TIP PROJECT: W-5601DE

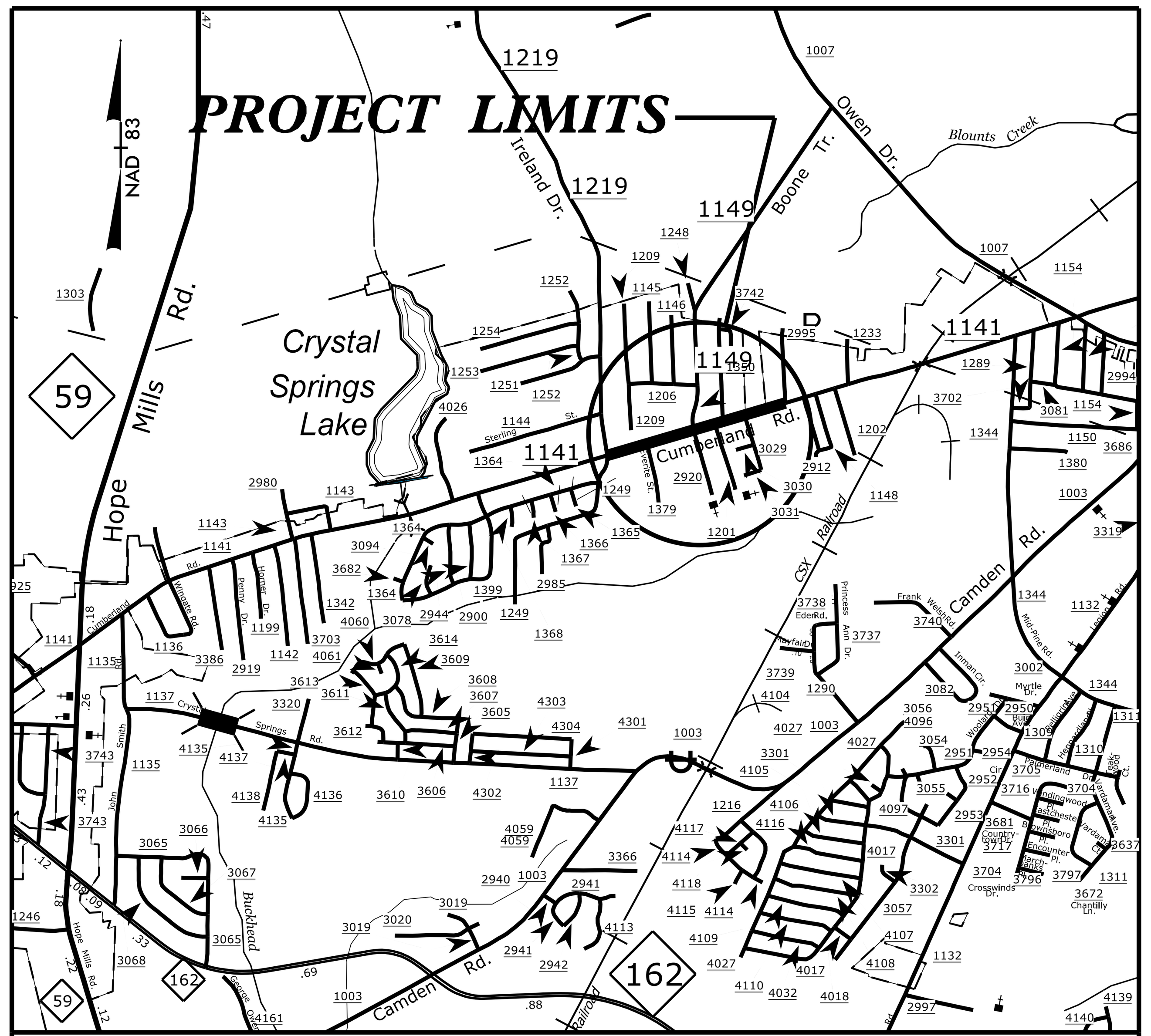
CONTRACT: DF00195

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5601DE	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
50138.1.110	HSIP-1141 (028)	PE
50138.2.110	HSIP-1141 (028)	R/W & UTIL.
50138.3.110	HSIP-1141 (028)	CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

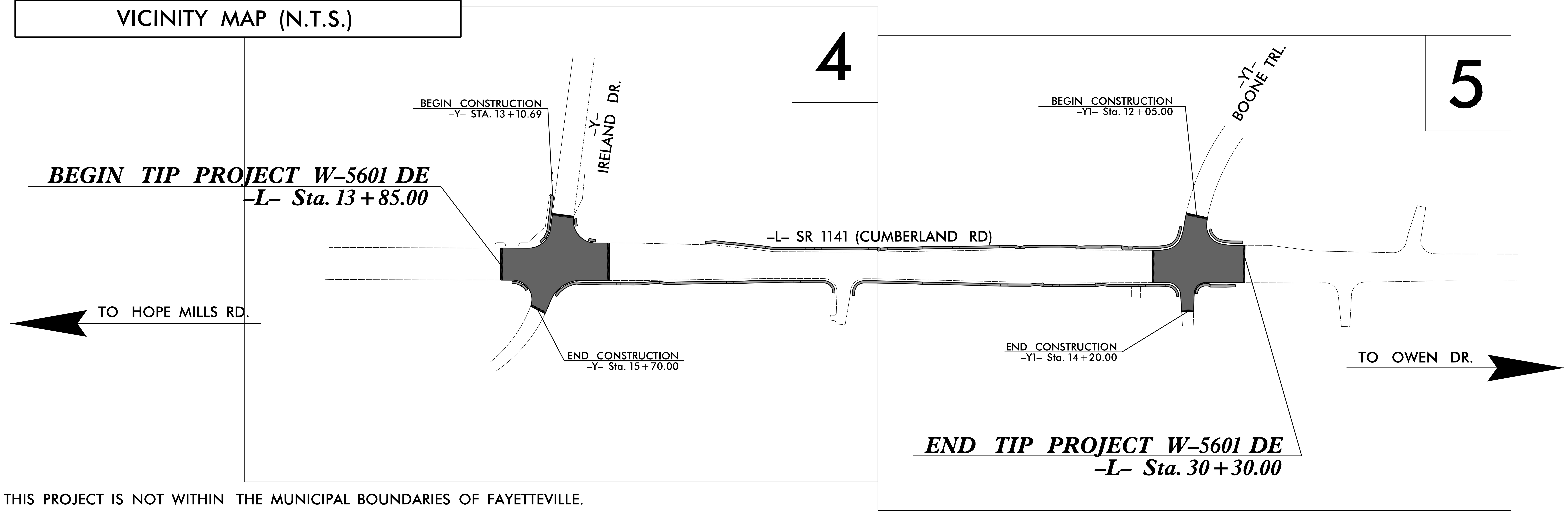


VICINITY MAP (N.T.S.)

CUMBERLAND COUNTY

LOCATION: SR 1141 (CUMBERLAND RD) FROM SR 1219 (IRELAND DR) TO SR 1149 (BOONE TRL)

TYPE OF WORK: GRADING, PAVING, SIDEWALK, SIGNALS AND PAVEMENT MARKINGS



THIS PROJECT IS NOT WITHIN THE MUNICIPAL BOUNDARIES OF FAYETTEVILLE.

GRAPHIC SCALES

50 25 0 50 100

PLANS

DESIGN DATA

ADT 2018 = 26,000

ADT 2038 = 47,500

V = 50 MPH

PROJECT LENGTH

LENGTH ROADWAY PROJECT = 0.312 MILES

Prepared in the Office of:

DIVISION OF HIGHWAYS

431 TRANSPORTATION DR., FAYETTEVILLE NC,28301

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JANUARY 20, 2017

LETTING DATE: FEBRUARY 21, 2018

SEAN MATUSZEWSKI
PROJECT ENGINEER

ALEX HENDERSON
PROJECT DESIGN ENGINEER

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

22-JAN-2018 09:47
H:\DDC\Projects\W-5601DE SR 1141(Cumberland Rd)\Roadway\proj\W-5601DE_rdy_tsh.dgn
$$$$USERNAME$$$$

09/08/99

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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
W-5601DE	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E.*) — W
- U/G Water Line LOS C (S.U.E.*) — W
- U/G Water Line LOS D (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

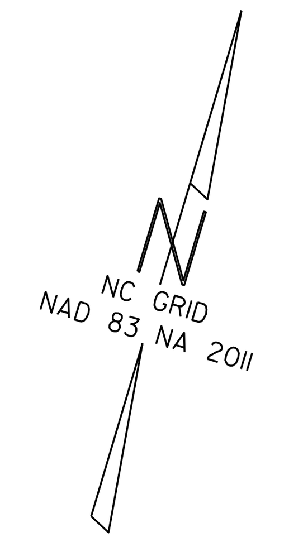
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

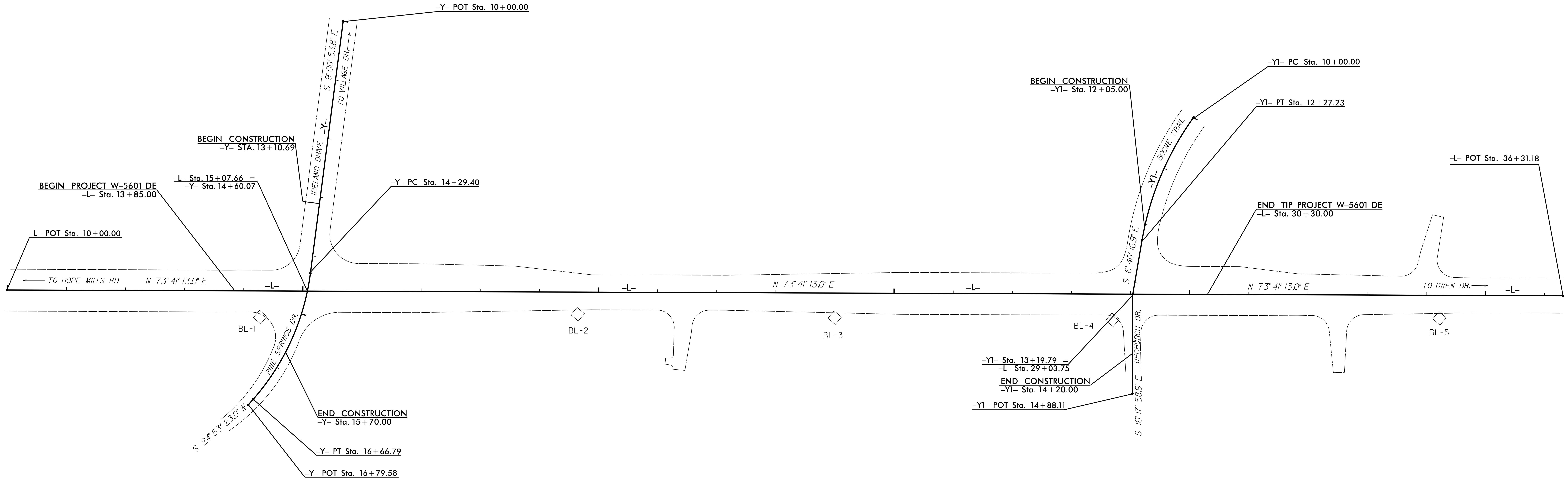
PROJECT REFERENCE NO.	SHEET NO.
W-5601DE	1C-1
Location and Surveys	

SURVEY CONTROL SHEET W-5601DE



BL

POINT	DESC.		NORTH	EAST	ELEVATION	EL STATION	OFFSET
1	W5601DE	BL-1	459655.7330	2017971.5300	0.00	14+27.82	44.26 RT
2	W5601DE	BL-2	459813.0350	2018485.0590	0.00	19+64.85	37.53 RT
3	W5601DE	BL-3	459931.1919	2018903.5383	0.00	23+99.67	41.67 RT
4	W5601DE	BL-4	460061.2824	2019355.1416	0.00	28+69.64	43.67 RT
5	W5601DE	BL-5	460220.9381	2019884.4154	0.00	34+22.45	39.11 RT



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "W5601DE-2"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 459813.0350(ft) EASTING: 2018485.0590(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "W5601DE-2" TO -L- STATION 10+00 IS
S75°54'51.92"W Distance 965.5838
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES

NOTES:

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

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

REVISIONS

6/2/99

PROPOSED ALIGNMENT CONTROL SHEET W-5601DE

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	459578.0400	2017548.5071
POT	36+31.18	460317.0986	2020073.7546

Y

TYPE	STATION	NORTH	EAST
POT	10+00.00	460175.0510	2017964.0160
PC	14+29.40	459751.0781	2018032.0389
PT	16+66.79	459519.3626	2017999.9377
POT	16+79.58	459507.7632	2017994.5560

Y1

TYPE	STATION	NORTH	EAST
PC	10+00.00	460428.6350	2019389.2187
PT	12+27.23	460204.6945	2019364.7015
POT	13+19.79	460112.7759	2019375.6156
POT	14+88.11	459951.2228	2019422.8561

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

REVISIONS

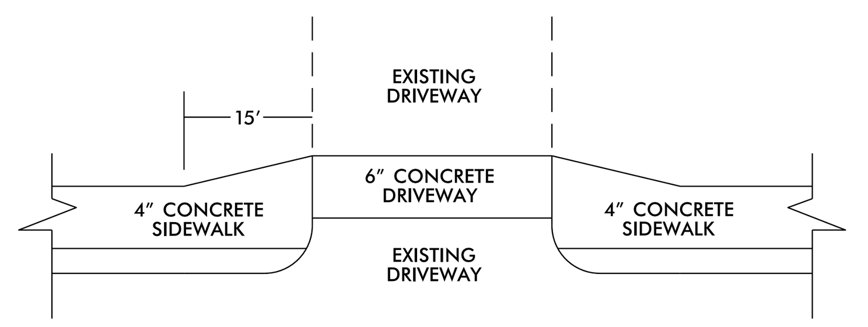
PAVEMENT SCHEDULE	
R1	EXISTING 2'-6" CONCRETE CURB AND GUTTER.
R2	4" CONCRETE SIDEWALK
U	EXIST. PAVEMENT

NOTE*

CONTRACTOR SHALL MILL 1.5" OF ASPHALT AND REPLACE WITH 1.5" OF ASHPALT SURFACE COURSE TYPE S9.5B AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. AT TWO LOCATIONS ON SR 1141 (CUMBERLAND RD).

