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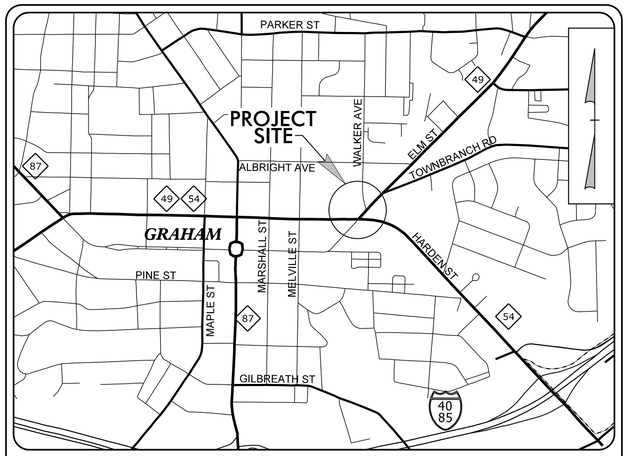
TIP PROJECT: U-6017



VICINITY MAP
NOT TO SCALE

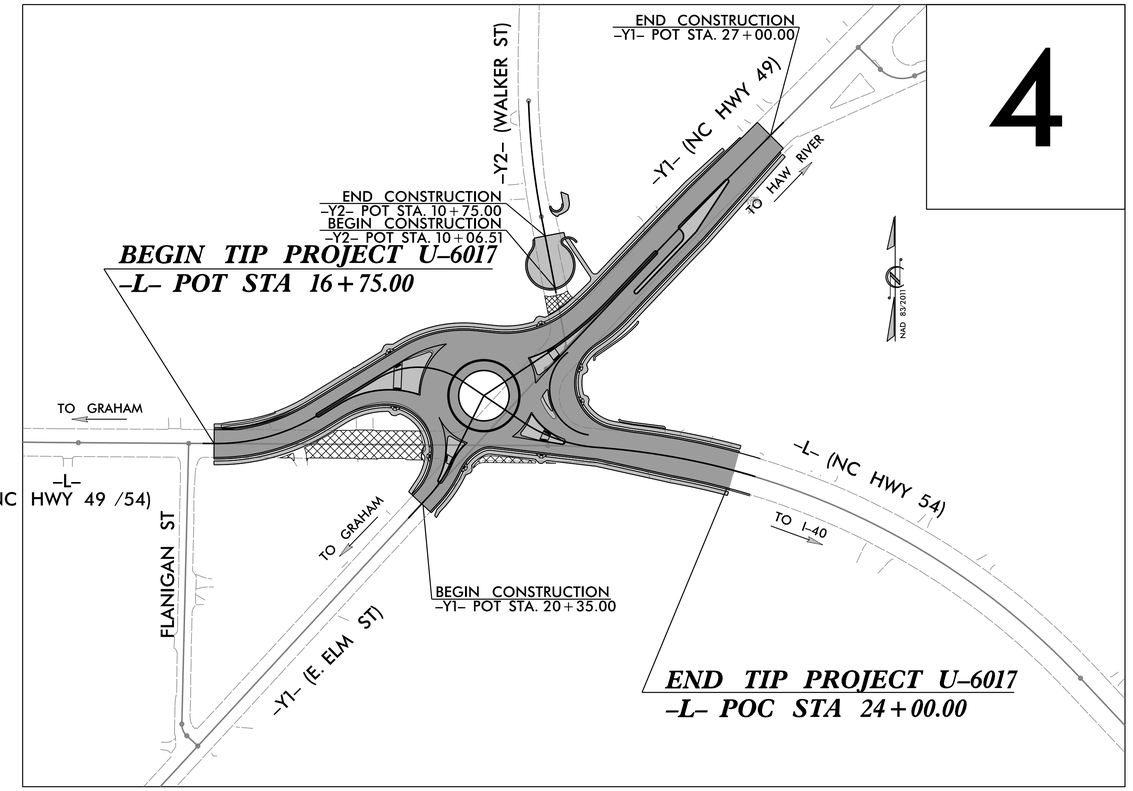
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

ALAMANCE COUNTY

LOCATION: INTERSECTION IMPROVEMENTS AT NC 54 (EAST HARDEN ST.) AND NC 49 (EAST ELM ST.) IN GRAHAM

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNING, AND PAVEMENT MARKING



4

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6017	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
47162.1.1	N/A	PE
47162.2.1	N/A	ROW
47162.2.2	N/A	UTIL
47162.3.1	N/A	CONST

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

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

GRAPHIC SCALE

50 25 0 50 100
PLANS

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

Company Logo

Prepared In the Office of:

SUNGATE DESIGN GROUP, P.A.

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

Designed by:

BRIAN N. ELAM, PE — ***3195***
NAME — *LEVEL III CERTIFICATION NO.*

Roadway Standard Drawings

The "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2024 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

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

1/24/2024
U6017_EC_dsn_psh_01.dgn
abrown

PROJECT REFERENCE NO.	SHEET NO.
U-6017	EC-02
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

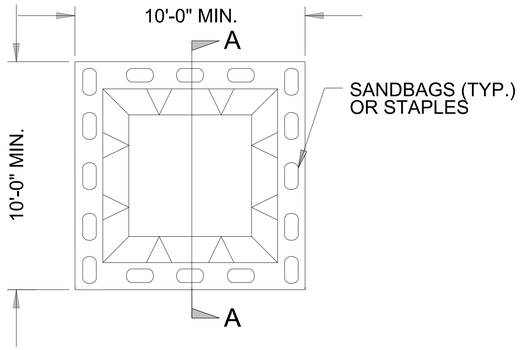
EROSION & SEDIMENT CONTROL LEGEND

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.04	Stilling Basin	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1630.07	Skimmer Basin	
1630.08	Tiered Skimmer Basin	
1630.09	Earthen Dam with Skimmer	
	Infiltration Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C

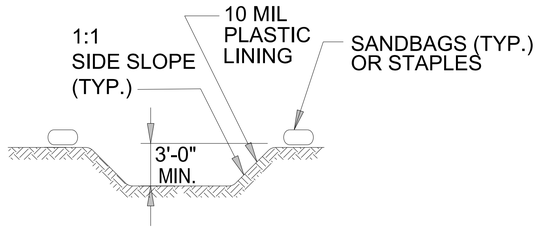
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet Sediment Trap Type A	A
1635.02	Rock Pipe Inlet Sediment Trap Type B	B
1636.01	Excelsior Wattle Check	
1636.01	Excelsior Wattle Check with Flocculant	
1636.01	Coir Fiber Wattle Check	
1636.01	Coir Fiber Wattle Check with Flocculant	
1636.02	Silt Fence Excelsior Wattle Break	EW
	Silt Fence Coir Fiber Wattle Break	CFW
1636.03	Excelsior Wattle Barrier	—EW—EW—EW—
1636.03	Coir Fiber Wattle Barrier	—CFW—CFW—CFW—

PROJECT REFERENCE NO.	SHEET NO.
U-6017	EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A

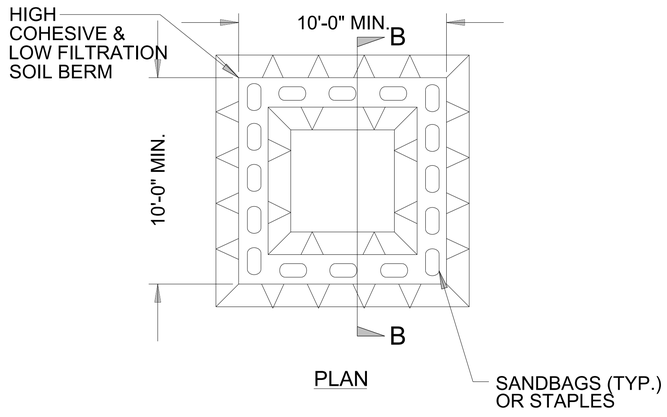
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

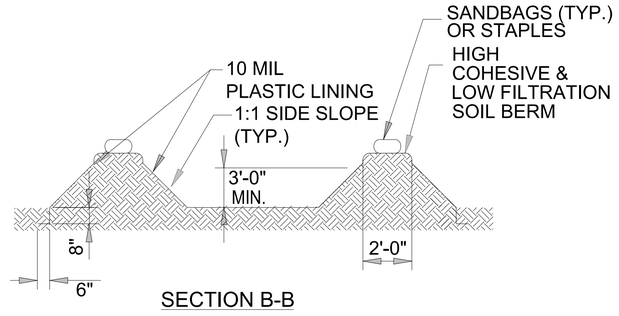
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

NOT TO SCALE



PLAN



SECTION B-B

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
U-6017	EC-3
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.

NOTE:
UTILIZE FABRIC INSERT INLET PROTECTION DEVICES IN LIEU OF ROCK INLET SEDIMENT TRAPS, TYPE-C AS DIRECTED TO AVOID IMPOUNDMENT OF RUNOFF IN ROADWAY OPEN TO TRAFFIC.

PROJECT REFERENCE NO.	SHEET NO.
U-6017	EC-04/CONST.04
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04

REVISIONS
1: 03/29/2022 - REVISED RIGHT OF WAY AND TEMPORARY EASEMENT ON PARCELS 1 AND 2 TO ACCOUNT FOR MAINTAINING THE STAIRWAY TO THE CHURCH.
2: 03/29/2022 - ADDED 3' X 5' AUE TO THE PUE ON PARCEL 20 TO AVOID IMPACT TO EXISTING BILLBOARD.
3: 03/29/2022 - REVISED TEMPORARY EASEMENT ON PARCEL 18 TO AVOID EXISTING BUILDING.
4: 08/26/2022 - REVISED PROPOSED ROW & PUE ON PARCEL 7.
5: 08/26/2022 - REVISED PUE ON PARCEL 8.

NAD 83/2011

NOTE: ALL DRIVEWAYS ARE RADIUS TYPE WITH A RADIUS OF 2' UNLESS NOTED OTHERWISE

SEE SHEET 2B-1 FOR ADDITIONAL HORIZONTAL DATA AND SUPERELEVATION INFORMATION

* SEE SHEET 2C-4 FOR DETAIL OF HANDRAIL ON RETAINING WALL

-Y2- PT Sta. 12+51.35

-Y2- PC Sta. 11+00.40

END CONSTRUCTION
-Y2- POT Sta. 10+75.00

BEGIN CONSTRUCTION
-Y2- POT Sta. 10+06.51

END CONSTRUCTION
-Y1- POT Sta. 27+00.00
-Y1- PT Sta. 26+95.64

END RETAINING WALL
-L- STA. 18+87.73

BEGIN RETAINING WALL
-L- STA. 17+65.00

CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL 1

REMOVE STAIR WINGS TO BACK OF CURB AND GRADE BACKSLOPE TO ALLOW PROPER DRAINAGE

-L- PC Sta. 16+77.43

BEGIN TIP PROJECT U-6017
-L- POT Sta. 16+75.00

-L- PC Sta. 13+76.24

-L- PT Sta. 15+01.84

TIE TO EXIST CURB AND SIDEWALK

3' X 5' AUE POCKET SEE DETAIL

BEGIN CONSTRUCTION
-Y1- POT Sta. 20+35.00

END TIP PROJECT U-6017
BEGIN RESURFACING
-L- POC Sta. 24+00.00

END RESURFACING
-L- POC Sta. 26+00.00

-L- PT Sta. 29+06.16

END PROP 2'-6" C&G
-L- STA. 24+47.00

DETAIL
3' X 5' AUE POCKET

DETAIL 1
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)

D= 1.0'
B= 2.0

FROM STA. 17+65 TO STA. 18+87 -L- LT.

1 CHILDREN'S CHAPEL UNITED CHURCH OF CHRIST DB 8 PG 653 PB 71PG 337
2 COL CEMETERY DB 79 PG 129 PB 71PG 337
3 JERRY D. SHOUSE, JR JEFFREY G. SHOUSE DB 975 PG 43
4 JJ JESUS L. MARQUEZ MINERVA DE MARQUEZ
5 GORDON H. MILLER
6 KATIE N. WHEELER HEIRS DB 500 PG 128 PB 2 PG 14
7 BASS PROPERTIES LLC DB 3614 PG 156
8 JOHN BREWER & MARY BREWER DB 2565 PG 769 DB 3084 PG 950
9 KERRY F. & EUNICE L. RICHMOND DB 4116 PG 994 PB 73 PG 118
10 GLENN E. BYRD DB 2522 PG 780
11 THOMAS PHILIP YOUNG DB 2171 PG 776
12 B.B.H. PROPERTIES DB 2522 PG 777
13 THOMAS P. YOUNG DB 3107 PG 87
14 SHAYONA CORP. DB 843 PG 328
15 KERRY F. & EUNICE L. RICHMOND DB 4292 PG 511
16 ANTHONY KUKIELKA BRANDY KUKIELKA DB 2246 PG 703
17 WILLIW ERVIN MEBANE HEIRS DB 294 PG 493
18 CAROLINA HOSIERY MILLS INC. DB 1130 PG 699
19 BARBARA J. HARRISON ROBERT O. LAKE
20 BARBARA JEAN LAKE HARRISON DB 445 PG 619 PB 1PG 24

PROJECT REFERENCE NO.	SHEET NO.
U-6017	EC-05/CONST.04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FINAL GRADING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04

NOTE:
UTILIZE FABRIC INSERT INLET PROTECTION DEVICES IN LIEU OF ROCK INLET SEDIMENT TRAPS, TYPE-C AS DIRECTED TO AVOID IMPOUNDMENT OF RUNOFF IN ROADWAY OPEN TO TRAFFIC.

NOTE: ALL DRIVEWAYS ARE RADIUS TYPE WITH A RADIUS OF 2' UNLESS NOTED OTHERWISE

SEE SHEET 2B-1 FOR ADDITIONAL HORIZONTAL DATA AND SUPERELEVATION INFORMATION

* SEE SHEET 2C-4 FOR DETAIL OF HANDRAIL ON RETAINING WALL

REVISIONS

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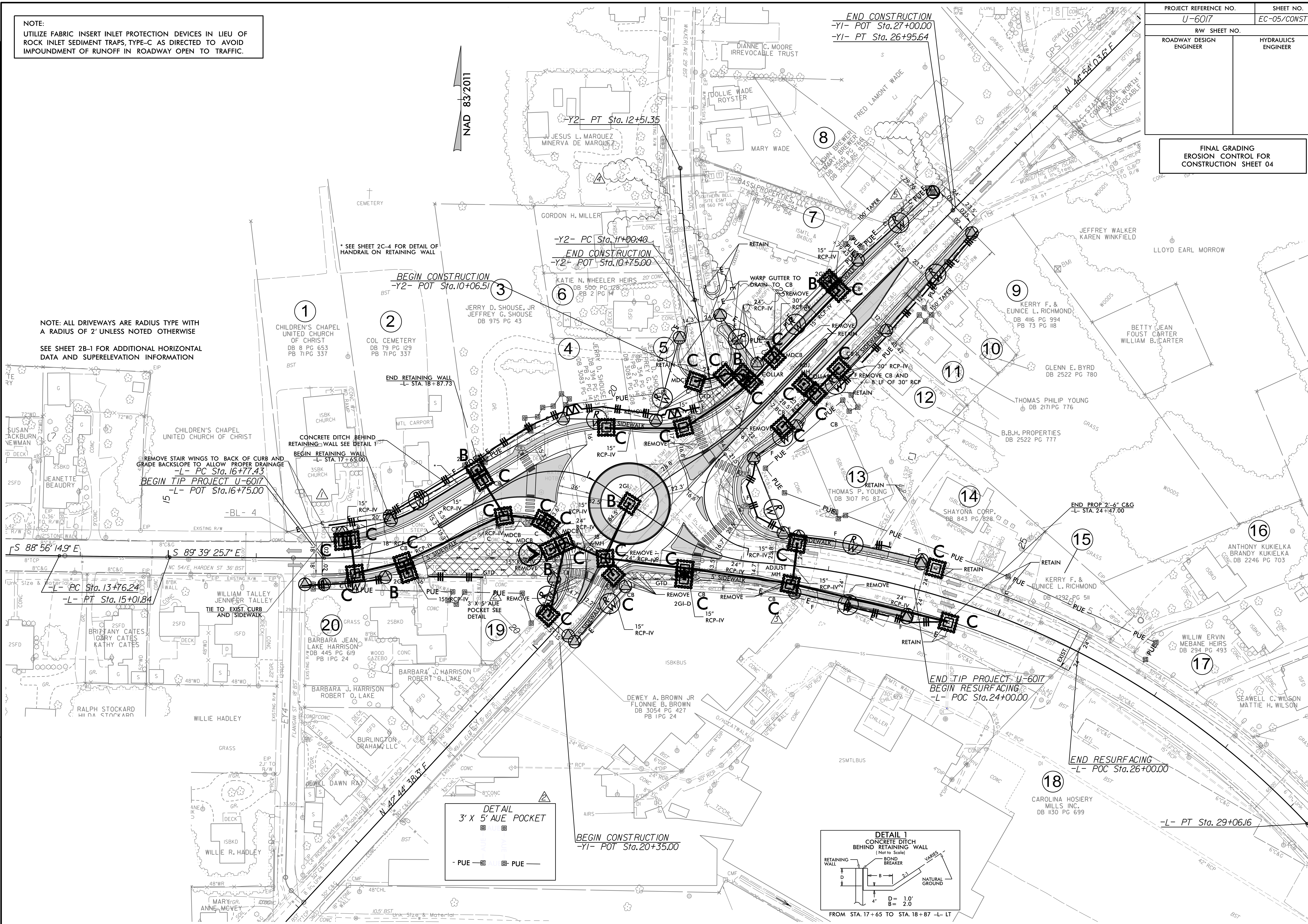


DETAIL 1
CONCRETE DITCH BEHIND RETAINING WALL
(Not to Scale)

RETAINING WALL — BOND BREAKER — VARIES — 2:1 — NATURAL GROUND

D = 1.0'
B = 2.0

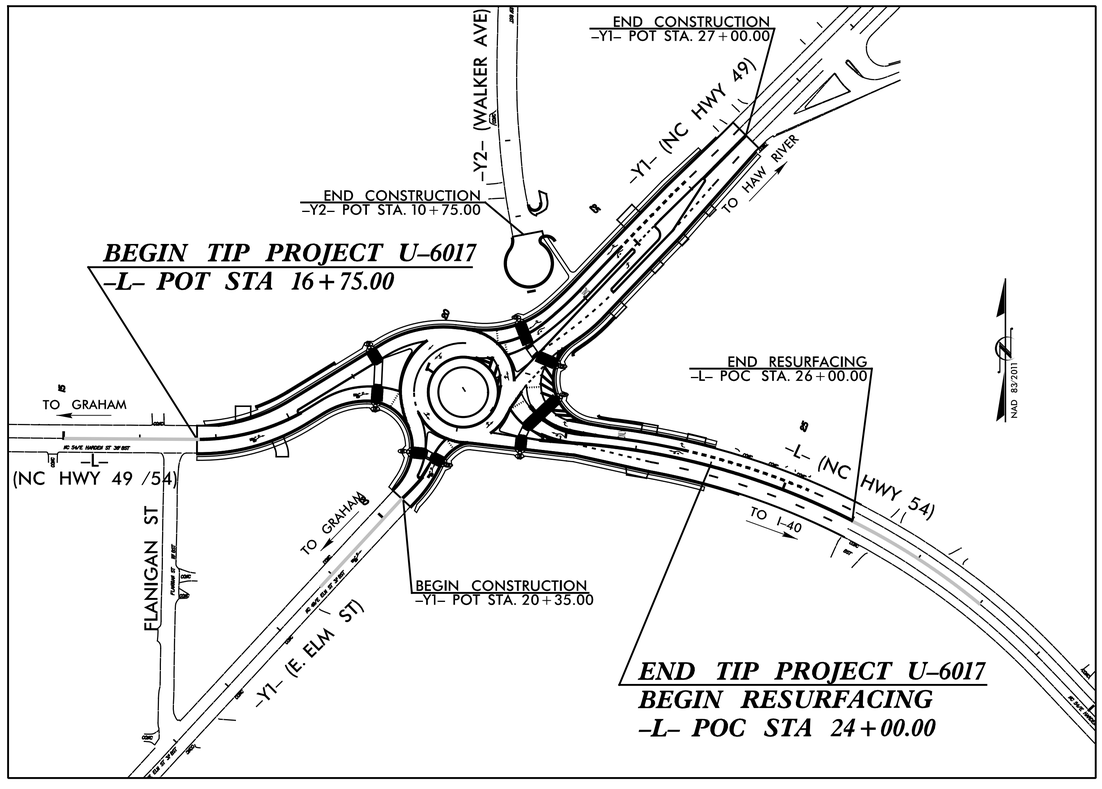
FROM STA. 17+65 TO STA. 18+87 -L- LT

TIP PROJECT: U-6017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
ALAMANCE COUNTY

LOCATION: INTERSECTION IMPROVEMENTS AT NC 54 (EAST HARDEN ST.) AND NC 49 (EAST ELM ST.) IN GRAHAM



INDEX

TIP NO.	SHEET NO.
U-6017	SIGN-1

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

DATE: 1/23/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLAN PREPARED BY:
SEPI, INC.

