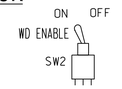
This electronic collection of documents is provided for the convenience of the user and is Not a Certified Document –

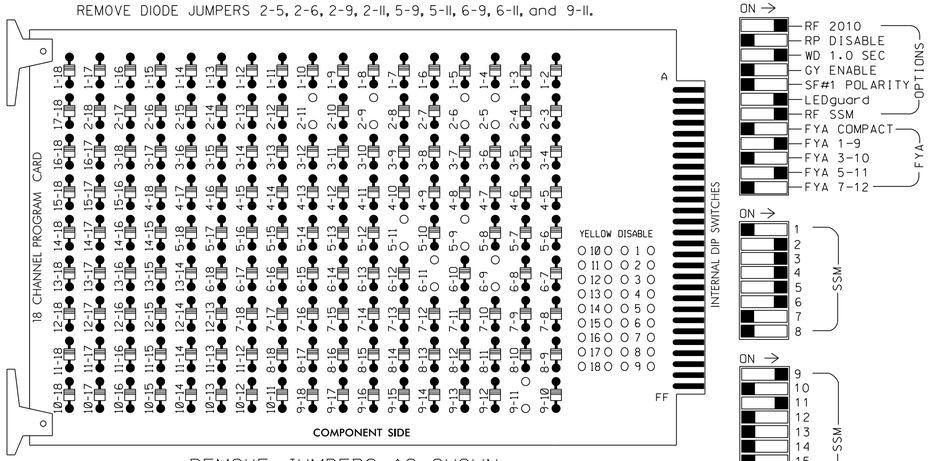
The documents contained herein were originally issued and sealed by the individuals whose names and license numbers appear on each page, on the dates appearing with their signature on that page.
This file or an individual page shall not be considered a certified document.

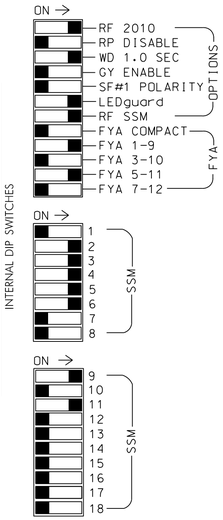
EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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





REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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 phase 2 Green and 6 Green.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

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

* See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-78.1

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	31,32	33,34	41	42,43	NU	51★	43	62,63	NU	NU	NU	NU	61★	NU	NU	51★	NU	NU
RED		128			116	101	101		*		134										
YELLOW		129			117	102	102				135										
GREEN		130			118	103	103				136										
RED ARROW				116												A121			A114		
YELLOW ARROW				117						132						A122			A115		
FLASHING YELLOW ARROW																A123			A116		
GREEN ARROW				118		103			133	133											

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

DETECTOR NOTES

1. For all loops, install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
2. For loop 5A, detector card placement and slot reserved for wired inputs are typical for a NCDOT installation. Inputs associated with this slot are compatible with time of day instructions located on sheet 2 of this electrical detail.

INPUT FILE POSITION LAYOUT

(front view)

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

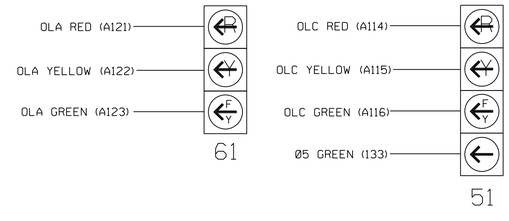
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



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
5A[1]	-	J1U	55	5 ★	5	YES		15		S
	-	I4U	47	22★	2	YES				S

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

★ See vehicle detector setup programming detail for alternate phasing on sheet 2.

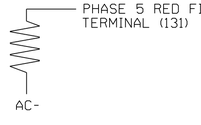
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0002T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 1 - TMP Phase I
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signals & Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Bus./SR 1414 (Raeford Road) at US 401 Bus. (Robeson Street) /McPhee Drive

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0002TI

DATE:
User:
File:C:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 1\U-4405_sig_ele_06-0002T1.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-78.2

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 . . . . . . . . . . . . . .
PROTECT  . . . . . . . . . . . . . . . .
PED PRTC . . . . . . . . . . . . . . . .
NOT OVLP . . . . . . . . . . . . . . . .
FLSH GRN . 1 . . . . . . . . . . . . . .
LAG X PH . . . . . . . . . . . . . . . .
LAG 2 PH . . . . . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Twice

OVERLAP C

Select TMG VEH OVLP [C] and 'PPLT FYA'

```
TMG VEH OVLP...[C] TYPE: ....PPLT FYA

PROTECTED LEFT TURN....   PHASE    5
OPPOSING THROUGH.......   PHASE    6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..........  5
```

← NOTICE SF BIT DISABLE 5

END PROGRAMMING

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

1. From Main Menu select [5. TIME BASE]
2. From TIME BASE Submenu select [2. ACTION PLAN]

```
ACTION PLAN...[  1]
PATTERN.........AUTO   SYS OVERRIDE.... NO
TIMING PLAN..... 0    SEQUENCE........  0
VEH DETECTOR PLAN.. 2  DET LOG........NONE
FLASH.........   --    RED REST........ NO
VEH DET DIAG PLN... 0  PED DET DIAG PLN..0
DIMMING ENABLE..   NO  PRIORITY RETURN. NO
PED PR RETURN..    NO  QUEUE DELAY..... NO
PMT COND DELAY     NO
  PHASE   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL   . . . . . . . . . . . . . . . .
WALK 2    . . . . . . . . . . . . . . . .
VEX 2     . . . . . . . . . . . . . . . .
VEH RCL   . . . . . . . . . . . . . . . .
MAX RCL   . . . . . . . . . . . . . . . .
MAX 2     . . . . . . . . . . . . . . . .
  PHASE   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
MAX 3     . . . . . . . . . . . . . . . .
CS INH    . . . . . . . . . . . . . . . .
OMIT      . . . . . . . . . . . . . . . .
SPC FCT   . . . . X . . . (1-8)
AUX FCT   . . . (1-3)
          1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15   . . . . . . . . . . . . . . .
LP 16-30  . . . . . . . . . . . . . . .
LP 31-45  . . . . . . . . . . . . . . .
LP 46-60  . . . . . . . . . . . . . . .
LP 61-75  . . . . . . . . . . . . . . .
LP 76-90  . . . . . . . . . . . . . . .
LP 91-100 . . . . . . . . . . . . . . .
```

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 5A

(program controller as shown)

IMPORTANT!

Program detectors per the input file connection and programming chart shown on sheet 1 before proceeding.

1. From Main Menu select [8. UTILITIES]
2. From UTILITIES Submenu select [1. COPY/CLEAR]
3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "2".

```
COPY / CLEAR UTILITY
       FROM              TO
PHASE TIMING.... . > PHASE TIMING.... .
TIMING PLAN..... . > TIMING PLAN..... .
PH DET OPT PLAN. . > PH DET OPT PLAN. .
DETECTOR PLAN... 1 > DETECTOR PLAN... 2
  TOGGLE TO SELECT A "FROM" AND A "TO"
          THEN PRESS ENTER
```

4. From Main Menu select [6. DETECTORS]
5. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]
6. Place cursor in VEH DET PLAN [ ] position and enter "2".
   - Place cursor in VEH DETECTOR [ ] position and enter "5".
   - Set delay time to "3.0".

```
VEH DETECTOR [ 5]   VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 5  5    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

← ENSURE DELAY IS SET TO '3.0'

   - Place cursor in VEH DETECTOR [ ] position and enter "22".
   - Set assigned phase to "0".

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

ENSURE PHASE IS SET TO "0" →

END PROGRAMMING

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN – PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BIT 5.

TO RUN ALT. PHASING DURING COORDINATION – SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BIT 5.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN DEFAULT PHASING	1	NONE
ACTIONS REQUIRED TO RUN ALTERNATE PHASING	2	5

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

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BIT 5 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

SF BIT 5:	Modifies overlap parent phases for head 51 to run protected turns only.
VEH DET PLAN 2:	Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0002T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 1 - TMP Phase I
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
Traffic Engineering Branch – Mobility and Safety Division
NC DEPARTMENT OF TRANSPORTATION
Traffic Engineering & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 401 Bus./SR 1414 (Raeford Road)
at
US 401 Bus. (Robeson Street)
/McPhee Drive

Division 6 | Cumberland County | Fayetteville

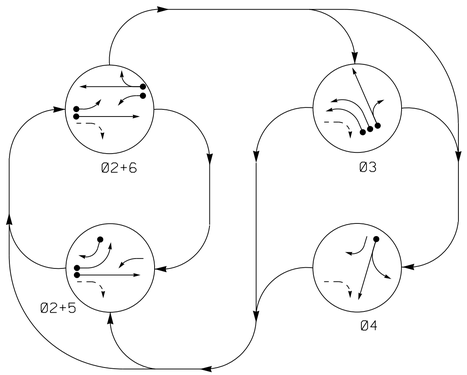
PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

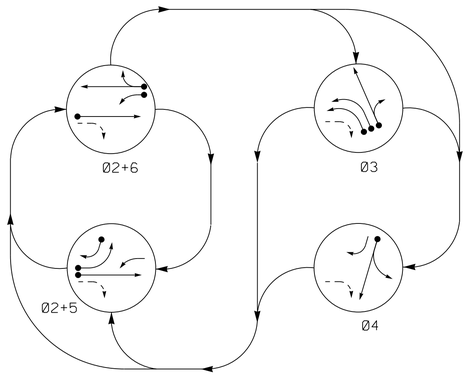
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0002TI

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-79.0

DEFAULT PHASING DIAGRAM

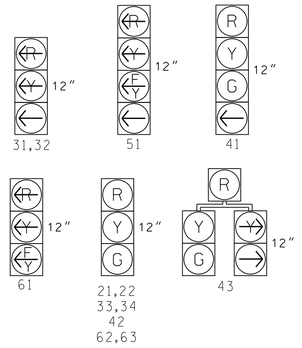


ALTERNATE PHASING DIAGRAM



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	UUSE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	70	✳	-	2	Yes	-	-	-	S	-	-
3A	6X40	0	✳	-	3	Yes	-	3	-	S	-	-
3B	6X40	0	✳	-	3	Yes	-	-	-	S	-	-
3C	6X40	0	✳	-	3	Yes	-	10	-	S	-	-
4A	6X40	0	✳	-	4	Yes	-	-	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	15★	-	S	-	-
					2#	Yes	-	-	-	S	-	-
5B	6X40	0	✳	-	5	Yes	-	15	-	S	-	-
6A	6X40	0	✳	-	6	Yes	-	-	-	S	-	-
6B	6X6	70	✳	-	6	Yes	-	-	-	S	-	-

✳ Video Detection Area.
Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.
Disable Phase(s) call during Alternate Phasing Operation.
★ Reduce delay from 15 to 3 seconds during Alternate Phasing Operation.

4 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Reposition existing signal heads numbered 61,62, and 63.
6. Set all detector units to presence mode.
7. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

DEFAULT PHASING TABLE OF OPERATION

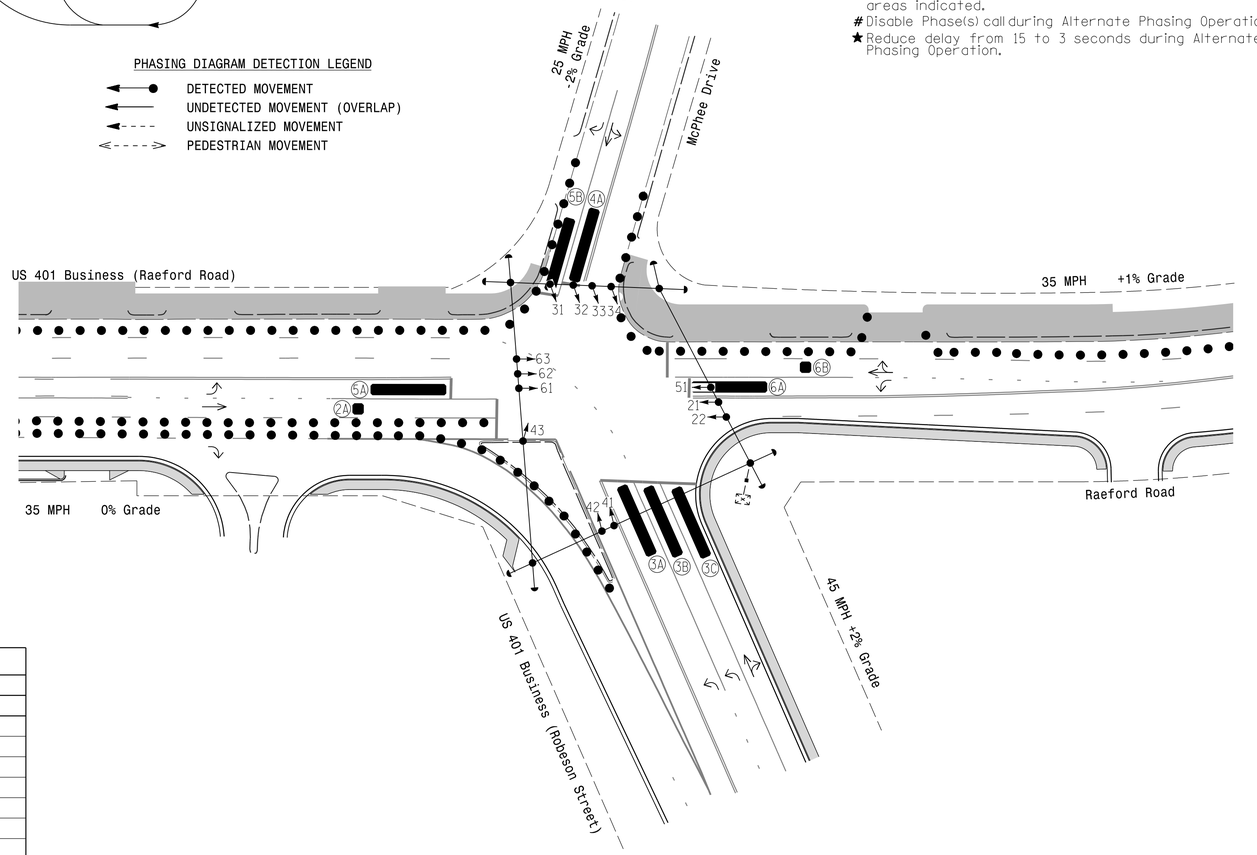
SIGNAL FACE	PHASE 2+5	PHASE 2+6	PHASE 3	PHASE 4	FLASH
21,22	G	G	R	R	Y
31,32	←R	←R	←R	←R	←R
33,34	R	R	G	R	R
41	R	R	R	G←	R
42	R	R	R	G	R
43	R↗	R	R	G	R
51	←	←F	←R	←R	←Y
61	←F	←F	←R	←R	←Y
62,63	R	G	R	R	Y

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 2+5	PHASE 2+6	PHASE 3	PHASE 4	FLASH
21,22	G	G	R	R	Y
31,32	←R	←R	←R	←R	←R
33,34	R	R	G	R	R
41	R	R	R	G←	R
42	R	R	R	G	R
43	R↗	R	R	G	R
51	←	←R	←R	←R	←Y
61	←F	←F	←R	←R	←Y
62,63	R	G	R	R	Y

PHASING DIAGRAM DETECTION LEGEND

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



ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6
Min Green *	10	7	7	7	10
Walk *	-	-	-	-	-
Ped Clear	-	-	-	-	-
Veh. Extension *	3.0	2.0	2.0	2.0	3.0
Max 1 *	45	25	20	15	45
Yellow	3.8	4.3	3.3	3.0	3.8
Red Clear	1.7	2.0	2.5	2.3	1.7
Red Revert	-	-	-	-	-
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	-	-	-	-	-
Simultaneous Gap	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.

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	
	Video Detection Area	N/A
	Construction Zone	N/A
	Drums	N/A

Signal Upgrade
Temporary Design 2 - TMP Phase II

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

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

SCALE 0 40 1"=40'

US 401 Bus./SR 1414 (Raeford Road)
at
US 401 Bus. (Robeson Street)
/McPhee Drive

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

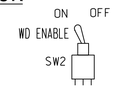
NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE

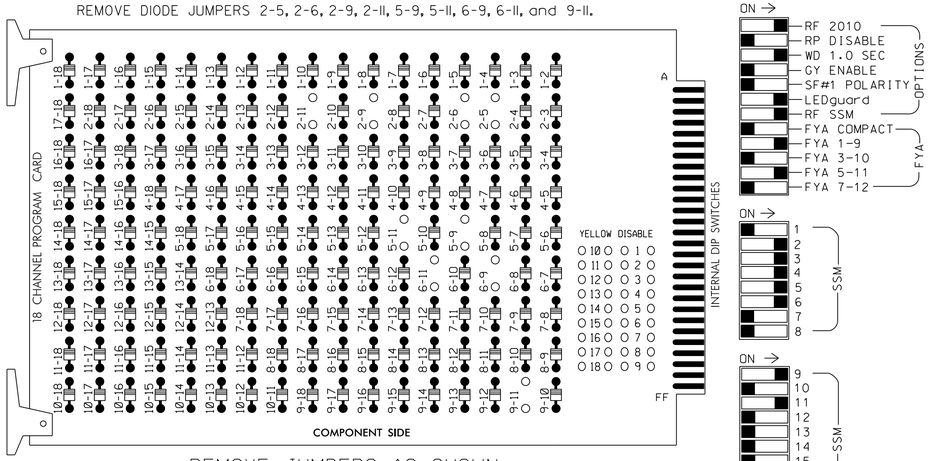
SIG. INVENTORY NO. 06-0002T2

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

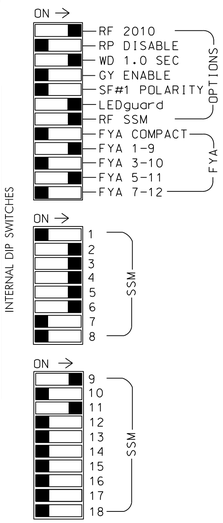
(remove jumpers and set switches as shown)



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



REMOVE JUMPERS AS SHOWN



■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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 phase 2 Green and 6 Green.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

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

✳ See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-79.1

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	4	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	31,32	33,34	41	42,43	NU	51★	43	62,63	NU	NU	NU	NU	61★	NU	NU	51★	NU	NU
RED		128			116	101	101		✳		134										
YELLOW		129			117	102	102				135										
GREEN		130			118	103	103				136										
RED ARROW				116												A121			A114		
YELLOW ARROW				117						132						A122			A115		
FLASHING YELLOW ARROW																A123			A116		
GREEN ARROW				118		103			133	133											

NU = Not Used

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

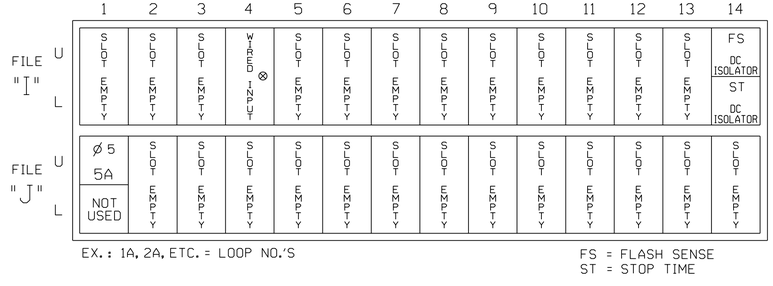
★ See pictorial of head wiring in detail this sheet.

DETECTOR NOTES

1. For all loops, install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
2. For loop 5A, detector card placement and slot reserved for wired inputs are typical for a NCDOT installation. Inputs associated with this slot are compatible with time of day instructions located on sheet 2 of this electrical detail.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
5A[1]	-	J1U	55	5 ★	5	YES		15		S
	-	I4U	47	22★	2	YES				S

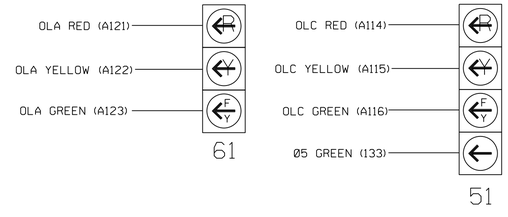
[1] Add jumper from J1-W to I4-W, on rear of input file.

★ See vehicle detector setup programming detail for alternate phasing on sheet 2.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

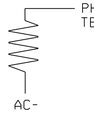
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)



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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0002T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 Bus./SR 1414 (Raeford Road)
at
US 401 Bus. (Robeson Street)
/McPhee Drive

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0002T2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-79.2

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 . . . . . . . . . . . . . .
PROTECT  . . . . . . . . . . . . . . . .
PED PRTC . . . . . . . . . . . . . . . .
NOT OVLP . . . . . . . . . . . . . . . .
FLSH GRN . 1 . . . . . . . . . . . . . .
LAG X PH . . . . . . . . . . . . . . . .
LAG 2 PH . . . . . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Twice

OVERLAP C

Select TMG VEH OVLP [C] and 'PPLT FYA'

```
TMG VEH OVLP...[C] TYPE: ....PPLT FYA

PROTECTED LEFT TURN....   PHASE    5
OPPOSING THROUGH.......   PHASE    6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..........  5
```

← NOTICE SF BIT DISABLE 5

END PROGRAMMING

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

1. From Main Menu select [5. TIME BASE]
2. From TIME BASE Submenu select [2. ACTION PLAN]

```
ACTION PLAN...[  1]
PATTERN.........AUTO   SYS OVERRIDE.... NO
TIMING PLAN..... 0    SEQUENCE........  0
VEH DETECTOR PLAN.. 2  DET LOG........NONE
FLASH...........  --   RED REST........ NO
VEH DET DIAG PLN... 0  PED DET DIAG PLN..0
DIMMING ENABLE..   NO  PRIORITY RETURN. NO
PED PR RETURN..    NO  QUEUE DELAY..... NO
PMT COND DELAY     NO
  PHASE   1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
PED RCL   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
WALK 2    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEX 2     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEH RCL   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX RCL   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX 2     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
  PHASE   1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
MAX 3     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
CS INH    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
OMIT      .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
SPC FCT   .  .  .  .  X  .  .  .  (1-8)
AUX FCT   .  .  .  (1-3)
          1  2  3  4  5  6  7  8  9  0  1  2  3  4  5
LP 1-15   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 16-30  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 31-45  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 46-60  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 61-75  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 76-90  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 91-100 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 5A

(program controller as shown)

IMPORTANT!

Program detectors per the input file connection and programming chart shown on sheet 1 before proceeding.

