VICINITY MAP
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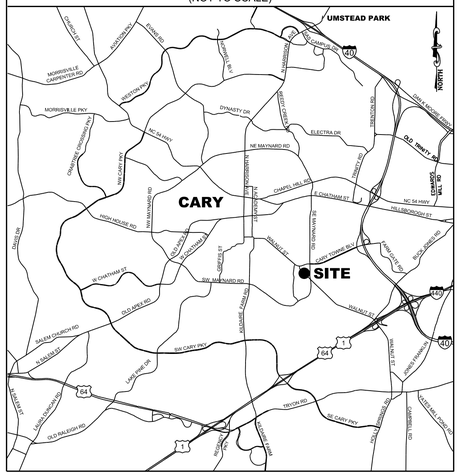


TOWN of CARY
NORTH CAROLINA

316 North Academy Street
Cary, N.C. 27513
Tel: 919-469-4030 Fax: 919-460-4935
www.townofcary.org

WALNUT STREET PEDESTRIAN HYBRID BEACON SIGNAL DESIGN PROJECT

Walnut Street near Cary High School

Project No. ST-1281

Contact Information:
priyatham.konda@townofcary.org
919.462.2005

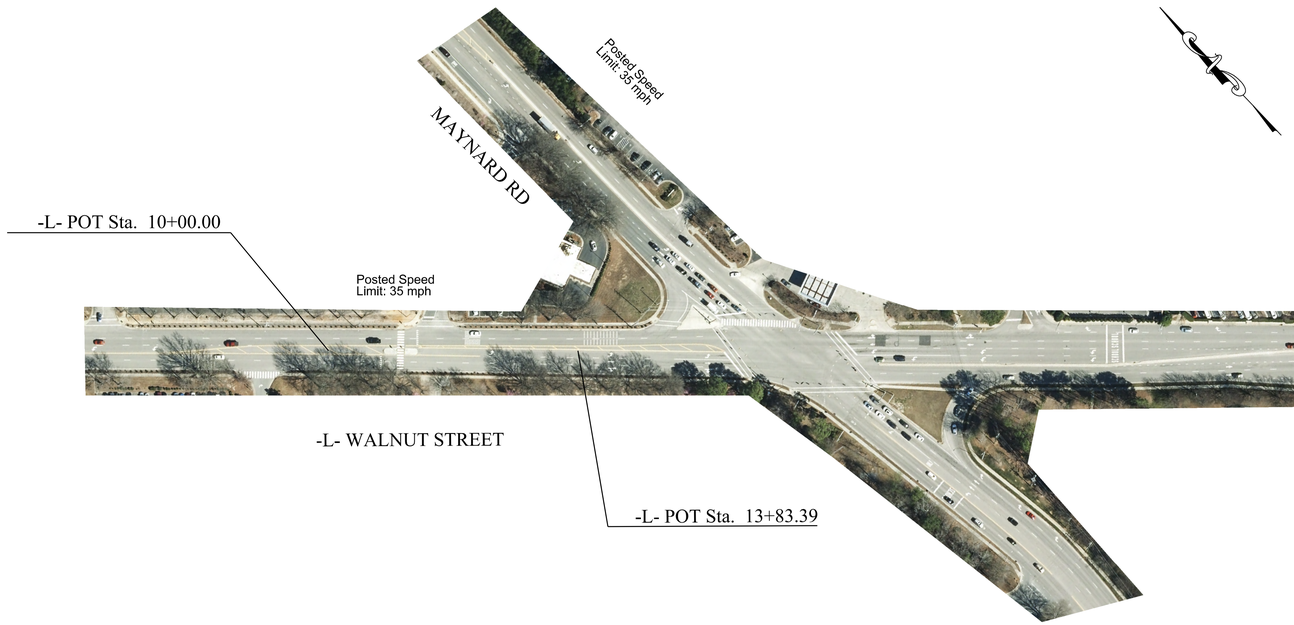
INDEX OF SHEETS

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

SITE DATA

Walnut Street

xx inch DIP	xxx L.F.
xx inch DIP	xxx L.F.
Bore & Jack	xxx L.F. ±
xx inch Casing	x Locations



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Revisions	
Date	Description
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Survey for this project was completed by Town of Cary professional land surveyors. Coordinate control based on the following:
Horizontal _____ Vertical _____

Drawn By : -

Designed By: -

Date: -

Project Engineer
ANTHONY M. ENCARNACION, PE

Signature

10/27/2022
Date

NORTH CAROLINA PROFESSIONAL SEAL 044476 ENGINEER ANTHONY M ENCARNACION
SEAL

Internal Control Approval Authorizing Release By The Town of Cary Transportation & Facilities Dept. (Check Indicating Type of Plan)

___ Final Drawings (No Marking)

Certification Optional:

___ Preliminary Drawings - Do Not Use For Construction
___ Progress Drawing - Do Not Use For Construction
___ Final Drawing - Not Released For Construction
___ Final Drawing - For Review Purposes Only
___ Not a Certified Document as to the Original Document but ONLY as to the Revisions

PROJECT REFERENCE NO.	SHEET NO.
ST-1281	09

R/W SHEET NO.

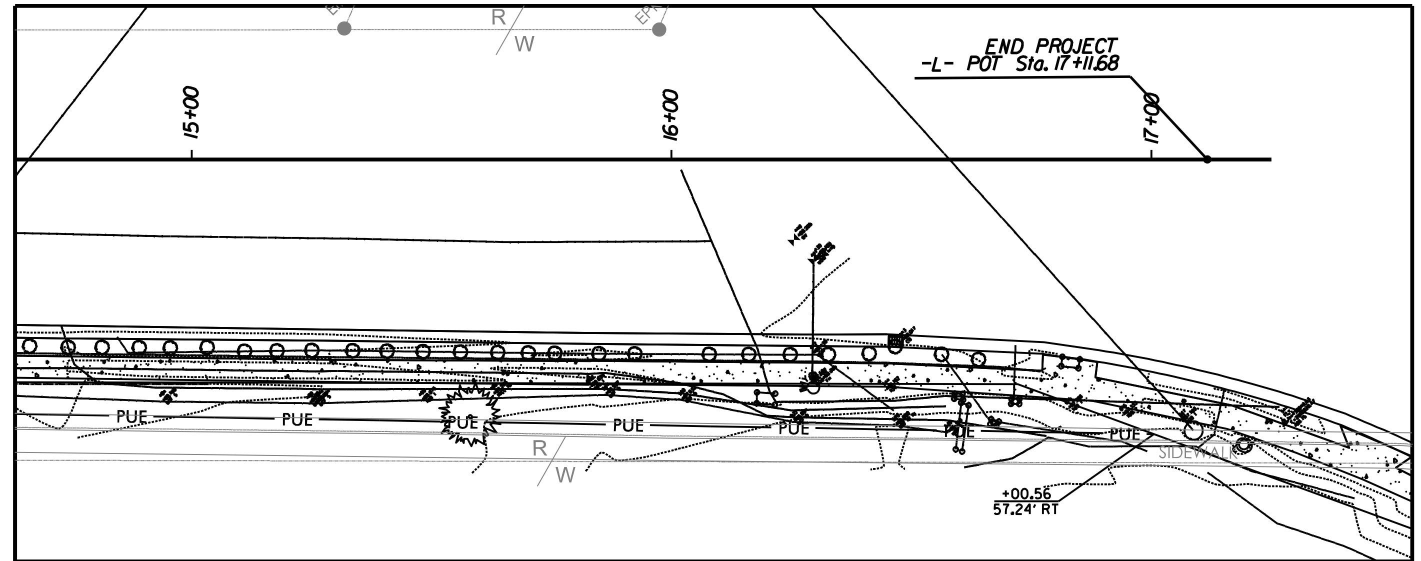
ROADWAY DESIGN ENGINEER — HYDRAULICS ENGINEER

Bruce Payne 7/12/2023

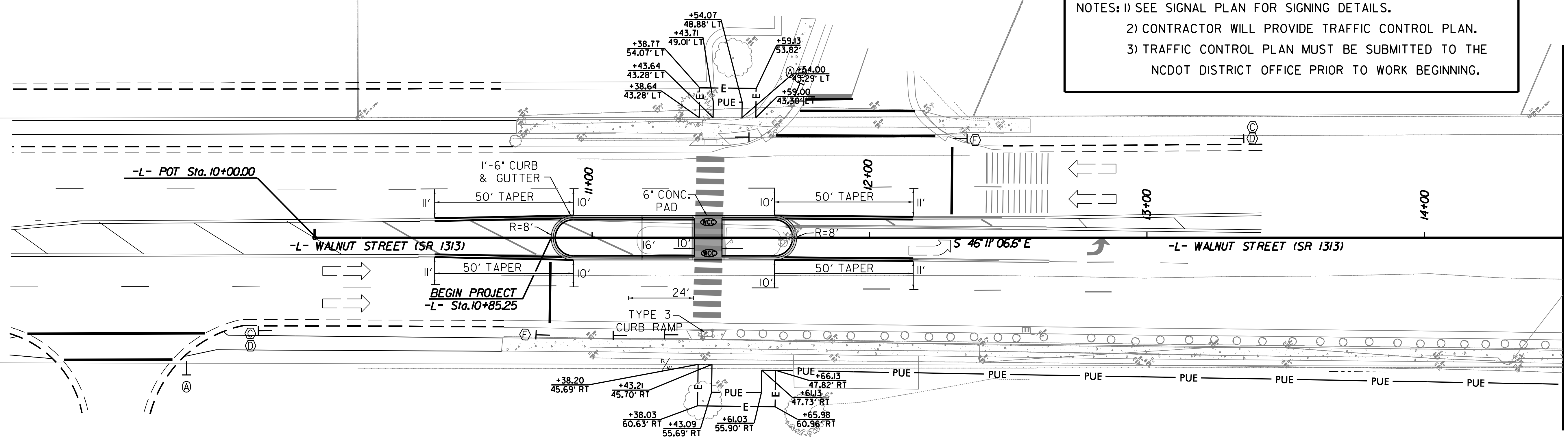
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

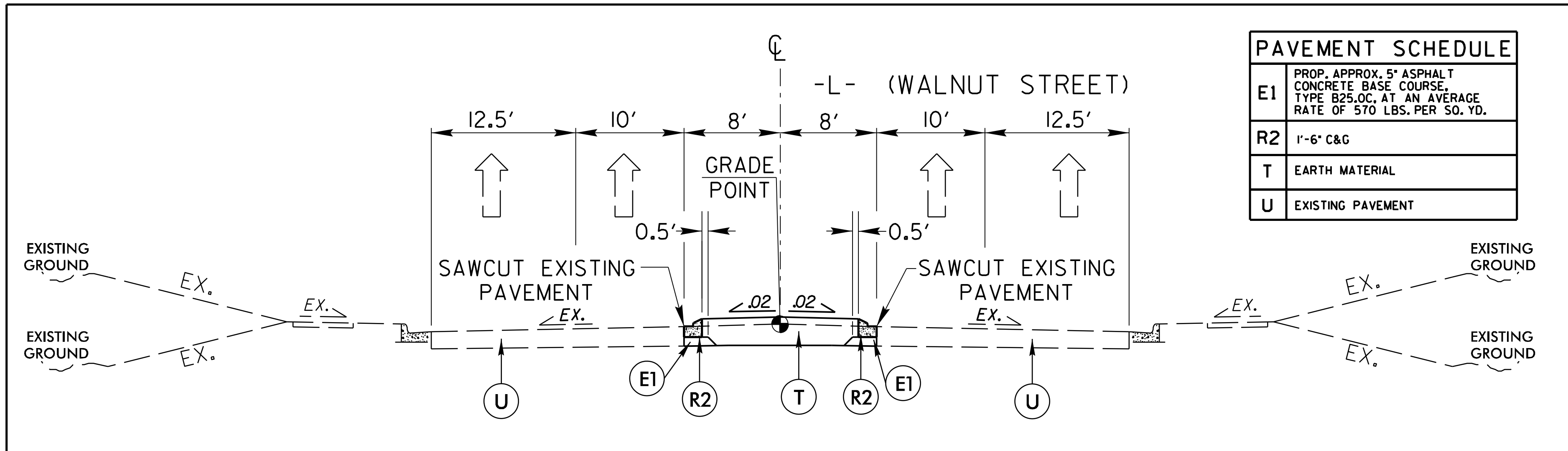
ATKINS 1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

GRAPHIC SCALE 20 0 20 40 10



NOTES: 1) SEE SIGNAL PLAN FOR SIGNING DETAILS.
2) CONTRACTOR WILL PROVIDE TRAFFIC CONTROL PLAN.
3) TRAFFIC CONTROL PLAN MUST BE SUBMITTED TO THE NCDOT DISTRICT OFFICE PRIOR TO WORK BEGINNING.