Steve Miller, PE PROJECT MANAGER

John Bauman, PE DESIGN ENGINEER

TRANSYSTEMS
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: F-0453

1/23/2024
K:\2019\SE19.015.03_U-6017 Roundabout NC54_NC49\TP\Traffic\Signing\SIGN-1.dgn
jbauman

TIP NO.	SHEET NO.
U-6017	SIGN-1A

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

DATE: 1/23/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS
910.40	SINGLE/TWO LANE ROUNDABOUT WITH PEDESTRIAN
1264.01	OBJECT MARKERS - TYPES
1264.02	OBJECT MARKERS - INSTALLATION

PROJECT NOTES

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

GENERAL NOTES

. SIGNS FURNISHED BY STATE

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

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

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

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

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

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

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

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	1250	LF
4096000000	904	SIGN ERECTION, TYPE D	2	EA
4102000000	904	SIGN ERECTION, TYPE E	55	EA
4108000000	904	SIGN ERECTION, TYPE F	11	EA
4116100000	904	SIGN ERECTION, RELOCATE SIGN TYPE E	1	EA
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	18	EA

TRANSYSTEMS
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: F-0453

PROJECT NOTES, SUMMARY OF QUANTITIES, GENERAL NOTES, & ROADWAY STANDARD DRAWINGS

TIP NO.	SHEET NO.
U-6017	SIGN-2

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

DATE: 1/23/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

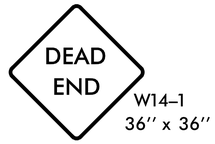
(401) QUANTITY REQ'D 4

ONE "U" POSTS PER SIGN

(406) QUANTITY REQ'D 8

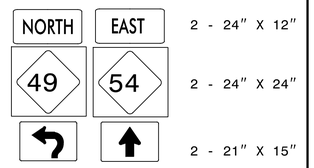
MOUNTED BELOW SIGN 405
IN 8 LOCATIONS

(417) QUANTITY REQ'D 1



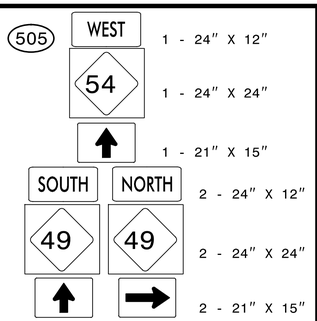
ONE "U" POSTS PER SIGN

(501)



TWO "U" POST PER SIGN ASSEMBLY

(505)



TWO "U" POST PER SIGN ASSEMBLY

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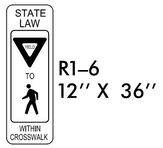


ONE "U" POSTS PER SIGN

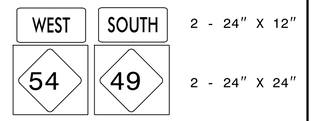
(412) QUANTITY REQ'D 3

ONE "U" POSTS PER SIGN

(418) QUANTITY REQ'D 1

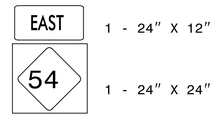
ONE "U" POSTS PER SIGN

(502)



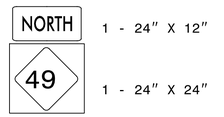
TWO "U" POST PER SIGN ASSEMBLY

(506)



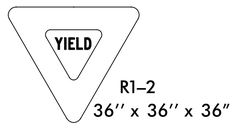
ONE "U" POST PER SIGN

(509)



ONE "U" POST PER SIGN

(408) QUANTITY REQ'D 9



ONE "U" POSTS PER SIGN

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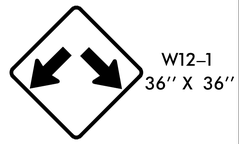
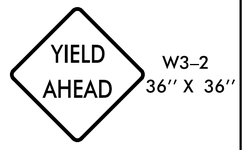


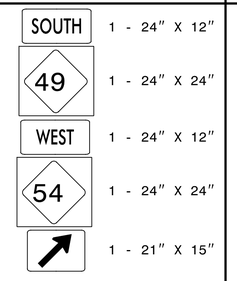
ONE "U" POST PER SIGN

(419) QUANTITY REQ'D 4



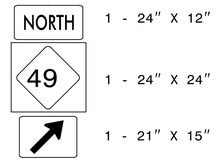
ONE "U" POSTS PER SIGN

(503)



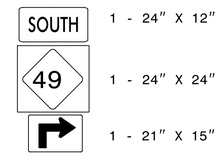
ONE "U" POST PER SIGN

(507)



ONE "U" POST PER SIGN

(510)



ONE "U" POST PER SIGN

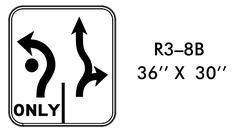
(404) QUANTITY REQ'D 2

ONE "U" POST PER SIGN

(409) QUANTITY REQ'D 4

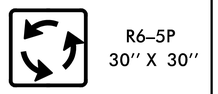
TWO "U" POST PER SIGN

(414) QUANTITY REQ'D 1



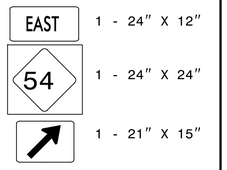
ONE "U" POST PER SIGN

(420) QUANTITY REQ'D 9



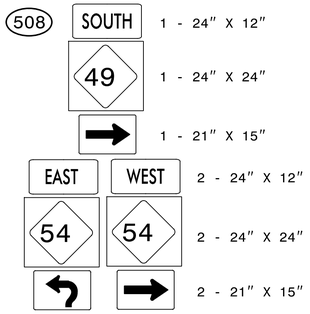
MOUNTED BELOW SIGN 408
IN 9 LOCATIONS

(504)



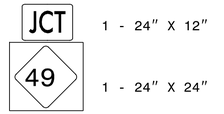
ONE "U" POST PER SIGN ASSEMBLY

(508)



TWO "U" POST PER SIGN ASSEMBLY

(511)

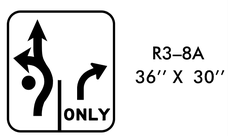


ONE "U" POST PER SIGN

(405) QUANTITY REQ'D 8

ONE "U" POST PER SIGN

(410) QUANTITY REQ'D 1



ONE "U" POST PER SIGN

TRANSYSTEMS
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: F-0453

TYPE "E" & "F" SIGNS

8/17/2023
K:\120\119SE19.015.03_U-6017 Roundabout NC54_NC49\TP\Traffic\Signing\SIGN-2.dgn
Roundabout

TIP NO.	SHEET NO.
U-6017	SIGN-2A

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

DATE: 1/23/2024

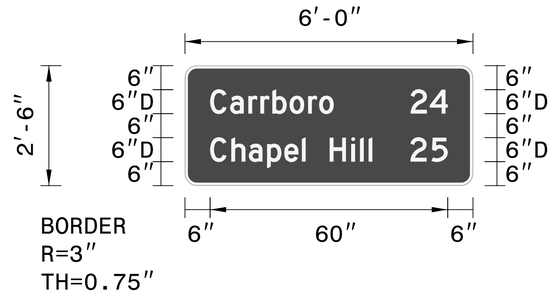
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIGN DETAIL

1:50



Panel Style: guide_con_distance.ssi
Dimensions are in inches.tenths

Letter spacings are to start of next letter

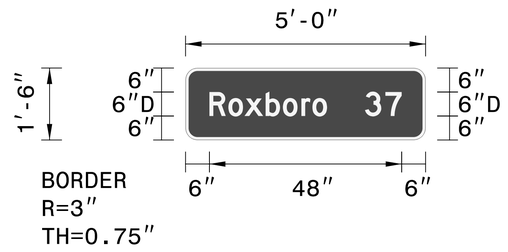
SIGN NUMBER	301
WIDTH x HGHT.	6'-0" x 2'-6"
BORDER WIDTH	0.75"
CORNER RADIUS	3"
MOUNTING	U-CHANNEL
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

SYMBOL	ROT	X	Y	WID	HT

LETTER POSITIONS (X)																					LENGTH	SERIES/SIZE
	C	a	r	r	b	o	r	o		2	4											D 2000
6	5	4.6	3	3	4.3	4.6	2.8	3.7	19.2	4.8	4.5	6									59.4	6/4.5
	C	h	a	p	e	l		H	i	l	l		2	5								D 2000
6	5.3	4.4	4.6	4.3	4.4	1	6	5.4	2.2	2.2	1	9.5	5.3	4.1	6						59.4	6/4.5

SIGN DETAIL

1:50



Panel Style: guide_con_distance.ssi
Dimensions are in inches.tenths

Letter spacings are to start of next letter

SIGN NUMBER	302
WIDTH x HGHT.	5'-0" x 1'-6"
BORDER WIDTH	0.75"
CORNER RADIUS	3"
MOUNTING	U-CHANNEL
BACKGROUND	TYPE: Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

SYMBOL	ROT	X	Y	WID	HT

LETTER POSITIONS (X)																					LENGTH	SERIES/SIZE
	R	o	x	b	o	r	o		3	7												D 2000
6	4.7	4	5.3	4.3	4.6	2.8	3.7	9.5	5.1	4.1	6										48.1	6/4.5

8/17/2023
K:\Cad\TIP\SE19.015.03_U-6017 Roundabout NC54_NC49\TP\Traffic\Signing\SIGN-2A.dgn
jbowman

TRANSYSTEMS
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: F-0453

SIGN DESIGNS

TIP NO.	SHEET NO.
U-6017	SIGN-3

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

DATE: 1/23/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

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PROJECT NOTES

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

NAD 83/2011

BEGIN TIP PROJECT U-6017
-L- POT Sta.16+75.00

END CONSTRUCTION
-Y1- POT Sta.27+00.00

END CONSTRUCTION
-Y2- POT Sta.10+75.00

BEGIN CONSTRUCTION
-Y1- POT Sta.20+35.00

END TIP PROJECT U-6017
BEGIN RESURFACING
-L- POC Sta.24+00.00

END RESURFACING
-L- POC Sta.26+00.00

HARDEN ST.

ELM ST.

NC 49/E ELM ST 48' BST

NC 54/E HARDEN ST 36' BST

NC 54/E HARDEN ST 44' BST

NC 49/E ELM ST 37' BST

E ELM STREET 48' BST

FLANIGAN ST 18' BST

SEE NOTE 1

SEE NOTE 2

STOP

NO PARKING

SPEED LIMIT 35

MUST TURN RIGHT

RIGHT LANE MUST TURN RIGHT

TRUCK

JCT

ROXBORO 37

CARBORO CHAPEL HILL 25

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1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: F-0453

EXISTING SIGNS

8/17/2023
C:\Projects\SE19.015.03_U-6017 Roundabout NC54_NC49\TP\Traffic\Signing\SIGN-3.dgn
jbowden

TIP NO.	SHEET NO.
U-6017	SIGN-4

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

DATE: 1/23/2024

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 037026 ENGINEER STEVEN D. MILLER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/2011

BEGIN TIP PROJECT U-6017
-L- POT Sta.16+75.00

END TIP PROJECT U-6017
BEGIN RESURFACING
-L- POC Sta.24+00.00

END RESURFACING
-L- POC Sta.26+00.00

BEGIN CONSTRUCTION
-Y1- POT Sta.20+35.00

END CONSTRUCTION
-Y1- POT Sta.27+00.00

END CONSTRUCTION
-Y2- POT Sta.10+75.00

HARDEN ST.

ELM ST.

NC 54/E HARDEN ST 38' BST

NC 49/E ELM ST 38' BST

FLINTRAN ST

WALKER AVE 29' BST

NO PARKING

SPEED LIMIT 35

25 MPH

2 SIGNS

Roxboro 37

Carrboro 15 Chapel Hill 25 24

JCT 49

-L- STA 15+92
-L- STA 16+34
-L- STA 16+75
-L- STA 16+91
-L- STA 17+65
-L- STA 17+66
-L- STA 17+98
-L- STA 18+24
-L- STA 19+40
-L- STA 19+60
-L- STA 19+77
-Y1- STA 18+84
-Y1- STA 19+84
-Y1- STA 20+94
-Y1- STA 20+95
-Y1- STA 21+30
-L- STA 21+20
-L- STA 21+50
-L- STA 21+65
-L- STA 22+18
-Y1- STA 22+75
-Y1- STA 23+13
-Y1- STA 23+21
-Y1- STA 24+34
-Y1- STA 24+54
-L- STA 24+00
-L- STA 21+25
-L- STA 21+75
-L- STA 21+92
-L- STA 23+62
-L- STA 25+30
-L- STA 26+00
-L- STA 27+00
-L- STA 25+00
-Y1- STA 25+34
-Y1- STA 25+52
-Y1- STA 26+06
-Y1- STA 26+75
-Y1- STA 26+85
-Y2- STA 10+04
-Y2- STA 13+67
-Y1- STA 24+00
-Y1- STA 25+10
-L- STA 28+00

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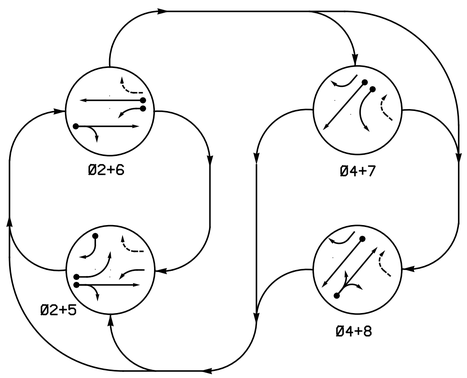
Fax:919.789.9591
License: F-0453

PROPOSED SIGNING

8/17/2023
8:15:16 AM
EIE19.015.03_U-6017 Roundabout NC54_NC49\TPY\Traffic\Signing\SIGN-4.dgn
jpumpo

PROJECT REFERENCE NO.	SHEET NO.
U-6017	Sig.1

PHASING DIAGRAM



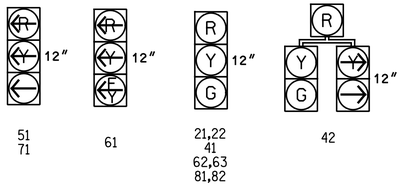
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION					
SIGNAL FACE	PHASE				
	Ø2+5	Ø2+6	Ø4+7	Ø4+8	FLASH
21, 22	G	G	R	R	Y
41	R	R	G	G	R
42	R	R	G	G	R
51	-	~~R~~	~~R~~	~~R~~	~~R~~
61	~~Y~~	~~Y~~	~~R~~	~~R~~	~~Y~~
62, 63	R	G	R	R	Y
71	~~R~~	~~R~~	-	~~R~~	~~R~~
81, 82	R	R	R	G	R

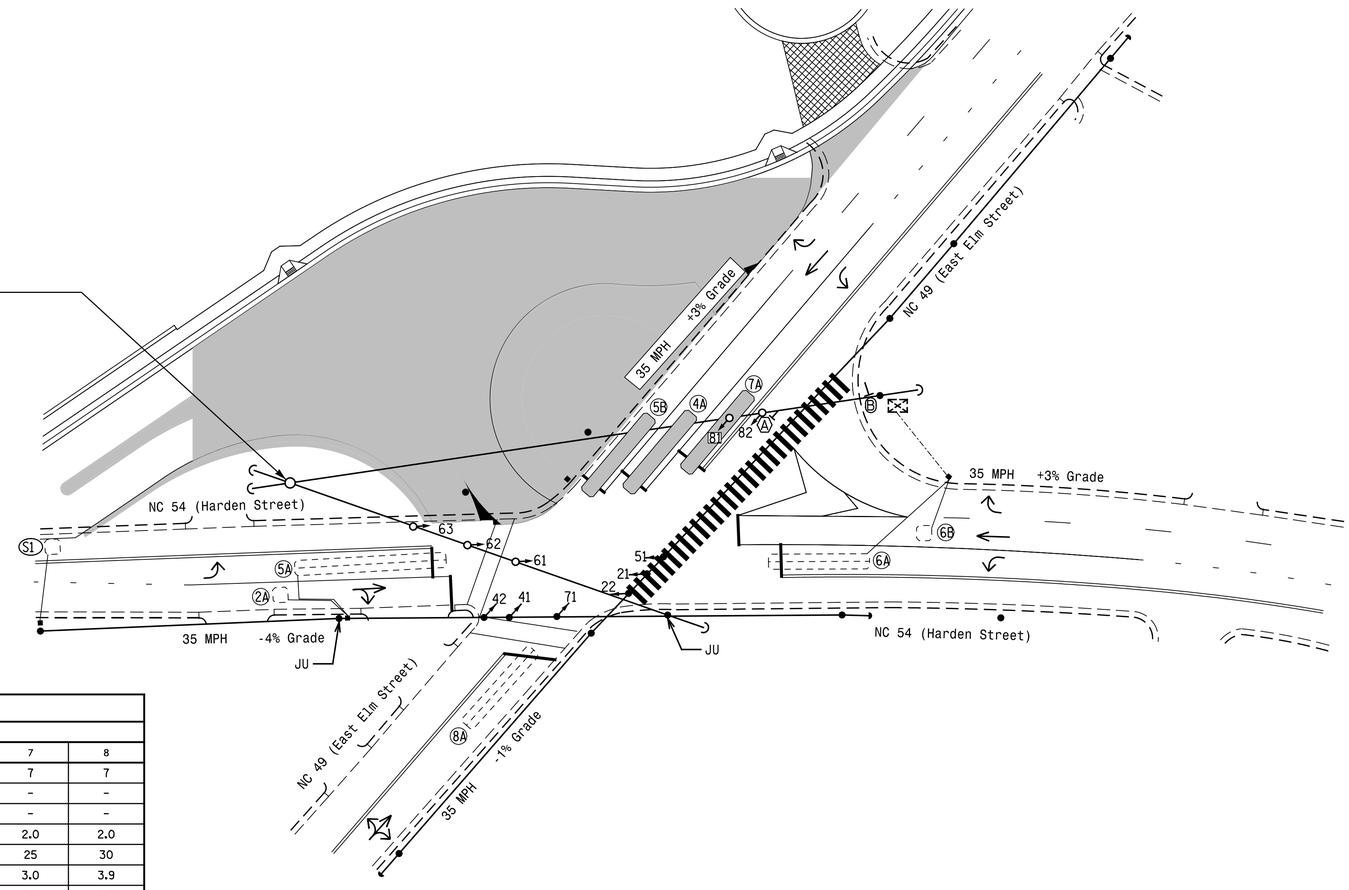
SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6x6	70	4	-	2	Yes	-	-	-	S	-	-
4A	6x40	+5	*	-	4	Yes	-	-	-	S	-	-
5A	6x60	+5	2-4-2	-	5	Yes	-	3	-	S	-	-
5B	6x40	+5	*	-	5	Yes	-	15	-	S	-	-
6A	6x40	+5	2-4-2	-	6	Yes	-	3	-	S	-	-
6B	6x6	70	4	-	6	Yes	-	-	-	S	-	-
7A	6x40	+5	*	-	7	Yes	-	3	-	S	-	-
8A	6x40	+5	2-4-2	-	8	Yes	-	3	-	S	-	-
S1	6x6	+270	EXIST.	-	-	No	-	-	-	N	X	-

* Video Detection Zone



ASC/3 TIMING CHART

FEATURE	PHASE					
	2	4	5	6	7	8
Min Green *	10	7	7	10	7	7
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	3.0	2.0	1.0	3.0	2.0	2.0
Max 1 *	50	30	25	50	25	30
Yellow	4.1	3.9	3.0	4.1	3.0	3.9
Red Clear	2.6	1.7	3.2	2.6	1.9	1.7
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	X	-	-	X	-	-
Recall Position	VEH. RECALL	-	-	VEH. RECALL	-	-
Dual Entry	-	X	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

* 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.