1. From Main Menu select [8. UTILITIES]
2. From UTILITIES Submenu select [1. COPY/CLEAR]
3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "2".

```
COPY / CLEAR UTILITY
       FROM              TO
PHASE TIMING.... . > PHASE TIMING.... .
TIMING PLAN..... . > TIMING PLAN..... .
PH DET OPT PLAN. . > PH DET OPT PLAN. .
DETECTOR PLAN... 1 > DETECTOR PLAN... 2
  TOGGLE TO SELECT A "FROM" AND A "TO"
          THEN PRESS ENTER
```

4. From Main Menu select [6. DETECTORS]
5. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]
6. Place cursor in VEH DET PLAN [ ] position and enter "2".
   - Place cursor in VEH DETECTOR [ ] position and enter "5".
   - Set delay time to "3.0".

```
VEH DETECTOR [ 5]   VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 5  5    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

← ENSURE DELAY IS SET TO '3.0'

   - Place cursor in VEH DETECTOR [ ] position and enter "22".
   - Set assigned phase to "0".

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

ENSURE PHASE IS SET TO "0" →

END PROGRAMMING

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN – PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BIT 5.

TO RUN ALT. PHASING DURING COORDINATION – SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BIT 5.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN DEFAULT PHASING	1	NONE
ACTIONS REQUIRED TO RUN ALTERNATE PHASING	2	5

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

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BIT 5 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

SF BIT 5:	Modifies overlap parent phases for head 51 to run protected turns only.
VEH DET PLAN 2:	Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0002T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
NC Department of Transportation – Mobility and Safety Division – Traffic Engineering Branch – Signals Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 401 Bus./SR 1414 (Raeford Road)
at
US 401 Bus. (Robeson Street)
/McPhee Drive

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

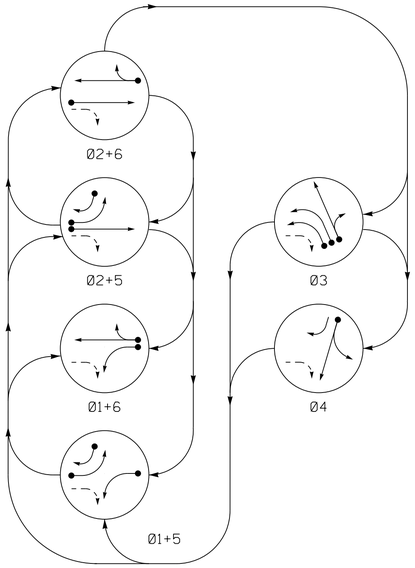
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0002T2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-80.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

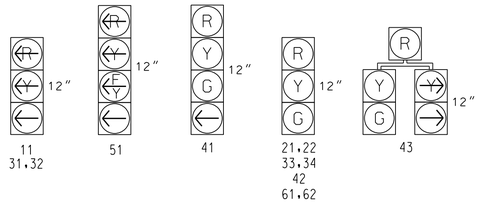
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~R~~	~~Y~~
21,22	R	R	G	G	R	R	Y
31,32	~~R~~	~~R~~	~~R~~	~~R~~	←	~~R~~	~~R~~
33,34	R	R	R	R	G	R	R
41	R	R	R	R	R	G	R
42	R	R	R	R	R	G	R
43	R/→	R	R/→	R	R	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~	~~Y~~
61,62	R	G	R	G	R	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

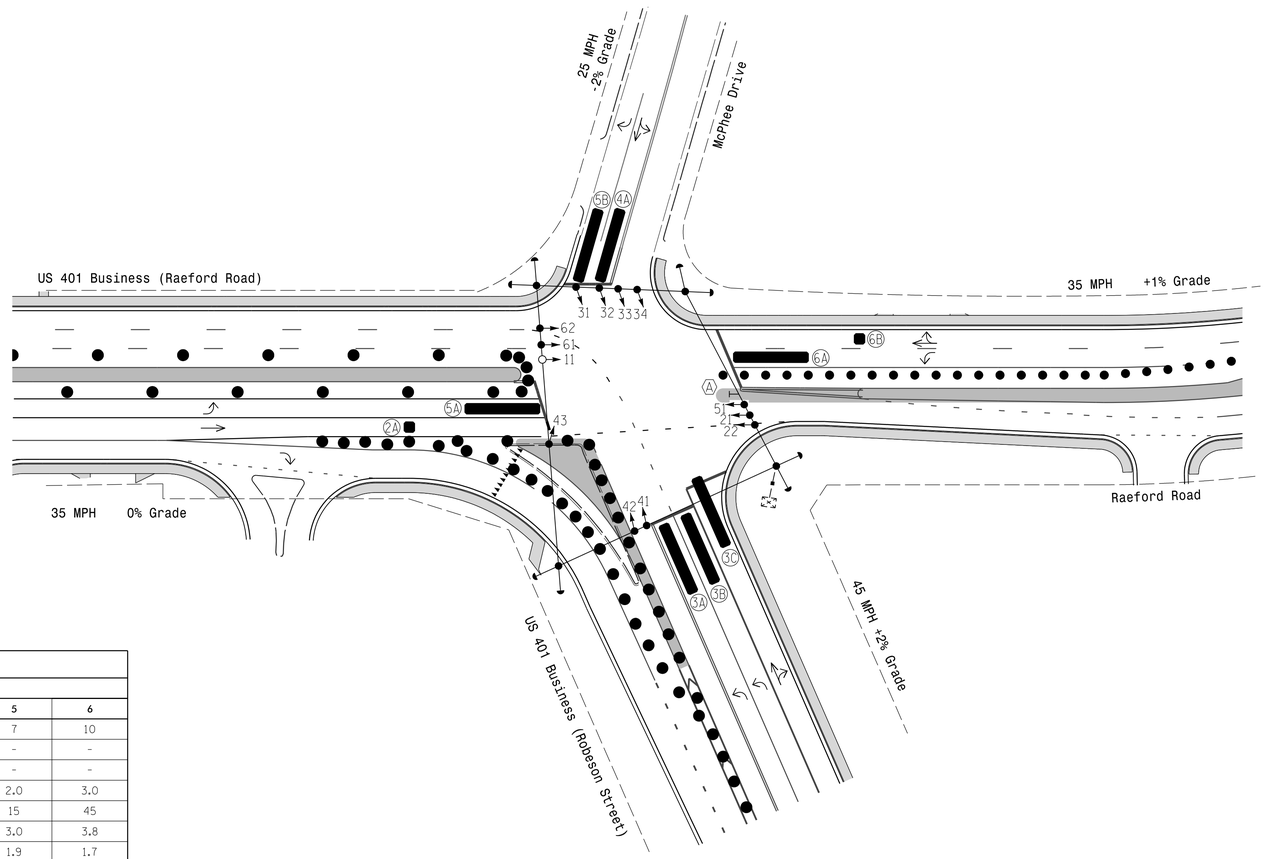
DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	UUSE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	10	✳	-	2	Yes	-	-	-	S	-	-
3A	6X40	0	✳	-	3	Yes	-	3	-	S	-	-
3B	6X40	0	✳	-	3	Yes	-	-	-	S	-	-
3C	6X40	0	✳	-	3	Yes	-	10	-	S	-	-
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	-	-	S	-	-
5B	6X40	0	✳	-	5	Yes	-	15	-	S	-	-
6A	6X40	0	✳	-	6	Yes	-	-	-	S	-	-
6B	6X6	70	✳	-	6	Yes	-	-	-	S	-	-

✳Video Detection Area.
Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.

6 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Reposition existing signal heads numbered 11,21,22,61, and 62.
6. Set all detector units to presence mode.
7. 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	⊣
▯↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○ʃ	Signal Pole with Sidewalk Guy	●ʃ
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
- - - - -	2-in Underground Conduit	- - - - -
N/A	Right of Way	- - - - -
→	Directional Arrow	→
▬	Video Detection Area	N/A
▭	Construction Zone	N/A
●●●	Drums	N/A
Ⓐ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓐ

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green *	7	10	7	7	7	10
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0
Max 1 *	15	45	25	20	15	45
Yellow	3.0	3.8	4.3	3.3	3.0	3.8
Red Clear	2.8	1.7	2.3	2.5	1.9	1.7
Red Revert	-	-	-	-	-	-
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	-	-	-	-	-	-
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.

Signal Upgrade
Temporary Design 3 - TMP Phase III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

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

US 401 Bus./SR 1414 (Raeford Road)
at
US 401 Bus. (Robeson Street)
/McPhee Drive

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

SCALE 0 40 1"=40'

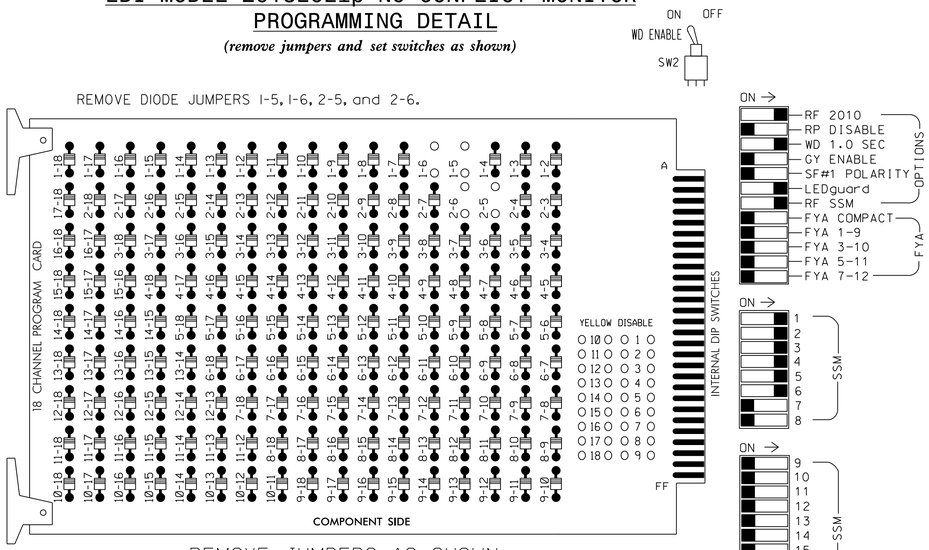
REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29449 BETSY L WATSON
DocuSigned by: Betsy L Watson 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0002T3

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.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Return controller to Factory Defaults before programming per this electrical detail.
3. Program controller to start up in phase 2 Green and 6 Green.
4. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

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

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-80.1

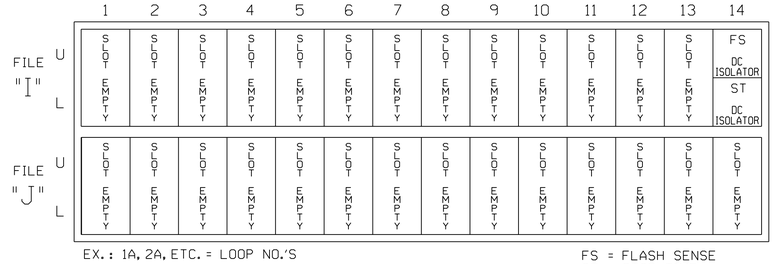
SIGNAL HEAD HOOK-UP CHART

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	NU	31,32	33,34	41	42,43	NU	51	43	62,63	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			116	101	101				134										
YELLOW		129			117	102	102				135										
GREEN		130			118	103	103				136										
RED ARROW	125			116					131												
YELLOW ARROW	126			117					132	132											
GREEN ARROW	127			118		103			133	133											

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

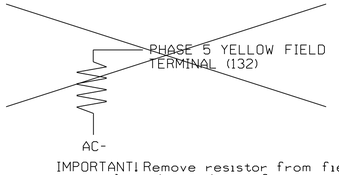
DETECTOR NOTES

1. For all loops, install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
2. Remove "Wired Inputs" from rear of input file to prevent unwanted calls to Phase 2.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

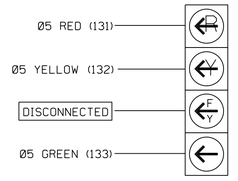
ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



IMPORTANT! Remove resistor from field terminal as shown above, if present.

SIGNAL WIRING DETAIL

(wire signal heads as shown)



51

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0002T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 3 - TMP Phase III
Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

NC Department of Transportation Mobility and Safety Division Traffic Engineering & Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Bus./SR 1414 (Raeford Road)
at
US 401 Bus. (Robeson Street)
/McPhee Drive

Division 6 Cumberland County Fayetteville

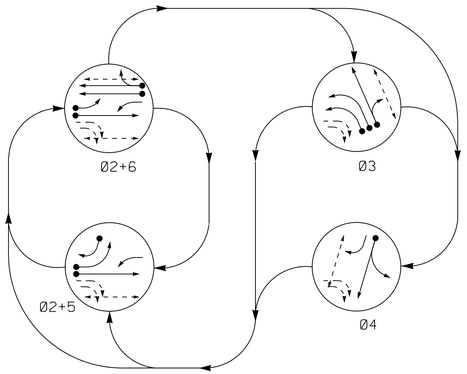
PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

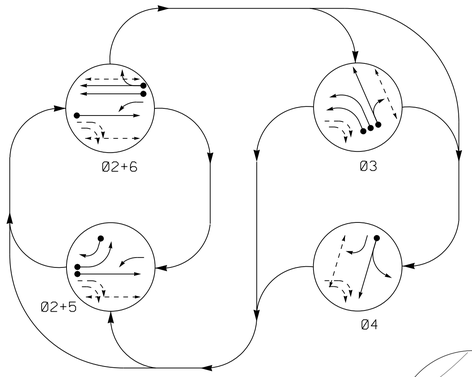
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0002T3

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-81.0

DEFAULT PHASING DIAGRAM

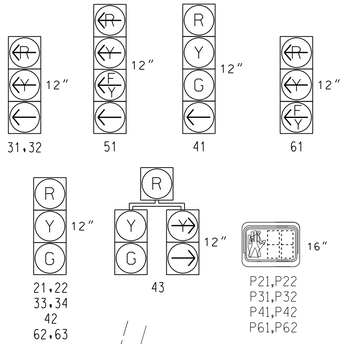


ALTERNATE PHASING DIAGRAM



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	3	X	2	Yes	-	-	-	S	-	X
3A	6X40	0	2-4-2	X	3	Yes	-	3	-	S	-	X
3B	6X40	0	2-4-2	X	3	Yes	-	-	-	S	-	X
3C	6X40	0	2-4-2	X	3	Yes	-	10	-	S	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	3	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	15★	-	S	-	X
					2#	Yes	-	-	-	S	-	X
5B	6X40	0	2-4-2	X	5	Yes	-	15	-	S	-	X
6A	6X40	0	2-4-2	X	6	Yes	-	-	-	S	-	X
6B	6X6	70	3	X	6	Yes	-	-	-	S	-	X
6C	6X6	70	3	X	6	Yes	-	-	-	S	-	X

#Disable Phase(s) call during Alternate Phasing Operation.
★Disable delay during Alternate Phasing Operation.

DEFAULT PHASING TABLE OF OPERATION

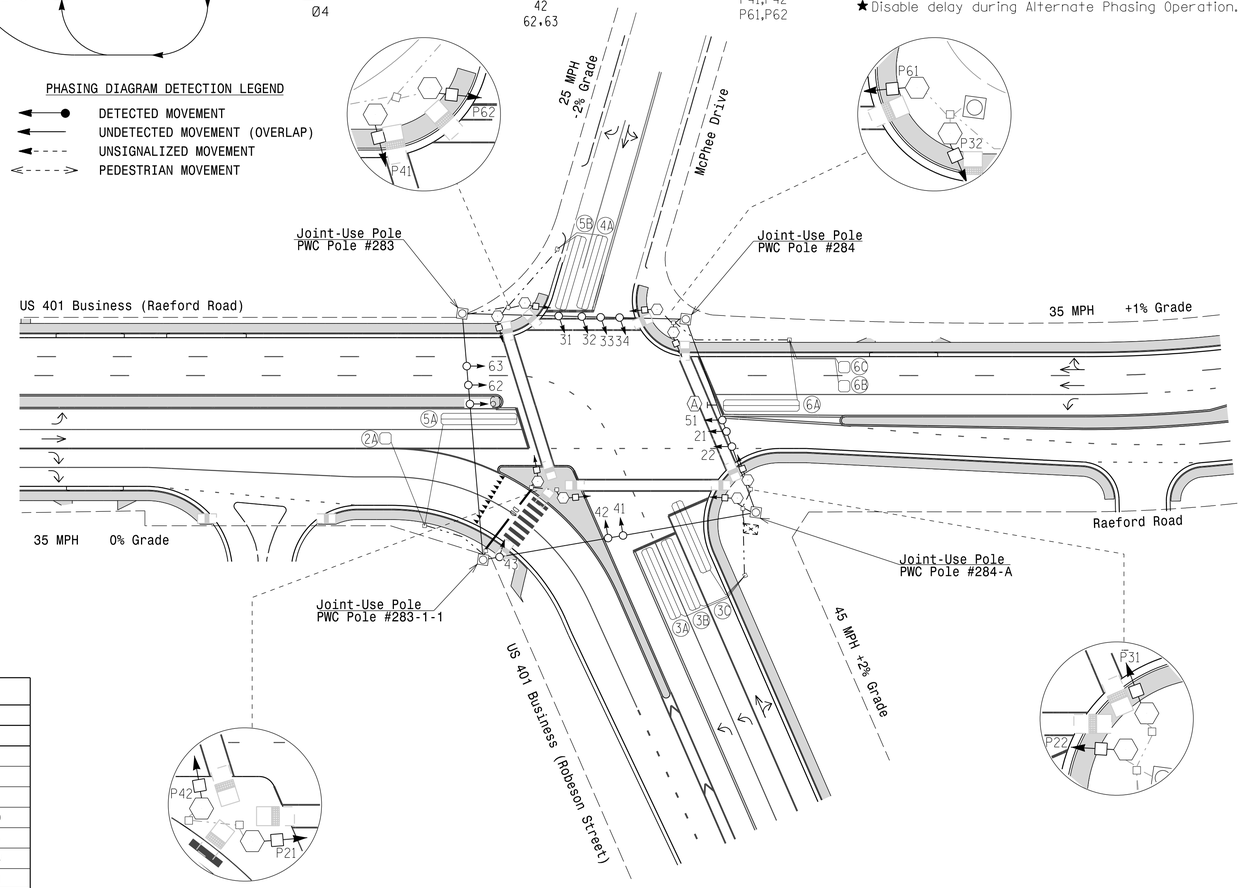
SIGNAL FACE	PHASE 2+5	PHASE 2+6	PHASE 3	PHASE 4	FLASH
21,22	G	G	R	R	Y
31,32	←R	←R	←R	←R	←R
33,34	R	R	G	R	R
41	R	R	R	G ←	R
42	R	R	R	G	R
43	R ↘	R	R	G	R
51	←F	←F	←R	←R	←Y
61	←F	←F	←R	←R	←Y
62,63	R	G	R	R	Y
P21,P22	W	W	DW	DW	DRK
P31,P32	DW	DW	W	DW	DRK
P41,P42	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	DW	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 2+5	PHASE 2+6	PHASE 3	PHASE 4	FLASH
21,22	G	G	R	R	Y
31,32	←R	←R	←R	←R	←R
33,34	R	R	G	R	R
41	R	R	R	G ←	R
42	R	R	R	G	R
43	R ↘	R	R	G	R
51	←F	←F	←R	←R	←Y
61	←F	←F	←R	←R	←Y
62,63	R	G	R	R	Y
P21,P22	W	W	DW	DW	DRK
P31,P32	DW	DW	W	DW	DRK
P41,P42	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	DW	DRK

PHASING DIAGRAM DETECTION LEGEND

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



ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6
Min Green *	10	7	7	7	10
Walk *	7	7	7	-	7
Ped Clear	18	15	19	-	12
Veh. Extension *	3.0	2.0	2.0	2.0	3.0
Max 1 *	45	25	20	15	45
Yellow	3.8	4.3	3.3	3.8	3.8
Red Clear	2.1	2.2	2.6	2.3	2.1
Red Revert	-	-	-	-	-
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	-	-	-	-	-
Simultaneous Gap	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
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. 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. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Pedestrian pedestals are conceoptual and shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1705.04 Sheets 1-3 for push button location details.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○~	Signal Pole with Sidewalk Guy	●~
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	----
→	Directional Arrow	→
◎	Metal Strain Pole	◘
DD	Directional Drill	N/A
Ⓐ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓐ

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

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

SCALE 0 40 1"=40'

US 401 Bus./SR 1414 (Raeford Road)
at
US 401 Bus. (Robeson Street)
/McPhee Drive

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L WATSON

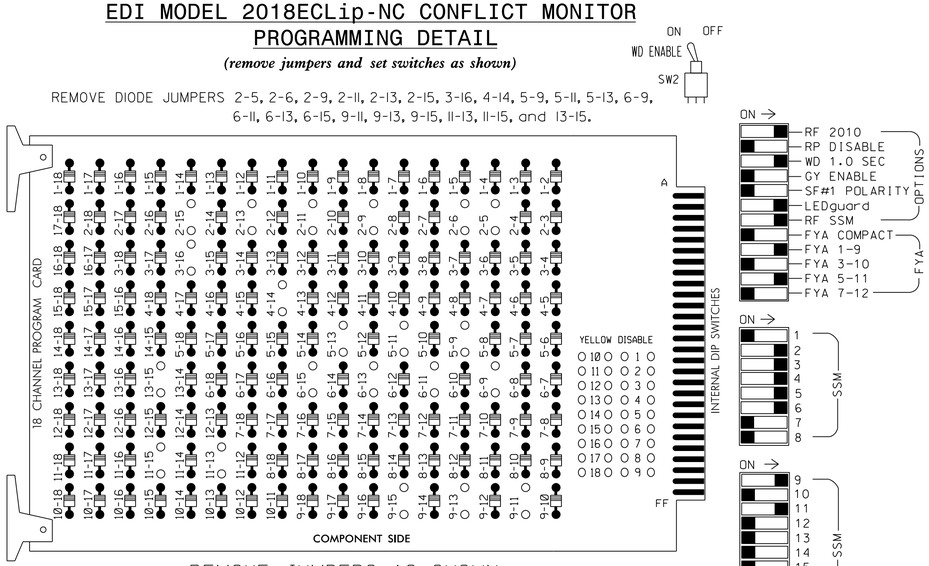
DocuSigned by: Betsy L Watson 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0002

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 3-16, 4-14, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 9-11, 9-13, 9-15, 11-13, 11-15, and 13-15.



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.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 2 WALK and 6 WALK.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

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

* See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-81.1

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	3 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	31,32	33,34	41	42,43	P41, P42	51★	43	62,63	P61, P62	NU	NU	P31, P32	61★	NU	NU	51★	NU	NU
RED		128			116	101	101		*		134										
YELLOW		129			117	102	102				135										
GREEN		130			118	103	103				136										
RED ARROW				116												A121			A114		
YELLOW ARROW				117					132							A122			A115		
FLASHING YELLOW ARROW																A123			A116		
GREEN ARROW				118		103			133	133											
✋			113					104				119			110						
🚶			115					106				121			112						

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

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	Ø2 2A	SLOT EMPTY	WIRED INPUT ⊗	Ø3 3A	Ø3 3B	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		NOT USED			NOT USED	Ø3 3C	Ø5 5B					Ø4 PED DC ISOLATOR	Ø3 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A	Ø6 6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø6 6B	NOT USED											

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES				S
3A	TB4-5,6	I5U	58	3	3	YES		3		S
3B	TB4-9,10	I6U	41	4	3	YES				S
3C	TB4-11,12	I6L	45	14	3	YES		10		S
4A	TB6-1,2	I7U	65	34	4	YES		3		S
5A[1]	TB3-1,2	J1U	55	5★	5	YES		15		S
	-	I4U	47	22★	2	YES				S
5B	TB6-3,4	I7L	78	44	5	YES		15		S
6A	TB3-5,6	J2U	40	6	6	YES				S
6B	TB3-7,8	J2L	44	16	6	YES				S
6C	TB3-9,10	J3U	64	36	6	YES				S
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED					
P31,P32	TB8-8,9	I13L	70	PED 8	3 PED					
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					

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

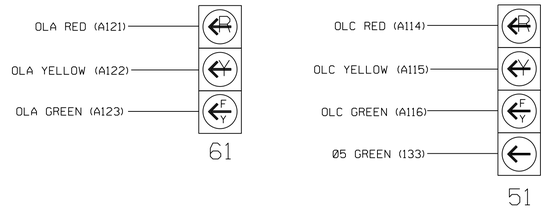
[1] Add jumper from J1-W to I4-W, on rear of input file.

★ See vehicle detector setup programming detail for alternate phasing on sheet 3.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA SIGNAL WIRING DETAIL

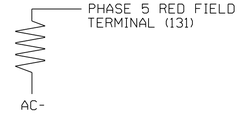
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0002
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section
NC DEPARTMENT OF TRANSPORTATION
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Bus./SR 1414 (Raeford Road) at US 401 Bus. (Robeson Street) /McPhee Drive

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0002

DATE:
User:
I:\Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0002.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-81.2

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 . . . . . . . . . . . . . .
PROTECT  . . . . . . . . . . . . . . . .
PED PRTC . . . . . . . . . . . . . . . .
NOT OVLP . . . . . . . . . . . . . . . .
FLSH GRN . 1 . . . . . . . . . . . . . .
LAG X PH . . . . . . . . . . . . . . . .
LAG 2 PH . . . . . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Twice

OVERLAP C

Select TMG VEH OVLP [C] and 'PPLT FYA'

