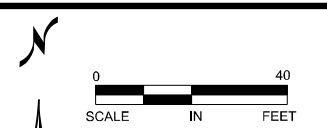


SIGNAL HEAD CHART				
FACE	R	Y	FYA	G
1-1, 1-2	←	←	←	←
2-1, 2-2, 2-3	○	○	○	○
3-1, 3-2	←	←	←	←
4-1, 4-2, 4-3	○	○	○	○
5-1, 5-2	←	←	←	←
6-1, 6-2, 6-3	○	○	○	○
7-1, 7-2	←	←	←	←
8-1, 8-2, 8-3	○	○	○	○



-ALL SIGNAL INDICATIONS SHALL BE 12" LED  
 -ALL SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BACKGROUND SHIELDS  
 -FYA DENOTES FLASHING YELLOW ARROW

ABANDON: 2" RSC  
 \*\*REMOVE: 1-FO CABLE (12SM)  
 \*\*F&I: 1.5" CONDUIT  
 1-FO ARMORED CABLE (12SM)

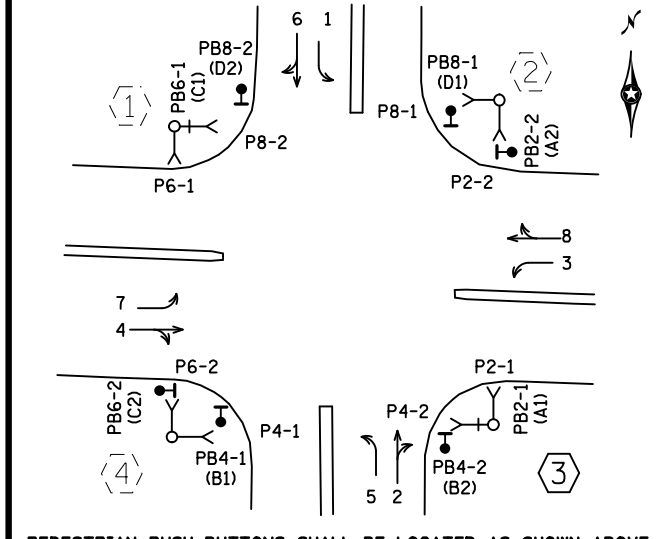
LOOP DETECTOR CHART		
NUMBER	SIZE (FT)	LOCATION
D1-1, D1-3	3-6x6	25, 40, 55
D1-2, D1-4	6x6	10
D2-1, D2-2	6x6	EXISTING
D2-3, D2-4	2-6x6	10,25
D3-1, D3-3	3-6x6	25, 40, 55
D3-2, D3-4	6x6	10
D4-1, D4-2	6x6	EXISTING
D4-3, D4-4	2-6x6	10,25
D5-1, D5-3	3-6x6	25, 40, 55
D5-2, D5-4	6x6	10
D6-1, D6-2	6x6	EXISTING
D6-3, D6-4	2-6x6	10,25
D7-1, D7-3	3-6x6	25, 40, 55
D7-2, D7-4	6x6	10
D8-1, D8-2	6x6	EXISTING
D8-3, D8-4	2-6x6	10,25

-ALL LOOP DETECTORS SHALL BE PVC UNLESS NOTED OTHERWISE  
 -LOCATION: DISTANCE FROM TEMPORARY CROSSWALK IN FEET

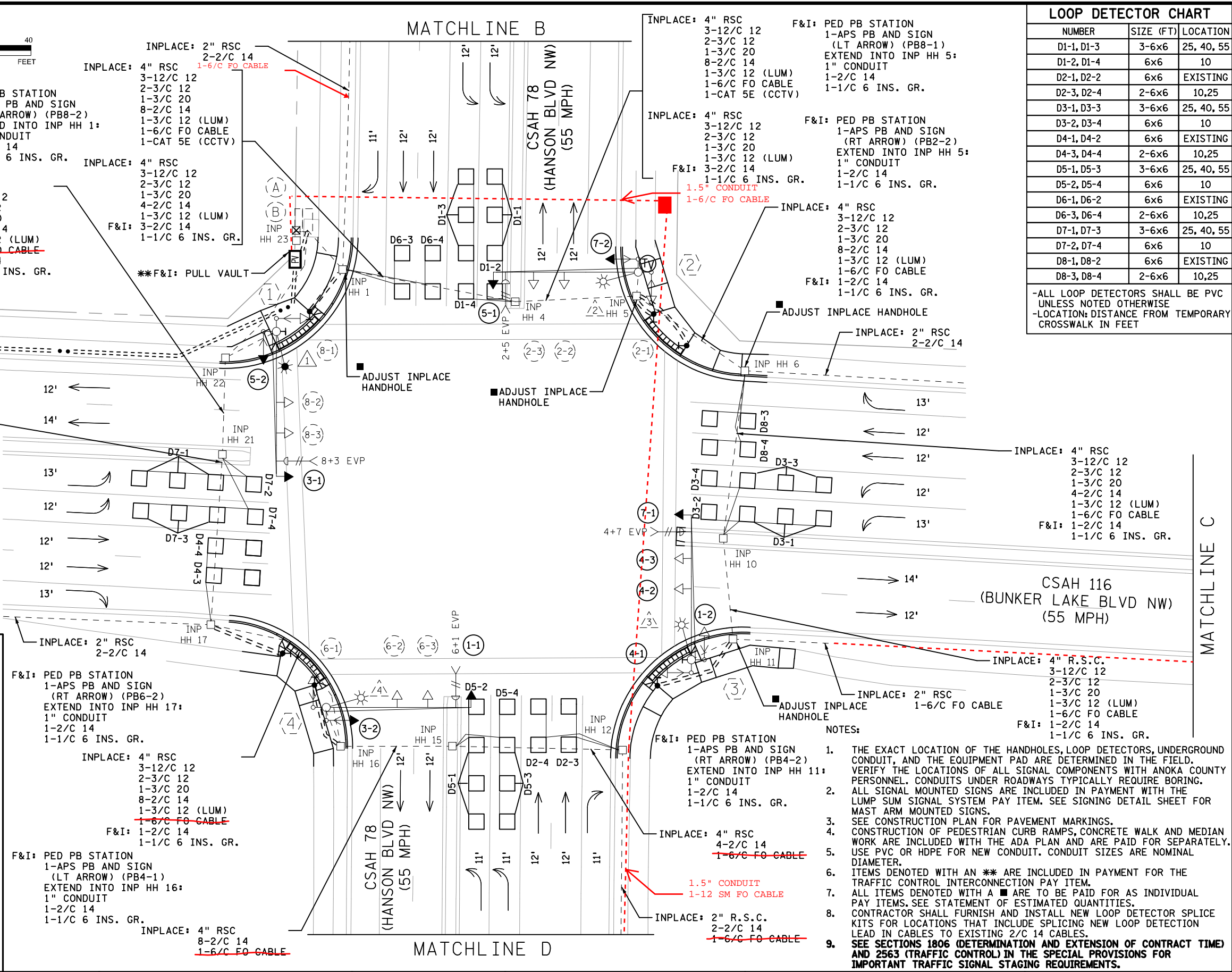
**SIGNAL SYSTEM OPERATION**

- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 8 PHASE, WITH PHASES 1, 3, 5 AND 7 BEING FLASHING YELLOW ARROWS BY TIME OF DAY.
- PHASES 2 AND 6 SHALL BE ON VEHICLE RECALL.

**CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS**



PEDESTRIAN PUSH BUTTONS SHALL BE LOCATED AS SHOWN ABOVE

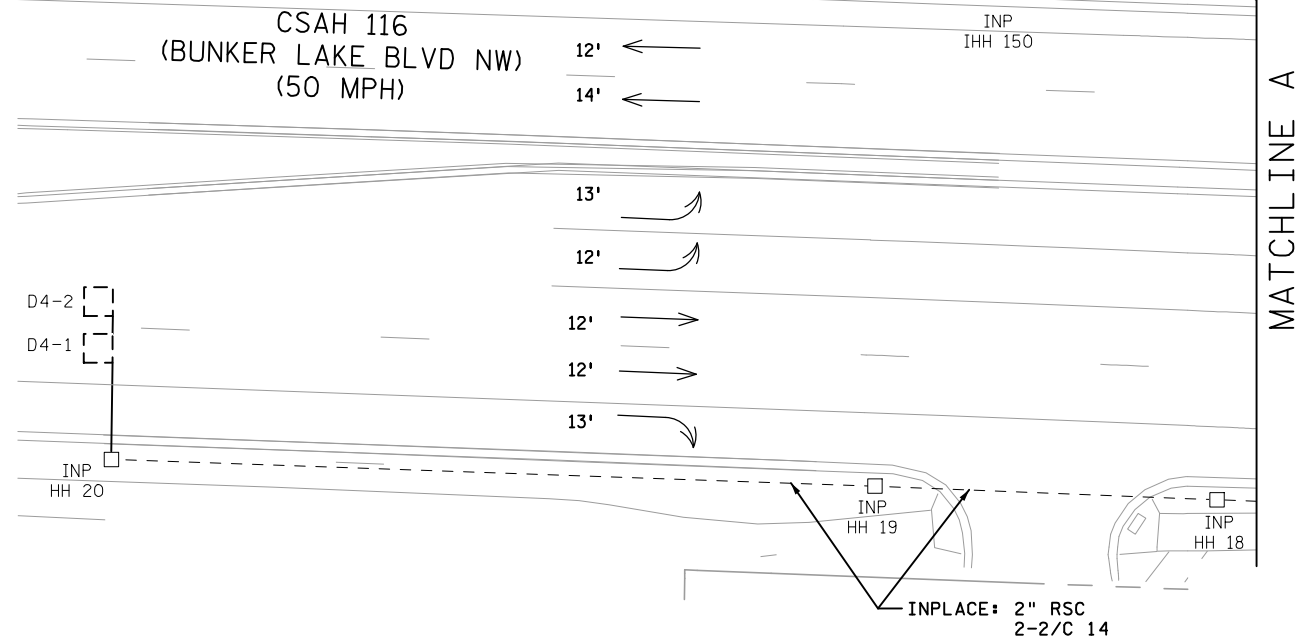


- NOTES:
1. THE EXACT LOCATION OF THE HANDHOLES, LOOP DETECTORS, UNDERGROUND CONDUIT, AND THE EQUIPMENT PAD ARE DETERMINED IN THE FIELD. VERIFY THE LOCATIONS OF ALL SIGNAL COMPONENTS WITH ANOKA COUNTY PERSONNEL. CONDUITS UNDER ROADWAYS TYPICALLY REQUIRE BORING.
  2. ALL SIGNAL MOUNTED SIGNS ARE INCLUDED IN PAYMENT WITH THE LUMP SUM SIGNAL SYSTEM PAY ITEM. SEE SIGNING DETAIL SHEET FOR MAST ARM MOUNTED SIGNS.
  3. SEE CONSTRUCTION PLAN FOR PAVEMENT MARKINGS.
  4. CONSTRUCTION OF PEDESTRIAN CURB RAMPS, CONCRETE WALK AND MEDIAN WORK ARE INCLUDED WITH THE ADA PLAN AND ARE PAID FOR SEPARATELY. USE PVC OR HDPE FOR NEW CONDUIT. CONDUIT SIZES ARE NOMINAL DIAMETER.
  5. ITEMS DENOTED WITH AN \*\* ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECTION PAY ITEM.
  6. ALL ITEMS DENOTED WITH A ■ ARE TO BE PAID FOR AS INDIVIDUAL PAY ITEMS. SEE STATEMENT OF ESTIMATED QUANTITIES.
  7. CONTRACTOR SHALL FURNISH AND INSTALL NEW LOOP DETECTOR SPLICE KITS FOR LOCATIONS THAT INCLUDE SPLICING NEW LOOP DETECTION LEAD IN CABLES TO EXISTING 2/C 14 CABLES.
  8. SEE SECTIONS 1806 (DETERMINATION AND EXTENSION OF CONTRACT TIME) AND 2563 (TRAFFIC CONTROL) IN THE SPECIAL PROVISIONS FOR IMPORTANT TRAFFIC SIGNAL STAGING REQUIREMENTS.