PAVEMENT SCHEDULE	
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
R2	1'-6" C&G
T	EARTH MATERIAL
U	EXISTING PAVEMENT

TYPICAL SECTION 1

SIGNING LEGEND

PROPOSED		EXISTING
(A)	"STOP" Sign (R1-1)	(A)
(B)	Right "TURNING VEHICLES" Yield "TO" Pedestrian Sign (R10-15L)	(B)
(C)	Pedestrian Warning Sign (W11-2)	(C)
(D)	"AHEAD" Plaque (W16-9P)	(D)
(E)	"CROSSWALK-STOP ON RED" Sign (R10-23)	(E)
(F)	"STOP HERE ON RED" Sign (R10-6)	(F)

REVISIONS

07-JUL-2023 15:06 R:\Proj\walnut_street_rdy_psh.dgn $$$$USERNAME$$$$

LANDSCAPE PLANT SCHEDULE						
SYMBOL	KEY	QUANITITY	SCIENTIFIC NAME	COMMON NAME	SIZE	COMMENT
SHRUBS AND ORNAMENTAL GRASSES						
⊗	ARC	29	ABELIA X GRANDIFLORA 'ROSE CREEK'	ABELIA 'ROSE CREEK'	3 GAL.	CONT. +/- 3' O.C.
⊙	RKP	18	ROSA 'MEIJOCOS' PINK DRIFT	PINK DRIFT ROSE	3 GAL.	CONT. +/- 3' O.C.
PERENNIALS AND GROUNDCOVERS						
▨	LS	232	LIRIOPE MUSCARI 'BIG BLUE'	LIRIOPE 'BIG BLUE'	4" POT	CONT. +/- 12" O.C.
LANDSCAPE MULCH - 105 SQ. YDS. 4 INCH LAYER OF PINE STRAW.						
MEDIAN PLANT TOPSOIL - 55 CU. YDS. - MIN. 18 INCHES DEPTH PLANT MIXTURE. REFER TO PLANTING DETAILS FOR MEDIAN CROWN AND NOTES.						
FERTILIZER - RATE PER SOIL TEST RECOMMENDATIONS. PRE-EMERGENT TO BE APPLIED TO PLANT BEDS PER MANUFACTURER'S RECOMMENDATIONS.						

NOTE: LANDSCAPE MULCH ENTIRE MEDIAN AFTER PLANTING.

TOWN OF CARY MEDIAN NOTES:

1. CONTRACTOR TO COORDINATE WITH PROJECT MANAGER TO FIELD VERIFY ALIGNMENT OF CROSSWALK.

2. CONTRACTOR TO SUBMIT TRAFFIC CONTROL PLAN FOR REVIEW TO PROJECT MANAGER PRIOR TO COMMENCING WORK.

3. CALL 811 BEFORE DIGGING.

4. FIELD VERIFY EXISTING LANE WIDTHS, LANES SHALL REMAIN THE SAME ONCE MEDIAN ISLAND AND PAVEMENT MARKINGS ARE INSTALLED.

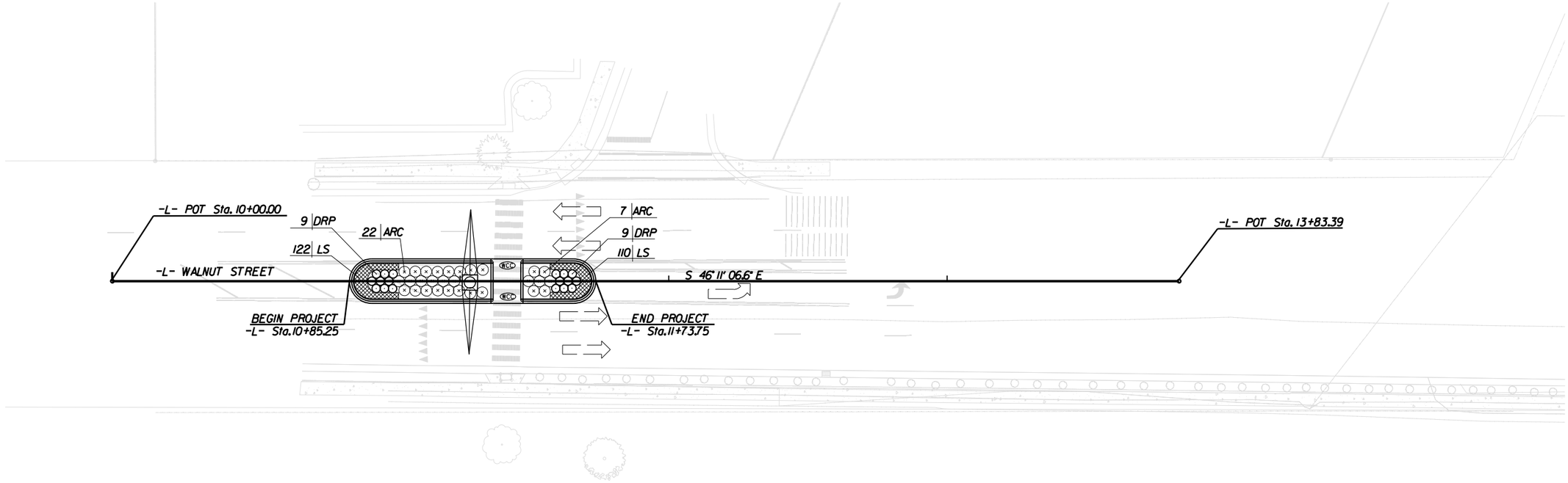
5. CONSTRUCT CONCRETE CURB & GUTTER MEDIAN ISLAND.

6. CONTACT TOWN ARBORIST TO SELECT PLANTINGS FOR LANDSCAPED AREA.

7. WHEEL CHAIR RMAP LOCATIONS ARE APPROXIMATE ONLY. CROSSWALK SHOULD BE LOCATED AFTER THE RAMPS HAVE BEEN INSTALLED.

8. LOCATE PUSH BUTTONS TO MEET ADA REQUIREMENTS.

9. ALL SIGNS ARE FLUORESCENT YELLOW GREEN. FIELD LOCATE SIGNS TO AVOID VISIBLE OBSTRUCTION.



GRAPHIC SCALE
20 0 20 40
10

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Walnut Street PHB
at Cary High School Pedestrian Crossing
Town of Cary, North Carolina

Landscape Plan and Schedule

Signature

Revisions

Proj. No.	ST0000
Design By:	CH
Drawn By:	CH
Date:	June 2021
Scale Hor:	1" = 20'
Scale Ver:	N/A

SHEET NO.
11

LANDSCAPE PLANTING NOTES:

1. ALL PLANTS MUST BE HEALTHY, VIGOROUS MATERIAL, FREE OF PESTS & DISEASES.

2. ALL PLANTS MUST BE CONTAINER-GROWN OR BALLED & BURLAPPED (B&B) AS INDICATED IN THE PLANT LIST. BURLAP MATERIAL ON BALLED AND BURLAPPED PLANTS SHALL BE THE TYPE WHICH WILL DECAY WITHIN TWO YEARS (NO SYNTHETICS, PLASTIC, NYLON , TREATED OR OTHER NON NATURAL TYPES WILL BE ALLOWED.) AFTER SETTING BALLED AND BURLAPPED PLANTS IN THE PLANTING PIT, ALL BINDER TWINE SHALL BE CUT AND THE BURLAP REMOVED FROM THE TOP 1/3 OF THE ROOTBALL.

3. ALL TREES MUST BE STRAIGHT TRUNKED, FULL-HEADED & MEET ALL REQUIREMENTS SPECIFIED.

4. ALL PLANTS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT & THE OWNER BEFORE, DURING & AFTER INSTALLATION UNTIL THE DATE OF FINAL ACCEPTANCE.

5. ALL TREES MUST BE GUYED OR STAKED AS SHOWN IN THE DETAILS.

6. ALL PLANTS & PLANTING AREAS MUST BE COMPLETELY MULCHED AS PER SPECIFICATIONS.

7. PRIOR TO CONSTRUCTION, THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES & SHALL AVOID DAMAGE TO ALL UTILITIES DURING THE COURSE OF THE WORK. THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY & ALL DAMAGE TO UTILITIES, STRUCTURES, SITE APPURTENANCES, ETC. WHICH OCCURS AS A RESULT OF THE LANDSCAPE CONSTRUCTION.

8. THE QUANTITIES SHOWN IN THE PLANT SCHEDULE ARE SOLELY FOR THE INFORMATION OF THE CONTRACTOR. THE CONTRACTOR SHALL VERIFY THE QUANTITIES SHOWN IN THE PLANT SCHEDULE WITH THE QUANTITIES SHOWN ON THE PLANTING PLAN. ALL DIFFERENCES IN THE QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT FOR CLARIFICATION. CONTRACTOR IS RESPONSIBLE TO INSTALL THE PLANT MATERIAL QUANTITIES THAT ARE SHOWN IN THE LANDSCAPE PLANS.

9. THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL PLANTING (INCLUDING, BUT NOT LIMITED TO: WEEDING, WATERING, SPRAYING, MULCHING, FERTILIZING, ETC.) OF PLANTING AREAS & LAWNS UNTIL FINAL ACCEPTANCE OF THE PROJECT.

10. THE LANDSCAPE CONTRACTOR SHALL COMPLETELY GUARANTEE ALL PLANT MATERIAL FOR A PERIOD OF ONE YEAR BEGINNING FROM THE FINAL ACCEPTANCE DATE. FINAL ACCEPTANCE WILL BE GRANTED BY THE OWNER'S REPRESENTATIVE UPON COMPLETION OF THE ENTIRE PROJECT. THE CONTRACTOR SHALL PROMPTLY MAKE ALL REPLACEMENTS BEFORE, DURING, AND AT THE END OF THE GUARANTEE PERIOD AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

11. THE LANDSCAPE ARCHITECT OR OWNERS REPRESENTATIVE WILL APPROVE THE STAKED LOCATION OF ALL MATERIAL PRIOR TO INSTALLATION.

12. AFTER BEING DUG AT THE NURSERY SOURCE, ALL TREES IN LEAF SHALL BE ACCLIMATED FOR TWO (2) WEEKS UNDER A MIST SYSTEM PRIOR TO INSTALLATION.

13. ANY PLANT MATERIAL WHICH DIES, TURNS BROWN OR DEFOLIATES (PRIOR TO FINAL ACCEPTANCE OF THE PROJECT AND DURING THE COURSE OF THE ONE YEAR GUARANTEE PERIOD) SHALL BE PROMPTLY REMOVED FROM THE SITE AND REPLACED WITH MATERIAL OF THE SAME SPECIES, QUALITY AND SIZE AND MEETING ALL PLANT LIST SPECIFICATIONS.

14. ALL PLANT MATERIAL SHALL CONFORM WITH THE LATEST EDITION OF "AMERICAN STANDARDS FOR NURSERY STOCK" BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION. ALL PLANT MATERIAL SHALL MEET OR EXCEED THE SPECIFICATIONS OF THE FEDERAL, STATE, AND COUNTY LAWS REQUIRING INSPECTION FOR DISEASE AND INSECT CONTROL. ONE PLANT OF EACH SPECIES SHALL BE PROVIDED FOR THE OWNER'S REVIEW WITH THE NAME AND SIZE OF THE PLANT IN ACCORDANCE WITH THE STANDARDS OF PRACTICE FOR THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION, INC. (ANLA). BOTANICAL NAMES SHALL TAKE PRECEDENCE OVER COMMON NAMES.

15. THE CONTRACTOR SHALL REMOVE ALL DEAD WOOD, SUCKERS, AND ALL BROKEN OR DAMAGED BRANCHES IN ACCORDANCE WITH THE ANLA IN ORDER TO PRESERVE THE NATURAL CHARACTER OF THE TREE AND SHRUB.

16. ALL PLANTING PITS SHALL BE FREE OF ROCKS, GRAVEL, AND OTHER DEBRIS. ALL PLANTING PITS SHALL BE PREPARED IN ACCORDANCE WITH THE PLANTING DETAILS.