4 Phase
Fully Actuated
(Burlington-Graham Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Omit phase 7 during phase 8 on.
5. Set all detector units to presence mode.
6. 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.
7. Pavement markings are existing.
8. This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. After Roundabout is opened up for traffic, remove all signal equipment and deliver to the attention of:

Shannon Brady
234 E. Summit Avenue
Burlington, NC 27215

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Construction Zone	N/A
	Video Detection Zone	
Ⓐ	"NO TURN ON RED" Sign (R10-11)	Ⓐ
Ⓑ	"YIELD" Sign (R1-2)	Ⓑ

This plan supersedes the plan signed and sealed on 8/21/2023.

Signal Upgrade - Temporary Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TRANSYSTEMS
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: F-0453

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

NC 54 (Harden Street)
at
NC 49 (East Elm Street)

Division 7 Alamance County Graham

PLAN DATE:	August 2023	REVIEWED BY:	G.G. Murr, Jr.
PREPARED BY:	B.E. Wynn	REVIEWED BY:	

SCALE: 0 30 1"=30'

REVISIONS	INIT.	DATE

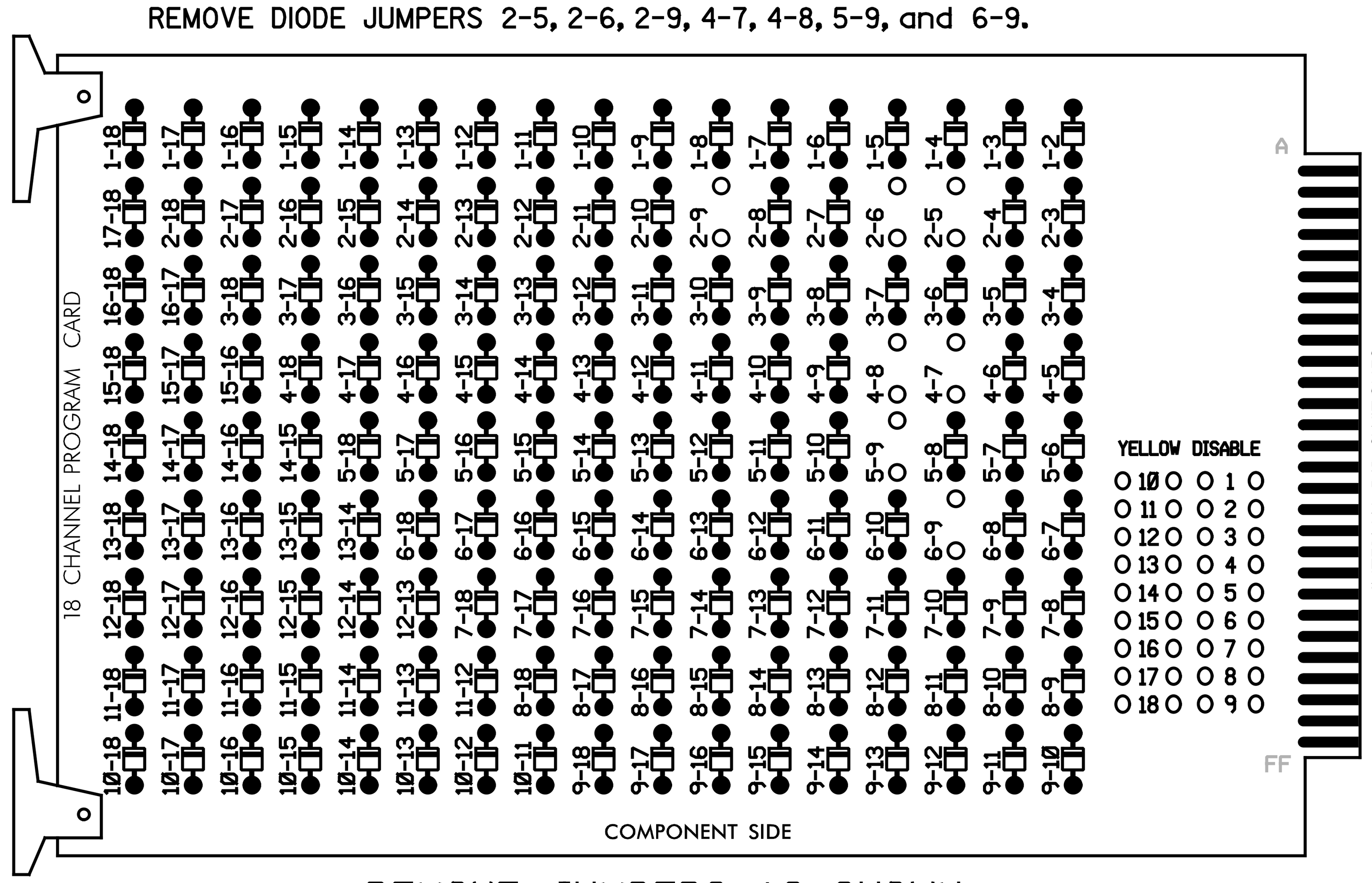
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14543 GENE G. MURR JR.
DocuSigned by: Gene G. Murr Jr. 2/8/2024
SIGNATURE DATE
SIG. INVENTORY NO. 07-0063T

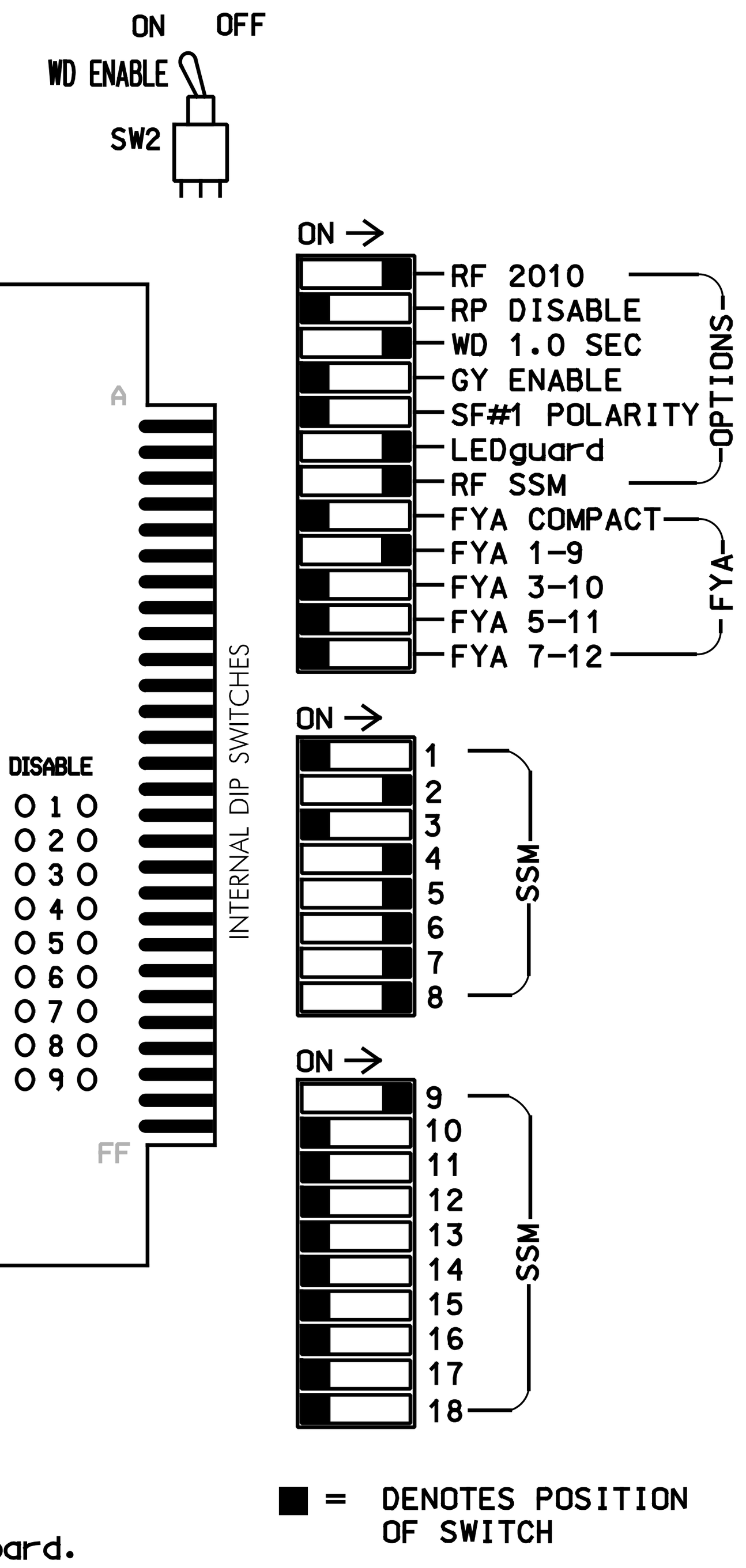
2/8/2024
X:\Projects\HE19.015.03.JJ-6017 Roundabout NC54_NC49\PW\Traffic\Signals\DESIGN\SIGNALS\07006ST_sig_dsn_20230821.dgn
bwynn

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 4-7, 4-8, 5-9, and 6-9.





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 phase 4 for Dual Entry.
3. Program controller to start up in phase 2 Green and 6 Green.
4. The cabinet and controller are part of the Burlington-Graham Signal System.

EQUIPMENT INFORMATION

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

* See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

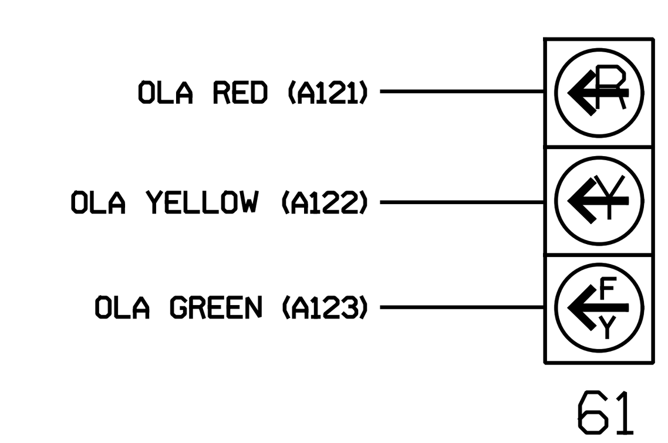
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51	42	62,63	NU	71	81,82	NU	61★	NU	NU	NU	NU	NU
RED		128			101				134			107							
YELLOW		129			102				135			108							
GREEN		130			103				136			109							
RED ARROW							131				122			A121					
YELLOW ARROW							132	132			123			A122					
FLASHING YELLOW ARROW														A123					
GREEN ARROW							133	133			124								

NU = Not Used

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



This plan supersedes the plan signed and sealed on 8-21-2023

INPUT FILE POSITION LAYOUT

(front view)

FILE		1	2	3	4	5	6	7	8	9	10	11	12	13	14
"I"	U	SLOT EMPTY	⌀2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SYS. DET. S1	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
"I"	L		NOT USED							NOT USED					ST DC ISOLATOR
"J"	U	⌀5 5A	⌀6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	⌀8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
"J"	L	NOT USED	⌀6 6B				NOT USED								

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES				S
5A	TB3-1,2	J1U	55	5	5	YES		3		S
6A	TB3-5,6	J2U	40	6	6	YES		3		S
6B	TB3-7,8	J2L	44	16	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES		3		S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N

* System detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0063T
DESIGNED: August 2023
SEALED: 02-08-24
REVISED: N/A

SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection in zones 4A, 5B, and 7A. Perform installation according to manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

TRANSYSTEMS
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: F-0453

Electrical Detail
Temporary Design 1 - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 54 (Harden Street)
at
NC 49 (East Elm Street)

Division 7 Alamance County Graham

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

PLAN DATE:	August 2023	REVIEWED BY:	J.T. Rowe
PREPARED BY:	J.T. Rowe	REVIEWED BY:	

REVISIONS | INIT. | DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 008453
JOHN T. ROWE JR.

DocuSigned by: John T. Rowe, Jr.
2/8/2024
DATE

SIG. INVENTORY NO. 07-0063T

2/8/2024
X:\2019\SE19.015.03_U-6017 Roundabout NC54_NC49\TP\Traffic\Signals\DESIGN\ELECTRICAL DETAILS\07063T_sm_ele_20230821.dgn
bwynn

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

OVERLAP A

Select TMG VEH OVLP [A] and 'OTHER/ECONOLITE'

TMG VEH OVLP...[A] TYPE: OTHER/ECONOLITE

PHASES	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
INCLUDED	.	X	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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LAG X PH	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LAG 2 PH	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0

END PROGRAMMING

ECONOLITE ASC/3-2070 BACKUP PROTECTION ENABLE PROGRAMMING

(program controller as shown)

1. From Main Menu select 1. CONFIGURATION
2. From CONFIGURATION Submenu select 1. CONTROLLER SEQ
3. From CONTROLLER SEQUENCE Submenu select 3. BACKUP PREVENT PHASES

Follow programming as shown below. On the 'ENABLE BACKUP PREVENT' screen move cursor to the appropriate field and press 'YES/NO' on the controller keypad to toggle field value between 'X' ,'B', 'C' and 'OFF'.

ENABLE BACKUP PREVENT

TMG/BKUP	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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END PROGRAMMING

NOTES

1. 'X' inhibits the controller from servicing the 'BACKUP' (column) phase when the 'TIMING' (row) phase is active or next.

This plan supersedes the plan signed and sealed on 8-21-2023

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0063T
DESIGNED: August 2023
SEALED: 02-08-24
REVISED: N/A

Electrical Detail
Temporary Design 1 - Sheet 2 of 2

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1 Glenwood Avenue
Raleigh, NC 27603
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

NC 54 (Harden Street)
at
NC 49 (East Elm Street)

Division 7 Alamance County Graham

PLAN DATE: August 2023	REVIEWED BY: J.T. Rowe
PREPARED BY: J.T. Rowe	REVIEWED BY:

REVISIONS	INIT.	DATE

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SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE JR.

DocuSigned by:
John T. Rowe, Jr.
D0847BA0ACA9400...
2/8/2024
DATE

SIG. INVENTORY NO. 07-0063T

2/8/2024
X:\2019\SE19.015.03_U-6017 Roundabout NC54_NC49\TP\Traffic\Signals\DESIGN\ELECTRICAL DETAILS\070063T_sm_ele_20230821.dgn
bwynn

PROJECT REFERENCE NO.	SHEET NO.
U-6017	SCP-1

1 INSTALL CATEGORY 6 CABLE

2 INSTALL COAX CABLE

3 INSTALL ETHERNET CABLE

4 INSTALL SMFO CABLE

5 EXISTING SMFO 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 WITH HEAT SHRINK RETROFIT KIT

20 INSTALL CABLE(S) IN NEW RISER

21 INSTALL CABLE(S) IN EXISTING CONDUIT STUB–OUTS

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 MODIFY EXISTING INTERCONNECT CENTER /SPLICE ENCLOSURE

27 INSTALL NEW ETHERNET EDGE SWITCH IN 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 MODIFY EXISTING SPLICE ENCLOSURE

32 INSTALL BASE MOUNTED SPLICE CABINET

33 REMOVE EXISTING SPLICE CABINET

34 INSTALL CABINET FOUNDATION

35 INSTALL CCTV CAMERA POLE MOUNTED CABINET

36 INSTALL CCTV CAMERA ASSEMBLY

37 INSTALL CCTV CAMERA WOOD POLE

38 RELOCATE EXISTING CCTV CAMERA AND METAL POLE TO NEW FOUNDATION

39 INSTALL JUNCTION BOX

40A INSTALL OVERSIZED JUNCTION BOX

40B INSTALL SPECIAL OVERSIZED JUNCTION BOX (36" x 24" x 24")

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

48A REMOVE EXISTING COMMUNICATIONS AND MESSENGER CABLE

48B REMOVE AND/OR ABANDON COMMUNICATIONS CABLE AND CONDUIT

49 BACK PULL EXISTING COMMUNICATIONS CABLE

50 INSTALL CELL MODEM

51 INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE

51A INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 200 FEET OF CABLE

52A INSTALL DELINEATOR MARKER

52B INSTALL JUNCTION BOX MARKER

53 STORE 30 FEET OF COMMUNICATIONS CABLE

54 LASH CABLE(S) TO EXISTING COMMUNICATIONS CABLE

55 LASH CABLE(S) TO EXISTING MESSENGER CABLE

56 LASH CABLE(S) TO NEW MESSENGER CABLE

57 MODIFY EXISTING ELECTRICAL SERVICE

58 INSTALL NEW ELECTRICAL SERVICE

59 INSTALL NEW ETHERNET EDGE SWITCH

60 BOND TRACER WIRE TO EQUIPMENT GROUND BUS

61 DO NOT BOND TRACER WIRE TO EQUIPMENT GROUND BUS

62 BOND RISER AND MESSENGER CABLE TO POLE GROUND

63 BOND RISER TO POLE GROUND

64 BOND MESSENGER CABLE TO POLE GROUND

65 INSTALL HEAT SHRINK TUBING RETROFIT KIT

66 INSTALL MOLDABLE DUCT SEAL

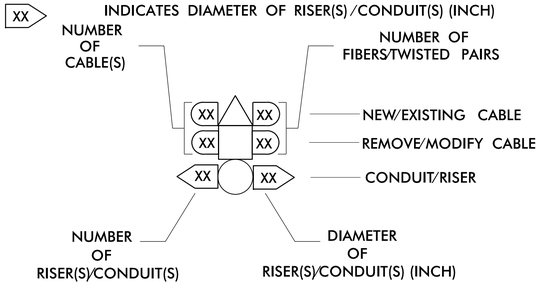
67 SLACK SPAN

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
- AERIAL SPLICE ENCLOSURE
- SPLICE ENCLOSURE
- EXISTING SPLICE ENCLOSURE
- NEW METAL POLE
- EXISTING METAL POLE
- NEW CCTV ASSEMBLY
- NEW STANDARD GUY ASSEMBLY
- NEW SIDEWALK GUY ASSEMBLY
- EXISTING GUY ASSEMBLY
- XX–XXXX — SIGNAL INVENTORY NUMBER
- NEW CABLE STORAGE RACKS (SNOW SHOES)
- EXISTING CABLE STORAGE RACK (SNOW SHOE)
- EXISTING CONTROLLER AND CABINET
- NEW CCTV CABINET
- EXISTING SPLICE CABINET
- NEW SPLICE CABINET
- SP — SIGNAL POLE
- FLAT PANEL ANTENNA (SINGLE)
- YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION
- YAGI ANTENNA (SINGLE)
- OMNI ANTENNA

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)



ATTACHMENT POINT:

- XX"/SS / YYY — DISTANCE ABOVE (IN)/ATTACHMENT POINT REFERENCE POINT
- YYY / XX"/SS — REFERENCE POINT DISTANCE BELOW (IN)/ATTACHMENT POINT

"SS" REFERENCE LOCATION	
FS	= FRONT SIDE OF POLE
BS	= BACK SIDE OF POLE

TRANSYSTEMS
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: F-0453

Prepared for the Offices of:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Mobility and Safety Division
Integrated Mobility Division
Transportation Planning Branch
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE: N/A

SIGNAL SYSTEM- BURLINGTON/GRAHAM
CONSTRUCTION NOTES

Division 7 Alamance County Graham

PLAN DATE: August 2023 | REVIEWED BY: G.G. Murr, Jr.
PREPARED BY: J. Bauman PE | MAN PROJECT NO.:

REVISIONS	INIT.	DATE

DocuSigned by: Gene G. Murr Jr. 19192BFB56A945A...
8/21/2023
SIGNATURE DATE

CADD FILE NAME: U-6017 SCP

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 14543
ENGINEER
GENE G. MURR, JR.

