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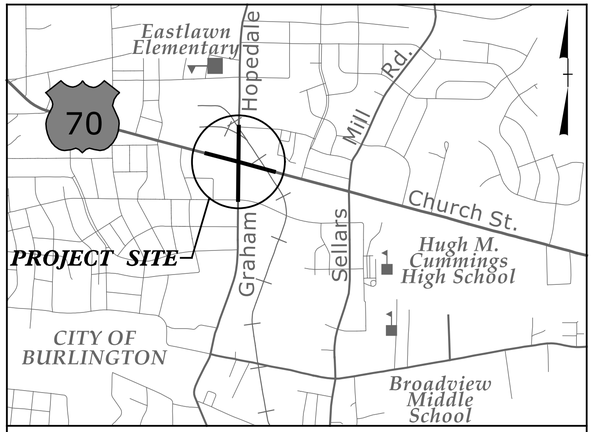
09/08/99

TIP PROJECT: U-5843

CONTRACT: DG00473

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

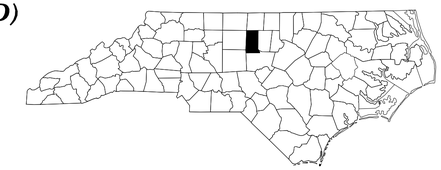
ALAMANCE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5843	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
50233.1.1		PE
50233.2.1		R/W, UTIL.
50233.3.1		CONST.

LOCATION: US 70 (CHURCH STREET) AT SR 1716 (GRAHAM-HOPEDALE ROAD) IN BURLINGTON. INTERSECTION IMPROVEMENTS.

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



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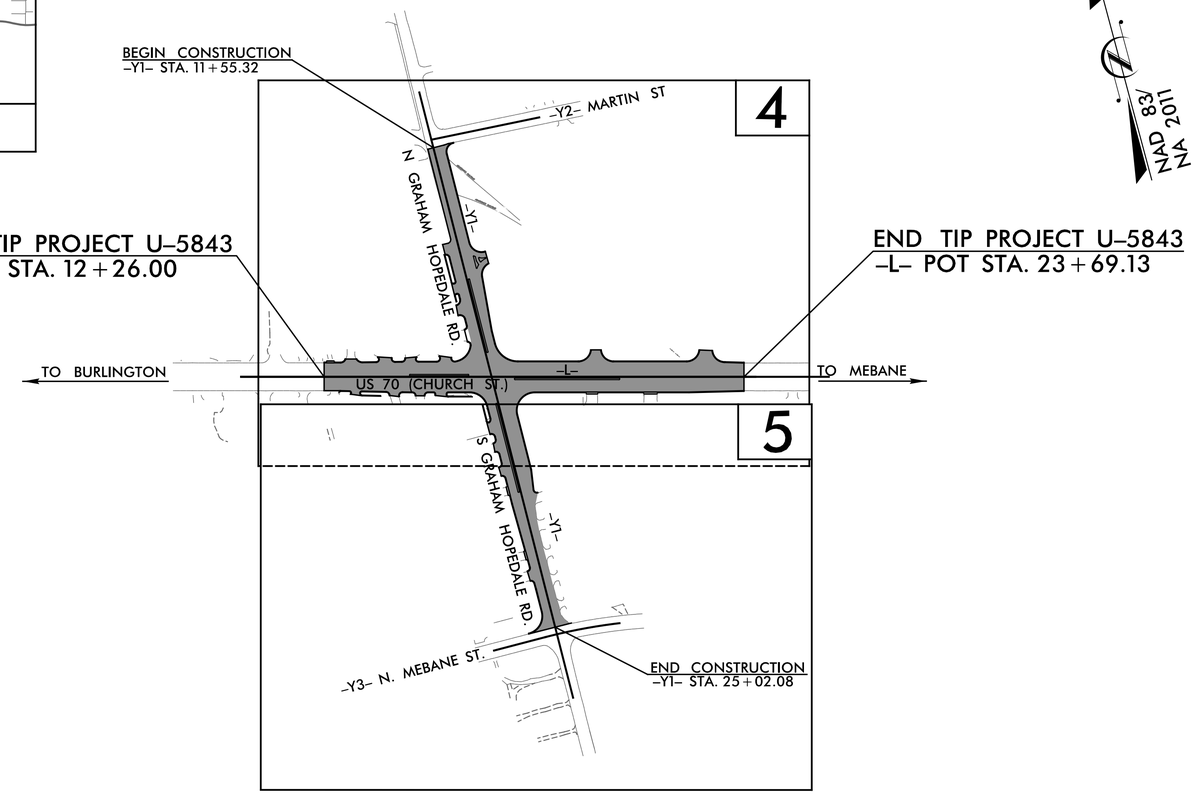

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2017 = 22,170
ADT 2037 = 31,870

V = 50 MPH

FUNC CLASS = PRINCIPAL/MINOR ARTERIAL AND MAJOR COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5843 = 0.217 MI.

TOTAL LENGTH OF TIP PROJECT U-5843 = 0.217 MI.

Prepared for the North Carolina Department of Transportation
In the Office of:

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-2658
ENG FIRM LICENSE NO. C-0910

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 30, 2017

LETTING DATE: DECEMBER 2018

JIMMY GOODNIGHT, PE
PROJECT ENGINEER

JERRY JAVELLANA, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT

CHRIS SMITHERMAN, PE
DIVISION DESIGN-CONSTRUCT ENGINEER

HYDRAULICS ENGINEER

10/9/2018

DocuSigned by: Joshua G. Dalton
10B9AD8C14994C3...
P.E.
SIGNATURE:

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

ROADWAY DESIGN ENGINEER

10/9/2018

DocuSigned by: Jimmy Goodnight
64CB24C43AFE4E8...
P.E.
SIGNATURE:

NORTH CAROLINA PROFESSIONAL SEAL 014493 ENGINEER Jimmy Stafford Goodnight

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

10/9/2018
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localuser

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5/9/06

PROJECT REFERENCE NO.	SHEET NO.
U-5843	1A

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 014493 ENGINEER James Stafford Goodnight, Jr.

DocuSigned by: Jimmy Goodnight
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INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, STANDARD DRAWINGS, AND GENERAL NOTES
1B	CONVENTIONAL SYMBOLS
1C-1 THRU 1C-2	SURVEY CONTROL SHEETS
2A-1 THRU 2A-2	PAVEMENT SCHEDULE, TYPICAL SECTIONS
2C-1 THRU 2C-2	MINIMUM DEPTH CONCRETE CATCH BASIN, SPECIAL OFFSET CATCH BASIN
3B-1	EARTHWORK SUMMARY
3D-1 THRU 3D-2	DRAINAGE SUMMARY
3P-1	PARCEL INDEX
4 THRU 6	PLAN AND PROFILE SHEETS
TMP-1 THRU TMP-5	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-3	PAVEMENT MARKING PLANS
EC-1 THRU EC-07	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-6	SIGNING PLANS
SIG-1.0 THRU SIG-4.4	SIGNAL PLANS
SCP-1 THRU SCP-4	SIGNAL COMMUNICATIONS PLANS
IT-1 THRU IT-4	ITS PLANS
UO-1 THRU UO-3	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY
X-1 THRU X-13	CROSS-SECTIONS
COB-1 THRU COB-2	GRAHAM HOPEDALE/MEBANE STREET INTERSECTION IMPROVEMENT PLANS (CITY OF BURLINGTON)

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
- 200.02 METHOD OF CLEARING - METHOD II
- 225.02 GUIDE FOR GRADING SUBGRADE - SECONDARY AND LOCAL
- 225.04 METHOD OF OBTAINING SUPERELEVATION - TWO LANE PAVEMENT
- 225.06 METHOD OF GRADING SIGHT DISTANCE AT INTERSECTIONS

DIVISION 3 - PIPE CULVERTS
- 300.01 METHOD OF PIPE INSTALLATION

DIVISION 6 - ASPHALT BASES AND PAVEMENTS
- 654.01 PAVEMENT REPAIRS

DIVISION 8 - INCIDENTALS
- 840.00 CONCRETE BASE PAD FOR DRAINAGE STRUCTURES
- 840.01 BRICK CATCH BASIN - 12" THRU 54" PIPE
- 840.02 CONCRETE CATCH BASIN - 12" THRU 54" PIPE
- 840.03 FRAME, GRATES AND HOOD - FOR USE ON STANDARD CATCH BASIN
- 840.14 CONCRETE DROP INLET - 12" THRU 30" PIPE
- 840.15 BRICK DROP INLET - 12" THRU 30" PIPE
- 840.16 DROP INLET FRAME AND GRATES - FOR USE WITH STD. DWG 840.14 AND 840.15
- 840.25 ANCHORAGE FOR FRAMES - BRICK OR CONCRETE OR PRECAST
- 840.29 FRAMES AND NARROW SLOT FLAT GRATES
- 840.34 TRAFFIC BEARING JUNCTION BOX - FOR USE WITH PIPES 42" AND UNDER
- 840.35 TRAFFIC BEARING GRATED DROP INLET - FOR CAST IRON DOUBLE FRAME AND GRATES
- 840.45 PRECAST DRAINAGE STRUCTURE
- 840.46 TRAFFIC BEARING PRECAST DRAINAGE STRUCTURE
- 840.51 BRICK MANHOLE - 12" THRU 36" PIPE
- 840.52 PRECAST MANHOLE - 4', 5' AND 6' DIAMETER
- 840.53 PRECAST MANHOLE WITH MASONRY BASE - 12" THRU 42" PIPE
- 840.54 MANHOLE FRAME AND COVER
- 840.66 DRAINAGE STRUCTURE STEPS
- 846.01 CONCRETE CURB, GUTTER AND CURB & GUTTER
- 848.01 CONCRETE SIDEWALK
- 848.02 DRIVEWAY TURNOUT - RADIUS TYPE
- 848.04 STREET TURNOUT
- 848.05 CURB RAMP - PROPOSED CURB & GUTTER
- 852.01 CONCRETE ISLANDS

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:
THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

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

SUPERELEVATION:
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATIONS 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.

DRIVEWAYS:
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:
STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

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

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

UTILITIES:
UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY - POWER, PIEDMONT NG - GAS, AT&T - TELEPHONE/TV/INTERNET, TIME WARNER CABLE - CATV, CITY OF BURLINGTON PUBLIC UTILITIES - WATER/SEWER AND CITY OF BURLINGTON - COMMUNICATIONS.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

CURB RAMPS
CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.
CONSTRUCT ALL CURB RAMPS IN ACCORDANCE WITH STD 848.05 and/or 848.06.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

9/27/2018
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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
U-5843	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

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

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) — 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:

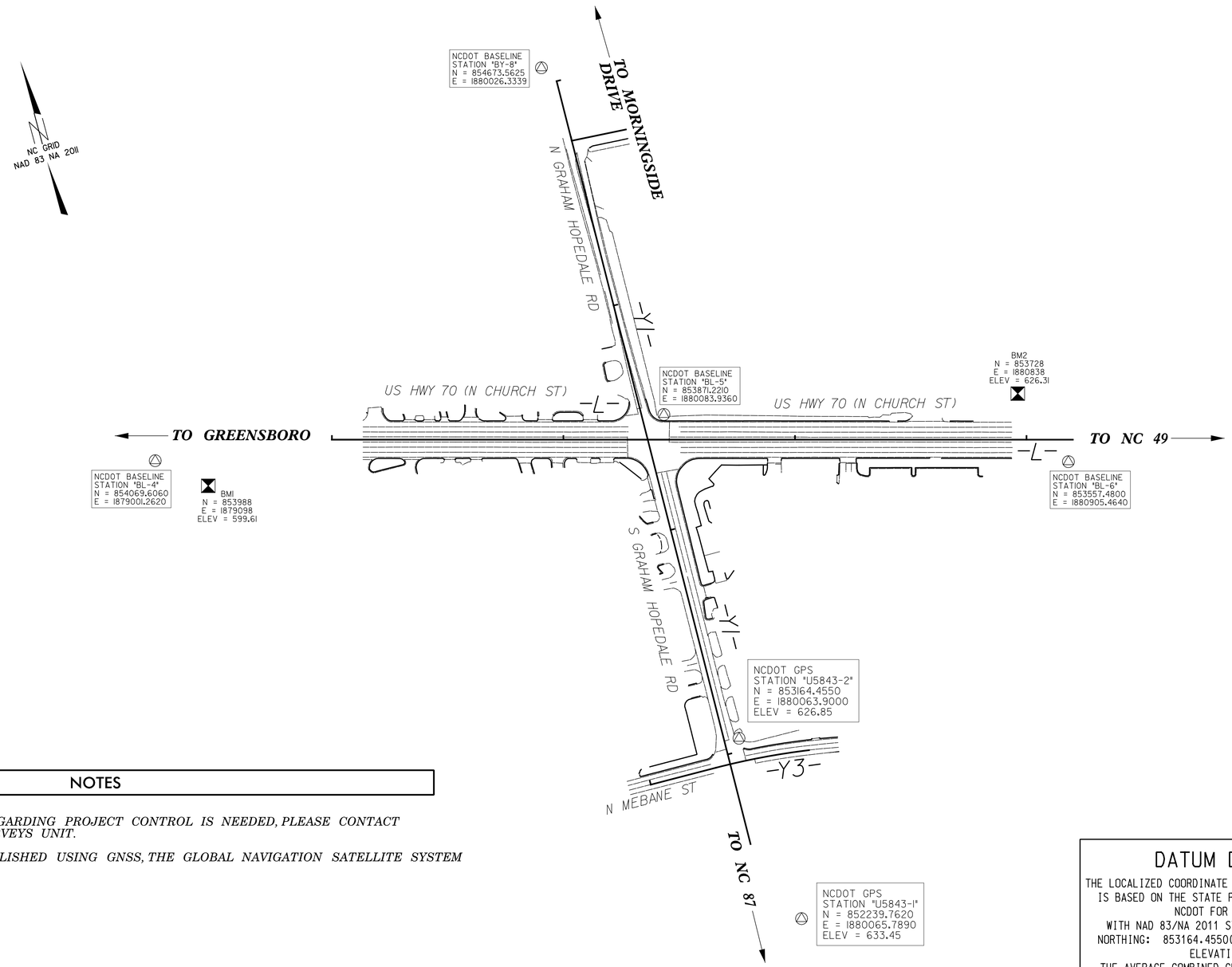
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

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.

PROJECT REFERENCE NO.	SHEET NO.
U-5843	1C-1
Location and Surveys	

U-5843 SURVEY CONTROL SHEET



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*

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

PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "U5843-2"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 853164.4550(ft) EASTING: 1880063.9000(ft)
ELEVATION: 626.85'(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999955212
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "U5843-2" TO -L- STATION 10+00.00 IS
S 8°46'27.97"W 229.84'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

NOTE: DRAWING NOT TO SCALE

12/01/2005

10/11/2018
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PROJECT REFERENCE NO.	SHEET NO.
U-5843	1C-2
Location and Surveys	

U-5843 SURVEY CONTROL SHEET

BASELINE DATA

BL

POINT	DESC.	NORTH	EAST	ELEVATION
3	BL-3	854376.3970	1878196.1190	600.95
4	BL-4	854069.6060	1879001.2620	596.60
5	BL-5	853871.2210	1880083.9360	620.69
6	BL-6	853557.4800	1880905.4640	625.19
7	BL-7	853493.7550	1881498.7700	615.16

BY

POINT	DESC.	NORTH	EAST	ELEVATION
8	BY-8	854673.5625	1880026.3339	607.41
A5	BL-5	853871.2210	1880083.9360	620.69
2	U5843-2	853164.4550	1880063.9000	626.85
1	U5843-1	852239.7620	1880065.7890	633.45

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	854014.7470	1879381.5100
POT	24+00.00	853652.6452	1880733.8718

Y1

TYPE	STATION	NORTH	EAST
POT	10+00.00	854637.1688	1880050.4717
POT	27+00.00	852937.3065	1880028.8393

Y2

TYPE	STATION	NORTH	EAST
POT	10+00.00	854504.4995	1880048.7834
POT	13+00.00	854487.2650	1880348.2879

Y3

TYPE	STATION	NORTH	EAST
POT	10+00.00	853116.9546	1879853.9934
PC	11+44.93	853115.9500	1879998.9187
PT	13+50.00	853100.5367	1880203.2527

BENCHMARK DATA

```
****************************************
BM1       ELEVATION = 599.61
N 853988      E 1879098
BL STATION 14+72.00 63 RIGHT
BM1-CHISELED SQUARE ON BC
****************************************
****************************************
BM2       ELEVATION = 626.31
N 853728      E 1880838
BL STATION 32+18.00 135 LEFT
BM2-CHISELED SQUARE ON BC
****************************************
```

-L- NEW PRELIMINARY R/W MONUMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
L	15+80.00	-50.00	853913.0320	1879954.7064
L	17+52.18	-56.00	853874.2933	1880122.5839
L	23+25.72	-56.00	853725.9518	1880676.6032
L	16+15.00	50.00	853807.3822	1879962.6510

-Y1- NEW PRELIMINARY R/W MONUMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	16+98.00	50.14	853939.8634	1879991.4491
Y1	18+78.00	40.50	853759.7553	1879998.8025
Y1	24+65.00	40.50	853172.8028	1879991.3329
Y1	19+43.32	-50.00	853693.2842	1880088.4639
Y1	21+36.00	-50.00	853500.6245	1880086.0121
Y1	21+36.00	-40.08	853500.7507	1880076.0963
Y1	17+14.55	-45.00	853922.0991	1880086.3754
Y1	11+84.41	-45.00	854452.2032	1880093.1215
Y1	24+91.99	74.00	853146.2379	1879957.4922

-Y1- NEW PRELIMINARY PERMANENT UTILITY EASEMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
Y1	10+63.00	22.65	854574.4621	1880027.0229
Y1	10+63.00	29.00	854574.5429	1880020.6724
Y1	10+94.00	30.00	854543.5582	1880019.2780
Y1	10+94.00	22.88	854543.4676	1880026.3929
Y1	10+81.00	30.00	854556.5571	1880019.4434
Y1	10+81.00	50.00	854556.8116	1879999.4450
Y1	10+73.00	29.00	854564.5437	1880020.5451
Y1	10+73.00	50.00	854564.8110	1879999.5468
Y1	19+16.00	57.50	853721.9747	1879981.3203
Y1	24+45.00	57.50	853193.0175	1879974.5888

-Y2- NEW PRELIMINARY R/W MONUMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
Y2	10+66.00	30.00	854470.7574	1880112.9509

-L- NEW PRELIMINARY PERMANENT UTILITY EASEMENTS

ALIGN	STATION	OFFSET	NORTH	EAST
L	23+24.23	-71.50	853741.3097	1880679.1730
L	11+48.25	-50.00	854024.7016	1879537.6480
L	11+52.00	-62.00	854035.3234	1879544.3738
L	12+29.00	-74.00	854026.9995	1879621.8574
L	12+29.00	-68.00	854021.2036	1879620.3056
L	12+36.00	-72.00	854023.2570	1879628.1020
L	12+36.00	-68.00	854019.3931	1879627.0674
L	14+37.00	-76.00	853975.1334	1879823.2970
L	14+37.00	-69.10	853968.4682	1879821.5124
L	14+43.00	-69.20	853967.0130	1879827.3341
L	14+43.00	-76.00	853973.5816	1879829.0929
L	11+65.90	50.00	853923.5399	1879528.8304
L	11+70.00	66.00	853907.0233	1879528.6549
L	11+82.00	62.50	853907.3005	1879541.1518
L	11+88.00	61.00	853907.1976	1879547.3356
L	12+00.00	57.00	853907.9577	1879559.9618
L	12+00.00	50.00	853914.7196	1879561.7724
L	11+88.00	83.00	853885.9462	1879541.6454
L	11+94.00	81.00	853886.3263	1879547.9585
L	13+63.00	50.00	853872.5606	1879719.2259
L	13+63.00	58.00	853864.8328	1879717.1567
L	13+77.00	58.00	853861.2118	1879730.6804
L	13+77.00	75.50	853844.3072	1879726.1541
L	13+86.00	74.50	853842.9454	1879735.1065
L	13+86.00	58.00	853858.8840	1879739.3741
L	13+95.00	50.00	853864.2839	1879750.1370
L	14+24.00	50.00	853856.7833	1879778.1502
L	14+24.00	58.00	853849.0555	1879776.0811
L	14+36.00	58.00	853845.9517	1879787.6728
L	14+36.00	79.00	853825.6663	1879782.2412
L	14+42.00	79.00	853824.1145	1879788.0371
L	14+42.00	58.00	853844.3999	1879793.4686
L	14+55.00	50.00	853848.7653	1879808.0954
L	14+55.00	58.00	853841.0375	1879806.0262
L	14+97.00	50.00	853837.9022	1879848.6662
L	15+09.00	66.50	853818.8600	1879855.9903
L	15+19.00	59.00	853823.5183	1879867.5898
L	15+31.50	76.00	853803.8637	1879875.2675
L	15+36.50	72.00	853806.4344	1879881.1320
L	15+31.00	55.00	853824.2785	1879880.2161
L	15+31.00	50.00	853829.1083	1879881.5093
L	13+95.00	58.00	853856.5562	1879748.0679
L	24+66.00	-62.00	853695.4650	1880813.6619
L	13+95.00	EXIST R/W	853683.8733	1880810.5582

NOTE: DRAWING NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
U-5843	2A-1

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 014493 ENGINEER Stafford Goodwright — James Goodwright 5/23/2018

PAVEMENT DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK MORRISON — Clark Morrison 5/23/2018

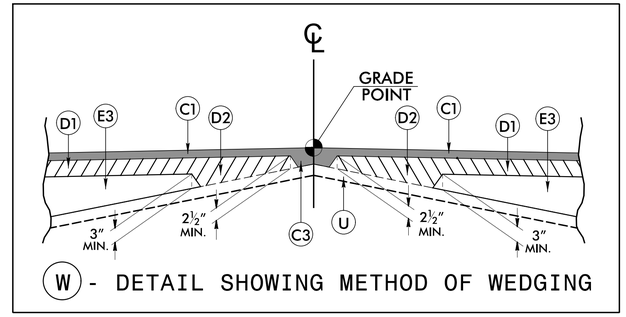
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared by VHB Engineering NC, P.C. (C-3705) 940 Main Campus Drive, Suite 500 Raleigh, NC 27606

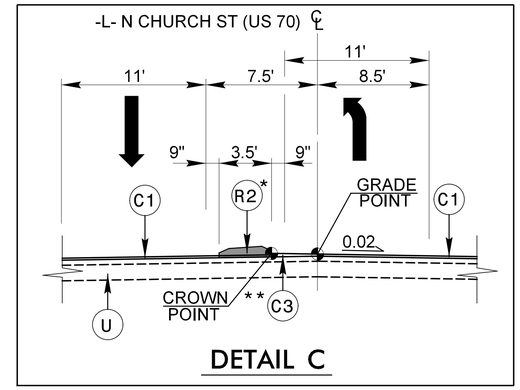
FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 2″ IN DEPTH
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2½″ IN DEPTH OR GREATER THAN 4″ IN DEPTH
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. APPROX. 5″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E3	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3″IN DEPTH OR GREATER THAN 5½″ IN DEPTH
R1	2′-6″ CONCRETE CURB AND GUTTER
R2	5″ MONOLITHIC CONCRETE ISLAND (KEYED IN)
S	4″ CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING BITUMINOUS PAVEMENT, 0″ TO 1.5″
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

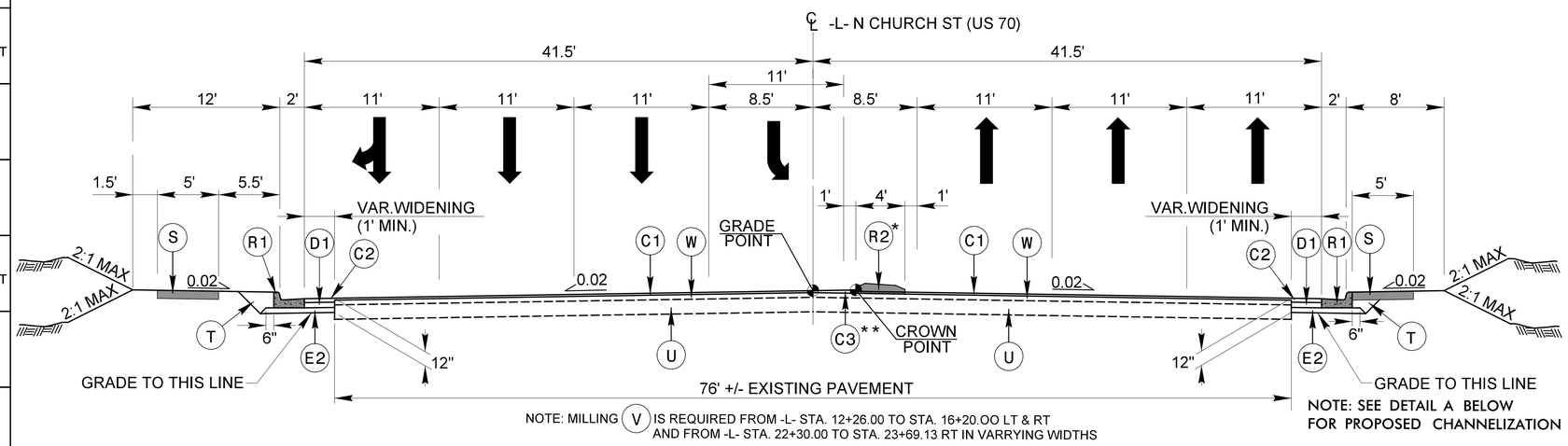
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



W - DETAIL SHOWING METHOD OF WEDGING



DETAIL C



NOTE: MILLING (V) IS REQUIRED FROM -L- STA. 12+26.00 TO STA. 16+20.00 LT & RT AND FROM -L- STA. 22+30.00 TO STA. 23+69.13 RT IN VARRYING WIDTHS

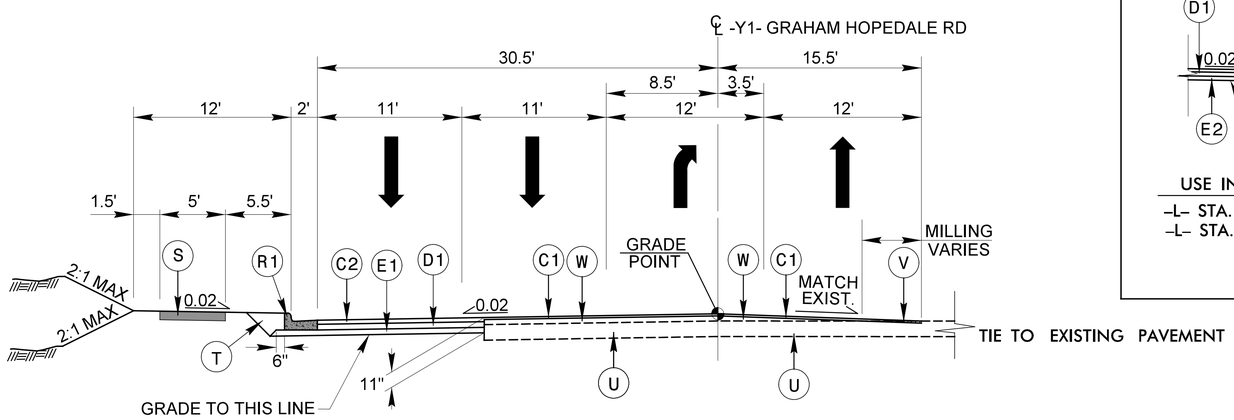
NOTE: SEE DETAIL A BELOW FOR PROPOSED CHANNELIZATION

* LIMITS OF MONOLITHIC CONCRETE ISLANDS
-L- STA. 14+58.36 TO STA. 16+20.00 (SEE DETAIL C FOR DIMENSIONS)
-L- STA. 17+44.00 TO STA. 20+31.13

** TRANSITION (C3) TO (C1) 10' FROM ENDS OF CONC. ISLANDS

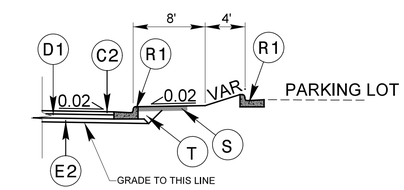
TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1
-L- STA. 12+26.00 TO STA. 23+69.13



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
-Y1- STA. 11+55.32 TO STA. 14+45.00



USE IN CONJUNCTION WITH T.S.# 1
-L- STA. 13+23.34 TO STA. 13+80.14 RT
-L- STA. 15+58.80 TO STA. 16+28.95 RT

DETAIL A

6/2/99

5/8/2018
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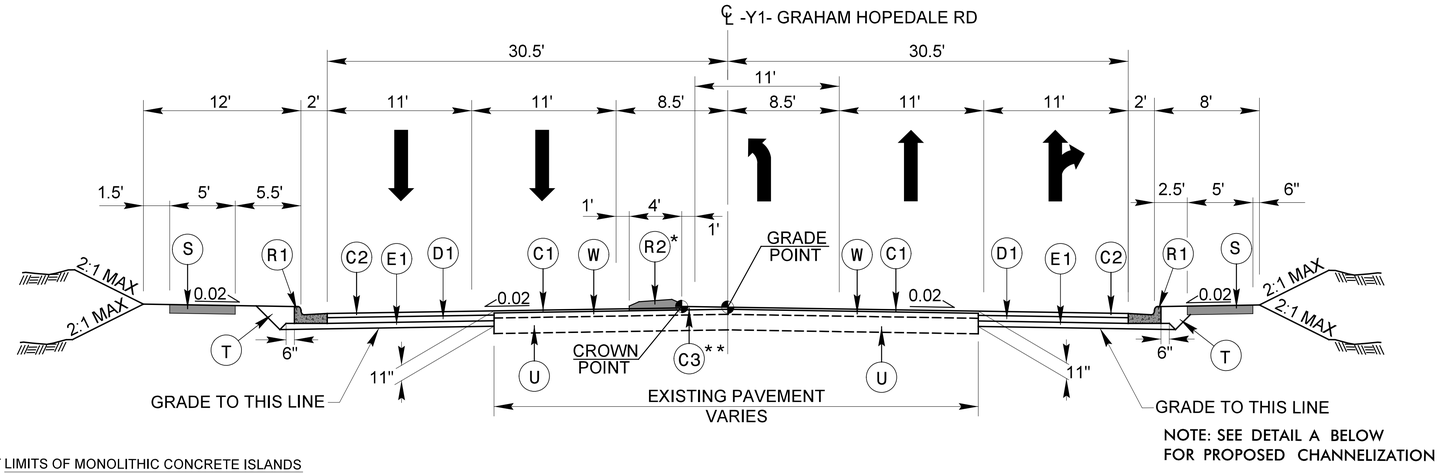
mcollins



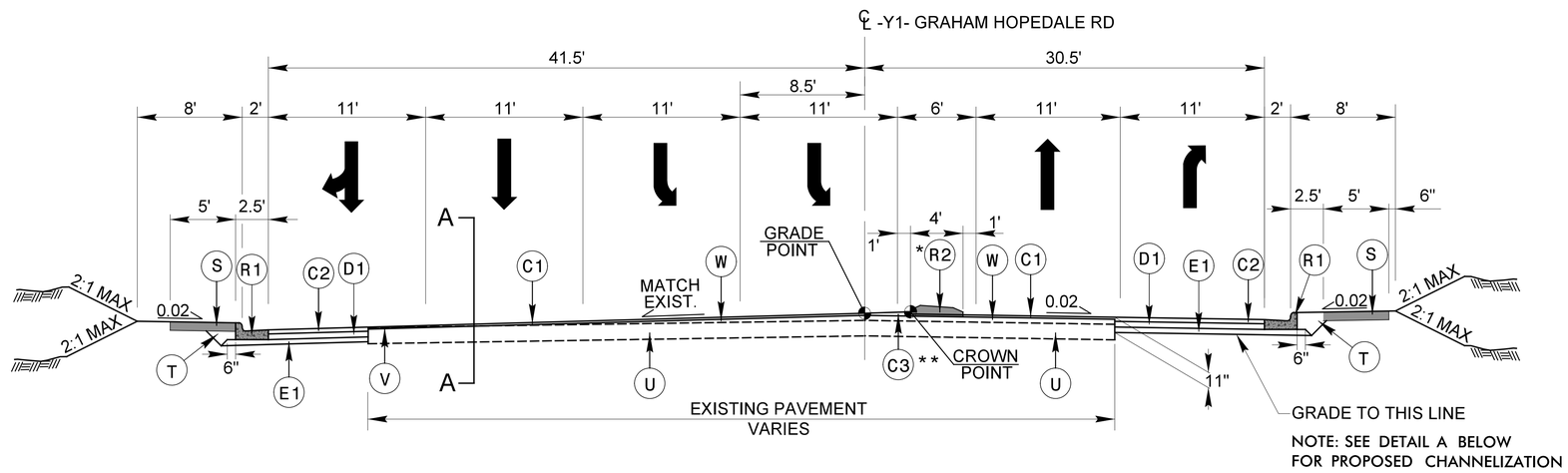
NOTE: SEE DETAIL A BELOW FOR PROPOSED CHANNELIZATION

* LIMITS OF MONOLITHIC CONCRETE ISLANDS
-Y1- STA. 15+25.00 TO STA. 17+32.00
-Y1- STA. 18+71.97 TO STA. 21+22.00

** TRANSITION (C3) TO (C1) 10' FROM ENDS OF CONC. ISLANDS

TYPICAL SECTION NO. 3

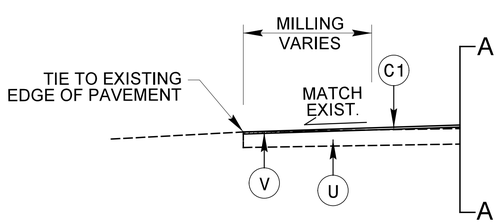
USE TYPICAL SECTION NO. 3
-Y1- STA. 14+45.00 TO STA. 17+44.25



NOTE: SEE DETAIL A BELOW FOR PROPOSED CHANNELIZATION

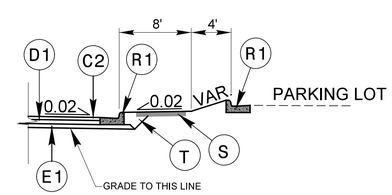
TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4
-Y1- STA. 18+70.97 TO STA. 25+02.08



SECTION A–A

USE IN CONJUNCTION WITH T.S.# 4
-Y1- STA. 21+35.89 TO STA. 25+02.08 LT



USE IN CONJUNCTION WITH T.S.# 3 & 4
-Y1- STA. 14+45.00 TO STA. 15+28.00 RT
-Y1- STA. 15+56.00 TO STA. 15+76.89 RT
-Y1- STA. 16+56.68 TO STA. 16+84.39 RT
-Y1- STA. 18+66.19 TO STA. 19+17.01 RT

DETAIL A

PROJECT REFERENCE NO.	SHEET NO.
U-5843	2A-2

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 014493 ENGINEER
Signed by: James Goodwright
5/22/2018

PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER
Signed by: Clark Morrison
5/23/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared by
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

PAVEMENT SCHEDULE

C1	1½" TYPE S9.5C
C2	3" TYPE S9.5C
C3	VAR. DEPTH TYPE S9.5C
D1	4" TYPE I19.0C
E1	4" TYPE B25.0C
R1	2'-6" C&G
R2	5" CONCRETE ISLAND
S	CONCRETE SIDEWALK
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 0" to 1.5"
W	WEDGING

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

6/2/99

5/23/2018
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loopuser

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GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

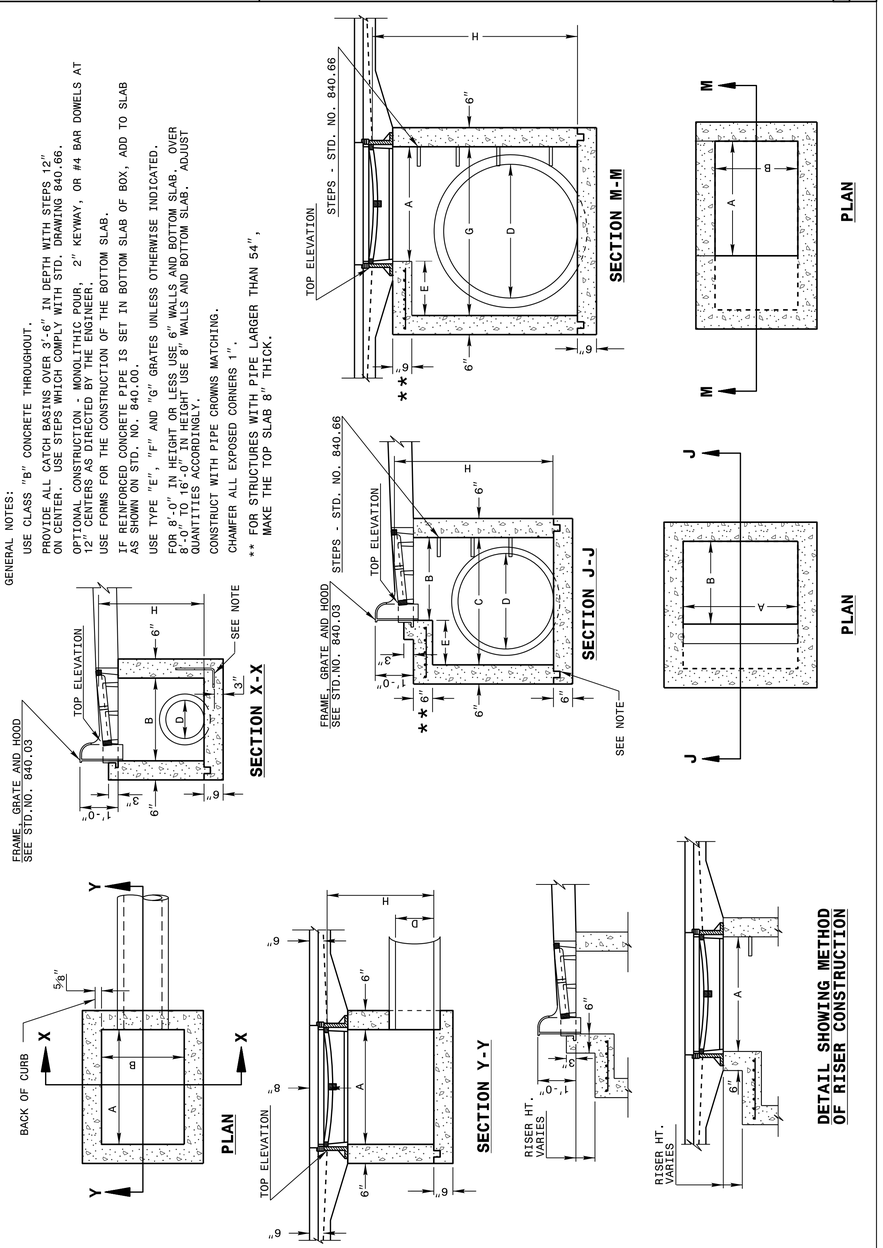
USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.

FOR 8'-0" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. OVER 8'-0" TO 16'-0" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. ADJUST QUANTITIES ACCORDINGLY.

CONSTRUCT WITH PIPE CROWNS MATCHING.

CHAMFER ALL EXPOSED CORNERS 1".

