

PVC LOOP DETECTORS				
NUMBER	SIZE (FT.)	LOCATION	FUNCTION	STATUS
D1-1	2-6x6	0' & 30'	1	INPLACE
D1-2	2-6x6	-15' & 15'	7	INPLACE
D2-1	6x6	475'	1	INPLACE
D2-2	6x6	475'	1	INPLACE
D3-1	2-6x6	7' & 37'	1	3
D3-2	2-6x6	-8' & 22'	7	3
D4-1	6x6	180'	3,8	2
D4-2	6x6 & 6x8	5' & 20'	7	1
D4-3	2-6x6	5' & 20'	1	1
D5-1	2-6x6	0' & 30'	1	INPLACE
D5-2	2-6x6	-15' & 15'	7	INPLACE
D6-1	6x6	475'	1	INPLACE
D7-1	2-6x6	20' & 50'	1	2
D7-2	2-6x6	5' & 35'	7	2
D8-1	2-6x6	400'	3,8	INPLACE
D8-2	6x6 & 6x10	-14' & 1'	7	INPLACE
D8-3	2-6x6	-9' & 6'	1	INPLACE
D8-3	6x6	21'	1	1

LOOP DETECTORS FUNCTIONS:

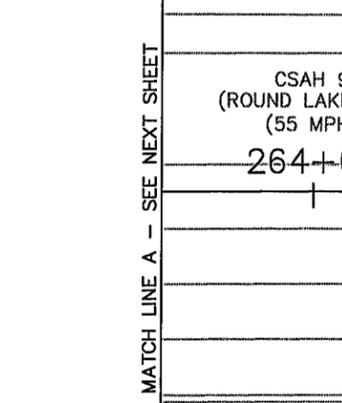
- 1) CALL AND EXTEND
- 3) EXTEND ONLY
- 7) DELAYED CALL- IMMEDIATE EXTEND
- 8) CARRY OVER (STRETCH)

LOOP DETECTOR STATUS:

- 1 = F & I NEW PVC LOOP DETECTOR.
- 2 = F & I NEW PVC LOOP DETECTOR WITH NEW LEAD-IN CABLE AND NEW SPLICE KIT.
- 3 = F & I NEW PVC LOOP DETECTORS FOR D3-1 & D3-2 WITH NEW LEAD-IN CABLE AND NEW SPLICE KIT AND UTILIZE THE EXISTING DETECTORS (OLD D8-4) IN THE WB CSAH 20 LEFT TURN LANE. WITH FINAL WB CSAH 20 LEFT TURN DETECTOR LAYOUT OF TWO D3-1 DETECTORS AT 7' AND 37' AND TWO D3-2 DETECTORS AT -8' AND 22'. PROTECT EXISTING LOOP DETECTORS IN ROADWAY.

LOCATION=DISTANCE FROM STOP BAR TO FRONT OF DETECTOR.

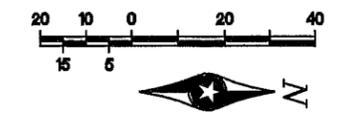
NOTE: WHEN INSTALLING NEW LOOP DETECTORS D3-1, D3-2, AND D8-3 (ADDITIONAL 3RD DETECTOR), ENSURE THAT ALL EXISTING LOOP DETECTOR ROADWAY CONDUITS FOR THE WB CSAH 20 APPROACH ARE EXACTLY LOCATED & PROTECTED DURING NEW LOOP INSTALLATION. ANY DAMAGE TO THESE EXISTING LOOP DETECTORS (ALL CONDUITS, WIRING, SPLICE KITS) DUE TO CONTRACTOR LOOP DETECTOR INSTALLATION WORK WILL REQUIRE THE CONTRACTOR TO FULLY REPLACE THE DAMAGED PVC LOOP DETECTORS AT NO EXPENSE TO THE CITY AND COUNTY.



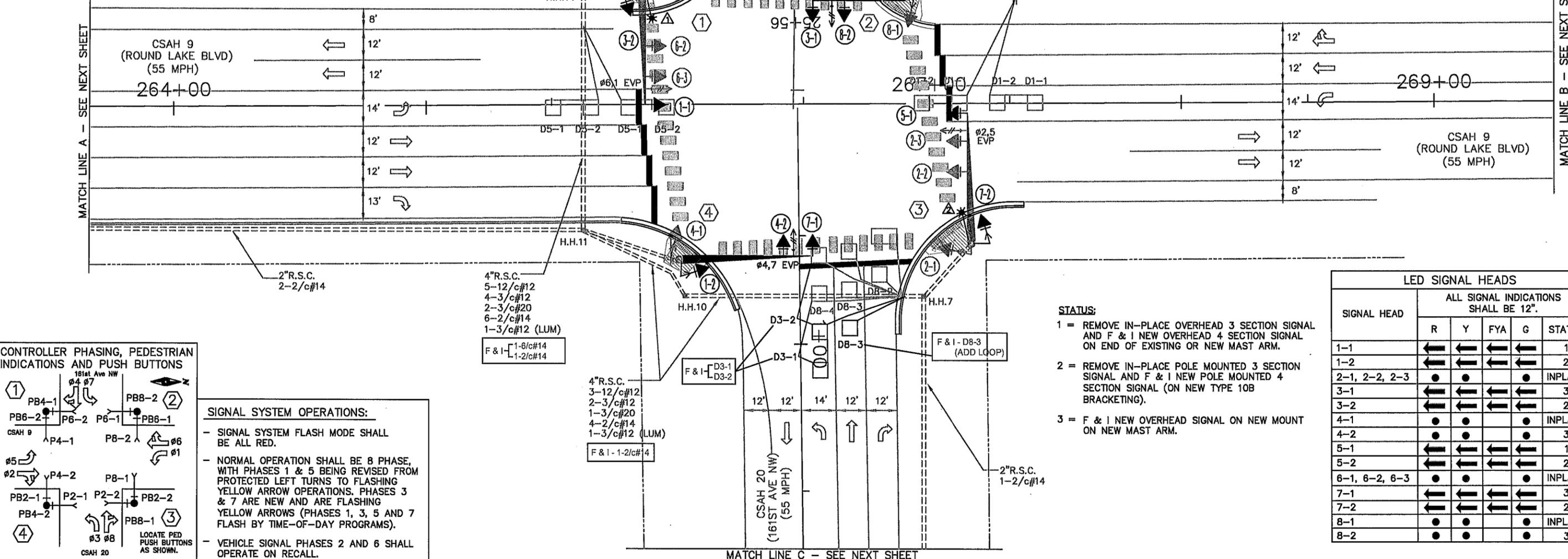
SIGNAL SYSTEM OPERATIONS:

