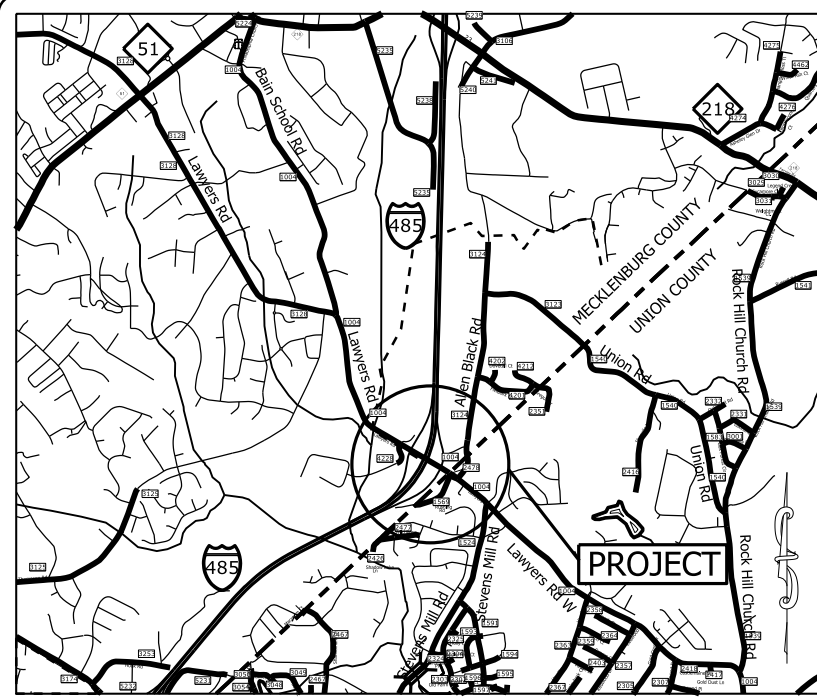


**PROJECT: 47660.3.1 TIP: SM-5710C**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	47660.3.1	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47660.1.1		P.E.	
47660.2.1		R/W	
47660.3.1		CONST.	

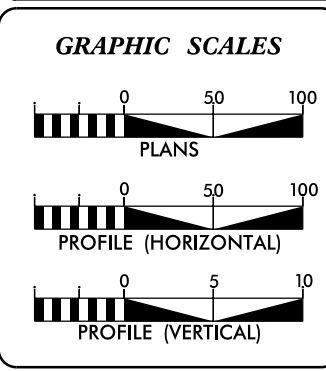
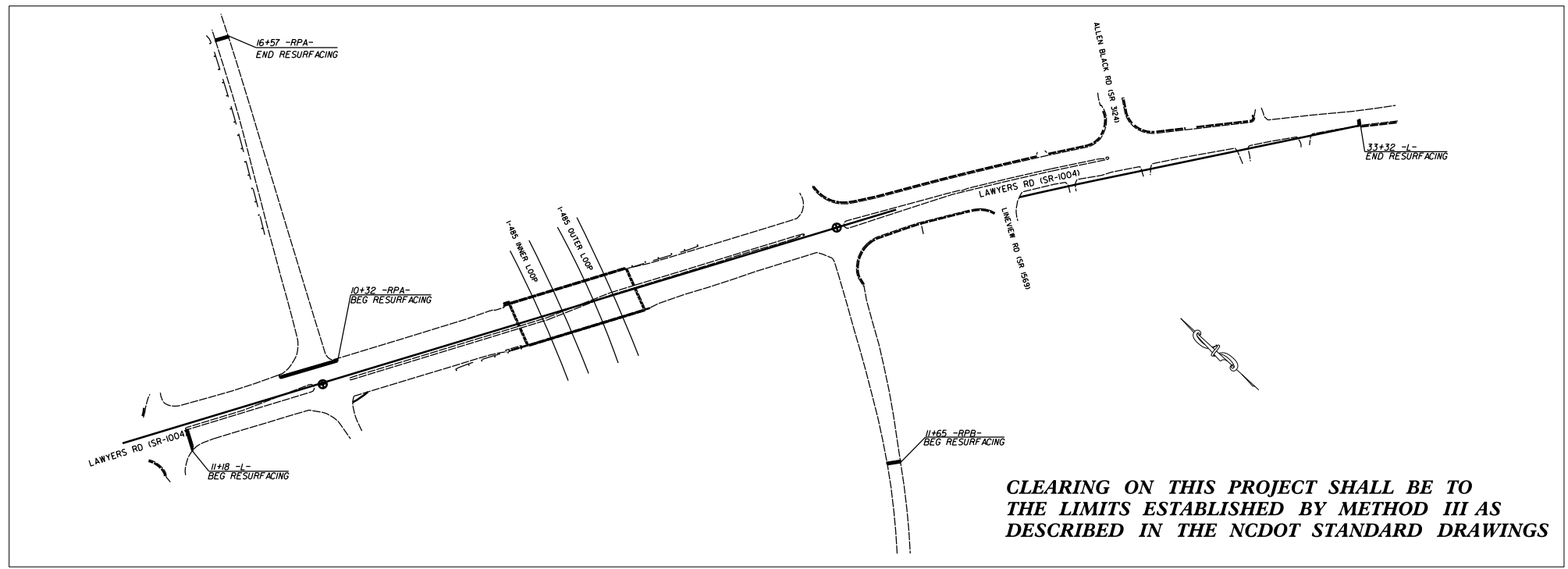


VICINITY MAP NOT TO SCALE

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**MECKLENBURG COUNTY**

**LOCATION:** LAWYERS RD. (SR-1004) AT I-485

**TYPE OF WORK:** GRADING, MILLING, PAVING, AND THERMOPLASTIC PAVEMENT MARKINGS.



**DESIGN DATA**

ADT	=	
ADT	=	
DHV	=	%
D	=	%
T	=	%
V	=	MPH

**PROJECT LENGTH**

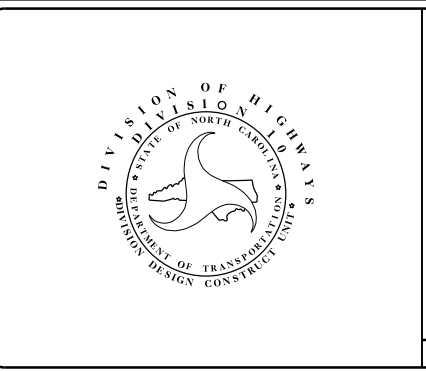
LENGTH OF ROADWAY PROJECT	=	0.61	MILES
TOTAL LENGTH OF STATE PROJECT	=	0.61	MILES

Prepared In the Office of:  
**DIVISION OF HIGHWAYS**  
DIVISION TEN  
DIVISION DESIGN / CONSTRUCT UNIT

---

2018 STANDARD SPECIFICATIONS

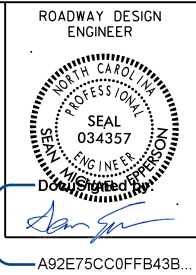
<b>RIGHT OF WAY DATE:</b>	<b>DONALD HARWARD</b> PROJECT ENGINEER
<b>LETTING DATE:</b>	<b>DONALD HARWARD</b> PROJECT DESIGN ENGINEER



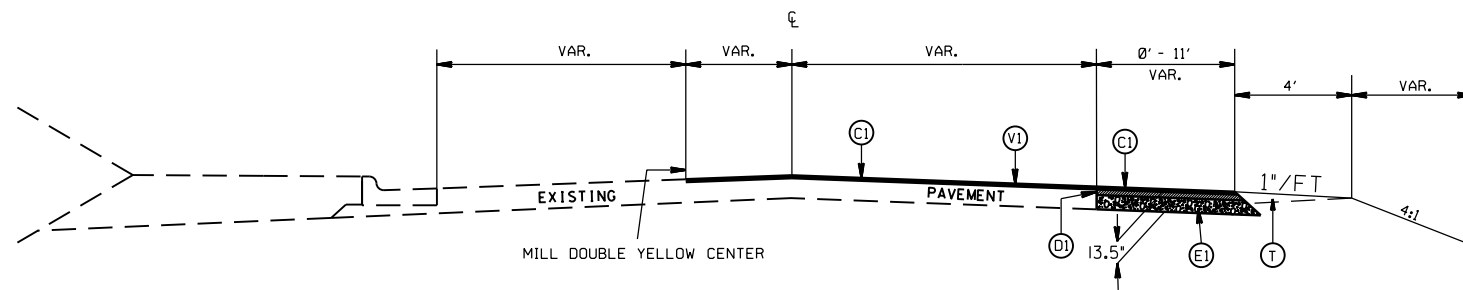
ROADWAY DESIGN ENGINEER

DocuSigned by:  
*Michael Eppersok*

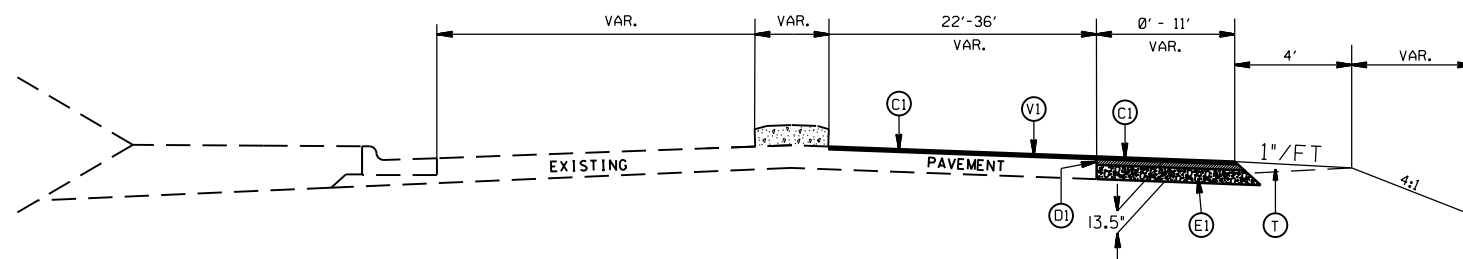
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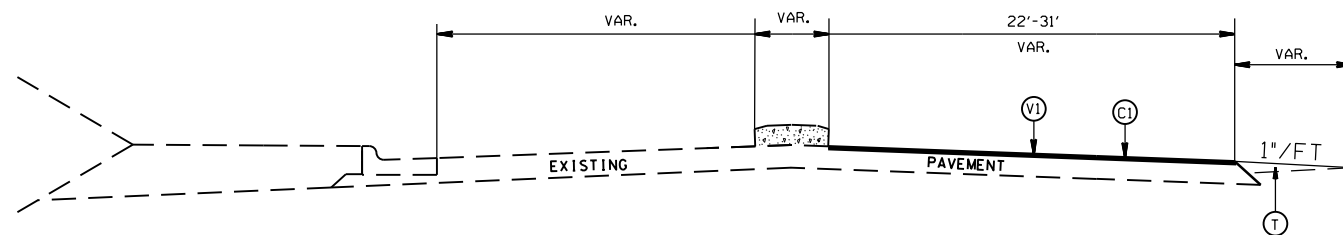
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TYPICAL SECTION NO. 3  
STA. 28+69.86 TO 33+32.00 -L-



TYPICAL SECTION NO. 2  
STA. 14+20.00 TO 14+55.27 -L-  
STA. 26+94.88 TO 28+69.86 -L-



TYPICAL SECTION NO. 1  
STA. 11+18.00 TO 14+23.23 -L-  
STA. 14+55.27 TO 17+56.00 -L-  
STA. 19+77.00 TO 26+94.88 -L-

### PAVEMENT SCHEDULE

(C1)	PROP. APPROX. 1.5" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
(D1)	PROP. APPROX. 4" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
(E1)	PROP. APPROX. 8" ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
(T)	EARTH MATERIAL
(V1)	MILLING ASPHALT PAVEMENT, 1.5" IN DEPTH

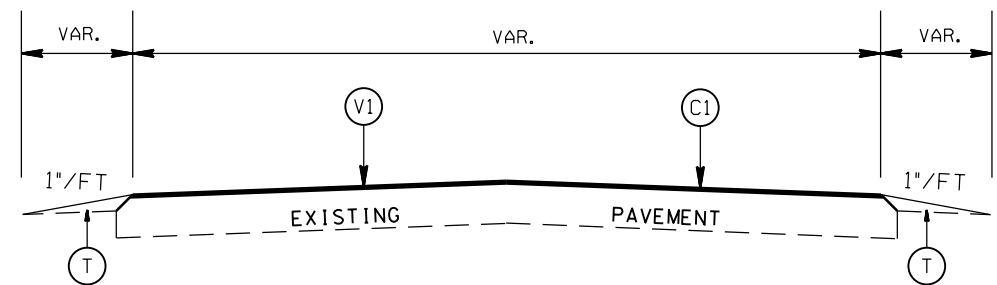
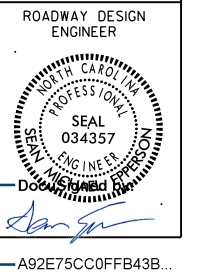
BRIDGE 17+56 TO 19+77

I-485 AT LAWYERS INTERCHANGE

SCALE	N/A
DATE	1-2019
DWG. BY	JCB
DESIGN BY	TBL
APPROVED	JDH



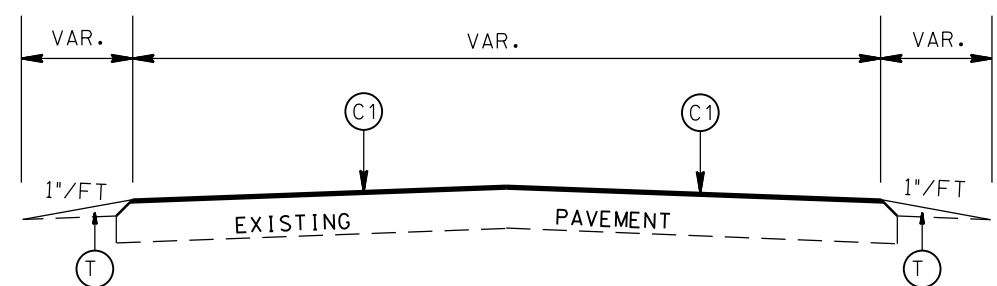
REVISIONS	



TYPICAL SECTION NO. 5  
STA. 14+85.00 TO 15+70.00 -RPB-

PAVEMENT SCHEDULE

(C1)	PROP. APPROX. 1.5" ASPHALT CONC. SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
(D1)	PROP. APPROX. 4" ASPHALT CONC. INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
(E1)	PROP. APPROX. 8" ASPHALT CONC. BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
(T)	EARTH MATERIAL
(V1)	MILLING ASPHALT PAVEMENT, 1.5" IN DEPTH

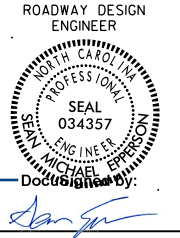


TYPICAL SECTION NO. 4  
STA. 10+32.00 TO 16+57.00 -RPA-  
STA. 11+65.00 TO 14+85.00 -RPB-

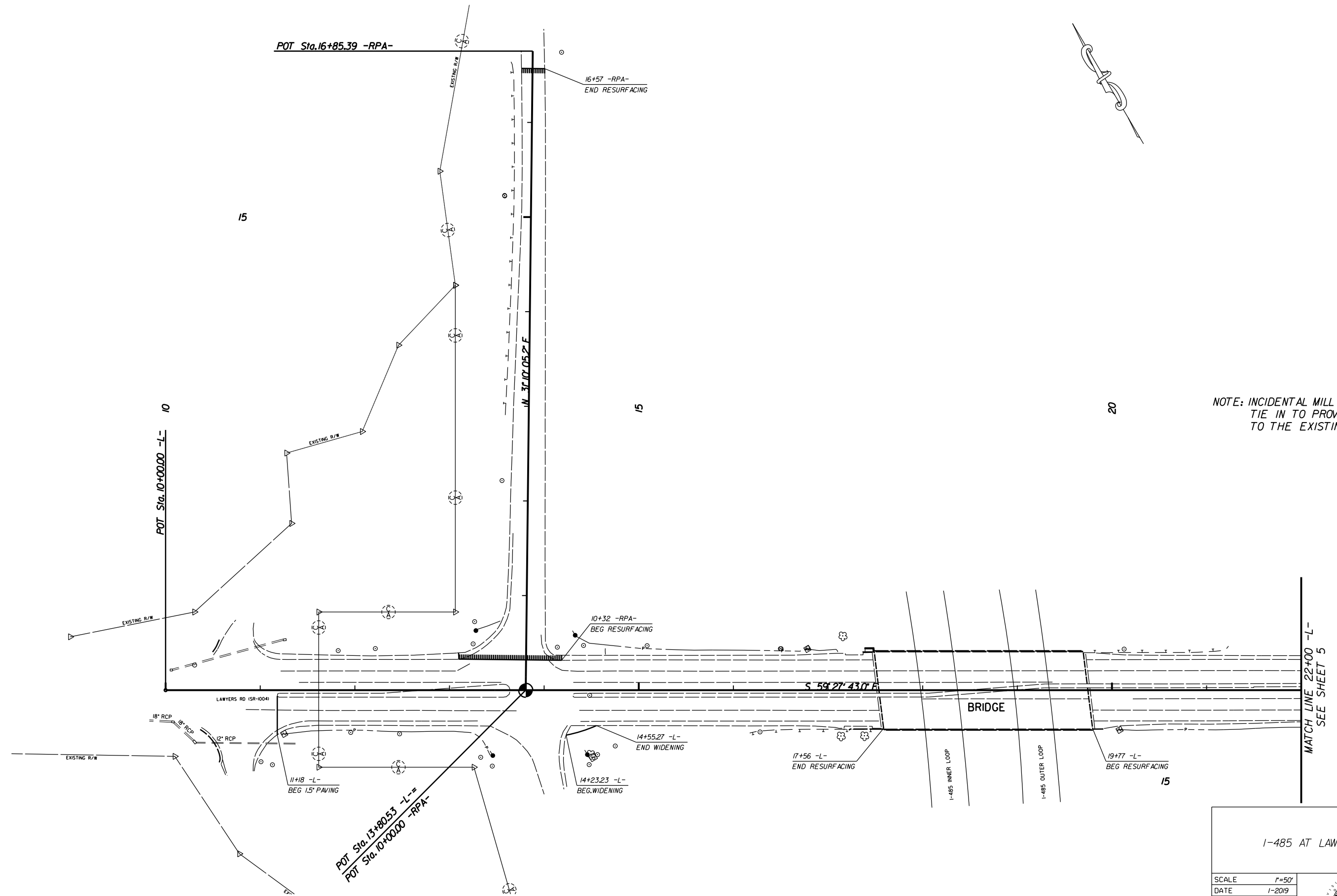
I-485 AT LAWYERS INTERCHANGE

SCALE	N/A		REVISIONS
DATE	1-2019		
DWG. BY	JCB		
DESIGN BY	TBL		
APPROVED	JDH		


PROJECT NO.	SHEET NO.
47660.3.1	4
F.A. PROJECT NO.	