** FOR STRUCTURES WITH PIPE LARGER THAN 54", MAKE THE TOP SLAB 8" THICK.



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

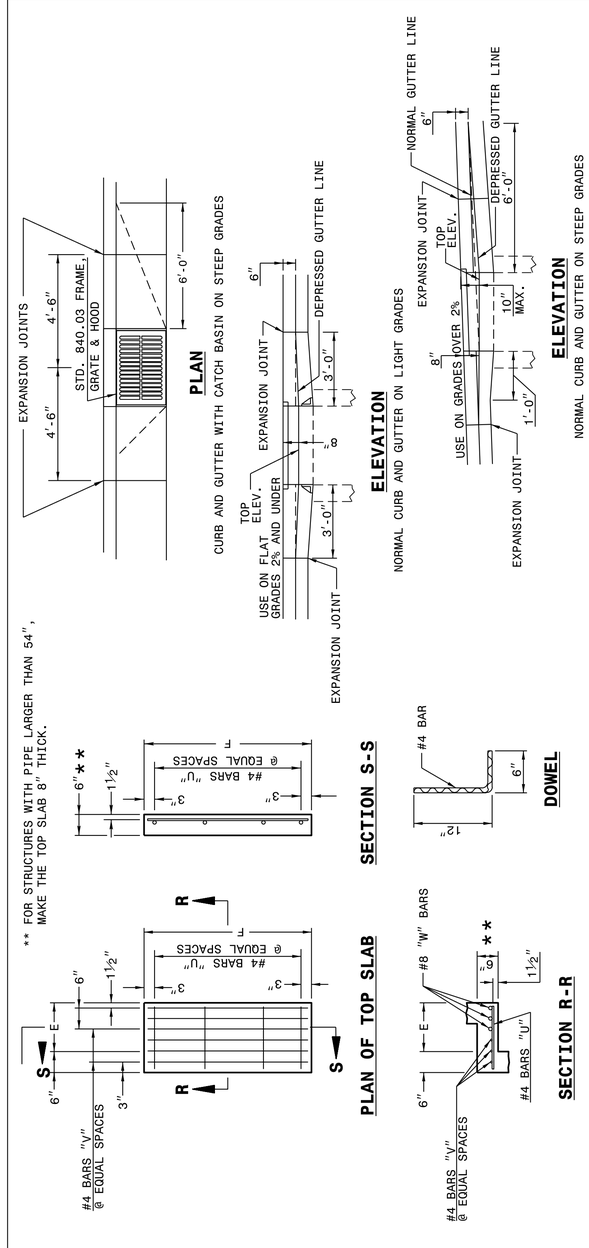
ENGLISH DETAIL DRAWING FOR
MINIMUM DEPTH CONCRETE CATCH BASIN
12" THRU 84" PIPE

SHEET 1 OF 2 **840D02**

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

ENGLISH DETAIL DRAWING FOR
MINIMUM DEPTH CONCRETE CATCH BASIN
12" THRU 84" PIPE

SHEET 2 OF 2 **840D02**



* RISER HAS .228 CUBIC YARDS OF CONCRETE PER FOOT HEIGHT

MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN(BASED ON MIN. HEIGHT, H, WITH NO RISER) *

	DIMENSIONS OF BOX AND PIPE						COVER DIMENSION		BARS-U		BARS-V		BARS-W		TOTAL LBS.	CU.YDS. CONC. IN BOX		DEDUCTIONS ONE PIPE	
PIPE	SPAN	WIDTH	WIDTH	SPAN	MIN.	HEIGHT										TOP SLAB	BOTTOM SLAB	TOT. CONC. PER 100 LF MIN. HEIGHT H	C.M.	R.C.
D	A	B	C	G	H		E	F	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH						
12"	3'-0"	2'-2"	--	--	2'-0"		--	--	--	--	--	--	--	--	--	0.235	0.772	0.015	0.026
15"	3'-0"	2'-2"			2'-3"											0.235	0.829	0.023	0.036
18"	3'-0"	2'-2"			2'-6"											0.235	0.887	0.033	0.049
24"	3'-0"	2'-2"			3'-1"											0.235	1.001	0.059	0.085
30"	3'-0"	2'-2"	3'-4"	3'-4"	3'-10"		1'-2"	4'-4"	4	1'-6"	2	4'-1"	3	39	0.123	0.347	1.433	0.092	0.127
36"	3'-0"	2'-2"	3'-10"	3'-10"	4'-6"		1'-8"	4'-10"	4	1'-11"	3	4'-7"	3	43	0.161	0.432	1.714	0.132	0.178
42"	3'-0"	2'-2"	4'-5"	4'-5"	4'-11"		2'-2"	5'-5"	5	2'-5"	4	5'-2"	3	47	0.200	0.543	1.738	0.180	0.243
48"	3'-0"	2'-2"	5'-0"	5'-0"	5'-6"		2'-10"	6'-0"	5	3'-1"	4	5'-9"	3	51	0.235	0.667	2.052	0.235	0.317
54"	3'-0"	2'-2"	5'-7"	5'-7"	6'-0"		3'-5"	6'-7"	6	3'-8"	5	6'-4"	3	56	0.289	0.802	2.387	0.297	0.401
60"	3'-0"	2'-2"	6'-3"	6'-3"	6'-6"		4'-1"	7'-3"	6	4'-4"	5	7'-0"	3	61	0.340	0.973	2.722	0.363	0.546
66"	3'-0"	2'-2"	6'-11"	6'-11"	7'-0"		4'-9"	7'-11"	7	5'-0"	6	7'-8"	3	66	0.391	1.160	3.057	0.440	0.655
72"	3'-0"	2'-2"	7'-6"	7'-6"	7'-6"		5'-3"	8'-6"	7	5'-6"	6	8'-3"	3	72	0.442	1.340	3.392	0.524	0.774
78"	3'-0"	2'-2"	8'-1"	8'-1"	8'-0"		5'-11"	9'-1"	8	6'-2"	7	8'-10"	3	78	0.493	1.530	3.727	0.615	0.893
84"	3'-0"	2'-2"	8'-9"	8'-9"	8'-6"		6'-7"	9'-9"	8	6'-10"	7	9'-6"	3	84	0.544	1.760	4.062	0.713	1.010

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

ENGLISH DETAIL DRAWING FOR
MINIMUM DEPTH CONCRETE CATCH BASIN
12" THRU 84" PIPE

SHEET 2 OF 2 **840D02**

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

5/15/2018 10:56:33 AM EDT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SEE PLATE FOR TITLE

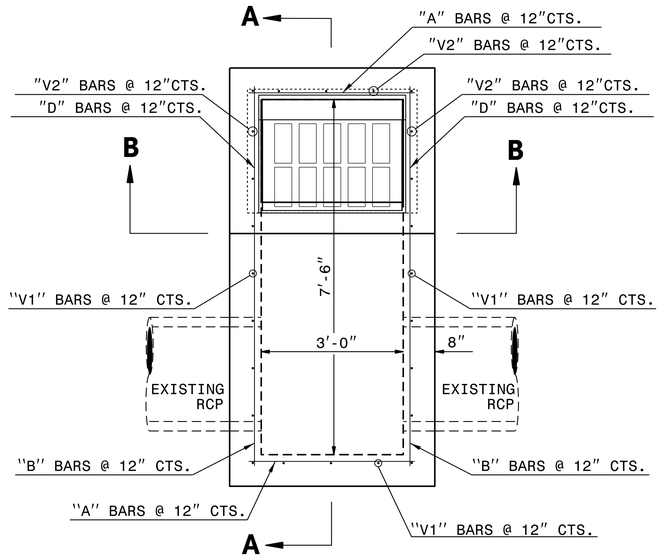
ORIGINAL BY: 2002 Std.840.01 DATE:
MODIFIED BY: E.E. WARD DATE: 3-1-02
CHECKED BY: DATE:
FILE SPEC.: s:Special Details/jhowerton/840d02.dgn

5/14/99
10-AUG-2017 10:11
S:\Contracts\Contracts\Special Details\jhowerton\840d02 Min Depth CB.dgn
jhowerton AT CSD-292595

DocuSign Envelope ID: BA70F75A-47EC-43C7-8EC5-A669351368DC

PROJECT REFERENCE NO.	SHEET NO.
U-5843	2C-2

Drainage Structures: 402, 403, 404, 430, & 431



PLAN

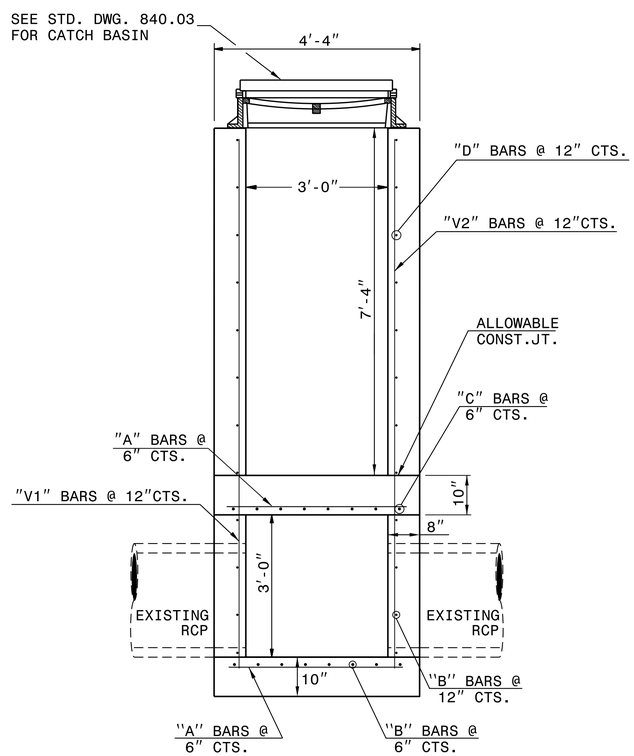
GENERAL NOTES:

1. USE CLASS "AA" CONCRETE THROUGHOUT.
2. CONSTRUCT CONCRETE BOX IN ACCORDANCE WITH SECTION 825 OF THE STANDARD SPECIFICATIONS.
3. USE FORMS TOR CONSTRUCT THE BOTTOM SLAB.
4. ADJUST LENGTH OF STEEL BARS AS NEEDED TO COMPENSATE FOR PIPES AND FRAME AND GRATE OPENINGS.
5. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60.
6. CUT OR BEND STEEL BARS AS NEEDED TO PROVIDE 2" CLEARANCE.
7. LOCATE FRAME AND GRATE AS FIELD CONDITIONS DICTATE AND AS DIRECTED BY THE ENGINEER.
8. DIMENSIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

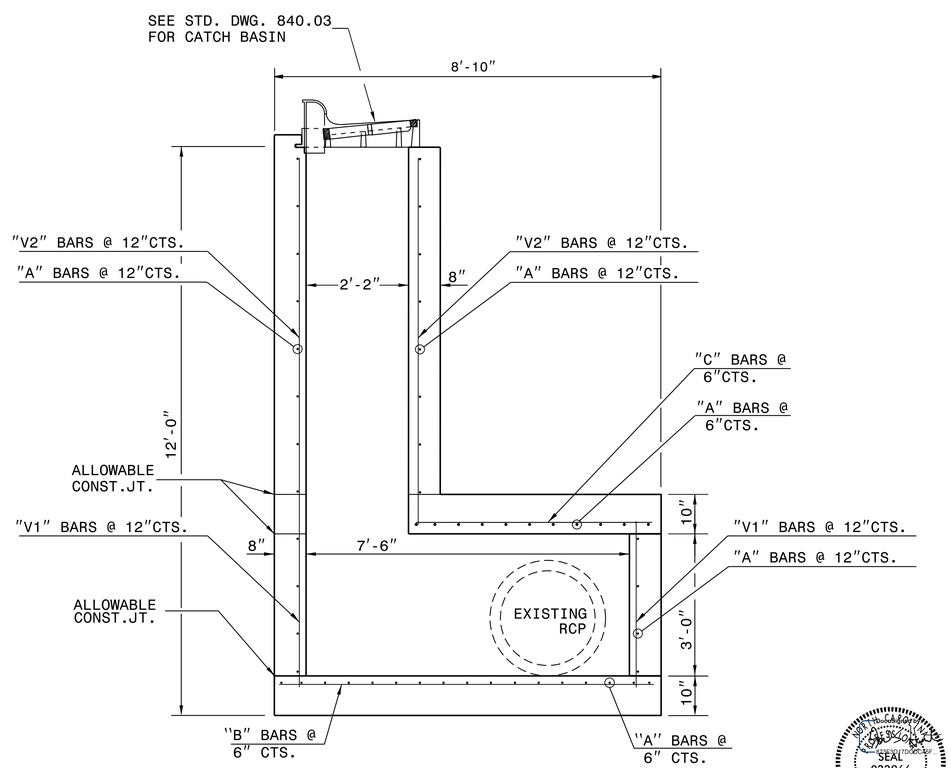
BILL OF MATERIALS

BAR	QTY	SIZE	LENGTH	WEIGHT
A	52	#5	4'-0"	217
B	16	#5	8'-6"	142
C	8	#5	6'-0"	51
D	16	#5	2'-8"	45
V1	24	#5	3'-6"	88
V2	24	#5	7'-4"	108
TOTAL REINF. STEEL (lbs.)				651
TOTAL CONC. CU. YDS.				5.4

NO DEDUCTIONS HAVE BEEN MADE TO ACCOMMODATE PIPES OR CATCH BASIN OPENING.



SECTION B-B



SECTION A-A

5/15/2018 10:56:33 AM EDT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DETAIL OF SPECIAL OFFSET CATCH BASIN

ORIGINAL BY: K.A.KEMPF DATE: JUNE 17,2014
MODIFIED BY: DATE: DEC 21,2016
CHECKED BY: DATE:
FILE SPEC.: s:details/kkempf/english/u5843_tb_cb_offset.dgn

03-MAY-2018 11:06
S:\Contracts\Contracts\Special Details\kkempf\english\U5843_tb_cb_offset.dgn
jhowerton AT CSD-292595

COMPUTED BY: E. MUMPASI DATE: 09-22-2016
CHECKED BY: J. JAVELLANA DATE: 12-13-2017

PROJECT REFERENCE NO.	SHEET NO.
U-5843	3B-1

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

STATION	STATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT +20%	BORROW	WASTE
-L- 12+26.00	23+69.13	341		1,259	918	
	SUBTOTAL	**341**		**1,259**	**918**	
-Y1- 11+55.32	17+50.00	457		150		307
-Y1- 18+50.00	25+02.08	544		32		512
	SUBTOTAL	**1,001**		**182**		**819**
	TOTAL	**1,342**		**1,441**	**918**	**819**
LOSS DUE TO CLEARING & GRUBBING						
WASTE IN LIEU OF BORROW					-819	-819
PROJECT TOTAL		**1,342**		**1,441**	**99**	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT					5	
GRAND TOTAL		**1,342**		**1,441**	**104**	
SAY		**1,400**			**120**	

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

5/9/06

4/24/2018
U5843_Grdg_sum.dgn
jpowell

Z7644

COMPUTED BY:	B. SMITH (SUNGATE DESIGN GROUP)	DATE:	09-17-18
CHECKED BY:	J. JAVELLANA - VHB	DATE:	09-17-18

PROJECT NO.	SHEET NO.
U-5843	3D-1

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 %	R.C. PIPE CLASS III 12	15	18	24	30	36	42	48	R.C. PIPE CLASS IV 12	15	18	24	30	36	42	48	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE	DRAINAGE STRUCTURE MASONRY CY	QUANTITIES FOR DRAINAGE STRUCTURES 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
L 12+90	40 RT	0401		613.2	604.9																							1	3.4		1			1
L 13+92	42 RT	0402		615.3	605.5																							1	4.8					1
L 14+50	43 RT	0403		616.4	605.9																							1	5.0	0.5				1
L 15+11	44 RT	0404		617.5	606.3																							1	5.0	1.3				1
L 16+27	44 RT	0405		619.4																								1	1.3		1			1
		0405	0434		613.1	613.0	0.9												4															
Y1 18+75	33 RT	0406		620.2																								1	1.0		1			1
		0406	0405		614.2	613.7	0.8												56															
Y1 18+75	41 RT	0407		620.7																								1			1	1		
		0407	0406		617.5	615.0											8																	
Y1 19+63	32 RT	0409		620.7																								1	1.0		1			1
		0409	0439		614.7	614.5													56															
Y1 20+10	33 RT	0410		621.0																								1			1			1
		0410	0409		617.4	615.2	0.7											48																
L 14+25	42 LT	0411		615.9																								1			1		1	
		0411	0412		612.9	611.8											60																	
L 13+65	41 LT	0412		614.8																								1			1		1	
		0412	0438		611.8	607.1	0.5										136																	
Y1 16+45	33 RT	0414		617.5																								1			1			1
		0414	0415		614.2	612.9											80																	
Y1 15+63	33 RT	0415		615.9																								1			1			1
		0415	0417		612.9	611.8											104																	
Y1 14+57	41 RT	0416		614.8																								1			1		1	
		0416	0417		611.8	611.7											8																	
Y1 14+57	33 RT	0417		614.8																								1			1			1
		0417	0419		611.7	610.6	0.4										88																	
Y1 15+28	43 LT	0418		615.2																								1			1		1	
		0418	0419		612.1	610.6											132																	
Y1 13+94	32 LT	0419		613.6																								1			1		1	
		0419	0420		610.6	608.3	0.8										108																	
Y1 12+87	32 LT	0420		612.1																													1	
		0420	0421		608.3	607.6	1.4										96																	
Y1 11+89	32 LT	0421		610.5																								1			1		1	
		0421	0440		607.6	607.2	1.5										52																	
L 17+94	44 RT	0422		621.5																								1			1			1
		0422	0426		619.5	619.1										124																		
L 23+22	41 RT	0423		624.7																														
L 22+10	44 RT	0424		624.3																								1			1			1
		0424	0425		621.2	620.6											116																	
L 20+92	43 RT	0425		623.6																								1			1			1
		0425	0426		620.6	619.5											164																	
L 19+26	44 RT	0426		622.5																														
L 17+55	44 LT	0427		621.3																								1			1		1	
		0427	0432		618.0	617.3											148																	
L 23+15	41 LT	0428		624.7																								1			1		1	
		0428	0429		621.6	620.5											100																	
L 22+28	39 LT	0429		624.7	617.4																													
L 21+31	44 LT	0430		624.0	615.8																							1	3.2				1	
SHEET TOTALS																124	1400	48	116									24	24.7	1.8	20	1	10	14

STRUCTURE NUMBER 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. 840.20	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	M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	ADJUST J.B.	ADJUST M.H.	SPECIAL OFFSET C.B.	CONVERT JB W/ M.H. TO C.B.	CONVERT EXISTING C.B. TO T.B.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	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
0401																																									
0402																													1												Special Offset CB, See Detail Sheet
0403																													1												Special Offset CB, See Detail Sheet
0404																													1												Special Offset CB, See Detail Sheet
0405																																									
0405	0434																																								
0406																																									
0406	0405																																				7.6				
0407																																									
0407	0406																																								
0409																																									
0409	0439																																								
0410																																									
0410	0409																																								
0411																																									
0411	0412																																								
0412																																									
0412	0438																																								
0414																																									
0414	0415																																								
0415																																									
0415	0417																																								
0416																																									
0416	0417																																								
0417																																									
0417	0419																																								
0418																																									
0418	0419																																								
0419																																									
0419	0420																																								
0420																														1											
0420	0421																																								
0421																																									
0421	0440																																								
0422																																									
0422	0426																																								
0423																																			1						CLEAN OUT C.B.
0424																																									
0424	0425																																								
0425																																									
0425	0426																																								
0426																																			1						
0427																																									
0427	0432																																								
0428																																									
0428	0429																																								
0429																									1					1											
0430																													1												Special Offset CB
SHEET TOTALS																									1			4	1	1				2		8				

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

NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)

Z7644

COMPUTED BY: B. SMITH (SUNGATE DESIGN GROUP)	DATE: 09-17-18
CHECKED BY: J. JAVELLANA - VHB	DATE: 09-17-18

PROJECT NO.	SHEET NO.
U-5843	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	STRUCTURE NUMBER TO	TOP ELEVATION FT.	INVERT ELEVATION FT.	INVERT ELEVATION FT.	MINIMUM REQUIRED SLOPE %	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
L 20+13	44	LT	0431		623.0	613.2																		
L 19+03	44	LT	0432		622.3																			
			0432	0433		610.5	609.2								32									
L 18+99	76	LT	0433		616.9	609.2																		
L 16+27	39	RT	0434		619.7																			
Y1 19+50	43	LT	0435		619.5																			
			0435	0436		616.2	615.6												32					
Y1 19+15	44	LT	0436		619.8																			
			0436	0439		615.6	615.0												76					
Y1 19+16	58	LT	0437		619.8																			
			0437	0436		617.4	615.9											16						
			0438		611.6																			
Y1 19+07	33	RT	0439		620.3																			
			0439	0406		614.5	614.2													32				
Y1 20+78	33	RT	0501		621.6																			
			0501	0410		618.5	617.6	1.3										68						
Y1 21+60	32	RT	0502		622.6																			
			0502	0501		619.5	618.5	0.9										80						
Y1 22+35	30	RT	0503		623.6																			
			0503	0502		620.6	619.5	0.6										76						
Y1 23+25	28	RT	0504		624.8																			
			0504	0503		621.3	620.6	0.4										88						
Y1 23+34	28	RT	0505		625.5																			
			0505	0504		621.4	621.3											8						
Y1 20+78	44	LT	0506		620.7																			
			0506	0435		616.9	616.2												104					
Y1 21+92	33	LT	0507		622.3																			
			0507	0506		618.6	616.9											136						
Y1 11+69	23	LT																						
Y1 12+43	27	LT																						
L 19+03	44	LT																						
L 19+00	65	LT																						
Y1 21+15	20	RT																						
Y1 20+23	22	RT																						
Y1 19+45	25	RT																						
Y1 19+19	21	RT																						
Y1 23+47	21	RT																						
Y1 22+93	20	RT																						
Y1 12+94	28	LT																						
Y1 21+74	33	LT																						
Y1 15+32	43	LT	0408		615.3																			
			0408	0418		612.2	612.1											4						
SHEET TOTALS															32			476	212	32				
PROJECT TOTALS															32		124	1876	260	148				

LINE & STATION	FROM	TO			15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	24" SIDE DRAIN PIPE		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	
L 20+13	0431									1	4.9				1		
L 18+99	0433									1	2.8						
Y1 19+50	0435									1			1	1			
Y1 19+15	0436									1			1			1	
Y1 19+16	0437									1							
Y1 19+07	0439									1	0.8		1			1	
Y1 20+78	0501									1			1			1	
Y1 21+60	0502									1			1			1	
Y1 22+35	0503									1			1			1	
Y1 23+25	0504									1			1			1	
Y1 23+34	0505									1							
Y1 20+78	0506									1			1		1		
Y1 15+32	0408									1			1		1		
SHEET TOTALS										13	8.5		9	1	3	6	
PROJECT TOTALS										37	35.5 (SAY 36)		29	2	13	20	

LINE & STATION	FROM	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		M.H. STD. 840.51, STD. 840.52, OR STD. 840.53	M.H. FRAME AND COVER STD. 840.54	ADJUST J.B.	ADJUST M.H.	SPECIAL OFFSET C.B.		CONVERT JB W/ M.H. TO C.B.	CONVERT EXISTING C.B. TO T.B.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.
L 20+13	0431																													1								
L 19+03	0432																																				1	
L 18+99	0433																	1						1														
L 16+27	0434																										1						1					
Y1 19+16	0437					1	1																															
	0438																																				1	
Y1 23+34	0505																						1			1	1											
SHEET TOTALS						1	1											1					1	1		1	2			1			1				2	
PROJECT TOTALS						1	1											1					1	1		1	3			5		1	2				4	

LINE & STATION	FROM	TO		FLOWABLE FILL CY	CONCRETE COLLARS CL. "B" STD. 840.72 CY	CONCRETE AND BRICK PIPE PLUG STD. 840.71 CY	PIPE REMOVAL LIN. FT.	REMARKS
L 20+13	0431							Special Offset CB
	0435	0436		1.2				
	0436	0439		2.5				
	0506	0435		4.6				
Y1 21+92	0507							Existing DI
	0507	0506		4.7				
Y1 11+69							57	
Y1 12+43							86	
L 19+03							8	
L 19+00							28	
Y1 21+15							50	
Y1 20+23							105	
Y1 19+45							42	
Y1 19+19							9	
Y1 23+47							42	
Y1 22+93							42	
Y1 12+94							13	
Y1 21+74							30	
SHEET TOTALS				13			512	
PROJECT TOTALS				21			512	

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

PARCEL INDEX

PARCEL NUMBER	SHEET NUMBER	PROPERTY OWNER NAME
1	4	BURGER KING CORP
2	4	GURDAVE & KATHLEEN PAUL
3	4	BURGERBUSTERS III LLC
4	4	JOHNNY BAKATSIAS
5	4	L E MANAGEMENT OF BALDWIN LLC
6	4 & 5	MCDONALDS CORP
7	4	JAMES L THOMPSON JR, E REID TEAGUE
8	4	K C MART INC
9	4	SAUCIER INC
10	4	BURLINGTON EAST DEVELOPMENT LLC
11	4	MARTIN COMPANIES LLC
12	5	MAPLE VIEW INC
13	5	PETERSON HOLDINGS LLC
14	4 & 5	CAROLINA HOSIERY MILLS INC
15	4	STATE OF NORTH CAROLINA

DocuSign Envelope ID: BAAD3396-9D4C-48C5-8D4E-A1CFE62D6946

PROJECT REFERENCE NO.	SHEET NO.
U-5843	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 014493 ENGINEER Stanford Goodnight
9/26/2018
DocuSigned by: Jimmy Goodnight

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
9/26/2018
DocuSigned by: Joshua G. Dalton

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared by

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

SUNGATE DESIGN GROUP, P.A.
121 S. STATE ST. STE. 300
PO BOX 89088
CONCORD, NC 28082
(704) 788-9998 FAX (704) 788-9999
CORPORATE FIRM LICENSE NO. C-0910

NAD 83/NA 2011

REVISIONS

8/17/99

-BY-8 5+00.00 POT

-Y1- POT Sta. 10+00.00

-Y2- POT Sta. 13+00.00

-Y2- S 86° 42' 23.9" E

-Y1- POT Sta. 11+32.68=
-Y2- POT Sta. 10+00.00
Δ=92°33'51.32"

BEGIN CONSTRUCTION
-Y1- STA. 11+55.32

NOTE:
UNLESS OTHERWISE LABELED ALL DRIVEWAY RADII ARE 10' AND ALL CONCRETE ISLAND RADII ARE 2'.

BEGIN TIP PROJECT U-5843
-L- POT STA. 12+26.00

END TIP PROJECT U-5843
-L- POT STA. 23+69.13

-L- POT Sta. 16+82.00=
-Y1- POT Sta. 17+98.88
Δ=75°44'22.12"
-BL-5 24+62.31 PINC=
-BY- 13+04.41 PINC

S 75° 00' 37.3" E

S 0° 43' 44.8" W

MATCHLINE -Y1- STA. 20+30.00
SEE SHEET 5

FOR -L- & -Y1- PROFILES SEE SHEET 6

US 70 (CHURCH ST.)
AT GRAHAM HOPEDALE RD.

N. GRAHAM HOPEDALE RD.	10330 / 16630	2017 / 2037 ADT
	2020 / 3220	1900 / 2900
22030 / 31330 US 70 (CHURCH ST.)		US 70 (CHURCH ST.) 22170 / 31870
	4600 / 6600	3870 / 5570
S. GRAHAM HOPEDALE RD.	14880 / 21680	

1 BURGER KING CORP DB 359 PG 536
2 R & C PROPERTIES, INC DB 3081 PG 474
3 BURGERBUSTERS III LLC DB 2868 PG 42
4 JOHNNY BAKATSIAS DB 508 PG 47
5 L E MANGAGMENT OF BALDWIN LLC DB 3247 PG 941
6 MCDONALDS CORP DB 4511 PG 221
7 JAMES E REID TEAGUE DB 871 PG 510
8 K & MART INC DB 2165 PG 527
9 SAUCIER INC DB 3256 PG 582
10 BURLINGTON EAST DEVELOPMENT LLC DB 3445 PG 334
11 MARTIN COMPANIES LLC DB 2183 PG 177
14 CAROLINA HOSIERY MILLS INC DB 2339 PG 251 PB 16 PG 82
15 STATE OF NORTH CAROLINA DB 208 PG 419

KARITSA PROPERTIES LLC DB 3246 PG 374
JOHN & LINDY BAKATSIAS DB 3187 PG 905
JOHN & LINDY BAKATSIAS DB 3187 PG 909
MICHAEL COY MASSEY DB 998 PG 623
GURDAVE & KATHLEEN PAUL DB 1770 PG 474
JERRY R PAYNE SR DB 246 PG 028
RHGC INVESTMENTS LLC DB 3011 PG 544

9/25/2018
U5843_Sheet_Layout_psh04.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-5843	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 014493 ENGINEER Stafford Goodnight

Stafford Goodnight Digitally signed by Stafford S. Goodnight, Jr. Date: 2018.05.21 18:32:16 -04'00'

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON

5/22/2018 8:38:04 AM EDT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared by

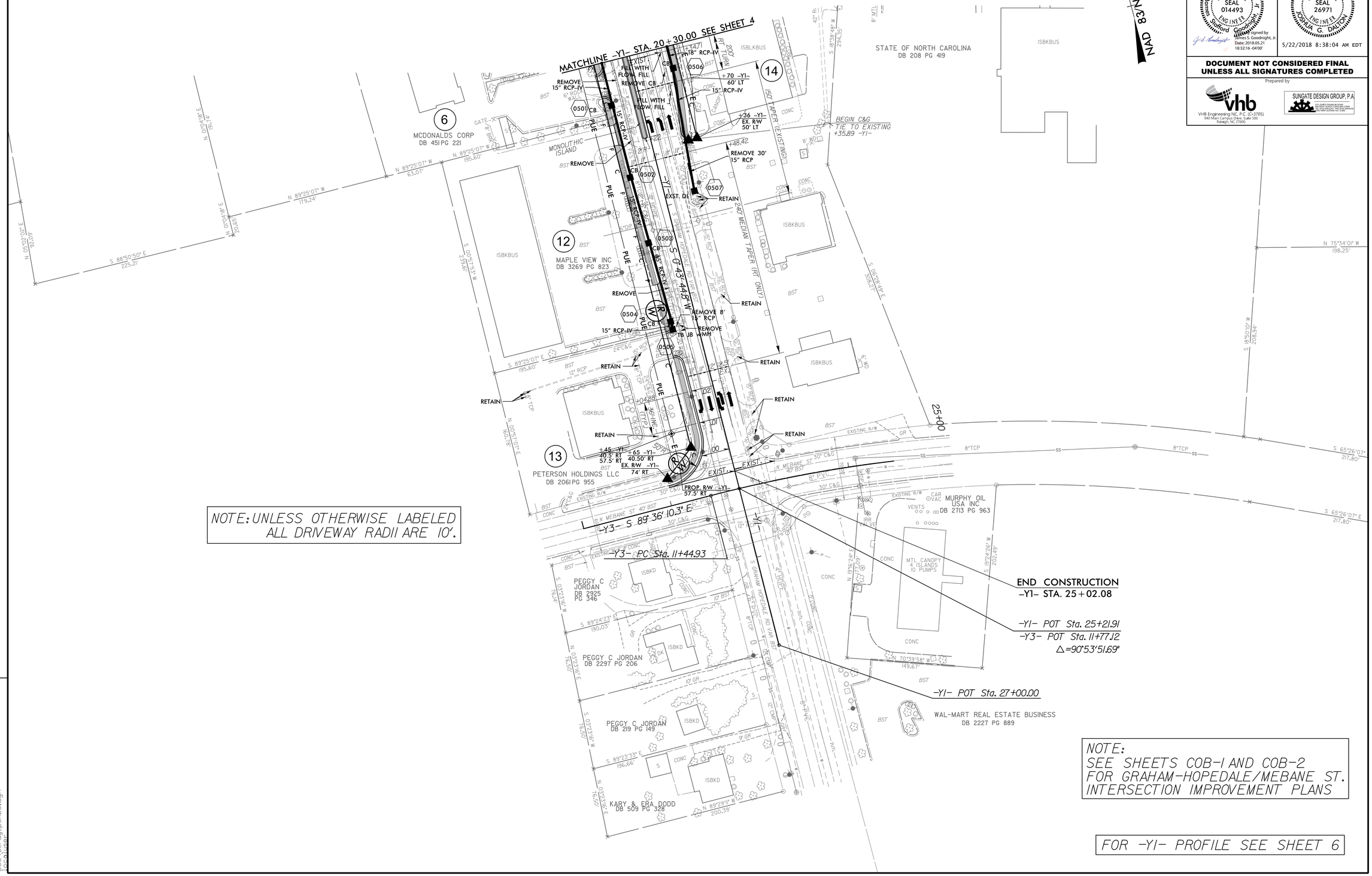
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

SUNGATE DESIGN GROUP, P.A.
P.O. BOX 17674
RALEIGH, NORTH CAROLINA 27619
(919) 772-2076 FAX (919) 772-8860
CONTACT PERSON: CLAYTON M. CARR

NAD 83/NA 2011

REVISIONS

8/17/99



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5/28/99

Prepared by

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

SUNGATE DESIGN GROUP, P.A.
PLANS PREPARED FOR A PUBLIC HIGHWAY BY A PROFESSIONAL ENGINEER OR UNDER HIS DIRECT SUPERVISION PER N.C. GENERAL STATUTES 89E AND 89C AND 21 NCAC 56

PROJECT REFERENCE NO.	SHEET NO.
U-5843	6

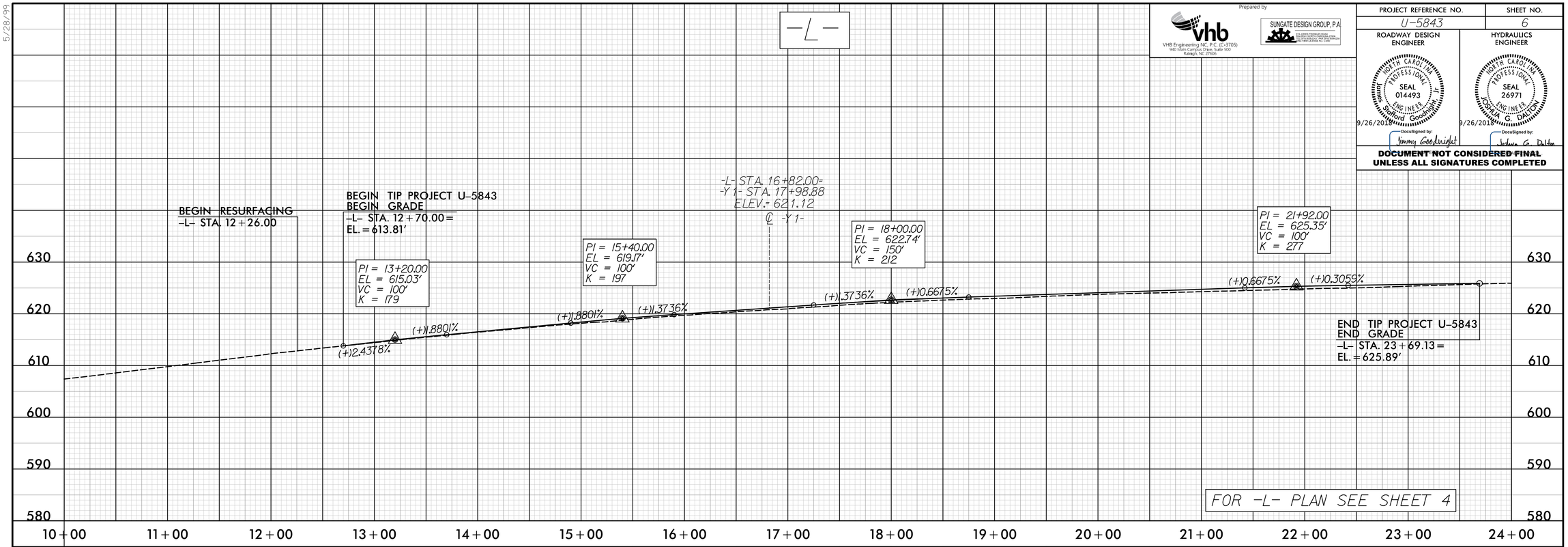
ROADWAY DESIGN ENGINEER

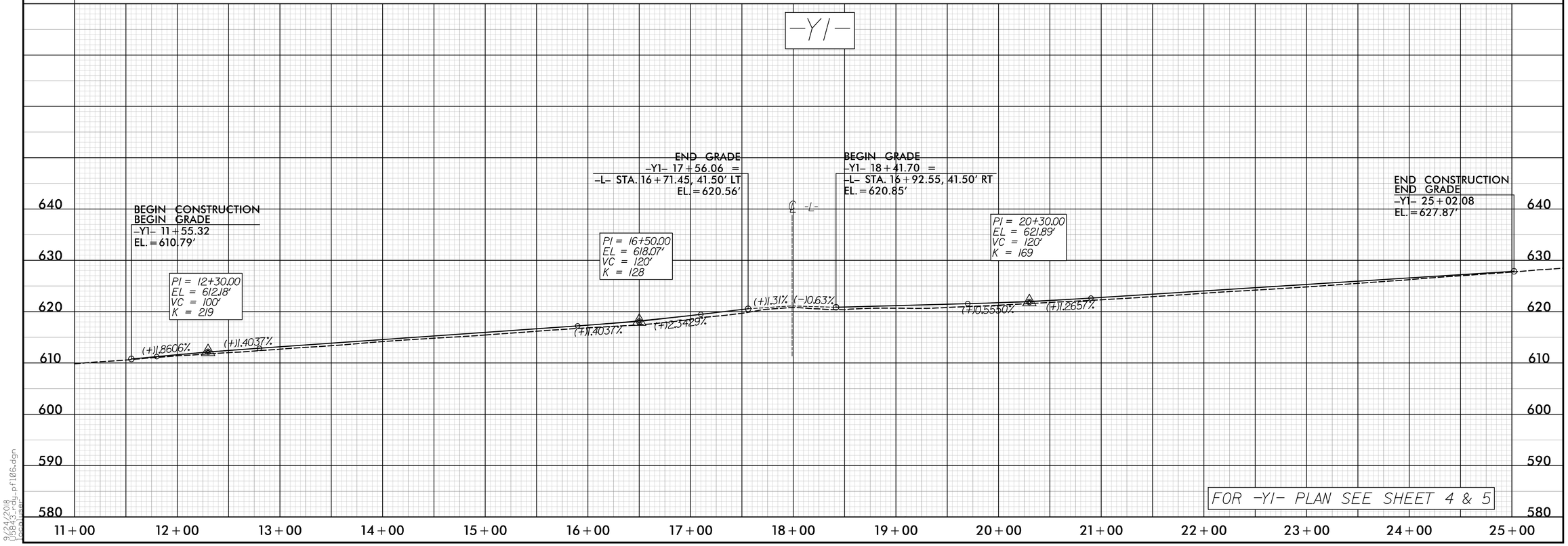
NORTH CAROLINA PROFESSIONAL SEAL 014493 ENGINEER Stafford Goodwright
9/26/2018
DocuSigned by: Jimmy Goodwright

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 26971 ENGINEER JOSHUA G. DALTON
9/26/2018
DocuSigned by: Joshua G. Dalton

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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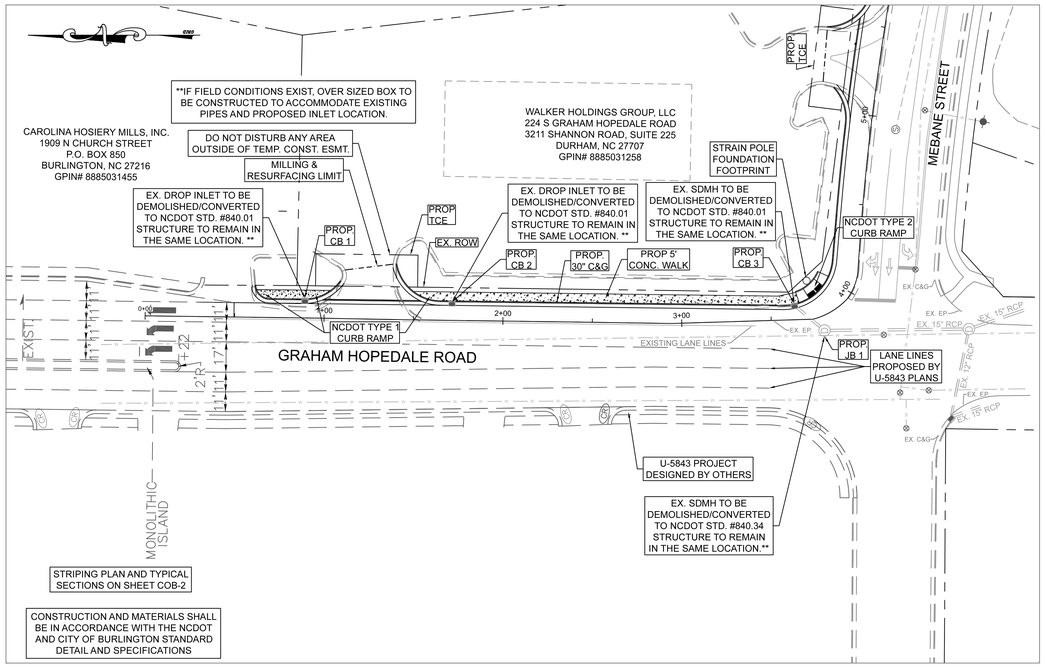
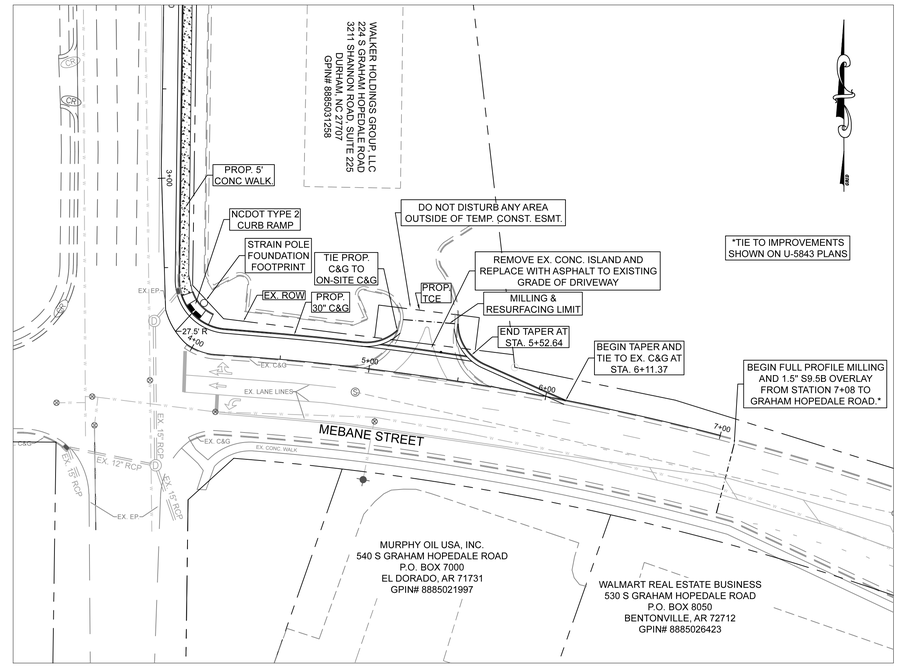
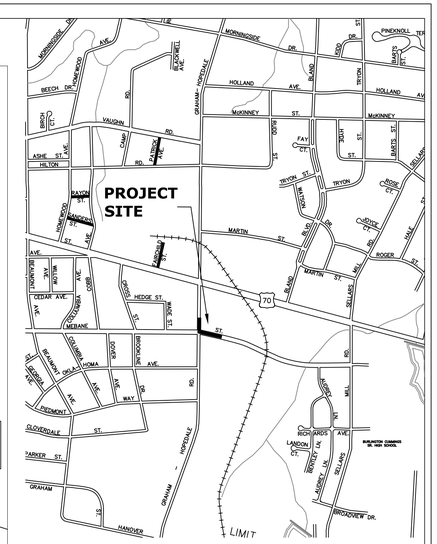
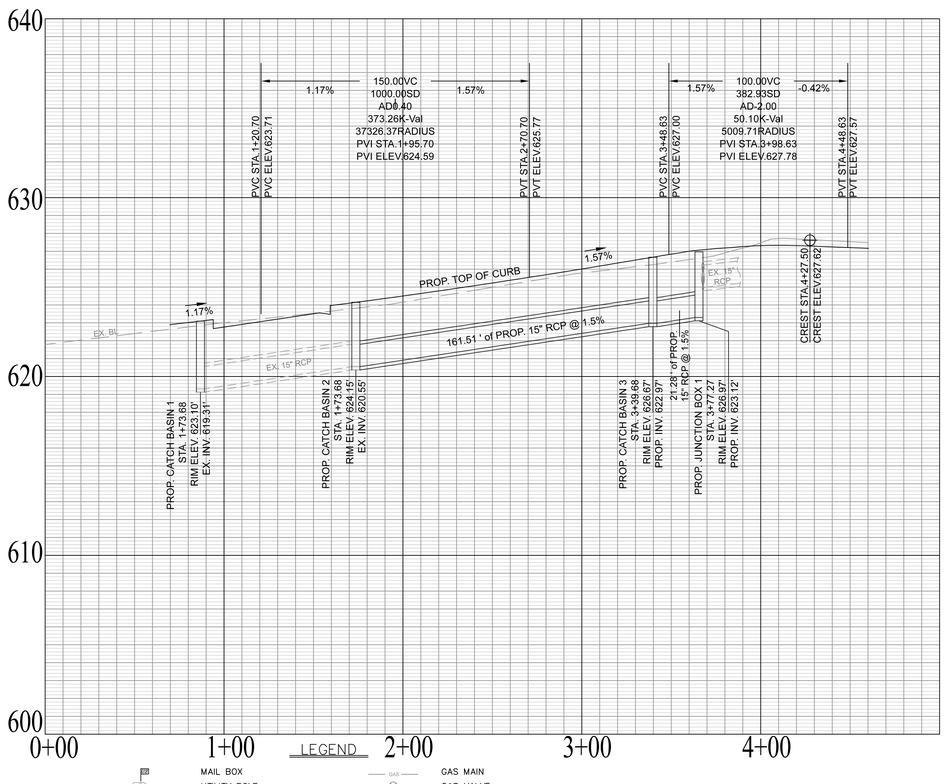
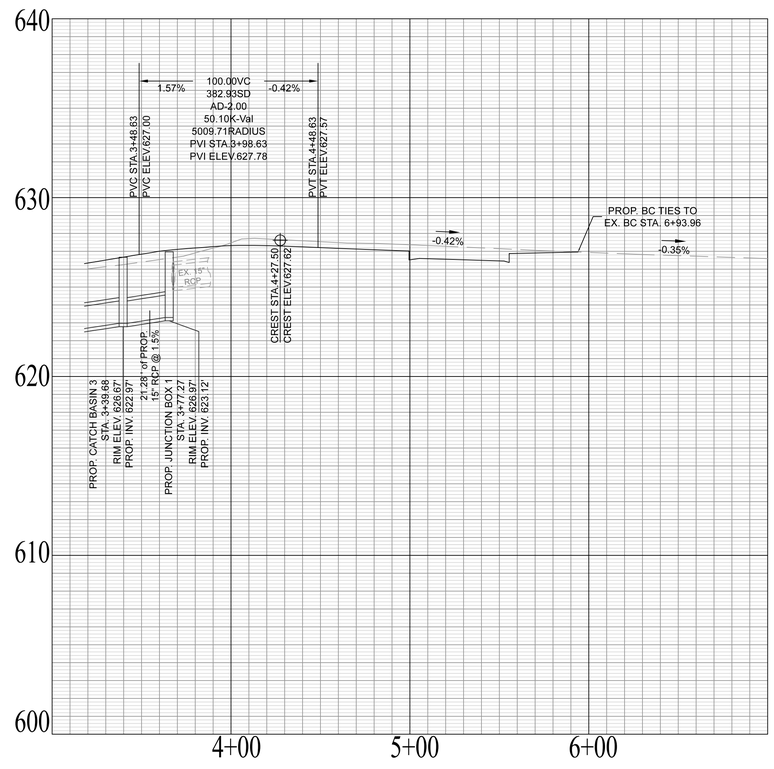


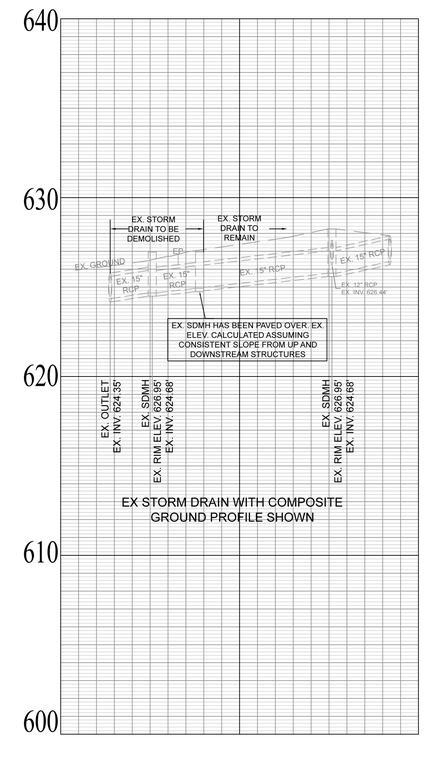




VICINITY MAP
1" = 1000'