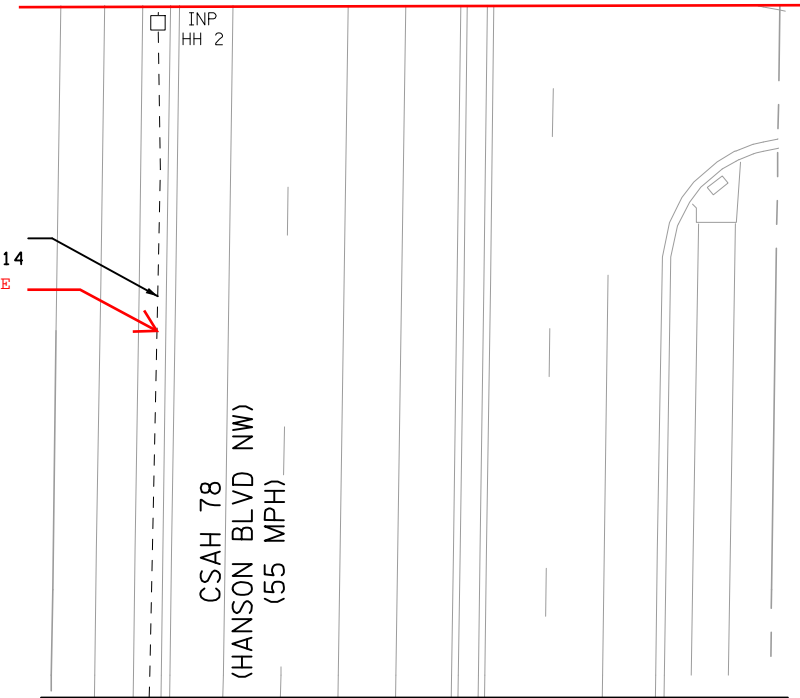
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. PRINT NAME: NICK VANGUNST SIGNATURE: <i>Nick Van Gunst</i> DATE: 11/26/24 LICENSE NO. 44683		DRAWN BY: KAS DATE 11/26/24 DESIGN BY: KAS DATE 11/26/24 CHECKED BY: NHV DATE 11/26/24	<b>ANOKA COUNTY</b> <b>HIGHWAY DEPT.</b>	REVISE SIGNAL SYSTEM F LAYOUT BUNKER LAKE BLVD & HANSON BLVD COUNTY PROJECT SAP 002-716-024 CITY PROJECT SAP 198-020-040	CSAH 116 (BUNKER LAKE BLVD) SIGNAL MODIFICATION & ADA IMPROVEMENTS Sheet 133 of 174 Sheets
--	--	--	---	---	---

ABANDON: 2" RSC  
 \*\*REMOVE: 1-FO CABLE (12SM)  
 \*\*F&I: 1.5" CONDUIT  
 1-FO ARMORED CABLE (12SM)

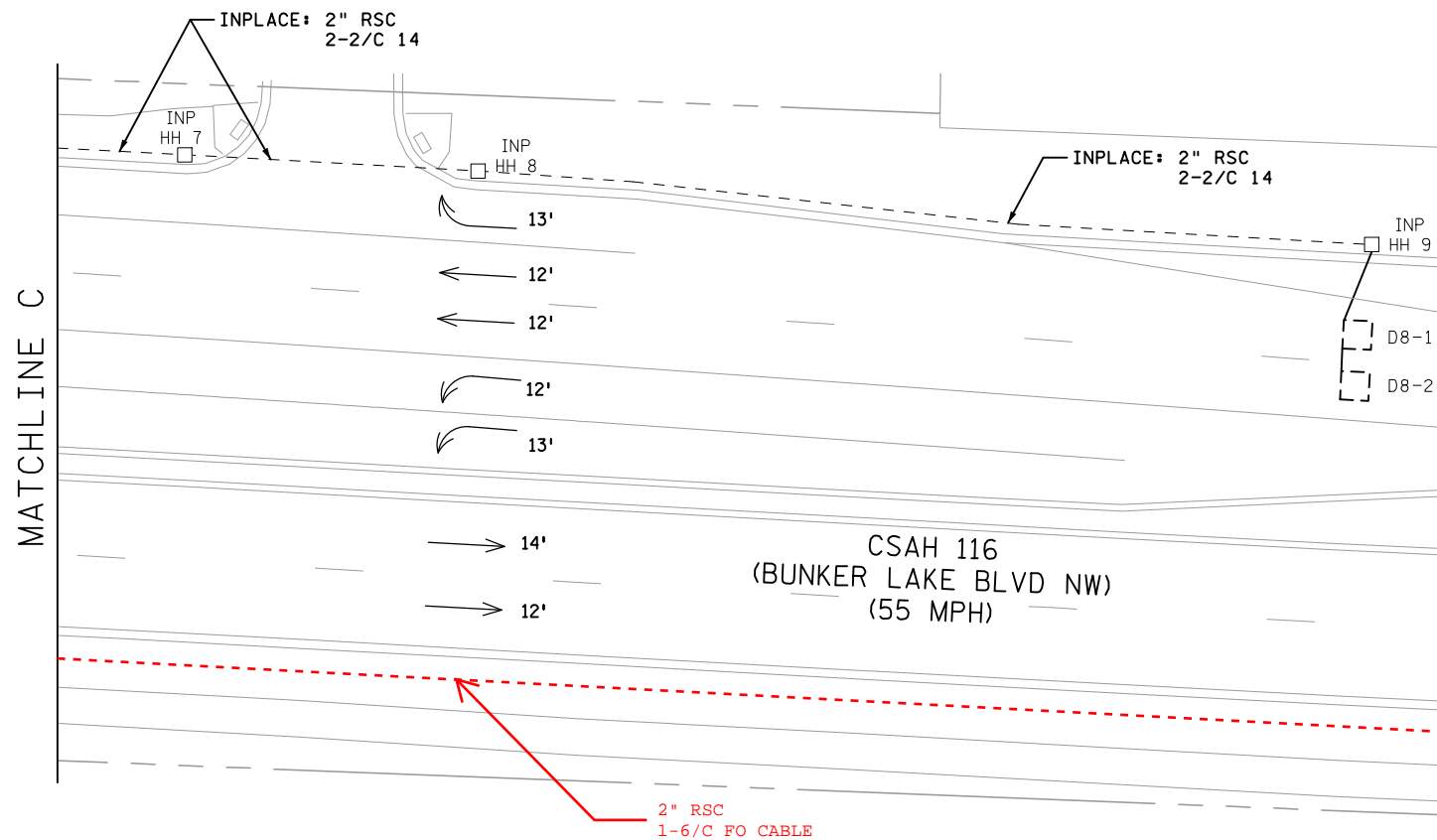
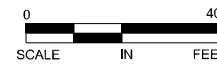
MATCH LINE - STATION 155+00



INPLACE: 2" RSC  
 2-2/C 14  
 1-6/C FO CABLE

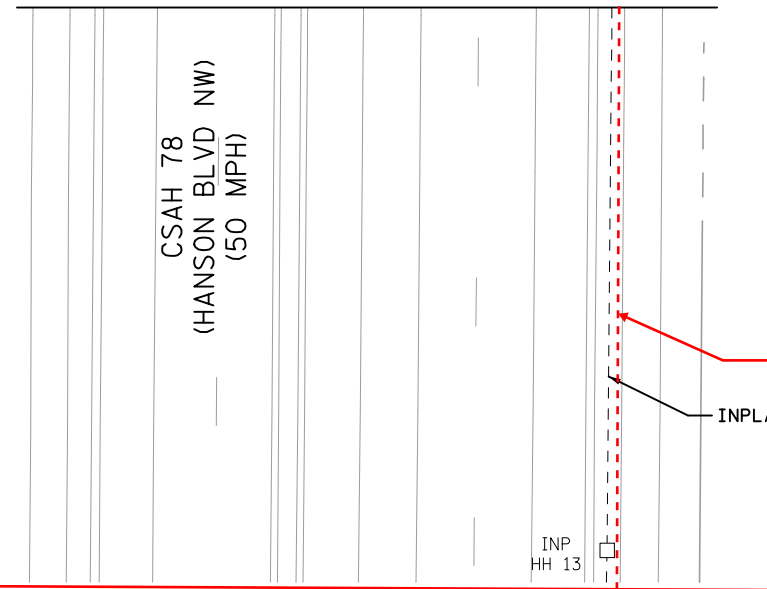


MATCHLINE B



MATCH LINE - STATION 25+70

MATCHLINE D



MATCH LINE - STATION 148+80

NOTES:

- ITEMS DENOTED WITH AN \*\* ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECTION PAY ITEM.
- SEE SECTIONS 1806 (DETERMINATION AND EXTENSION OF CONTRACT TIME) AND 2563 (TRAFFIC CONTROL) IN THE SPECIAL PROVISIONS FOR IMPORTANT TRAFFIC SIGNAL STAGING REQUIREMENTS.

NO	DATE	BY	CKD	APPR	REVISION

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 PRINT NAME: NICK VANGUNST  
 SIGNATURE: *Nick Van Gunst*  
 DATE: 11/26/24 LICENSE NO. 44683

DRAWN BY: KAS DATE 11/26/24  
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ANOKA COUNTY  
 HIGHWAY DEPT.

REVISE SYSTEM F MATCHLINES  
 BUNKER LAKE BLVD & HANSON BLVD  
 COUNTY PROJECT SAP 002-716-024  
 CITY PROJECT SAP 198-020-040

CSAH 116 (BUNKER LAKE BLVD)  
 SIGNAL MODIFICATION  
 & ADA IMPROVEMENTS  
 Sheet 134 of 174 Sheets

① INPLACE: PA100 POLE FOUNDATION  
 PA100-A55-D40-9 (DAVIT 350°)  
 LUMINAIRE-250 W HPS  
 PA100 SWING-AWAY HINGES  
 3-ONE WAY SIGNALS OVERHEAD (0', 17' & 29'  
 FROM END OF MAST ARM)  
 2-ANGLE MOUNT SIGNALS AT 45° & 225°  
 2-ANGLE MOUNT C.D. PED HEADS AT 45° & 225°  
 2-PEDESTRIAN PUSH BUTTONS  
 ONE WAY EVP DETECTOR AND LIGHT (PHASES 8+3)  
 TYPE D SIGN PANEL OVERHEAD  
 2-R6-1 SIGN PANELS-POLE MOUNTED 0° & 180°  
 REMOVE: 1-ONE WAY SIGNAL OVERHEAD AT 0'  
 1-ANGLE MOUNT SIGNAL AT 45°  
 2-PEDESTRIAN PUSHBUTTONS & SIGNS & PLUG HOLE  
 D40-9 AND LUMINAIRE-250 W HPS  
 F&I: 1-ONE WAY SIGNAL OVERHEAD AT 0'  
 1-ANGLE MOUNT SIGNAL AT 45°  
 1-APS PB AND SIGN (LT ARROW) (PB6-1)  
 AND APS PB MOUNTING SPACERS  
 1-D30-9 LUMINAIRE EXTENSION  
 LUMINAIRE-LED (FOR 30' MOUNTING HEIGHT)  
 1-R10-X12 SIGN ADJACENT TO HEAD (3-1)  
 INPLACE: 3" RSC TO INP HH 22:  
 3-12/C 12  
 1-3/C 12  
 1-3/C 12 (EVP)  
 1-3/C 20 (EVP)  
 1-3/C 12 (LUM)