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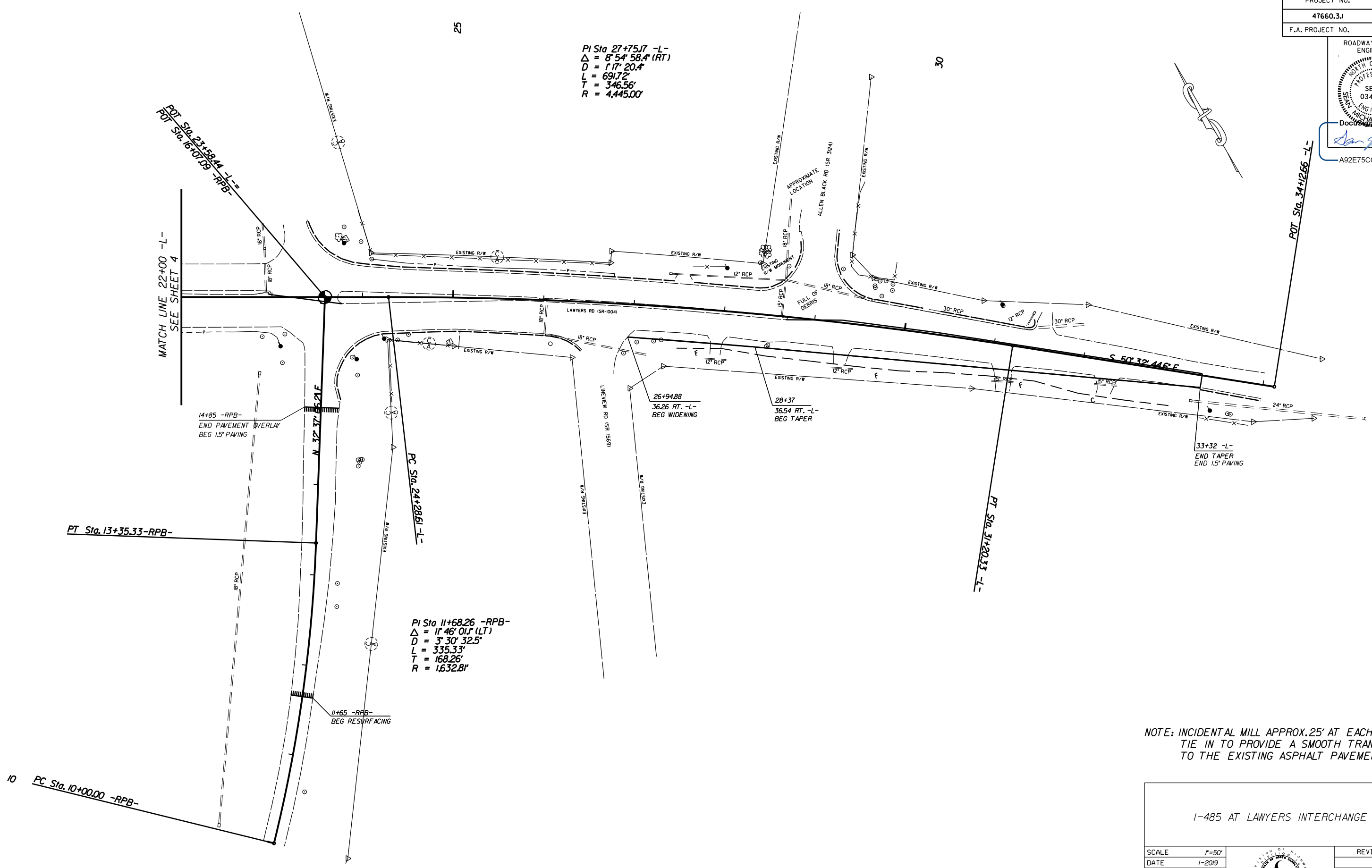
NOTE: INCIDENTAL MILL APPROX. 25' AT EACH TIE IN TO PROVIDE A SMOOTH TRANSITION TO THE EXISTING ASPHALT PAVEMENT.

I-485 AT LAWYERS INTERCHANGE			REVISIONS	
SCALE	r=50'			
DATE	1-2019			
DWG. BY	TBL			
DESIGN BY	JDH			
APPROVED	JDH			

ROADWAY DESIGN ENGINEER  
 SEAL  
 034357  
 MICHAEL J. SPENCER  
 Document by: [Signature]  
 A92E75CC0FFB43B...

PI Sta 27+75.77 -L-  
 $\Delta = 8^{\circ}54'58.4"$  (RT)  
 $D = 17^{\circ}20.4'$   
 $L = 691.72'$   
 $T = 346.56'$   
 $R = 4,445.00'$

PI Sta 11+68.26 -RPB-  
 $\Delta = 11^{\circ}46'01.7"$  (LT)  
 $D = 3^{\circ}30'32.5"$   
 $L = 335.33'$   
 $T = 168.26'$   
 $R = 1,632.81'$



NOTE: INCIDENTAL MILL APPROX. 25' AT EACH TIE IN TO PROVIDE A SMOOTH TRANSITION TO THE EXISTING ASPHALT PAVEMENT.

I-485 AT LAWYERS INTERCHANGE			
SCALE	1"=50'	REVISIONS	
DATE	1-2019		
DWG. BY	TBL		
DESIGN BY	JDH		
APPROVED	JDH		

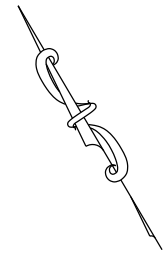


PROJECT NO.	SHEET NO.
47660.3.1	6
F.A. PROJECT NO.	

ROADWAY DESIGN ENGINEER

Seal: 034357  
 Name: MICHAEL J. DOHERTY  
 Title: ENGINEER  
 State: NORTH CAROLINA

DocuSign by: *[Signature]*  
 A92E75CC0FFB43B...



POT Sta. 16+85.39 -RPA-

15

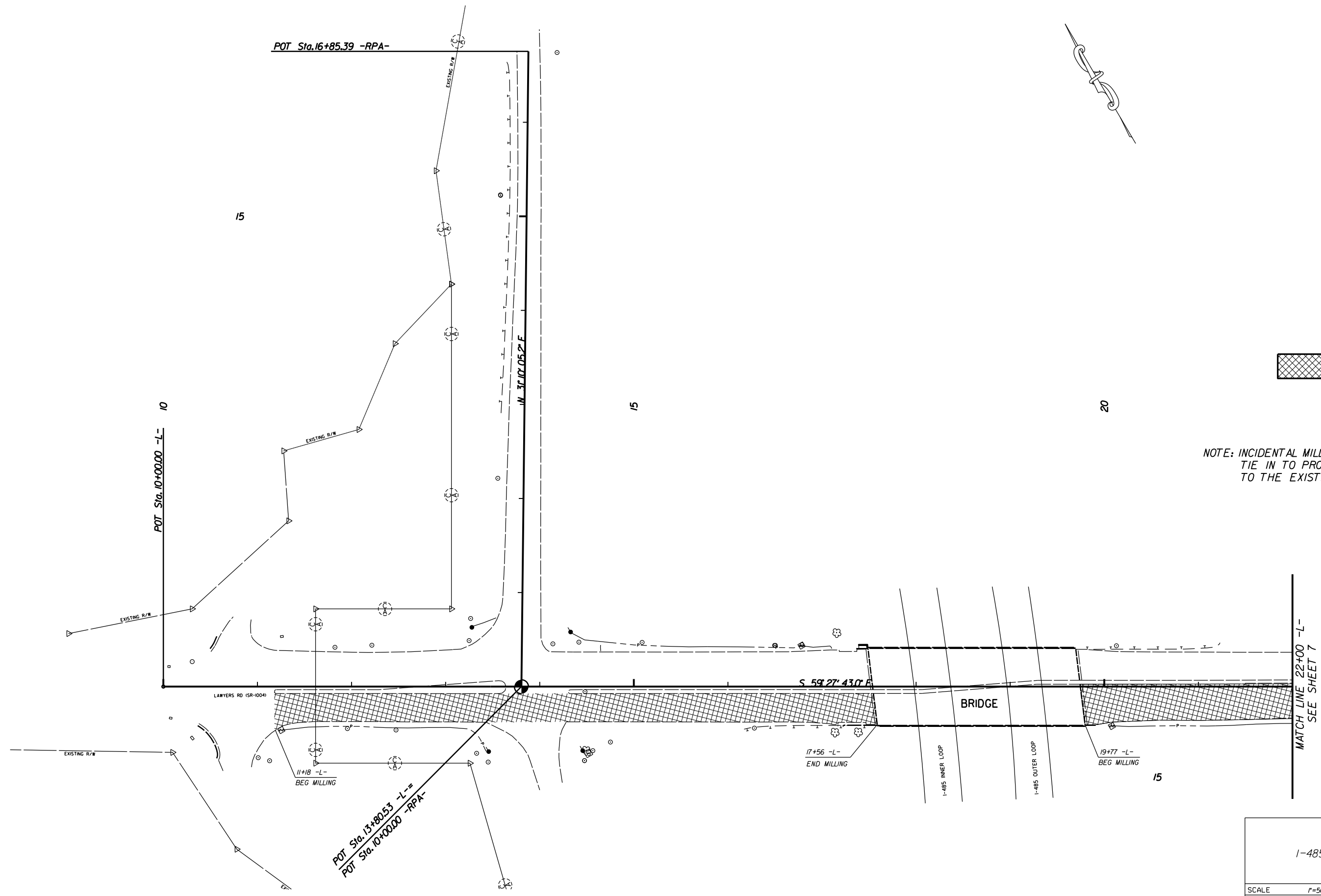
POT Sta. 10+00.00 -L-

15

20

MILLING AREA

NOTE: INCIDENTAL MILL APPROX. 25' AT EACH TIE IN TO PROVIDE A SMOOTH TRANSITION TO THE EXISTING ASPHALT PAVEMENT.



MATCH LINE 22+00 -L-  
SEE SHEET 7


1-485 AT LAWYERS INTERCHANGE

SCALE	1"=50'
DATE	1-2019
DWG. BY	TBL
DESIGN BY	JDH
APPROVED	JDH



REVISIONS	

ROADWAY DESIGN ENGINEER



Seal: 034357  
 Documented by: [Signature]  
 A92E75CC0FFB43B...

PI Sta 27+75.77 -L-  
 $\Delta = 8^\circ 54' 58.4" (RT)$   
 $D = 17' 20.4"$   
 $L = 691.72'$   
 $T = 346.56'$   
 $R = 4,445.00'$

PI Sta 11+68.26 -RPB-  
 $\Delta = 11^\circ 46' 01.7" (LT)$   
 $D = 3^\circ 30' 32.5"$   
 $L = 335.33'$   
 $T = 168.26'$   
 $R = 1,632.81'$

 MILLING AREA

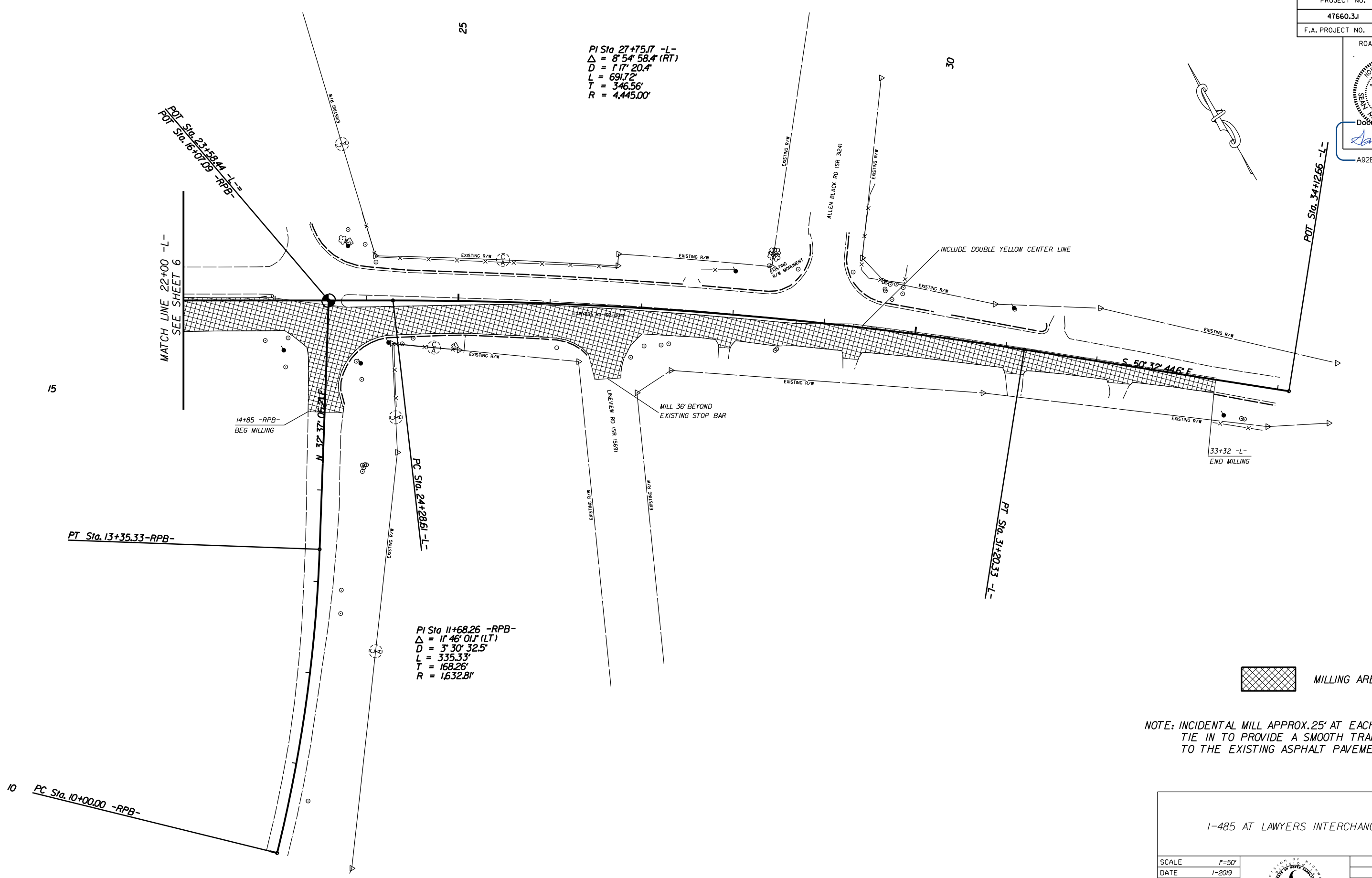
NOTE: INCIDENTAL MILL APPROX. 25' AT EACH TIE IN TO PROVIDE A SMOOTH TRANSITION TO THE EXISTING ASPHALT PAVEMENT.

I-485 AT LAWYERS INTERCHANGE

SCALE	1"=50'
DATE	1-2019
DWG. BY	TBL
DESIGN BY	JDH
APPROVED	JDH



REVISIONS	



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	47660.3.1	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47660.1.1		P.E.	
47660.2.1		RW	
47660.3.1		CONST.	

