

**SIGNAL HEAD CHART**

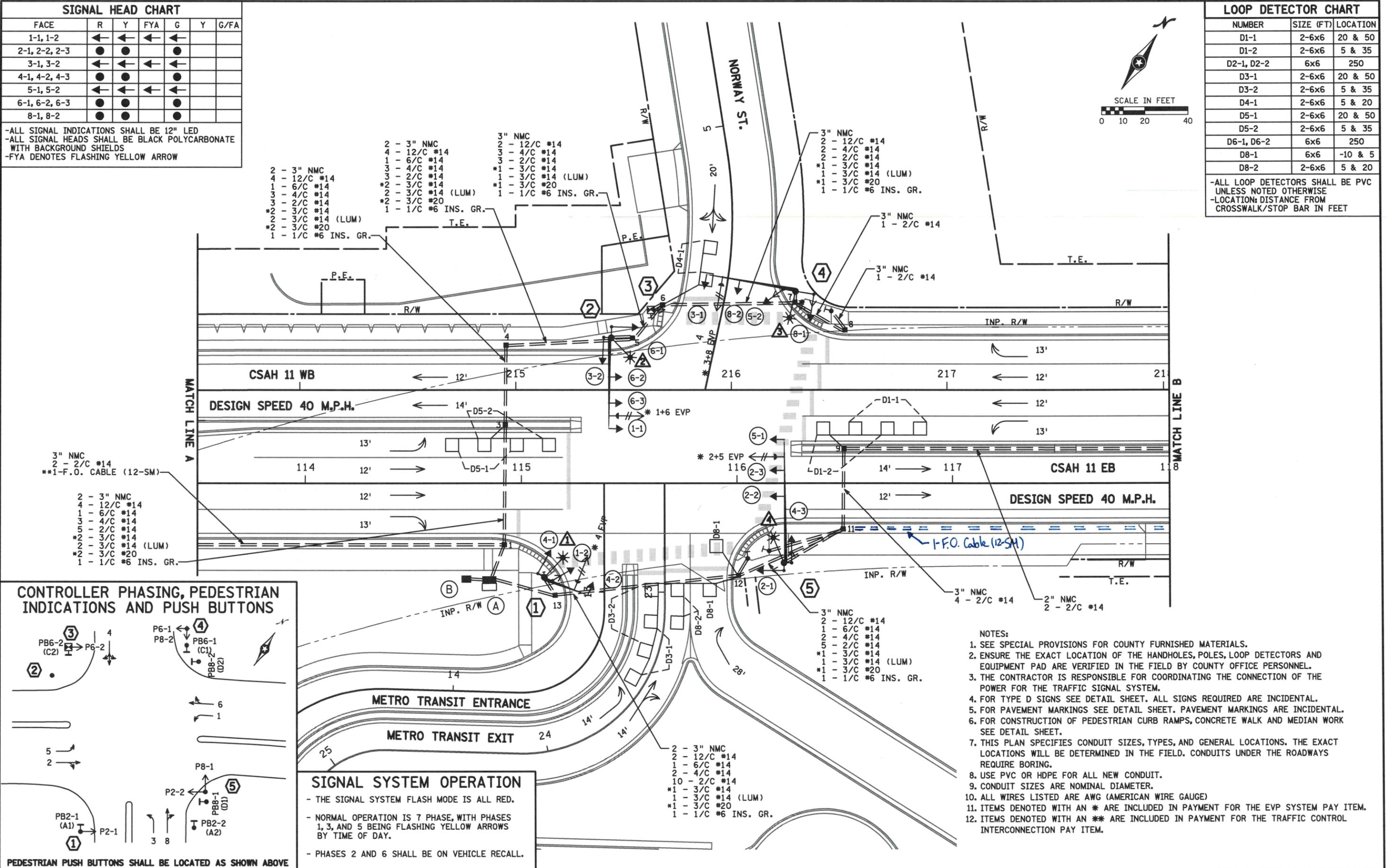
FACE	R	Y	FYA	G	Y	G/FA
1-1, 1-2	←	●	←	●		
2-1, 2-2, 2-3	●	●	●	●		
3-1, 3-2	←	●	←	●		
4-1, 4-2, 4-3	●	●	●	●		
5-1, 5-2	←	●	←	●		
6-1, 6-2, 6-3	●	●	●	●		
8-1, 8-2	●	●	●	●		