PROJECT REFERENCE NO.	SHEET NO.
U-6017	SCP-2

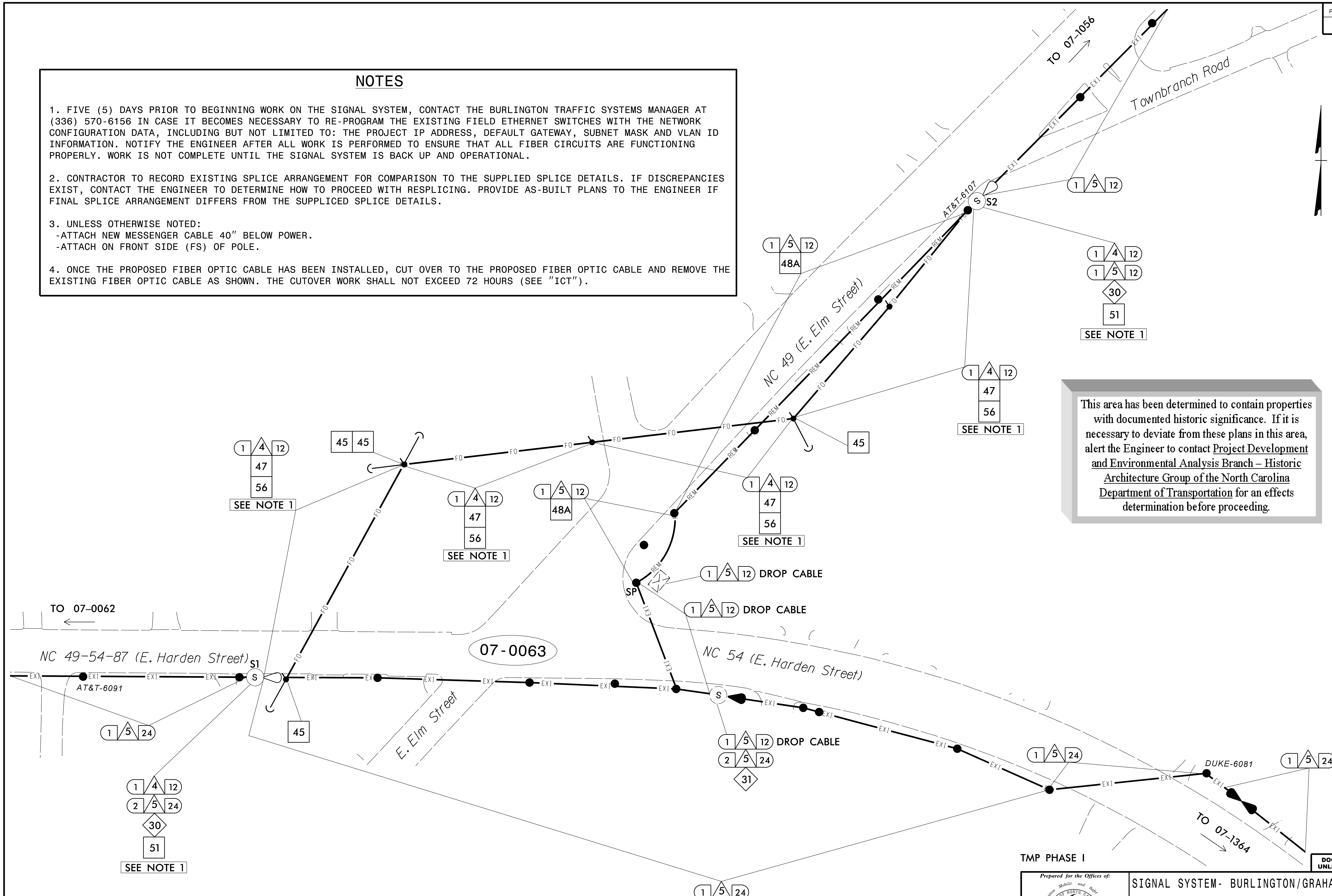
NOTES

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE BURLINGTON TRAFFIC SYSTEMS MANAGER AT (336) 570-6156 IN CASE IT BECOMES NECESSARY TO RE-PROGRAM THE EXISTING FIELD ETHERNET SWITCHES WITH THE NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. 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 SUPPLICED SPLICE DETAILS.

3. UNLESS OTHERWISE NOTED:
 -ATTACH NEW MESSENGER CABLE 40" BELOW POWER.
 -ATTACH ON FRONT SIDE (FS) OF POLE.

4. ONCE THE PROPOSED FIBER OPTIC CABLE HAS BEEN INSTALLED, CUT OVER TO THE PROPOSED FIBER OPTIC CABLE AND REMOVE THE EXISTING FIBER OPTIC CABLE AS SHOWN. THE CUTOVER WORK SHALL NOT EXCEED 72 HOURS (SEE "ICT").



This area has been determined to contain properties with documented historic significance. If it is necessary to deviate from these plans in this area, alert the Engineer to contact Project Development and Environmental Analysis Branch – Historic Architecture Group of the North Carolina Department of Transportation for an effects determination before proceeding.

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1 Glenwood Avenue
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Prepared for the Offices of: Transportation Mobility and Safety Division, Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

SIGNAL SYSTEM- BURLINGTON/GRAHAM

COMMUNICATIONS CABLE AND CONDUIT ROUTING PLAN

Division 07 Alamance County Graham

PLAN DATE: August 2023 REVIEWED BY: G.G. Murr, Jr.
PREPARED BY: J. Bauman PE REVIEWED BY:

SCALE N/A

REVISIONS INIT. DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 14543 ENGINEER GENE G. MURR, JR.

DocuSigned by: Gene G. Murr Jr. 8/21/2023
SIGNATURE DATE

SIG. INVENTORY NO. 07-0063

PROJECT REFERENCE NO.	SHEET NO.
U-6017	SCP-3

NOTES

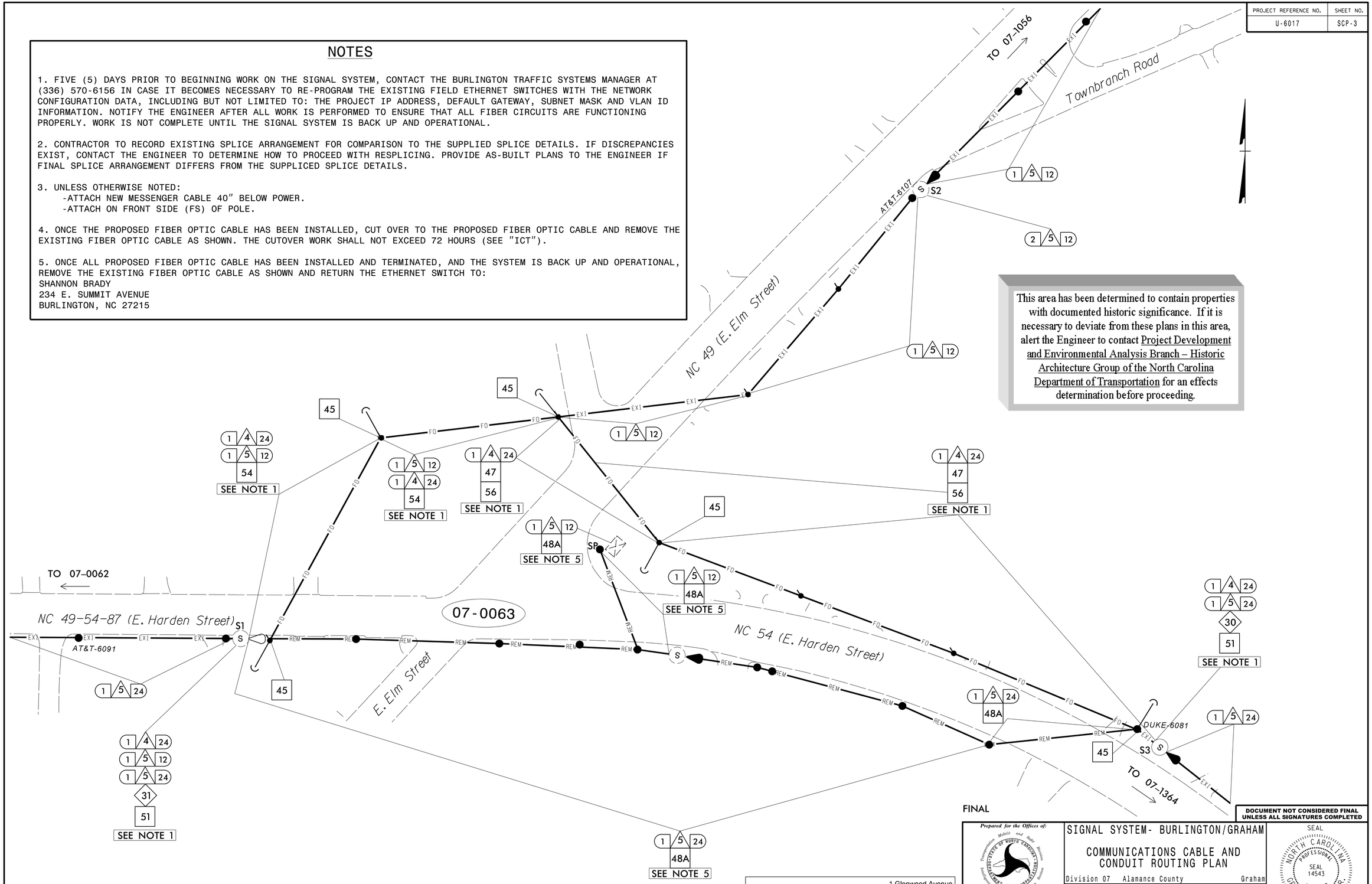
1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE BURLINGTON TRAFFIC SYSTEMS MANAGER AT (336) 570-6156 IN CASE IT BECOMES NECESSARY TO RE-PROGRAM THE EXISTING FIELD ETHERNET SWITCHES WITH THE NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. 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 SUPPLICED SPLICE DETAILS.

3. UNLESS OTHERWISE NOTED:
   -ATTACH NEW MESSENGER CABLE 40" BELOW POWER.
   -ATTACH ON FRONT SIDE (FS) OF POLE.

4. ONCE THE PROPOSED FIBER OPTIC CABLE HAS BEEN INSTALLED, CUT OVER TO THE PROPOSED FIBER OPTIC CABLE AND REMOVE THE EXISTING FIBER OPTIC CABLE AS SHOWN. THE CUTOVER WORK SHALL NOT EXCEED 72 HOURS (SEE "ICT").

5. ONCE ALL PROPOSED FIBER OPTIC CABLE HAS BEEN INSTALLED AND TERMINATED, AND THE SYSTEM IS BACK UP AND OPERATIONAL, REMOVE THE EXISTING FIBER OPTIC CABLE AS SHOWN AND RETURN THE ETHERNET SWITCH TO:
SHANNON BRADY
234 E. SUMMIT AVENUE
BURLINGTON, NC 27215



FINAL

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Prepared for the Offices of:
North Carolina Department of Transportation — Transportation Mobility and Safety Division, Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

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SIGNAL SYSTEM- BURLINGTON/GRAHAM

COMMUNICATIONS CABLE AND CONDUIT ROUTING PLAN

Division 07 Alamance County Graham

PLAN DATE:	August 2023	REVIEWED BY:	G.G. Murr, Jr.
PREPARED BY:	J. Bauman PE	REVIEWED BY:	

SCALE: N/A

REVISIONS	INIT.	DATE

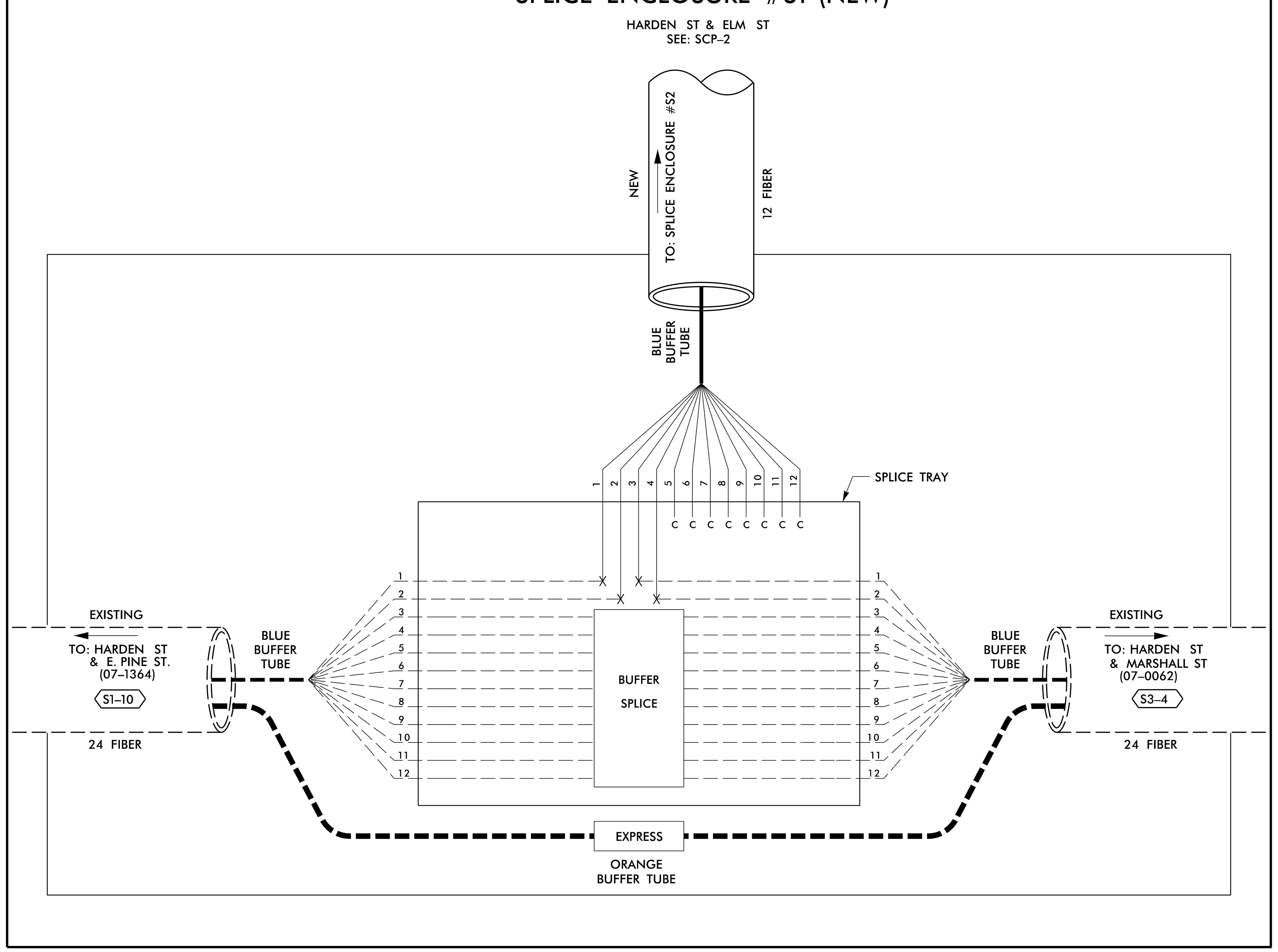
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 14543 ENGINEER GENE G. MURR, JR.

DocuSigned by: Gene G. Murr Jr. 19192BFB56A945A...
8/21/2023
SIGNATURE DATE

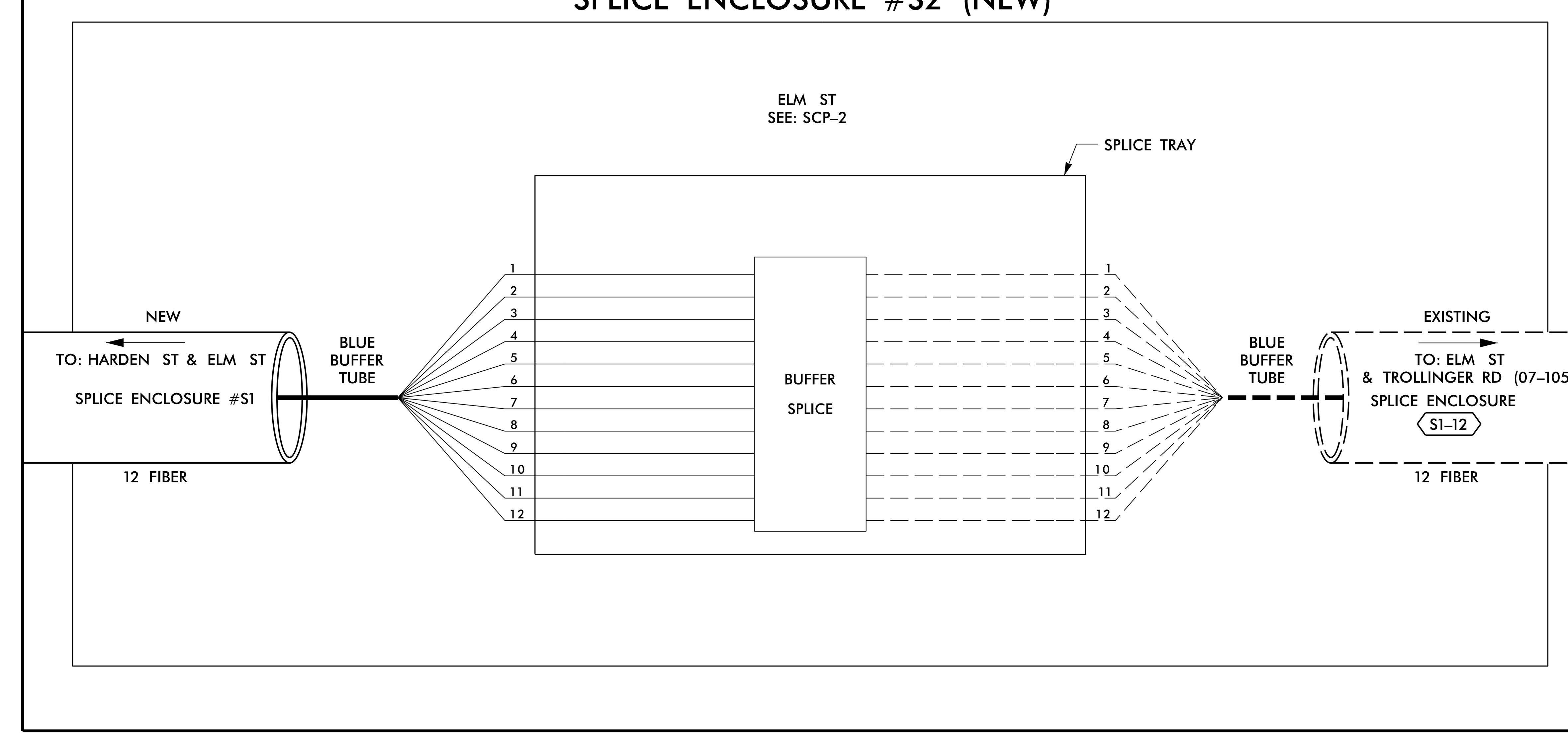
SIG. INVENTORY NO. 07-0063

NEW AERIAL SPLICE ENCLOSURES:
S1 – HARDEN STREET DUE WEST OF HARDEN STREET AT E. ELM STREET (07–0063)
S2 – E. ELM STREET DUE SOUTH OF E. ELM STREET AT TROLLIGER ROAD (07–1056)

SPLICE ENCLOSURE #S1 (NEW)



SPLICE ENCLOSURE #S2 (NEW)



NOTES

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE BURLINGTON TRAFFIC SYSTEMS MANAGER AT (336) 570-6156 IN CASE IT BECOMES NECESSARY TO RE-PROGRAM THE EXISTING FIELD ETHERNET SWITCHES WITH THE NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. 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 SUPPLICED SPLICE DETAILS.

3. INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 **FIBER OPTIC SPLICE ENCLOSURE*

1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICING

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY, TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

4. UNUSED FIBERS LEFT COILED AND STORED IN SPLICE TRAY

5. UNUSED BUFFER TUBES LEFT COILED AND STORED IN SPLICE ENCLOSURE

LEGEND

COLOR CODE TIA/EIA 598-B

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

X = FUSION SPLICE INDIVIDUAL FIBER
C = CAP AND SEAL
EXPRESS — EXPRESS ENTIRE BUFFER TUBE /FIBERS THROUGH WITHOUT CUTTING
BUFFER SPLICE — SPLICE ALL FIBERS IN BUFFER TUBE COLOR TO COLOR
EXISTING — EXISTING BUFFER TUBE /FIBERS. DO NOT MODIFY EXISTING SPLICES OR EXPRESSED FIBERS.

TMP PHASE I

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

SCALE N/A

SIGNAL SYSTEM- BURLINGTON/GRAHAM
Fiber-Optic Splicing Details
Division 7 Alamance County Graham
PLAN DATE: August 2023 | REVIEWED BY: G.G. Murr, Jr.
PREPARED BY: J. Bauman PE | M&N PROJECT NO.:
REVISIONS | INIT. | DATE

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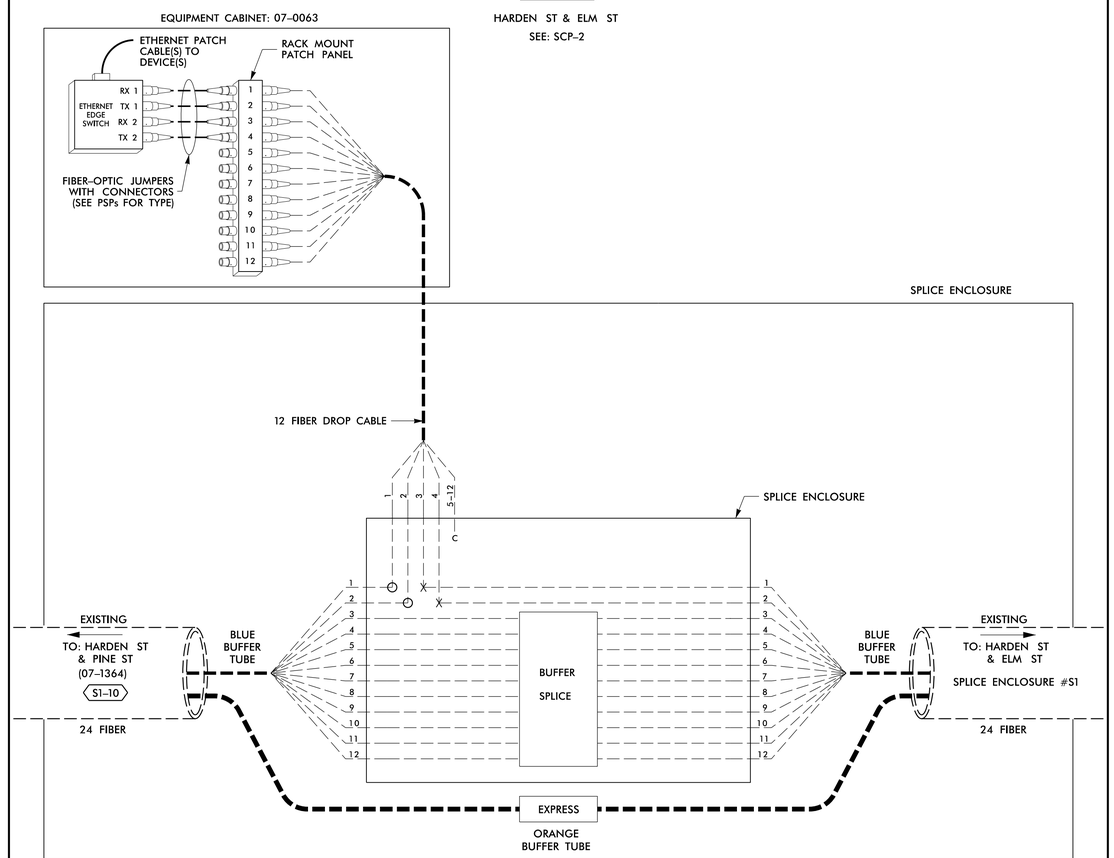
NORTH CAROLINA PROFESSIONAL SEAL 14543 ENGINEER GENE G. MURR, JR.
DocuSigned by: Gene G. Murr Jr. 191928FB56A945A... 8/21/2023
SIGNATURE DATE

CADD FILE NAME: U-6017 SCP

PROJECT REFERENCE NO.	SHEET NO.
U-6017	SCP-5

MODIFY AERIAL SPLICE ENCLOSURE: BURLINGTON–GRAHAM SIGNAL SYSTEM SPLICE NO. S1–11 AT HARDEN STREET AND E. ELM (07–0063)

BURLINGTON–GRAHAM SIGNAL SYSTEM EXISTING SPLICE NO. S1–11 (MODIFIED)



NOTES

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE BURLINGTON TRAFFIC SYSTEMS MANAGER AT (336) 570-6156 IN CASE IT BECOMES NECESSARY TO RE-PROGRAM THE EXISTING FIELD ETHERNET SWITCHES WITH THE NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. 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 SUPPLICED SPLICE DETAILS.

3. INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 **FIBER OPTIC SPLICE ENCLOSURE*

    1)SPLICE LOCATION
    2)DATE
    3)COMPANY NAME
    4)NAME OF INDIVIDUAL PERFORMING THE SPLICING

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY, TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

4. UNUSED FIBERS LEFT COILED AND STORED IN SPLICE TRAY

5. UNUSED BUFFER TUBES LEFT COILED AND STORED IN SPLICE ENCLOSURE

LEGEND

COLOR CODE TIA/EIA 598–B

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

X = FUSION SPLICE INDIVIDUAL FIBER
O = EXISTING SPLICE
C = CAP AND SEAL

EXPRESS	EXPRESS ENTIRE BUFFER TUBE /FIBERS THROUGH WITHOUT CUTTING
BUFFER SPLICE	SPLICE ALL FIBERS IN BUFFER TUBE COLOR TO COLOR
EXISTING	EXISTING BUFFER TUBE /FIBERS. DO NOT MODIFY EXISTING SPLICES OR EXPRESSED FIBERS.

TMP PHASE I

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TRANSYSTEMS
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: F-0453

Prepared for the Offices of:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION — Transportation Mobility and Safety Division — Integrated Mobility Division — 5 Street Section
750 N. Greenfield Pkwy., Garner, NC 27529

SIGNAL SYSTEM- BURLINGTON/GRAHAM

Fiber-Optic Splicing Details

Division 7 Alamance County Graham

PLAN DATE: August 2023 | REVIEWED BY: G.G. Murr, Jr.
PREPARED BY: J. Bauman PE | MAN PROJECT NO.:

REVISIONS	INIT.	DATE

SCALE: N/A

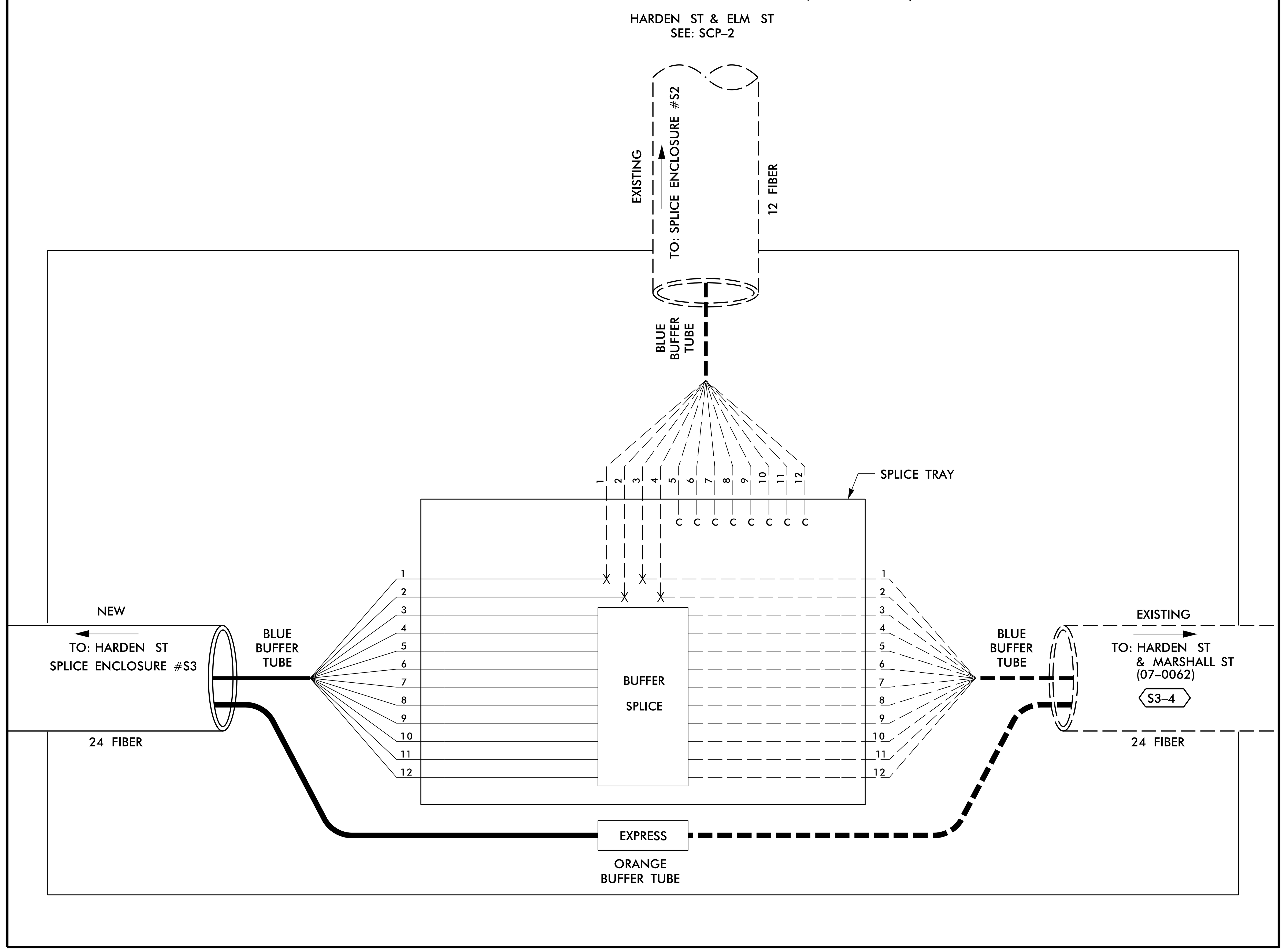
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 14543 ENGINEER GENE G. MURR, JR.

DocuSigned by: Gene G. Murr Jr. 8/21/2023
19192BF856A945A...
SIGNATURE DATE

CADD FILE NAME: U-6017 SCP

PROJECT REFERENCE NO.	SHEET NO.
U-6017	SCP-6

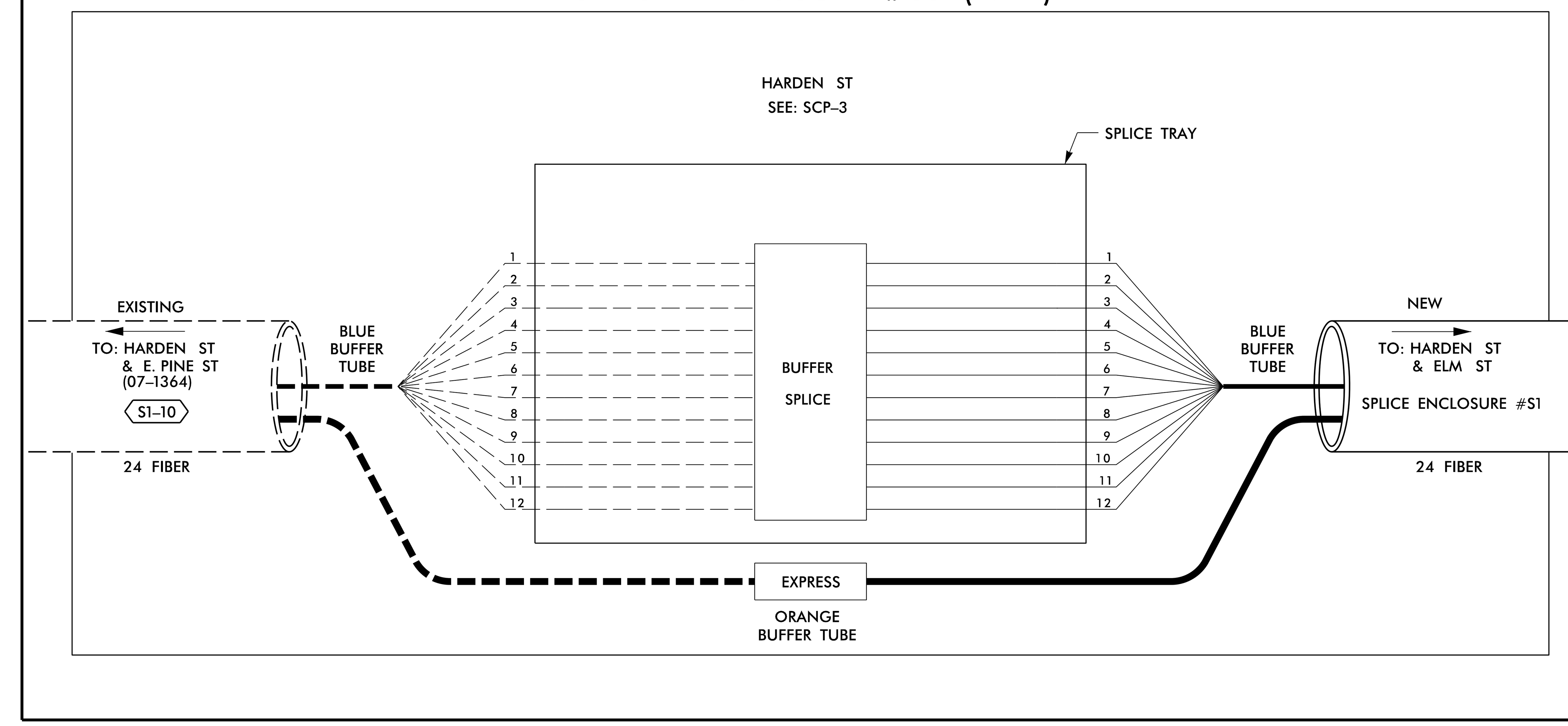
SPLICE ENCLOSURE #S1 (MODIFY)



MODIFY AERIAL SPLICE ENCLOSURE:
S1 – HARDEN STREET DUE WEST OF HARDEN STREET AT E. ELM STREET

NEW AERIAL SPLICE ENCLOSURE:
S3 – E. ELM STREET DUE SOUTH OF E. ELM STREET AT TROLLIGER ROAD (07–1056)

SPLICE ENCLOSURE #S3 (NEW)



NOTES

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE BURLINGTON TRAFFIC SYSTEMS MANAGER AT (336) 570-6156 IN CASE IT BECOMES NECESSARY TO RE-PROGRAM THE EXISTING FIELD ETHERNET SWITCHES WITH THE NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. 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 SUPPLICED SPLICE DETAILS.

3. INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
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1) SPLICE LOCATION
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4. UNUSED FIBERS LEFT COILED AND STORED IN SPLICE TRAY

5. UNUSED BUFFER TUBES LEFT COILED AND STORED IN SPLICE ENCLOSURE

6. AFTER ALL FIBER OPTIC CABLE HAS BEEN INSTALLED AS SHOWN ON SHEET SCP-3, NEW COMMUNICATION CIRCUITS ARE FUNCTIONAL AND OPERATING, AND AFTER THE ROUNDABOUT HAS BEEN OPENED UP TO TRAFFIC, REMOVE THE TRAFFIC SIGNAL AT HARDEN STREET AND E. ELM STREET (07-0063). DELIVER ALL REMOVED EQUIPMENT TO THE ATTENTION OF:
SHANNON BRADY
234 E. SUMMIT AVENUE
BURLINGTON, NC 27215

LEGEND

COLOR CODE TIA/EIA 598-B

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

X = FUSION SPLICE INDIVIDUAL FIBER
C = CAP AND SEAL

EXPRESS	EXPRESS ENTIRE BUFFER TUBE /FIBERS THROUGH WITHOUT CUTTING
BUFFER SPLICE	SPLICE ALL FIBERS IN BUFFER TUBE COLOR TO COLOR
EXISTING	EXISTING BUFFER TUBE /FIBERS. DO NOT MODIFY EXISTING SPLICES OR EXPRESSED FIBERS.

FINAL

TRANSYSTEMS
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: F-0453

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

SIGNAL SYSTEM- BURLINGTON/GRAHAM

Fiber-Optic Splicing Details

Division 7 Alamance County Graham

PLAN DATE: August 2023 REVIEWED BY: G.G. Murr, Jr.
PREPARED BY: J. Bauman PE M&N PROJECT NO.:

SCALE N/A

REVISIONS | INIT. | DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 14543 ENGINEER GENE G. MURR, JR.