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  

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**PLAN FOR PROPOSED  
HIGHWAY EROSION CONTROL**

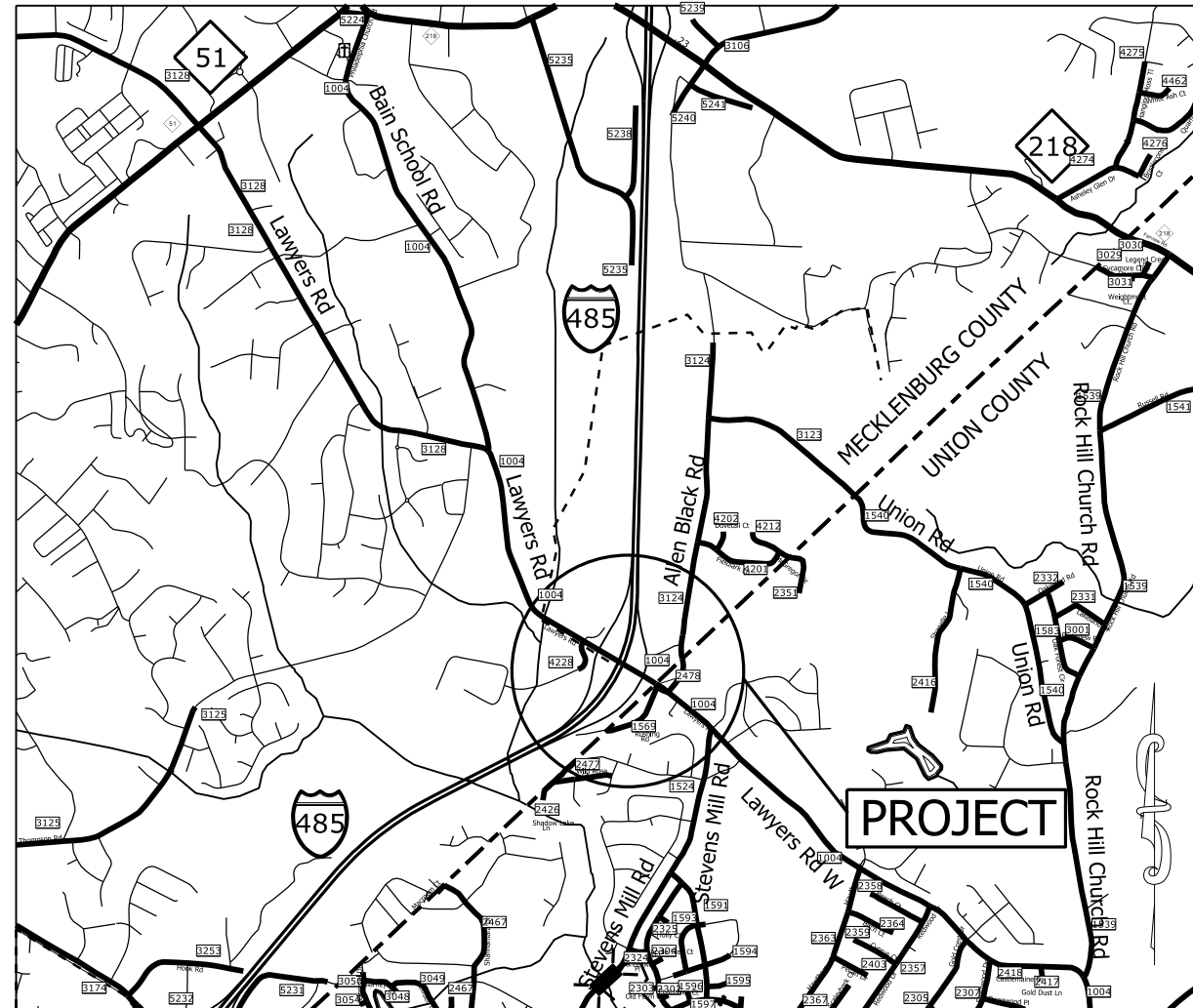
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**EROSION AND SEDIMENT CONTROL MEASURES**

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

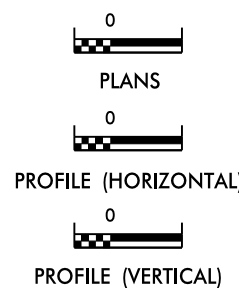
THIS PROJECT CONTAINS  
EROSION CONTROL PLANS  
FOR CLEARING AND  
GRUBBING PHASE OF  
CONSTRUCTION.



VICINITY MAP NOT TO SCALE

**PROJECT: 47660.3.1 TIP: SM-5710C**

**GRAPHIC SCALE**



ROADSIDE ENVIRONMENTAL UNIT  
DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY  
WITH THE REGULATIONS SET FORTH BY THE  
NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011  
ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND  
NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared in the Office of:  
**DDC UNIT DIVISION 10**  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
**2018 STANDARD SPECIFICATIONS**

**TRAVIS LOWDER**  
EROSION CONTROL DESIGNER

3742  
LEVEL III CERTIFICATION NO.

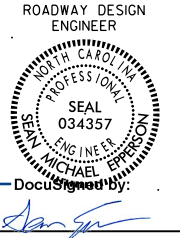
**Roadway Standard Drawings**

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

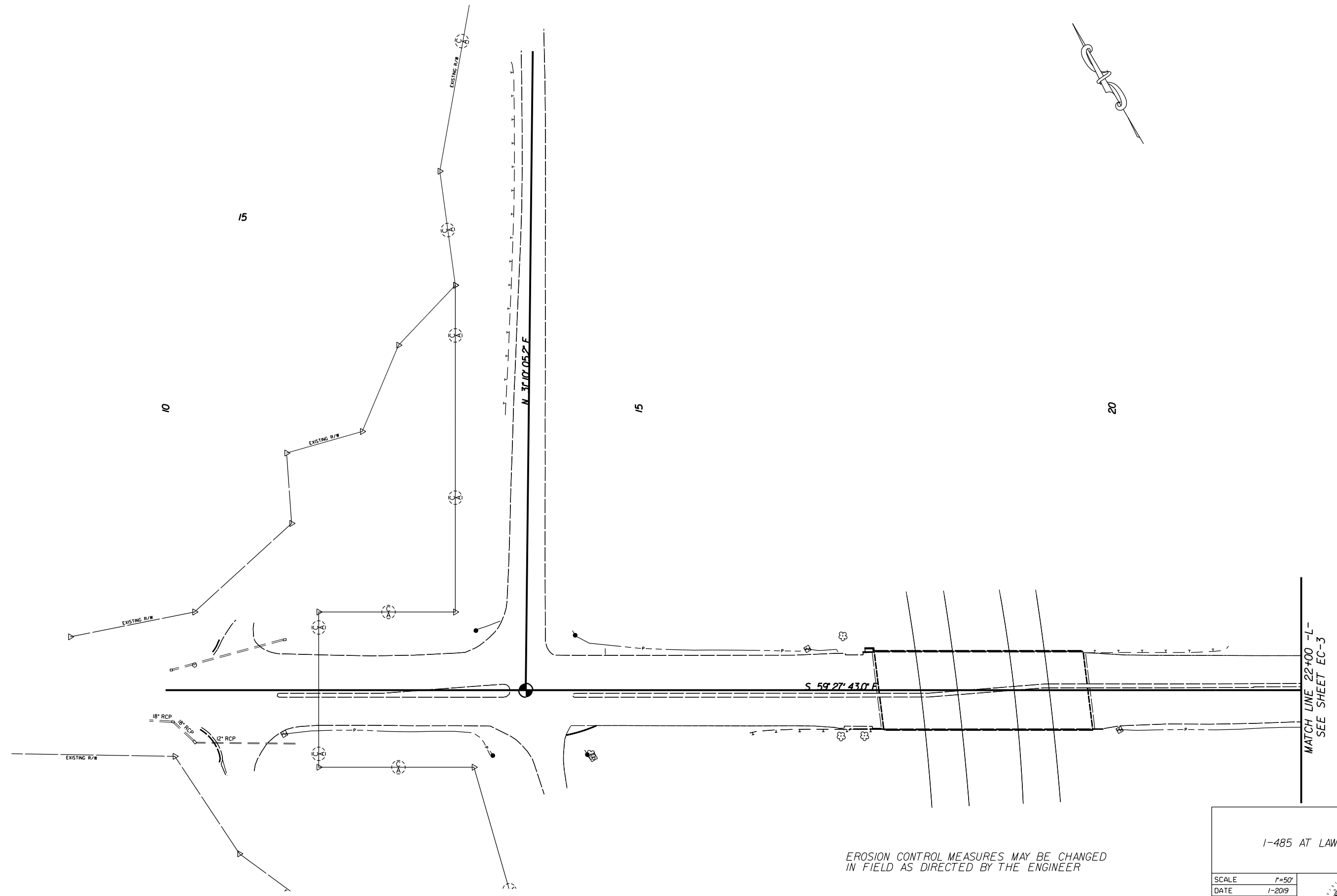
1604.01 Railroad Erosion Control Detail	1632.01 Rock Inlet Sediment Trap Type A
1605.01 Temporary Silt Fence	1632.02 Rock Inlet Sediment Trap Type B
1606.01 Special Sediment Control Fence	1632.03 Rock Inlet Sediment Trap Type C
1607.01 Gravel Construction Entrance	1633.01 Temporary Rock Silt Check Type A
1622.01 Temporary Berms and Slope Drains	1633.02 Temporary Rock Silt Check Type B
1630.01 Riser Basin	1633.03 Temporary Rock Silt Check Type C
1630.02 Silt Basin Type 3	1634.01 Temporary Rock Sediment Dam Type A
1630.03 Temporary Silt Ditch	1634.02 Temporary Rock Sediment Dam Type B
1630.04 Stilling Basin	1635.01 Rock Pipe Inlet Sediment Trap Type A
1630.05 Temporary Diversion	1635.02 Rock Pipe Inlet Sediment Trap Type B
1630.06 Special Stilling Basin	1640.01 Coir Fiber Jaffle
1631.01 Matting Installation	1645.01 Temporary Stream Crossing



PROJECT NO.	SHEET NO.
47660.3.I	EC-2
F.A. PROJECT NO.	



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EROSION CONTROL MEASURES MAY BE CHANGED  
IN FIELD AS DIRECTED BY THE ENGINEER

I-485 AT LAWYERS INTERCHANGE

SCALE	1"=50'
DATE	1-2019
DWG. BY	TBL
DESIGN BY	JDH
APPROVED	JDH



REVISIONS	

ROADWAY DESIGN ENGINEER

DocuSign by: *Michael J. Johnson*

A92E75CC0FFB43B...

PI Sta 27+75.77 -L-  
 $\Delta = 8^{\circ} 54' 58.4''$  (RT)  
 $D = 117^{\circ} 20.4''$   
 $L = 691.72'$   
 $T = 346.56'$   
 $R = 4,445.00'$

PI Sta 11+68.26 -RPB-  
 $\Delta = 11^{\circ} 46' 01.1''$  (LT)  
 $D = 3^{\circ} 30' 32.5''$   
 $L = 335.33'$   
 $T = 168.26'$   
 $R = 1,632.81'$

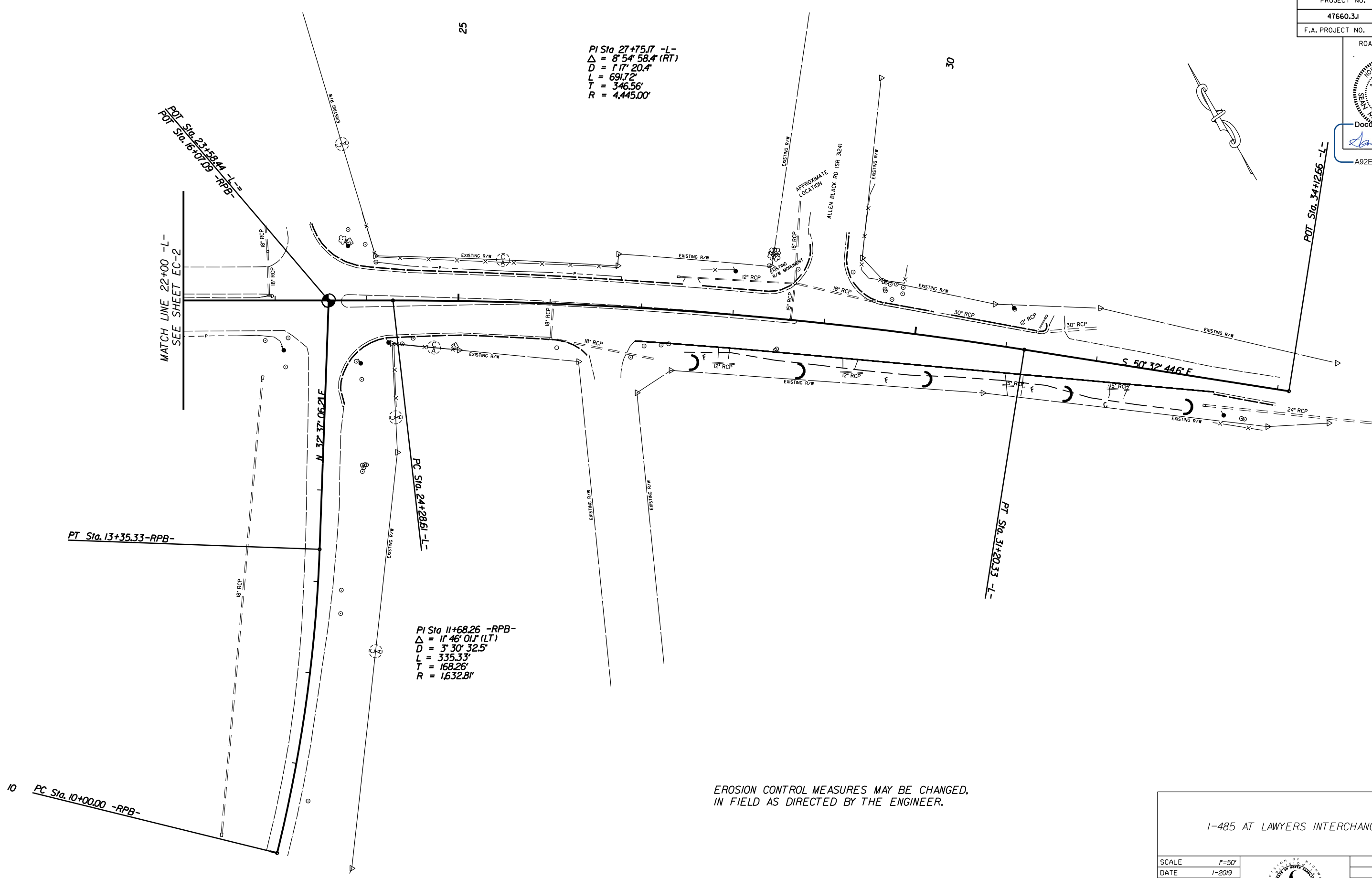
EROSION CONTROL MEASURES MAY BE CHANGED, IN FIELD AS DIRECTED BY THE ENGINEER.

I-485 AT LAWYERS INTERCHANGE

SCALE	1"=50'
DATE	1-2019
DWG. BY	TBL
DESIGN BY	JDH
APPROVED	JDH

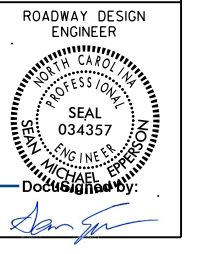


REVISIONS	



PAVEMENT MARKING SCHEDULE

PROJECT NO.	SHEET NO.
47660.3.I	PMP-1
F.A. PROJECT NO.	



