ See pictorial of head wiring in detail below.

EQUIPMENT INFORMATION

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

INPUT FILE POSITION LAYOUT

(front view)

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

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

⊗ Wired Input - Do not populate slot with detector card

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

For detector zones 1B, 4A, 4B and 8A, install a microwave detection system for vehicle detection. Perform installation according to the manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

INPUT FILE CONNECTION & PROGRAMMING CHART

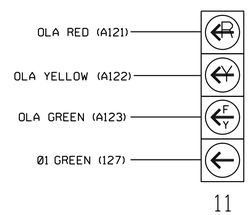
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			10
	-	J4U	48	10	26	6	Y	Y	Y		3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
2C	TB2-9,10	I3U	63	25	32	2	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



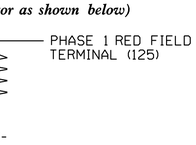
NOTE

1. The sequence display for signal head 11 requires special programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0752T
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail - Temporary Design
Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 (Military Cutoff Road)
at
Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO.:	19258 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton 11/08/2021
SIGNATURE DATE
SIG. INVENTORY NO. 03-0752T

750 N.Greenfield Pkwy,Garner,NC 27529

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Phone: 919-872-0115 | www.rameykemp.com | NC License No. C-0910

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-2.2

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

(program controller as shown below)

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

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

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

                SCROLL DOWN

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

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

PRESS '+'

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

                SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

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

PRESS '+'

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

                SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

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

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0752T
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

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Electrical Detail - Temporary Design
Sheet 2 of 2

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 (Military Cutoff Road)
at
Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE: November 2021		REVIEWED BY:	WJ Hamilton
PREPARED BY: A. Andrews		RKA PROJ. NO.:	19258 (040)

REVISIONS	INIT.	DATE

750 N.Greenfield Pkwy,Garner,NC 27529

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William J. Hamilton
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SIG. INVENTORY NO. 03-0752T

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-2.3

SIGNAL FACE I.D.

All Heads L.E.D.

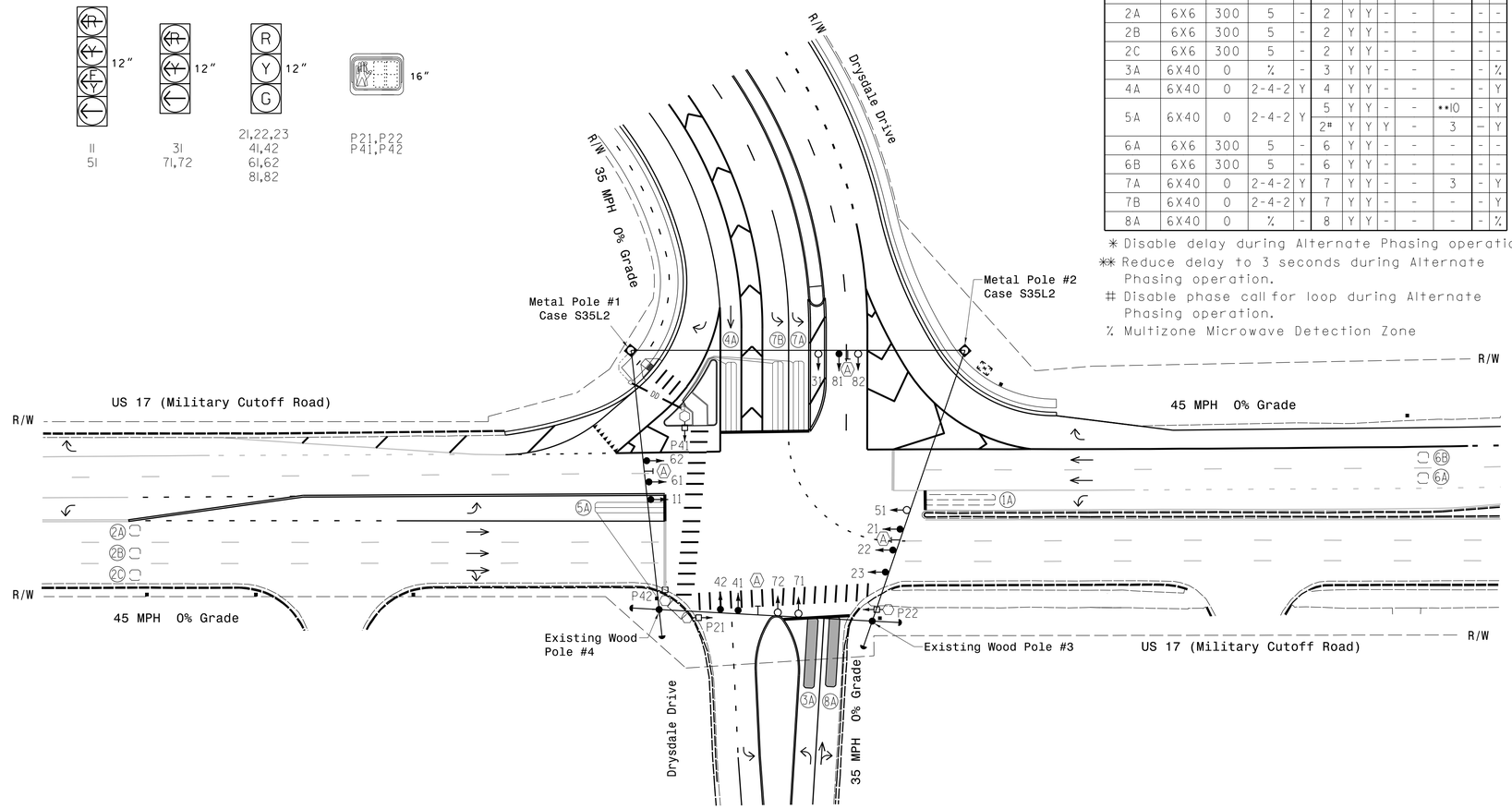
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP/ ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	*10	-	-
					6#	Y	Y	Y	-	3	—	-
2A	6X6	300	5	-	2	Y	Y	-	-	-	-	-
2B	6X6	300	5	-	2	Y	Y	-	-	-	-	-
2C	6X6	300	5	-	2	Y	Y	-	-	-	-	-
3A	6X40	0	%	-	3	Y	Y	-	-	-	-	%
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	**10	-	Y
					2#	Y	Y	Y	-	3	—	Y
6A	6X6	300	5	-	6	Y	Y	-	-	-	-	-
6B	6X6	300	5	-	6	Y	Y	-	-	-	-	-
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	3	-	Y
7B	6X40	0	2-4-2	Y	7	Y	Y	-	-	-	-	Y
8A	6X40	0	%	-	8	Y	Y	-	-	-	-	%

* Disable delay during Alternate Phasing operation.
** Reduce delay to 3 seconds during Alternate Phasing operation.
\# Disable phase call for loop during Alternate Phasing operation.
% Multizone Microwave Detection Zone

8 Phase
Fully Actuated
(Wilmington Signal System)

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018, "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Reposition existing signal heads numbered 41, 42 and 81.
6. Set all detector units to presence mode.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program the pedestrian heads to countdown the flashing "DON'T WALK" time only.
9. The Division Traffic Engineer will determine the hours of use for each phasing plan.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Relabel existing loops 8A as 3A and 1B as 8A.
12. Incorporate Microwave Detection system for vehicle detection.
13. Provide the Engineer with the Manufacturer's approved Microwave Detection locations and mounting heights to obtain detection zones as shown.
14. Signal system data:
    Controller Asset #0752.
15. Refer to pavement marking plans for stop bar and crosswalk locations.
16. Type II pedestals shall be black powder-coated.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	"Shark's Teeth" Yieldbar	
	Metal Strain Pole	
	Type II Signal Pedestal	
	Microwave Detection Zone	
	Street Name Sign	

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	5	12	5	5	5	12	5	5
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	15	100	25	25	15	100	25	25
Yellow Clearance	3.0	4.5	3.0	3.8	3.0	4.5	3.0	3.8
Red Clearance	3.6	2.1	3.1	2.0	3.3	2.1	3.3	1.9
Walk 1 *	-	7	-	7	-	-	-	-
Don't Walk 1	-	27	-	27	-	-	-	-
Seconds Per Actuation *	-	1.2	-	-	-	1.5	-	-
Max Variable Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

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

Signal Upgrade - Final Design
Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: Transportation Mobility and Safety Division, Signal Design Section, 750 N.Greenfield Pkwy,Garner,NC 27529

US 17 (Military Cutoff Road) at Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO.:	19258 (040)

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton — SIGNATURE — 11/08/2021 DATE

SIG. INVENTORY NO. 03-0752

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11/8/2021
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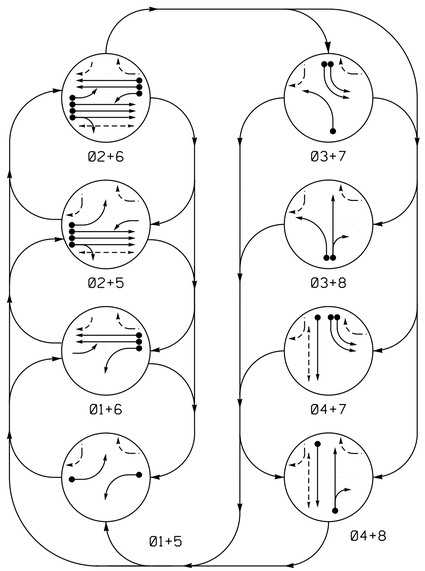
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-2.4

DEFAULT PHASING DIAGRAM



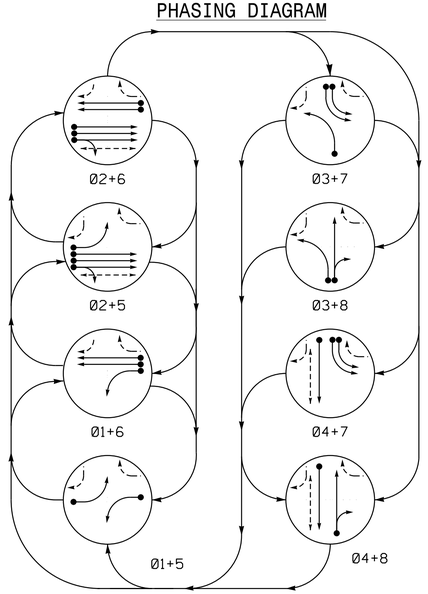
PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
11	←—	←—	F Y	F Y	←R	←R	←R	←R	←Y
21,22,23	R	R	G	G	R	R	R	R	Y
31	←R	←R	←R	←R	←—	←—	←R	←R	←R
41,42	R	R	R	R	R	R	G	G	R
51	←—	F Y	←—	F Y	←R	←R	←R	←R	←Y
61,62	R	G	R	G	R	R	R	R	Y
71,72	←R	←R	←R	←R	←—	←R	←—	←R	←R
81,82	R	R	R	R	R	G	R	G	R
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P41,P42	DW	DW	DW	DW	DW	DW	W	W	DRK

ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
11	←—	←—	←R	←R	←R	←R	←R	←R	←Y
21,22,23	R	R	G	G	R	R	R	R	Y
31	←R	←R	←R	←R	←—	←—	←R	←R	←R
41,42	R	R	R	R	R	R	G	G	R
51	←—	←R	←—	←R	←R	←R	←R	←R	←Y
61,62	R	G	R	G	R	R	R	R	Y
71,72	←R	←R	←R	←R	←—	←R	←—	←R	←R
81,82	R	R	R	R	R	G	R	G	R
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P41,P42	DW	DW	DW	DW	DW	DW	W	W	DRK

8 Phase Fully Actuated (Wilmington Signal System)

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018, "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Reposition existing signal heads numbered 41, 42 and 81.
6. Set all detector units to presence mode.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program the pedestrian heads to countdown the flashing "DON'T WALK" time only.
9. The Division Traffic Engineer will determine the hours of use for each phasing plan.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Relabel existing loops 8A as 3A and 1B as 8A.
12. Incorporate Microwave Detection system for vehicle detection.
13. Provide the Engineer with the Manufacturer's approved Microwave Detection locations and mounting heights to obtain detection zones as shown.
14. Signal system data:
    Controller Asset #0752.
15. Refer to pavement marking plans for stop bar and crosswalk locations.
16. Type II pedestals shall be black powder-coated.

Signal Upgrade - Final Design
Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: Transportation Mobility and Safety Division, Signal Design Section, Department of Transportation, State of North Carolina
750 N.Greenfield Pkwy,Garner,NC 27529

US 17 (Military Cutoff Road) at Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO.:	19258 (040)

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton 11/08/2021
SIGNATURE DATE

SIG. INVENTORY NO. 03-0752

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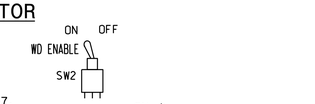
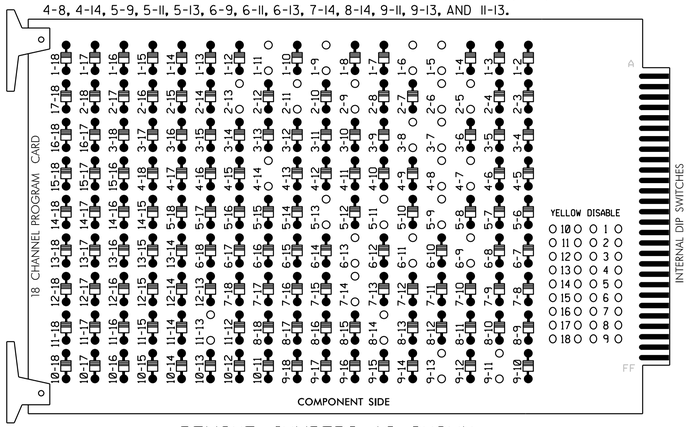
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-2.5

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

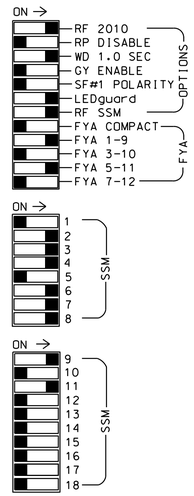
(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS I-5, I-6, I-9, I-11, 2-5, 2-6, 2-9, 2-11, 2-13, 3-7, 3-8, 4-7, 4-8, 4-14, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 7-14, 8-14, 9-11, 9-13, AND 11-13.



REMOVE JUMPERS AS SHOWN



■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø2 2A	Ø2 2C	WIRED INPUT ⊗	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	Ø2 2B	NOT USED			NOT USED						Ø4 PED DC ISOLATOR		ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A	SLOT EMPTY	WIRED INPUT ⊗	Ø7 7A	Ø7 7B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø6 6B			NOT USED	NOT USED								

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

⊗ Wired Input - Do not populate slot with detector card

FS = FLASH SENSE
ST = STOP TIME

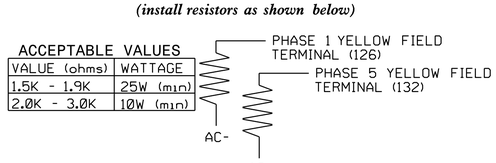
SPECIAL DETECTOR NOTE

For detector zones 3A and 8A, install a microwave detection system for vehicle detection. Perform installation according to the manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Startup In Green.
5. Program phase 2 and 4 for Startup Ped Call.
6. Program phases 2 and 6 for Yellow Flash and overlap 1 as Wag Overlaps.
7. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S10,S11, AUX S1,AUX S4
PHASES USED.....1,2,2PED,3,4,4PED,5,6,7,8
OVERLAP "A".....1+2
OVERLAP "B".....NOT USED
OVERLAP "C".....5+6
OVERLAP "D".....NOT USED

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			10
	-	J4U	48	10 ★	26	6	Y	Y	Y		3
	-	I1U	56	18 ★	51	1	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
2C	TB2-9,10	I3U	63	25	32	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y			10
	-	I4U	47	9 ★	22	2	Y	Y	Y		3
	-	J1U	55	17 ★	55	5	Y	Y			3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			3
7B	TB5-9,10	J6U	42	4	8	7	Y	Y			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOT I12.

[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from J1-W to I4-W, on rear of input file.
★ See Input Page Assignment programming details on sheets 3 and 4.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22, 23	P21, P22	31	41,42	P41, P42	51★	61,62	NU	71,72	81,82	NU	11★	NU	NU	51★	NU	NU
RED		128			101			134			107							
YELLOW	✳	129			102		✳	135			108							
GREEN		130			103			136			109							
RED ARROW				116						122			A121			A114		
YELLOW ARROW				117						123			A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127			118			133			124								
✋			113			104												
🚶			115			106												

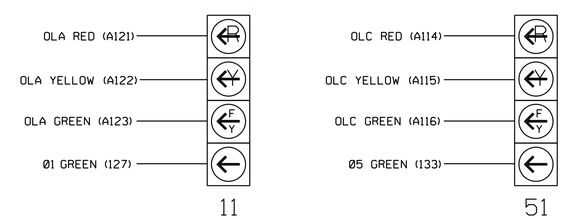
NU = Not Used
✳ Denotes install load resistor. See load resistor installation detail this sheet.
★ See pictorial of head wiring in detail below.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The sequence display for signal heads 11 and 51 requires special programming. See sheet 2 for programming instructions.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0752
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail - Final Design
Sheet 1 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 (Military Cutoff Road) at Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE: November 2021	REVIEWED BY: WJ Hamilton
PREPARED BY: A. Andrews	RKA PROJ. NO.: 19258 (040)

REVISIONS	INIT.	DATE

SIGNATURE: William J. Hamilton — DATE: 11/08/2021
SIG. INVENTORY NO. 03-0752

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

Traffic Engineering Mobility and Safety Division
Signals Management Section
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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-2.6

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

(program controller as shown below)

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

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

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

                SCROLL DOWN

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

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

PRESS '+'

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

                SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

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

PRESS '+'

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

                SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

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

PRESS '+'

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

                SCROLL DOWN

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

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

PRESS '+'

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

                SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

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

                SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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

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

NOTICE GREEN FLASH

PRESS '+' TWICE

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

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

NOTICE PAGE 2

```
 PAGE 2: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          ¦123456789101112131415 16
VEH OVL PARENTS: ¦X
VEH OVL NOT VEH: ¦
VEH OVL NOT PED: ¦
VEH OVL GRN EXT: ¦
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

PRESS '+' TWICE

NOTICE PAGE 2

```
 PAGE 2: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          ¦123456789101112131415 16
VEH OVL PARENTS: ¦    X
VEH OVL NOT VEH: ¦
VEH OVL NOT PED: ¦
VEH OVL GRN EXT: ¦
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0752
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail - Final Design
Sheet 2 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 (Military Cutoff Road) at Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE: November 2021		REVIEWED BY:	WJ Hamilton
PREPARED BY: A. Andrews		RKA PROJ. NO.:	19258 (040)

REVISIONS	INIT.	DATE

750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton 11/08/2021
SIGNATURE DATE

SIG. INVENTORY NO. 03-0752

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-2.7

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 10 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.

```
PAGE: 2 C1 PIN:48  VEHICLE DETECTOR
INPUT ASSIGNMENT #..................10
DEBOUNCE TIME (0-25.5 SEC)..........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................Y
VEHICLE DETECTOR (1-64).............26
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

DEFAULT DETECTOR NUMBER WILL REMAIN UNTIL 'NOT ENABLED' IS ENTERED.

ENTER A 'Y' FOR NOT ENABLED

(LOOP 1A - PHASE 6)

```
PAGE: 2 C1 PIN:48  NOT ENABLED
INPUT ASSIGNMENT #..................10
DEBOUNCE TIME (0-25.5 SEC)..........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................Y
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

PRESS '+' TO ADVANCE TO INPUT 18

```
PAGE: 2 C1 PIN:56  VEHICLE DETECTOR
INPUT ASSIGNMENT #..................18
DEBOUNCE TIME (0-25.5 SEC)..........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................
VEHICLE DETECTOR (1-64).............1
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

ENTER '51' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT

(LOOP 1A - PHASE 1)

```
PAGE: 2 C1 PIN:56  VEHICLE DETECTOR
INPUT ASSIGNMENT #..................18
DEBOUNCE TIME (0-25.5 SEC)..........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................
VEHICLE DETECTOR (1-64).............51
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

PROGRAMMING COMPLETE

SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.

```
VEHICLE DETECTOR #51  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................N
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#            ¦12345678910111213141516
PHASES ASSIGNED ¦
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)...............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%)..............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

ENTER 'Y' FOR ENABLE DETECTOR

ENTER '1' FOR PHASES ASSIGNED

ENSURE DELAY IS '0'

```
VEHICLE DETECTOR #51  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#            ¦12345678910111213141516
PHASES ASSIGNED ¦X
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)...............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%)..............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0752
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail - Final Design
Sheet 3 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 (Military Cutoff Road)
at
Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO:	19258 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton
A6B6D0A4A4A4A8...
SIGNATURE 11/08/2021 DATE

SIG. INVENTORY NO. 03-0752

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11/8/2021
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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-2.8

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 10 SECONDS TO 3 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.

```
PAGE: 2 C1 PIN:47  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................9
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC)............0.0
HOLD-OVER TIME (0-25.5 SEC)........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................Y
VEHICLE DETECTOR (1-64)............22
PEDESTRIAN DETECTOR (1-16).........
ALTERNATE PED DETECTOR (1-16)......
PREEMPT (1-10).....................
INVERTED PREEMPT (1-10)............
STOP TIME (Y/N)....................
FLASH SENSE (Y/N)..................
DOOR OPEN (Y/N)....................
MANUAL CONTROL ENABLE (Y/N)........
MANUAL CONTROL ADVANCE (Y/N)       .
SPECIAL FUNCTION ALARM (1-8)       .
TOD HOUR SYCHRONIZATION (0-23)     .
FORCE OFF RING (1-4)              .
HOLD PHASES (1-16)                .
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)     .
CHANGE PHASE CONTROL PAGE (1-4)    .
CHANGE OVERLAP CONTROL PAGE (1-4)  .
CHANGE INPUT PAGE (1-4)           .
CHANGE OUTPUT PAGE (1-4)          .
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

DEFAULT DETECTOR NUMBER WILL REMAIN UNTIL 'NOT ENABLED' IS ENTERED.

ENTER A 'Y' FOR NOT ENABLED →

(LOOP 5A - PHASE 2)

```
PAGE: 2 C1 PIN:47  NOT ENABLED
INPUT ASSIGNMENT #.................9
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC)............0.0
HOLD-OVER TIME (0-25.5 SEC)........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................Y
VEHICLE DETECTOR (1-64)           .
PEDESTRIAN DETECTOR (1-16)        .
ALTERNATE PED DETECTOR (1-16)     .
PREEMPT (1-10)                    .
INVERTED PREEMPT (1-10)           .
STOP TIME (Y/N)                   .
FLASH SENSE (Y/N)                 .
DOOR OPEN (Y/N)                   .
MANUAL CONTROL ENABLE (Y/N)       .
MANUAL CONTROL ADVANCE (Y/N)      .
SPECIAL FUNCTION ALARM (1-8)      .
TOD HOUR SYCHRONIZATION (0-23)    .
FORCE OFF RING (1-4)              .
HOLD PHASES (1-16)                .
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)     .
CHANGE PHASE CONTROL PAGE (1-4)    .
CHANGE OVERLAP CONTROL PAGE (1-4)  .
CHANGE INPUT PAGE (1-4)           .
CHANGE OUTPUT PAGE (1-4)          .
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

PRESS '+' TO ADVANCE TO INPUT 17

```
PAGE: 2 C1 PIN:55  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................17
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC)............0.0
HOLD-OVER TIME (0-25.5 SEC)........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)                 .
VEHICLE DETECTOR (1-64)............5
PEDESTRIAN DETECTOR (1-16)        .
ALTERNATE PED DETECTOR (1-16)     .
PREEMPT (1-10)                    .
INVERTED PREEMPT (1-10)           .
STOP TIME (Y/N)                   .
FLASH SENSE (Y/N)                 .
DOOR OPEN (Y/N)                   .
MANUAL CONTROL ENABLE (Y/N)       .
MANUAL CONTROL ADVANCE (Y/N)      .
SPECIAL FUNCTION ALARM (1-8)      .
TOD HOUR SYCHRONIZATION (0-23)    .
FORCE OFF RING (1-4)              .
HOLD PHASES (1-16)                .
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)     .
CHANGE PHASE CONTROL PAGE (1-4)    .
CHANGE OVERLAP CONTROL PAGE (1-4)  .
CHANGE INPUT PAGE (1-4)           .
CHANGE OUTPUT PAGE (1-4)          .
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

ENTER '55' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT →

(LOOP 5A - PHASE 5)

```
PAGE: 2 C1 PIN:55  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................17
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC)............0.0
HOLD-OVER TIME (0-25.5 SEC)........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)                 .
VEHICLE DETECTOR (1-64)           55
PEDESTRIAN DETECTOR (1-16)        .
ALTERNATE PED DETECTOR (1-16)     .
PREEMPT (1-10)                    .
INVERTED PREEMPT (1-10)           .
STOP TIME (Y/N)                   .
FLASH SENSE (Y/N)                 .
DOOR OPEN (Y/N)                   .
MANUAL CONTROL ENABLE (Y/N)       .
MANUAL CONTROL ADVANCE (Y/N)      .
SPECIAL FUNCTION ALARM (1-8)      .
TOD HOUR SYCHRONIZATION (0-23)    .
FORCE OFF RING (1-4)              .
HOLD PHASES (1-16)                .
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)     .
CHANGE PHASE CONTROL PAGE (1-4)    .
CHANGE OVERLAP CONTROL PAGE (1-4)  .
CHANGE INPUT PAGE (1-4)           .
CHANGE OUTPUT PAGE (1-4)          .
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

PROGRAMMING COMPLETE

SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.

```
VEHICLE DETECTOR #55  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR....................N
ENABLE LOGGING.....................N
ENABLE DIAGNOSTICS.................N
SPEED TRAP.........................N
CALL DETECTOR......................Y
EXTENSION DETECTOR.................Y
MODE 2 STOP BAR....................N
SWITCHING DETECTOR.................N
DUPLICATING DETECTOR...............N
ENABLE FULL TIME DELAY.............N
IF FAILED, SET MIN RECALL?.........N
IF FAILED, SET MAX1 RECALL?........N
IF FAILED, SET MAX2 RECALL?........N
PHASE#          ¦1234567891011121314151 6
PHASES ASSIGNED ¦
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)...............6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)..........0
STRETCH (0-25.5 SEC)...............0.0
DELAY (0-255 SEC)..................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

ENTER 'Y' FOR ENABLE DETECTOR →

ENTER '5' FOR PHASES ASSIGNED →

ENSURE DELAY IS '3' →

```
VEHICLE DETECTOR #55  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR....................Y
ENABLE LOGGING.....................N
ENABLE DIAGNOSTICS.................N
SPEED TRAP.........................N
CALL DETECTOR......................Y
EXTENSION DETECTOR.................Y
MODE 2 STOP BAR....................N
SWITCHING DETECTOR.................N
DUPLICATING DETECTOR...............N
ENABLE FULL TIME DELAY.............N
IF FAILED, SET MIN RECALL?.........N
IF FAILED, SET MAX1 RECALL?........N
IF FAILED, SET MAX2 RECALL?........N
PHASE#          ¦1234567891011121314151 6
PHASES ASSIGNED ¦    X
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)...............6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)..........0
STRETCH (0-25.5 SEC)...............0.0
DELAY (0-255 SEC)..................3
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0752
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail - Final Design
Sheet 4 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 (Military Cutoff Road)
at
Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO:	19258 (040)

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton 11/08/2021
ACCEPTED BY: SIGNATURE DATE

SIG. INVENTORY NO. 03-0752

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750 N.Greenfield Pkwy,Garner,NC 27529

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User:jWendt

DocuSign Envelope ID: BC993C83-7488-4378-9D99-61583583DEA0

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-2.9

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PAGES REQUIRED TO RUN ALTERNATE PHASING	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY PAGE CHANGE EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN PAGE CHANGE EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 11 and 51 to run protected turns only.

INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0752
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail - Final Design
Sheet 5 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 (Military Cutoff Road)
at
Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO:	19258 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton
SIGNATURE 11/08/2021 DATE

SIG. INVENTORY NO. 03-0752

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5808 Faringdon Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

750 N.Greenfield Pkwy,Garner,NC 27529

11/8/2021
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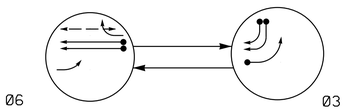
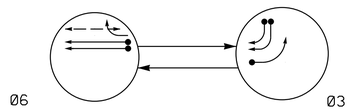
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-3.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 06	PHASE 03	FLASH
31,32	F Y	←	Y
33,34,35	R	→	R
61,62,63	G	R	Y
P61,P62	W	DW	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 06	PHASE 03	FLASH
31,32	R	←	Y
33,34,35	R	→	R
61,62,63	G	R	Y
P61,P62	W	DW	DRK

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	*10	-	Y
3B	6X40	0	2-4-2	Y	3	Y	Y	-	-	15	-	Y
3C	6X40	0	2-4-2	Y	3	Y	Y	-	-	15	-	Y
6A	6X6	300	5	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	300	5	Y	6	Y	Y	-	-	-	-	Y

* Disable Delay During Alternate Phasing Operation.

2 Phase Fully Actuated (Wilmington Signal System)

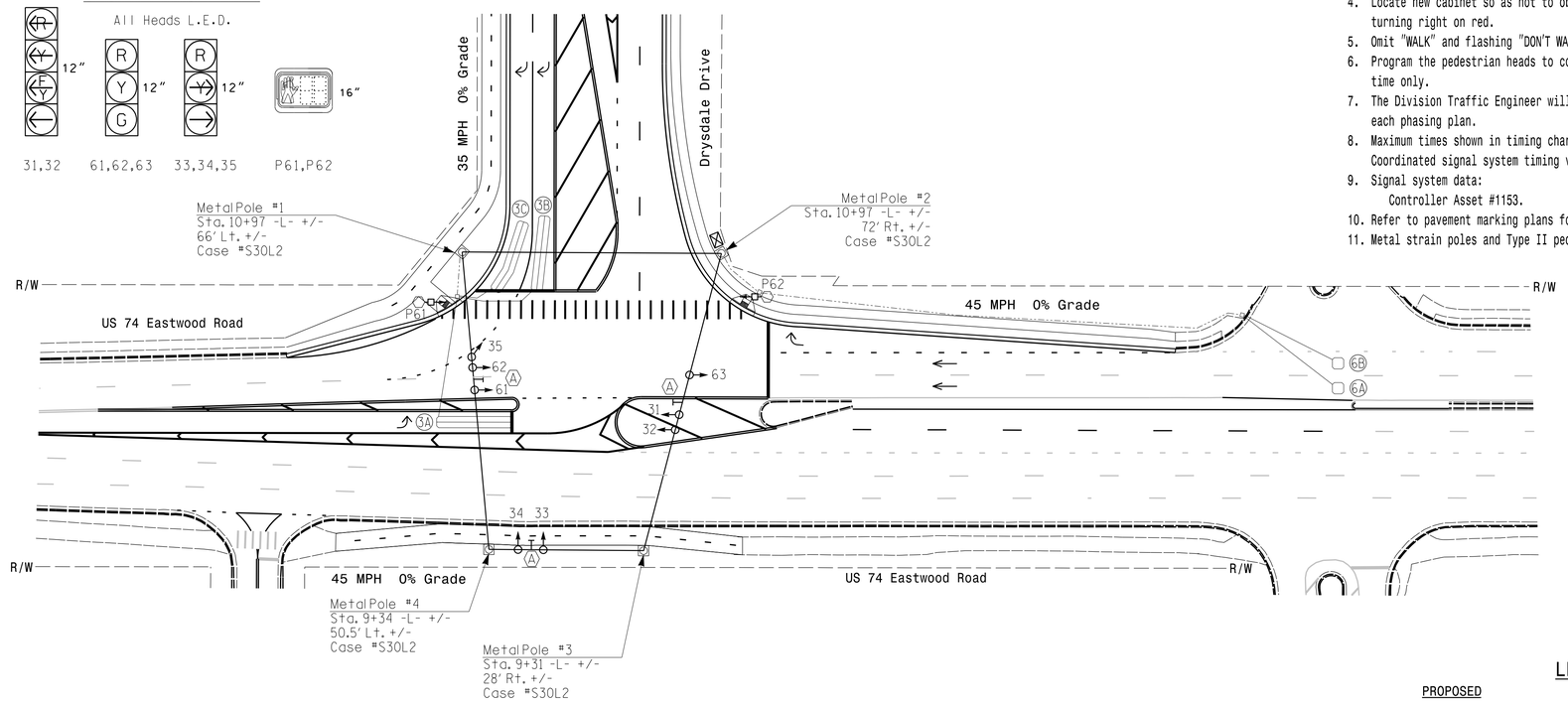
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018, "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program the pedestrian heads to countdown the flashing "DON'T WALK" time only.
7. The Division Traffic Engineer will determine the hours of use for each phasing plan.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Signal system data:
   Controller Asset #1153.
10. Refer to pavement marking plans for stop bar and crosswalk location.
11. Metal strain poles and Type II pedestals shall be black powder-coated.

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Strain Pole	
	Type II Signal Pedestal	
	Street Name Sign	

OASIS 2070 TIMING CHART

FEATURE	PHASE 3	PHASE 6
Min Green 1 *	5	12
Extension 1 *	2.0	6.0
Max Green 1 *	15	90
Yellow Clearance	3.0	4.5
Red Clearance	3.2	2.2
Walk 1 *	-	7
Don't Walk 1	-	40
Seconds Per Actuation *	-	1.5
Max Variable Initial *	-	34
Time Before Reduction *	-	15
Time To Reduce *	-	30
Minimum Gap	-	3.0
Recall Mode	-	MIN RECALL
Vehicle Call Memory	-	YELLOW
Dual Entry	-	-
Simultaneous Gap	ON	ON

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

11/8/2021
...\03-Design\03-1153_Sig_dsn.dgn
User:kwend

New Installation

RKA
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Prepared for: Transportation Mobility and Safety Division, Signal Design Section, State of North Carolina Department of Transportation
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 40 1"=40'

US 74 (Eastwood Road) at Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO.:	19258 (040)

REVISIONS	INIT.	DATE

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SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton 11/08/2021
ACCEPTED BY: DATE

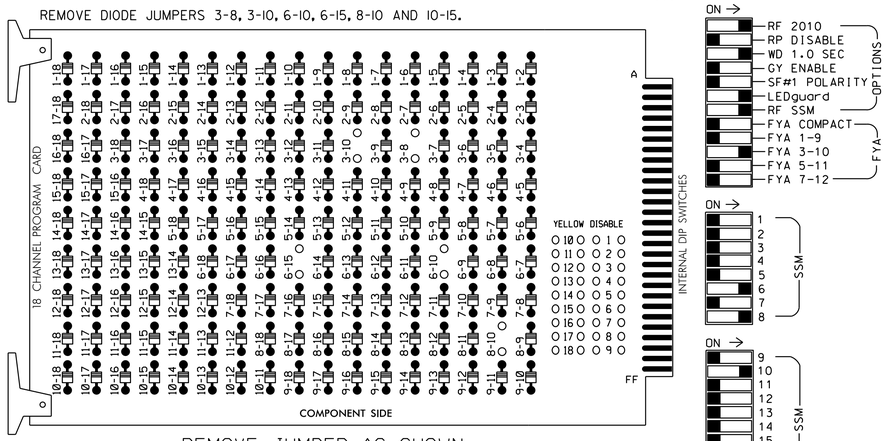
SIG. INVENTORY NO. 03-1153

DocuSign Envelope ID: BC993C83-7488-4378-9D99-61583583DEA0

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-3.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPER AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all Phases.
3. Program phase 6 for Variable Initial and Gap Reduction.
4. Program phase 6 for Startup In Green.
5. Program phase 6 for Startup Ped Call.
6. Program phase 6 for Yellow Flash.
7. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S4,S8,S9,S11,AUX S2
PHASES USED.....3,6,6PED
OVERLAP "A".....NOT USED
OVERLAP "B".....3+6
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED
OVERLAP "G".....3

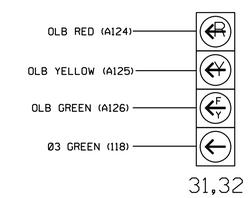
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	✱✱ OLG	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	NU	NU	★ 31,32	NU	NU	NU	61,62, 63	P61, P62	NU	33,34, 35	NU	NU	★ 31,32	NU	NU	NU	NU
RED								134			107							
YELLOW				✱				135										
GREEN								136										
RED ARROW														A124				
YELLOW ARROW											108			A125				
FLASHING YELLOW ARROW														A126				
GREEN ARROW				118							109							
✋									119									
🚶									121									

NU = Not Used
★ See pictorial of head wiring in detail this sheet.
✱ Denotes install load resistor. See load resistor installation detail this sheet.
✱✱ Requires special programming and output remapping. See sheets 2 and 4.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The display sequence for signal heads 31 and 32 requires special programming. See sheet 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø3 3A	Ø3 3B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L					NOT USED	Ø3 3C							NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6 6B												

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			10
	-	I5U	58	20 ★	53	3	Y	Y			
3B	TB4-9,10	I6U	41	3	4	3	Y	Y			15
3C	TB4-11,12	I6L	45	7	14	3	Y	Y			15
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
PED PUSH BUTTONS											
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

★ See Input Page Assignment programming details on sheet 3.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

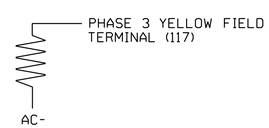
Countdown ped signals are required to display timing only during ped clearance interval. Consult ped signal module user's manual for instructions on selecting this feature.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1153
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail
Sheet 1 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 74 (Eastwood Road) at Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE: November 2021	REVIEWED BY: WJ Hamilton
PREPARED BY: A. Andrews	RKA PROJ. NO.: 19258 (040)

REVISIONS | INIT. | DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton 11/08/2021
SIGNATURE DATE

SIG. INVENTORY NO. 03-1153

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750 N.Greenfield Pkwy,Garner,NC 27529

11/8/2021
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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-3.2

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

(program controller as shown below)

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

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

```
  LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE      #3  IS ON
AND RED CLEAR ON PHASE #3  IS ON

                 SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #47 ON
SET OUTPUT  ASSIGNMENT #48 OFF
```

NOTE: LOGIC FOR PHASE 3 RED CLEAR WHEN TRANSITIONING FROM PHASE 3 TO PHASE 6 (HEADS 31 AND 32).