17. NO SUBSTITUTION OF PLANT SPECIES OR VARIETY SHALL BE MADE WITHOUT PRIOR WRITTEN PERMISSION FROM THE LANDSCAPE ARCHITECT OR OWNERS REPRESENTATIVE.

18. ALL SHRUB AND GROUNDCOVER AREAS SHALL BE TOP DRESSED WITH A MINIMUM OF 4" OF DARK BROWN PINE STRAW MULCH. THE MULCH SHALL BE FREE FROM MOLD, STICKS, CONES, WEEDS AND OTHER DEBRIS. COMPACTION OF THE MULCH SHALL OCCUR NATURALLY OVER A TWO WEEK PERIOD DURING WHICH AT LEAST ONE SIGNIFICANT RAINFALL HAS OCCURRED. ADDITIONAL MULCH SHALL BE PLACED IN ORDER TO MAINTAIN THE MINIMUM DEPTH UNTIL DATE OF FINAL ACCEPTANCE AND APPROVED BY OWNER.

19. FERTILIZER APPLICATION AMOUNTS AND SOIL PREPARATION DESCRIBED IN THE PLANT SCHEDULE SHALL BE STRICTLY FOLLOWED.

20. SPRAY TREES AND SHRUBS WITH ANTI-DESICCANT, PRIOR TO TRANSPORTING AND TRANSPLANTING IF FOLIAGE IS PRESENT. ALL PLANT MATERIAL MUST BE PROTECTED DURING SHIPMENT FROM WIND BY A TARPAULIN.

21. ALL PLANT MATERIALS SHALL BE PLANTED AS PER THE PLANTING DETAILS OR THE PLANTINGS NOTES.

22. ALL EXISTING TURF AND VEGETATION SHALL BE STRIPPED AND REMOVED PRIOR TO THE INSTALLATION OF ANY TURF OR PLANT MATERIAL.

LANDSCAPE PLANTING NOTES CONTINUED:

23. BACKFILL MIXTURE FOR ALL PLANTING AREAS SHALL CONTAIN 1 / 3 BY VOLUME OF AMENDMENT GRADE, FINELY GROUND AND FULLY COMPOSTED PINE OR HARDWOOD BARK. AMENDMENT SHALL BE MIXED THOROUGHLY WITH THE ENTIRE VOLUME OF GOOD SOIL REMOVED FROM THE PLANTING PIT. THIS MIXTURE SHALL BE USED TO BACKFILL AROUND THE ROOTBALL.

24. ALL PLANT MATERIAL SHALL BE PROPERLY WATERED IMMEDIATELY AFTER PLANTING. WATER SHALL BE APPLIED AT A RATE THAT WILL COMPLETELY SATURATE THE ENTIRE ROOTBALL REGARDLESS OF WEATHER CONDITIONS. IF THE HEIGHT OF THE ROOTBALL IS 24", THEN THE PLANT SHALL BE WATERED TO A DEPTH OF 24".

25. THE OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO REJECT, AT ANY TIME UNTIL THE END OF THE GUARANTEE PERIOD, ANY AND/OR ALL PLANT MATERIAL THAT DOES NOT MEET THE SPECIFICATIONS AS SET FORTH HERE IN AND IN THE PLANT SCHEDULE.

26. ALL DISTURBED AREAS SHALL BE SEEDED UNLESS INDICATED OTHERWISE ON THE PLANS. CONTRACTOR IS TO PROVIDE A VIGOROUS STAND OF TURF, FREE FROM DISEASE AND / OR WEEDS.

27. ALL SLOPES THAT ARE GREATER THAN 3:1 SHALL BE STABILIZED WITH EROSION CONTROL FABRIC PRIOR TO PLANTING. EROSION CONTROL FABRIC SHALL BE OF THE TYPE THAT DECOMPOSES AFTER 18 MONTHS TO 2 YEARS.

28. FINAL LOCATION OF ALL PLANT MATERIAL SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE. BEFORE INSTALLATION, THE CONTRACTOR IS TO NOTIFY THE OWNER'S REPRESENTATIVE FOR INSPECTION AFTER THE LAYOUT IS COMPLETE. FIELD VERIFY PLANT LOCATIONS WITH LANDSCAPE ARCHITECT PRIOR TO INSTALLATION OF ANY PLANT MATERIAL. ANY PLANT MATERIAL INSTALLED PRIOR TO THE OWNER'S REPRESENTATIVE'S APPROVAL WILL BE SUBJECT TO ADJUSTMENT/RELOCATION AT THE LANDSCAPE CONTRACTOR'S EXPENSE.

29. CONTRACTOR SHALL WATER ALL PLANT MATERIAL AS NECESSARY TO MAINTAIN PLANT MATERIAL IN HEALTHY CONDITION UNTIL THE END OF THE ONE YEAR GUARANTEE PERIOD.

30. DO NOT SCALE FROM DRAWINGS.

31. PLANT QUALITY: ALL PLANTS SHALL BE SOUND, FREE OF PLANT DISEASE OR PESTS AND SHALL HAVE A HEALTHY, NORMAL ROOT SYSTEM FREE OF GIRDLING ROOTS. THE OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO REJECT AT ANY TIME, AN AND/OR ALL PLANT MATERIAL THAT DOES NOT MEET THE SPECIFICATIONS AS SET FORTH IN THE PLANTING SCHEDULE.

32. TOPPING AND HEADING CUTS OF ALL SHRUBS ARE STRICTLY PROHIBITED.

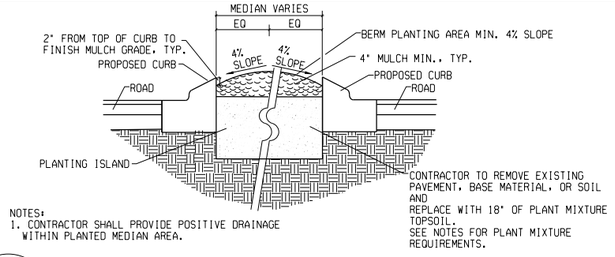
33. ALL PLANTINGS OUTSIDE OF THE LIMITS OF DISTURBANCE AND EROSION CONTROL FENCING MUST BE PREPPED, PLANTED, WATERED AND MULCHED IN ONE (1) DAY, SO BARE SOIL IS NOT EXPOSED AND TO PREVENT EROSION INTO SENSITIVE AREAS.

34. THE CONTRACTOR SHALL INSTALL TOPSOIL FOR THE MEDIAN PLANTED AREAS AND CROWN THE MEDIAN WITH THE TOPSOIL TO ALLOW FOR POSITIVE DRAINAGE.

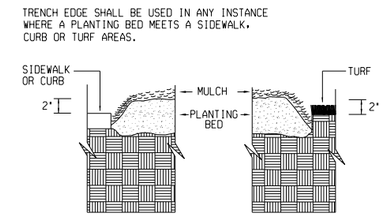
35. PERFERABLE PLANTING SCHEDULE AND PLANTING PREPARATION BETWEEN OCTOBER 15 AND MARCH 15.

36. EXISTING ASPHALT AND BASE MATERIAL TO BE REMOVED AND DISPOSED OF OFFSITE AT PROPOSED MEDIAN ISLAND AND PLANT BED LOCATION. CONTRACTOR TO BREAK THROUGH ANY EXISTING 'HARDPAN' AND REMOVE AS NECESSARY TO PROVIDE GOOD PERCOLATION AND POSITIVE DRAINAGE AT PLANTED MEDIAN ISLAND.

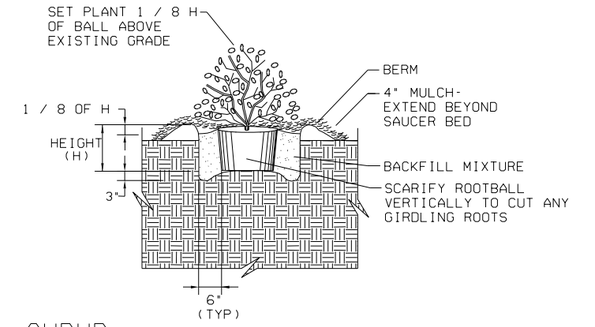
37. **PLANT TOPSOIL:** MEDIAN TO HAVE MINIMUM OF EIGHTEEN (18) INCHES OF PLANT TOPSOIL MIXTURE AMENDMENT. THE CONTRACTOR SHALL ROTO-TILL PLANT MIXTURE INTO MEDIAN PLANT BED AREAS. THE PLANT MIXTURE AMENDMENT SHALL CONSIST OF ONE PART COMPOSTED MANURE, FIVE PARTS OF CLEAN TOPSOIL, AND FOUR PARTS PEATMOSS. CONTRACTOR SHALL INCLUDE FERTILIZER AT APPROVED RATES BASED ON SOIL TEST. PLANT TOPSOIL THAT CONTAINS CONSTRUCTION DEBRIS, ROCKS, AND CLAY ARE NOT ACCEPTABLE.



A MEDIAN PLANTING DETAIL, TYP.
NOT TO SCALE



B TRENCH EDGE DETAILS, TYP.
NOT TO SCALE



C SHRUB
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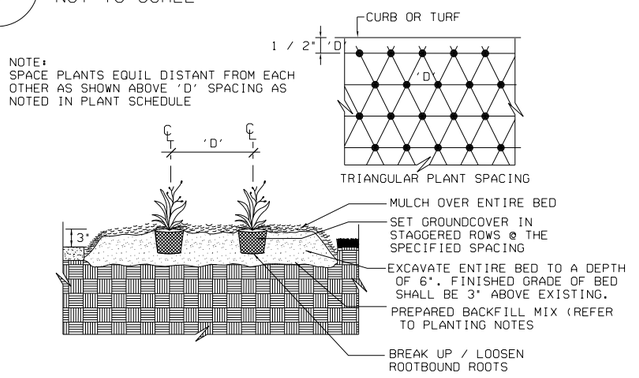

D GROUNDCOVER
NOT TO SCALE

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Walnut Street PHB
at Cary High School Pedestrian Crossing
Town of Cary, North Carolina
Landscape Details and Notes

Signature

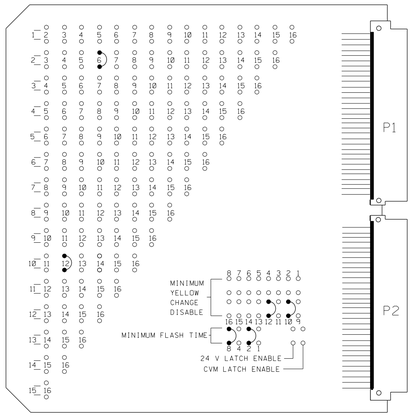
Revisions

Proj. No.	ST0000
Design By:	CH
Drawn By:	CH
Date:	June 2021
Scale Hor:	1" = 20'
Scale Ver:	N/A

SHEET NO.
12

EDI MODEL MMU2-16LEip MALFUNCTION MANAGEMENT UNIT PROGRAMMING DETAIL

(program card and tables as shown)



MMU PROGRAMMING CARD

FIELD CHECK ENABLE DUAL IND ENABLE RED FAIL ENABLE	
CHANNEL NUMBER	ENABLE/ DISABLE
1	DISABLE
* 2	ENABLE
3	DISABLE
4	DISABLE
5	DISABLE
6	DISABLE
7	DISABLE
8	DISABLE
9	DISABLE
10	ENABLE
11	DISABLE
12	ENABLE
13	DISABLE
14	DISABLE
15	DISABLE
16	DISABLE

UNIT OPTIONS	
OPTION	SETTING
RECURRENT PULSE	ON
WALK DISABLE	OFF
LOG CVM FAULTS	ON
EXTERN WATCHDOG	OFF
24V-2=12VDC	OFF
PGM CARD MEMORY	ON
LEDguard	ON
FORCE TYPE 16	OFF
TYPE12-SDLC	OFF
VM 3x/Day Latch	ON

FLASHING YELLOW ARROW	
CONFIG MODE	B
ENABLE CHANNEL PAIR, FYA	
CH 1-13	OFF
CH 3-14	OFF
CH 5-15	OFF
CH 7-16	OFF
RED/YEL INPUT ENABLE	
CH 1	OFF
CH 3	OFF
CH 5	OFF
CH 7	OFF
FLASH RATE FAULT	OFF
FYA TRAP DETECT	OFF

MMU PROGRAMMING NOTE

ENSURE YELLOW CHANGE PLUS RED CLEARANCE MONITORING IS ENABLED FOR ALL CHANNELS.