```
TMG VEH OVLP...[C] TYPE: .....PPLT FYA

PROTECTED LEFT TURN....   PHASE    5
OPPOSING THROUGH.......   PHASE    6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 5
```

← NOTICE SF BIT DISABLE 5

END PROGRAMMING

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.

ECONOLITE ASC/3-2070 PED 3 PROGRAMMING ASSIGNMENT DETAIL

(program controller as shown)

1. From Main Menu select [6. DETECTORS]
2. From DETECTOR Submenu select [3. PED DETECTOR INPUT ASSIGNMENT]

```
PED DET PHASE ASSIGNMENT MODE:  NTCIP

   PHASE  1  2  3  4  5  6  7  8
DETECTOR  0  2  8  4  0  6  0  0

   PHASE  9 10 11 12 13 14 15 16
DETECTOR  0  0  0  0  0  0  0  0
```

← NOTICE PED DETECTOR 8 ASSIGNED TO PHASE 3

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [3. LOAD SW ASSIGN]

```
LD SWITCH ASSIGN
    PHASE       DIMMING ---FLASH---
    /OVLP TYPE R Y G D PWR AUT TGR
1     1   V    . . . + A   R   X
2     2   V    . . . + A   Y   .
3     3   V    . . . + A   R   X
4     4   V    . . . + A   R   .
5     5   V    . . . - A   R   .
6     6   V    . . . - A   Y   X
7     7   V    . . . - A   R   .
8     8   V    . . . - A   R   X
9     1   O    . . . + A   Y   X
10    2   O    . . . + A   R   X
11    3   O    . . . - A   Y   .
12    4   O    . . . - A   R   .
13    2   P    . . . + A   .   .
14    4   P    . . . - A   .   .
15    6   P    . . . + A   .   .
16    3   P    . . . - A   .   .
```

NOTICE PHASE 3 PED ASSIGNED TO LD SWITCH 16 →

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

1. From Main Menu select [5. TIME BASE]
2. From TIME BASE Submenu select [2. ACTION PLAN]

```
ACTION PLAN...[  1]
PATTERN.....AUTO   SYS OVERRIDE.... NO
TIMING PLAN..... 0   SEQUENCE.....  0
VEH DETECTOR PLAN.. 2   DET LOG.....NONE
FLASH.....    --   RED REST..... NO
VEH DET DIAG PLN... 0   PED DET DIAG PLN..0
DIMMING ENABLE..   NO   PRIORITY RETURN. NO
PED PR RETURN..    NO   QUEUE DELAY..... NO
PMT COND DELAY     NO
  PHASE   1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
PED RCL   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
WALK 2    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEX 2     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEH RCL   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX RCL   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX 2     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
  PHASE   1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
MAX 3     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
CS INH    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
OMIT      .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
SPC FCT   .  .  .  .  X  .  .  .  (1-8)
AUX FCT   .  .  .  (1-3)
          1  2  3  4  5  6  7  8  9  0  1  2  3  4  5
LP 1-15   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 16-30  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 31-45  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 46-60  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 61-75  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 76-90  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 91-100 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0002
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 Bus./SR 1414 (Raeford Road)
at
US 401 Bus. (Robeson Street)
/McPhee Drive

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0002

DATE:
U:\Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0002.dgn
User:rmuncy

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-81.3

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 5A

(program controller as shown)

IMPORTANT!

Program detectors per the input file connection and programming chart shown on sheet 1 before proceeding.

1. From Main Menu select [8. UTILITIES]
2. From UTILITIES Submenu select [1. COPY/CLEAR]
3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "2".

```
COPY / CLEAR UTILITY
      FROM                TO
PHASE TIMING.... . > PHASE TIMING.... .
TIMING PLAN..... . > TIMING PLAN..... .
PH DET OPT PLAN. . > PH DET OPT PLAN. .
DETECTOR PLAN... 1 > DETECTOR PLAN... 2
  TOGGLE TO SELECT A "FROM" AND A "TO"
          THEN PRESS ENTER
```