PRESS '+'

```
  LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE       #3  IS ON

                 SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #49 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 3 (HEADS 31 AND 32).

PRESS '+'

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

                 SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #48 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 3 (HEADS 31 AND 32).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 47 = Overlap B Red
OUTPUT 48 = Overlap B Yellow
OUTPUT 49 = Overlap B Green

DEFAULT OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+'

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

OVERLAP 'B' PROGRAMMING COMPLETE

NOTICE GREEN FLASH

PRESS '+' UNTIL OVERLAP 'G' APPEARS

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

OVERLAP 'G' PROGRAMMING COMPLETE

ALTERNATE OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

NOTICE PAGE 2 →

PRESS '+'

```
 PAGE 2: VEHICLE OVERLAP 'B' SETTINGS
 PHASE:          ¦123456789101112131415 16
VEH OVL PARENTS: ¦  X
VEH OVL NOT VEH: ¦
VEH OVL NOT PED: ¦
VEH OVL GRN EXT: ¦
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

OVERLAP 'B' PROGRAMMING COMPLETE

REMOVE GREEN FLASH PROGRAMMING

NOTICE PAGE 2 →

PRESS '+' UNTIL OVERLAP 'G' APPEARS

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

OVERLAP 'G' PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1153
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail
Sheet 2 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 74 (Eastwood Road)
at
Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE: November 2021	REVIEWED BY: WJ Hamilton		
PREPARED BY: A. Andrews	RKA PROJ. NO.: 19258 (040)		
REVISIONS		INIT.	DATE

750 N.Greenfield Pkwy,Garner,NC 27529

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NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton
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SIGNATURE DATE

SIG. INVENTORY NO. 03-1153

11/8/2021
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User:JWendt

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-3.3

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 3A

(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THIS PROGRAMMING REASSIGNS DETECTOR 53 TO INPUT #20 SO THAT THE DELAY ON LOOP 3A CAN BE REDUCED FROM 10 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 20 IS REACHED.

```
PAGE: 2 C1 PIN:58  VEHICLE DETECTOR
INPUT ASSIGNMENT #..................20
DEBOUNCE TIME (0-25.5 SEC)..........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................._
VEHICLE DETECTOR (1-64).............3
PEDESTRIAN DETECTOR (1-16)..........._
ALTERNATE PED DETECTOR (1-16)........_
PREEMPT (1-10)......................._
INVERTED PREEMPT (1-10).............._
STOP TIME (Y/N)....................._
FLASH SENSE (Y/N)..................._
DOOR OPEN (Y/N)....................._
MANUAL CONTROL ENABLE (Y/N)........._
MANUAL CONTROL ADVANCE (Y/N)........_
SPECIAL FUNCTION ALARM (1-8)........_
TOD HOUR SYCHRONIZATION (0-23)......_
FORCE OFF RING (1-4)................_
HOLD PHASES (1-16)..................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
CHANGE PHASE SEQUENCE PAGE (1-12)...._
CHANGE PHASE TIMING PAGE (1-4)......._
CHANGE PHASE CONTROL PAGE (1-4)....._
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4)............._
CHANGE OUTPUT PAGE (1-4)............_
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

→ ENTER '53' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT →

(LOOP 3A - PHASE 3)

```
PAGE: 2 C1 PIN:58  VEHICLE DETECTOR
INPUT ASSIGNMENT #..................20
DEBOUNCE TIME (0-25.5 SEC)..........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................._
VEHICLE DETECTOR (1-64)............53
PEDESTRIAN DETECTOR (1-16)..........._
ALTERNATE PED DETECTOR (1-16)........_
PREEMPT (1-10)......................._
INVERTED PREEMPT (1-10).............._
STOP TIME (Y/N)....................._
FLASH SENSE (Y/N)..................._
DOOR OPEN (Y/N)....................._
MANUAL CONTROL ENABLE (Y/N)........._
MANUAL CONTROL ADVANCE (Y/N)........_
SPECIAL FUNCTION ALARM (1-8)........_
TOD HOUR SYCHRONIZATION (0-23)......_
FORCE OFF RING (1-4)................_
HOLD PHASES (1-16)..................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
CHANGE PHASE SEQUENCE PAGE (1-12)...._
CHANGE PHASE TIMING PAGE (1-4)......._
CHANGE PHASE CONTROL PAGE (1-4)....._
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4)............._
CHANGE OUTPUT PAGE (1-4)............_
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

PROGRAMMING COMPLETE

SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 3A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #53.

```
VEHICLE DETECTOR #53  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR....................N
ENABLE LOGGING.....................N
ENABLE DIAGNOSTICS.................N
SPEED TRAP.........................N
CALL DETECTOR......................Y
EXTENSION DETECTOR.................Y
MODE 2 STOP BAR....................N
SWITCHING DETECTOR.................N
DUPLICATING DETECTOR...............N
ENABLE FULL TIME DELAY.............N
IF FAILED, SET MIN RECALL?.........N
IF FAILED, SET MAX1 RECALL?........N
IF FAILED, SET MAX2 RECALL?........N
PHASE#          ¦1234567891011121314151 6
PHASES ASSIGNED ¦
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)...............6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

→ ENTER 'Y' FOR ENABLE DETECTOR →

→ ENTER '3' FOR PHASES ASSIGNED →

→ ENSURE DELAY IS '0' →

```
VEHICLE DETECTOR #53  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR....................Y
ENABLE LOGGING.....................N
ENABLE DIAGNOSTICS.................N
SPEED TRAP.........................N
CALL DETECTOR......................Y
EXTENSION DETECTOR.................Y
MODE 2 STOP BAR....................N
SWITCHING DETECTOR.................N
DUPLICATING DETECTOR...............N
ENABLE FULL TIME DELAY.............N
IF FAILED, SET MIN RECALL?.........N
IF FAILED, SET MAX1 RECALL?........N
IF FAILED, SET MAX2 RECALL?........N
PHASE#          ¦1234567891011121314151 6
PHASES ASSIGNED ¦  X
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)...............6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1153
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail
Sheet 3 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 74 (Eastwood Road) at Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO:	19258 (040)

REVISIONS	INIT.	DATE

750 N.Greenfield Pkwy,Garner,NC 27529

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Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton 11/08/2021
ENGINEER SEALING DATE

SIG. INVENTORY NO. 03-1153

11/8/2021
12:44:04
User:Wendt

DocuSign Envelope ID: BC993C83-7488-4378-9D99-61583583DEA0

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-3.4

OUTPUT ASSIGNMENT PROGRAMMING DETAIL FOR OVERLAP "G" TO LOADSWITCH "S11"

(program controller as shown below)

1. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS).
2. WITH CURSOR IN "OUTPUT ASSIGNMENT #" FIELD, USE + KEY TO FIND THE OUTPUT ASSIGNMENT NUMBER 19, AS SHOWN BELOW.
3. PROGRAM CONTROLLER AS SHOWN:

```
PAGE:1  C1 PIN:21  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................19
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:21  C1 PIN:21  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=161)...7
SELECT COLOR (0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' AFTER AFTER INPUTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:21  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................19
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS '+' KEY FOR OUTPUT 20

```
PAGE:1  C1 PIN:22  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................20
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:22  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=161)...7
SELECT COLOR (0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' AFTER AFTER INPUTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:22  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................20
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS '+' KEY FOR OUTPUT 21

```
PAGE:1  C1 PIN:23  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................21
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:23  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=161)...7
SELECT COLOR (0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

PRESS THE 'ENT' AFTER AFTER INPUTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:23  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................21
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............1
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIONS REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIONS REQUIRED TO RUN ALTERNATE PHASING	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BIT 1 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phase for heads 31 and 32 to run protected turns only.

INPUTS PAGE 2: Reduces delay time for phase 3 call on loop 3A to 0 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1153
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail
Sheet 4 of 4

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Transportation Mobility and Safety Division — ITS & Signals Management Section — State of North Carolina Department of Transportation
750 N.Greenfield Pkwy,Garner,NC 27529

US 74 (Eastwood Road)
at
Drysdale Drive

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO:	19258 (040)

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton
A0560D704648484...
SIGNATURE 11/08/2021 DATE

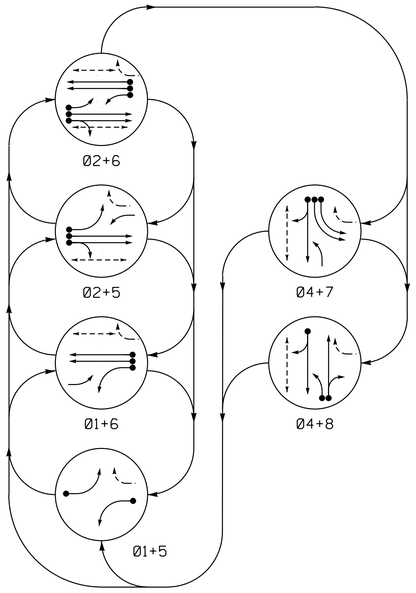
SIG. INVENTORY NO. 03-1153

11/8/2021 ...\04-Design\03-1153_sm_ele4.dgn User:Wendt

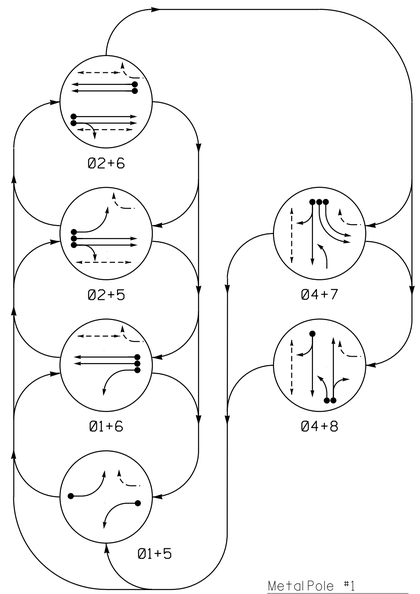
DocuSign Envelope ID: BC993C83-7488-4378-9D99-61583583DEA0

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-4.0

DEFAULT PHASING DIAGRAM

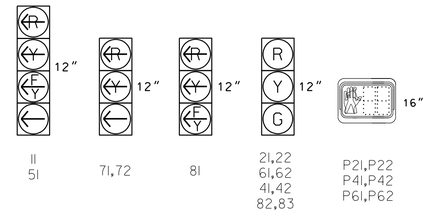


ALTERNATE PHASING DIAGRAM



SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	10*	-	Y
					6**	Y	Y	-	-	-	-	Y
2A	6X6	200	5	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	200	5	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	10	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	10*	-	Y
					2**	Y	Y	-	-	-	-	Y
6A	6X6	200	5	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	200	5	Y	6	Y	Y	-	-	-	-	Y
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	-	-	Y
7B	6X40	0	2-4-2	Y	7	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	10	-	Y

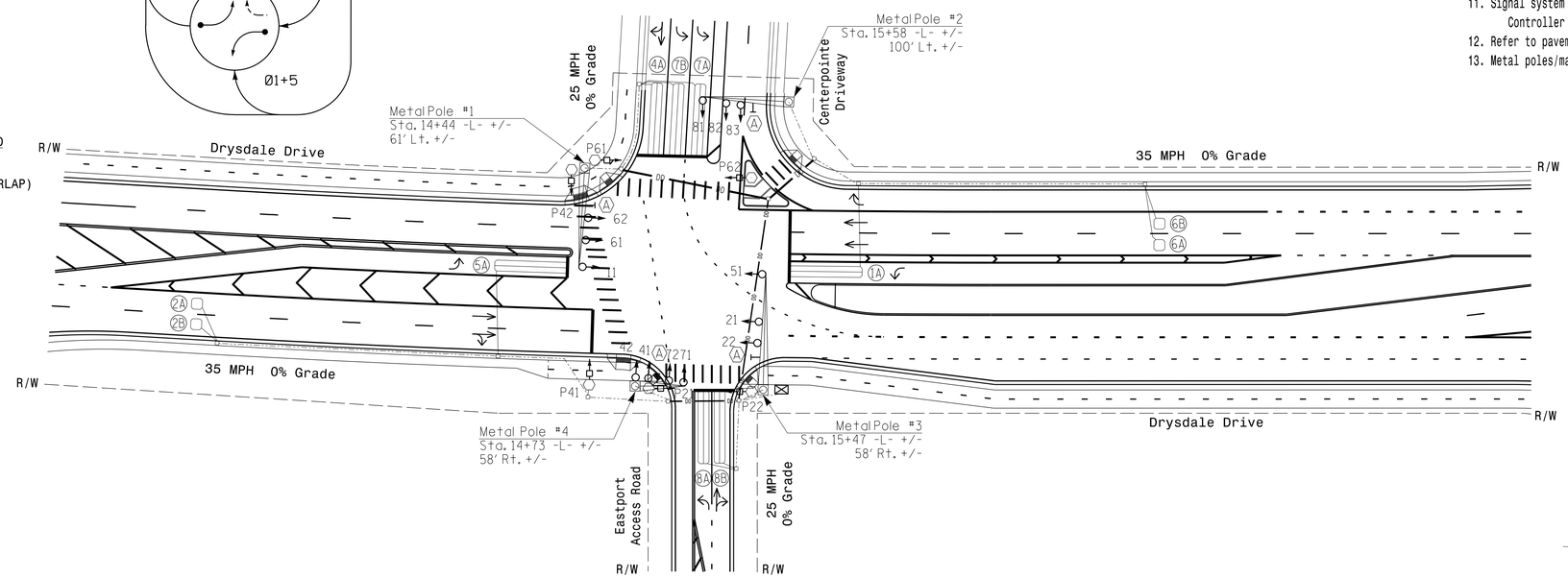
* Disable delay during Alternate Phasing operation.
** Disable phase call for loop during Alternate Phasing operation.

6 Phase
Fully Actuated
(Wilmington Signal System)

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018, "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program the pedestrian heads to countdown the flashing "DON'T WALK" time only.
9. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Signal system data:
    Controller Asset #1152.
12. Refer to pavement marking plans for stop bar and crosswalk location.
13. Metal poles/mast arms and Type II pedestals shall be black powder-coated.

PHASING DIAGRAM DETECTION LEGEND

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



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Strain Pole	
N/A	Curb Ramp	
	Metal Pole with Mastarm	
	Directional Drill	N/A
	Type II Signal Pedestal	
	Street Name Sign (By Others)	

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	7	8
Min Green 1 *	5	12	5	5	12	5	5
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	15	100	25	15	100	15	25
Yellow Clearance	3.0	3.8	3.2	3.0	3.8	3.0	3.2
Red Clearance	2.8	2.4	3.2	3.2	2.4	3.2	3.1
Walk 1 *	-	7	7	-	7	-	-
Don't Walk 1	-	11	23	-	18	-	-
Seconds Per Actuation *	-	1.5	-	-	1.5	-	-
Max Variable Initial *	-	24	-	-	24	-	-
Time Before Reduction *	-	15	-	-	15	-	-
Time To Reduce *	-	30	-	-	30	-	-
Minimum Gap	-	3.0	-	-	3.0	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-	-
Dual Entry	-	-	ON	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON

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

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+7	04+8	FLASH
11	←	←	F Y	F Y	R	R	Y
21,22	R	R	G	G	R	R	Y
41,42	R	R	R	R	G	G	R
51	←	F Y	←	F Y	R	R	Y
61,62	R	G	R	G	R	R	Y
71,72	R	R	R	R	←	R	R
81	R	R	R	R	F Y	F Y	R
82,83	R	R	R	R	R	G	R
P21,P22	DW	DW	W	W	DW	DW	DRK
P41,P42	DW	DW	DW	DW	W	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+7	04+8	FLASH
11	←	←	R	R	R	R	Y
21,22	R	R	G	G	R	R	Y
41,42	R	R	R	R	G	G	R
51	←	R	←	R	R	R	Y
61,62	R	G	R	G	R	R	Y
71,72	R	R	R	R	←	R	R
81	R	R	R	R	F Y	F Y	R
82,83	R	R	R	R	R	G	R
P21,P22	DW	DW	W	W	DW	DW	DRK
P41,P42	DW	DW	DW	DW	W	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

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New Installation

Prepared for:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

Drysdale Drive at Centerpointe/Eastport Access

Division 3 | New Hanover County | Wilmington

PLAN DATE: November 2021	REVIEWED BY: WJ Hamilton		
PREPARED BY: A. Andrews	RKA PROJ. NO.: 19258 (040)		
REVISIONS		INIT.	DATE

SCALE 0 40 1"=40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton 11/08/2021
SIGNATURE DATE

SIG. INVENTORY NO. 03-1152

11/8/2021
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User:JJWendt

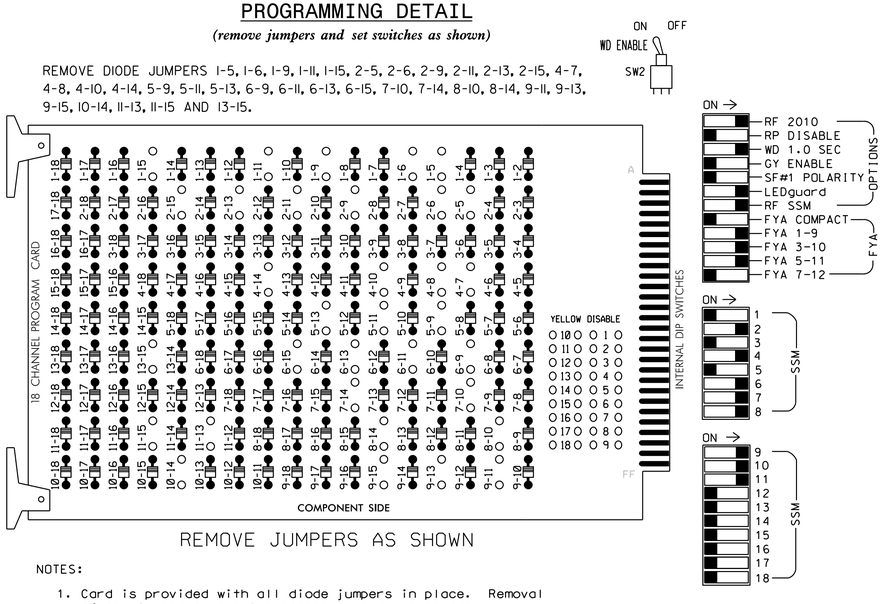
DocuSign Envelope ID: BC993C83-7488-4378-9D99-61583583DEA0

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-4.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 4-7, 4-8, 4-10, 4-14, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 7-10, 7-14, 8-10, 8-14, 9-11, 9-13, 9-15, 10-14, 11-13, 11-15 AND 13-15.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phase 4 for Dual Entry.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Enable Simultaneous Gap-Out for all phases.
5. Program phases 2 and 6 for Startup In Green.
6. Program phases 2, 4 and 6 for Startup Ped Call.
7. Program phases 2 and 6 for Yellow Flash and overlaps 1 and 2 as Wag Overlaps.
8. The cabinet and controller are part of the Wilmington Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	P21, P22	NU	41,42	P41, P42	51★	61,62	P61, P62	71,72	82,83	NU	11★	81★	NU	51★	NU	NU
RED		128			101			134			107							
YELLOW	✳	129			102		✳	135			108							
GREEN		130			103			136			109							
RED ARROW										122			A121	A124		A114		
YELLOW ARROW										123			A122	A125		A115		
FLASHING YELLOW ARROW													A123	A126		A116		
GREEN ARROW	127						133			124								
✋			113			104			119									
🚶			115			106			121									

NU = Not Used

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

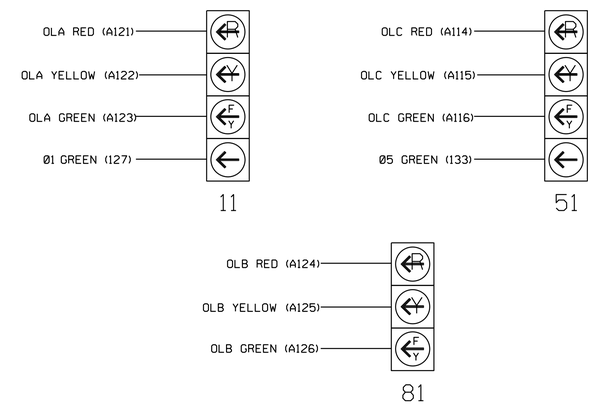
★ See pictorial of head wiring in detail below.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S7,S8,S9,S10,S11,AUX S1, AUX S2,AUX S4
PHASES USED.....1,2,2PED,4,4PED,5,6,6PED,7,8
OVERLAP "A".....1+2
OVERLAP "B".....4
OVERLAP "C".....5+6
OVERLAP "D".....NOT USED

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The sequence display for signal heads 11 and 51 requires special programming. See sheet 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

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

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

⊗ Wired Input - Do not populate slot with detector card

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			10
	-	J4U	48	10★	26	6	Y	Y			
	-	I1U	56	18★	51	1	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			10
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y			10
	-	I4U	47	9★	22	2	Y	Y			
	-	J1U	55	17★	55	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			
7B	TB5-9,10	J6U	42	4	8	7	Y	Y			
8A	TB5-11,12	J6L	46	8	18	8	Y	Y			
8B	TB7-1,2	J7U	66	28	38	8	Y	Y			10
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

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

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

★ See Input Page Assignment programming details on sheets 3 and 4.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

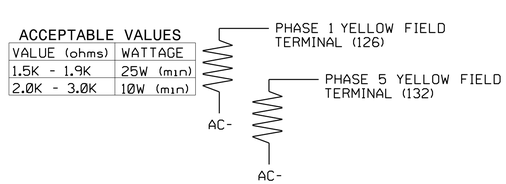
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1152
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

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Electrical Detail
Sheet 1 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Drysdale Drive
at
Centerpointe/Eastport Access

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO.:	19258 (040)

REVISIONS | INIT. | DATE

750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton A0568D2D4B4B4BE... 11/08/2021 DATE

SIG. INVENTORY NO. 03-1152

11/8/2021
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User:JWardt

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-4.2

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

(program controller as shown below)

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

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

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

SCROLL DOWN

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

PRESS '+'

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

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

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #52 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #51 ON

PRESS '+'

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

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

SCROLL DOWN

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

PRESS '+'

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

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

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #43 ON

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1152
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PAGES REQUIRED TO RUN ALTERNATE PHASING	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY PAGE CHANGE EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN PAGE CHANGE EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 11 and 51 to run protected turns only.

INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

Electrical Detail
Sheet 2 of 5

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

750 N.Greenfield Pkwy,Garner,NC 27529

Drysdale Drive
at
Centerpointe/Eastport Access

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO.:	19258 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by:
William J. Hamilton
PROJECT SIGNATURE 11/08/2021 DATE

SIG. INVENTORY NO. 03-1152

11/8/2021
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User:WendyS

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-4.3

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 10 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.

```
PAGE: 2 C1 PIN:48  VEHICLE DETECTOR
INPUT ASSIGNMENT #..................10
DEBOUNCE TIME (0-25.5 SEC)..........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................Y
VEHICLE DETECTOR (1-64).............26
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

DEFAULT DETECTOR NUMBER WILL REMAIN UNTIL 'NOT ENABLED' IS ENTERED.

ENTER A 'Y' FOR NOT ENABLED

(LOOP 1A - PHASE 6)

```
PAGE: 2 C1 PIN:48  NOT ENABLED
INPUT ASSIGNMENT #..................10
DEBOUNCE TIME (0-25.5 SEC)..........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................Y
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

PRESS '+' TO ADVANCE TO INPUT 18

```
PAGE: 2 C1 PIN:56  VEHICLE DETECTOR
INPUT ASSIGNMENT #..................18
DEBOUNCE TIME (0-25.5 SEC)..........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................
VEHICLE DETECTOR (1-64).............1
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

ENTER '51' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT

(LOOP 1A - PHASE 1)

```
PAGE: 2 C1 PIN:56  VEHICLE DETECTOR
INPUT ASSIGNMENT #..................18
DEBOUNCE TIME (0-25.5 SEC)..........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................
VEHICLE DETECTOR (1-64).............51
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

PROGRAMMING COMPLETE

SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.

```
VEHICLE DETECTOR #51  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR....................N
ENABLE LOGGING.....................N
ENABLE DIAGNOSTICS.................N
SPEED TRAP.........................N
CALL DETECTOR......................Y
EXTENSION DETECTOR.................Y
MODE 2 STOP BAR....................N
SWITCHING DETECTOR.................N
DUPLICATING DETECTOR...............N
ENABLE FULL TIME DELAY.............N
IF FAILED, SET MIN RECALL?.........N
IF FAILED, SET MAX1 RECALL?........N
IF FAILED, SET MAX2 RECALL?........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)...............6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

ENTER 'Y' FOR ENABLE DETECTOR

ENTER '1' FOR PHASES ASSIGNED

ENSURE DELAY IS '0'

```
VEHICLE DETECTOR #51  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR....................Y
ENABLE LOGGING.....................N
ENABLE DIAGNOSTICS.................N
SPEED TRAP.........................N
CALL DETECTOR......................Y
EXTENSION DETECTOR.................Y
MODE 2 STOP BAR....................N
SWITCHING DETECTOR.................N
DUPLICATING DETECTOR...............N
ENABLE FULL TIME DELAY.............N
IF FAILED, SET MIN RECALL?.........N
IF FAILED, SET MAX1 RECALL?........N
IF FAILED, SET MAX2 RECALL?........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦X
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)...............6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1152
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail
Sheet 3 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Drysdale Drive
at
Centerpointe/Eastport Access

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO:	19258 (040)

REVISIONS	INIT.	DATE

750 N.Greenfield Pkwy,Garner,NC 27529

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SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton 11/08/2021
SIGNATURE DATE

SIG. INVENTORY NO. 03-1152

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User:Wendt

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-4.4

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 10 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.

```
PAGE: 2 C1 PIN:47  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................9
DEBOUNCE TIME (0-25.5 SEC)..........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................Y
VEHICLE DETECTOR (1-64)............22
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

DEFAULT DETECTOR NUMBER WILL REMAIN UNTIL 'NOT ENABLED' IS ENTERED.

ENTER A 'Y' FOR NOT ENABLED →

(LOOP 5A - PHASE 2)

```
PAGE: 2 C1 PIN:47  NOT ENABLED
INPUT ASSIGNMENT #.................9
DEBOUNCE TIME (0-25.5 SEC)..........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................Y
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

PRESS '+' TO ADVANCE TO INPUT 17

```
PAGE: 2 C1 PIN:55  VEHICLE DETECTOR
INPUT ASSIGNMENT #................17
DEBOUNCE TIME (0-25.5 SEC)..........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................
VEHICLE DETECTOR (1-64)............5
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

ENTER '55' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT →

(LOOP 5A - PHASE 5)

```
PAGE: 2 C1 PIN:55  VEHICLE DETECTOR
INPUT ASSIGNMENT #................17
DEBOUNCE TIME (0-25.5 SEC)..........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................
VEHICLE DETECTOR (1-64)............55
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

PROGRAMMING COMPLETE

SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.

```
VEHICLE DETECTOR #55  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR....................N
ENABLE LOGGING.....................N
ENABLE DIAGNOSTICS.................N
SPEED TRAP.........................N
CALL DETECTOR......................Y
EXTENSION DETECTOR.................Y
MODE 2 STOP BAR....................N
SWITCHING DETECTOR.................N
DUPLICATING DETECTOR...............N
ENABLE FULL TIME DELAY.............N
IF FAILED, SET MIN RECALL?.........N
IF FAILED, SET MAX1 RECALL?........N
IF FAILED, SET MAX2 RECALL?........N
PHASE#          ¦1234567891011121314151 6
PHASES ASSIGNED ¦
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)...............6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

ENTER 'Y' FOR ENABLE DETECTOR →

ENTER '5' FOR PHASES ASSIGNED →

ENSURE DELAY IS '0' →

```
VEHICLE DETECTOR #55  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR....................Y
ENABLE LOGGING.....................N
ENABLE DIAGNOSTICS.................N
SPEED TRAP.........................N
CALL DETECTOR......................Y
EXTENSION DETECTOR.................Y
MODE 2 STOP BAR....................N
SWITCHING DETECTOR.................N
DUPLICATING DETECTOR...............N
ENABLE FULL TIME DELAY.............N
IF FAILED, SET MIN RECALL?.........N
IF FAILED, SET MAX1 RECALL?........N
IF FAILED, SET MAX2 RECALL?........N
PHASE#          ¦1234567891011121314151 6
PHASES ASSIGNED ¦    X
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)...............6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1152
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail
Sheet 4 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Drysdale Drive
at
Centerpointe/Eastport Access

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO:	19258 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton 11/08/2021
ACCEPTANCE SIGNATURE DATE

SIG. INVENTORY NO. 03-1152

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750 N.Greenfield Pkwy,Garner,NC 27529

11/8/2021
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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-4.5

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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

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

← NOTICE GREEN FLASH

PRESS '+'

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

← NOTICE GREEN FLASH

PRESS '+'

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

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          ¦123456789101112131415 16
VEH OVL PARENTS:¦X
VEH OVL NOT VEH:¦
VEH OVL NOT PED:¦
VEH OVL GRN EXT:¦
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

PRESS '+'

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'B' SETTINGS
 PHASE:          ¦123456789101112131415 16
VEH OVL PARENTS:¦   X
VEH OVL NOT VEH:¦
VEH OVL NOT PED:¦
VEH OVL GRN EXT:¦
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+'

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          ¦123456789101112131415 16
VEH OVL PARENTS:¦    X
VEH OVL NOT VEH:¦
VEH OVL NOT PED:¦
VEH OVL GRN EXT:¦
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

OVERLAP PROGRAMMING COMPLETE

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1152
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail
Sheet 5 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Drysdale Drive
at
Centerpointe/Eastport Access

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO:	19258 (040)

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton — 11/08/2021
SIGNATURE DATE

SIG. INVENTORY NO. 03-1152

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750 N.Greenfield Pkwy,Garner,NC 27529

11/8/2021
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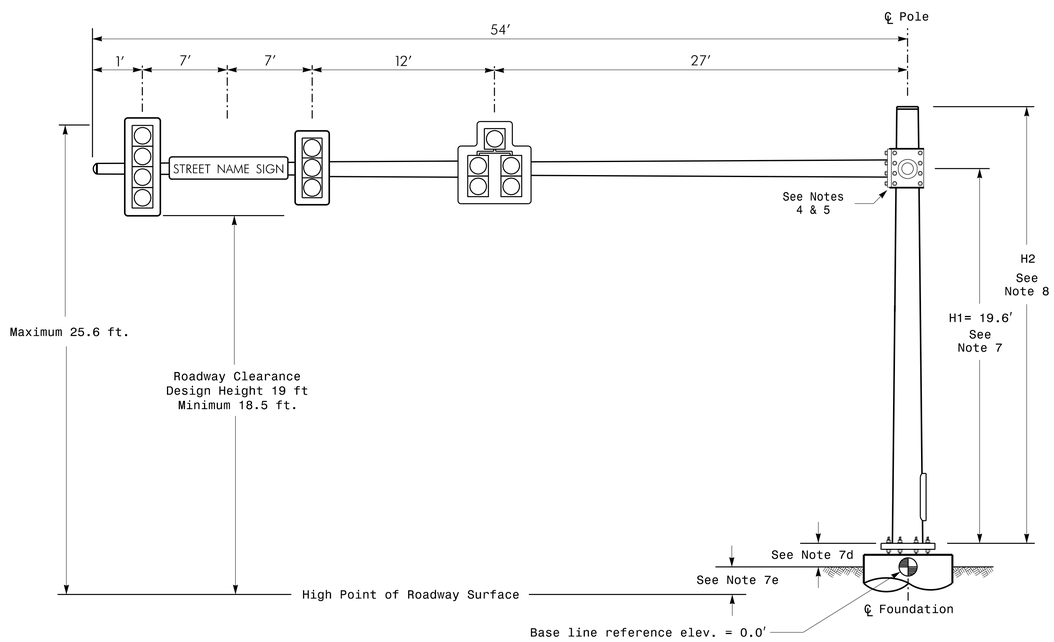
User:JWendt

DocuSign Envelope ID: BC993C83-7488-4378-9D99-61583583DEA0

METAL POLES No. 1 & 2

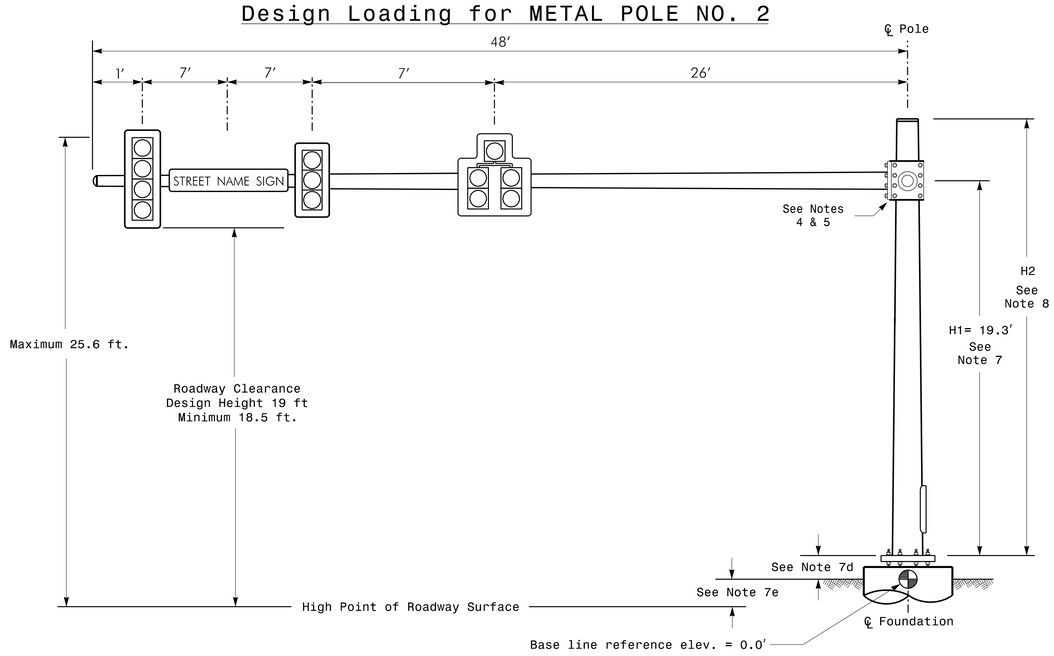
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-4.6

Design Loading for METAL POLE NO. 1



Elevation View @ 270°

Design Loading for METAL POLE NO. 2



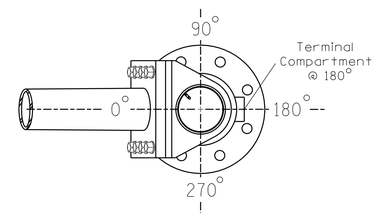
Elevation View @ 270°

SPECIAL NOTE

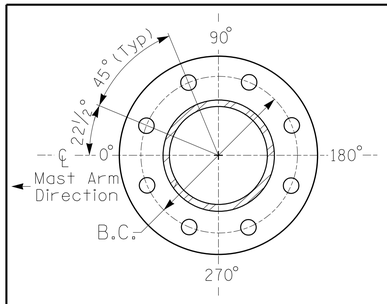
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

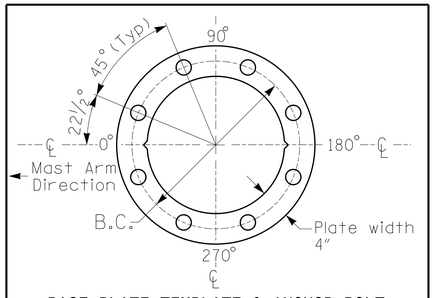
Elevation Differences for:	Pole 1	Pole 2
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+ 0.6 ft.	+ 0.9 ft.
Elevation difference at Edge of travelway or face of curb	+ 1.0 ft.	+ 0.3 ft.



POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

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

NOTES

DESIGN REFERENCE MATERIAL

1. Design the traffic signal structure and foundation in accordance with:
   - The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2018 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
   - The 2018 NCDOT Roadway Standard Drawings.
   - The traffic signal project plans and special provisions.
   - The NCDOT "Metal Pole Standards" located at the following NCDOT website: https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

DESIGN REQUIREMENTS

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Design all signal supports using stress ratios that do not exceed 0.9.
4. The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Signal heads are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

All metal poles and arms should be black in color as specified in the project special provisions.

NCDOT Wind Zone 2 (130 mph)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: Transportation Mobility and Safety Division — Signal Design Section

750 N.Greenfield Pkwy.Garner,NC 27529

Drysdale Drive at Centerpointe/Eastport Access

Division 3 New Hanover County Wilmington

PLAN DATE: November 2021 REVIEWED BY: WJ Hamilton

PREPARED BY: A. Andrews RKA PROJ. NO: 19258 (040)

SCALE 0 N/A N/A

REVISIONS INIT. DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton — A0A6D1D0A6A444...

SIGNATURE 11/08/2021 DATE

SIG. INVENTORY NO. 03-1152

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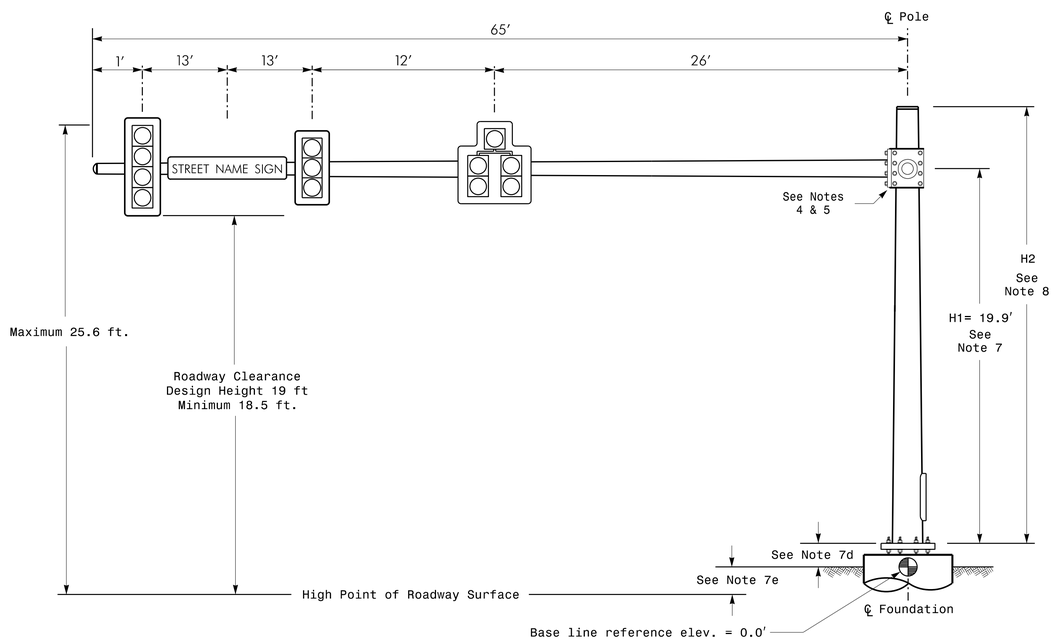
METAL POLES No. 3 & 4

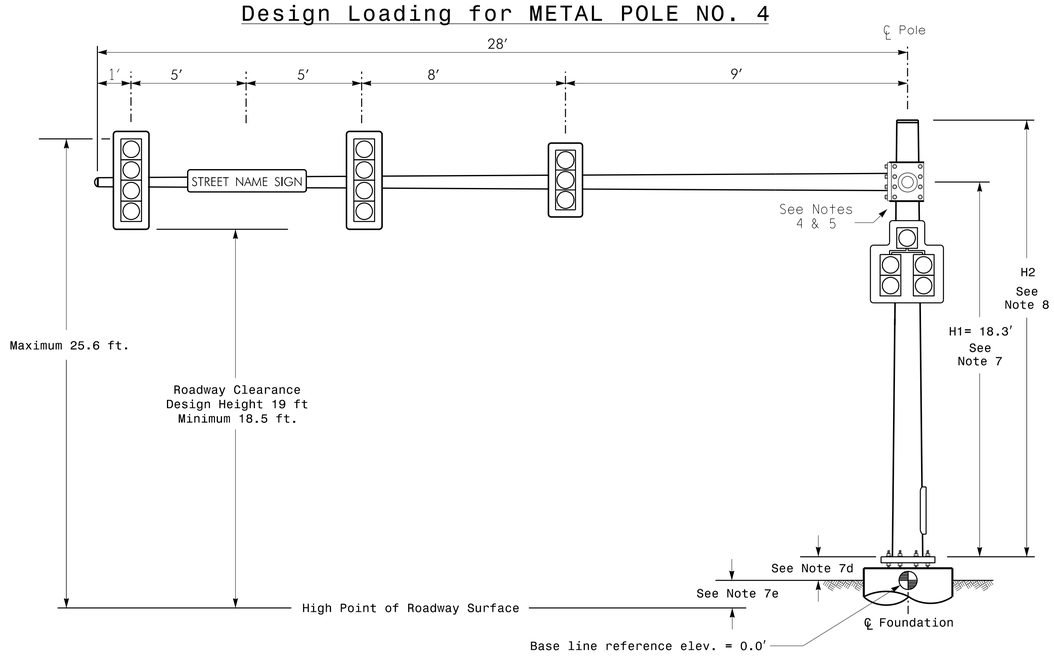
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-4.7

Design Loading for METAL POLE NO. 3



Elevation View @ 270°

Design Loading for METAL POLE NO. 4



Elevation View @ 270°

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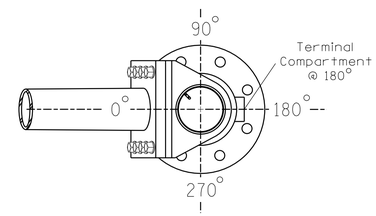
SPECIAL NOTE

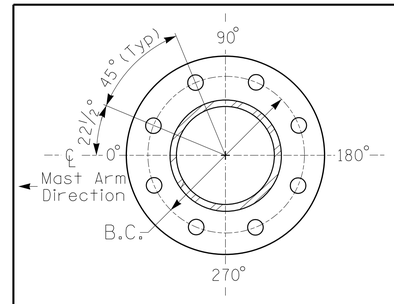
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

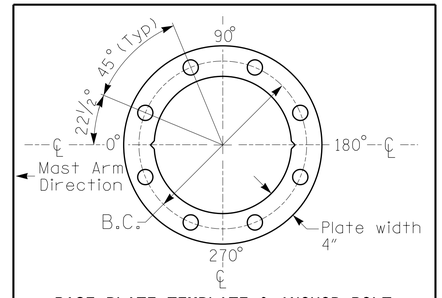
Elevation Differences for:	Pole 3	Pole 4
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+ 0.8 ft.	- 0.1 ft.
Elevation difference at Edge of travelway or face of curb	+ 0.5 ft.	+ 0.2 ft.



POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12″–3 SECTION–WITH BACKPLATE–RIGID MOUNTED	9.3 S.F.	25.5″ W X 52.5″ L	60 LBS
	SIGNAL HEAD 12″–5 SECTION–WITH BACKPLATE–RIGID MOUNTED	16.3 S.F.	42.0″ W X 56.0″ L	103 LBS
	SIGNAL HEAD 12″–4 SECTION–WITH BACKPLATE–RIGID MOUNTED	11.5 S.F.	25.5″ W X 66.0″ L	74 LBS
STREET NAME SIGN	STREET NAME SIGN RIGID MOUNTED	12.0 S.F.	18.0″ W X 96.0″ L	27 LBS

NOTES

DESIGN REFERENCE MATERIAL

1. Design the traffic signal structure and foundation in accordance with:
   - The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2018 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
   - The 2018 NCDOT Roadway Standard Drawings.
   - The traffic signal project plans and special provisions.
   - The NCDOT "Metal Pole Standards" located at the following NCDOT website: https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

DESIGN REQUIREMENTS

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Design all signal supports using stress ratios that do not exceed 0.9.
4. The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Signal heads are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

All metal poles and arms should be black in color as specified in the project special provisions.

NCDOT Wind Zone 2 (130 mph)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: Transportation Mobility and Safety Division, Signal Design Section, State of North Carolina Department of Transportation
750 N.Greenfield Pkwy.Garner,NC 27529

Drysdale Drive at Centerpointe/Eastport Access

Division 3 | New Hanover County | Wilmington

PLAN DATE: November 2021 | REVIEWED BY: WJ Hamilton
PREPARED BY: A. Andrews | RKA PROJ. NO: 19258 (040)

SCALE: 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

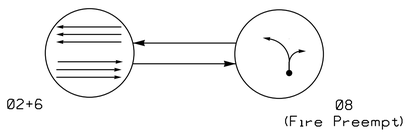
DocuSigned by: William J. Hamilton
Addendum Made
SIGNATURE | DATE 11/08/2021

SIG. INVENTORY NO. 03-1152

DocuSign Envelope ID: BC993C83-7488-4378-9D99-61583583DEA0

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-5.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

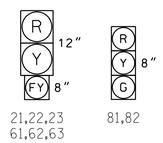
TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø8	PHASE FLASH
21, 22, 23	FY	R	Y
61, 62, 63	FY	R	Y
81, 82	DRK	G	R

FY = 8" FLASHING YELLOW
DRK = DARK

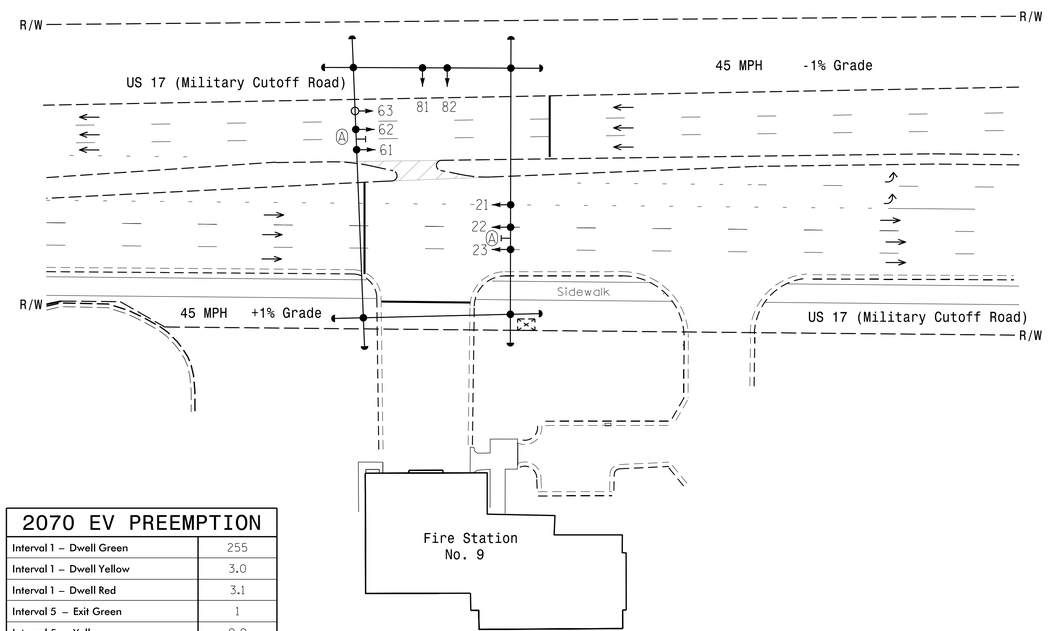
SIGNAL FACE I.D.

All Heads L.E.D.



2 Phase
Semi-Actuated
(Wilmington Signal System)

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018, "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Maintain emergency vehicle preemption switch in Fire Station.
4. The City Traffic Engineer will determine the Delay before Preempt and Preempt Dwell Min Green time for the emergency vehicle preemption timing.
5. Clear signal heads 21, 22, 23, 61, 62, and 63 from flashing 8" yellow to steady 12" yellow during interval 1 and steady red during interval 2.
6. When clearing to preemption, signal heads 81 and 82 shall display red during interval 1 and 2. When clearing from preemption, signal heads 81 and 82 shall display yellow during interval 1 and red during interval 2.
7. Pavement markings are existing.
8. Signal system data:
   Controller Asset #0946.



OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	12	12	7
Extension 1 *	0.0	0.0	0.0
Max Green 1 *	30	30	30
Yellow Clearance	4.4	4.6	3.0
Red Clearance	1.0	1.6	3.1
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	-	-	-
Dual Entry	-	-	-
Simultaneous Gap	-	-	-

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

2070 EV PREEMPTION

Interval 1 – Dwell Green	255
Interval 1 – Dwell Yellow	3.0
Interval 1 – Dwell Red	3.1
Interval 5 – Exit Green	1
Interval 5 – Yellow	0.0
Interval 5 – Red	0.0
Delay Time	**
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	0.0 *
Red Clear Before Pre	0.0 *
Dwell Min Time	**
Enable Backup Protection	N
Ped Clear Through Yellow	N

* Clearance time defaults to times used for phase during normal operation.
** See Note 4.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	"Emergency Signal" Sign (W3-8)	

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: Transportation Mobility and Safety Division, Signal Design Section, 750 N.Greenfield Pkwy,Garner,NC 27529

US 17 (Military Cutoff Road) at Wilmington Fire Station #9

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO.:	19258 (040)

REVISIONS | INIT. | DATE

SCALE 0 40 1"=40'

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton A0660D704648484... SIGNATURE 11/08/2021 DATE

SIG. INVENTORY NO. 03-0946

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11/8/2021
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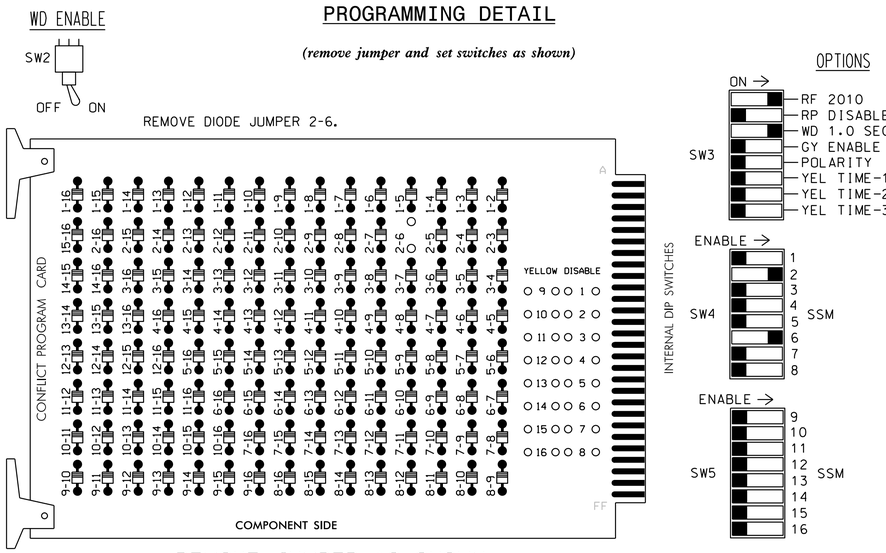
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-5.1

EDI MODEL 2010ECL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



REMOVE JUMPER AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL2-SEL5 are present on the monitor board.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. To prevent red failures on unused monitor channels, see Red Monitor Board Programming Detail this sheet.
3. Program controller to start up in phases 2 and 6 green.
4. Enable Simultaneous Gap-Out, for all phases.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Wilmington Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22, 23	*	NU	NU	NU	NU	61,62, 63	NU	NU	81,82	NU
RED		128						134			107	
YELLOW		129						135			108	
GREEN											109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
8" FLASHING YELLOW →		130					8" FLASHING YELLOW →	136				

NU = Not Used
* See Lamp Notes (Sheet 2 of 2)

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S2P**,S6,S8
PHASES USED.....2,6,8*
OVERLAPS.....NONE

* USED DURING PREEMPT ONLY
** USED FOR PILOT LAMP

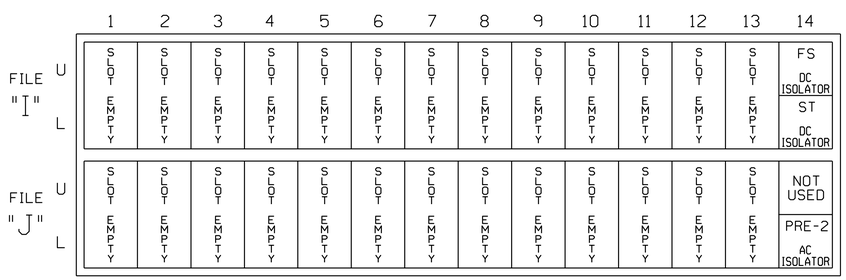
PREEMPT ONLY PHASE OMIT NOTE

(program controller as noted below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 8 for 'Omit Phase' and phases 2 and 6 for 'Startup Calls'. This is to prevent phase 8 from being served when not in Preempt.

INPUT FILE POSITION LAYOUT

(front view)

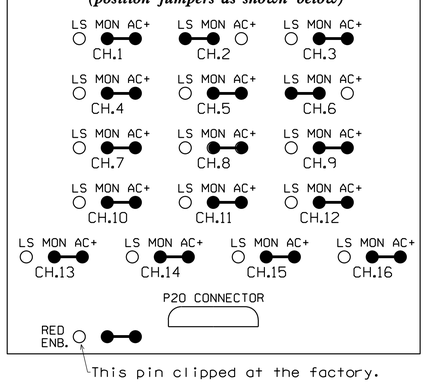


EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME
PRE-2 = PREEMPT 2

RED MONITOR BOARD PROGRAMMING

(position jumpers as shown below)



IN-CYCLE FLASH PROGRAMMING NOTE FOR HEADS 21,22,23,61 AND 62

(program controller as noted below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phases 2 and 6 for 'Green Int Flash'. This is done to flash phases 2 and 6 yellow when not in Preempt.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0946
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail
Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 (Military Cutoff Road) at Wilmington Fire Station #9

Division 3 New Hanover County Wilmington

PLAN DATE: November 2021	REVIEWED BY: WJ Hamilton		
PREPARED BY: A. Andrews	RKA PROJ. NO.: 19258 (040)		
REVISIONS		INIT.	DATE

750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton 11/08/2021
ASSISTANT ENGINEER DATE

SIG. INVENTORY NO. 03-0946

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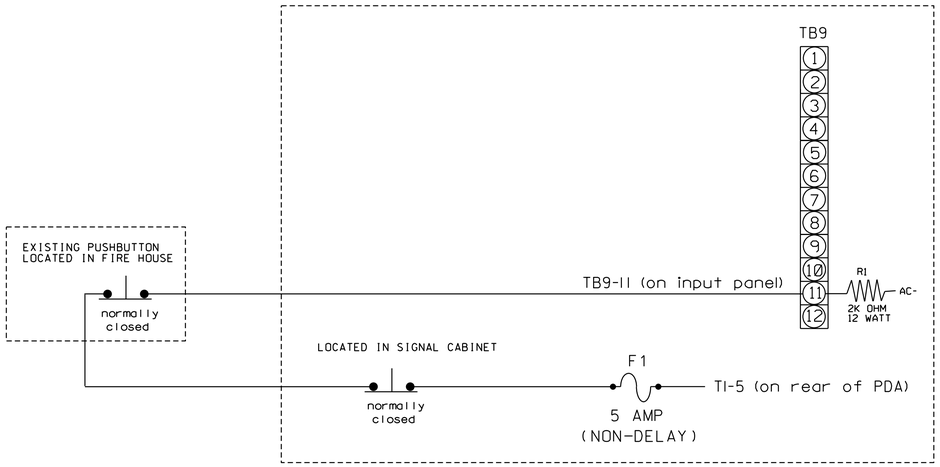
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-5.2

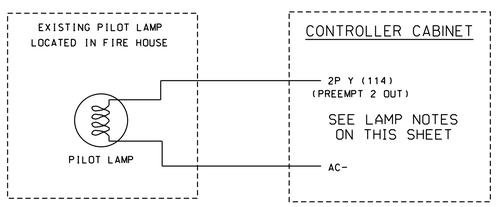
EMERGENCY VEHICLE PREEMPTION PUSHBUTTON AND INDICATOR LAMP WIRING DETAIL

(wire push-button and lamp as shown below)



IMPORTANT!

1. Make sure AC isolator inserted in Slot J14L is set for inverted input.
2. Connect terminal TB9-12B (on input panel) to AC neutral (jumper may need to be added).

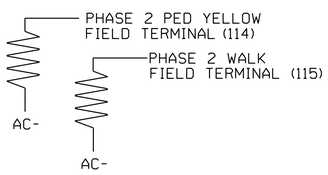


LAMP NOTES

In order for the pilot lamp in the fire house to function, make the following programming changes to Output No. 33:

1. Change the function of C1 pin 35 to be an output for Preempt 2. This is accomplished by the following:
   - A) From Main Menu select '6' (Outputs). Then select '1' (Output Assignments).
   - B) Scroll to C1 pin 35, Output No. 33. You will see that it is not enabled.
   - C) Scroll down to Preempt and input 'YES'. You will then be asked for a preempt number. Enter a '2' here.
   - D) The output is now assigned for PRE-2 output.
2. If field terminal 114 has a conflict monitor wire attached, remove, tape, and label wire.
3. Make sure load resistors are in place as shown in the Load Resistor Installation Detail.
4. Install a loadswitch in Output File Slot S2P.

LOAD RESISTOR INSTALLATION DETAIL



ACCEPTABLE VALUES

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

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL FOR SPECIAL OPERATIONS

NOTE

When preempt delay time is used, Step 1 below is necessary to ensure the pilot lamp in the fire house will activate immediately after the push button is depressed:

STEP 1

From Main Menu: Press '6' (Outputs), then select '3' (Logical I/O Processor).

NOTICE OR CONDITION →