* Only enable R-Y Dual Indication for this channel. During the Flashing Yellow Clearance interval, channel 2 Green will be active at the same time the logic is instructed to turn on channel 2 Yellow (a G-Y Dual Indication). Enabling G-Y Dual Indication would result in a self made flash condition.

NOTES

1. To prevent "flash-conflict" problems, wire all unused load switches to flash red. Verify that signal heads flash in accordance with the Signal Plans.
2. To prevent red failures on unused monitor channels, tie unused load switch red outputs 1,3,4,5,7,8,9,11,13,14,15, and 16 to load switch AC+ by inserting a jumper plug in the unused load switch socket from pin 1 (LS AC+) to pin 3 (RED out). Make sure all flash transfer relays are in place.
3. Program controller to start up in phase 2 Walk and 6 Walk.
4. Set power-up flash time to 10 seconds and implement on the Malfunction Management Unit. Set controller power-up flash time to 0 seconds.
5. Enable simultaneous gap-out feature for all phases.
6. Program phases 2 and 6 for Rest in Walk.
7. Program phases 2 and 6 for Ped Recall.
8. Program phases 4 and 8 for PED CLR>RED.

EQUIPMENT INFORMATION

CONTROLLER.....2070LXN2
CABINET TS-2
SOFTWARE .....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
LOADBAY POSITIONS.....16
LOAD SWITCHES USED.....2,6,10,12
PHASES USED.....2,*2PED,*4,4PED,6,*6PED,*8,8PED
OVERLAPS.....NONE
* Used for timing purposes only.

OPERATIONAL NOTES

1. In order for the controller to perform the Pedestrian Hybrid Beacon (HAWK signal) sequence, special logic programming is necessary. Refer to sheet 2 for the Econolite ASC/3-2070 Logic Processor Programming Detail.
2. For operational purposes, Phase 2 and Phase 6 both run dummy pedestrian phases that are required to produce the correct HAWK signal sequence. There are no Phase 2 or Phase 6 pedestrian heads.
3. The only Phase 6 load switch output that is being used drives one of the red signal faces of each signal head.
4. The Logic Processor flashes Phase 2 Yellow during the Phase 2 pedestrian clearance phase, and Phase 2 Yellow drives the solid Yellow signal faces during Phase 2 vehicle yellow clear.
5. The Phase 2 and Phase 6 Red outputs drive the solid Red displays during Phase 2 and 6 Red. The Logic Processor flashes the Phase 2 and Phase 6 Red outputs in a wig-wag pattern during Phase 4+8 Ped Clear and thru Phase 4+8 vehicle Yellow and Red clear.
6. The controller must be programmed for Ped Clear Thru Red for Pedestrian Phases 4 and 8 so that the Red displays continue to flash during Phases 4 and 8 Yellow clear and Red clear.
7. Make sure that all Phase 2 and Phase 6 timings match each other, and that all Phase 4 and Phase 8 timings match each other.
8. The Ped 4 push button is programmed to call Ped 4 and Ped 8, and the Ped 8 push button is programmed to call Ped 8 and Ped 4.

DETECTOR RACK SET-UP DETAIL

INSERT DETECTOR CARDS IN RACK ACCORDING TO THE DETAIL SHOWN BELOW.
PARTICULAR DETECTOR CHANNELS WILL CALL PHASES INDICATED.

BIU	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY

WIRE LOOPS TO TERMINALS ON LOOP PANEL AS SHOWN IN THE CHART BELOW

LOOP NO.	LOOP PANEL TERMINALS
NU	L1A,L1B
NU	L2A,L2B
NU	L3A,L3B
NU	L4A,L4B
NU	L5A,L5B
NU	L6A,L6B
NU	L7A,L7B
NU	L8A,L8B
NU	L9A,L9B
NU	L10A,L10B
NU	L11A,L11B
NU	L12A,L12B
NU	L13A,L13B
NU	L14A,L14B
NU	L15A,L15B
NU	L16A,L16B

PROGRAM CONTROLLER DETECTORS ACCORDING TO THE SCHEDULE SHOWN IN THE CHART BELOW

CONTROLLER DETECTOR NO.	FUNCTION	TIMING	
		FEATURE	TIME(SEC)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			

TIMING INTERVAL

PHASE 2+6 WALK = Dark Display
PHASE 2+6 PED CLEAR = Flashing Yellow Display
PHASE 2+6 VEH YEL CLR = Steady Yellow Display
PHASE 2+6 RED CLEAR = Steady Red Display
PHASE 4+8 WALK = Steady Red Display
PHASE 4+8 PED CLEAR = Alternating Flashing Red Display
PHASE 4+8 VEH YEL CLR = Alternating Flashing Red Display
PHASE 4+8 VEH RED CLR = Alternating Flashing Red Display

NC Dept of Transportation
Division of Highways
Final Drawing Date: 11/09/2022
DocuSigned by:
ITS & Signals Unit

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-0933
DESIGNED: March 2022
SEALED: 10/27/2022
REVISED:

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

PROJECT REFERENCE NO.	SHEET NO.
ST-1281	3

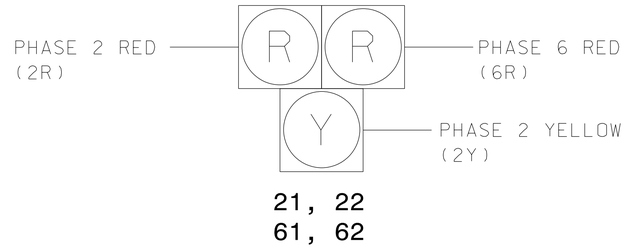
SIGNAL HEAD HOOK-UP CHART

PHASE	1	2	3	4	5	6	7	8	2 PED	4 PED	6 PED	8 PED	OLA	OLB	OLC	OLD
SIGNAL HEAD NO.	NU	21,22 61,62	NU	NC	NU	21,22 61,62	NU	NC	NC	P41	NC	P81	NU	NU	NU	NU
RED		2R				6R										
YELLOW		2Y				*										
GREEN		*				*										
RED ARROW																
YELLOW ARROW																
GREEN ARROW																
✋										10R		12R				
🚶										10G		12G				

NU = Not Used
NC = Not Connected
* Denotes install load resistor. See Load Resistor Installation Detail this sheet.

SIGNAL HEAD WIRING DETAIL

(wire signal as shown)

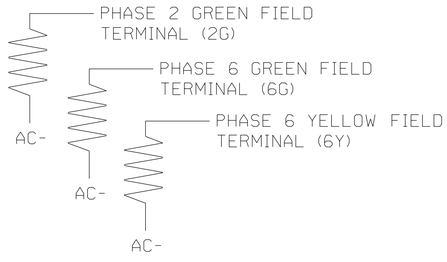


LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

Pedestrian Hybrid Beacon on SR 1313 (Walnut Street) at Cary High School

Division 5 | Wake County | Cary
PLAN DATE: March 2022 | REVIEWED BY: PL Alexander
PREPARED BY: AM Encarnacion | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044476 ENGINEER ANTHONY M. ENCARNACION
Docusigned by: Anthony Encarnacion SIGNATURE
10/27/2022 DATE
SIG. INVENTORY NO. 05-0933

PROJECT REFERENCE NO.	SHEET NO.
ST-1281	4

ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL PEDESTRIAN HYBRID BEACON SEQUENCE

(program controller as shown)

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [8. LOGIC PROCESSOR]
3. From LOGIC PROCESSOR Submenu select [2. LOGIC STATEMENTS]

ENTER A "1" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:   1  COPY FROM:   1  ACTIVE:  M   (T/F)
IF     PED ON PH PED CLR    2    IS  ON
AND    LP COB CODE ON                  546

THEN   SIG SET PH YELLOW    2        ON

ELSE
```

LOGIC TO FLASH YELLOW SIGNAL FACES AFTER A PED CALL IS PLACED.

ENTER A "2" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:   2  COPY FROM:   1  ACTIVE:  M   (T/F)
IF     PED ON PH PED CLR   4    IS  ON
AND    LP COB CODE ON                 546

THEN   SIG SET PHASE RED   2        OFF

ELSE
```

LOGIC FOR ALTERNATING FLASH ON THE RED SIGNAL FACES DURING THE PHASE 4 PED CLEAR (FORCES PHASE 2 RED OFF).

ENTER A "3" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:   3  COPY FROM:   1  ACTIVE:  M   (T/F)
IF     PED ON PH PED CLR   4    IS  ON
AND    LP COB CODE OFF                546

THEN   SIG SET PHASE RED   6        OFF

ELSE
```

LOGIC FOR ALTERNATING FLASH ON THE RED SIGNAL FACES DURING THE PHASE 4 PED CLEAR (FORCES PHASE 6 RED OFF).

END PROGRAMMING

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [8. LOGIC PROCESSOR]
3. From LOGIC PROCESSOR Submenu select [1. LOGIC STATEMENT CONTROL]

ENABLE LOGIC PROCESSOR STATEMENTS 1, 2 & 3 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

```
LOGIC STATEMENT CONTROL
          1  2  3  4  5  6  7  8  9  0  1  2  3  4  5
LP 1-15   E  E  E  .  .  .  .  .  .  .  .  .  .  .  .
LP 16-30  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 31-45  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 46-60  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 61-75  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 76-90  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

END PROGRAMMING

LOAD SWITCH ASSIGNMENT DETAIL

(program controller according to schedule in chart below)

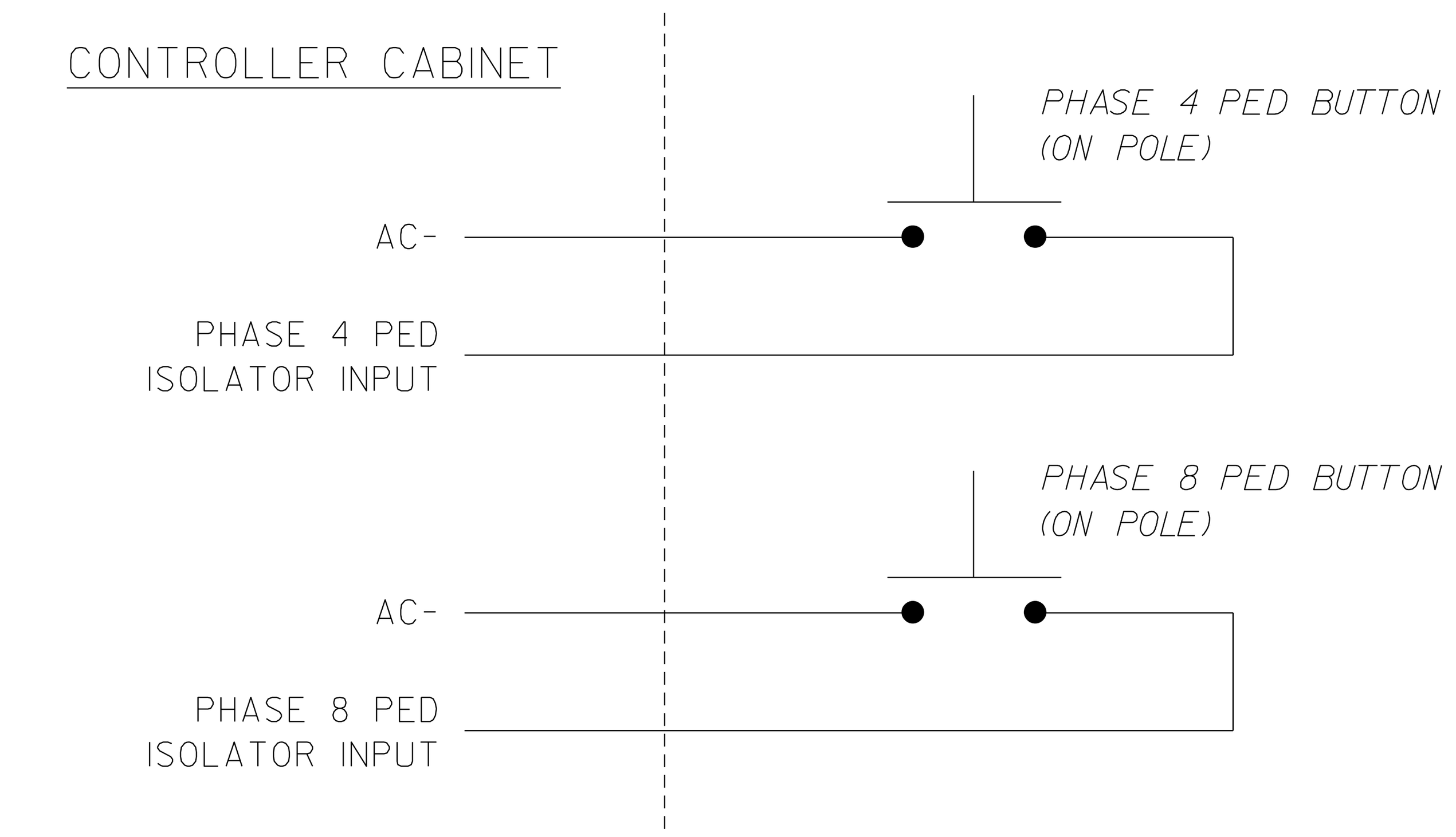
LOAD SWITCH NUMBER	FUNCTION
1	–
*2	Ø2
3	–
4	–
5	–
*6	Ø6
7	–
8	–
9	–
10	Ø4 PED
11	–
12	Ø8 PED
13	–
14	–
15	–
16	–

*Program 'Flash AUT'=Y

NOTE: COB CODE 546 is a 1Hz 50% Duty Cycle internal logic processor reference.