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

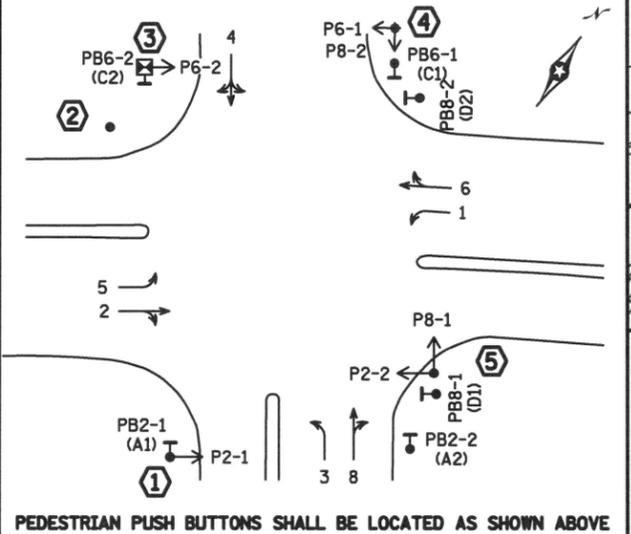
**LOOP DETECTOR CHART**

NUMBER	SIZE (FT)	LOCATION
D1-1	2-6x6	20 & 50
D1-2	2-6x6	5 & 35
D2-1, D2-2	6x6	250
D3-1	2-6x6	20 & 50
D3-2	2-6x6	5 & 35
D4-1	2-6x6	5 & 20
D5-1	2-6x6	20 & 50
D5-2	2-6x6	5 & 35
D6-1, D6-2	6x6	250
D8-1	6x6	-10 & 5
D8-2	2-6x6	5 & 20