EX STORM DRAIN WITH COMPOSITE GROUND PROFILE SHOWN

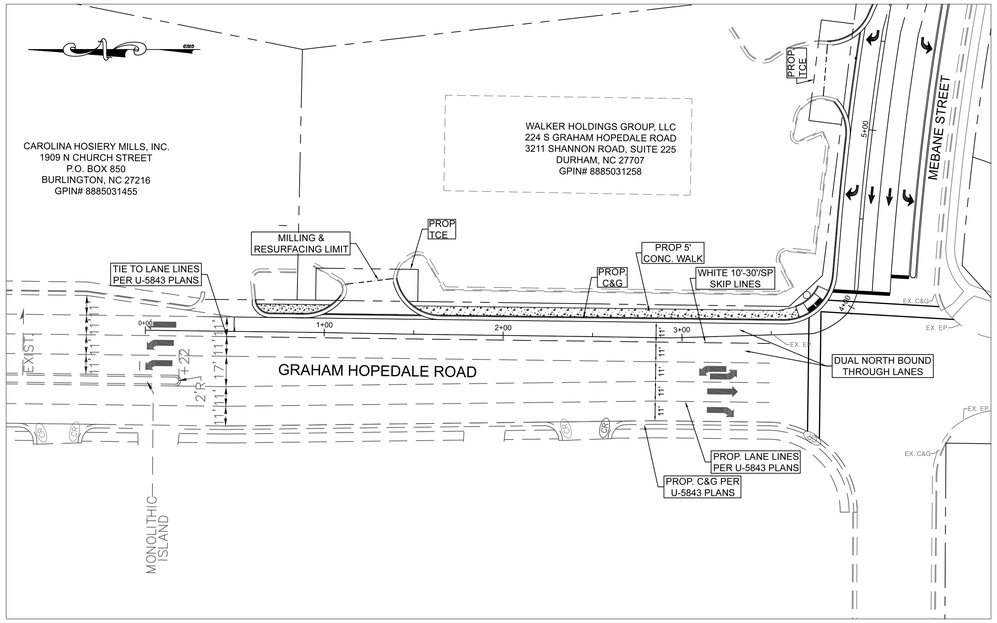
LEGEND

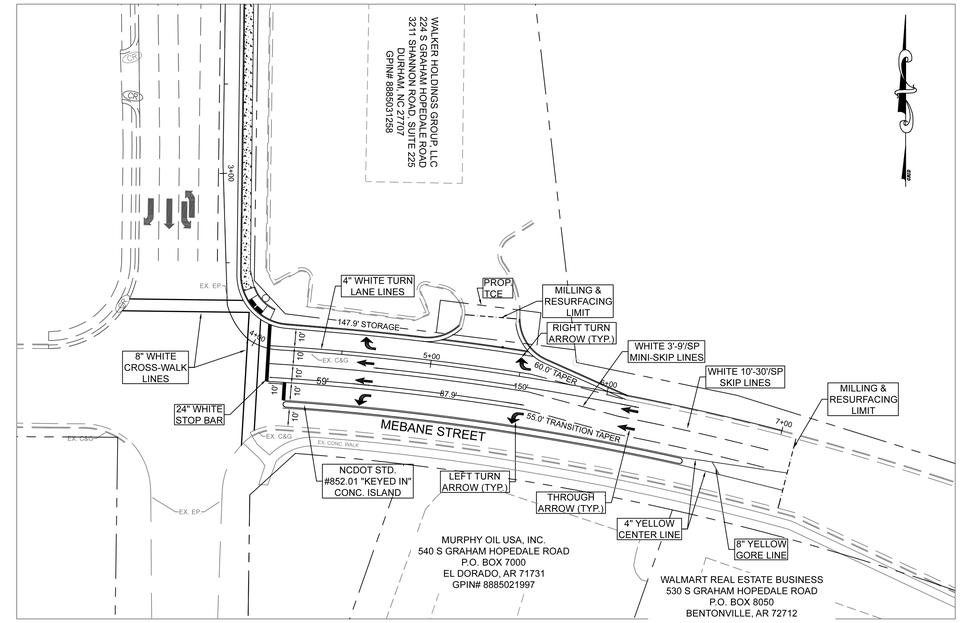
- MAIL BOX
- UTILITY POLE
- UTILITY POLE GUY WIRE
- STORM DRAIN PIPE
- STORM DRAINAGE STRUCTURE
- PROPERTY LINE, IRON PIN
- FENCE
- SHRUB, TREE, ETC.
- SANITARY SEWER
- SANITARY SEWER MANHOLE
- WATER MAIN
- GAS MAIN
- GAS VALVE
- OVERHEAD WIRE
- SEWER CLEAN OUT
- WALKWAY–SIDEWALK
- SILT FENCE
- FIRE HYDRANT & VALVE
- STREET SIGN
- WATER VALVE
- WATER METER

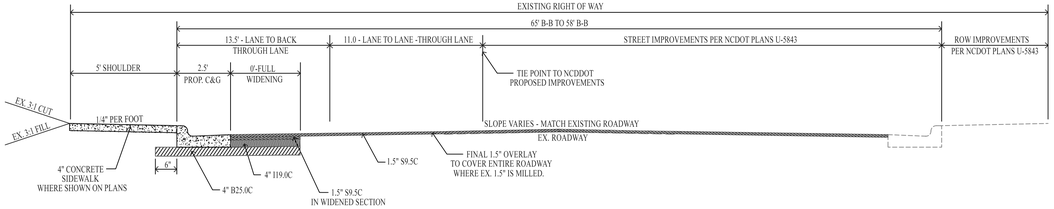
CALL 48 HOURS BEFORE YOU DIG
1-800-632-4949
NORTH CAROLINA ONE CALL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042622 BRANDON M. HOLT
Brandon Holt
4/18/2018

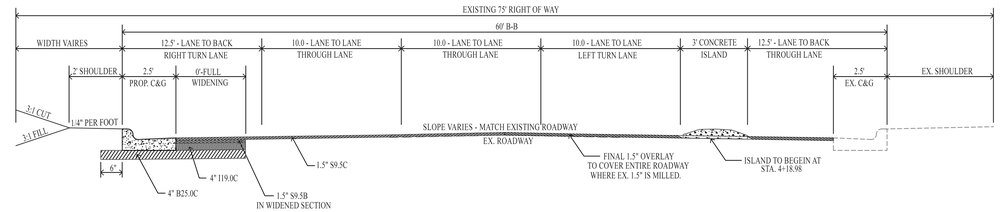
PETITION OR PROJECT NO.	DRAWN BY	CITY OF BURLINGTON, NORTH CAROLINA ENGINEERING DEPARTMENT	SCALE	BOOK: C&G 20
0000-00	BMH	INTERSECTION IMPROVEMENTS	HORIZ: 1"=40'	
CONTRACTOR	CHECKED BY	MEBANE STREET TURN LANE	VERT: 1"=4'	PAGE(S): 26-29
ENGINEER	WTL	AT GRAHAM HOPEDALE ROAD	DATE	SHEET NO. COB 1
BMH			02/12/18	DRAWING NO. 4353-16



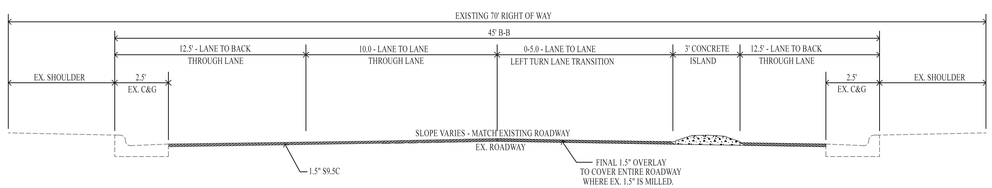




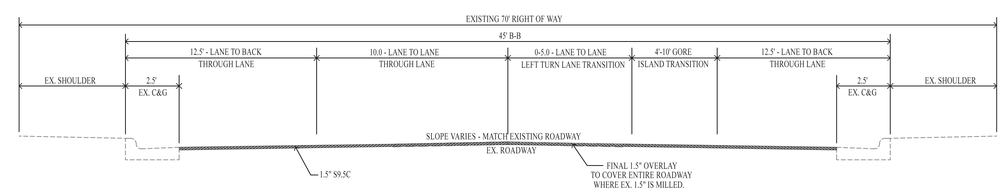
TYPICAL SECTION
STATION 0+00 TO STATION 4+03
N.T.S.



TYPICAL SECTION
STATION 4+03 TO STATION 6+11
N.T.S.



TYPICAL SECTION
STATION 6+11 TO STATION 6+49
N.T.S.



TYPICAL SECTION
STATION 6+49 TO STATION 7+09
N.T.S.

CALL 48 HOURS BEFORE YOU DIG
1-800-632-4949
NORTH CAROLINA ONE CALL

STRIPING PLAN

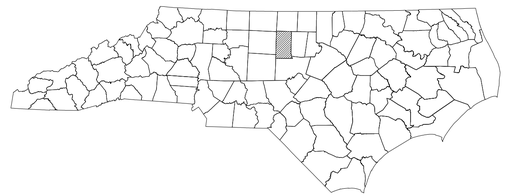
NORTH CAROLINA PROFESSIONAL SEAL 042622 ENGINEER BRANDON M. WOLT
Brandon Wolt
4/15/2018

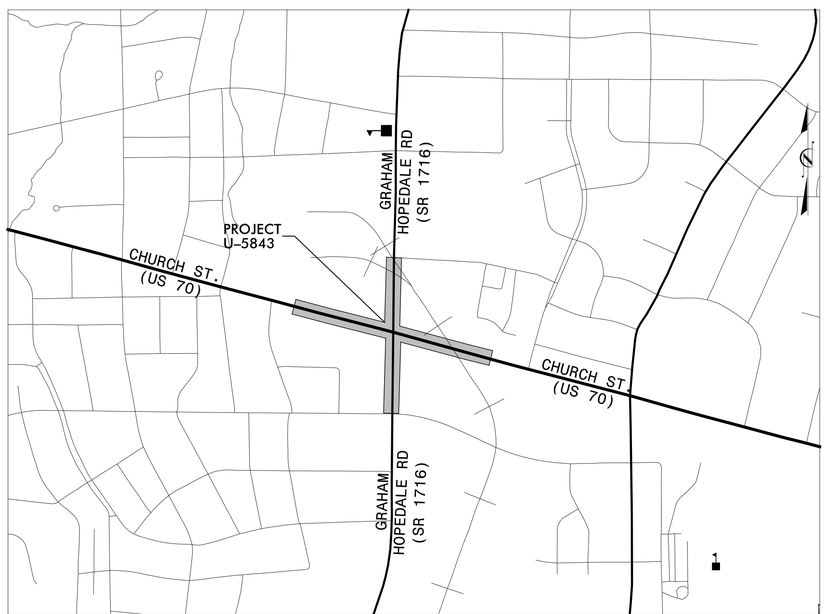
PETITION OR PROJECT NO.	DRAWN BY	CITY OF BURLINGTON, NORTH CAROLINA ENGINEERING DEPARTMENT	SCALE	BOOK: C&G 20
0000-00	BMH	INTERSECTION IMPROVEMENTS	HORIZ: 1"=40'	PAGE(S): 26-29
CONTRACTOR	CHECKED BY	MEBANE STREET TURN LANE AT GRAHAM HOPEDALE ROAD	VERT: 1"=4'	SHEET NO. COB 2
ENGINEER	WTL		DATE	
BMH			02/12/18	DRAWING NO. 4353-16

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

ALAMANCE COUNTY





VICINITY MAP

LOCATION: US 70 (CHURCH STREET)/AT SR 1716 (GRAHAM-HOPEDALE ROAD) IN BURLINGTON.
INTERSECTION IMPROVEMENTS.

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-2-2B	TRANSPORTATION OPERATIONS PLAN: (GENERAL NOTES AND LOCAL NOTES)
TMP-3	TEMPORARY TRAFFIC CONTROL PHASING
TMP-4-5	TEMPORARY TRAFFIC CONTROL PHASE I DETAIL

SHEET NO.
TMP-1

U-5843

TIP PROJECT:

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

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

JOSEPH HUMMER, P.E. STATE TRAFFIC MANAGEMENT ENGINEER

_____ TRAFFIC CONTROL PROJECT ENGINEER

_____ TRAFFIC CONTROL PROJECT DESIGN ENGINEER

_____ TRAFFIC CONTROL DESIGN ENGINEER

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

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

A. MATTHEW THIGPEN, PE
TRAFFIC CONTROL
PROJECT ENGINEER

APPROVED: DocuSigned by: Matthew Thigpen
DATE: FD15553E9193410...

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034343 ENGINEER A. MATTHEW THIGPEN

10/10/2018
\\vhb\Proj\Raleigh\38412.10 NCDOT U-5843 Burlington\NCDOT\Traffic\TrafficControl\TCP\U-5843_TC_TMP_01.dgn
User:MThigpen

PROJ. REFERENCE NO.	SHEET NO.
U-5843	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.06	WARNING SIGNS FOR BLASTING ZONES
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	FLAGGERS
1160.01	TEMPORARY CRASH CUSHION
1165.01	TRUCK MOUNTED ATTENUATOR
1170.01	PORTABLE CONCRETE BARRIER
1180.01	SKINNY-DRUM
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.03	PAVEMENT MARKINGS - EXITS AND ENTRANCE RAMPS
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
1205.10	PAVEMENT MARKINGS - SCHOOL AREAS
1205.11	PAVEMENT MARKINGS - RAILROAD CROSSINGS
1205.12	PAVEMENT MARKINGS - BRIDGES
1205.13	PAVEMENT MARKINGS - LANE REDUCTIONS
1205.14	PAVEMENT MARKINGS - ROUNDABOUTS
1205.15	PAVEMENT MARKINGS - SUPERSTREETS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION
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
- REMOVAL

SIGNALS

EXISTING PROPOSED TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

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

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

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

PAVEMENT MARKING SYMBOLS

PAVEMENT MARKING SYMBOLS

2018.05.21
10:18:15 -04'00'

APPROVED: _____ DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034343 ENGINEER A. MATTHEW THIGPEN

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

ROADWAY STANDARD DRAWINGS & LEGEND

5/4/2018
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User:localuser

PROJ. REFERENCE NO.	SHEET NO.
U-5843	TMP-2

GENERAL NOTES

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

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

TIME RESTRICTIONS

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

ROAD NAME	DAY AND TIME RESTRICTIONS
ALL ROADS	MONDAY THRU FRIDAY 6:00 A.M. TO 9:00 A.M. AND 4:00 P.M. TO 6:00 P.M.
	FRIDAY 7:00 P.M. TO SUNDAY 7:00 P.M.

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

ROAD NAME
ALL ROADS

HOLIDAY

1. FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.

2. FOR NEW YEAR'S, BETWEEN THE HOURS OF 6:00 A.M. DECEMBER 31st TO 6:00 P.M. JANUARY 3RD. IF NEW YEAR'S DAY IS ON A FRIDAY,SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 6:00 P.M. THE FOLLOWING TUESDAY.

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

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

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

   IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY THEN BETWEEN THE HOURS OF 6:00 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 6:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.

6. FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY TO 6:00 P.M. WEDNESDAY.

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

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

C) 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.

LANE AND SHOULDER CLOSURE REQUIREMENTS

D) 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.

E) 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.

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

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

G) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRANSPORTATION MANAGEMENT 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.

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

I) DO NOT INSTALL MORE THAN ONE LANE CLOSURE IN ANY ONE DIRECTION ON US 70.

J) PROVIDE TRAFFIC CONTROL FOR APPROPRIATE LANE CLOSURES FOR SURVEYING DONE BY THE DEPARTMENT.

2018.05.25
08:43:48
-04'00'

APPROVED: DATE:

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034343 ENGINEER MATTHEW THIGPEN

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

TRANSPORTATION OPERATIONS PLAN: (GENERAL NOTES)

5/25/2018
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User:MThigpen

PROJ. REFERENCE NO.	SHEET NO.
U-5843	TMP-2B

GENERAL NOTES CONTINUED

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 TWENTY ONE (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

M) 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) 500 FT 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 (DRUMS) 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 MONTHS AFTER THE INITIAL APPLICATION AND EVERY 6 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 LOCATION WITH PROPER COLOR PAVEMENT MARKINGS PRIOR TO INSTALLATION. PLACE CONES TO DELINEATE ANY PROPOSED MONOLITHIC ISLANDS BEFORE INSTALLATION.

MISCELLANEOUS

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

2018.05.21
10:19:59 -04'00'

APPROVED: _____ DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034343 ENGINEER MATTHEW THIGPEN

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

TRANSPORTATION OPERATIONS PLAN: (GENERAL NOTES)

5/4/2018
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User:localuser

PROJ. REFERENCE NO.	SHEET NO.
U-5843	TMP-3

PHASING

THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL EXISTING DRIVEWAYS AS DIRECTED BY THE ENGINEER.

WEDGE EXISTING PAVEMENT IN SUCH A MANNER THAT PONDING OF WATER WILL NOT OCCUR IN THE TRAVEL LANES.

COMPLETE WEDGING AND WIDENING SIMULTANEOUSLY SO THAT CURRENT TRAFFIC PATTERNS, DROP-OFF REQUIREMENTS AND POSITIVE DRAINAGE ARE MAINTAINED.

PHASE I

STEP 1
INSTALL WORK ZONE ADVANCE WARNING SIGNS

STEP 2
AWAY FROM TRAFFIC, AS MUCH AS POSSIBLE, AND USING LANE CLOSURES (RSD 1101.02, SHEETS 2, 3 AND 7 OF 14), WHEN NECESSARY, INSTALL AND ACTIVATE TEMPORARY SIGNAL 07-0032T AT THE INTERSECTION OF NORTH CHURCH STREET AND GRAHAM HOPEDALE ROAD (SEE SIGNAL PLANS AND TMP-4).

STEP 3
AWAY FROM TRAFFIC, AS MUCH AS POSSIBLE, AND USING LANE CLOSURES (RSD NO. 1101.02, SHEETS 2, 3 AND 7 OF 14), WHEN NECESSARY, BEGIN CONSTRUCTION OF THE FOLLOWING UP TO, BUT NOT INCLUDING, THE FINAL LAYER OF SURFACE COURSE INCLUDING DRAINAGE (SEE SHEET TMP-4).

* -L- FROM STA 12+26 +/- TO -Y1-
* -L- FROM -Y1- TO -L- STA 23+69 +/-
* -Y1- FROM STA 11+55 +/- TO -L-
* -Y1- FROM -L- TO -Y1- STA 25+02 +/-

CONSTRUCT PROPOSED DRAINAGE CROSS PIPES AS FOLLOWS:

USE LANE CLOSURES (RSD NO. 1101.02, SHEET 2 OF 15) AND LAW ENFORCEMENT AS NECESSARY.

PATCH PAVEMENT AND RESTORE TRAFFIC TO ITS PRIOR PATTERN BY THE END OF THE WORK PERIOD.

THE CONTRACTOR SHALL WORK IN A CONTINUOUS MANNER TO COMPLETE ALL WORK IN PHASE I, STEP 4.

STEP 4
AWAY FROM TRAFFIC, AS MUCH AS POSSIBLE, AND USING LANE CLOSURES (RSD 1101.02, SHEETS 2, 3 AND 7 OF 14), AND LAW ENFORCEMENT WHEN NECESSARY, PERFORM THE FOLLOWING:

PLACE TEMPORARY PAVEMENT MARKINGS & MARKERS IN THE FINAL PATTERN (INCLUDING SOLID YELLOW EDGE LINE MARKINGS OUTLINING SHAPE OF PROPOSED MEDIANS), COMPLETE SIGNAL REVISIONS, SHIFT TRAFFIC TO THE FINAL PATTERN, PLACE SKINNY DRUMS WITHIN OUTLINES OF PROPOSED RAISED MEDIANS AND INSTALL REMAINING TRAFFIC CONTROL DEVICES. ACTIVATE ALL FINAL SIGNALS AND OPEN TO THE FINAL TRAFFIC PATTERN.

PHASE II

STEP 1
USING LANE CLOSURES (RSD NO. 1101.02, SHEETS 1, 2, 3 AND 7 OF 14), WHEN NECESSARY, CONSTRUCT PROPOSED MONOLITHIC ISLANDS, PLACE FINAL LAYER OF SURFACE COURSE AND INSTALL PAVEMENT MARKINGS AND MARKERS IN THE FINAL PATTERN AS SHOWN IN THE FINAL PAVEMENT MARKING PLANS.

STEP 2
REMOVE ALL REMANING TRAFFIC CONTROL DEVICES.

2018.05.21
10:24:31 -04'00'

APPROVED:_____ DATE:_____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034343 ENGINEER A. MATTHEW THIGPEN

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

PHASING

5/4/2018
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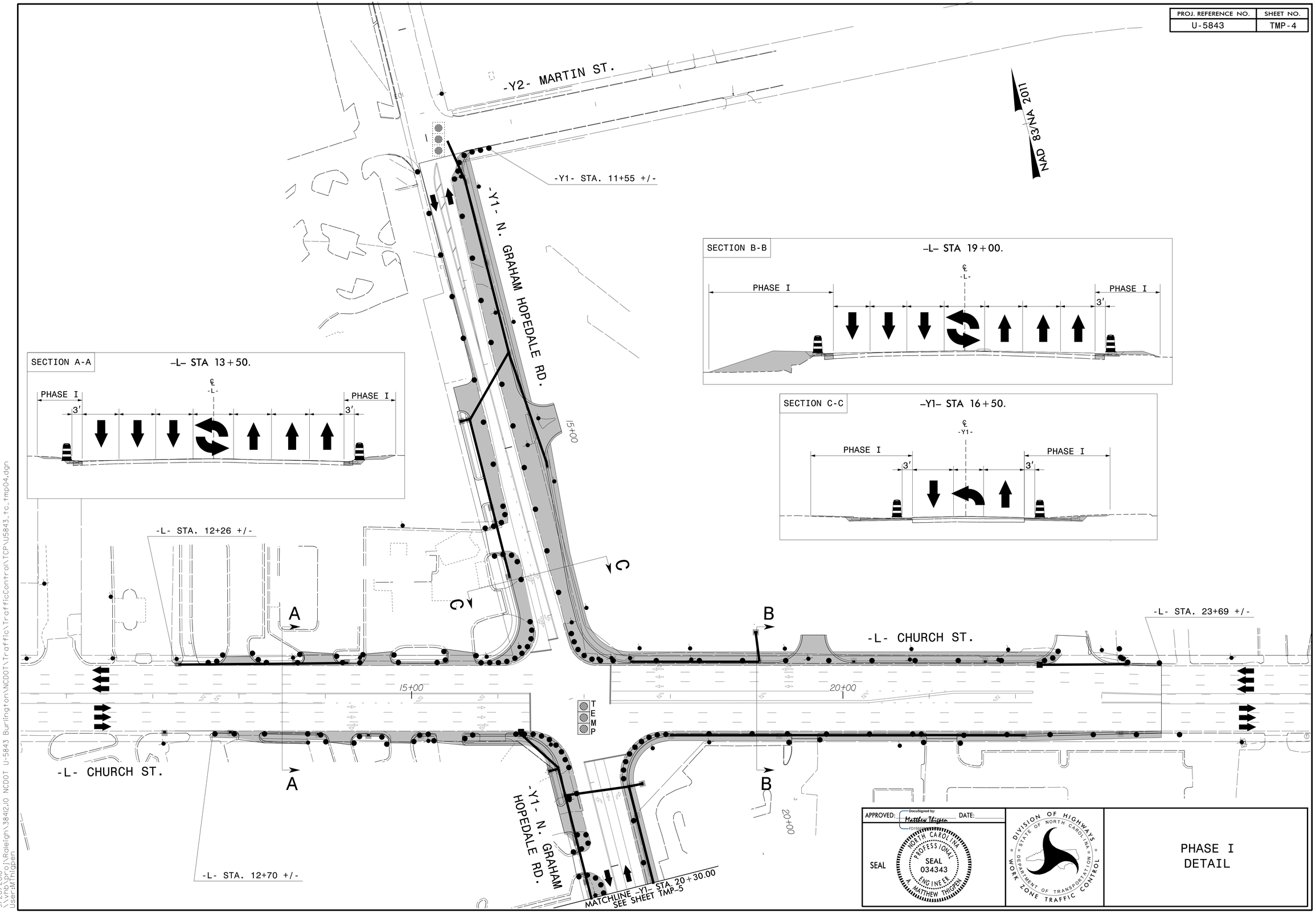
PROJ. REFERENCE NO.	SHEET NO.
U-5843	TMP-4



9/20/2018
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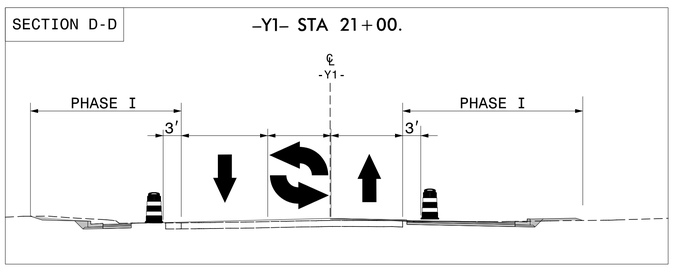
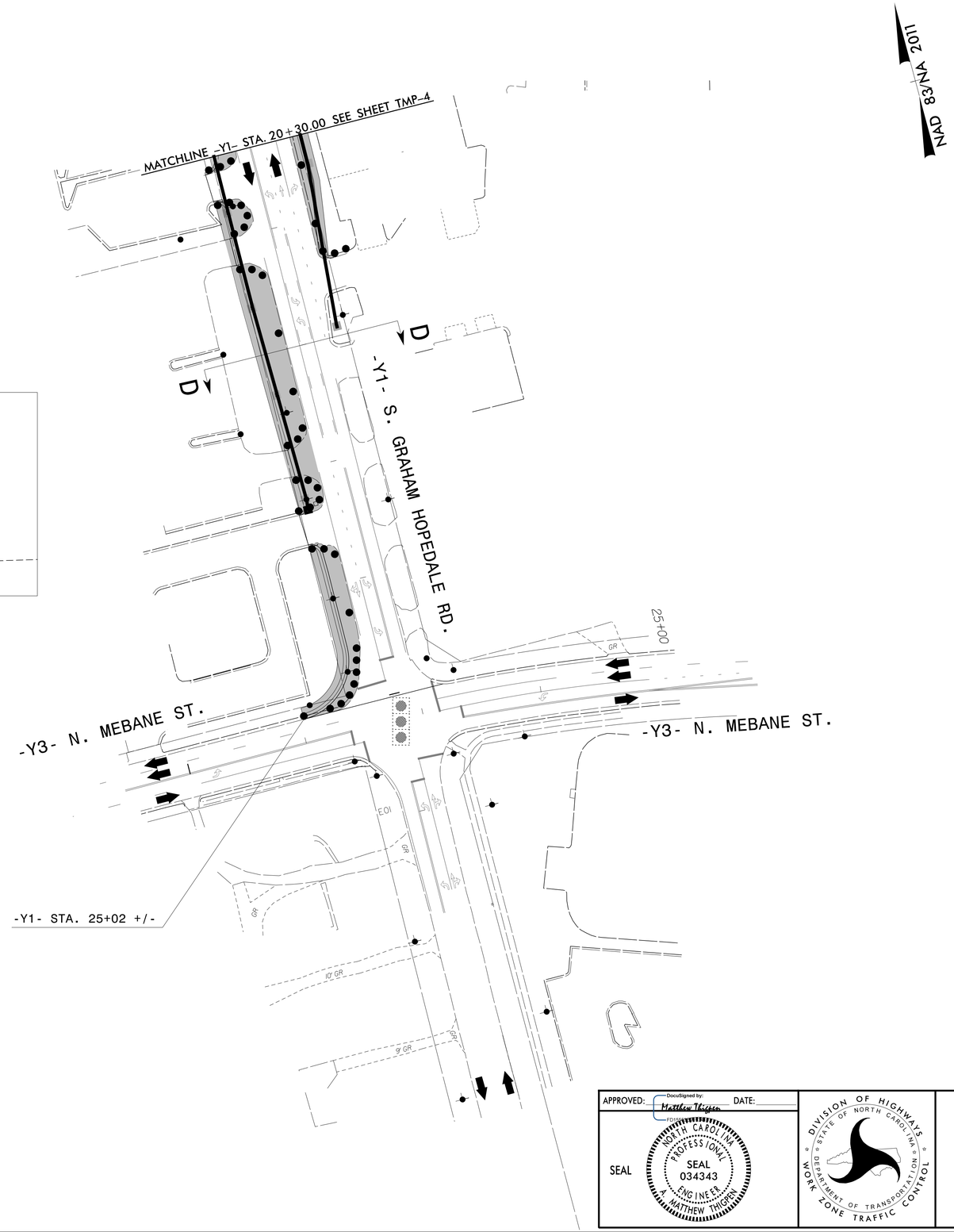
User:MThigpen

PROJ. REFERENCE NO.	SHEET NO.
U-5843	TMP-5





APPROVED: DocuSigned by: Matthew Thigpen FD4 DATE:

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034343 ENGINEER MATTHEW THIGPEN

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

PHASE I
DETAIL

9/20/2018
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PROJECT REFERENCE NO.	SHEET NO.
U-5843	PMP-1

APPROVED: DocuSigned by: Matthew Thigpen FD15553E9193410...

DATE:

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034343 ENGINEER A. MATTHEW THIGPEN

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
ALAMANCE COUNTY

LOCATION: US 70 (CHURCH STREET) AT SR 1716 (GRAHAM–HOPEDALE ROAD) IN BURLINGTON. INTERSECTION IMPROVEMENTS.

T.I.P.: U-5843

CONTRACT: DG00473

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE AND SCHEDULE SHEET
PMP-2-3	PAVEMENT MARKING DETAIL

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION	TOTAL QUANTITY
	THERMOPLASTIC (4", 90 MILS)	TOTAL 2,436 LF
TA	WHITE EDGELINE	
TB	YELLOW EDGELINE	
	THERMOPLASTIC (4", 120 MILS)	TOTAL 6,320 LF
T8	2 FT. - 6 FT./SP WHITE MINISKIP	
T9	2 FT. - 6 FT./SP YELLOW MINISKIP	
TC	10 FT. WHITE SKIP	
TD	3 FT. - 9 FT./SP WHITE MINISKIP	
TE	WHITE SOLID LANE LINE	
TF	10 FT. YELLOW SKIP	
TH	YELLOW SINGLE CENTER	
TI	YELLOW DOUBLE CENTER	
	THERMOPLASTIC (8", 90 MILS)	TOTAL 133 LF
TO	WHITE DIAGONAL	
TP	YELLOW DIAGONAL	
	THERMOPLASTIC (8", 120 MILS)	TOTAL 926 LF
T13	3 FT. - 9 FT./SP WHITE MINISKIP	
TQ	WHITE CROSSWALK LINE	
TR	WHITE SOLIE LANE LINE	
	THERMOPLASTIC (24", 120 MILS)	TOTAL 677 LF
T2	WHITE STOPBAR	
T3	WHITE CROSSWALK LINE	
	THERMOPLASTIC PAVEMENT MARKING CHARACTER (120 MILS)	TOTAL 12 EA
UI	ALPHANUMERIC CHARACTER	
	THERMOPLASTIC PAVEMENT MARKING SYMBOLS (90 MILS)	TOTAL 47 EA
UA	LEFT TURN ARROW	
UB	RIGHT TURN ARROW	
UC	STRAIGHT ARROW	
	PERMANENT RAISED PAVEMENT MARKERS	TOTAL 216 EA
MA	YELLOW & YELLOW	
MB	CRYSTAL & RED	

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
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.13	PAVEMENT MARKINGS - LANE REDUCTIONS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY
1253.01	RAISED PAVEMENT MARKERS - SNOWPLOWABLE

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	PERMANENT RAISED

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

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

D) STOP BAR LOCATION AT NON-SIGNALIZED INTERSECTIONS MAY BE ADJUSTED AS DIRECTED 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.

F) SEE ROADWAY PLANS FOR ALTERNATE CURB RAMP DESIGNS WHEN INDICATED ON PAVEMENT MARKING DETAIL SHEETS.

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

KELVIN JORDAN SIGNING & DELINEATION REGIONAL ENGINEER

SIGNING & DELINEATION PROJECT DESIGN ENGINEER/TECHNICIAN

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY: VHB Engineering NC, P.C.

A. Matthew Thigpen, PE PROJECT ENGINEER

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

10/10/2018
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User:MThigpen

PROJECT REFERENCE NO.	SHEET NO.
U-5843	PMP-2

APPROVED: DocuSigned by: Matthew Thigpen FD15553E9193410...

DATE:

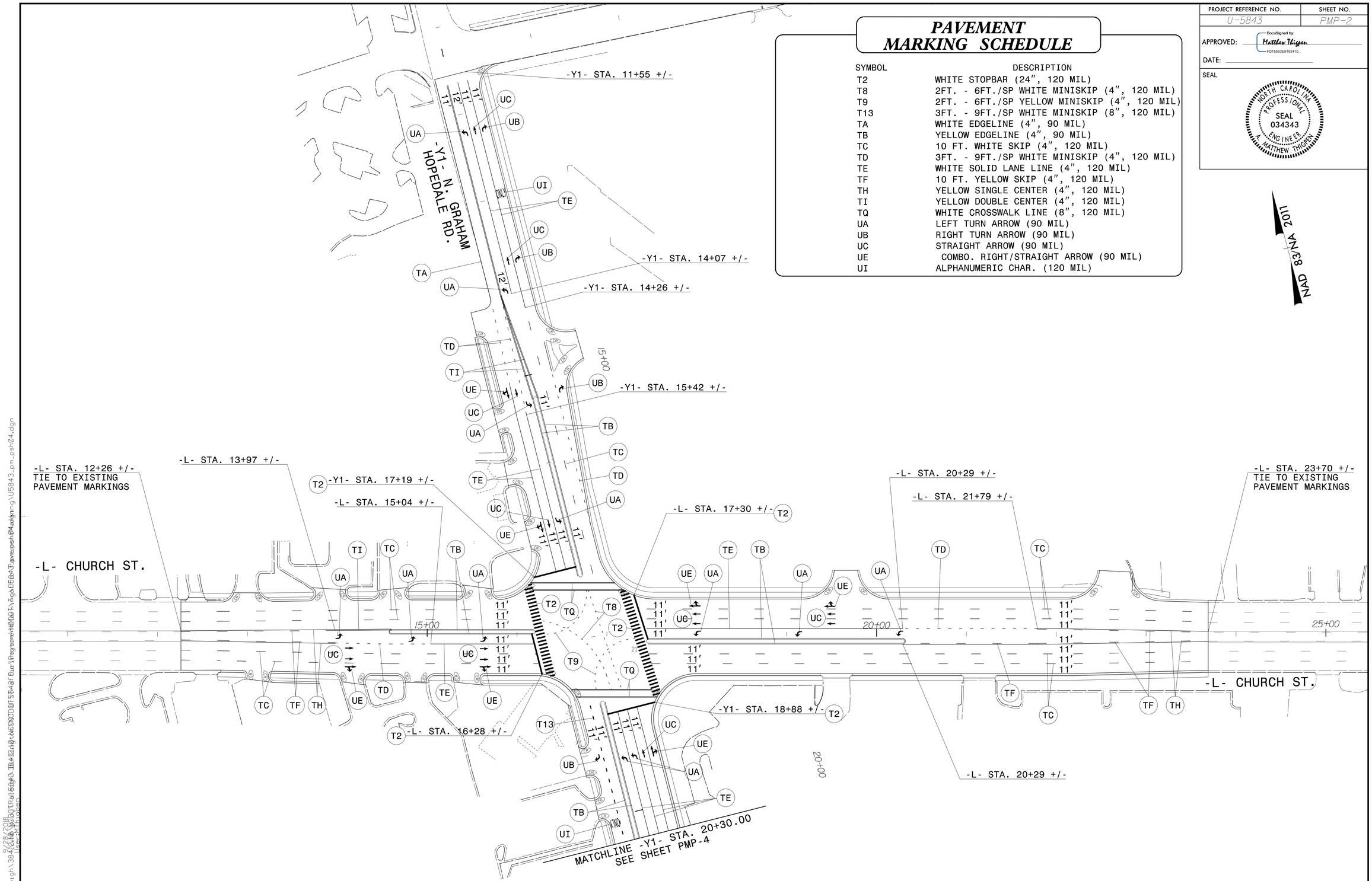
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034343 ENGINEER MATTHEW THIGPEN

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
T2	WHITE STOPBAR (24", 120 MIL)
T8	2FT. - 6FT./SP WHITE MINISKIP (4", 120 MIL)
T9	2FT. - 6FT./SP YELLOW MINISKIP (4", 120 MIL)
T13	3FT. - 9FT./SP WHITE MINISKIP (8", 120 MIL)
TA	WHITE EDGELINE (4", 90 MIL)
TB	YELLOW EDGELINE (4", 90 MIL)
TC	10 FT. WHITE SKIP (4", 120 MIL)
TD	3FT. - 9FT./SP WHITE MINISKIP (4", 120 MIL)
TE	WHITE SOLID LANE LINE (4", 120 MIL)
TF	10 FT. YELLOW SKIP (4", 120 MIL)
TH	YELLOW SINGLE CENTER (4", 120 MIL)
TI	YELLOW DOUBLE CENTER (4", 120 MIL)
TQ	WHITE CROSSWALK LINE (8", 120 MIL)
UA	LEFT TURN ARROW (90 MIL)
UB	RIGHT TURN ARROW (90 MIL)
UC	STRAIGHT ARROW (90 MIL)
UE	COMBO. RIGHT/STRAIGHT ARROW (90 MIL)
UI	ALPHANUMERIC CHAR. (120 MIL)

NAD 83/NA 2011



PAVEMENT MARKING DETAIL

9/28/2018
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PROJECT REFERENCE NO.	SHEET NO.
U-5843	PMP-3

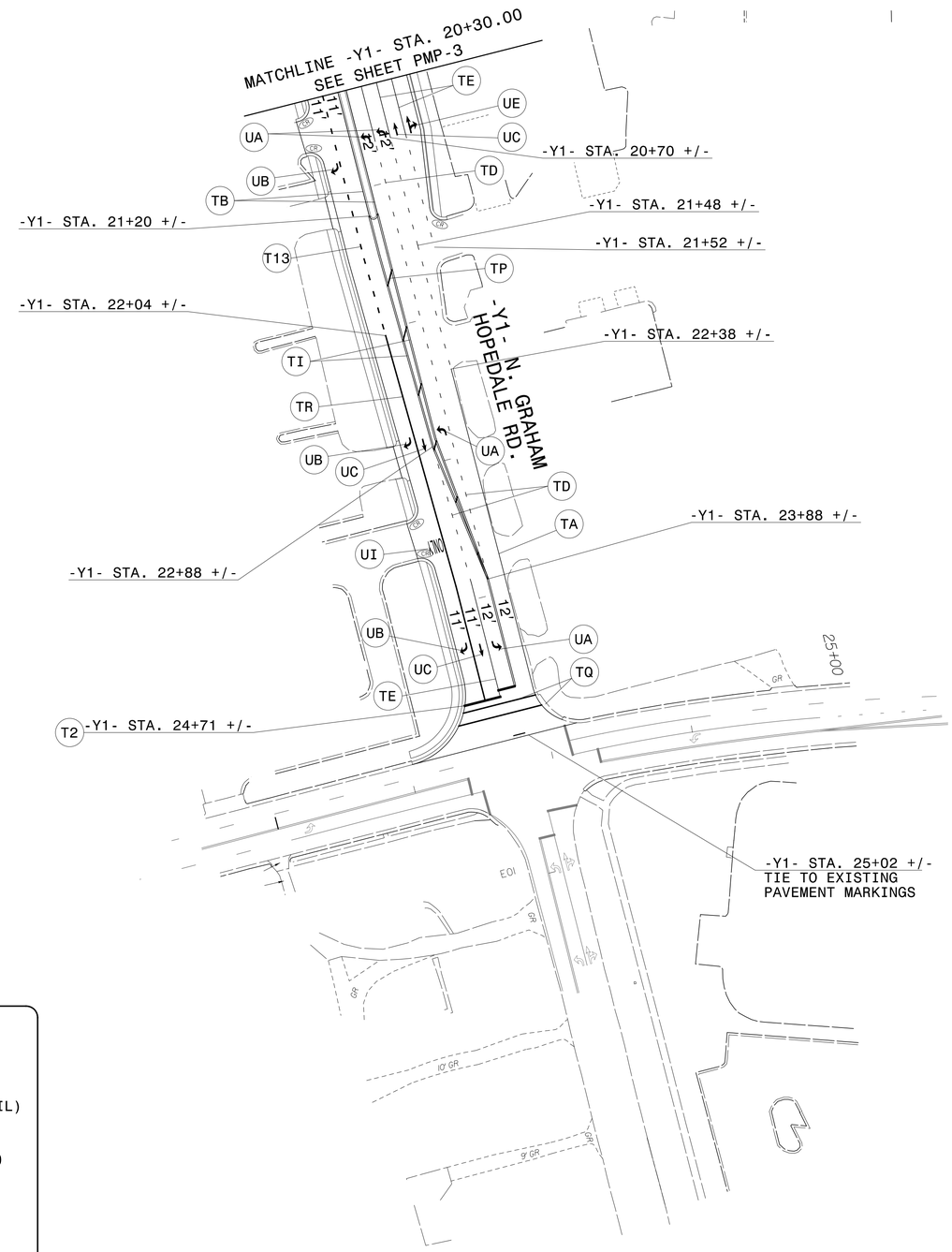
APPROVED: DocuSigned by: Matthew Thigpen FD15553E9193410...

DATE:

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 034343 ENGINEER MATTHEW THIGPEN

NAD 83/NA 2011



PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
T2	WHITE STOPBAR (24", 120 MIL)
T13	3 FT.-9 FT./SP WHITE MINISKIP (8", 120 MIL)
TA	WHITE EDGELINE (4", 90 MIL)
TB	YELLOW EDGELINE (4", 90 MIL)
TD	3FT.-9FT./SP WHITE MINISKIP (4", 120 MIL)
TE	WHITE SOLID LANE LINE (4", 120 MIL)
TI	YELLOW DOUBLE CENTER (4", 120 MIL)
TP	YELLOW DIAGONAL (8", 90 MIL)
TQ	WHITE CROSSWALK LINE (8", 120 MIL)
TR	WHITE SOLID LANE LINE (8", 120 MIL)
UA	LEFT TURN ARROW (90 MIL)
UB	RIGHT TURN ARROW (90 MIL)
UC	STRAIGHT ARROW (90 MIL)
UE	COMBO. RIGHT/STRAIGHT ARROW (90 MIL)
UI	ALPHANUMERIC CHAR. (90 MIL)

PAVEMENT MARKING DETAIL

9/24/2018
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User:MThigpen

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5843	EC-1	

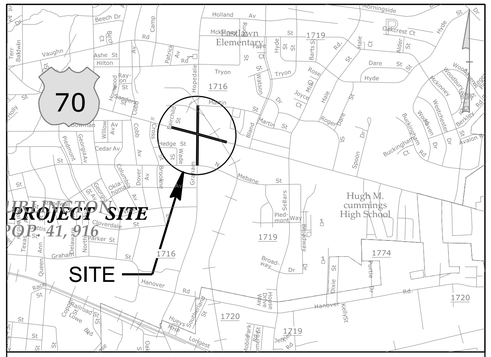
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
50233.1.1		PE
50233.2.1		R/W, UTIL.
50233.3.1		CONST.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

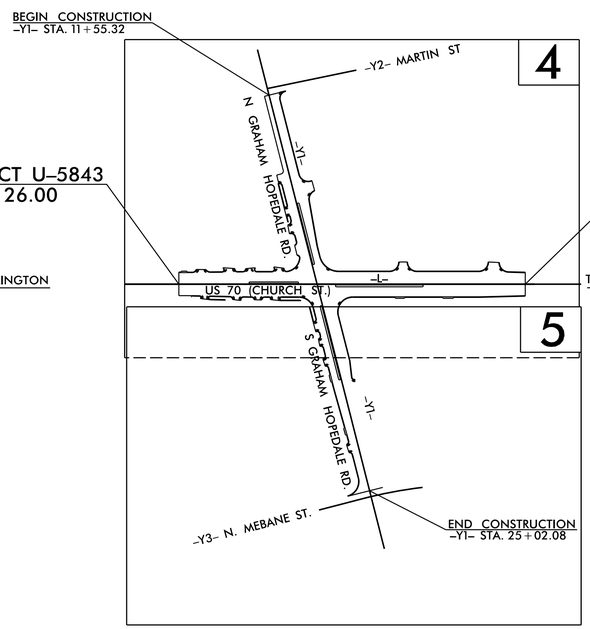
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

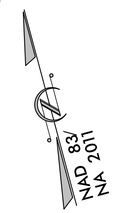
ALAMANCE COUNTY

LOCATION: US 70 (CHURCH STREET) / GRAHAM–HOPEDALE ROAD
IN BURLINGTON
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND SIGNALS



VICINITY MAP





EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	EW CFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

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

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

TIP PROJECT: U–5843

CONTRACT: DG00473

GRAPHIC SCALE

50 25 0 50 100
PLANS

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

Prepared In the Office of:

SUNGATE DESIGN GROUP, P.A.