PEDESTRIAN PUSH-BUTTON WIRING DETAIL

(wire push-buttons as shown below)



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

ECONOLITE ASC/3-2070 PEDESTRIAN DETECTOR PHASE ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [6. DETECTORS]
2. From DETECTOR Submenu select [3. PED DETECTOR INPUT ASSIGNMENT]
3. Press the TOGGLE key to select [ECONOLITE MODE] and press ENTER.

```
PED DET PHASE ASSIGNMENT MODE:ECONOLITEv
PHASE   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
  D  1  X . . . . . . . . . . . . . . .
  E  2  . X . . . . . . . . . . . . . .
  T  3  . . X . . . . . . . . . . . . .
  E  4  . . . X . . . X . . . . . . . .
  C  5  . . . . X . . . . . . . . . . .
  T  6  . . . . . X . . . . . . . . . .
  O  7  . . . . . . X . . . . . . . . .
  R  8  . . . X . . . X . . . . . . . .
     9  . . . . . . . . X . . . . . . .
    10  . . . . . . . . . X . . . . . .
    11  . . . . . . . . . . X . . . . .
    12  . . . . . . . . . . . X . . . .
    13  . . . . . . . . . . . . X . . .
    14  . . . . . . . . . . . . . X . .
    15  . . . . . . . . . . . . . . X .
    16  . . . . . . . . . . . . . . . X
```

"." = No assignment, disabled
X = Assigns Pedestrian Push Button (PPB) to call the phase or phases
2 = Call for Ped timing 2
B = Allows for the PPB to call for Min Green 2 (BIKE GREEN)

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC Dept of Transportation
Division of Highways
Final Drawing Date: 11/09/2022
ITS & Signals Unit

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-0933
DESIGNED: March 2022
SEALED: 10/27/2022
REVISED:

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

ELECTRICAL AND PROGRAMMING DETAILS FOR:
Prepared for the Offices of:
Transportation Mobility and Safety Division, Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

Pedestrian Hybrid Beacon on SR 1313 (Walnut Street) at Cary High School

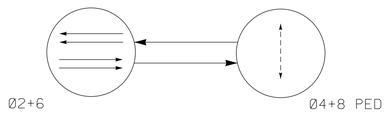
Division 5 | Wake County | Cary
PLAN DATE: March 2022 | REVIEWED BY: PL Alexander
PREPARED BY: AM Encarnacion | REVIEWED BY:
REVISIONS | INIT. | DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 044476
ANTHONY M. ENCARNACION
10/27/2022
DATE
SIG. INVENTORY NO. 05-0933

PROJECT REFERENCE NO.	SHEET NO.
ST-1281	2

2 Phase Semi-Actuated Pedestrian Hybrid Beacon Cary Signal System

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	Ø2+6 DARK	ACTIVATION	STEADY YELLOW	ALL RED	Ø4+8 PED WALK	Ø4+8 PED CLEAR	FLASH
21, 22	DRK	F Y	Y	R	R	FR*	Y
61, 62	DRK	F Y	Y	R	R	FR*	Y
P41	DW	DW	DW	DW	W	FDW	DRK
P81	DW	DW	DW	DW	W	FDW	DRK

* Alternate Flash
Y - Steady Yellow
FY - Flashing Yellow
R - Steady Red
FR - Flashing Red
W - Walk
DW - Don't Walk
FDW - Flashing Don't Walk
DRK - Dark

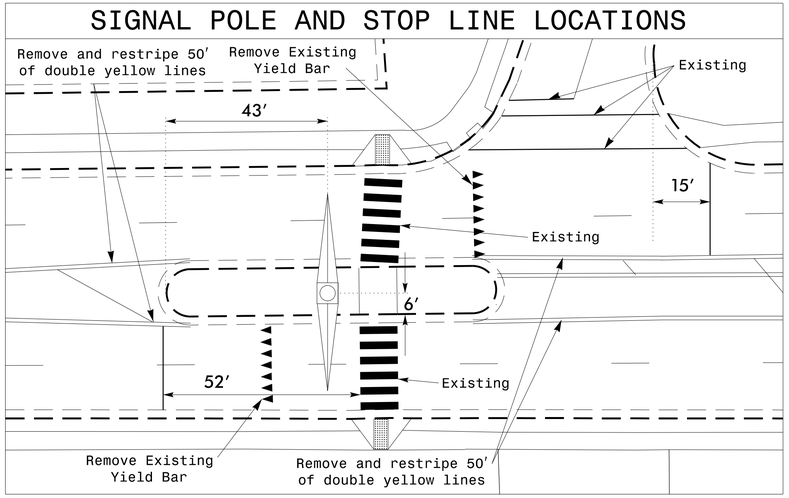
SIGNAL FACE I.D.

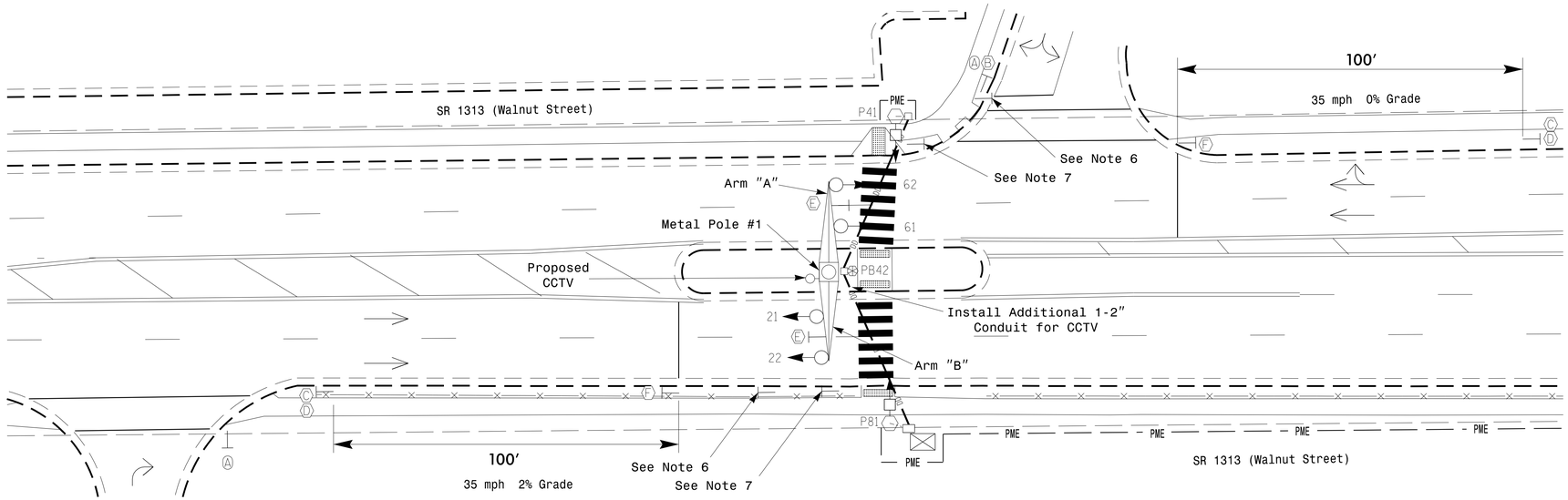
All Heads L.E.D.

21, 22
61, 62

P41
P81

SIGNAL POLE AND STOP LINE LOCATIONS





TIMING CHART

ASC/3-2070LXN2 CONTROLLER

PHASE	02	04 PED	06	08 PED
MINIMUM GREEN *	10 SEC.	7 SEC.	10 SEC.	7 SEC.
VEHICLE EXT. *	– SEC.	– SEC.	– SEC.	– SEC.
YELLOW CHANGE INT.	3.8 SEC.	3.0 SEC.	3.8 SEC.	3.0 SEC.
RED CLEARANCE	5.0 SEC.	0.0 SEC.	5.0 SEC.	0.0 SEC.
MAX. 1 *	– SEC.	– SEC.	– SEC.	– SEC.
RECALL POSITION	MAX. RECALL	–	MAX. RECALL	–
LOCK DET.	OFF	OFF	OFF	OFF
WALK *	7 SEC.	7 SEC.	7 SEC.	7 SEC.
PED. CLEAR	5 SEC.	20 SEC.	5 SEC.	20 SEC.
ACTUATION B4 ADD *	– VEH.	– VEH.	– VEH.	– VEH.
SEC. PER ACTUATION *	– SEC.	– SEC.	– SEC.	– SEC.
MAX. INITIAL *	– SEC.	– SEC.	– SEC.	– SEC.
TIME B4 REDUCTION *	– SEC.	– SEC.	– SEC.	– SEC.
TIME TO REDUCE *	– SEC.	– SEC.	– SEC.	– SEC.
MINIMUM GAP	– SEC.	– SEC.	– SEC.	– SEC.
DUAL ENTRY	OFF	OFF	OFF	OFF
SIMULTANEOUS GAP	ON	ON	ON	ON

Serves as Steady Yellow Clearance Time
Serves as All Red Clearance Time
Serves as Flashing Yellow Time

* 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.

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
3. Enable Extended Ped Clear through Yel+Red for Phase 4 PED and Phase 8 PED.
4. Install backplates for signal heads 21, 22, 61 and 62.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Remove existing Yield "HERE TO PEDESTRIANS" Signs (R1-5).
7. Remove existing School Crossing Assembly Signs (S1-1 and W16-7P).
8. Pavement markings are existing unless otherwise shown.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supercede these values.
10. Cary Signal System: Fiber #8.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Metal Pole with Mastarm	
	Type II Signal Pedestal	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
DD	Directional Drill	N/A
N/A	Right of Way	
N/A	Permanent Maintenance Easement	PME
	Directional Arrow	
N/A	Curb Ramp	
	Type I Pushbutton Post	
N/A	Fence	
Ⓐ	"STOP" Sign (R1-1)	Ⓐ
Ⓑ	Right "TURNING VEHICLES" Yield "TO" Pedestrian Sign (R10-15L)	Ⓑ
Ⓒ	Pedestrian Warning Sign (W11-2)	Ⓒ
Ⓓ	"AHEAD" Plaque (W16-9P)	Ⓓ
Ⓔ	"CROSSWALK-STOP ON RED" Sign (R10-23)	Ⓔ
Ⓕ	"STOP HERE ON RED" Sign (R10-6)	Ⓕ

NC Dept of Transportation
Division of Highways
Final Drawing Date: 11/09/2022
DocuSigned by:
ITS & Signals Unit

New Installation

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 20 1"=20'

Pedestrian Hybrid Beacon on SR 1313 (Walnut Street) at Cary High School

Division 5 Wake County Cary

PLAN DATE: March 2022 REVIEWED BY: PL Alexander
PREPARED BY: AM Encarnacion REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044476 ENGINEER ANTHONY M ENCARNACION