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PAVEMENT MARKING LINES

- |   |  |
|---|--|
| TA - WHITE EDGELINE (4',.90 MIL)              | TU - WHITE DIAGONAL (12',.90 MIL)                            |
| TB - YELLOW EDGELINE (4',.90 MIL)             | TV - YELLOW DIAGONAL (12',.90 MIL)                           |
| TC - 10FT. WHITE SKIP (4',.90 MIL)            | T1 - WHITE LINE, RR X (16',.90 MIL)                          |
| TD - 3FT.-9FT./SP WHITE MINISKIP (4',.90 MIL) | T2 - WHITE STOPBAR (24',.90 MIL)                             |
| TE - WHITE SOLID LANE LINE (4',.90 MIL)       | T3 - WHITE CROSSWALK LINE (24',.90 MIL)                      |
| TF - 10FT. YELLOW SKIP (4',.90 MIL)           | T4 - WHITE RUMBLE STRIP (4",.240 MIL)                        |
| TH - YELLOW SINGLE CENTER (4',.90 MIL)        | T5 - YELLOW RUMBLE STRIP (4",.240 MIL)                       |
| TJ - YELLOW DOUBLE CENTER (4',.90 MIL)        | T6 - WHITE EDGELINE (6',.90 MIL)                             |
| TK - 10FT. WHITE SKIP (6',.90 MIL)            | T7 - YELLOW EDGELINE (6',.90 MIL)                            |
| TL - 3FT.-9FT./SP WHITE MINISKIP (6',.90 MIL) | T8 - 2FT.-6FT./SP WHITE MINISKIP (4',.90 MIL)                |
| TM - WHITE SOLID LANE LINE (6',.90 MIL)       | T9 - 2FT.-6FT./SP YELLOW MINISKIP (4',.90 MIL)               |
| TN - 10FT. YELLOW SKIP (6',.90 MIL)           | T10 - 3FT.-3FT./SP WHITE MINISKIP (12',.90 MIL)              |
| TO - WHITE GORELINE (8',.90 MIL)              | T11 - 2FT.-6FT./SP WHITE MINISKIP (6',.90 MIL)               |
| TP - WHITE DIAGONAL (8',.90 MIL)              | T12 - 2FT.-6FT./SP YELLOW MINISKIP (6',.90 MIL)              |
| TQ - WHITE CROSSWALK LINE (8',.90 MIL)        | T13 - 3FT.-9FT./SP WHITE MINISKIP (8',.90 MIL)               |
| TR - WHITE SOLID LANE LINE (8',.90 MIL)       | T14 - 3FT.-9FT./SP WHITE MINISKIP (12',.90 MIL)              |
| TS - WHITE GORELINE (12',.90 MIL)             | T15 - YELLOW SINGLE CENTER (6',.90 MIL)                      |
| TT - WHITE SOLID LANE LINE (12',.90 MIL)      | T16 - YELLOW DOUBLE CENTER (6',.90 MIL)                      |
|   | T17 - 3FT.-3FT./SP WHITE MINISKIP ENTRANCE LINE (8',.90 MIL) |

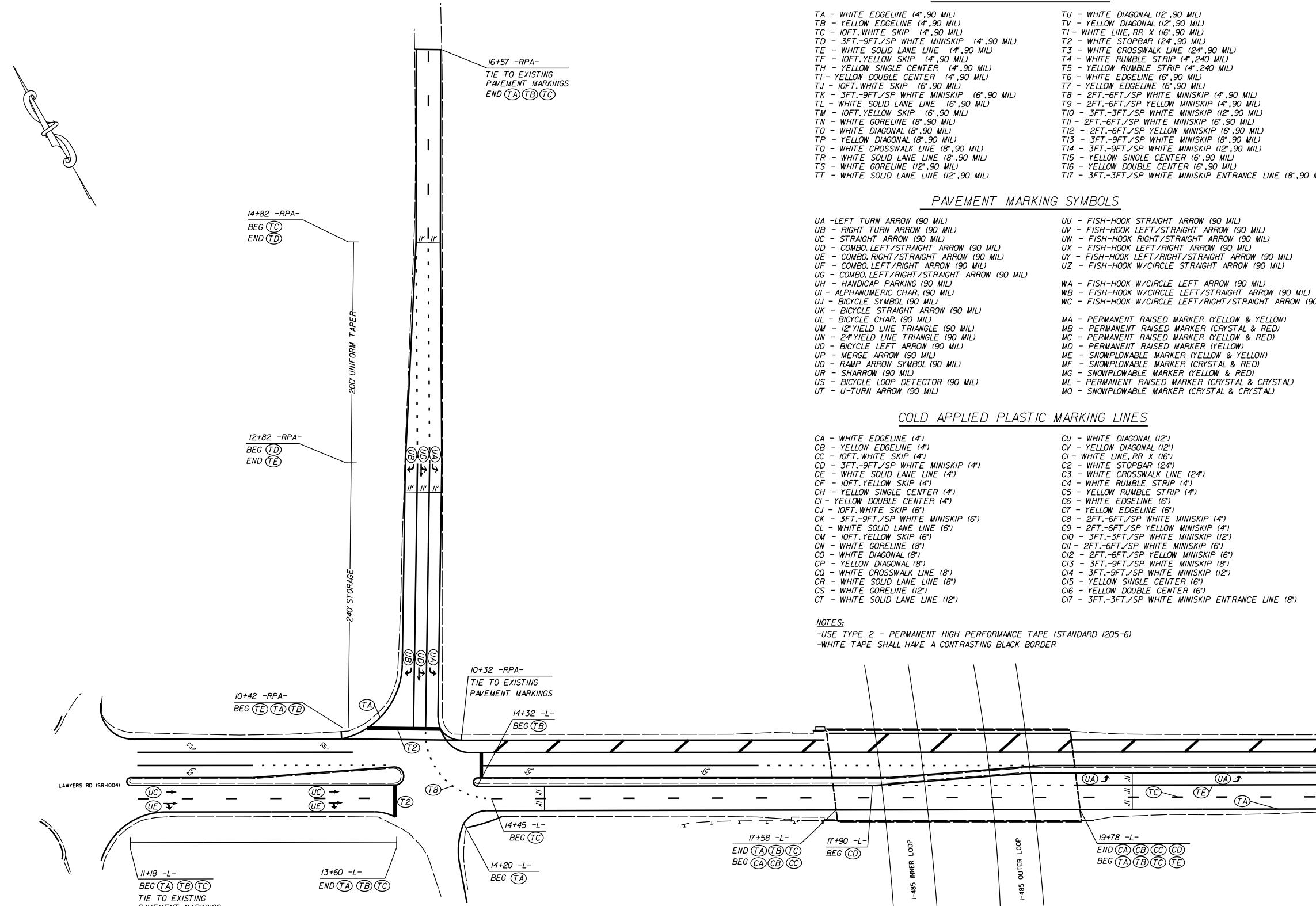
PAVEMENT MARKING SYMBOLS

- |  |  |
|--|--|
| UA - LEFT TURN ARROW (90 MIL)                  | UU - FISH-HOOK STRAIGHT ARROW (90 MIL)                     |
| UB - RIGHT TURN ARROW (90 MIL)                 | UV - FISH-HOOK LEFT/STRAIGHT ARROW (90 MIL)                |
| UC - STRAIGHT ARROW (90 MIL)                   | UW - FISH-HOOK RIGHT/STRAIGHT ARROW (90 MIL)               |
| UD - COMBO. LEFT/STRAIGHT ARROW (90 MIL)       | UX - FISH-HOOK LEFT/RIGHT ARROW (90 MIL)                   |
| UE - COMBO. RIGHT/STRAIGHT ARROW (90 MIL)      | UY - FISH-HOOK LEFT/RIGHT/STRAIGHT ARROW (90 MIL)          |
| UF - COMBO. LEFT/RIGHT ARROW (90 MIL)          | UZ - FISH-HOOK W/CIRCLE STRAIGHT ARROW (90 MIL)            |
| UG - COMBO. LEFT/RIGHT/STRAIGHT ARROW (90 MIL) | WA - FISH-HOOK W/CIRCLE LEFT ARROW (90 MIL)                |
| UH - HANDICAP PARKING (90 MIL)                 | WB - FISH-HOOK W/CIRCLE LEFT/STRAIGHT ARROW (90 MIL)       |
| UI - ALPHANUMERIC CHAR. (90 MIL)               | WC - FISH-HOOK W/CIRCLE LEFT/RIGHT/STRAIGHT ARROW (90 MIL) |
| UJ - BICYCLE SYMBOL (90 MIL)                   |  |
| UK - BICYCLE STRAIGHT ARROW (90 MIL)           | MA - PERMANENT RAISED MARKER (YELLOW & YELLOW)             |
| UL - BICYCLE CHAR. (90 MIL)                    | MB - PERMANENT RAISED MARKER (CRYSTAL & RED)               |
| UM - 12" YIELD LINE TRIANGLE (90 MIL)          | MC - PERMANENT RAISED MARKER (YELLOW & RED)                |
| UN - 24" YIELD LINE TRIANGLE (90 MIL)          | MD - PERMANENT RAISED MARKER (YELLOW)                      |
| UO - BICYCLE LEFT ARROW (90 MIL)               | ME - SNOWPLOWABLE MARKER (YELLOW & YELLOW)                 |
| UP - MERGE ARROW (90 MIL)                      | MF - SNOWPLOWABLE MARKER (CRYSTAL & RED)                   |
| UQ - RAMP ARROW SYMBOL (90 MIL)                | MG - SNOWPLOWABLE MARKER (YELLOW & RED)                    |
| UR - SHARROW (90 MIL)                          | ML - PERMANENT RAISED MARKER (CRYSTAL & CRYSTAL)           |
| US - BICYCLE LOOP DETECTOR (90 MIL)            | MO - SNOWPLOWABLE MARKER (CRYSTAL & CRYSTAL)               |
| UT - U-TURN ARROW (90 MIL)                     |  |

COLD APPLIED PLASTIC MARKING LINES

- |                                       |  |
|---------------------------------------|--|
| CA - WHITE EDGELINE (4')              | CU - WHITE DIAGONAL (12')                            |
| CB - YELLOW EDGELINE (4')             | CV - YELLOW DIAGONAL (12')                           |
| CC - 10FT. WHITE SKIP (4')            | C1 - WHITE LINE, RR X (16')                          |
| CD - 3FT.-9FT./SP WHITE MINISKIP (4') | C2 - WHITE STOPBAR (24')                             |
| CE - WHITE SOLID LANE LINE (4')       | C3 - WHITE CROSSWALK LINE (24')                      |
| CF - 10FT. YELLOW SKIP (4')           | C4 - WHITE RUMBLE STRIP (4')                         |
| CH - YELLOW SINGLE CENTER (4')        | C5 - YELLOW RUMBLE STRIP (4')                        |
| CI - YELLOW DOUBLE CENTER (4')        | C6 - WHITE EDGELINE (6')                             |
| CJ - 10FT. WHITE SKIP (6')            | C7 - YELLOW EDGELINE (6')                            |
| CK - 3FT.-9FT./SP WHITE MINISKIP (6') | C8 - 2FT.-6FT./SP WHITE MINISKIP (4')                |
| CL - WHITE SOLID LANE LINE (6')       | C9 - 2FT.-6FT./SP YELLOW MINISKIP (4')               |
| CM - 10FT. YELLOW SKIP (6')           | C10 - 3FT.-3FT./SP WHITE MINISKIP (12')              |
| CN - WHITE GORELINE (8')              | C11 - 2FT.-6FT./SP WHITE MINISKIP (6')               |
| CO - WHITE DIAGONAL (8')              | C12 - 2FT.-6FT./SP YELLOW MINISKIP (6')              |
| CP - YELLOW DIAGONAL (8')             | C13 - 3FT.-9FT./SP WHITE MINISKIP (8')               |
| CQ - WHITE CROSSWALK LINE (8')        | C14 - 3FT.-9FT./SP WHITE MINISKIP (12')              |
| CR - WHITE SOLID LANE LINE (8')       | C15 - YELLOW SINGLE CENTER (6')                      |
| CS - WHITE GORELINE (12')             | C16 - YELLOW DOUBLE CENTER (6')                      |
| CT - WHITE SOLID LANE LINE (12')      | C17 - 3FT.-3FT./SP WHITE MINISKIP ENTRANCE LINE (8') |

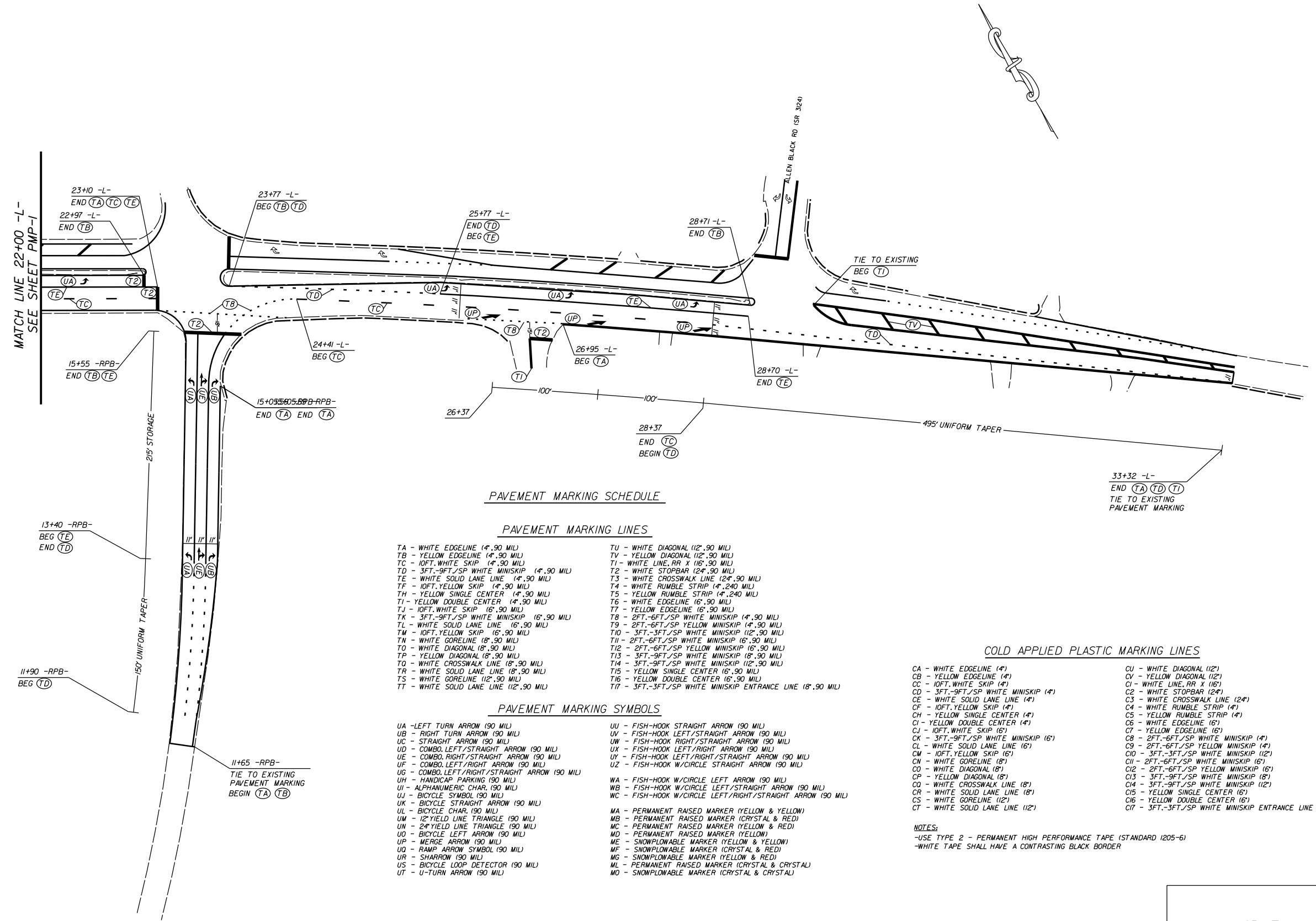
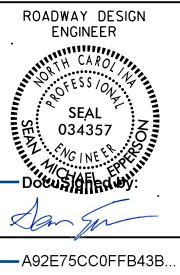
- NOTES:  
 -USE TYPE 2 - PERMANENT HIGH PERFORMANCE TAPE (STANDARD 1205-6)  
 -WHITE TAPE SHALL HAVE A CONTRASTING BLACK BORDER



MATCH LINE 22+00 -L- SEE SHEET PMP-2

I-485 AT LAWYERS INTERCHANGE

SCALE	1"=50'		REVISIONS
DATE	1-2019		
DWG. BY	TBL		
DESIGN BY	JDH		
APPROVED	JDH		



**PAVEMENT MARKING SCHEDULE**

**PAVEMENT MARKING LINES**

- |   |  |
|---|--|
| TA - WHITE EDGELINE (4', 90 MIL)              | TU - WHITE DIAGONAL (12', 90 MIL)                            |
| TB - YELLOW EDGELINE (4', 90 MIL)             | TV - YELLOW DIAGONAL (12', 90 MIL)                           |
| TC - 10FT. WHITE SKIP (4', 90 MIL)            | TI - WHITE LINE, RR X (16', 90 MIL)                          |
| TD - 3FT.-9FT./SP WHITE MINISKIP (4', 90 MIL) | T2 - WHITE STOPBAR (24', 90 MIL)                             |
| TE - WHITE SOLID LANE LINE (4', 90 MIL)       | T3 - WHITE CROSSWALK LINE (24', 90 MIL)                      |
| TF - 10FT. YELLOW SKIP (4', 90 MIL)           | T4 - WHITE RUMBLE STRIP (4', 240 MIL)                        |
| TH - YELLOW SINGLE CENTER (4', 90 MIL)        | T5 - YELLOW RUMBLE STRIP (4', 240 MIL)                       |
| TI - YELLOW DOUBLE CENTER (4', 90 MIL)        | T6 - WHITE EDGELINE (6', 90 MIL)                             |
| TJ - 10FT. WHITE SKIP (6', 90 MIL)            | T7 - YELLOW EDGELINE (6', 90 MIL)                            |
| TK - 3FT.-9FT./SP WHITE MINISKIP (6', 90 MIL) | T8 - 2FT.-6FT./SP WHITE MINISKIP (4', 90 MIL)                |
| TL - WHITE SOLID LANE LINE (6', 90 MIL)       | T9 - 2FT.-6FT./SP YELLOW MINISKIP (4', 90 MIL)               |
| TM - 10FT. YELLOW SKIP (6', 90 MIL)           | T10 - 3FT.-3FT./SP WHITE MINISKIP (12', 90 MIL)              |
| TN - WHITE GORELINE (8', 90 MIL)              | T11 - 2FT.-6FT./SP WHITE MINISKIP (6', 90 MIL)               |
| TO - WHITE DIAGONAL (8', 90 MIL)              | T12 - 2FT.-6FT./SP YELLOW MINISKIP (6', 90 MIL)              |
| TP - YELLOW DIAGONAL (8', 90 MIL)             | T13 - 3FT.-9FT./SP WHITE MINISKIP (12', 90 MIL)              |
| TQ - WHITE CROSSWALK LINE (8', 90 MIL)        | T14 - 3FT.-9FT./SP WHITE MINISKIP (12', 90 MIL)              |
| TR - WHITE SOLID LANE LINE (8', 90 MIL)       | T15 - YELLOW SINGLE CENTER (6', 90 MIL)                      |
| TS - WHITE GORELINE (12', 90 MIL)             | T16 - YELLOW DOUBLE CENTER (6', 90 MIL)                      |
| TT - WHITE SOLID LANE LINE (12', 90 MIL)      | T17 - 3FT.-3FT./SP WHITE MINISKIP ENTRANCE LINE (8', 90 MIL) |