915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 FAX (919) 859-6258
ENG FIRM LICENSE NO. C-890

Designed by:

Brad T. Smith — *NAME*
3520 — *LEVEL III CERTIFICATION NO.*

Reviewed In the Office of:

ROADSIDE ENVIRONMENTAL UNIT
1 South Wilmington St.
Raleigh, NC 27611

2018 STANDARD SPECIFICATIONS

Reviewed by:

Jennifer Parish

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		

9/26/2018
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PROJECT REFERENCE NO.	SHEET NO.
U-5843	EC-2
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

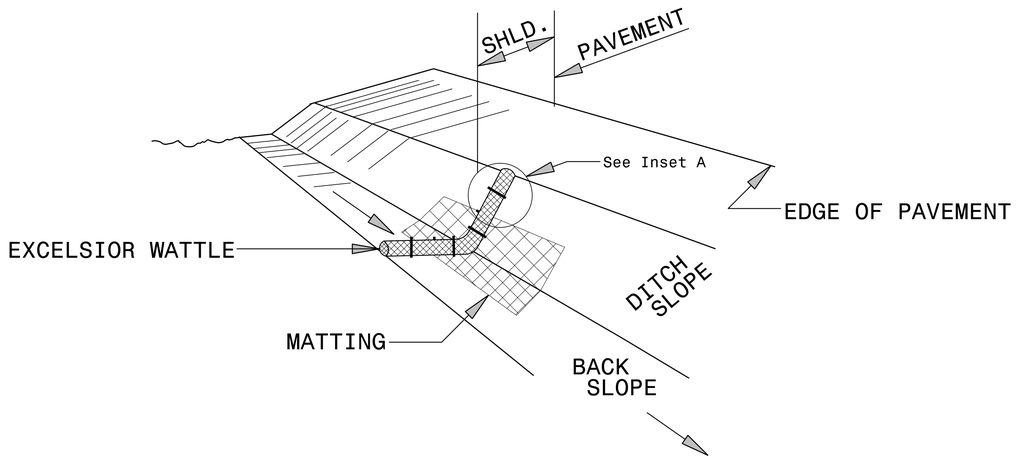
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

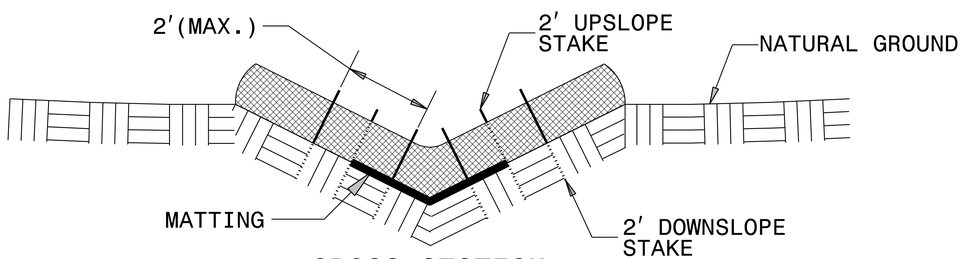
SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS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

PROJECT REFERENCE NO.	SHEET NO.
U-5843	EC-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

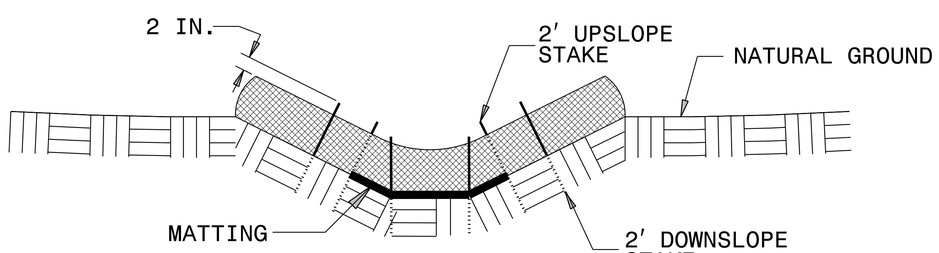
WATTLE DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

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

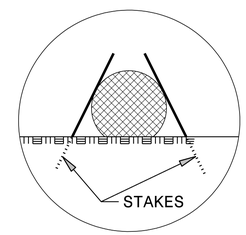
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

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

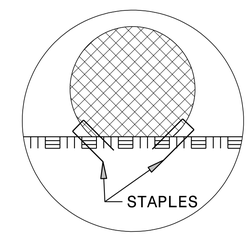
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

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

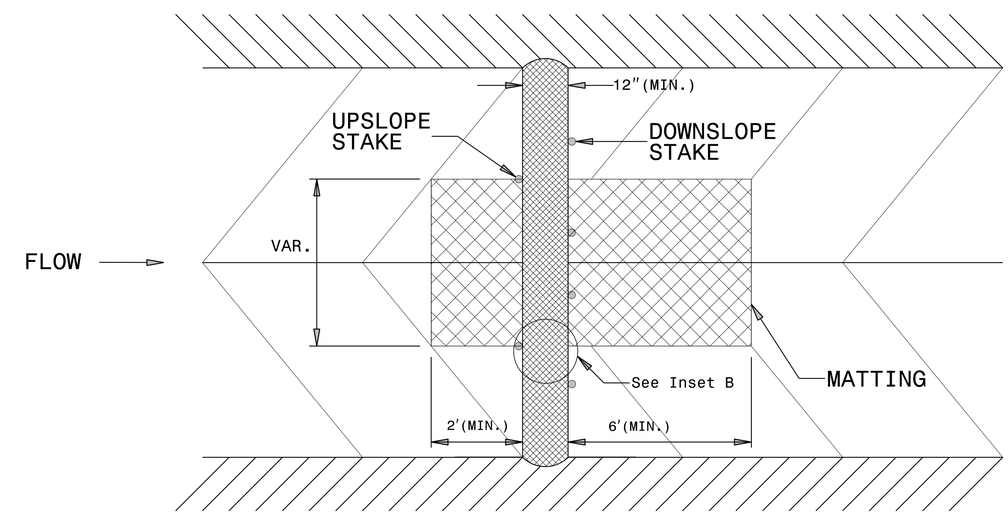
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.



INSET A



INSET B



TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
U-5843	EC-04/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

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

RIST TYPE-C INLET PROTECTION EROSION CONTROL MEASURES MAY BE SUBSTITUTED WITH FABRIC INSERT INLET PROTECTION DEVICES ON CATCH BASINS AT THE DISCRETION OF THE ENGINEER.

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 04

NOTE:
UNLESS OTHERWISE LABELED ALL DRIVEWAY RADII ARE 10' AND ALL CONCRETE ISLAND RADII ARE 2'.

-Y1- POT Sta. 10+00.00

-Y2- POT Sta. 13+00.00

-Y2- S 86° 42' 23.9" E

-Y1- POT Sta. 11+32.68=
-Y2- POT Sta. 10+00.00
Δ=92°33'51.32"

BEGIN CONSTRUCTION
-Y1- STA. 11+55.32

BEGIN TIP PROJECT U-5843
-L- POT STA. 12+26.00

END TIP PROJECT U-5843
-L- POT STA. 23+69.13

-L- POT Sta. 16+82.00=
-Y1- POT Sta. 17+98.88
Δ=75°44'22.12"

S 0°43'44.8" W

75° 00' 37.3" E

S 75° 00' 37.3" E

MATCHLINE -Y1- STA. 20+30.00
SEE SHEET 5

FOR -L- & -Y1- PROFILES SEE SHEET

PROJECT REFERENCE NO.	SHEET NO.
U-5843	EC-05/CONST.05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

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

RIST TYPE–C INLET PROTECTION EROSION CONTROL MEASURES MAY BE SUBSTITUTED WITH FABRIC INSERT INLET PROTECTION DEVICES ON CATCH BASINS AT THE DISCRETION OF THE ENGINEER.

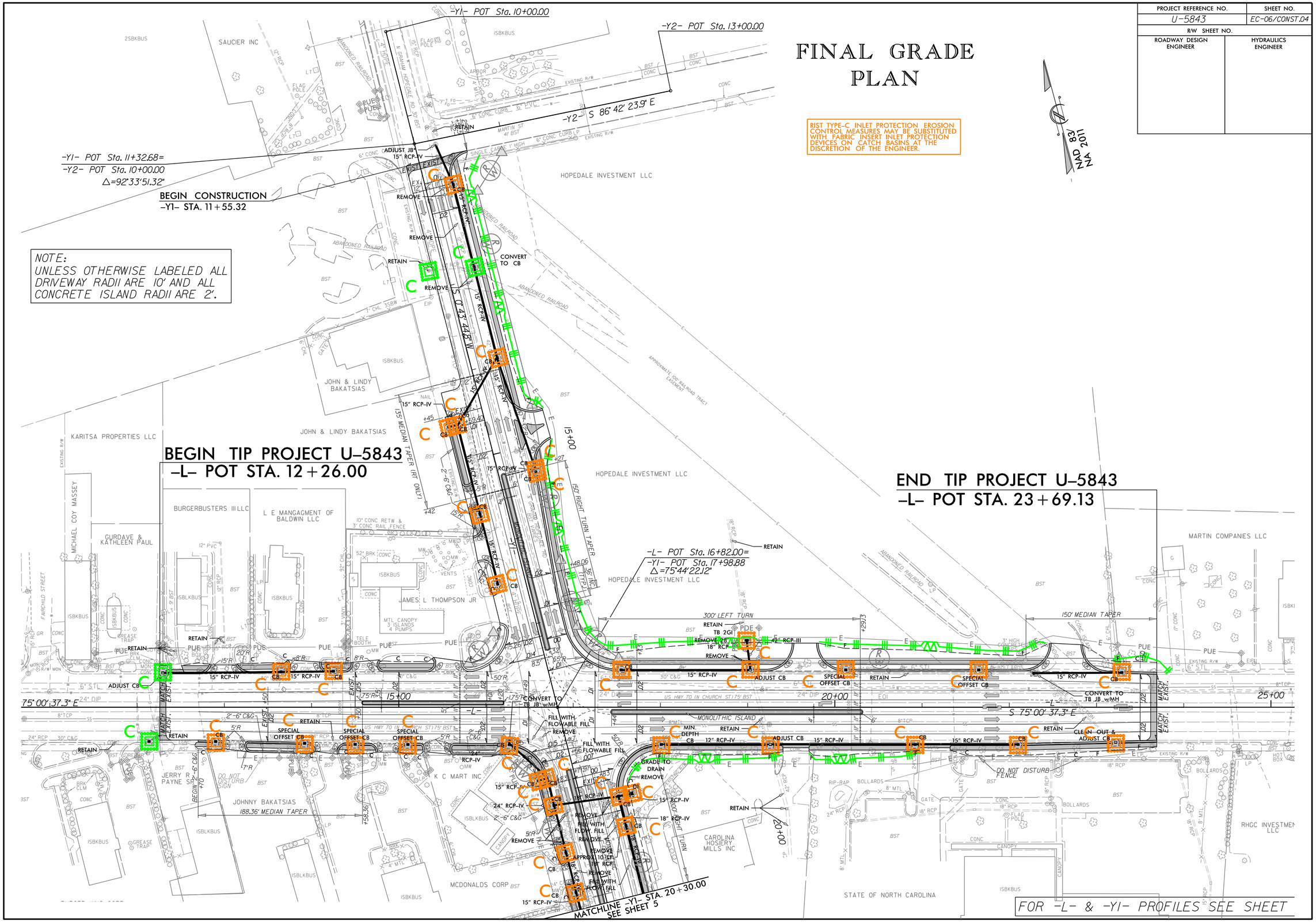
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 05

PROJECT REFERENCE NO.	SHEET NO.
U-5843	EC-06/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FINAL GRADE PLAN

RIST TYPE-C INLET PROTECTION EROSION CONTROL MEASURES MAY BE SUBSTITUTED WITH FABRIC INSERT INLET PROTECTION DEVICES ON CATCH BASINS AT THE DISCRETION OF THE ENGINEER.

NAD 1983/2011



PROJECT REFERENCE NO.	SHEET NO.
U-5843	EC-07/CONST.05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FINAL GRADE PLAN

RIST TYPE-C INLET PROTECTION EROSION CONTROL MEASURES MAY BE SUBSTITUTED WITH FABRIC INSERT INLET PROTECTION DEVICES ON CATCH BASINS AT THE DISCRETION OF THE ENGINEER.

DocuSign Envelope ID: 7B5D785A-85A2-45C4-81DF-6A984B81CFFF

T.I.P.: U-5843

CONTRACT: DG00473

PROJECT REFERENCE NO.	SHEET NO.
U-5843	SIGN-1

APPROVED: DocuSigned by: Joseph L. Lewis 80D1EA08823641E...

DATE: 10/10/2018

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 027696 ENGINEER JOSEPH L. LEWIS

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
ALAMANCE COUNTY

LOCATION: US 70 (CHURCH STREET) AT SR 1716 (GRAHAM-HOPEDALE ROAD) IN BURLINGTON. INTERSECTION IMPROVEMENTS.

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
901.20	TYPE 'B' SIGNS
901.80	SIGN MOUNTING DETAILS - FOR TYPE A AND TYPE B SIGNS
903.10	GROUND MOUNTED SIGN SUPPORTS
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS

PROJECT NOTES

1. DISPOSAL OF SIGN SYSTEM, U CHANNEL
2. SIGN ERECTION, RELOCATE SIGN TYPE D, E, & F
3. DISPOSAL OF SUPPORT, U-CHANNEL
4. DISPOSAL OF SIGN SYSTEM, STEEL BEAM

GENERAL NOTES

. SIGNS FURNISHED BY STATE

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

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

. ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE RETAINED 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.

. ALL TYPE 'D' SIGNS SHALL BE MOUNTED ON TWO U-CHANNEL POSTS UNLESS OTHERWISE INDICATED ON THE PLANS.

SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	234	L.F.
4102000000	904	SIGN ERECTION, TYPE D, E, & F	12	EA.
4116100000	904	SIGN ERECTION, RELOCATE SIGN TYPE D, E, & F	4	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	10	EA.
4192000000	907	DISPOSAL OF SUPPORT, U-CHANNEL	15	EA.
4110000000	904	SIGN ERECTION, TYPE A (GROUND MOUNTED)	1	EA.
4152000000	907	DISPOSAL OF SIGN SYSTEM, STEEL BEAM	1	EA.
4060000000	903	SUPPORTS, BREAKAWAY STEEL BEAM	287	LB.

INDEX

SHEET NO.	DESCRIPTION
SIGN-1	TITLE SHEET
SIGN-2 - 2B	SUPPORT INFORMATION
SIGN-3	TYPE "E" & "F" SIGNS
SIGN-4	SIGN DESIGN
SIGN-5 - 6	SIGNING PLAN SHEETS

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

KELVIN JORDAN — SIGNING & DELINEATION REGIONAL ENGINEER

_____ SIGNING & DELINEATION PROJECT DESIGN ENGINEER

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

PLAN PREPARED BY: VHB Engineering NC, P.C.

Joseph L. Lewis, PE — PROJECT ENGINEER

Morgan North, EI — PROJECT DESIGN ENGINEER

vhb

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606

10/9/2018
Engseed.dgn
bcollier

PROJECT REFERENCE NO.	SHEET NO.
U-5843	SIGN-2

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 027696 ENGINEER JOSEPH L. LEWIS

Joseph L. Lewis 2018.05.18 15:08:13 -04'00'

Version: 3.1 Posted: 6/2/2017

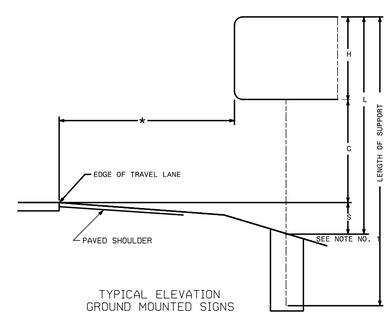
SIGN					ROADWAY	NUMBER	BEAM	SUPPORT	OMNI	ATTACHMENT	MOUNTING	HORIZONTAL	SUPPORT	LENGTH (ft)			LEFT SUPPORT (ft)			CENTER SUPPORT (ft)			RIGHT SUPPORT (ft)			SUPPORT WEIGHTS		FOOTINGS				FIELD
		SIZE (in.)				OF		TYPE				CLEARANCE*		SNS HT	MTG HT	EMBED-										B/A	SIMPLE	DIAMETER	DEPTH	REINFORCED	PLAIN	VERIFIED
NUMBER	TYPE	w	x	h	STATION	SUPPORTS	SECTION	BA or S	COUPLER	METHOD	METHOD	(ft.)	SPACING	"H"	"C"	MENT	S	L	LENGTH	S	L	LENGTH	S	L	LENGTH	(lbs.)	(lbs.)	(ft.)	(ft.)	(c.y.)	(c.y.)	SEE NOTE 2 (mm/dd/yy)
101	A	138	x	60	_____	2	S4x7.7	BA	N/A	N/A	N/A	0.00	6.74	5.00	7.00	3.0	1.00	13.00	16.00	0.00	0.00	0.00	1.00	13.00	16.00	286.40	0	1.0	3.5	0.00	0.20	_____
																										TOTAL	TOTAL			TOTAL	TOTAL	
																										286.40	0.00			0.00	0.20	
																									USE:	287.00	0.00			0.00	1.00	

NOTES

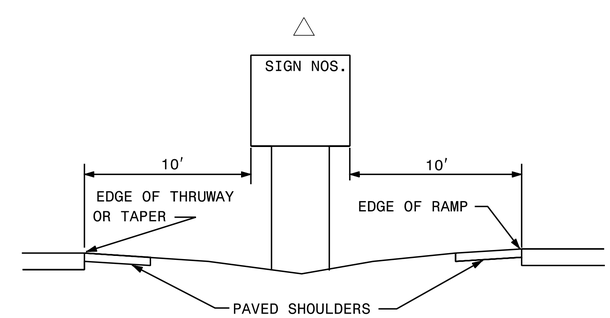
1. DIMENSION "S" REPRESENTS AN INCREASE (+), OR A DECREASE (-) IN POLE LENGTH, RELATIVE TO THE ELEVATION OF THE EDGE OF PAVEMENT.

2. FIELD VERIFICATIONS SHALL BE REQUIRED FOR ALL SUPPORTS, SEE (*) ARTICLE 903-3. FABRICATORS SHALL BE AISC CERTIFIED IN CATEGORY 1, SEE (*) ARTICLE 1072-1. (*) = N.C.D.O.T. STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES

3. PLAN LOCATIONS FOR EXISTING UTILITIES ARE BASED ON THE BEST AVAILABLE INFORMATION AND, THEREFORE MAY NOT BE PRECISELY ACCURATE. THEREFORE, IT IS INCUMBENT UPON THE CONTRACTOR TO DETERMINE THE EXACT LOCATION OF UTILITIES BEFORE BEGINNING WORK IN A LOCATION.



TYPICAL ELEVATION
GROUND MOUNTED SIGNS



TYPE "A" AND TYPE "B" GROUND MOUNTED SIGNS

5/4/2018
R:\Roadway\Proj\5843_sign01.dgn
mmcintyre

PROJECT REFERENCE NO.	SHEET NO.
U-5843	SIGN-2A

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 027696 ENGINEER JOSEPH LEWIS

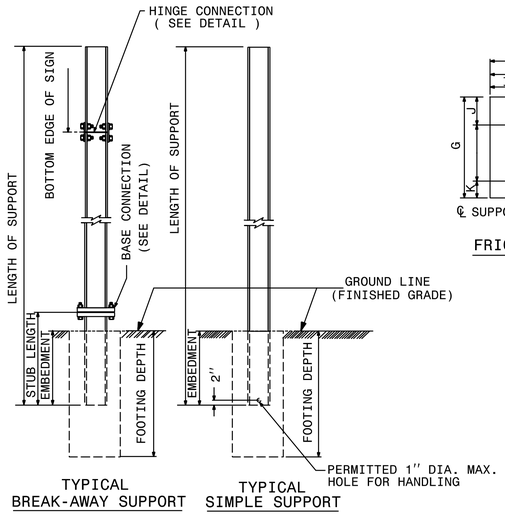
Joseph L Lewis 2018.05.18 15:10:06 -04'00'

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

1-12

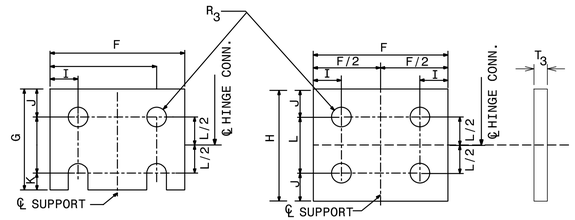
ENGLISH STANDARD DRAWING FOR

GROUND MOUNTED SIGN SUPPORTS



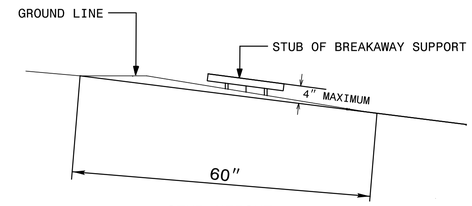
TYPICAL BREAK-AWAY SUPPORT

TYPICAL SIMPLE SUPPORT

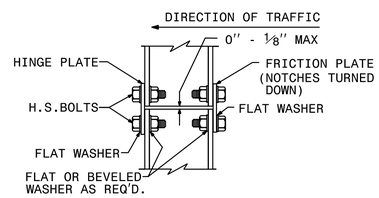


FRICTION ℙ DETAIL

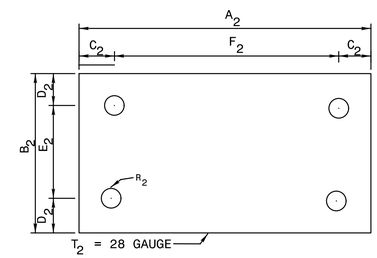
HINGE ℙ DETAIL



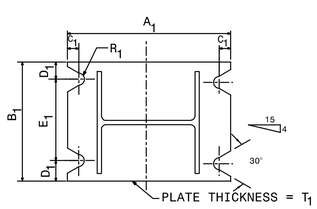
STUB HEIGHT REQUIREMENTS



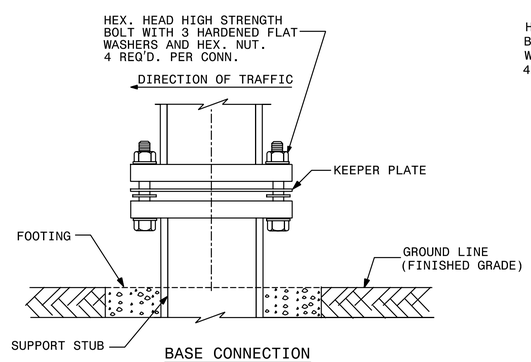
HINGE CONNECTION



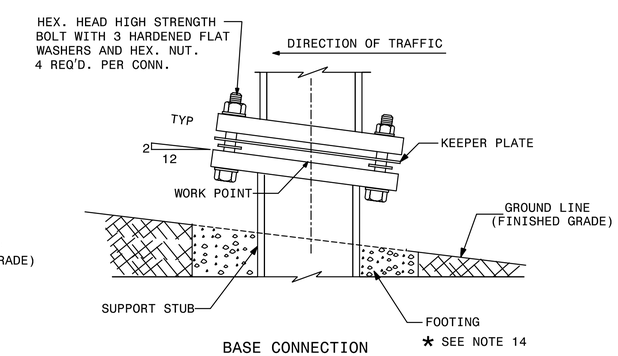
KEEPER PLATE



SLIP BASE PLATE



BASE CONNECTION



BASE CONNECTION

SEE SHEET 2 OF 3 FOR BASE CONNECTION DATA HINGE CONNECTION DATA & FOUNDATION DATA. SEE SHEET 3 OF 3 FOR GENERAL NOTES.

SHEET 1 OF 3

903D10

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

1-12

ENGLISH STANDARD DRAWING FOR

GROUND MOUNTED SIGN SUPPORTS

SHEET 1 OF 3

903D10

5/4/2018
ln:\proj\sign
mmarsh

REVISED SIGNING ROADWAY STANDARD DRAWING

PROJECT REFERENCE NO.	SHEET NO.
U-5843	SIGN-2B

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 027696 ENGINEER JOSEPH L. LEWIS

Joseph L Lewis 2018.05.18 15:10:53 -04'00'

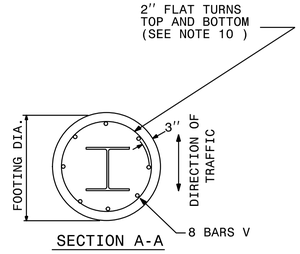
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH DETAIL DRAWING FOR

GROUND MOUNTED SIGN SUPPORTS

	SLIP BASE PLATE DATA								KEEPER PLATE DATA							HINGE CONNECTION DATA										BREAK AWAY SUPPORT WEIGHT CONSTANT LBS.
BEAM SHAPE	BOLT SIZE	A_1	B_1	C_1	D_1	E_1	T_1	R_1	A_2	B_2	C_2	D_2	E_2	R_2	T_2	BOLT SIZE	F	G	H	I	J	K	L	R_3	T_3	
S3X5.7	1/2"DIA.X 3 1/4"	7"	4"	1"	3/4"	2 1/2"	1"	9/32"	7"	4"	1"	3/4"	2 1/2"	9/32"	28 GAUGE	1/2"DIA.X1 3/4"	2 1/4"	3 1/2"	4"	1/2"	1"	1/2"	2"	9/32"	3/8"	18
S4X7.7	1/2"DIA.X 3 1/4"	8"	4"	1"	3/4"	2 1/2"	1"	9/32"	8"	4"	1"	3/4"	2 1/2"	9/32"	28 GAUGE	1/2"DIA.X1 3/4"	2 5/8"	3 1/2"	4"	1/2"	1"	1/2"	2"	9/32"	3/8"	20
W6X9	1/2"DIA.X 3 1/4	10"	5"	1"	3/4"	3 1/2"	1"	9/32"	10"	5"	1"	3/4"	3 1/2"	9/32"	28 GAUGE	1/2"DIA.X1 3/4"	4"	3 1/2"	4"	3/4"	1"	1/2"	2"	9/32"	3/8"	32
W6X12	5/8"DIA.X 4"	11"	5"	1 1/4"	7/8"	3 1/4"	1 1/4"	11/32"	11"	5"	1 1/4"	7/8"	3 1/4"	11/32"	28 GAUGE	5/8"DIA.X 2"	4"	4"	4 1/2"	3/4"	1 1/8"	5/8"	2 1/4"	11/32"	3/8"	39
W6X16	5/8"DIA.X 4 1/2"	12"	6"	1 1/4"	7/8"	4 1/4"	1 1/2"	11/32"	12"	6"	1 1/4"	7/8"	4 1/4"	11/32"	28 GAUGE	5/8"DIA.X2 1/4"	4"	4"	4 1/2"	3/4"	1 1/8"	5/8"	2 1/4"	11/32"	1/2"	47
W8X18	5/8"DIA.X 4 1/2"	13 1/2"	6 1/2"	1 1/4"	7/8"	4 3/4"	1 1/2"	11/32"	13 1/2"	6 1/2"	1 1/4"	7/8"	4 3/4"	11/32"	28 GAUGE	5/8"DIA.X2 1/4"	5 1/4"	4"	4 1/2"	1"	1 1/8"	5/8"	2 1/4"	11/32"	1/2"	70
W8X21	3/4"DIA.X 4 1/2"	14"	7"	1 1/2"	1"	5"	1 1/2"	13/32"	14"	7"	1 1/2"	1"	5"	13/32"	28 GAUGE	3/4"DIA.X2 1/2"	5 1/4"	6"	7"	1"	1 3/4"	3/4"	3 1/2"	13/32"	1/2"	73
W10X22	3/4"DIA.X 4 1/2"	16"	8"	1 1/2"	1"	6"	1 1/2"	13/32"	16"	8"	1 1/2"	1"	6"	13/32"	28 GAUGE	3/4"DIA.X2 1/2"	5 3/4"	6"	7"	1"	1 3/4"	3/4"	3 1/2"	13/32"	1/2"	119
W10X26	3/4"DIA.X 5 1/2"	16 1/2"	8"	1 1/2"	1"	6"	1 3/4"	13/32"	16 1/2"	8"	1 1/2"	1"	6"	13/32"	28 GAUGE	3/4"DIA.X2 3/4"	5 3/4"	6"	7"	1"	1 3/4"	3/4"	3 1/2"	13/32"	5/8"	140
W12X26	3/4"DIA.X 5 1/2"	18 1/2"	9"	1 1/2"	1"	7"	1 3/4"	13/32"	18 1/2"	9"	1 1/2"	1"	7"	13/32"	28 GAUGE	3/4"DIA.X2 3/4"	6 1/2"	6"	7"	1"	1 3/4"	3/4"	3 1/2"	13/32"	5/8"	176
W14X30	1"DIA.X 6"	22"	9"	2"	1 1/2"	6"	2"	17/32"	22"	9"	2"	1 1/2"	6"	17/32"	28 GAUGE	1"DIA.X 3"	6 3/4"	7"	8"	1 1/4"	2"	1"	4"	17/32"	5/8"	205
W16X31	1"DIA.X 6"	24"	9"	2"	1 1/2"	6"	2"	17/32"	24"	9"	2"	1 1/2"	6"	17/32"	28 GAUGE	1"DIA.X 3"	5 1/2"	7"	8"	1 1/4"	2"	1"	4"	17/32"	3/4"	223
W18X35	1"DIA.X 6"	25"	9"	2"	1 1/2"	6"	2"	17/32"	25"	9"	2"	1 1/2"	6"	17/32"	28 GAUGE	1"DIA.X 3"	6"	7"	8"	1 1/4"	2"	1"	4"	17/32"	3/4"	243
W18X40	1"DIA.X 6 1/2"	26"	9"	2"	1 1/2"	6"	2 1/4"	17/32"	26"	9"	2"	1 1/2"	6"	17/32"	28 GAUGE	1"DIA.X3 1/2"	6"	7"	8"	1 1/4"	2"	1"	4"	17/32"	7/8"	278
W21X44	1"DIA.X 7"	29"	9"	2"	1 1/2"	6"	2 1/2"	17/32"	29"	9"	2"	1 1/2"	6"	17/32"	28 GAUGE	1"DIA.X3 1/2"	6 1/2"	7"	8"	1 1/4"	2"	1"	4"	17/32"	7/8"	310



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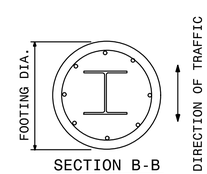

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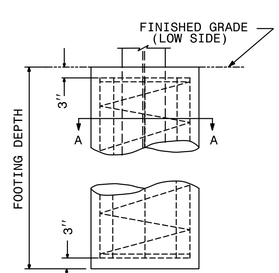
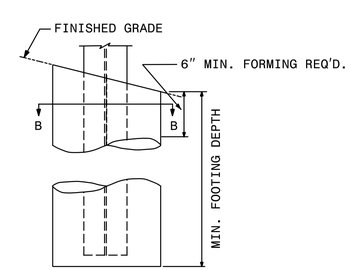


FOOTING DETAIL



FOOTING DETAIL

FOUNDATION DATA *		
FOOTING DIAMETER	REINFORCEMENT	SPIRAL BAR
1'-6"	8 # 6 BARS	#3 BAR, 6" PITCH
2'	8 # 7 BARS	#3 BAR, 6" PITCH
2'-6"	8 # 9 BARS	#3 BAR, 6" PITCH
3'	8 # 11 BARS	#3 BAR, 6" PITCH
3'-6"	8 # 12 BARS	#3 BAR, 6" PITCH
4'	8 # 14 BARS	#3 BAR, 6" PITCH

* FOUNDATION DIMENSIONS ARE SHOWN IN PLANS

SHEET 2 OF 3

903D10

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

1-12

ENGLISH DETAIL DRAWING FOR

GROUND MOUNTED SIGN SUPPORTS

SHEET 2 OF 3

903D10

REVISED SIGNING
ROADWAY STANDARD DRAWING

5/4/2018
ENGLISH_903D10.dgn
mpatch

PROJECT REFERENCE NO.	SHEET NO.
U-5843	SIGN-3

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 027696 ENGINEER JOSEPH L. LEWIS

Joseph L. Lewis 2018.05.18 15:11:37 -04'00'

(401) QUANTITY REQ'D 5

24" X 30"
R2-1

ONE "U" POST PER SIGN

(402) QUANTITY REQ'D 2

18" X 24"
R8-3

ONE "U" POST PER SIGN

(403) QUANTITY REQ'D 1

18" X 24"
R7-18-4

MOUNT BELOW SIGN R8-3
IN SPECIFIED INSTALLATIONS

(404) QUANTITY REQ'D 1

18" X 24"
R7-18-4

ONE "U" POST PER SIGN

(501) QUANTITY REQ'D 1

1 - 24" X 12"
M3-2

1 - 24" X 24"
M1-4

(502) QUANTITY REQ'D 1

1 - 24" X 12"
M3-4

1 - 24" X 24"
M1-4

TYPE "E" & "F" SIGNS

5/14/2018
mpeck
mpeck

PROJECT REFERENCE NO.	SHEET NO.
U-5843	SIGN-4

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 027696 ENGINEER JOSEPH L. LEWIS

Joseph L Lewis 2018.05.18 15:12:17 -04'00'

SIGN NUMBER: 101
TYPE: B
QUANTITY: 1

SIGN WIDTH: 11′-6″
HEIGHT: 5′-0″
TOTAL AREA: 57.5 Sq.Ft.

BORDER TYPE: FLUSH
RECESS: 0″
WIDTH: 1.46″
RADII: 8.00″

NO. Z BARS: 2
LENGTH: 107.0

BACKG COLOR: Green
COPY COLOR: White

SYMBOL	X	Y	WID	HT
AR_Type D	94.6	20.8	8.3	12.5

MAT'L: 0.125″ (3.2 mm) ALUMINUM

DESIGN BY: M. NORTH
PROJECT ID: U-5843

CHECKED BY: J. LEWIS
LOCATION: BURLINGTON, NC

May 04, 2018
DIV: 7

USE NOTES:

1. Legend and border(except those that are colored black) shall be direct applied Grade B sheeting.
2. Background shall be Grade C reflective sheeting.
3. Shields; A, B, and C type arrows shall be on 0.032″ (0.8mm) aluminum and demountable.

Panel Style: guide_exp_recreational.ssi
M.U.T.C.D.: 2009 Edition

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner

																												Series/Size Text Length
	F	A	I	R	C	H	I	L	D		P	A	R	K														EM 2000
	7.9	13.6	21.5	24.7	31.2	38.1	45.4	48.6	54.6	60	66.6	72.6	80.5	87.3														84.9
	B	U	R	L	I	N	G	T	O	N																		EM 2000
	7.9	14.8	22	28.8	34.8	38	45	51.4	57.2	64.4																		61.9
	A	T	H	L	E	T	I	C		S	T	A	D	I	U	M												EM 2000
	7.9	15.2	21.3	28.6	34.6	40.2	46.4	49.3	54.7	61.4	67.8	73.2	81.2	88.2	91.4	98.6												96.9

FILENAME: guidsign_sgn_PSH03

NORTH CAROLINA D.O.T. SIGN DETAIL

5/14/2018
guidsign_sgn_PSH03.dgn
mnorth

SIGN DESIGNS

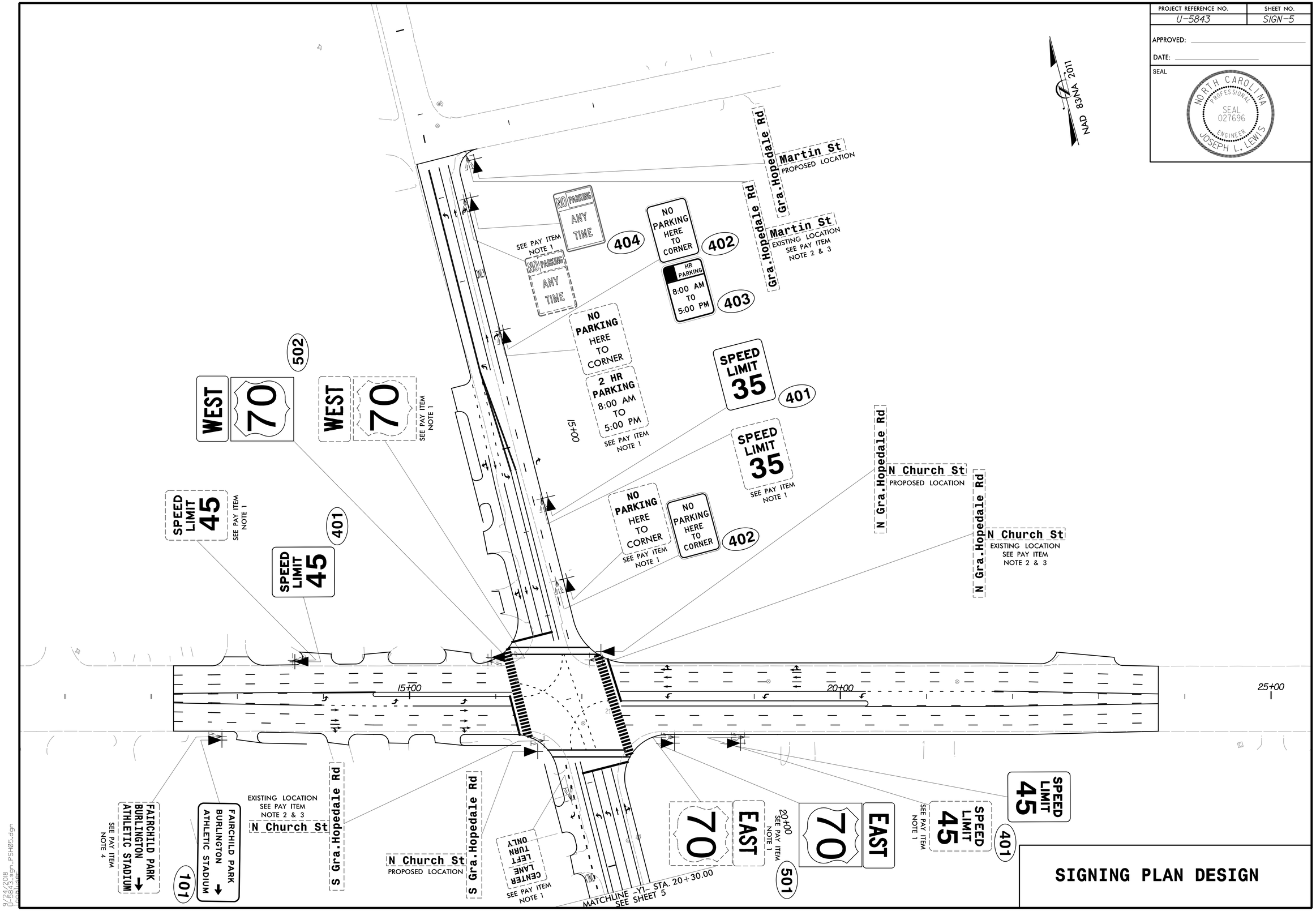
PROJECT REFERENCE NO.	SHEET NO.
U-5843	SIGN-5

APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 027696 ENGINEER JOSEPH L. LEWIS



SIGNING PLAN DESIGN

9/24/2018
U-5843_sgn_PSH05.dgn
jrcollins

PROJECT REFERENCE NO.	SHEET NO.
U-5843	SIGN-6

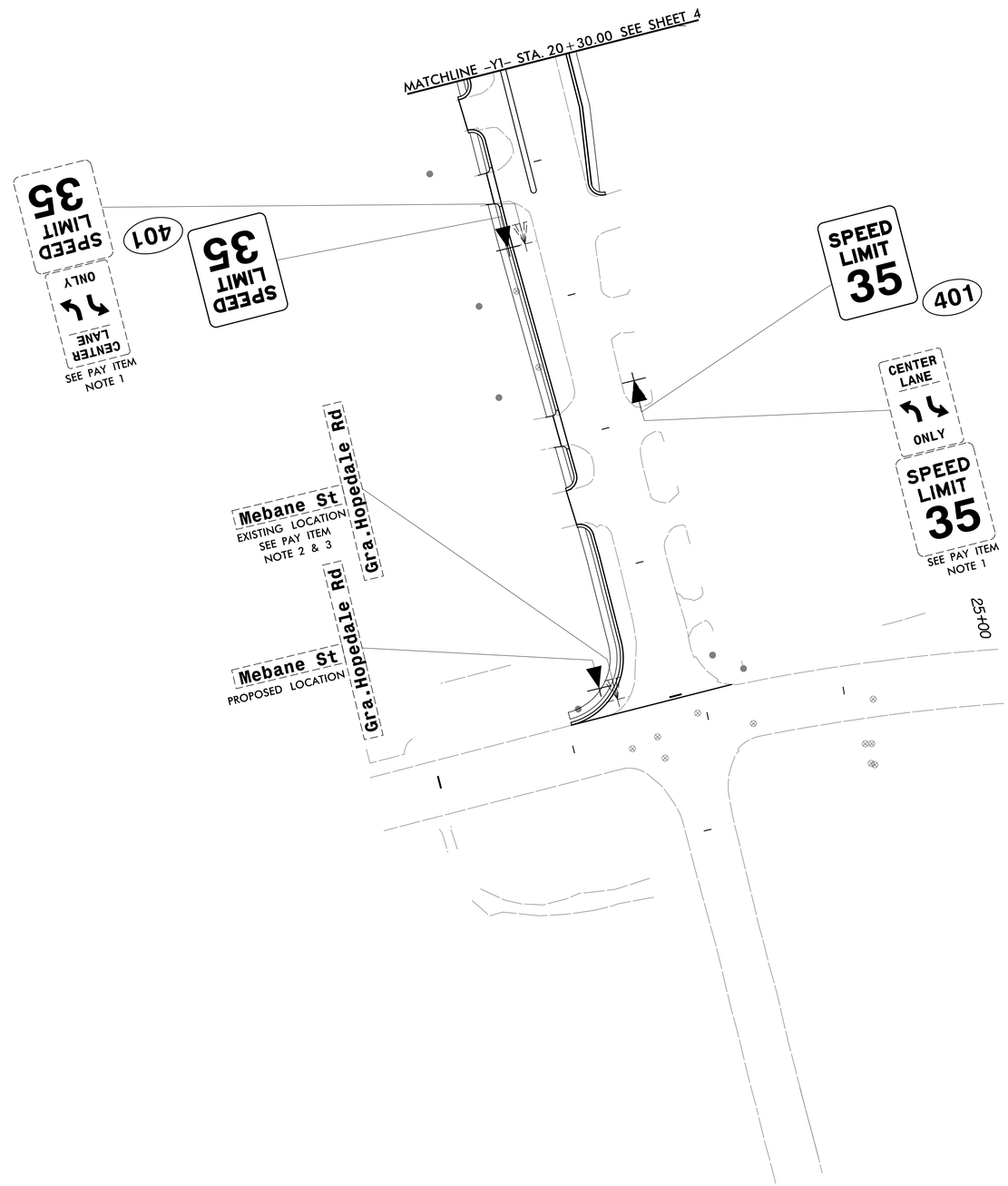
APPROVED: _____

DATE: _____

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 027696 ENGINEER JOSEPH L. LEWIS