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



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



**SIGNAL SYSTEM OPERATION**

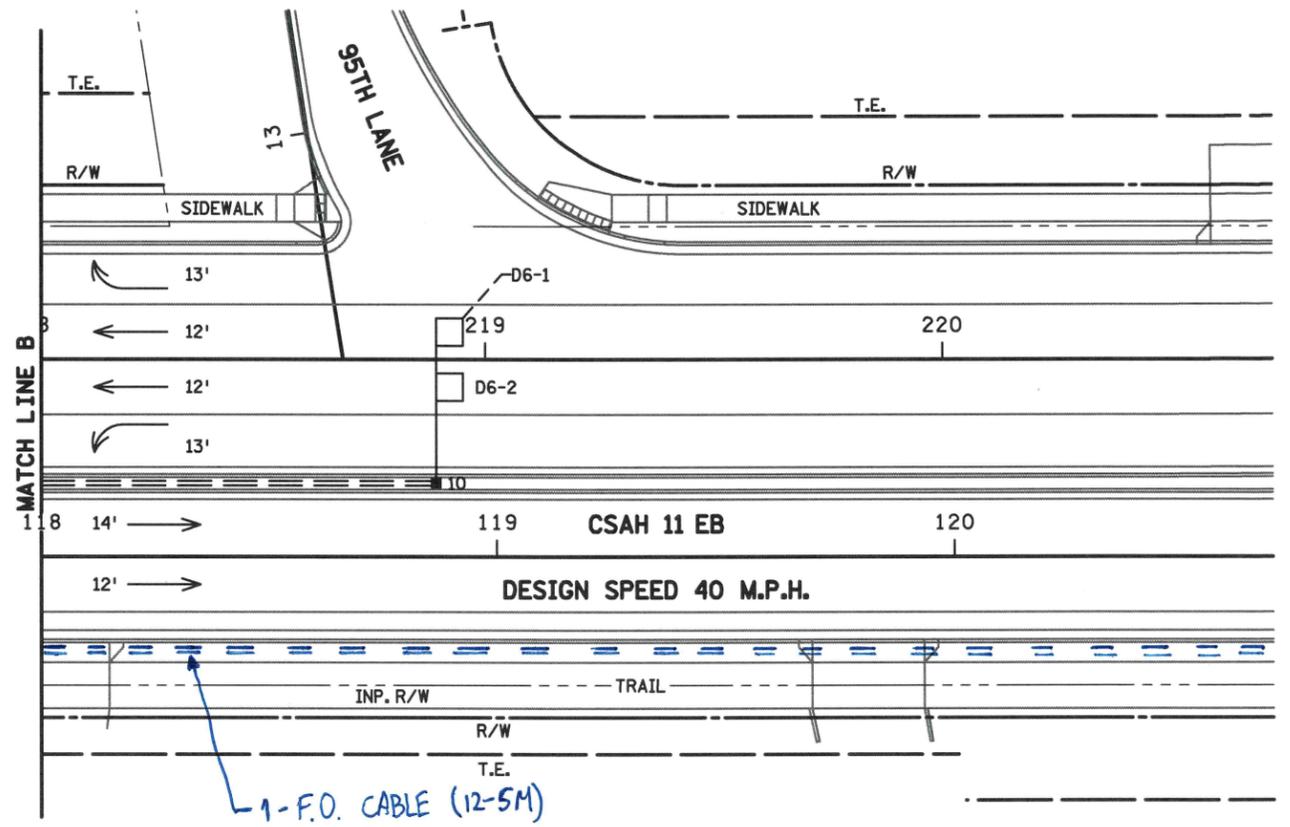
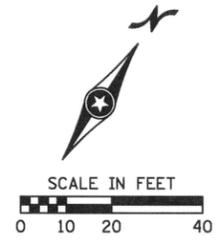
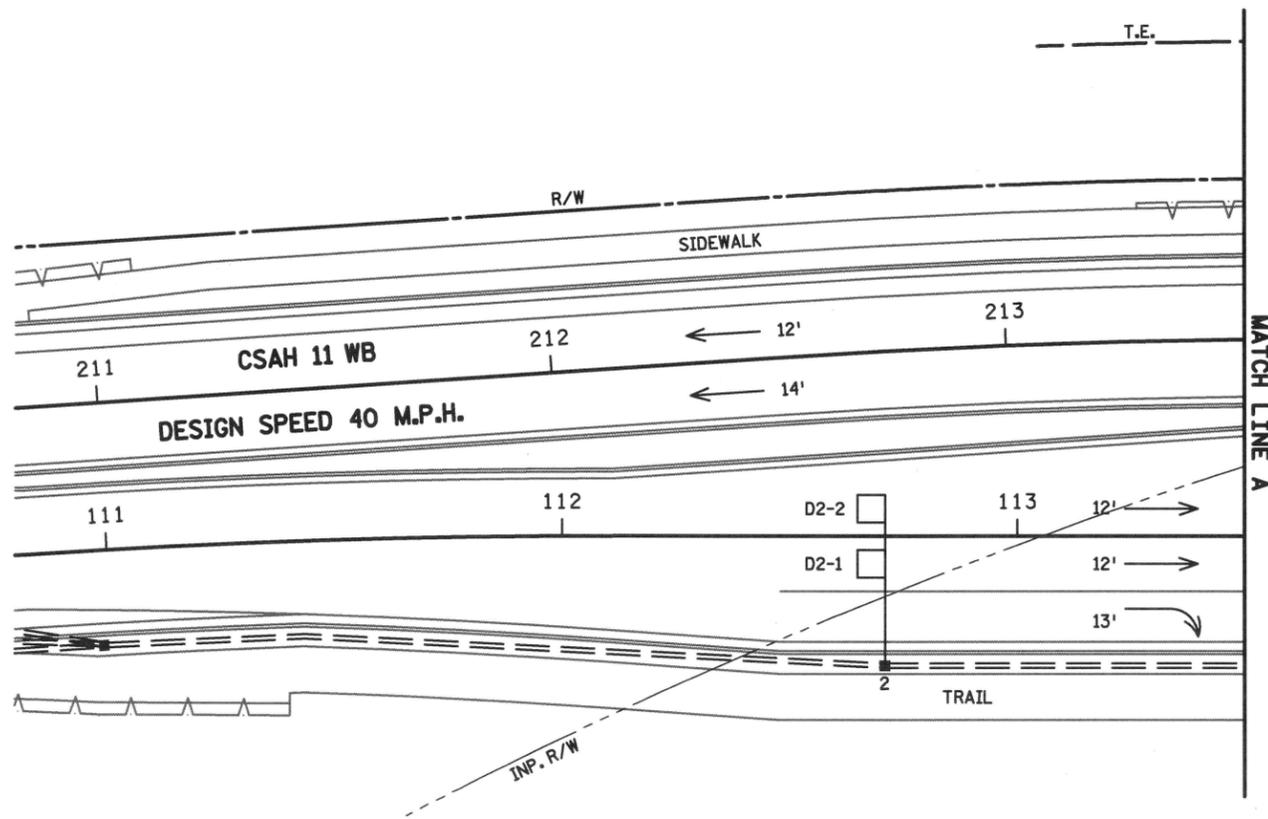
- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.  
 - NORMAL OPERATION IS 7 PHASE, WITH PHASES 1, 3, AND 5 BEING FLASHING YELLOW ARROWS BY TIME OF DAY.  
 - PHASES 2 AND 6 SHALL BE ON VEHICLE RECALL.