- SIGNAL SYSTEM FLASH MODE SHALL BE ALL RED.
- NORMAL OPERATION SHALL BE 8 PHASE, WITH PHASES 1 & 5 BEING REVISED FROM PROTECTED LEFT TURNS TO FLASHING YELLOW ARROW OPERATIONS. PHASES 3 & 7 ARE NEW AND ARE FLASHING YELLOW ARROWS (PHASES 1, 3, 5 AND 7 FLASH BY TIME-OF-DAY PROGRAMS).
- VEHICLE SIGNAL PHASES 2 AND 6 SHALL OPERATE ON RECALL.

MATCH LINE D - SEE NEXT SHEET



SEE SHEET 37 FOR GENERAL NOTES AND DETAILED POLE NOTES



- STATUS:**
- 1 = REMOVE IN-PLACE OVERHEAD 3 SECTION SIGNAL AND F & I NEW OVERHEAD 4 SECTION SIGNAL ON END OF EXISTING OR NEW MAST ARM.
 - 2 = REMOVE IN-PLACE POLE MOUNTED 3 SECTION SIGNAL AND F & I NEW POLE MOUNTED 4 SECTION SIGNAL (ON NEW TYPE 10B BRACKETING).
 - 3 = F & I NEW OVERHEAD SIGNAL ON NEW MOUNT ON NEW MAST ARM.

LED SIGNAL HEADS					
SIGNAL HEAD	ALL SIGNAL INDICATIONS SHALL BE 12"				STATUS
	R	Y	FYA	G	
1-1	←	←	←	←	1
1-2	←	←	←	←	2
2-1, 2-2, 2-3	•	•	•	•	INPLACE
3-1	←	←	←	←	3
3-2	←	←	←	←	2
4-1	•	•	•	•	INPLACE
4-2	•	•	•	•	3
5-1	←	←	←	←	1
5-2	←	←	←	←	2
6-1, 6-2, 6-3	•	•	•	•	INPLACE
7-1	←	←	←	←	3
7-2	←	←	←	←	2
8-1	•	•	•	•	INPLACE
8-2	•	•	•	•	3

NO	DATE	BY	CKD	APPR	REVISION
1	03/03/2023	ST	JB	ST	Added SAP 198-105-005 to Title Block

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: SEAN R. THIEL DATE: 3/3/23
 SIGNATURE: *Sean R. Thiel* LICENSE NO. 45129

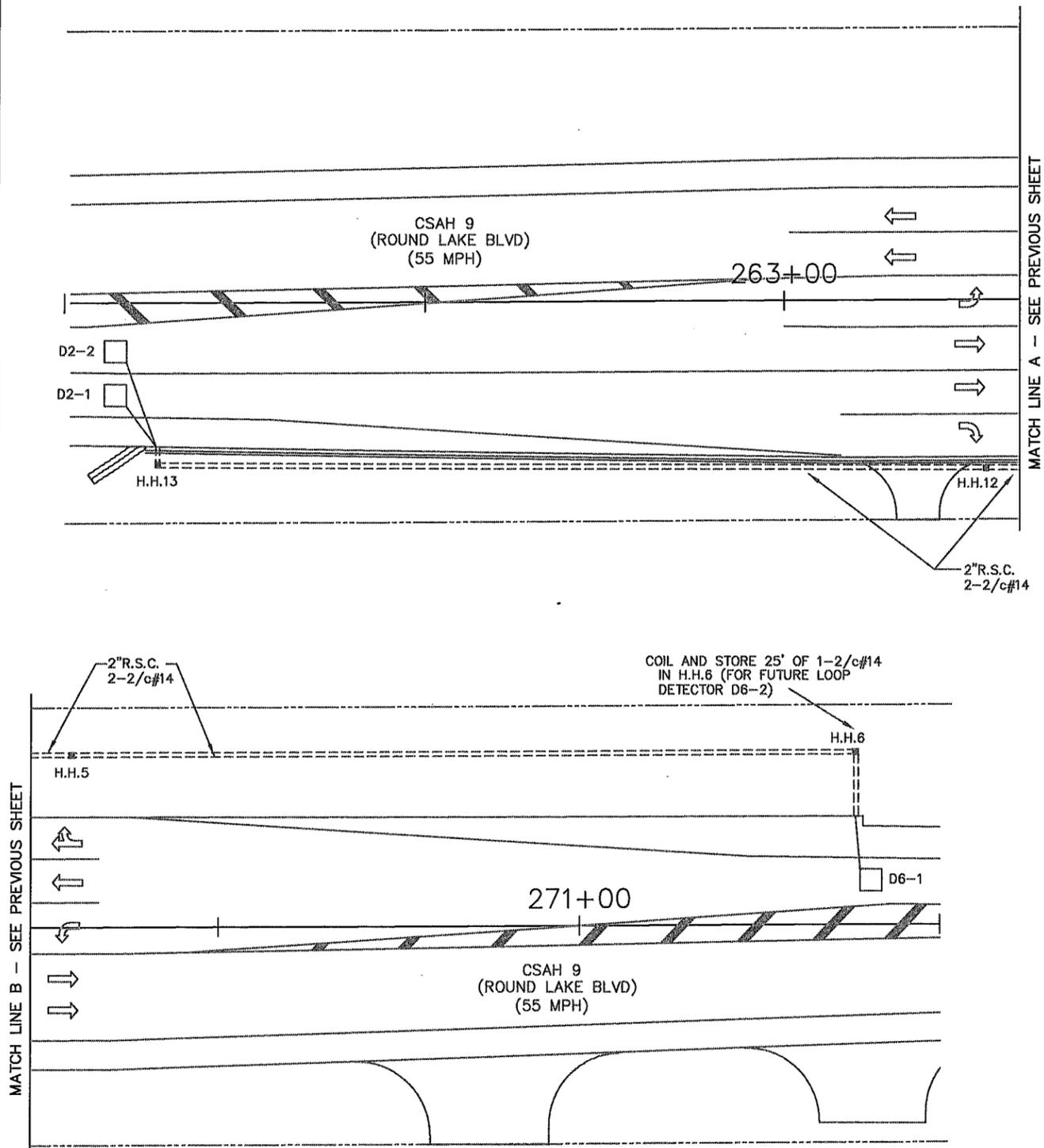
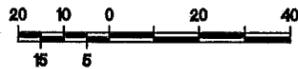
DRAWN BY ST DATE 1/25/23
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 CHECKED BY BL DATE 2/2/23



