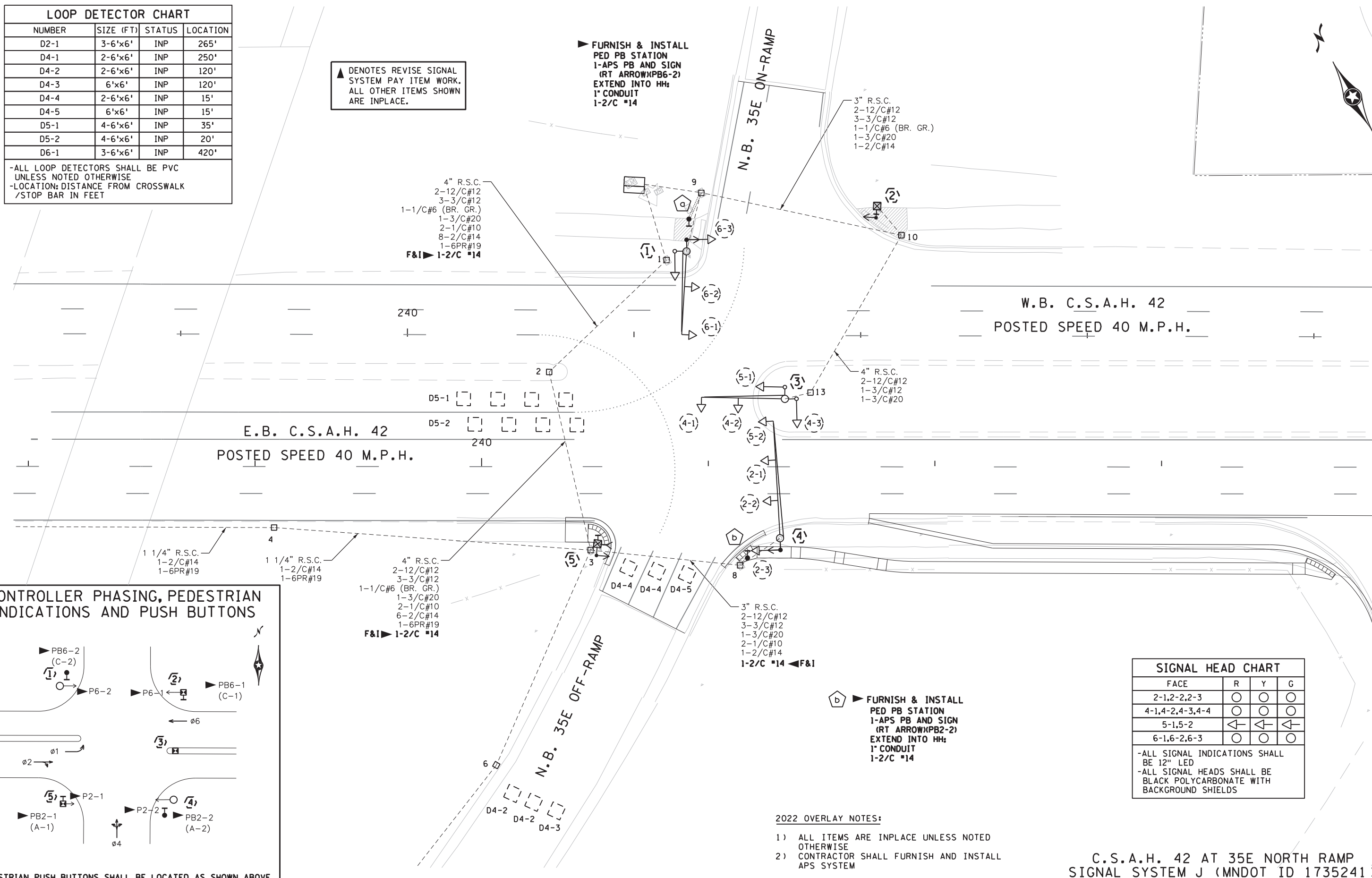


LOOP DETECTOR CHART			
NUMBER	SIZE (FT)	STATUS	LOCATION
D2-1	3-6'x6'	INP	265'
D4-1	2-6'x6'	INP	250'
D4-2	2-6'x6'	INP	120'
D4-3	6'x6'	INP	120'
D4-4	2-6'x6'	INP	15'
D4-5	6'x6'	INP	15'
D5-1	4-6'x6'	INP	35'
D5-2	4-6'x6'	INP	20'
D6-1	3-6'x6'	INP	420'