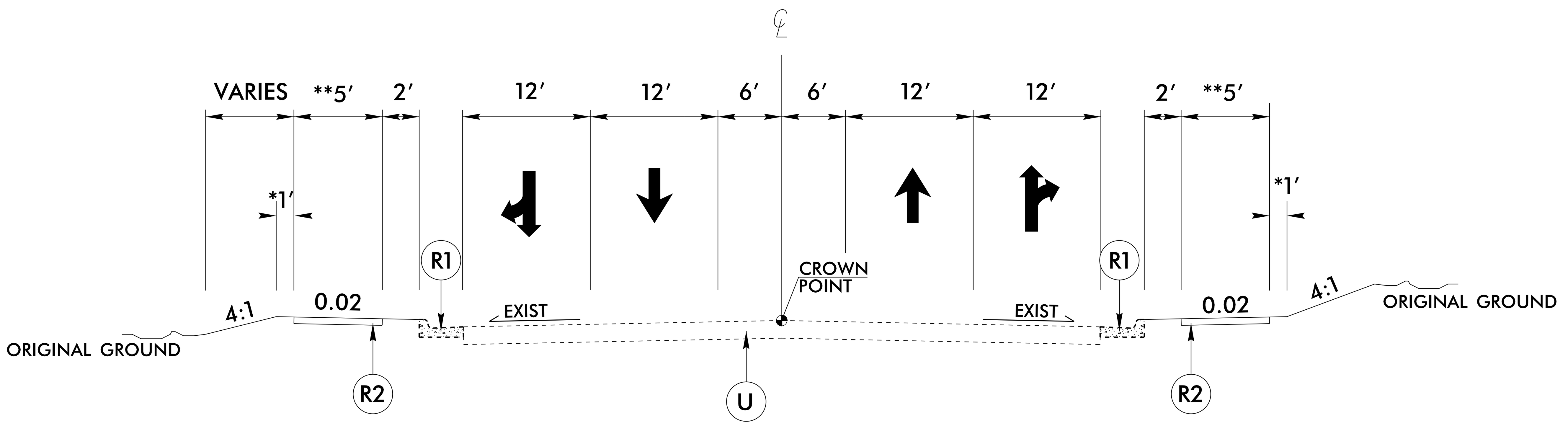
1) INTERSECTION OF CUMBERLAND RD AND IRELAND DR
2) INTERSECTION OF CUMBERLAND RD AND BOONE TRL
3) SEE SHEET 4 & 5 FOR MILLING AND PAVING LIMITS.

DETAIL FOR SIDEWALK @ EXISTING DRIVEWAYS



Not To Scale

MAY BE MODIFIED TO AVOID UTILITIES



TYPICAL SECTION NO. 1

-L- STA. 13+85.00 TO STA -L- 30+30.00
-Y- STA. 13+10.69 TO STA -Y- 15+70.00
-Y1- STA. 12+05.00 TO STA -Y1- 14+20.00
*WHERE EXIST ROW ALLOWS
**4' WHERE NECESSARY TO AVOID UTILITIES
SEE PLAN SHEETS FOR LIMITS OF SIDEWALK

PROJECT NOTES

1. The Contractor shall not work on both sides of the road simultaneously within the same area.
2. Ingress and egress shall be maintained to all businesses and dwellings on the project.
3. At the end of each workday, the Contractor shall be required to backfill any area adjacent to existing travelway that has been graded leaving no more than a 1" drop-off.
4. A minimum of two-way, two-lane traffic (plus all existing left and right turn lanes) shall be maintained during periods of construction inactivity.
5. The Contractor shall not be allowed to stop traffic for more than 5 minutes at a time in any one direction.
6. During periods of construction inactivity, the difference in elevation between lanes shall not exceed 1-1/2 inch.
7. Access to fire station and fire hydrants shall be maintained at all times.
8. During periods of construction inactivity, place cones/drums 3' from existing edge of pavement (travelway) as directed by the Engineer.
9. Channelizing devices in work areas shall be spaced not greater than 50' on center in tangent areas, 45' on center in tapers, and 10' on center in radii, and shall be set 3' off the edge of travelway, unless otherwise indicated on plans.
10. Contractor to install Erosion Control devices as directed by the Engineer.

11. Contractor will be responsible for relocating any existing signs after construction. The contractor should coordinate with the sign owner. There will be no additional pay for relocating signs in conflict with construction. This work will be considered incidental to the project.

12. Contractor will be responsible for ensuring mailboxes are upright and accessible at the end of each workday.

CONTRACTOR SHALL COORDINATE WITH LOCAL TRAFFIC SERVICES UNIT FOR PROPOSED SIGNAL DESIGN,SIGNS, AND PLACEMENT OF ALL PAVEMENT MARKINGS.

FOR SIGNAL WORK,CONTACT TRAFFIC SERVICES 910-364-0606,28 DAYS PRIOR TO PLACEMENT.

FOR SIGNS AND PAVEMENT MARKINGS,CONTACT TRAFFIC SERVICES 910-364-0606,14 DAYS PRIOR TO FINAL PLACEMENT.

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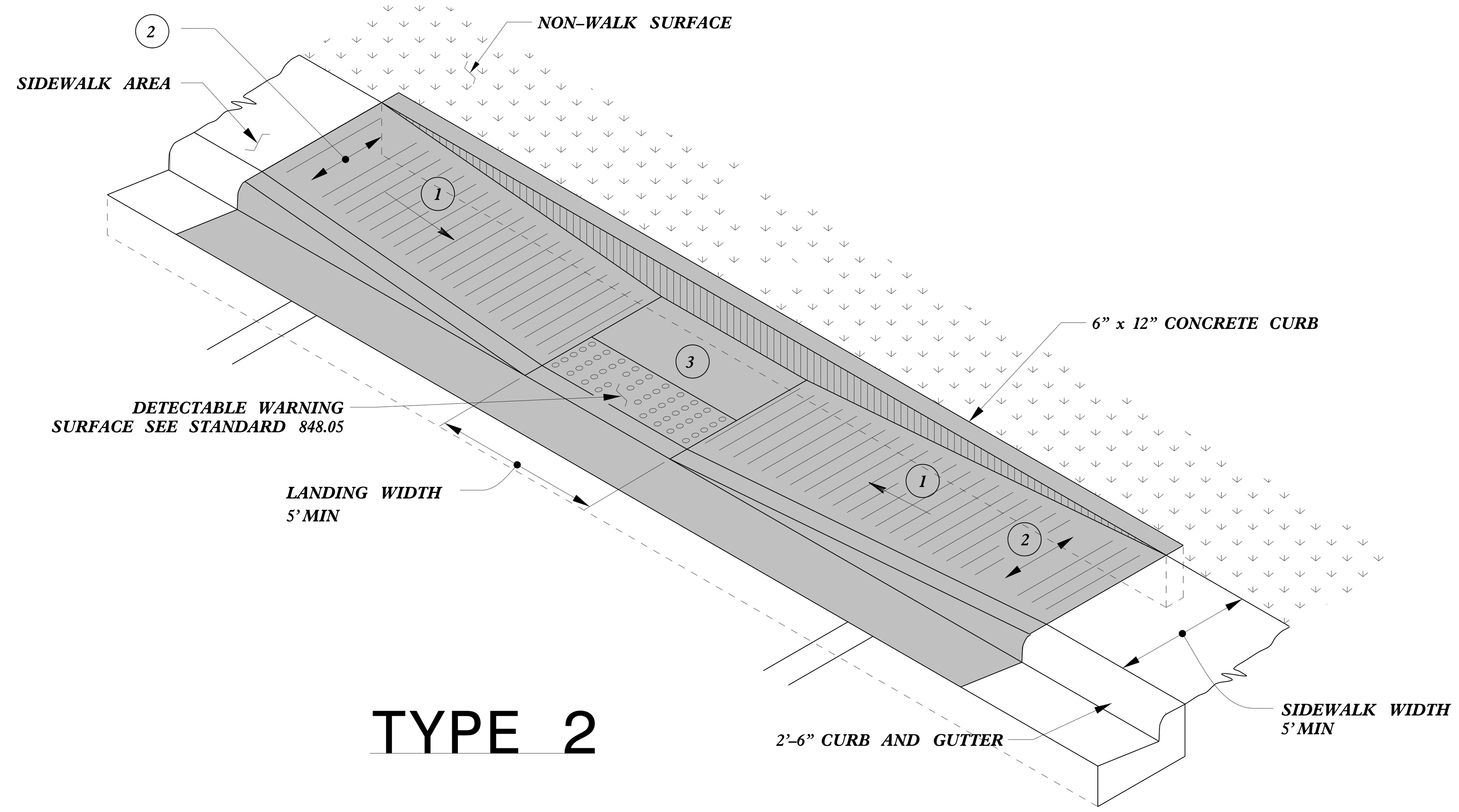
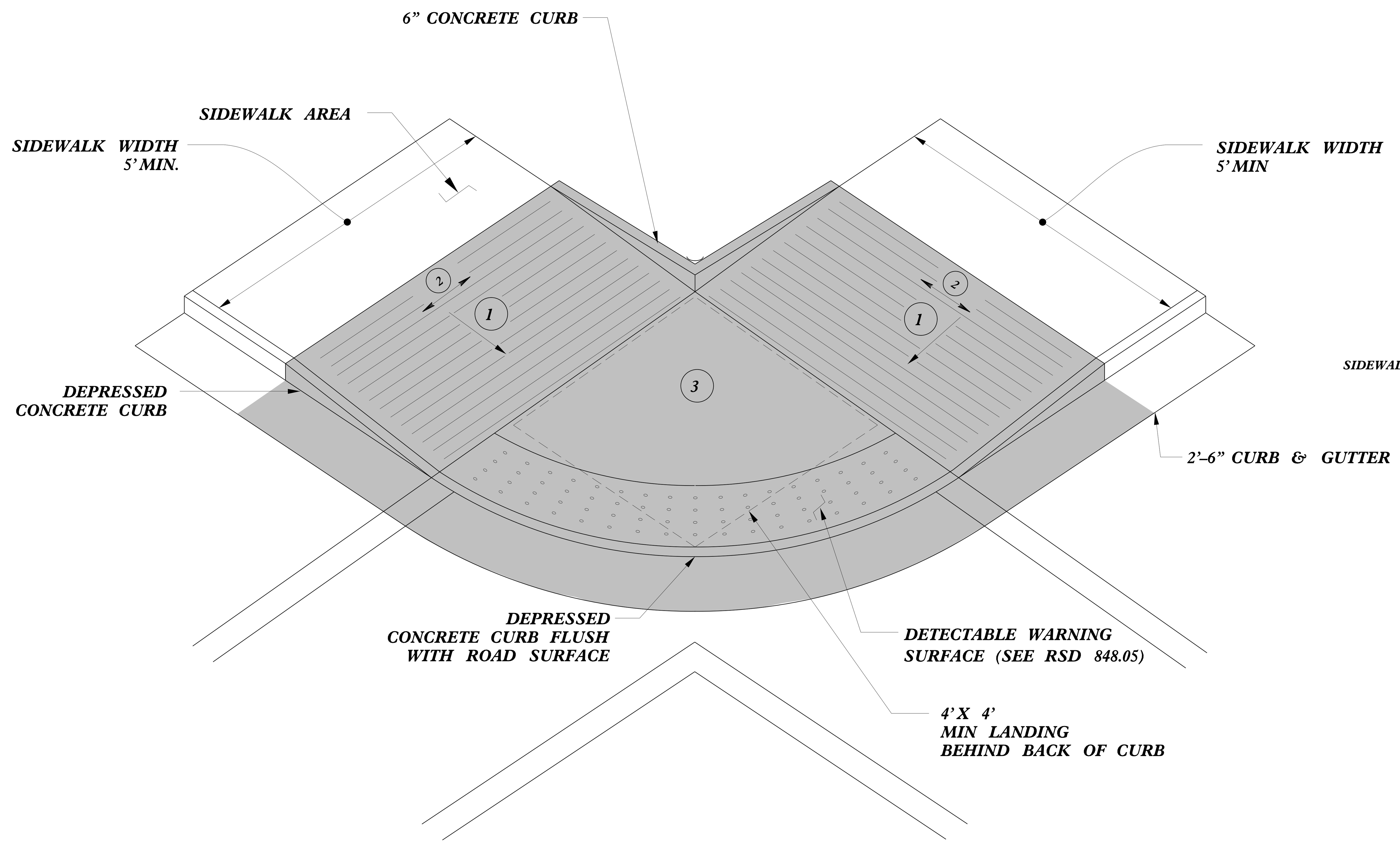
PROJECT REFERENCE NO.	SHEET NO.
W-5601DE	2B-1



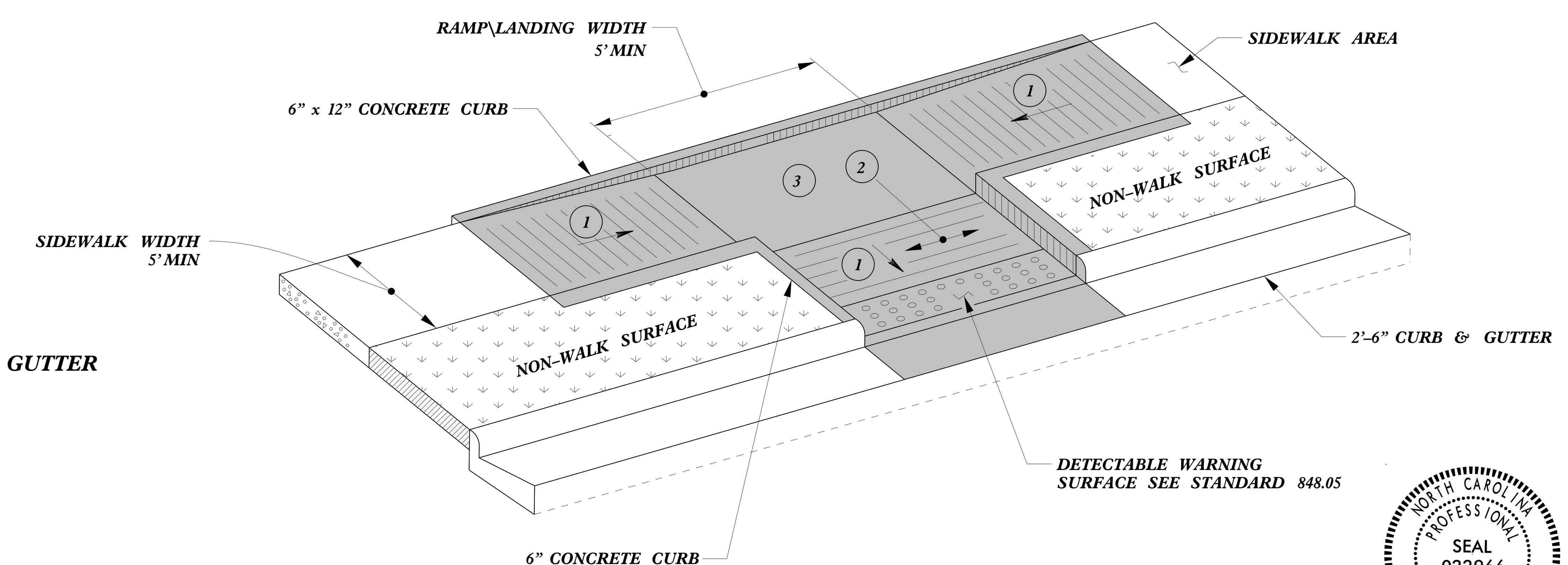
TYPE 2

PAY LIMITS FOR 1 CURB RAMP

1. 8.33% (12:1) MAX RAMP SLOPE
2. CROSS SLOPE: 2.00%
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.