**PAVEMENT MARKING SYMBOLS**

- |  |  |
|--|--|
| UA - LEFT TURN ARROW (90 MIL)                  | UU - FISH-HOOK STRAIGHT ARROW (90 MIL)                     |
| UB - RIGHT TURN ARROW (90 MIL)                 | UV - FISH-HOOK LEFT/STRAIGHT ARROW (90 MIL)                |
| UC - STRAIGHT ARROW (90 MIL)                   | UW - FISH-HOOK RIGHT/STRAIGHT ARROW (90 MIL)               |
| UD - COMBO. LEFT/STRAIGHT ARROW (90 MIL)       | UX - FISH-HOOK LEFT/RIGHT ARROW (90 MIL)                   |
| UE - COMBO. RIGHT/STRAIGHT ARROW (90 MIL)      | UY - FISH-HOOK LEFT/RIGHT/STRAIGHT ARROW (90 MIL)          |
| UF - COMBO. LEFT/RIGHT ARROW (90 MIL)          | UZ - FISH-HOOK W/CIRCLE STRAIGHT ARROW (90 MIL)            |
| UG - COMBO. LEFT/RIGHT/STRAIGHT ARROW (90 MIL) | WA - FISH-HOOK W/CIRCLE LEFT ARROW (90 MIL)                |
| UH - HANDICAP PARKING (90 MIL)                 | WB - FISH-HOOK W/CIRCLE LEFT/STRAIGHT ARROW (90 MIL)       |
| UI - ALPHANUMERIC CHAR. (90 MIL)               | WC - FISH-HOOK W/CIRCLE LEFT/RIGHT/STRAIGHT ARROW (90 MIL) |
| UJ - BICYCLE SYMBOL (90 MIL)                   | MA - PERMANENT RAISED MARKER (YELLOW & YELLOW)             |
| UK - BICYCLE STRAIGHT ARROW (90 MIL)           | MB - PERMANENT RAISED MARKER (CRYSTAL & RED)               |
| UL - BICYCLE CHAR. (90 MIL)                    | MC - PERMANENT RAISED MARKER (YELLOW & RED)                |
| UM - 12' YIELD LINE TRIANGLE (90 MIL)          | MD - PERMANENT RAISED MARKER (YELLOW)                      |
| UN - 24' YIELD LINE TRIANGLE (90 MIL)          | ME - SNOWPLOWABLE MARKER (YELLOW & YELLOW)                 |
| UO - BICYCLE LEFT ARROW (90 MIL)               | MF - SNOWPLOWABLE MARKER (CRYSTAL & RED)                   |
| UP - MERGE ARROW (90 MIL)                      | MG - SNOWPLOWABLE MARKER (YELLOW & RED)                    |
| UQ - RAMP ARROW SYMBOL (90 MIL)                | ML - PERMANENT RAISED MARKER (CRYSTAL & CRYSTAL)           |
| UR - SHARROW (90 MIL)                          | MO - SNOWPLOWABLE MARKER (CRYSTAL & CRYSTAL)               |
| US - BICYCLE LOOP DETECTOR (90 MIL)            |  |
| UT - U-TURN ARROW (90 MIL)                     |  |

**COLD APPLIED PLASTIC MARKING LINES**

- |                                       |  |
|---------------------------------------|--|
| CA - WHITE EDGELINE (4')              | CU - WHITE DIAGONAL (12')                            |
| CB - YELLOW EDGELINE (4')             | CV - YELLOW DIAGONAL (12')                           |
| CC - 10FT. WHITE SKIP (4')            | C1 - WHITE LINE, RR X (16')                          |
| CD - 3FT.-9FT./SP WHITE MINISKIP (4') | C2 - WHITE STOPBAR (24')                             |
| CE - WHITE SOLID LANE LINE (4')       | C3 - WHITE CROSSWALK LINE (24')                      |
| CF - 10FT. YELLOW SKIP (4')           | C4 - WHITE RUMBLE STRIP (4')                         |
| CH - YELLOW SINGLE CENTER (4')        | C5 - YELLOW RUMBLE STRIP (4')                        |
| CI - YELLOW DOUBLE CENTER (4')        | C6 - WHITE EDGELINE (6')                             |
| CJ - 10FT. WHITE SKIP (6')            | C7 - YELLOW EDGELINE (6')                            |
| CK - 3FT.-9FT./SP WHITE MINISKIP (6') | C8 - 2FT.-6FT./SP WHITE MINISKIP (4')                |
| CL - WHITE SOLID LANE LINE (6')       | C9 - 2FT.-6FT./SP YELLOW MINISKIP (4')               |
| CM - 10FT. YELLOW SKIP (6')           | C10 - 3FT.-3FT./SP WHITE MINISKIP (12')              |
| CN - WHITE GORELINE (8')              | C11 - 2FT.-6FT./SP WHITE MINISKIP (6')               |
| CO - WHITE DIAGONAL (8')              | C12 - 2FT.-6FT./SP YELLOW MINISKIP (6')              |
| CP - YELLOW DIAGONAL (8')             | C13 - 3FT.-9FT./SP WHITE MINISKIP (12')              |
| CQ - WHITE CROSSWALK LINE (8')        | C14 - 3FT.-9FT./SP WHITE MINISKIP (12')              |
| CR - WHITE SOLID LANE LINE (8')       | C15 - YELLOW SINGLE CENTER (6')                      |
| CS - WHITE GORELINE (12')             | C16 - YELLOW DOUBLE CENTER (6')                      |
| CT - WHITE SOLID LANE LINE (12')      | C17 - 3FT.-3FT./SP WHITE MINISKIP ENTRANCE LINE (8') |

**NOTES:**  
 -USE TYPE 2 - PERMANENT HIGH PERFORMANCE TAPE (STANDARD 1205-6)  
 -WHITE TAPE SHALL HAVE A CONTRASTING BLACK BORDER

I-485 AT LAWYERS INTERCHANGE

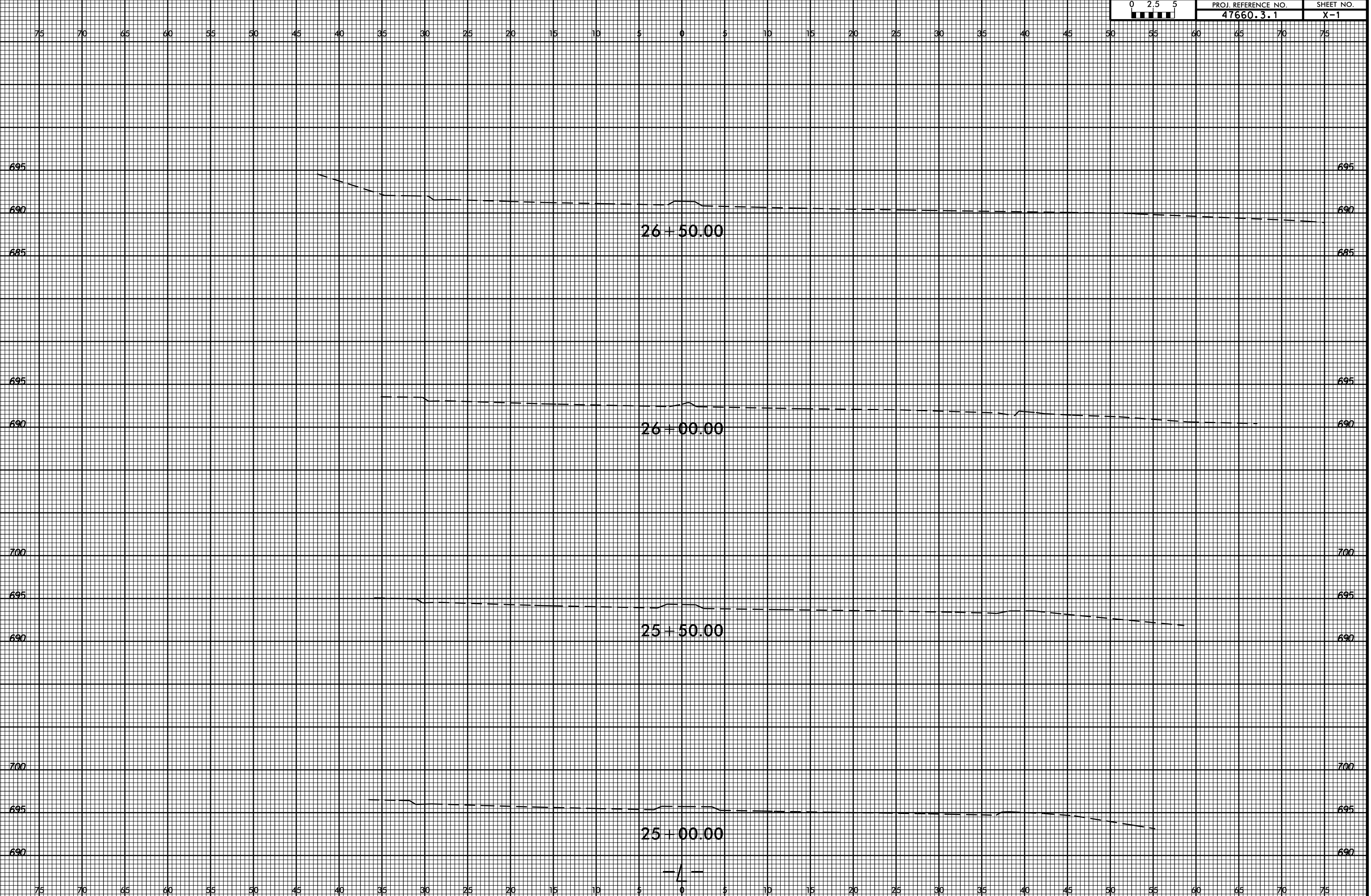
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DATE	1-2019		
DWG. BY	TBL		
DESIGN BY	JDH		
APPROVED	JDH		

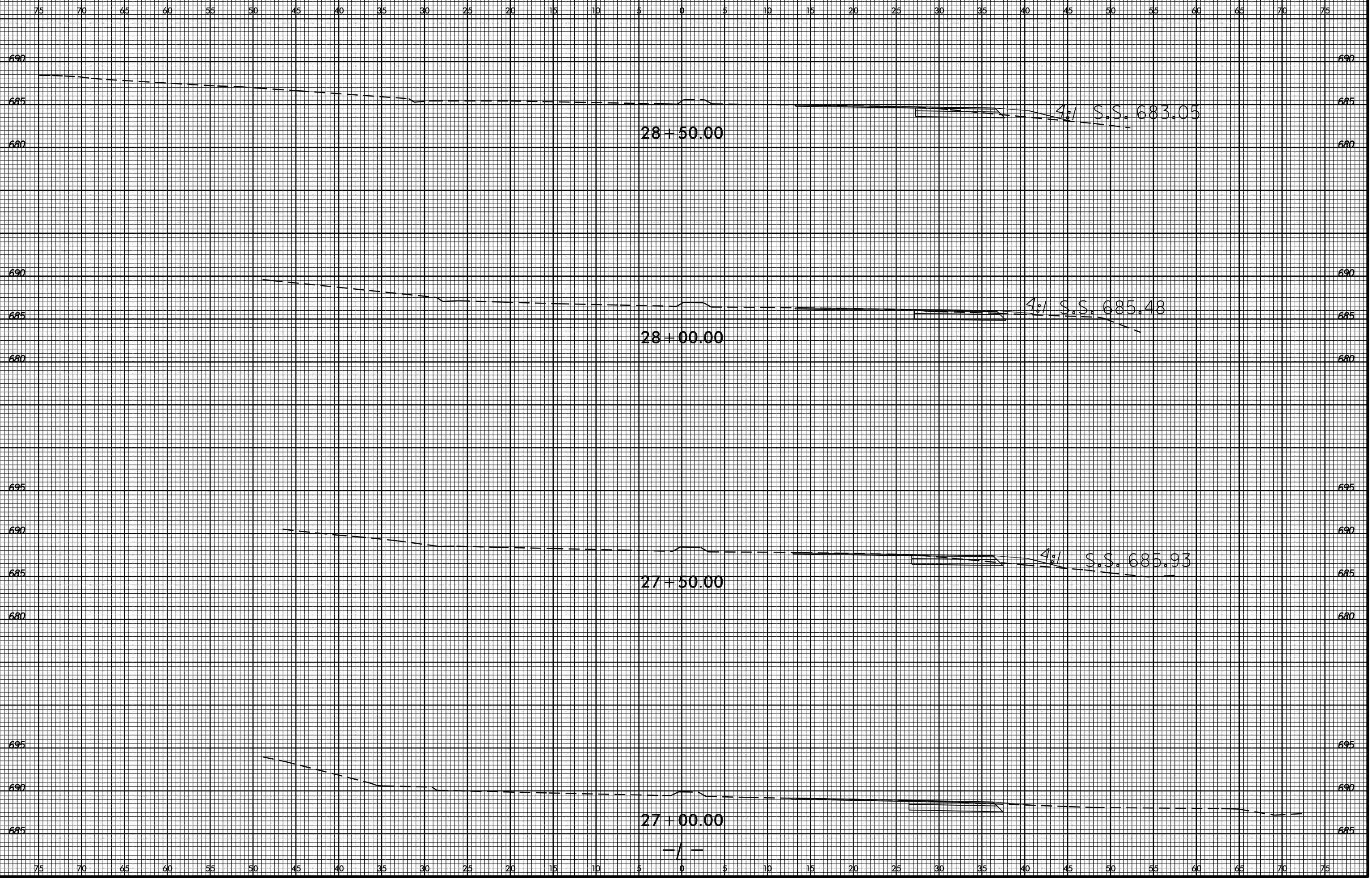
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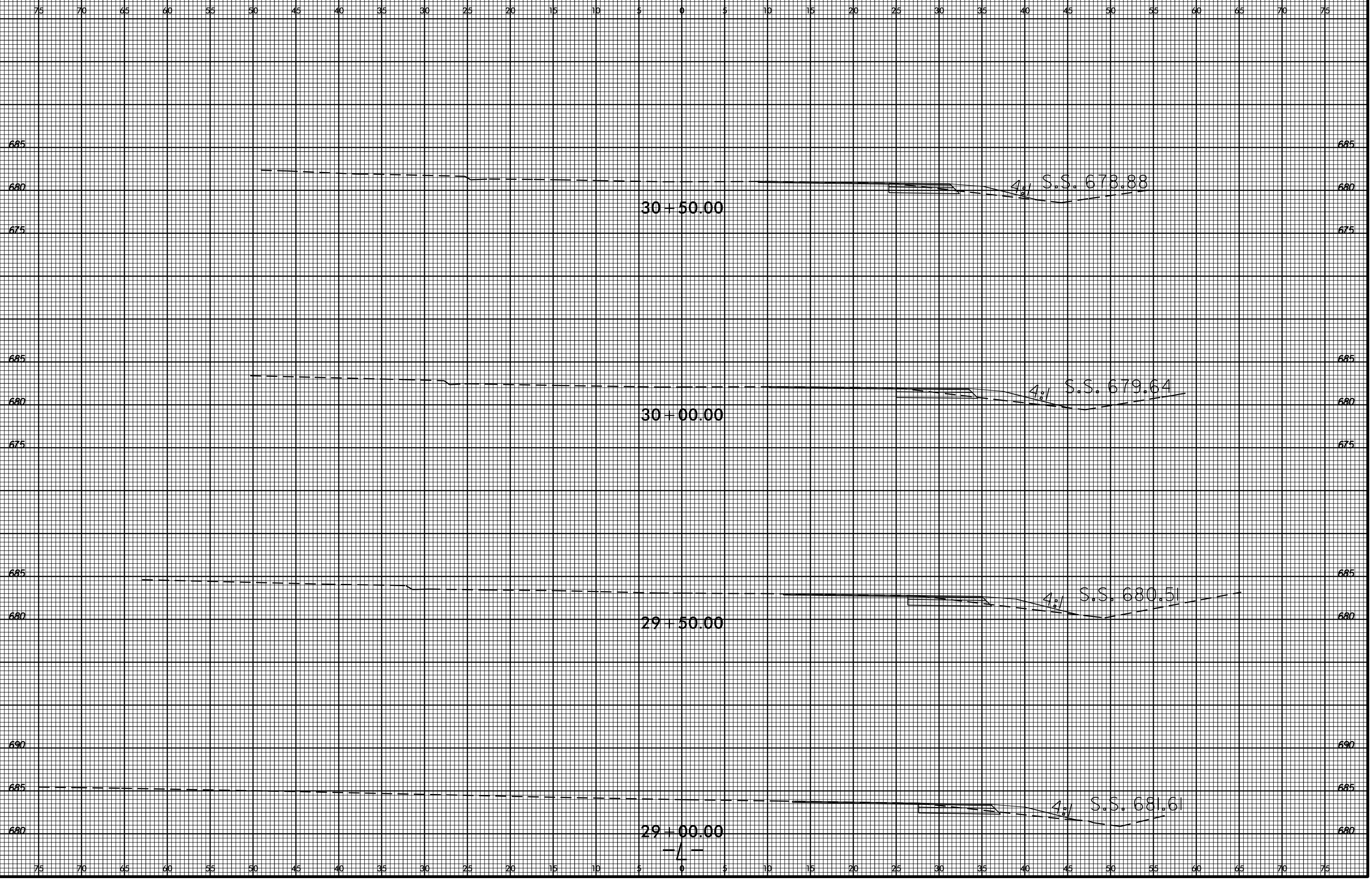
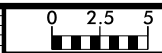