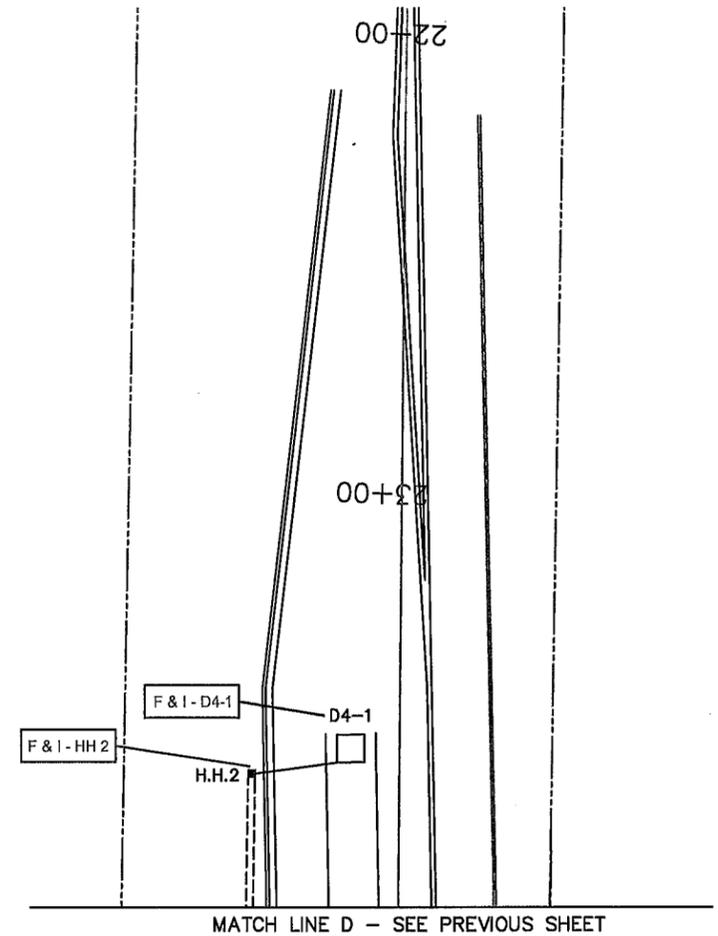
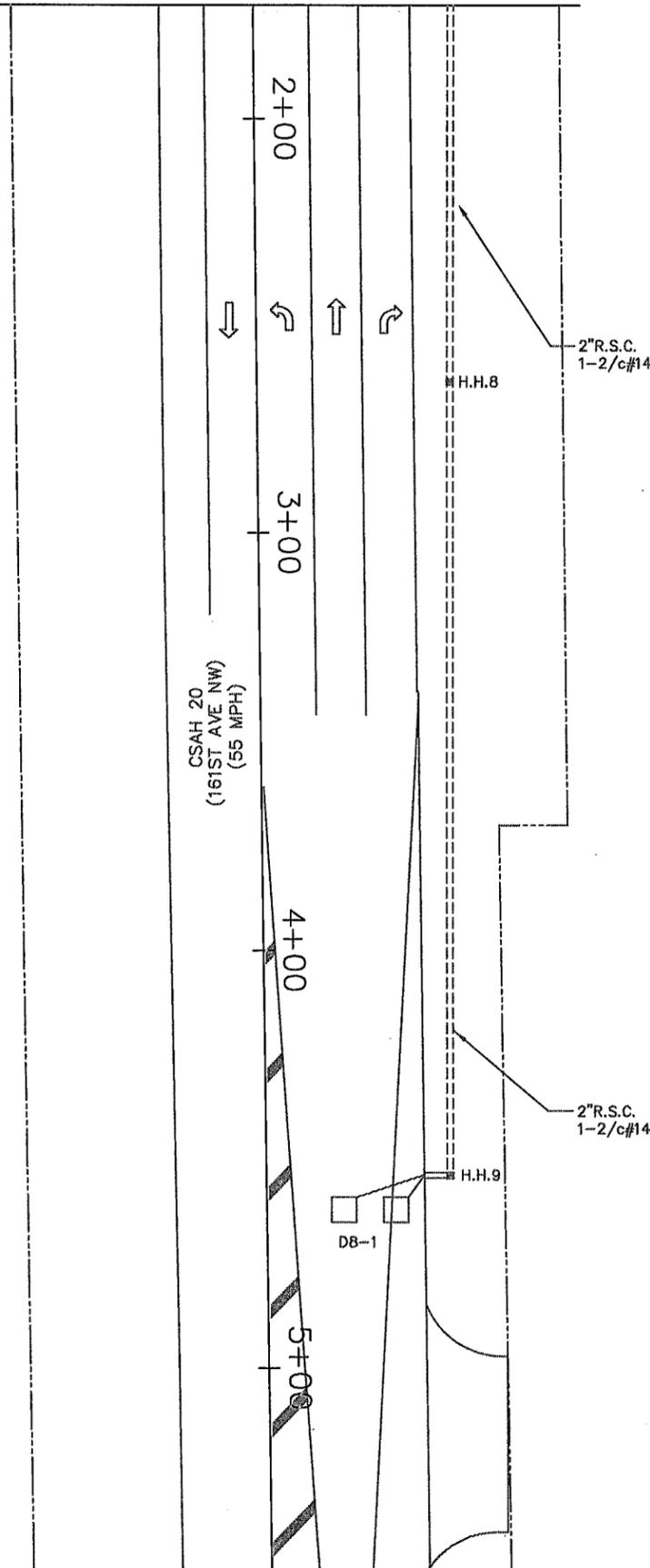
**ANOKA COUNTY
HIGHWAY DEPT.**