TYPE 2A



TYPE 3

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER Joel S. Howerton

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REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

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

CURB RAMPS

Parallel Ramps

ORIGINAL BY: J.S. HOWERTON DATE: 7/7/11
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn

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

PROJECT REFERENCE NO.	SHEET NO.
W-5601DE	4

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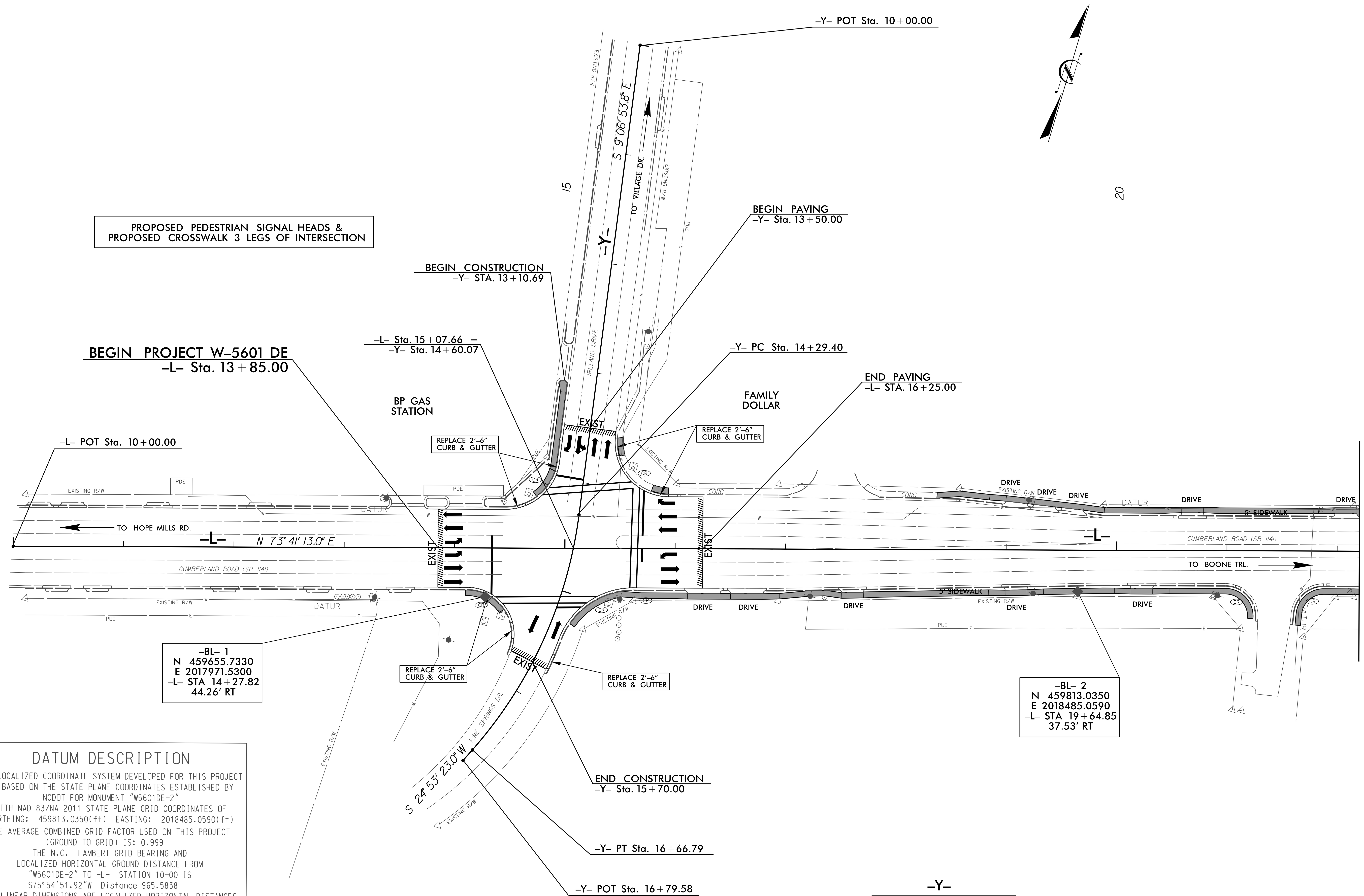
REVISIONS

8/17/99



DATUM DESCRIPTION

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ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES

-Y-

PI Sta 15+51.71
Δ = 34° 00' 16.8" (RT)
D = 14° 19' 26.2"
L = 237.40'
T = 122.31'
R = 400.00'

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$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
W-5601DE	5

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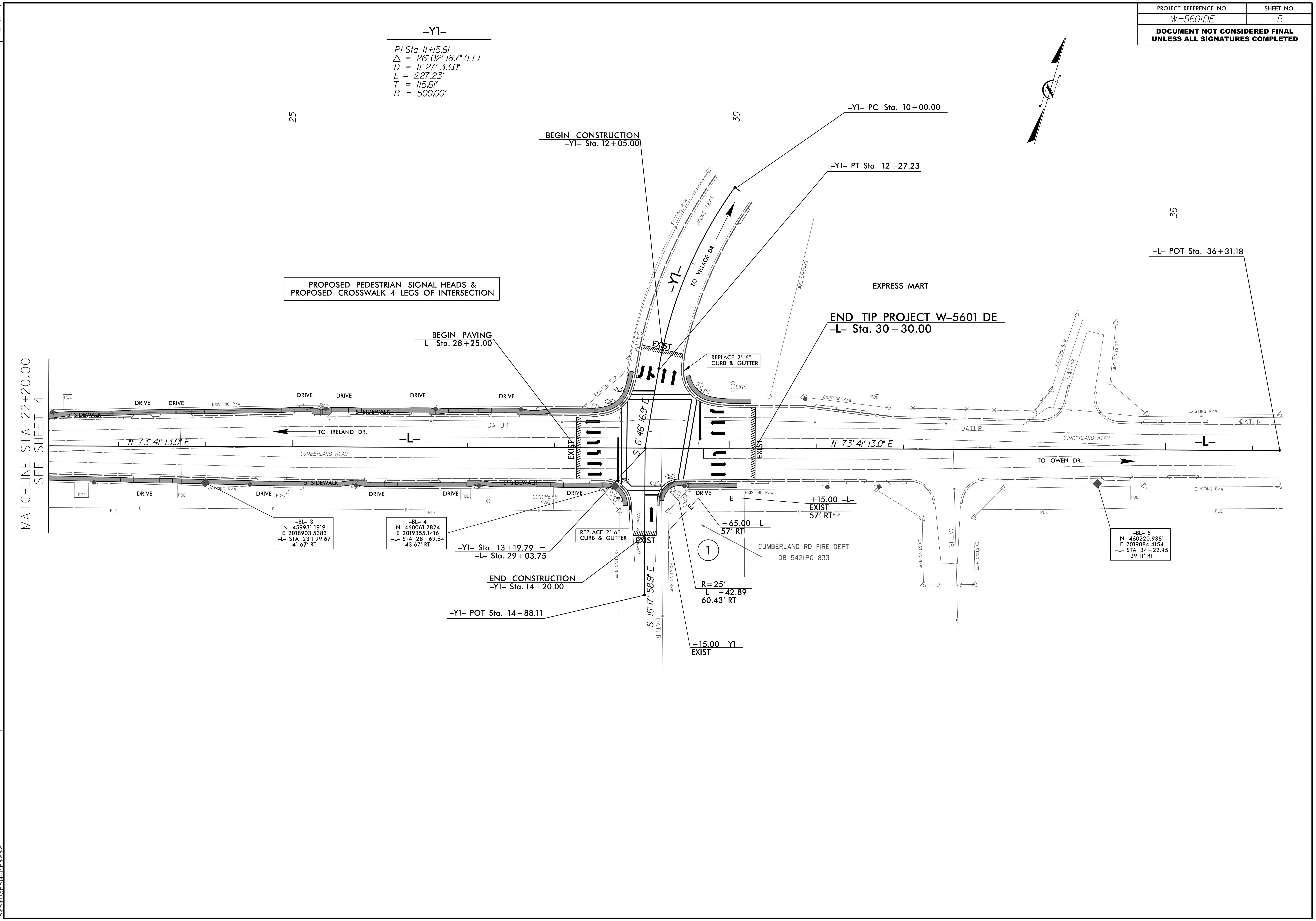
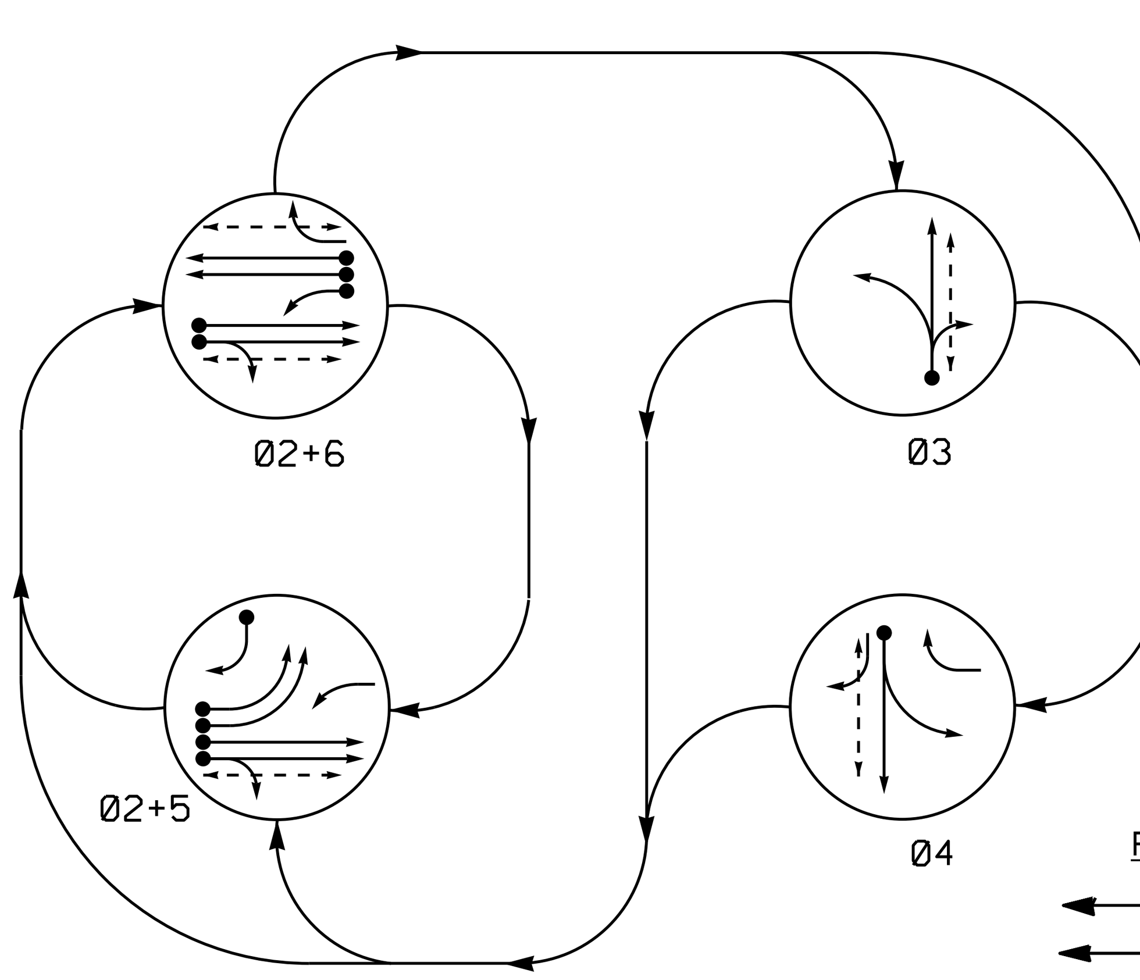


-Y1-
PI Sta 11+15.61
Δ = 26° 02' 18.7" (LT)
D = 11° 27' 33.0"
L = 227.23'
T = 115.61'
R = 500.00'
PROPOSED PEDESTRIAN SIGNAL HEADS & PROPOSED CROSSWALK 4 LEGS OF INTERSECTION
BEGIN CONSTRUCTION -Y1- Sta. 12+05.00
-Y1- PC Sta. 10+00.00
-Y1- PT Sta. 12+27.23
-L- POT Sta. 36+31.18
EXPRESS MART
END TIP PROJECT W-5601 DE
-L- Sta. 30+30.00
BEGIN PAVING -L- Sta. 28+25.00
REPLACE 2'-6" CURB & GUTTER
TO VILLAGE DR.
TO IRELAND DR.
TO OWEN DR.
N 73° 41' 13.0" E
S 6° 46' 16.9" E
S 16° 17' 58.9" E
CUMBERLAND ROAD
MATCHLINE STA 22+20.00 SEE SHEET 4
5' SIDEWALK
DRIVE
EXIST
-BL- 3 N 459931.1919 E 2018903.5383 -L- STA 23+99.67 41.67' RT
-BL- 4 N 460061.2824 E 2019355.1416 -L- STA 28+69.64 43.67' RT
-BL- 5 N 460220.9381 E 2019884.4154 -L- STA 34+22.45 39.11' RT
-Y1- Sta. 13+19.79 = -L- Sta. 29+03.75
END CONSTRUCTION -Y1- Sta. 14+20.00
-Y1- POT Sta. 14+88.11
+15.00 -L- EXIST 57' RT
+65.00 -L- 57' RT
CUMBERLAND RD FIRE DEPT DB 5421PG 833
R=25' -L- +42.89 60.43' RT
+15.00 -Y1- EXIST
REVISIONS
8/17/99
22-JAN-2018 09:48

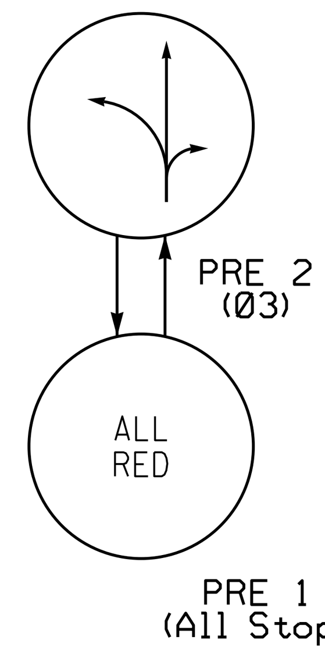
PROJECT REFERENCE NO.	SHEET NO.
W-5601DE	Sig.1.0

4 Phase
Fully Actuated w/ EV Preemption
Fayetteville Signal System

PHASING DIAGRAM



EV PREEMPT PHASES
(Medium Priority)



PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.
All Heads L.E.D.