NAD 83/NA 2011



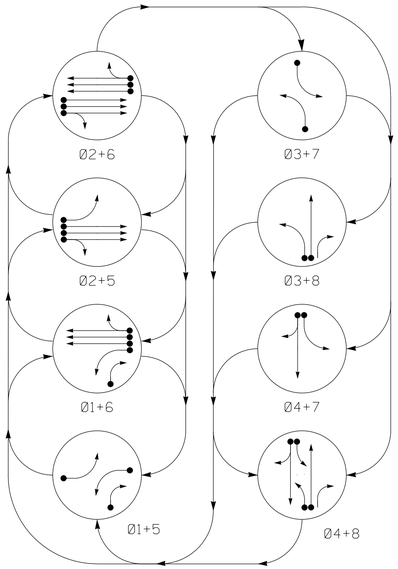
SIGNING PLAN DESIGN

9/24/2018
U-5843_sgn_PSH06.dgn
lcpallister

PROJECT REFERENCE NO.	SHEET NO.
U-5843	Sig.1.0

8 Phase Fully Actuated (Burlington-Graham Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

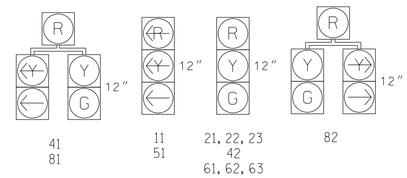
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
11	←	←	←R	←R	←R	←R	←R	←R	←R
21,22,23	R	R	G	G	R	R	R	R	Y
41	R	R	R	R	←R	R	←G	G	R
42	R	R	R	R	R	R	G	G	R
51	←	←R	←	←R	←R	←R	←R	←R	←R
61,62,63	R	G	R	G	R	R	R	R	Y
81	R	R	R	R	←R	←G	R	G	←R
82	R→R		R	R	R	G	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

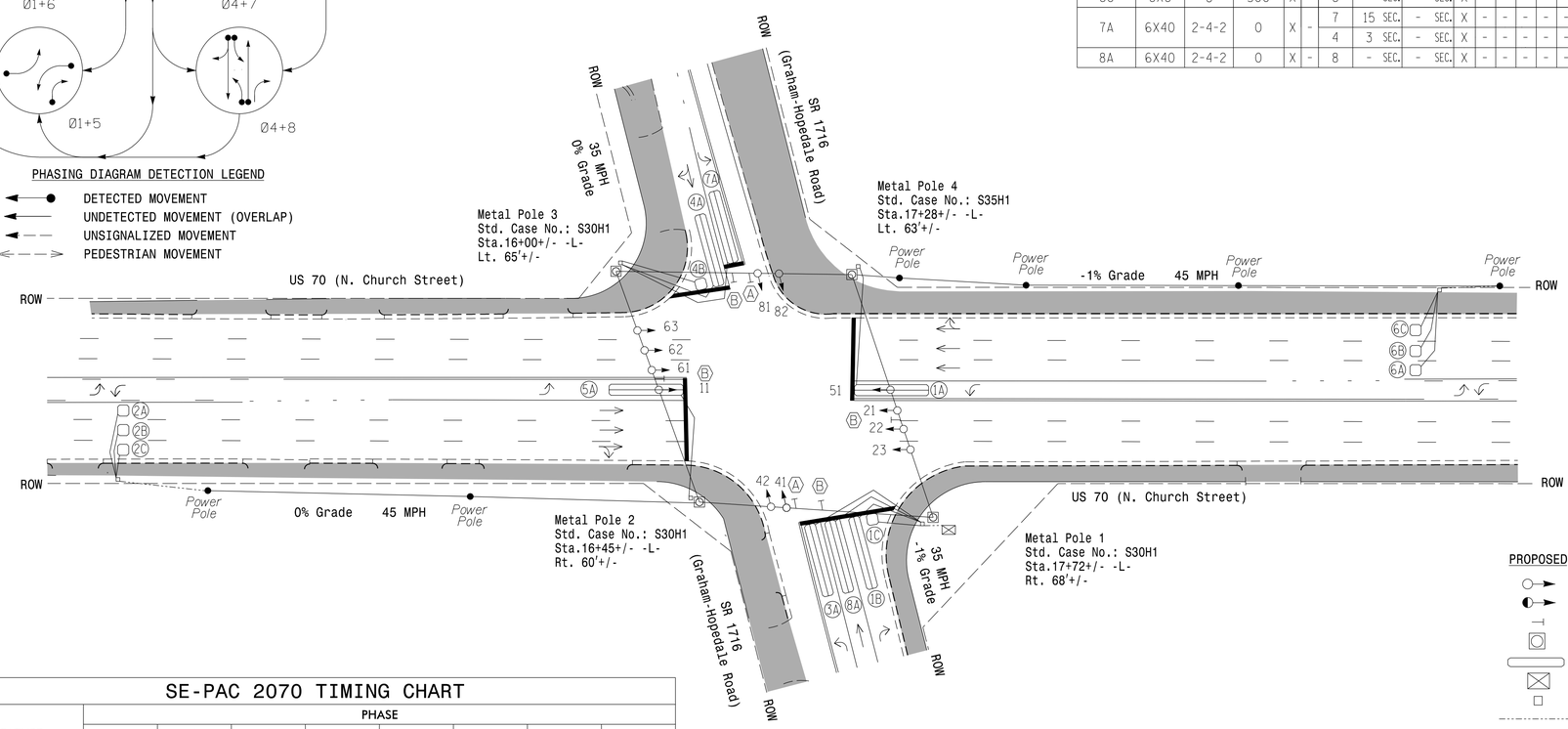


SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

INDUCTIVE LOOPS						DETECTOR PROGRAMMING															
							TIMING		OPERATION MODE									STATUS	
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	ASSIGNED PHASE	DELAY	EXTEND (STRETCH)	0 VEHICLE	1 PEDESTRIAN	2 1 CALL	3 STOP A	4 STOP B	5 PROTFER FIRST	6 PROTFER THROUGH	7 AND	SWITCH	SYSTEM LOOPS	NEW	EXISTING
1A	6X40	2-4-2	0	X	-	1	3 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
1B	6X40	2-4-2	0	X	-	1	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
1C	6X6	3	0	X	-	1	25 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
2A	6X6	6	300	X	-	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
2B	6X6	6	300	X	-	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
2C	6X6	6	300	X	-	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
3A	6X40	2-4-2	0	X	-	3	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
						8	3 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
4A	6X40	2-4-2	0	X	-	4	10 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
4B	6X6	5	0	X	-	4	25 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
5A	6X40	2-4-2	0	X	-	5	3 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
6A	6X6	6	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
6B	6X6	6	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
6C	6X6	6	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
7A	6X40	2-4-2	0	X	-	7	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
						4	3 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
8A	6X40	2-4-2	0	X	-	8	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-

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. Omit phase 3 during phase 4 on.
4. Omit phase 7 during phase 8 on.
5. Phase 1 or phase 5 may be lagged.
6. Set all detector units to presence mode.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. Pavement markings are existing.
9. Install condulets on risers for lead-in cable.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Metal Strain Pole	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Street Name Sign (D3-1)	Ⓑ
	Construction Zone	N/A

SE-PAC 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Passage Gap *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Maximum Green *	40	50	20	25	40	50	20	25
Yellow Change	3.0	4.5	3.0	3.8	3.0	4.6	3.0	3.9
Red Clear	2.1	1.5	3.2	2.5	2.3	1.3	3.3	2.4
Walk *	-	-	-	-	-	-	-	-
Pedestrian Clear	-	-	-	-	-	-	-	-
Added Initial *	-	2.5	-	-	-	2.5	-	-
Maximum 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	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK	NON-LOCK	NON-LOCK
Dual Entry	-	-	-	ON	-	-	-	ON
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.

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC Dept of Transportation
Division of Highways

Final Drawing Date: 5/4/2018

DocuSigned by:
Ryan W. Hough
430320FAA2654C3...

ITS & Signals Unit

Signal Upgrade Temporary Design

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

US 70 (N. Church Street) at SR 1716 (Graham-Hopedale Road)

Division 7 Alamance County Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.03 14:45:42 -04'00'

SIGNATURE DATE

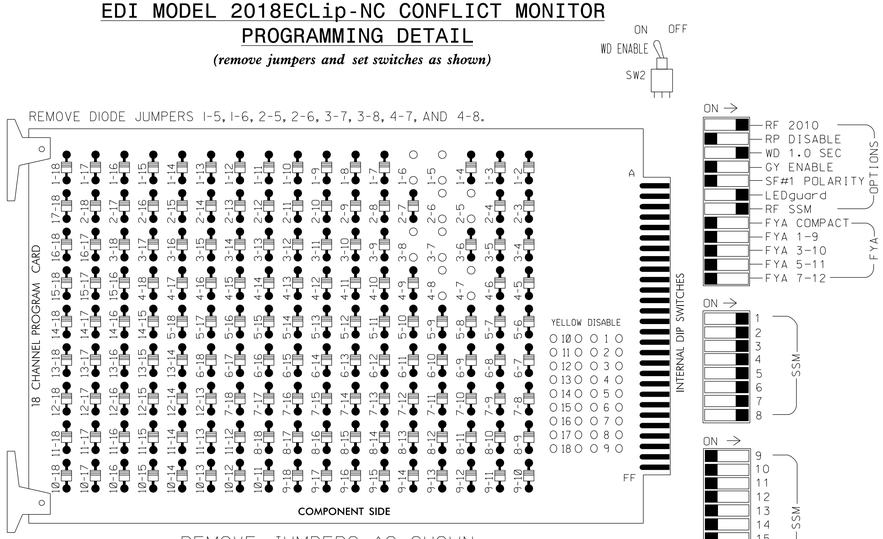
SIG. INVENTORY NO. 07-0032T

338412.10

PROJECT REFERENCE NO.	SHEET NO.
U-5843	Sig.1.1

EDI MODEL 2018ECLip-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. 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 controller to start up in phases 2 and 6 green.
3. Enable Simultaneous Gap-Out feature, on controller unit, for all phases.
4. Program phases 4 and 8, on controller unit, for dual entry.
5. Program phases 2 and 6, on controller unit, for volume density.
6. The cabinet and controller are part of the Burlington-Graham Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....SE-PAC2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S10,S11
PHASES USED.....1,2,3,4,5,6,7,8.
OVERLAP "A".....NOT USED
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

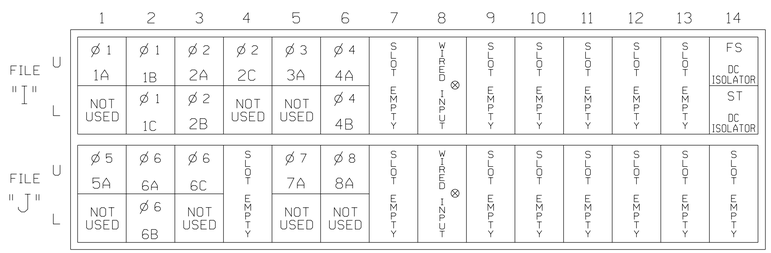
LOAD SWITCH NO.	S1		S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1		2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1		2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	82	21,22 23	NU	81	41,42	NU	51	61,62 63	NU	41	81,82	NU	NU	NU	NU	NU	NU	NU
RED			128		*	101			134		*	107							
YELLOW			129			102			135			108							
GREEN			130			103			136			109							
RED ARROW	125							131											
YELLOW ARROW	126	126			117			132			123								
GREEN ARROW	127	127			118			133			124								

NU = Not Used

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

INPUT FILE POSITION LAYOUT

(front view)



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.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
1A	TB2-1,2	I1U	56	1	1	3	
1B	TB2-5,6	I2U	39	3	1	15	
1C	TB2-7,8	I2L	43	4	1	25	
2A	TB2-9,10	I3U	63	5	2		
2B	TB2-11,12	I3L	76	6	2		
2C	TB4-1,2	I4U	47	7	2		
3A[1]	TB4-5,6	I5U	58	9	3	15	
	-	J8U	50	35	8	3	
4A	TB4-9,10	I6U	41	11	4	10	
4B	TB4-11,12	I6L	45	12	4	25	
5A	TB3-1,2	J1U	55	19	5	3	
6A	TB3-5,6	J2U	40	21	6		
6B	TB3-7,8	J2L	44	22	6		
6C	TB3-9,10	J3U	64	23	6		
7A[2]	TB5-5,6	J5U	57	29	7	15	
	-	I8U	49	15	4	3	
8A	TB5-9,10	J6U	42	31	8		

[1] Add jumper from I5-W to J8-W, on rear of input file.

[2] Add jumper from J5-W to I8-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

BACK-UP PROTECTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu, press '3' (Phase Data)

```
EPAC PHASE DATA          PRESS # DESIRED

 1-VEHICLE TIMES         5-V & P RECALLS
 2-DENSITY TIMES         6-N.LOCK & MISC
 3-PEDEST. TIMES         7-SPEC. SEQUENCE
 4-INITIALIZE &          8-SPEC. DETECTOR
   N.A. RESPONSE         9-PHASE COPY

                         F-PRIOR MENU
```

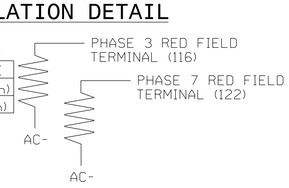
```
PHASE......1...2...3...4...5...6...7...8
  OMIT     0   0   4   0   0   0   8   0
  -YEL     0   0   0   0   0   0   0   0
  OCAL     0   0   0   0   0   0   0   0
  OMIT:## PHS ON OMITS THIS PHASE
   -YEL:## PHS YEL OMITS THIS PHS YEL
   OCAL: WHEN OMIT, DETS CALL## PHS

A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU
```

Special Sequence programming complete.

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

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



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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-0032T
DESIGNED: May 2018
SEALED: 05-03-18
REVISED: N/A

NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/4/2018
Ryan W. Hough
430320FAA26543...
ITS & Signals Unit

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical Detail-Temporary Design

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 70 (N. Church Street)
at
SR 1716 (Graham-Hopedale Road)

Prepared for the Offices of:
Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ITS Transportation Management & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

Division 7	Alamance County	Burlington
PLAN DATE: May 2018	REVIEWED BY: J. L. Lewis	
PREPARED BY: J. Ma	REVIEWED BY: M. L. Stygles	

REVISIONS	INIT.	DATE

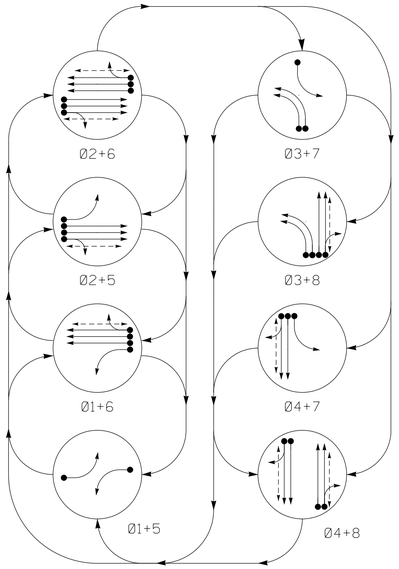
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA
Jianxin Ma 2018.05.03 14:45:03 -04'00'
SIGNATURE DATE
SIG. INVENTORY NO. 07-0032T

38412.10

PROJECT REFERENCE NO.	SHEET NO.
U-5843	Sig.2.0

8 Phase
Fully Actuated
(Burlington-Graham Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

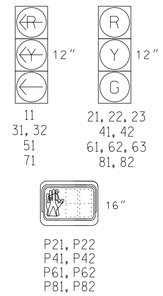
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+05	01+06	02+05	02+06	03+07	03+08	04+07	04+08	FLASH
11	←-	←-	←R	R	←R	←R	←R	←R	←R
21,22,23	R	R	G	G	R	R	R	R	Y
31,32	←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	←R
61,62,63	R	G	R	G	R	R	R	R	Y
71	←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
P61, P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81, P82	DW	DW	DW	DW	DW	W	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

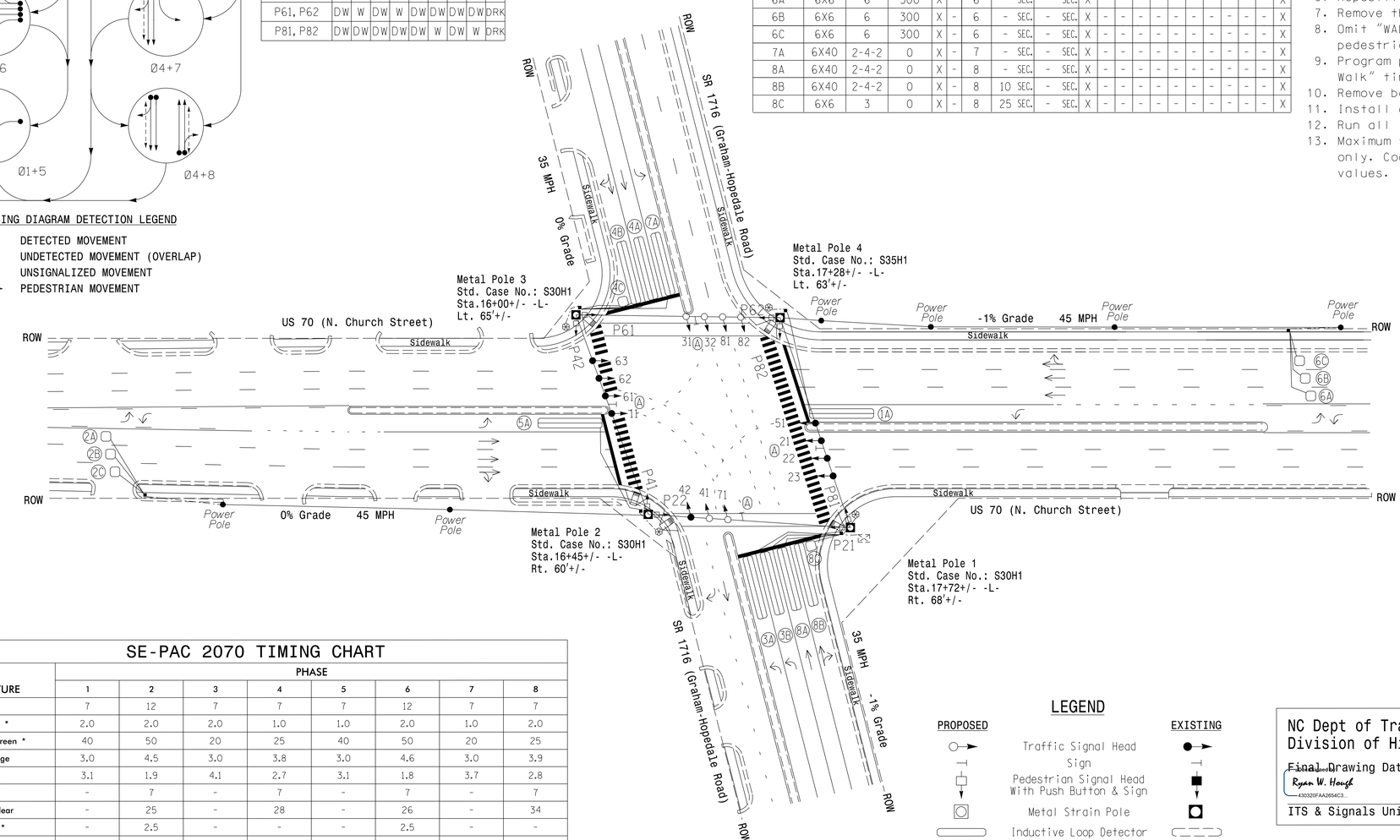


SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

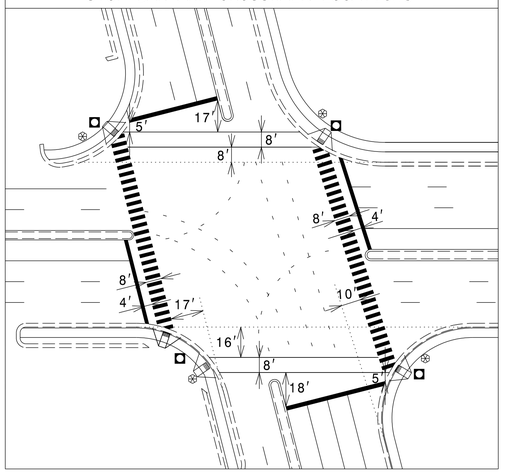
INDUCTIVE LOOPS						DETECTOR PROGRAMMING														
							TIMING		OPERATION MODE									STATUS	
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	ASSIGNED PHASE	DELAY	EXTEND (STRETCH)	0 VEHICLE	1 PEDESTRIAN	2 1 CALL	3 STOP A	4 STOP B	5 PROTPER LEFT	6 PROTPER THROUGH	7 AND	SWITCH	SYSTEM LOOPS	NEW	EXISTING
1A	6X40	2-4-2	0	X	-	1	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
2A	6X6	6	300	X	-	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
2B	6X6	6	300	X	-	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
2C	6X6	6	300	X	-	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
3A	6X40	2-4-2	0	X	-	3	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
3B	6X40	2-4-2	0	X	-	3	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
4A	6X40	2-4-2	+5	X	-	4	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
4B	6X40	2-4-2	+5	X	-	4	10 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-	
4C	6X6	5	0	X	-	4	25 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
5A	6X40	2-4-2	+5	X	-	5	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
6A	6X6	6	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
6B	6X6	6	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
6C	6X6	6	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
7A	6X40	2-4-2	0	X	-	7	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
8A	6X40	2-4-2	0	X	-	8	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
8B	6X40	2-4-2	0	X	-	8	10 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
8C	6X6	3	0	X	-	8	25 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018 and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website:
   http://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx
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. Set all detector units to presence mode.
6. Reposition all existing signal heads.
7. Remove the existing Left Arrow "ONLY" signs (R3-5L).
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. Remove back up protect for phase 4 and 8.
11. Install conduiets on risers for lead-in cable and signal pedestals.
12. Run all lead-in overhead on existing utility poles where possible.
13. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



STOP BAR AND CROSSWALK LOCATIONS



SE-PAC 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Passage Gap *	2.0	2.0	2.0	1.0	1.0	2.0	1.0	2.0
Maximum Green *	40	50	20	25	40	50	20	25
Yellow Change	3.0	4.5	3.0	3.8	3.0	4.6	3.0	3.9
Red Clear	3.1	1.9	4.1	2.7	3.1	1.8	3.7	2.8
Walk *	-	7	-	7	-	7	-	7
Pedestrian Clear	-	25	-	28	-	26	-	34
Added Initial *	-	2.5	-	-	-	2.5	-	-
Maximum 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	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK	NON-LOCK	NON-LOCK
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.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Metal Strain Pole	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
DD	Directional Drill	N/A
	Type I Pushbutton Post	
	Type II Signal Pedestal	
A	Street Name Sign (D3-1)	A
	Curb Ramp	

NC Dept of Transportation
Division of Highways

Final Drawing Date: 5/4/2018

Ryan W. Hough
430320FAA2654C3...

ITS & Signals Unit

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Signal Upgrade-Final Design

Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section

750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 40 1"=40'

US 70 (N. Church Street) at SR 1716 (Graham-Hopedale Road)

Division 7 Alamance County Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.04 08:37:15 -04'00'

SIGNATURE DATE

SIG. INVENTORY NO. 07-0032

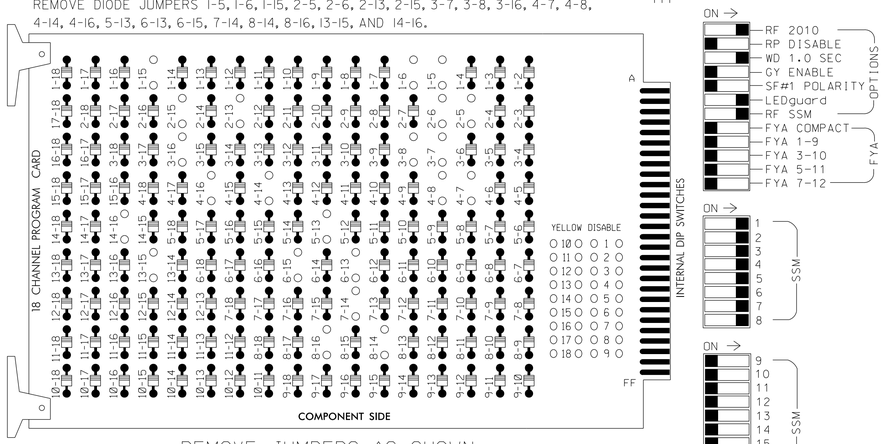
338412.10

PROJECT REFERENCE NO.	SHEET NO.
U-5843	Sig. 2.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS I-5, I-6, I-15, 2-5, 2-6, 2-13, 2-15, 3-7, 3-8, 3-16, 4-7, 4-8, 4-14, 4-16, 5-13, 6-13, 6-15, 7-14, 8-14, 8-16, 13-15, AND 14-16.



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. 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 controller to start up in phases 2 and 6 green.
3. Enable Simultaneous Gap-Out feature, on controller unit, for all phases.
4. Program phases 2 and 6, on controller unit, for volume density.
5. The cabinet and controller are part of the Burlington-Graham Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....SE-PAC2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8, S9,S10,S11,S12
PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED, 7,8,8PED
OVERLAP A.....NOT USED
OVERLAP B.....NOT USED
OVERLAP C.....NOT USED
OVERLAP D.....NOT USED

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 63	P61, P62	71	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125			116			131			122								
YELLOW ARROW	126			117			132			123								
GREEN ARROW	127			118			133			124								
✋			113			104			119			110						
🚶			115			106			121			112						

NU = 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	SLOT EMPTY	Ø 2 2A	Ø 2 2C	Ø 3 3A	Ø 4 4A	Ø 4 4C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED		Ø 2 2B	NOT USED	Ø 3 3B	Ø 4 4B	NOT USED					Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	Ø 6 6A	Ø 6 6C	SLOT EMPTY	Ø 7 7A	Ø 8 8A	Ø 8 8C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø 6 6B	NOT USED		NOT USED	Ø 8 8B	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.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
1A	TB2-1,2	I1U	56	1	1		
2A	TB2-9,10	I3U	63	5	2		
2B	TB2-11,12	I3L	76	6	2		
2C	TB4-1,2	I4U	47	7	2		
3A	TB4-5,6	I5U	58	9	3		
3B	TB4-7,8	I5L	62	10	3		
4A	TB4-9,10	I6U	41	11	4		
4B	TB4-11,12	I6L	45	12	4	10	
4C	TB6-1,2	I7U	65	13	4	25	
5A	TB3-1,2	J1U	55	19	5		
6A	TB3-5,6	J2U	40	21	6		
6B	TB3-7,8	J2L	44	22	6		
6C	TB3-9,10	J3U	64	23	6		
7A	TB5-5,6	J5U	57	29	7		
8A	TB5-9,10	J6U	42	31	8		
8B	TB5-11,12	J6L	46	32	8	10	
8C	TB7-1,2	J7U	66	33	8	25	
PED PUSH BUTTONS							
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED		
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED		
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED		
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED		

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

Remove the following jumpers, if present:
From I5-W to J8-W, on rear of input file.
From J5-W to I8-W, on rear of input file.

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.

Disable Back-up protect for phase 4 and phase 8.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-0032
DESIGNED: May 2018
SEALED: May 4th, 2018
REVISED: N/A

NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/4/2018
DocuSigned by: Ryan W. Haugh 430320FAA2654C3...
ITS & Signals Unit

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

Electrical Detail - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ITS & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 70 (N. Church Street) at SR 1716 (Graham-Hopedale Road)

Division 7 | Alamance County | Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.04 08:38:24 -04'00'
SIGNATURE DATE

SIG. INVENTORY NO. 07-0032

38412.10

PROJECT REFERENCE NO.	SHEET NO.
U-5843	Sig.3.0

4 Phase
Fully Actuated
(Burlington-Graham Signal System)

PHASING DIAGRAM

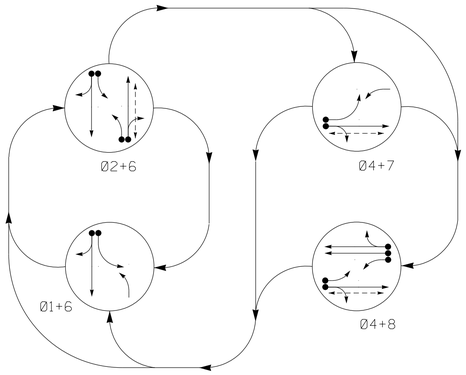


TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	Ø2+6	Ø4+7	Ø4+8	FLASH
11	←-F/Y	←-R	←-R	←-Y	
21,22	R	G	R	R	Y
23	F/Y	F/Y	←-R	←-R	←-Y
41, 42	R	R	G	G	R
61,62	G	G	R	R	Y
71	←-R	←-R	←-F/Y	←-F/Y	←-R
81,82	R	R	R	G	R
83	←-R	←-R	←-F/Y	←-F/Y	←-R
P21, P22	DW	W	DW	DW	DRK
P41, P42	DW	DW	W	W	DRK

SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

INDUCTIVE LOOPS						DETECTOR PROGRAMMING														
							TIMING		OPERATION MODE										STATUS	
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	ASSIGNED PHASE	DELAY	EXTEND (STRETCH)	0 VEHICLE	1 PEDESTRIAN	2 1 CALL	3 STOP A	4 STOP B	5 PROTPER LEFT	6 PROTPER THROUGH	7 AND	SWITCH	SYSTEM LOOPS	NEW	EXISTING
1A	EXIST	EXIST	EXIST	-	X	1	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
						6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
2A	EXIST	EXIST	EXIST	-	X	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
4A	EXIST	EXIST	EXIST	-	X	4	10 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
6A	EXIST	EXIST	EXIST	-	X	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
7A	EXIST	EXIST	EXIST	-	X	7	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
						4	3 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
8A	EXIST	EXIST	EXIST	-	X	8	3 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
8B	EXIST	EXIST	EXIST	-	X	8	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
8C	EXIST	EXIST	EXIST	-	X	8	10 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X

NOTES

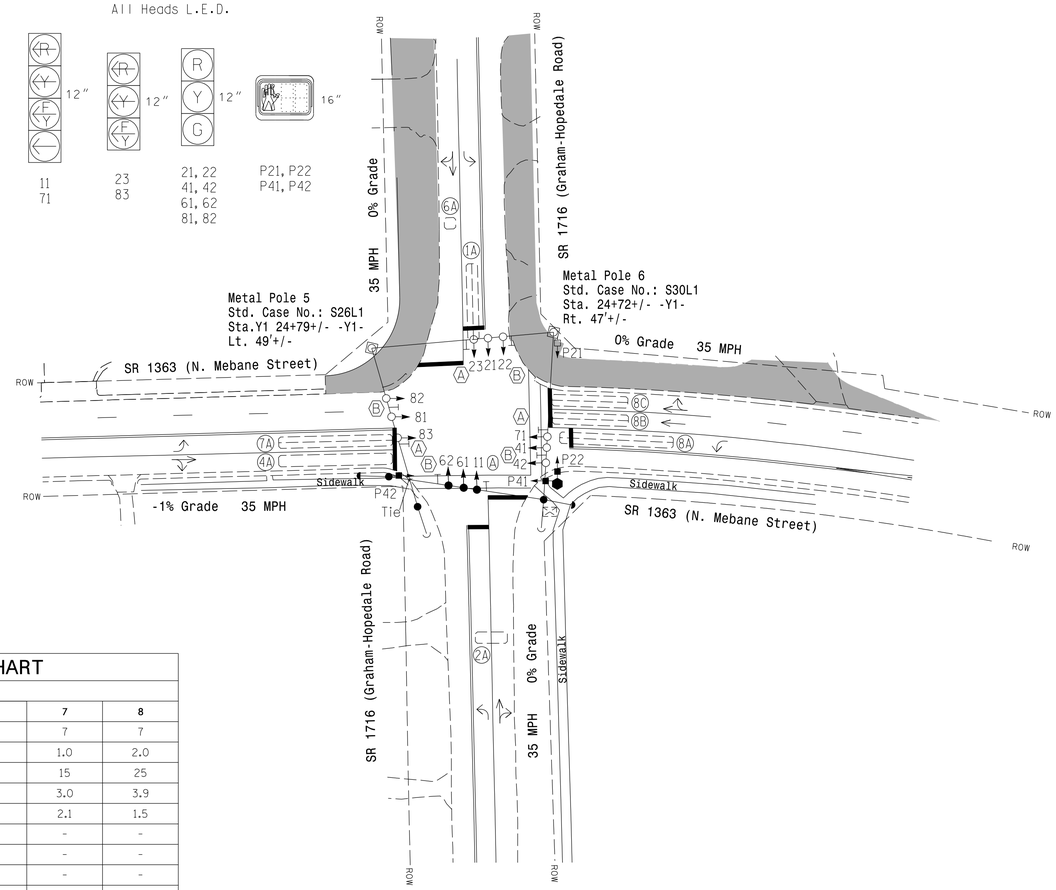
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018 and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website:
   http://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. 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.
9. Pavement markings are existing.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

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	
	Metal Strain Pole	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Construction Zone	N/A
	Type I Pushbutton Post	
	Type II Signal Pedestal	
	Left Arrow "ONLY" Sign (R3-5L)	
	Street Name Sign (D3-1)	
	Curb Ramp	

SE-PAC 2070 TIMING CHART

FEATURE	PHASE 1	2	4	6	7	8
Min Green *	7	10	7	10	7	7
Passage Gap *	2.0	3.0	1.0	3.0	1.0	2.0
Maximum Green *	15	45	25	45	15	25
Yellow Change	3.0	3.8	3.9	3.8	3.0	3.9
Red Clear	2.6	1.8	1.5	1.8	2.1	1.5
Walk *	-	7	4	-	-	-
Pedestrian Clear	-	14	17	-	-	-
Added Initial *	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL	-	-
Vehicle Call Memory	NON-LOCK	LOCK	NON-LOCK	LOCK	NON-LOCK	NON-LOCK
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/4/2018
Ryan W. Hough
430320FAA2654C3...
ITS & Signals Unit

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

Signal Upgrade-Temporary Design

Prepared for the Offices of:
Intermodal Transportation Mobility and Safety Division
Signal Management Section
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 40 1"=40'

SR 1716 (Graham-Hopedale Road)
at
SR 1363 (N. Mebane Street)

Division 7 Alamance County Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.03 14:51:27 -04'00'

SIGNATURE DATE

SIG. INVENTORY NO. 07-0149T

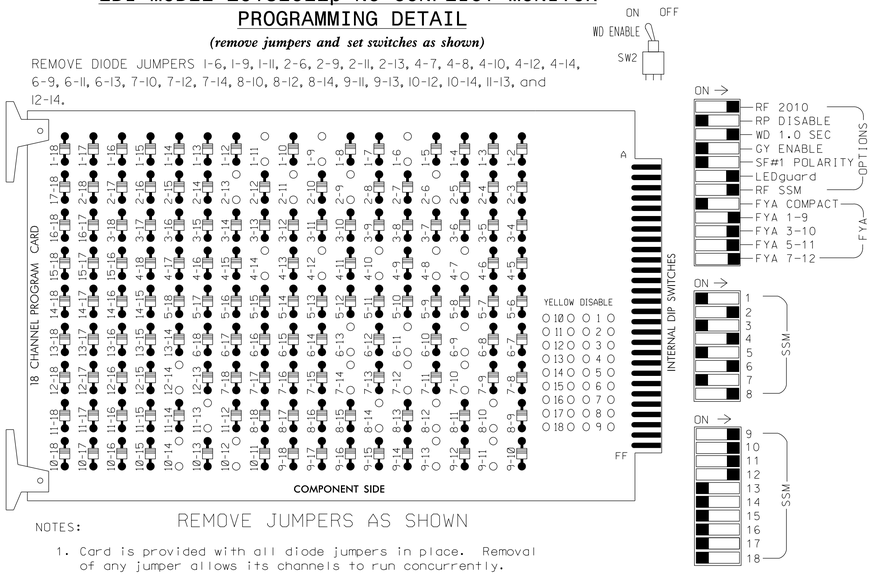
38412.10

PROJECT REFERENCE NO.	SHEET NO.
U-5843	Sig.3.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-6, 1-9, 1-11, 2-6, 2-9, 2-11, 2-13, 4-7, 4-8, 4-10, 4-12, 4-14, 6-9, 6-11, 6-13, 7-10, 7-12, 7-14, 8-10, 8-12, 8-14, 9-11, 9-13, 10-12, 10-14, 11-13, and 12-14.



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. 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 controller to start up in phases 2 and 6 green.
3. Enable Simultaneous Gap-Out feature, on controller unit, for all phases.
4. Program phases 4 and 8, on controller unit, for dual entry.
5. The cabinet and controller are part of the Burlington-Graham Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....SE-PAC2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S8,S10,S11
AUXS1,AUXS2,AUXS4,AUXS5.
PHASES USED.....1,2,2PED,4,4PED,6,7,8
OVERLAP "A".....*
OVERLAP "B".....*
OVERLAP "C".....*
OVERLAP "D".....*

* See sheet 2 for Overlap programming details.

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	NU	61,62	NU	71★	81,82	NU	11★	83★	NU	23★	71★	NU
RED		128			101			134			107							
YELLOW	*	129			102			135		*	108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW													A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127									124								
✋			113			104												
🚶			115			106												

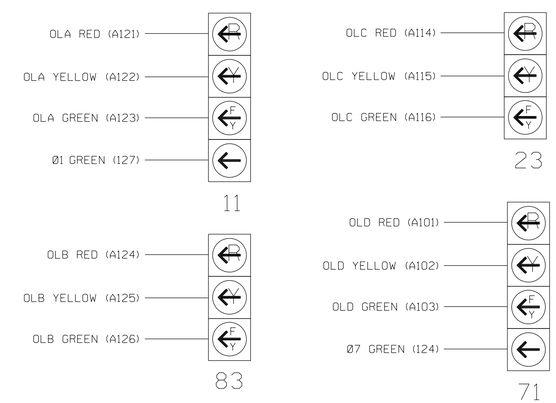
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

See Sheet 2 for Protected and Permissive phases programming.

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	Ø 1 / 2A	Ø 6 / 1A	SLOT EMPTY	SLOT EMPTY	Ø 4 / 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED / DC ISOLATOR	SLOT EMPTY	FS / DC ISOLATOR
	L		NOT USED	Ø 1 / 1A			NOT USED						Ø4 PED / DC ISOLATOR		ST / DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø 6 / 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 8 / 8A	Ø 4 / 7A	Ø 8 / 8C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		NOT USED				Ø 8 / 8B	Ø 7 / 7A	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.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
1A[1]	TB2-9,10	I3U	63	5	6		
	TB2-11,12	I3L	76	6	1	15	
2A	TB2-5,6	I2U	39	3	2		
4A	TB4-9,10	I6U	41	11	4	10	
6A	TB3-5,6	J2U	40	21	6		
7A[2]	TB7-1,2	J7U	66	33	4	3	
	TB7-3,4	J7L	79	34	7	15	
8A	TB5-9,10	J6U	42	31	8	3	
8B	TB5-11,12	J6L	46	32	8		
8C	TB7-5,6	J8U	50	35	8	10	
PED PUSH BUTTONS							
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED		
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED		

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOT I12.

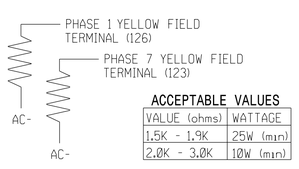
[1] ADD JUMPERS FROM TB2-9 TO TB2-11, AND FROM TB2-10 TO TB2-12.

[2] ADD JUMPERS FROM TB7-1 TO TB7-3, AND FROM TB7-2 TO TB7-4.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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)

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.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: Ø7-0149T
DESIGNED: May 2018
SEALED: May 3rd, 2018
REVISED: N/A

NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/4/2018
Digitally signed by Ryan W. Hough
4303D20FAA2654C3...
ITS & Signals Unit

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical Detail-Temporary Design (Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1716 (Graham-Hopedale Road)
at
N. Mebane Street

Prepared for the Offices of:
Transportation Mobility and Safety Division
ITS & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

Division 7	Alamance County	Burlington
PLAN DATE: May 2018	REVIEWED BY: J. L. Lewis	
PREPARED BY: J. Ma	REVIEWED BY: M. L. Stygles	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA
Jianxin Ma 2018.05.03 14:51:58 -04'00'
SIGNATURE DATE
SIG. INVENTORY NO. 07-0149T

38412.10

PROJECT REFERENCE NO.	SHEET NO.
U-5843	Sig.3.2

FLASHING YELLOW ARROW PROTECTED/PERMISSIVE SEQUENCE FOR OVERLAPS A, B, C, & D

(program controller as shown below)

FROM MAIN MENU PRESS 4 (UNIT DATA)

```
SE-PAC UNIT DATA          PRESS # DESIRED

 1-STARTUP & MISC       6-ALT SEQUENCES
 2-REMOTE FLASH         7-PORT 1 DATA
 3-OVERLAP STANDARD     8-I/O MISC
 4-OVERLAP SPECIAL      9-SIG DRV OUT
 5-RING STRUCTURE

                                F-PRIOR MENU
```

DO NOT enter any OVL PHASES! →

```
SE-PAC OVERLAP - A              (0-NO/1-YES)

 OVL PHASES:  000000000 0000000
    PHS/CHN:  123456789 0123456789 01234
 OVL CHN(S):  000000000 000100000 00000

A-UP B-DN D-DspChn   E-EDIT  F-PRIOR MENU
```

PRESS "B" TWICE

DO NOT enter any OVL PHASES! →

```
SE-PAC OVERLAP - B              (0-NO/1-YES)

 OVL PHASES:  000000000 0000000
    PHS/CHN:  123456789 0123456789 01234
 OVL CHN(S):  000000000 000010000 00000

A-UP B-DN D-DspChn   E-EDIT  F-PRIOR MENU
```

PRESS "B" TWICE

DO NOT enter any OVL PHASES! →

```
SE-PAC OVERLAP - C              (0-NO/1-YES)

 OVL PHASES:  000000000 0000000
    PHS/CHN:  123456789 0123456789 01234
 OVL CHN(S):  000000000 000001000 00000

A-UP B-DN D-DspChn   E-EDIT  F-PRIOR MENU
```

PRESS "B" TWICE

DO NOT enter any OVL PHASES! →

```
SE-PAC OVERLAP - C              (0-NO/1-YES)

 OVL PHASES:  000000000 0000000
    PHS/CHN:  123456789 0123456789 01234
 OVL CHN(S):  000000000 000000100 00000

A-UP B-DN D-DspChn   E-EDIT  F-PRIOR MENU
```

OVERLAP PROGRAMMING COMPLETE
PRESS 'F' TO RETURN TO UNIT DATA

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.

38412.10

PROTECTED AND PERMISSIVE PHASES FOR FLASHING YELLOW ARROW

(program controller as shown below)

FROM MAIN MENU PRESS 4 (UNIT DATA)

```
SE-PAC UNIT DATA          PRESS # DESIRED

 1-STARTUP & MISC       6-ALT SEQUENCES
 2-REMOTE FLASH         7-PORT 1 DATA
 3-OVERLAP STANDARD     8-I/O MISC
 4-OVERLAP SPECIAL      9-SIG DRV OUT
 5-RING STRUCTURE

                                F-PRIOR MENU
```

```
SE-PAC OVLP.A...B...C...D...E...F...G...H.
   TR GRN   0   0   0   0   0   0   0   0
   YEL/10  40  40  40  40  40  40  40  40
   RED/10  20  20  20  20  20  20  20  20
   -G/Y     1   3   5   7   0   0   0   0
   +GRN     2   4   6   8   0   0   0   0
(-) #-PH G/Y KILLS OVLP= (+) #-PH G STRT
A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU
```

PROTECTED PHASES →
PERMISSIVE PHASES →

NOTE: THIS PROGRAMMING IS REQUIRED FOR SIGNAL HEADS 11, 23, 71, AND 83 SO THAT THE SOLID GREEN ARROW TURNS ON EXCLUSIVELY DURING PROTECTED GREEN PHASES 1 & 7, AND THE FLASHING YELLOW ARROW ONLY TURNS ON EXCLUSIVELY DURING PERMITTED GREEN PHASES 2, 4, 6 & 8.

PPLT DEFINITION PROGRAMMING COMPLETE
PRESS 'F' TO RETURN TO UNIT DATA

INIT & N.A. RESP PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu, press '3' (Phase Data)

```
EPAC PHASE DATA           PRESS # DESIRED

 1-VEHICLE TIMES        5-V & P RECALLS
 2-DENSITY TIMES        6-N.LOCK & MISC
 3-PEDEST. TIMES        7-SPEC. SEQUENCE
 4-INITIALIZE &         8-SPEC. DETECTOR
   N.A. RESPONSE        9-PHASE COPY

                                F-PRIOR MENU
```

Note Phases 3 and 5 NOT used! →

```
PHASE......1...2...3...4...5...6...7...8
  INITIAL  1   4   0   1   0   4   1   1
  NA RESP  0   1   0   2   0   1   0   2

CODES.......0....1....2....3....4....5
  INITIAL  NONE INACT RED  YEL  GRN  DRK
  NA RESP  NONE  NA1  NA2 BOTH  ---  ---
A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU
```

INIT & N.A. RESP programming complete.

NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/4/2018
Digitally signed by Ryan W. Hough
430320FAA2654C3...
ITS & Signals Unit

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

Electrical Detail-Temporary Design (Sheet 2 of 2)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-0149T
DESIGNED: May 2018
SEALED: May 3rd, 2018
REVISED: N/A

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ITS & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1716 (Graham-Hopedale Road)
at
N. Mebane Street

Division 7 | Alamance County | Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.03 14:52:36 -04'00'

SIGNATURE | DATE

SIG. INVENTORY NO. 07-0149T

PROJECT REFERENCE NO.	SHEET NO.
U-5843	Sig.4.0

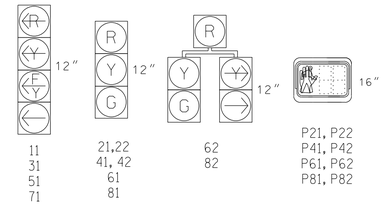
8 Phase
Fully Actuated
(Burlington-Graham Signal System)

SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

INDUCTIVE LOOPS						DETECTOR PROGRAMMING														
							TIMING		OPERATION MODE									STATUS		
									0	1	2	3	4	5	6	7				
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	ASSIGNED PHASE	DELAY	EXTEND (STRETCH)	VEHICLE	PEDESTRIAN	1 CALL	STOP A	STOP B	PROT/PER LEFT	PROT/PER THROUGH	AND	SWITCH	SYSTEM LOOPS	NEW	EXISTING
1A	6X40	2-4-2	0	X	-	1	5 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
1B	6X40	2-4-2	0	X	-	1	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
2A	6X6	3	70	X	-	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
3A	6X40	2-4-2	0	X	-	3	5 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
4A	6X40	2-4-2	0	X	-	4	10 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
5A	6X40	2-4-2	0	X	-	5	5 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X	-
6A	6X6	4	70	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
7A	6X40	2-4-2	0	X	-	7	5 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
8A	6X40	2-4-2	0	X	-	8	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
8B	6X40	2-4-2	0	X	-	8	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X

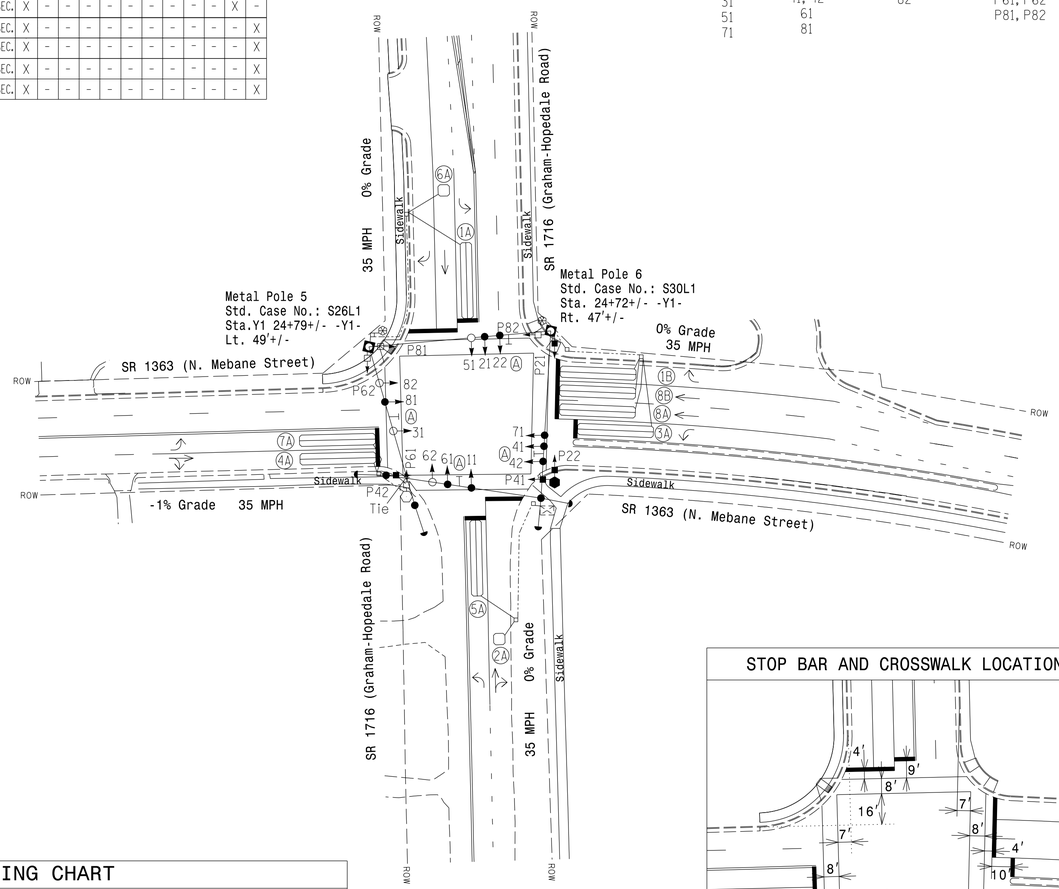
SIGNAL FACE I.D.

All Heads L.E.D.

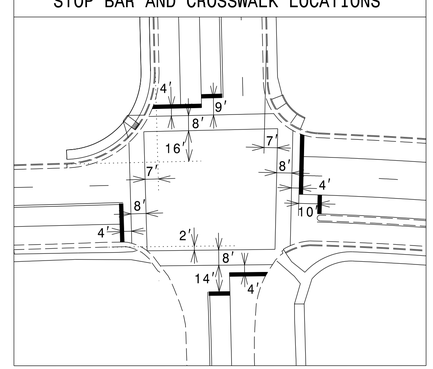


NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018 and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website:
   http://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx
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. Set all detector units to presence mode.
6. Remove exisitng Left Arrow "ONLY" signs. Reposition existing street name signs.
7. Reposition all the existing signal heads.
8. Set all detector units to presence mode.
9. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
10. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



STOP BAR AND CROSSWALK LOCATIONS



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Metal Strain Pole	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Type I Pushbutton Post	
	Type II Signal Pedestal	
	Street Name Sign (D3-1)	
	Curb Ramp	

SE-PAC 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	10	7	7	7	10	7	7
Passage Gap *	2.0	3.0	1.0	2.0	2.0	3.0	1.0	2.0
Maximum Green *	15	45	15	25	15	45	15	25
Yellow Change	3.0	3.8	3.0	3.9	3.0	3.8	3.0	3.9
Red Clear	2.8	2.0	2.4	1.7	2.4	2.0	2.6	1.7
Walk *	-	7	-	7	-	7	-	7
Pedestrian Clear	-	17	-	17	-	15	-	20
Added Initial *	-	-	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK	NON-LOCK	NON-LOCK
Dual Entry	-	-	-	ON	-	-	-	ON
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.

338412.10

NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/4/2018
Digitally signed by Ryan W. Hough
430320FAA2654C3...
ITS & Signals Unit

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Signal Upgrade - Final Design (Sheet 1 of 2)

Prepared for the Offices of:
NC Transportation Mobility and Safety Division
Traffic Engineering & Signals Management Section
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1716 (Graham-Hopedale Road)
at
N. Mebane Street

Division 7 Alamance County Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

SCALE 0 40 1"=40'

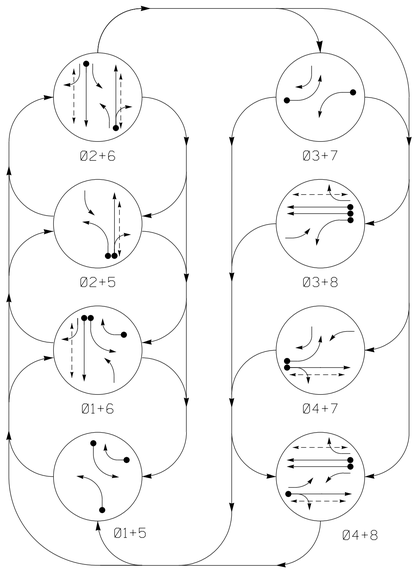
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA
Jianxin Ma 2018.05.03 14:53:04 -04'00'
SIGNATURE DATE
SIG. INVENTORY NO. 07-0149

PROJECT REFERENCE NO.	SHEET NO.
U-5843	Sig.4.1

8 Phase
Fully Actuated
(Burlington-Graham Signal System)

DEFAULT PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

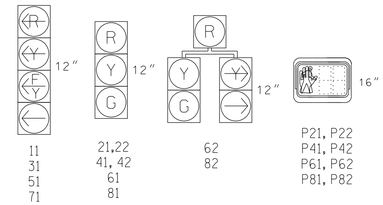
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

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	R	R	G	G	R	R	R	R	Y
31	~~R~~	~~R~~	~~R~~	~~R~~	←	←	F Y	F Y	~~R~~
41, 42	R	R	R	R	R	R	G	G	R
51	←	F Y	←	F Y	~~R~~	~~R~~	~~R~~	~~R~~	~~Y~~
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R →	R	R →	R	Y
71	~~R~~	~~R~~	~~R~~	~~R~~	←	F Y	←	F Y	~~R~~
81	R	R	R	R	R	G	R	G	R
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
P61, P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81, P82	DW	DW	DW	DW	DW	W	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



NOTES

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5. Set all detector units to presence mode.
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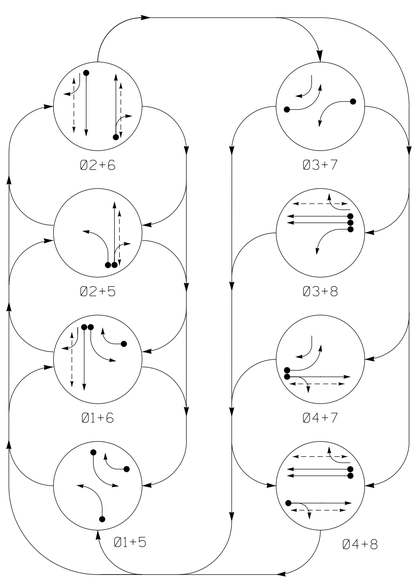
10. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

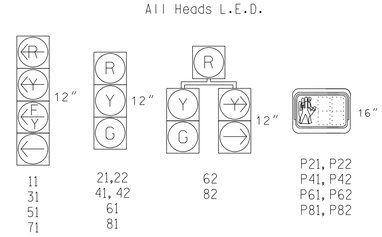
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

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	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	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R →	R	R →	R	Y
71	~~R~~	~~R~~	~~R~~	~~R~~	←	~~R~~	←	~~R~~	~~R~~
81	R	R	R	R	R	G	R	G	R
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
P61, P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81, P82	DW	DW	DW	DW	DW	W	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

Signal Upgrade - Final Design (Sheet 2 of 2)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC Dept of Transportation
Division of Highways

Final Drawing Date: 5/4/2018

DocuSigned by: Ryan W. Hough 430320FAA2654C3...

ITS & Signals Unit

Prepared for the Offices of:
Traffic Engineering, Mobility and Safety Division
Signals Management Section
NORTH CAROLINA DEPT. OF TRANSPORTATION
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1716 (Graham-Hopedale Road)
at
N. Mebane Street

Division 7 Alamance County Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.03 14:53:35 -04'00'

SIGNATURE DATE

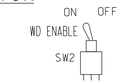
SIG. INVENTORY NO. 07-0149

338412.10

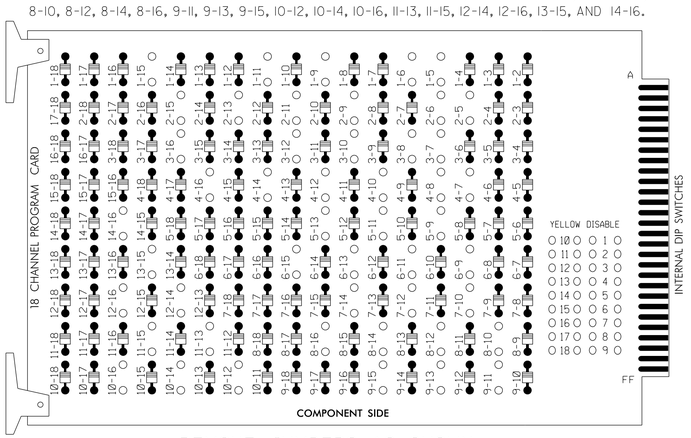
PROJECT REFERENCE NO.	SHEET NO.
U-5843	Sig 4.2

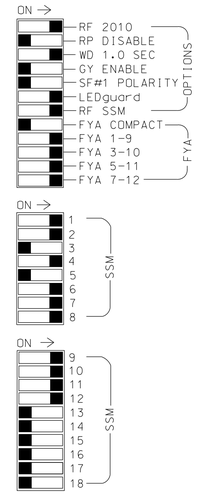
EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS I-5, I-6, I-9, I-11, I-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 3-7, 3-8, 3-10, 3-12, 3-16, 4-7, 4-8, 4-10, 4-12, 4-14, 4-16, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 7-10, 7-12, 7-14, 8-10, 8-12, 8-14, 8-16, 9-11, 9-13, 9-15, 10-12, 10-14, 10-16, 11-13, 11-15, 12-14, 12-16, 13-15, AND 14-16.





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. 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 phases 2 and 6 for Start Up In Green.
4. Program phases 4 and 8, on controller unit, for dual entry.
5. The cabinet and controller are part of the Burlington-Graham Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....SE-PAC2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S9, S10,S11,S12,AUX S1,AUX S2, AUX S4,AUX S5
PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED, 7,8,8PED
OVERLAP "A".....*
OVERLAP "B".....*
OVERLAP "C".....*
OVERLAP "D".....*

* See sheet 2 for Overlap programming details.

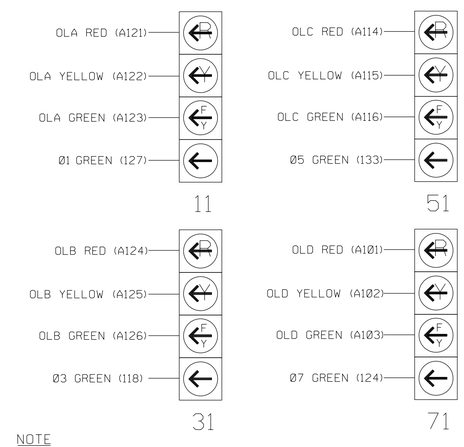
SIGNAL HEAD HOOK-UP CHART

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	P21, P22	31★	41,42	P41, P42	51★	61,62	P61, P62	71★	62	81,82	P81, P82	11★	31★	NU	51★	71★	NU
RED	*		128			101			134		*		107							
YELLOW			129		*	102		*	135				108							
GREEN			130			103			136				109							
RED ARROW															A121	A124		A114	A101	
YELLOW ARROW		126										123			A122	A125		A115	A102	
FLASHING YELLOW ARROW															A123	A126		A116	A103	
GREEN ARROW	127	127			118			133			124	124								
✋				113			104			119				110						
🚶				115			106			121				112						

NU = Not Used
* Denotes install load resistor. See load resistor installation detail on sheet 2.
★ See pictorial of head wiring in detail below.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

See sheet 2 for Protected and Permitted phases programming.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT	Ø1	Ø1	SLOT	SLOT	Ø4	Ø3	SLOT	SLOT	SLOT	SLOT	Ø2 PED	Ø6 PED	FS
			2A	1A			4A	3A					DC ISOLATOR	DC ISOLATOR	DC ISOLATOR
	L	EMPTY	NOT USED	Ø1 1B	EMPTY	EMPTY	NOT USED	NOT USED	EMPTY	EMPTY	EMPTY	EMPTY	Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT	Ø6	Ø5	SLOT	SLOT	Ø8	Ø7	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT
			6A	5A			8A	7A							
	L	EMPTY	NOT USED	NOT USED	EMPTY	EMPTY	Ø8 8B	NOT USED	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY

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.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
1A	TB2-9,10	I3U	63	5	1	5	
1B	TB2-11,12	I3L	76	6	1	15	
2A	TB2-5,6	I2U	39	3	2		
3A	TB6-1,2	I7U	65	13	3	5	
4A	TB4-9,10	I6U	41	11	4	10	
5A	TB3-9,10	J3U	64	23	5	5	
6A	TB3-5,6	J2U	40	21	6		
7A	TB7-1,2	J7U	66	33		5	
8A	TB5-9,10	J6U	42	31	8		
8B	TB5-11,12	J6L	46	32	8		
PED PUSH BUTTONS							
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED		
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED		
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED		
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED		

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

Remove the following jumpers, if present:
From TB2-9 to TB2-11, and from TB2-10 to TB2-12.
From TB7-1 to TB7-3, and from TB7-2 to TB7-4.

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.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: Ø7-0149
DESIGNED: May 2018
SEALED: May 3rd, 2018
REVISED: N/A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical Detail-Final Design (Sheet 1 of 3)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1716 (Graham-Hopedale Road) at N. Mebane Street

Division 7 | Alamance County | Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

REVISIONS	INIT.	DATE

SEAL 033108 NORTH CAROLINA PROFESSIONAL ENGINEER JIANXIN MA

Jianxin Ma 2018.05.03 14:54:04 -04'00'

SIGNATURE | DATE

SIG. INVENTORY NO. 07-0149

NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/4/2018
Docusigned by: Ryan W. Hough
430320FAA2654C3...
ITS & Signals Unit

Prepared for the Offices of: NC Transportation Mobility and Safety Division, Traffic Engineering Branch, Signal Management Section, Dept. of Transportation

750 N.Greenfield Pkwy,Garner,NC 27529

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

VHB PROJECT NO.: 38412.10

PROJECT REFERENCE NO.	SHEET NO.
U-5843	Sig 4.3

SE-PAC2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS 4 (UNIT DATA)

```
SE-PAC UNIT DATA                PRESS # DESIRED

1- STARTUP & MISC          6- ALT SEQUENCES
2- REMOTE FLASH            7- PORT 1 DATA
3- OVERLAP STANDARD        8- I/O MISC
4- OVERLAP SPECIAL         9- SIG DRV OUT
5- RING STRUCTURE
                                F- PRIOR MENU
```

```
SE-PAC OVERLAP - A              (0-NO / 1-YES)

 OVL PHASES:   000000000 0000000
    PHS/CHN:   123456789 0123456789 01234
 OVL CHN(S):   000000000 0001000000 00000

A-UP  B-DN  D-DspChn  E-EDIT  F-PRIOR MENU
```

Do NOT enter any OVL PHASES! →

PRESS 'B'

```
SE-PAC OVERLAP - B              (0-NO / 1-YES)

 OVL PHASES:   000000000 0000000
    PHS/CHN:   123456789 0123456789 01234
 OVL CHN(S):   000000000 0000100000 00000

A-UP  B-DN  D-DspChn  E-EDIT  F-PRIOR MENU
```

Do NOT enter any OVL PHASES! →

PRESS 'B'

```
SE-PAC OVERLAP - C              (0-NO / 1-YES)

 OVL PHASES:   000000000 0000000
    PHS/CHN:   123456789 0123456789 01234
 OVL CHN(S):   000000000 0000010000 00000

A-UP  B-DN  D-DspChn  E-EDIT  F-PRIOR MENU
```

Do NOT enter any OVL PHASES! →

PRESS 'B'

```
SE-PAC OVERLAP - D              (0-NO / 1-YES)

 OVL PHASES:   000000000 0000000
    PHS/CHN:   123456789 0123456789 01234
 OVL CHN(S):   000000000 0000001000 00000

A-UP  B-DN  D-DspChn  E-EDIT  F-PRIOR MENU
```

Do NOT enter any OVL PHASES! →

OVERLAP PROGRAMMING COMPLETE
PRESS 'F' TO RETURN TO UNIT DATA

PROTECTED AND PERMISSIVE PHASES FOR FLASHING YELLOW ARROW

(program controller as shown below)

FROM MAIN MENU PRESS 4 (UNIT DATA)

```
SE-PAC UNIT DATA                PRESS # DESIRED

1- STARTUP & MISC          6- ALT SEQUENCES
2- REMOTE FLASH            7- PORT 1 DATA
3- OVERLAP STANDARD        8- I/O MISC
4- OVERLAP SPECIAL         9- SIG DRV OUT
5- RING STRUCTURE
                                F- PRIOR MENU
```

```
SE-PAC OVLP.A...B...C...D...E...F...G...H.
   TR GRN   0   0   0   0   0   0   0   0
   YEL/10  40  40  40  40  40  40  40  40
   RED/10  20  20  20  20  20  20  20  20
   -G/Y     1   3   5   7   0   0   0   0   ← PROTECTED PHASES
   +GRN     2   4   6   8   0   0   0   0   ← PERMITTED PHASES

 (-) #-PH G/Y KILLS OVLP= (+) #-PH G STRT

A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU
```

PPLT DEFINITION PROGRAMMING COMPLETE
PRESS 'F' TO RETURN TO UNIT DATA

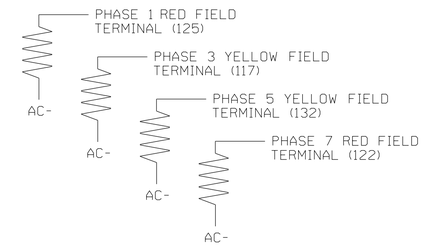
NOTE: THIS PROGRAMMING IS REQUIRED FOR SIGNAL HEADS 11, 31, 51 AND 71 SO THAT THE SOLID GREEN ARROWS TURN ON EXCLUSIVELY DURING PROTECTED GREEN PHASES 1, 3, 5 & 7, AND THE FLASHING YELLOW ARROWS TURN ON EXCLUSIVELY DURING PERMITTED GREEN PHASES 2, 4, 6, & 8.

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)



IMPORTANT! Move resistor from Yellow terminal to Red terminal for phases 1 and 7.

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: 07-0149
DESIGNED: May 2018
SEALED: May 3rd, 2018
REVISED: N/A

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/4/2018
DocuSigned by: Ryan W. Hough 430320FAA2654C3...
ITS & Signals Unit

Electrical Detail-Final Design (Sheet 2 of 3)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1716 (Graham-Hopedale Road) at N. Mebane Street

Prepared for the Offices of: N.C. Department of Transportation Mobility and Safety Division ITS & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

Division 7 | Alamance County | Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.03 14:54:31 -04'00'

SIGNATURE | DATE

SIG. INVENTORY NO. 07-0149

VHB PROJECT NO.: 38536.01

PROJECT REFERENCE NO.	SHEET NO.
U-5843	Sig 4.4

TOD EVENT SCHEDULING PROGRAMMING DETAIL
TO CALL ALTERNATE PHASING OPERATION DURING COORDINATION

(program controller as shown below)

* DENOTES TO BE DETERMINED BY THE DIVISION TRAFFIC ENGINEER.

NOTES

1. Phase Functions can be called by Time of Day (TOD) in Traffic Events, but not during coordination.
2. Special Functions can be called by Time of Day using Aux Events, and can run in conjunction with Coordination.
3. Special Functions can be used to call a Phase Function. In doing this a Phase function can run while a Coordination pattern is running.
4. If Alternate Phasing is used during FREE-RUN Phase Function 1 must be turned on with a Traffic Event.

PHASE FUNCTION MAPPING PROGRAMMING DETAIL

(program controller as shown below)

Step 1 - Assign OMIT OVERLAP "A", "B", "C", AND "D" to Phase Function 1.

FROM MAIN MENU PRESS 6 (TIME BASE DATA)

```
EPAC TIME BASE DATA        PRESS # DESIRED

 1-VIEW CURRENT            6-EQUATE/TRANSFER
 2-SET TIME/DATE           7-CLEAR MEMORY
 3-TRAFFIC EVENTS          8-DIMMING
 4-AUX EVENTS              9-PHS FUNC MAPPING
 5-TOY EVENTS              0-SPC FUNC MAPPING
                                   F-PRIOR MENU
```

```
EPAC  TIME BASE PHS FUNC MAPPING
                PHS FUNC SEL(0-OFF/1-ON)
 NUM..P-FUNCT NAME.....123456789 0123456
   1  PHS-01 MAX # 2    000000000 0000000
   2  PHS-02 MAX # 2    010000000 0000000
   3  PHS-03 MAX # 2    001000000 0000000
   4  PHS-04 MAX # 2    000100000 0000000
A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU
```

REMOVE PHASE FUNCTION NUM 1 DEFAULT VALUE

HIT "A" KEY UNTIL POSITIONED ON NUM 145

```
EPAC  TIME BASE PHS FUNC MAPPING
                PHS FUNC SEL(0-OFF/1-ON)
 NUM..P-FUNCT NAME.....123456789 0123456
 145  OVERLAP A OMIT    100000000 0000000
 146  OVERLAP B OMIT    100000000 0000000
 147  OVERLAP C OMIT    100000000 0000000
 148  OVERLAP D OMIT    100000000 0000000
A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU
```

SET SWITCH 1 "ON" AS SHOWN
FOR OVERLAP A OMIT
FOR OVERLAP B OMIT
FOR OVERLAP C OMIT
FOR OVERLAP D OMIT

PHASE FUNCTION PROGRAMMING COMPLETE
PRESS 'F' TO RETURN TO TIME BASE DATA

SPECIAL FUNCTION MAPPING PROGRAMMING DETAIL

(program controller as shown below)

Step 2 - Assign Special Function 1 to call Phase Function 1.

FROM MAIN MENU PRESS 6 (TIME BASE DATA)

```
EPAC TIME BASE DATA        PRESS # DESIRED

 1-VIEW CURRENT            6-EQUATE/TRANSFER
 2-SET TIME/DATE           7-CLEAR MEMORY
 3-TRAFFIC EVENTS          8-DIMMING
 4-AUX EVENTS              9-PHS FUNC MAPPING
 5-TOY EVENTS              0-SPC FUNC MAPPING
                                   F-PRIOR MENU
```

```
EPAC TIME BASE SPC FUNC MAPPING
                              SPC FUNC
 S-FUNCTION NAME .........     12345678
   SPC 1-8 AS PHS FUNC 1- 8    10000000
   SPC 1-8 AS PHS FUNC 9-16    00000000
   SPEC FUNCTION 1             10000000
 CODES.......0-OFF....1-ON............
A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU
```

PHASE FUNCTION 1 WILL BE CALLED WHEN SPECIAL FUNCTION 1 IS SELECTED

SPECIAL FUNCTION PROGRAMMING COMPLETE
PRESS 'F' TO RETURN TO TIME BASE DATA

PROGRAM AUX EVENT TO CALL SPECIAL FUNCTION

(program controller as shown below)

Step 3 - An Auxiliary event will be used to call the Special Function. This is done in Time Base Data under Aux Event. Add Auxiliary events as needed remembering to use one event to turn the Special Function on and one event to turn the Special Function off. If these are to be used in conjunction with the Traffic Events during Coordination then the On/Off times should be identical.

FROM MAIN MENU PRESS 6 (TIME BASE DATA)

```
EPAC TIME BASE DATA        PRESS # DESIRED

 1-VIEW CURRENT            6-EQUATE/TRANSFER
 2-SET TIME/DATE           7-CLEAR MEMORY
 3-TRAFFIC EVENTS          8-DIMMING
 4-AUX EVENTS              9-PHS FUNC MAPPING
 5-TOY EVENTS              0-SPC FUNC MAPPING
                                   F-PRIOR MENU
```

```
EPAC TIME BASE - AUXILIARY EVENTS
  DD  HH MM  A123  D123  DIM  S12345678
   *   *  *   000   000   0    10000000
   *   *  *   000   000   0    00000000
   *   *  *   000   000   0    00000000
CODES........0-OFF....1-ON..............
OVERWRITE ">" W/ 1-ADD  2-DELETE  3-EDIT
A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU
```

Special Function (SF)
SF 1 "ON"
SF 1 "OFF"

AUX EVENT PROGRAMMING COMPLETE
PRESS 'F' TO RETURN TO TIME BASE DATA

! AUX EVENT MUST BE SCHEDULED TO RUN CONCURRENT WITH A TRAFFIC EVENT SCHEDULED COORDINATION PATTERN.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-0149
DESIGNED: May 2018
SEALED: May 3rd, 2018
REVISED: N/A

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical Detail-Final Design (Sheet 3 of 3)

NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/4/2018
Digitally signed by Ryan W. Haugh
430320FAA2654C3...
ITS & Signals Unit

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:
ITS Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1716 (Graham-Hopedale Road)
at
N. Mebane Street

Division 7 | Alamance County | Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.03 14:55:03 -04'00'
SIGNATURE DATE
SIG. INVENTORY NO. 07-0149

VHB PROJECT NO.: 38536.01

PROJECT REFERENCE NO.	SHEET NO.
U-5843	SCP 1

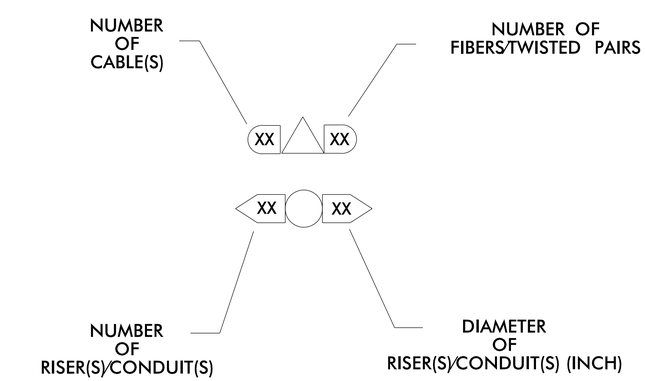
1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL REA, PE – 39, (UNDERGROUND) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
4. INSTALL SMFO CABLE
5. INSTALL MMFO CABLE
6. INSTALL FIBER OPTIC DROP CABLE
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. TERMINATE COMMUNICATIONS CABLE ON EXISTING TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET
27. INSTALL NEW TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET
28. INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND FUSION SPLICE CABLE IN CABINET
29. INSTALL UNDERGROUND SPLICE ENCLOSURE
30. INSTALL AERIAL 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 TELEPHONE SERVICE
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 20 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

LEGEND

- 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 — NEW DIRECTIONAL DRILLED CONDUIT
- B&J — NEW BORED AND JACKED CONDUIT
- NEW JUNCTION BOX
- EXISTING JUNCTION BOX
- NEW WOOD POLE
- EXISTING WOOD POLE
- S — NEW AERIAL SPLICE ENCLOSURE
- NEW METAL POLE
- EXISTING METAL POLE
- NEW 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)



NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/4/2018
DocuSigned by: Ryan W. Haugh
430320FAA2654C3...
ITS & Signals Unit

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

US 70 (N. Church Street)
at
SR 1716 (Graham-Hopedale Road)
Construction Notes

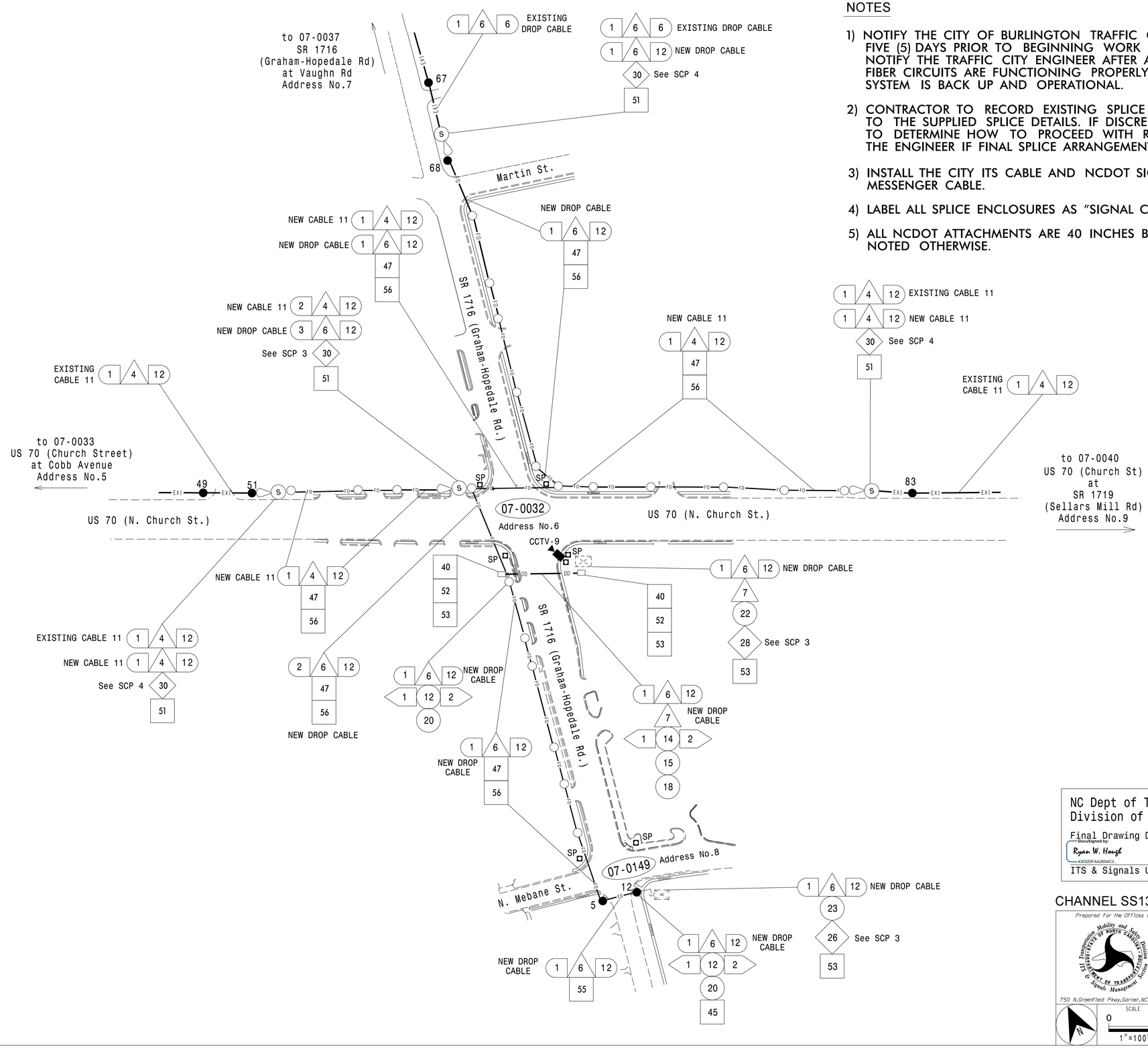
Division 7 Alamance County Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA
Jianxin Ma 2018.05.03 14:59:29 -04'00'
SIGNATURE DATE

PROJECT REFERENCE NO.	SHEET NO.
U-5843	SCP 2



NOTES

1) NOTIFY THE CITY OF BURLINGTON TRAFFIC CITY ENGINEER, JASON GEARY, AT (336) 570–6156, FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE TRAFFIC CITY 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) INSTALL THE CITY ITS CABLE AND NCDOT SIGNAL COMMUNICATION CABLE ON THE SAME MESSENGER CABLE.

4) LABEL ALL SPLICE ENCLOSURES AS "SIGNAL COMMUNICATIONS".

5) ALL NCDOT ATTACHMENTS ARE 40 INCHES BELOW POWER, FRONT SIDE OF POLE, UNLESS NOTED OTHERWISE.

NC Dept of Transportation
Division of Highways

Final Drawing Date: 5/4/2018

DocuSigned by:
Ryan W. Haugh
430320FAA2654C3...

ITS & Signals Unit

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940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

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CHANNEL SS13

Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ITS & Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

US 70 (N. Church Street) at SR 1716 (Graham-Hopedale Road) Signal Communication Plan

Division 7 Alamance County Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

SCALE 0 100 1"=100'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.03 15:00:23 -04'00'

SIGNATURE DATE

38412.10

PROJECT REFERENCE NO.	SHEET NO.
U-5843	SCP 3

CHANNEL SS13

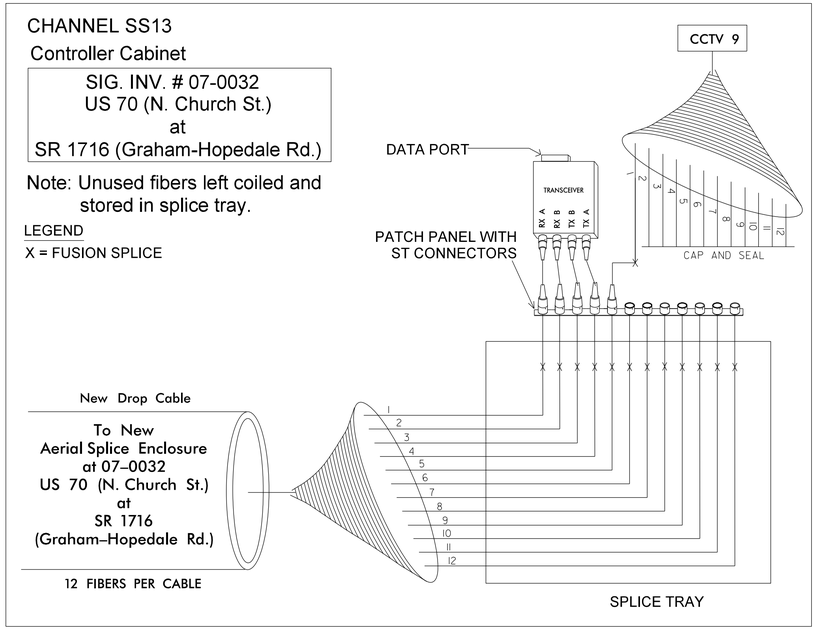
Controller Cabinet

SIG. INV. # 07-0032
US 70 (N. Church St.)
at
SR 1716 (Graham-Hopedale Rd.)

Note: Unused fibers left coiled and stored in splice tray.

LEGEND

X = FUSION SPLICE



CHANNEL SS13

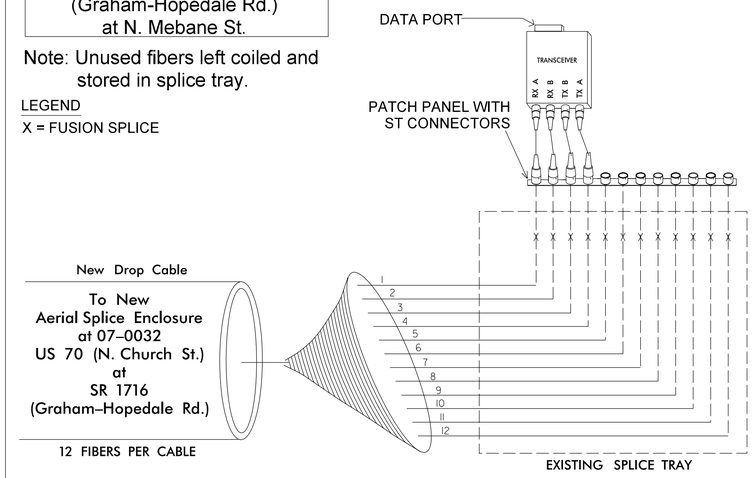
Controller Cabinet

SIG. INV. # 07-0149
SR 1716
(Graham-Hopedale Rd.)
at N. Mebane St.

Note: Unused fibers left coiled and stored in splice tray.

LEGEND

X = FUSION SPLICE



CHANNEL SS13

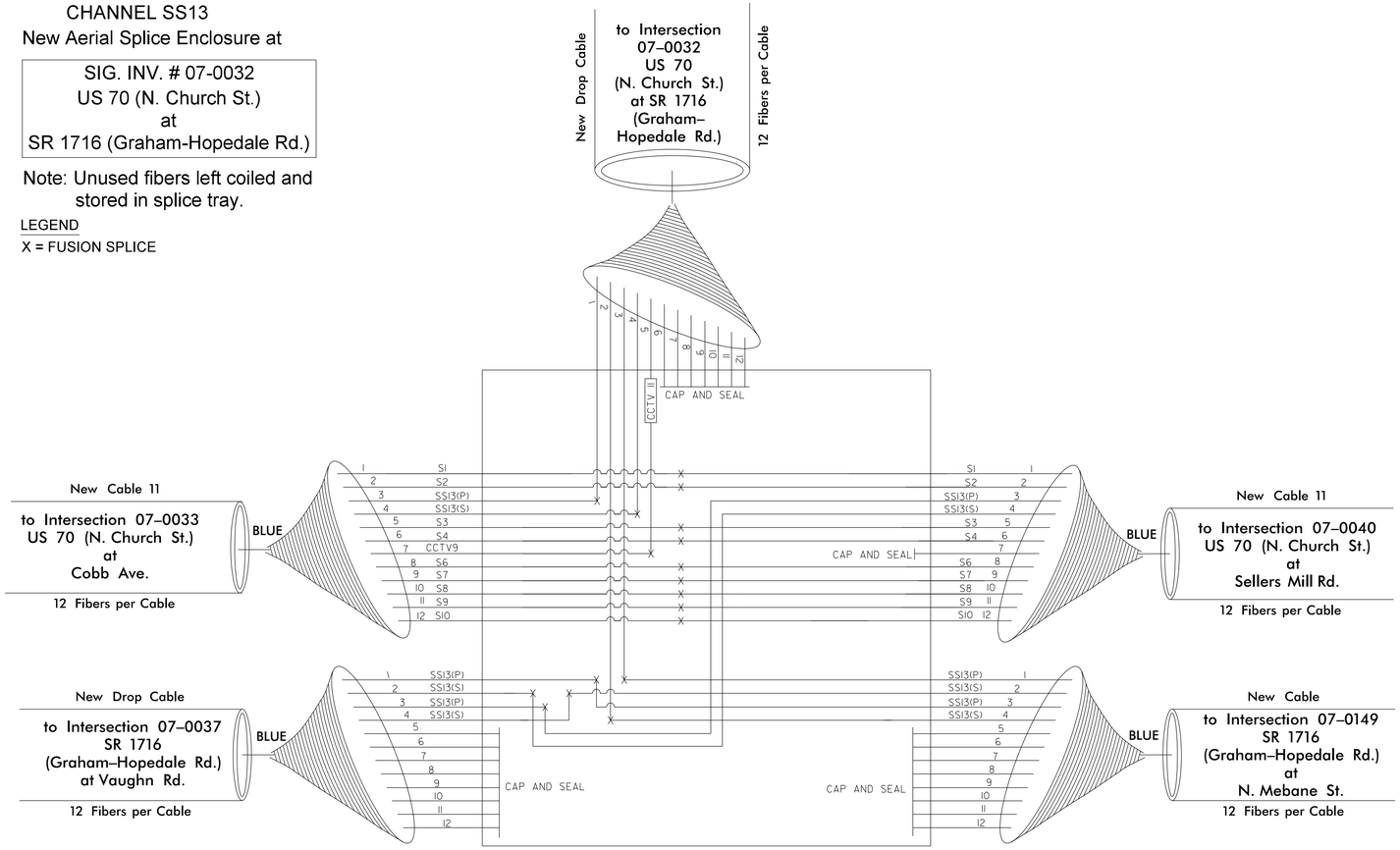
New Aerial Splice Enclosure at

SIG. INV. # 07-0032
US 70 (N. Church St.)
at
SR 1716 (Graham-Hopedale Rd.)

Note: Unused fibers left coiled and stored in splice tray.

LEGEND

X = FUSION SPLICE



NEW AERIAL SPLICE ENCLOSURE

NOTES

1) NOTIFY THE CITY OF BURLINGTON TRAFFIC CITY ENGINEER, JASON GEARY, AT (336) 570-6156, FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE TRAFFIC CITY 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) TRANSCEIVER TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING \ ENSURING PROPER TERMINATIONS.

4) INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE CENTERS"

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.

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

NC Dept of Transportation
Division of Highways

Final Drawing Date: 5/4/2018

DocuSigned by:
Ryan W. Hough
A30320FAA2654C3...