```
LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  INPUT  ASSIGNMENT #14 IS ON
OR  ACTIVE PREEMPTION #2  IS ON

        ↓

      SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #33 ON
```

NOTE: PREEMPT INDICATOR LAMP CONTROL.

STEP 2

NOTE

In order for pilot lamp in fire house to deactivate immediately after ending preemption, program the following:

Toggle the '+' button once to access Logical I/O Command #2.

NOTICE AND CONDITION →

```
LOGICAL I/O COMMAND #2   (+/-COMMAND#)
IF  INPUT  ASSIGNMENT #14 IS OFF
AND  ACTIVE PREEMPTION #2  IS OFF

        ↓

      SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #33 OFF
```

NOTE: PREEMPT INDICATOR LAMP CONTROL.

STEP 3

NOTE

In order to clear signal heads 81,82 from dark to a steady red during clearance intervals 1 and 2, program the following:

Toggle the '+' button once to access Logical I/O Command #3.

NOTICE AND CONDITION →

```
LOGICAL I/O COMMAND #3   (+/-COMMAND#)
IF   GREEN ON PHASE #2  IS ON
AND GREEN ON PHASE  #6  IS ON.

        ↓

      SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT  #19 OFF
```

NOTE: SIGNAL HEADS 81,82 RED CONTROL.

STEP 4

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable logical processor (Act Logic 1-16) by flagging #1, #2 and #3.

END OF PROGRAM.

EMERGENCY VEHICLE PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press 'NEXT' to advance to Preemption #2.