4. From Main Menu select [6. DETECTORS]
5. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]
6. Place cursor in VEH DET PLAN [ ] position and enter "2".
   - Place cursor in VEH DETECTOR [ ] position and enter "5".
   - Set delay time to "0".

```
VEH DETECTOR [ 5]   VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 5  5    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

NOTICE VEH DET PLAN 2

ENSURE DELAY IS SET TO '0'

   - Place cursor in VEH DETECTOR [ ] position and enter "22".
   - Set assigned phase to "0".

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

NOTICE VEH DET PLAN 2

ENSURE PHASE IS SET TO "0"

END PROGRAMMING

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BIT 5.

TO RUN ALT. PHASING DURING COORDINATION - SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BIT 5.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN DEFAULT PHASING	1	NONE
ACTIONS REQUIRED TO RUN ALTERNATE PHASING	2	5

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

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BIT 5 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

SF BIT 5:	Modifies overlap parent phases for head 51 to run protected turns only.
VEH DET PLAN 2:	Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0002
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
NC DEPARTMENT OF TRANSPORTATION – Traffic Engineering Branch – Communication, Mobility and Safety Division – Traffic Signals & Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Bus./SR 1414 (Raeford Road)
at
US 401 Bus. (Robeson Street)
/McPhee Drive

Division 6 | Cumberland County | Fayetteville

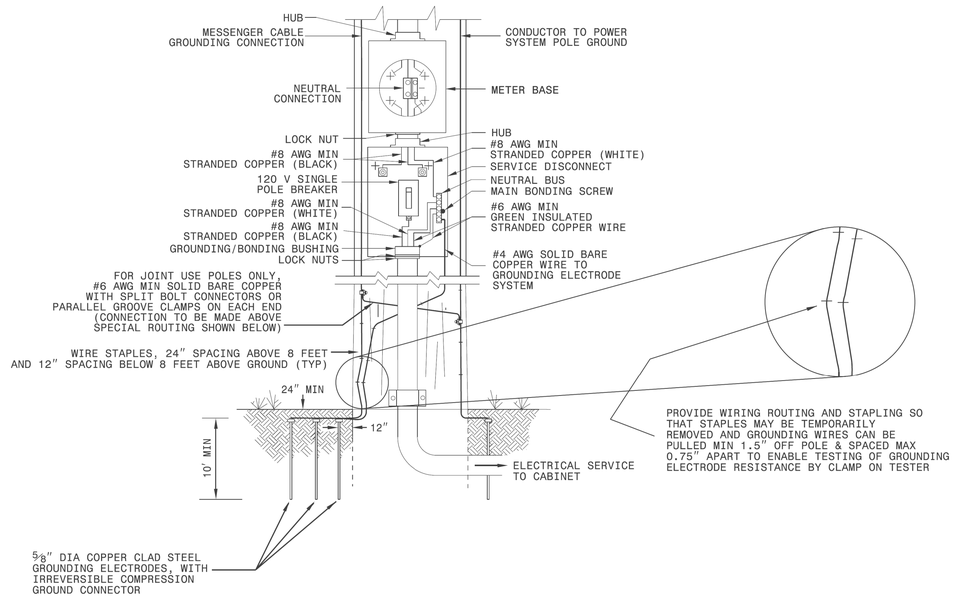
PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0002

DATE
User:Office:C:\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0002.dgn
User:rmuncey

PROJECT NO.	SHEET NO.
U-4405	Sig.82.0



1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

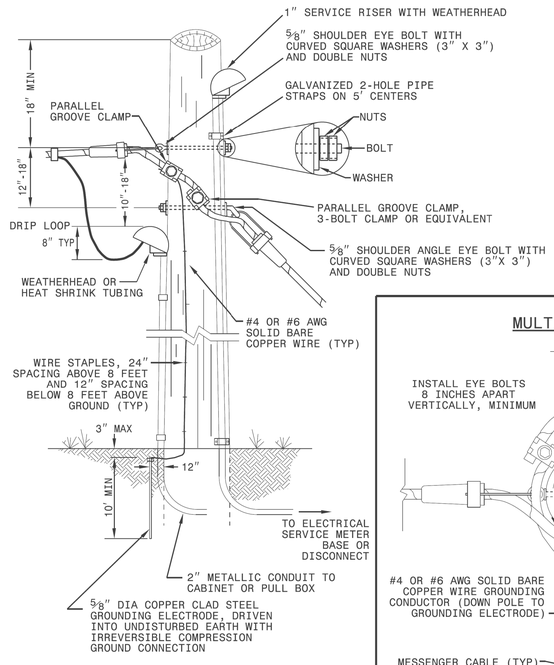
ELECTRICAL SERVICE GROUNDING

GROUNDING AND BONDING

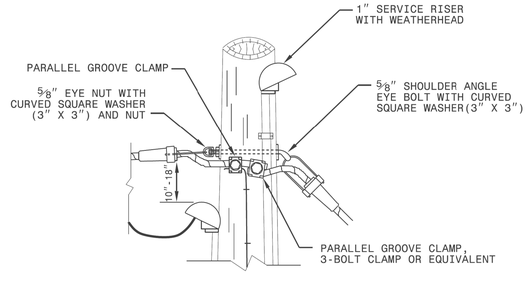
SHEET 1 OF 1

1700D01

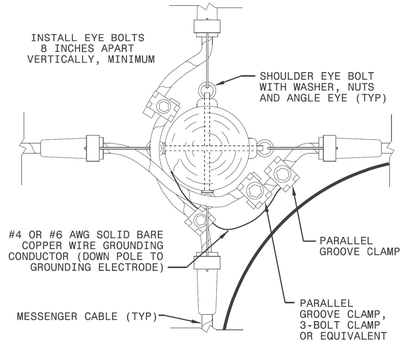
TWO-BOLT METHOD (PREFERRED)



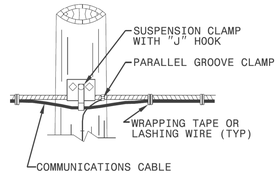
ONE-BOLT METHOD



MULTIPLE SPANS



COMMUNICATIONS CABLE AT INTERMEDIATE POLE



NOTE

FOR CONNECTING MESSENGER TO MESSENGER, USE PARALLEL GROOVE CLAMP, 3-BOLT CLAMP OR EQUIVALENT. FOR CONNECTING COPPER WIRE TO MESSENGER, USE PARALLEL GROOVE CLAMP.

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

WOOD POLES

METHODS OF ATTACHMENT AND GROUNDING

SHEET 1 OF 1

1720D01

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

See Plate for Title

Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS & Signals Unit

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

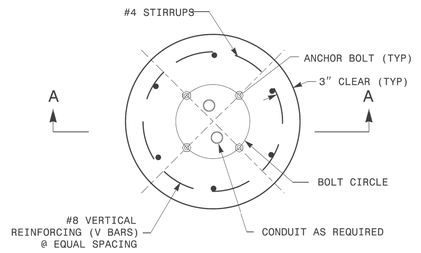
NORTH CAROLINA PROFESSIONAL SEAL 032108 ENGINEER MOHD A. ASLAMI

DocuSigned by: Mohd Aslami
5D980BA6DBB6495...

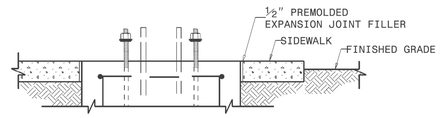
10/11/2017
DATE

11-OCT-2017 08:56
I:\Projects\2017 Std Drawings\Plate Sheets\2018_Plate Sheet .dgn
rwhough

PROJECT NO.	SHEET NO.
U-4405	Sig.83.0



PEDESTAL FOUNDATION - PLAN VIEW

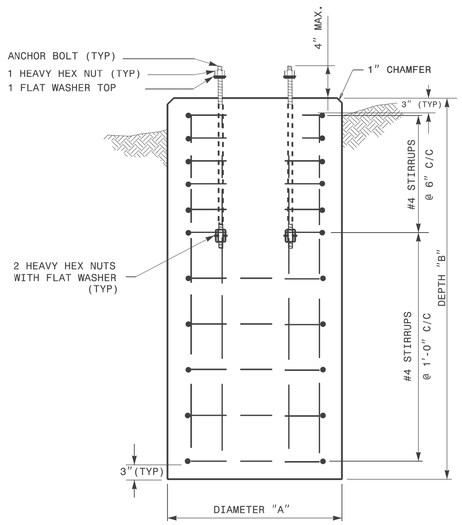


PEDESTAL FOUNDATION DETAILS FOR SIDEWALK

NOTES:

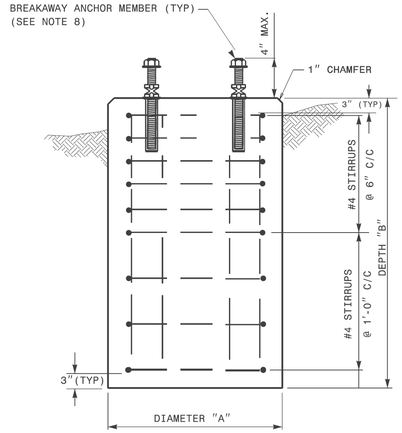
1. CAST FOUNDATION AGAINST UNDISTURBED SOIL WHEREVER CONDITIONS PERMIT. IN UNSTABLE SOIL, CAST-IN-PLACE TUBE FORMS ARE ALLOWED WITH APPROVAL.
2. COMPLY WITH APPLICABLE PROVISIONS OF SECTION 825 FOR CONCRETE CONSTRUCTION.
3. USE CLASS "A" CONCRETE THAT MEETS THE REQUIREMENTS OF SECTION 1000 WITH A COMPRESSION STRENGTH AT 28 DAYS OF F'c= 3000 PSI (MIN.).
4. USE ASTM GRADE 60 DEFORMED BARS FOR ALL REINFORCING STEEL.
5. GRADE IS ASSUMED TO BE (8H:1V) OR FLATTER. FOUNDATION SIZE AND DEPTHS ARE BASED ON THE FOLLOWING SOIL DESIGN PARAMETERS:
   A. SANDY TYPE SOIL
   B. NO GROUND WATER WITHIN 5'-0" OF SURFACE ELEVATION
   C. WIND SPEED NOT TO EXCEED 140 MPH

   IF ACTUAL CONDITIONS VARY SUBSTANTIALLY FROM THOSE ASSUMED, THE FOUNDATION DEPTH MAY BE ADJUSTED. IN THIS CASE, CONTACT THE ENGINEER.
6. MAINTAIN AT LEAST 3" COVER ON ALL REINFORCEMENT.
7. ORIENT CONDUIT AS REQUIRED BY THE DESIGN OR AS DICTATED BY FIELD CONDITIONS.
8. USE ADHESIVE ANCHOR FOR THREADED COUPLING INSERT. FOR TYPE I MINIMUM DEPTH NECESSARY IS 0'-4½" AND FOR TYPE II MINIMUM DEPTH NECESSARY IS 0'-6⅝". FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.



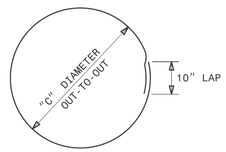
TYPES I, II & III

SECTION A-A

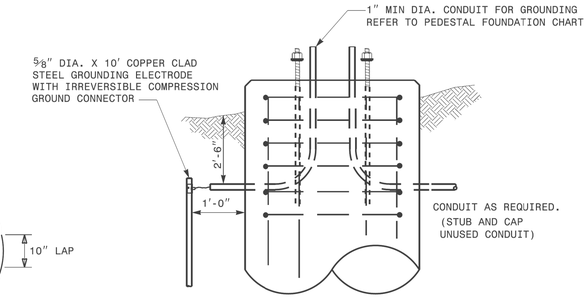


TYPES I & II ONLY

SECTION A-A



CLOSED HOOPS



GROUNDING & CONDUIT DETAIL

PEDESTAL FOUNDATION TYPE AND SIZE

TYPE	PEDESTAL DESCRIPTION	SIZE			ANCHOR BOLT		INSTALL GROUNDING SYSTEM (YES/NO)
		DIAMETER "A" FT	DEPTH "B" FT	CONCRETE VOLUME CY	DIAMETER (MIN.) IN	LENGTH FT-IN	
I	PEDESTRIAN PUSHBUTTON	2'-0"	3'-6"	.41	½	1'-6"	NO
II	NORMAL-DUTY	2'-0"	5'-0"	.58	¾	2'-0"	YES
III	HEAVY-DUTY	2'-6"	7'-0"	1.27	1	4'-0"	YES

REINFORCING STEEL SCHEDULE

TYPE	V-BAR				STIRRUP								TOTAL STEEL WEIGHT LBS
	SIZE #	QTY	LENGTH	WEIGHT LBS	SIZE #	QUANTITY VERTICAL SPACING ON 6" CENTERS	QUANTITY VERTICAL SPACING ON 12" CENTERS	QUANTITY TOTAL	LENGTH	DIAMETER "C" FT	OVERLAP MIN.	WEIGHT LBS	
I	8	6	3'-0"	56	4	0	4	4	5'-7"	1'-6"	0'-10"	15	71
II	8	6	4'-6"	86	4	5	3	8	5'-7"	1'-6"	0'-10"	30	116
III	8	6	6'-6"	122	4	7	4	11	7'-2"	2'-0"	0'-10"	53	175

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

1-18

ENGLISH STANDARD DRAWING FOR
PEDESTALS
FOUNDATIONS

SHEET 1 OF 1

1743D01

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

See Plate for Title

Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS & Signals Unit

750 N. Greenfield Parkway
Garner, NC 27529

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
028094
ENGINEER
DEBESH C. SARKAR

DocuSigned by:
Debesh C. Sarkar
44E8E32E147E4C4...

10/11/2017
DATE

11-OCT-2017 09:03
U:\2018 Std Drawings\Plate Sheets\2018_Plate Sheet .dgn
rwhough

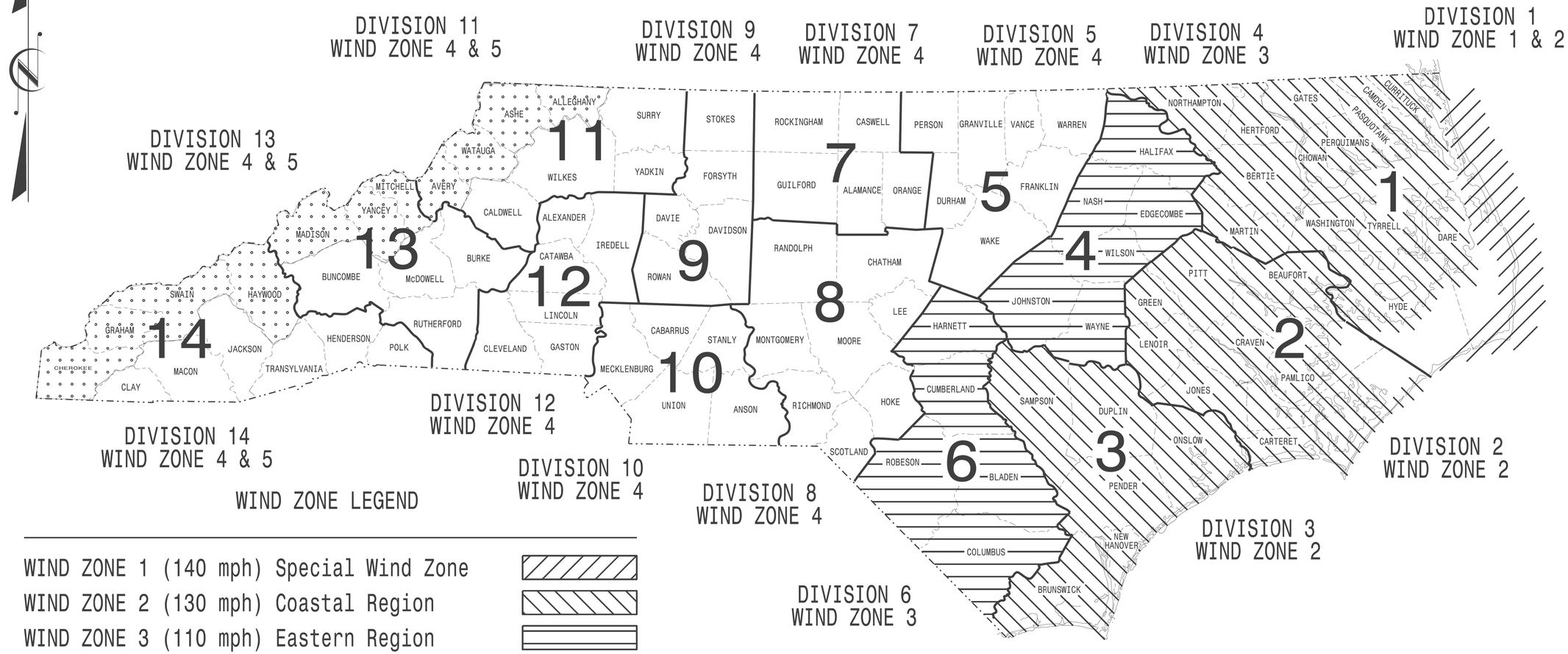
PROJECT I.D. NO.	SHEET NO.
U-4405	Sig.M1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR ALL METAL POLES

POLE STANDARDS

NCDOT METAL POLES



WIND ZONE LEGEND

WIND ZONE 1 (140 mph) Special Wind Zone	
WIND ZONE 2 (130 mph) Coastal Region	
WIND ZONE 3 (110 mph) Eastern Region	
WIND ZONE 4 (90 mph) Central & Mtn. Region	
WIND ZONE 5 (120 mph) Special Wind Zone	

https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

Prepared In the Offices of:

Transportation Mobility and Safety Division
Signal Design Section
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

750 N.Greenfield Pkwy.
Garner,NC 27529

Designed in conformance with the latest 2015 Interim to the 6th Edition 2013

AASHTO

Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals

INDEX OF PLANS

NCDOT CONTACTS:

MOBILITY AND SAFETY DIVISION – ITS AND SIGNALS UNIT

M.M. MCDIARMID, P.E. – STATE ITS AND SIGNALS ENGINEER

J. P. GALLOWAY, P.E. – STATE SIGNALS ENGINEER

D.C. SARKAR, P.E. – ITS AND SIGNALS SENIOR STRUCTURAL ENGINEER

SEAL

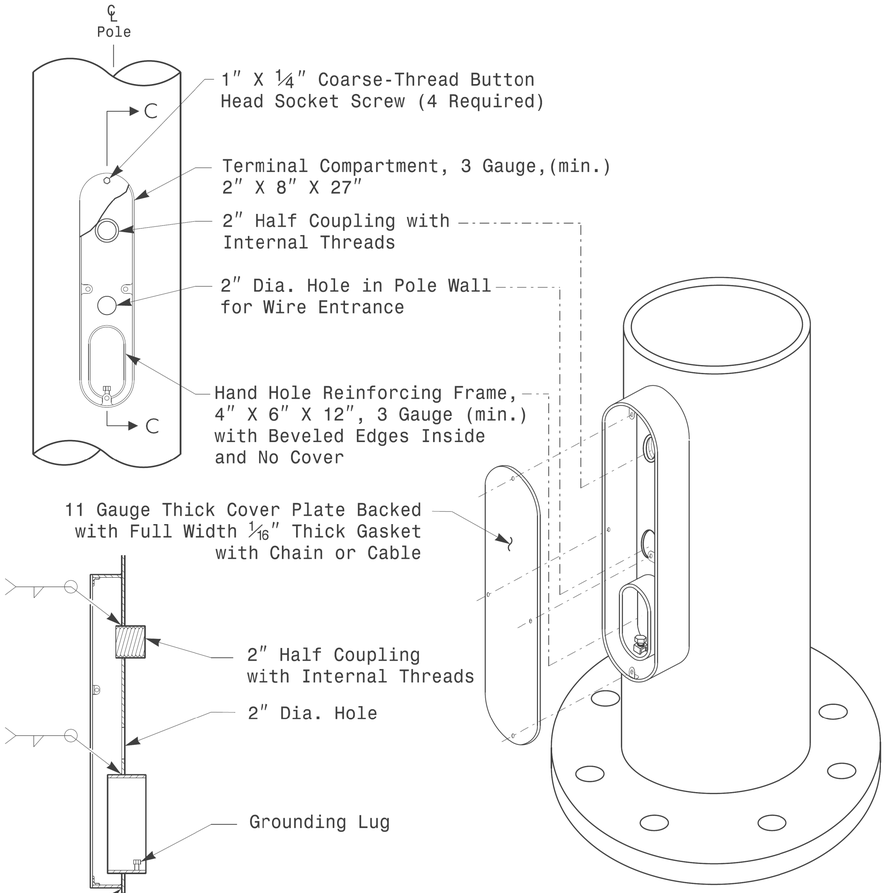
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44E8B3... SIGNATURE

10/11/2017 DATE

PROJECT ID. NO.	SHEET NO.
U-4405	Sig.M2

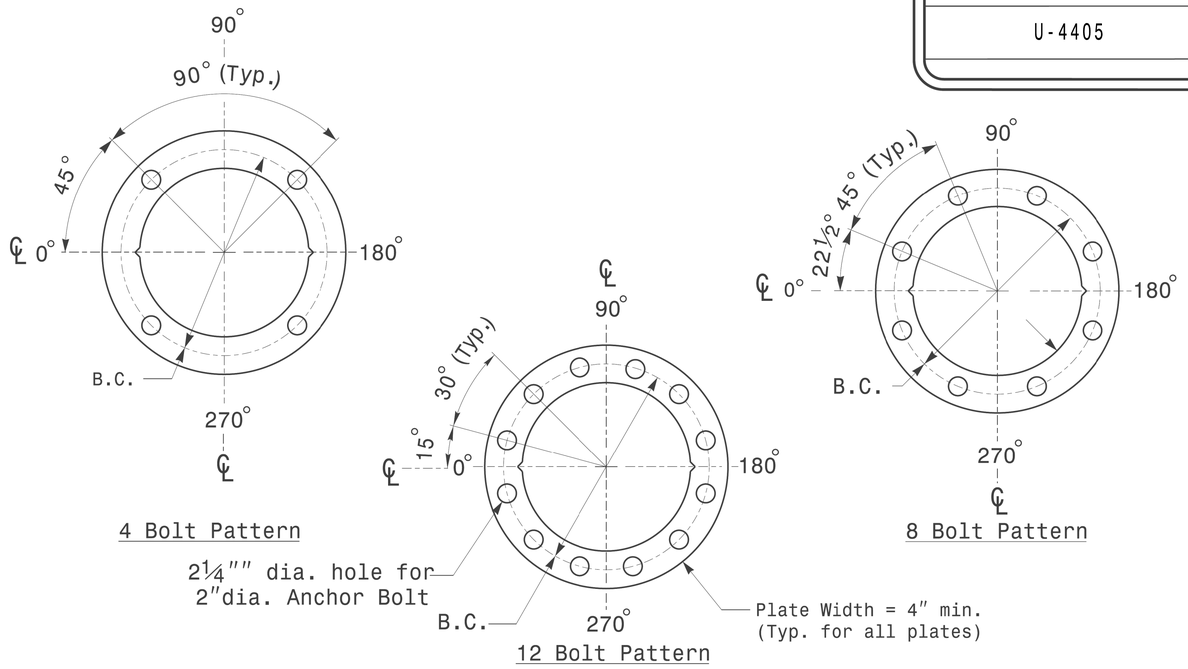
Fabrication Details – All Metal Poles



Section C-C

Note: Unless otherwise specified, locate Terminal Compartment 1 foot above the pole base plate at 180 degrees on the pole's radial index.

Terminal Compartment Detail



Construct Templates and Plates from ¼″ min. thick Steel. Galvanizing is not required.

Base Plate Template and Anchor Bolt Lock Plate Details

MFG _____ MFG. DATE: MM/YY
SHAFT D/T/L/Y ----/----/----/----
ARM-A D/T/L/Y ----/----/----/----
----/----/----/----
ARM-B D/T/L/Y ----/----/----/----
----/----/----/----
A.B. DIA./B.C./L/Y ----/----/----/----
NCDOT SIG. INV. NO. _ _ _ _ _ _ _ _
NCDOT POLE NO. _ _ _ _ _ _ _ _

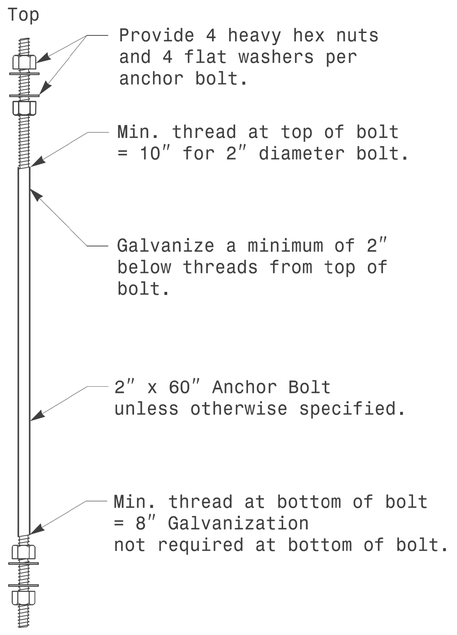
Shaft I.D. Tag
(Provide on Shaft of Strain Poles and Mast Arm Poles Shaft)

MFG _____ MFG. DATE: MM/YY
SECTION D/T/L/Y ----/----/----/----
NCDOT SIG. INV. NO. _ _ _ _ _ _ _ _
NCDOT POLE NO. _ _ _ _ _ _ _ _

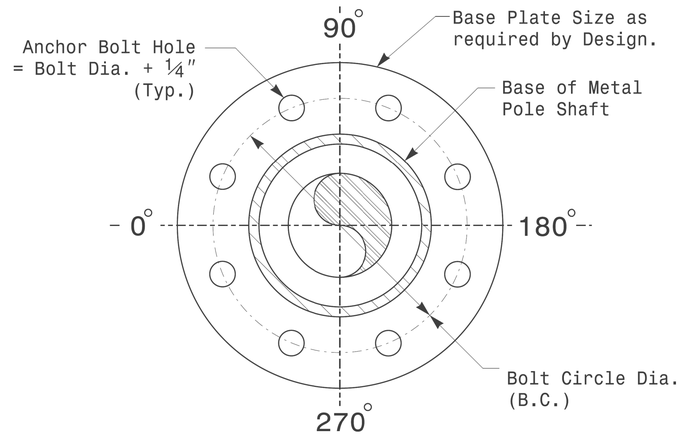
Arm I.D. Tag
(Provide on each section of a multi-section mast arm.)

Notes:
1) D= Diameter, T= Thickness, L= Length, Y= Yield Strength
2) A.B. = Anchor Bolt
3) B.C. = Bolt Circle of Anchor Bolts
4) If Custom Design, use "NCDOT STANDARD" line for Signal Inv. Number and pole I.D. number
5) See drawing M3 and M4 for mounting positions of I.D. tags.

Identification Tag Details



Anchor Bolt Detail



Note: Base plate may be circular,octagonal,square or rectangular in shape.

Typical Base Plate Detail

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

Typical Fabrication Details For All Metal Poles

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	C.F.ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SCALE
0 NA
NONE

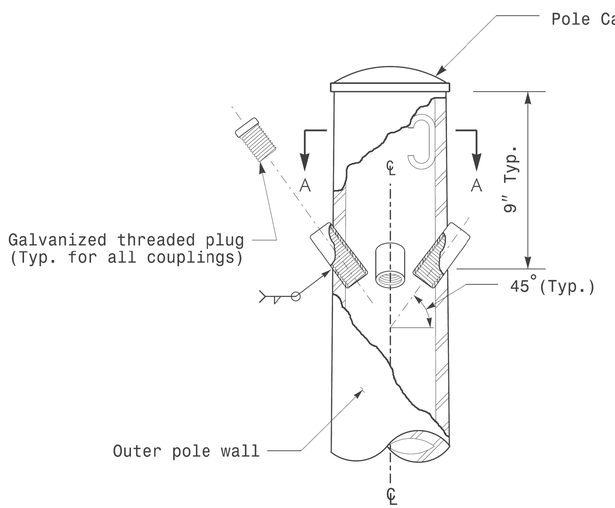
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44EBE32B... SIGNATURE
10/11/2017 DATE

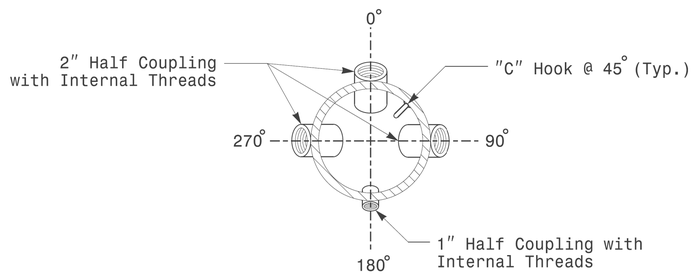
11-OCT-2017 08:30
S:\MTS&S\MTS Signals\Signal Design Section\Eastern Region\M Sheets\2016\2014 Sig.M2 Std. Fabrication Details-All Poles..dgn
rmiller

PROJECT ID. NO.	SHEET NO.
U-4405	Sig.M3

Fabrication Details – Strain Poles



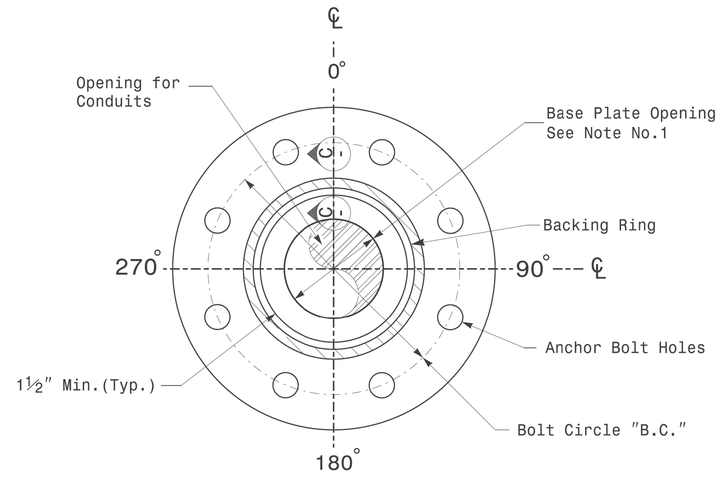
Cable Entrances at Top of Pole



Section A-A

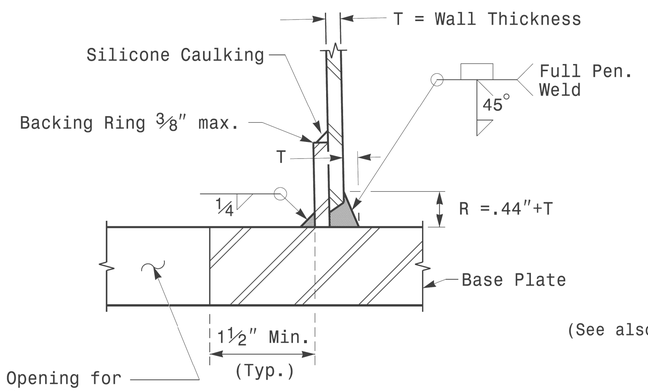
Radial Orientation for Factory Installed Accessories at Top of Pole

Note:
1. Opening in pole base plate shall be equal to pole base inside diameter minus 3½″ but shall not be less than 8½″.



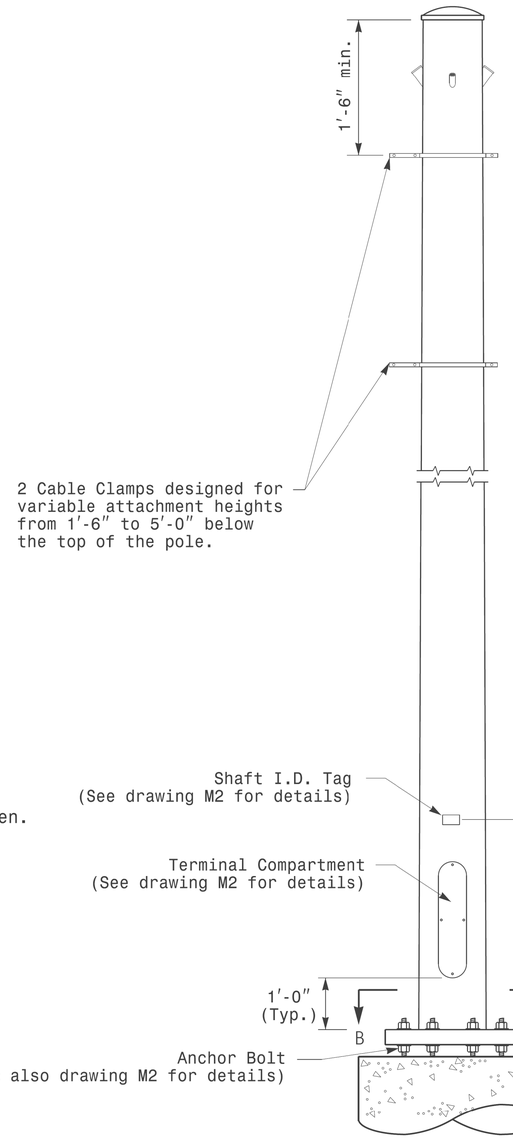
Section B-B

Pole Base Plate Details
(8 and 12 Bolt Pattern)



Section C-C
(Pole Attachment to Base Plate)

Full-Penetration
Groove Weld Detail



Monotube Strain Pole

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

SCALE
0 NA
NONE

Typical Fabrication Details
For
Strain Poles

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	K.C.DURIGON
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C SARKAR

DocuSigned by: Debesh C. Sarkar
SIGNATURE

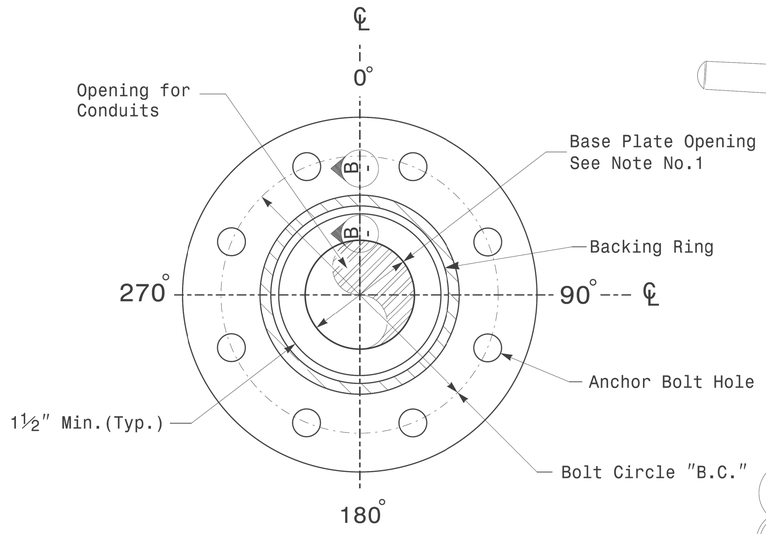
10/11/2017
DATE

11-OCT-2017 08:25
S:*IT\&SU\ITS Signals\Signal Design Section\Eastern Region\MU Sheets*2016*2014 Sig.MU Std. Fabrication Details\Strain Poles.dgn
rezlinear

PROJECT ID. NO.	SHEET NO.
U-4405	Sig.M4