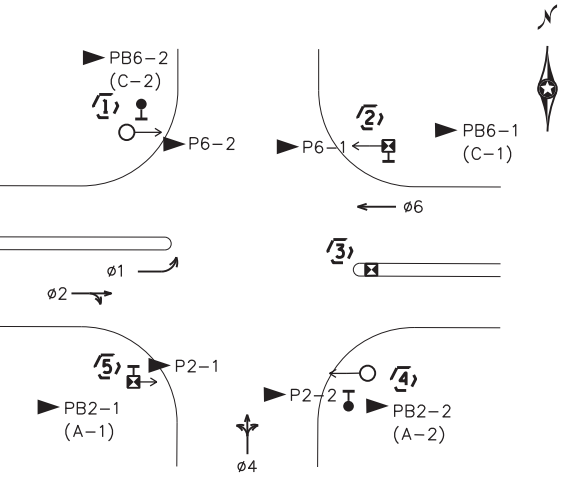
-ALL LOOP DETECTORS SHALL BE PVC UNLESS NOTED OTHERWISE  
 -LOCATION: DISTANCE FROM CROSSWALK /STOP BAR IN FEET

▲ DENOTES REVISE SIGNAL SYSTEM PAY ITEM WORK. ALL OTHER ITEMS SHOWN ARE INPLACE.

► FURNISH & INSTALL PED PB STATION  
 1-APS PB AND SIGN (RT ARROW)(PB6-2)  
 EXTEND INTO HH: 1' CONDUIT 1-2/C #14



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



SIGNAL HEAD CHART			
FACE	R	Y	G
2-1,2-2,2-3	○	○	○
4-1,4-2,4-3,4-4	○	○	○
5-1,5-2	◄	◄	◄
6-1,6-2,6-3	○	○	○

-ALL SIGNAL INDICATIONS SHALL BE 12" LED  
 -ALL SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BACKGROUND SHIELDS

- 2022 OVERLAY NOTES:**
- 1) ALL ITEMS ARE INPLACE UNLESS NOTED OTHERWISE
  - 2) CONTRACTOR SHALL FURNISH AND INSTALL APS SYSTEM

**C.S.A.H. 42 AT 35E NORTH RAMP  
 SIGNAL SYSTEM J (MNDOT ID 1735241)**

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12224 NICOLLET AVENUE  
 BURNSVILLE, MINNESOTA 55337  
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 Email: Burns@bolton-menk.com  
 www.bolton-menk.com

REV.	BY	DATE

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT 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.

JACOB J. BONGARD  
 LIC. NO. 52210 DATE 09-17-2021

DESIGNED ABM
DRAWN ABM
CHECKED JJB

S.P. 019-642-063
C.S.A.H. 42 IMPROVEMENTS
SIGNAL REVISION PLAN

SHEET  
 155  
 OF  
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(A) CONTROLLER & CABINET  
 EXTEND INTO H.H. 1  
 4" R.S.C.  
 2 - 12/c #12  
 3 - 3/c #12  
 1 - 1/c #6 (BR. GR.)  
 1 - 3/c #20  
 8 - 2/c #14  
 1 - 6pr. #19  
**F&I ▶ 1-2/C #14**  
 EXTEND INTO H.H. 8  
 4" R.S.C.  
 4 - 12/c #12  
 4 - 3/c #12  
 1 - 1/c #6 (BR. GR.)  
 2 - 3/c #20  
 1 - 2/c #14  
**F&I ▶ 1-2/C #14**

PAD MOUNTED SERVICE EQUIPMENT  
 EXTEND INTO CONTROLLER CABINET  
 2" R.S.C.  
 2 - 1/c #6  
 1 - 1/c #6 (BARE)  
 EXTEND INTO H.H. 1  
 2" R.S.C.  
 2 - 1/c #10  
 EXTEND INTO H.H. 9  
 2" R.S.C.  
 2 - 1/c #10  
 EXTEND INTO S.O.P.  
 2" R.S.C.  
 3 - 1/c #2