② INPLACE: PA100 POLE FOUNDATION  
 PA100-A55-D40-9 (DAVIT 350°)  
 LUMINAIRE-LED  
 PA100 SWING-AWAY HINGES  
 3-ONE WAY SIGNALS OVERHEAD (0', 17' & 29'  
 FROM END OF MAST ARM)  
 2-ANGLE MOUNT SIGNALS AT 45° & 225°  
 2-ANGLE MOUNT C.D. PED HEADS AT 45° & 225°  
 2-PEDESTRIAN PUSH BUTTONS  
 ONE WAY EVP DETECTOR AND LIGHT (PHASES 2+5)  
 TRAFFIC MANAGEMENT CAMERA  
 TYPE D SIGN PANEL OVERHEAD  
 2-R6-1 SIGN PANELS-POLE MOUNTED 0° & 180°  
 REMOVE: 1-ONE WAY SIGNAL OVERHEAD AT 0'  
 1-ANGLE MOUNT SIGNAL AT 45°  
 2-PEDESTRIAN PUSHBUTTONS & SIGNS & PLUG HOLES  
 F&I: 1-ONE WAY SIGNAL OVERHEAD AT 0'  
 1-ANGLE MOUNT SIGNAL AT 45°  
 1-R10-X12 SIGN ADJACENT TO HEAD (5-1)  
 INPLACE: 3" RSC TO INP HH 5:  
 3-12/C 12  
 1-3/C 12  
 1-3/C 12 (EVP)  
 1-3/C 20 (EVP)  
 1-3/C 12 (LUM)  
 1-CAT 5E (CCTV)

③ INPLACE: PA100 POLE FOUNDATION  
 PA100-A55-D40-9 (DAVIT 350°)  
 LUMINAIRE-LED  
 PA100 SWING-AWAY HINGES  
 3-ONE WAY SIGNALS OVERHEAD (0', 17' & 29'  
 FROM END OF MAST ARM)  
 2-ANGLE MOUNT SIGNALS AT 45° & 225°  
 2-ANGLE MOUNT C.D. PED HEADS AT 45° & 225°  
 2-PEDESTRIAN PUSH BUTTONS  
 ONE WAY EVP DETECTOR AND LIGHT (PHASES 4+7)  
 TYPE D SIGN PANEL OVERHEAD  
 2-R6-1 SIGN PANELS-POLE MOUNTED 0° & 180°  
 REMOVE: 1-ONE WAY SIGNAL OVERHEAD AT 0'  
 1-ANGLE MOUNT SIGNAL AT 45°  
 2-PEDESTRIAN PUSHBUTTONS & SIGNS & PLUG HOLE  
 F&I: 1-ONE WAY SIGNAL OVERHEAD AT 0'  
 1-ANGLE MOUNT SIGNAL AT 45°  
 1-APS PB AND SIGN (LT ARROW) (PB2-1)  
 AND APS PB MOUNTING SPACERS  
 1-R10-X12 SIGN ADJACENT TO HEAD (7-1)  
 INPLACE: 3" RSC TO INP HH 11:  
 3-12/C 12  
 1-3/C 12  
 1-3/C 12 (EVP)  
 1-3/C 20 (EVP)  
 1-3/C 12 (LUM)

④ INPLACE: PA100 POLE FOUNDATION  
 PA100-A55-D40-9 (DAVIT 350°)  
 LUMINAIRE-LED  
 PA100 SWING-AWAY HINGES  
 3-ONE WAY SIGNALS OVERHEAD (0', 17' & 29'  
 FROM END OF MAST ARM)  
 2-ANGLE MOUNT SIGNALS AT 45° & 225°  
 2-ANGLE MOUNT C.D. PED HEADS AT 45° & 225°  
 2-PEDESTRIAN PUSH BUTTONS  
 ONE WAY EVP DETECTOR AND LIGHT (PHASES 6+1)  
 TYPE D SIGN PANEL OVERHEAD  
 2-R6-1 SIGN PANELS-POLE MOUNTED 0° & 180°  
 REMOVE: 1-ONE WAY SIGNAL OVERHEAD AT 0'  
 1-ANGLE MOUNT SIGNAL AT 45°  
 2-PEDESTRIAN PUSHBUTTONS & SIGNS & PLUG HOLES  
 D40-9  
 F&I: 1-ONE WAY SIGNAL OVERHEAD AT 0'  
 1-ANGLE MOUNT SIGNAL AT 45°  
 1-D30-9 LUMINAIRE EXTENSION  
 1-R10-X12 SIGN ADJACENT TO HEAD (3-1)  
 SALVAGE & REINSTALL: LUMINAIRE-LED  
 INPLACE: 3" RSC TO INP HH 16:  
 3-12/C 12  
 1-3/C 12  
 1-3/C 12 (EVP)  
 1-3/C 20 (EVP)  
 1-3/C 12 (LUM)

Ⓐ INPLACE: CONTROLLER AND CABINET  
 CABINET FOUNDATION  
 1 1/4" RSC TO INP HH 23:  
 3-1/C 6  
 INPLACE: 4" RSC TO INP HH 1: 4" RSC  
 3-12/C 12 3-12/C 12  
 1-3/C 12 1-3/C 12  
 1-3/C 12 (EVP) 1-3/C 12 (EVP)  
 1-3/C 20 (EVP) 1-3/C 20 (EVP)  
 8-2/C 14 8-2/C 14  
 1-6SM FO CABLE 1-6SM FO CABLE  
 F&I: 4-2/C 14 1-CAT 5E (CCTV)  
 1-1/C 6 INS. GR.  
 INPLACE: 4" RSC TO INP HH 22: 4" RSC  
 3-12/C 12 3-12/C 12  
 1-3/C 12 1-3/C 12  
 1-3/C 12 (EVP) 1-3/C 12 (EVP)  
 1-3/C 20 (EVP) 1-3/C 20 (EVP)  
 16-2/C 14 \*\*REMOVE: 1-6PR 19  
 1-FO CAB (6SM)  
 F&I: 2-2/C #14  
 1-1/C 6 INS. GR.  
 \*\* F&I: 1.5" CONDUIT TO PULL VAULT  
 1-FO ARMORED CABLE (12SM)

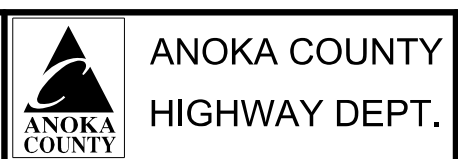
Ⓑ INPLACE: SIGNAL SERVICE CABINET  
 2" RSC TO INP HH 23:  
 3-1/C 6  
 REMOVE: SERVICE CABINET  
 F&I: BATTERY BACKUP SERVICE CABINET (SEE DETAIL SHEET)  
 INPLACE: 2" RSC TO INP HH 1  
 4-3/C 12 (LUM)  
 INPLACE: BETWEEN INP HH 1 AND INP HH 23  
 2" RSC  
 2-3/C 12 (LUM)  
 INPLACE: BETWEEN INP HH 22 AND INP HH 23  
 2" RSC  
 2-3/C 12 (LUM)  
 STUB OUT 2" RSC FROM SERVICE CABINET TO WEST

- NOTES:
- ALL SIGNAL MOUNTED SIGNS ARE INCLUDED IN PAYMENT WITH THE LUMP SUM SIGNAL SYSTEM PAY ITEM. SEE SIGNING DETAIL SHEET FOR MAST ARM MOUNTED SIGNS.
  - ITEMS DENOTED WITH AN \*\* ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECTION PAY ITEM.
  - SEE SECTIONS 1806 (DETERMINATION AND EXTENSION OF CONTRACT TIME) AND 2563 (TRAFFIC CONTROL) IN THE SPECIAL PROVISIONS FOR IMPORTANT TRAFFIC SIGNAL STAGING REQUIREMENTS.

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 SIGNATURE: *Nick Van Gunst*  
 DATE: 11/26/24 LICENSE NO. 44683

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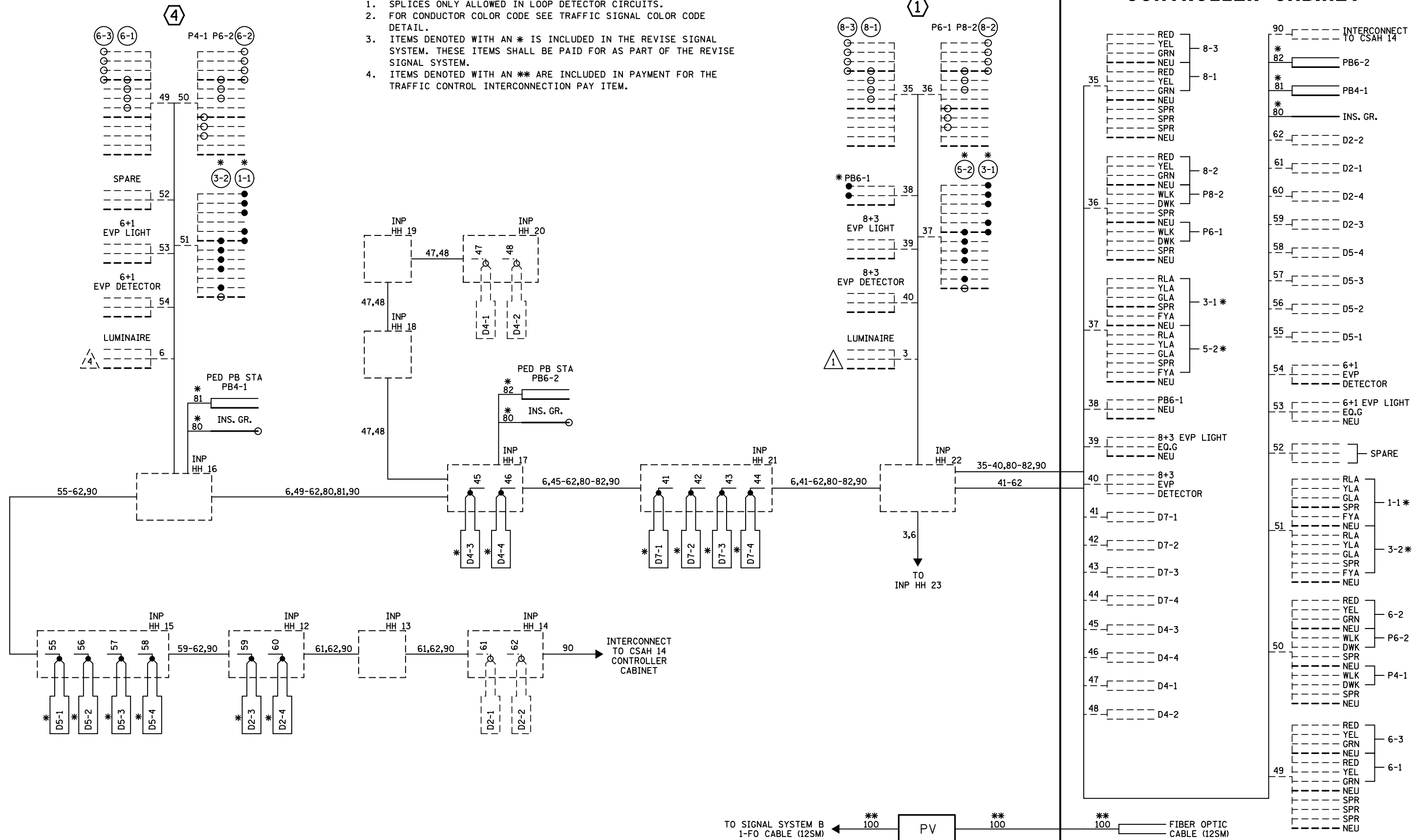