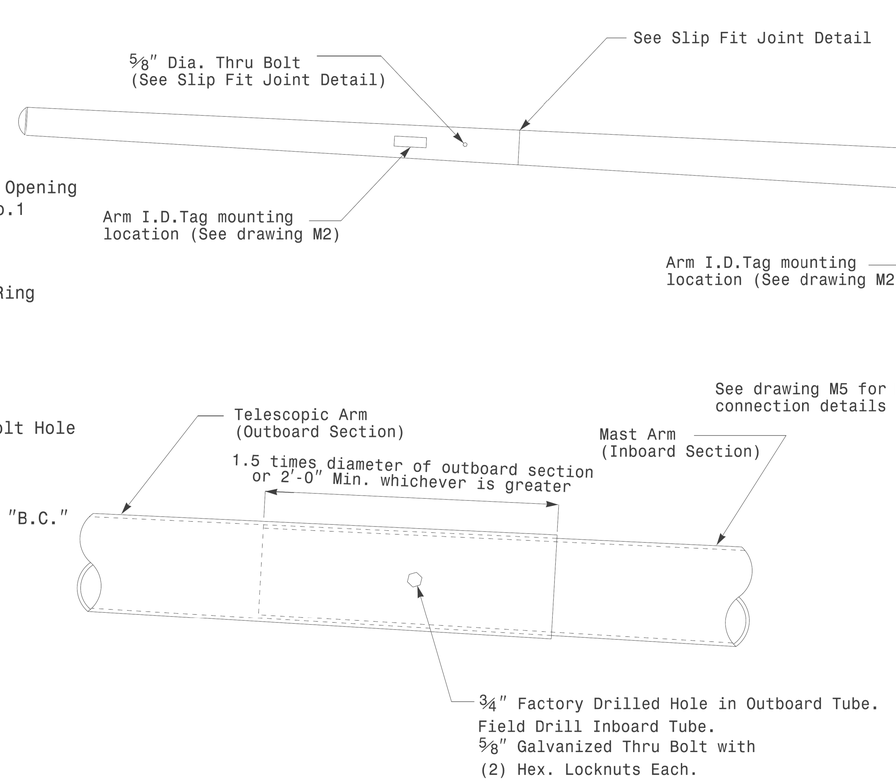
Fabrication Details – Mast Arm Poles

Note:
1. Opening in pole base plate shall be equal to pole base inside diameter minus 3½" but shall not be less than 8½".

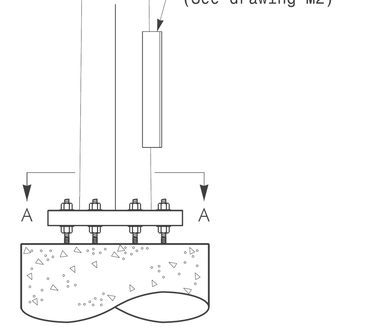


Section A-A

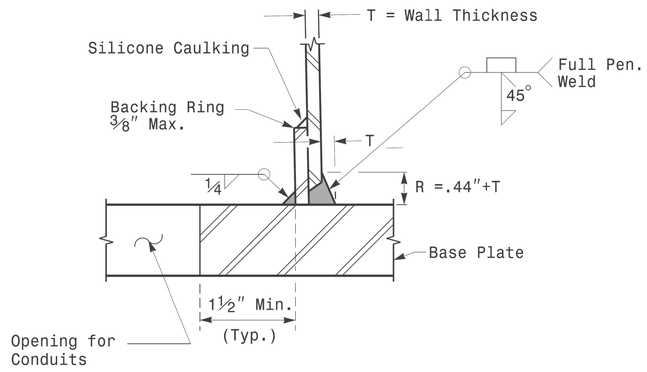
Pole Base Plate Details



Slip Fit Joint Detail for Mast Arm



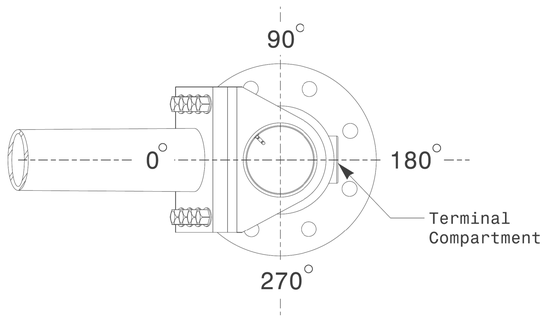
Mast Arm Pole



Section B-B

(Pole Attachment to Base Plate)

Full-Penetration Groove Weld Detail



Mast Arm Radial Orientation

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

SCALE: 0 NA NONE

Typical Fabrication Details For Mast Arm Poles

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	K.C.DURIGON
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

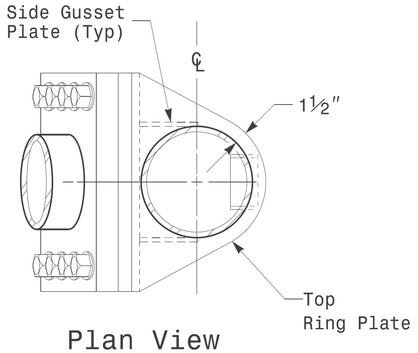
DocuSigned by: Debesh C. Sarkar 44EBE3... SIGNATURE

10/11/2017 DATE

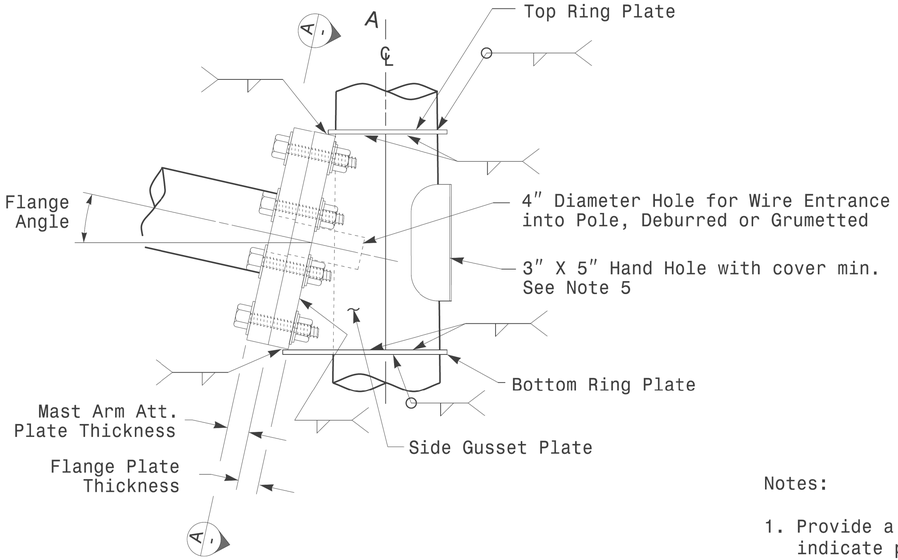
11-OCT-2017 08:33
S:*ITS&Sig\ITS Signals\Signal Design Section\Eastern Region\Mast Sheets\2016*2014 Sig.M4 Std. Fabrication Details-Mast Arm Poles.dgn
rs_fnsbr

Welded Ring Stiffened Mast Arm Connection

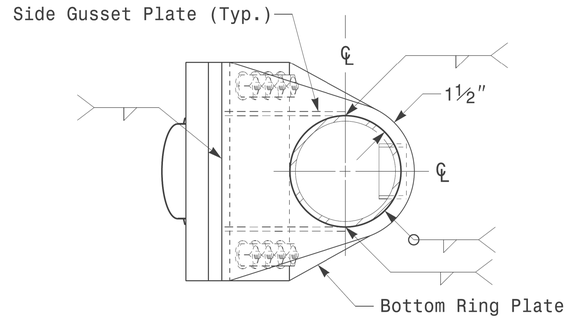
PROJECT ID. NO.	SHEET NO.
U-4405	Sig.M5



Plan View



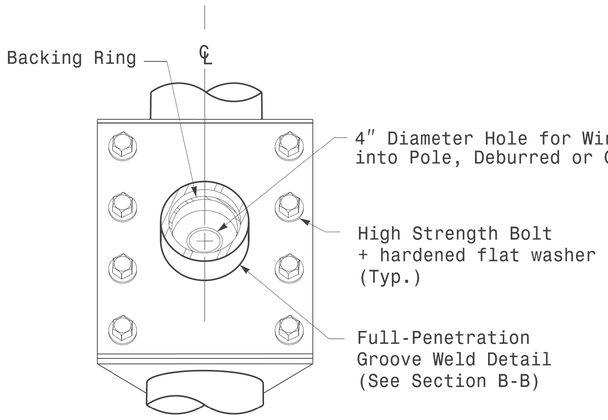
Side Elevation View



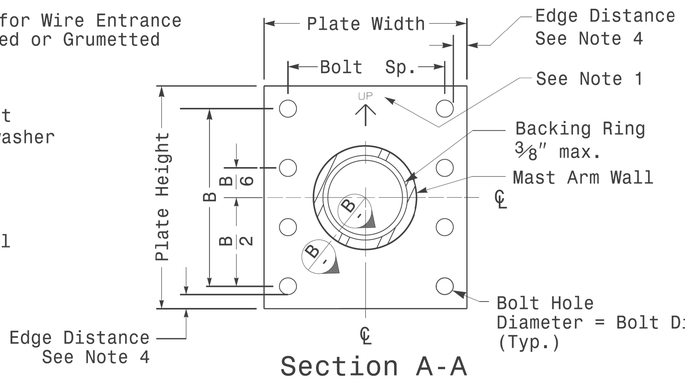
Bottom View

Notes:

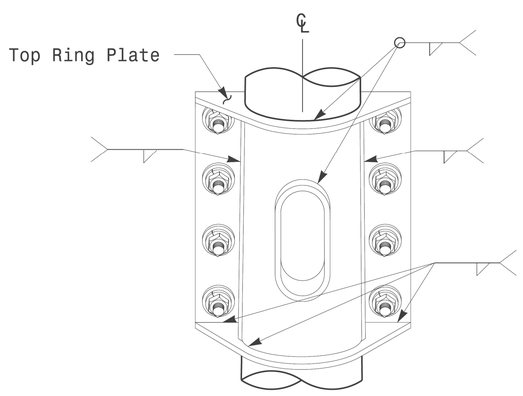
1. Provide a permanent means of identification above the mast arm to indicate proper attachment orientation of the mast arm.
2. Designer will determine the size of all structural components, plates, fasteners, and welds shown unless they are already specified.
3. Fabricator is responsible for providing appropriate holes at drainage points to drain galvanizing materials.
4. For minimum edge distance follow AISC Table J3.4 and J3.5. For nominal bolt hole size use Table J3.3.
5. Provide upper handhole as necessary when shaft extensions are required for luminaire arms or camera. For poles without luminaires/camera, wiring can be done through the top of pole.
6. Allowable range of flange tilt angle will vary from 0° to as required.



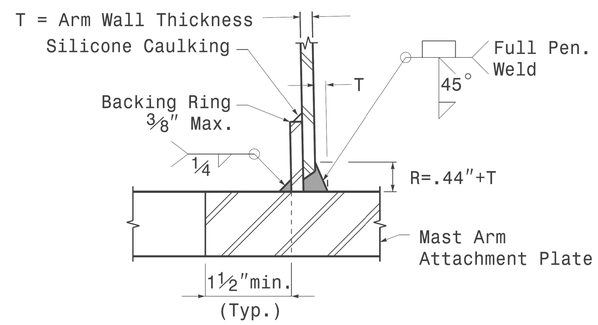
Front Elevation View



Section A-A
Mast Arm Attachment Plate



Back Elevation View



Section B-B
Full-Penetration Groove Weld Detail

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

Typical Fabrication Details For Mast Arm Connection To Pole

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	C.F.ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SCALE: 0 NA — NONE

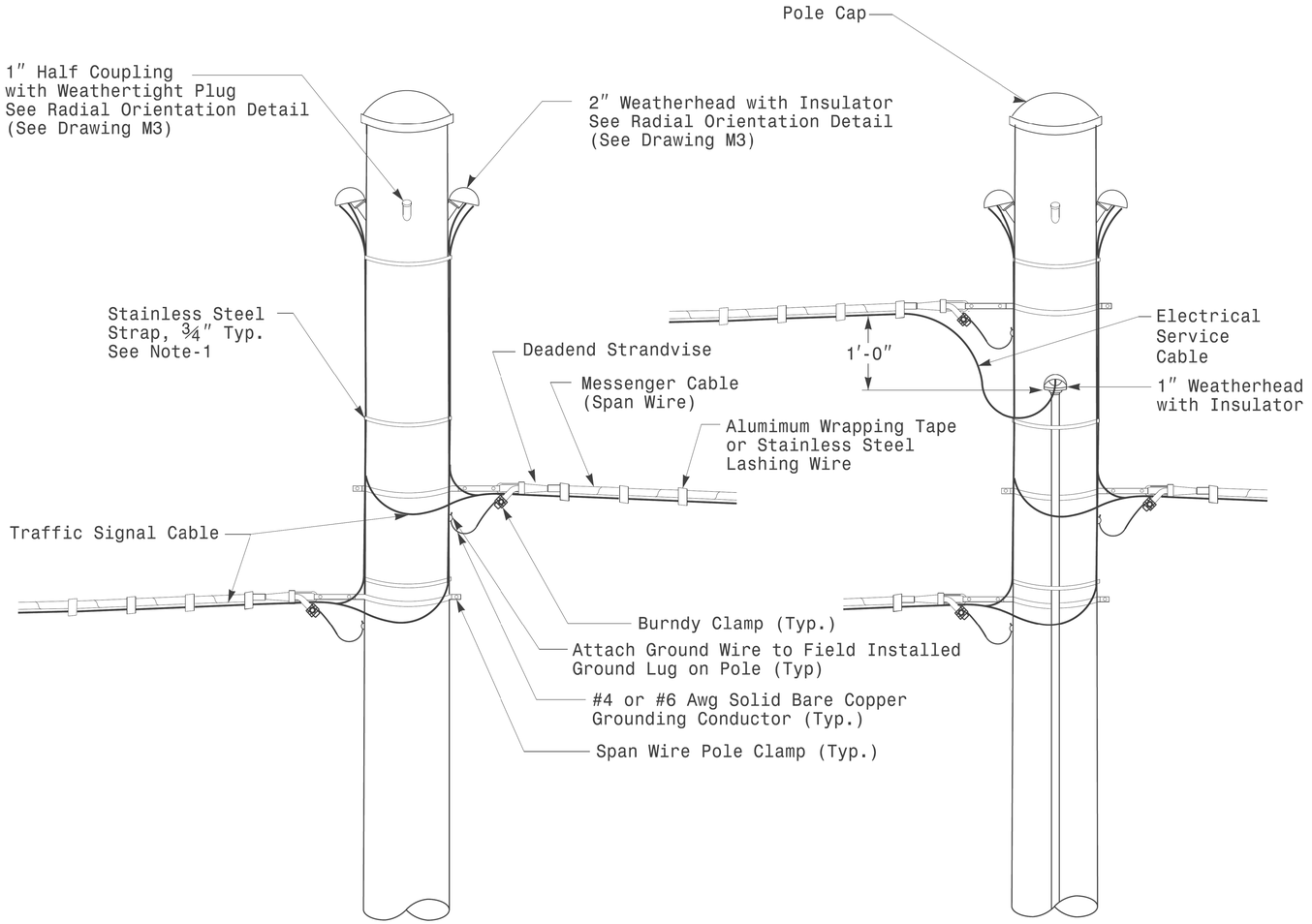
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44E0E3E... SIGNATURE — 10/11/2017 DATE

Fabrication Details — Mast Arm Connection

PROJECT ID. NO.	SHEET NO.
U-4405	Sig.M6

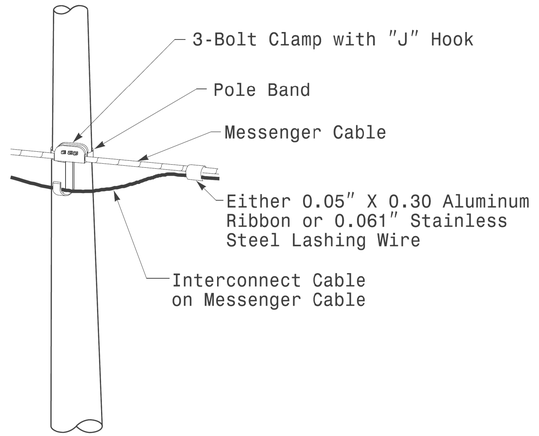
Fabrication Details – Strain Pole Attachments



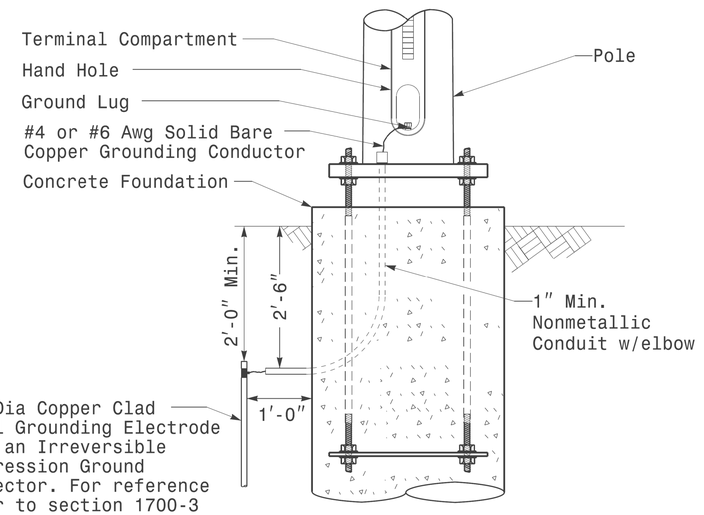
Strain Pole Attachments

NOTE:

1. Strap all signal cables to the side of the pole with ¾″ stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 3′-0″.
2. Provide minimum two spanwire pole clamps per pole.
3. It is prohibited to attach two span wires at one pole clamp.
4. For general requirements refer to NCDOT Standard Specifications for Roadway and Structures, January 2018.



Attachment of Cable to Intermediate Metal Pole



Metal Pole Grounding Detail For Strain Pole and Mast Arm

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

SCALE
0 NA
NONE

Typical Fabrication Details
For
Strain Pole Attachments

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	C.F.ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
028094
ENGINEER
DEBASISH C. SARKAR

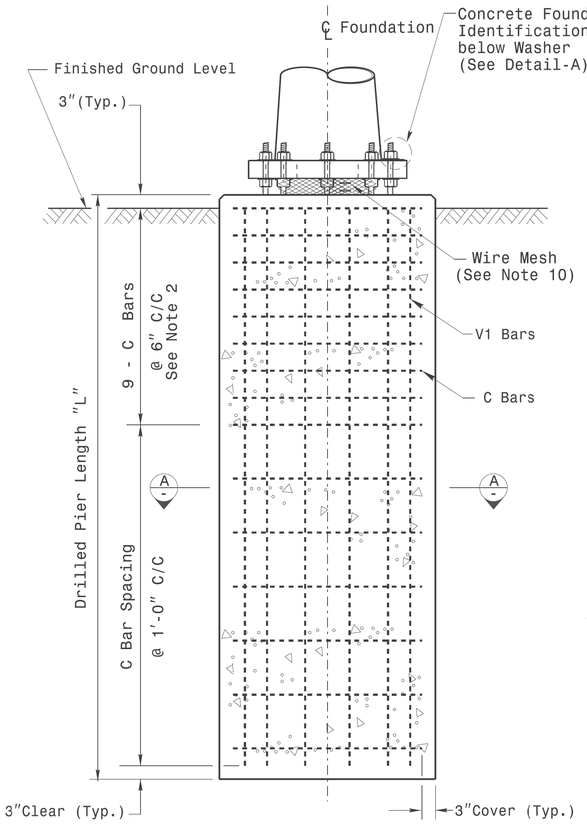
DocuSigned by:
Debasish C. Sarkar
SIGNATURE

10/11/2017
DATE

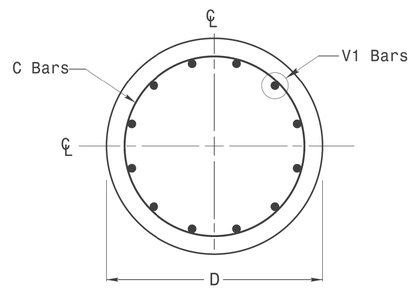
11-OCT-2017 08:36
S:\MTS&SU\TS Signals\Signal Design Section\Eastern Region\MW Sheets\2016\2014 Sig.M6 Std. Fabrication Details-Strain Poles.dgn
rwallace

PROJECT ID. NO.	SHEET NO.
U-4405	Sig.M7

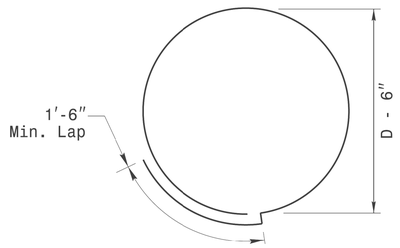
Construction Details — Foundations



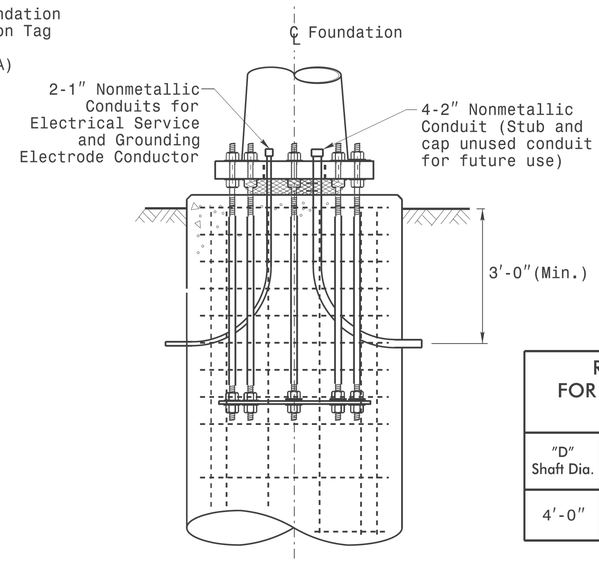
Concrete Shaft Elevation



Section A-A



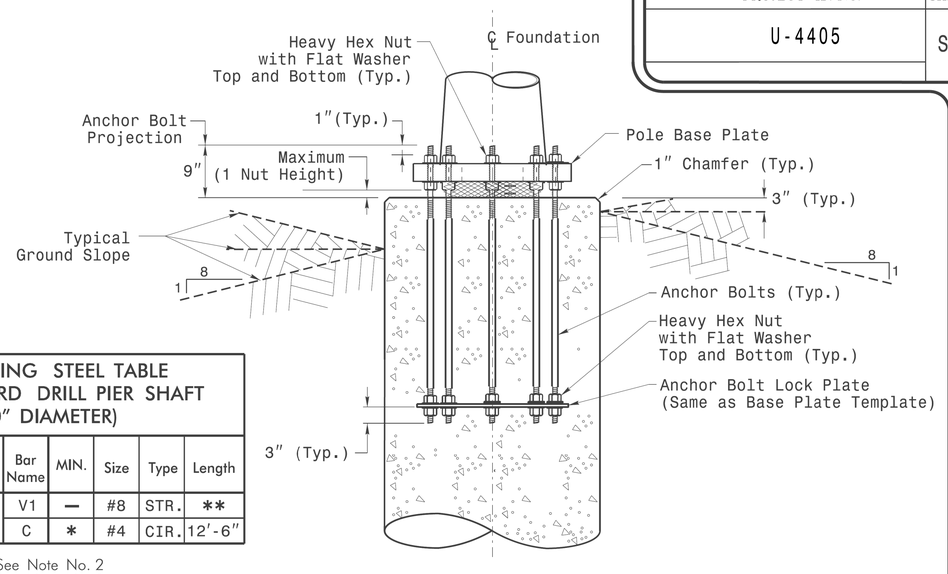
Typical "C" Bar Detail



Typical Foundation Conduit Details

REINFORCING STEEL TABLE FOR STANDARD DRILL PIER SHAFT (4′–0″ DIAMETER)						
"D" Shaft Dia.	Conc. Volume (cu. yds.)	Bar Name	MIN.	Size	Type	Length
4′-0″	.465 x L	V1	—	#8	STR.	**
		C	*	#4	CIR.	12′-6″

* See Note No. 2
** See Note No. 3



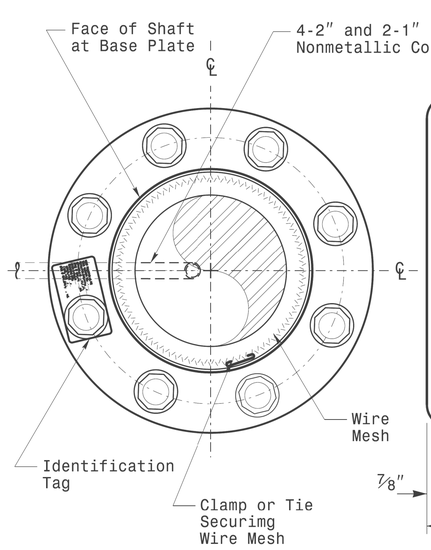
Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)

General Notes:

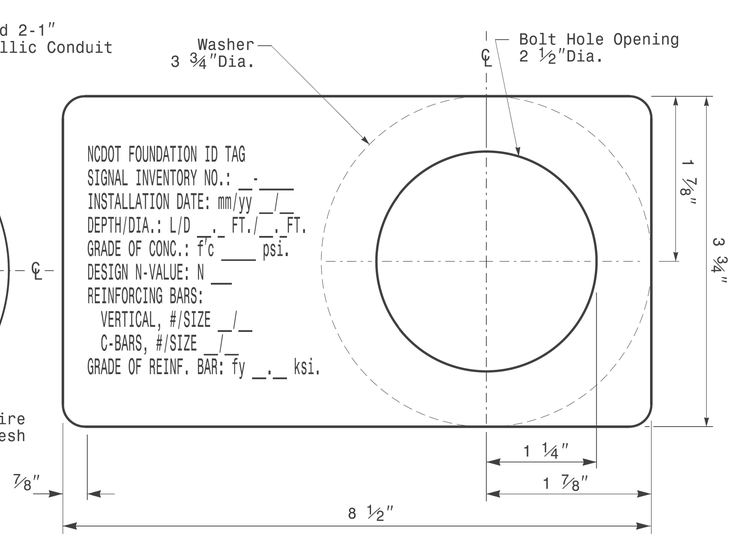
1. If actual subsurface conditions differ significantly from boring data contact the Engineer before excavating or placing concrete.
2. Circular tie reinforcing rings may be vertically adjusted by +/-3″ at a depth between 2′-0″ and 3′-0″ to facilitate the installation of electrical conduit entering in the cage.
3. For standard foundations, see sheet Sig. M8 for details. Vertical reinforcing bars (V1) may be horizontally adjusted by +/-3″ to facilitate the installation of electrical conduit entering into the cage.
4. Provide 2″ to 5″ foundation projection above ground level depending on the ground slope.
5. Unless otherwise shown, foundation designs are based on non-sloping level ground surfaces with slope ratios of 8:1 (H:V) or flatter. If actual ground line slopes are steeper contact the Engineer before excavating or placing concrete.
6. Construct foundations in accordance with NCDOT Standard Provisions SP09 R005- Foundations and Anchor Rod Assemblies for Metal Poles. All applicable 2018 NCDOT Standard Specifications are referenced in this provision. Refer to the NCDOT Resources/Specifications page located on the Connect NCDOT website.

   https://connect.ncdot.gov/resources/Specifications and Special Provisions.aspx
7. Use air entrained AA concrete mix with a compression strength of f'c=4500 psi.(min.) after 28 days.
8. Use ASTM A615 grade 60 deformed bars for all reinforcing steel. Maintain at least 3″ cover on all reinforcement.
9. Locate the Identification Tag on the top of the base plate, directly above the conduit's entry point.
10. Provide two layers of galvanized welded 23 gauge (0.25) 6″ wide 4 mesh wire around pipes under the base plate and secure it with ties if necessary.
11. Preferred location for the I.D. Tag is as shown in Detail-A; directly above the conduit entering the foundation.



D = Diameter
L = Length/Depth
mm = Month
yy = Year

Detail-A



Concrete Foundation Identification Tag Details

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

Construction Details For Foundations

PLAN DATE:	OCTOBER 2018	DESIGNED BY:	C.B.COGDELL
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

SCALE: 0 NA — NONE

REV. NO.	COMMENTS	INIT.	DATE
1	Revised Foundation Tag Details	N.B.	5/11/2015

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44E8E3E3SIGNATURE

10/11/2017
DATE

SOIL CONDITION

PROJECT ID. NO.	SHEET NO.
U-4405	Sig.M8

		STANDARD STRAIN POLES						STANDARD FOUNDATIONS 48″ Diameter Drilled Pier Length (L) – Feet							Reinforcement			
					Reactions at the Pole Base			Clay				Sand			Longitudinal		Stirrups	
		Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Axial (kip)	Shear (kip)	Moment (ft–kip)	Medium N–Value 4–8	Stiff N–Value 9–15	Very Stiff N–Value 16–30	Hard N–Value >30	Loose N–Value 4–10	Medium N–Value 11–30	Dense N–Value >30	Bar Size (#)	Quantity (ea.)	Bar Size (#)	Spacing (in.)
WIND ZONE 1	LIGHT	S26L3	26	25	2	11	270	19	13	10	8	17	14.5	12.5	8	12	4	12
		S30L3	30	25	2	11	300	19.5	13.5	10	8	17.5	15	13	8	14	4	12
		S35L3	35	25	3	11	320	20	13.5	10.5	8	17.5	15	13	8	14	4	12
	HEAVY	S30H3	30	29	3	16	450	24.5	16	12	9	21	17.5	15	8	16	4	6
		S35H3	35	29	4	16	515	26	17	12.5	9.5	22	18.5	16	8	16	4	6
WIND ZONE 2	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
		S30L2	30	23	2	10	270	18.5	12.5	10	8	16.5	14	12.5	8	12	4	12
		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6
WIND ZONE 3	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
		S30L2	30	23	2	10	270	18.5	12.5	10	8	16.5	14	12.5	8	12	4	12
		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6
WIND ZONE 4	LIGHT	S26L1	26	22	2	8	190	16	11.5	8.5	8	15	12.5	11	8	12	4	12
		S30L1	30	22	2	8	205	16.5	11.5	9	8	15	13	11.5	8	12	4	12
		S35L1	35	22	3	8	230	17	12	9	8	15.5	13.5	11.5	8	12	4	12
	HEAVY	S30H1	30	25	3	12	320	20.5	13.5	10.5	8	18	15	13.5	8	16	4	6
		S35H1	35	25	4	12	350	21	14	10.5	8.5	18.5	15.5	13.5	8	16	4	6
WIND ZONE 5	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
		S30L2	30	23	2	10	270	18.5	12.5	10	8	16.5	14	12.5	8	12	4	12
		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6

48″ Dia. Foundations Concrete Volume (cubic yards) = (0.465) x Drilled Pier Length

General Notes:

1. Values shown in the "Reactions at the Pole Base" column represent the minimum acceptable capacity allowed for design using a design CSR of 1.00.
2. Use chairs and spacers to maintain proper clearance.
3. For foundation, always use air-entrain concrete mix.

Foundation Selection:

1. Perform a standard penetration test at each proposed foundation site to determine "N" value.
2. Select the appropriate wind zone from M 1 drawing.
3. Select the soil type (Clay or Sand) that best describes the soil characteristics.
4. Get the appropriate standard pole case number from the plans or from the Engineer.
5. Select the appropriate column under "Standard Foundations" based on soil type and "N" value. Select the appropriate row based on the pole load case.
6. The foundation depth is the value shown in the "Standard Foundations" category where the column and the row intersect.
7. Use Construction Procedures and Design Methods prescribed by FHWA-NHI-10-016 for Reference Drilled Shafts.

Standard Strain Pole Foundation–All Soil Condition

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

Standard Strain Pole Foundation for All Soil Conditions

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	C.B. COGDELL
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE
Changed "Foundation Depth" to "Drilled Pier Length"in Conc. Eqn.	N.B.	7/13/2015

SCALE: 0 NA NONE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar — 10/11/2017
SIGNATURE — DATE

09/08/99

TIP PROJECT: U-4405

CONTRACT: C204107

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