Designed by: Anthony Encarnacion 10/27/2022
PROFESSIONAL ENGINEER SIGNATURE DATE

SIG. INVENTORY NO. 05-0933

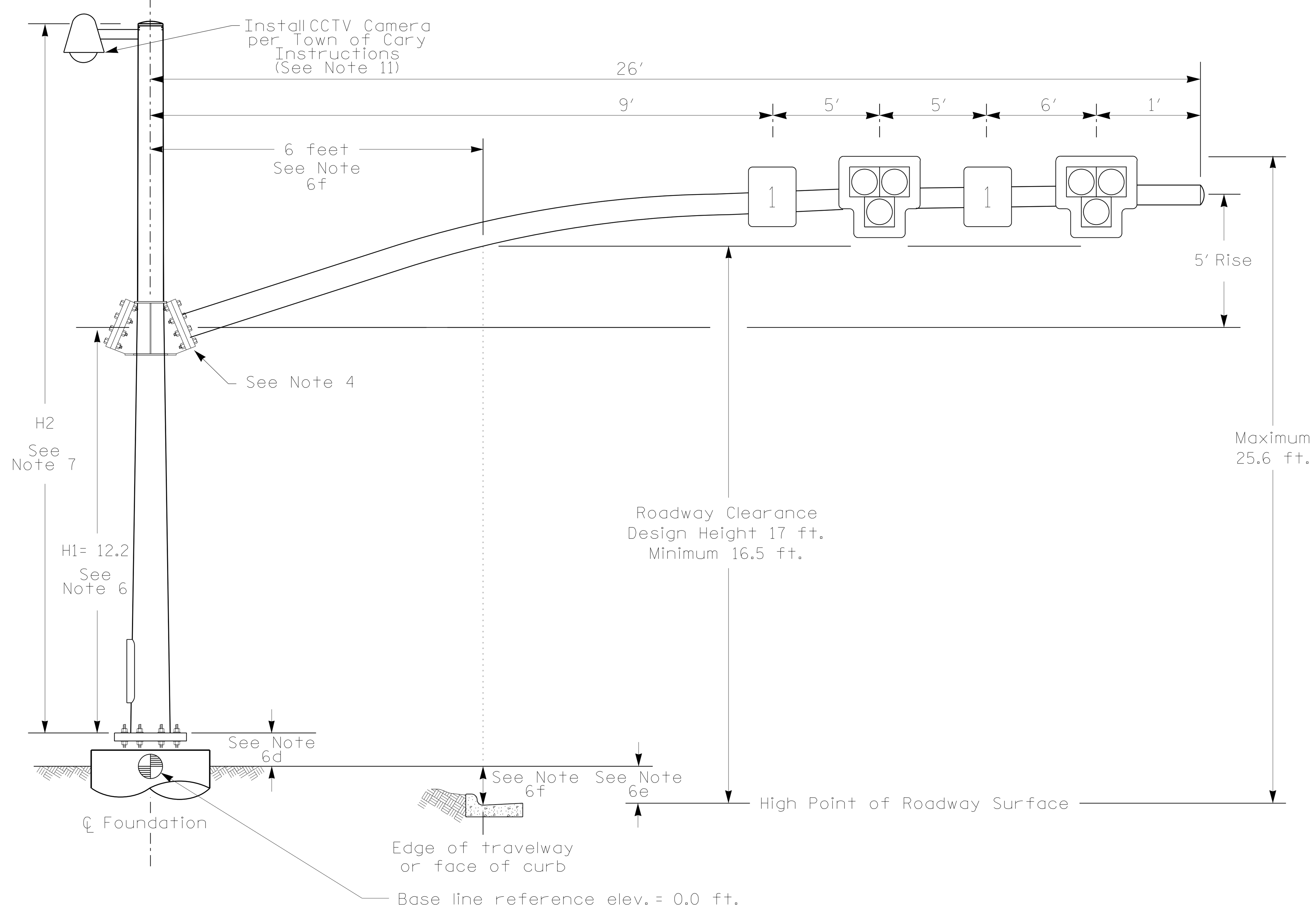
ATKINS 1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

27-OCT-2022 14:59
D:\Data\Transportation\Projects\TEC\Curr\100073537 TOC Walnut St PHB Design\04-Deliverable Development\05-Design Plans\03-Sheets\050933_sig_dsn_2022mmdd.dgn
STIF4685 AT LUS491089

PROJECT REFERENCE NO.	SHEET NO.
ST-1281	5

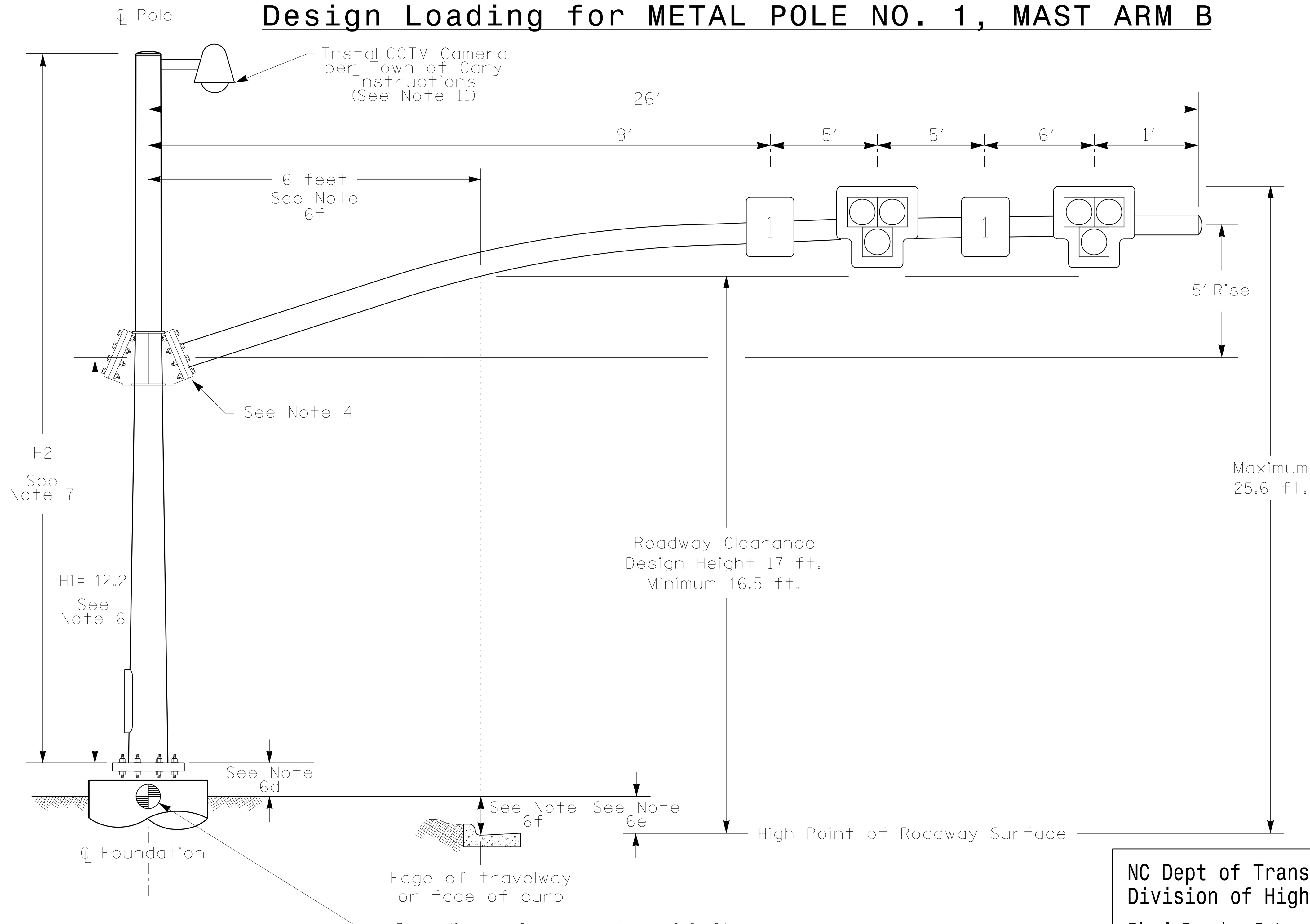
METAL POLE No. 1

Design Loading for METAL POLE NO. 1, MAST ARM A



Elevation View @ 180°

Design Loading for METAL POLE NO. 1, MAST ARM B



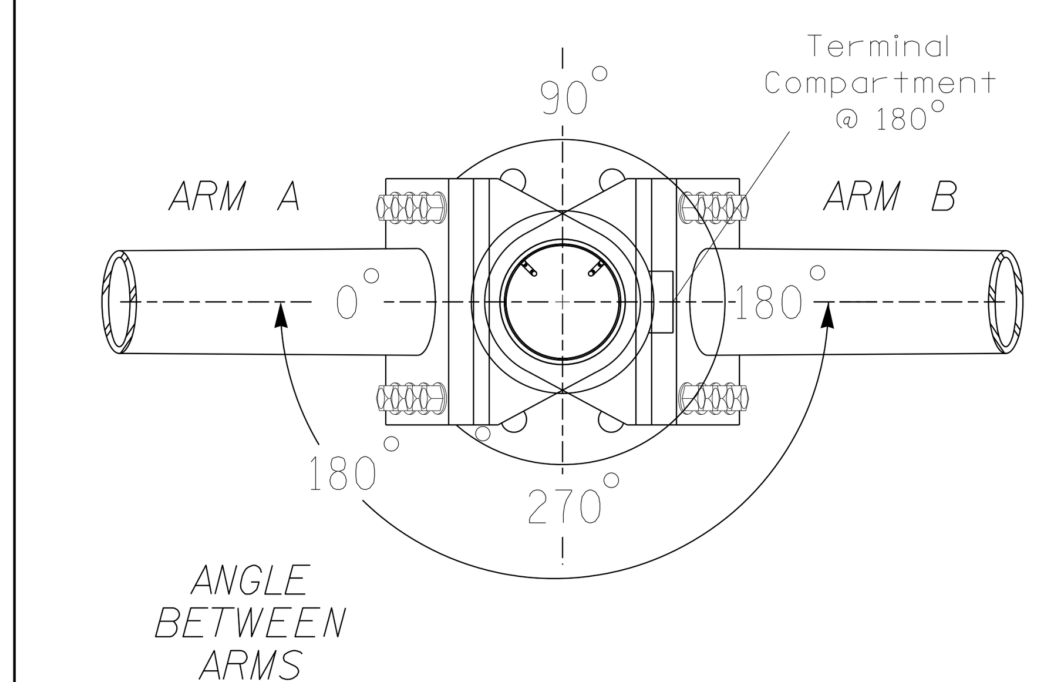
Elevation View @ 0°

SPECIAL NOTE

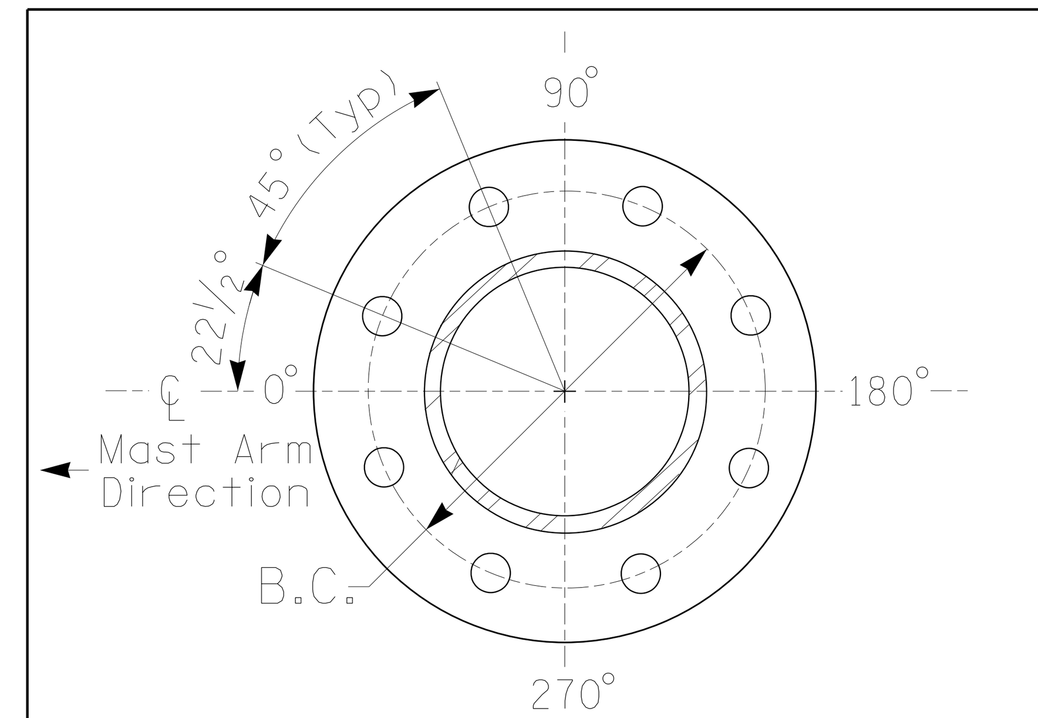
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Arm "A"	Arm "B"
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	-0.6 ft.	-0.6 ft.
Elevation difference at Edge of travelway or face of curb	-0.6 ft.	-0.6 ft.