REVISE SIGNAL SYSTEM F NOTES  
 BUNKER LAKE BLVD & HANSON BLVD  
 COUNTY PROJECT SAP 002-716-024  
 CITY PROJECT SAP 198-020-040

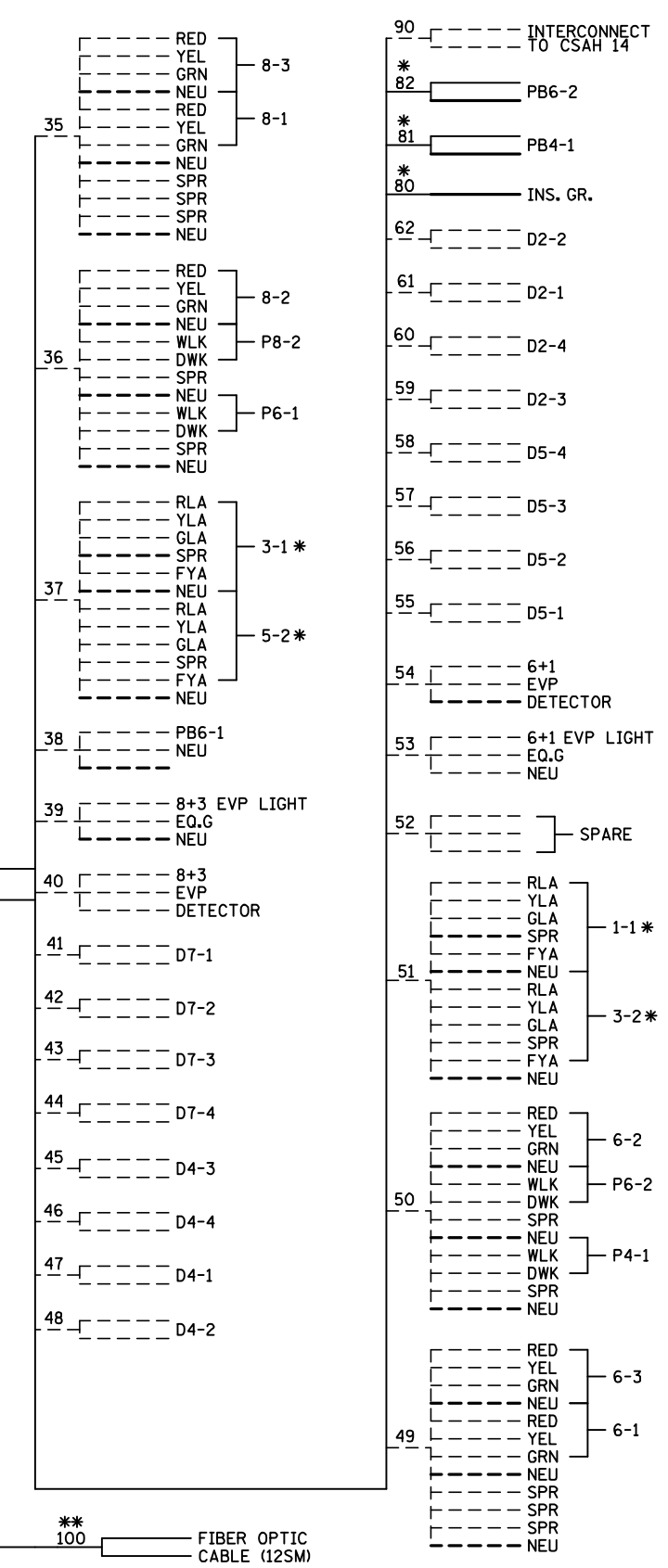
CSAH 116 (BUNKER LAKE BLVD)  
 SIGNAL MODIFICATION  
 & ADA IMPROVEMENTS  
 Sheet 135 of 174 Sheets

NOTES:

1. SPLICES ONLY ALLOWED IN LOOP DETECTOR CIRCUITS.
2. FOR CONDUCTOR COLOR CODE SEE TRAFFIC SIGNAL COLOR CODE DETAIL.
3. ITEMS DENOTED WITH AN \* IS INCLUDED IN THE REVISE SIGNAL SYSTEM. THESE ITEMS SHALL BE PAID FOR AS PART OF THE REVISE SIGNAL SYSTEM.
4. ITEMS DENOTED WITH AN \*\* ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECTION PAY ITEM.



CONTROLLER CABINET



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 SIGNATURE: *Nick Van Gunst*  
 DATE: 11/26/24 LICENSE NO. 44683

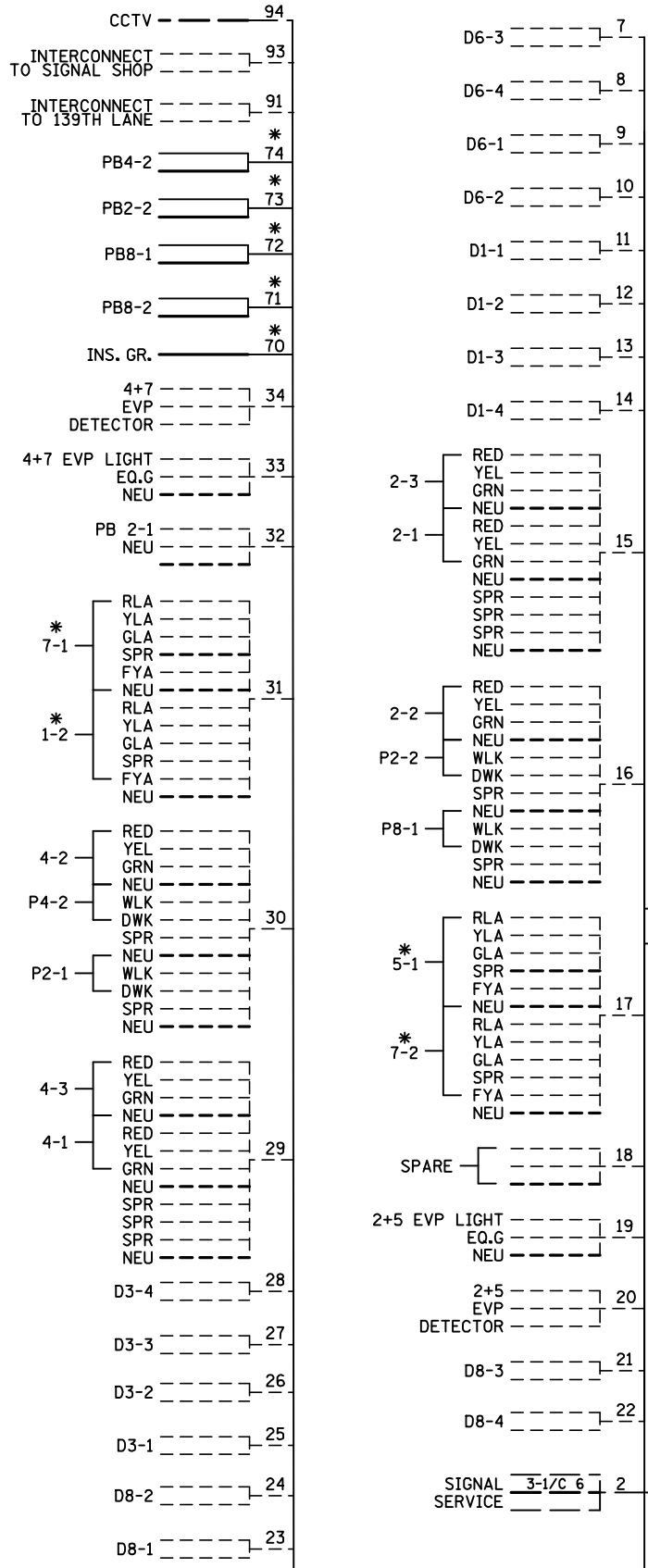
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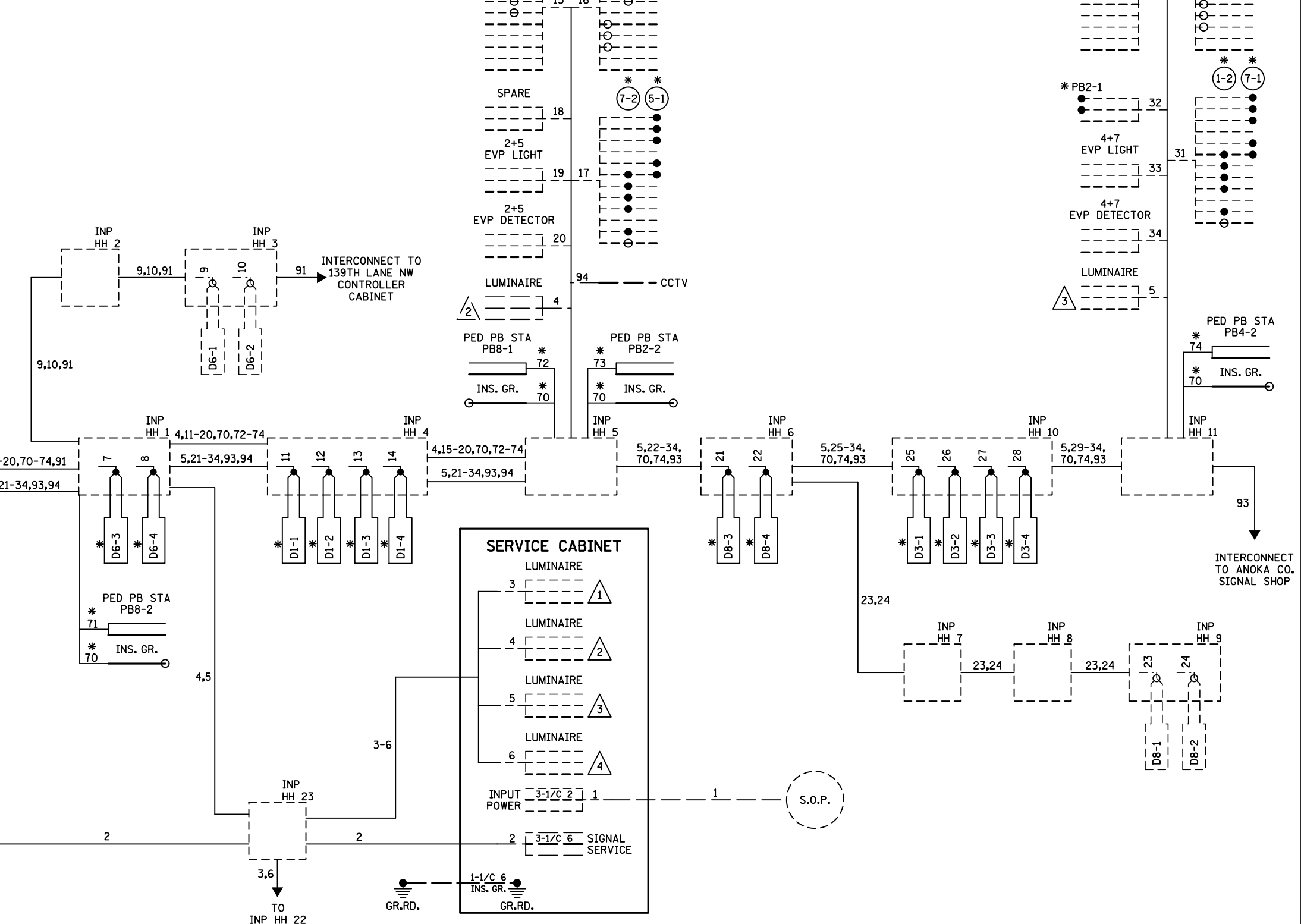
REVISE SIGNAL SYSTEM F WIRING  
 BUNKER LAKE BLVD & HANSON BLVD  
 COUNTY PROJECT SAP 002-716-024  
 CITY PROJECT SAP 198-020-040

CSAH 116 (BUNKER LAKE BLVD)  
 SIGNAL MODIFICATION  
 & ADA IMPROVEMENTS  
 Sheet 136 of 174 Sheets

# CONTROLLER CABINET



- NOTES:**
1. SPLICES ONLY ALLOWED IN LOOP DETECTOR CIRCUITS.
  2. FOR CONDUCTOR COLOR CODE SEE TRAFFIC SIGNAL COLOR CODE DETAIL.
  3. ITEMS DENOTED WITH AN \* IS INCLUDED IN THE REVISE SIGNAL SYSTEM. THESE ITEMS SHALL BE PAID FOR AS PART OF THE REVISE SIGNAL SYSTEM.
  4. ITEMS DENOTED WITH AN \*\* ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECTION PAY ITEM.