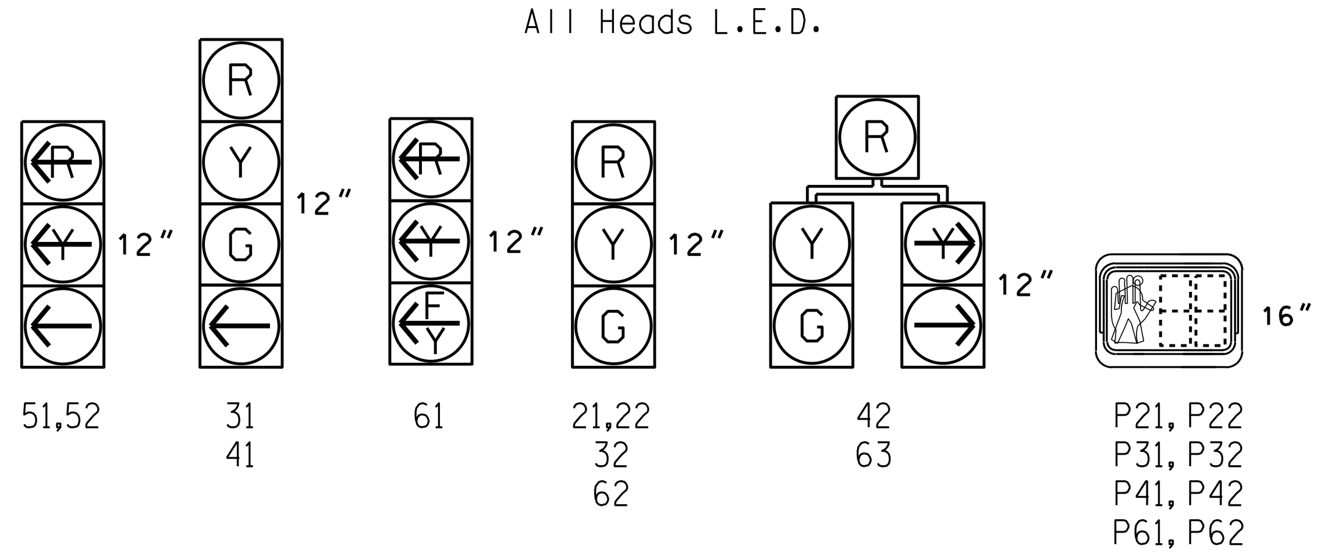


TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	Ø2+6	Ø3	Ø4	Pre 1	Pre 2 Ø3	FLASH
21,22	G	G	R	R	R	R	Y
31	R	R	G ←	R	R	G ←	R
32	R	R	G	R	R	G	R
41	R	R	R	G ←	R	R	R
42	R/→	R	R	G	R	R	R
51,52	←	←R	←R	←R	←R	←R	←R
61	←F/Y	←F/Y	←R	←R	←R	←R	←Y
62	R	G	R	R	R	R	Y
63	R	G	R	R/→	R	R	Y
P21, P22	W	W	DW	DW	DW	DW	DRK
P31, P32	DW	DW	W	DW	DW	DW	DRK
P41, P42	DW	DW	DW	W	DW	DW	DRK
P61, P62	DW	W	DW	DW	DW	DW	DRK

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR: LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING: PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	300	5	X	2	Yes	-	-	N	-	-
2B	6X6	300	5	X	2	Yes	-	-	N	-	-
3A	6X40	0	2-4-2	X	3	Yes	-	10	S	-	-
4A	6X40	0	2-4-2	X	4	Yes	-	3	S	-	-
5A	6X40	0	2-4-2	X	5	Yes	-	3	S	-	-
5B	6X40	0	2-4-2	X	5	Yes	-	-	S	-	-
5C	6X40	0	2-4-2	X	5	Yes	-	15	S	-	-
6A	6X6	300	5	X	6	Yes	-	-	N	-	-
6B	6X6	300	5	X	6	Yes	-	-	N	-	-
6C	6X40	0	2-4-2	X	6	Yes	-	3	G	-	-
S6A	6X6	+165	4	X	-	No	-	-	N	X	-
S6B	6X6	+165	4	X	-	No	-	-	N	X	-

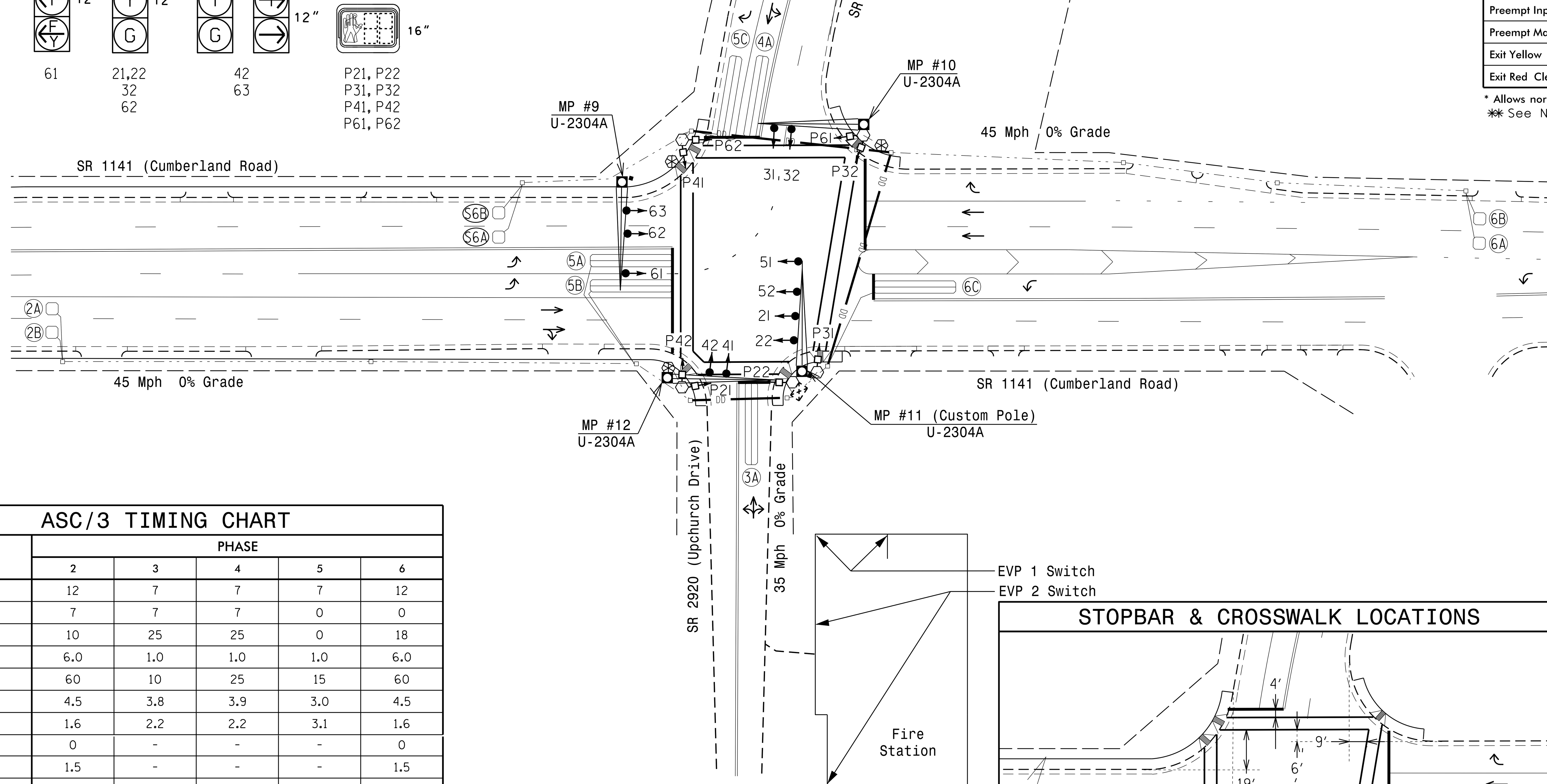
ASC/3 EV PREEMPT

FUNCTION	PRE 1	PRE 2
Exit Phase(s)	2,6	2,6
Preempt Override	OFF	OFF
Delay Time	**	**
Ped Clear Through Yellow	Y	Y
Terminate Phases	N	N
Entrance Walk	1	1
Entrance Ped Clear	255	255
Entrance Min Green	1	1
Entrance Yellow Change	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*
Minimum Dwell Time	**	**
Preempt Input Extension Time	0	0
Preempt Max Time	0	0
Exit Yellow Change	25.5*	25.5*
Exit Red Clear	25.5*	25.5*

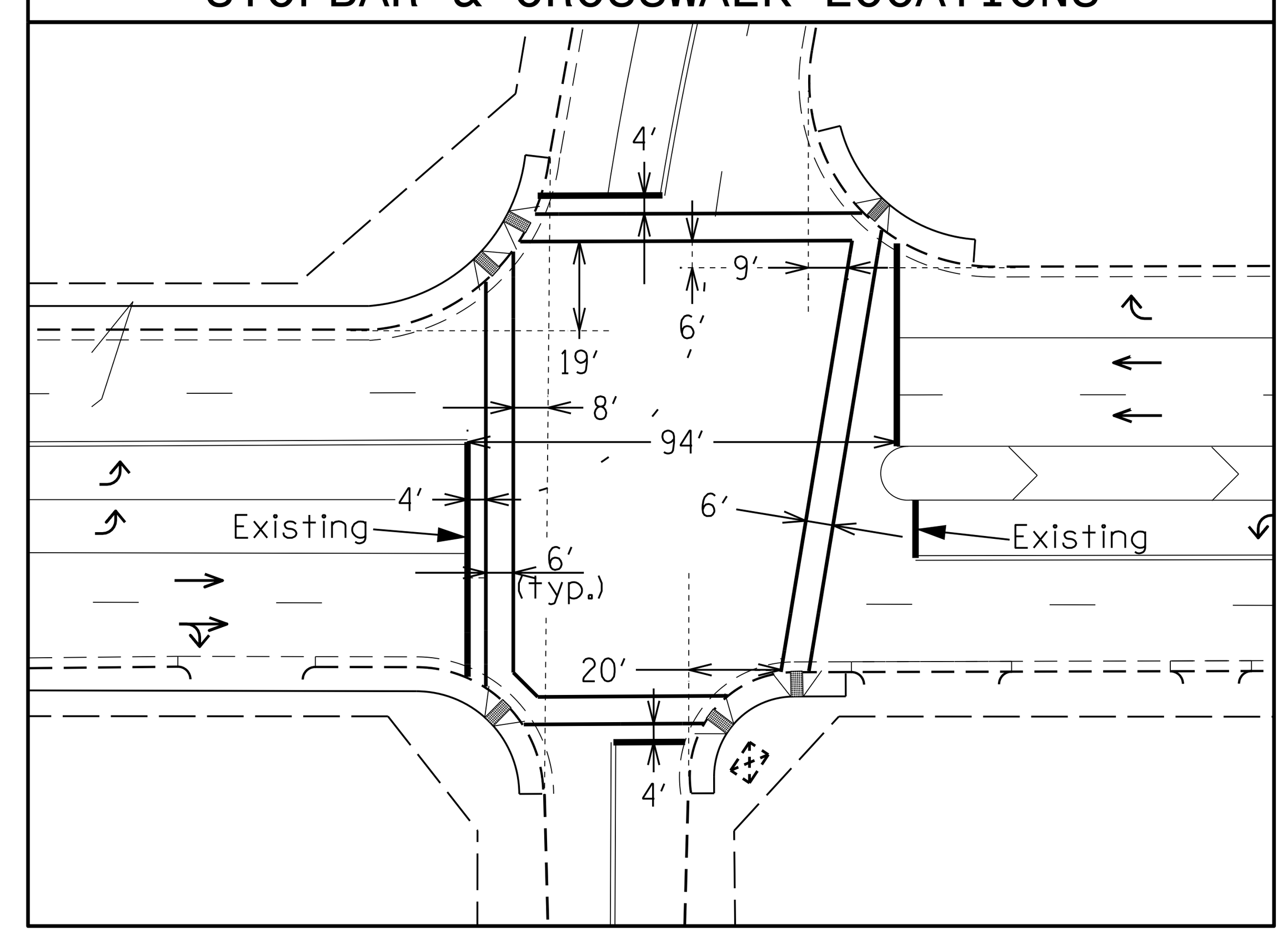
* Allows normal phase times to be used.
** See Note 9.

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. Pavement markings are existing unless otherwise shown.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Pedestrian pedestals are conceptual and shown for reference only. See sheets P1-P3 for pushbutton location details.
9. The Division Traffic Engineer will determine the Delay Time and Preempt Min Dwell time for the emergency vehicle preemption timing.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



STOPBAR & CROSSWALK LOCATIONS



ASC/3 TIMING CHART

FEATURE	PHASE 2	3	4	5	6
Min Green *	12	7	7	7	12
Walk *	7	7	7	0	0
Ped Clear	10	25	25	0	18
Veh. Extension *	6.0	1.0	1.0	1.0	6.0
Max 1 *	60	10	25	15	60
Yellow	4.5	3.8	3.9	3.0	4.5
Red Clear	1.6	2.2	2.2	3.1	1.6
Actuations B4 Add *	0	-	-	-	0
Seconds /Actuation *	1.5	-	-	-	1.5
Max Initial *	34	-	-	-	34
Time Before Reduction *	15	-	-	-	15
Time To Reduce *	30	-	-	-	30
Minimum Gap	3.0	-	-	-	3.0
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	
	Metal Pole with Mastarm	
	Type I Pushbutton Post	
	Type II Signal Pedestal	
N/A	Curb Ramp	

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SR 1141 (Cumberland Road) at SR 2920 (Upchurch Drive) / SR 1149 (Boone Trail)

Division 6 Cumberland County Fayetteville

PLAN DATE:	November 2017	REVIEWED BY:	ZML
PREPARED BY:	Meghan LeBlanc	REVIEWED BY:	

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
North Carolina Professional Engineer
SEAL 042608
Meghan E. LeBlanc
DocuSigned by: Meghan E. LeBlanc 11/29/2017
B236DA823630498
DATE