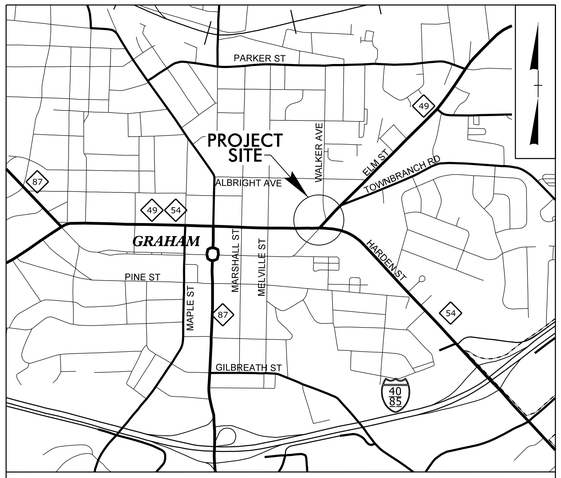
DocuSigned by: Gene G. Murr Jr.
8/21/2023
SIGNATURE DATE

CADD FILE NAME: U-6017 SCP

TIP PROJECT: U–6017

T.I.P. NO.	SHEET NO.
U–6017	UC–1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



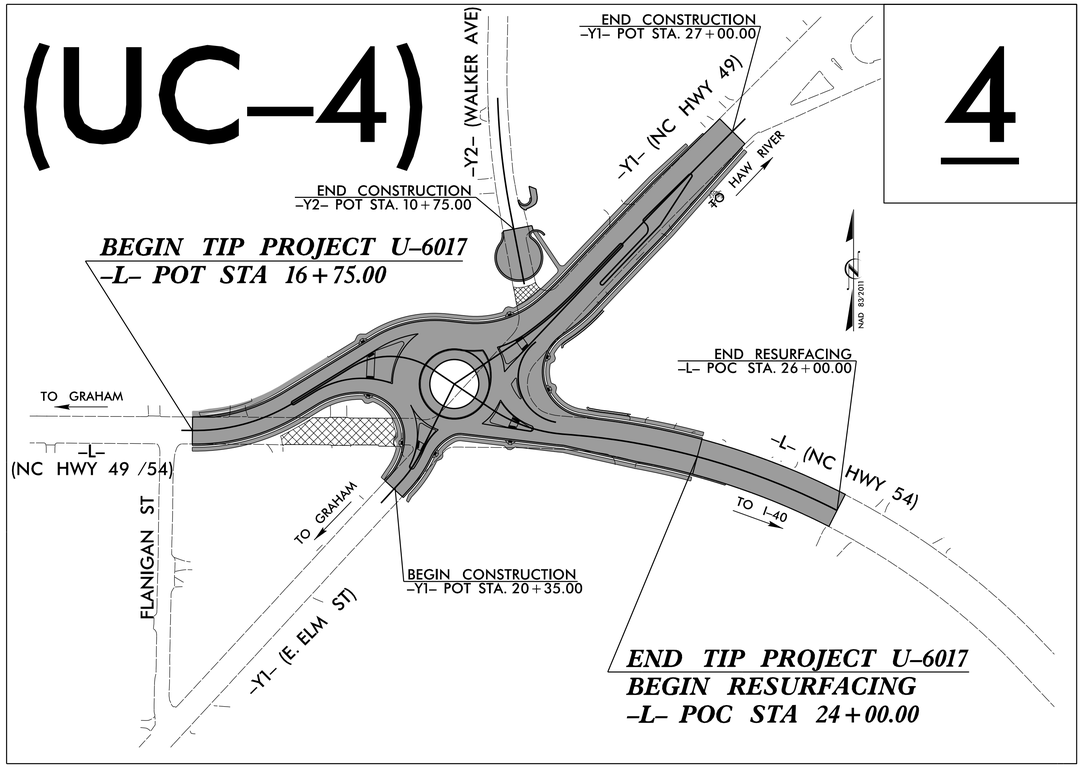
VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS
ALAMANCE COUNTY

LOCATION: INTERSECTION IMPROVEMENTS AT NC 54 (EAST OF HARDEN ST.) AND NC 49 (EAST ELM ST.) IN GRAHAM

TYPE OF WORK: WATER & SEWER RELOCATIONS



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

WATER AND SEWER OWNER ON PROJECT

(A) CITY OF GRAHAM

PREPARED IN THE OFFICE OF:

HINDE ENGINEERING
License No. C-2639
401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513
Ph. (919) 653-0001

Clint L. Stevens, P.E.	*UTILITIES PROJECT MANAGER*
Jordan K. Chapman	*UTILITIES PROJECT ENGINEER*
James N. Arnold	*UTILITIES PROJECT DESIGNER*

SEAL

DocuSigned by:
Clint L. Stevens
9D6F32D777EB42D...
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040370 CLINT L. STEVENS
2/9/2024

DIVISION OF HIGHWAYS
DIVISION 7
1584 YANCEYVILLE STREET
GREENSBORO, NC 27415–4996
PHONE (336) 487–0000
FAX (336) 334–3637

Wright R. Archer, P.E.	*DIV. ENGINEER*
Patty Eason, P.E.	*DIV. CONSTRUCTION ENGINEER*
Chris Smitherman, P.E.	*PROJECT TEAM LEAD*
Rob N. Weisz, P.E.	*PROJECT ENGINEER*

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HINDE ENGINEERING
License No. C-2639
401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

PROJECT REFERENCE NO.	SHEET NO.
U-6017	UC-2

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

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

PROPOSED SEWER SYMBOLS

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

PROPOSED MISCELLANOUS UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Telephone Pedestal — TEL PED
- Utility Line by Others (Type as Shown) — PROP O/H POW LINES
- Trenchless Installation — 12" TL INSTALL
- Encasement by Open Cut — 24" ENCAS BY OC
- Encasement — 24" ENCASEMENT
- Thrust Block
- Air Release Valve — AR
- Utility Vault — UV
- Concrete Pier — CP
- Steel Pier — SP
- Plan Note — NOTE
- Pay Item Note — PAY ITEM

EXISTING UTILITIES SYMBOLS

- Power Pole
- Telephone Pole
- Joint Use Pole
- Utility Pole
- Utility Pole with Base
- H-Frame Pole
- Power Transmission Line Tower
- Water Manhole
- Power Manhole
- Telephone Manhole
- Sanitary Sewer Manhole
- Hand Hole for Cable
- Power Transformer
- Telephone Pedestal — T
- CATV Pedestal — C
- Gas Valve
- Gas Meter
- Located Miscellaneous Utility Object
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.
- *Underground Power Line — P
- *Underground Telephone Cable — T
- *Underground Telephone Conduit — TC
- *Underground Fiber Optics Telephone Cable — T FO
- *Underground TV Cable — TV
- *Underground Fiber Optics TV Cable — TV FO
- *Underground Gas Pipeline — G
- Aboveground Gas Pipeline — A/G Gas
- *Underground Water Line — W
- Aboveground Water Line — A/G Water
- *Underground Gravity Sanitary Sewer Line — SS
- Aboveground Gravity Sanitary Sewer Line — A/G Sanitary Sewer
- *Underground SS Forced Main Line — FSS
- Underground Unknown Utility Line — ?UTL
- SUE Test Hole
- Water Meter
- Water Valve
- Fire Hydrant
- Sanitary Sewer Cleanout

*For Existing Utilities

- Utility Line Drawn from Record (Type as Shown) — W
- Designated Utility Line (Type as Shown) — W

REV: 2/1/2012

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UTILITY CONSTRUCTION

HINDE ENGINEERING
License No. C-2639
401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-6017	UC-3

DESIGNED BY: JKC
DRAWN BY: JNA
CHECKED BY: JKC
APPROVED BY: CLS
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040370 JOINT L STEVENS
Digitally signed by Joint L Stevens
9D6F32D777E842D...
2/9/2024
UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2024.

2. THE EXISTING UTILITIES BELONG TO CITY OF GRAHAM. THE CONTACT PERSON IS:

TONYA MANN
UTILITIES DIRECTOR
336-570-6721

REFER TO CITY OF GRAHAM STANDARD DETAILS AND SPECIFICATIONS - LATEST ADDITION. IN THE EVENT OF A CONFLICT BETWEEN THE UTILITY OWNER'S TECHNICAL SPECIFICATIONS AND NCDOT STANDARD SPECIFICATIONS/PROJECT SPECIAL PROVISIONS, THE MOST STRINGENT SHALL GOVERN.

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.

5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.

8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.

9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

10. ALL WATER LINE INSTALLED ON THIS PROJECT SHALL MEET THE REQUIREMENTS OF THE RULES GOVERNING PUBLIC WATER SYSTEMS. VERTICAL SEPARATION BETWEEN PROPOSED WATER MAINS AND STORM DRAINAGE SHALL BE A MINIMUM OF 18-INCHES PER RECOMMENDED STANDARDS OF WATER WORKS. ALL PROPOSED WATER LINE SHALL HAVE A MINIMUM COVER OF 36-INCHES. PROPOSED WATER MAINS SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF 10-FEET FROM SEWER MAINS (REF. RULE .0904, RULE.0906). UTILITIES BEING RELOCATED OR INSTALLED AS SHOWN ON THE UTILITY CONSTRUCTION PLANS MUST BE ADJUSTED ACCORDINGLY TO MEET THESE CRITERIA.

11. DEADMAN THRUST RESTRAINT SHALL BE USED ON DUCTILE IRON WATER PIPE AT LOCATIONS WITH MECHANICAL JOINT PLUGS. SEE DETAIL W-22 SHEET UC-3A.

STANDARD WATER DETAILS

HINDE ENGINEERING
License No. C-2639
401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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PROJECT REFERENCE NO.	SHEET NO.
U-6017	UC-3A

DESIGNED BY: JKC
DRAWN BY: JNA
CHECKED BY: JKC
APPROVED BY: CLS
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040370 JOINT L STEVENS
Digitally signed by Clint L Stevens
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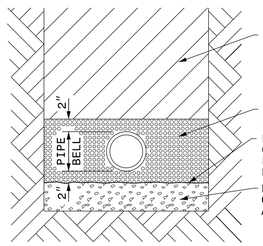
2/9/2024

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

TRENCH DETAIL



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

MAXIMUM TRENCH WIDTH AT TOP OF PIPE

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

RELATION OF WATER MAINS TO SEWERS

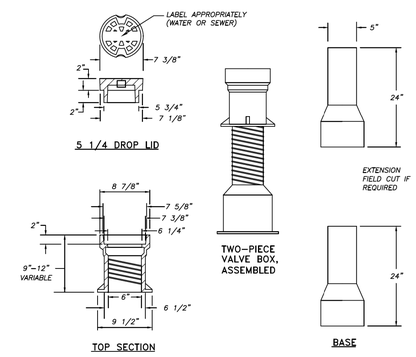
(a) Lateral Separation of Sewer and Water Mains. Water Mains shall be laid at least 10 feet laterally from outside of pipe to outside of pipe, from existing or proposed sewer, unless local conditions or barriers prevent a 10' foot lateral separation in which case:

1. *The water main is laid in a separate trench, with the elevation of the bottom of the water main at least 18 inches above the top of the sewer; or*
2. *The water main is laid in the same trench as the sewer with the water main located at one side of a bench of undisturbed earth, and with the elevation of the bottom of the water main at least 18 inches above the top of the sewer.*

(b) Crossing a Water Main over a Sewer. Whenever it is necessary for a water main to cross over a sewer, the water main shall be laid at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer, unless local conditions or barriers prevent an 18 inch vertical separation — — in which case both the water main and sewer shall be constructed of ferrous materials and with joints that are equivalent to water main standards for a distance of 10 feet on each side of the point of crossing.

(c) Crossing a Water Main Under a Sewer. Whenever it is necessary for a water main to cross under a sewer, both the water main and the sewer shall be constructed of ferrous materials and with joints equivalent to water main standards for a distance of 10 feet on each side of the point of crossing. A section of water main pipe shall be centered at the point of crossing.

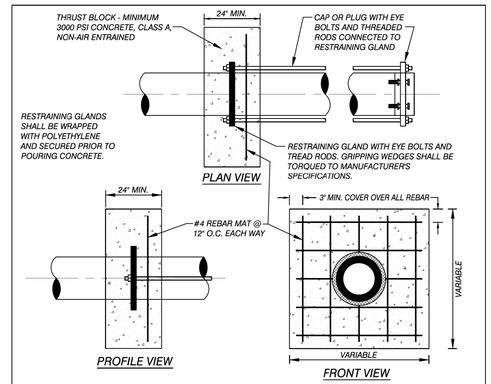
CITY OF GRAHAM		W-1
RELATION OF WATER MAINS TO SEWERS	DWG NO. T:DETAILS/GRAHAM DETAILS/2018 DETAILS/WATER	REV. 2/1/15



CAST IRON VALVE BOX – SCREW TYPE ACCOMMODATES 4" THROUGH 12" VALVES 5 1/4–INCH SHAFTS

NOTES:
VALVE BOX AND COVER WILL CONFORM TO ASTM A 48 CLASS 35

CITY OF GRAHAM		W-3
CAST IRON VALVE BOX	DWG NO. T:DETAILS/GRAHAM DETAILS/2018 DETAILS/WATER	REV. 6/25/18



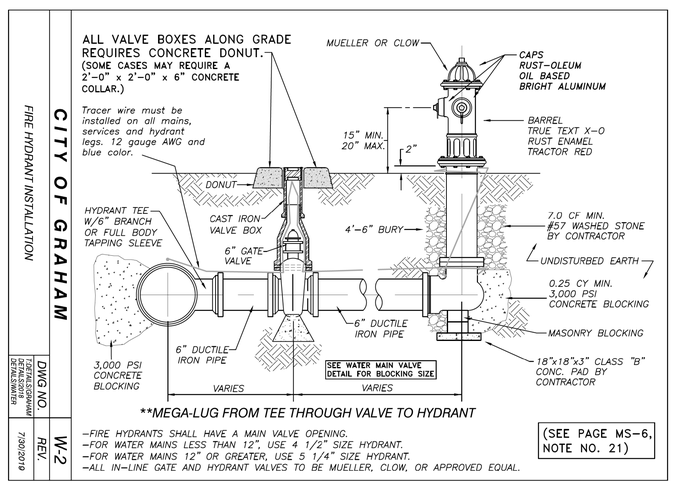
NOTES:
1. THRUST BLOCK SHALL BE ORIENTED APPROXIMATELY CENTER OF PIPE JOINT.
2. *OPTIONAL* A WELDED COLLAR (INSTALLED BY PIPE MANUFACTURER) MAY BE USED IN LIEU OF RESTRAINING GLANDS. ALL OTHER DESIGN REQUIREMENTS SHALL APPLY AS SHOWN.
3. FOR PIPES LARGER THAN 16" DIAMETER, THE DEADMAN THRUST RESTRAINT WITH BLOCKING MUST BE DESIGNED AND SEALED BY A N.C. PROFESSIONAL ENGINEER.
4. ANY PROPOSED MODIFICATIONS TO THIS STANDARD BASED ON THE FIELD CONDITIONS MUST BE PRE-APPROVED BY THE CITY AND/OR THE ENGINEER OF RECORD.
5. QUANTITIES SHOWN BELOW ARE TO THE NEAREST QUARTER YARD AND ARE BASED ON MINIMUM MASS WEIGHT REQUIREMENTS OF THE TEST PRESSURES SHOWN.

MINIMUM CUBIC YARDS OF CONCRETE REQUIRED

PIPE DIAMETER	150 PSI TEST PRES.	200 PSI TEST PRES.	250 PSI TEST PRES.
6"	0.75	1.0	1.25
8"	1.5	2.0	2.25
10"	2.0	3.0	3.5
12"	3.0	5.0	5.0
16"	5.5	7.25	9.0

CITY OF GRAHAM		W-22
DEADMAN THRUST RESTRAINT WITH MASS WEIGHT BLOCKING FOR DUCTILE IRON PIPE	DWG NO. T:DETAILS/GRAHAM DETAILS/2018 DETAILS/WATER	REV. 6/22/18

FIRE HYDRANT INSTALLATION



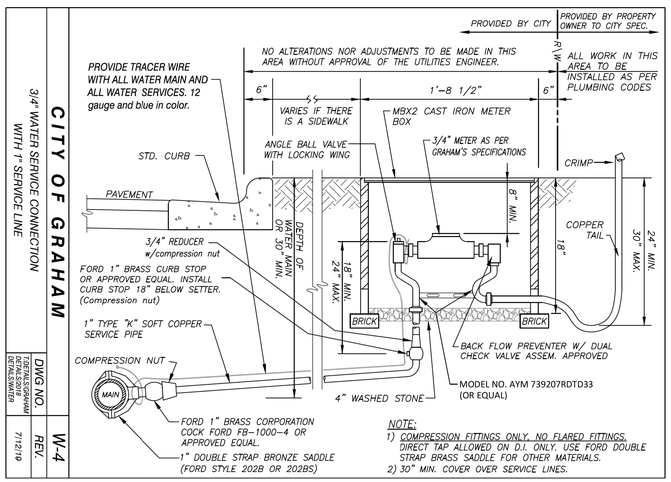
**MEGA-LUG FROM TEE THROUGH VALVE TO HYDRANT

–FIRE HYDRANTS SHALL HAVE A MAIN VALVE OPENING.
–FOR WATER MAINS LESS THAN 12", USE 4 1/2" SIZE HYDRANT.
–FOR WATER MAINS 12" OR GREATER, USE 5 1/4" SIZE HYDRANT.
–ALL IN–LINE GATE AND HYDRANT VALVES TO BE MUELLER, CLOW, OR APPROVED EQUAL.

(SEE PAGE MS–6, NOTE NO. 21)

CITY OF GRAHAM		W-2
	DWG NO. T:DETAILS/GRAHAM DETAILS/2018 DETAILS/WATER	REV. 7/30/2019

3/4" WATER SERVICE CONNECTION WITH 1" SERVICE LINE



NOTE:
1) COMPRESSION FITTINGS ONLY. NO FLARED FITTINGS. DIRECT TAP ALLOWED ON D.I. ONLY. USE FORD DOUBLE STRAP BRASS SADDLE FOR OTHER MATERIALS.
2) 30" MIN. COVER OVER SERVICE LINES.

CITY OF GRAHAM		W-4
	DWG NO. T:DETAILS/GRAHAM DETAILS/2018 DETAILS/WATER	REV. 7/12/19

STANDARD SEWER DETAILS

HINDE ENGINEERING
License No. C-2639
401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

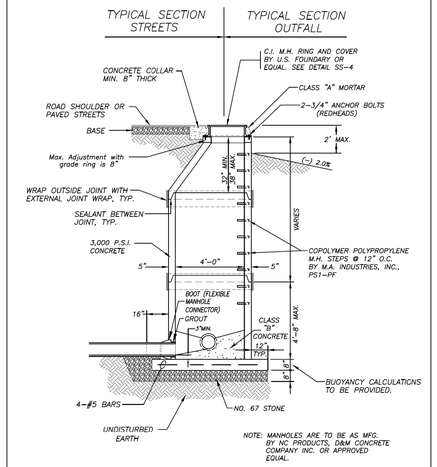
PROJECT REFERENCE NO.	SHEET NO.
U-6017	UC-3B
DESIGNED BY: JKC	
DRAWN BY: JNA	
CHECKED BY: JKC	
APPROVED BY: CLS	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040370 JOINT L STEVENS
DocuSigned by: Joint L Stevens 9D6F32D777EB42B...
2/9/2024

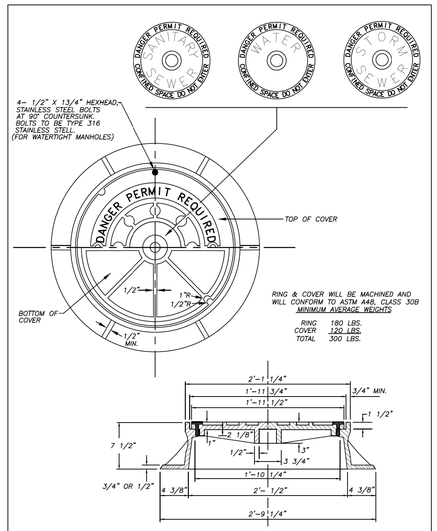
UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

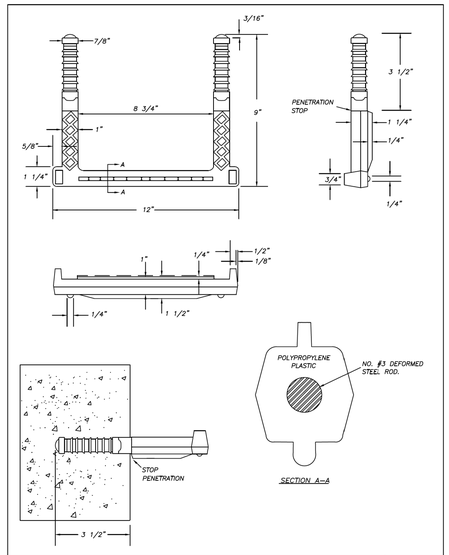


PARGE ALL INSIDE JOINTS WITH NON-SHRINK GROUT

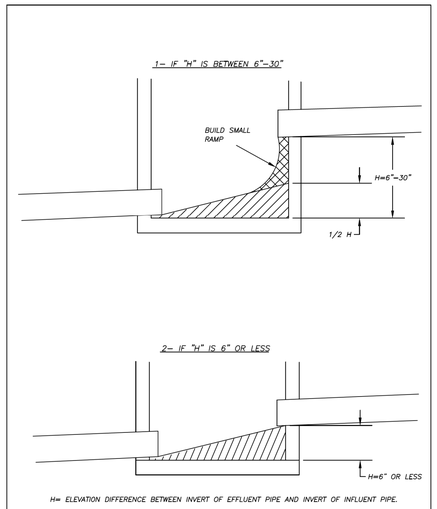
CITY OF GRAHAM	SS-1
STANDARD PRECAST MANHOLE	DWG NO.: T:DETAILS\GRAHAM DETAILS\2018 DETAILS\SEWER; REV.: 7/31/19