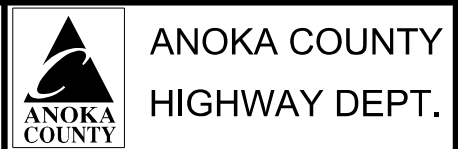


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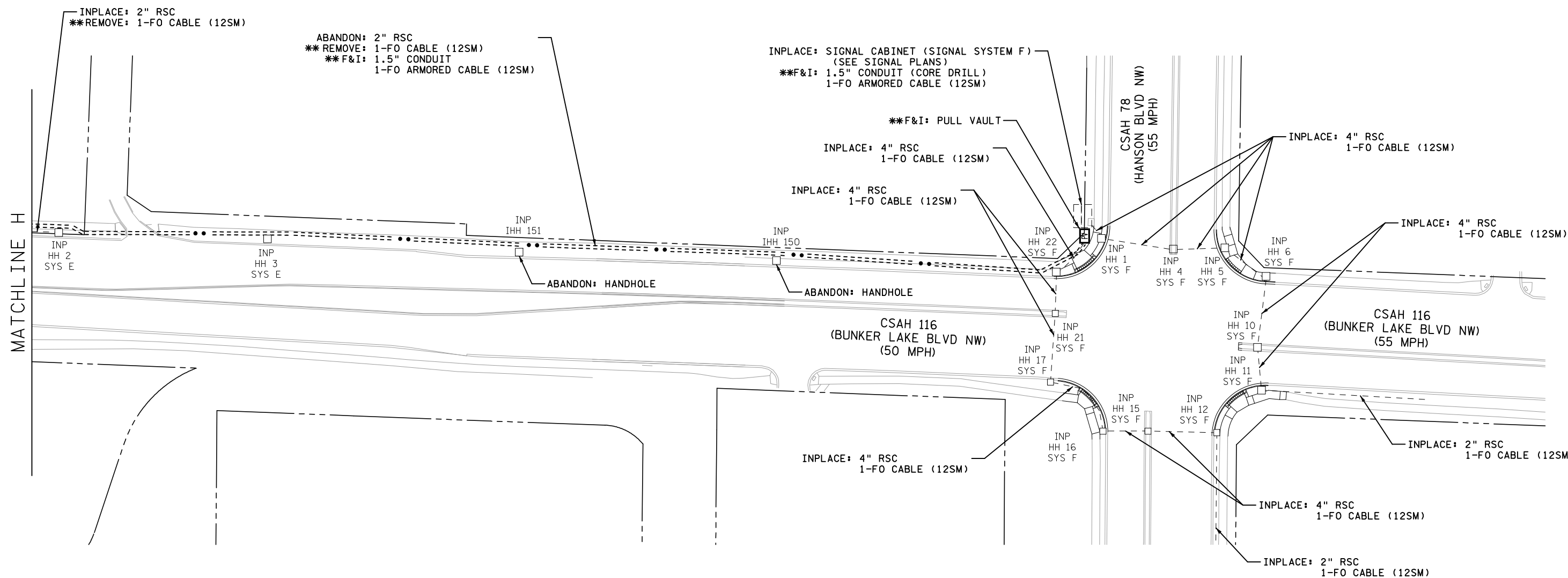
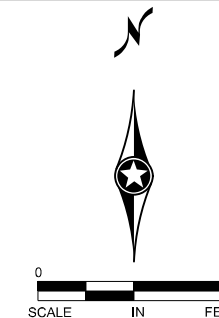
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REVISE SIGNAL SYSTEM F WIRING  
 BUNKER LAKE BLVD & HANSON BLVD  
 COUNTY PROJECT SAP 002-716-024  
 CITY PROJECT SAP 198-020-040

CSAH 116 (BUNKER LAKE BLVD)  
 SIGNAL MODIFICATION & ADA IMPROVEMENTS  
 Sheet 137 of 174 Sheets



MATCHLINE H

**NOTES:**

1. THE LOCATION OF PULL VAULTS AND CONDUITS SHOWN IN THE PLAN ARE APPROXIMATED. EXACT LOCATIONS SHALL BE COORDINATED WITH ALL UTILITY FACILITIES IN SIDEWALK AND ROADWAY AND SHALL BE VERIFIED IN THE FIELD BY THE ENGINEER.
2. ALL ITEMS ARE TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.
3. ITEMS DENOTED WITH \*\* ARE INCLUDED IN THE PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM.
4. CONTRACTOR SHALL TERMINATE FIBER OPTIC CABLE WITHIN TRAFFIC SIGNAL CABINETS IN THE CONTRACTOR PROVIDED TERMINATION PANEL. SEE SPECIAL PROVISIONS.
5. DIRECTIONAL BORE INTERCONNECT CONDUIT UNDER ALL HARD SURFACES LIKE SIDEWALKS, ROADS AND DRIVEWAYS.

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PRINT NAME: NICK VANGUNST

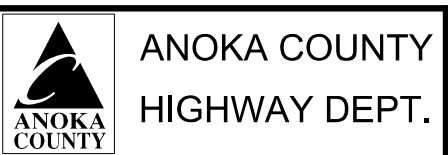
SIGNATURE: *Nick Van Gunst*

DATE: 11/26/24      LICENSE NO. 44683

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DESIGN BY KAS      DATE 11/26/24

CHECKED BY NHV      DATE 11/26/24

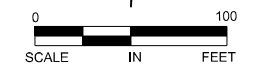


**TRAFFIC SIGNAL SYSTEM  
INTERCONNECT LAYOUT**

COUNTY PROJECT SAP 002-716-024  
CITY PROJECT SAP 198-020-040

**CSAH 116 (BUNKER LAKE BLVD)  
SIGNAL MODIFICATION  
& ADA IMPROVEMENTS**

Sheet 155 of 174 Sheets



ABANDON: 2" RSC  
 \*\* REMOVE: 1-FO CABLE (12SM)  
 \*\* F&I: 1.5" CONDUIT  
 1-FO ARMORED CABLE (12SM)

ABANDON: 2" RSC  
 \*\* REMOVE: 1-FO CABLE (12SM)  
 \*\* F&I: 1.5" CONDUIT  
 1-FO ARMORED CABLE (12SM)

\*\* F&I: 1.5" CONDUIT  
 2-FO ARMORED CABLE (12SM)

\*\* F&I: PULL VAULT

INPLACE: 2" RSC  
 \*\* REMOVE: 1-FO CABLE (12SM)

PROPOSED SIGNAL CABINET (SIGNAL SYSTEM E)  
 (SEE SIGNAL PLANS)

INP  
 IHH 125

INP  
 IHH 126

INP  
 IHH 127

INP  
 IHH 128

INP  
 HH 13  
 SYS E

INP  
 HH 1  
 SYS E

MATCHLINE G

MATCHLINE H

CSAH 116  
 (BUNKER LAKE BLVD NW)  
 (50 MPH)

JAY ST NW  
 (30 MPH)

NOTES:

1. THE LOCATION OF PULL VAULTS AND CONDUITS SHOWN IN THE PLAN ARE APPROXIMATE. EXACT LOCATIONS SHALL BE COORDINATED WITH ALL UTILITY FACILITIES IN SIDEWALK AND ROADWAY AND SHALL BE VERIFIED IN THE FIELD BY THE ENGINEER.
2. ALL ITEMS ARE TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.
3. ITEMS DENOTED WITH \*\* ARE INCLUDED IN THE PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM.
4. CONTRACTOR SHALL TERMINATE FIBER OPTIC CABLE WITHIN TRAFFIC SIGNAL CABINETS IN THE CONTRACTOR PROVIDED TERMINATION PANEL. SEE SPECIAL PROVISIONS.
5. DIRECTIONAL BORE INTERCONNECT CONDUIT UNDER ALL HARD SURFACES LIKE SIDEWALKS, ROADS AND DRIVEWAYS.

NO	DATE	BY	CHKD	APPR	REVISION
NAME: ..\Projects\2023\1230174\DESIGN\Plan Sheet Design\cd1230174_ic17.dgn 11/26/2024 3:06:16 PM					

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
 PRINT NAME: NICK VANGUNST  
 SIGNATURE: *Nick Van Gunst*  
 DATE: 11/26/24 LICENSE NO. 44683

DRAWN BY: KAS DATE 11/26/24  
 DESIGN BY: KAS DATE 11/26/24  
 CHECKED BY: NHV DATE 11/26/24



TRAFFIC SIGNAL SYSTEM  
 INTERCONNECT LAYOUT  
 COUNTY PROJECT SAP 002-716-024  
 CITY PROJECT SAP 198-020-040

CSAH 116 (BUNKER LAKE BLVD)  
 SIGNAL MODIFICATION  
 & ADA IMPROVEMENTS  
 Sheet 154 of 174 Sheets

MATCH LINE - STATION 25 + 70

MATCH LINE - SEE BELOW RIGHT

- (A) EQUIPMENT PAD FOUNDATION  
INSTALL CONTROLLER AND CABINET  
(FURNISHED BY COUNTY)
- MASTER CONTROLLER (F & I BY COUNTY)
- SIGNAL SERVICE CABINET
- BETWEEN CONTROLLER CABINET AND  
SERVICE CABINET:
- METERED SIGNAL SERVICE
- 2"R.S.C.
- 3-1/c#6
- CONTROLLER CABINET TO H.H.1:
- 4"R.S.C. 4"R.S.C.
- 3-12/c#12 3-12/c#12
- 1-3/c#12 1-3/c#12
- 1-3/c#12 (EVP) 1-3/c#12 (EVP)
- 1-3/c#20 (EVP) 1-3/c#20 (EVP)
- 8-2/c#14 8-2/c#14
- 1-6/c FO CABLE (INT) 1-6/c FO CABLE (INT)
- 1-3/c#18 1-3/c#18

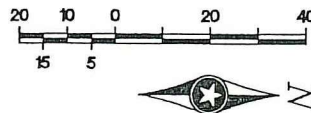
- CONTROLLER CABINET TO H.H.22:
- 4"R.S.C. 4"R.S.C.
- 3-12/c#12 3-12/c#12
- 1-3/c#12 1-3/c#12
- 1-3/c#12 (EVP) 1-3/c#12 (EVP)
- 1-3/c#20 (EVP) 1-3/c#20 (EVP)
- 16-2/c#14 1-6 Pr.#19-INPLACE (S & I) (INTERCONNECT)
- 1-3/c#18 1-6/c FIBER OPTIC CABLE (INTERCONNECT)
- 1-3/c#18 1-3/c#18

- STUB OUT 2-3"R.S.C. FROM  
CONTROLLER CABINET TO NORTH  
(THREAD & CAP-FOR FUTURE USE)
- STUB OUT 1"N.M.C. FROM  
CONTROLLER CABINET (FOR FUTURE  
PHONE LINE BY OTHERS)

- SERVICE CABINET TO H.H.1:
- 2"R.S.C.
- UNMETERED STREET LIGHT SERVICE
- 2-3/c#12 (LUM)

- SERVICE CABINET TO H.H.22:
- 2"R.S.C.
- UNMETERED STREET LIGHT SERVICE
- 2-3/c#12 (LUM)

- STUB OUT 2"R.S.C. FROM  
SERVICE CABINET TO WEST  
(FOR POWER BY CONNEXUS)



**FINAL PLAN**  
CONFORMING TO  
CONST. RECORDS  
DATE *JMG, 12-15-08*

COUNTY HIGHWAY  
DEPARTMENT BUILDING

(REMOVE INPLACE 1-6 Pr.#19 CABLE  
TO COUNTY SIGNAL SHOP)

CONTRACTOR SHALL BE RESPONSIBLE FOR  
DETERMINING AND ACCOUNTING FOR  
DISTANCE FROM THIS PLAN SHEET TO  
THE COUNTY'S SIGNAL SHOP FACILITIES,  
AND FOR INCLUDING ALL REQUIRED  
QUANTITY OF FIBER OPTIC CABLE  
TO THE COUNTY SIGNAL SHOP IN THE  
BID FOR THIS PROJECT.