SAP 002-620-009
 SAP 198-106-005
 SAP 198-105-005
 City Project 21-39

REVISE SIGNAL SYSTEM
 INTERSECTION LAYOUT
 CSAH 9 (ROUND LK BLVD) AT CSAH 20 (161ST AVE)
 SHEET 36 OF 41 SHEETS



MATCH LINE C - SEE PREVIOUS SHEET



NO	DATE	BY	CKD	APPR	REVISION
1	03/03/2023	ST	JB	ST	Added SAP 198-105-005 to Title Block

NAME: P:\002-620-009 161st Signal Mod\BaselSignal\002-620-009_SignalLayout.dwg

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: SEAN R. THIEL DATE: 3/3/23

SIGNATURE: *Sean R. Thiel* LICENSE NO. 45129

DRAWN BY ST DATE 1/25/23

DESIGN BY ST DATE 1/12/23

CHECKED BY BL DATE 2/2/23



ANOKA COUNTY
HIGHWAY DEPT.

SAP 002-620-009
SAP 198-106-005
SAP 198-105-005
City Project 21-39

REVISE SIGNAL SYSTEM
INTERSECTION LAYOUT
CSAH 9 (ROUND LK BLVD) AT CSAH 20 (161ST AVE)

SHEET 37 OF 41 SHEETS

NOTES:

- 1) ALL ITEMS OF THIS SIGNAL SYSTEM ARE INPLACE AND SHALL BE REUSED AND MAINTAINED INPLACE, UNLESS OTHERWISE NOTED ON PLANS.
- 2) ALL HANDHOLES ARE PVC HANDHOLES WITH METAL FRAMES AND COVERS AND ARE INPLACE AND SHALL BE REUSED AND MAINTAINED INPLACE UNLESS OTHERWISE NOTED ON PLANS.
- 3) ALL PEDESTRIAN SIGNAL HEADS ARE ONE-SECTION LED "HAND/WALKING PERSON" COUNTDOWN TIMER INDICATIONS AND ARE INPLACE (REUSE AND MAINTAIN INPLACE).
- 4) ALL LOOP DETECTORS ARE INPLACE AND SHALL BE REUSED AND MAINTAINED INPLACE AND OPERATIONAL, EXCEPT AS FOLLOWS: CONTRACTOR SHALL FURNISH AND INSTALL NEW LOOP DETECTORS D3-1, D3-2, D4-1, D4-2, D4-3, D7-1, AND D7-2 IN PVC PER DETAILS INCLUDED ELSEWHERE IN THE PLANS. LOOP DETECTOR WIRES FOR NEW LOOP DETECTORS SHALL BE CROSS-LINKED POLYETHYLENE (XLP) #12 AWG IN 3/4" NMC. SEE SPECIAL PROVISIONS.
- 5) ANY DAMAGE TO INPLACE TRAFFIC SIGNAL FACILITIES (CONDUIT, CABLES, HANDHOLES, SIGNAL POLES, ETC.), DUE TO TRAFFIC SIGNAL REVISION WORK, SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE ENGINEER, AT NO EXPENSE TO THE CITY AND COUNTY.
- 6) LOCATION OF NEW LOOP DETECTORS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- 7) ALL NEW VEHICULAR SIGNAL HEADS SHALL HAVE A BACKGROUND SHIELD FURNISHED & INSTALLED BY CONTRACTOR.
- 8) F & I = NEW, FURNISH AND INSTALL.
S & I = INPLACE, SALVAGE AND INSTALL.
- 9) SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS TO BE INSTALLED AND MADE OPERATIONAL BY CONTRACTOR.
- 10) SEE SPECIAL PROVISIONS & DETAILS REGARDING SIGNS TO BE FURNISHED AND INSTALLED BY CONTRACTOR (INCLUDED AS PART OF THE "REVISE SIGNAL SYSTEM" PAY ITEM).