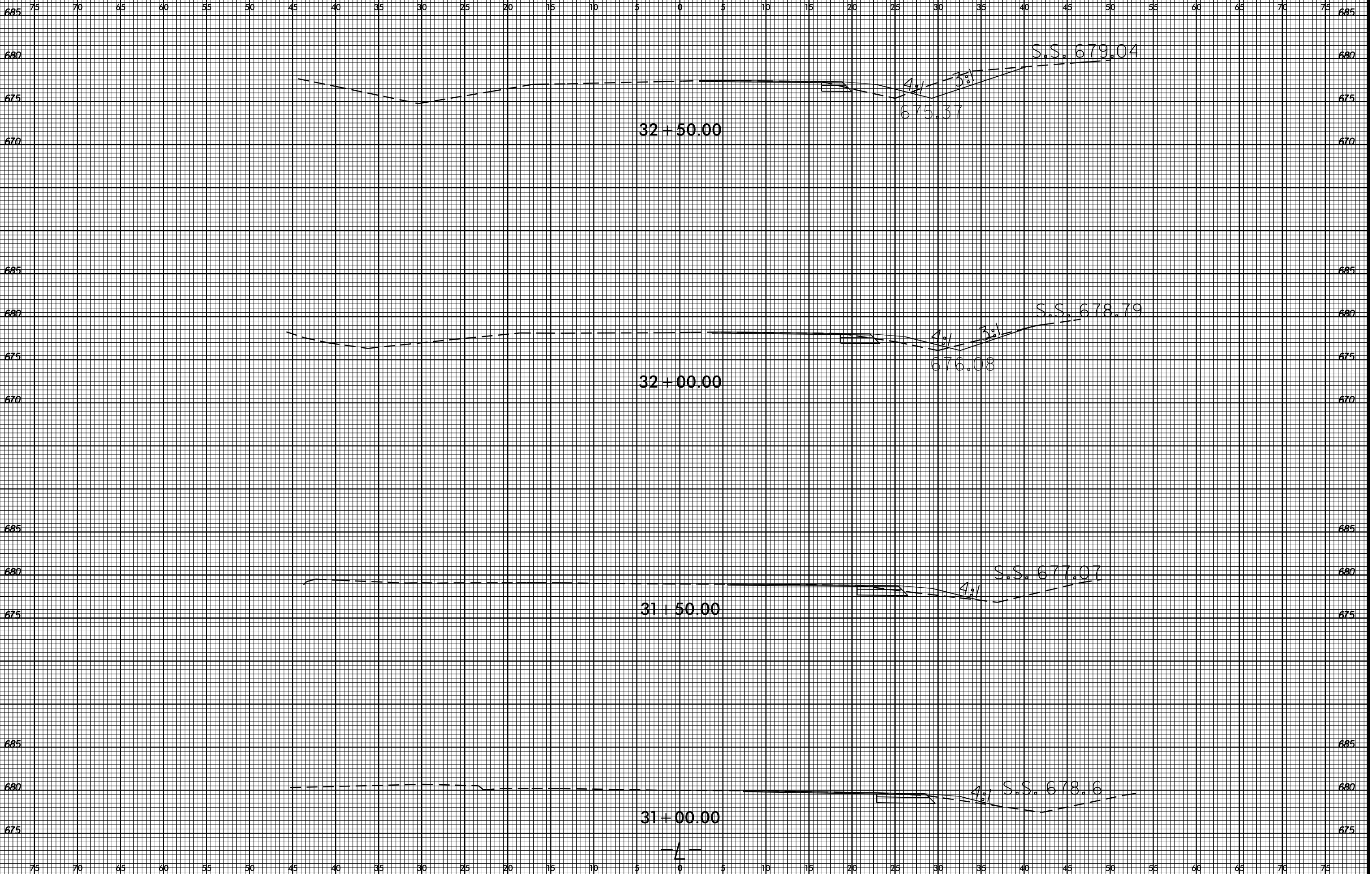
PROJ. REFERENCE NO.  
47660.3.1

SHEET NO.  
X-1











75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

680 680

675 675

670 670

685 685

680 680

675 675

670 670

685 685

680 680

675 675

670 670

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

34+00.00

33+50.00

33+00.00

4'±  
674.86

3'±

S.S. 679.60

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16brooks

PHASING DIAGRAM

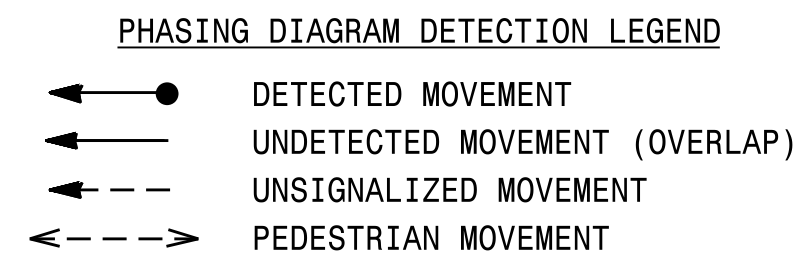
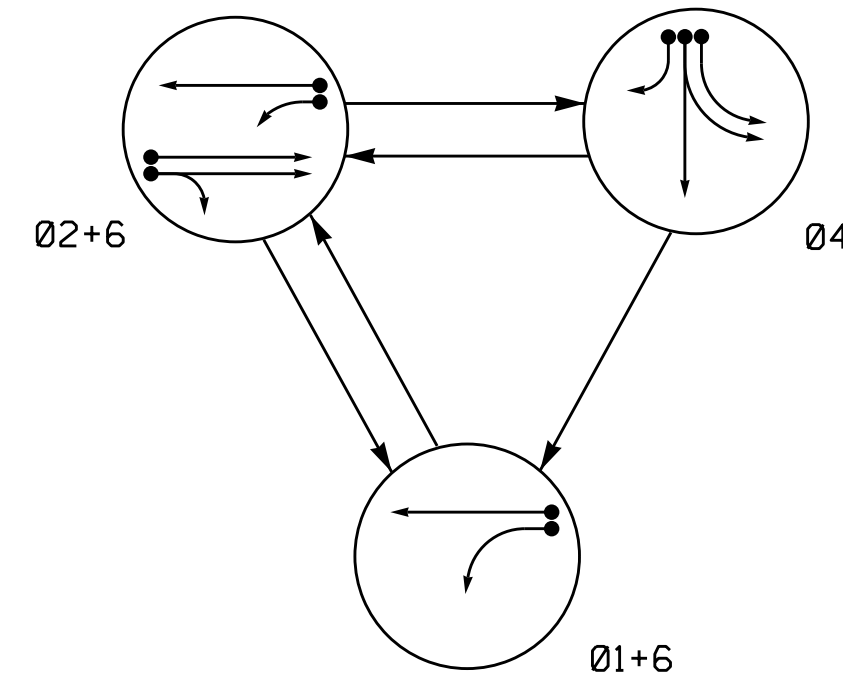
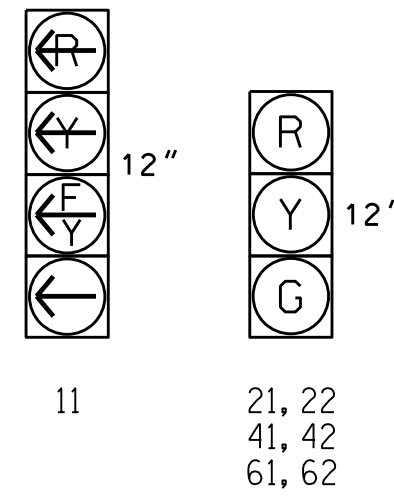


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø 1 + 6	Ø 2 + 6	Ø 4	FLASH
11	←	←	←	←
21, 22	R	G	R	Y
41, 42	R	R	G	R
61, 62	G	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



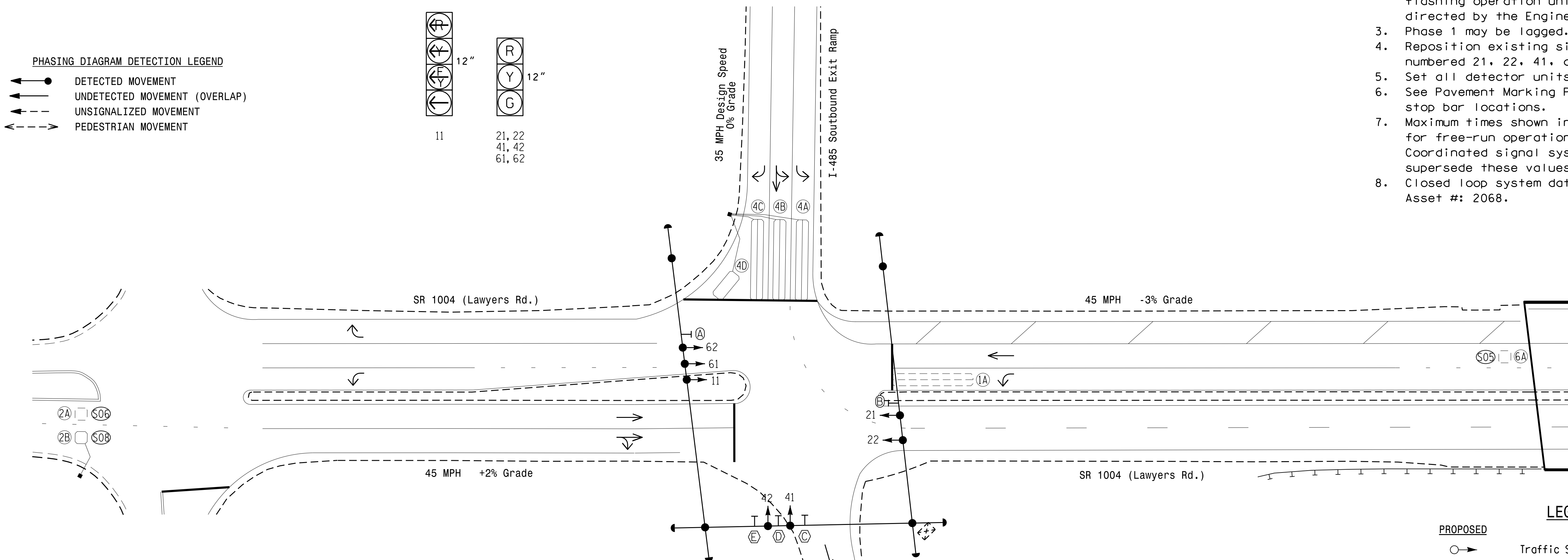
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME		
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-
					6	Y	Y	Y	-	3	-
2A/S06	6X6	320	4	-	2	Y	Y	-	-	-	Y
2B/S08	6X6	320	4	Y	2	Y	Y	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-
4C	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-
4D	6X15	0	2-4-2	Y	4	Y	Y	-	-	15	-
6A/S05	6X6	300	4	-	6	Y	Y	-	-	-	Y

3 Phase Fully Actuated SR 1004 (Lawyers Road) CLS

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Reposition existing signal heads numbered 21, 22, 41, and 42.
- Set all detector units to presence mode.
- See Pavement Marking Plans for proposed stop bar locations.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #: 2068.

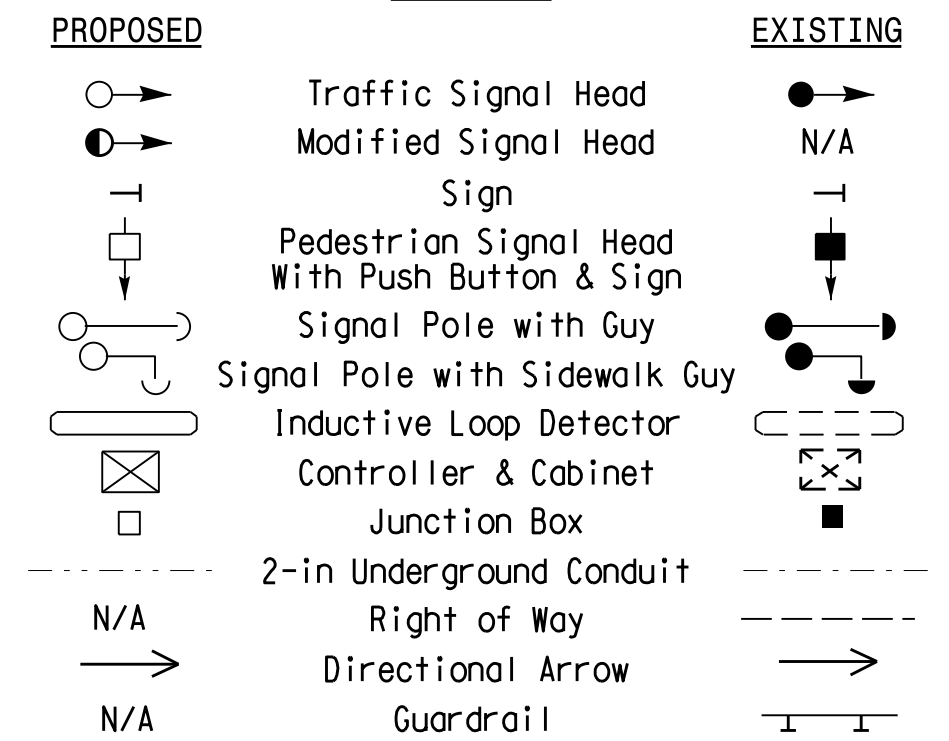


OASIS 2070 TIMING CHART

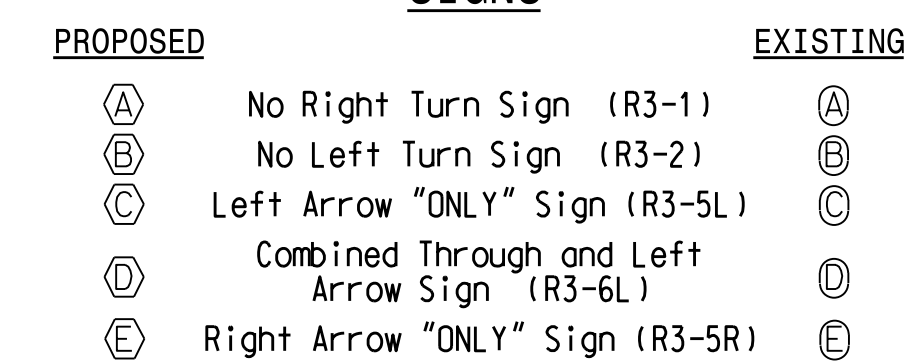
FEATURE	PHASE			
	1	2	4	6
Min Green 1 *	7	12	7	12
Extension 1 *	2.0	6.0	2.0	6.0
Max Green 1 *	20	90	30	90
Yellow Clearance	3.0	4.8	3.8	4.8
Red Clearance	2.1	1.6	1.8	1.6
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	1.5	-	2.5
Max Variable Initial *	-	36	-	34
Time Before Reduction *	-	15	-	15
Time To Reduce *	-	30	-	30
Minimum Gap	-	3.0	-	3.0
Recall Mode	-	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND



SIGNS



Signal Upgrade

Prepared in the Offices of:  
  
 TRANSPORTATION MOBILITY AND SAFETY DIVISION  
 STATE OF NORTH CAROLINA  
 STREET OF EXCELLENCE  
 SIGNAL DESIGN SECTION

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1004 (Lawyers Rd.) at I-485 Southbound Exit Ramp