SIG. INVENTORY NO. 06-0383

14-DEC-2017 15:46
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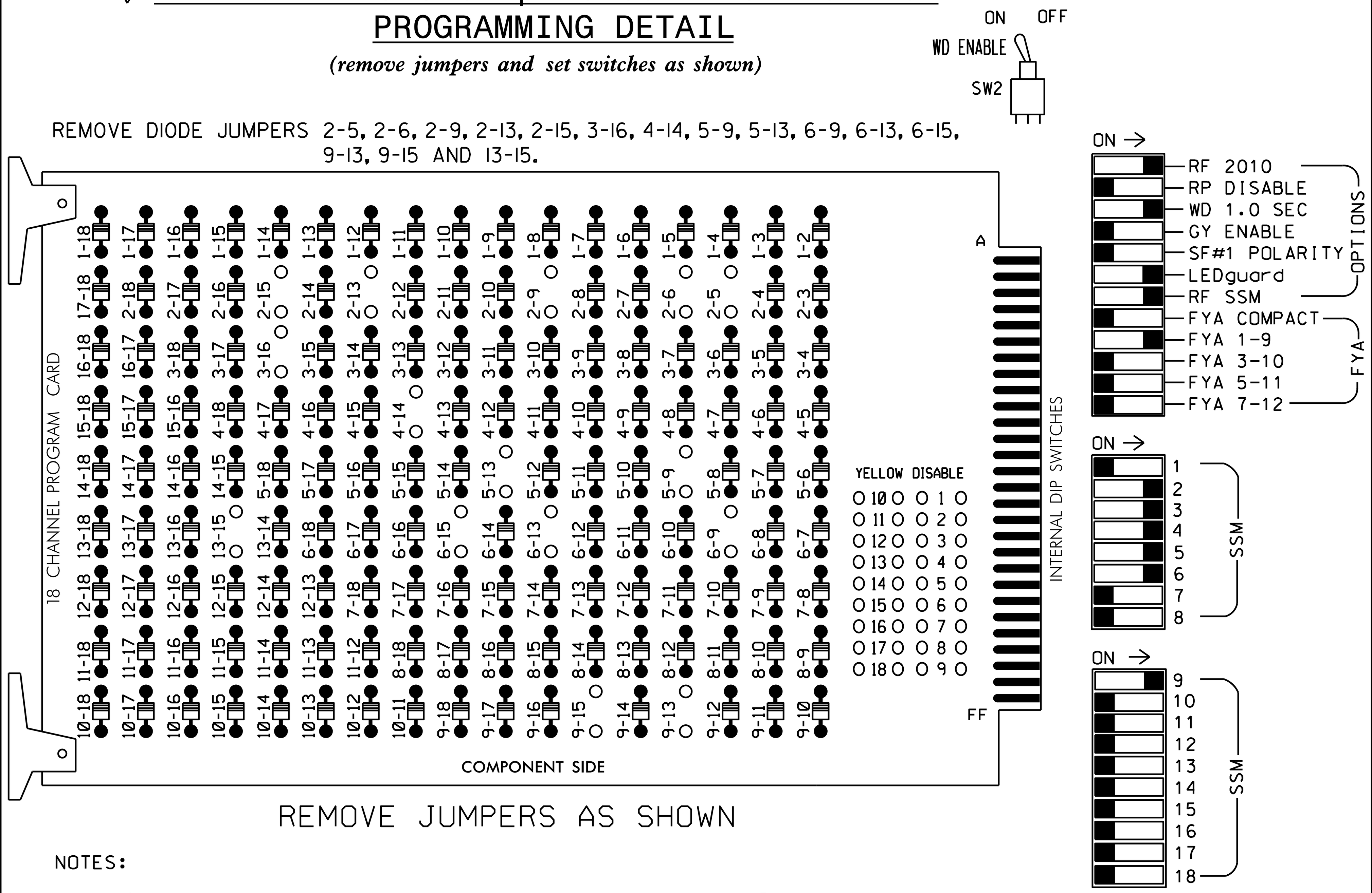
mxleblanc

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER..............2070E
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
PHASES USED.............2,3,4,5,6,2 PED,3 PED, 4 PED,6 PED
OVERLAP "A".............*
OVERLAP "B".............NOT USED
OVERLAP "C".............NOT USED
OVERLAP "D".............NOT USED

* See overlap programming detail on sheet 2

(2P-Y and 4P-Y used for pilot lamps 1 & 2.)

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4		S5			S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3		4			14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3		4			4 PED	5		6	6 PED	7	8	3 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	31	32	41	42	63	P41, P42	42	51,52	62,63	P61, P62	NU	NU	P31, P32	61★	NU	NU	NU	NU	NU
RED		128		116	116	101	101					134										
YELLOW		129		117	117	102	102					135										
GREEN		130		118	118	103	103					136										
RED ARROW											131						A121					
YELLOW ARROW								102		132	132						A122					
FLASHING YELLOW ARROW																	A123					
GREEN ARROW				118		103		103		133	133											
(Don't Walk hand)			113						104				119			110						
PED YELLOW			*						*													
(Walk pedestrian)			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)

FILE		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø 2 2A	SLOT EMPTY	SLOT EMPTY	Ø 3 3A	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I"	L		Ø 2 2B			NOT USED	NOT USED						Ø4 PED DC ISOLATOR	Ø3 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	Ø 5 5B	Ø 6 6A	Ø 6 6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SYS. DET. S6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	PRE-1 AC ISOLATOR
FILE "J"	L	NOT USED	Ø 5 5C	Ø 6 6B	NOT USED					SYS. DET. S6B					PRE-2 AC ISOLATOR

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

FS = FLASH SENSE
ST = STOP TIME
PRE-1 = PREEMPTOR 1 (EV)
PRE-2 = PREEMPTOR 2 (EV)

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			N
2B	TB2-7,8	I2L	43	12	2	YES			N
3A	TB4-5,6	I5U	58	3	3	YES		10	S
4A	TB4-9,10	I6U	41	4	4	YES		3	S
5A	TB3-1,2	J1U	55	5	5	YES		3	S
5B	TB3-5,6	J2U	40	6	5	YES			S
5C	TB3-7,8	J2L	44	16	5	YES		15	S
6A	TB3-9,10	J3U	64	36	6	YES			N
6B	TB3-11,12	J3L	77	46	6	YES		3	G
6C	TB5-1,2	J4U	48	26	6	YES			S
*S6A	TB7-9,10	J9U	59	15	SYS	NO			N
*S6B	TB7-11,12	J9L	61	17	SYS	NO			N
PED PUSH BUTTONS									
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED				
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED				
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED				
P31,P32	TB8-8,9	I13L	70	PED 8	3 PED				

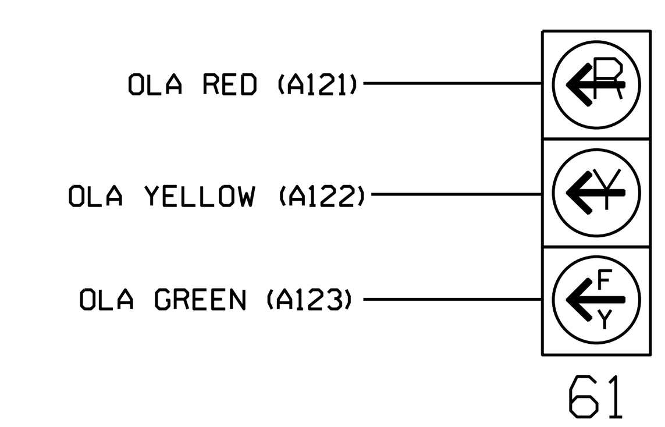
NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

* System detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

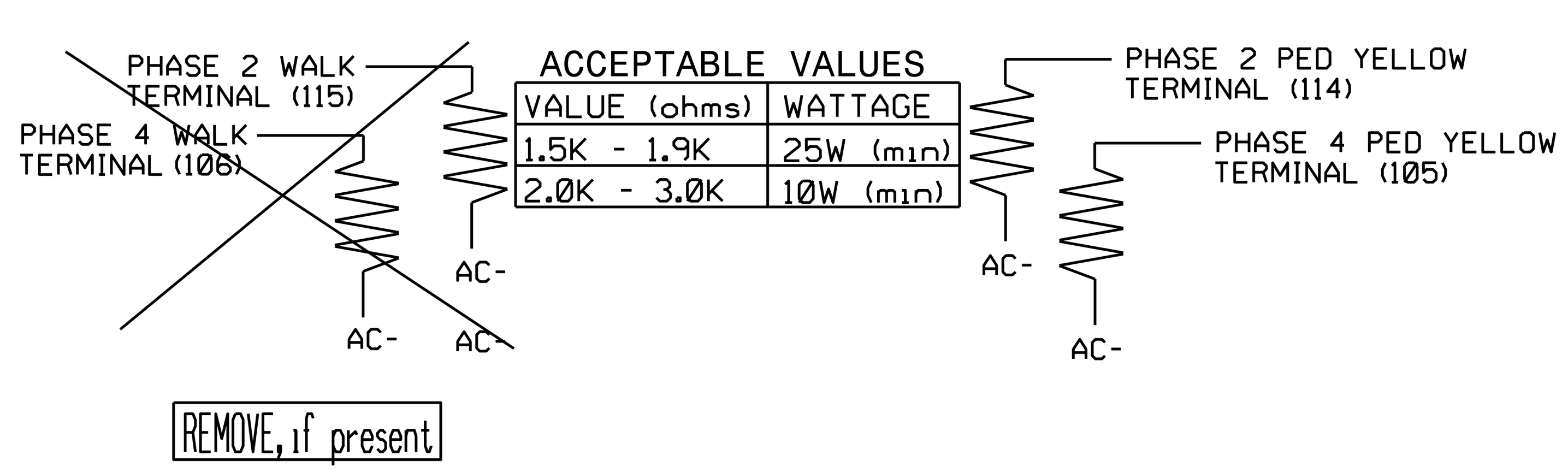
FYA SIGNAL WIRING DETAIL

(wire signal head 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)

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0383
DESIGNED: November 2017
SEALED: 11-29-17
REVISED: N/A

Electrical Detail Sheet 1 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1141 (Cumberland Road)
at
SR 2920 (Upchurch Drive)/
SR 1149 (Boone Trail)

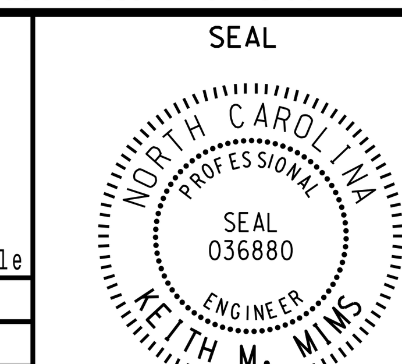
Division 6 Cumberland County Fayetteville

PLAN DATE: August 2016	REVIEWED BY: BAS
PREPARED BY: James Peterson	REVIEWED BY:

REVISIONS	INIT.	DATE
1 Added PEDs. (JP)	KMM	12/13/2017

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

SEAL



DocuSigned by: Keith M. Mims 2F80786E8CD34A5... DATE 10-21-16

SIG. INVENTORY NO. 06-0383

PROJECT REFERENCE NO.	SHEET NO.
W-5601DE	Sig. 1.2

ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL FOR FIRE STATION PILOT LAMP

(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     PMT INPUT            1     IS  ON
OR     PMT PREEMPT ACTIVE   1     IS  ON

THEN   SIG SET PH PED CLR   4     IS  ON
ELSE
```

NOTE: LOGIC TO TURN ON FIRE HOUSE PILOT LAMP 1

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

```
LP#:   2  COPY FROM:   1  ACTIVE:  M   (T/F)
IF     PMT INPUT            1     IS  OFF
AND    PMT PREEMPT ACTIVE   1     IS  OFF

THEN   SIG SET PH PED CLR   4     IS  OFF
ELSE
```

NOTE: LOGIC TO TURN OFF FIRE HOUSE PILOT LAMP 1

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

```
LP#:   3  COPY FROM:   1  ACTIVE:  M   (T/F)
IF     PMT INPUT            2     IS  ON
OR     PMT PREEMPT ACTIVE   2     IS  ON

THEN   SIG SET PH PED CLR   2     IS  ON
ELSE
```

NOTE: LOGIC TO TURN ON FIRE HOUSE PILOT LAMP 2

ENTER A "4" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:   4  COPY FROM:   1  ACTIVE:  M   (T/F)
IF     PMT INPUT            2     IS  OFF
AND    PMT PREEMPT ACTIVE   2     IS  OFF

THEN   SIG SET PH PED CLR   2     IS  OFF
ELSE
```

NOTE: LOGIC TO TURN OFF FIRE HOUSE PILOT LAMP 2

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 & 4 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 E . . . . . . . . . . .
LP 16-30  . . . . . . . . . . . . . . .
LP 31-45  . . . . . . . . . . . . . . .
LP 46-60  . . . . . . . . . . . . . . .
LP 61-75  . . . . . . . . . . . . . . .
LP 76-90  . . . . . . . . . . . . . . .
```

END PROGRAMMING

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
```

END PROGRAMMING

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   R   X
10   2   O   . . . + A   R   X
11   3   O   . . . - A   R   .
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 →

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0383
DESIGNED: November 2017
SEALED: 11-29-17
REVISED: N/A

Electrical Detail - Sheet 2 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1141 (Cumberland Road)
at
SR 2920 (Upchurch Drive)/
SR 1149 (Boone Trail)

Division 6 | Cumberland County | Fayetteville

PLAN DATE: August 2016 | REVIEWED BY: BAS

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE
Added PEDs. (JP)	KMM	12/13/2017

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036880 ENGINEER KEITH M. MIMS

DocuSigned by: Keith M. Mims 10-21-16 DATE
2FB07B5EBCD34A6...