ITS & Signals Unit

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

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CHANNEL SS13

Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 70 (N. Church Street) at SR 1716 (Graham-Hopedale Road)
Signal Communications
Splicing Details

Division 7 Alamance County Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.03 15:01:09 -04'00'

SIGNATURE DATE

38412.10

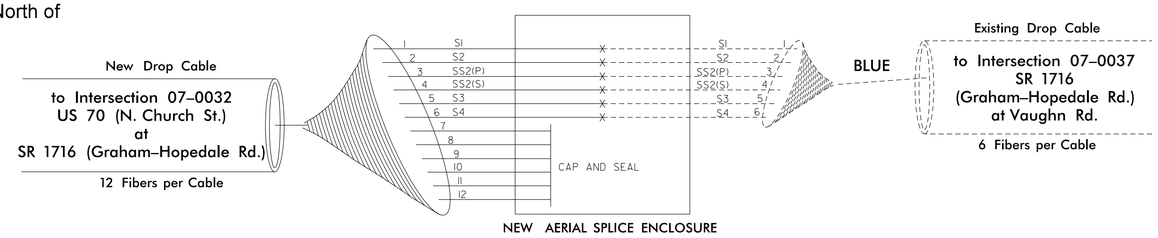
PROJECT REFERENCE NO.	SHEET NO.
U-5843	SCP 4

CHANNEL SS13
Install New Aerial Splice Enclosure North of

SIG. INV. # 07-0032
US 70 (N. Church St.)
at
SR 1716 (Graham-Hopedale Rd.)

Note: Unused fibers left coiled and stored in splice tray.

LEGEND
X = FUSION SPLICE

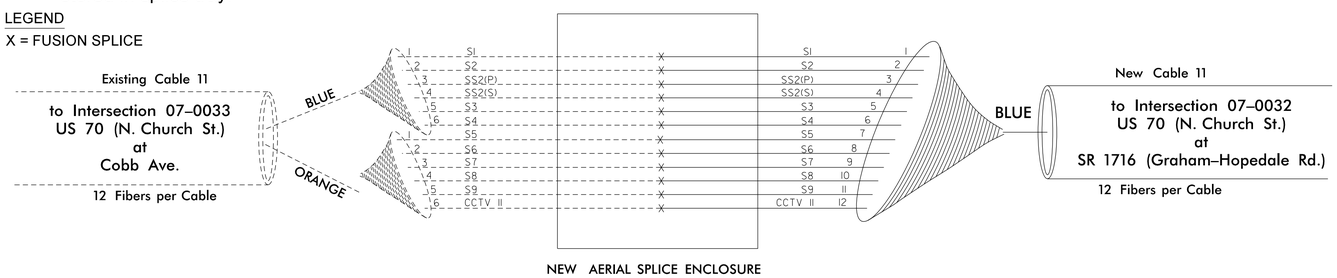


CHANNEL SS13
Install New Aerial Splice Enclosure West of

SIG. INV. # 07-0032
US 70 (N. Church St.)
at
SR 1716 (Graham-Hopedale Rd.)

Note: Unused fibers left coiled and stored in splice tray.

LEGEND
X = FUSION SPLICE

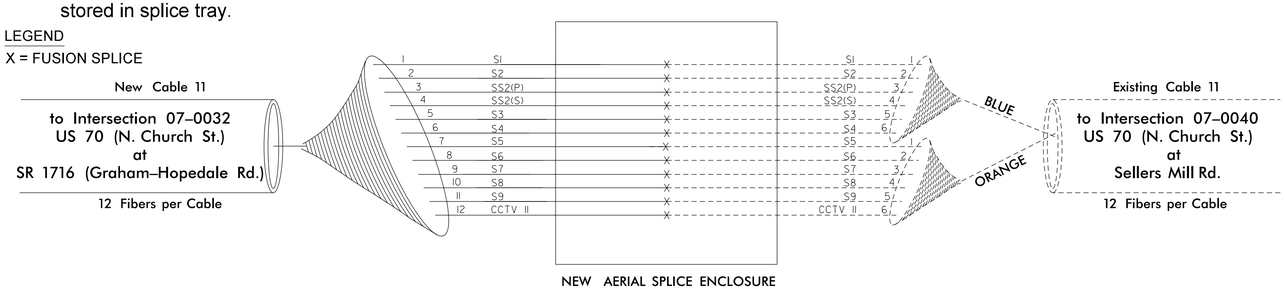


CHANNEL SS13
Install New Aerial Splice Enclosure East of

SIG. INV. # 07-0032
US 70 (N. Church St.)
at
SR 1716 (Graham-Hopedale Rd.)

Note: Unused fibers left coiled and stored in splice tray.

LEGEND
X = FUSION SPLICE



NOTES

1) NOTIFY THE CITY OF BURLINGTON TRAFFIC CITY ENGINEER, JASON GEARY, AT (336) 570-6156, FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE TRAFFIC CITY 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) TRANSCEIVER TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING \ ENSURING PROPER TERMINATIONS.

3) INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE CENTERS"

1) SPLICE LOCATION
2) DATE
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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.

COLOR CODE
TIA/EIA 598-A

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(6) WHITE	(12) AQUA

NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/4/2018
Docusigned by:
Ryan W. Hough
E0020FAA2654C3...
ITS & Signals Unit

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

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CHANNEL SS13

Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 70 (N. Church Street) at
SR 1716 (Graham-Hopedale Road)
Signal Communications
Splicing Details

Division 7 Alamance County Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.03 15:01:35 -04'00'
SIGNATURE DATE

38412.10

PROJECT REFERENCE NO.	SHEET NO.
U-5843	IT 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
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. TERMINATE COMMUNICATIONS CABLE ON EXISTING TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET
27. INSTALL NEW TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET
28. INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND FUSION SPLICE CABLE IN CABINET
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30. INSTALL AERIAL SPLICE ENCLOSURE
31. INSTALL POLE MOUNTED SPLICE CABINET
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35. REMOVE EXISTING CABINET FOUNDATION
36. INSTALL CCTV CAMERA ASSEMBLY
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51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
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58. INSTALL NEW ELECTRICAL SERVICE

LEGEND

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- 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
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- B&J — NEW BORED AND JACKED CONDUIT
- NEW JUNCTION BOX
- EXISTING JUNCTION BOX
- NEW WOOD POLE
- EXISTING WOOD POLE
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- NEW METAL POLE
- EXISTING METAL POLE
- NEW 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.
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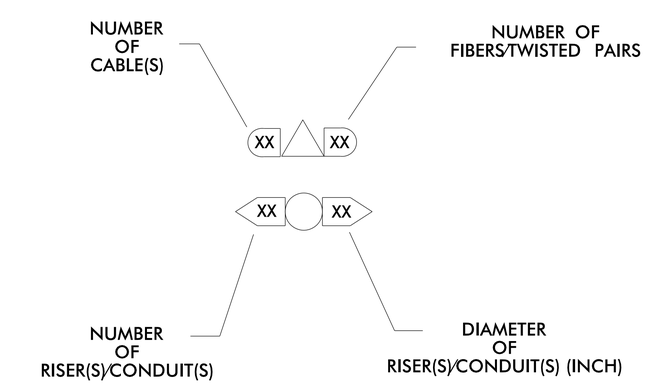
- XX — INDICATES NUMBER OF RISER(S)/CONDUIT(S)
- XX — INDICATES DIAMETER OF RISER(S)/CONDUIT(S) (INCH)



CITY IT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

vhb
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

CITY OF BURLINGTON NORTH CAROLINA FEB. 14, 1893

US 70 (N. Church Street)
at
SR 1716 (Graham-Hopedale Road)
Construction Notes

Division 7 Alamance County Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	VHB PROJECT NO.:	38637.00

REVISIONS	INIT.	DATE

SEAL NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.03 14:55:52 -04'00'

SIGNATURE DATE

PROJECT REFERENCE NO.	SHEET NO.
U-5843	IT 2

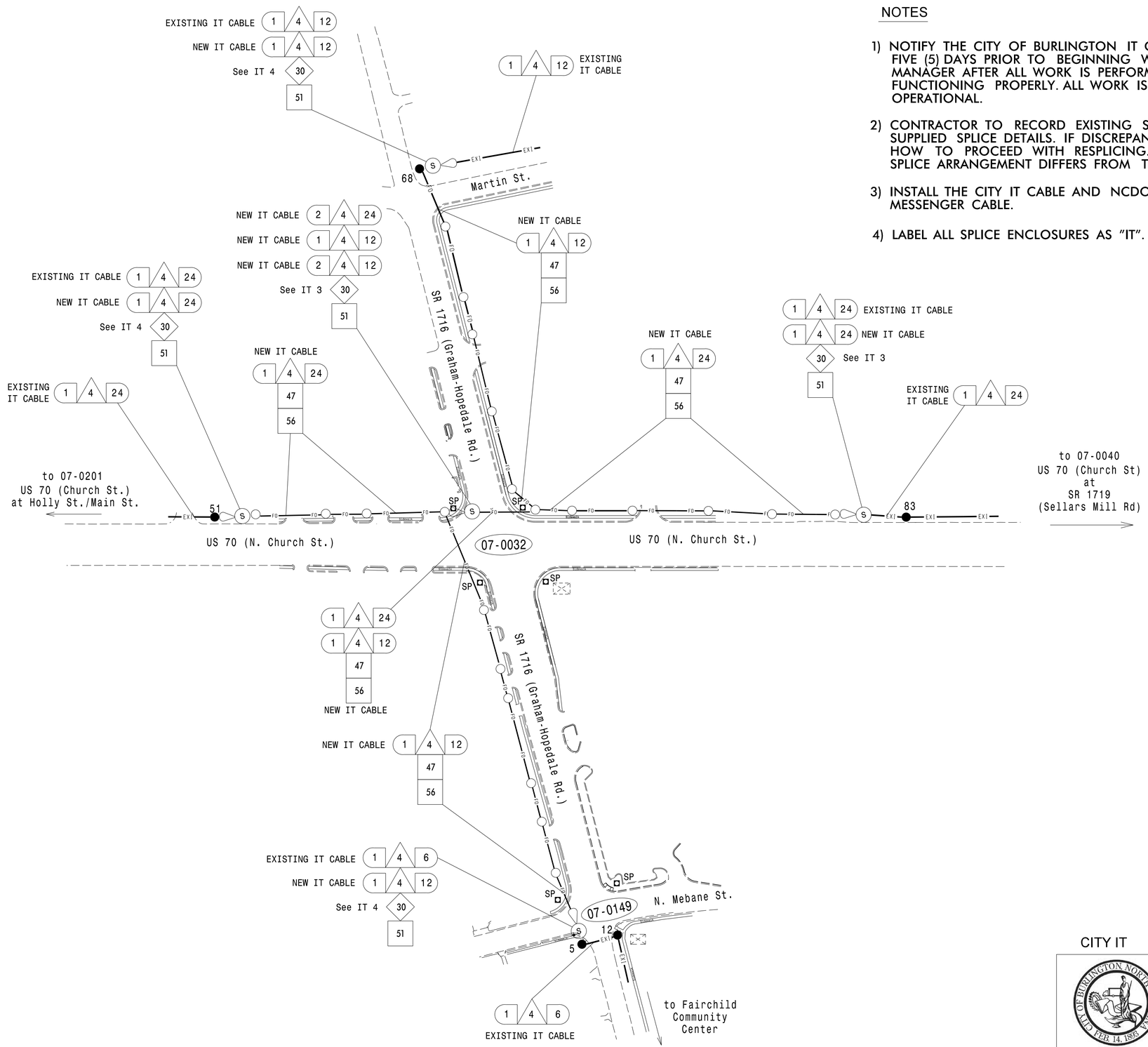
NOTES

1) NOTIFY THE CITY OF BURLINGTON IT OPERATIONS MANAGER, SCOTT BIBLER, AT (336) 222-5044, FIVE (5) DAYS PRIOR TO BEGINNING WORK ON CITY IT CABLE. NOTIFY THE IT OPERATIONS MANAGER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL THE 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) INSTALL THE CITY IT CABLE AND NCDOT SIGNAL COMMUNICATION CABLE ON THE SAME MESSENGER CABLE.

4) LABEL ALL SPLICE ENCLOSURES AS "IT".



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Raleigh, NC 27606
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CITY IT

US 70 (N. Church Street)
at
SR 1716 (Graham-Hopedale Road)
IT Communication Plan

Division 7 Alamance County Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

SCALE 0 100 1"=100'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.03 14:56:28 -04'00'

SIGNATURE DATE

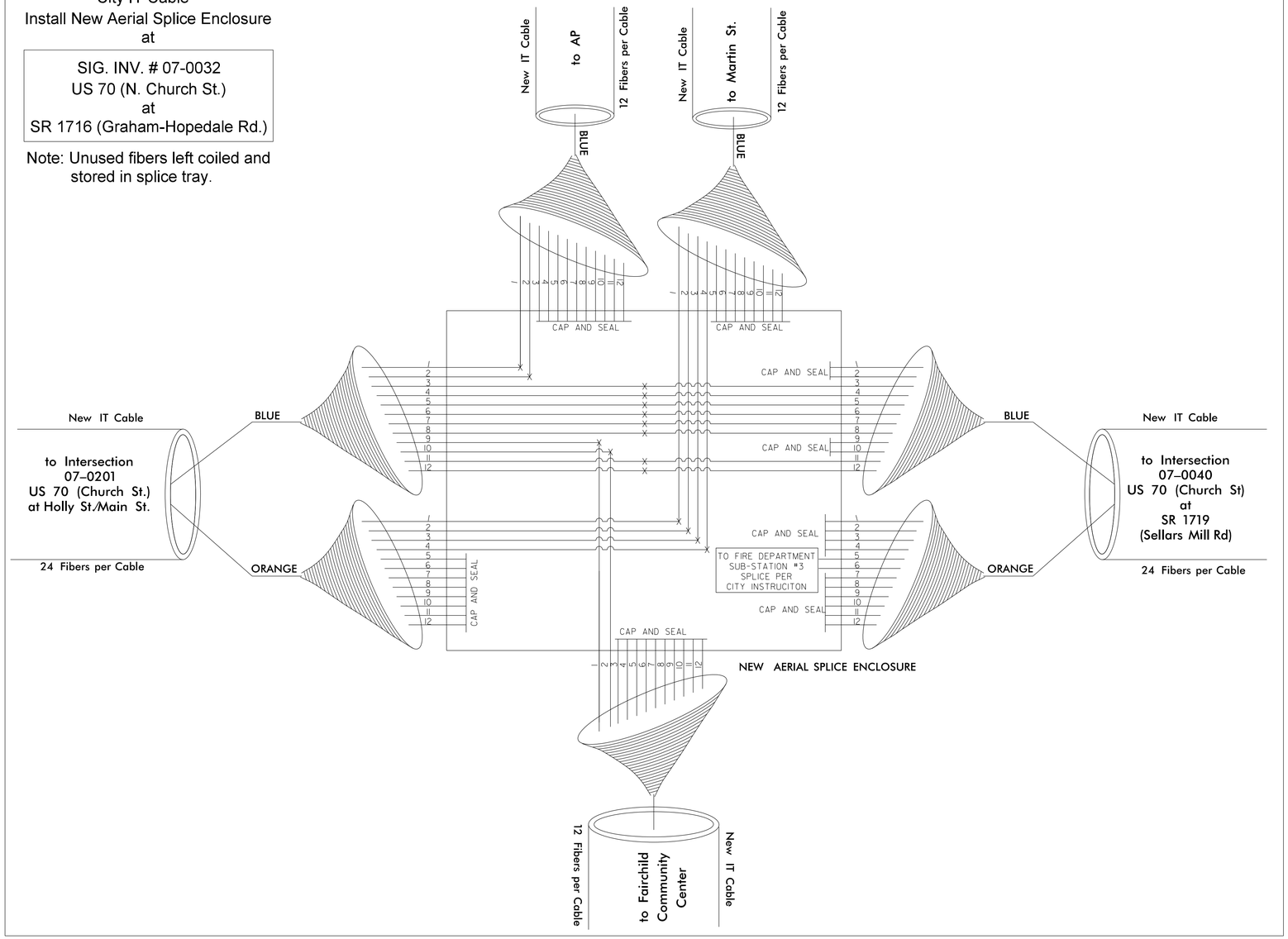
38412.10

PROJECT REFERENCE NO.	SHEET NO.
U-5843	IT 3

City IT Cable
Install New Aerial Splice Enclosure
at

SIG. INV. # 07-0032
US 70 (N. Church St.)
at
SR 1716 (Graham-Hopedale Rd.)

Note: Unused fibers left coiled and stored in splice tray.



NOTES

1) NOTIFY THE CITY OF BURLINGTON IT OPERATIONS MANAGER, SCOTT BIBLER, AT (336) 222-5044, FIVE (5) DAYS PRIOR TO BEGINNING WORK ON CITY IT CABLE. NOTIFY THE IT OPERATIONS MANAGER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL THE SYSTEM IS BACK UP AND OPERATIONAL.

2) TRANSCEIVER TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING \ ENSURING PROPER TERMINATIONS.

3) INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING: REFERENCE SECTION 1731 "FIBER OPTIC SPLICE CENTERS"

   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.

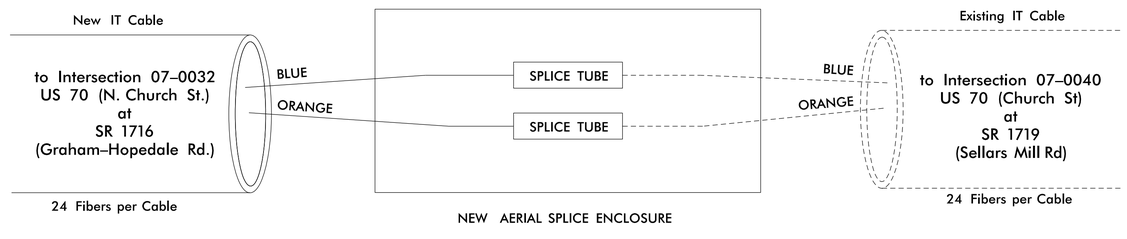
COLOR CODE
TIA/EIA 598-A

(1) BLUE	(7) RED
(2) ORANGE	(8) BLACK
(3) GREEN	(9) YELLOW
(4) BROWN	(10) VIOLET
(5) SLATE	(11) ROSE
(6) WHITE	(12) AQUA

City IT Cable
Install New Aerial Splice Enclosure
East of

SIG. INV. # 07-0032
US 70 (N. Church St.)
at
SR 1716 (Graham-Hopedale Rd.)

Note: Unused fibers left coiled and stored in splice tray.



VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CITY IT

US 70 (N. Church Street)
at
SR 1716 (Graham-Hopedale Road)
IT Splicing Details

Division 7 Alamance County Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.03 14:56:56 -04'00'
SIGNATURE DATE

38412.10

City IT Cable
Install New Aerial Splice Enclosure
West of

SIG. INV. # 07-0032
US 70 (N. Church St.)
at
SR 1716 (Graham-Hopedale Rd.)

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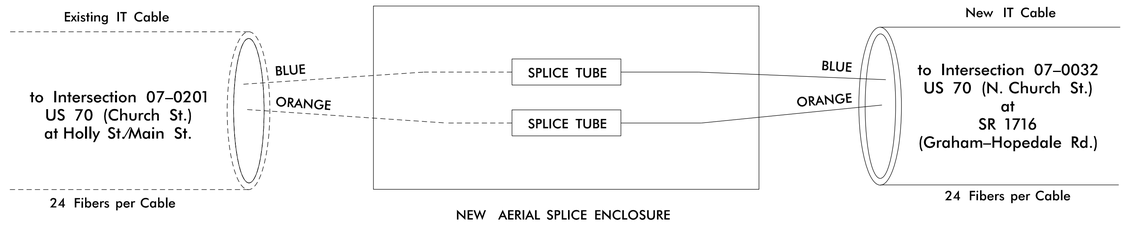
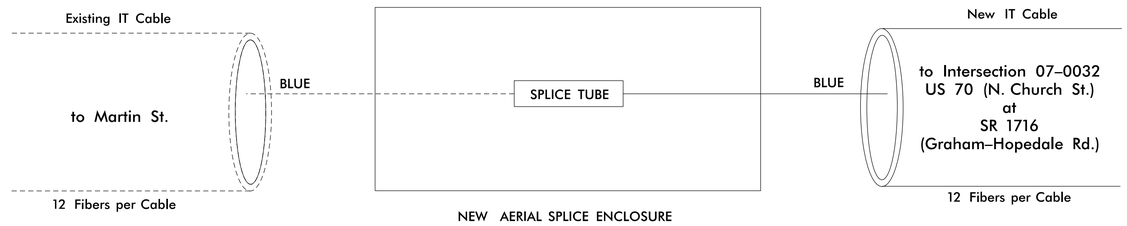


City IT Cable
Install New Aerial Splice Enclosure
North of

SIG. INV. # 07-0032
US 70 (N. Church St.)
at
SR 1716 (Graham-Hopedale Rd.)

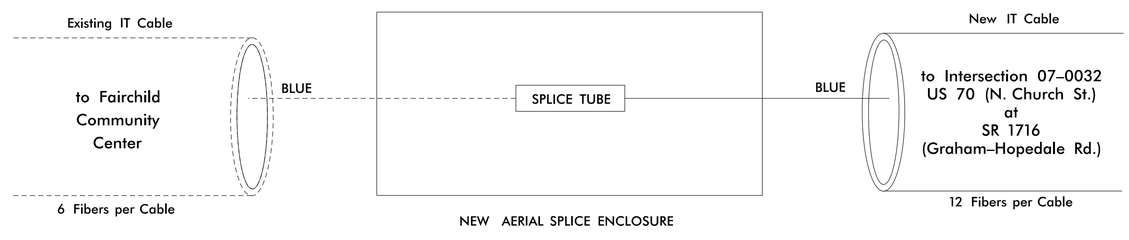
Note: Unused fibers left coiled and stored in splice tray.



City IT Cable
Install New Aerial Splice Enclosure
at

SIG. INV. # 07-0149
SR 1716
(Graham-Hopedale Rd.)
at N. Mebane St.

Note: Unused fibers left coiled and stored in splice tray.



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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CITY IT

US 70 (N. Church Street)
at
SR 1716 (Graham-Hopedale Road)
IT Splicing Details

Division 7 Alamance County Burlington

PLAN DATE:	May 2018	REVIEWED BY:	J. L. Lewis
PREPARED BY:	J. Ma	REVIEWED BY:	M. L. Stygles

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 033108 ENGINEER JIANXIN MA

Jianxin Ma 2018.05.03 14:58:47 -04'00'
SIGNATURE DATE

38412.10

TIP PROJECT: U-5843

CONTRACT: DG00473

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

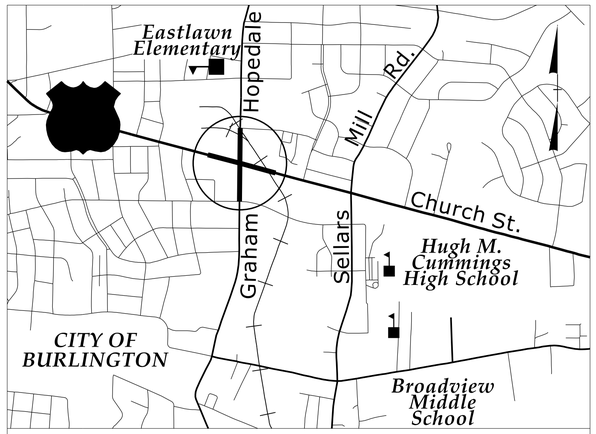
T.I.P. NO.	SHEET NO.
U-5843	UO-1

UTILITIES BY OTHER PLANS
ALAMANCE COUNTY

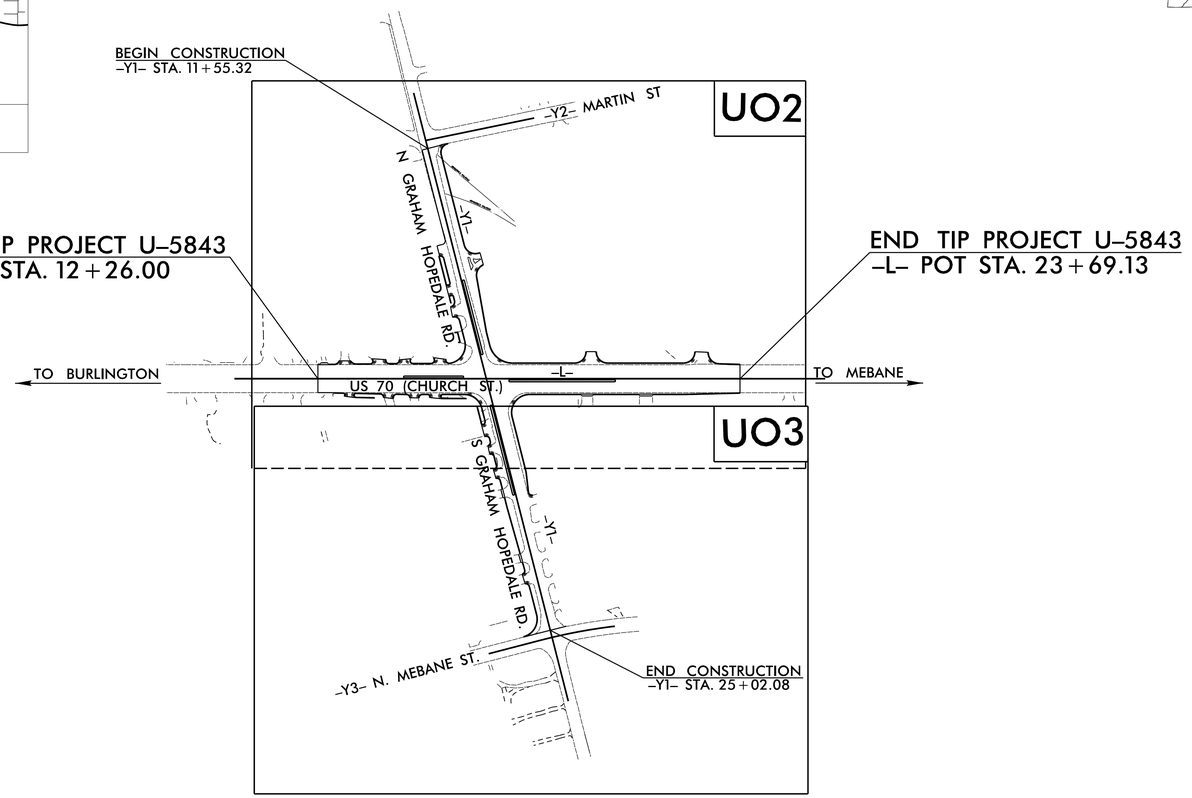
NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET IS DONE BY OTHERS.
NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

LOCATION: US 70 (CHURCH STREET) / GRAHAM-HOPEDALE ROAD IN BURLINGTON

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



VICINITY MAP



NAD 83/NA 2011

THIS PROJECT IS WITHIN THE CITY LIMITS OF BURLINGTON.

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-3	UBO PLAN SHEETS

UTILITY OWNERS WITH CONFLICTS

(A) POWER- DUKE ENERGY, RICK MURRAY 336-222-5564
(B) PHONE- AT&T, RON STOKES 336-682-1090
(C) CABLE- CHARTER, ROGER STANFIELD 336-271-3460
(D) COM.- LEVEL3, MICHAEL NEBINGER 336-217-4211
(E) COM.- MCNC, GRAY DAUGHTRY 919-248-4179
(F) COM.- CITY OF BURLINGTON, SCOTT BIBLER 336-222-5044
(G) WATER & SEWER- CITY OF BURLINGTON MATT BECKWITH 336-222-5055

PREPARED IN THE OFFICE OF:

CH ENGINEERING
3220 GLEN ROYAL RD. RALEIGH, NC 27617
TELE 919.788.0224 FAX 919.788.0232
NC LICENSE #P-0189

BRIAN WILES, PE — UTILITY PROJECT MANAGER
ERIC TWEED, PE — PROJECT UTILITY COORDINATOR

DIVISION OF HIGHWAYS
DIVISION 7
PO BOX 766
115 E. CRESCENT SQUARE DR
GRAHAM, NC 27253

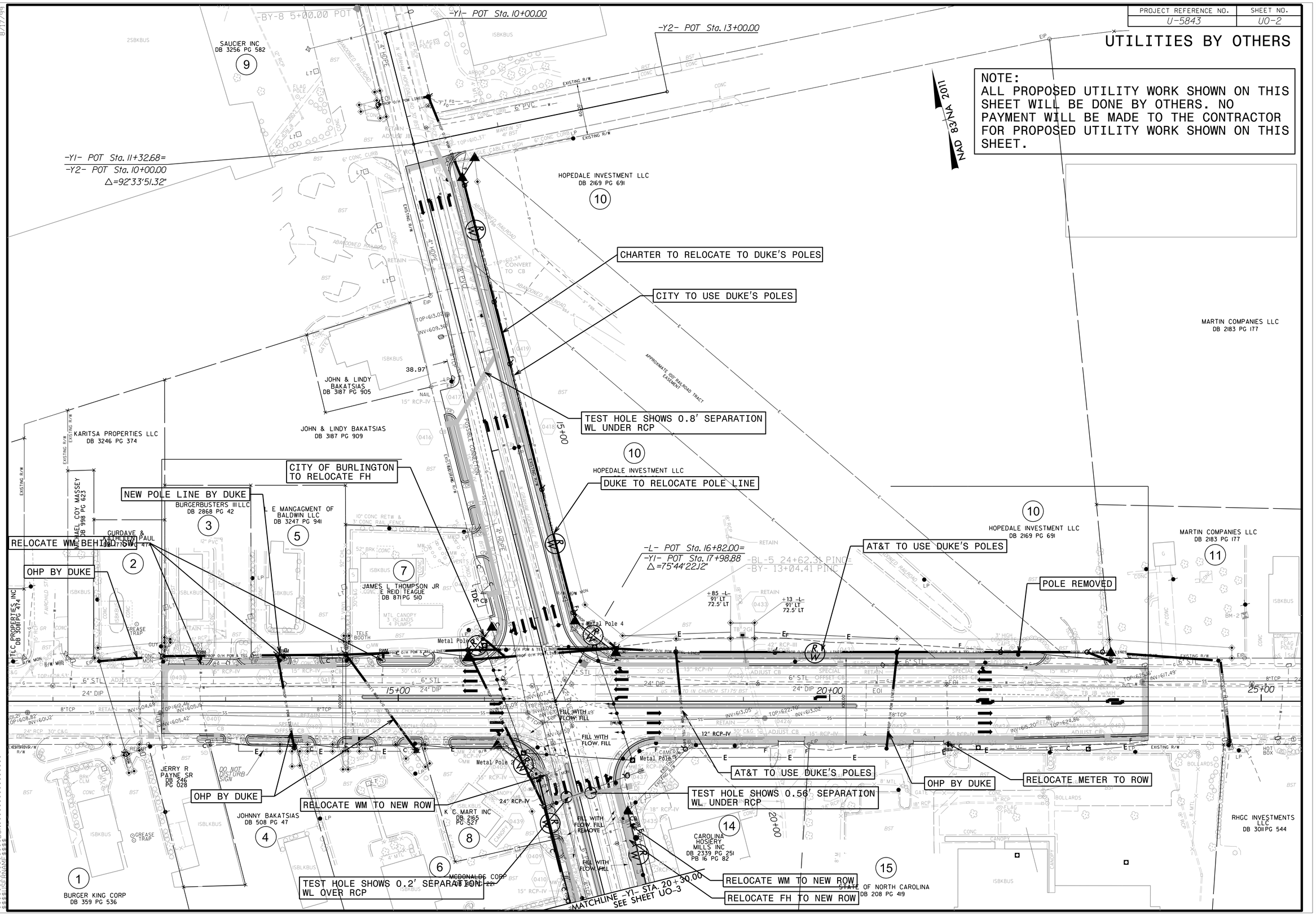
CHRIS SMITHERMAN — DIVISION PROJ. TEAM LEAD
CHAD REIMAKOSKI — DIVISION DESIGN ENGR.
DONALD LANGLEY — DIVISION UTILITY COORDINATOR
PATTY EASON — DIVISION CONSTRUCTION ENGR.

$$$$$SYSTIME$$$$
$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$$$$$UERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-5843	U0-2

UTILITIES BY OTHERS

NOTE:
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.



PROJECT REFERENCE NO.	SHEET NO.
U-5843	UO-3

UTILITIES BY OTHERS

NOTE:
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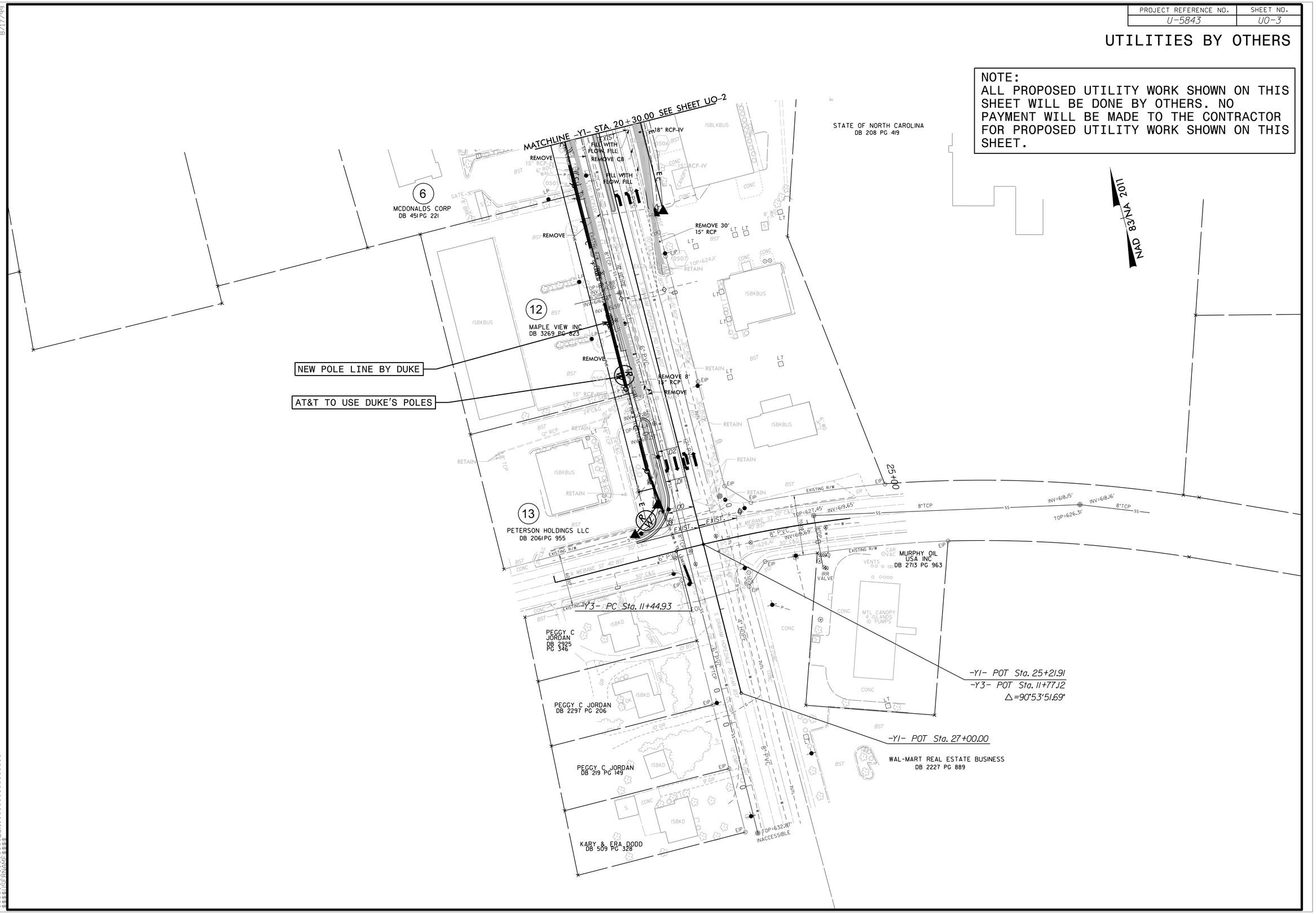

8/17/99

PROJ. REFERENCE NO.	SHEET NO.
U-5843	X-1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

CROSS-SECTION SUMMARY

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)	Station Y1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)	Station Y1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
12+26.00	0	0	11+55.32	0	0	18+50.00	0	0
12+50.00	4	0	12+00.00	24	12	19+00.00	55	3
12+70.00	7	0	12+50.00	24	10	19+50.00	58	3
13+00.00	8	0	13+00.00	24	13	20+00.00	68	0
13+50.00	16	0	13+50.00	24	11	20+50.00	75	0
14+00.00	18	0	14+00.00	26	8	21+00.00	61	2
14+50.00	14	0	14+50.00	44	10	21+50.00	40	6
15+00.00	23	0	15+00.00	64	8	22+00.00	21	6
15+50.00	14	0	15+50.00	68	4	22+50.00	22	4
16+00.00	10	1	16+00.00	64	2	23+00.00	28	2
16+50.00	7	1	16+50.00	64	1	23+50.00	23	1
17+00.00	0	0	17+00.00	64	9	24+00.00	33	0
17+50.00	6	20	17+50.00	35	21	24+50.00	41	0
18+00.00	14	73				25+02.08	19	0
18+50.00	14	141						
19+00.00	9	192						
19+50.00	10	191						
20+00.00	15	150						
20+50.00	18	106						
21+00.00	19	74						
21+50.00	23	50						
22+00.00	30	30						
22+50.00	28	11						
23+00.00	17	3						
23+50.00	12	5						
23+69.13	5	1						

INDEX OF SHEETS

LINE	STATIONS	SHEETS
-L-	12+26.00 TO 23+69.13	X-1 THRU X-6
-Y1-	11+55.32 TO 25+02.08	X-7 THRU X-13

5/9/06
8/28/2018
8:28:27 PM
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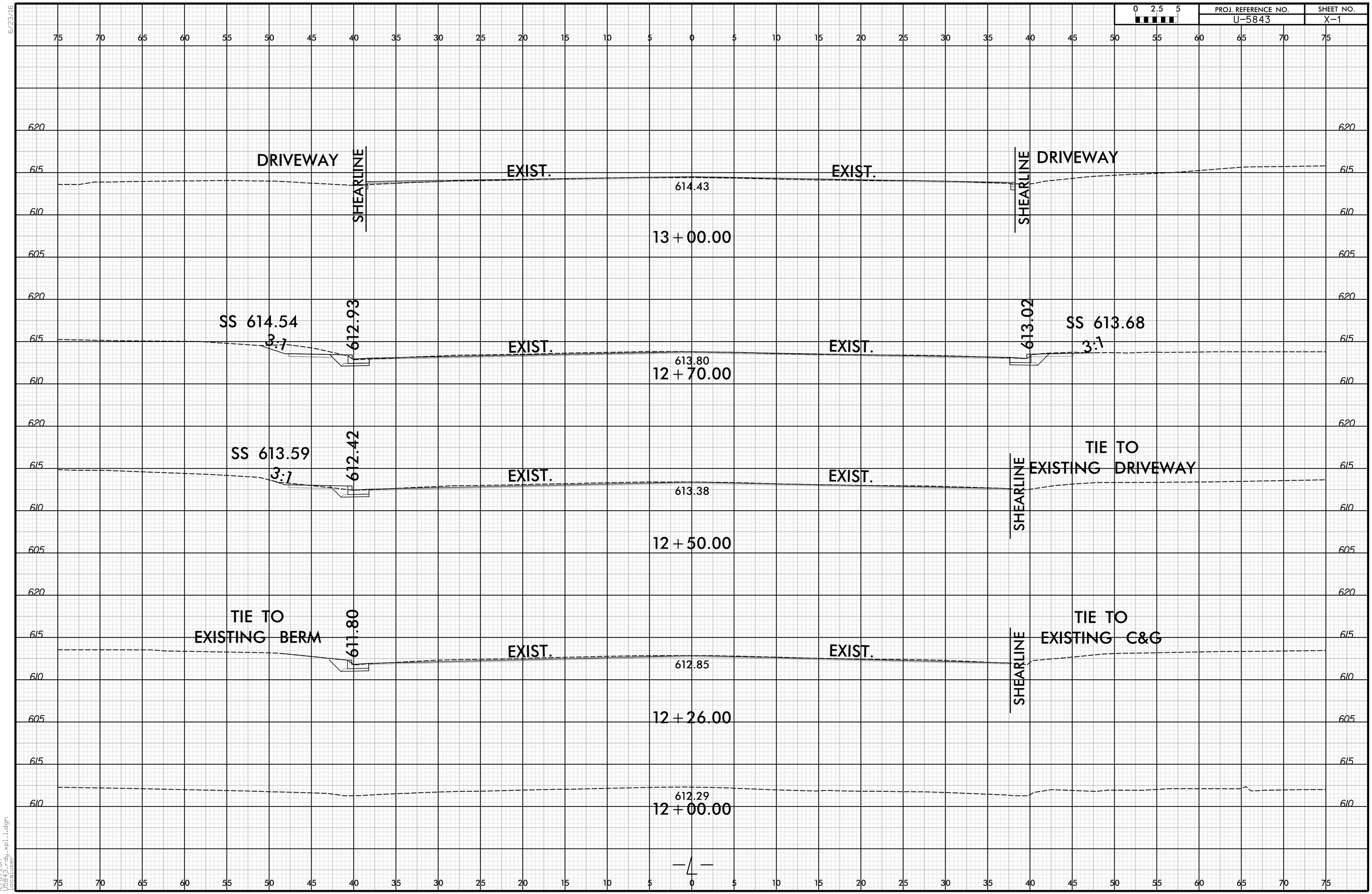
ldpu1ser

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
U-5843	X-1

0 2.5 5



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PROJ. REFERENCE NO.	SHEET NO.
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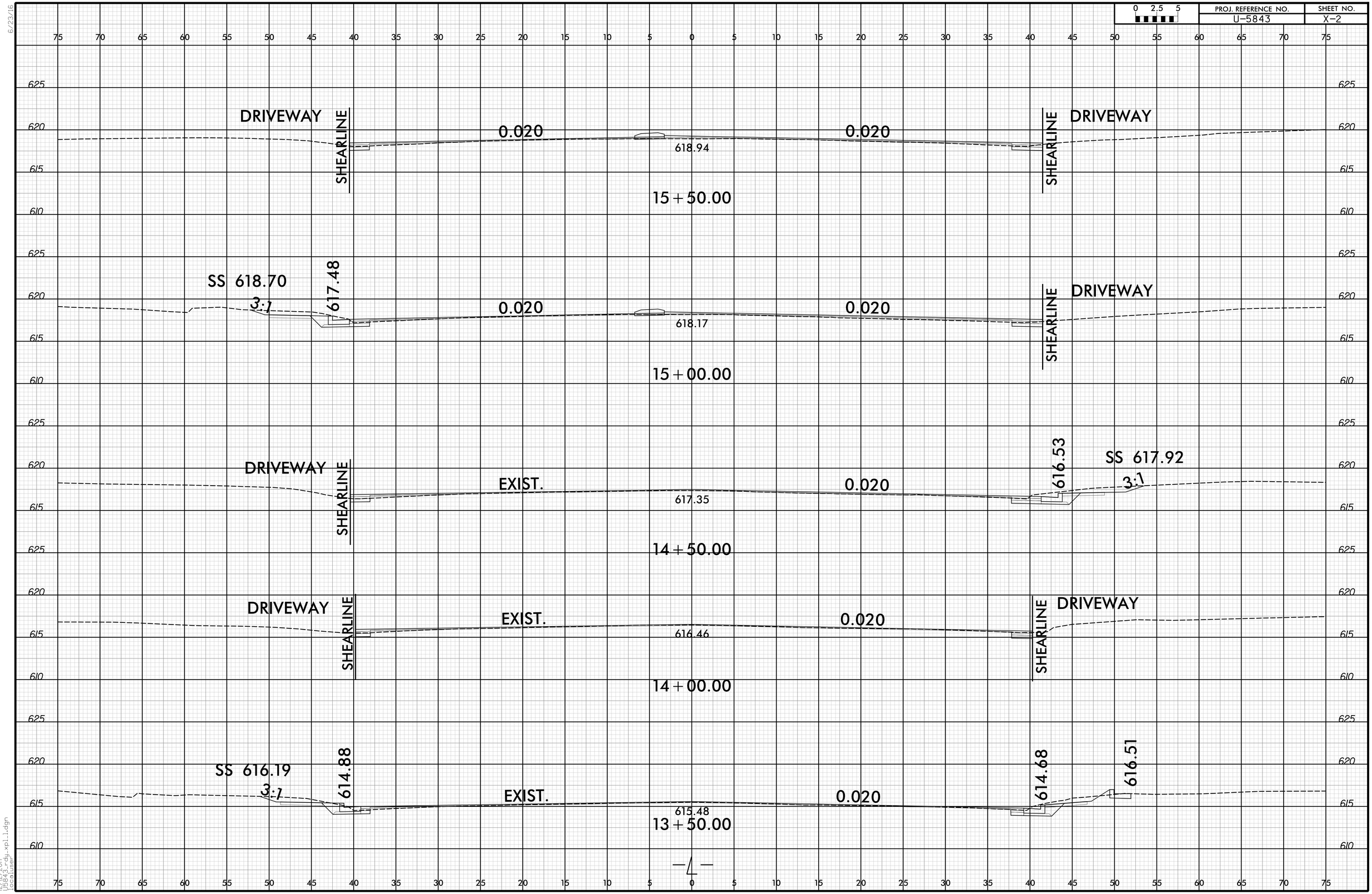