Division 10 Mecklenburg County Mint Hill

PLAN DATE: March 2019 REVIEWED BY: T.J. Williams

PREPARED BY: R.N. Zinser REVIEWED BY:

REVISIONS: \_\_\_\_\_ INIT. DATE

SCALE: 0 30  
1"=30'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 043914  
 RICHARD N. ZINSE

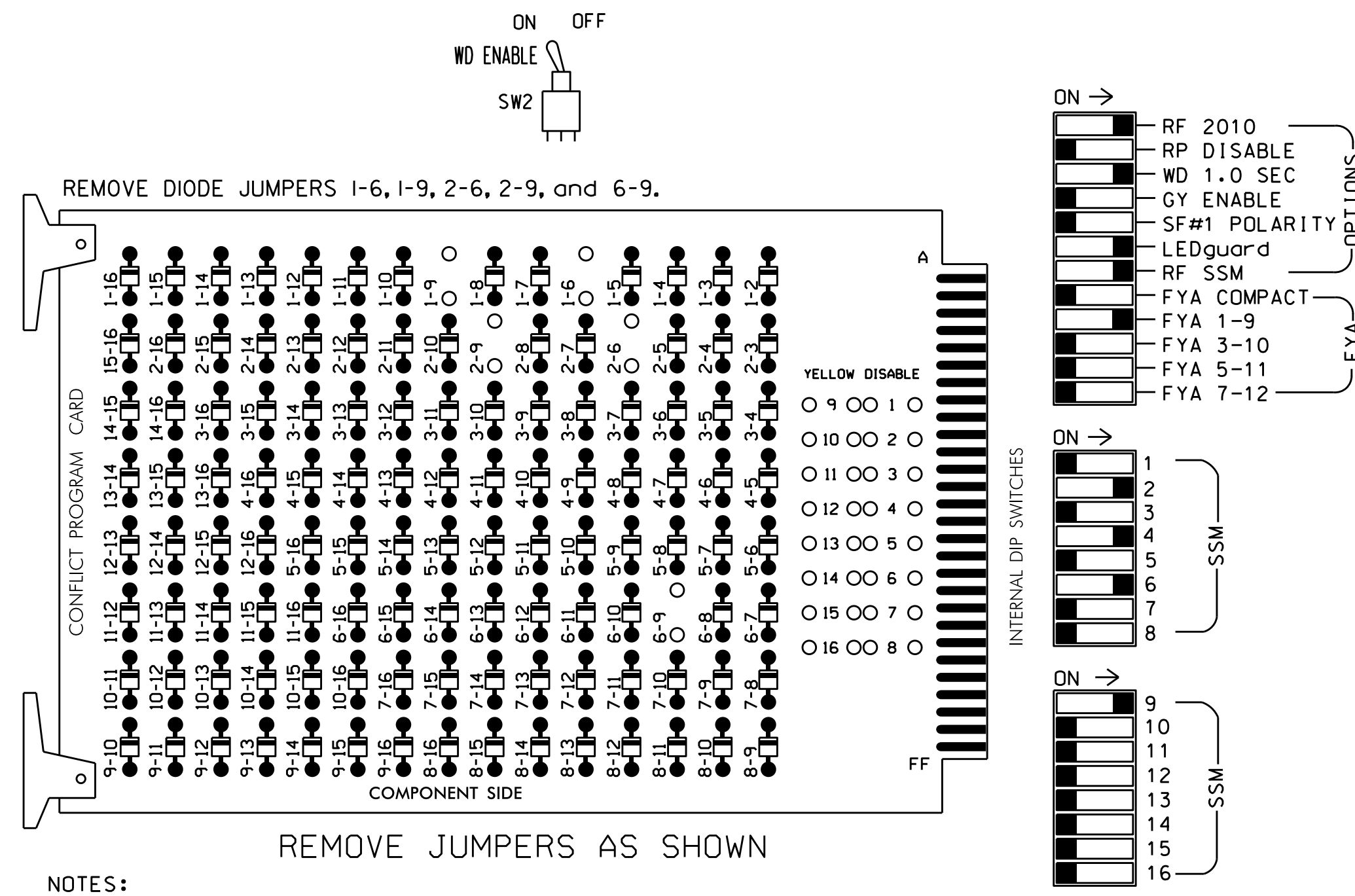
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SIG. INVENTORY NO. 10-2068

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### EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.

■ = DENOTES POSITION OF SWITCH

### NOTES

- 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.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,5,7,8, 10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all Phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Startup In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- The cabinet and controller are part of the SR 1004 (Lawyers Road) Closed Loop System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 CABINET.....332 W/ AUX  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX.OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S4,S6,S9  
 PHASES USED.....1,2,4,6  
 OVERLAP "A".....1+2  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	9	10	11	12	13	14
SIGNAL HEAD NO.	11*	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	NU	NU	11*	NU	NU	NU	NU	NU
RED		128			101			134										
YELLOW	*	129			102			135										
GREEN		130			103			136										
RED ARROW															A121			
YELLOW ARROW															A122			
FLASHING YELLOW ARROW															A123			
GREEN ARROW	127																	

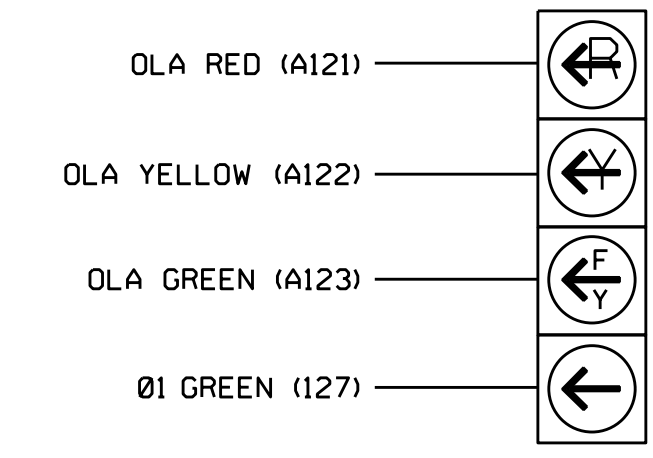
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

### FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



11

NOTE

The sequence display for signal head 11 requires special logic programming. See sheet 2 for programming instructions.

### INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1 1A	∅ 2/SYS 2A/S06	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	∅ 14
L	NOT USED	∅ 2/SYS 2B/S08	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	∅ 14
U	∅ 5	∅ 6/SYS 6A/S05	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	∅ 14	∅ 15	∅ 16	∅ 17	∅ 18
L	∅ 5	NOT USED	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	∅ 14	∅ 15	∅ 16	∅ 17	∅ 18

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

FS = FLASH SENSE  
 ST = STOP TIME

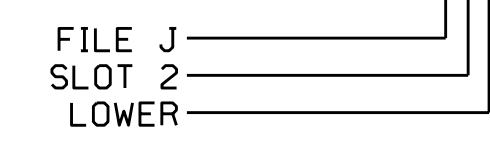
⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A <sup>1</sup>	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y	Y		3
2A/S06	TB2-5,6	I2U	39	1	2	2/SYS	Y	Y			
2B/S08	TB2-7,8	I2L	43	5	12	2/SYS	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			15
4D	TB6-3,4	I7L	78	40	44	4	Y	Y			15
6A/S05	TB3-5,6	J2U	40	2	6	6/SYS	Y	Y			

<sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.

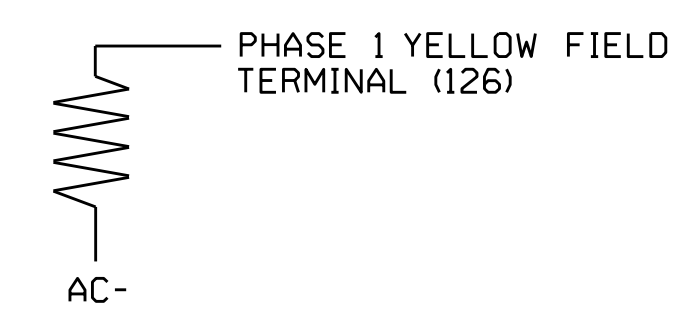
### INPUT FILE POSITION LEGEND: J2L



### LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1004 (Lawyers Rd.)  
 at  
 I-485 Southbound Exit Ramp

Division 10 Mecklenburg County Mint Hill

PLAN DATE: March 2019 REVIEWED BY: CES

PREPARED BY: B. Christian REVIEWED BY:

REVISIONS

INIT. DATE

DocuSigned by:  
 D. Todd Joyce 4/9/2019

SIG. INVENTORY NO. 10-2068

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

SEAL 031001

ENGINEER TODD JOYCE

DATE

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**LOGICAL I/O PROCESSOR PROGRAMMING DETAIL  
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE**

*(program controller as shown below)*

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2 AND 3.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

LOGICAL I/O COMMAND #1 (+/-COMMAND#)  
IF ACTIVE PHASE #1 IS ON  
AND RED CLEAR ON PHASE #1 IS ON

↓  
SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #50 ON  
SET OUTPUT ASSIGNMENT #51 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

LOGICAL I/O COMMAND #2 (+/-COMMAND#)  
IF ACTIVE PHASE #1 IS ON

↓  
SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #52 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW OFF DURING PHASE 1 (HEAD 11).

LOGICAL I/O COMMAND #3 (+/-COMMAND#)  
IF YELLOW ON PHASE #1 IS ON

↓  
SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #51 ON

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

<b>OUTPUT REFERENCE SCHEDULE</b>	
OUTPUT 50	= Overlap A Red
OUTPUT 51	= Overlap A Yellow
OUTPUT 52	= Overlap A Green

**OVERLAP PROGRAMMING DETAIL**

*(program controller as shown below)*

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS

PHASE: 12345678910111213141516

VEH OVL PARENTS: XX

VEH OVL NOT VEH: :

VEH OVL NOT PED: :

VEH OVL GRN EXT: :

STARTUP COLOR: - RED - YELLOW - GREEN

FLASH COLORS: - RED - YELLOW X GREEN

SELECT VEHICLE OVERLAP OPTIONS: (Y/N)

FLASH YELLOW IN CONTROLLER FLASH?...Y

GREEN EXTENSION (0-255 SEC)...0.0

YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0

RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0

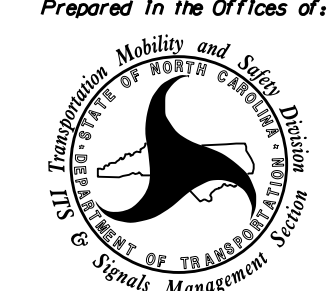
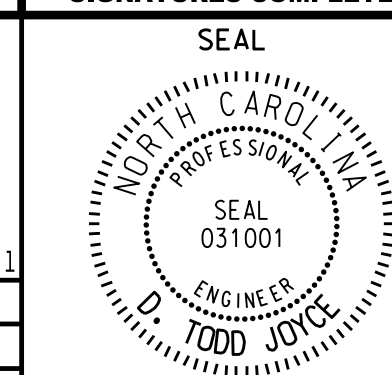
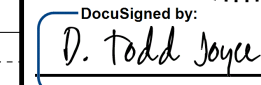
OUTPUT AS PHASE # (0=NONE, 1-16)...0

← NOTICE GREEN FLASH

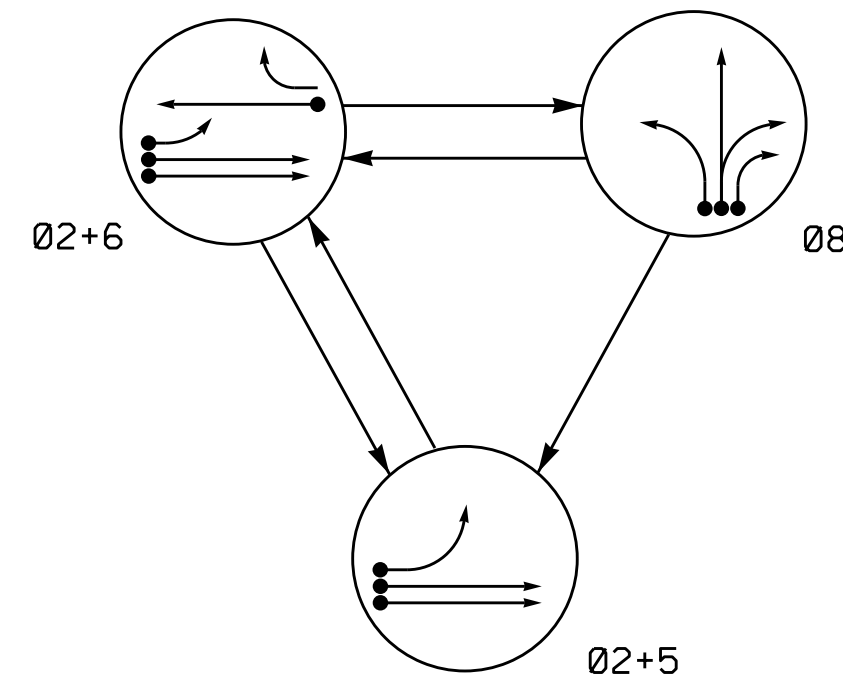
OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 10-2068  
DESIGNED: March 2019  
SEALED: 4/8/2019  
REVISED: N/A

08-Apr-2019 15:32  
\*10068 sm en elec.wrk.dgn  
dbchr:stj:sm

Electrical Detail - Sheet 2 of 2		<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared In the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529		SR 1004 (Lawyers Rd.) at I-485 Southbound Exit Ramp Division 10 Mecklenburg County Mint Hill PLAN DATE: March 2019 REVIEWED BY: CES PREPARED BY: B. Christian REVIEWED BY:	
REVISIONS _____ _____ _____		SEAL  SEAL 031001 ENGINEER TODD JOYCE DocuSigned by:  4/9/2019 DATE _____ _____	
SIC. INVENTORY NO. 10-2068		SIC. INVENTORY NO. 10-2068	

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

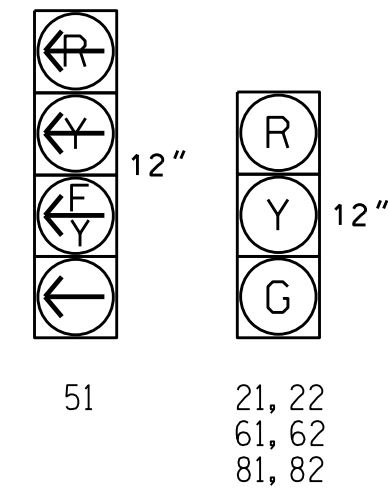
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- - - UNSIGNALIZED MOVEMENT
- ⚡ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	08	02+5
21, 22	G	G	R	Y
51	←	←	←	←
61, 62	R	G	R	Y
81, 82	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



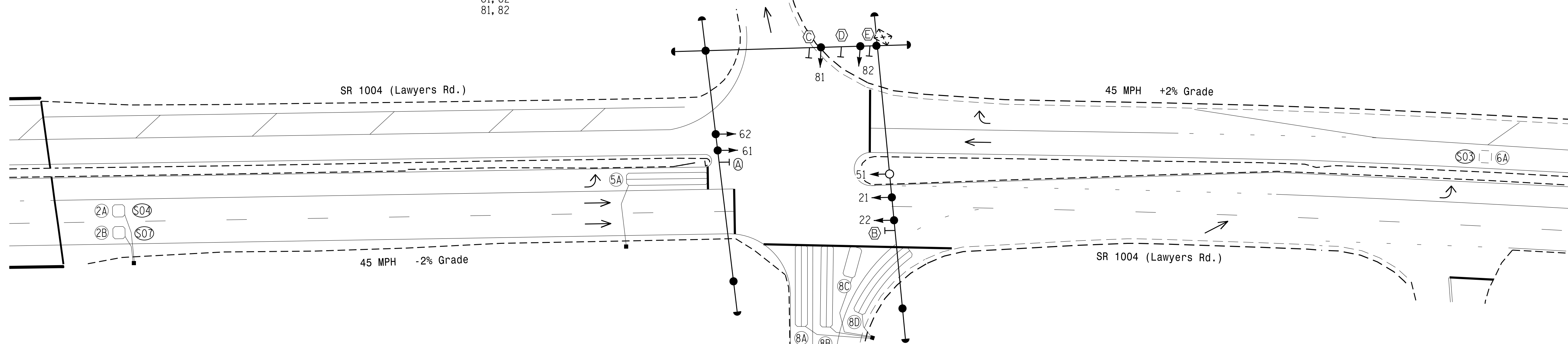
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A/S04	6X6	300	5	Y	2	Y	Y	-	-	-	Y	-
2B/S07	6X6	300	5	Y	2	Y	Y	-	-	-	Y	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-
6A/S03	6X6	300	EXIST	-	6	Y	Y	-	-	-	Y	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	-
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	10	-	-
8C	6X15	0	4	Y	8	Y	Y	-	-	15	-	-
8D	6X40	0	2-4-2	Y	8	Y	Y	-	-	15	-	-

3 Phase Fully Actuated SR 1004 (Lawyers Road) CLS

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Reposition existing signal heads numbered 21, 22, 81, and 82.
- Set all detector units to presence mode.
- See Pavement Marking Plans for proposed stop bar locations.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #: 1910.