SIG. INVENTORY NO. 06-0383

13-DEC-2017 13:15
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jpeterson

ECONOLITE ASC/3-2070 EV PREEMPT PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [4. PREEMPTOR/TSP]
2. From PREEMPTOR/TSP/SCP Submenu select [1. PREEMPT PLAN 1-10]

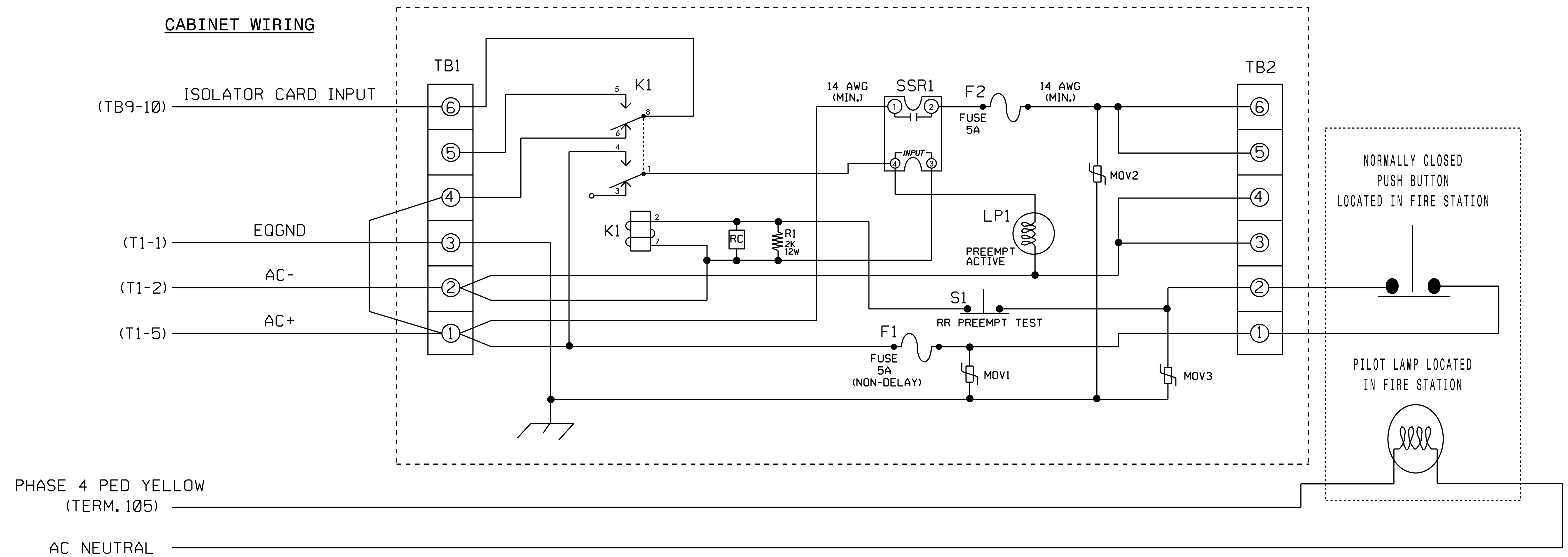
Place cursor in [ ] next to Preempt Plan and press 1. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Preempt #1.

```
PREEMPT PLAN [  1]     ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . . . . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . . . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . X . . . X . . . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES|PMT OVRIDE..INTERLOCK. NO
DET LOCK... X|DELAY..     0|INHIBIT...  0
OVERIDE FL. .|DURATION    0|CLR-GRN.... NO
TERM OLP.  NO|PC>YEL    YES|TERM PH     NO
PED DARK.. NO|TC RESRV  YES|DWELL FL   OFF
LINK PMT....0|X FLCOLR  RED|EXIT OPT.  OFF
X TMG PLN...0|RE-SERV..   0|FLT TYPE.HARD
FREE DUR PMT|R1  NO|R2  NO|R3  NO|R4  NO
--TIMING-----WALK|PED CLIMN GRI YEL| RED
ENTRANCE TM.    1|    255|    1|25.5|25.5
-----------MIN GR|EXT GR|MX GRI YEL| RED
TRACK CLEAR     0|      0|    0|25.5|25.5
-----------MIN DL|PMT|EXT|MX TM|YEL| RED
DWL/CYC-EXIT    0|   0.0|    0|25.5|25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

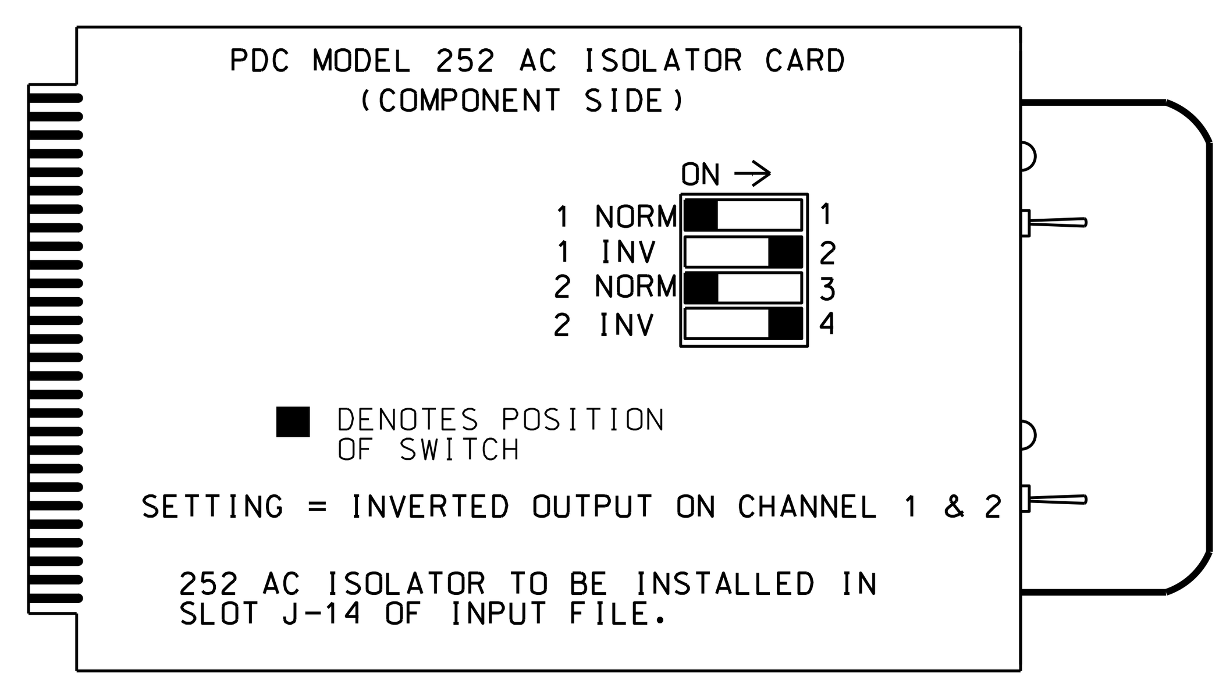
EV Preemption 1 Control Box Wiring Detail

(wire as shown below)



AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)

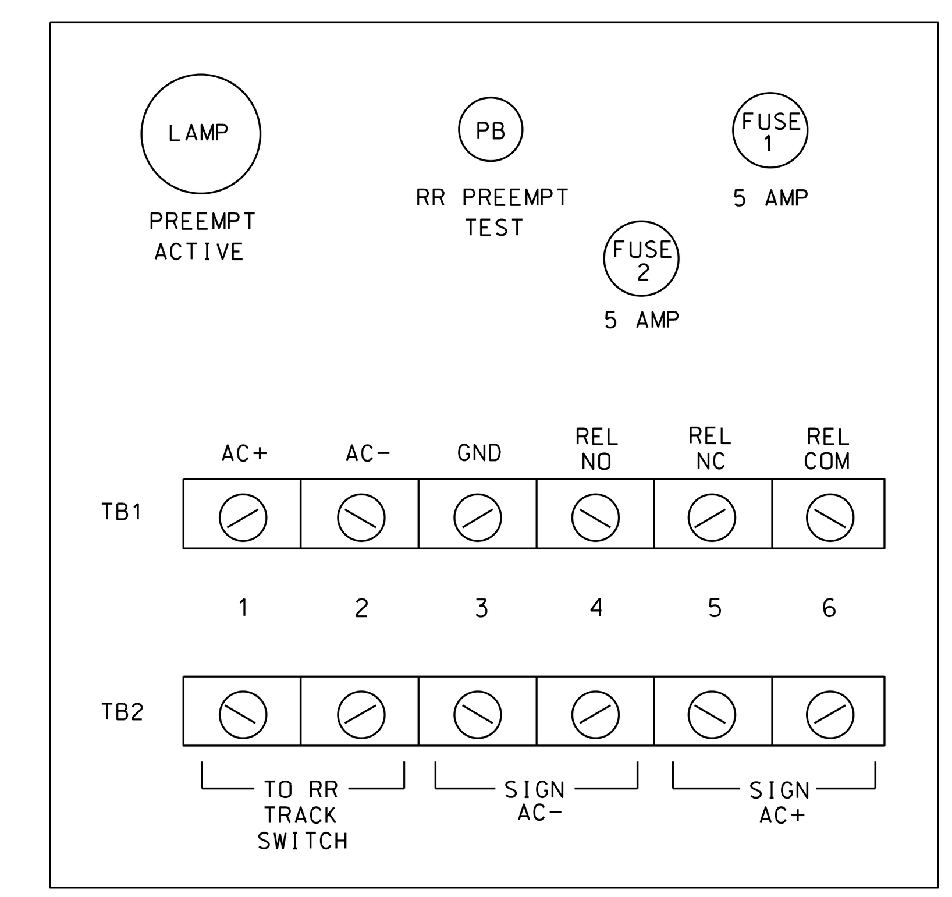


NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay 'K1' is an enclosed DPDT general purpose relay with a 120VAC coil, 10A contacts, and octal-style plug.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this, set invert dip switch on AC Isolator Card.
5. IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0383
DESIGNED: November 2017
SEALED: 11-29-17
REVISED: N/A

Electrical Detail - Sheet 3 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1141 (Cumberland Road) at SR 2920 (Upchurch Drive)/ SR 1149 (Boone Trail)

Division 6 | Cumberland County | Fayetteville

PLAN DATE: August 2016 | REVIEWED BY: BAS
PREPARED BY: James Peterson | REVIEWED BY:

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

REVISIONS	INIT.	DATE
Added PEDs. (JP)	KMM	12/13/2017

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036880 KEITH M. MIMS

DocuSigned by: Keith M. Mims 10-21-16 DATE

SIG. INVENTORY NO. 06-0383

13-DEC-2017 13:16
S:*ITS&SU*ITS Signals*Workgroups*Sig Man*Peterson*060383_sm_ele_20161021.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
W-5601DE	Sig. 1.4

③ ECONOLITE ASC/3-2070 EV PREEMPT PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [4. PREEMPTOR/TSP]
2. From PREEMPTOR/TSP/SCP Submenu select [1. PREEMPT PLAN 1-10]

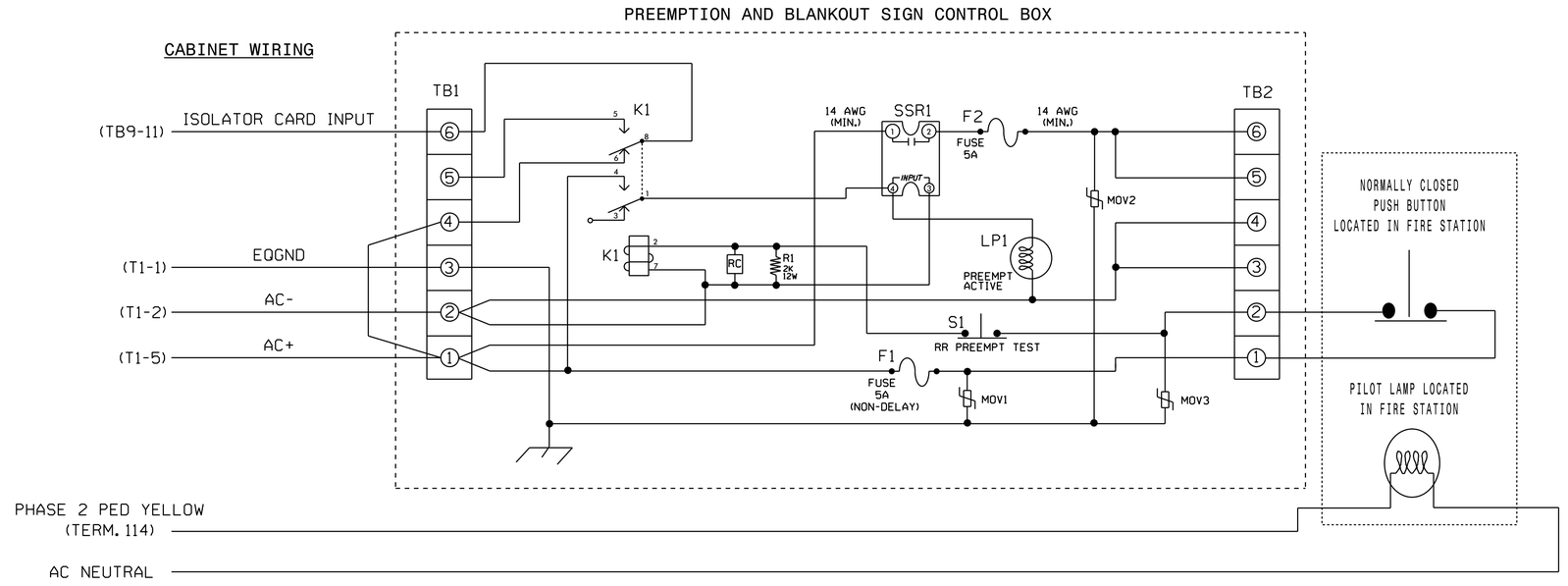
Place cursor in [ ] next to Preempt Plan and press 2. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Preempt #2.

```
PREEMPT PLAN [ 2]     ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . . .
TRKCLR O . . . . . .
ENA TRL  . . . . . .
DWEL VEH . . X . . . . . .
DWEL PED . . . . . .
DWEL OLP . . . . . .
CYC VEH  . . . . . .
CYC PED  . . . . . .
CYC OLP  . . . . . .
EXIT PH  . X . . . X . . . . . .
EXIT CAL . . . . . .
SP FUNC  . . . . . .

ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK... X|DELAY..    0|INHIBIT...  0
OVERIDE FL. .|DURATION   0|CLR-GRN... NO
TERM OLP.  NO|PC>YEL   YES|TERM PH    NO
PED DARK.. NO|TC RESRV YES|DWELL FL   OFF
LINK PMT....0|X FLCOLR RED|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1  NO|R2  NO|R3  NO|R4  NO
--TIMING-----WALK|PED CL|MN GR|YEL|RED
ENTRANCE TM.   1|  25|5   1|25.5|25.5
-----------MIN GR|EXT GR|MX GR|YEL|RED
TRACK CLEAR    0|   0|   0|25.5|25.5
-----------MIN DL|PMTEXT|MX TM|YEL|RED
DWL/CYC-EXIT   0|  0.0|   0|25.5|25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

EV Preemption 2 Control Box Wiring Detail

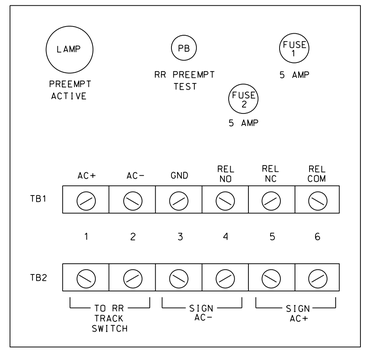
(wire as shown below)



NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay 'K1' is an enclosed DPDT general purpose relay with a 120VAC coil, 10A contacts, and octal-style plug.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this, set invert dip switch on AC Isolator Card.