**NOTES:**

- SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS.
- ENSURE THE EXACT LOCATION OF THE HANDHOLES, POLES, LOOP DETECTORS AND EQUIPMENT PAD ARE VERIFIED IN THE FIELD BY COUNTY OFFICE PERSONNEL.
- THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE TRAFFIC SIGNAL SYSTEM.
- FOR TYPE D SIGNS SEE DETAIL SHEET. ALL SIGNS REQUIRED ARE INCIDENTAL.
- FOR PAVEMENT MARKINGS SEE DETAIL SHEET. PAVEMENT MARKINGS ARE INCIDENTAL.
- FOR CONSTRUCTION OF PEDESTRIAN CURB RAMPS, CONCRETE WALK AND MEDIAN WORK SEE DETAIL SHEET.
- THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD. CONDUITS UNDER THE ROADWAYS REQUIRE BORING.
- USE PVC OR HDPE FOR ALL NEW CONDUIT.
- CONDUIT SIZES ARE NOMINAL DIAMETER.
- ALL WIRES LISTED ARE AWG (AMERICAN WIRE GAUGE)
- ITEMS DENOTED WITH AN \* ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
- ITEMS DENOTED WITH AN \*\* ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECTION PAY ITEM.

DATE: 11/25/2020 TIME: 8:01:00 AM FILENAME: c:\tkda\_project\se\trm.vangstad\dms01247\cd00261036\_s12a.dgn

DATE: 11/25/2020 TIME: 8:01:15 AM  
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NO.	DATE	BY	DESCRIPTION OF REVISIONS

DES: JSB  
 DRW: RRC  
 CHK: JAH

I HEREBY CERTIFY THAT THIS SHEET 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.

SIGNATURE: *Jeffrey A. Hilden* LIC. NO. 20781 DATE: 11/25/2020  
 JEFFREY A. HILDEN



SIGNAL SYSTEM B MATCH LINE LAYOUT  
 CSAH 11 AT METRO TRANSIT AND NORWAY ST.  
 STATE PROJ. NO. 002-611-036

TRAFFIC SIGNAL PLAN  
 SHEET NO. 399 OF 416 SHEETS

DATE: 12/18/2020 TIME: 1:39:57 PM  
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Ⓑ SOP-GROUND MOUNTED TRANSFORMER (CONNEXUS ENERGY)  
 2" CONDUIT INTO SERVICE CABINET:  
 3-1/C 2

Ⓐ PA90 POLE FOUNDATION  
 TYPE PA90-A-40-D30-9 (DAVIT AT 350 DEG)  
 1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'  
 2- STRAIGHT MOUNT SIGNALS OVERHEAD AT 12' AND 24'  
 2-ANGLE MOUNT SIGNALS AT 90 AND 180 DEG  
 \* 1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 1+6)  
 LUMINAIRE-LED (FOR 30' MOUNTING HEIGHT)  
 1-R10-X12 SIGN ADJACENT TO HEAD (1-1)  
 1-TYPE D SIGN (D-5) (SEE SIGN DETAILS)  
 3" CONDUIT TO HH #5:  
 2-12/C 14  
 1-6/C 14  
 \* 1-3/C 14  
 1-3/C 14 (LUM)  
 \* 1-3/C 20  
 1-1/C 6 INS. GR.

Ⓒ PEDESTAL FOUNDATION  
 13' PEDESTAL POLE PLUS BASE  
 1-STRAIGHT MOUNT C.D. PED HEAD AT 270 DEG  
 1-PEDESTRIAN PUSH BUTTON AND SIGN (RT ARROW) (PB6-2)  
 3" CONDUIT TO HH #6:  
 1-4/C 14  
 1-2/C 14  
 1-1/C 6 INS. GR.

Ⓓ PA90 POLE FOUNDATION  
 TYPE PA90-B-40-D30-9 (DAVIT AT 350 DEG)  
 1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'  
 1- STRAIGHT MOUNT SIGNAL OVERHEAD AT 15'  
 2-ANGLE MOUNT SIGNALS AT 0 AND 180 DEG  
 2-ANGLE MOUNT C.D. PED HEAD AT 0 AND 180 DEG  
 \* 1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 3+8)  
 LUMINAIRE-LED (FOR 30' MOUNTING HEIGHT)  
 1-R10-X12 SIGN ADJACENT TO HEAD (3-1)  
 1-TYPE D SIGN (D-1) (SEE SIGN DETAILS)  
 3" CONDUIT TO HH #7:  
 2-12/C 14  
 2-4/C 14  
 \* 1-3/C 14  
 1-3/C 14 (LUM)  
 \* 1-3/C 20  
 1-1/C 6 INS. GR.