NO ADDITIONAL COMPENSATION WILL BE  
MADE THEREFOR FOR FIBER OPTIC  
CABLE INSTALLATION WORK FROM  
CSAH 116 TO THE SIGNAL SHOP.

S.P. 02-678-16 & 02-7 10  
S.P. 198-020-25  
ANDOVER CITY PROJ. 04-23A

DESIGN TEAM	NO.	BY	DATE	REVISIONS
	1	JMG	01/06	REVISED PER COUNTY AND STATE COMMENTS
	2	JMG	06/06	REVISED PER COUNTY COMMENTS
	3	JMG	12/08	RECORD DRAWING

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DAMAGES RESULTING THEREFROM.

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR  
UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED  
PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*John M. Gray*  
Name: John M. Gray, PE  
Date: November 28, 2006 Lic. No. 22457

**SEH**  
PHONE: (651) 490-2000  
3535 VADNAIS CENTER DR.  
ST. PAUL, MN 55110

ANOKA COUNTY, MINNESOTA  
CITY OF ANDOVER

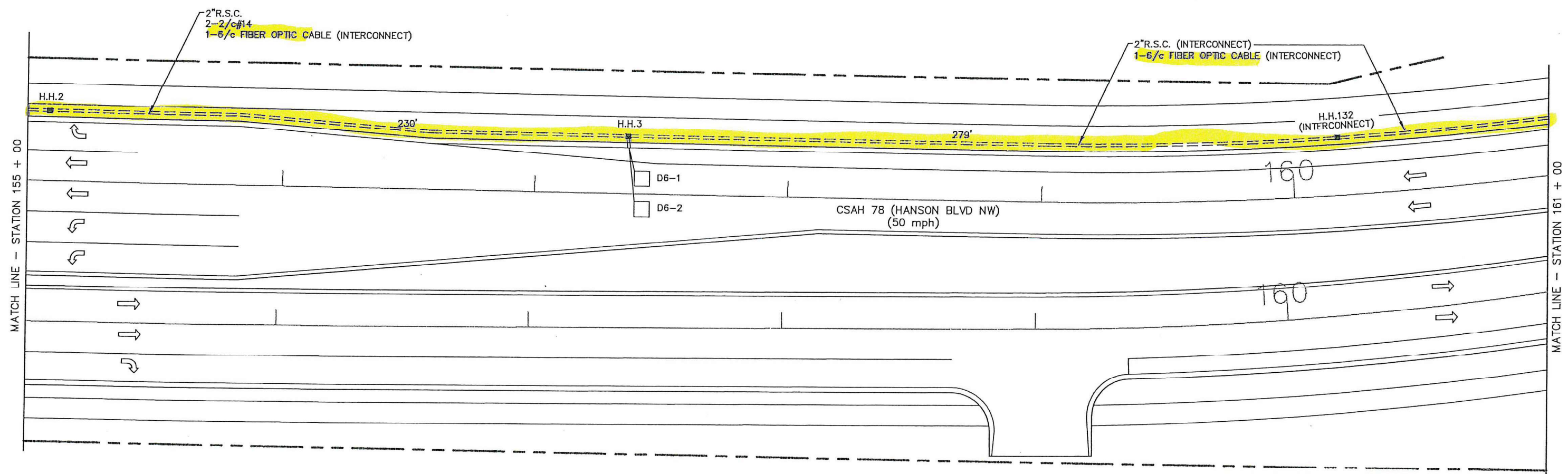
**TRAFFIC SIGNAL SYSTEM "B"**  
**INTERSECTION LAYOUT**  
CSAH 78 (HANSON BLVD NW) AT  
CSAH 116 (BUNKER LAKE BLVD)

FILE NO.  
AANOKC0601.00  
SIGNAL SHEET  
23 OF 38  
264  
400

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**NOTES:**

- 1) IT SHALL BE CONTRACTOR'S RESPONSIBILITY TO UTILIZE THE "ONE CALL EXCAVATION NOTICE SYSTEM" (TELEPHONE NUMBER 651-454-0002), AS REQUIRED BY MINNESOTA STATUTE 2160.
- 2) DISTANCE OFF SHOULDER OR CURB FOR INTERCONNECT CONDUIT SHALL BE 1-2 FEET.
- 3) (INTERCONNECT) DENOTES ITEMS TO BE MEASURED AND PAID FOR UNDER ITEM NO. 2565 (TRAFFIC CONTROL INTERCONNECTION). SEE ESTIMATED QUANTITIES AND SPECIAL PROVISIONS.



**FINAL PLAN**  
 CONFORMING TO  
 CONST. RECORDS  
 DATE JMG, 12-15-08

S:\NEVA\WORK\COMMON\CSAH-78-SIGNALS\SIGBASE-REC.DWG

DESIGNER:	JMG	1	JMG	01/06	REVISED PER COUNTY AND STATE COMMENTS
CHECKED BY:	JMG	2	JMG	12/08	RECORD DRAWING
DESIGN TEAM		NO.	BY	DATE	REVISIONS

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I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Name: John M. Gray, PE  
 Lic. No. 22457  
 Date: November 28, 2008

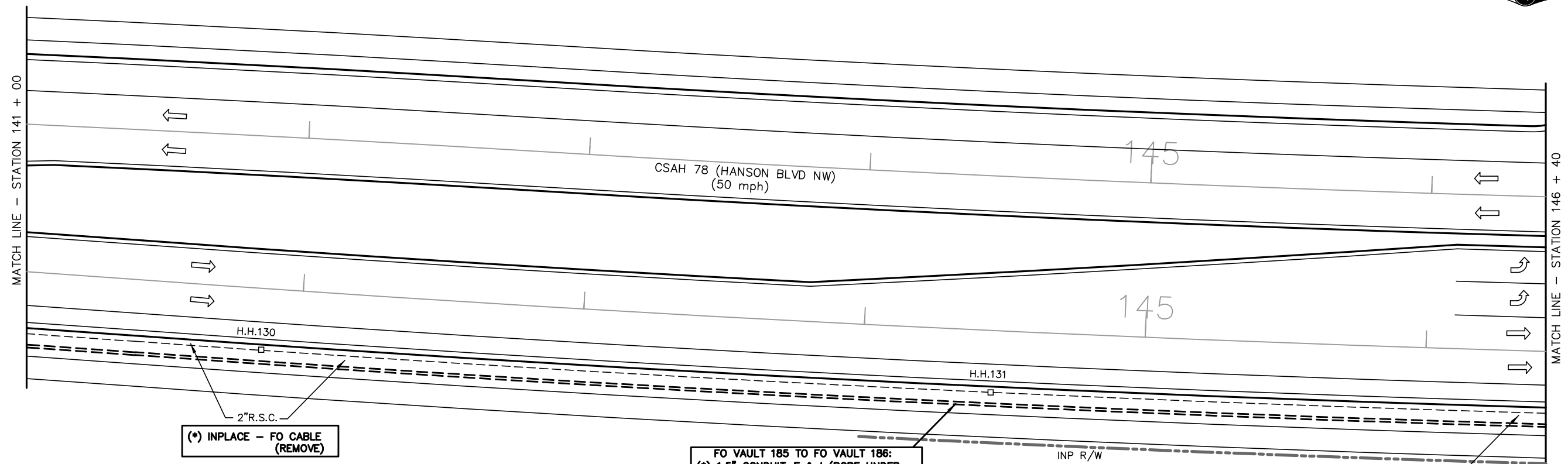
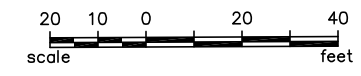
**SEH**  
 PHONE: (651) 490-2000  
 3535 VADNAIS CENTER DR.  
 ST. PAUL, MN 55110

ANOKA COUNTY, MINNESOTA  
 CITY OF ANDOVER

**TRAFFIC SIGNAL INTERCONNECT INTERSECTION LAYOUT**  
 CSAH 78 (HANSON BLVD NW)  
 (STATION 155 + 00 TO STATION 161 + 00)

S.P. 02-678-16  
 S.P. 198-020-25  
 ANDOVER CITY PROJ. 04-23A

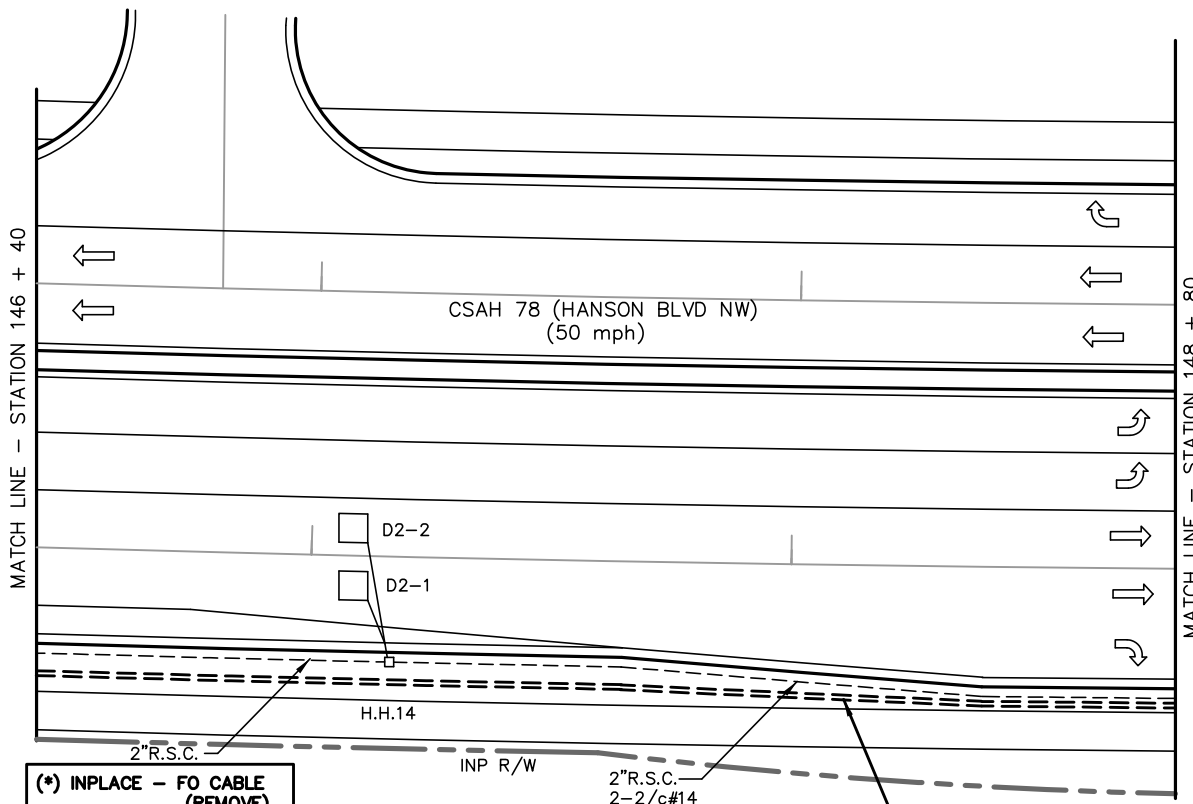
FILE NO. AANOKC0601.00  
 SIGNAL SHEET 26 OF 38  
 267 / 400