② INPLACE (MAINTAIN INPLACE) PA90 POLE FOUNDATION
TYPE PA90-A
1-TYPE 10B-POLE MOUNTED 180' (8-1, P8-2)
EXTEND INTO H.H.3:
3"R.S.C.
2-12/c#12
2-3/c#12
1-3/c#20

① INPLACE (MAINTAIN INPLACE) PA100 POLE FOUNDATION
TYPE PA100-A-45-D40-9 (DAVIT AT 350')
2-ONE WAY SIGNALS-OVERHEAD (11' AND 23' FROM END OF MAST ARM)
1-TYPE 10B-POLE MOUNTED 180' (6-1, P6-2)
ONE WAY EVP DETECTOR AND LIGHT-OVERHEAD (ø6,1)
EXTEND INTO H.H.1:
3"R.S.C.
3-12/c#12
2-3/c#12
1-3/c#20
1-3/c#12 (LUM)

INPLACE (REMOVE) 30- FOOT MAST ARM
ONE WAY SIGNAL AND MOUNT OVERHEAD AT 0' (OLD 8-2)
TYPE 10 B BRACKETING AT 90 DEG
ONE WAY SIGNAL AND MOUNT - POLE MOUNTED 90 DEG (OLD 5-2)
TYPE D SIGN PANEL - OVERHEAD

INPLACE (S & I) 1 - SET CD PED SIGNALS - POLE MOUNTED 90 DEG (P6-1)
2 - RELOCATE PEDESTRIAN PUSH BUTTONS AS NEEDED
ONE WAY EVP DETECTOR AND LIGHT - OVERHEAD AT 6' (ø8, 3)

INSTALL 35- FOOT MAST ARM (WITH MID-MOUNT AT 11' FROM END OF MAST ARM) - FURNISHED BY COUNTY

F & I 1 - ANGLE MOUNT SIGNAL - OVERHEAD AT 0' (NEW 3-1)
1 - STRAIGHT MOUNT SIGNAL - OVERHEAD AT 11' (NEW 8-2)
TYPE 10 B BRACKETING - POLE MOUNTED 90 DEG (FOR 5-2, P6-1)
1 - ONE WAY SIGNAL - POLE MOUNTED 90 DEG (NEW 5-2)
TYPE D SIGN PANEL - OVERHEAD (D-2)
R10-X12 SIGN PANEL - ADJACENT TO 3-1
1-6/c#14

INPLACE (REMOVE) LUMINAIRE - 250 W HPS
ONE WAY SIGNAL AND MOUNT OVERHEAD AT 0' (OLD 1-1)
TYPE 10 B BRACKETING AT 90 DEG
ONE WAY SIGNAL AND MOUNT - POLE MOUNTED 90 DEG (OLD 8-3)
TYPE D SIGN PANEL - OVERHEAD

INPLACE (S & I) 1 - SET CD PED SIGNALS - POLE MOUNTED 90 DEG (P4-1)
2 - RELOCATE PEDESTRIAN PUSH BUTTONS AS NEEDED

F & I LUMINAIRE - LED
1 - ANGLE MOUNT SIGNAL - OVERHEAD AT 0' (NEW 1-1)
TYPE 10 B BRACKETING - POLE MOUNTED 90 DEG (FOR 3-2, P4-1)
1 - ONE WAY SIGNAL - POLE MOUNTED 90 DEG (NEW 3-2)
TYPE D SIGN PANEL - OVERHEAD (D-1)
R10-X12 SIGN PANEL - ADJACENT TO 1-1

④ INPLACE (MAINTAIN INPLACE) PA100 POLE FOUNDATION
TYPE PA100-A
1-TYPE 10B-POLE MOUNTED 180' (4-1, P4-2)
EXTEND INTO H.H.11:
3"R.S.C.
2-12/c#12
2-3/c#12
1-3/c#20

③ INPLACE (MAINTAIN INPLACE) PA100 POLE FOUNDATION
TYPE PA100-A-50-D40-9 (DAVIT AT 350')
2-ONE WAY SIGNALS-OVERHEAD (11' AND 23' FROM END OF MAST ARM)
1-TYPE 10B-POLE MOUNTED 180' (2-1, P2-2)
ONE WAY EVP DETECTOR AND LIGHT-OVERHEAD (ø2,5)
EXTEND INTO H.H.7:
3"R.S.C.
3-12/c#12
2-3/c#12
1-3/c#20
1-3/c#12 (LUM)

INPLACE (REMOVE) 40- FOOT MAST ARM
ONE WAY SIGNAL AND MOUNT OVERHEAD AT 0' (OLD 4-2)
TYPE 10 B BRACKETING AT 90 DEG
ONE WAY SIGNAL AND MOUNT - POLE MOUNTED 90 DEG (OLD 1-2)
TYPE D SIGN PANEL - OVERHEAD

INPLACE (S & I) 1 - SET CD PED SIGNALS - POLE MOUNTED 90 DEG (P2-1)
2 - RELOCATE PEDESTRIAN PUSH BUTTONS AS NEEDED
ONE WAY EVP DETECTOR AND LIGHT - OVERHEAD AT 6' (ø4, 7)

INSTALL 50- FOOT MAST ARM (WITH MID-MOUNT AT 10' FROM END OF MAST ARM) - FURNISHED BY COUNTY

F & I 1 - ANGLE MOUNT SIGNAL - OVERHEAD AT 0' (NEW 7-1)
1 - STRAIGHT MOUNT SIGNAL - OVERHEAD AT 10' (NEW 4-2)
TYPE 10 B BRACKETING - POLE MOUNTED 90 DEG (FOR 1-2, P2-1)
1 - ONE WAY SIGNAL - POLE MOUNTED 90 DEG (NEW 1-2)
TYPE D SIGN PANEL - OVERHEAD (D-4)
R10-X12 SIGN PANEL - ADJACENT TO 7-1
1-6/c#14