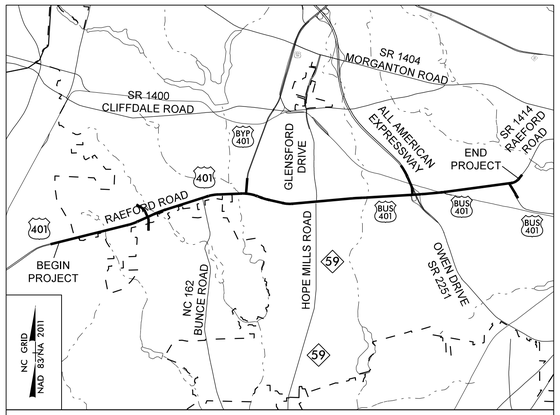
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Project No.	Sheet No.
U-4405	SCP-1

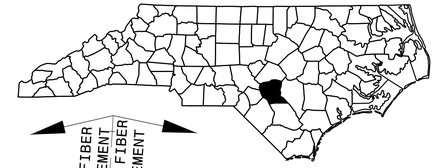
CUMBERLAND COUNTY

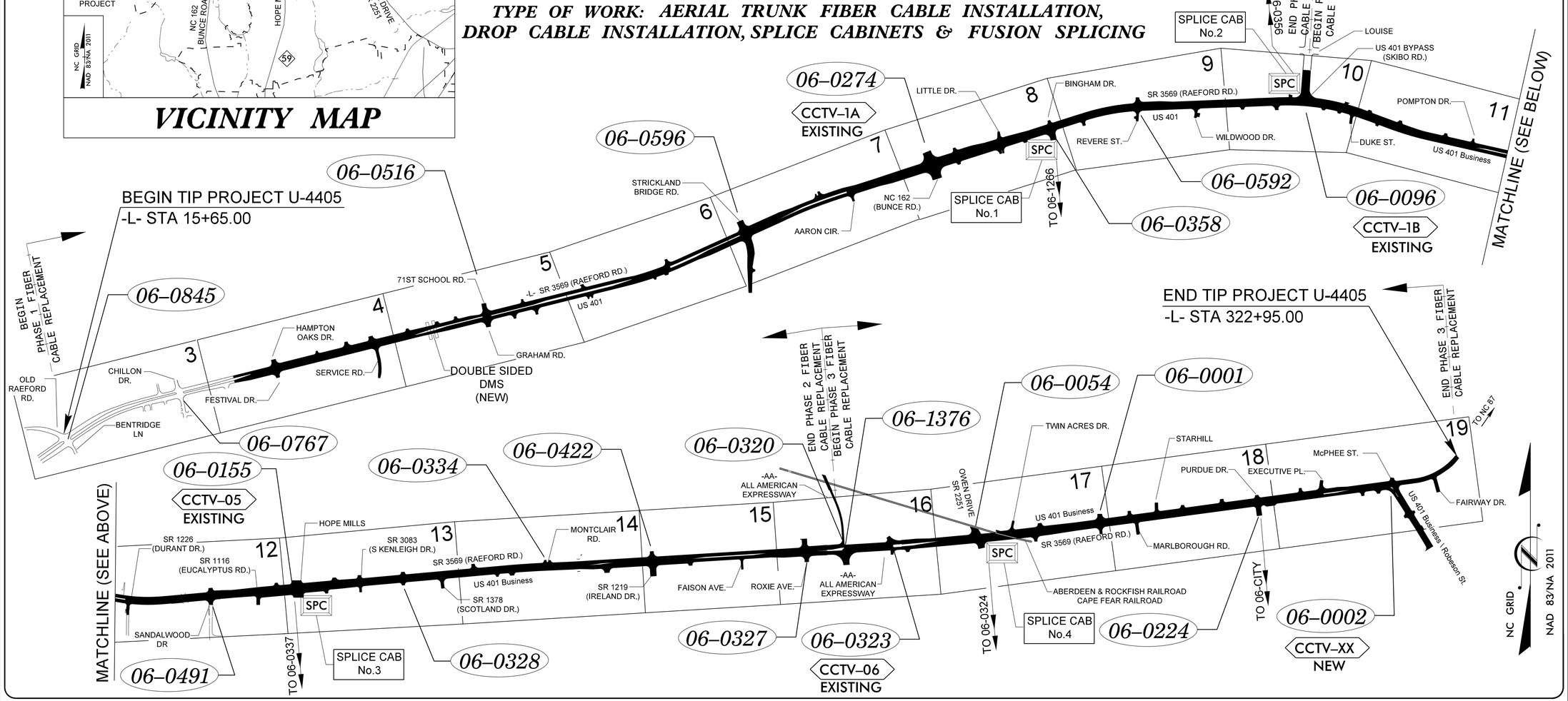
LOCATION: FAYETTEVILLE – US 401 (RAEFORD ROAD) FROM OLD RAEFORD ROAD TO ROBESON STREET (US 401 BUSINESS)

TYPE OF WORK: AERIAL TRUNK FIBER CABLE INSTALLATION, DROP CABLE INSTALLATION, SPLICE CABINETS & FUSION SPLICING



VICINITY MAP





INDEX OF PLANS

SHEET NUMBER	LOCATION / DESCRIPTION
SCP 1	TITLE SHEET
SCP 2	DRAWING FORMAT ITEMS – CONSTRUCTION NOTES, CABLE INSTALLATION NOTES
SCP 3 thru SCP 19	AERIAL TRUNK FIBER INSTALLATION (US 401 RAEFORD ROAD) FROM OLD RAEFORD ROAD TO ROBESON STREET (US 401 BUSINESS)
SCP 20 thru SCP 48	FIBER CABLE SPLICING DETAILS, SPECIAL DETAILS AND DMS DETAILS

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" ROADWAY DESIGN UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C. DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS.

STD. No.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURE
1101.03	TEMPORARY SHOULDER CLOSURE
1715.01	UNDERGROUND CONDUIT
1716.01	JUNCTION BOXES
1722.01	RISER ASSEMBLY
1730.01	FIBER OPTIC CABLE
1731.01	SPLICE ENCLOSURE

LEGEND

XX-XXXX *SIGNAL INVENTORY No.*

NCDOT CONTACT:
TRANSPORTATION SAFETY AND MOBILITY
INTELLIGENT TRANSPORTATION SYSTEMS SECTION

I. Neil Avery
Signal Communication Project Engineer

Heidi Berggren, EI
Signal Communication Project Design Engineer

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Rd-Suite 300
Raleigh, NC 27606
Tel. 919.851.6866
Fax. 919.851.7024
www.stantec.com
License No. F-0672

Larry Overn, PE, PTOE
Senior Transportation Engineer

Dean Harris
Senior Transportation Designer

Jim Ingram
Senior ITS Designer

Plans Prepared for:
DIVISION OF HIGHWAYS
750 N. Greenfield Parkway, Garner, NC 27529

SEAL
045933
DocuSigned by: Lawrence E Overn
3/27/2018
DATE

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SCP.02

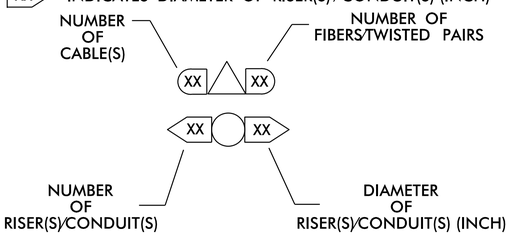
1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL REA, PE – 39, (UNDERGROUND) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
4. INSTALL SMFO CABLE
5. INSTALL WEATHERPROOF CATEGORY 5e UTP – 4 PAIR 23 AWG CABLE (PoE)
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
12A. INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
12B. INSTALL CABLES/DROP CABLE THROUGH NIPPLE ON METAL POLE (SIGNAL OR JOINT USE). INSTALL HEAT SHRINK TUBING OVER NIPPLE.
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 CABINET
32. INSTALL BASE MOUNTED SPLICE CABINET (336) WITH EXTENDED BASE
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 ETHERNET SWITCH
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 50 FEET OF COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING PWC FIBER OPTIC LINE
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 FOR DMS/CCTV
59. INSTALL NEW BASE MOUNTED CABINET (336)
60. SEAL ALL CONDUIT ENTERING JUNCTION BOXES AND SIGNAL/CCTV/DMS CONTROL CABINETS WITH MOLDABLE DUCT SEAL
61. ROUTE CABLE(S) INSIDE METAL POLE AND OUT TO SIGNAL CABINET. USE EXISTING JUNCTION BOXES AND CONDUIT SYSTEMS WHEN AVAILABLE. ENSURE FIBER CABLES DO NOT SHARE JUNCTION BOXES AND CONDUIT SYSTEMS WITH SIGNAL CABLES OR OTHER 120 VOLT CURRENT CARRYING CONDUCTORS.
62. INSTALL "TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET"

LEGEND

- FO — FO — NEW FIBER OPTIC COMMUNICATIONS CABLE
- TWIST PR — NEW TWISTED PAIR COMMUNICATIONS CABLE
- EXI — EXISTING COMMUNICATIONS CABLE
- REM — EXISTING COMMUNICATIONS CABLE TO BE REMOVED
- NEW AERIAL GUY ASSEMBLY
- NEW CONDUIT
- EXISTING CONDUIT
- DD — DD — NEW DIRECTIONAL DRILLED CONDUIT
- B&J — B&J — NEW BORED AND JACKED CONDUIT
- NEW JUNCTION BOX
- EXISTING JUNCTION BOX
- NEW WOOD POLE
- EXISTING WOOD POLE
- S — NEW AERIAL SPLICE ENCLOSURE
- NEW METAL POLE
- EXISTING METAL POLE
- NEW CCTV CAMERA ASSEMBLY
- EXISTING CCTV CAMERA ASSEMBLY
- NEW STANDARD GUY ASSEMBLY
- NEW STANDARD GUY USING EXISTING ANCHOR
- NEW SIDEWALK GUY ASSEMBLY
- NEW CABLE STORAGE RACKS (SNOW SHOES)
- EXISTING CONTROLLER CABINET
- S — EXISTING SPLICE CABINET
- SPC — NEW SPLICE CABINET, BASE MOUNTED
- TS / TV — EXISTING CCTV CABINET
- SP — SIGNAL POLE
- XX–XXXX — SIGNAL INVENTORY NUMBER
- CCTV–XX — CCTV IDENTIFICATION NUMBER
- YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION
- YAGI ANTENNA (SINGLE)
- OMNI ANTENNA
- PROPOSED TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET
- –REM– EXISTING UTILITY CABLE TO BE RELOCATED OR REMOVED
- PP — EXISTING POWER PEDESTAL
- 174 — UTILITY POLE TAG NUMBER
- JU — JOINT USE POLE
- MP — METAL POLE

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)



TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET:

WHERE INDICATED ON THE PLANS, THE CONTRACTOR WILL PROVIDE TEMPORARY SPARE LENGTHS OF DROP CABLE "TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET" TO ACCOMMODATE FUTURE RELOCATIONS OF THE SIGNAL CABINETS AS THEY PROGRESS THROUGH THEIR VARIOUS CONSTRUCTION PHASES. THE TEMPORARY SPARE LENGTH OF DROP CABLE SHALL BE COILED AND STORED ON THE NEAREST METAL POLE BETWEEN THE SPLICE ENCLOSURE AND THE FIBERS TRANSITION FROM ABOVE GROUND TO BELOW GROUND INSTALLATION AS IT PREPARES TO ENTER THE CONTROLLER CABINET.
UPON A CABINET BEING SET IN ITS FINAL LOCATION AND FINAL SPLICING TO BE PERFORMED, REMOVE THE "TEMPORARY DROP CABLE MAINTENANCE LOOP AND BRACKET". RETURN THE BRACKET TO CITY OF FAYETTEVILLE'S SIGNAL SYSTEMS MANAGEMENT ENGINEER:
CARL McCARTNEY AT (910) 433–1660.

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

US 401 (RAEFORD ROAD)
SIGNAL SYSTEM
CONSTRUCTION NOTES

PLAN DATE:	MARCH 2018	REVIEWED BY:	D. HARRIS
PREPARED BY:	J. INGRAM	REVIEWED BY:	B. WATSON

SCALE: N/A

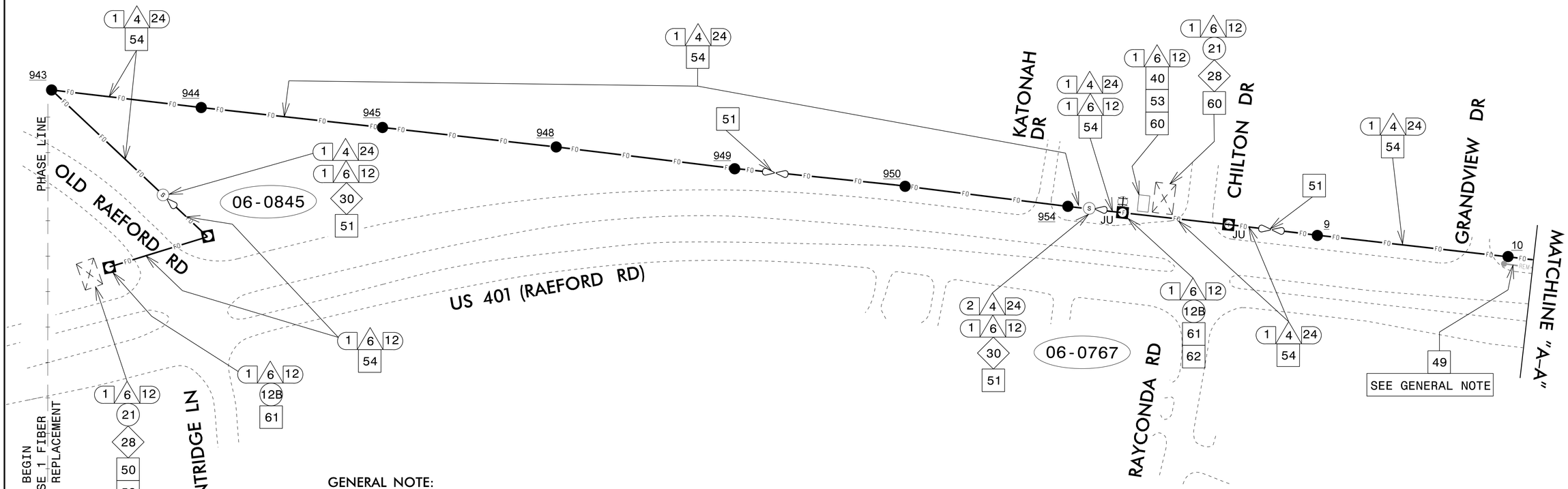
REVISIONS	INIT.	DATE
9/03/2018 SIGNATURE		

CADD FILE NAME

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II

DocuSigned by: Lawrence E Overn II 9/29/2018
DATE

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SCP.3



GENERAL NOTE:

AFTER ALL NEW CABLES ARE INSTALLED AND THE SYSTEM INTERSECTIONS ARE OPERATING, REMOVE THE EXISTING CABLES LABELED "REM". PRIOR TO REMOVING, COORDINATE THESE ACTIVITIES WITH PWC. PWC CONTACT: DARLENE GOODHART AT (910) 223–4526.

1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL 3–CONDUCTOR, CLASS B, STRANDED UNDERGROUND POWER CABLE
4. INSTALL SMFO CABLE
5. INSTALL WEATHERPROOF CATEGORY 5e UTP – 4 PAIR 23 AWG CABLE (PoE)
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
12A. INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
12B. INSTALL CABLES/DROP CABLE THROUGH NIPPLE ON METAL POLE (SIGNAL OR JOINT USE). INSTALL HEAT SHRINK TUBING OVER NIPPLE.
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 CABINET
32. INSTALL BASE MOUNTED SPLICE CABINET (336) WITH EXTEND BASE
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 ETHERNET SWITCH
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 50 FEET OF COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING PWC FIBER OPTIC LINE
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 FOR DMS/CCTV
59. INSTALL NEW BASE MOUNTED CABINET (336)
60. SEAL ALL CONDUIT ENTERING JUNCTION BOXES AND SIGNAL/CCTV/DMS CONTROL CABINETS WITH MOLDABLE DUCT SEAL
61. ROUTE CABLE(S) INSIDE METAL POLE AND OUT TO SIGNAL CABINET. USE EXISTING JUNCTION BOXES AND CONDUIT SYSTEMS WHEN AVAILABLE. ENSURE FIBER CABLES DO NOT SHARE JUNCTION BOXES AND CONDUIT SYSTEMS WITH SIGNAL CABLES OR OTHER 120 VOLT CURRENT CARRYING CONDUCTORS.
62. INSTALL "TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET"

PROPOSED TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET.
SPC NEW SPLICE CABINET, BASE MOUNTED
TV EXISTING CCTV CABINET
—FO— NEW FIBER OPTIC COMMUNINCATIONS CABLE
—REM— EXISTING COMMUNICATIONS CABLE TO BE REMOVED OR RELOCATED
PP EXISTING POWER PEDESTAL
174 UTILITY POLE TAG NUMBER
JU JOINT USE POLE
MP METAL POLE

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PHASE I FIBER TRUNK CABLE INSTALLATION

Prepared for the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Integrity Honesty Teamwork Transparency A Great Place to Work
750 N. Greenfield Pkwy., Garner, NC 27529

US 401 (RAEFORD ROAD) SIGNAL SYSTEM AND COMMUNICATIONS CABLE / CONDUIT ROUTING PLANS

DIVISION 06 CUMBERLAND CO. FAYETTEVILLE

PLAN DATE:	MARCH 2018	REVIEWED BY:	D. HARRIS
PREPARED BY:	J. INGRAM	REVIEWED BY:	B. WATSON

SCALE: NTS

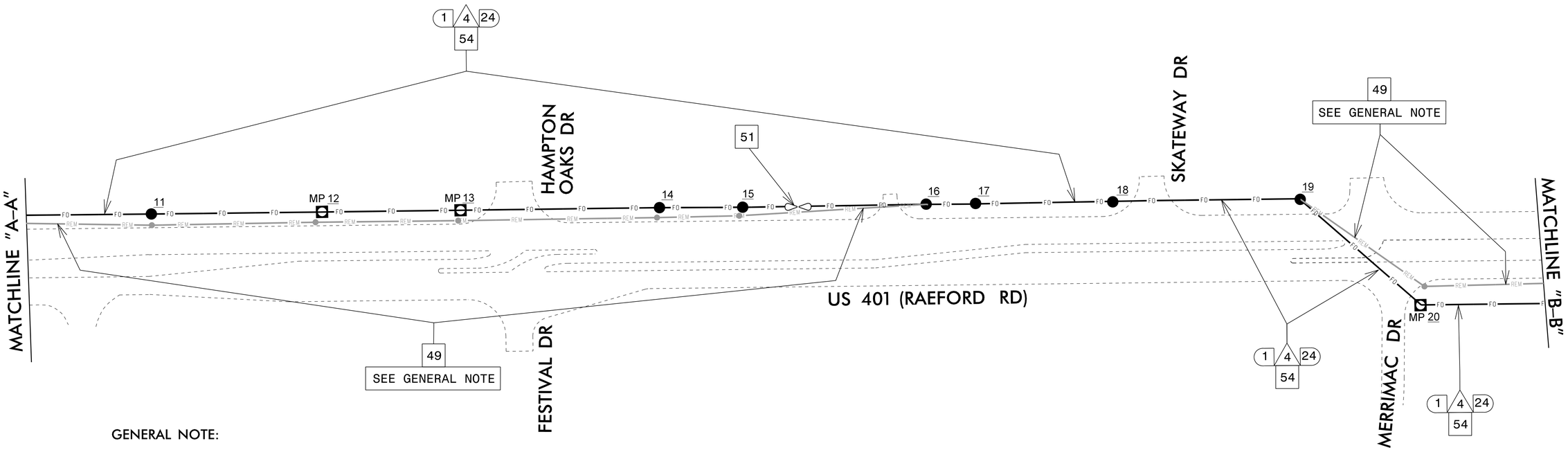
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN

DocuSigned by: Lawrence E Overn 3/29/2018
DATE

CADD FILE NAME:

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SCP.4



GENERAL NOTE:

AFTER ALL NEW CABLES ARE INSTALLED AND THE SYSTEM INTERSECTIONS ARE OPERATING, REMOVE THE EXISTING CABLES LABELED "REM". PRIOR TO REMOVING, COORDINATE THESE ACTIVITIES WITH PWC.
PWC CONTACT: DARLENE GOODHART AT (910) 223–4526.

1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL 3–CONDUCTOR, CLASS B, STRANDED UNDERGROUND POWER CABLE
4. INSTALL SMFO CABLE
5. INSTALL WEATHERPROOF CATEGORY 5e UTP – 4 PAIR 23 AWG CABLE (PoE)
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
12A. INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
12B. INSTALL CABLES/DROP CABLE THROUGH NIPPLE ON METAL POLE (SIGNAL OR JOINT USE). INSTALL HEAT SHRINK TUBING OVER NIPPLE.
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 CABINET
32. INSTALL BASE MOUNTED SPLICE CABINET (336) WITH EXTEND BASE
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 ETHERNET SWITCH
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 50 FEET OF COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING PWC FIBER OPTIC LINE
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 FOR DMS/CCTV
59. INSTALL NEW BASE MOUNTED CABINET (336)
60. SEAL ALL CONDUIT ENTERING JUNCTION BOXES AND SIGNAL/CCTV/DMS CONTROL CABINETS WITH MOLDABLE DUCT SEAL
61. ROUTE CABLE(S) INSIDE METAL POLE AND OUT TO SIGNAL CABINET. USE EXISTING JUNCTION BOXES AND CONDUIT SYSTEMS WHEN AVAILABLE. ENSURE FIBER CABLES DO NOT SHARE JUNCTION BOXES AND CONDUIT SYSTEMS WITH SIGNAL CABLES OR OTHER 120 VOLT CURRENT CARRYING CONDUCTORS.
62. INSTALL "TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET"

PROPOSED TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET.
SPC NEW SPLICE CABINET, BASE MOUNTED
TV EXISTING CCTV CABINET
FO NEW FIBER OPTIC COMMUNINCATIONS CABLE