(\* INPLACE - FO CABLE (REMOVE))

FO VAULT 185 TO FO VAULT 186:  
 (\* 1.5" CONDUIT-F & I (BORE UNDER ALL WALKS/DRIVEWAYS/ROADS)  
 (\* 1-12 SM FIBER-OPTIC CABLE-F & I (TO 133RD STREET SIGNAL SYSTEM)

(\* INPLACE - FO CABLE (REMOVE))



(\* INPLACE - FO CABLE (REMOVE))

(\* INPLACE - FO CABLE (REMOVE))

FO VAULT 185 TO FO VAULT 186:  
 (\* 1.5" CONDUIT-F & I (BORE UNDER ALL WALKS/DRIVEWAYS/ROADS)  
 (\* 1-12 SM FIBER-OPTIC CABLE-F & I (TO CSAH 116 SIGNAL SYSTEM)

- INTERCONNECT NOTES:**
- 1) IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UTILIZE THE "ONE CALL EXCAVATION NOTICE SYSTEM" (TELEPHONE NUMBER 651-454-0002) AS REQUIRED BY MINNESOTA STATUTE 2160.
  - 2) (\*) DENOTES INTERCONNECT WORK TO BE COMPLETED BY THE CONTRACTOR UNDER ITEM NO. 2565 (TRAFFIC CONTROL INTERCONNECT "J"). SEE STATEMENT OF ESTIMATED QUANTITIES AND SPECIAL PROVISIONS.
  - 3) ALL ITEMS OF THIS SIGNAL SYSTEM ARE INPLACE AND SHALL BE REUSED, PROTECTED & MAINTAINED INPLACE, EXCEPT WHERE BOXED IN & DENOTED BY (\*), F & I (FURNISH & INSTALL) AND/OR BY "REMOVE" (ITEMS TO BE REMOVED & DISPOSED OF BY CONTRACTOR).
  - 4) NEW FIBER OPTIC VAULTS REQUIRED TO BE FURNISHED & INSTALLED BY CONTRACTOR AS PART OF PROJECT SHALL BE IN ACCORDANCE WITH THE DETAILS INCLUDED ELSEWHERE IN THESE PLANS.
  - 5) ESTIMATED UTILITIES ALONG CORRIDOR WHICH MAY IMPACT TRAFFIC SIGNAL INTERCONNECT WORK INCLUDE THE FOLLOWING:  
 ANOKA COUNTY - TRAFFIC SIGNAL CONDUITS, AND FIBER ON EAST SIDE BETWEEN 133RD AND CSAH 116.  
 CITY OF ANDOVER - WATER CROSSING ON NORTH SIDE OF CSAH 116.  
 CENTURYLINK/LUMEN - EAST SIDE BETWEEN CSAH 14 AND NORTH OF 125TH LANE, CROSSING ON NORTH SIDE AT 131ST, AND CROSSING BACK TO EAST SIDE (AND THEN NORTH) AT STATION PARKWAY.  
 COMCAST - CROSSINGS OF CSAH 78 AT NUMEROUS LOCATIONS BETWEEN CSAH 14-127TH, AND ALSO SOUTH OF 131ST.  
 CONNEXUS - CROSSINGS OF NORTH-SOUTH-WEST LEGS AT CSAH 116, AND OF CSAH 78 BETWEEN CSAH 14 AND 133RD.  
 ZAYO - EAST SIDE OF CSAH 78 FROM CSAH 116 TO 131ST, WITH A SEPARATE CROSSING OF CSAH 78 NEAR 133RD.

STATE AID PROJ. NO. 002-030-013

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SEH Project ANOKC 179182  
 Drawn By JMG  
 Designed By JMG  
 Checked By JMG

Rev.#	Revision Issue Description	Date	Rev.#	Revision Issue Description	Date

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

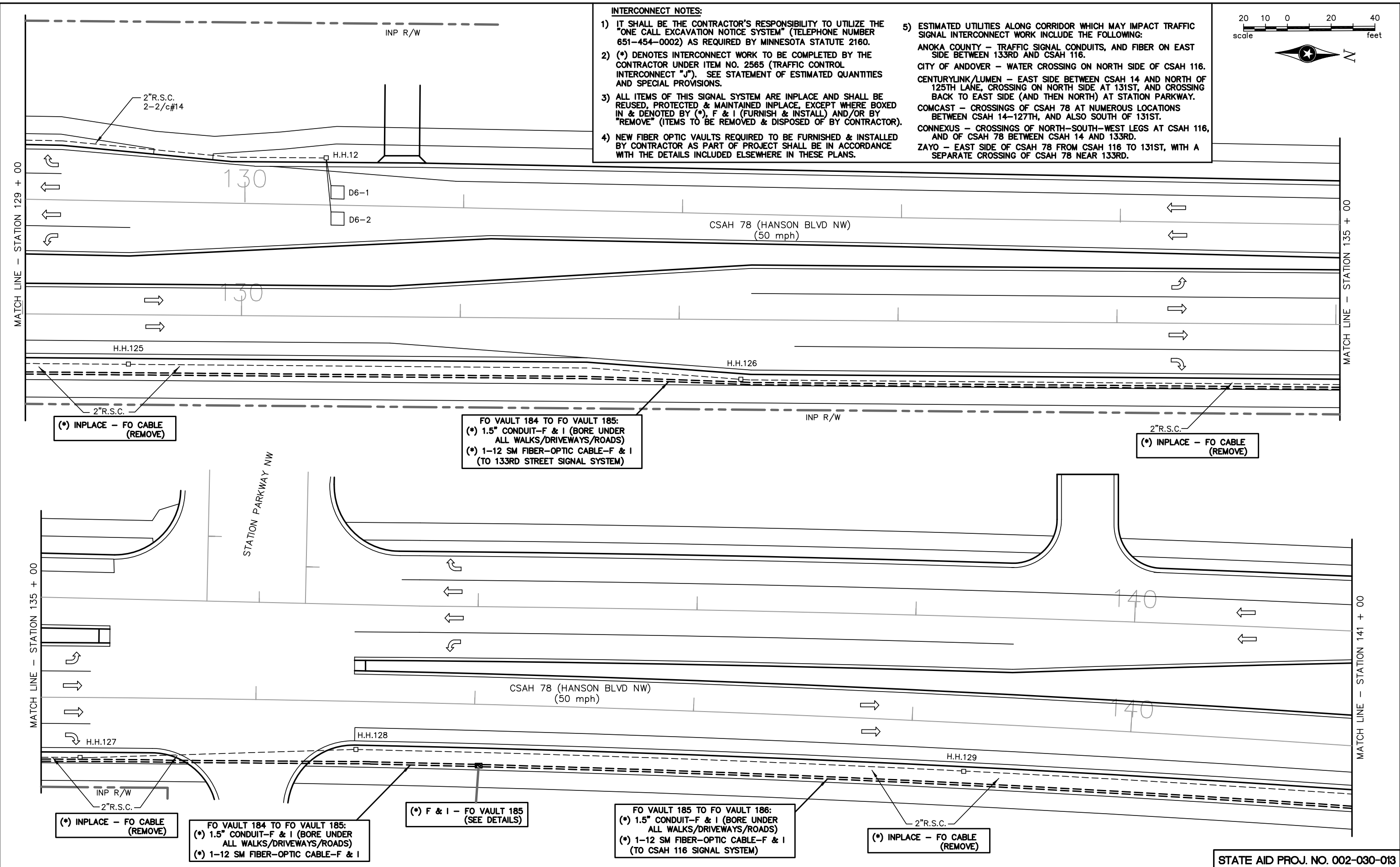
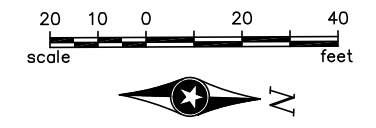
**SEH**

Name: John M. Gray, PE  
 Date: September 6, 2024  
 Lic. No. 22457

**2024 ATMS FIBER INTERCONNECT**  
**ANOKA COUNTY, MINNESOTA**

**TRAFFIC CONTROL INTERCONNECT ' J '**  
**INTERSECTION LAYOUT**  
 MATCH LINES (133RD AVENUE TO CSAH 116)

- INTERCONNECT NOTES:**
- 1) IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UTILIZE THE "ONE CALL EXCAVATION NOTICE SYSTEM" (TELEPHONE NUMBER 651-454-0002) AS REQUIRED BY MINNESOTA STATUTE 2160.
  - 2) (\*) DENOTES INTERCONNECT WORK TO BE COMPLETED BY THE CONTRACTOR UNDER ITEM NO. 2565 (TRAFFIC CONTROL INTERCONNECT "J"). SEE STATEMENT OF ESTIMATED QUANTITIES AND SPECIAL PROVISIONS.
  - 3) ALL ITEMS OF THIS SIGNAL SYSTEM ARE INPLACE AND SHALL BE REUSED, PROTECTED & MAINTAINED INPLACE, EXCEPT WHERE BOXED IN & DENOTED BY (\*), F & I (FURNISH & INSTALL) AND/OR BY "REMOVE" (ITEMS TO BE REMOVED & DISPOSED OF BY CONTRACTOR).
  - 4) NEW FIBER OPTIC VAULTS REQUIRED TO BE FURNISHED & INSTALLED BY CONTRACTOR AS PART OF PROJECT SHALL BE IN ACCORDANCE WITH THE DETAILS INCLUDED ELSEWHERE IN THESE PLANS.
  - 5) ESTIMATED UTILITIES ALONG CORRIDOR WHICH MAY IMPACT TRAFFIC SIGNAL INTERCONNECT WORK INCLUDE THE FOLLOWING:  
 ANOKA COUNTY - TRAFFIC SIGNAL CONDUITS, AND FIBER ON EAST SIDE BETWEEN 133RD AND CSAH 116.  
 CITY OF ANDOVER - WATER CROSSING ON NORTH SIDE OF CSAH 116.  
 CENTURYLINK/LUMEN - EAST SIDE BETWEEN CSAH 14 AND NORTH OF 125TH LANE, CROSSING ON NORTH SIDE AT 131ST, AND CROSSING BACK TO EAST SIDE (AND THEN NORTH) AT STATION PARKWAY.  
 COMCAST - CROSSINGS OF CSAH 78 AT NUMEROUS LOCATIONS BETWEEN CSAH 14-127TH, AND ALSO SOUTH OF 131ST.  
 CONNEXUS - CROSSINGS OF NORTH-SOUTH-WEST LEGS AT CSAH 116, AND OF CSAH 78 BETWEEN CSAH 14 AND 133RD.  
 ZAYO - EAST SIDE OF CSAH 78 FROM CSAH 116 TO 131ST, WITH A SEPARATE CROSSING OF CSAH 78 NEAR 133RD.