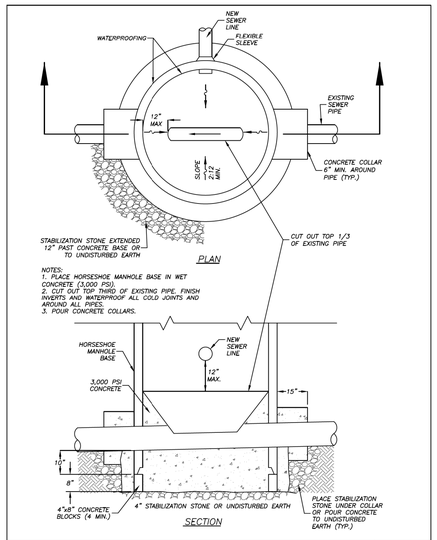
CITY OF GRAHAM	SS-5
MANHOLE RING AND COVER	DWG NO.: T:DETAILS\GRAHAM DETAILS\2018 DETAILS\SEWER; REV.: 9/20/18



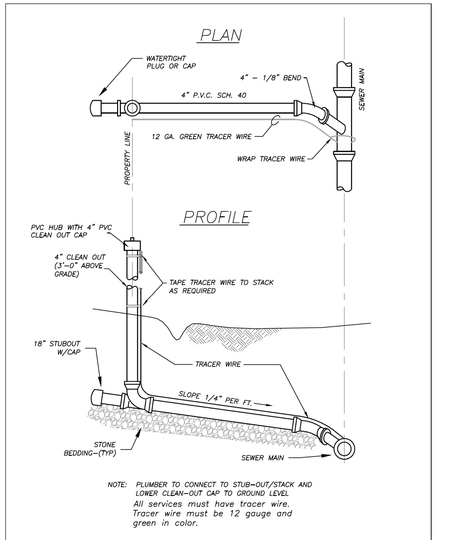
CITY OF GRAHAM	SS-6
POLYPROPYLENE MANHOLE STEP	DWG NO.: T:DETAILS\GRAHAM DETAILS\2015 DETAILS\SEWER; REV.: 10/30/19



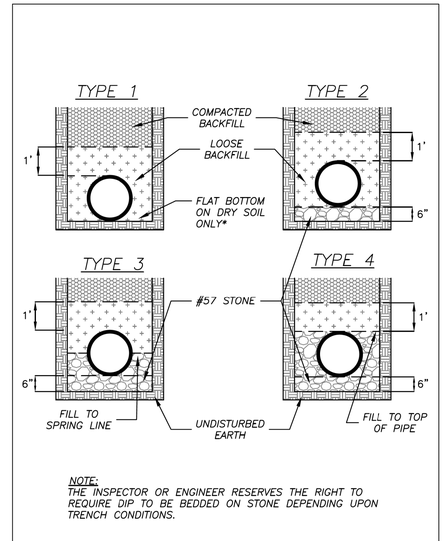
CITY OF GRAHAM	SS-8
MANHOLE CHANNEL	DWG NO.: T:DETAILS\GRAHAM DETAILS\2018 DETAILS\SEWER; REV.: 2/1/15



CITY OF GRAHAM	SS-9
DOGHOUSE MANHOLE	DWG NO.: T:DETAILS\GRAHAM DETAILS\2018 DETAILS\SEWER; REV.: 2-6-18

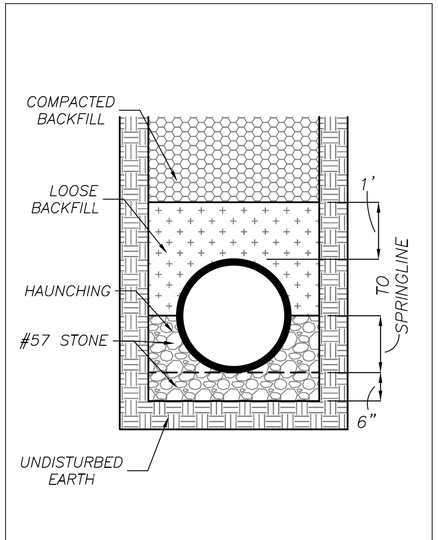


CITY OF GRAHAM	SS-10
STANDARD SEWER SERVICE CONNECTION	DWG NO.: T:DETAILS\GRAHAM DETAILS\2018 DETAILS\SEWER; REV.: 1/1/2020



NOTE:
THE INSPECTOR OR ENGINEER RESERVES THE RIGHT TO REQUIRE DIP TO BE BEDDED ON STONE DEPENDING UPON TRENCH CONDITIONS.

CITY OF GRAHAM	SS-11
DIP SANITARY SEWER BEDDING	DWG NO.: T:DETAILS\GRAHAM DETAILS\2018 DETAILS\SEWER; REV.: 8/8/19



CITY OF GRAHAM	SS-12
Pipe Embedment for PVC Sewer Lines	DWG NO.: T:DETAILS\GRAHAM DETAILS\2018 DETAILS\SEWER; REV.: 2/1/15

NAD 83/2011

RELOCATE FIRE HYDRANT
6″ VALVE
8 LF OF FIRE HYDRANT LEG
16″ X 16″ X 6″ TEE

(DI, CLASS 50) 114 LF OF 8″ SANITARY GRAVITY SEWER

(MANHOLE 3A) 4′ DIA UTILITY MANHOLE
1 LF UTILITY MANHOLE WALL 4′ DIA

46 LF OF 8″ SANITARY GRAVITY SEWER
(DI, CLASS 50)

4″ DIA UTILITY MANHOLE
(MANHOLE 3B, DOGHOUSE)

RELOCATE WATER METER
10 LF OF WATER SERVICE LINE

ABANDON 116 LF OF 6″ UTILITY PIPE
REMOVE UTILITY MANHOLE

12″ 45° BEND

12″ 45° BEND

8″ TAPPING SLEEVE & VALVE

12″ VALVE

8″ X 8″ X 8″ TEE
2-8″ MJ PLUG

12″ 22.5° BEND

8″ 22.5° BEND

ABANDON 343 LF OF
8″ UTILITY PIPE

ABANDON 128 LF OF
8″ UTILITY PIPE

235 LF OF 12″ WATER LINE
(DI RJ, CLASS 50)

-W3-

110 LF OF 8″ WATER LINE
(DI RJ, CLASS 50)

16″ X 16″ X 16″ TEE

16″ X 12″ REDUCER

8″ 22.5° BEND

NOTE: A
A RADIL

2-RELOCATE WATER METER
120 LF OF WATER SERVICE LINE

8″ VALVE

106 LF OF 8″ SANITARY GRAVITY SEWER
(DI, CLASS 50)

12″ X 12″ X 8″ TEE

12″ VALVE

4′ DIA UTILITY MANHOLE
(MANHOLE 1C, DOGHOUSE)

12″
22.5°
BEND

-W2-

8″
PLUG

6″ PLUG
6″ MJ PLUG

-W1-

6″ TAPPING SLEEVE & VALVE
4 LF OF 6″ WATER LINE
(DI RJ, CLASS 50)

12″ X 12″ X 6″ TEE
12″ MJ PLUG

12″ 11.25° BEND

2-RECONNECT WATER METER
30 LF OF WATER SERVICE LINE

4′ DIA UTILITY MANHOLE
(MANHOLE 1B)

-S1-

ABANDON 274 LF OF
6″ UTILITY PIPE
(PER THE CITY, PART OF THE EXISTING
WATER LINE MAY BE ABANDONED ALREADY)

82 LF OF 8″ SANITARY GRAVITY SEWER
(DI, CLASS 50)

4′ DIA UTILITY MANHOLE
(MANHOLE 1A)

RELOCATE WATER METER
66 LF OF WATER SERVICE LINE

12″ 11.25° BEND

428 LF OF 12″ WATER LINE
(DI RJ, CLASS 50)

12″ X 12″
X 8″ TEE
12″ MJ PLUG

33 LF OF 8″ WATER LINE
(DI RJ, CLASS 50)

8″ 22.5° BEND
8″ 45° BEND

8″ TAPPING
SLEEVE & VALVE

8″ PLUG

8″ MJ PLUG

12″
22.5°
BEND

12″ X 12″
X 12″ TEE

12″ VALVE

16″
11.25°
BEND

-S2-

16″
45°
BEND

RECONNECT
WATER METER
7 LF OF WATER
SERVICE LINE

358 LF OF
16″ WATER LINE
(DI RJ, CLASS 50)

RELOCATE
WATER METER
8 LF OF WATER
SERVICE LINE

16″ VALVE

16″ X 16″ X 8″ TEE
16″ MJ PLUG

8″ TAPPING SLEEVE & VALVE

16″
11.25°
BEND

8″ MJ PLUG

8″ PLUG

RECONNECT WATER METER
79 LF OF WATER SERVICE LINE

ABANDON 633 LF OF
8″ UTILITY PIPE

RELOCATE WATER METER
75 LF OF WATER SERVICE LINE

RELOCATE WATER METER
91 LF OF WATER SERVICE LINE

RELOCATE WATER METER
95 LF OF WATER SERVICE LINE

4′ DIA UTILITY MANHOLE (MANHOLE 2A)
REMOVE UTILITY MANHOLE

75 LF OF 10″ SANITARY GRAVITY SEWER (DI, CLASS 50)
ABANDON 75 LF OF 10″ UTILITY PIPE (REMOVE & REPLACE ON EX. GRADE)

4′ DIA UTILITY MANHOLE (MANHOLE 2B, DOGHOUSE)

86 LF OF 10″ SANITARY GRAVITY SEWER
(DI, CLASS 50)

16″
11.25°
BEND

16″ VALVE

4′ DIA UTILITY MANHOLE
(MANHOLE 2C)

16″ VALVE

RELOCATE WATER METER
36 LF OF WATER SERVICE LINE

-W4-

316 LF OF 16″ WATER LINE
(DI RJ, CLASS 50)

16″ X 16″ X 6″ TEE
16″ MJ PLUG

22 LF OF 6″ WATER LINE
(DI RJ, CLASS 50)

6″
PLUG

5″ MJ
PLUG

ABANDON 305 LF OF
6″ UTILITY PIPE

6″ TAPPING SLEEVE & VALVE

RECONNECT WATER METER
141 LF OF WATER SERVICE LINE

ABANDON 346 LF OF
10″ UTILITY PIPE

REMOVE UTILITY
MANHOLE

RELOCATE WATER METER
118 LF OF WATER SERVICE LINE

263 LF OF 10″ SANITARY GRAVITY SEWER
(DI, CLASS 50)

ABANDON 72 LF OF
10″ UTILITY PIPE

4′ DIA UTILITY MANHOLE (MANHOLE 2D, DOGHOUSE)
3 LF UTILITY MANHOLE WALL 4′ DIA

118 LF OF 8″ SANITARY GRAVITY SEWER
(DI, CLASS 50)

END CONSTRUCTION
-Y1- POT Sta.27+00.00
-Y1- PT Sta. 26+95.64

BEGIN TIP PROJECT U-6017
-L- POT Sta.16+75.43

BEGIN CONSTRUCTION
-Y1- POT Sta.20+35.00

END RESURFACING
-L- POC Sta.26+00.00

-L- PT Sta. 29+06.16

-L- PT Sta. 15+01.84

-L- Sta. 13+62.84

CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL 7

BEGIN RETAINING WALL
-L- STA. 17+65.00

END RETAINING WALL
-L- STA. 18+87.73

3′ X 3′ AUE POCKET SEE DETAIL

Unk Size & Material

CHILDREN'S CHAPEL UNITED CHURCH OF CHRIST
DB 422 PG 491
PB 71 PG 337

SUSAN ACKBURN NEWMAN
DB 447 PG 723

JEANETTE BEAUDRY
DB 553 PG 628

BRITTANY CATES
CORY CATES
KATHY CATES
DB 5820 PG 535

WILLIAM TALLEY JENNIFER TALLEY
DB 1496 PG 323
PB 1 PG 24

BARBARA J. HARRISON
ROBERT O. LANE
DB 1320 PG 103
PB 1 PG 24

RALPH STOC
HILDA STOCI

ISBK CHURCH

COL CEMETERY
DB 12 PG 129
PB 71 PG 337

JEANETTE BEAUDRY
DB 553 PG 628

MARY WADE
DB 506 PG 643

DOLLIE WADE ROYSTER
DB 64 PG 636

IMMEVOCABLE TRUST
DB 2862 PG 54
PB 2 PG 14

FRED LAMON
DB 828 PG

LLOYD EARL MORROW
DB 495 PG 221

JEFFI KAREN WINKLELEG
DB 2161 PG 232

KENNETH EUNICE RICHMOND
DB 4116 PG 994
PB 73 PG 118

SHAYONA CO
DB 843 PG/B

ANTHONY KUKIELKA
BRANDY KUKIELKA
DB 2246 PG 703

WILLIW ERVIN MEBANE HEIRS
DB 294 PG 493

SEAWELL C. WILSON
MATTIE H. WILSON
DB 177 PG 320

CAROLINA HOSIERY MILLS INC.

HINDE ENGINEERING
License No. C-2639
401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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PROJECT REFERENCE NO.	SHEET NO.
U-6017	UC-4
DESIGNED BY: JKC	
DRAWN BY: JNA	
CHECKED BY: JKC	
APPROVED BY: CLS	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040370 JOINT L STEVENS
DocuSigned by: Joint L Stevens 8D6F32D777EB42D...
2/9/2024

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

06-FEB-2024 13:34
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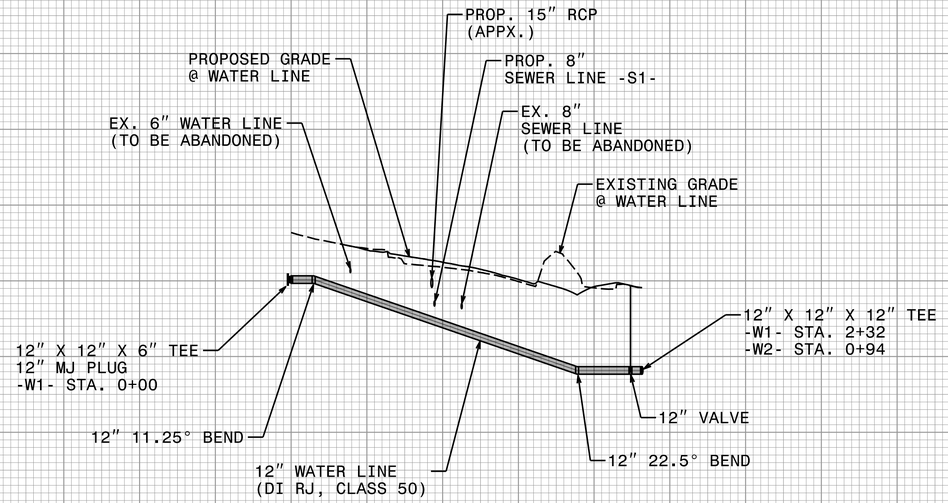
-W1-



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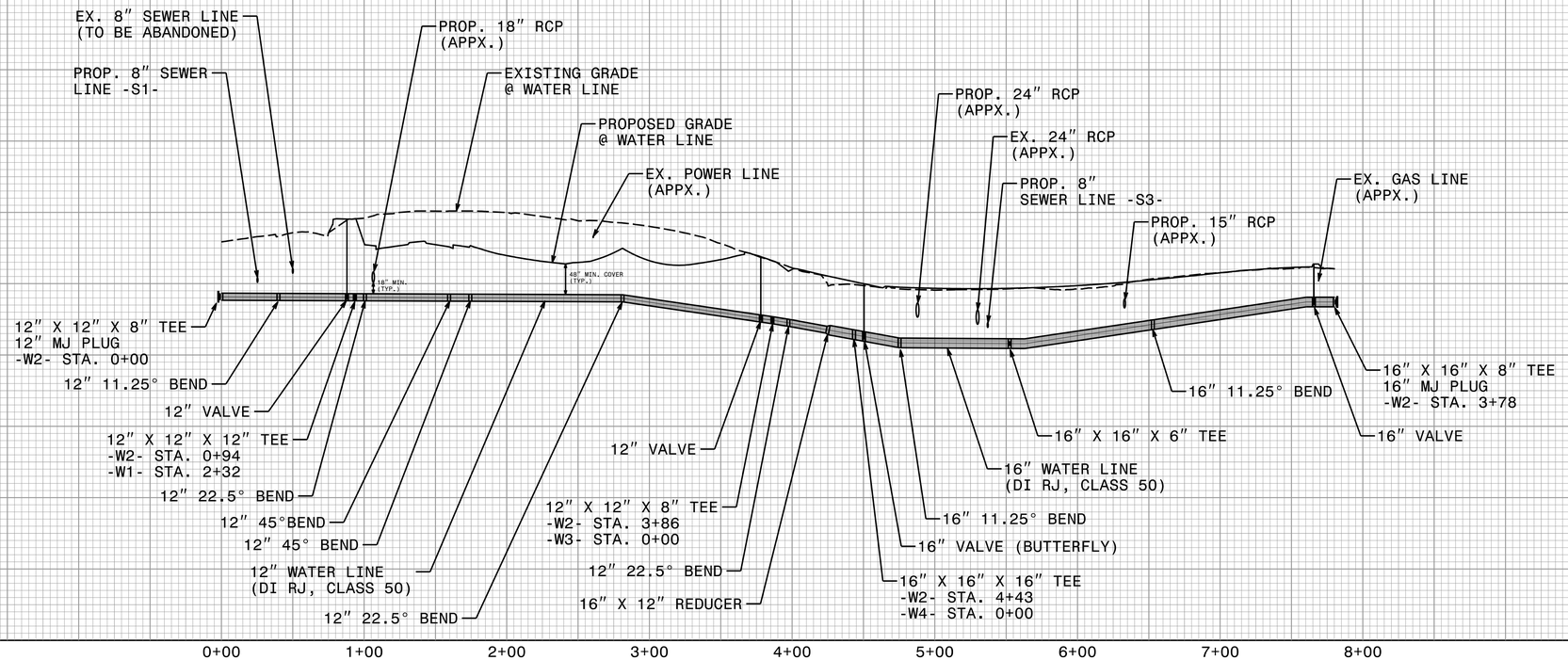

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License No. C-2639
401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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PROJECT REFERENCE NO.	SHEET NO.
U-6017	UC-5

DESIGNED BY: JKC
DRAWN BY: JNA
CHECKED BY: JKC
APPROVED BY: CLS
REVISED:

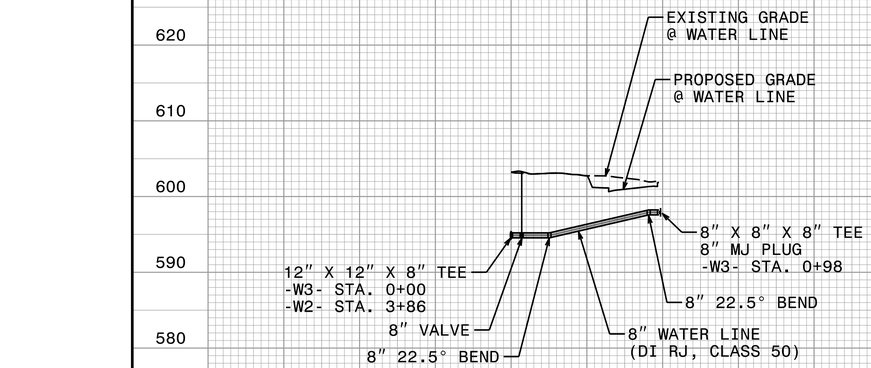
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