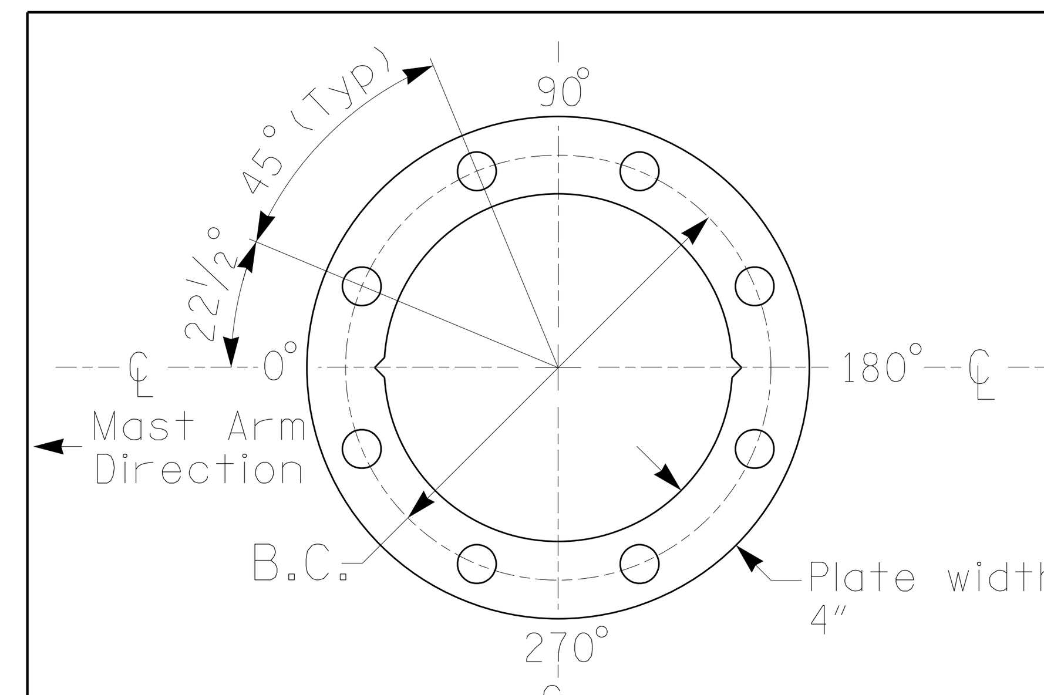


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12″-3 SECTION-WITH BACKPLATE	10.0 S.F.	38.0″W X 38.0″L	70 LBS
1	SIGN RIGID MOUNTED	5.0 S.F.	24.0″W X 30.0″L	11 LBS
	CCTV CAMERA	0.7 S.F.	9.3″W X 10.6″L	15 LBS

NOTES

DESIGN REFERENCE MATERIAL

1. Design the traffic signal structure and foundation in accordance with:
   - The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals," including all of the latest interim revisions.
   - The 2018 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
   - The 2018 NCDOT Roadway Standard Drawings.
   - The traffic signal project plans and special provisions.
   - The NCDOT "Metal Pole Standards" located at the following NCDOT website: https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

DESIGN REQUIREMENTS

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Design all signal supports using stress ratios that do not exceed 0.9.
4. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements. This requires staggering the connections. Use elevation data for each arm to determine appropriate connection points.
5. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
6. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Nominal vertical rise in mast arm is 5 feet as measured from the centerline of the arm base to the centerline of the free end of the arm.
   b. Signal heads are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
   f. Provide horizontal distance from the proposed centerline of the foundation to the edge of travelway. Refer to the Elevation Data Chart for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary to ensure that the roadway clearance is maintained at the edge of the travelway and to aid in the camber design of the arm.
7. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 10 feet, or
   - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
8. If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
9. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
10. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.
11. Provide a handhole on the metal pole at CCTV camera arm connection point for future cable installation use.

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
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NCDOT Wind Zone 4 (90 mph)

NC Dept of Transportation
Division of Highways
Final Drawing Date: 11/09/2022
ITS & Signals Unit

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

SCALE 0 N/A
N/A

Pedestrian Hybrid Beacon on SR 1313 (Walnut Street) at Cary High School

Division 5 Wake County Cary
PLAN DATE: March 2022 REVIEWED BY: PL Alexander
PREPARED BY: AM Encarnacion REVIEWED BY:
REVISIONS INIT. DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044476 ENGINEER ANTHONY M. ENCARNACION
Anthony Encarnacion
SIGNATURE 10/27/2022 DATE
SIG. INVENTORY NO. 05-0933

PROJECT REFERENCE NO.	SHEET NO.
ST-1281	6

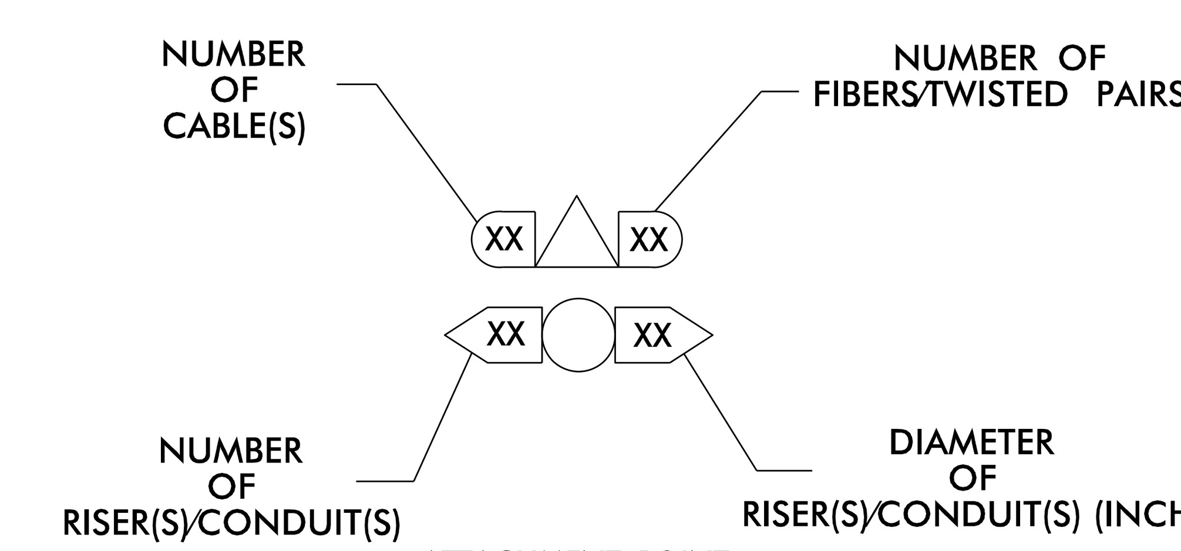
1. INSTALL CATEGORY 6 CABLE
2. INSTALL LOW VOLTAGE POWER CABLE (24VAC)
3. INSTALL COMPOSITE CCTV CABLE
4. INSTALL SMFO CABLE
5. INSTALL COAXIAL ANTENNA CABLE
6. INSTALL FIBER-OPTIC DROP CABLE
7. INSTALL TRACER WIRE
8. INSTALL CONDUIT UNDERGROUND
9. INSTALL PVC CONDUIT
10. INSTALL RIGID, GALVANIZED STEEL CONDUIT
11. INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
12. INSTALL RIGID, GALVANIZED STEEL RISER WITH HEAT SHRINK TUBING
13. INSTALL HEAT SHRINK TUBING RETROFIT KIT
14. INSTALL HIGH DENSITY 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(S)
20. INSTALL CABLE(S) IN NEW RISER(S)
21. INSTALL CABLE(S) IN EXISTING CABINET ENTRANCE
22. INSTALL NEW CONDUIT INTO CABINET BASE (USE EXISTING CONDUIT STUBOUTS WHEN AVAILABLE)
23. INSTALL NEW RISER INTO CABINET BASE (USE EXISTING CONDUIT STUBOUTS WHEN AVAILABLE)
24. INSTALL NEW CONDUIT INTO POLE MOUNTED CABINET
25. INSTALL NEW RISER INTO POLE MOUNTED CABINET
26. INSTALL DIGITAL VIDEO ENCODER
27. INSTALL NEW ETHERNET EDGE SWITCH IN CABINET
28. INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND FUSION SPLICE CABLE IN CABINET
29. INSTALL UNDERGROUND SPLICE ENCLOSURE
30. INSTALL AERIAL SPLICE ENCLOSURE
31. INSTALL TYPE 332 HUB CABINET
32. MODIFY EXISTING SPLICE ENCLOSURE OR INTERCONNECT CENTER
33. REMOVE EXISTING SPLICE / HUB / CCTV CABINET
34. INSTALL CABINET FOUNDATION
35. REMOVE EXISTING CABINET FOUNDATION
36. INSTALL CCTV CAMERA ASSEMBLY
37. INSTALL 50' CCTV WOOD POLE
38. INSTALL 16"x10" STANDARD SIZE JUNCTION BOX
39. INSTALL 36"x24" SPECIAL-SIZED JUNCTION BOX
40. INSTALL 30"x15" OVER-SIZED 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 SERVICE CONDUCTORS
51. INSTALL CABLE STORAGE GUIDE(S) [SNOW SHOE(S)] AND STORE 100 FEET OF EACH CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 30 FEET OF COMMUNICATIONS CABLE (EACH CABLE)
54. LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE
55. LASH CABLE(S) TO EXISTING MESSENGER CABLE
56. LASH CABLE(S) TO NEW MESSENGER CABLE
57. MODIFY EXISTING ELECTRICAL SERVICE
58. INSTALL NEW ELECTRICAL SERVICE
59. INTERCEPT AND REROUTE EXISTING CONDUITS

LEGEND

Symbol	Description
FO	NEW FIBER OPTIC COMMUNICATIONS CABLE
EXI	EXISTING COMMUNICATIONS CABLE
REM	EXISTING COMMUNICATIONS CABLE TO BE REMOVED
	NEW AND EXISTING AERIAL GUY ASSEMBLY
	NEW CONDUIT
	EXISTING CONDUIT
DD	NEW DIRECTIONAL DRILLED CONDUIT
B&J	NEW BORED AND JACKED CONDUIT
	NEW WOOD POLE
	EXISTING WOOD POLE
	NEW METAL POLE
	EXISTING METAL POLE
	NEW STANDARD GUY ASSEMBLY
	EXISTING STANDARD GUY ASSEMBLY
	NEW SIDEWALK GUY ASSEMBLY
	EXISTING SIDEWALK GUY ASSEMBLY
	NEW CONTROLLER AND CABINET
	EXISTING CONTROLLER AND CABINET
	NEW STANDARD JUNCTION BOX
	EXISTING STANDARD JUNCTION BOX
	NEW OVER-SIZED OR SPECIAL-SIZED JUNCTION BOX
	EXISTING OVER-SIZED OR SPECIAL-SIZED JUNCTION BOX
05-XXXX	NCDOT SIGNAL ID NUMBER
CCTV-XX	CCTV CAMERA ID NUMBER

CONSTRUCTION NOTE SYMBOLOGY KEY

- XX — INDICATES NUMBER OF CABLES, LOOPS, ETC.
- XX — INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.
- XX — INDICATES NUMBER OF RISER(S)/CONDUIT(S)
- XX — INDICATES DIAMETER OF RISER(S)/CONDUIT(S) (INCH)



ATTACHMENT POINT:

- XXX / YYY — DISTANCE ABOVE (IN) REFERENCE POINT
- YYY / XXX — REFERENCE POINT DISTANCE BELOW (IN)

NC Dept of Transportation
Division of Highways
Final Drawing Date: 11/09/2022
ITS & Signals Unit

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of:
750 Greenfield Parkway, Garner, NC 27529

NTS

Signal Communication Plan

Construction Notes

Division 5 Wake County Cary

PLAN DATE: March 2022	REVIEWED BY: BJ Slocum
PREPARED BY: AM Encarnacion	REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 044476 ENGINEER ANTHONY M. ENCARNACION