```
   PREEMPTION  #2  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN YEL  RED   | 123456789101112131415 16
1 255  3.0  3.1  |        X
2   0  0.0  0.0  |
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   1  0.0  0.0  | X   X
EXIT CALLS       |
          OPTIONS
PRIORITY (Y/N TO SELECT) ............MED
DELAY TIMER (0-255 SEC) .............*
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....0
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........*
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................Y
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......N
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............Y
OVERLAPS:                  | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW     |
OMIT OVERLAPS:             |
```

* Denotes timing to be determined in field.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0946
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

Electrical Detail
Sheet 2 of 2

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 (Military Cutoff Road)
at
Wilmington Fire Station #9

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ. NO.:	19258 (040)

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by:
William J. Hamilton
A0560D2D4A4F84BE
11/08/2021
DATE

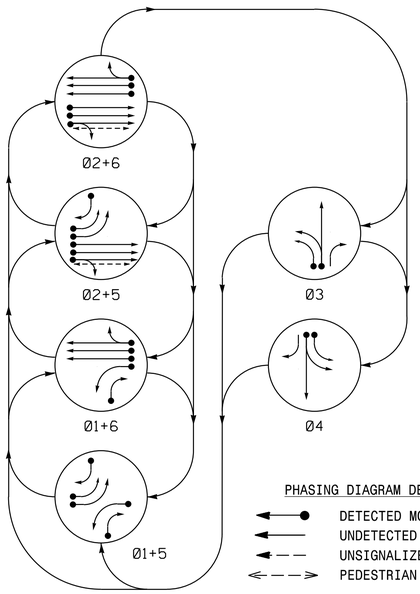
SIG. INVENTORY NO. 03-0946

NC Department of Transportation Mobility and Safety Division
Traffic Engineering & Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

DocuSign Envelope ID: BC993C83-7488-4378-9D99-61583583DEA0

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-6.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

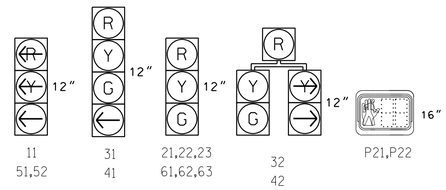
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03	04	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~R~~	~~Y~~
21,22,23	R	R	G	G	R	R	Y
31	R	R	R	R	G ←	R	R
32	R → /	R → /	R	R	G	R	R
41	R	R	R	R	R	G ←	R
42	R → /	R	R → /	R	R	G	R
51,52	←	~~R~~	←	~~R~~	~~R~~	~~R~~	~~Y~~
61,62,63	R	G	R	G	R	R	Y
P21,P22	DW	DW	W	W	DW	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



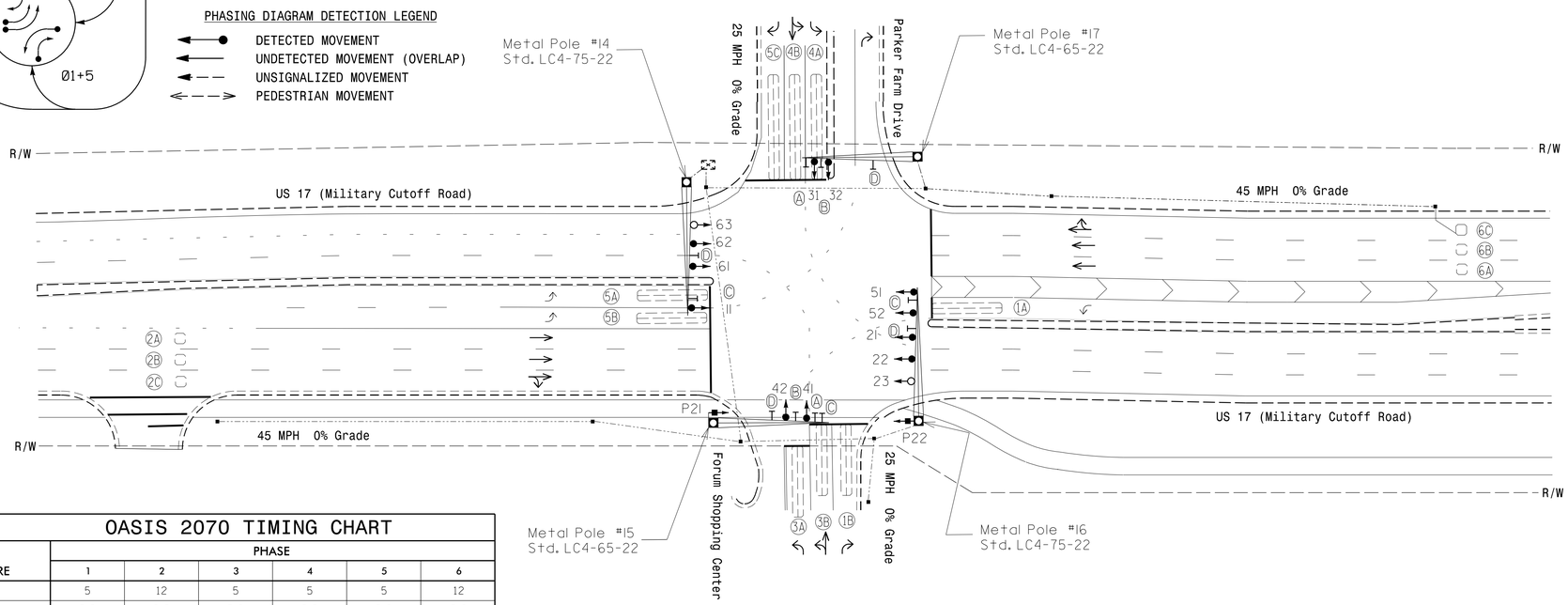
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	-	-	-
1B	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	-
2A	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	-
2B	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	-
2C	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	-
3A	6X40	0	2-4-2	-	3	Y	-	-	-	3	-	-
3B	6X40	0	2-4-2	-	3	Y	-	-	-	-	-	-
4A	6X60	0	2-4-2	-	4	Y	Y	-	-	-	-	-
4B	6X60	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	-	-	-
5B	6X40	0	2-4-2	-	5	Y	Y	-	-	-	-	-
5C	6X60	0	2-4-2	-	5	Y	Y	-	-	15	-	-
6A	6X6	300	EXIST	-	6	Y	Y	-	-	-	-	-
6B	6X6	300	EXIST	-	6	Y	Y	-	-	-	-	-
6C	6X6	300	EXIST	Y	6	Y	Y	-	-	-	-	Y

6 Phase
Fully Actuated
(Wilmington Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Reposition existing signal heads numbered 21, 22, 61 and 62.
7. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
11. Signal system data:
    Controller Asset #: 0895.
12. Reposition existing sign 'D' on Metal Pole #14.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Combined Through and Left Arrow Sign (R3-6L)	Ⓑ
Ⓒ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓒ
Ⓓ	Street Name Sign	Ⓓ

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green 1 *	5	12	5	5	5	12
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0
Max Green 1 *	15	100	20	30	15	100
Yellow Clearance	3.0	4.5	3.2	3.2	3.0	4.5
Red Clearance	3.5	1.4	3.3	3.3	3.5	1.6
Walk 1 *	-	7	-	-	-	-
Don't Walk 1	-	20	-	-	-	-
Seconds Per Actuation *	-	1.2	-	-	-	1.2
Max Variable Initial *	-	34	-	-	-	34
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	30	-	-	-	30
Minimum Gap	-	3.0	-	-	-	3.0
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

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Signal Upgrade

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Prepared for: Transportation Mobility and Safety Division, Signal Design Section, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N.Greenfield Pkwy,Garner,NC 27529

RKA
RAMEY KEMP ASSOCIATES
5808 Farlingdon Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

US 17 (Military Cutoff Road) at Forum Shopping Center/ Parker Farm Drive

Division 3 New Hanover County Wilmington

PLAN DATE: November 2021 REVIEWED BY: WJ Hamilton
PREPARED BY: A. Andrews RKA PROJ. NO: 19258 (040)

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by:
William J. Hamilton
SIGNATURE
11/08/2021
DATE

SIG. INVENTORY NO. 03-0895

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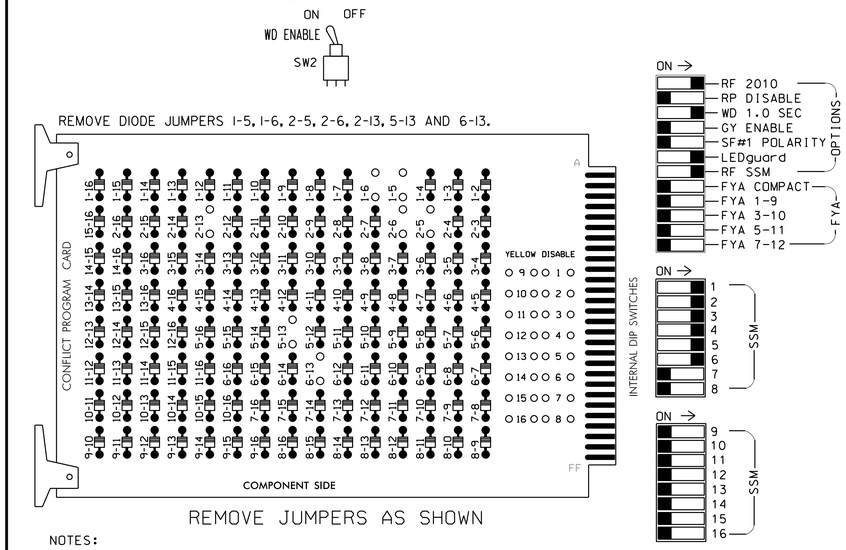
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	Sig-6.1

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL2-SEL5 are present on the monitor board.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that red enable is active at all times during normal operation. To prevent red failures on unused monitor channels, tie unused red monitor unputs 7,8,9,10,11,12,13,14,15 & 16 to load switch AC+ per cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all Phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Startup In Green.
6. Program phase 2 for Startup Ped Call.
7. Program phases 2 and 6 for Yellow Flash.
8. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET 332
SOFTWARE .....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S2P,S3,S4,S5,S6
PHASES USED.....1,2,2PED,3,4,5,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S2P	S3		S4		S4P	S5		S6	S6P	S7	S8	S8P
PHASE	1		2	2 PED	3		4		4 PED	5		6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	32	21,22 23	P21, P22	31	32	41	42	NU	42	51,52	61,62, 63	NU	NU	NU	NU
RED			128		116	116	101	101				134				
YELLOW			129		117	117	102	102				135				
GREEN			130		118	118	103	103				136				
RED ARROW	125										131					
YELLOW ARROW	126	126								132	132					
GREEN ARROW	127	127			118		103			133	133					
✋				113												
🚶				115												

NU = NOT USED

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1 1A	Ø 1 1B	Ø 2 2B	SLOT EMPTY	Ø 3 3A	Ø 4 4A	SLOT EMPTY	Ø 3 3B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	Ø 2 2A	Ø 2 2C		NOT USED	Ø 4 4B		NOT USED				NOT USED		ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	Ø 5 5B	Ø 6 6A	Ø 6 6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø 5 5C	Ø 6 6B	NOT USED										

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2A	TB2-7,8	I2L	43	5	12	2	Y	Y			
2B	TB2-9,10	I3U	63	25	32	2	Y	Y			
2C	TB2-11,12	I3L	76	38	42	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y				3
3B	TB6-5,6	I8U	49	11	24	3	Y				
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			
5C	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
6C	TB5-1,2	J4U	48	10	26	6	Y	Y			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0895
DESIGNED: Nov 2021
SEALED: 11/08/2021
REVISED: N/A

RAMEY KEMP ASSOCIATES
5808 Faringdon Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

Electrical Detail

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 (Military Cutoff Road)
at
Forum Shopping Center/
Parker Farm Drive

Division 3 New Hanover County Wilmington

PLAN DATE: November 2021	REVIEWED BY: WJ Hamilton		
PREPARED BY: A Andrews	RKA PROJ. NO: 19258 (040)		
REVISIONS		INIT.	DATE

750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton
SIGNATURE 11/08/2021 DATE

SIG. INVENTORY NO. 03-0895

11/8/2021
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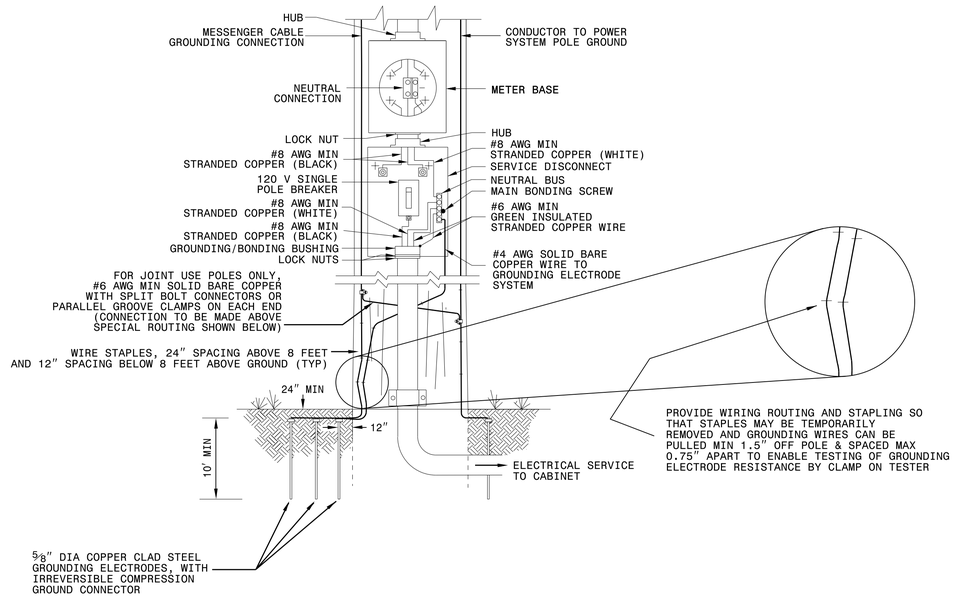


STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

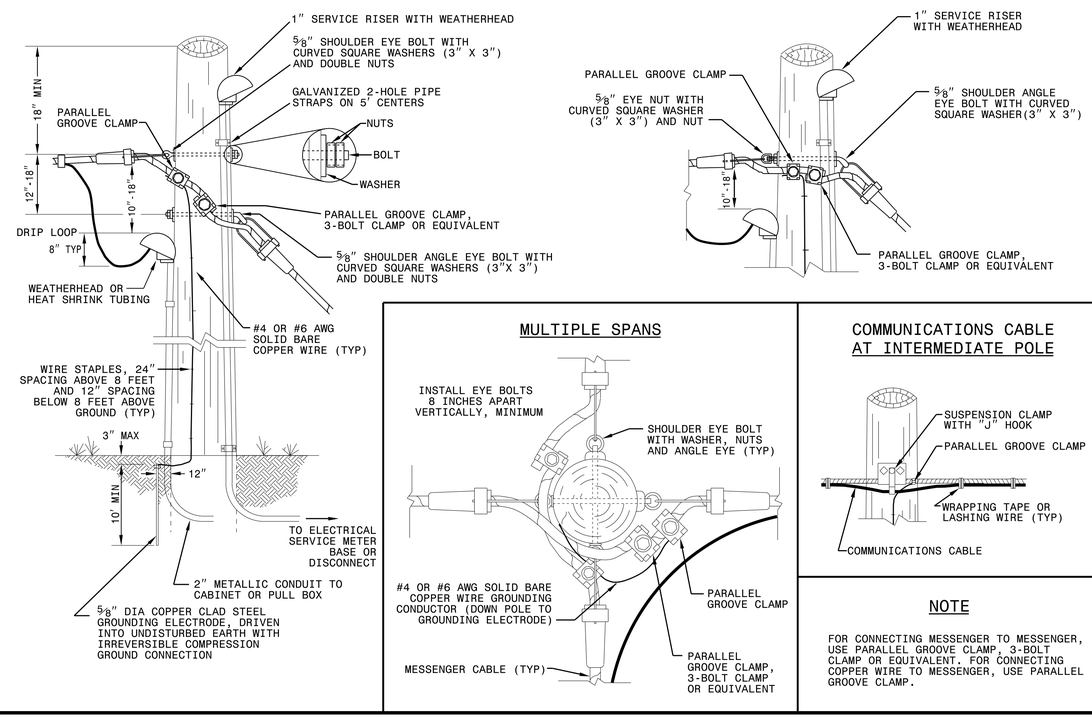
ENGLISH STANDARD DRAWING FOR

ELECTRICAL SERVICE GROUNDING

GROUNDING AND BONDING

SHEET 1 OF 1

1700D01



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

1-18

ENGLISH STANDARD DRAWING FOR

WOOD POLES

METHODS OF ATTACHMENT AND GROUNDING

SHEET 1 OF 1

1720D01

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See Plate for Title

Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS & Signals Unit

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032108 ENGINEER MOHD A. ASLAMI

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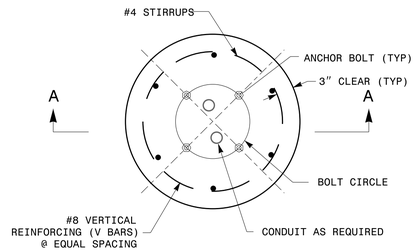
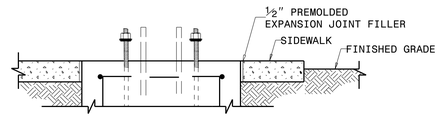
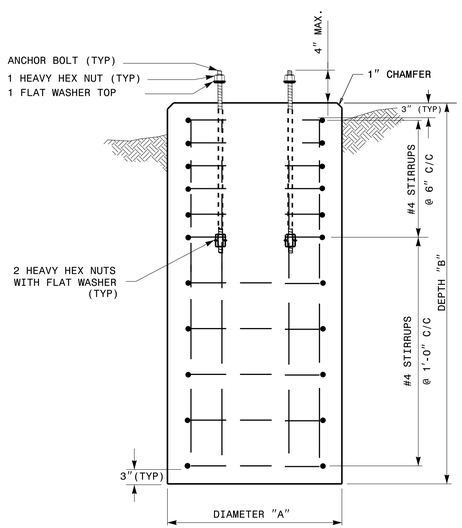


PEDESTAL FOUNDATION - PLAN VIEW

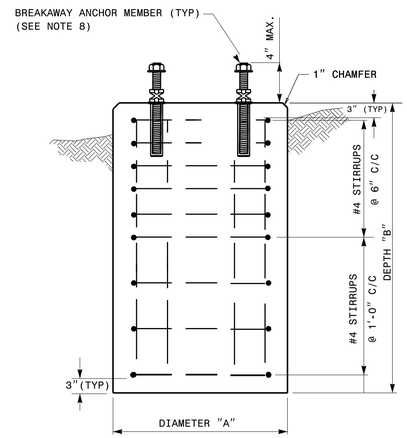


PEDESTAL FOUNDATION DETAILS FOR SIDEWALK



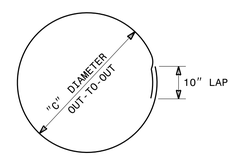
TYPES I, II & III

SECTION A-A



TYPES I & II ONLY

SECTION A-A

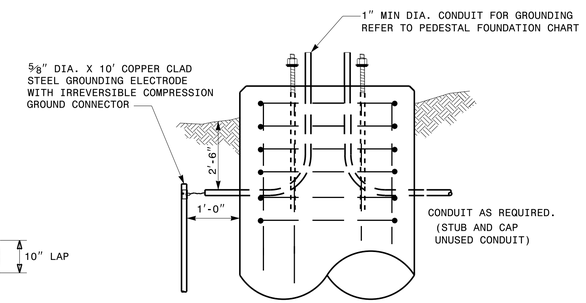


CLOSED HOOPS

NOTES:

1. CAST FOUNDATION AGAINST UNDISTURBED SOIL WHEREVER CONDITIONS PERMIT. IN UNSTABLE SOIL, CAST-IN-PLACE TUBE FORMS ARE ALLOWED WITH APPROVAL.
2. COMPLY WITH APPLICABLE PROVISIONS OF SECTION 825 FOR CONCRETE CONSTRUCTION.
3. USE CLASS "A" CONCRETE THAT MEETS THE REQUIREMENTS OF SECTION 1000 WITH A COMPRESSION STRENGTH AT 28 DAYS OF F'c= 3000 PSI (MIN.).
4. USE ASTM GRADE 60 DEFORMED BARS FOR ALL REINFORCING STEEL.
5. GRADE IS ASSUMED TO BE (8H:1V) OR FLATTER. FOUNDATION SIZE AND DEPTHS ARE BASED ON THE FOLLOWING SOIL DESIGN PARAMETERS:
   A. SANDY TYPE SOIL
   B. NO GROUND WATER WITHIN 5'-0" OF SURFACE ELEVATION
   C. WIND SPEED NOT TO EXCEED 140 MPH

   IF ACTUAL CONDITIONS VARY SUBSTANTIALLY FROM THOSE ASSUMED, THE FOUNDATION DEPTH MAY BE ADJUSTED. IN THIS CASE, CONTACT THE ENGINEER.
6. MAINTAIN AT LEAST 3" COVER ON ALL REINFORCEMENT.
7. ORIENT CONDUIT AS REQUIRED BY THE DESIGN OR AS DICTATED BY FIELD CONDITIONS.
8. USE ADHESIVE ANCHOR FOR THREADED COUPLING INSERT. FOR TYPE I MINIMUM DEPTH NECESSARY IS 0'-4½" AND FOR TYPE II MINIMUM DEPTH NECESSARY IS 0'-6⅝". FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.



GROUNDING & CONDUIT DETAIL

PEDESTAL FOUNDATION TYPE AND SIZE

TYPE	PEDESTAL DESCRIPTION	SIZE			ANCHOR BOLT		INSTALL GROUNDING SYSTEM (YES/NO)
		DIAMETER "A" FT	DEPTH "B" FT	CONCRETE VOLUME CY	DIAMETER (MIN.) IN	LENGTH FT-IN	
I	PEDESTRIAN PUSHBUTTON	2'-0"	3'-6"	.41	½	1'-6"	NO
II	NORMAL-DUTY	2'-0"	5'-0"	.58	¾	2'-0"	YES
III	HEAVY-DUTY	2'-6"	7'-0"	1.27	1	4'-0"	YES

REINFORCING STEEL SCHEDULE

TYPE	V-BAR				STIRRUP								TOTAL STEEL WEIGHT LBS
	SIZE #	QTY	LENGTH	WEIGHT LBS	SIZE #	QUANTITY VERTICAL SPACING ON 6" CENTERS	QUANTITY VERTICAL SPACING ON 12" CENTERS	QUANTITY TOTAL	LENGTH	DIAMETER "C" FT	OVERLAP MIN.	WEIGHT LBS	
I	8	6	3'-0"	56	4	0	4	4	5'-7"	1'-6"	0'-10"	15	71
II	8	6	4'-6"	86	4	5	3	8	5'-7"	1'-6"	0'-10"	30	116
III	8	6	6'-6"	122	4	7	4	11	7'-2"	2'-0"	0'-10"	53	175

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

1-18

ENGLISH STANDARD DRAWING FOR
PEDESTALS
FOUNDATIONS

SHEET 1 OF 1

1743D01

See Plate for Title

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Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS & Signals Unit

750 N. Greenfield Parkway
Garner, NC 27529

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
028094
ENGINEER
DEBESH C. SARKAR

DocuSigned by:
Debesh C. Sarkar
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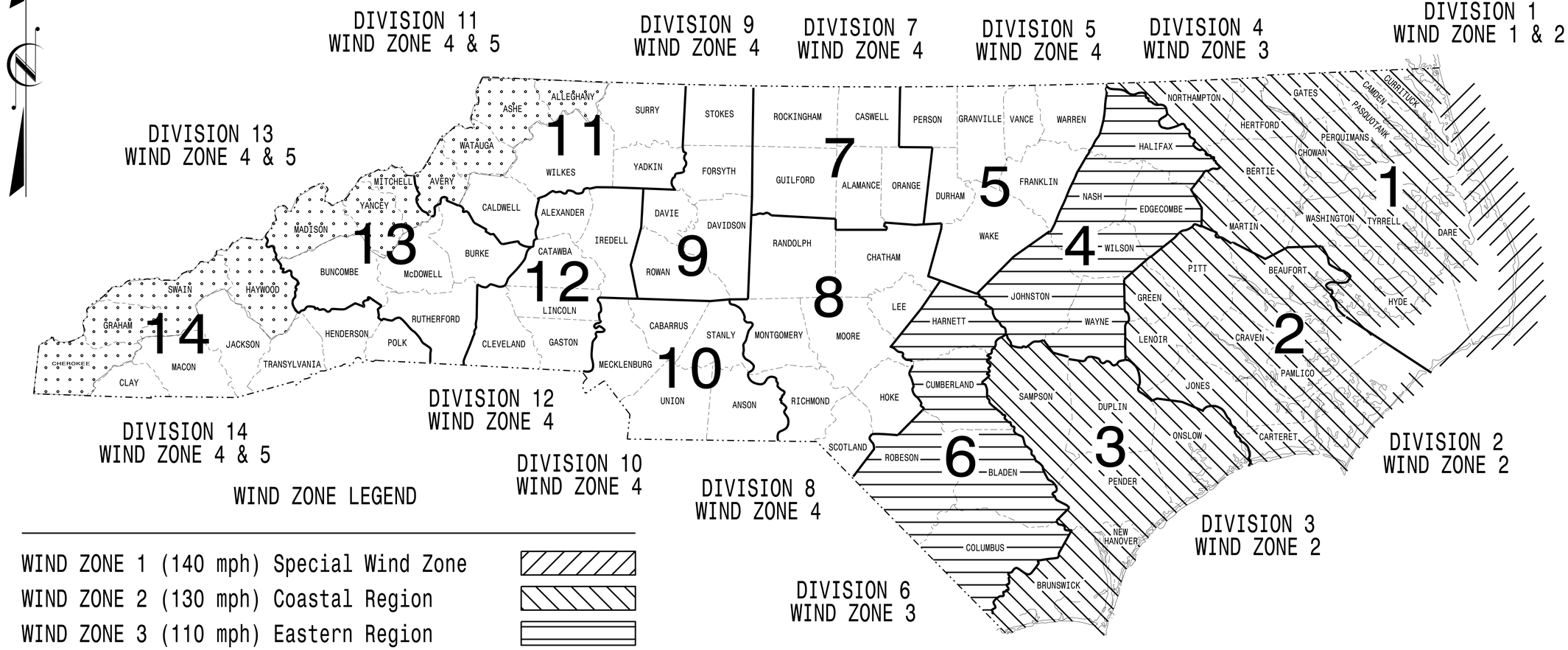
NCDOT METAL POLE STANDARDS

PROJECT I.D. NO.	SHEET NO.
U-5710A	Sig.M1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR ALL METAL POLES



WIND ZONE LEGEND

WIND ZONE 1 (140 mph) Special Wind Zone	
WIND ZONE 2 (130 mph) Coastal Region	
WIND ZONE 3 (110 mph) Eastern Region	
WIND ZONE 4 (90 mph) Central & Mtn. Region	
WIND ZONE 5 (120 mph) Special Wind Zone	

https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.
Garner,NC 27529

Designed in conformance with the latest 2015 Interim to the 6th Edition 2013

AASHTO

Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals

INDEX OF PLANS

DRAWING NUMBER	DESCRIPTION
Sig. M 1	Statewide Wind Zone Map
Sig. M 2	Typical Fabrication Details–All Metal Poles
Sig. M 3	Typical Fabrication Details–Strain Poles
Sig. M 4	Typical Fabrication Details–Mast Arm Poles
Sig. M 5	Typical Fabrication Details–Mast Arm Connection
Sig. M 6	Typical Fabrication Details–Strain Pole Attachments
Sig. M 7	Construction Details–Foundations
Sig. M 8	Standard Strain Pole Foundation–All Soil Conditions

NCDOT CONTACTS:

MOBILITY AND SAFETY DIVISION – ITS AND SIGNALS UNIT

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J. P. GALLOWAY, P.E. – STATE SIGNALS ENGINEER

D.C. SARKAR, P.E. – ITS AND SIGNALS SENIOR STRUCTURAL ENGINEER

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar
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SIGNATURE

10/11/2017
DATE

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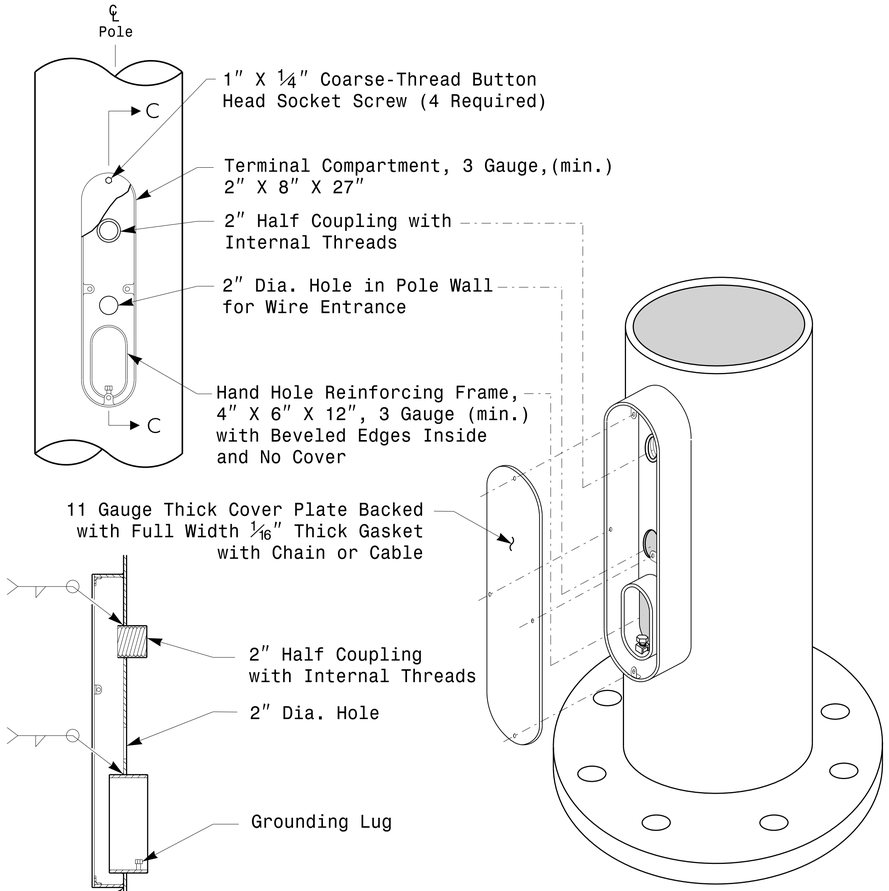
PROJECT ID. NO.	SHEET NO.
U-5710A	Sig.M2

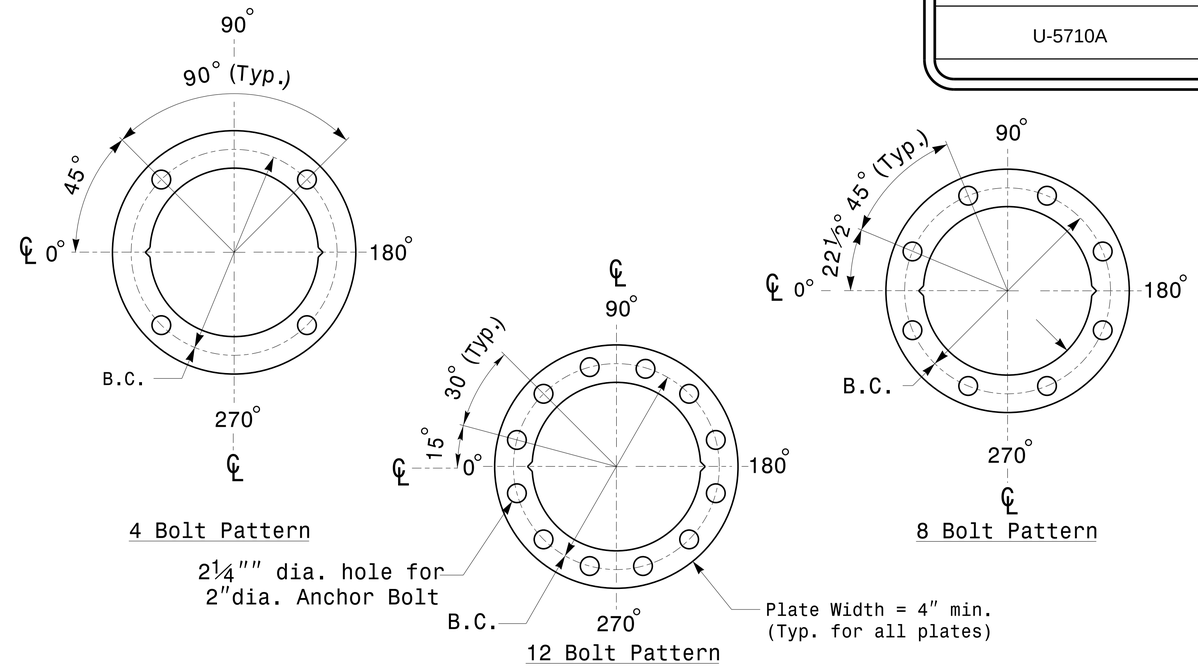
Fabrication Details – All Metal Poles



Section C-C

Note: Unless otherwise specified, locate Terminal Compartment 1 foot above the pole base plate at 180 degrees on the pole's radial index.

Terminal Compartment Detail



Construct Templates and Plates from ¼″ min. thick Steel. Galvanizing is not required.

Base Plate Template and Anchor Bolt Lock Plate Details

MFG _____ MFG. DATE: MM/YY
SHAFT D/T/L/Y ----/----/----/----
ARM-A D/T/L/Y ----/----/----/----
----/----/----/----
ARM-B D/T/L/Y ----/----/----/----
----/----/----/----
A.B. DIA./B.C./L/Y ----/----/----/----
NCDOT SIG. INV. NO. _____
NCDOT POLE NO. _____

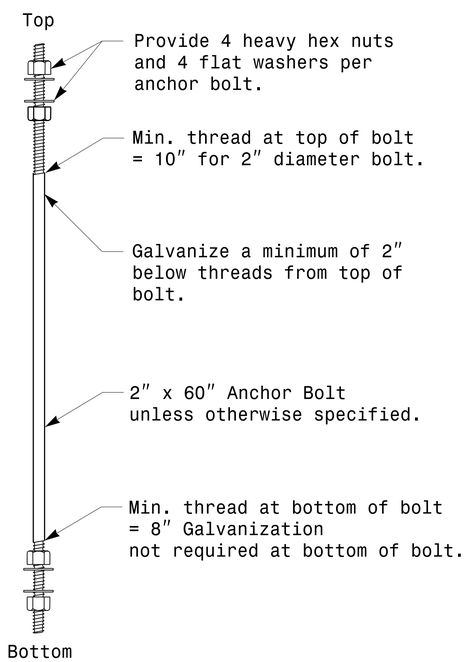
Shaft I.D. Tag
(Provide on Shaft of Strain Poles and Mast Arm Poles Shaft)

MFG _____ MFG. DATE: MM/YY
SECTION D/T/L/Y ----/----/----/----
NCDOT SIG. INV. NO. _____
NCDOT POLE NO. _____

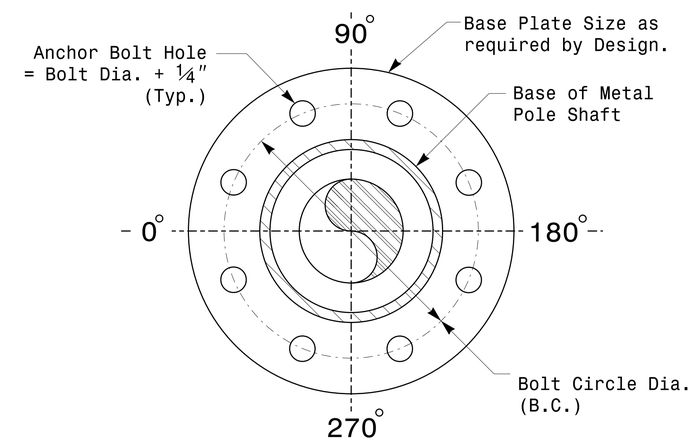
Arm I.D. Tag
(Provide on each section of a multi-section mast arm.)

Notes:
1) D= Diameter, T= Thickness, L= Length, Y= Yield Strength
2) A.B. = Anchor Bolt
3) B.C. = Bolt Circle of Anchor Bolts
4) If Custom Design, use "NCDOT STANDARD" line for Signal Inv. Number and pole I.D. number
5) See drawing M3 and M4 for mounting positions of I.D. tags.

Identification Tag Details



Anchor Bolt Detail



Note: Base plate may be circular,octagonal,square or rectangular in shape.

Typical Base Plate Detail

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 NA NONE

Typical Fabrication Details For All Metal Poles

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	C.F.ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44EBE32D9A4... SIGNATURE 10/11/2017 DATE

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rzalfman

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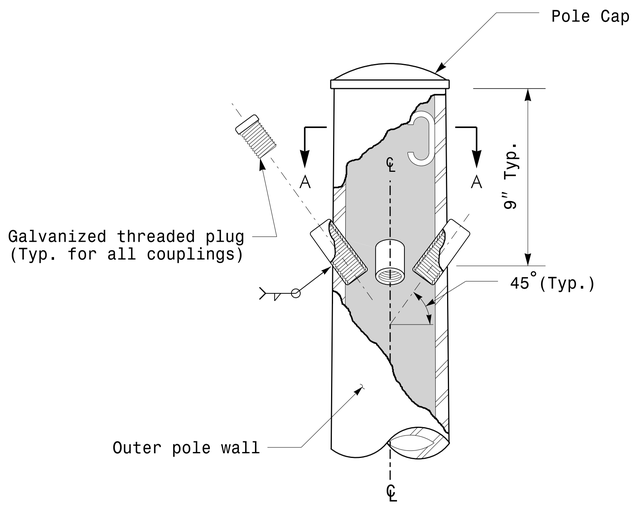
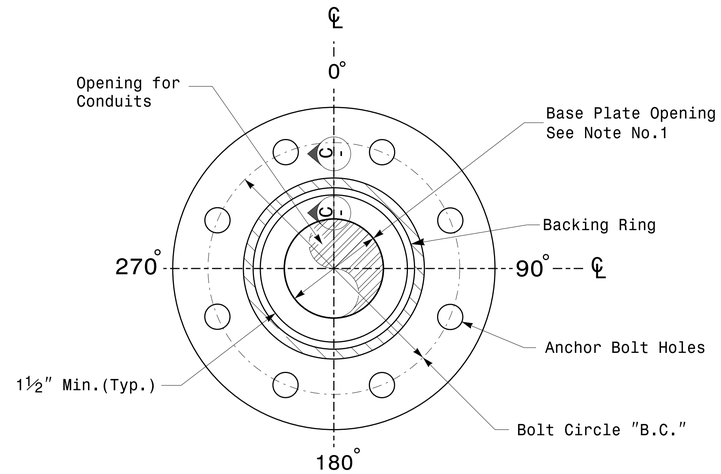
PROJECT ID. NO.	SHEET NO.
U-5710A	Sig.M3

Fabrication Details – Strain Poles

Note:
1. Opening in pole base plate shall be equal to pole base inside diameter minus 3½″ but shall not be less than 8½″.

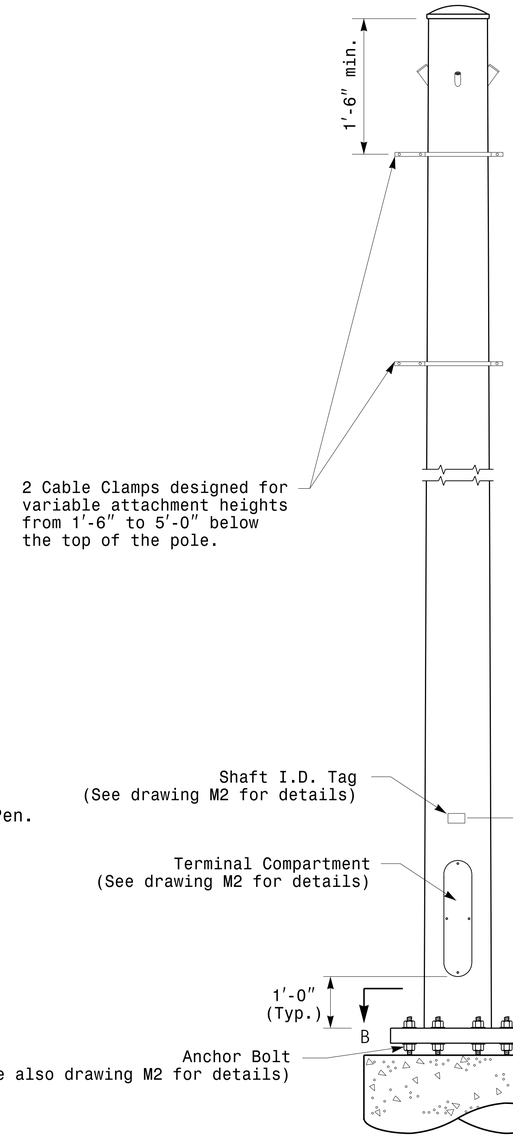


Cable Entrances at Top of Pole

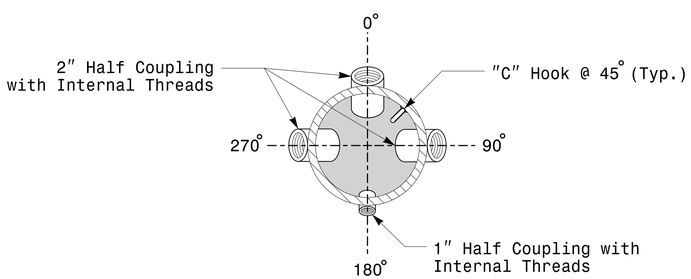


Section B-B

Pole Base Plate Details
(8 and 12 Bolt Pattern)

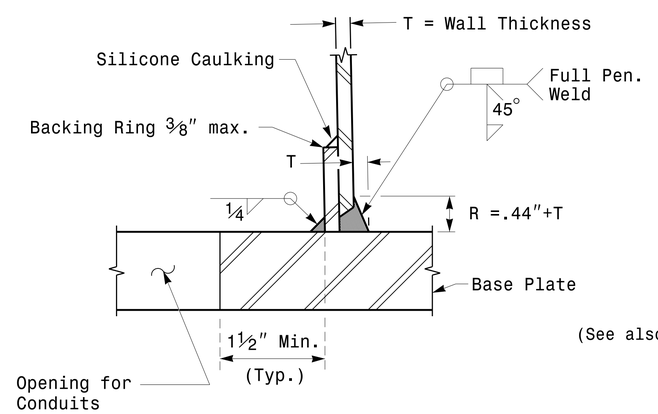


Monotube Strain Pole



Section A-A

Radial Orientation for Factory Installed
Accessories at Top of Pole



Section C-C
(Pole Attachment to Base Plate)

Full-Penetration
Groove Weld Detail

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE
0 NA
NONE

Typical Fabrication Details
For
Strain Poles

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	K.C.DURIGON
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by:
Debesh C. Sarkar
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SIGNATURE

10/11/2017
DATE

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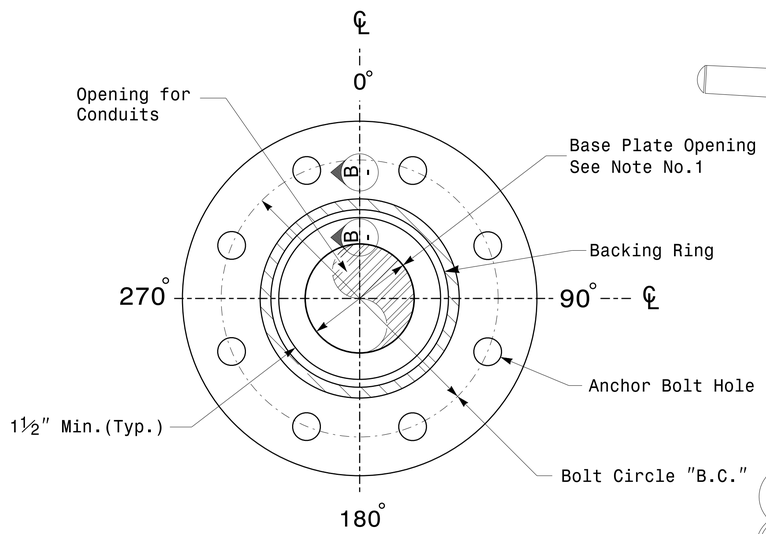