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12/12/2017
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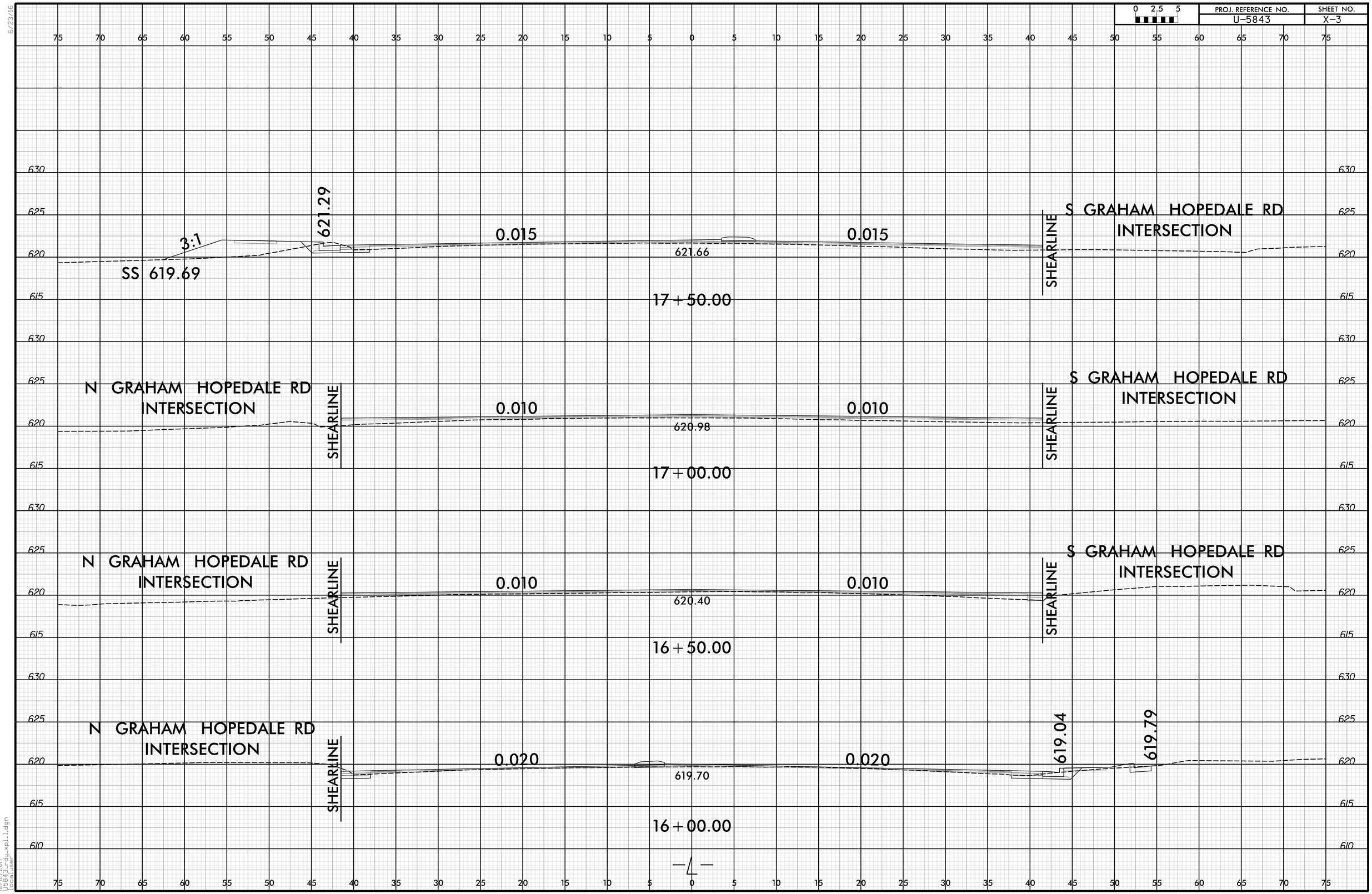
630
625
620
615
610
3:1
621.29
SS 619.69
0.015
621.66
0.015
17+50.00
S GRAHAM HOPEDALE RD
INTERSECTION
SHEARLINE
N GRAHAM HOPEDALE RD
INTERSECTION
SHEARLINE
0.010
620.98
0.010
17+00.00
S GRAHAM HOPEDALE RD
INTERSECTION
SHEARLINE
N GRAHAM HOPEDALE RD
INTERSECTION
SHEARLINE
0.010
620.40
0.010
16+50.00
S GRAHAM HOPEDALE RD
INTERSECTION
SHEARLINE
N GRAHAM HOPEDALE RD
INTERSECTION
SHEARLINE
0.020
619.70
0.020
619.04
619.79
16+00.00
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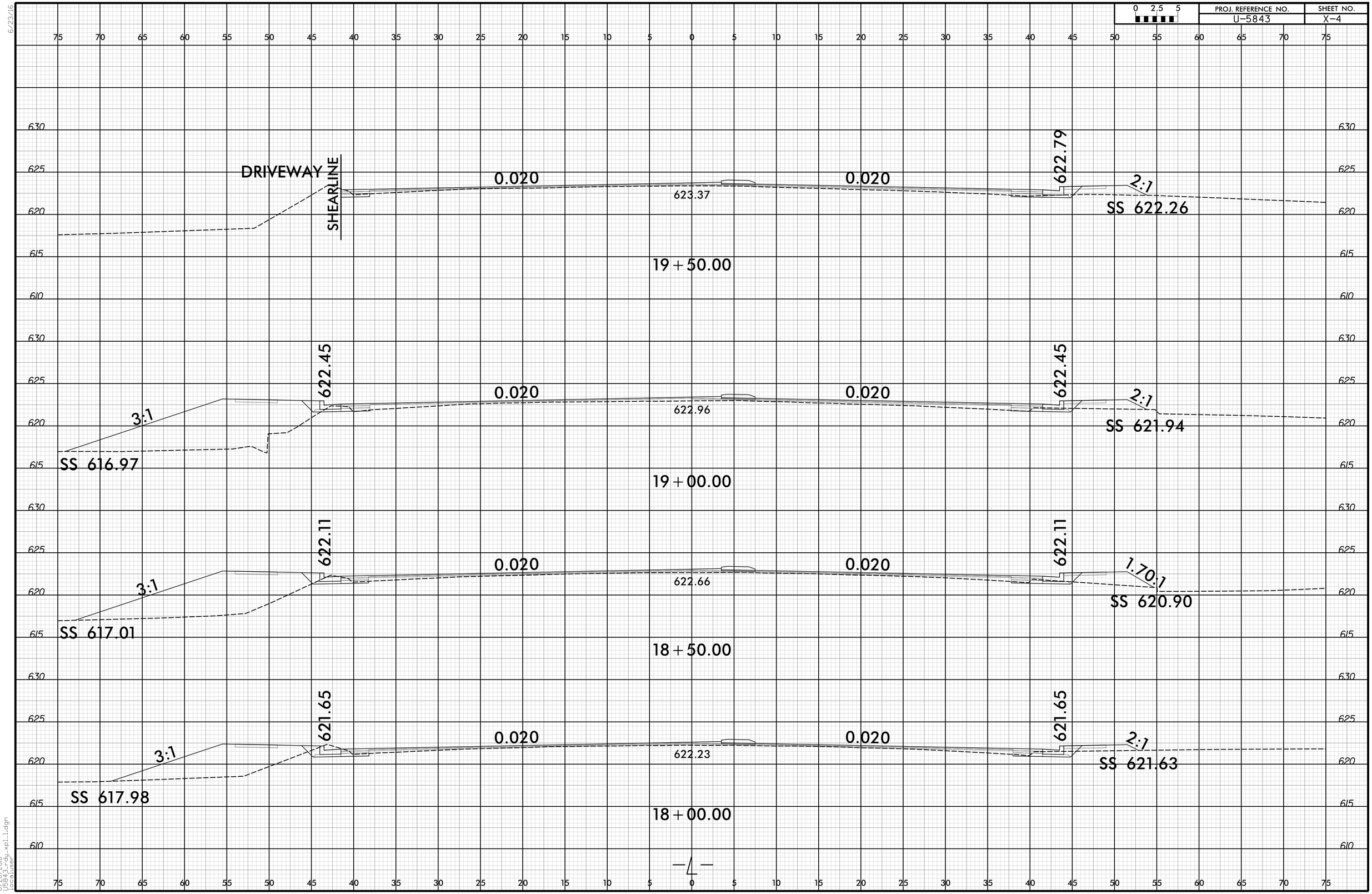
PROJ. REFERENCE NO.	SHEET NO.
U-5843	X-4



6/23/16

8/28/2018
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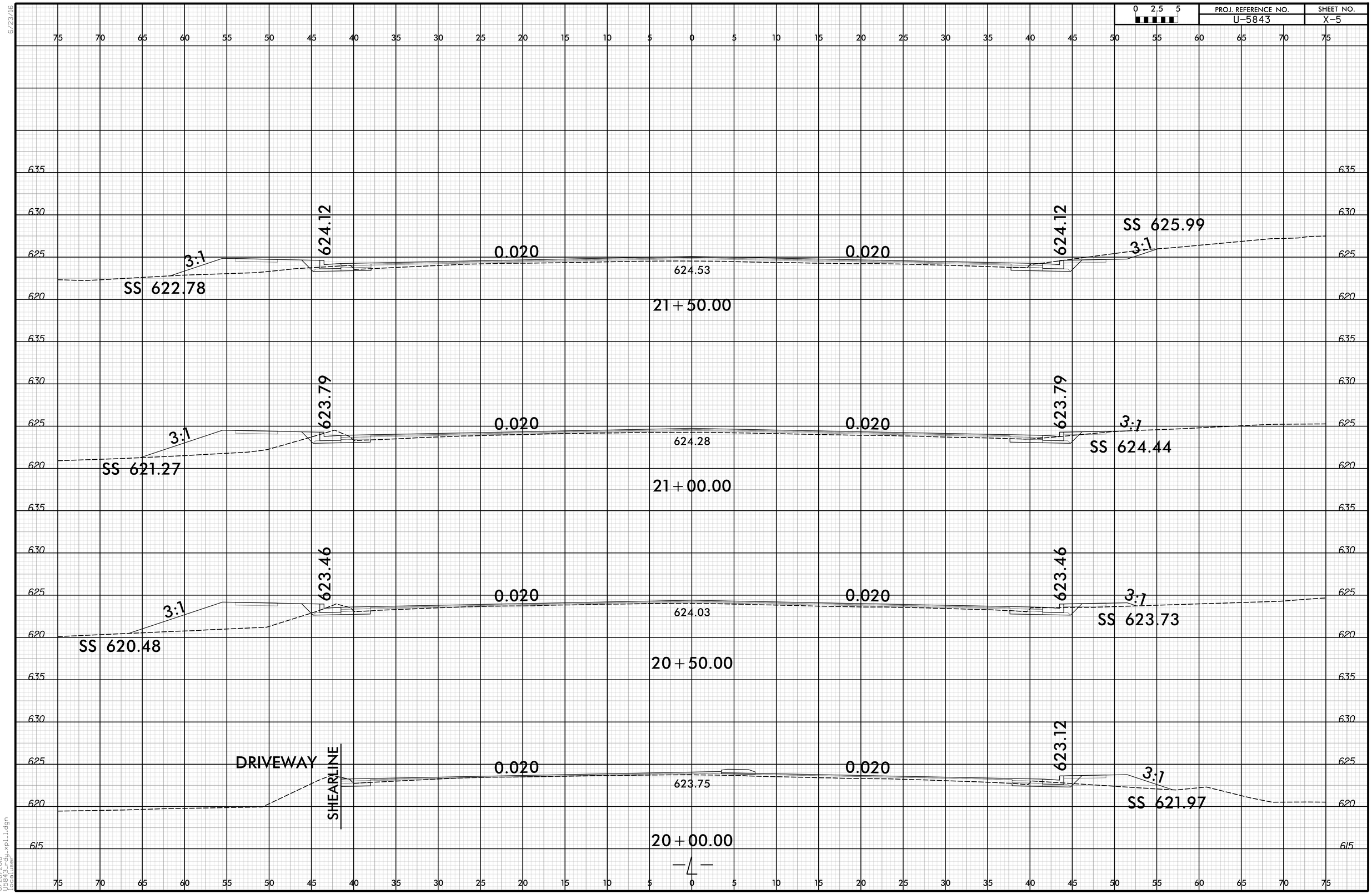

6/23/16
8/28/2018
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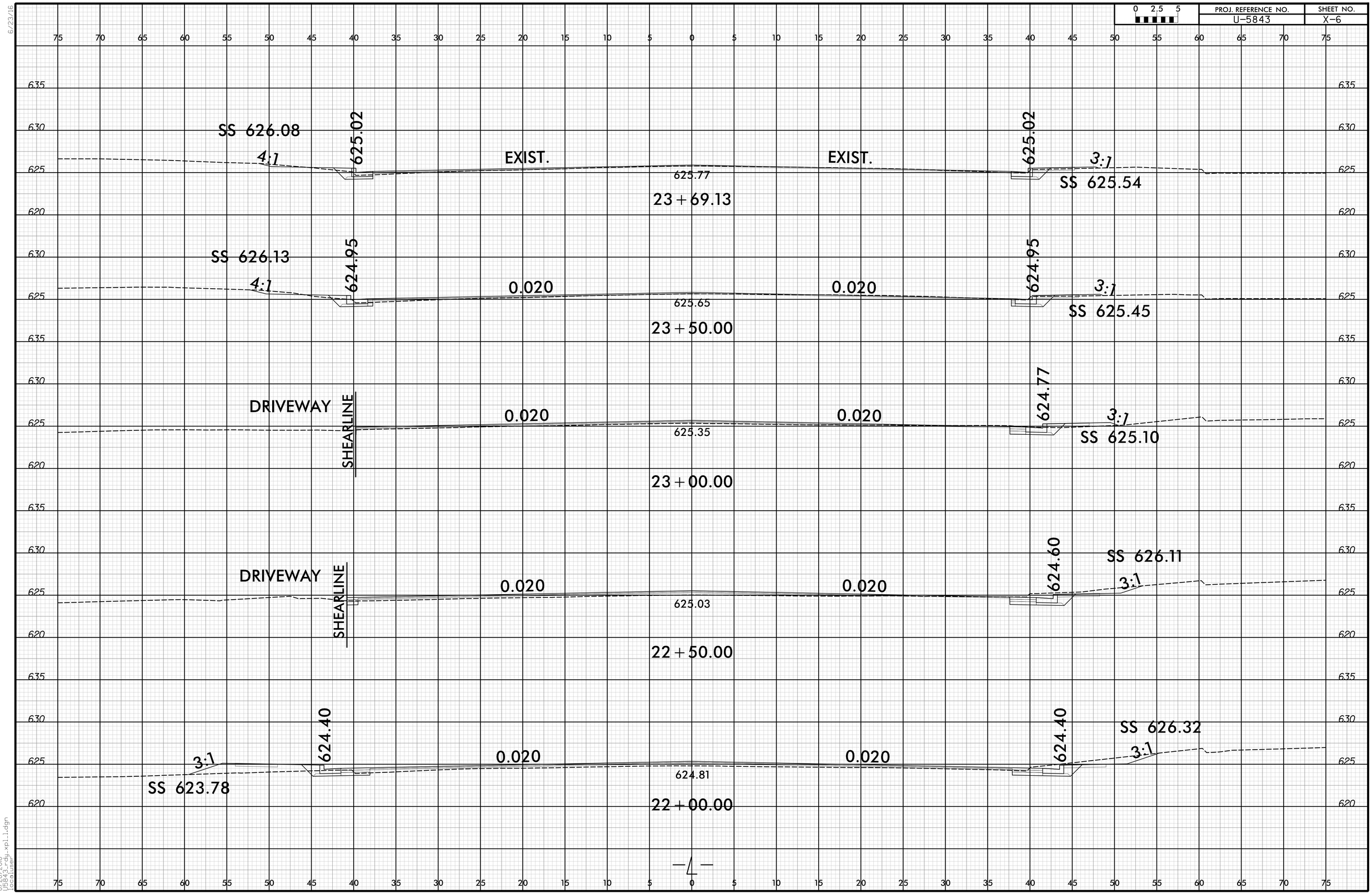

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8/28/2018
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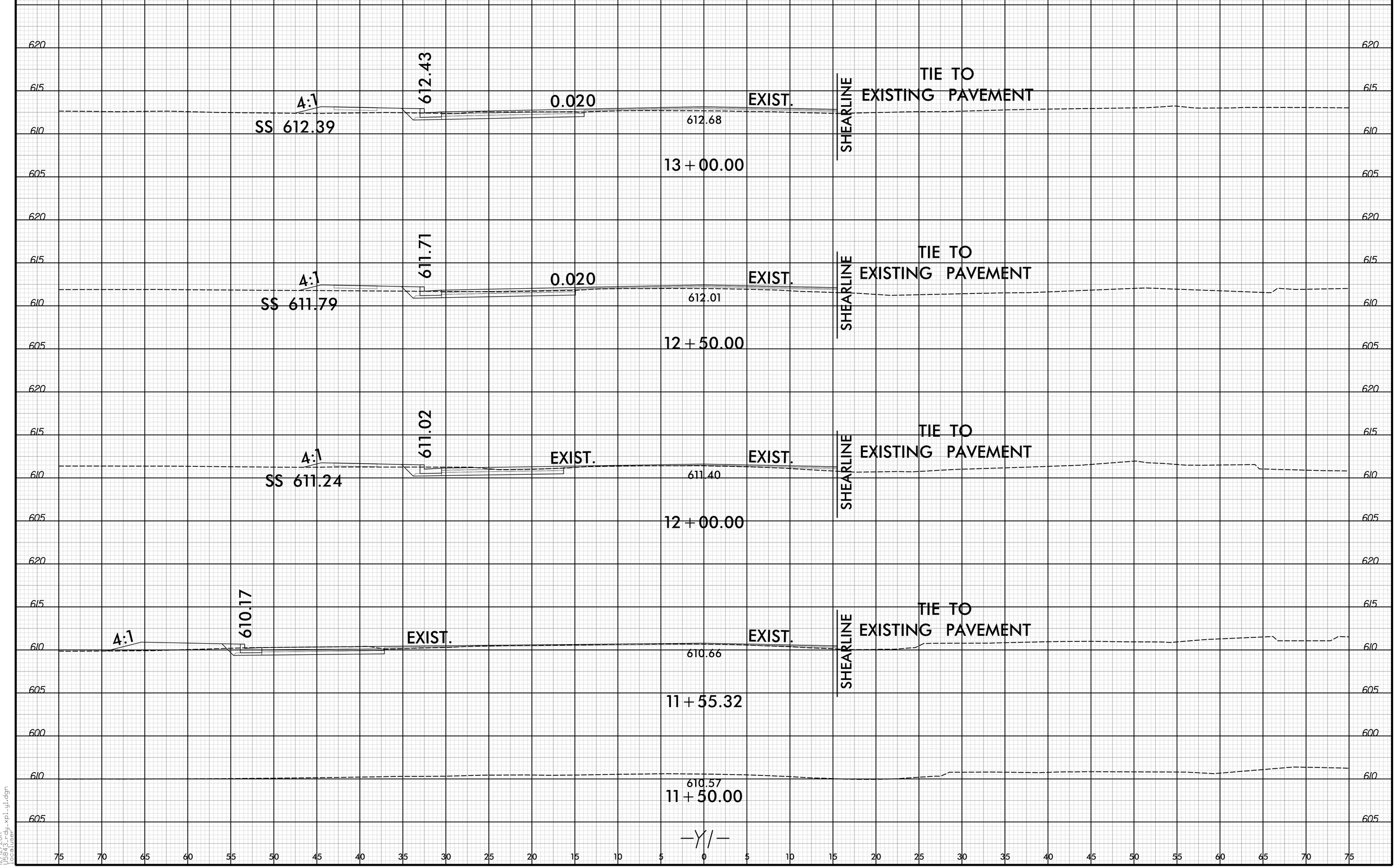

6/23/16
12/12/2017
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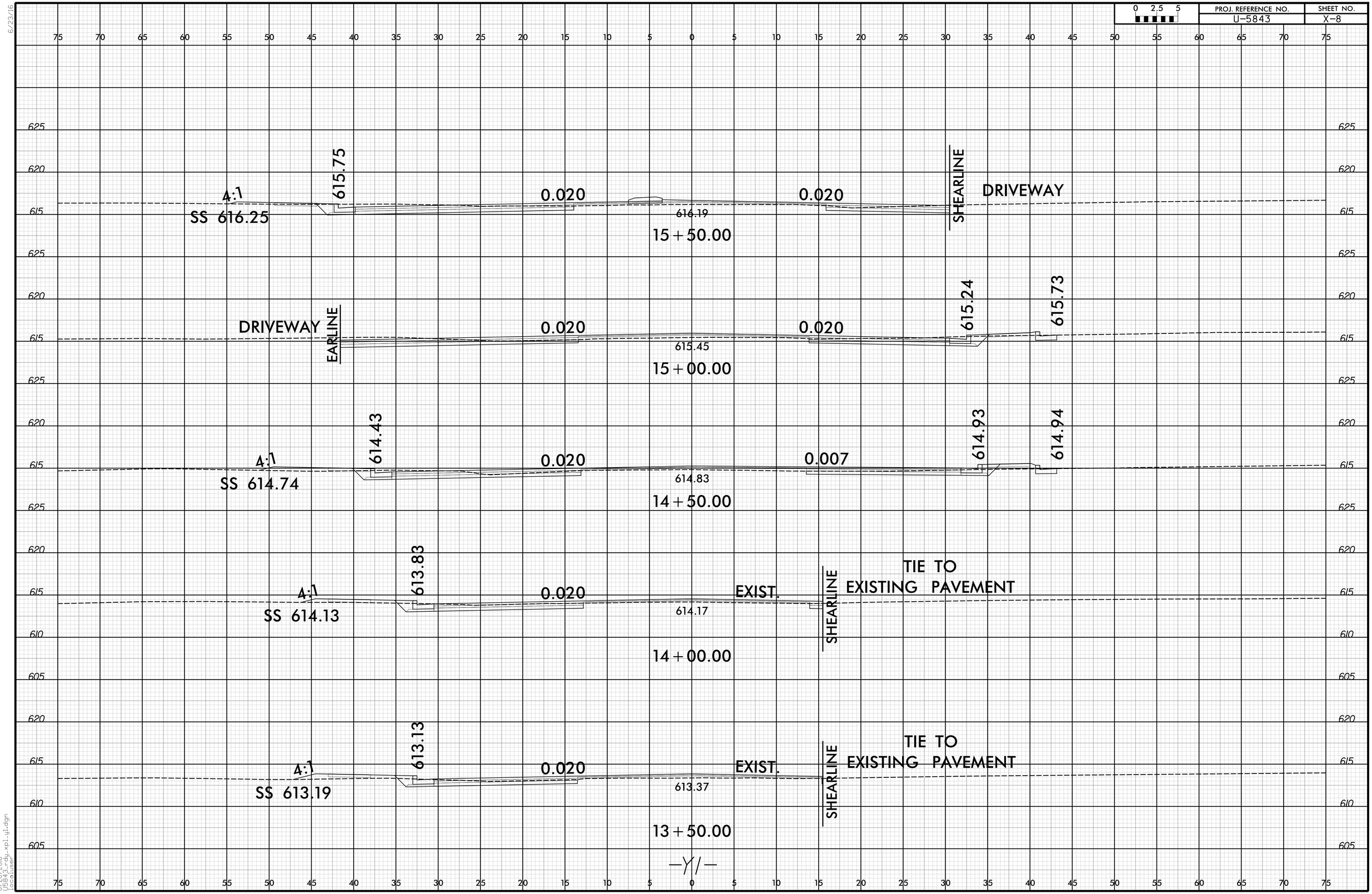
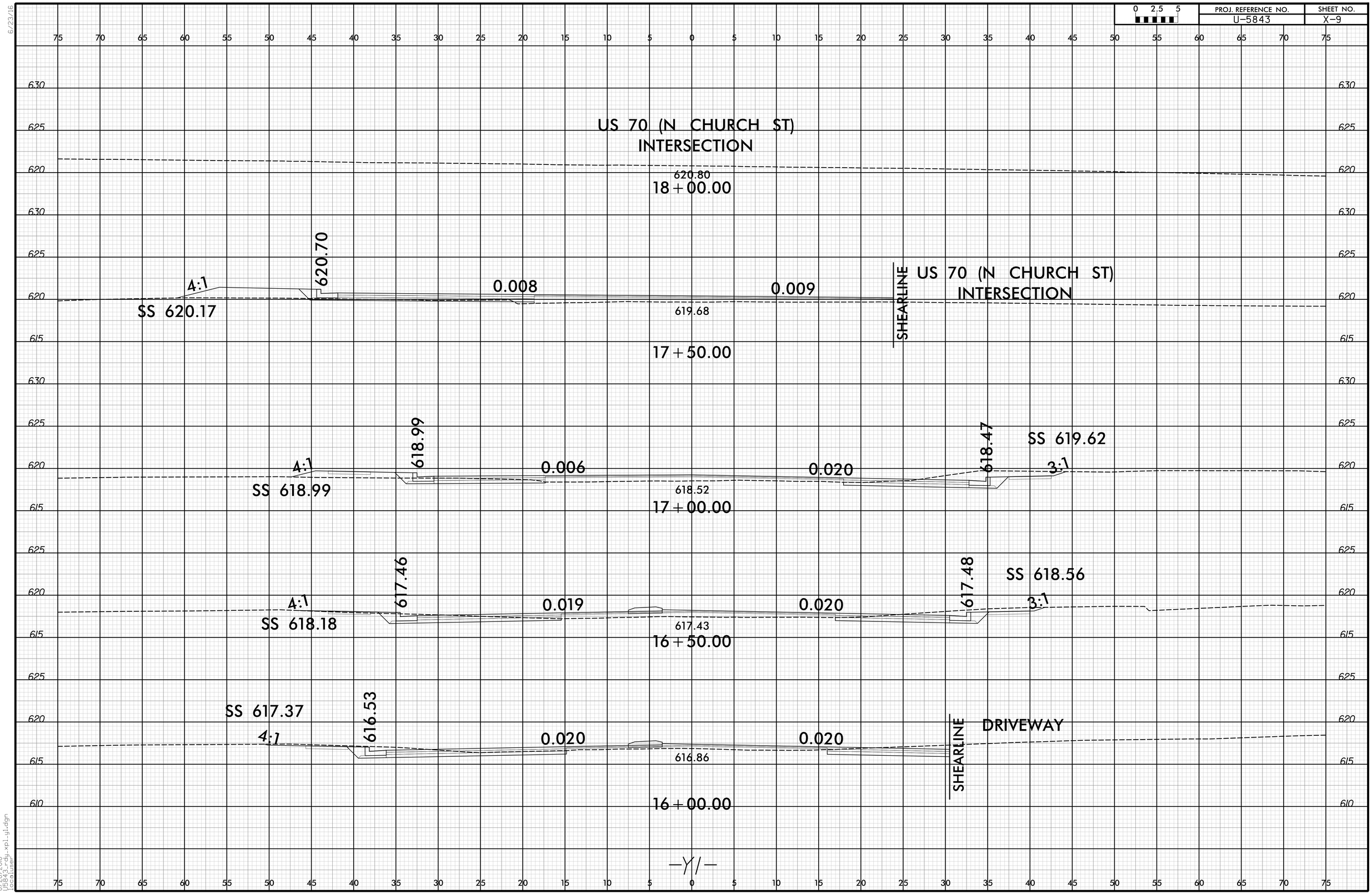
locoluser

PROJ. REFERENCE NO.	SHEET NO.
U-5843	X-8





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8/28/2018
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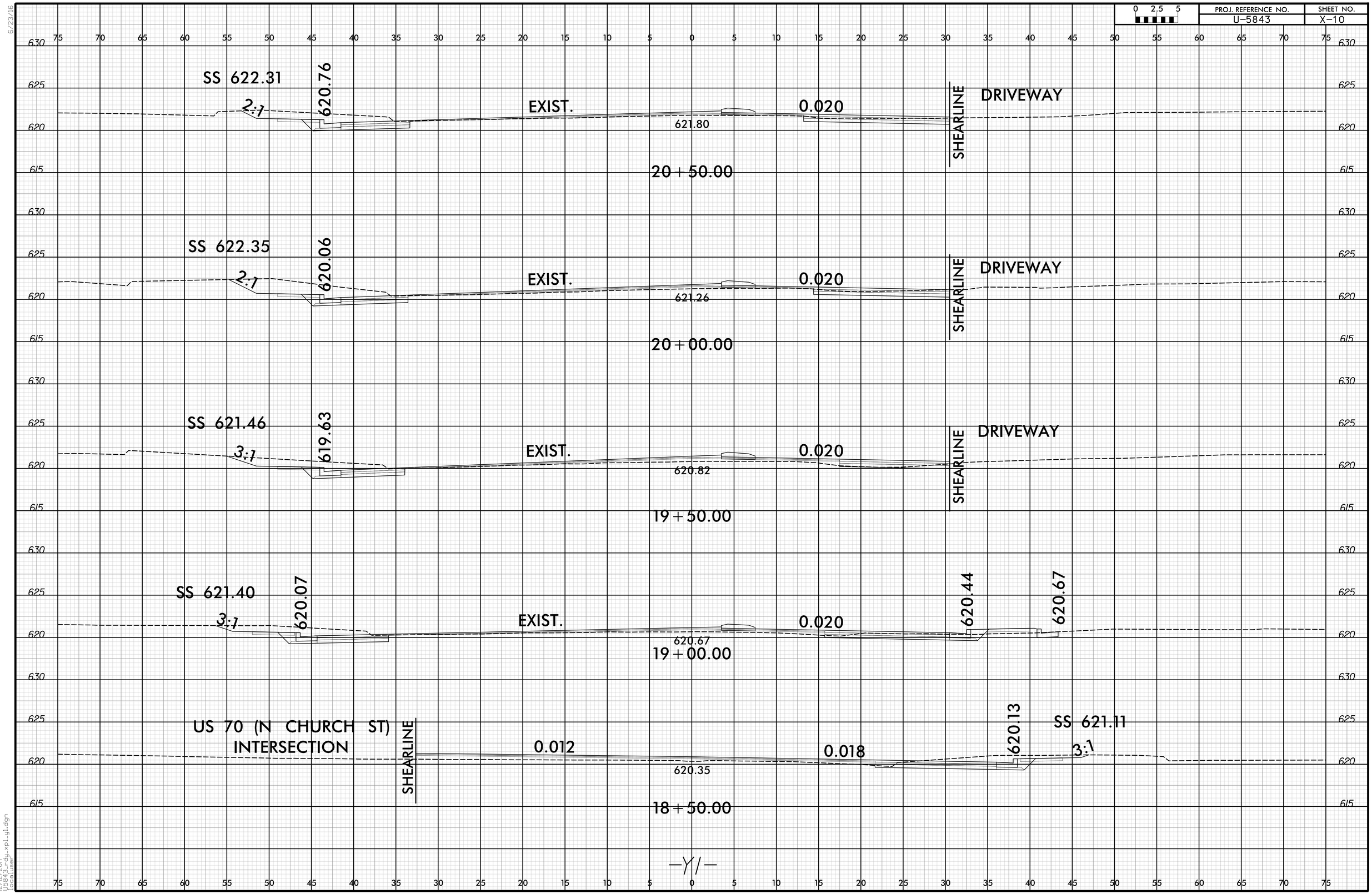
locaUser


SS 622.31
620.76
2:1
EXIST.
0.020
621.80
SHEARLINE
DRIVEWAY
20+50.00
SS 622.35
620.06
2:1
EXIST.
0.020
621.26
SHEARLINE
DRIVEWAY
20+00.00
SS 621.46
619.63
3:1
EXIST.
0.020
620.82
SHEARLINE
DRIVEWAY
19+50.00
SS 621.40
620.07
3:1
EXIST.
0.020
620.67
620.44
620.67
19+00.00
US 70 (N CHURCH ST)
INTERSECTION
SHEARLINE
0.012
0.018
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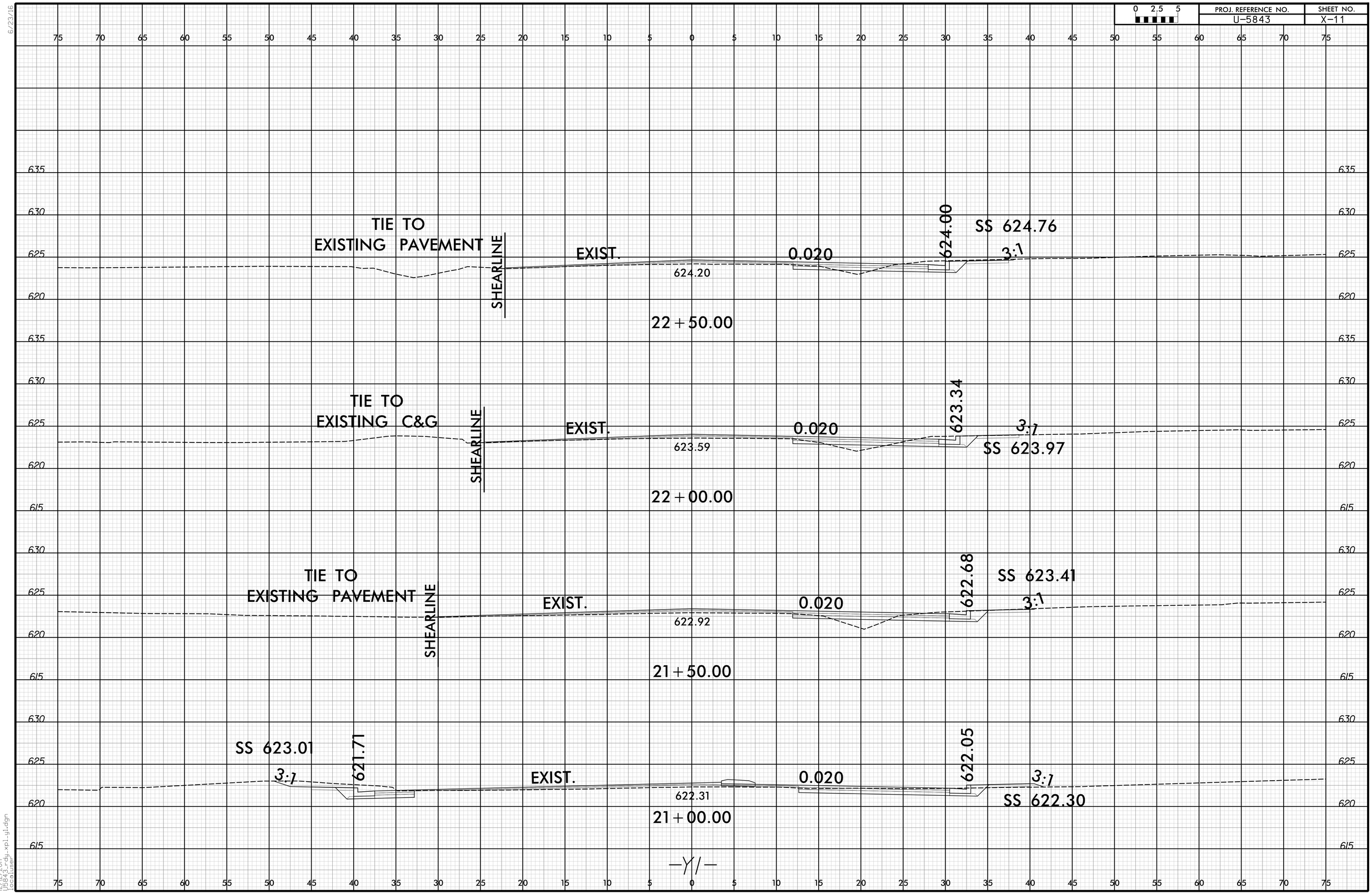
620.13
SS 621.11
3:1
18+50.00
-Y1-

PROJ. REFERENCE NO.	SHEET NO.
U-5843	X-11



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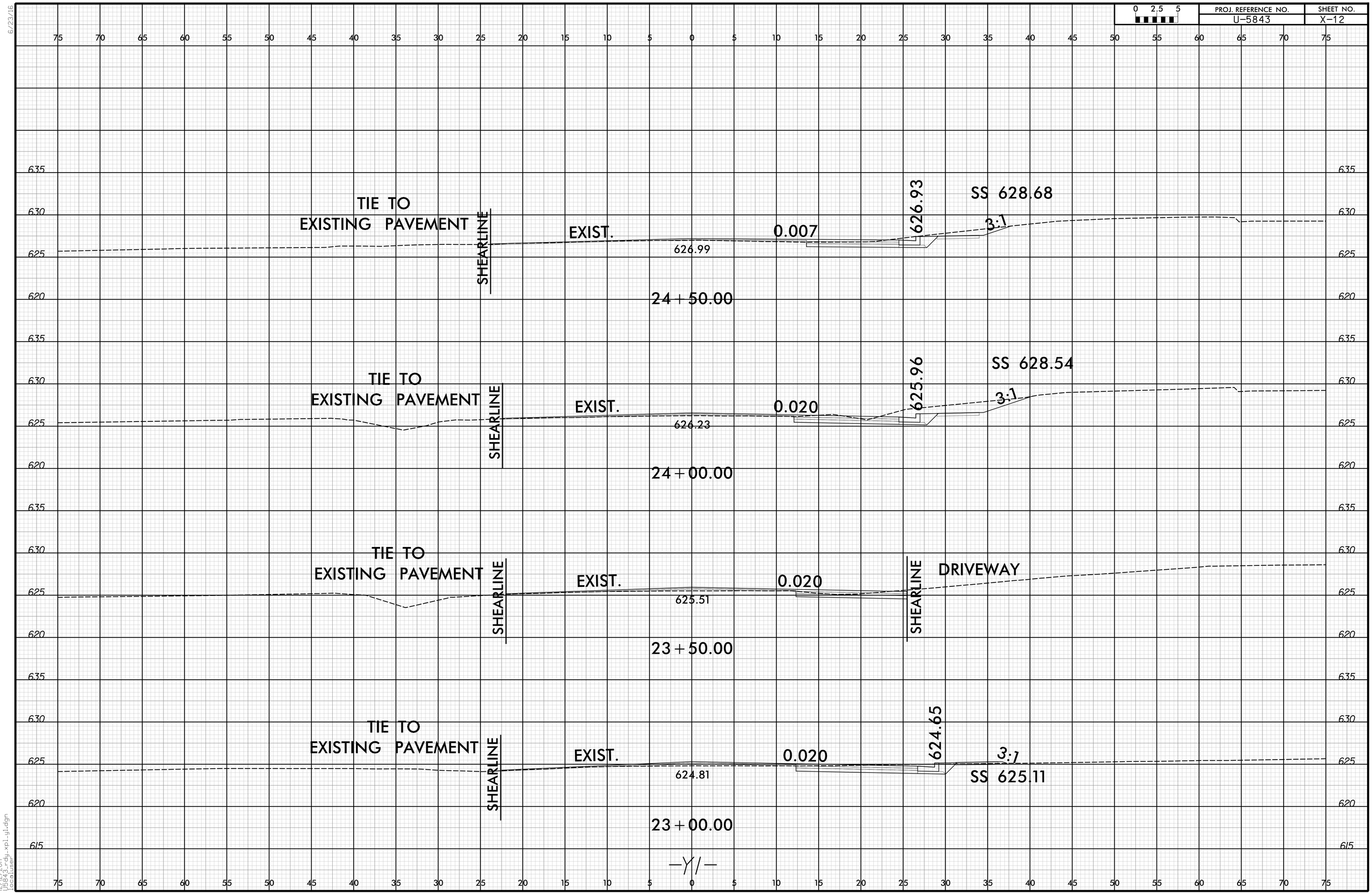
jocelyuser



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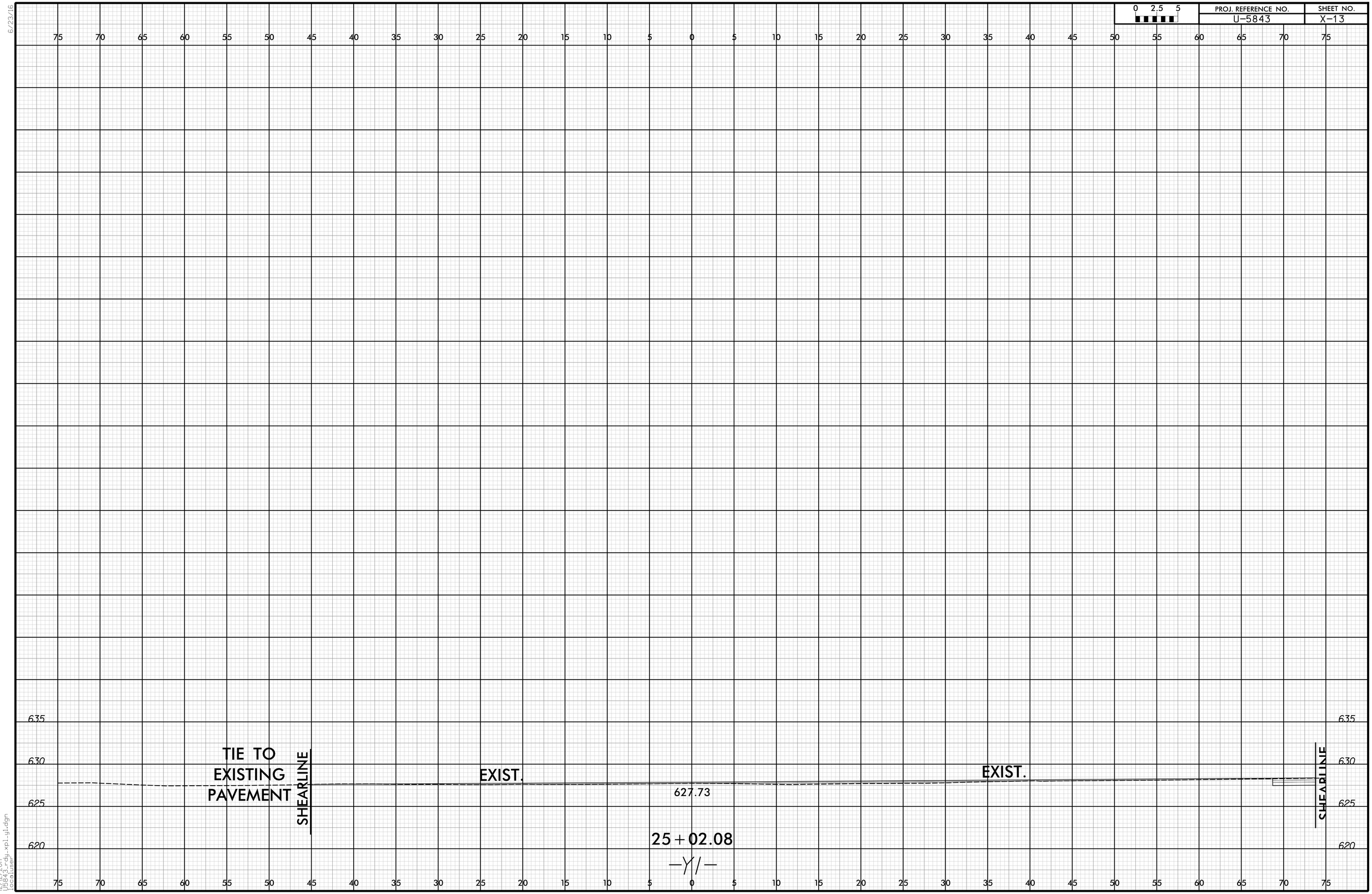
localuser

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-5843	X-13



12/12/2017
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locoluser