DocuSigned by: Anthony Encarnacion
SIGNATURE DATE 10/27/2022

CADD Filename: TOC Walnut St PHB -

27-OCT-2022 14:59
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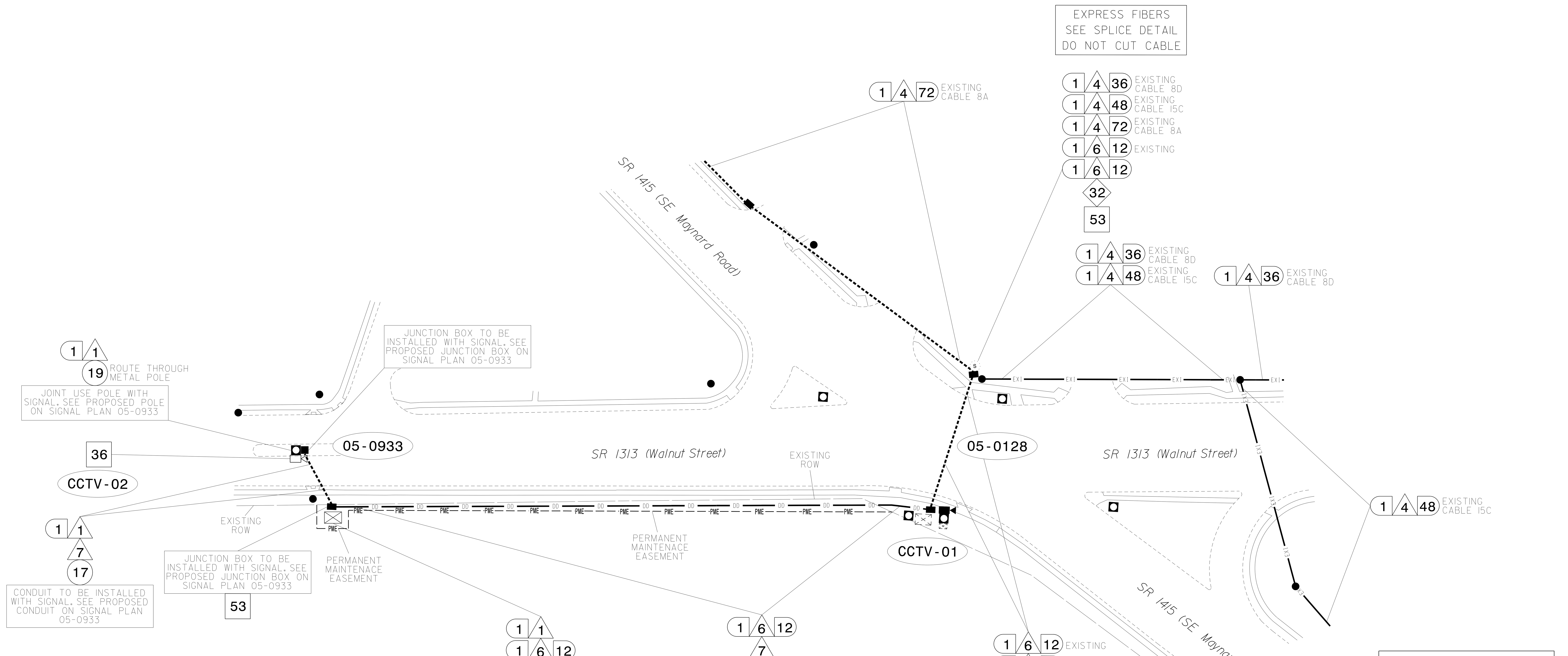
STIF4685 AT LUS491089

PROJECT REFERENCE NO.	SHEET NO.
ST-1281	7



NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE CITY TRAFFIC MANAGEMENT CENTER AT (919) 380-2105 TO ARRANGE FOR THE TOWN TO PROGRAM THE NEW FIELD ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE CITY TRAFFIC MANAGEMENT CENTER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.
2. CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.
3. SEAL ALL CONDUIT ENDS WITH DUCT AND CONDUIT SEALER AT ALL JUNCTION BOX / CABINET ENTRANCES.

NC Dept of Transportation
Division of Highways
Final Drawing Date: 11/09/2022
ITS & Signals Unit

ATTACHMENT POINT:

XXX/YYY DISTANCE ABOVE (IN) REFERENCE POINT

YYY/XXX REFERENCE POINT DISTANCE BELOW (IN)

CONSTRUCTION NOTE SYMBOLOGY KEY

NUMBER OF CABLE(S)/LOOPS, DETECTOR AMPLIFIERS, GUYS, ANTENNAS — NUMBER OF FIBERS/TWISTED PAIRS

NUMBER OF RISER(S)/CONDUIT(S) — DIAMETER OF RISER(S)/CONDUIT(S) (IN)

No.	Description
1	INSTALL CATEGORY 6 CABLE
2	INSTALL LOW VOLTAGE POWER CABLE (24VAC)
3	INSTALL COMPOSITE CCTV CABLE
4	INSTALL SMFO CABLE
5	INSTALL COAXIAL ANTENNA CABLE
6	INSTALL FIBER-OPTIC DROP CABLE
7	INSTALL TRACER WIRE
8	INSTALL CONDUIT UNDERGROUND
9	INSTALL PVC CONDUIT
10	INSTALL RIGID, GALVANIZED STEEL CONDUIT
11	INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
12	INSTALL RIGID, GALVANIZED STEEL RISER WITH HEAT SHRINK TUBING
13	INSTALL HEAT SHRINK TUBING KIT
14	INSTALL HIGH DENSITY 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(S)
20	INSTALL CABLE(S) IN NEW RISER(S)
21	INSTALL CABLE(S) IN EXISTING CABINET ENTRANCE
22	INSTALL NEW CONDUIT INTO CABINET BASE (USE EX CABINET ENTRANCE WHEN AVAILABLE)
23	INSTALL NEW RISER INTO CABINET BASE (USE EX CABINET ENTRANCE WHEN AVAILABLE)
24	INSTALL NEW CONDUIT INTO POLE MOUNTED CABINET
25	INSTALL NEW RISER INTO POLE MOUNTED CABINET
26	INSTALL DIGITAL VIDEO ENCODER
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51	INSTALL CABLE STORAGE GUIDE(S) [SNOW SHOE(S)] AND STORE 100 FEET OF EACH CABLE
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53	STORE 30' OF COMMUNICATIONS CABLE (EACH CABLE)
54	LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE
55	LASH CABLE(S) TO EXISTING MESSENGER CABLE
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57	MODIFY EXISTING ELECTRICAL SERVICE
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ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of: 750 Greenfield Parkway, Garner, NC 27529

Signal Communication Plan for SR 1313 (Walnut Street) at Cary High School

Division 5 — Wake County — Cary

PLAN DATE: March 2022 — REVIEWED BY: BJ Slocum
PREPARED BY: AM Encarnacion — REVIEWED BY: PL Alexander

SCALE 0 50 — 1"=50'

REVISIONS — INIT. — DATE

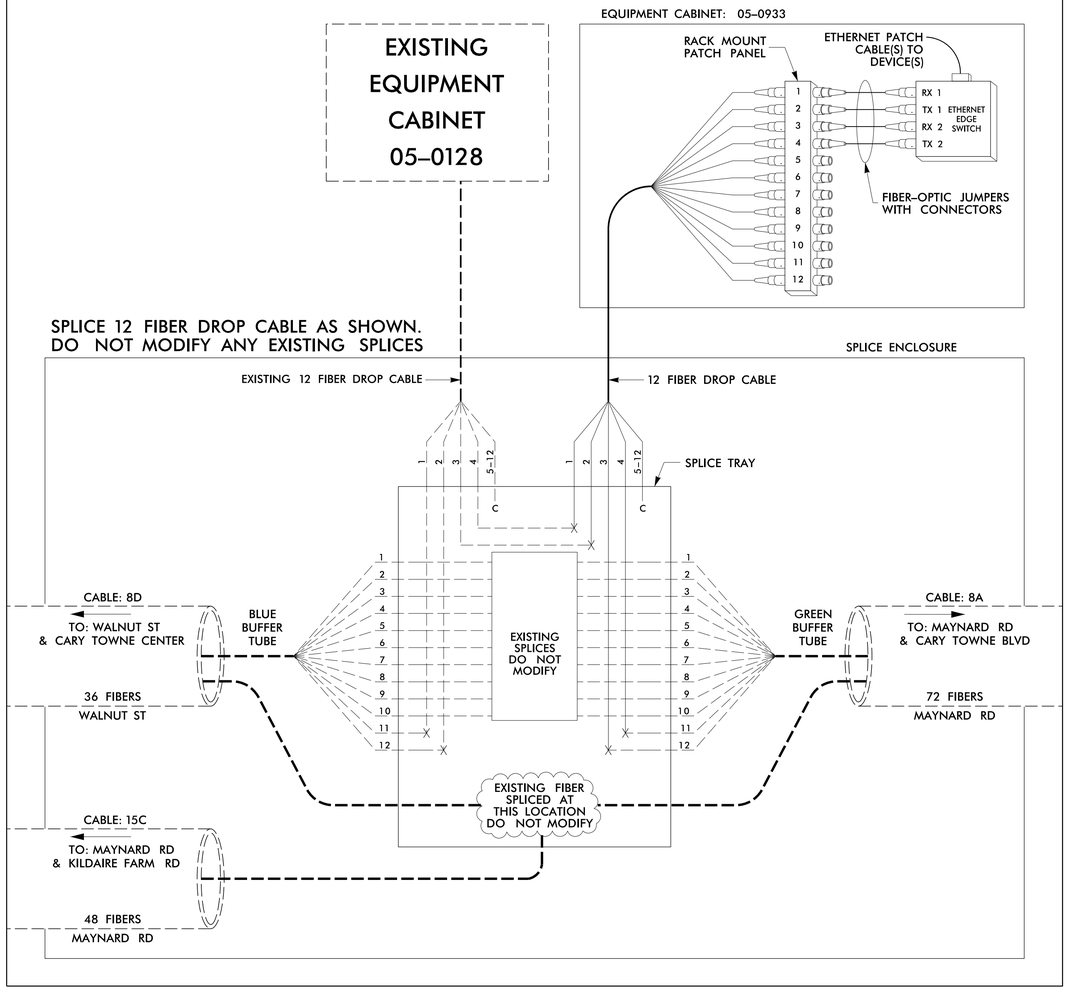
SEAL: NORTH CAROLINA PROFESSIONAL SEAL 044476 ENGINEER ANTHONY M. ENCARNACION — 10/27/2022

SIGNATURE — DATE

CADD Filename: CL-01.dgn

PROJECT REFERENCE NO.	SHEET NO.
ST-1281	8

EXISTING SPLICE ENCLOSURE LOCATED AT INTERSECTION OF WALNUT STREET AND MAYNARD ROAD FOR SIG INV# 05–0933 WALNUT STREET AT CARY HIGH SCHOOL



LEGEND

COLOR CODE TIA/EIA 598–B		
(1) BLUE	(7) RED	
(2) ORANGE	(8) BLACK	EXPRESS
(3) GREEN	(9) YELLOW	
(4) BROWN	(10) VIOLET	BUFFER SPLICE
(5) SLATE	(11) ROSE	
(6) WHITE	(12) AQUA	EXISTING

X = FUSION SPLICE INDIVIDUAL FIBER

C = CAP AND SEAL

EXPRESS ENTIRE BUFFER TUBE /FIBERS THROUGH WITHOUT CUTTING

SPLICE ALL FIBERS IN BUFFER TUBE COLOR TO COLOR

EXISTING BUFFER TUBE /FIBERS. DO NOT MODIFY EXISTING SPLICES OR EXPRESSED FIBERS.

NOTES

1. UNUSED FIBERS LEFT COILED AND STORED IN SPLICE TRAY
2. UNUSED BUFFER TUBES LEFT COILED AND STORED IN SPLICE ENCLOSURE
3. EDGE SWITCH CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING/ENSURING THE PROPER TERMINATIONS.

NC Dept of Transportation
Division of Highways
Final Drawing Date: 11/09/2022
DocuSigned by: Kirk V Taylor
ITS & Signals Unit

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of:
750 Greenfield Parkway, Garner, NC 27529

Splicing Details for SR 1313 (Walnut Street) at Cary High School

Division 5 Wake County Cary

PLAN DATE: March 2022	REVIEWED BY: BJ Slocum
PREPARED BY: AM Encarnacion	REVIEWED BY:

SCALE	REVISIONS	INIT.	DATE
N/A			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044476 ANTHONY M. ENCARNACION

DocuSigned by: Anthony Encarnacion SIGNATURE 10/27/2022 DATE

CADD Filename: Splice Diagram.dgn