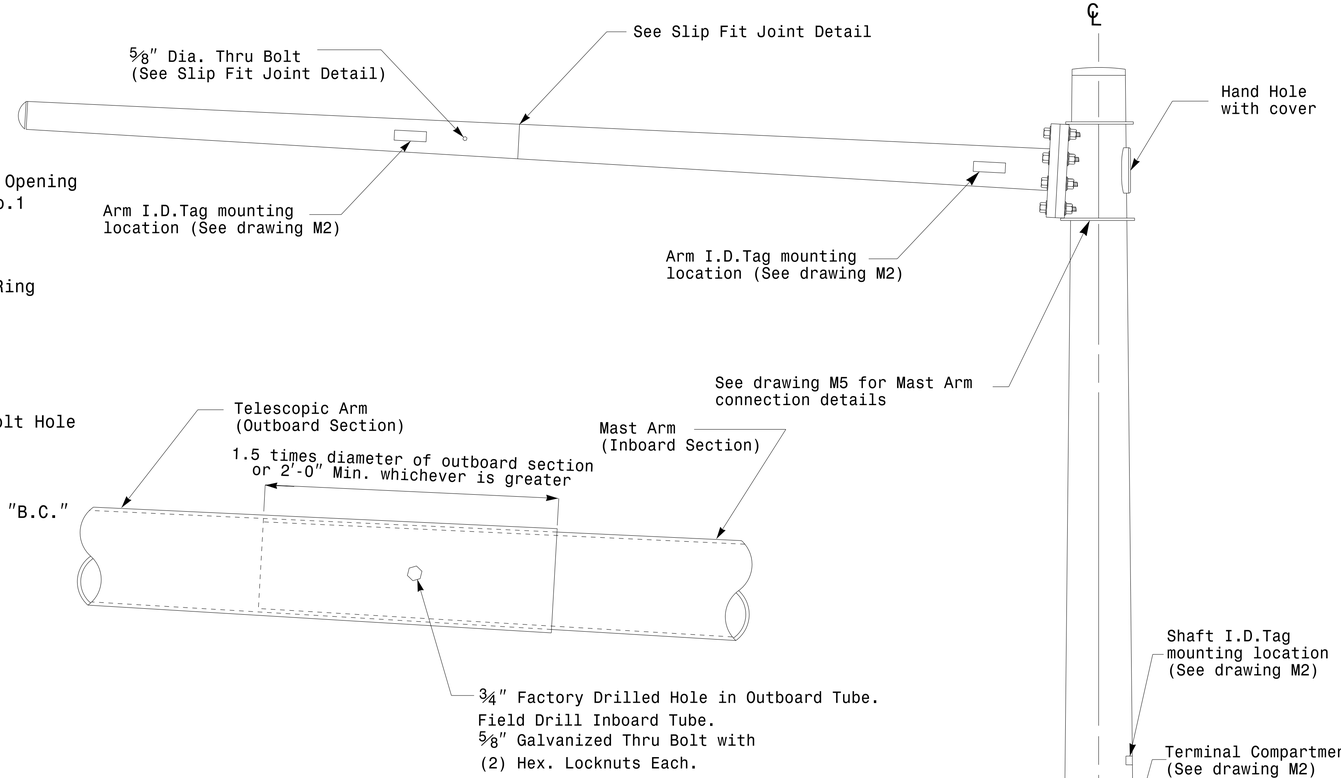
PROJECT ID. NO.	SHEET NO.
U-5710A	Sig.M4

Note:
1. Opening in pole base plate shall be equal to pole base inside diameter minus 3½″ but shall not be less than 8½″.

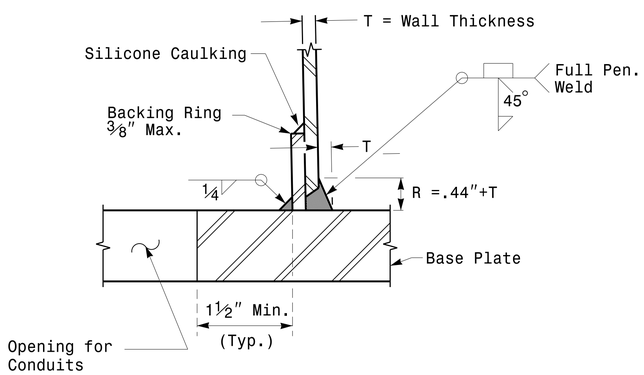


Section A-A

Pole Base Plate Details

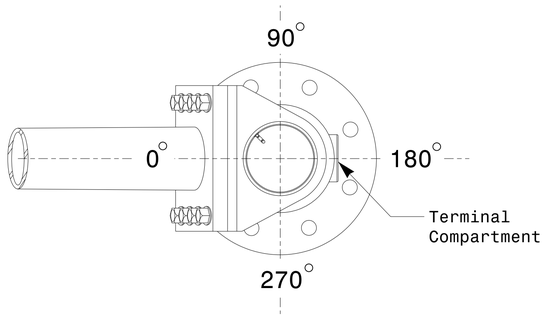


Slip Fit Joint Detail for Mast Arm

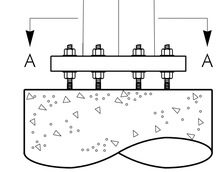


Section B-B
(Pole Attachment to Base Plate)

Full-Penetration Groove Weld Detail



Mast Arm Radial Orientation



Mast Arm Pole

Fabrication Details – Mast Arm Poles

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE
0 NA
NONE

Typical Fabrication Details
For
Mast Arm Poles

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	K.C.DURIGON
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar
SIGNATURE
10/11/2017
DATE

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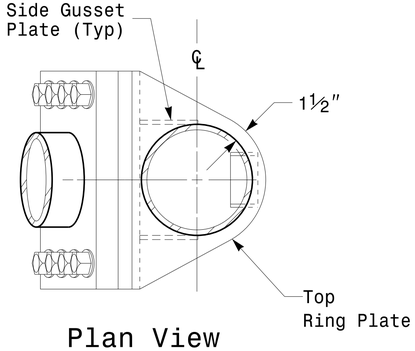
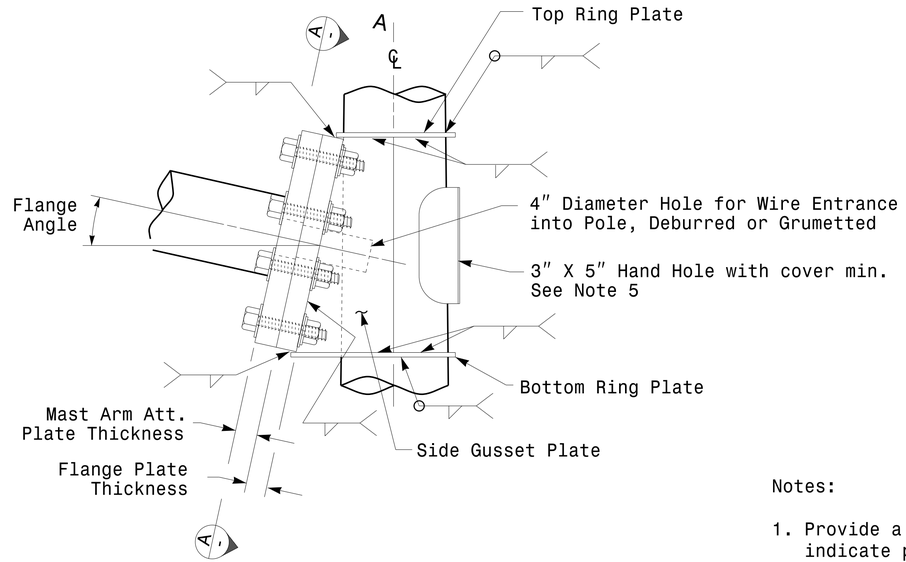
Welded Ring Stiffened Mast Arm Connection

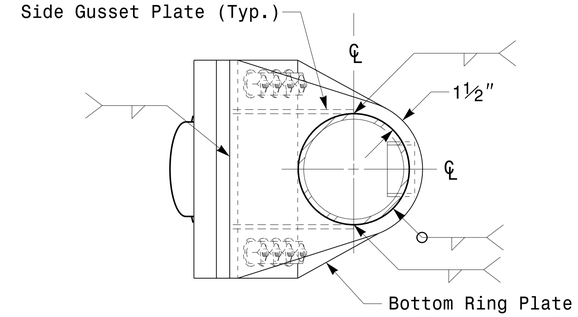
PROJECT ID. NO.	SHEET NO.
U-5710A	Sig.M5



Plan View



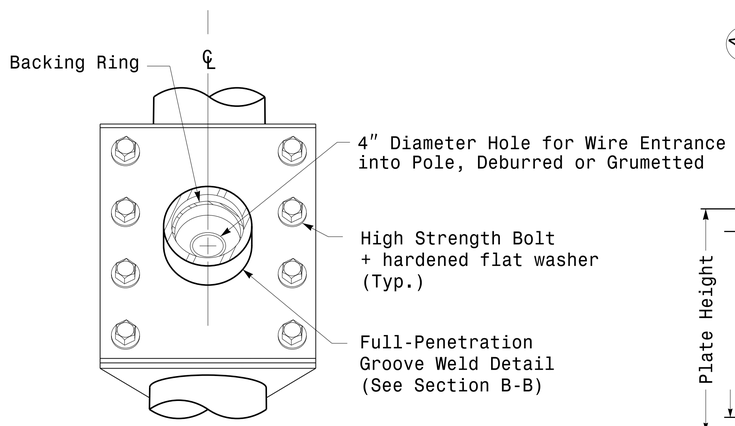
Side Elevation View



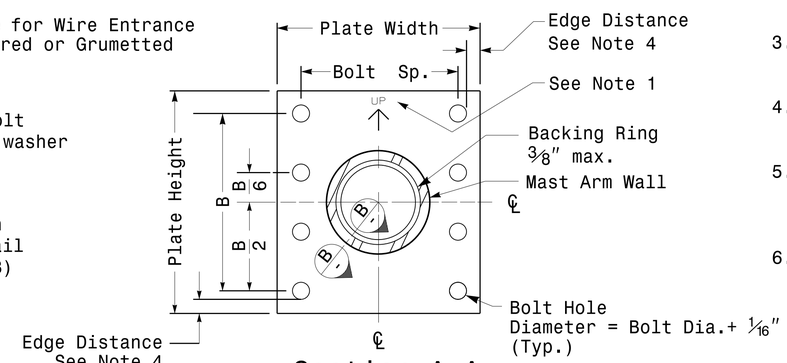
Bottom View

Notes:

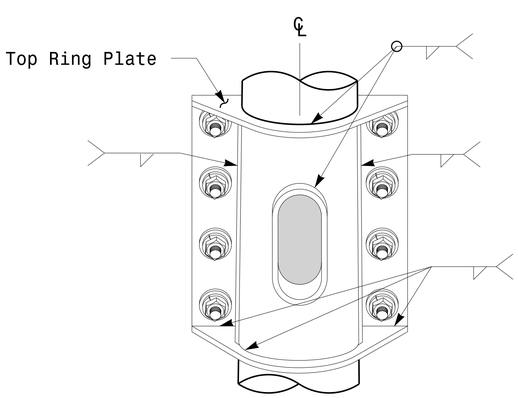
1. Provide a permanent means of identification above the mast arm to indicate proper attachment orientation of the mast arm.
2. Designer will determine the size of all structural components, plates, fasteners, and welds shown unless they are already specified.
3. Fabricator is responsible for providing appropriate holes at drainage points to drain galvanizing materials.
4. For minimum edge distance follow AISC Table J3.4 and J3.5. For nominal bolt hole size use Table J3.3.
5. Provide upper handhole as necessary when shaft extensions are reguired for luminaire arms or camera. For poles without luminaires/camera, wiring can be done through the top of pole.
6. Allowable range of flange tilt angle will vary from 0° to as required.



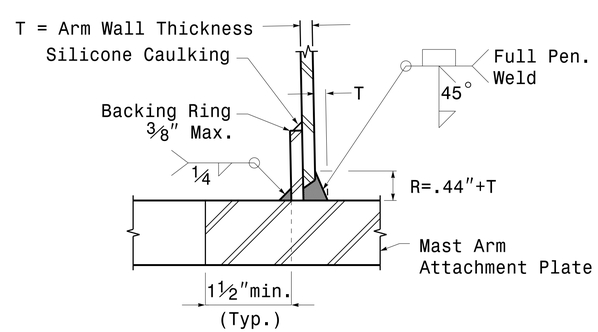
Front Elevation View



Section A-A
Mast Arm Attachment Plate



Back Elevation View



Section B-B
Full-Penetration Groove Weld Detail

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE
0 NA
NONE

Typical Fabrication Details
For
Mast Arm Connection To Pole

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	C.F.ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar
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SIGNATURE

10/11/2017
DATE

Fabrication Details – Mast Arm Connection

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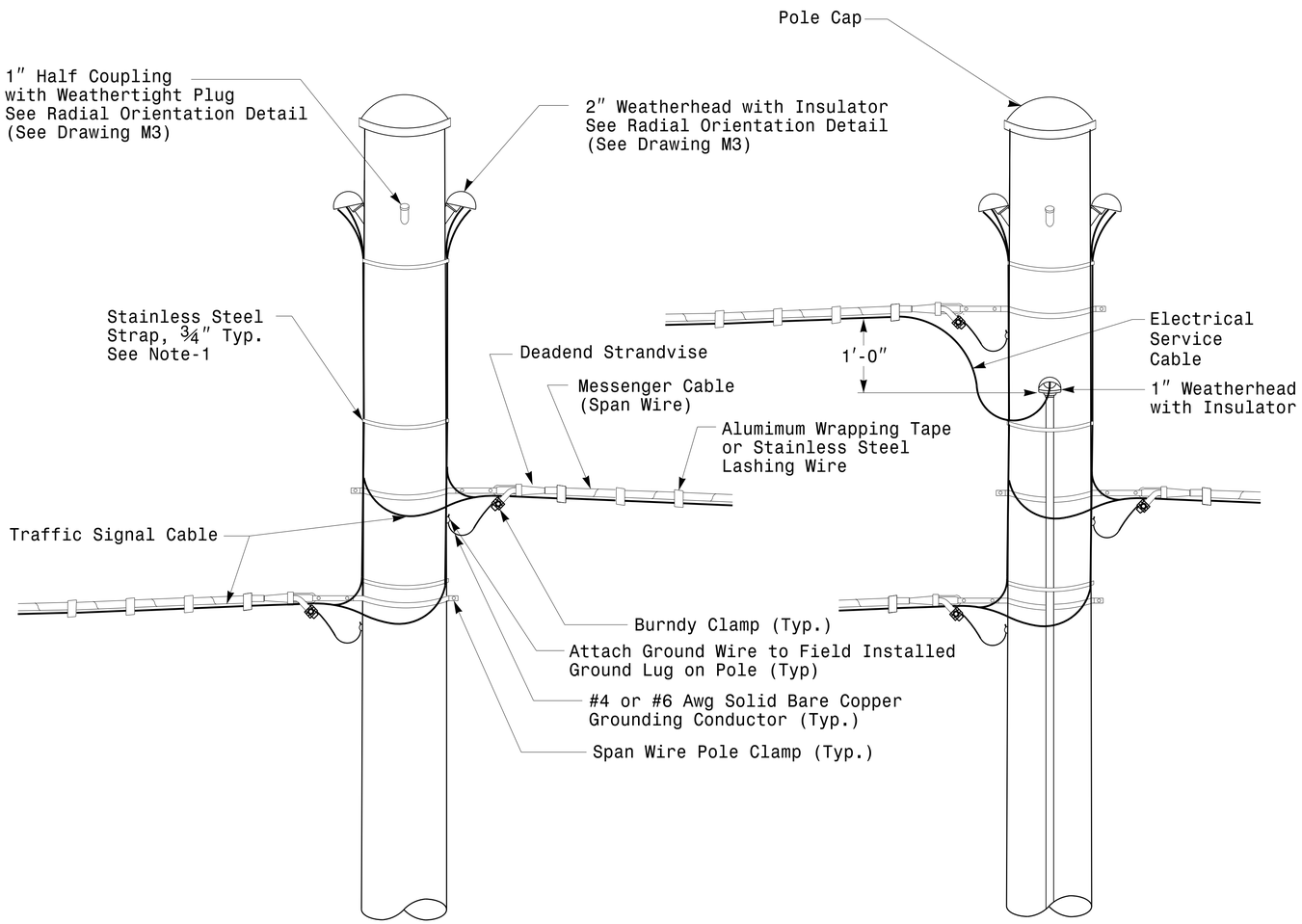
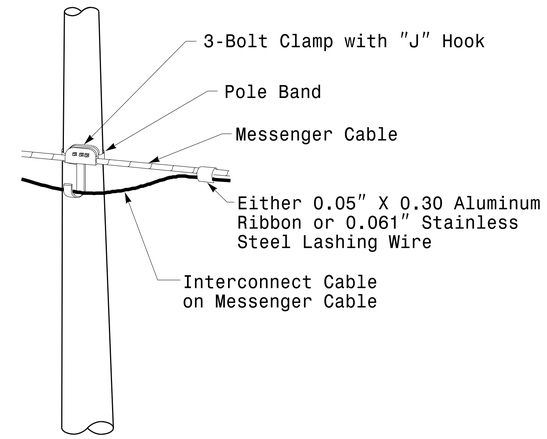
PROJECT ID. NO.	SHEET NO.
U-5710A	Sig.M6

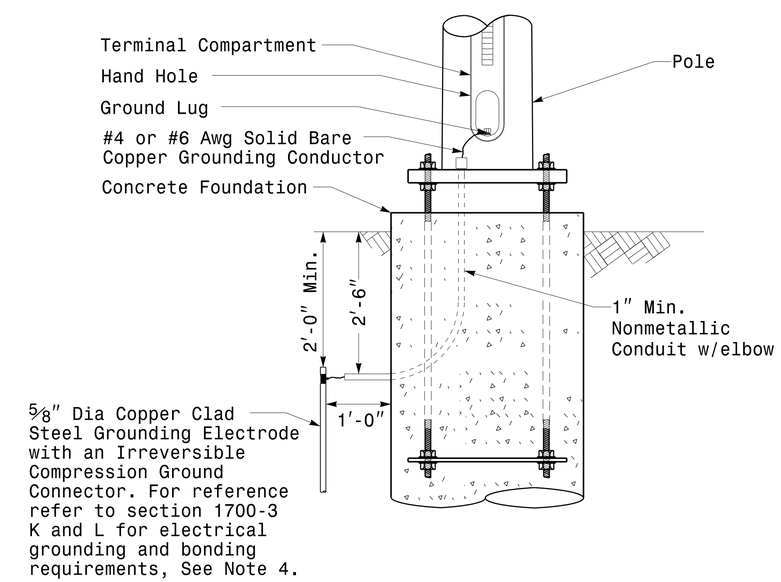
Fabrication Details – Strain Pole Attachments



Strain Pole Attachments



Attachment of Cable to Intermediate Metal Pole



Metal Pole Grounding Detail For Strain Pole and Mast Arm

NOTE:

1. Strap all signal cables to the side of the pole with ¾″ stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 3′-0″.
2. Provide minimum two spanwire pole clamps per pole.
3. It is prohibited to attach two span wires at one pole clamp.
4. For general requirements refer to NCDOT Standard Specifications for Roadway and Structures, January 2018.

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.Garner.NC 27529

SCALE
0 NA
NONE

Typical Fabrication Details
For
Strain Pole Attachments

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	C.F.ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

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10/11/2017
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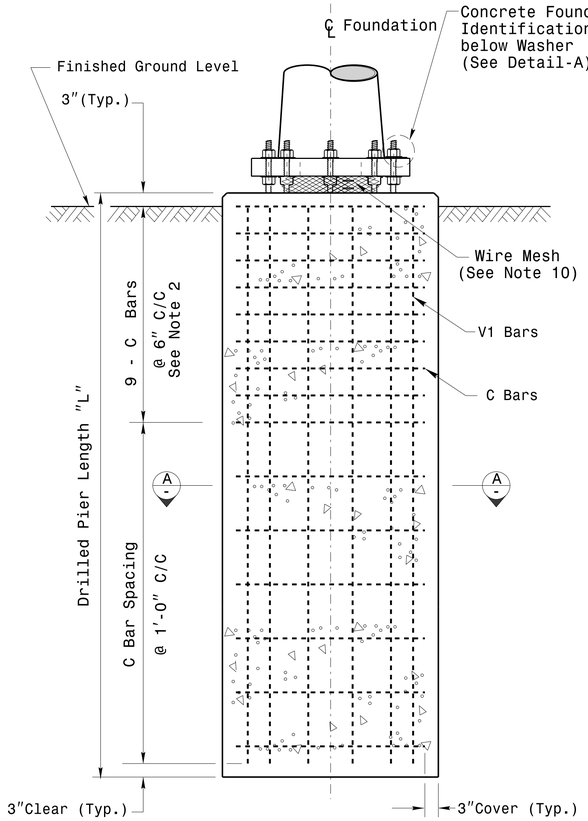
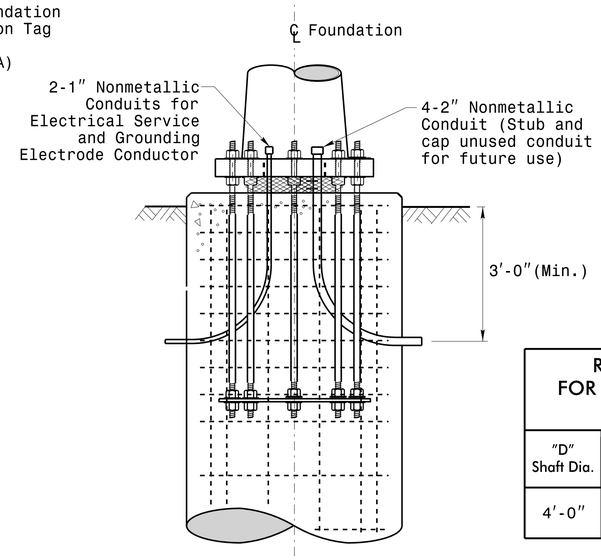
PROJECT ID. NO.	SHEET NO.
U-5710A	Sig.M7

Construction Details – Foundations



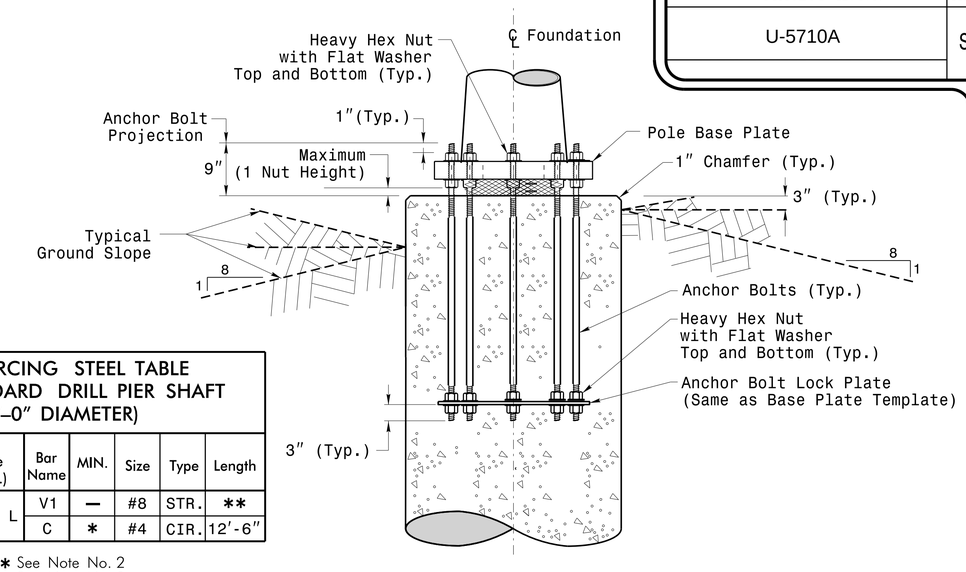
Concrete Shaft Elevation



Typical Foundation Conduit Details

REINFORCING STEEL TABLE FOR STANDARD DRILL PIER SHAFT (4′–0″ DIAMETER)						
"D" Shaft Dia.	Conc. Volume (cu. yds.)	Bar Name	MIN.	Size	Type	Length
4′-0″	.465 x L	V1	—	#8	STR.	**
		C	*	#4	CIR.	12′-6″

* See Note No. 2
** See Note No. 3



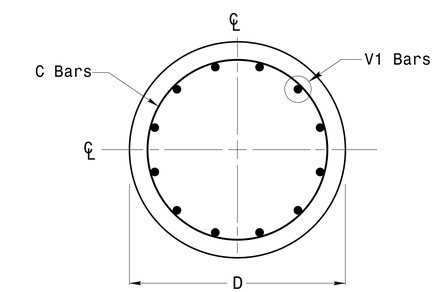
Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)

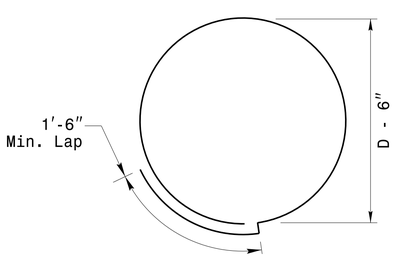
General Notes:

1. If actual subsurface conditions differ significantly from boring data contact the Engineer before excavating or placing concrete.
2. Circular tie reinforcing rings may be vertically adjusted by +/-3″ at a depth between 2′-0″ and 3′-0″ to facilitate the installation of electrical conduit entering in the cage.
3. For standard foundations, see sheet Sig. M8 for details. Vertical reinforcing bars (V1) may be horizontally adjusted by +/-3″ to facilitate the installation of electrical conduit entering into the cage.
4. Provide 2″ to 5″ foundation projection above ground level depending on the ground slope.
5. Unless otherwise shown, foundation designs are based on non-sloping level ground surfaces with slope ratios of 8:1 (H:V) or flatter. If actual ground line slopes are steeper contact the Engineer before excavating or placing concrete.
6. Construct foundations in accordance with NCDOT Standard Provisions SP09 R005- Foundations and Anchor Rod Assemblies for Metal Poles. All applicable 2018 NCDOT Standard Specifications are referenced in this provision. Refer to the NCDOT Resources/Specifications page located on the Connect NCDOT website.

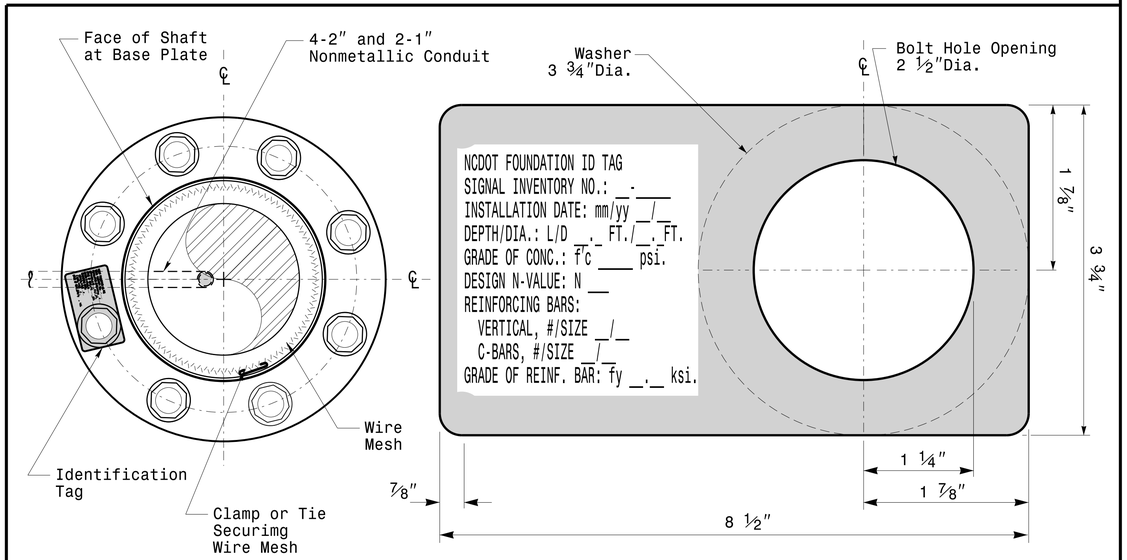
   https://connect.ncdot.gov/resources/Specifications and Special Provisions.aspx
7. Use air entrained AA concrete mix with a compression strength of f′c=4500 psi.(min.) after 28 days.
8. Use ASTM A615 grade 60 deformed bars for all reinforcing steel. Maintain at least 3″ cover on all reinforcement.
9. Locate the Identification Tag on the top of the base plate, directly above the conduit's entry point.
10. Provide two layers of galvanized welded 23 gauge (0.25) 6″ wide 4 mesh wire around pipes under the base plate and secure it with ties if necessary.
11. Preferred location for the I.D. Tag is as shown in Detail-A; directly above the conduit entering the foundation.



Section A-A



Typical "C" Bar Detail



D = Diameter
L = Length/Depth
mm = Month
yy = Year

Detail-A

Concrete Foundation Identification Tag Details

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE: 0 NA — NONE

Construction Details For Foundations

PLAN DATE:	OCTOBER 2018	DESIGNED BY:	C.B.COGDELL
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REV. NO.	COMMENTS	INIT.	DATE
1	Revised Foundation Tag Details	N.B.	5/11/2015

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar — 4AEBE3D5... SIGNATURE — 10/11/2017 DATE

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PROJECT ID. NO.	SHEET NO.
U-5710A	Sig.M8

SOIL CONDITION

		STANDARD STRAIN POLES						STANDARD FOUNDATIONS 48″ Diameter Drilled Pier Length (L) – Feet							Reinforcement			
					Reactions at the Pole Base			Clay				Sand			Longitudinal		Stirrups	
		Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Axial (kip)	Shear (kip)	Moment (ft–kip)	Medium N–Value 4–8	Stiff N–Value 9–15	Very Stiff N–Value 16–30	Hard N–Value >30	Loose N–Value 4–10	Medium N–Value 11–30	Dense N–Value >30	Bar Size (#)	Quantity (ea.)	Bar Size (#)	Spacing (in.)
WIND ZONE 1	LIGHT	S26L3	26	25	2	11	270	19	13	10	8	17	14.5	12.5	8	12	4	12
		S30L3	30	25	2	11	300	19.5	13.5	10	8	17.5	15	13	8	14	4	12
		S35L3	35	25	3	11	320	20	13.5	10.5	8	17.5	15	13	8	14	4	12
	HEAVY	S30H3	30	29	3	16	450	24.5	16	12	9	21	17.5	15	8	16	4	6
		S35H3	35	29	4	16	515	26	17	12.5	9.5	22	18.5	16	8	16	4	6
WIND ZONE 2	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
		S30L2	30	23	2	10	270	18.5	12.5	10	8	16.5	14	12.5	8	12	4	12
		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6
WIND ZONE 3	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
		S30L2	30	23	2	10	270	18.5	12.5	10	8	16.5	14	12.5	8	12	4	12
		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6
WIND ZONE 4	LIGHT	S26L1	26	22	2	8	190	16	11.5	8.5	8	15	12.5	11	8	12	4	12
		S30L1	30	22	2	8	205	16.5	11.5	9	8	15	13	11.5	8	12	4	12
		S35L1	35	22	3	8	230	17	12	9	8	15.5	13.5	11.5	8	12	4	12
	HEAVY	S30H1	30	25	3	12	320	20.5	13.5	10.5	8	18	15	13.5	8	16	4	6
		S35H1	35	25	4	12	350	21	14	10.5	8.5	18.5	15.5	13.5	8	16	4	6
WIND ZONE 5	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
		S30L2	30	23	2	10	270	18.5	12.5	10	8	16.5	14	12.5	8	12	4	12
		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6

48″ Dia. Foundations Concrete Volume (cubic yards) = (0.465) x Drilled Pier Length

General Notes:

1. Values shown in the "Reactions at the Pole Base" column represent the minimum acceptable capacity allowed for design using a design CSR of 1.00.
2. Use chairs and spacers to maintain proper clearance.
3. For foundation, always use air-entrain concrete mix.

Foundation Selection:

1. Perform a standard penetration test at each proposed foundation site to determine "N" value.
2. Select the appropriate wind zone from M 1 drawing.
3. Select the soil type (Clay or Sand) that best describes the soil characteristics.
4. Get the appropriate standard pole case number from the plans or from the Engineer.
5. Select the appropriate column under "Standard Foundations" based on soil type and "N" value. Select the appropriate row based on the pole load case.
6. The foundation depth is the value shown in the "Standard Foundations" category where the column and the row intersect.
7. Use Construction Procedures and Design Methods prescribed by FHWA-NHI-10-016 for Reference Drilled Shafts.

Standard Strain Pole Foundation–All Soil Condition

Prepared in the Offices of: Transportation Mobility and Safety Division, Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE: 0 NA — NONE

Standard Strain Pole Foundation for All Soil Conditions

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	C.B. COGDELL
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE
Changed "Foundation Depth" to "Drilled Pier Length" in Conc. Eqn.	N.B.	7/12/2015

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar — SIGNATURE — 10/11/2017 DATE

11-OCT-2017 08:40
S:\TS&SU\TS Signals\Signal Design Section\Eastern Region\M Sheets\2016\2014 Sig.M8 Std. Strain Pole Found.-Saturated Soil Condition.dgn
rrazinsky

DocuSign Envelope ID: BC993C83-7488-4378-9D99-61583583DEA0

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	SCP-1

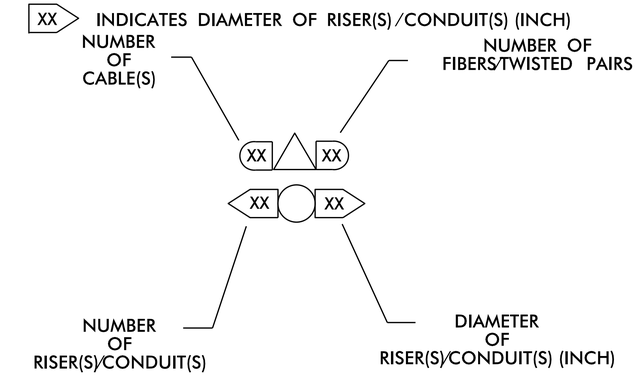
1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL REA, PE – 39, (UNDERGROUND) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
4. INSTALL SMFO CABLE
5. INSTALL MMFO CABLE
6. INSTALL FIBER OPTIC DROP CABLE ASSEMBLY
7. INSTALL TRACER WIRE
8. TRENCH
9. INSTALL PVC CONDUIT
10. INSTALL RIGID, GALVANIZED STEEL CONDUIT
11. INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
12. INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
13. INSTALL OUTER–DUCT POLYETHYLENE CONDUIT
14. INSTALL POLYETHYLENE CONDUIT
15. DIRECTIONAL DRILL CONDUIT
16. BORE AND JACK CONDUIT
17. INSTALL CABLE(S) IN EXISTING CONDUIT
18. INSTALL CABLE(S) IN NEW CONDUIT
19. INSTALL CABLE(S) IN EXISTING RISER
20. INSTALL CABLE(S) IN NEW RISER
21. INSTALL CABLE(S) IN EXISTING CONDUIT STUBOUTS
22. INSTALL NEW CONDUIT INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB–OUTS WHEN AVAILABLE)
23. INSTALL NEW RISER INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB–OUTS WHEN AVAILABLE)
24. INSTALL NEW CONDUIT INTO EXISTING POLE MOUNTED CABINET
25. INSTALL NEW RISER INTO EXISTING POLE MOUNTED CABINET
26. INSTALL FIBER–OPTIC VIDEO/DATA TRANCEIVER
27. INSTALL FIBER–OPTIC TRANCEIVER – DROP AND REPEAT
28. INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND FUSION SPLICE CABLE IN CABINET
29. INSTALL UNDERGROUND SPLICE ENCLOSURE
30. MODIFY EXISTING SPLICE ENCLOSURE
31. INSTALL POLE MOUNTED SPLICE CABINET
32. INSTALL BASE MOUNTED SPLICE CABINET
33. REMOVE EXISTING SPLICE CABINET
34. INSTALL CABINET FOUNDATION
35. REMOVE EXISTING CABINET FOUNDATION
36. INSTALL CCTV CAMERA ASSEMBLY
37. INSTALL CCTV CAMERA WOOD POLE
38. INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
39. INSTALL JUNCTION BOX
40. INSTALL OVERSIZED JUNCTION BOX
41. REMOVE EXISTING JUNCTION BOX
42. INSTALL WOOD POLE
43. REMOVE EXISTING WOOD POLE
44. INSTALL AERIAL GUY ASSEMBLY
45. INSTALL STANDARD GUY ASSEMBLY
46. INSTALL SIDEWALK GUY ASSEMBLY
47. INSTALL MESSENGER CABLE
48. REMOVE EXISTING COMMUNICATIONS CABLE AND MESSENGER CABLE
49. REMOVE EXISTING COMMUNICATIONS CABLE
50. INSTALL CELL MODEM
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 30 FEET OF COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE
55. LASH CABLE(S) TO EXISTING MESSENGER CABLE
56. LASH CABLE(S) TO NEW MESSENGER CABLE
57. MODIFY EXISTING ELECTRICAL SERVICE
58. INSTALL NEW ELECTRICAL SERVICE
59. INSTALL NEW POLE MOUNTED CCTV CABINET
60. BOND TRACER WIRE TO EQUIPMENT GROUND BUS

LEGEND

- FO — FO: NEW FIBER OPTIC COMMUNICATIONS CABLE
- TWIST PR: NEW TWISTED PAIR COMMUNICATIONS CABLE
- EXI: EXISTING COMMUNICATIONS CABLE
- REM: EXISTING COMMUNICATIONS CABLE TO BE REMOVED
- NEW AERIAL GUY ASSEMBLY
- NEW CONDUIT
- EXISTING CONDUIT
- DD — DD: NEW DIRECTIONAL DRILLED CONDUIT
- B&J — B&J: NEW BORED AND JACKED CONDUIT
- NEW JUNCTION BOX
- EXISTING JUNCTION BOX
- NEW WOOD POLE
- EXISTING WOOD POLE
- S: NEW UNDERGROUND SPLICE ENCLOSURE
- NEW METAL POLE
- EXISTING METAL POLE
- NEW CCTV CAMERA ASSEMBLY
- EXISTING CCTV CAMERA ASSEMBLY
- NEW STANDARD GUY ASSEMBLY
- NEW STANDARD GUY USING EXISTING ANCHOR
- NEW SIDEWALK GUY ASSEMBLY
- NEW CABLE STORAGE RACKS (SNOW SHOES)
- EXISTING CONTROLLER AND CABINET
- S: EXISTING SPLICE CABINET
- S: NEW SPLICE CABINET
- SP: SIGNAL POLE
- XX–XXXX: SIGNAL INVENTORY NUMBER

CONSTRUCTION NOTE SYMBOLOGY KEY

- XX: INDICATES NUMBER OF CABLES, LOOPS, ETC.
- XX: INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.
- XX: INDICATES NUMBER OF RISER(S)/CONDUIT(S)
- XX: INDICATES DIAMETER OF RISER(S)/CONDUIT(S) (INCH)



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared For:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Intermodal Transportation System Development

750 N. Greenfield Pkwy., Garner, NC 22529

RKA
RAMEY KEMP ASSOCIATES
5808 Faringdon Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

Construction Notes

Division 3 New Hanover County Wilmington

PLAN DATE:	November 2021	REVIEWED BY:	WJ Hamilton
PREPARED BY:	A. Andrews	RKA PROJ NO:	19258 (041)

SCALE: 0

REVISIONS	INIT.	DATE

SEAL

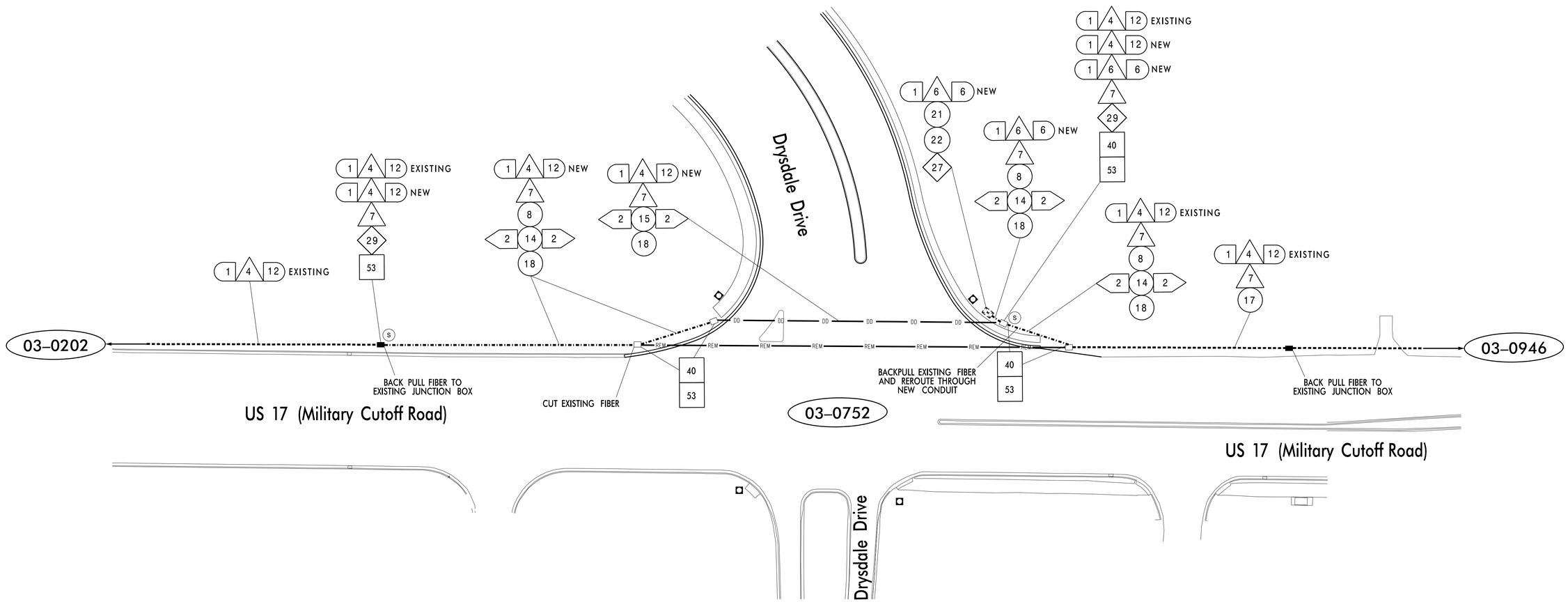
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton
SIGNATURE

11/08/2021
DATE

DocuSign Envelope ID: BC993C83-7488-4378-9D99-61583583DEA0

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	SCP-2



NOTES:

1) NOTIFY THE CITY OF WILMINGTON SIGNAL SYSTEMS ENGINEER, DENYS VIELKANOWITZ, AT 910–341–4676 FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE CITY OF WILMINGTON SIGNAL SYSTEMS ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.

2) RESTORE COMMUNICATIONS WITHIN 24 HOURS IF THE FIBER OPTIC CABLE IS CUT OR NOT COMMUNICATING PROPERLY DURING CONSTRUCTION.

3) CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS–BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

4) CONTRACTOR SHALL ENSURE THAT SYSTEM DOWN TIME IS MINIMIZED DURING SPLICING OF NEW FIBER.

5) ALL JUNCTION BOX LIDS TO READ "NCDOT FIBER OPTIC CABLE"