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SEH Project	ANOKC 179182
Drawn By	JMG
Designed By	JMG
Checked By	JMG

Rev.#	Revision Issue Description	Date	Rev.#	Revision Issue Description	Date

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**SEH**

Name: John M. Gray, PE  
 Date: September 6, 2024  
 Lic. No. 22457

**2024 ATMS FIBER INTERCONNECT**  
**ANOKA COUNTY, MINNESOTA**

**TRAFFIC CONTROL INTERCONNECT ' J '**  
**INTERSECTION LAYOUT**  
 MATCH LINES (133RD AVENUE TO CSAH 116)

STATE AID PROJ. NO. 002-030-013

99  
of 102

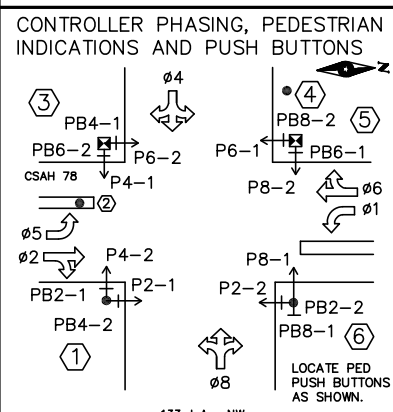
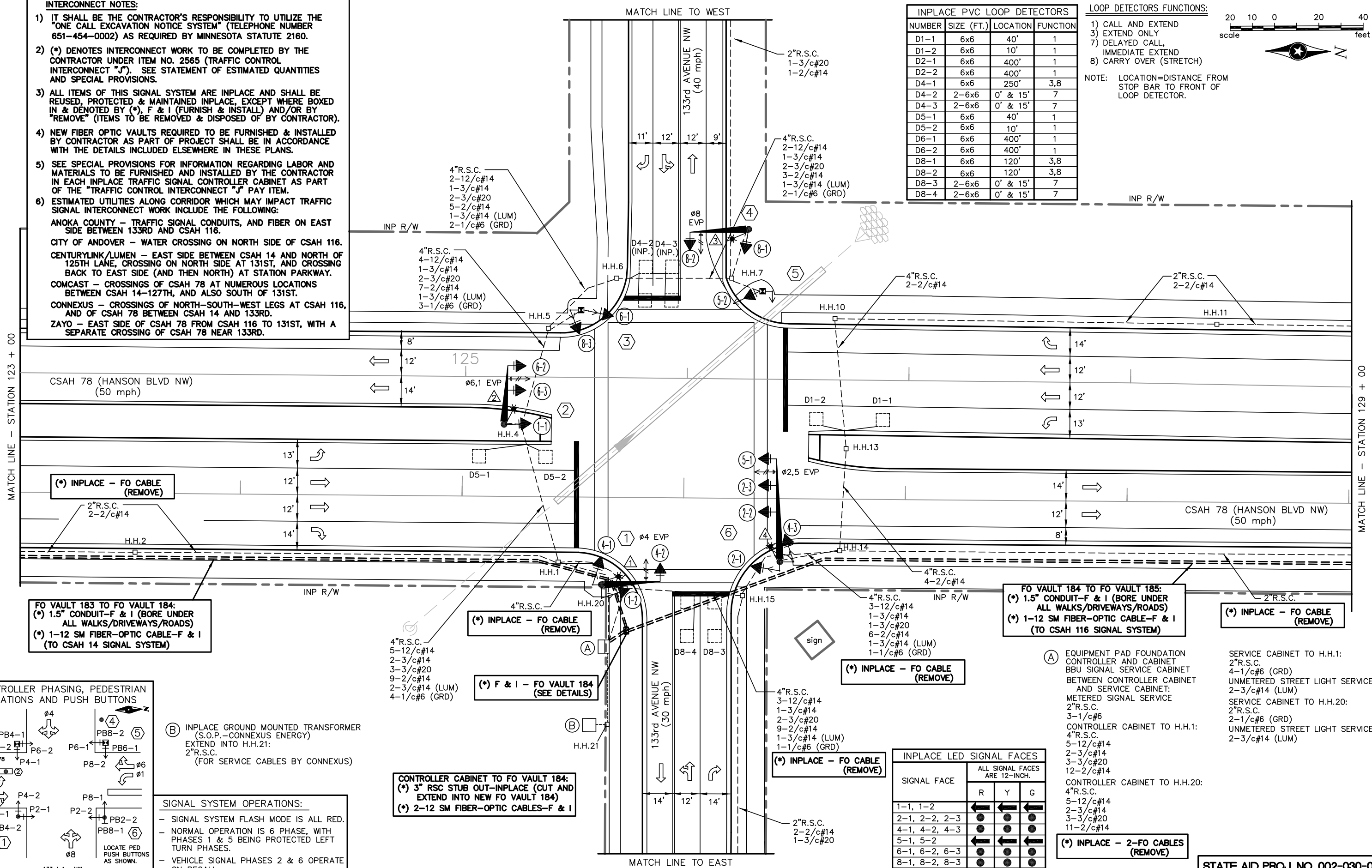
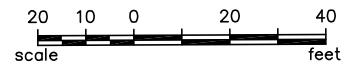
**INTERCONNECT NOTES:**

- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UTILIZE THE "ONE CALL EXCAVATION NOTICE SYSTEM" (TELEPHONE NUMBER 651-454-0002) AS REQUIRED BY MINNESOTA STATUTE 2160.
- (\*) DENOTES INTERCONNECT WORK TO BE COMPLETED BY THE CONTRACTOR UNDER ITEM NO. 2565 (TRAFFIC CONTROL INTERCONNECT "J"). SEE STATEMENT OF ESTIMATED QUANTITIES AND SPECIAL PROVISIONS.
- ALL ITEMS OF THIS SIGNAL SYSTEM ARE INPLACE AND SHALL BE REUSED, PROTECTED & MAINTAINED INPLACE, EXCEPT WHERE BOXED IN & DENOTED BY (\*), F & I (FURNISH & INSTALL) AND/OR BY "REMOVE" (ITEMS TO BE REMOVED & DISPOSED OF BY CONTRACTOR).
- NEW FIBER OPTIC VAULTS REQUIRED TO BE FURNISHED & INSTALLED BY CONTRACTOR AS PART OF PROJECT SHALL BE IN ACCORDANCE WITH THE DETAILS INCLUDED ELSEWHERE IN THESE PLANS.
- SEE SPECIAL PROVISIONS FOR INFORMATION REGARDING LABOR AND MATERIALS TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR IN EACH INPLACE TRAFFIC SIGNAL CONTROLLER CABINET AS PART OF THE "TRAFFIC CONTROL INTERCONNECT "J" PAY ITEM.
- ESTIMATED UTILITIES ALONG CORRIDOR WHICH MAY IMPACT TRAFFIC SIGNAL INTERCONNECT WORK INCLUDE THE FOLLOWING:  
 ANOKA COUNTY - TRAFFIC SIGNAL CONDUITS, AND FIBER ON EAST SIDE BETWEEN 133RD AND CSAH 116.  
 CITY OF ANDOVER - WATER CROSSING ON NORTH SIDE OF CSAH 116.  
 CENTURYLINK/LUMEN - EAST SIDE BETWEEN CSAH 14 AND NORTH OF 125TH LANE, CROSSING ON NORTH SIDE AT 131ST, AND CROSSING BACK TO EAST SIDE (AND THEN NORTH) AT STATION PARKWAY.  
 COMCAST - CROSSINGS OF CSAH 78 AT NUMEROUS LOCATIONS BETWEEN CSAH 14-127TH, AND ALSO SOUTH OF 131ST.  
 CONNEXUS - CROSSINGS OF NORTH-SOUTH-WEST LEGS AT CSAH 116, AND OF CSAH 78 BETWEEN CSAH 14 AND 133RD.  
 ZAYO - EAST SIDE OF CSAH 78 FROM CSAH 116 TO 131ST, WITH A SEPARATE CROSSING OF CSAH 78 NEAR 133RD.

INPLACE PVC LOOP DETECTORS			
NUMBER	SIZE (FT.)	LOCATION	FUNCTION
D1-1	6x6	40'	1
D1-2	6x6	10'	1
D2-2	6x6	400'	1
D4-1	6x6	250'	3,8
D4-2	2-6x6	0' & 15'	7
D4-3	2-6x6	0' & 15'	7
D5-1	6x6	40'	1
D5-2	6x6	10'	1
D6-1	6x6	400'	1
D6-2	6x6	400'	1
D8-1	6x6	120'	3,8
D8-2	6x6	120'	3,8
D8-3	2-6x6	0' & 15'	7
D8-4	2-6x6	0' & 15'	7

**LOOP DETECTORS FUNCTIONS:**

- CALL AND EXTEND
  - EXTEND ONLY
  - DELAYED CALL, IMMEDIATE EXTEND
  - CARRY OVER (STRETCH)
- NOTE: LOCATION=DISTANCE FROM STOP BAR TO FRONT OF LOOP DETECTOR.



(B) INPLACE GROUND MOUNTED TRANSFORMER (S.O.P.-CONNEXUS ENERGY) EXTEND INTO H.H.21: 2"R.S.C. (FOR SERVICE CABLES BY CONNEXUS)

**SIGNAL SYSTEM OPERATIONS:**

- SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 6 PHASE, WITH PHASES 1 & 5 BEING PROTECTED LEFT TURN PHASES.
- VEHICLE SIGNAL PHASES 2 & 6 OPERATE ON RECALL.

**CONTROLLER CABINET TO FO VAULT 184:**  
 (\*) 3" RSC STUB OUT-INPLACE (CUT AND EXTEND INTO NEW FO VAULT 184)  
 (\*) 2-12 SM FIBER-OPTIC CABLES-F & I

SIGNAL FACE	ALL SIGNAL FACES ARE 12-INCH.		
	R	Y	G
1-1, 1-2	←	←	←
2-1, 2-2, 2-3	●	●	●
4-1, 4-2, 4-3	●	●	●
5-1, 5-2	←	←	←
6-1, 6-2, 6-3	●	●	●
8-1, 8-2, 8-3	●	●	●

- (A) EQUIPMENT PAD FOUNDATION  
 CONTROLLER AND CABINET  
 BBU SIGNAL SERVICE CABINET  
 BETWEEN CONTROLLER CABINET AND SERVICE CABINET:  
 METERED SIGNAL SERVICE  
 SERVICE CABINET TO H.H.1:  
 2"R.S.C.  
 4-1/c#6 (GRD)  
 UNMETERED STREET LIGHT SERVICE  
 2-3/c#14 (LUM)
- SERVICE CABINET TO H.H.20:  
 2"R.S.C.  
 3-1/c#6  
 2-1/c#6 (GRD)  
 UNMETERED STREET LIGHT SERVICE  
 2-3/c#14 (LUM)
- CONTROLLER CABINET TO H.H.20:  
 4"R.S.C.  
 5-12/c#14  
 2-3/c#14  
 3-3/c#20  
 12-2/c#14
- CONTROLLER CABINET TO H.H.20:  
 4"R.S.C.  
 5-12/c#14  
 2-3/c#14  
 3-3/c#20  
 11-2/c#14

- SERVICE CABINET TO H.H.1:  
 2"R.S.C.  
 4-1/c#6 (GRD)  
 UNMETERED STREET LIGHT SERVICE  
 2-3/c#14 (LUM)
- SERVICE CABINET TO H.H.20:  
 2"R.S.C.  
 3-1/c#6  
 2-1/c#6 (GRD)  
 UNMETERED STREET LIGHT SERVICE  
 2-3/c#14 (LUM)

SEH Project ANOKK 179182  
 Drawn By JMG  
 Designed By JMG  
 Checked By JMG

Rev.#	Revision Issue Description	Date	Rev.#	Revision Issue Description	Date

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

**SEH**  
 Name: John M. Gray, PE  
 Lic. No. 22457  
 Date: September 6, 2024

**2024 ATMS FIBER INTERCONNECT**  
 ANOKA COUNTY, MINNESOTA

**TRAFFIC CONTROL INTERCONNECT "J"**  
 INTERSECTION LAYOUT  
 CSAH 78 (HANSON BLVD) AT 133RD AVENUE NW

97 of 102

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