Ⓐ EQUIPMENT PAD (SEE DETAIL SHEET)  
 SERVICE CABINET (SSB) WITH BATTERY BACKUP SYSTEM AND BATTERIES  
 CONTROLLER AND CABINET (COUNTY FURNISHED)

CABINET TO HH 1:	CABINET TO HH 13:
2 - 3" NMC	2 - 3" NMC
4 - 12/C 14	3 - 12/C 14
1 - 6/C 14	2 - 6/C 14
3 - 4/C 14	3 - 4/C 14
7 - 2/C 14	11 - 2/C 14
* 2 - 3/C 14	* 2 - 3/C 14
* 2 - 3/C 20	* 2 - 3/C 20
1 - 1/C 6 INS. GR.	1 - 1/C 6 INS. GR..
1 - FO CABLE (12-SM)	

GROUND WIRE AND GROUND ROD - MIN 8' OUT FROM PAD  
 2-2" AND 1-3" CONDUIT STUBBED OUT (CAPPED BOTH ENDS)  
 1-1/2" CONDUIT TO HH 1:  
 1-FO PIGTAIL (12-SM)  
 CONTROLLER CABINET TO SERVICE CABINET:  
 2" CONDUIT  
 3-1/C 6  
 CONTROLLER CABINET TO SERVICE CABINET (COMMS):  
 2" CONDUIT  
 1-6PR 19  
 SERVICE CABINET TO GROUND MOUNTED TRANSFORMER:  
 2" CONDUIT  
 3-1/C 2

SERVICE CABINET TO EXTERNAL GR. RD.:  
 1" CONDUIT  
 1-1/C 6 INS. GR.  
 (SEE EQUIPMENT PAD LAYOUT)

SERVICE CABINET TO HH1:  
 1-1/4" CONDUIT AND LUMINAIRE CABLES (2 - 3/C #14)

SERVICE CABINET TO HH13:  
 1-1/4" CONDUIT AND LUMINAIRE CABLES (2 - 3/C #14)

Ⓐ PA85 POLE FOUNDATION  
 TYPE PA85-B-20-D30-9 (DAVIT AT 350 DEG)  
 1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'  
 2-ANGLE MOUNT SIGNALS AT 0 AND 180 DEG  
 1-ANGLE MOUNT C.D. PED HEAD AT 0 DEG  
 \* 1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 4)  
 LUMINAIRE-LED (FOR 30' MOUNTING HEIGHT)  
 1-TYPE D SIGN (D-1) (SEE SIGN DETAILS)  
 3" CONDUIT TO HH #13:  
 1-12/C 14  
 1-6/C 14  
 1-4/C 14  
 1-2/C 14  
 \* 1-3/C 14  
 1-3/C 14 (LUM)  
 \* 1-3/C 20  
 1-1/C 6 INS. GR.

Ⓒ PA100 POLE FOUNDATION  
 TYPE PA100-A-55-D30-9 (DAVIT AT 350 DEG)  
 1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'  
 2- STRAIGHT MOUNT SIGNALS OVERHEAD AT 14' AND 26'  
 2-ANGLE MOUNT SIGNALS AT 90 AND 180 DEG  
 2-ANGLE MOUNT C.D. PED HEADS AT 90 AND 180 DEG  
 \* 1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 2+5)  
 LUMINAIRE-LED (FOR 30' MOUNTING HEIGHT)  
 1-R10-X12 SIGN ADJACENT TO HEAD (5-1)  
 1-TYPE D SIGN (D-6) (SEE SIGN DETAILS)  
 3" CONDUIT TO HH #11:  
 2-12/C 14  
 1-6/C 14  
 2-4/C 14  
 \* 1-3/C 14  
 1-3/C 14 (LUM)  
 \* 1-3/C 20  
 1-1/C 6 INS. GR.