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Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

Prepared for:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0 40
1" = 40'

Drysdale Drive at US 17 (Military Cutoff Road) Cable Routing Plan

Division 3 New Hanover County Wilmington

PLAN DATE: November 2021		REVIEWED BY:	WJ Hamilton
PREPARED BY: A. Andrews		RKA PROJ. No.:	19258 (041)

REVISIONS	INIT.	DATE

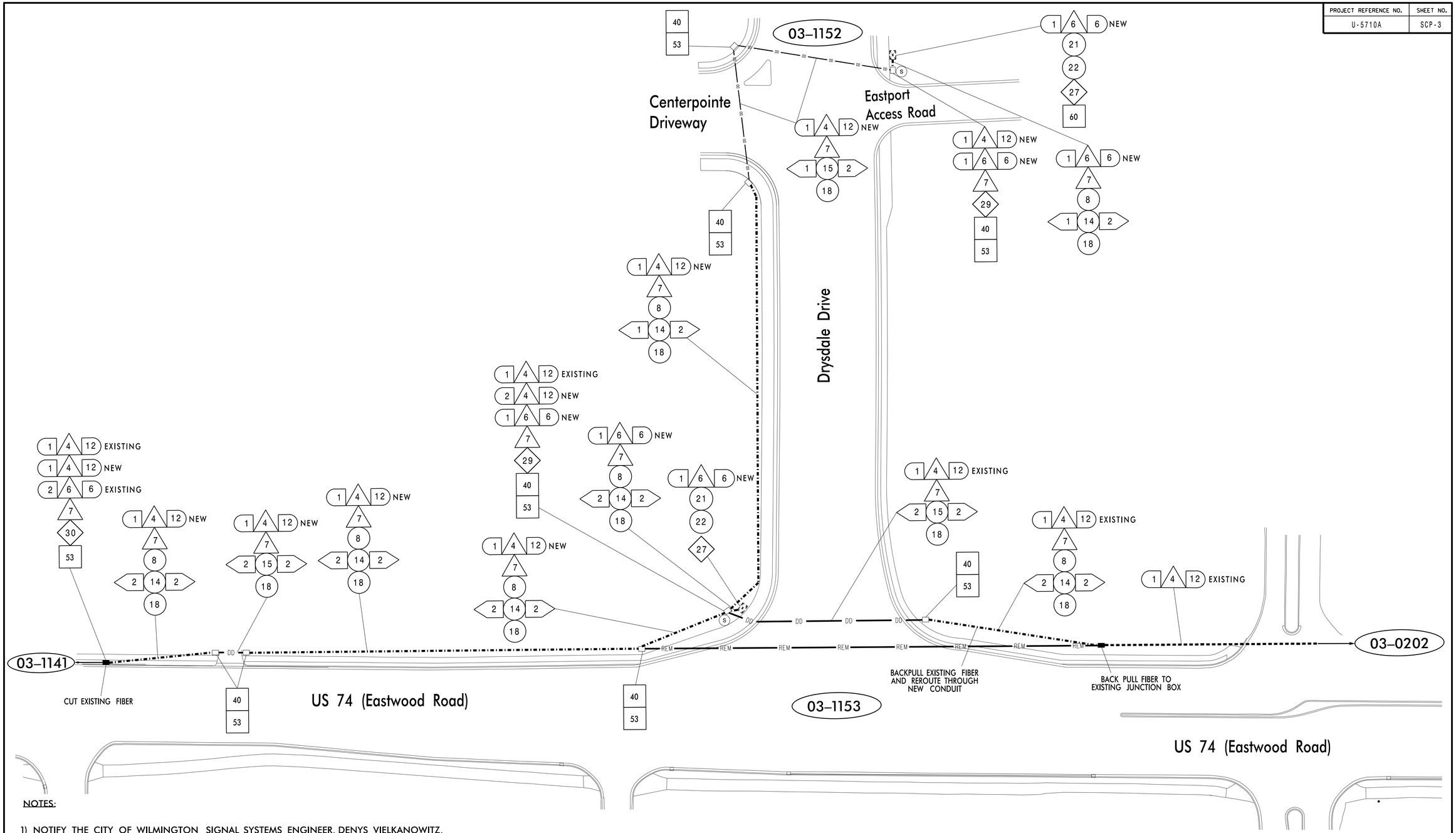
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by:
William J. Hamilton
ASSISTANT ENGINEER
SIGNATURE
11/08/2021
DATE

DocuSign Envelope ID: BC993C83-7488-4378-9D99-61583583DEA0

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	SCP-3



NOTES:

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2) RESTORE COMMUNICATIONS WITHIN 24 HOURS IF THE FIBER OPTIC CABLE IS CUT OR NOT COMMUNICATING PROPERLY DURING CONSTRUCTION.

3) CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS–BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

4) CONTRACTOR SHALL ENSURE THAT SYSTEM DOWN TIME IS MINIMIZED DURING SPLICING OF NEW FIBER.

5) ALL JUNCTION BOX LIDS TO READ "NCDOT FIBER OPTIC CABLE"

RAMEY KEMP ASSOCIATES
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Prepared for:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Transportation Systems Management
250 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0 40 1"=40'

Drysdale Drive
Cable Routing Plan

Division 3 New Hanover County Wilmington

PLAN DATE: November 2021 REVIEWED BY: WJ Hamilton
PREPARED BY: A. Andrews RKA PROJ. No.: 19258 (041)

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton
SIGNATURE 11/08/2021 DATE

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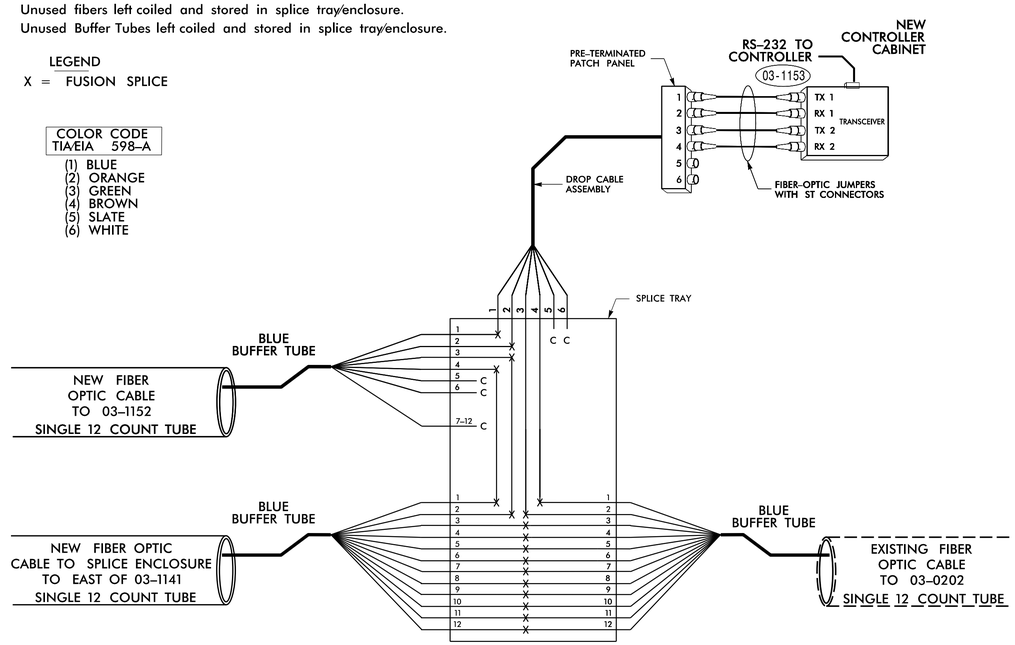
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	SCP-4

US 74 (EASTWOOD ROAD)
AT
DRYSDALE DRIVE
SIG. INV. # 03–1153

Notes:
Unused fibers left coiled and stored in splice tray/enclosure.
Unused Buffer Tubes left coiled and stored in splice tray/enclosure.

LEGEND
X = FUSION SPLICE

COLOR CODE
TIA/EIA 598–A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

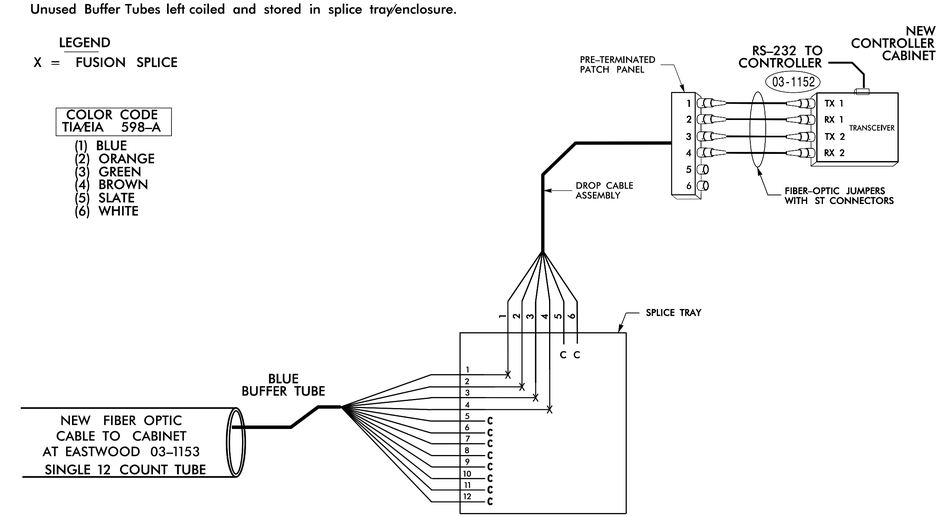


DRYSDALE DRIVE
AT
CENTERPOINTE DRIVEWAY/
EASTPORT ACCESS ROAD
SIG. INV. # 03–1152

Notes:
Unused fibers left coiled and stored in splice tray/enclosure.
Unused Buffer Tubes left coiled and stored in splice tray/enclosure.

LEGEND
X = FUSION SPLICE

COLOR CODE
TIA/EIA 598–A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE



NOTES:

1) NOTIFY THE CITY OF WILMINGTON SIGNAL SYSTEMS ENGINEER, DENYS VIELKANOWITZ, AT 910-341-4676 FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE CITY OF WILMINGTON SIGNAL SYSTEMS ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.

2) CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

3) INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"
1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICING

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

4) CONTRACTOR SHALL ENSURE THAT SYSTEM DOWN TIME IS MINIMIZED DURING SPLICING OF NEW FIBER.

RAMEY KEMP ASSOCIATES
5808 Faringdon Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

Prepared for:
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Transportation Mobility and Safety Division
Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

Splice Details

Division 3 New Hanover County Wilmington

PLAN DATE: November 2021	REVIEWED BY: WJ Hamilton
PREPARED BY: A. Andrews	RKA PROJ. No.: 19258 (041)

SCALE
0
N/A

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by:
William J. Hamilton 11/08/2021
A0D9BD2D9A64E8AE
SIGNATURE DATE

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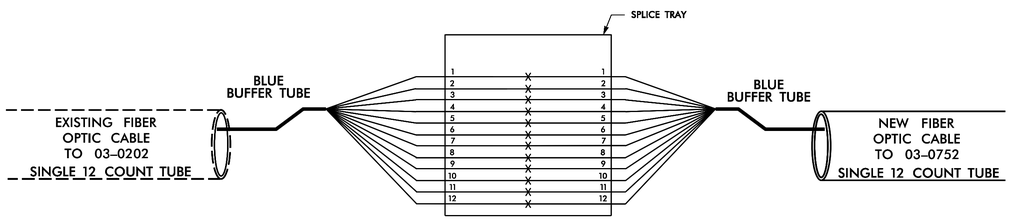
PROJECT REFERENCE NO.	SHEET NO.
U-5710A	SCP-5

NEW SPLICE ENCLOSURE
SOUTH OF 03–0752 US 17 (MILITARY
CUTOFF ROAD) AT DRYSDALE DRIVE

Notes:
Unused fibers left coiled and stored in splice tray/enclosure.
Unused Buffer Tubes left coiled and stored in splice tray/enclosure.

LEGEND
X = FUSION SPLICE

COLOR CODE
TIA/EIA 598–A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

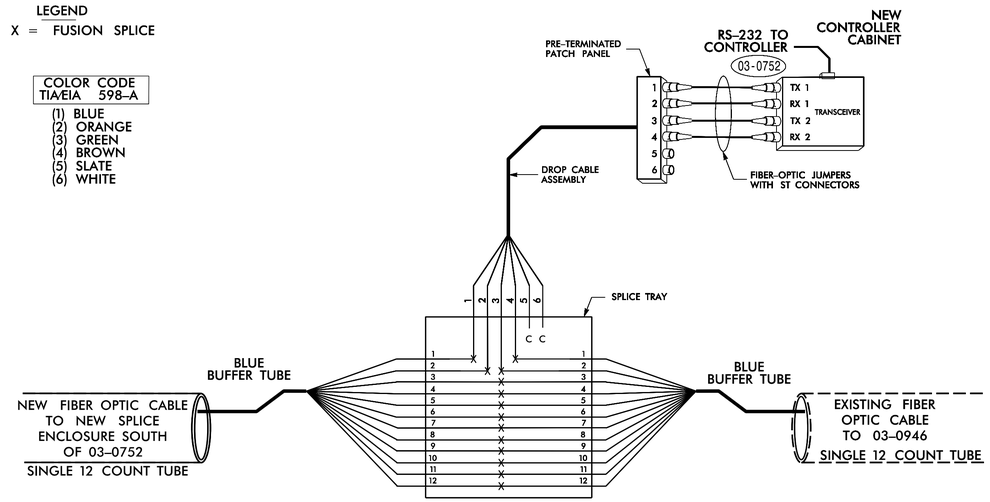


US 17 (MILITARY CUTOFF ROAD)
AT
DRYSDALE DRIVE
SIG. INV. # 03–0752

Notes:
Unused fibers left coiled and stored in splice tray/enclosure.
Unused Buffer Tubes left coiled and stored in splice tray/enclosure.

LEGEND
X = FUSION SPLICE

COLOR CODE
TIA/EIA 598–A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE



NOTES:

1) NOTIFY THE CITY OF WILMINGTON SIGNAL SYSTEMS ENGINEER, DENYS VIELKANOWITZ, AT 910-341-4676 FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE CITY OF WILMINGTON SIGNAL SYSTEMS ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.

2) CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

3) INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"
1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICING

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

4) CONTRACTOR SHALL ENSURE THAT SYSTEM DOWN TIME IS MINIMIZED DURING SPLICING OF NEW FIBER.

RAMEY KEMP ASSOCIATES
5808 Faringdon Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

Prepared for:
Transportation Mobility and Safety Division
Intelligent Transportation Systems Section
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

Splice Details

Division 3 New Hanover County Wilmington

PLAN DATE: November 2021	REVIEWED BY: WJ Hamilton
PREPARED BY: A. Andrews	RKA PROJ. No.: 19258 (041)

SCALE
0
N/A

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton
A0660D2A4B434...
SIGNATURE 11/08/2021
DATE

DocuSign Envelope ID: BC993C83-7488-4378-9D99-61583583DEA0

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	SCP-6

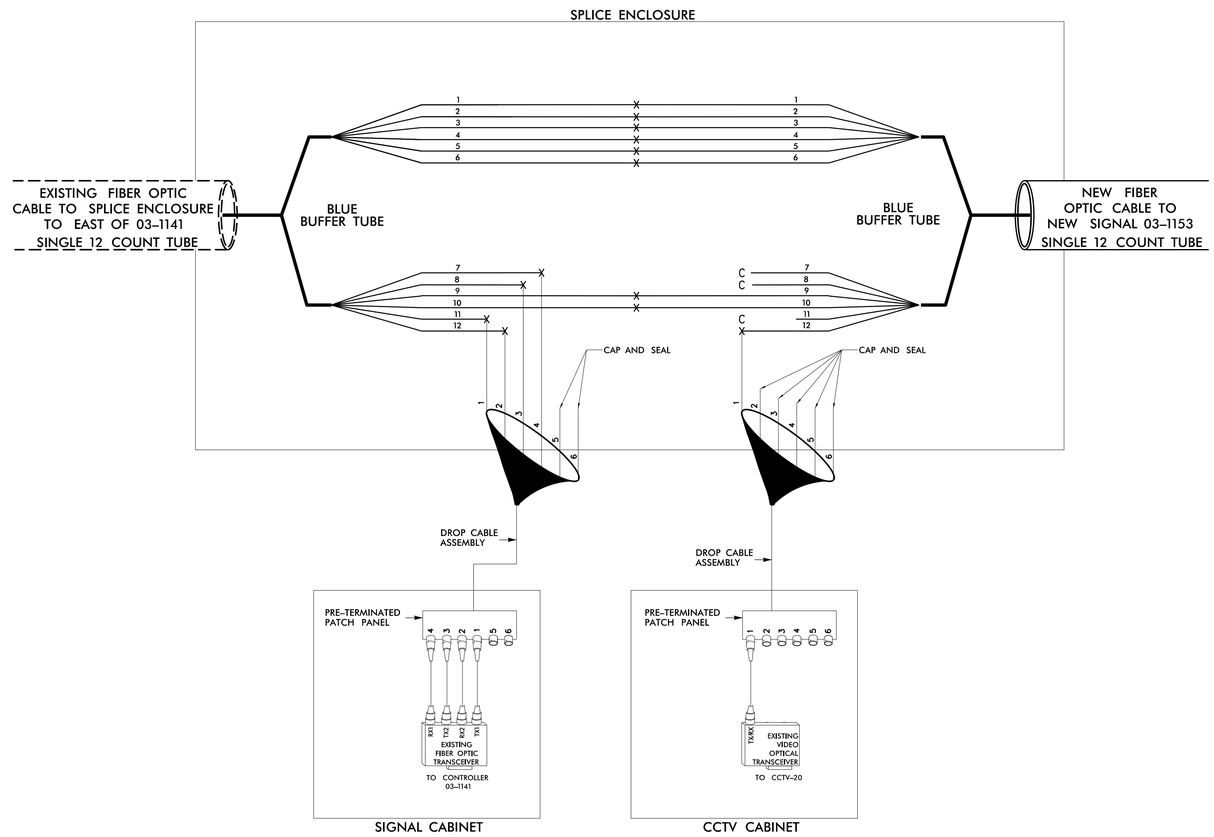
MODIFIED SPLICE ENCLOSURE
EAST OF 03–1141 (US 74 AT
CAVALIER DRIVE)

Notes:
Unused fibers left coiled and stored in splice tray/enclosure.
Unused Buffer Tubes left coiled and stored in splice tray/enclosure.

LEGEND
C = CAP AND SEAL
X = FUSION SPLICE

COLOR CODE
TIA/EIA 598–A

(1) BLUE	(7) RED
(2) ORANGE	(8) BLACK
(3) GREEN	(9) YELLOW
(4) BROWN	(10) VIOLET
(5) SLATE	(11) ROSE
(6) WHITE	(12) AQUA



NOTES:

1) NOTIFY THE CITY OF WILMINGTON SIGNAL SYSTEMS ENGINEER, DENYS VIELKANOWITZ, AT 910-341-4676 FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE CITY OF WILMINGTON SIGNAL SYSTEMS ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.

2) CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

3) INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"
1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICING

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

4) CONTRACTOR SHALL ENSURE THAT SYSTEM DOWN TIME IS MINIMIZED DURING SPLICING OF NEW FIBER.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

RAMEY KEMP ASSOCIATES
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Prepared for:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

Splice Details

Division 3 New Hanover County Wilmington

PLAN DATE: November 2021	REVIEWED BY: WJ Hamilton		
PREPARED BY: A. Andrews	RKA PROJ. No.: 19258 (041)		
SCALE: 0 N/A	REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON
DocuSigned by: William J. Hamilton A0D9D2D2D6AFEBAC 11/08/2021
DATE

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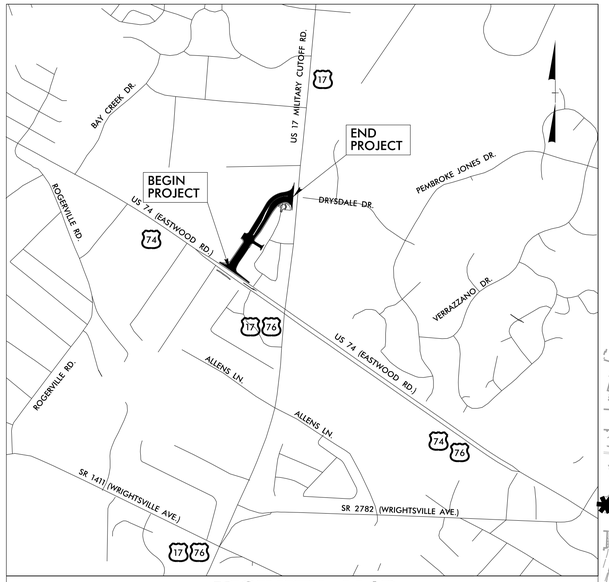
09/08/99

TIP PROJECT: U-5710A

See Sheet 2 For Conventional Symbols



VICINITY MAP
(NOT TO SCALE)

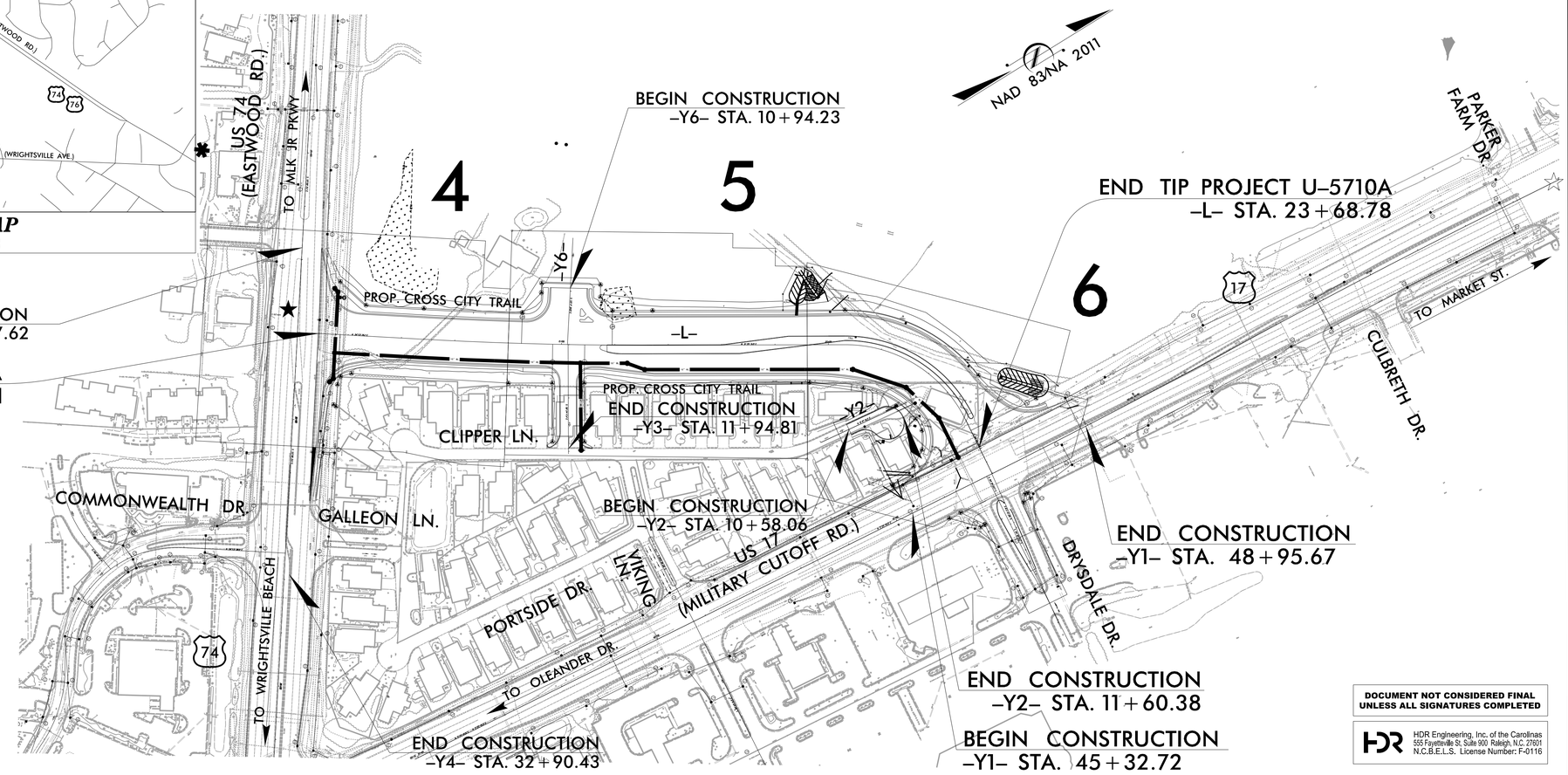
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
U-5710A	UC-1

NEW HANOVER COUNTY

LOCATION: FROM US-17 (MILITARY CUTOFF ROAD) AT DRYSDALE DRIVE TO US-74 (EASTWOOD ROAD). CONSTRUCT ROADWAY ON NEW LOCATION (DRYSDALE DRIVE EXT).

TYPE OF WORK: WATER LINE IMPROVEMENTS



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HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

GRAPHIC SCALES

40 10 0 20 40
PLANS

INDEX OF SHEETS PHASE 1

SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A, 3B	DETAILS
UC-4 TO UC-6	PLAN SHEETS
UC-7	PROFILE SHEET

WATER AND SEWER OWNERS ON PROJECT

(A) WATER - CAPE FEAR PUBLIC UTILITY AUTHORITY

(B) SANITARY - CAPE FEAR PUBLIC UTILITY AUTHORITY

PREPARED IN THE OFFICE OF

HDR Engineering, Inc. of the Carolinas
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N.C.B.E.L.S. License Number: F-0116

PHILLIP ROGERS	PROJECT ENGINEER
ERIC WILLIAMS	UTILITY ENGINEER
MATTHEW W WATT	UTILITY DESIGN ENGINEER

SEAL

STATE OF NORTH CAROLINA PROFESSIONAL SEAL 037518 ENGINEER MATTHEW W. WATT
Matthew Watt
12/9/2021

DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

DIVISION ENGINEER
UTILITIES ENGINEER
DESIGN BUILD UTILITIES ENGINEER
DESIGN BUILD UTILITIES COORDINATOR

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	UC-2

DESIGNED BY: MWW
DRAWN BY: KSR
CHECKED BY:
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

NORTH CAROLINA PROFESSIONAL SEAL 037518 ENGINEER MATTHEW W. WATT
Matthew Watt
12/9/2021

UTILITY CONSTRUCTION PLANS ONLY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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N.C.B.E.L.S. License Number: F-0116

UTILITY CONSTRUCTION

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

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

PROPOSED SEWER SYMBOLS

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

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL PED
- Utility Line by Others (Type as Shown) — PROP O/H POWR LINE
- Trenchless Installation — 12" TL INSTALL
- Water Main — 12" WL
- Encasement by Open Cut — 24" ENCSE BY OC
- Encasement — 24" ENCASEMENT
- Thrust Block
- Air Release Valve — AR
- Utility Vault — UV
- Concrete Pier — CP
- Steel Pier — SP
- Gate Valve — GV
- Plan Note — NOTE
- Pay Item Note — PAY ITEM

EXISTING UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Utility Pole
- Utility Pole with Base
- H-Frame Pole
- Power Transmission Line Tower
- Water Manhole
- Power Manhole
- Telephone Manhole
- Sanitary Sewer Manhole
- Hand Hole for Cable
- Power Transformer
- Telephone Pedestal
- CATV Pedestal
- Gas Valve
- Gas Meter
- Located Miscellaneous Utility Object
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.
- *Underground Power Line — P
- *Underground Telephone Cable — T
- *Underground Telephone Conduit — TC
- *Underground Fiber Optics Telephone Cable — FO
- *Underground TV Cable — TV
- *Underground Fiber Optics TV Cable — TV FO
- *Underground Gas Pipeline — G
- Aboveground Gas Pipeline — A/G Gas
- *Underground Water Line — W
- Aboveground Water Line — A/G Water
- *Underground Gravity Sanitary Sewer Line — SS
- Aboveground Gravity Sanitary Sewer Line — A/G Sanitary Sewer
- *Underground SS Forced Main Line — FSS
- Underground Unknown Utility Line — ?UTL
- SUE Test Hole
- Water Meter
- Water Valve
- Fire Hydrant
- Sanitary Sewer Cleanout
- Well — W
- Septic — S

ABBREVIATIONS

BC	BACK OF CURB	FOD	FULL OF DEBRIS
B.H.	BUILDING HEIGHT	PB	PLAT BOOK
BST	BITUMINOUS SURFACE TREATMENT	PG	PAGE
CC	CURB CUT	PIN	TAX PARCEL ID NUMBER
CGF	COMBINED GRID FACTOR	POB	POINT OF BEGINNING
CH	CHORD	PVC	POLYVINYL CHLORIDE PIPE
CM	CONCRETE MONUMENT	RCP	REINFORCED CONCRETE PIPE
CMP	CORRUGATED METAL PIPE	RRS	RAILROAD SPIKE
CONC.	CONCRETE	R/W	RIGHT-OF-WAY
DB	DEED BOOK	SE	SIGHT EASEMENT
DIP	DUCTILE IRON PIPE	S.F.	SQUARE FEET
FFE	FINISHED FLOOR ELEVATION	TW	TOP OF WALL
		(M)	MEASURED
		(R)	RECORDED INVERT ELEVATION

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

REVISIONS

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UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED 2018 OR CAPE FEAR PUBLIC UTILITY AUTHORITY SPECIFICATIONS DATED 1/1/2021, WHICHEVER IS MORE STRINGENT.

2. THE EXISTING UTILITIES BELONG TO CAPE FEAR PUBLIC UTILITY AUTHORITY, CONTACT IS DAVID DAILEY AT (910)-332-6626.

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.

5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.

8. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT, SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

9. PROPOSED WATER LINE SHALL BE D.I. (DUCTILE IRON PIPE).

10. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS CONTRACTOR'S RESPONSIBILITY TO HAVE BORE DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER. NO DAMAGE IS ALLOWED TO RIVER, WETLANDS, OR BUFFER ZONES.

11. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR SITE SAFETY ASSOCIATED WITH THE WORK UNDER THIS PROJECT AND FOR COMPLIANCE WITH ALL FEDERAL, STATE, AND LOCAL HEALTH AND SAFETY LAWS, CODES, REGULATIONS, AND ORDINANCES INCLUDING BUT NOT LIMITED TO THOSE CURRENTLY MANDATED BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

12. ALL EROSION CONTROL DEVICES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE MOST CURRENT STANDARDS OF THE LAND QUALITY SECTION OF THE NCDEQ.

13. STABILIZATION STONE UNDER PIPING TO BE PLACED AS REQUIRED BY CAPE FEAR PUBLIC UTILITY AUTHORITY INSPECTOR WHEN CONDITIONS WARRANT.

14. AS A MINIMUM REQUIREMENT, ALL GRADED AREAS NOT UNDER PAVEMENT AND WITHIN THE RIGHT-OF-WAY AND/OR EASEMENTS SHALL BE PREPARED, FERTILIZED AND LIMED, SEEDED, AND MULCHED IMMEDIATELY UPON COMPLETION OF CONSTRUCTION AS FOLLOWS (APPLICATION RATE PER 1,000 SQUARE FEET):

15. PRIOR TO REQUESTING A FINAL INSPECTION, THE CONTRACTOR MUST SUBMIT RECORD DRAWINGS AND ENGINEER'S CERTIFICATION TO THE ENGINEERING DIVISION'S RECORD CENTER. THE OWNER MUST ALSO SUBMIT THE CONSTRUCTION CHECKLIST TO THE CAPE FEAR PUBLIC UTILITY AUTHORITY INSPECTOR.

16. ALL WORK MUST CARRY A ONE-YEAR WARRANTY TO COVER ALL DEFECTS IN MATERIALS AND WORKMANSHIP.

17. A CAPE FEAR PUBLIC UTILITY AUTHORITY INSPECTOR SHALL BE PRESENT WHEN MAKING OR TERMINATING WATER AND SEWER CONNECTIONS INTO NEW OR EXISTING WATER AND SEWER LINES.

18. CROSS-CONNECTION CONTROL PROTECTION DEVICES ARE REQUIRED BASED ON DEGREE OF HEALTH HAZARD INVOLVED AS LISTED IN APPENDIX B OF THE RULES GOVERNING PUBLIC WATER SYSTEMS IN NORTH CAROLINA. THESE GUIDELINES ARE THE MINIMUM REQUIREMENTS. THE DEVICES SHALL MEET AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE) STANDARDS OR BE ON THE UNIVERSITY OF SOUTHERN CALIFORNIA APPROVAL LIST. THE DEVICES SHALL BE INSTALLED AND TESTED (BOTH INITIAL AND PERIODIC TESTING THERAFTER) IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR THE LOCAL CROSS-CONNECTION CONTROL PROGRAM, WHICHEVER IS MORE STRINGENT.

PROJECT SPECIFIC NOTES:

1. REMOVAL OF EXCAVATED MATERIALS AND DAILY CLEANUP OPERATIONS SHALL BE PERFORMED IN COMPLIANCE WITH THE SPECIFICATIONS AND TO THE SATISFACTION OF THE OWNER/ENGINEER, AND/OR NCDOT.

2. ALL DEBRIS SHALL BE REMOVED FROM THE SITE.

3. ALL TREE PROTECTION AND EROSION AND SEDIMENTATION CONTROLS SHALL BE IMPLEMENTED BEFORE CONSTRUCTION COMMENCES AND SHALL NOT BE REMOVED UNTIL RE-VEGETATION HAS BEEN ESTABLISHED.

4. ANY AGREEMENT BETWEEN THE CONTRACTOR AND PROPERTY OWNERS SHALL BE MADE IN WRITING AND COPIED TO THE OWNER.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE ENGINEER WITH A SET OF SURVEY RECORD (AS-BUILT) DRAWINGS PREPARED BY A NORTH CAROLINA REGISTERED LAND SURVEYOR CERTIFYING THE ACCURACY OF THE SURVEY HORIZONTAL AND VERTICAL LOCATIONS TO ONE TENTH (0.10) OF A FOOT. SURVEY SHALL BE TIED TO THE NORTH CAROLINA STATE PLANE COORDINATE SYSTEM (NAD83 FEET) HORIZONTALLY, AND ELEVATIONS SHALL BE NORTH AMERICAN VERTICAL DATUM (NAVD88). SURVEY POINT INFORMATION SHALL BE PROVIDED IN AN ELECTRONIC FORMAT FILE OR AN ASCII POINT TEXT FILE [X-Y-Z COORDINATES].

THESE DRAWINGS SHALL AT A MINIMUM SHOW THE FINAL ELEVATIONS AND HORIZONTAL LOCATIONS FOR THE FOLLOWING:

ALL RELOCATIONS, INCLUDING VAULTS, BELOW GRADE FITTINGS, VALVES, WATER METERS AND BACKFLOW PREVENTION DEVICES ALONG THE WATER LINE ALIGNMENT. CONTRACTOR SHALL PROVIDE THE ENGINEER WITH A LETTER CERTIFYING TO THEIR COMPLIANCE WITH THE CONTRACT DRAWINGS.

6. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION STAKING.

7. BORE PITS, TRENCHES AND ALL OTHER EXCAVATIONS WHERE SLOPE IS 1:1 OR STEEPER FROM EDGE OF ROADWAY MUST INCLUDE POSITIVE SHORING MEETING NCDOT AND OSHA REQUIREMENTS. ALL SHORING SYSTEMS MUST BE DESIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER LICENSED IN NORTH CAROLINA.

8. NOT ALL TREES OR VEGETATION ARE SHOWN ON DRAWINGS. DO NOT REMOVE VEGETATION OUTSIDE LIMITS OF DISTURBANCE. ANY TREES SCARRED DURING CONSTRUCTION SHALL HAVE THE SCARS TRIMMED AND PAINTED WITH ASPHALT-BASE TREE PAINT.

9. BASE TOPOGRAPHIC SURVEY AND SUE SERVICES PROVIDED BY NCDOT.

10. BASE GEOTECHNICAL INVESTIGATION SERVICES PROVIDED BY NCDOT.

11. RELOCATE ALL MAIL BOXES WITHIN LIMITS OF DISTURBANCE AS REQUIRED BY SECTION 107-11 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES. COORDINATE THIS WORK WITH THE U.S. POSTAL SERVICE.

12. REMOVE AND RESET FENCES AS NOTED ON THE PLANS AND/OR AS DIRECTED BY THE ENGINEER.

13. PROTECT ALL TREES AND SHRUBS OUTSIDE OF CUT/FILL LINES, IN ADDITION TO THOSE THAT RECEIVE TREE/SHRUB PROTECTION BARRIERS. THE CONTRACTOR IS ALSO REQUESTED TO SAVE OTHER EXISTING TREES AND SHRUBS AS DIRECTED BY THE ENGINEER. WHEN ROOT PRUNING IS NECESSARY, CUT ROOTS CLEANLY USING A DISC TRENCHER. ALL TREE PROTECTION AND EROSION AND SEDIMENTATION CONTROLS SHALL BE IMPLEMENTED BEFORE CONSTRUCTION COMMENCES AND SHALL NOT BE REMOVED UNTIL RE-VEGETATION HAS BEEN ESTABLISHED.

14. SAWCUT EXISTING ASPHALT AND/OR CONCRETE SURFACES PRIOR TO REMOVAL UNLESS OTHERWISE DIRECTED BY THE ENGINEER. SAW CUT WIDTH SHALL BE 1 FOOT MINIMUM FROM THE EXISTING EDGE OF PAVEMENT. SAW CUT PAVEMENT SHALL BE REPLACED AS WELL AS ADDITIONAL PAVEMENT REQUIRED TO TIE-IN TO FACE OF CURB AND GUTTER.

15. REPLACE ANY DISTURBED PAVEMENT FROM FINISHED GRADE TO THE SUB-GRADE. THE CONTRACTOR WILL CONSTRUCT THE BASE AND BINDER COURSES IN ACCORDANCE WITH THE TYPICAL PAVEMENT SECTION.THE CONTRACTOR SHALL PROVIDE TRANSITIONS (RAMPED ASPHALT) TO THE FINISH GRADE, TO PREVENT ABRUPT CHANGES IN THE RIDING SURFACE, IN CASE THE PLANTS ARE CLOSED AND ASPHALT IS UNAVAILABLE FOR THE FINAL SURFACE COURSE UNTIL LATE WINTER/EARLY SPRING. CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL SURFACE COURSE.

16. TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE PLANS AND NOTES HEREIN, CAPE FEAR PUBLIC UTILITY AUTHORITY CRITERIA INCLUDING NCDOT STANDARDS, AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

17. CONTRACTOR SHALL INCLUDE REPLACEMENT OF DRIVEWAYS IN THE LIMITS OF DISTURBANCE BACK TO EDGE OF RIGHT-OF-WAY.

18. CONTRACTOR SHALL USE ADEQUATE SHORING METHODS TO ENSURE:
A. COMPLIANCE WITH OSHA REGULATIONS.
B. PROTECTION OF EXISTING PAVEMENT AND ROAD SHOULDERS.
C. CONSTRUCTION ACTIVITIES ARE CONFINED TO RIGHTS-OF-WAY OR EASEMENTS AS INDICATED.

19. CONTRACTOR TO REPAIR/REPLACE ALL MAINTAINED PAVEMENT DAMAGED BY CONSTRUCTION ACTIVITIES TO SATISFACTION OF NCDOT AND CAPE FEAR PUBLIC UTILITY AUTHORITY.

20. THE CONTRACTOR SHALL RECONSTRUCT ALL ROAD SHOULDERS, DRAINAGE DITCHES AND SWALES DISTURBED BY CONSTRUCTION ACTIVITIES TO THEIR ORIGINAL GRADE AND LOCATION.

21. TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH NCDOT SPECIFICATIONS AND REQUIREMENTS.

22. ALL HOLES, TRENCHES, AND OTHER HAZARDOUS AREAS SHALL BE ADEQUATELY PROTECTED BY BARRICADES, LIGHTS OR OTHER PROTECTIVE DEVICES.

23. TAKE PROPER PRECAUTIONS NOT TO DISTURB EXISTING PROPERTY CORNERS. ANY NECESSARY REMOVAL AND RESETTING OF PROPERTY IRONS SHALL BE DONE BY A REGISTERED LAND SURVEYOR LICENSED IN NORTH CAROLINA.

UTILITIES

1. PRIOR TO CONSTRUCTION, NOTIFY ALL UTILITY OWNERS WHOSE FACILITIES MAY BE AFFECTED TO DETERMINE UTILITY LOCATIONS. THE CONTRACTOR SHALL PROTECT ALL UTILITIES FROM DAMAGE CAUSED BY HIS OPERATIONS OR THOSE OF HIS AGENTS. THE CONTRACTOR SHALL HOLD THE CAPE FEAR PUBLIC UTILITY AUTHORITY HARMLESS FOR ANY THIRD-PARTY INCONVENIENCE CREATED BY WORK OF HIS OWN FORCES OR THAT OF HIS AGENTS.

2. IN THE EVENT OF DAMAGE TO EXISTING UTILITIES, CONTRACTOR SHALL STOP WORK IMMEDIATELY, TAKE NECESSARY PRECAUTIONS TO PREVENT INJURY OR FURTHER DAMAGE, AND NOTIF'Y PROPER AUTHORITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING/REPAIRING ALL EXISTING STRUCTURES, CONDUITS, OR OTHER UTILITIES DAMAGED BY CONTRACTOR'S OPERATIONS AT NO ADDITIONAL COST TO THE DEPARTMENT.

FOR UTILITY LOCATE MEMBERS, CALL NORTH CAROLINA ONE-CALL (NC811) @ 1-800-632-4949. FOR LOCATES OF UTILITIES NOT MEMBERS OF NORTH CAROLINA ONE-CALL (NC811) CONTACT THE SPECIFIC UTILITY COMPANY DIRECTLY.

3. CONTRACTOR SHALL ANTICIPATE HAND DIGGING AROUND EXISTING WATER SERVICES, SANITARY SEWER LATERALS, AND OTHER UTILITIES.

4. FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS. SUBMITTED SEPARATELY.

5. FOR TRAFFIC CONTROL PLANS, SEE TRANSPORTATION MANAGEMENT PLANS. SUBMITTED SEPARATELY.

6. WATER DISTRIBUTION SHALL BE INSTALLED AT A MINIMUM OF 3' DEEP.

7. CONTRACTOR SHALL COORDINATE CONNECTIONS AND ANY WATER SERVICE SHUT DOWNS AND PROVIDE 24 HOURS OF NOTICE TO CAPE FEAR PUBLIC UTILITY AUTHORITY.

8. MAINTAIN SANITARY SEWER SERVICE AT ALL TIMES. ANY NECESSARY SERVICE INTERRUPTIONS SHALLBE PRECEEDED BY A 24 HOUR ADVANCE NOTICE TO CAPE FEAR PUBLIC UTILITY AUTHORITY.

9. PLUG ALL PIPE OPENINGS AND FILL ANY EXPOSED TRENCHES AT THE END OF THE DAY.

WATER AND SEWER

1. ALL MATERIAL AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH CAPE FEAR PUBLIC UTILITY AUTHORITY, OR NCDOT DESIGN STANDARDS, DETAILS AND SPECIFICATIONS

2. UTILITY SEPARATION REQUIREMENTS:

a) A DISTANCE OF 100' SHALL BE MAINTAINED BETWEEN SANITARY SEWER AND ANY PRIVATE OR PUBLIC WATER SUPPLY SOURCE SUCH AS AN IMPOUNDED RESERVIOR USED AS A SOURCE OF DRINKING WATER. IF ADEQUATE LATERAL SEPERATION CANNOT BE ACHIEVED, FERROUS SANITARY SEWER PIPE SHALL BE SPECIFIED AND INSTALLED TO WATERLINE SPECIFICATIONS. HOWEVER, THE MINIMUM SEPERATION SHALL NOT BE LESS THAN 25' FROM A PRIVATE WELL OR 50' FROM A PUBLIC WELL.

b) WHEN INSTALLING WATER AND/OR SEWER MAINS, THE LATERAL SEPARATION BETWEEN UTILITIES SHALL BE 10'. IF THIS EQUATION CANNOT BE MAINTAINED DUE TO EXISTING CONDITIONS, THE VARIATION ALLOWED IS THE WATER MAIN IN A SEPERATE TRENCH WITH THE ELEVATION OF THE WATER MAIN AT LEAST 18" ABOVE THE TOP OF THE SEWER, OR IN THE SAME TRENCH ON A BENCH OF UNDISTURBED EARTH AND MUST BE APPROVED BY THE CAPE FEAR PUBLIC UTILITY AUTHORITY. ALL DISTANCES ARE MEASURED FROM OUTSIDE DIAMETER TO OUTSIDE DIAMETER.

c) WHERE IT IS IMPOSSIBLE TO OBTAIN PROPER SEPARATION, OR ANYTIME A SANITARY SEWER PASSES OVER A WATERMAIN, DIP MATERIALS OR STEEL ENCASEMENT EXTENDED 10' ON EACH SIDE OF CROSSING MUST BE SPECIFIED AND INSTALLED TO WATERLINE SPECIFICATIONS.

d) MAINTAIN 18" MIN. VERTICAL SEPARATION AT ALL WATER MAIN AND RCP STORM DRAIN CROSSINGS; MAINTAIN 24" MIN. VERTICAL SEPARATION AT ALL SANITARY SEWER AND RCP STORM DRAIN CROSSINGS, WHERE ADEQUATE SEPARATIONS CANNOT BE ACHIEVED, SPECIFY DIP MATERIALS AND A CONCRETE CRADLE HAVING 6" MIN. CLEARANCE.

e) ALL OTHER UNDERGROUND UTILITIES SHALL CROSS WATER AND SEWER FACILITIES WITH 18" MIN. VERTICAL SEPARATION REQUIRED.

3. ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW AND APPROVAL OF AN AMENDED PLAN AND/OR PROFILE BY CAPE FEAR PUBLIC UTILITY AUTHORITY PRIOR TO CONSTRUCTION.

4. CONTRACTOR SHALL MAINTAIN CONTINOUS WATER AND SEWER SERVICE TO EXISTING RESIDENCES, BUSINESSES THROUGHOUT CONSTRUCTION OF PROJECT . ANY NECESSARY SERVICE INTERRRUPTIONS SHALL BE PRECEDED BY A 24 HOUR ADVANCE NOTICE TO CAPE FEAR PUBLIC UTILITY AUTHORITY.

5. 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS AND SEWER FORCE MAINS.

6. IT IS THE DEVELOPER'S RESPONSIBILITY TO ABANDON OR REMOVE EXISTING WATER AND SEWER SERVICES NOT BEING USED IN REDEVELOPMENT OF A SITE UNLESS OTHERWISE DIRECTED BY CAPE FEAR PUBLIC UTILITY AUTHORITY THIS INCLUDES ABANDONING TAP AT MAIN AND REMOVAL OF SERVICE FROM ROW OR ENCASEMENT.

7. INSTALL WATER SERVICE LINES WITH METERS LOCATED AT ROW - REFER TO CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD DETAILS AND/OR SPECIFICATIONS. NOTE: IT IS THE APPLICANT'S RESPONSIBILITY TO PROPERLY SIZE THE WATER SERVICE FOR EACH CONNECTION TO PROVIDE ADEQUATE FLOW AND PRESSURE.

WATER

1. CONTRACTOR SHALL ABANDON EXISTING WATER MAIN IN PLACE EXCEPT WHERE REMOVAL IS REQUIRED FOR PROPOSED WORK OR WHERE NOTED. WITHIN THE RIGHT-OF-WAY OF NCDOT MAINTAINED ROADS, CONTRACTOR SHALL FILL ABANDONED WATER MAINS WITH GROUT OR FLOWABLE FILL. ABANDON EXISTING WATER MAINS PER NCDOT 2018 STANDARD SPECIFICATION SECTION 1530-3A.

2. EXISTING WATER MAIN SHALL REMAIN IN SERVICE UNTIL PROPOSED WATER MAIN HAS BEEN TESTED, DISINFECTED AND APPROVED.

3. EXISTING WATER SERVICES AND FIRE HYDRANTS SHALL BE CONNECTED TO PROPOSED WATER MAIN AFTER PROPOSED WATER MAIN HAS BEEN TESTED, DISINFECTED AND APPROVED.

4. FOR ALL WATER SERVICES TO BE CONNECTED TO THE PROPOSED WATER MAIN, CONTRACTOR SHALL REPLACE ALL WATER SERVICE PIPING WHICH IS NOT TYPE K COPPER OR IS IN POOR CONDITION, AS DIRECTED BY THE ENGINEER. TO DETERMINE WATER SERVICE PIPING MATERIAL AND CONDITION, CONTRACTOR SHALL EXPOSE, IN THE PRESENCE OF THE ENGINEER, EACH WATER SERVICE AT THE TIE TO THE EXISTING MAIN, APPROXIMATELY TWO FEET FROM THE METER ON THE WATER MAIN SIDE, AND APPROXIMATELY TWO FEET FROM THE METER BOXES ON THE SERVICE SIDE.

5. WATER VALVES ABANDONED IN PLACE SHALL BE ABANDONED IN THE CLOSED POSITION. ABANDON VALVES BY REMOVING VALVE BOX AND BACKFILLING WITH APPROVED MATERIAL.

6. PROVIDE CONCRETE THRUST BLOCKS AT ALL WATER MAIN BENDS, TEES, AND CAPS UNLESS OTHERWISE NOTED.

7. FOR ALL WATER SERVICES DISTURBED BY CONSTRUCTION, IF THE WATER SERVICE IS ACTIVE, THEN RECONNECT; IF THE WATER SERVICE IS INACTIVE, THEN REMOVE. REMOVAL SHALL INCLUDE TURNING OFF CORPORATION COCK AT THE MAIN AND PHYSICALLY CUTTING THE PIPE AT THE MAIN.

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	UC-3
DESIGNED BY: MWW	
DRAWN BY: KSR	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 037518 ENGINEER MATTHEW W. WATT 12/9/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

UTILITY CONSTRUCTION LIST OF STANDARD DRAWINGS

S-1	WS-10
WS-4	WS-14
WS-5	W-7
WS-13	W-9

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	UC-3A

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REVISED: 4/23/21

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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NORTH CAROLINA PROFESSIONAL SEAL 037518 ENGINEER MATTHEW W. WATT
Matthew Watt
12/9/2021

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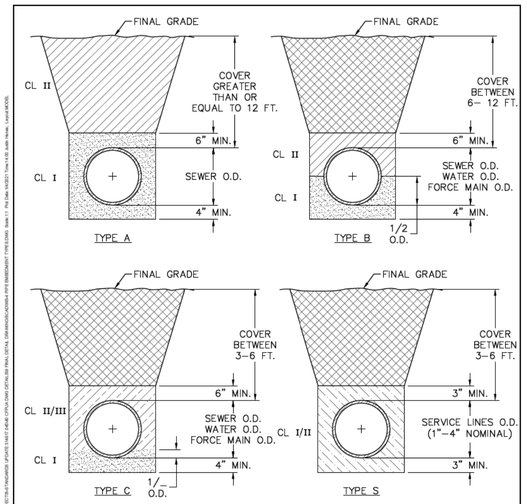
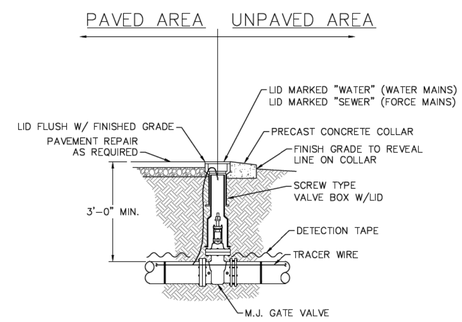
UTILITY CONSTRUCTION



COMPACTION NOTES:

1. ALL ZONES: 95% STD EFFORT PER ASTM D698, EXCEPT AS STATED IN COMPACTION NOTE 2.
2. 12" SUBGRADE UNDER PAVEMENT: 98% STD EFFORT PER ASTM D698.
3. BEDDING REQUIREMENTS FOR SEWER FORCE MAINS AND WATER MAINS WITHIN TYPE A THROUGH TYPE S CONDITIONS, SHALL BE FOLLOWED IF IT HAS BEEN DETERMINED THAT UNSUITABLE SOILS EXIST WITHIN THE EXCAVATED TRENCH. OTHERWISE BEDDING FOR SEWER FORCE MAINS AND WATER MAINS MAY BE CLASS I OR CLASS II.

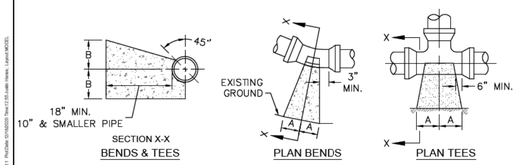
DETAIL: PIPE EMBEDMENT TYPES
SCALE: NOT TO SCALE | CFPUA DETAIL DATE: 01/01/2021
CAPE FEAR PUBLIC UTILITY AUTHORITY, 235 GOVERNMENT CENTER DRIVE, WILMINGTON, NC 28403, OFFICE: (910)332-6560
Stewardship. Sustainability. Service.
DETAIL NO: WS-4 | SHEET NO: -



NOTES:

1. TRACER WIRE SHALL PENETRATE VALVE BOX THROUGH DRILLED HOLE APPROX. 6" BELOW GRADE WITH MINIMUM 2-FEET EXTRA LENGTH COILED IN THE VALVE BOX. SEE WS–6.

DETAIL: VALVE DETAIL
SCALE: NOT TO SCALE | CFPUA DETAIL DATE: 01/01/2021
CAPE FEAR PUBLIC UTILITY AUTHORITY, 235 GOVERNMENT CENTER DRIVE, WILMINGTON, NC 28403, OFFICE: (910)332-6560
Stewardship. Sustainability. Service.
DETAIL NO: WS-5 | SHEET NO: -

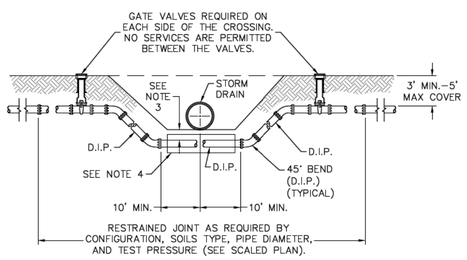


SIZE	90 BENDS A	90 BENDS B	45 BENDS A	45 BENDS B	22-1/2 BENDS A	22-1/2 BENDS B	TEES/PLUGS A	TEES/PLUGS B	45 VERT. BENDS
3"	8"	6"	5"	6"	3"	7"	6"	8"	27"
4"	8"	9"	5"	8"	3"	11"	6"	9"	28"
6"	14"	11"	9"	9"	8"	8"	12"	9"	36"
8"	16"	16"	12"	12"	10"	13"	14"	13"	42"
10"	18"	22"	15"	14"	14"	16"	18"	15"	50"
12"	20"	28"	18"	17"	16"	16"	22"	18"	62"
14"	26"	29"	21"	19"	18"	18"	26"	20"	72"
16"	33"	29"	25"	21"	20"	21"	32"	21"	83"
18"	40"	30"	28"	24"	22"	23"	36"	24"	88"

NOTES:

1. THRUST BLOCKING IS NOT PERMITTED EXCEPT IN SPECIAL INSTALLATIONS WHERE DESIGNED BY ENGINEER AND APPROVED BY CFPUA.
2. ALLOW 7-DAY MINIMUM CONCRETE CURE TIME BEFORE PLACING LOAD ON THRUST BLOCK
3. BASED ON 160 PSI TEST PRESSURE AND 2,000 PSF SOIL BEARING CAPACITY.
4. ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED GROUND.
5. PIPE & FITTINGS TO BE WRAPPED IN 10 MIL PLASTIC PRIOR TO THRUST BLOCK BEING POURED.

DETAIL: THRUST BLOCK
SCALE: NOT TO SCALE | CFPUA DETAIL DATE: 01/01/2021
CAPE FEAR PUBLIC UTILITY AUTHORITY, 235 GOVERNMENT CENTER DRIVE, WILMINGTON, NC 28403, OFFICE: (910)332-6560
Stewardship. Sustainability. Service.
DETAIL NO: WS-13 | SHEET NO: -



NOTES:

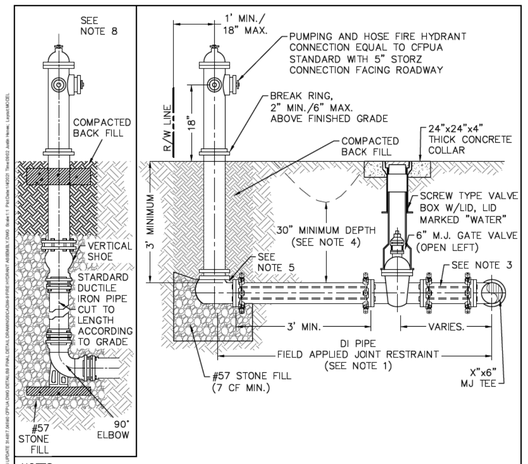
1. USE PRESSURE CLASS 350 DIP, UNLESS SPECIFIED OTHERWISE.
2. ALL BURIED PIPES, VALVES AND FITTINGS SHALL BE RESTRAINED.
3. MINIMUM DEPTH REQUIRED, UNLESS SPECIFIED OTHERWISE BY CFPUA:
   a. IN DOT R/W, 36" MIN. TYPICAL, OR 24" MIN. WHEN CROSSING A DITCH LINE.
   b. ALL OTHER LOCATIONS, 30" MIN.
   c. WHEN STORM DRAIN INVERT IS BURIED AT OR BELOW ABOVE DEPTHS, WATER MAIN AND STORM DRAIN SHALL BE CONSTRUCTED OF FERROUS MATERIALS WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10-FEET EACH SIDE OF THE POINT OF CROSSING.
4. INSTALL CASING PIPE (PER WS–8) AT THE CROSSING IF THE TOP OF THE MAIN IS 6' OR GREATER BELOW GRADE. THE CASING WILL NEED TO EXTEND A MINIMUM OF 2' PAST THE OUTSIDE WALL OF THE STORM DRAIN.

DETAIL: PRESSURE MAIN DITCH AND STORM DRAIN DITCH CROSSING-DIP
SCALE: NOT TO SCALE | CFPUA DETAIL DATE: 01/01/2021
CAPE FEAR PUBLIC UTILITY AUTHORITY, 235 GOVERNMENT CENTER DRIVE, WILMINGTON, NC 28403, OFFICE: (910)332-6560
Stewardship. Sustainability. Service.
DETAIL NO: WS-10 | SHEET NO: -

CAPE FEAR PUBLIC UTILITY AUTHORITY STANDARD NOTES:

1. ALL PROPOSED ADDITIONS TO THE CAPE FEAR PUBLIC UTILITY AUTHORITY (CFPUA) WATER DISTRIBUTION AND SANITARY SEWER COLLECTION SYSTEMS, AS SHOWN AND SPECIFIED HEREIN, SHALL BE DESIGNED AND CONSTRUCTED TO CONFORM TO STATE RULES AND THE CFPUA'S MINIMUM TECHNICAL STANDARDS. THE CFPUA MINIMUM TECHNICAL STANDARDS ARE CONTAINED IN THE CURRENT DESIGN GUIDANCE MANUAL, MATERIAL SPECIFICATION MANUAL, TECHNICAL SPECIFICATIONS FOR CONSTRUCTION, AND STANDARD DRAWING DETAILS.
2. SEWER GUARDS REQUIRED AT ALL MANHOLES. STAINLESS STEEL SEWER GUARDS REQUIRED AT MANHOLES LOCATED IN TRAFFIC AREAS.
3. WATER AND SEWER SERVICES SHALL BE PERPENDICULAR TO MAIN AND TERMINATE 18" INSIDE RIGHT-OF-WAY LINE. SEWER SERVICES IN CUL-DE-SACS ARE REQUIRED TO BE PERPENDICULAR, OR MUST ORIGINATE IN END OF LINE MANHOLE AND TERMINATE 18" INSIDE RIGHT-OF-WAY LINE.
4. ALL SEWER SERVICES CONNECTING INTO DUCTILE IRON MAINS SHALL ALSO BE CONSTRUCTED OF DIP.
5. MINIMUM 10' UTILITIES EASEMENT PROVIDED ALONG THE FRONTAGE OF ALL LOTS AND AS SHOWN FOR NEW DEVELOPMENTS.