FRONT VIEW



▽ THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0383
DESIGNED: November 2017
SEALED: 11-29-17
REVISED: N/A

Electrical Detail - Sheet 4 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1141 (Cumberland Road) at SR 2920 (Upchurch Drive)/ SR 1149 (Boone Trail)

Division 6 | Cumberland County | Fayetteville

PLAN DATE: August 2016 | REVIEWED BY: BAS

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE
▽ Added PEDs. (JP)	KMM	12/13/2017

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

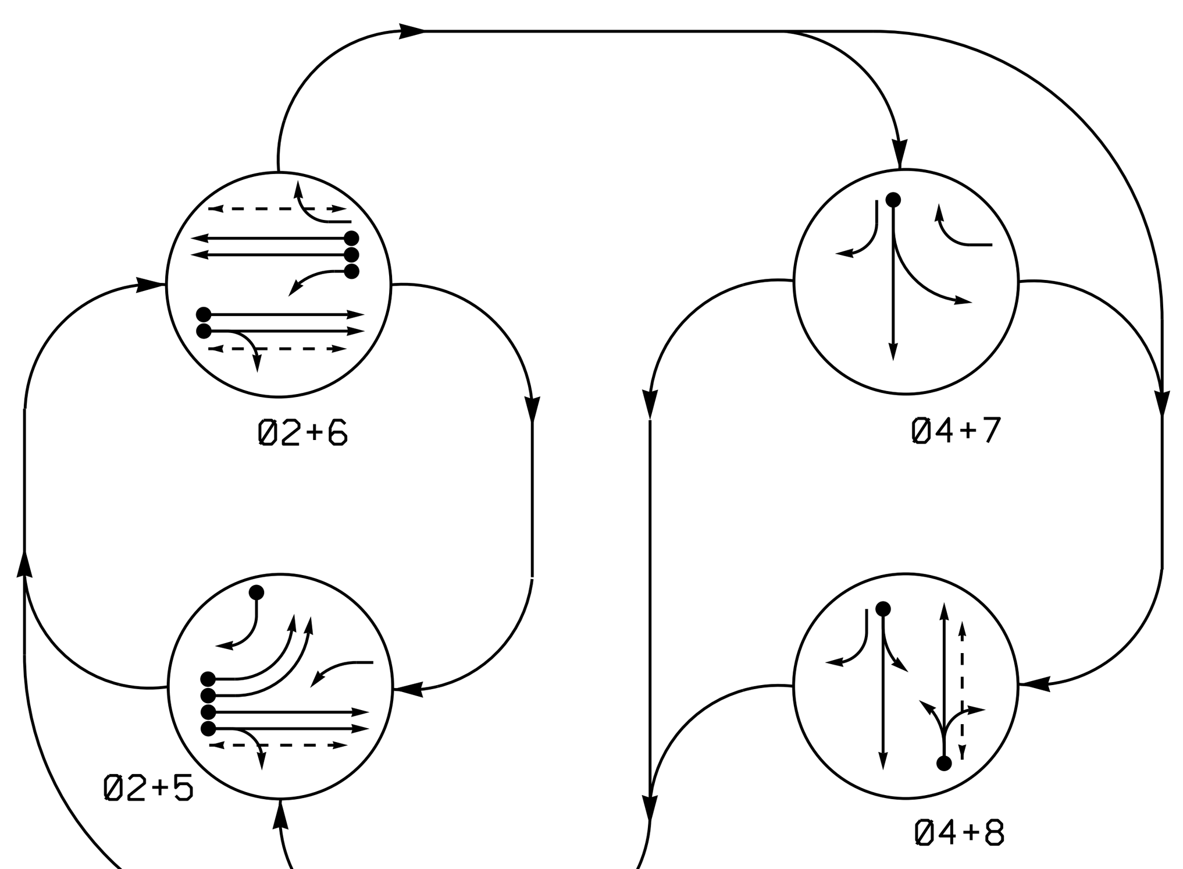
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036880 ENGINEER KEITH M. MIMS

DocuSigned by: Keith M. Mims 10-21-16
SIG. INVENTORY NO. 06-0383

13-DEC-2017 13:16
S:\#ITSSIG\#ITS\Signals\Workgroups\Sig Mgmt\Peterson\060383_sm_ele_20161021.dgn
jpeterson

PROJECT REFERENCE NO.	SHEET NO.
W-5601DE	Sig.2.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

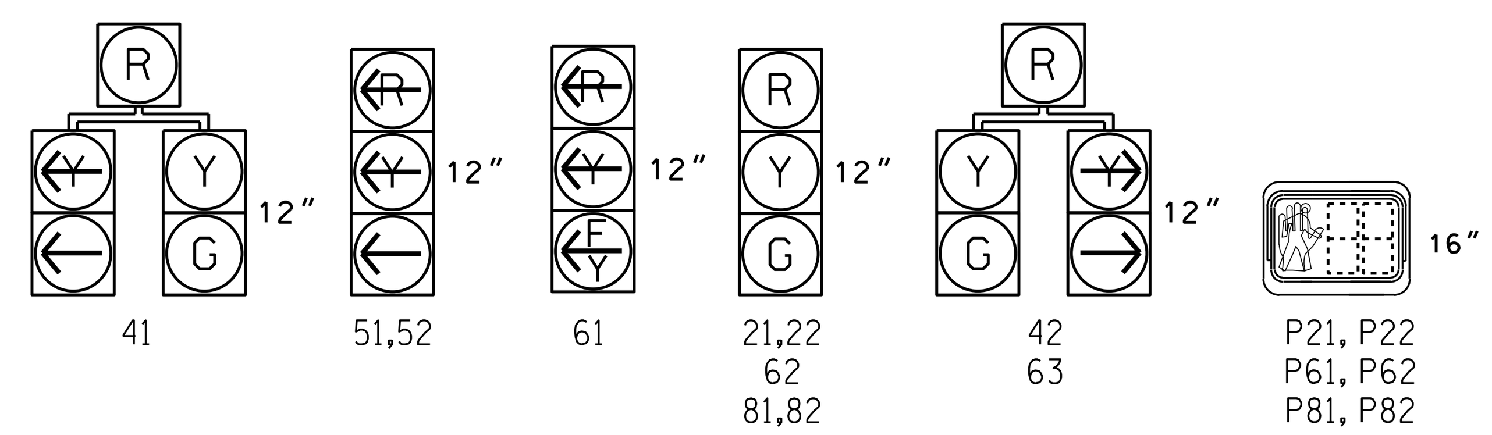
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	Ø2+6	Ø4+7	Ø4+8	FLASH
21,22	G	G	R	R	Y
41	R	R	← / G	G	R
42	R / →	R	G	G	R
51,52	←	←R	←R	←R	←R
61	←F/Y	←F/Y	←R	←R	←Y
62	R	G	R	R	Y
63	R	G	R / →	R	Y
81,82	R	R	R	G	R
P21, P22	W	W	DW	DW	DRK
P61, P62	DW	W	DW	DW	DRK
P81, P82	DW	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



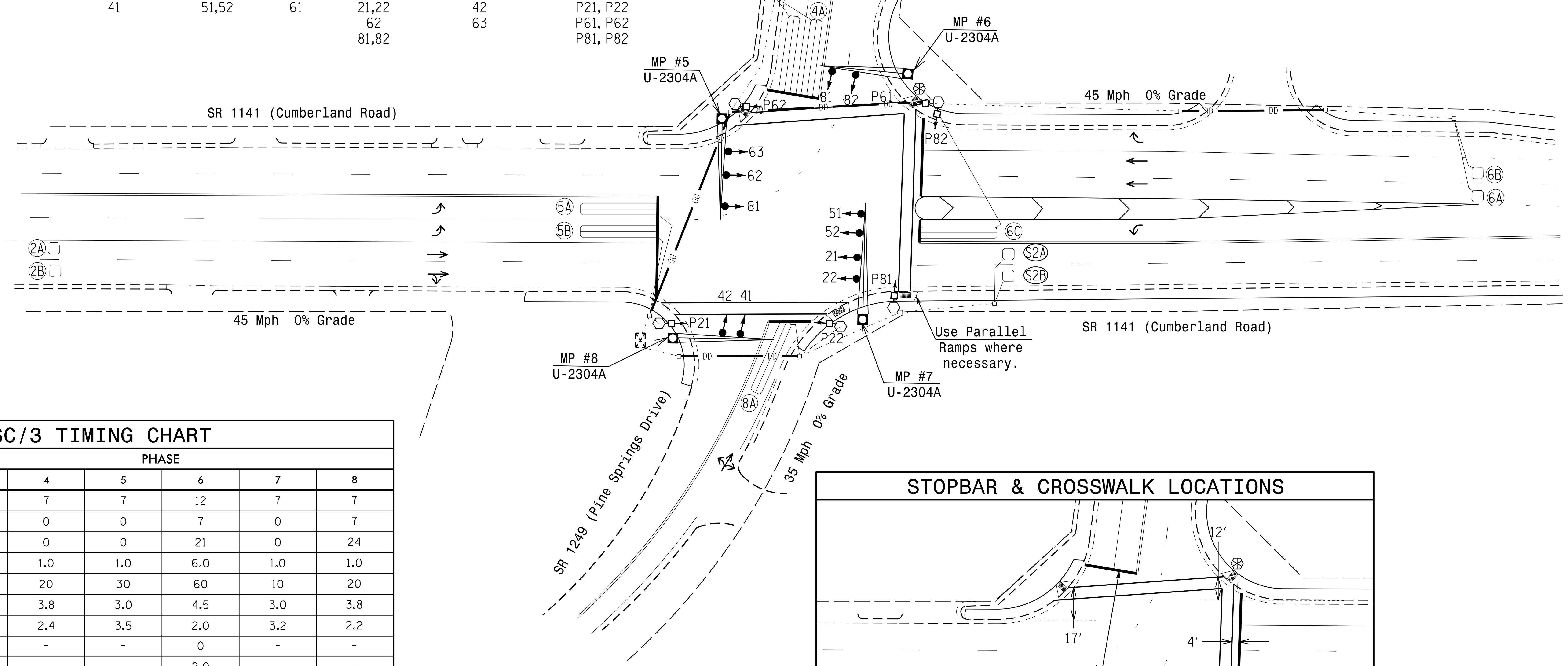
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	300	4	-	2	Yes	-	-	N	-	-
2B	6X6	300	4	-	2	Yes	-	-	N	-	-
4A	6X40	0	2-4-2	X	4	Yes	-	3	S	-	-
5A	6X40	0	2-4-2	X	5	Yes	-	3	S	-	-
5B	6X40	0	2-4-2	X	5	Yes	-	-	S	-	-
5C	6X40	0	2-4-2	X	5	Yes	-	15	S	-	-
6A	6X6	300	5	X	6	Yes	-	-	N	-	-
6B	6X6	300	5	X	6	Yes	-	-	N	-	-
6C	6X40	+15	2-4-2	X	6	Yes	-	-	S	-	-
7A	6X15	50	4	X	7	Yes	-	15	S	-	-
8A	6X40	0	2-4-2	X	8	Yes	-	10	S	-	-
S2A	6X6	+165	4	X	-	No	-	-	N	X	-
S2B	6X6	+165	4	X	-	No	-	-	N	X	-

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. Omit phase 7 during phase 8 on.
4. Phase 5 may be lagged.
5. Set all detector units to presence mode.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Pedestrian pedestals are conceptual and shown for reference only. See sheets P1-P3 for pushbutton location details.
8. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

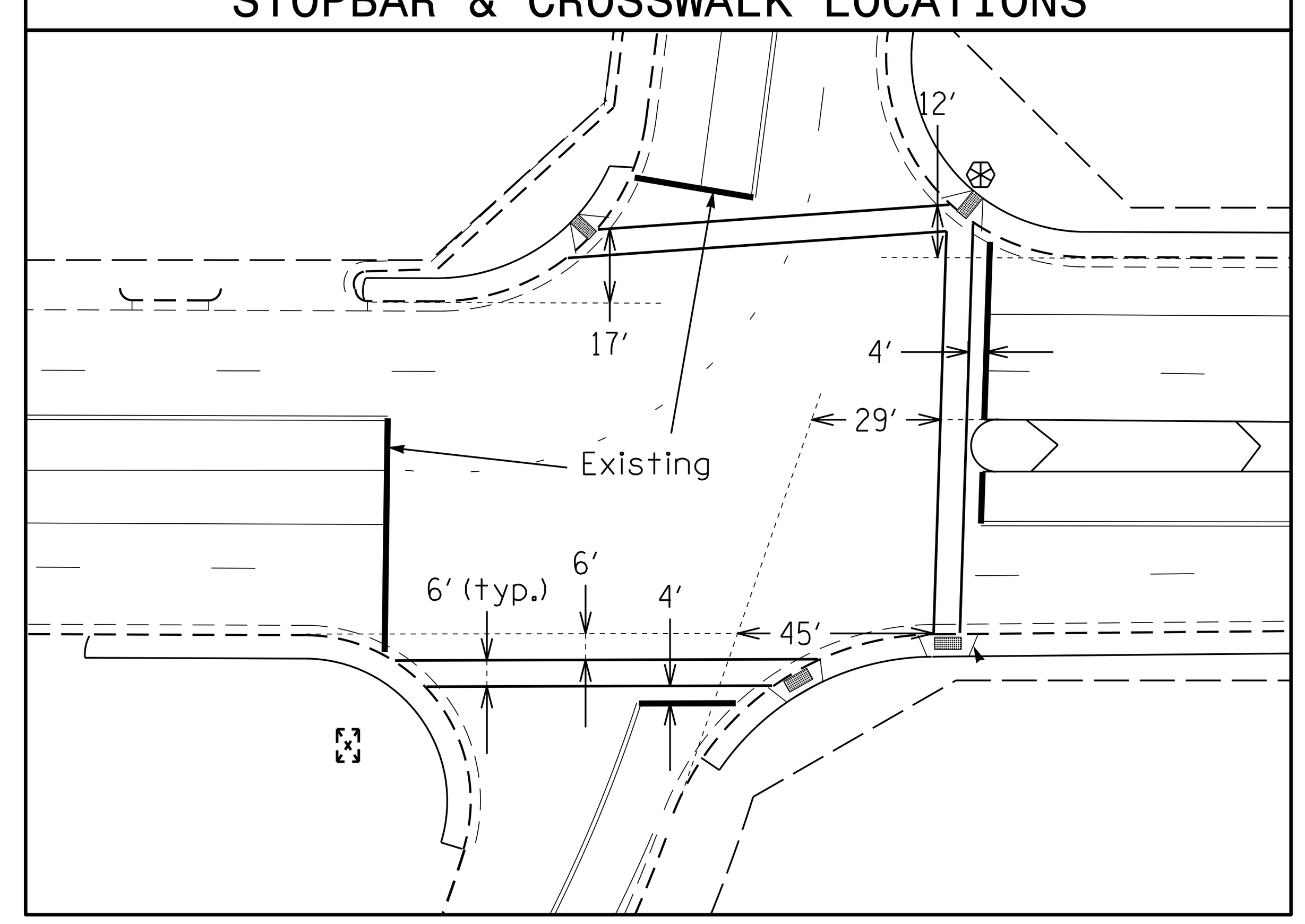
PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow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