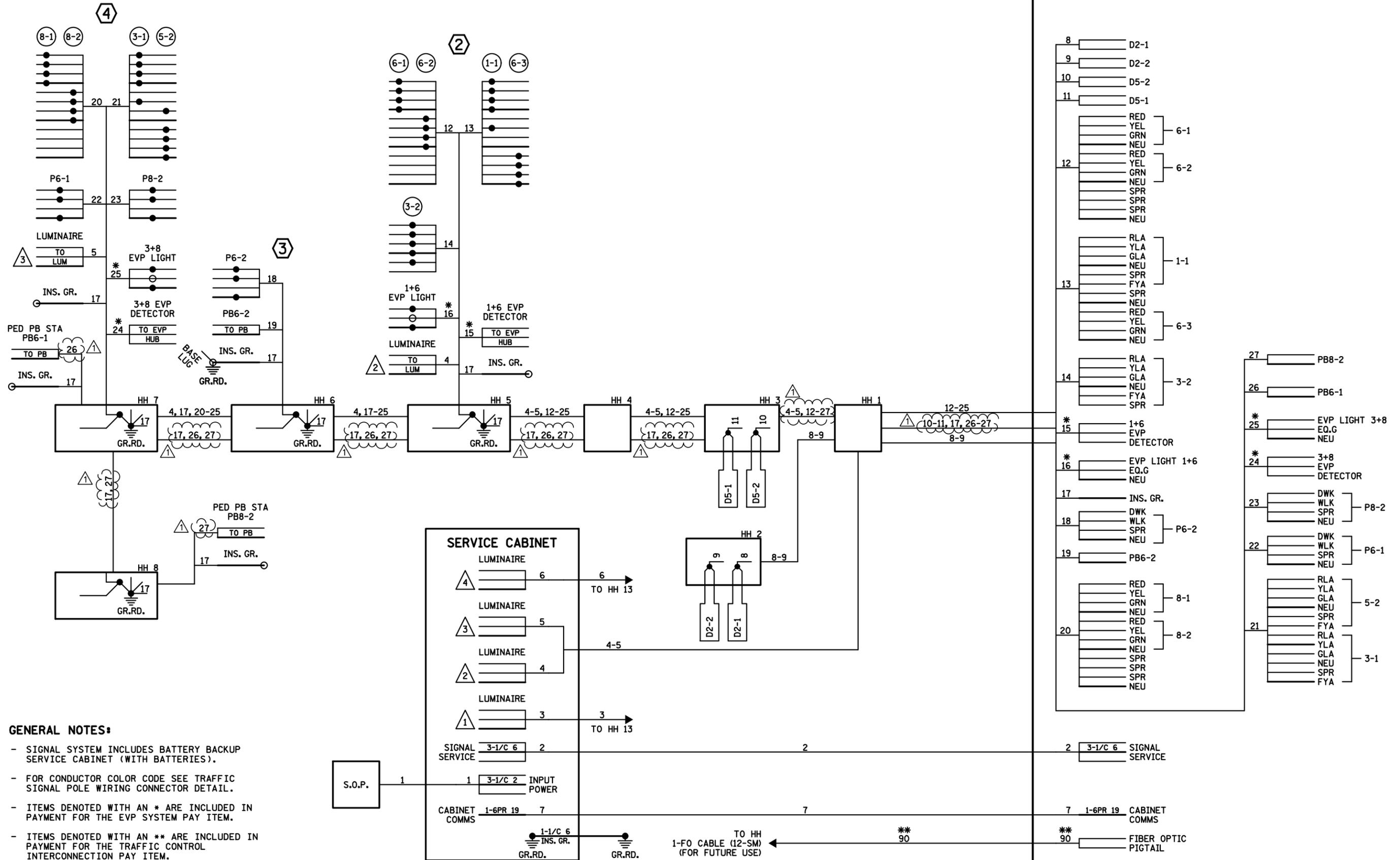
**GENERAL NOTES:**

- ITEMS DENOTED WITH AN \* ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.

			DES: JSB	I HEREBY CERTIFY THAT THIS SHEET 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.		TKDA	SIGNAL SYSTEM B POLE NOTES CSAH 11 AT METRO TRANSIT AND NORWAY ST.		TRAFFIC SIGNAL PLAN		
			DRW: RRC	SIGNATURE: <i>Jeffrey A. Hilden</i> LIC. NO. 20781 DATE: 12/18/2020			STATE PROJ. NO. 002-611-036		SHEET NO. 400 OF 416 SHEETS		
NO.	DATE	BY	DESCRIPTION OF REVISIONS			CHK: JAH					

DATE: 4/8/2021 TIME: 12:22:38 PM  
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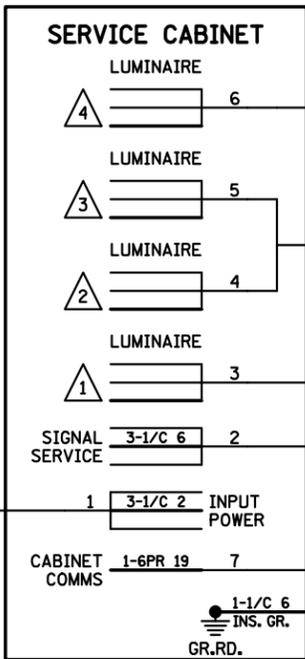
**CONTROLLER CABINET**



**GENERAL NOTES:**

- SIGNAL SYSTEM INCLUDES BATTERY BACKUP SERVICE CABINET (WITH BATTERIES).
- FOR CONDUCTOR COLOR CODE SEE TRAFFIC SIGNAL POLE WIRING CONNECTOR DETAIL.
- ITEMS DENOTED WITH AN \* ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
- ITEMS DENOTED WITH AN \*\* ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECTION PAY ITEM.