REM EXISTING COMMUNICATIONS CABLE TO BE REMOVED OR RELOCATED
PP EXISTING POWER PEDESTAL
174 UTILITY POLE TAG NUMBER
JU JOINT USE POLE
MP METAL POLE

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PHASE I FIBER TRUNK CABLE INSTALLATION

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

US 401 (RAEFORD ROAD) SIGNAL SYSTEM AND COMMUNICATIONS CABLE / CONDUIT ROUTING PLANS

DIVISION 06 CUMBERLAND CO. FAYETTEVILLE

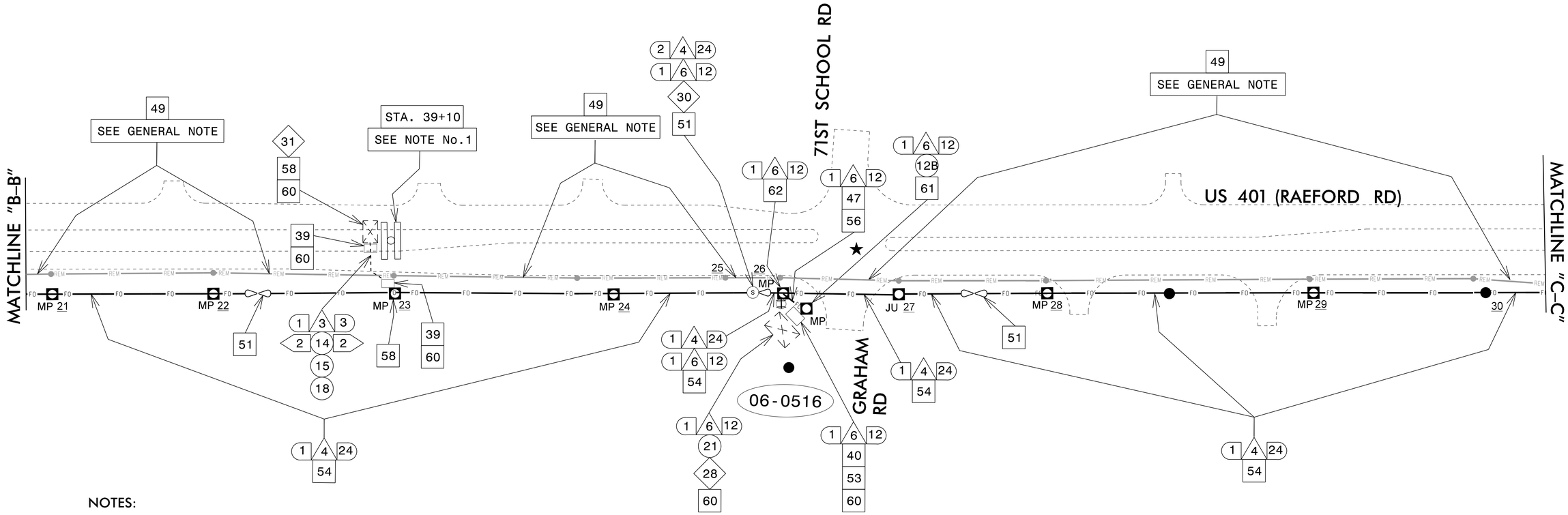
PLAN DATE:	MARCH 2018	REVIEWED BY:	D. HARRIS
PREPARED BY:	J. INGRAM	REVIEWED BY:	B. WATSON

REVISIONS	INIT.	DATE

SCALE NTS

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERMAN
DocuSigned by: Lawrence E Overman 3/29/2018
DESIGNER'S NAME DATE
CADD FILE NAME

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SCP.5



NOTES:

1. FOR DMS; CONTRACTOR SHALL INSTALL, CENTER SUPPORT STRUCTURE WITH DUAL, BACK TO BACK FRONT ACCESS DMS SIGNS. MOUNT DMS CABINET ON SUPPORT STRUCTURE. INSTALL CELLULAR MODEM PROVIDED BY ENGINEER AND TEST THE OPERATION OF DMS SIGNS. REFER TO DMS DETAIL SHEETS SCP–45, SCP–46 AND SCP–47 FOR ADDITIONAL DETAILS AND INFORMATION.

GENERAL NOTE:

AFTER ALL NEW CABLES ARE INSTALLED AND THE SYSTEM INTERSECTIONS ARE OPERATING, REMOVE THE EXISTING CABLES LABELED "REM". PRIOR TO REMOVING, COORDINATE THESE ACTIVITIES WITH PWC.
PWC CONTACT: DARLENE GOODHART AT (910) 223–4526.

1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL 3–CONDUCTOR, CLASS B, STRANDED UNDERGROUND POWER CABLE
4. INSTALL SMFO CABLE
5. INSTALL WEATHERPROOF CATEGORY 5e UTP – 4 PAIR 23 AWG CABLE (PoE)
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
12A. INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
12B. INSTALL CABLES/DROP CABLE THROUGH NIPPLE ON METAL POLE (SIGNAL OR JOINT USE). INSTALL HEAT SHRINK TUBING OVER NIPPLE.
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 CABINET
32. INSTALL BASE MOUNTED SPLICE CABINET (336) WITH EXTEND BASE
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 ETHERNET SWITCH
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 50 FEET OF COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING PWC FIBER OPTIC LINE
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 FOR DMS/CCTV
59. INSTALL NEW BASE MOUNTED CABINET (336)
60. SEAL ALL CONDUIT ENTERING JUNCTION BOXES AND SIGNAL/CCTV/DMS CONTROL CABINETS WITH MOLDABLE DUCT SEAL
61. ROUTE CABLE(S) INSIDE METAL POLE AND OUT TO SIGNAL CABINET. USE EXISTING JUNCTION BOXES AND CONDUIT SYSTEMS WHEN AVAILABLE. ENSURE FIBER CABLES DO NOT SHARE JUNCTION BOXES AND CONDUIT SYSTEMS WITH SIGNAL CABLES OR OTHER 120 VOLT CURRENT CARRYING CONDUCTORS.
62. INSTALL "TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET"

PROPOSED TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET.
SPC NEW SPLICE CABINET, BASE MOUNTED
TV EXISTING CCTV CABINET
FO NEW FIBER OPTIC COMMUNINCATIONS CABLE
REM EXISTING COMMUNICATIONS CABLE TO BE REMOVED OR RELOCATED
PP EXISTING POWER PEDESTAL
174 UTILITY POLE TAG NUMBER
JU JOINT USE POLE
MP METAL POLE

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PHASE I FIBER TRUNK CABLE INSTALLATION

Prepared for the Offices of:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

US 401 (RAEFORD ROAD)
SIGNAL SYSTEM AND
COMMUNICATIONS CABLE /
CONDUIT ROUTING PLANS

DIVISION 06 CUMBERLAND CO. FAYETTEVILLE

PLAN DATE:	MARCH 2018	REVIEWED BY:	D. HARRIS
PREPARED BY:	J. INGRAM	REVIEWED BY:	B. WATSON

SCALE: NTS

REVISIONS	INIT.	DATE

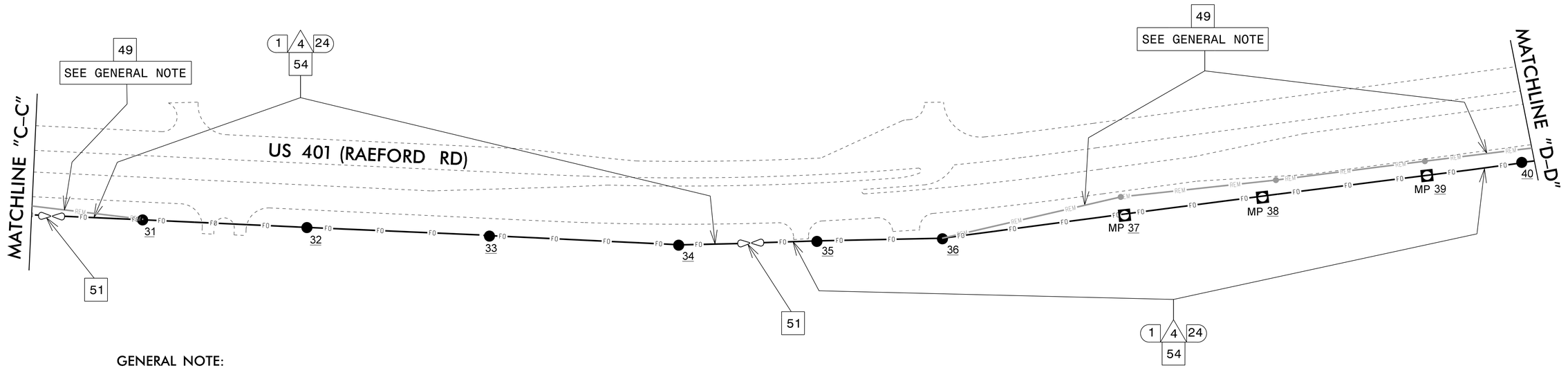
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERMAN

DocuSigned by: Lawrence E Overman 3/29/2018
SIGNATURE DATE

CADD FILE NAME

3/27/2018
U:\#171001766\transportation\design\Traffic\Signals\Design\ITS U-4405\SCP Cable Routing\DGN Files\260_25_U-4405_SCP_SCP-05_180329.dgn
jingram

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SCP.6



GENERAL NOTE:

AFTER ALL NEW CABLES ARE INSTALLED AND THE SYSTEM INTERSECTIONS ARE OPERATING, REMOVE THE EXISTING CABLES LABELED "REM". PRIOR TO REMOVING, COORDINATE THESE ACTIVITIES WITH PWC.
PWC CONTACT: DARLENE GOODHART AT (910) 223–4526.

1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL 3–CONDUCTOR, CLASS B, STRANDED UNDERGROUND POWER CABLE
4. INSTALL SMFO CABLE
5. INSTALL WEATHERPROOF CATEGORY 5e UTP – 4 PAIR 23 AWG CABLE (PoE)
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
12A. INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
12B. INSTALL CABLES/DROP CABLE THROUGH NIPPLE ON METAL POLE (SIGNAL OR JOINT USE). INSTALL HEAT SHRINK TUBING OVER NIPPLE.
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 CABINET
32. INSTALL BASE MOUNTED SPLICE CABINET (336) WITH EXTEND BASE
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 ETHERNET SWITCH
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 50 FEET OF COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING PWC FIBER OPTIC LINE
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 FOR DMS/CCTV
59. INSTALL NEW BASE MOUNTED CABINET (336)
60. SEAL ALL CONDUIT ENTERING JUNCTION BOXES AND SIGNAL/CCTV/DMS CONTROL CABINETS WITH MOLDABLE DUCT SEAL
61. ROUTE CABLE(S) INSIDE METAL POLE AND OUT TO SIGNAL CABINET. USE EXISTING JUNCTION BOXES AND CONDUIT SYSTEMS WHEN AVAILABLE. ENSURE FIBER CABLES DO NOT SHARE JUNCTION BOXES AND CONDUIT SYSTEMS WITH SIGNAL CABLES OR OTHER 120 VOLT CURRENT CARRYING CONDUCTORS.
62. INSTALL "TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET"

PROPOSED TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET.
SPC NEW SPLICE CABINET, BASE MOUNTED
TV EXISTING CCTV CABINET
FO NEW FIBER OPTIC COMMUNINCATIONS CABLE
REM EXISTING COMMUNICATIONS CABLE TO BE REMOVED OR RELOCATED
PP EXISTING POWER PEDESTAL
174 UTILITY POLE TAG NUMBER
JU JOINT USE POLE
MP METAL POLE

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PHASE I FIBER TRUNK CABLE INSTALLATION

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

US 401 (RAEFORD ROAD) SIGNAL SYSTEM AND COMMUNICATIONS CABLE / CONDUIT ROUTING PLANS

DIVISION 06 CUMBERLAND CO. FAYETTEVILLE

PLAN DATE:	MARCH 2018	REVIEWED BY:	D. HARRIS
PREPARED BY:	J. INGRAM	REVIEWED BY:	B. WATSON

SCALE: NTS

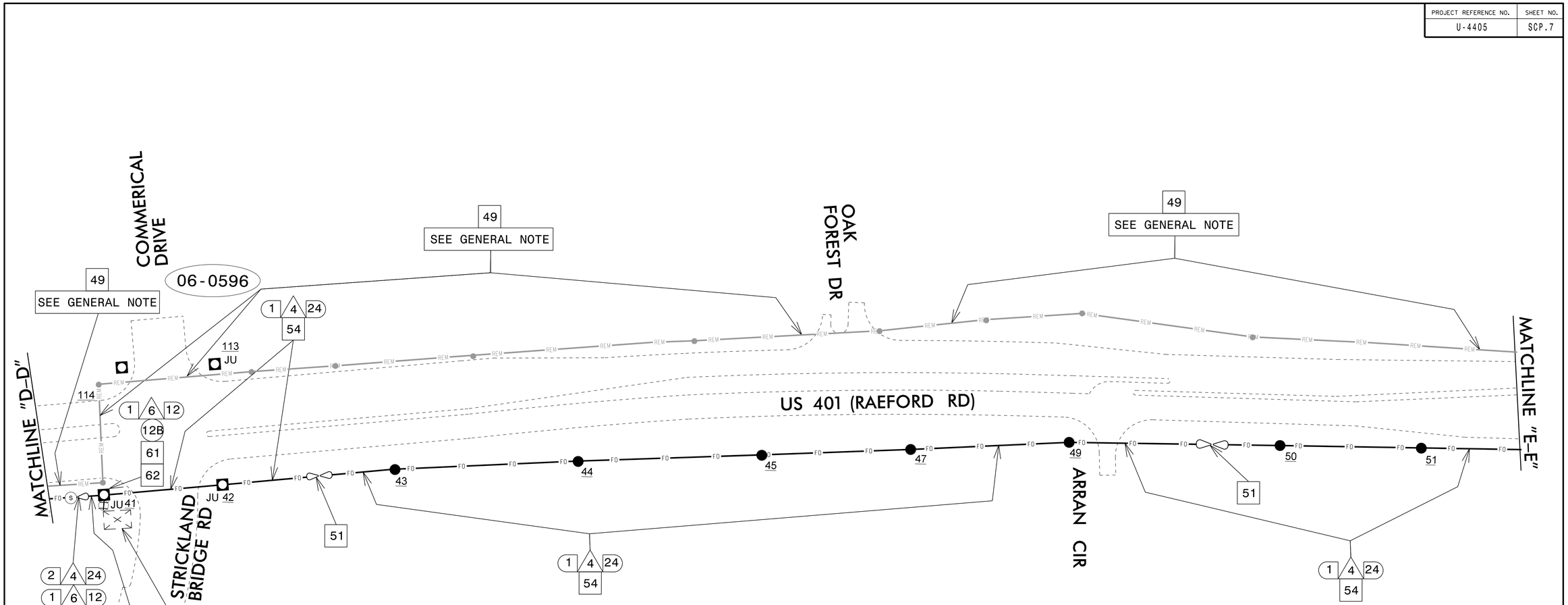
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OWEN, II

DocuSigned by: Lawrence E Owen 3/29/2018
963059F0B4B54BE DATE

CADD FILE NAME

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SCP.7



GENERAL NOTE:

AFTER ALL NEW CABLES ARE INSTALLED AND THE SYSTEM INTERSECTIONS ARE OPERATING, REMOVE THE EXISTING CABLES LABELED "REM". PRIOR TO REMOVING, COORDINATE THESE ACTIVITIES WITH PWC.
PWC CONTACT: DARLENE GOODHART AT (910) 223-4526.

1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL 3-CONDUCTOR, CLASS B, STRANDED UNDERGROUND POWER CABLE
4. INSTALL SMFO CABLE
5. INSTALL WEATHERPROOF CATEGORY 5e UTP – 4 PAIR 23 AWG CABLE (PoE)
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
12A. INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
12B. INSTALL CABLES/DROP CABLE THROUGH NIPPLE ON METAL POLE (SIGNAL OR JOINT USE). INSTALL HEAT SHRINK TUBING OVER NIPPLE.
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 CABINET
32. INSTALL BASE MOUNTED SPLICE CABINET (336) WITH EXTEND BASE
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 ETHERNET SWITCH
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 50 FEET OF COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING PWC FIBER OPTIC LINE
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 FOR DMS/CCTV
59. INSTALL NEW BASE MOUNTED CABINET (336)
60. SEAL ALL CONDUIT ENTERING JUNCTION BOXES AND SIGNAL/CCTV/DMS CONTROL CABINETS WITH MOLDABLE DUCT SEAL
61. ROUTE CABLE(S) INSIDE METAL POLE AND OUT TO SIGNAL CABINET. USE EXISTING JUNCTION BOXES AND CONDUIT SYSTEMS WHEN AVAILABLE. ENSURE FIBER CABLES DO NOT SHARE JUNCTION BOXES AND CONDUIT SYSTEMS WITH SIGNAL CABLES OR OTHER 120 VOLT CURRENT CARRYING CONDUCTORS.
62. INSTALL "TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET"

PROPOSED TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET.
SPC NEW SPLICE CABINET, BASE MOUNTED
TV EXISTING CCTV CABINET
FO NEW FIBER OPTIC COMMUNINCATIONS CABLE
REM EXISTING COMMUNICATIONS CABLE TO BE REMOVED OR RELOCATED
PP EXISTING POWER PEDESTAL
174 UTILITY POLE TAG NUMBER
JU JOINT USE POLE
MP METAL POLE

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PHASE I FIBER TRUNK CABLE INSTALLATION

Prepared for the Offices of:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Mobility and Safety Through Innovative Solutions
750 N. Greenfield Pkwy., Garner, NC 27529

US 401 (RAEFORD ROAD)
SIGNAL SYSTEM AND
COMMUNICATIONS CABLE /
CONDUIT ROUTING PLANS

DIVISION 06 CUMBERLAND CO. FAYETTEVILLE

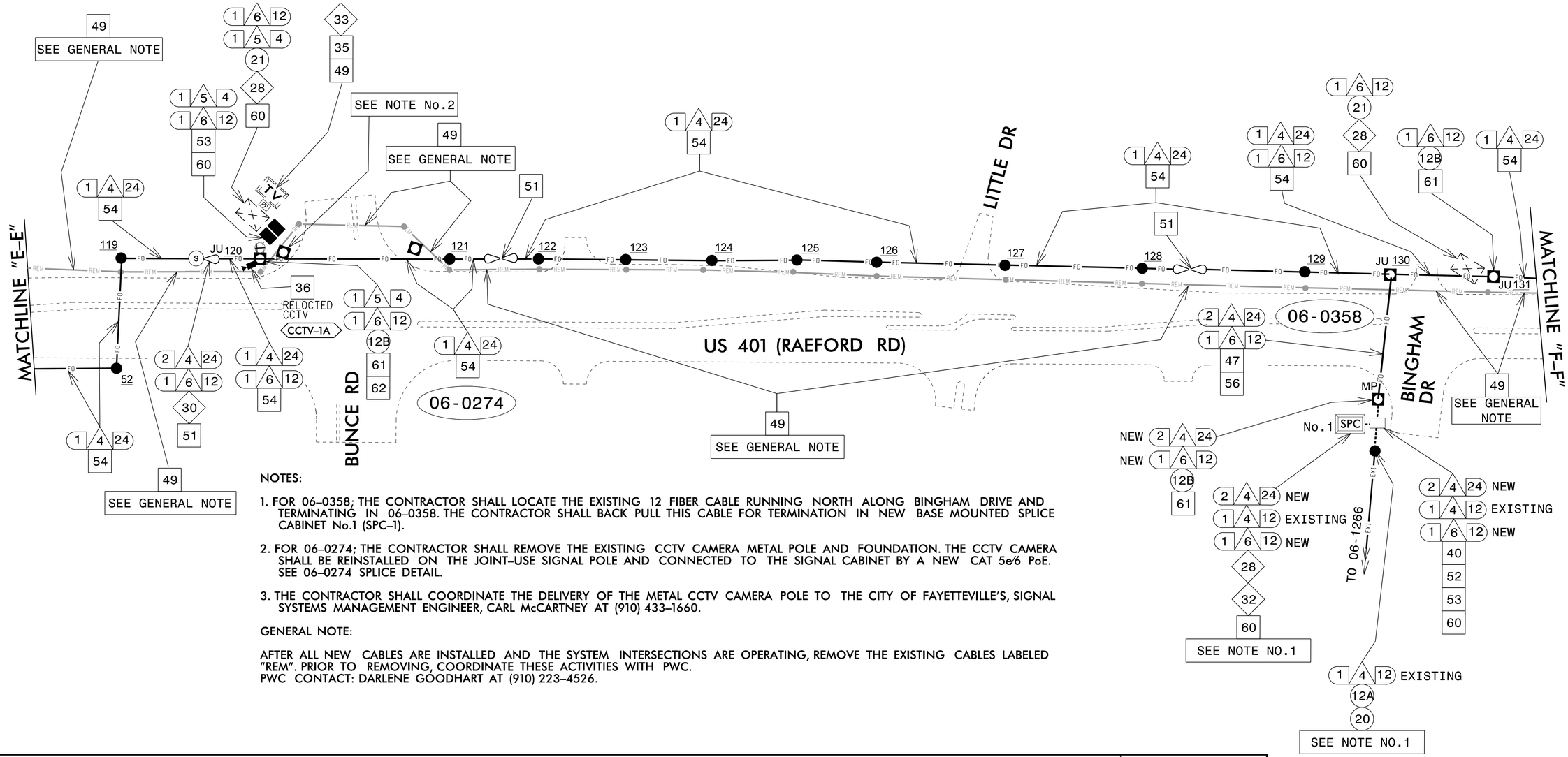
PLAN DATE:	MARCH 2018	REVIEWED BY:	D. HARRIS
PREPARED BY:	J. INGRAM	REVIEWED BY:	B. WATSON

SCALE: NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERMAN
DocuSigned by: Lawrence E Overman 3/29/2018
SIGNATURE DATE
CADD FILE NAME

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SCP.8



NOTES:

1. FOR 06–0358; THE CONTRACTOR SHALL LOCATE THE EXISTING 12 FIBER CABLE RUNNING NORTH ALONG BINGHAM DRIVE AND TERMINATING IN 06–0358. THE CONTRACTOR SHALL BACK PULL THIS CABLE FOR TERMINATION IN NEW BASE MOUNTED SPLICE CABINET No.1 (SPC–1).

2. FOR 06–0274; THE CONTRACTOR SHALL REMOVE THE EXISTING CCTV CAMERA METAL POLE AND FOUNDATION. THE CCTV CAMERA SHALL BE REINSTALLED ON THE JOINT–USE SIGNAL POLE AND CONNECTED TO THE SIGNAL CABINET BY A NEW CAT 5e/6 PoE. SEE 06–0274 SPLICE DETAIL.

3. THE CONTRACTOR SHALL COORDINATE THE DELIVERY OF THE METAL CCTV CAMERA POLE TO THE CITY OF FAYETTEVILLE'S, SIGNAL SYSTEMS MANAGEMENT ENGINEER, CARL McCARTNEY AT (910) 433–1660.

GENERAL NOTE:

AFTER ALL NEW CABLES ARE INSTALLED AND THE SYSTEM INTERSECTIONS ARE OPERATING, REMOVE THE EXISTING CABLES LABELED "REM". PRIOR TO REMOVING, COORDINATE THESE ACTIVITIES WITH PWC.
PWC CONTACT: DARLENE GOODHART AT (910) 223–4526.

1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL 3–CONDUCTOR, CLASS B, STRANDED UNDERGROUND POWER CABLE
4. INSTALL SMFO CABLE
5. INSTALL WEATHERPROOF CATEGORY 5e UTP – 4 PAIR 23 AWG CABLE (PoE)
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
12A. INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
12B. INSTALL CABLES/DROP CABLE THROUGH NIPPLE ON METAL POLE (SIGNAL OR JOINT USE). INSTALL HEAT SHRINK TUBING OVER NIPPLE.
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 CABINET