OASIS 2070 TIMING CHART

FEATURE	PHASE			
	2	5	6	8
Min Green 1 *	12	7	12	7
Extension 1 *	6.0	2.0	6.0	2.0
Max Green 1 *	90	20	90	30
Yellow Clearance	4.7	3.0	4.7	3.8
Red Clearance	1.7	2.1	1.7	1.5
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	1.5	-	2.5	-
Max Variable Initial *	34	-	34	-
Time Before Reduction *	15	-	15	-
Time To Reduce *	30	-	30	-
Minimum Gap	3.0	-	3.0	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

<b>PROPOSED</b>	<b>EXISTING</b>
○ → Traffic Signal Head	● → Traffic Signal Head
○ → Modified Signal Head	○ → Modified Signal Head
⊥ Sign	⊥ Sign
⊥ Pedestrian Signal Head With Push Button & Sign	⊥ Pedestrian Signal Head With Push Button & Sign
○ → Signal Pole with Guy	○ → Signal Pole with Guy
○ → Signal Pole with Sidewalk Guy	○ → Signal Pole with Sidewalk Guy
□ Inductive Loop Detector	□ Inductive Loop Detector
□ Controller & Cabinet	□ Controller & Cabinet
□ Junction Box	□ Junction Box
- - - 2-in Underground Conduit	- - - 2-in Underground Conduit
- - - Right of Way	- - - Right of Way
→ Directional Arrow	→ Directional Arrow

**SIGNS**

<b>PROPOSED</b>	<b>EXISTING</b>
(A) No Left Turn Sign (R3-2)	(A) No Left Turn Sign (R3-2)
(B) No Right Turn Sign (R3-1)	(B) No Right Turn Sign (R3-1)
(C) Left Arrow "ONLY" Sign (R3-5L)	(C) Left Arrow "ONLY" Sign (R3-5L)
(D) Combined Through and Right Arrow Sign (R3-6R)	(D) Combined Through and Right Arrow Sign (R3-6R)
(E) Right Arrow "ONLY" Sign (R3-5R)	(E) Right Arrow "ONLY" Sign (R3-5R)

Signal Upgrade

Prepared in the Offices of:

TRANSPORTATION MOBILITY AND SAFETY GROUP  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 SIGNAL DESIGN SECTION

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1004 (Lawyers Rd.) at I-485 Northbound Exit Ramp

Division 10 Mecklenburg County Mint Hill

PLAN DATE: March 2019 REVIEWED BY: T.J. Williams

PREPARED BY: R.N. Zinser REVIEWED BY:

REVISIONS: INIT. DATE

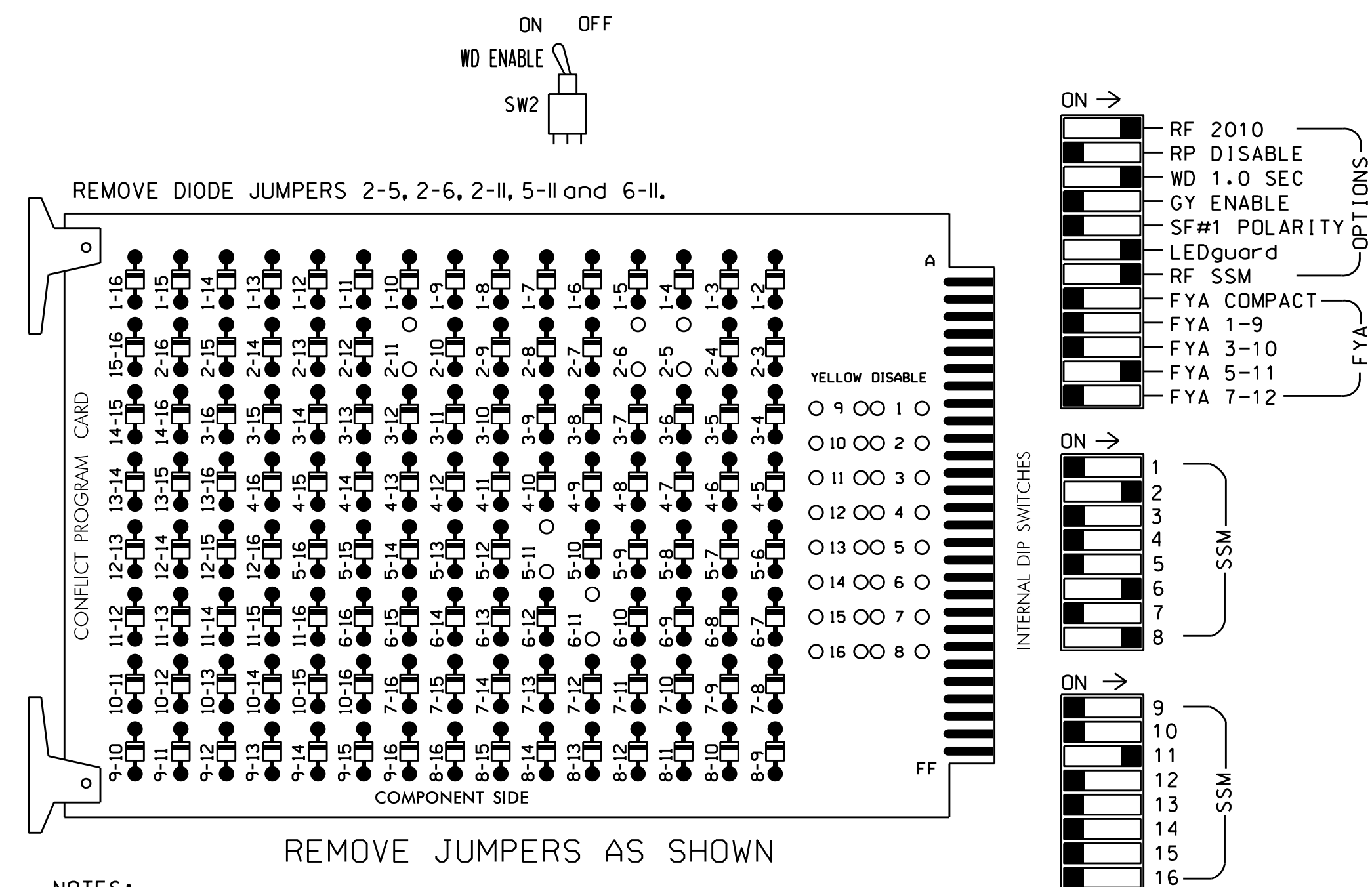
Seal: RICHARD N. ZINSELER, PROFESSIONAL ENGINEER, SEAL 043914

DATE: 4/8/2019

SIG. INVENTORY NO. 10-1910

**EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



**NOTES:**

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL2-SEL5 are present on the monitor board.

**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. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,4,5,7,9,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all Phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Startup In Green.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the SR 1004 (Lawyers Road) Closed Loop System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070  
 CABINET.....332 W/ AUX  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S6,S8,S12  
 PHASES USED.....2,5,6,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....5+6  
 OVERLAP "D".....NOT USED

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	51*	61,62	NU	NU	81,82	NU	NU	NU	NU	51*	NU	NU	
RED		128						134			107								
YELLOW		129					*	135			108								
GREEN		130						136			109								
RED ARROW																		A114	
YELLOW ARROW																			A115
FLASHING YELLOW ARROW																			A116
GREEN ARROW								133											

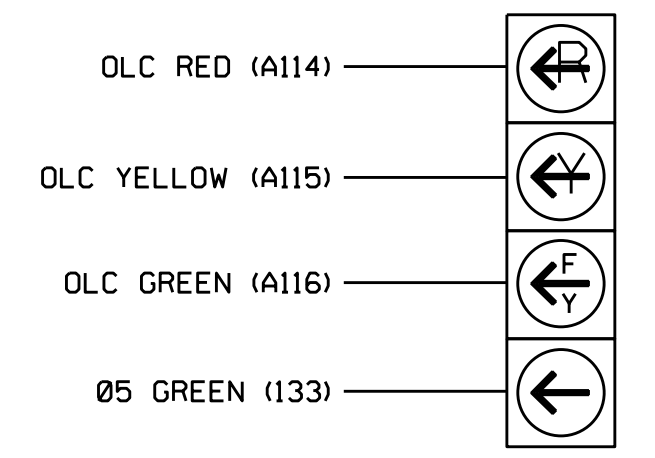
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

**FYA SIGNAL WIRING DETAIL**

(wire signal head as shown)



51

**NOTE**

The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

**INPUT FILE POSITION LAYOUT**

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14	FS
U	Ø2/SYS	2A/SØ4	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	DC ISOLATOR
L	Ø2/SYS	2B/SØ7	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	Ø2/SYS	DC ISOLATOR
U	Ø5	Ø6/SYS	Ø6/SYS	Ø6/SYS	Ø6/SYS	Ø6/SYS	Ø6/SYS	Ø6/SYS	Ø6/SYS	Ø6/SYS	Ø6/SYS	Ø6/SYS	Ø6/SYS	Ø6/SYS	DC ISOLATOR
L	5A	6A/SØ3	6A/SØ3	6A/SØ3	6A/SØ3	6A/SØ3	6A/SØ3	6A/SØ3	6A/SØ3	6A/SØ3	6A/SØ3	6A/SØ3	6A/SØ3	6A/SØ3	DC ISOLATOR
	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	DC ISOLATOR

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

FS = FLASH SENSE  
 ST = STOP TIME

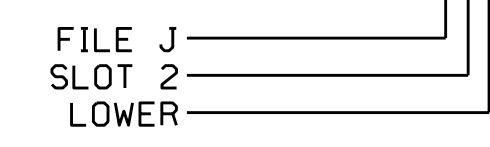
⊗ Wired Input - Do not populate slot with detector card

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A/SØ4	TB2-5,6	I2U	39	1	2	2/SYS	Y	Y			
2B/SØ7	TB2-7,8	I2L	43	5	12	2/SYS	Y	Y			
5A <sup>1</sup>	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y	Y		3
6A/SØ3	TB3-5,6	J2U	40	2	6	6/SYS	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			10
8C	TB7-1,2	J7U	66	28	38	8	Y	Y			15
8D	TB7-3,4	J7L	79	41	48	8	Y	Y			15

<sup>1</sup>Add jumper from J1-W to I4-W, on rear of input file.

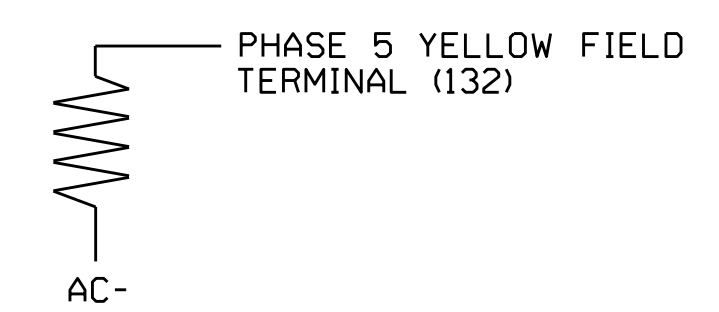
**INPUT FILE POSITION LEGEND:**



**LOAD RESISTOR INSTALLATION DETAIL**

(install resistor as shown below)

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



Electrical Detail - Sheet 1 of 2

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

SR 1004 (Lawyers Rd.)  
 at  
 I-485 Northbound Exit Ramp

Division 10 Mecklenburg County Mint Hill

PLAN DATE: March 2019 REVIEWED BY: CES

PREPARED BY: B. Christian REVIEWED BY:

REVISIONS	INIT.	DATE

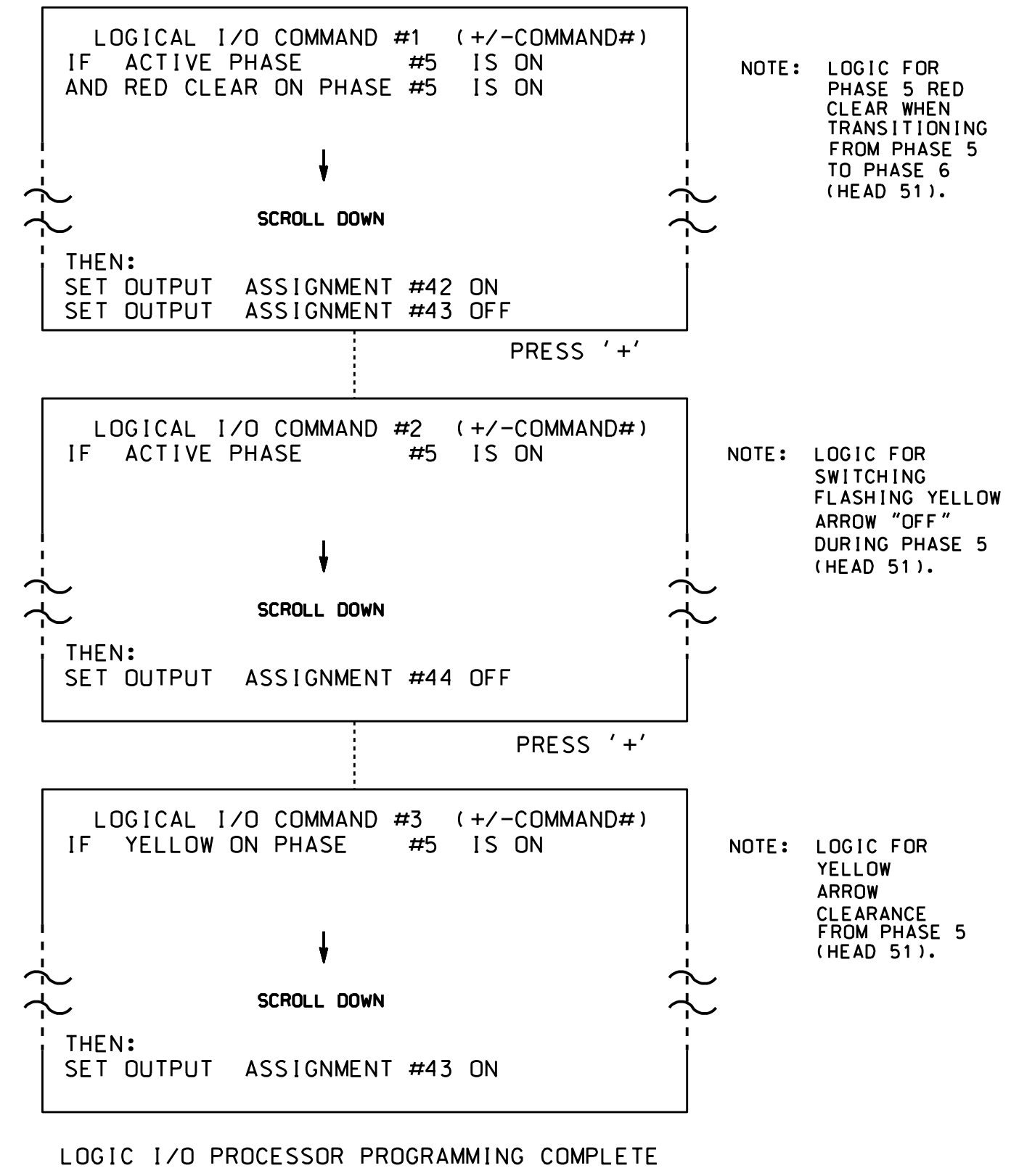
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
  
 D. Todd Joyce  
 4/11/2019  
 DATE

**LOGICAL I/O PROCESSOR PROGRAMMING DETAIL  
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE**

*(program controller as shown below)*

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2 AND 3.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

<b>OUTPUT REFERENCE SCHEDULE</b>	
OUTPUT 42	= Overlap C Red
OUTPUT 43	= Overlap C Yellow
OUTPUT 44	= Overlap C Green

**OVERLAP PROGRAMMING DETAIL**

*(program controller as shown below)*

- FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).  
PRESS '+' TWICE

```

    PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
    PHASE:      12345678910111213141516
    VEH OVL PARENTS:  XX
    VEH OVL NOT VEH:
    VEH OVL NOT PED:
    VEH OVL GRN EXT:
    STARTUP COLOR:  _ RED _ YELLOW _ GREEN
    FLASH COLORS:  _ RED _ YELLOW X GREEN
    SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
    FLASH YELLOW IN CONTROLLER FLASH?...Y
    GREEN EXTENSION (0-255 SEC)...0.0
    YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
    RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
    OUTPUT AS PHASE # (0=NONE, 1-16)...0
  
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 10-1910  
DESIGNED: March 2019  
SEALED: 4/8/2019  
REVISED: N/A

Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared In the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	<b>SR 1004 (Lawyers Rd.) at I-485 Northbound Exit Ramp</b>		<b>SEAL</b> 
	Division 10 Mecklenburg County Mint Hill PLAN DATE: March 2019 REVIEWED BY: CES PREPARED BY: B. Christian REVIEWED BY:	Division 10 Mecklenburg County Mint Hill PLAN DATE: March 2019 REVIEWED BY: CES PREPARED BY: B. Christian REVIEWED BY:	
REVISIONS _____ INIT. DATE _____	SIG. INVENTORY NO. 10-1910		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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