S.O.P.



NO.	DATE	BY	DESCRIPTION OF REVISIONS
1	4/8/21	JAH	REVISED WIRE NUMBERS

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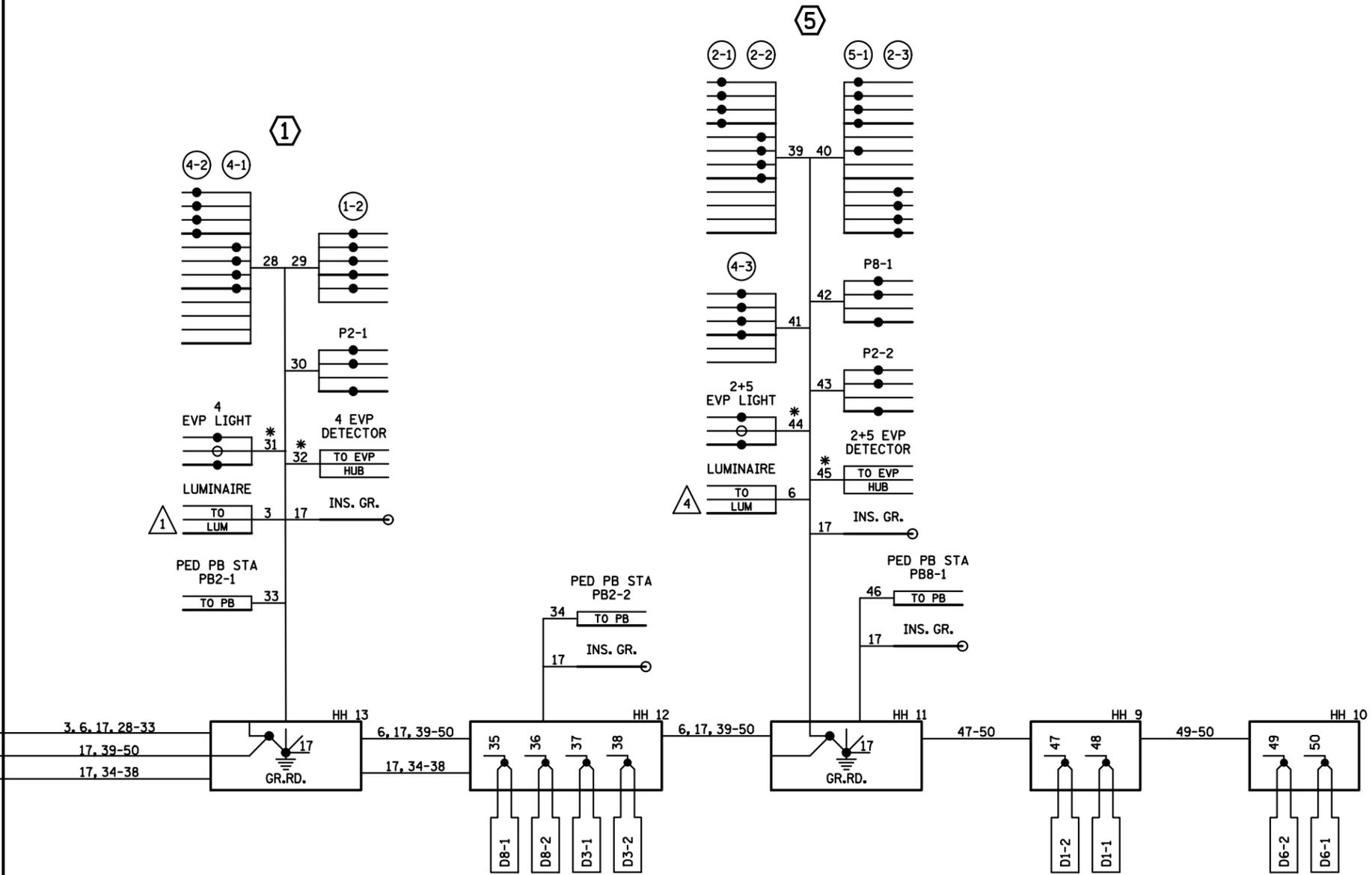
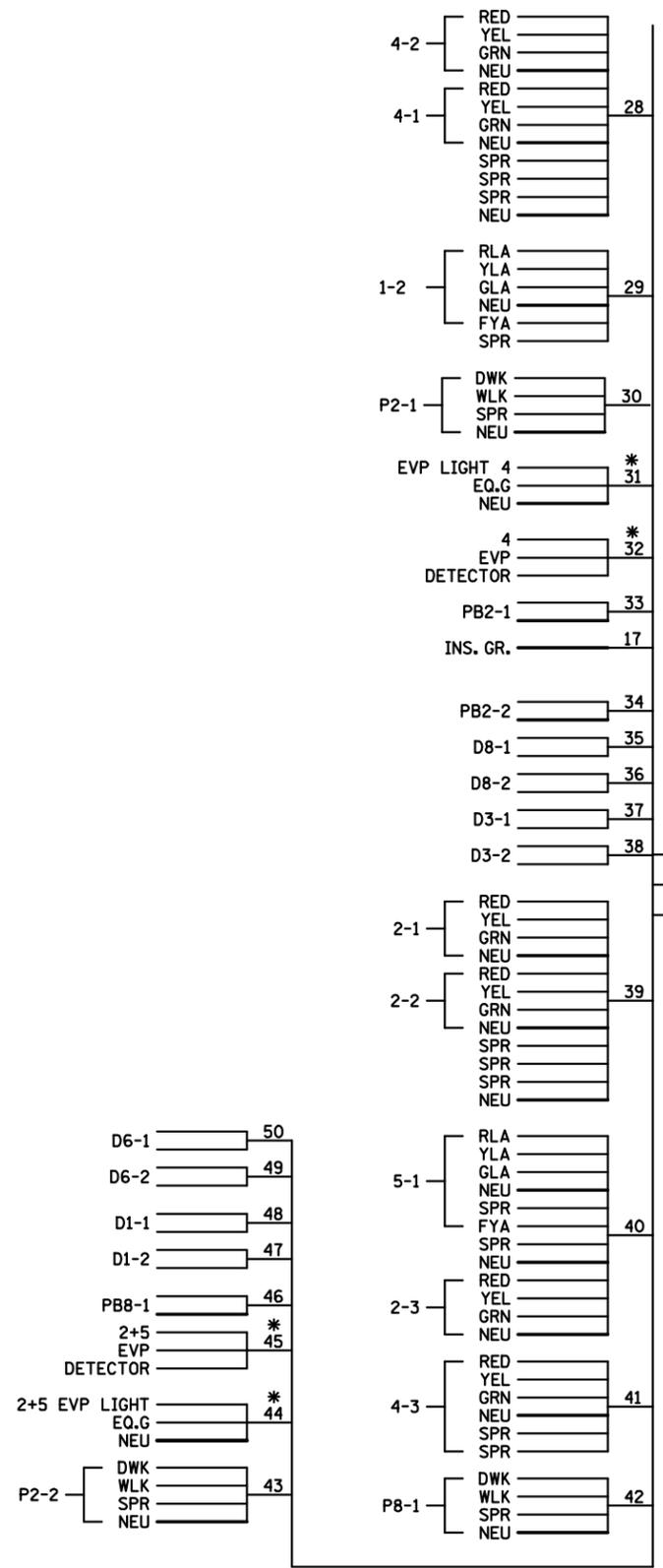
SIGNATURE: *Jeffrey A. Hilden* LIC. NO. 20781 DATE: 4/8/2021  
 JEFFREY A. HILDEN



SIGNAL SYSTEM B WIRING DIAGRAM  
 CSAH 11 AT METRO TRANSIT AND NORWAY ST.  
 STATE PROJ. NO. 002-611-036

TRAFFIC SIGNAL PLAN  
 SHEET NO. 401R OF 416 SHEETS

# CONTROLLER CABINET



- GENERAL NOTES:**
- SIGNAL SYSTEM INCLUDES BATTERY BACKUP SERVICE CABINET (WITH BATTERIES).
  - FOR CONDUCTOR COLOR CODE SEE TRAFFIC SIGNAL POLE WIRING CONNECTOR DETAIL.
  - ITEMS DENOTED WITH AN \* ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
  - ITEMS DENOTED WITH AN \*\* ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECTION PAY ITEM.

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JEFFREY A. HILDEN



SIGNAL SYSTEM B WIRING DIAGRAM  
 CSAH 11 AT METRO TRANSIT AND NORWAY ST.  
 STATE PROJ. NO. 002-611-036

TRAFFIC SIGNAL PLAN  
 SHEET NO. 402 OF 416 SHEETS