INPLACE (REMOVE) LUMINAIRE - 250 W HPS
ONE WAY SIGNAL AND MOUNT OVERHEAD AT 0' (OLD 5-1)
TYPE 10 B BRACKETING AT 90 DEG
ONE WAY SIGNAL AND MOUNT - POLE MOUNTED 90 DEG (OLD 4-3)
TYPE D SIGN PANEL - OVERHEAD

INPLACE (S & I) 1 - SET CD PED SIGNALS - POLE MOUNTED 90 DEG (P8-1)
2 - RELOCATE PEDESTRIAN PUSH BUTTONS AS NEEDED

F & I LUMINAIRE - LED
1 - ANGLE MOUNT SIGNAL - OVERHEAD AT 0' (NEW 5-1)
TYPE 10 B BRACKETING - POLE MOUNTED 90 DEG (FOR 7-2, P8-1)
1 - ONE WAY SIGNAL - POLE MOUNTED 90 DEG (NEW 7-2)
TYPE D SIGN PANEL - OVERHEAD (D-3)
R10-X12 SIGN PANEL - ADJACENT TO 5-1

INPLACE (SALVAGE) — CONTROLLER AND CABINET
INSTALL (FURNISHED BY COUNTY) — CONTROLLER AND CABINET

Ⓐ INPLACE (MAINTAIN INPLACE) CABINET FOUNDATION
EXTEND INTO H.H.15:
METERED SIGNAL SERVICE
2"R.S.C.
3-1/c#6
EXTEND INTO H.H.1:
4"R.S.C.
5-12/c#12
4-3/c#12
2-3/c#20
7-2/c#14
EXTEND INTO H.H.14:
4"R.S.C.
5-12/c#12
4-3/c#12
2-3/c#20
8-2/c#14
STUB OUT 2-3"R.S.C. FROM CABINET TO NORTH (THREAD AND CAP BOTH ENDS-FOR FUTURE USE)

Ⓑ SIGNAL SERVICE CABINET
CABINET FOUNDATION
EXTEND INTO H.H.15:
2"R.S.C.
METERED SIGNAL SERVICE
3-1/c#6
UNMETERED STREET LIGHT SERVICE
2-3/c#12 (LUM)
STUB OUT 2"R.S.C. (FOR SERVICE BY CONNEXUS)

NO	DATE	BY	CKD	APPR	REVISION
1	03/03/2023	ST	JB	ST	Added SAP 198-105-005 to Title Block

NAME: P:\002-620-009 181st Signal Mod\Bases\Signal\002-620-009_SignalLayout.dwg

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: SEAN R. THIEL DATE: 3/3/23
SIGNATURE: *Sean R. Thiel* LICENSE NO. 45128

DRAWN BY ST DATE 1/25/23
DESIGN BY ST DATE 1/12/23
CHECKED BY BL DATE 2/2/23



**ANOKA COUNTY
HIGHWAY DEPT.**

SAP 002-620-009
SAP 198-106-005
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City Project 21-39