Digitally signed by Clint L Stevens
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040370 CLINT L STEVENS
9D6F32D777EB42D...
2/9/2024

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

-W3-



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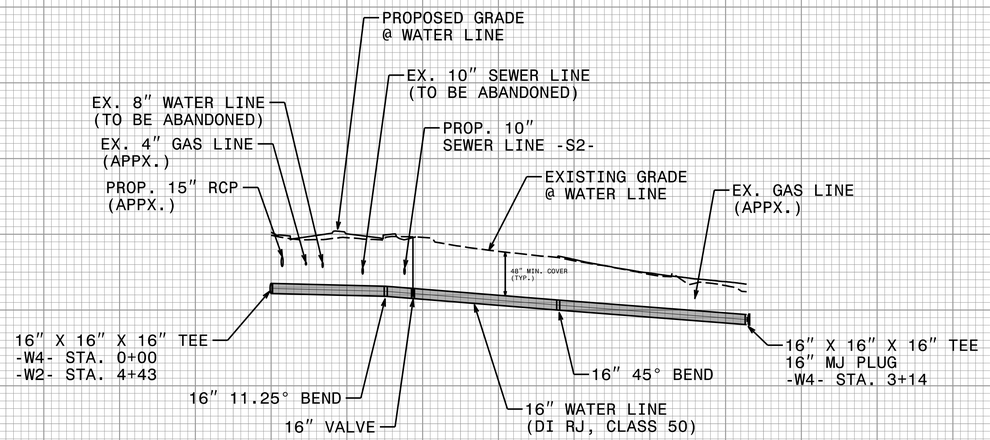

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License No. C-2639
401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-6017	UC-6

DESIGNED BY:	JKC
DRAWN BY:	JNA
CHECKED BY:	JKC
APPROVED BY:	CLS
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040370 JOHN CLINT L STEVENS
DocuSigned by: Clint L Stevens 9D6F32D777EB42D...
2/9/2024

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

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License No. C-2639
401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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PROJECT REFERENCE NO.	SHEET NO.
U-6017	UC-7

DESIGNED BY:	JKC
DRAWN BY:	JNA
CHECKED BY:	JKC
APPROVED BY:	CLS
REVISED:	

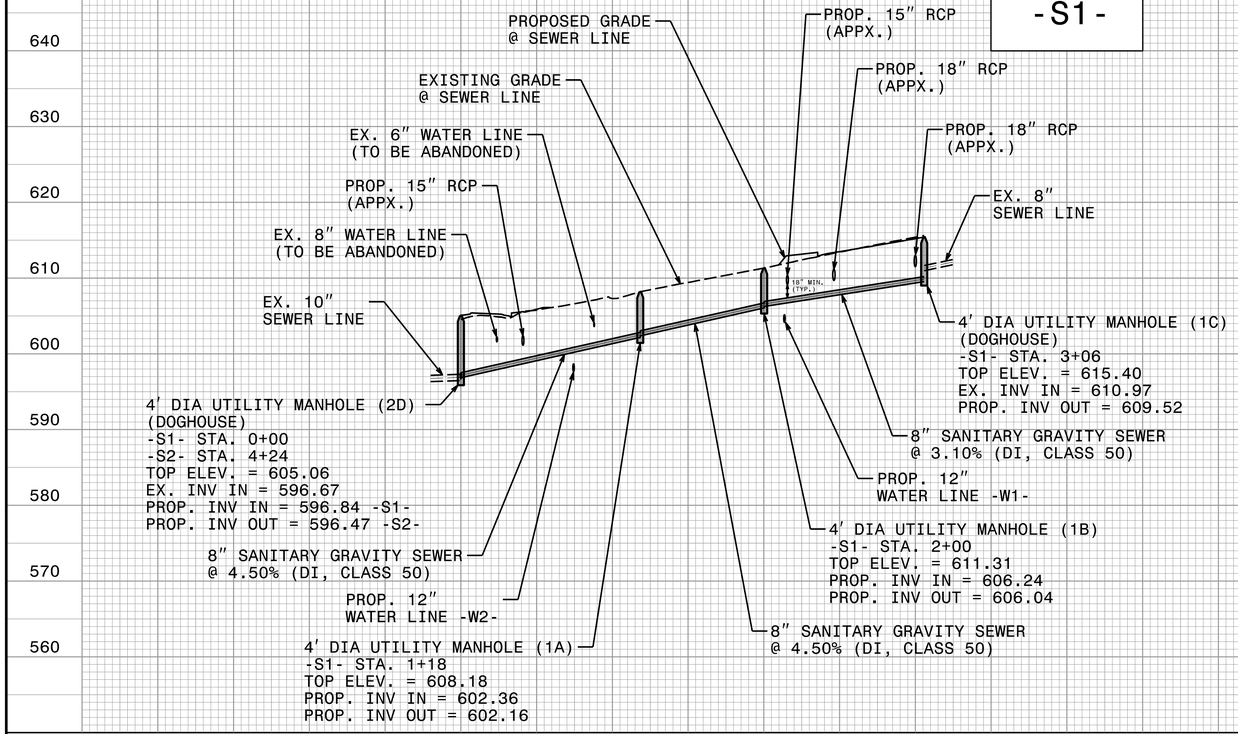
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040370 JOINT L. STEVENS
Digitally signed by Joint L. Stevens
3D6F32D777EB42D...
2/9/2024

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

-S1-



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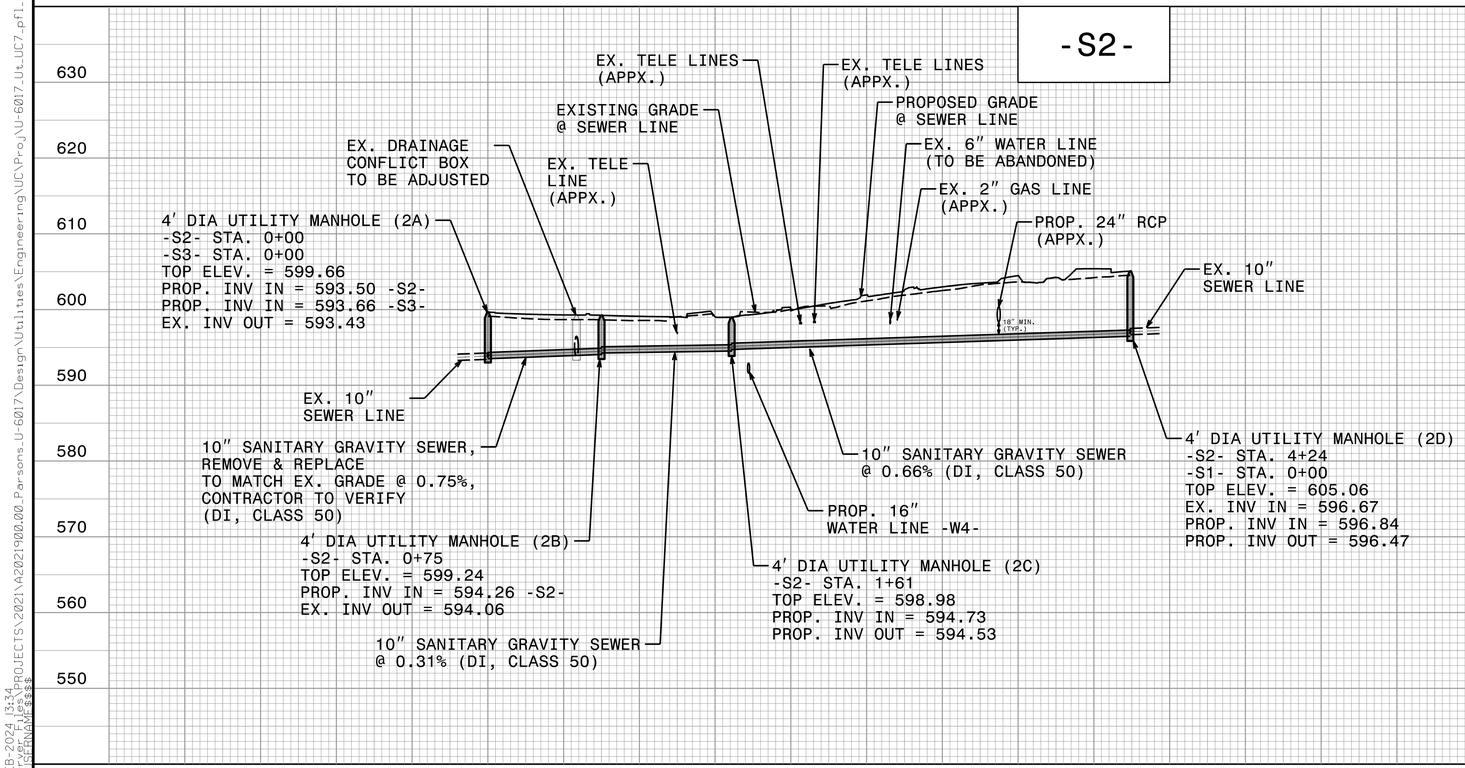

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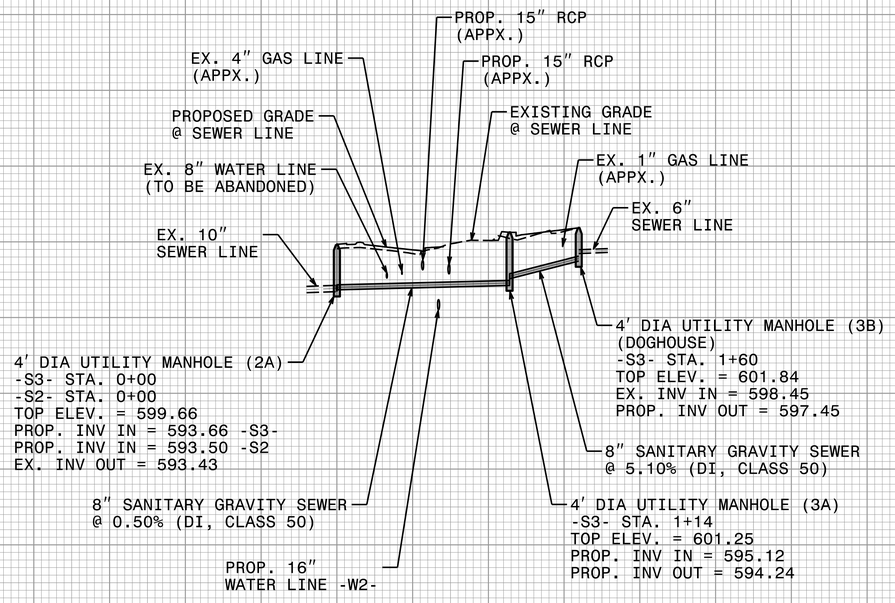

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PROJECT REFERENCE NO.	SHEET NO.
U-6017	UC-8

DESIGNED BY:	JKC
DRAWN BY:	JNA
CHECKED BY:	JKC
APPROVED BY:	CLS
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040370 CLINT L STEVENS
DocuSigned by: Clint L Stevens 9D6F22D777EB42D...
2/9/2024

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

09/08/99

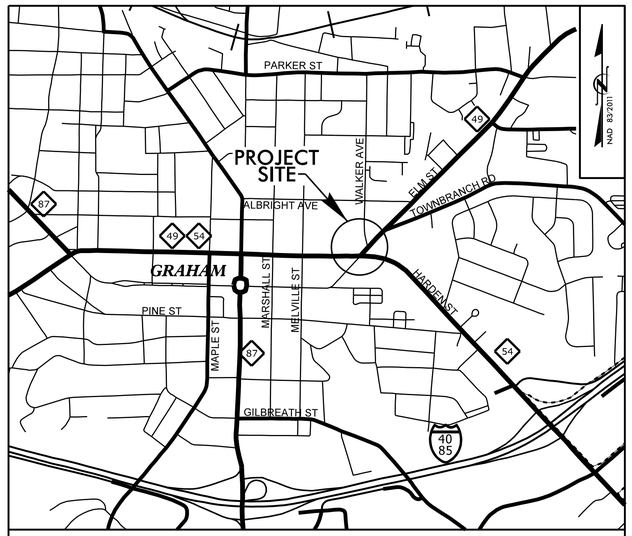
TIP PROJECT: U–6017

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
ALAMANCE COUNTY

T.I.P. NO.	SHEET NO.
U–6017	UO–1

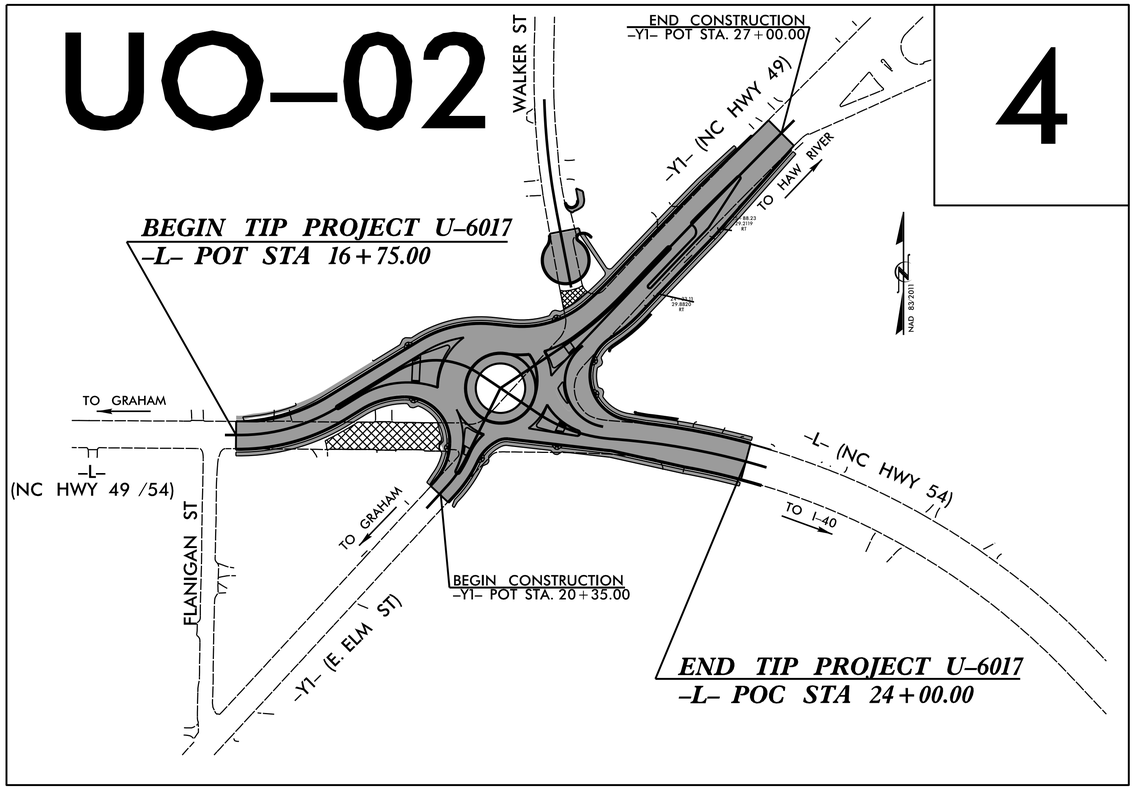
NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.



VICINITY MAP

LOCATION: INTERSECTION IMPROVEMENTS AT NC 54 (EAST HARDEN ST.) AND NC 49 (EAST ELM ST.) IN GRAHAM

TYPE OF WORK: POWER, GAS AND COMMUNICATIONS



GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

INDEX OF SHEETS

UTILITY OWNERS WITH CONFLICTS

(A) POWER – DUKE ENERGY
(B) GAS – PNG
(C) COMMUNICATIONS – AT&T
(D) COMMUNICATIONS – SPECTRUM

PREPARED IN THE OFFICE OF:

SAM™
2641 Sumner Boulevard
Suite 116
Raleigh, NC 27616
(919) 878–7466

Freddie Bunn — UTILITY PROJECT MANAGER
Matthew Ward — PROJECT UTILITY COORDINATOR

DIVISION OF HIGHWAYS
DIVISION 07

DIV ADDRESS
15884 Yanceyville Street
Greensboro, 27405

Chris Smitherman, PE — DIVISION PROJECT MANAGER

8/17/2023
...\Proj\U-6017_RDY_TSH.dgn
10:37:25 AM

PROJECT REFERENCE NO.	SHEET NO.
U-6017	U0-02
THIS SHEET CORRESPONDS TO RDY- 4	

UTILITIES BY OTHERS

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

NAD 83/2011

NOTE: ALL DRIVEWAYS ARE RADIUS TYPE WITH A RADIUS OF 2' UNLESS NOTED OTHERWISE

SEE SHEET 2B-1 FOR ADDITIONAL HORIZONTAL DATA AND SUPERELEVATION INFORMATION

PNG TIE TO EXIST.
PNG CAP
AT&T TIE TO EXIST.
AT&T/ SPECTRUM O/H
ABANDONED
DUKE/AT&T SPECTRUM O/H
REM
PNG CAP EXIST.
DUKE/AT&T SPECTRUM O/H
AT&T U/G
AT&T ADJUST MANHOLE TO GRADE
DUKE/SPECTRUM O/H

-Y2- PT Sta.12+51.35
-Y2- PC Sta.11+00.40
END CONSTRUCTION
-Y2- POT Sta.10+75.00
END RETAINING WALL -L- STA. 18+87.73
BEGIN RETAINING WALL -L- STA. 17+65.00
-L- PC Sta.16+77.43
BEGIN TIP PROJECT U-6017
-L- POT Sta.16+75.00
-L- PC Sta.13+76.24
-L- PT Sta.15+01.84
-Y1- POT Sta.20+35.00
BEGIN CONSTRUCTION
END TIP PROJECT U-6017
BEGIN RESURFACING
-L- POC Sta.24+00.00
END RESURFACING
-L- POC Sta.26+00.00
-L- PT Sta.29+06.16
-Y1- PT Sta.27+00.00
-Y1- PT Sta.26+95.64

DETAIL 3' X 5' AUE POCKET

CHILDREN'S CHAPEL UNITED CHURCH OF CHRIST
COL CEMETERY
JERRY D. SHOUSE, SR FRANCES D. SHOUSE
GORDON H. MILLER
KATIE N. WHEELER HEIRS
J JESUS L. MARQUEZ MINERVA DE MARQUEZ
DIANNE C. MOORE IRREVOCABLE TRUST
DOLLIE WADE ROYSTER
MARY WADE
FRED LAMONT WADE
JOHN BREWER BREWER
JEFFREY WALKER KAREN WINKFIELD
LLOYD EARL MORROW
FRANK L. TINNIN
BETTY JEAN FOUST CARTER WILLIAM B. CARTER
GLENN E. BYRD EDITH VALEREE M. BYRD
THOMAS PHILIP YOUNG
B.B.H. PROPERTIES
ANTHONY KUKIELKA BRANDY KUKIELKA
NEW MOUNT ZION CHRISTIAN CHURCH TRUSTEES
WILLIW ERVIN MEBANE HEIRS
SEAWELL C. WILSON MATTIE H. WILSON
CAROLINA HOSIERY MILLS INC.
SUSAN BLACKBURN NEWMAN
JEANETTE BEAUDRY
WILLIAM TALLEY JENNIFER TA
BRITTANY CATES CORY CATES KATHY CATES
RALPH STOCKARD HILDA STOCKARD
WILLIE HADLEY
WILLIE R. HADLEY
MARY ANNE MCVEY
THE MCVEY CO. INC.
TALLEY R TALLEY
DEWEY A. BROWN FLORINE B. BROWN
BARBARA J. HARRISON ROBERT O. LAKE
BURLINGTON GRAHAM LLC
DEWEL DAWN RAY
FRANK BURDETTE

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