32. INSTALL BASE MOUNTED SPLICE CABINET (336) WITH EXTEND BASE
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 ETHERNET SWITCH
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 50 FEET OF COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING PWC FIBER OPTIC LINE
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 FOR DMS/CCTV
59. INSTALL NEW BASE MOUNTED CABINET (336)
60. SEAL ALL CONDUIT ENTERING JUNCTION BOXES AND SIGNAL/CCTV/DMS CONTROL CABINETS WITH MOLDABLE DUCT SEAL
61. ROUTE CABLE(S) INSIDE METAL POLE AND OUT TO SIGNAL CABINET. USE EXISTING JUNCTION BOXES AND CONDUIT SYSTEMS WHEN AVAILABLE. ENSURE FIBER CABLES DO NOT SHARE JUNCTION BOXES AND CONDUIT SYSTEMS WITH SIGNAL CABLES OR OTHER 120 VOLT CURRENT CARRYING CONDUCTORS.
62. INSTALL "TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET"

PROPOSED TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET.
SPC NEW SPLICE CABINET, BASE MOUNTED
TV EXISTING CCTV CABINET
FO NEW FIBER OPTIC COMMUNINCATIONS CABLE
REM EXISTING COMMUNICATIONS CABLE TO BE REMOVED OR RELOCATED
PP EXISTING POWER PEDESTAL
174 UTILITY POLE TAG NUMBER
JU JOINT USE POLE
MP METAL POLE

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PHASE I FIBER TRUNK CABLE INSTALLATION

Prepared for the Offices of:
750 N. Greenfield Pkwy., Garner, NC 27529

US 401 (RAEFORD ROAD) SIGNAL SYSTEM AND COMMUNICATIONS CABLE / CONDUIT ROUTING PLANS

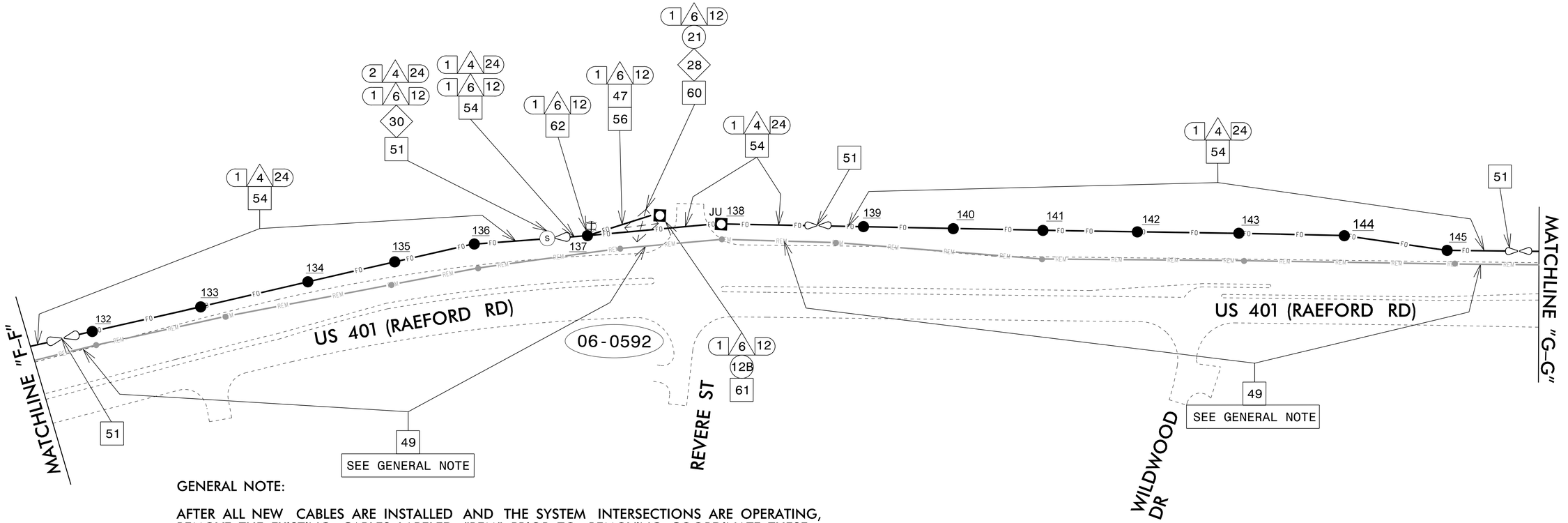
DIVISION 06 CUMBERLAND CO. FAYETTEVILLE
PLAN DATE: MARCH 2018 REVIEWED BY: D. HARRIS
PREPARED BY: J. INGRAM REVIEWED BY: B. WATSON

SCALE: NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERMAN
DocuSigned by: Lawrence E Overman 3/29/2018
DATE
CADD FILE NAME

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SCP.9



GENERAL NOTE:

AFTER ALL NEW CABLES ARE INSTALLED AND THE SYSTEM INTERSECTIONS ARE OPERATING, REMOVE THE EXISTING CABLES LABELED "REM". PRIOR TO REMOVING, COORDINATE THESE ACTIVITIES WITH PWC.
PWC CONTACT: DARLENE GOODHART AT (910) 223–4526.

1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL 3–CONDUCTOR, CLASS B, STRANDED UNDERGROUND POWER CABLE
4. INSTALL SMFO CABLE
5. INSTALL WEATHERPROOF CATEGORY 5e UTP – 4 PAIR 23 AWG CABLE (PoE)
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
12A. INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
12B. INSTALL CABLES/DROP CABLE THROUGH NIPPLE ON METAL POLE (SIGNAL OR JOINT USE). INSTALL HEAT SHRINK TUBING OVER NIPPLE.
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 CABINET
32. INSTALL BASE MOUNTED SPLICE CABINET (336) WITH EXTEND BASE
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 ETHERNET SWITCH
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 50 FEET OF COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING PWC FIBER OPTIC LINE
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 FOR DMS/CCTV
59. INSTALL NEW BASE MOUNTED CABINET (336)
60. SEAL ALL CONDUIT ENTERING JUNCTION BOXES AND SIGNAL/CCTV/DMS CONTROL CABINETS WITH MOLDABLE DUCT SEAL
61. ROUTE CABLE(S) INSIDE METAL POLE AND OUT TO SIGNAL CABINET. USE EXISTING JUNCTION BOXES AND CONDUIT SYSTEMS WHEN AVAILABLE. ENSURE FIBER CABLES DO NOT SHARE JUNCTION BOXES AND CONDUIT SYSTEMS WITH SIGNAL CABLES OR OTHER 120 VOLT CURRENT CARRYING CONDUCTORS.
62. INSTALL "TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET"

PROPOSED TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET.
SPC NEW SPLICE CABINET, BASE MOUNTED
TV EXISTING CCTV CABINET
FO NEW FIBER OPTIC COMMUNINCATIONS CABLE
REM EXISTING COMMUNICATIONS CABLE TO BE REMOVED OR RELOCATED
PP EXISTING POWER PEDESTAL
174 UTILITY POLE TAG NUMBER
JU JOINT USE POLE
MP METAL POLE

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PHASE I FIBER TRUNK CABLE INSTALLATION

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

US 401 (RAEFORD ROAD) SIGNAL SYSTEM AND COMMUNICATIONS CABLE / CONDUIT ROUTING PLANS

DIVISION 06 CUMBERLAND CO. FAYETTEVILLE

PLAN DATE:	MARCH 2018	REVIEWED BY:	D. HARRIS
PREPARED BY:	J. INGRAM	REVIEWED BY:	B. WATSON

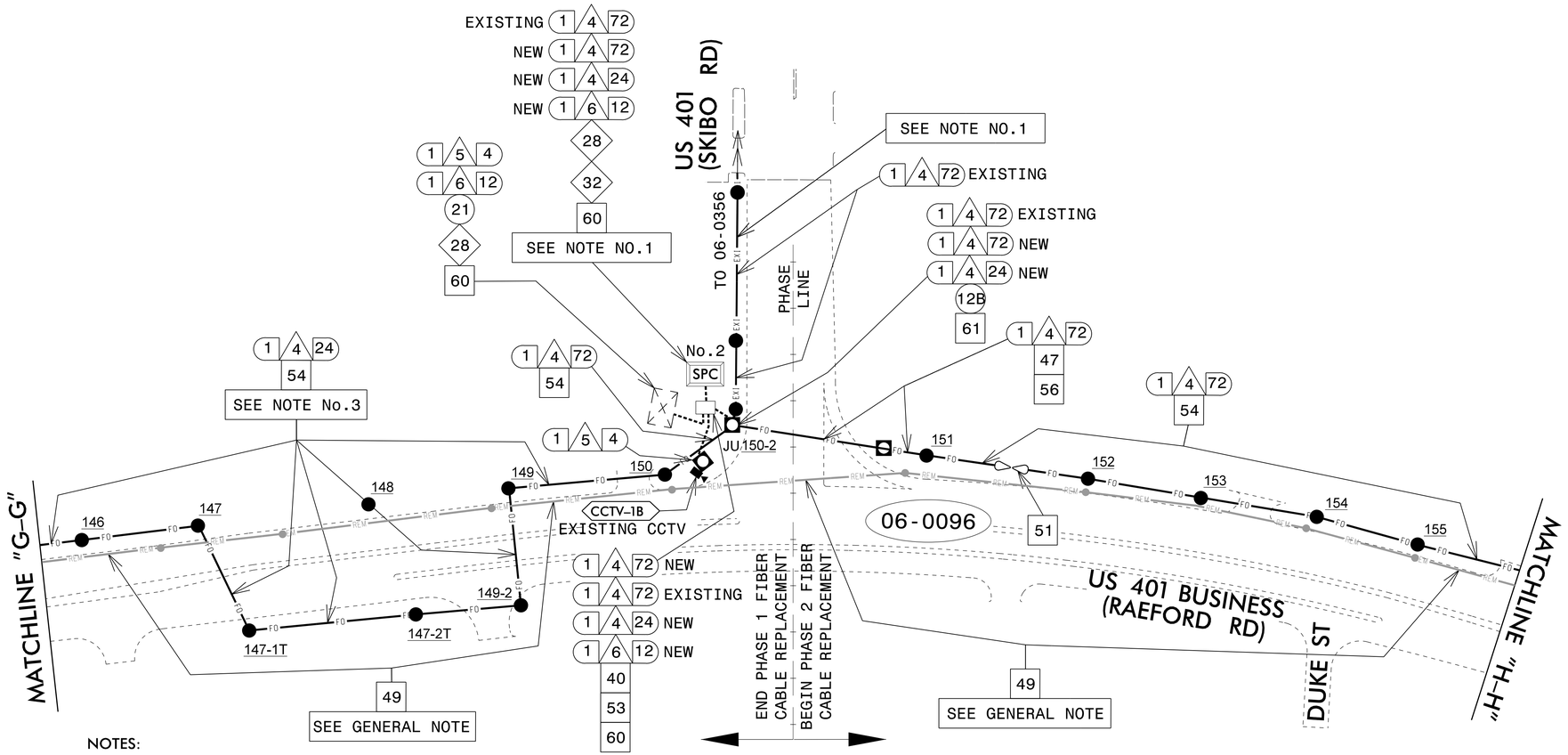
SCALE: NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OWEN

DocuSigned by: Lawrence E Owen 3/29/2018
SIGNATURE DATE
CADD FILE NAME

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SCP.10



NOTES:

1. THE CONTRACTOR SHALL LOCATE THE EXISTING FIBER CABLE RUNNING NORTH ALONG SKIBO ROAD AND TERMINATING IN 06–0096. THEN THE CONTRACTOR SHALL BACK PULL THIS CABLE FOR TERMINATION IN NEW BASE MOUNTED SPLICE CABINET No.2 (SPC–2).

2. THE CONTRACTOR SHALL BEGIN PHASE TWO CABLE INSTALLATION OF THE NEW 72F SM FO CABLE FROM THIS BASE MOUNTED SPLICE CABINET No.2 (SPC–2), AND CONTINUE THE AERIAL CABLE INSTALLATION EAST, TO 06–0491 (SANDALWOOD DRIVE) AS SHOWN ON THESE DESIGN PLANS.

3. THE SECTION OF FIBER CABLE SHOWN TO BE INSTALLED ON THE SOUTH SIDE OF THE ROAD, FROM POLE No.147, 147–1T, 147–2T, 149–2 AND BACK TO POLE No. 149, IS A TEMPORARY CABLE ROUTE TO ACCOMMODATE CULVERT CONSTRUCTION. ONCE THIS WORK IS COMPLETED, THE CONTRACTOR SHALL REINSTALL THE FO CABLE BACK TO THE NORTH SIDE OF RAEFORD ROAD UTILIZING POLE No. 147, No. 148 AND No. 149, THIS WORK SHALL BE AT THE DIRECTION OF THE ENGINEER.

GENERAL NOTE:

AFTER ALL NEW CABLES ARE INSTALLED AND THE SYSTEM INTERSECTIONS ARE OPERATING, REMOVE THE EXISTING CABLES LABELED "REM". PRIOR TO REMOVING, COORDINATE THESE ACTIVITIES WITH PWC.
PWC CONTACT: DARLENE GOODHART AT (910) 223–4526.

1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL 3–CONDUCTOR, CLASS B, STRANDED UNDERGROUND POWER CABLE
4. INSTALL SMFO CABLE
5. INSTALL WEATHERPROOF CATEGORY 5e UTP – 4 PAIR 23 AWG CABLE (PoE)
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
12A. INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
12B. INSTALL CABLES/DROP CABLE THROUGH NIPPLE ON METAL POLE (SIGNAL OR JOINT USE). INSTALL HEAT SHRINK TUBING OVER NIPPLE.
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 CABINET
32. INSTALL BASE MOUNTED SPLICE CABINET (336) WITH EXTEND BASE
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 ETHERNET SWITCH
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 50 FEET OF COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING PWC FIBER OPTIC LINE
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 FOR DMS/CCTV
59. INSTALL NEW BASE MOUNTED CABINET (336)
60. SEAL ALL CONDUIT ENTERING JUNCTION BOXES AND SIGNAL/CCTV/DMS CONTROL CABINETS WITH MOLDABLE DUCT SEAL
61. ROUTE CABLE(S) INSIDE METAL POLE AND OUT TO SIGNAL CABINET. USE EXISTING JUNCTION BOXES AND CONDUIT SYSTEMS WHEN AVAILABLE. ENSURE FIBER CABLES DO NOT SHARE JUNCTION BOXES AND CONDUIT SYSTEMS WITH SIGNAL CABLES OR OTHER 120 VOLT CURRENT CARRYING CONDUCTORS.
62. INSTALL "TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET"

PROPOSED TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET.
SPC NEW SPLICE CABINET, BASE MOUNTED
TV EXISTING CCTV CABINET
FO NEW FIBER OPTIC COMMUNINCATIONS CABLE
REM EXISTING COMMUNICATIONS CABLE TO BE REMOVED OR RELOCATED
PP EXISTING POWER PEDESTAL
174 UTILITY POLE TAG NUMBER
JU JOINT USE POLE
MP METAL POLE

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

END OF PHASE I AND BEGINNING OF PHASE II FIBER TRUNK CABLE INSTALLATION

Prepared for the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Integrity Honesty Teamwork Accountability Respect
750 N. Greenfield Pkwy., Garner, NC 27529

US 401 (RAEFORD ROAD) SIGNAL SYSTEM AND COMMUNICATIONS CABLE / CONDUIT ROUTING PLANS

DIVISION 06 CUMBERLAND CO. FAYETTEVILLE

PLAN DATE:	MARCH 2018	REVIEWED BY:	D. HARRIS
PREPARED BY:	J. INGRAM	REVIEWED BY:	B. WATSON

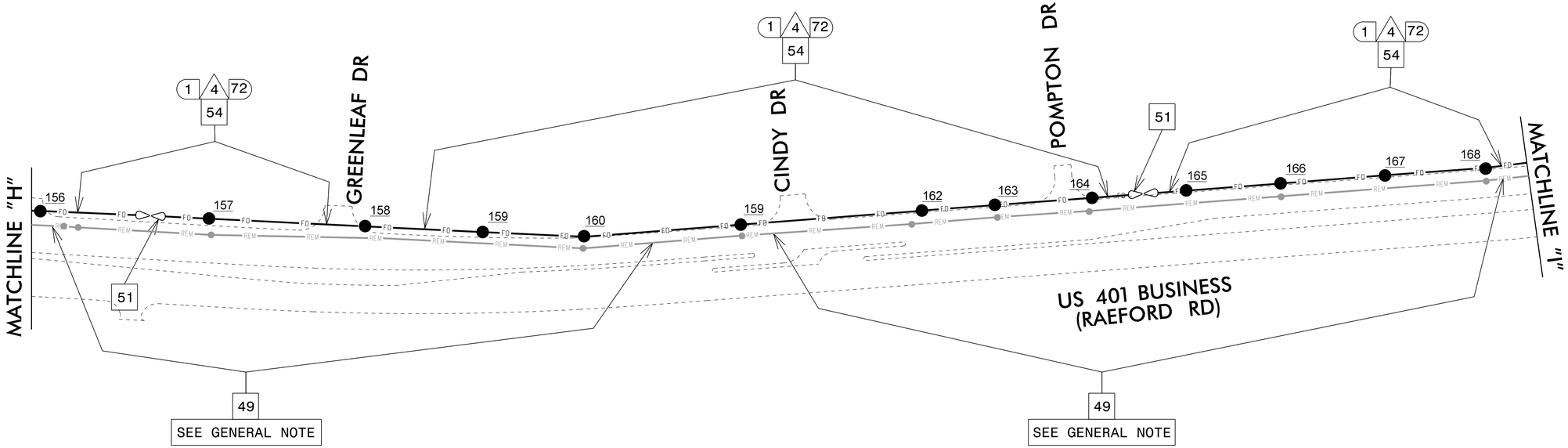
SCALE: NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN

DocuSigned by: Lawrence E Overn 3/29/2018
DATE
CADD FILE NAME

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SCP.11



GENERAL NOTE:

AFTER ALL NEW CABLES ARE INSTALLED AND THE SYSTEM INTERSECTIONS ARE OPERATING, REMOVE THE EXISTING CABLES LABELED "REM". PRIOR TO REMOVING, COORDINATE THESE ACTIVITIES WITH PWC.
PWC CONTACT: DARLENE GOODHART AT (910) 223–4526.

1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL 3–CONDUCTOR, CLASS B, STRANDED UNDERGROUND POWER CABLE
4. INSTALL SMFO CABLE
5. INSTALL WEATHERPROOF CATEGORY 5e UTP – 4 PAIR 23 AWG CABLE (PoE)
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
12A. INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
12B. INSTALL CABLES/DROP CABLE THROUGH NIPPLE ON METAL POLE (SIGNAL OR JOINT USE). INSTALL HEAT SHRINK TUBING OVER NIPPLE.
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 CABINET
32. INSTALL BASE MOUNTED SPLICE CABINET (336) WITH EXTEND BASE
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 ETHERNET SWITCH
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 50 FEET OF COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING PWC FIBER OPTIC LINE
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 FOR DMS/CCTV
59. INSTALL NEW BASE MOUNTED CABINET (336)
60. SEAL ALL CONDUIT ENTERING JUNCTION BOXES AND SIGNAL/CCTV/DMS CONTROL CABINETS WITH MOLDABLE DUCT SEAL
61. ROUTE CABLE(S) INSIDE METAL POLE AND OUT TO SIGNAL CABINET. USE EXISTING JUNCTION BOXES AND CONDUIT SYSTEMS WHEN AVAILABLE. ENSURE FIBER CABLES DO NOT SHARE JUNCTION BOXES AND CONDUIT SYSTEMS WITH SIGNAL CABLES OR OTHER 120 VOLT CURRENT CARRYING CONDUCTORS.
62. INSTALL "TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET"

PROPOSED TEMPORARY DROP CABLE MAINTENANCE LOOP WITH CABLE BRACKET.
SPC NEW SPLICE CABINET, BASE MOUNTED
TV EXISTING CCTV CABINET
—FO— NEW FIBER OPTIC COMMUNINCATIONS CABLE
—REM— EXISTING COMMUNICATIONS CABLE TO BE REMOVED OR RELOCATED
PP EXISTING POWER PEDESTAL
174 UTILITY POLE TAG NUMBER
JU JOINT USE POLE
MP METAL POLE

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

PHASE II FIBER TRUNK CABLE INSTALLATION

Prepared for the Offices of:
Traffic Engineering Branch, Traffic Engineering Unit, Transportation Mobility and Safety Division, NCDEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

US 401 BUSINESS (RAEFORD ROAD) SIGNAL SYSTEM AND COMMUNICATIONS CABLE / CONDUIT ROUTING PLANS

DIVISION 06 CUMBERLAND CO. FAYETTEVILLE

PLAN DATE:	MARCH 2018	REVIEWED BY:	D. HARRIS
PREPARED BY:	J. INGRAM	REVIEWED BY:	B. WATSON

SCALE: NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN

DocuSigned by: Lawrence E Overn 3/29/2018
SIGNATURE DATE

CADD FILE NAME