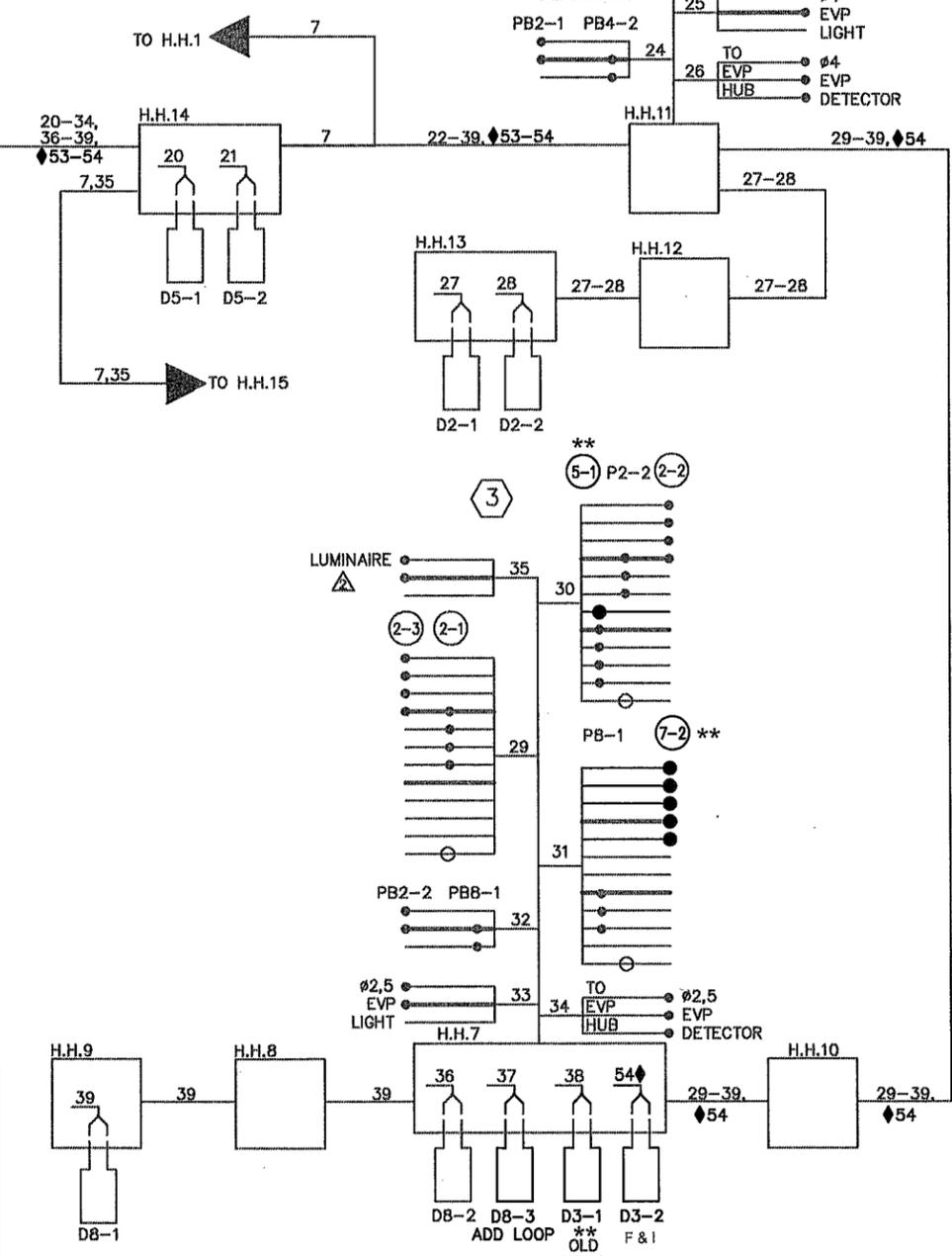
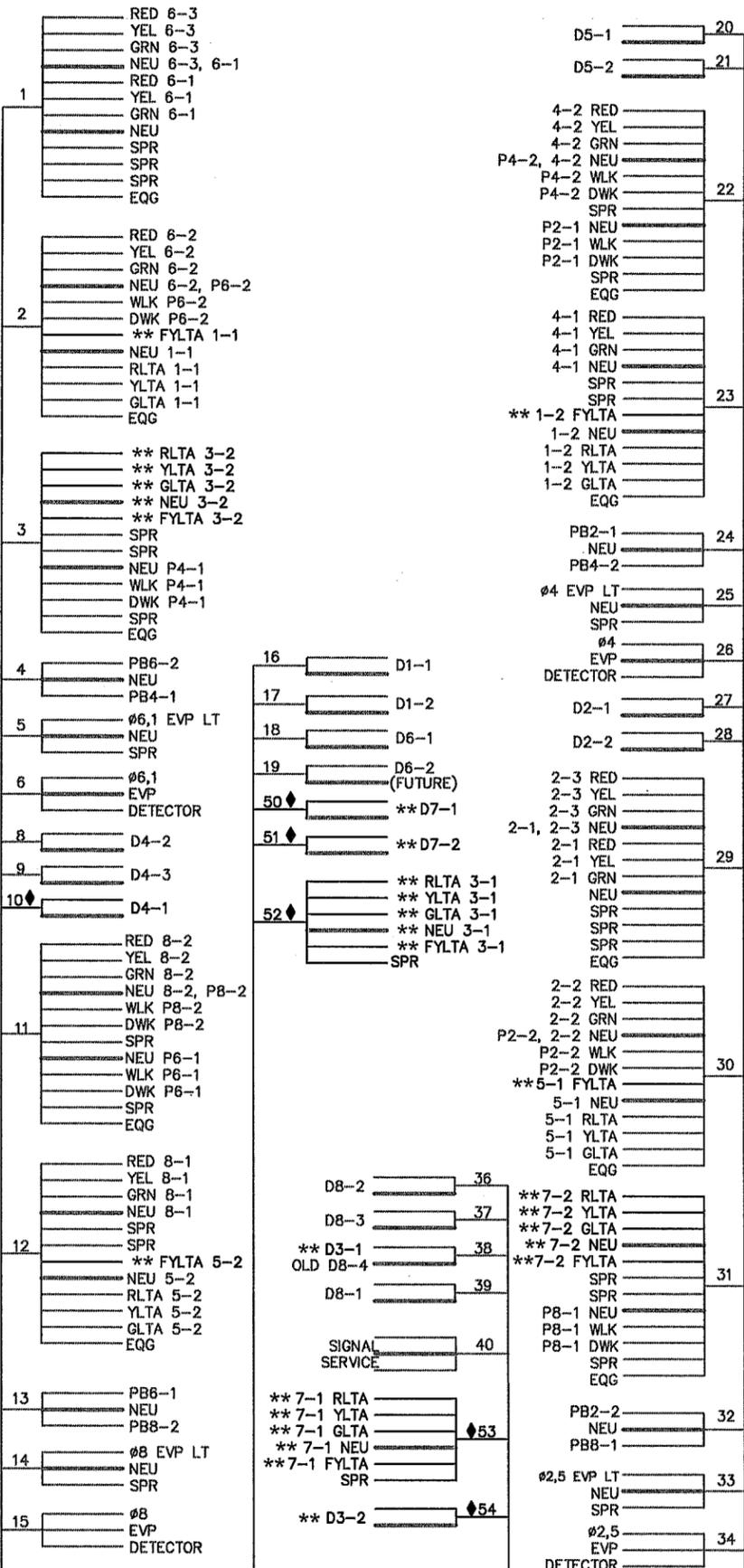
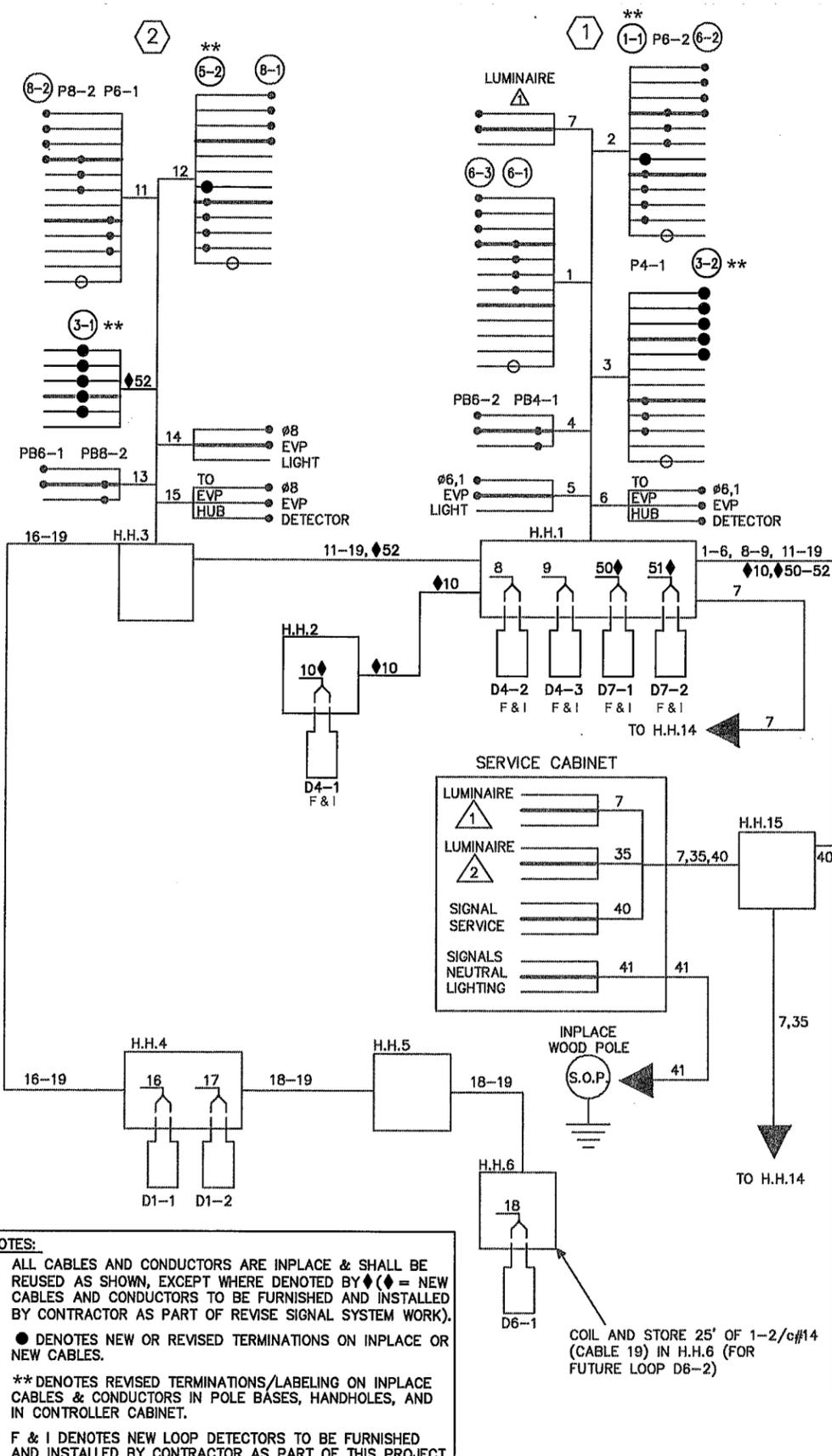
REVISE SIGNAL SYSTEM
POLE AND GENERAL NOTES
CSAH 9 (ROUND LK BLVD) AT CSAH 20 (161ST AVE)
SHEET 38 OF 41 SHEETS