ASC/3 TIMING CHART

FEATURE	PHASE 2	4	5	6	7	8
Min Green *	12	7	7	12	7	7
Walk *	7	0	0	7	0	7
Ped Clear	21	0	0	21	0	24
Veh. Extension *	6.0	1.0	1.0	6.0	1.0	1.0
Max 1 *	60	20	30	60	10	20
Yellow	4.5	3.8	3.0	4.5	3.0	3.8
Red Clear	2.0	2.4	3.5	2.0	3.2	2.2
Actuations B4 Add *	0	-	-	0	-	-
Seconds /Actuation *	1.5	-	-	2.0	-	-
Max Initial *	34	-	-	34	-	-
Time Before Reduction *	15	-	-	15	-	-
Time To Reduce *	30	-	-	30	-	-
Minimum Gap	3.0	-	-	3.0	-	-
Locking Detector	X	-	-	X	-	-
Recall Position	VEH. RECALL	-	-	VEH. RECALL	-	-
Dual Entry	-	X	-	-	-	X
Simultaneous Gap	X	X	X	X	X	X

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

STOPBAR & CROSSWALK LOCATIONS



Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SR 1141 (Cumberland Road)
at
SR 1219 (Ireland Drive) /
SR 1249 (Pine Springs Drive)

Division 6 Cumberland County Fayetteville

PLAN DATE: November 2017	REVIEWED BY: ZML
PREPARED BY: Meghan LeBlanc	REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 042608 ENGINEER MEGHAN E. LEBLANC

DocuSigned by: Meghan E. LeBlanc 11/29/2017 DATE

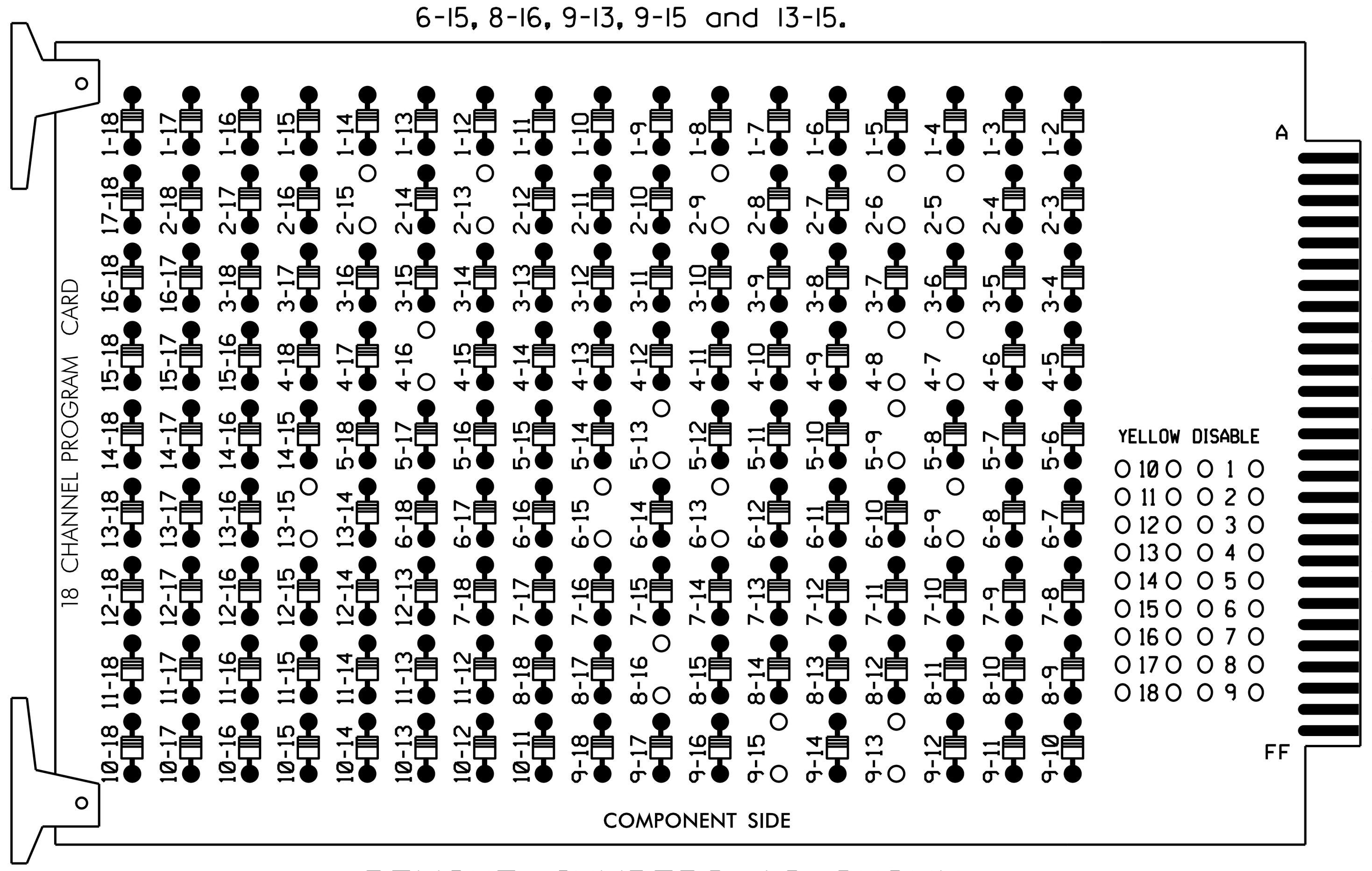
SIG. INVENTORY NO. 06-0446

14-DEC-2017 16:39
S:*ITS&SU*ITS Signals\Signal Design Section\Eastern Region\Div-06\W-5601DE\06-0446_sig_dsn_2017mmdd.dgn
mleblanc

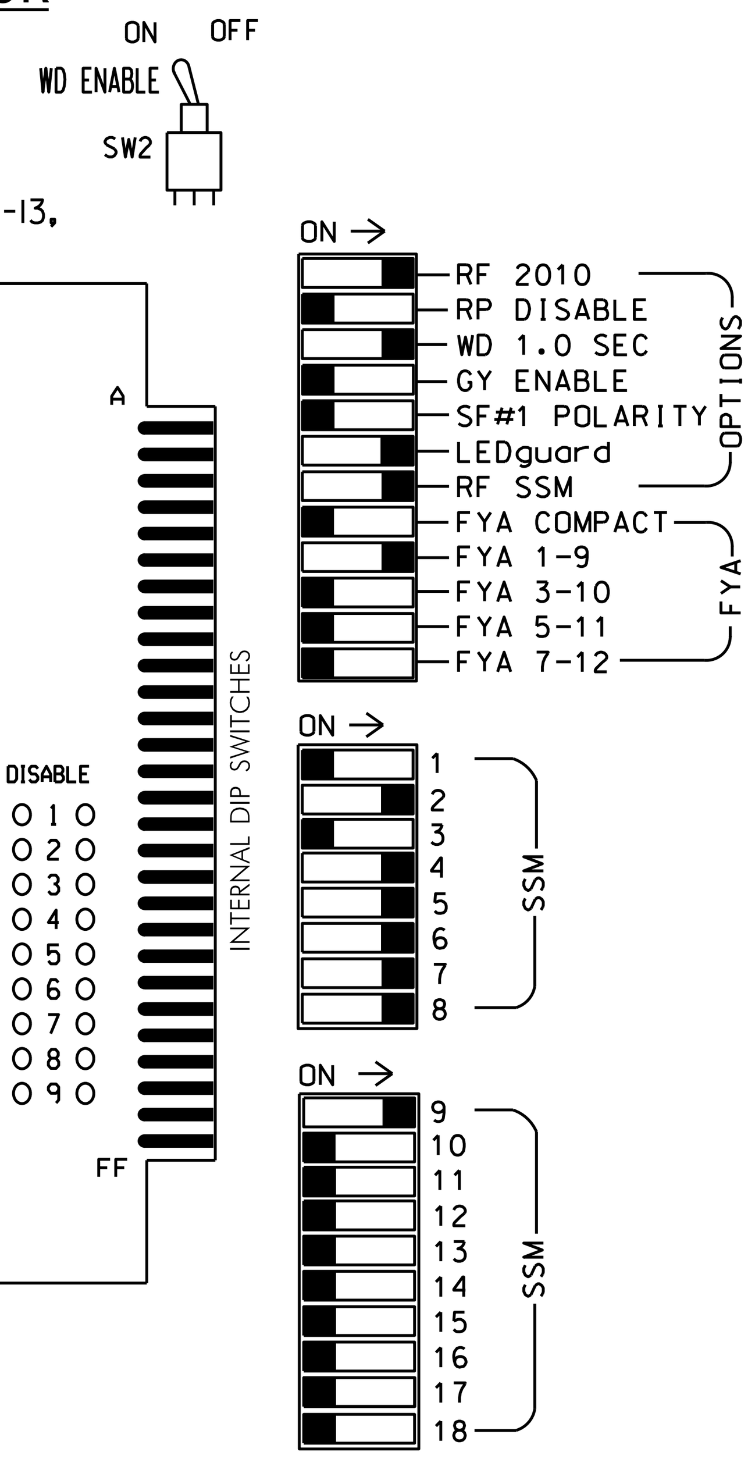
EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-13, 2-15, 4-7, 4-8, 4-16, 5-9, 5-13, 6-9, 6-13, 6-15, 8-16, 9-13, 9-15 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.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for volume density operation.
5. Program controller to start up in phase 2 Walk and 6 Green.
6. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER..............2070E
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,S5,S7,S8,S9,S10,S11,
S12,AUX S1
PHASES USED.............2,4,5,6,7,8,2 PED,6 PED,8 PED
OVERLAP "A".............*
OVERLAP "B".............NOT USED
OVERLAP "C".............NOT USED
OVERLAP "D".............NOT USED

* See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	NU	42	51,52	62,63	P61, P62	41,63	81,82	P81, P82	61★	NU	NU	NU	NU	NU
RED		128			101				134		*	107							
YELLOW		129			102				135			108							
GREEN		130			103				136			109							
RED ARROW								131						A121					
YELLOW ARROW							132	132			123			A122					
FLASHING YELLOW ARROW														A123					
GREEN ARROW							133	133			124								
(Don't Walk)			113							119			110						
(Walk)			115							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)

FILE		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø 2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SYS. DET. S2A	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		Ø 2 2B				NOT USED			SYS. DET. S2B			NOT USED	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	Ø 5 5B	Ø 6 6A	SLOT EMPTY	Ø 7 7A	Ø 8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø 5 5C	Ø 6 6C		NOT USED	Ø 6 6B								

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			N
2B	TB2-7,8	I2L	43	12	2	YES			N
4A	TB4-9,10	I6U	41	4	4	YES		3	S
5A	TB3-1,2	J1U	55	5	5	YES		3	S
5B	TB3-5,6	J2U	40	6	5	YES			S
5C	TB3-7,8	J2L	44	16	5	YES		15	S
6A	TB3-9,10	J3U	64	36	6	YES			N
6C	TB3-11,12	J3L	77	46	6	YES			S
7A	TB5-5,6	J5U	57	7	7	YES		15	S
8A	TB5-9,10	J6U	42	8	8	YES		10	S
6B	TB5-11,12	J6L	46	18	6	YES			N
*S2A	TB6-9,10	I9U	60	11	SYS	NO			N
*S2B	TB6-11,12	I9L	62	13	SYS	NO			N
PED PUSH BUTTONS									
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED				
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED				
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED				

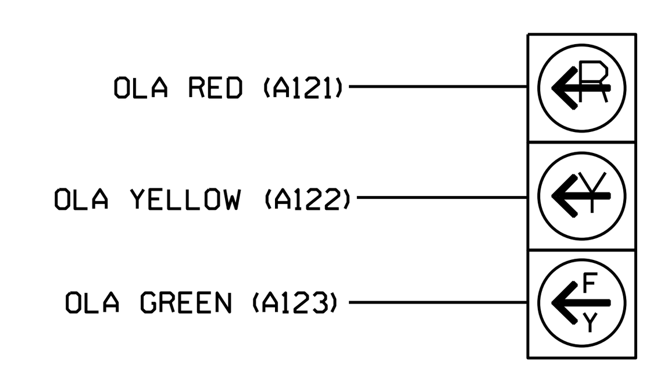
NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

* System detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)

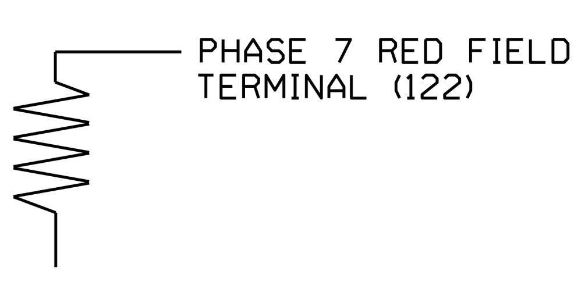


61

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)



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0446
DESIGNED: November 2017
SEALED: 11-29-17
REVISED: N/A

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

SR 1141 (Cumberland Road) at SR 1219 (Ireland Drive)/ SR 1249 (Pine Springs Drive)

Division 6 Cumberland County Fayetteville

PLAN DATE: July 2016	REVIEWED BY: BAS
PREPARED BY: S. Armstrong	REVIEWED BY:

REVISIONS	INIT.	DATE
1 Added PEDs.(JP)	KMM	12/13/2017

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036880 ENGINEER KEITH M. MIMS

DocuSigned by: Keith M. Mims
2F80786E8CD34A5...
8-4-16
DATE

SIG. INVENTORY NO. 06-0446

PROJECT REFERENCE NO.	SHEET NO.
W-5601DE	Sig. 2.2

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

END PROGRAMMING

ECONOLITE ASC/3-2070 BACKUP PROTECTION ENABLE PROGRAMMING

(program controller as shown)

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

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

ENABLE BACKUP PREVENT

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

NOTES

1. 'B' without a 'C' programmed for the 'TIMING' (row) phase inhibits the controller from servicing the 'BACKUP' (column) phase when the 'TIMING' (row) phase is active, or next, until the controller goes through Red Revert and Red Clear. Make sure the proper Red Revert and Red Clear times shown on the Signal Design plan are programmed in the controller phase timing.

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

1 THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0446
DESIGNED: November 2017
SEALED: 11-29-17
REVISED: N/A

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

SR 1141 (Cumberland Road)
at
SR 1219 (Ireland Drive)/
SR 1249 (Pine Springs Drive)

Division 6 | Cumberland County | Fayetteville

PLAN DATE: July 2016	REVIEWED BY: BAS
PREPARED BY: S. Armstrong	REVIEWED BY:

REVISIONS	INIT.	DATE
1 Added PEDs.(JP)	KMM	12/13/2017

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036880 ENGINEER KEITH M. MIMS
DocuSigned by: Keith M. Mims 2F80786E8CD34A5... 8-4-16 DATE

SIG. INVENTORY NO. 06-0446