6. NO FLEXIBLE COUPLINGS SHALL BE USED.
7. ALL STAINLESS STEEL FASTENERS SHALL BE TYPE 316.
8. CLEANOUTS SHALL BE LOCATED A MINIMUM OF 6 FEET FROM ALL PROPERTY CORNERS.
9. WATER METER BOXES ARE TO BE A MINIMUM OF 5 FEET FROM THE PROPERTY CORNER.
10. UNUSED SERVICES SHALL BE ABANDONED. ABANDONED WATER SERVICES SHALL BE DISCONNECTED FROM MAIN.
11. A MINIMUM OF 10' OF MAIN LINE, 5' UPSTREAM AND 5' DOWNSTREAM SHALL BE REPLACED FOR NEW SEWER SERVICE CONNECTIONS TO EXISTING CLAY GRAVITY SEWER MAINS.
12. A MINIMUM OF 20' OF MAIN LINE, 10' UPSTREAM AND 10' DOWNSTREAM SHALL BE REPLACED FOR NEW CUT IN MANHOLES ON EXISTING CLAY GRAVITY SEWER MAINS
13. PROVIDE A MINIMUM DISTANCE OF SIX (6) INCHES BETWEEN EDGE OF MANHOLE CORE HOLES AND MANHOLE BARREL JOINTS. PROVIDE A MINIMUM DISTANCE OF SIX (6) INCHES BETWEEN EDGES OF CORE HOLES. CORING THE MANHOLE CONE IS NOT PERMITTED
14. WATER MAIN AND FORCE MAIN PIPE INSTALLED BY OPEN CUT SHALL BE BURIED AT A MINIMUM OF THREE (3) FEET AND A MAXIMUM OF FIVE (5) FEET BELOW FINISHED GRADE. DEPTHS GREATER THAN FIVE (5) FEET MUST BE APPROVED BY CFPUA.
15. ALL MANHOLE MAIN LINE AND SERVICE PIPING TO BE INSTALLED AT A MINIMUM OF CROWN TO CROWN OF THE LARGEST DIAMETER PIPE.

DETAIL: STANDARD NOTES (REQUIRED ON ALL PLAN AND PROFILE SHEETS)
SCALE: NOT TO SCALE | CFPUA DETAIL DATE: 01/01/2021
CAPE FEAR PUBLIC UTILITY AUTHORITY, 235 GOVERNMENT CENTER DRIVE, WILMINGTON, NC 28403, OFFICE: (910)332-6560
Stewardship. Sustainability. Service.
DETAIL NO: WS-14 | SHEET NO: -



NOTES

1. JOINT RESTRAINT SYSTEMS SHALL BE WEDGE ACTION STYLE FOR DI.
2. WHEN HYDRANT LEGS REQUIRE FULL LENGTH PIPE SECTIONS, OVER BELL RESTRAINT SYSTEM SHALL HAVE 316 STAINLESS STEEL HARNESS AND FASTENERS.
3. CONTINUOUS 316 STAINLESS STEEL RODS (TEE TO VALVE AND VALVE TO HYDRANT) MAY BE USED WITH COR-BLUE MJ T-BOLT AND GASKET KITS, AS AN ALTERNATIVE.
4. HYDRANT AND VALVE SHALL BE PLACED OUTSIDE DITCH LIMITS.
5. WEEP HOLES OPEN AND UNBLOCKED TO DRAIN.
6. MJ TEE SHALL BE RESTRAINED ON EACH SIDE OF MAIN PLUS MAIN VALVES, FITTING, OR JOINTS WITHIN 10-FEET OF MJ TEE.
7. TRACING WIRE SHALL EXTEND ALONG HYDRANT LATERAL AND UP TO FINISHED GRADE WITH 2-FEET EXTENDED ABOVE THE BREAK RING OF HYDRANT.
8. HYDRANT TO UTILIZE A VERTICAL SHOE WHEN INSTALLED 6' IN DEPTH OR GREATER.

DETAIL: FIRE HYDRANT ASSEMBLY
SCALE: NOT TO SCALE | CFPUA DETAIL DATE: 01/01/2021
CAPE FEAR PUBLIC UTILITY AUTHORITY, 235 GOVERNMENT CENTER DRIVE, WILMINGTON, NC 28403, OFFICE: (910)332-6560
Stewardship. Sustainability. Service.
DETAIL NO: W-9 | SHEET NO: -

1

REVISIONS 1 DETAILS UPDATED FROM 2020 TO 2021

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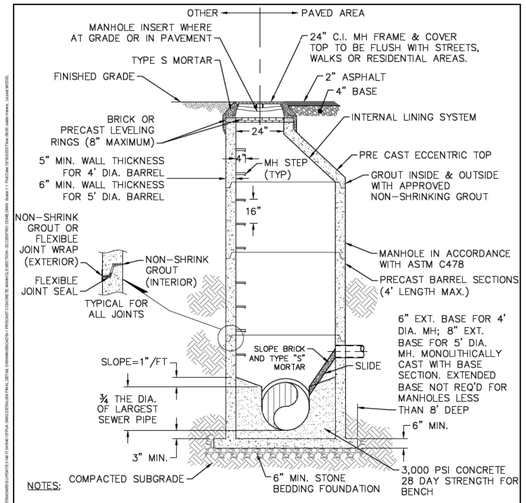
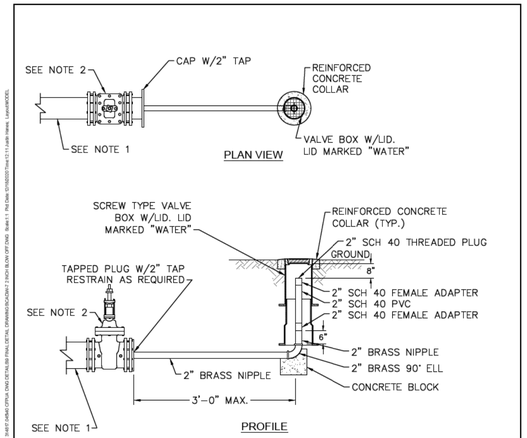


NOTES:

1. FOR MANHOLES UP TO 12 FEET IN DEPTH MINIMUM BARREL DIAMETER SHALL BE 4 FEET. MANHOLES GREATER THAN 12 FEET IN DEPTH SHALL BE A MINIMUM OF 5 FEET IN DIAMETER.
2. PROVIDE A MINIMUM DISTANCE OF SIX (6) INCHES BETWEEN EDGE OF MANHOLE CORE HOLES AND MANHOLE BARREL JOINTS. PROVIDE A MINIMUM OF SIX (6) INCHES BETWEEN EDGES OF CORE HOLES. CORING THE MANHOLE CONE IS NOT ALLOWED.
3. ALL MANHOLE MAIN LINE AND SERVICE PIPING TO BE INSTALLED AT A MINIMUM OF CROWN TO CROWN OF THE LARGEST DIAMETER PIPE.

FOR LESS THAN 30" INSIDE DROP

DETAIL: PRECAST CONCRETE MANHOLE SECTION - ECCENTRIC CONE	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: S-1
SCALE: NOT TO SCALE / CFPUA DETAIL DATE: 01/01/2021	Stewardship. Sustainability. Service.	SHEET NO: -



NOTES:

1. PROVIDE TOTAL LENGTH OF RESTRAINED JOINTS UPSTREAM AS REQUIRED FOR MAIN DIAMETER AT 150 psi TEST PRESSURE. WHEN UPSTREAM BENDS ARE WITHIN THE DEAD LENGTH, ADD TOTAL BEND RESTRAINT FOR EACH BEND TO DEAD-IN LENGTH.
2. IF MAIN IS LARGER THAN 2", END WITH A VALVE SIZED FOR THE MAIN, THREADED CAP SIZED ON VALVE FOR THE 2" BLOW-OFF.

DETAIL: 2 INCH BLOW-OFF	CAPE FEAR PUBLIC UTILITY AUTHORITY 235 GOVERNMENT CENTER DRIVE WILMINGTON, NC 28403 OFFICE: (910)332-6560	DETAIL NO: W-7
SCALE: NOT TO SCALE / CFPUA DETAIL DATE: 01/01/2021	Stewardship. Sustainability. Service.	SHEET NO: -

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	UC-3B

DESIGNED BY: MWW
DRAWN BY: KSR
CHECKED BY:
APPROVED BY:
REVISED: 4/23/21

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

UTILITIES ENGINEERING SEC.
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NORTH CAROLINA PROFESSIONAL SEAL 037518 ENGINEER MATTHEW W. WATT
Matthew Watt
12/9/2021

UTILITY CONSTRUCTION PLANS ONLY

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555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

UTILITY CONSTRUCTION

1

REVISIONS 1 DETAILS UPDATED FROM 2020 TO 2021

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	UC-4

DESIGNED BY: MWW
DRAWN BY: KSR
CHECKED BY:
APPROVED BY:
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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NORTH CAROLINA PROFESSIONAL SEAL 037518 ENGINEER MATTHEW W. WATT
12/9/2021

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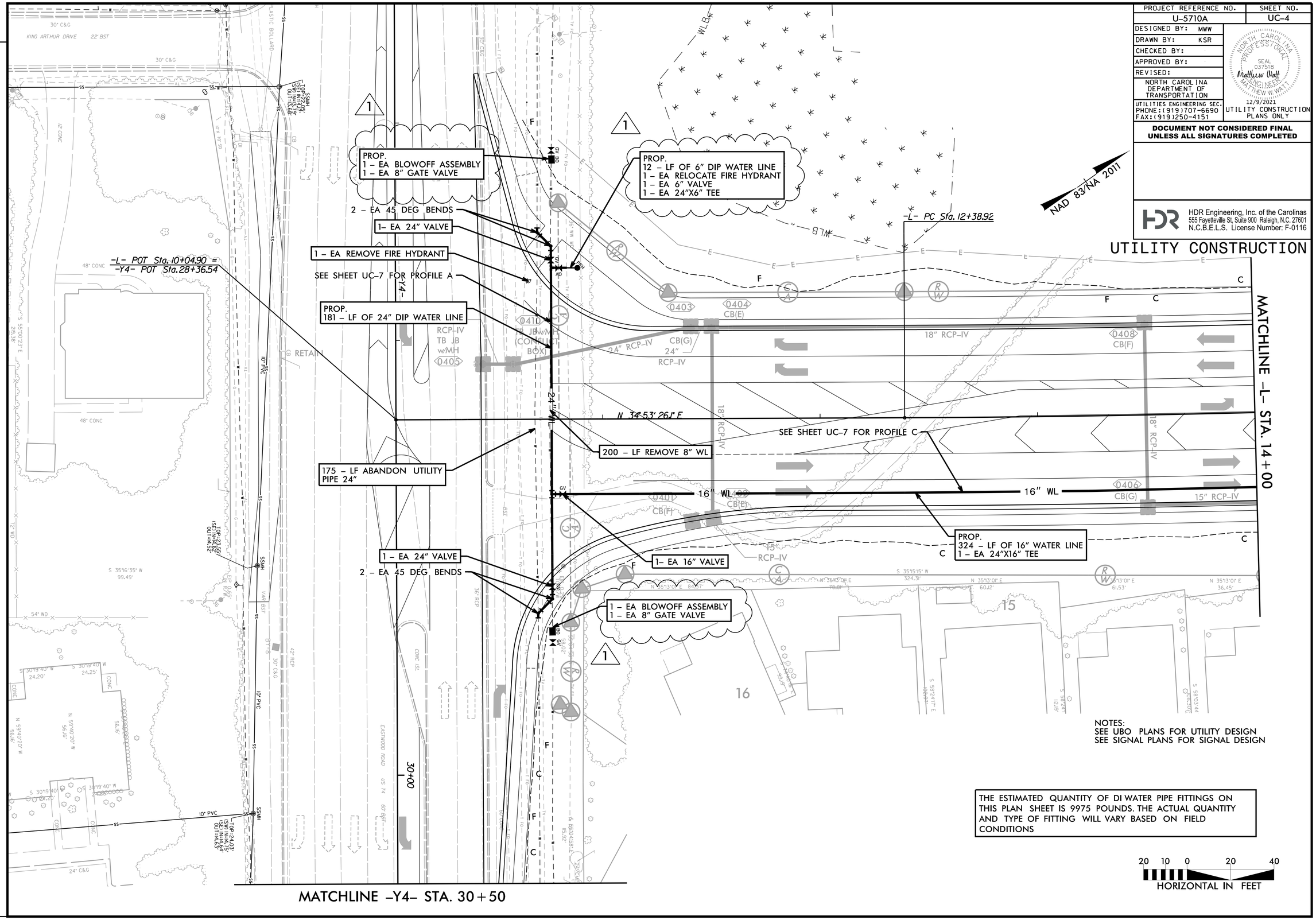
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

UTILITY CONSTRUCTION

REVISIONS

1 REMOVED 28 LF 8" WATER LINE, 24"X8" TEE, 2 45 DEG BENDS, 2 LINE STOPS, AND 8"X6" REDUCER. ADDED 2 8" GATE VALVES, 1 BLOWOFF ASSEMBLY, AND 24"X6" TEE.



NOTES:
SEE UBO PLANS FOR UTILITY DESIGN
SEE SIGNAL PLANS FOR SIGNAL DESIGN

THE ESTIMATED QUANTITY OF DI WATER PIPE FITTINGS ON THIS PLAN SHEET IS 9975 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTING WILL VARY BASED ON FIELD CONDITIONS

20 10 0 20 40
HORIZONTAL IN FEET

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	UC-5

DESIGNED BY: MWW
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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NORTH CAROLINA PROFESSIONAL SEAL 037518 ENGINEER MATTHEW W WATT
12/9/2021

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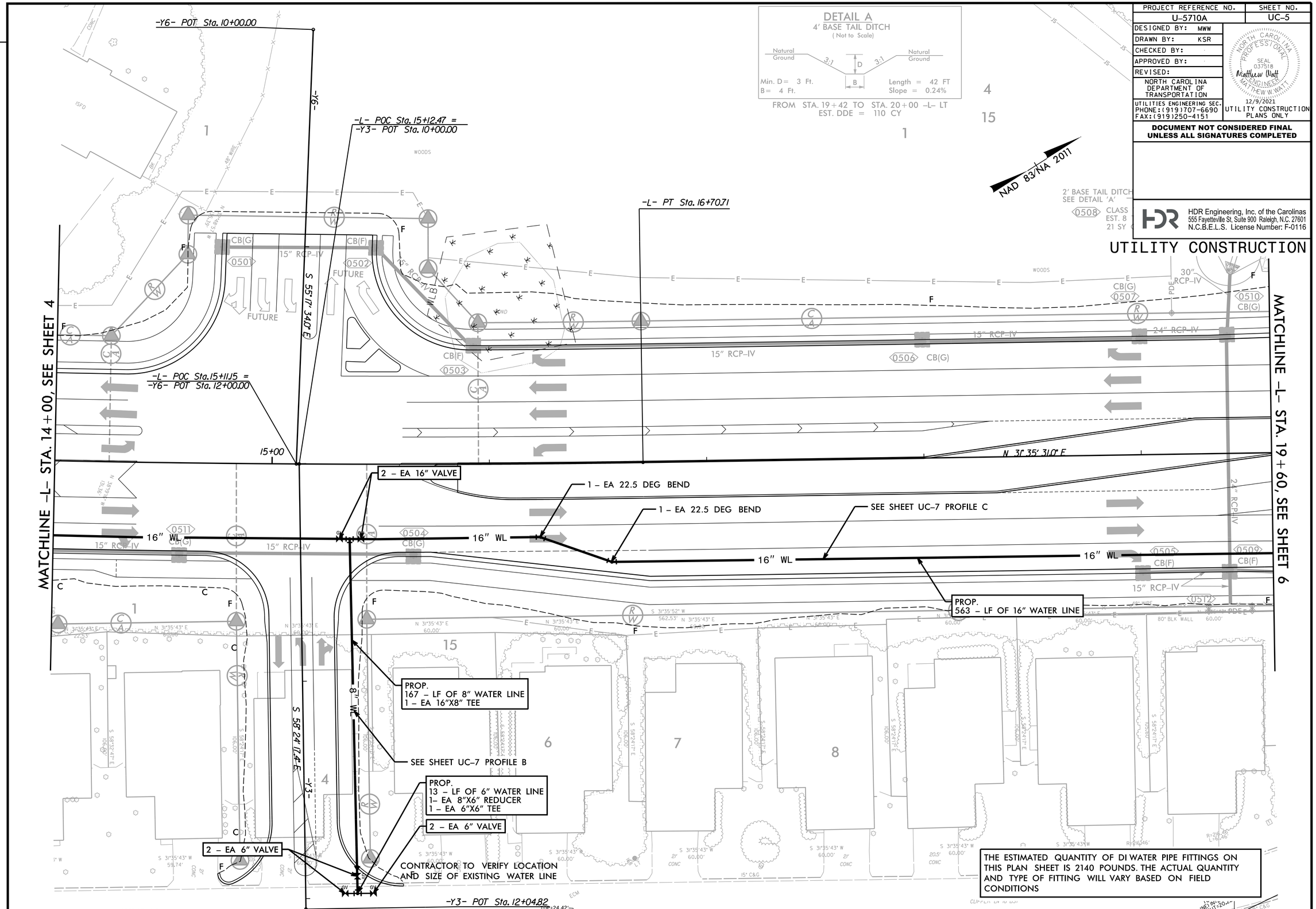
UTILITY CONSTRUCTION



REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	UC-6

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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N.C.B.E.L.S. License Number: F-0116

UTILITY CONSTRUCTION

NAD 83/NA 2011

20 10 0 20 40
HORIZONTAL IN FEET

-L- PC Sta. 20+31.43

MATCHLINE -L- STA. 19+60, SEE SHEET 5

PROP.
357 – LF OF 16" WATER LINE

1 – EA 22.5 DEG BEND
SEE SHEET UC-7
PROFILE C

-Y2- POT Sta. 11+78.23

1 – EA 22.5 DEG BEND

-L- PT Sta. 23+10.34

1 – EA 22.5 DEG BEND

PROP.
1 – EA BLOWOFF ASSEMBLY

1 – EA REMOVE EXIST MANHOLE
104 – LF ABANDON 8" UTILITY PIPE

1 – EA 12" VALVES

INSTALL NEW 4' DIAMETER MANHOLE
PROP. TOP=22.83'
PROP. INVERT OUT=20.74

2 – EA 12" VALVES

-L- POT Sta. 24+24.16 =
-Y1- POT Sta. 46+99.05
-Y7- POT Sta. 10+00.00 =
-Y1- POT Sta. 46+87.62

PROP.
12 – LF OF 12" WATER LINE
1 – EA 12"X12" TEE
1 – EA 16" X 12" REDUCER

-Y1- PC Sta. 4

-Y2- POT Sta. 10+00.00

-Y1- +23.00
77.00' LT &
64.00' LT &
EX. R/W

TOP=24.62
INV=20.25

523 – LF ABANDON 12" UTILITY PIPE

N 6°47'16.2" E

INSET A

PROP.
1 – EA BLOWOFF ASSEMBLY
1 – EA LINE STOP

THE ESTIMATED QUANTITY OF DI WATER PIPE FITTINGS ON THIS PLAN SHEET IS 3790 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTING WILL VARY BASED ON FIELD CONDITIONS

SEE INSET A

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	UC-7

DESIGNED BY: MWW
DRAWN BY: KSR
CHECKED BY:
APPROVED BY:
REVISED: 4/23/21

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

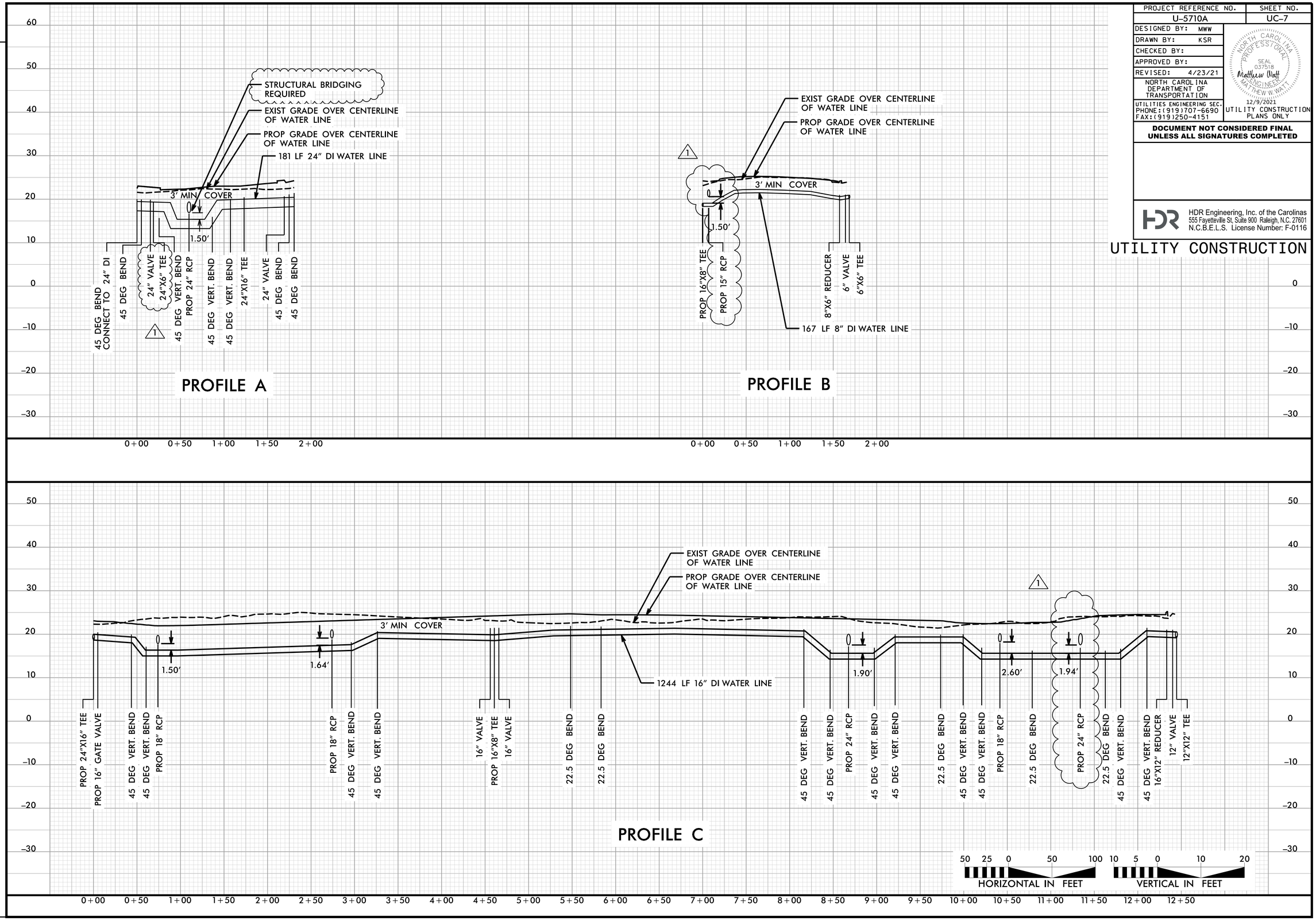
NORTH CAROLINA PROFESSIONAL SEAL 037518 ENGINEER MATTHEW W. WATT
Matthew Watt
12/9/2021

UTILITY CONSTRUCTION PLANS ONLY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

UTILITY CONSTRUCTION



REVISIONS

1 PROP. 15" RCP ADDED TO PROFILE B. PROP. 18" RCP CHANGED TO 24" RCP. REMOVED 24"X8" TEE ADDED 24"X6" AND ADJUSTED LOCATION. ADJUSTED LOCATION OF 24" VALVE. ADDED NOTE FOR STRUCTURAL BRIDGING.

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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

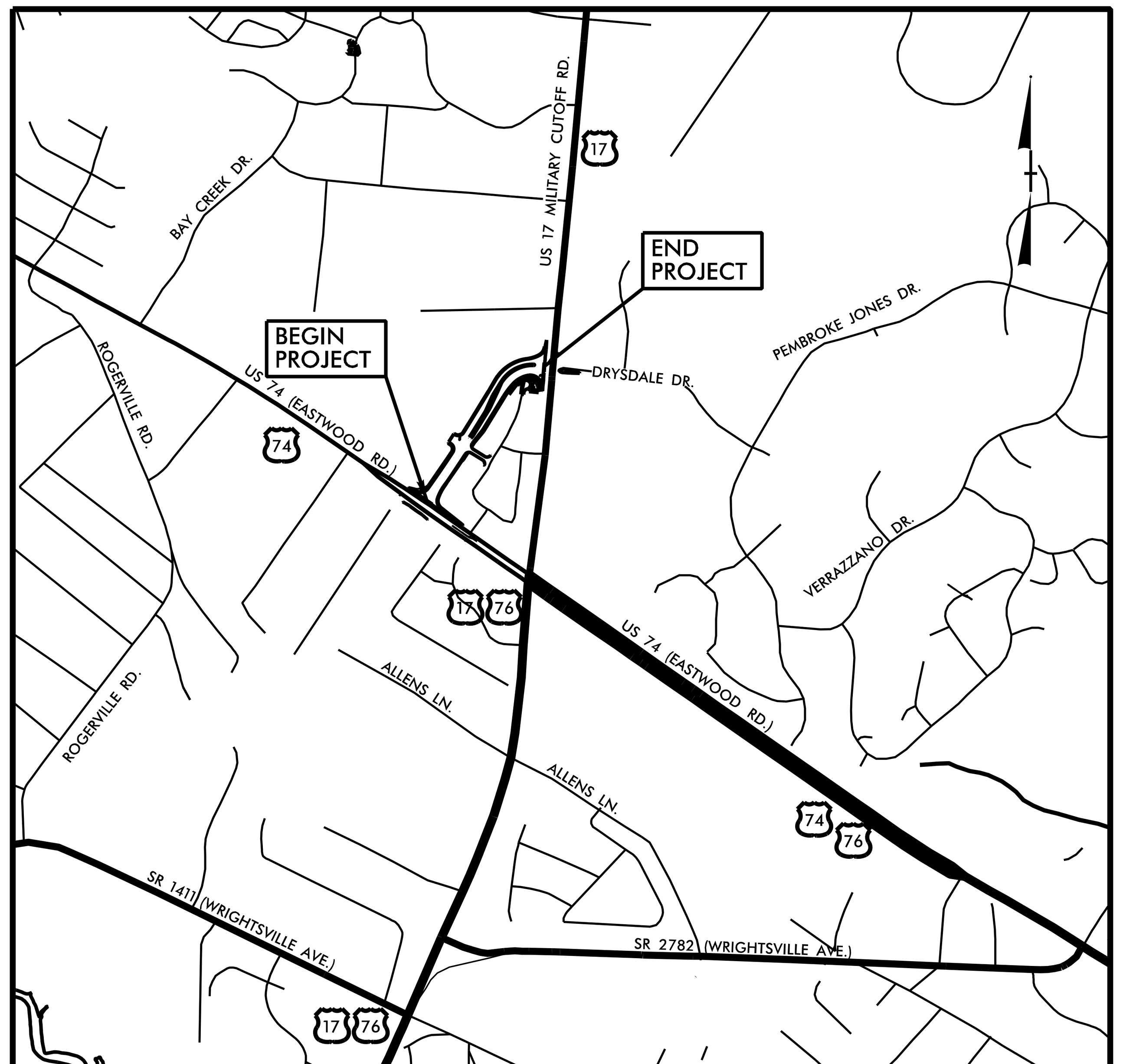
T.I.P. NO.	SHEET NO.
U-5710A	UO-1

NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

UTILITIES BY OTHERS PLANS
NEW HANOVER COUNTY

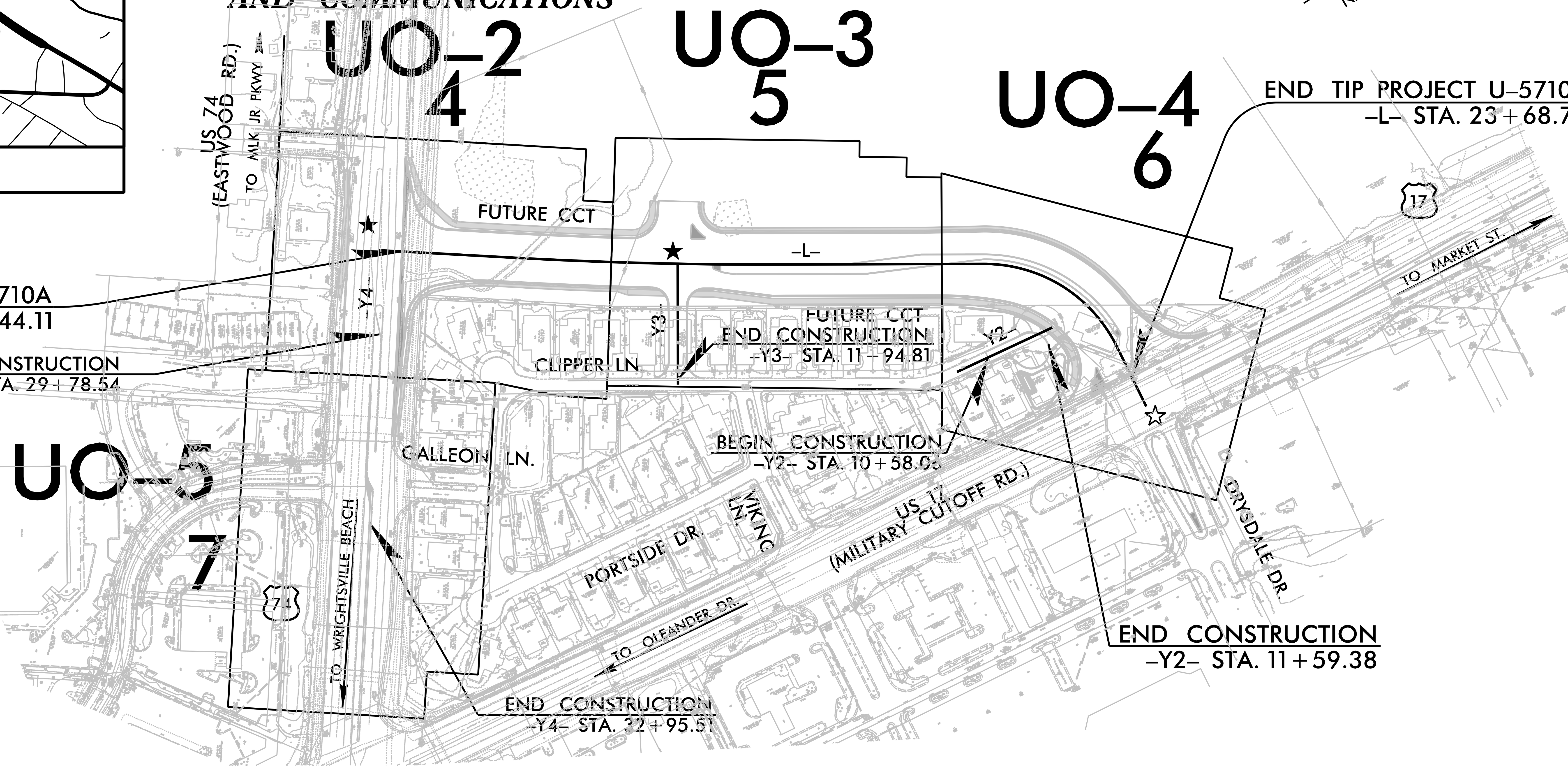
TIP PROJECT: U-5710A

See Sheet 1B For Conventional Symbols



VICINITY MAP
(NOT TO SCALE)

LOCATION: NEW LOCATION NORTHWESTERN QUADRANT CONNECTION BETWEEN US 74 (EASTWOOD RD.) AND US 17 (MILITARY CUTOFF RD.)
TYPE OF WORK: POWER (DISTRIBUTION) GAS (DISTRIBUTION) AND COMMUNICATIONS



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.:	*DESCRIPTION:*
UO-1	*TITLE SHEET*
UO-2 THRU UO-5	*UBO PLAN SHEETS*

UTILITY OWNERS WITH CONFLICTS

(A) POWER (DISTRIBUTION) - DUKE
(B) GAS (DISTRIBUTION) - PNG
(C) COMMUNICATIONS - AT&T
(D) COMMUNICATIONS - LEVEL 3
(E) COMMUNICATIONS - SEGRA
(F) COMMUNICATIONS - SPECTRUM

PREPARED IN THE OFFICE OF:

SAM
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Suite 116
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(919) 878-7466

Keith Garry	UTILITY PROJECT MANAGER
Scott Williford	PROJECT UTILITY COORDINATOR

DIVISION OF HIGHWAYS
DIVISION 03
DIV ADDRESS
5501 Barbados Blvd.
Castle Hayne, NC 28429

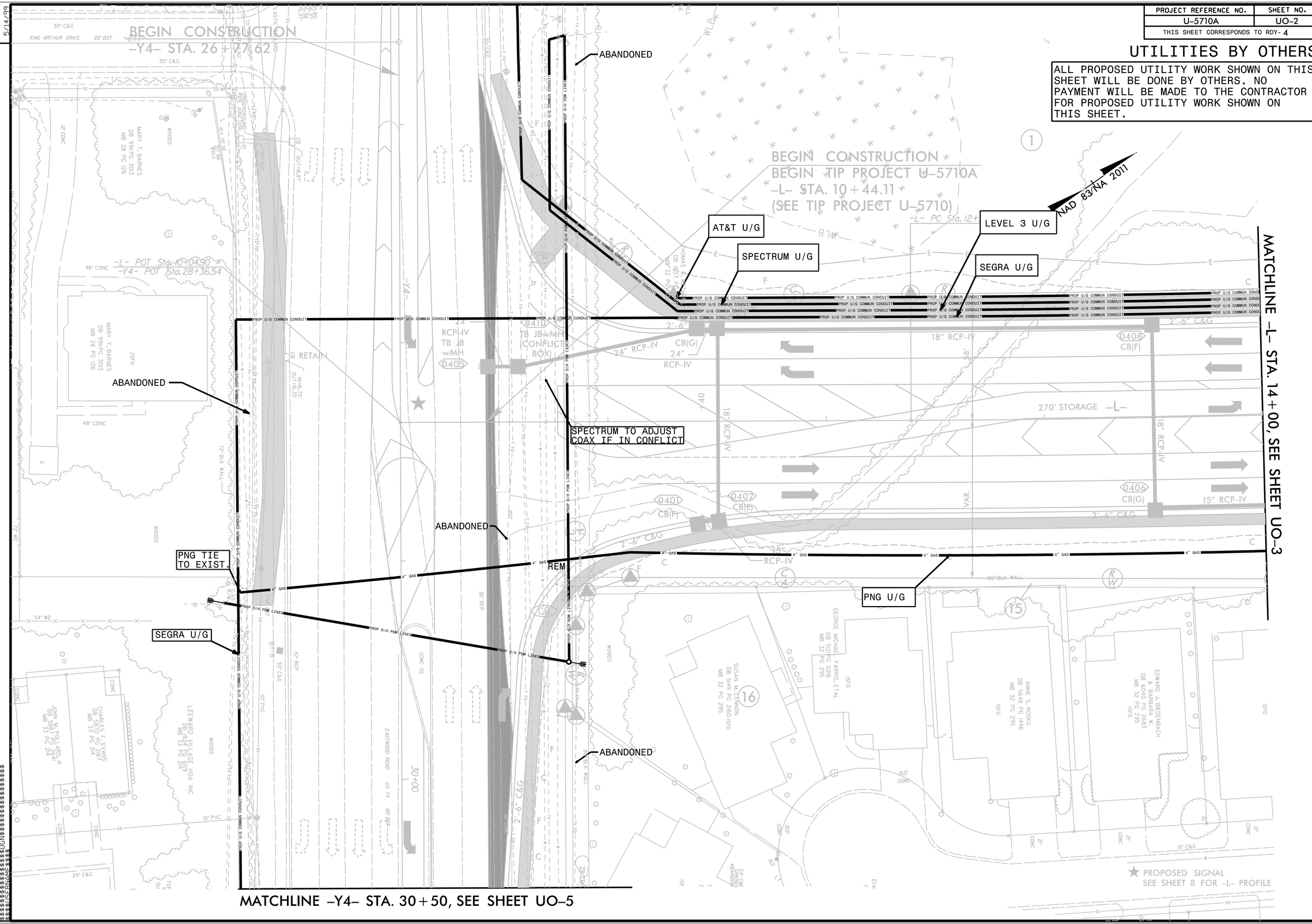
Michael Bass	DIVISION CONTACT #1
Lonny Sleeper	DIVISION CONTACT #2

09/08/99
$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$DGN$$$$$$$$$$$$
$$$$$$USERNAME$$$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	UO-2
THIS SHEET CORRESPONDS TO RDY- 4	

UTILITIES BY OTHERS

ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.



REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
U-5710A	UO-3
THIS SHEET CORRESPONDS TO RDY- 5	

UTILITIES BY OTHERS

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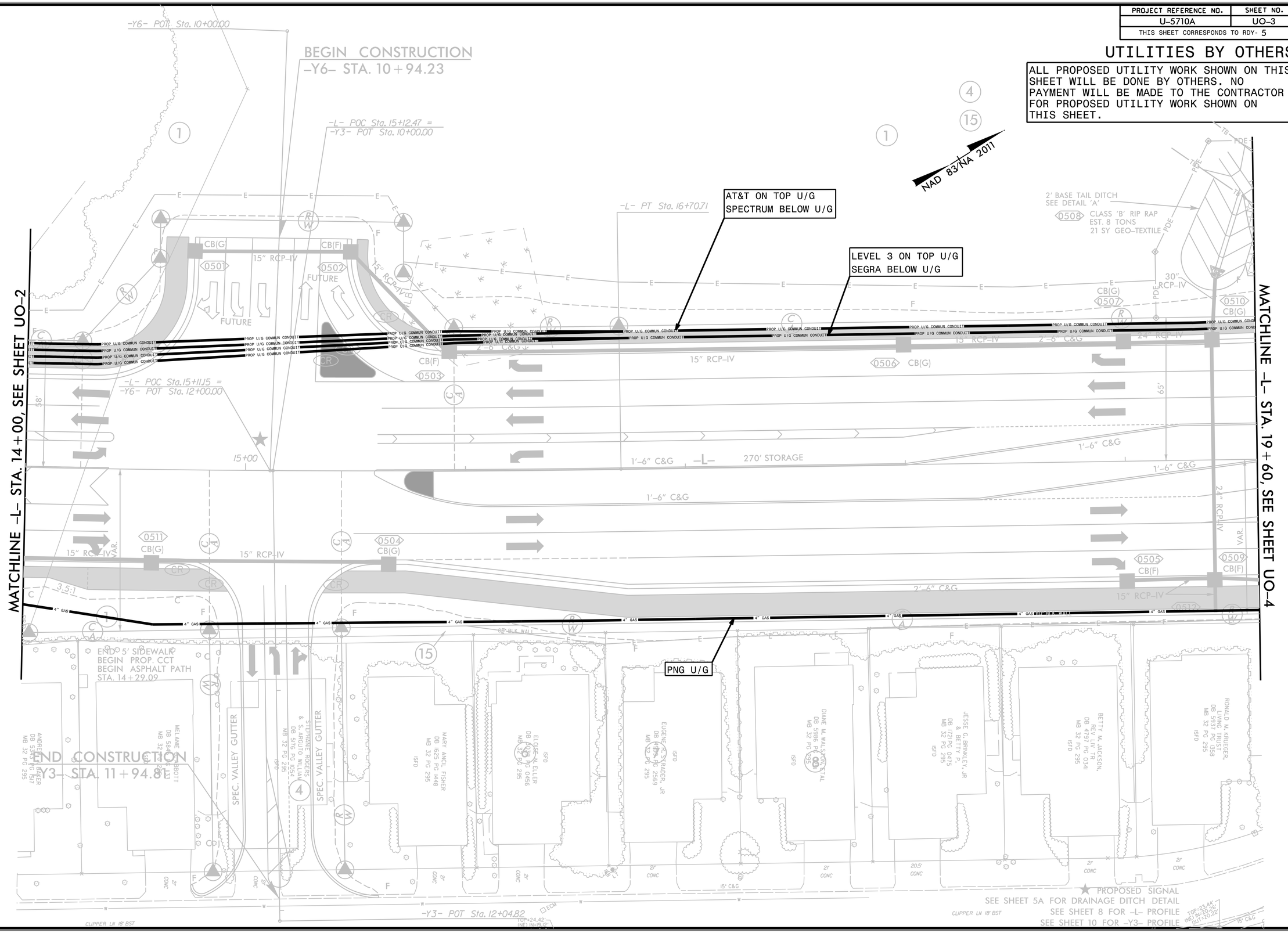

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	UO-4
THIS SHEET CORRESPONDS TO RDY-6	

UTILITIES BY OTHERS

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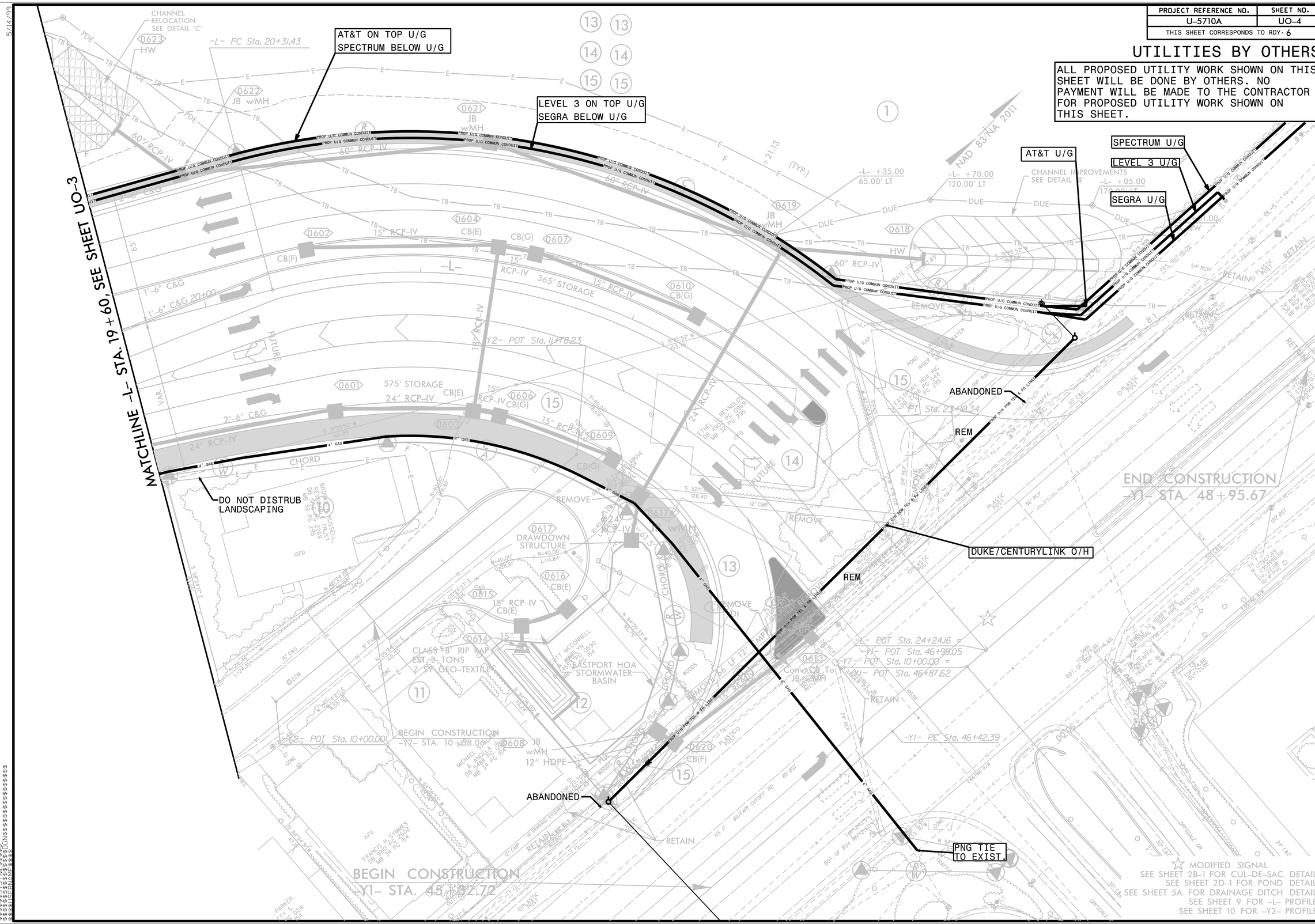

PROJECT REFERENCE NO.	SHEET NO.
U-5710A	UO-5
THIS SHEET CORRESPONDS TO RDY- 7	

UTILITIES BY OTHERS

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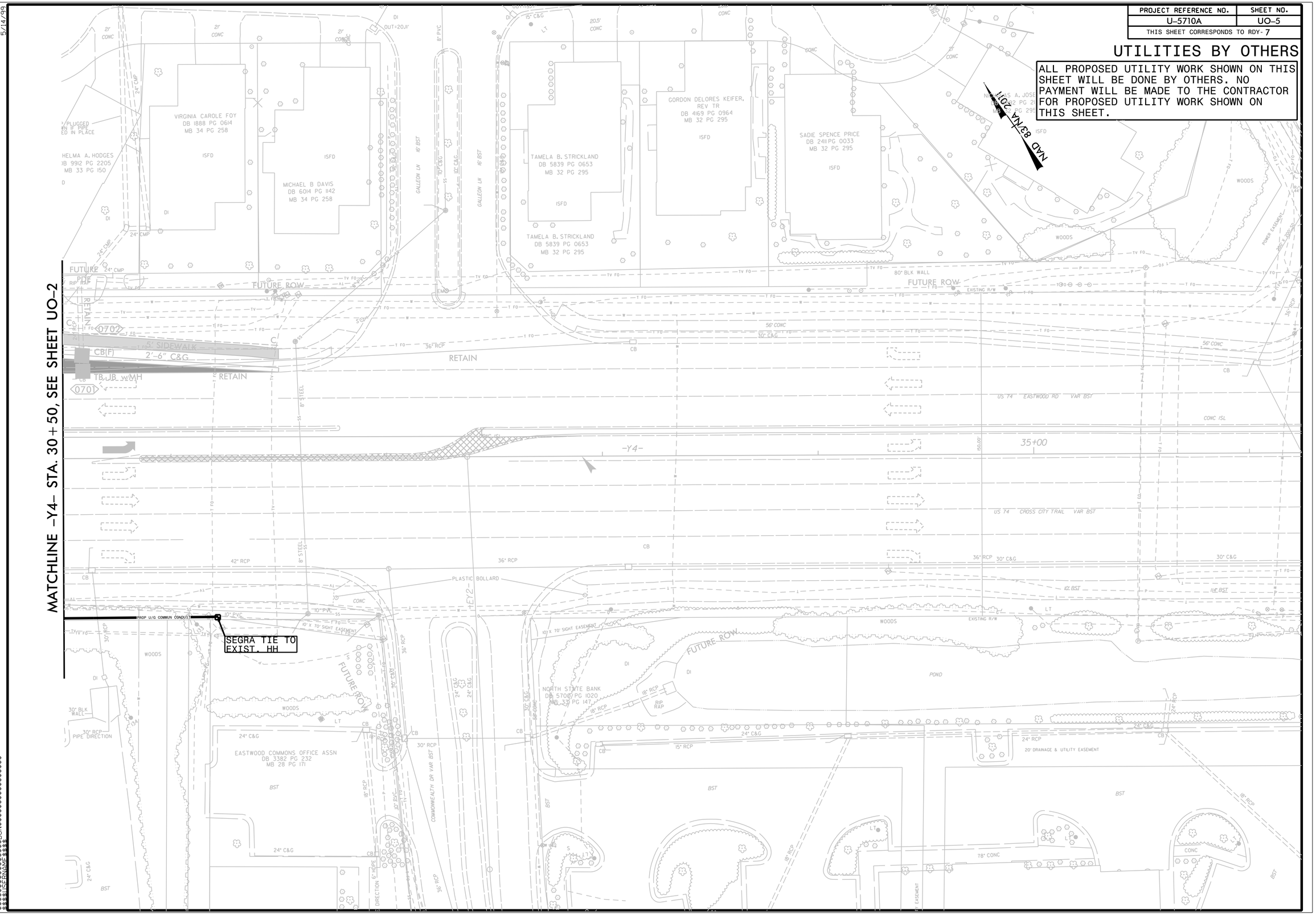


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJ. REFERENCE NO.	SHEET NO.
U-5710A	X-0

Quantities are approximate only. The Resident Engineer will recross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid.

NOTE: EMBANKMENT COLUMN INCLUDES BACKFILL FOR UNDERCUT

CROSS-SECTION SUMMARY

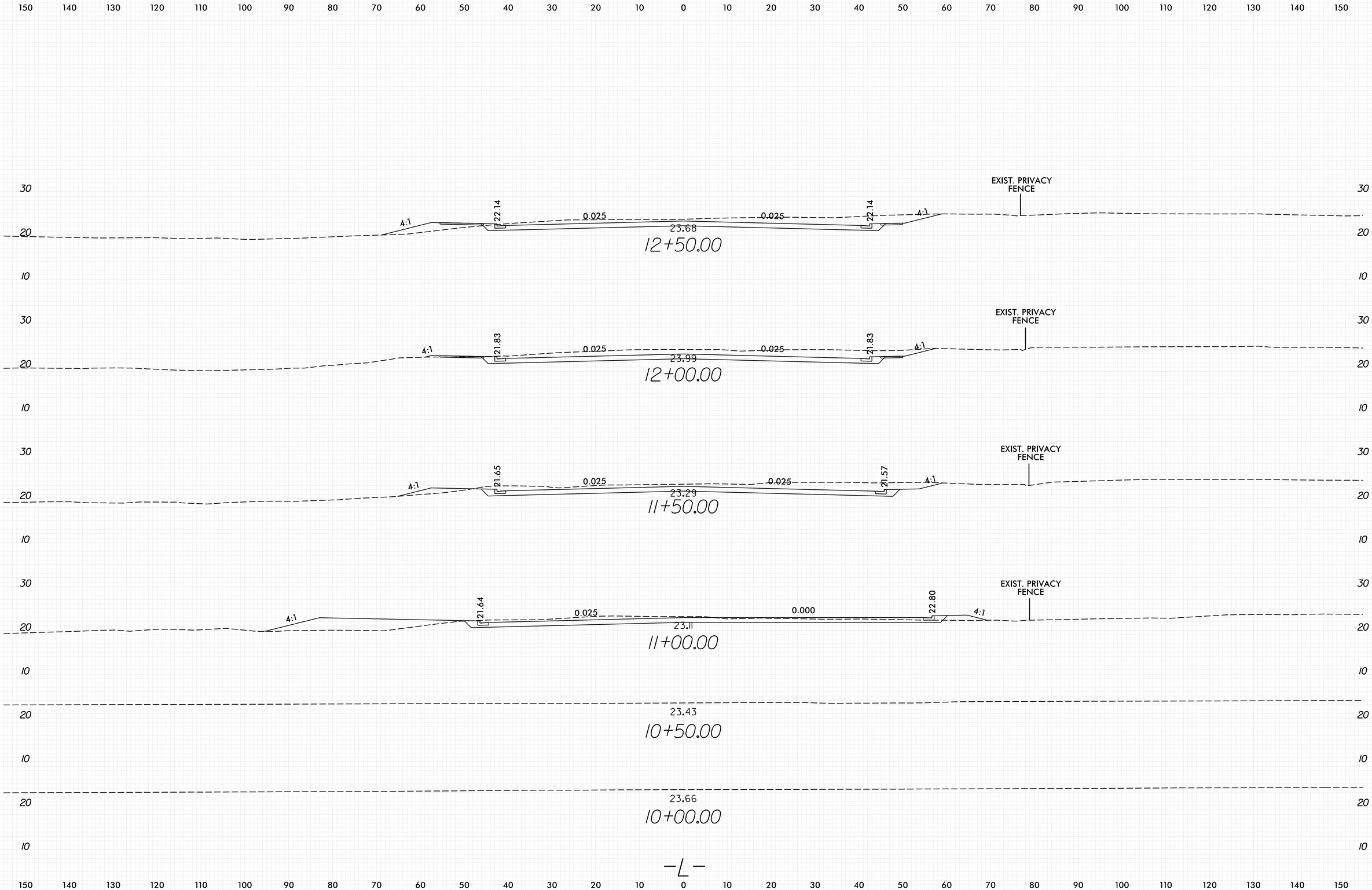
Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)	UnderCut (cu. yd.)	Station Y7	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
11+00.00	0	0	0	10+44.49	0	0
11+50.00	331	34	0	10+50.00	11	0
12+00.00	397	15	0	10+75.00	49	0
12+50.00	394	28	0	11+00.00	49	0
13+00.00	385	34	0	11+25.00	52	0
13+50.00	389	9	0	11+50.00	50	0
14+00.00	337	0	0	11+75.00	49	0
14+50.00	202	5	0	12+00.00	53	0
15+00.00	92	33	0	12+25.00	50	0
15+50.00	34	175	0	12+44.04	35	0
16+00.00	1	471	0			
16+50.00	0	562	0			
17+00.00	0	467	0			
17+50.00	1	403	0			
18+00.00	8	241	0			
18+50.00	34	127	0			
19+00.00	69	121	0			
19+50.00	55	197	0			
20+00.00	19	338	0			
20+50.00	11	631	37			
21+00.00	27	743	143			
21+50.00	56	622	214			
22+00.00	79	548	173			
22+50.00	131	396	0			
23+00.00	143	428	0			
23+50.00	128	333	0			

Station Y2	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+58.06	0	0
10+75.00	4	0
11+00.00	20	1
11+25.00	55	3
11+50.00	48	6
11+59.38	8	3

Station Y3	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+50.00	0	0
11+00.00	105	7
11+50.00	132	1
11+75.00	74	0

Station Y4	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
30+00.00	0	0
30+50.00	48	0
31+00.00	35	0
31+50.00	22	0

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-5710A	X-1



8/23/99

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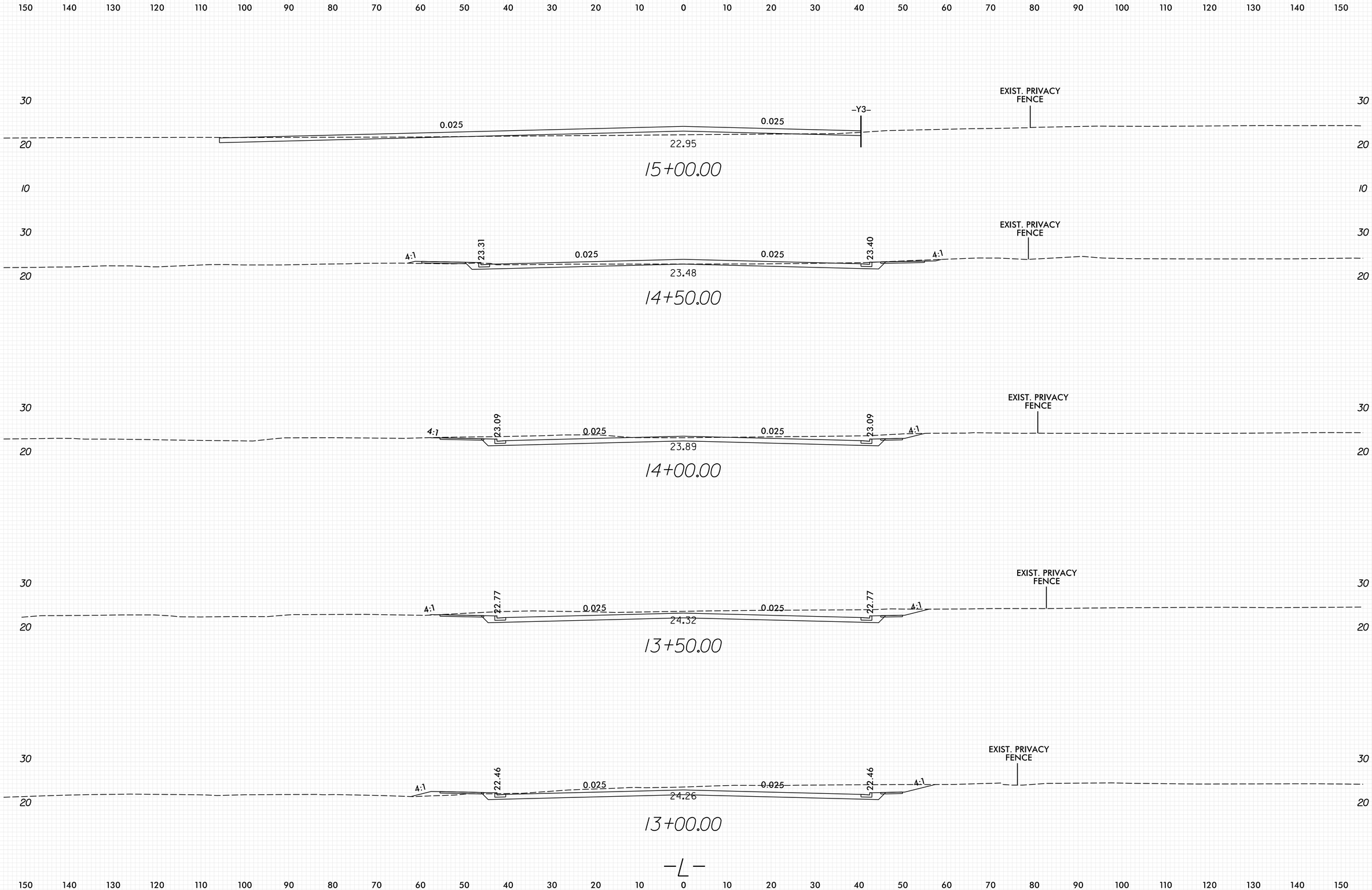

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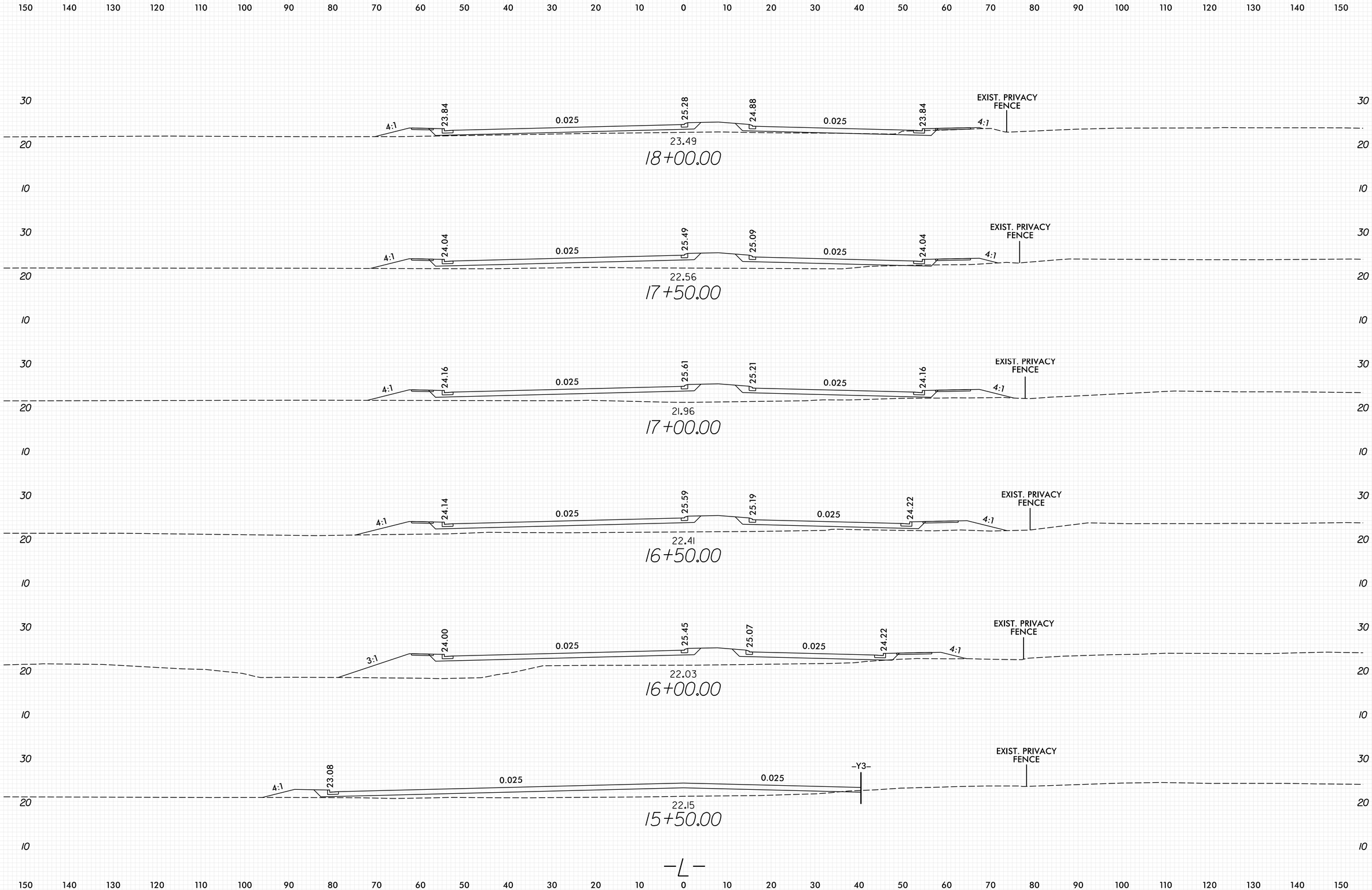
	U-5710A	X-3



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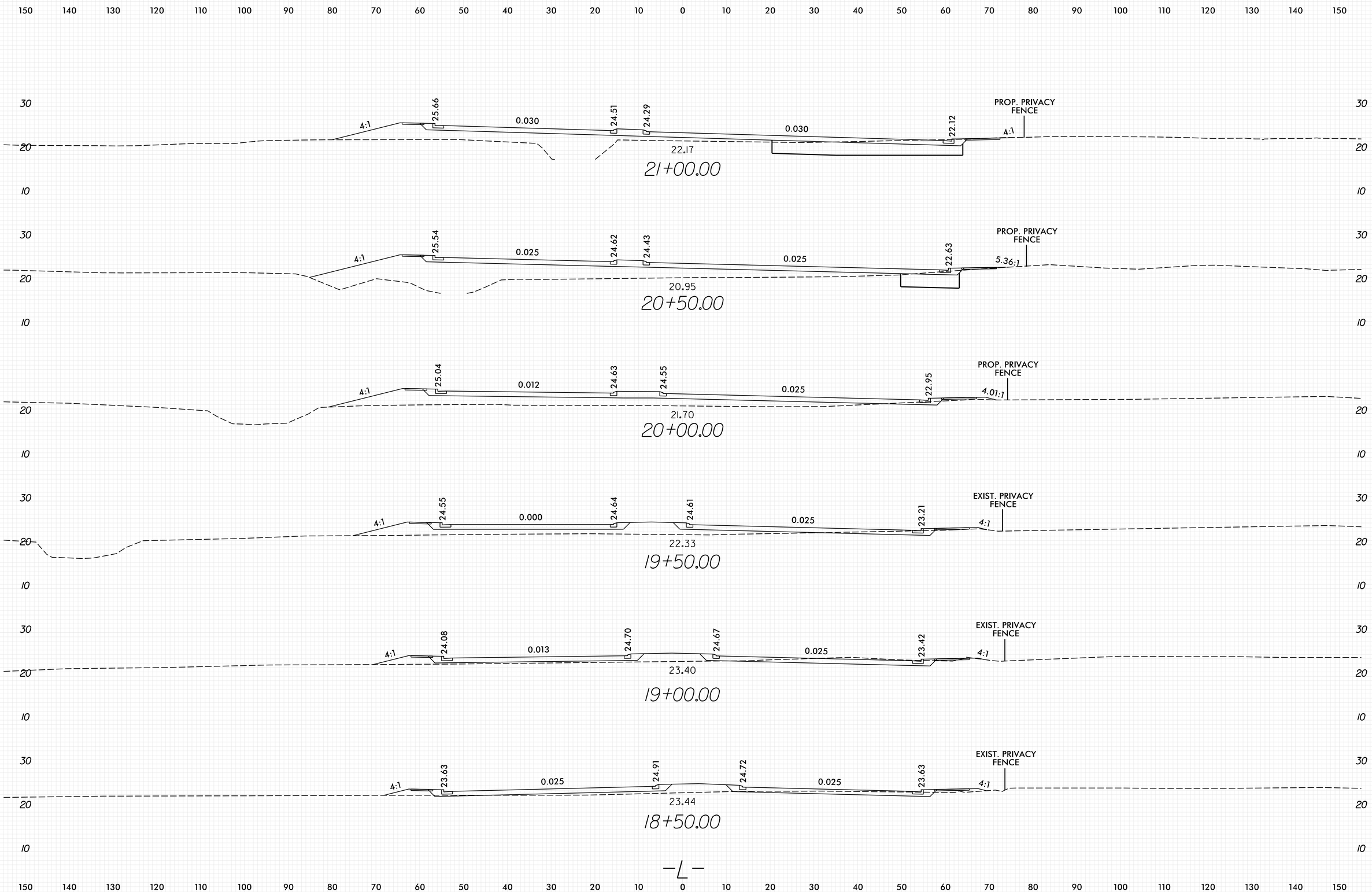

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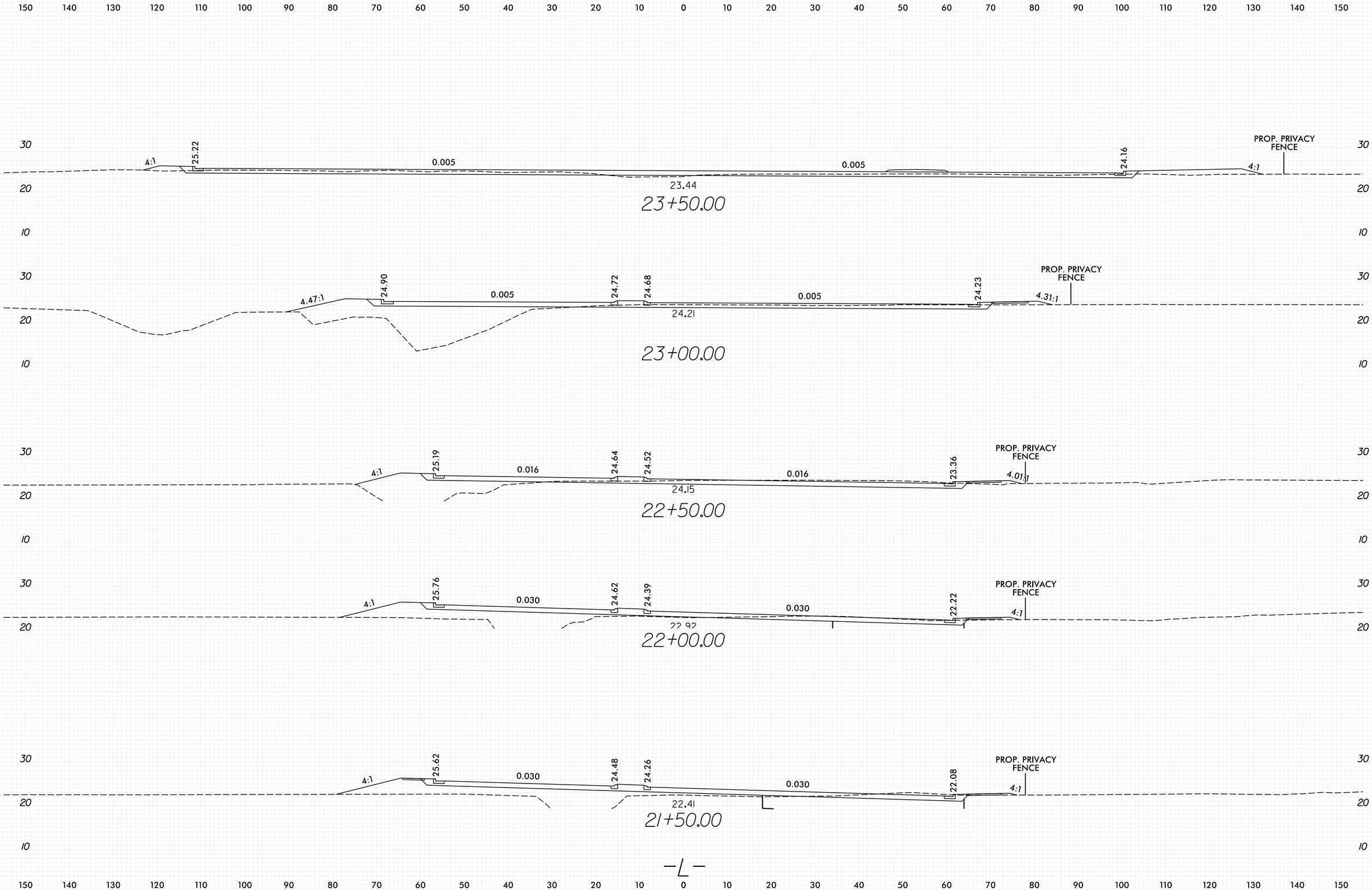

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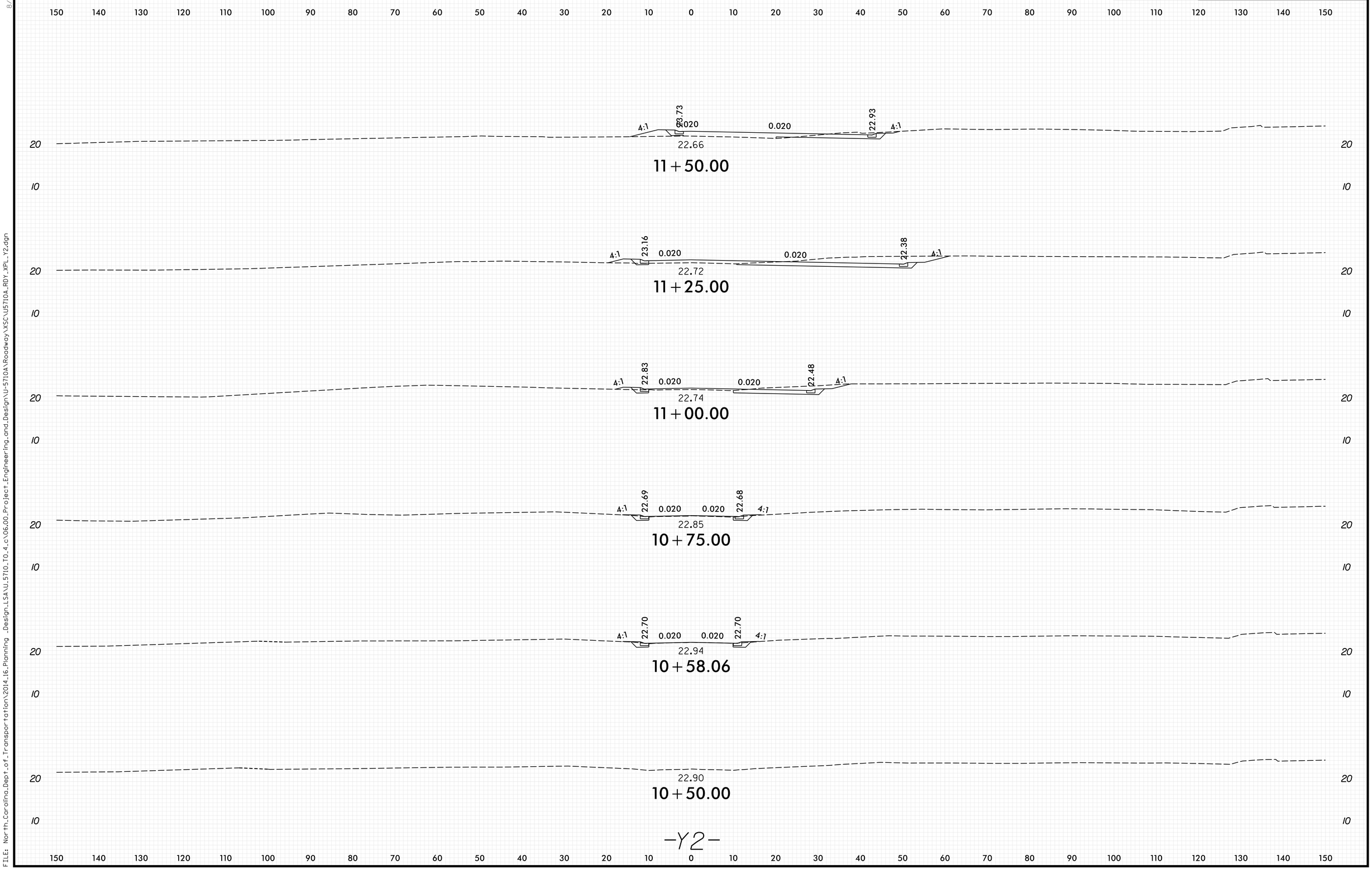

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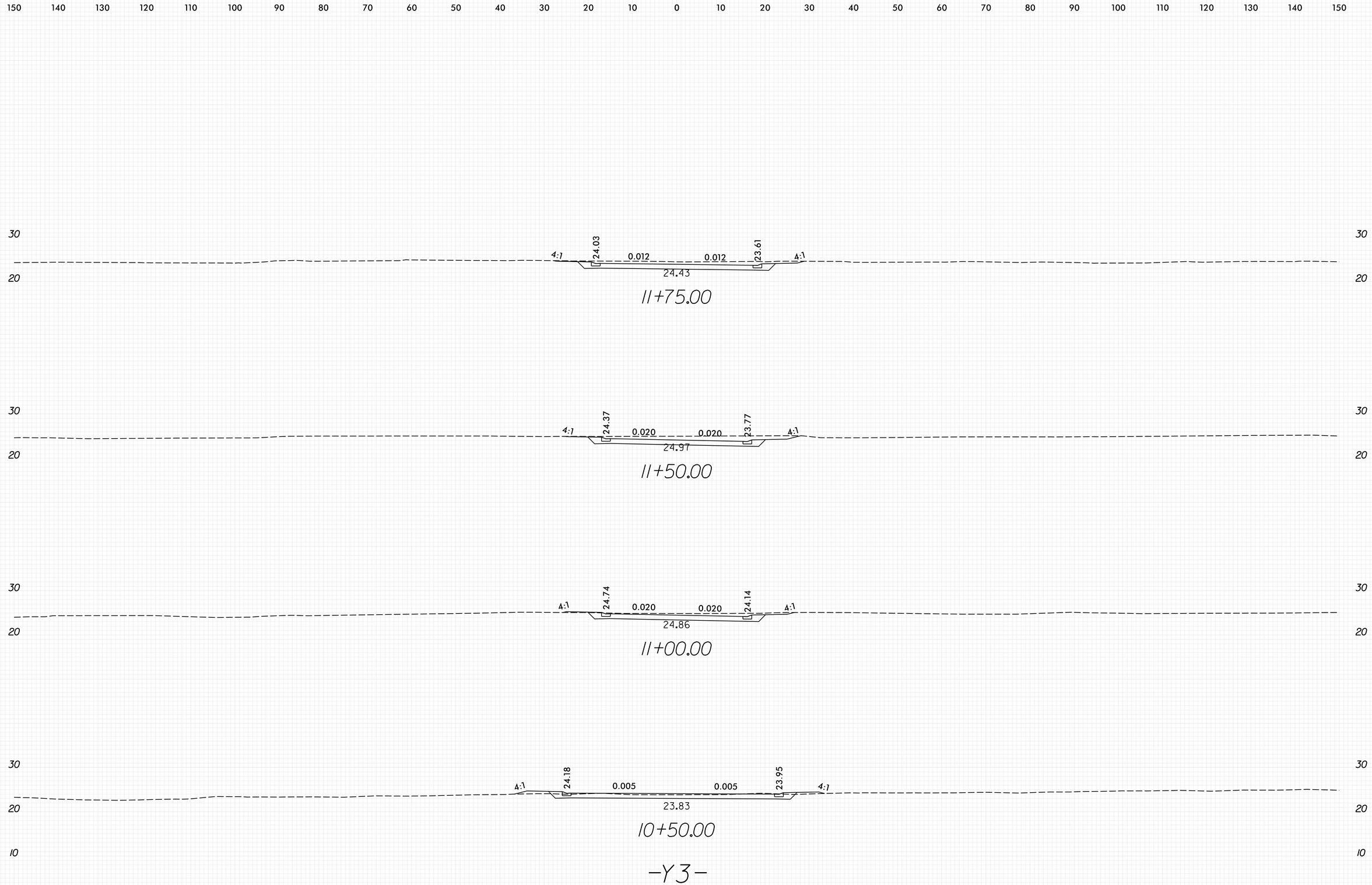

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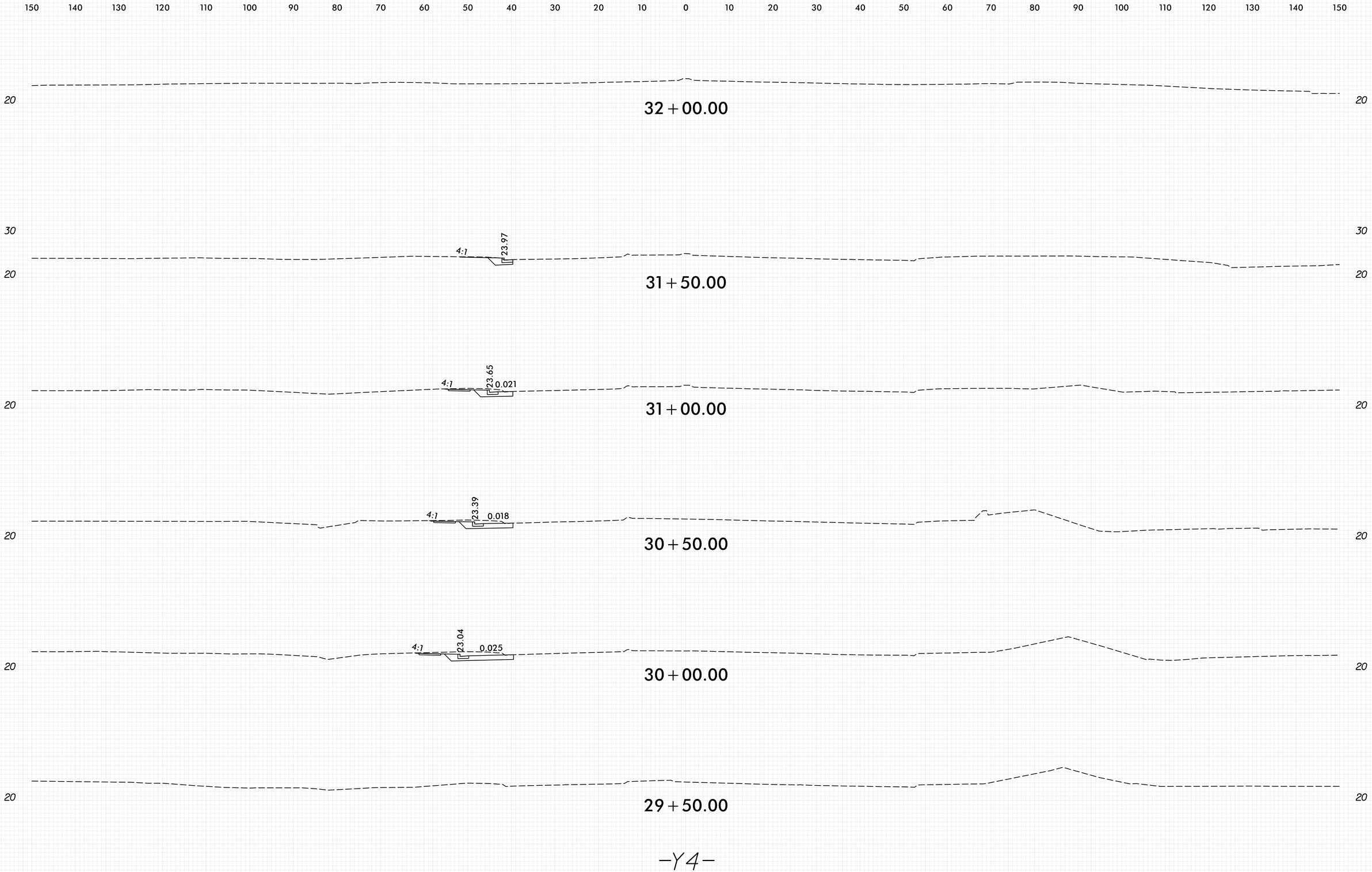

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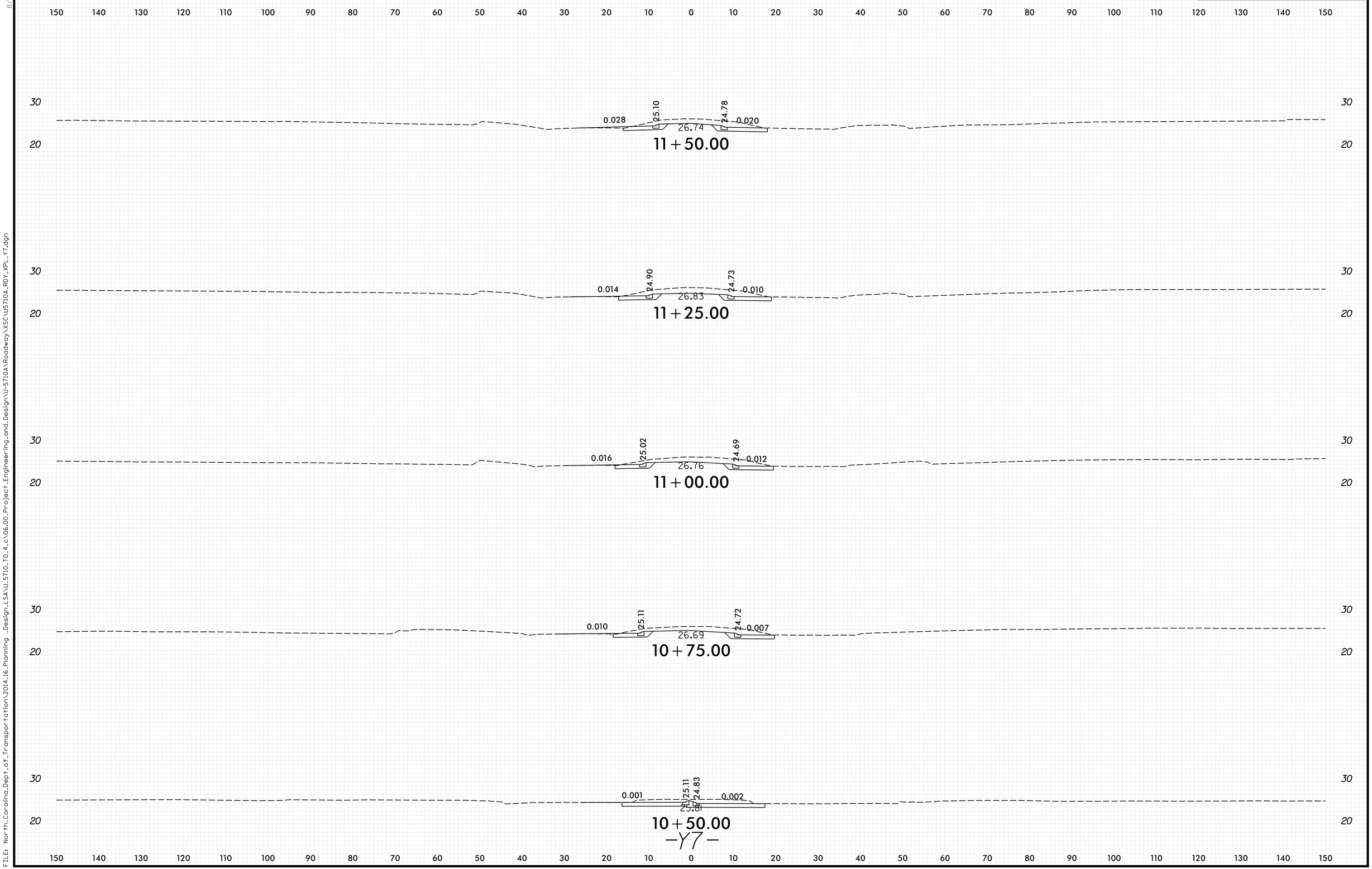

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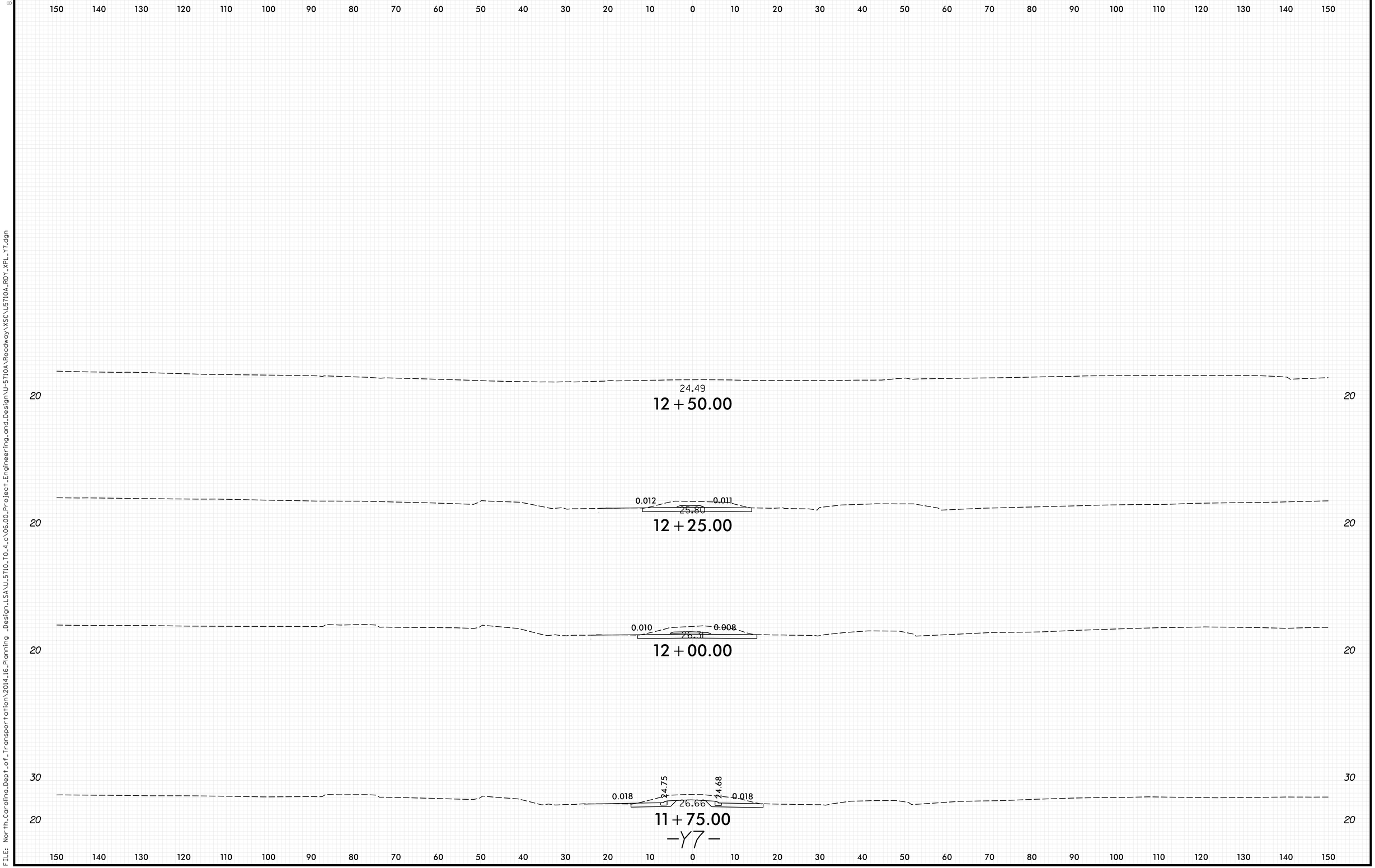

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8/23/99

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8/17/99

GRAPHIC SCALE (10 5 0 10 20) PLANS	PROJECT REFERENCE NO.	SHEET NO.
	U-5710A	W-1
	R/W SHEET NO.	

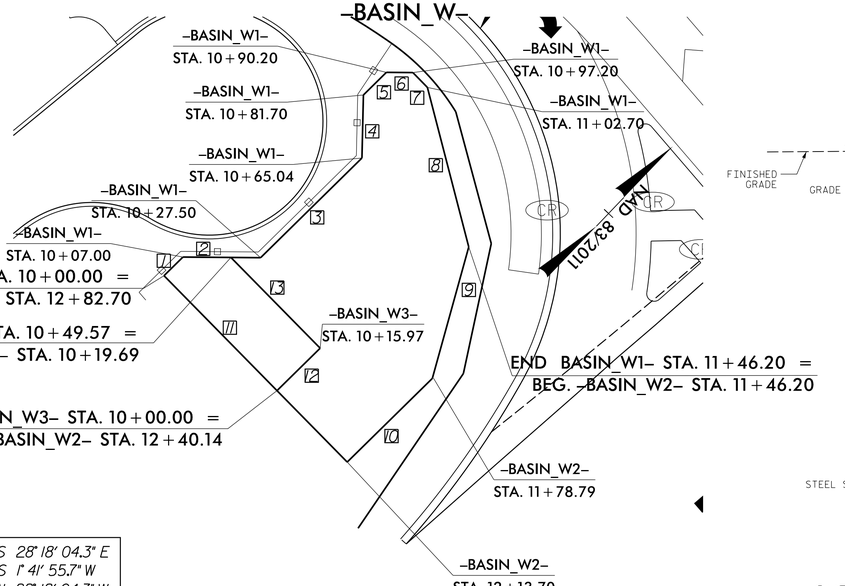
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039763 ENGINEER MICHAEL G. BATTEN 12/15/2021

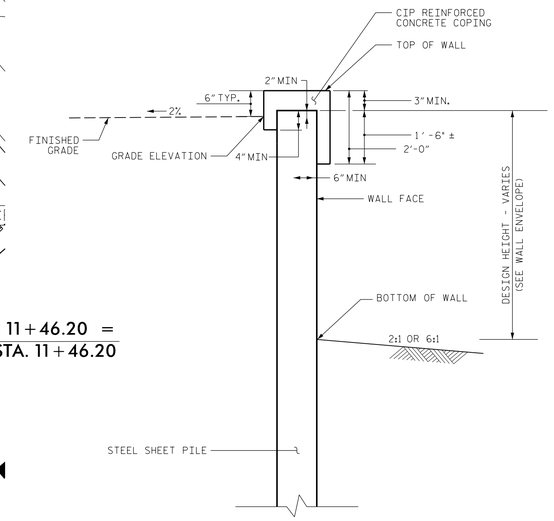
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

WALL ENVELOPE



1 N 1° 41' 55.7" E
2 N 46° 41' 55.7" E
3 N 1° 41' 55.7" E
4 N 42° 31' 19.7" W
5 N 1° 41' 55.7" E
6 N 46° 41' 55.7" E
7 S 88° 18' 04.3" E
8 S 58° 18' 04.3" E
9 S 28° 18' 04.3" E
10 S 1° 41' 55.7" W
11 N 88° 18' 04.3" W
12 N 1° 41' 55.7" E
13 N 88° 18' 04.3" W



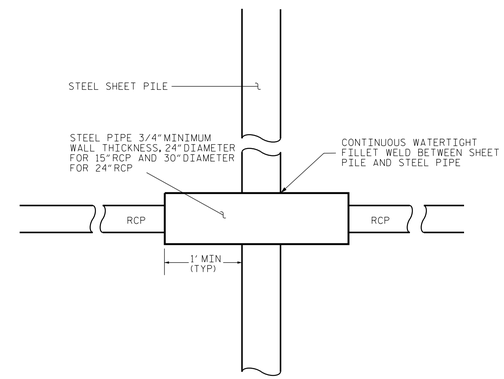
SHEET PILE WALL - TYPICAL SECTION

NOT TO SCALE

ESTIMATED SHEET PILE WALL QUANTITIES

RETAINING WALL NO.	SHEET PILE RETAINING WALLS (SQUARE FEET)
W1	877
W2	819
W3	298
TOTAL QUANTITY = 1,994 SF	

* WALL QUANTITIES ARE CALCULATED BASED ON EXPOSED WALL SURFACE



TYPICAL PIPE PENETRATION DETAIL

NOT TO SCALE

NOTES:

FOR SHEET PILE RETAINING WALLS, SEE SECTION 452 OF THE STANDARD SPECIFICATIONS.

STEEL SHEET PILES SHALL BE PZ-35 SECTIONS OR EQUIVALENT AND SHALL CONFORM TO ASTM A690. SEE SECTION 1084 OF THE STANDARD SPECIFICATIONS.

INSTALL SHEET PILES TO A TIP ELEVATION NO HIGHER THAN -19.0 FT.

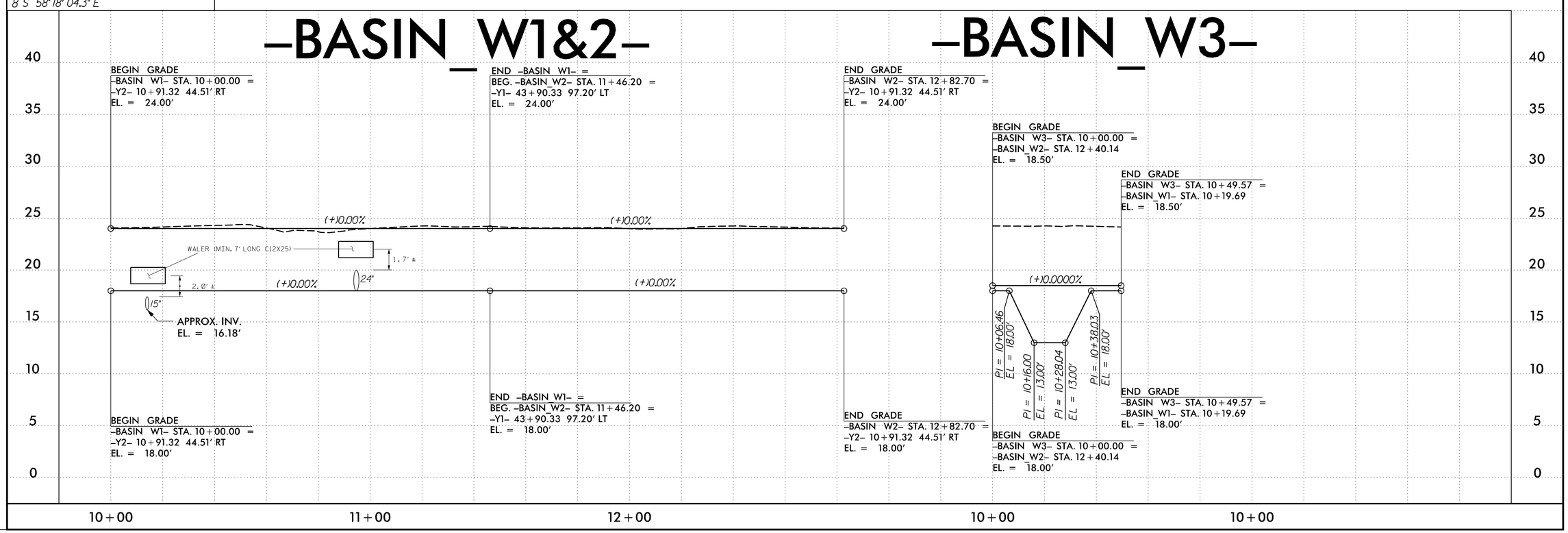
CONSTRUCT COPING IN ACCORDANCE WITH SECTION 825 OF THE STANDARD SPECIFICATIONS. THE CLASS A CONCRETE REQUIRED FOR COPING SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER SQUARE FOOT FOR SHEET PILE RETAINING WALLS.

CUTTING OF HOLES ARE REQUIRED FOR INSTALLING 15" & 24" DIAMETER RCP PIPES THROUGH THE RETAINING WALLS AFTER INSTALLAION OF SHEET PILES TO FINAL TIP ELEVATION. FOR THE LOCATION OF THE PIPES, SEE THE WALL ENVELOPES AND ROADWAY PLAN. MINIMUM 7' LONG C12X25 SHALL BE FULL PENETRATION WELDED AS A WALER LOCATED ABOVE THE PIPES AS SHOWN ON PLAN PRIOR TO CUTTING OF HOLES IN THE SHEET PILES. USE TYPICAL PIPE PENETRATION DETAIL TO CARRY RCP PIPES THROUGH STEEL PIPE SLEEVED THROUGH SHEET PILE WALL.

USE STANDARD PZ TYPE CORNER PILE INTERLOCKS FOR ANGLES THAT REQUIRE GREATER THAN 10 DEGREES OF ROTATION BETWEEN INDIVIDUAL SHEET PILES. SUBMIT SHOP DRAWINGS FOR ENTIRE WALL ASSEMBLY, INCLUDING CORNER PILE INTERLOCKS FOR ENGINEER REVIEW AND APPROVAL.

REFER TO SPECIAL PROVISION FOR INSTRUMENTATION AND MONITORING OF ADJACENT STRUCTURES FOR ALL SHEET PILE INSTALLATION.

SHEET PILES SHALL BE PRESSED INTO THE GROUND AND SHALL NOT BE DRIVEN USING A VIBRATORY HAMMER NOR IMPACT HAMMER FOR ALL SHEET PILES THAT ARE WITHIN 30 FT OF AN ADJACENT STRUCTURE OR UNDERGROUND UTILITY.



REVISIONS

PLOT DRIVER: $PLTDRV$ USER: $USER$ FILE: $PWVARVAULTPATHDESC$ DATE: $DATE$ TIME: $TIME$ PENTABLE: $PENTBLS$