CONTROLLER CABINET

CONDUCTOR COLOR CODING

R	BLK	
O	WH	2-1/c#6
BL		
WH		
R/BLK	R	
O/BLK	WH	3/c#12
BL/BLK	BLK	
WH/BLK		
BLK	BLK	2/c#14
BLK/WH	CLEAR	
G/BLK		
G		
	R OR O	
	WH OR YEL	3/c#20
	BLK OR BL	

NOTE:
ALL TERMINAL BLOCK CONNECTIONS SHALL BE ARRANGED AS SPECIFIED ABOVE.



NOTES:
1) ALL CABLES AND CONDUCTORS ARE INPLACE & SHALL BE REUSED AS SHOWN, EXCEPT WHERE DENOTED BY (◆) = NEW CABLES AND CONDUCTORS TO BE FURNISHED AND INSTALLED BY CONTRACTOR AS PART OF REVISE SIGNAL SYSTEM WORK.
2) ● DENOTES NEW OR REVISED TERMINATIONS ON INPLACE OR NEW CABLES.
3) ** DENOTES REVISED TERMINATIONS/LABELING ON INPLACE CABLES & CONDUCTORS IN POLE BASES, HANDHOLES, AND IN CONTROLLER CABINET.
4) F & I DENOTES NEW LOOP DETECTORS TO BE FURNISHED AND INSTALLED BY CONTRACTOR AS PART OF THIS PROJECT.

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PRINT NAME: SEAN R. THIEL DATE: 3/3/23
SIGNATURE: *Sean R. Thiel* LICENSE NO. 45129

DRAWN BY: ST DATE: 1/31/23
DESIGN BY: ST DATE: 1/12/23
CHECKED BY: BL DATE: 2/2/23



ANOKA COUNTY
HIGHWAY DEPT.

SAP 002-620-009
SAP 198-106-005
SAP 198-105-005
City Project 21-39

REVISE SIGNAL SYSTEM
FIELD WIRING DIAGRAM
CSAH 9 (ROUND LK BLVD) AT CSAH 20 (181ST AVE)
SHEET 39 OF 41 SHEETS

NO	DATE	BY	CKD	APPR	REVISION
1	03/03/2023	ST	JB	ST	Added SAP 198-105-005 to Title Block