(1) TYPE A100-A35-D40-12 (MID MAST ARM MOUNT AT 20')  
 A100 POLE FOUNDATION  
 2 - ONE WAY SIGNALS (OVERHEAD)  
 1 - TYPE 10A - POLE MOUNTED AT 0°  
 1 - TYPE 10B - POLE MOUNTED AT 270°  
**REMOVE ▶ 1 - PEDESTRIAN PUSH BUTTON & SIGN**  
 LUMINAIRE BY OTHERS (200 WATT H.P.S. AT 350' w/P.E.C.)  
 ONE WAY E.V.P. DETECTOR & LIGHT  
 EXTEND INTO H.H. 9  
 3" R.S.C.  
 2 - 12/c #12  
 1 - 3/c #12  
 1 - 3/c #20  
 2 - 1/c #10  
**REMOVE ▶ 1 - POLE MOUNTED PEDESTRIAN INDICATION**  
**F&I ▶ 1 - POLE MOUNTED C.D. PED HEAD AT 180 DEG**

(2) TYPE 4B  
**REMOVE ▶ 2 - PEDESTRIAN PUSH BUTTONS & SIGNS**  
 EXTEND INTO H.H. 10  
 2" R.S.C.  
 4 - 3/c #12  
 1 - 1/c #6 (BR. GR.)  
**REMOVE ▶ 2 - POLE MOUNTED PEDESTRIAN INDICATIONS**  
**F&I ▶ 1 - POLE MOUNTED C.D. PED HEAD AT 0 DEG**  
**F&I ▶ 1 - APS PB AND SIGN (LT ARROW)(PB6-1)**  
**AND APS PB POLE MOUNT ADAPTER**

(3) TYPE A100-A35-D40-12 (MID MAST ARM MOUNT AT 15')  
 A100 POLE FOUNDATION  
 2 - ONE WAY SIGNALS (OVERHEAD)  
 1 - TYPE 10B - POLE MOUNTED AT 0°  
 1 - TYPE 10B - POLE MOUNTED AT 270°  
**REMOVE ▶ 1 - PEDESTRIAN PUSH BUTTON & SIGN**  
 ONE WAY E.V.P. DETECTOR & LIGHT  
 EXTEND INTO H.H. 13  
 3" R.S.C.  
 2 - 12/c #12  
 1 - 3/c #12  
 1 - 3/c #20  
**REMOVE ▶ 2 - POLE MOUNTED PEDESTRIAN INDICATIONS**

(4) TYPE A100-A50-D40-12 (MID MAST ARM MOUNTS AT 16' & 34')  
 A100 POLE FOUNDATION  
 3 - ONE WAY SIGNALS (OVERHEAD)  
 1 - TYPE 30A - POLE MOUNTED AT 0°  
 1 - TYPE 10B - POLE MOUNTED AT 270°  
**REMOVE ▶ 2 - PEDESTRIAN PUSH BUTTON & SIGN**  
 LUMINAIRE BY OTHERS (200 WATT H.P.S. AT 350' w/P.E.C.)  
 ONE WAY E.V.P. DETECTOR & LIGHT  
 EXTEND INTO H.H. 8  
 3" R.S.C.  
 2 - 12/c #12  
 2 - 3/c #12  
 1 - 3/c #20  
 2 - 1/c #10  
**REMOVE ▶ 2 - POLE MOUNTED PEDESTRIAN INDICATIONS**  
**F&I ▶ 1 - POLE MOUNTED C.D. PED HEAD AT 270 DEG**

(5) TYPE 4A  
**REMOVE ▶ 1 - PEDESTRIAN PUSH BUTTONS & SIGNS**  
 EXTEND INTO H.H. 3  
 2" R.S.C.  
 3 - 3/c #12  
 1 - 1/c #6 (BR. GR.)  
**REMOVE ▶ 1 - POLE MOUNTED PEDESTRIAN INDICATION**  
**F&I ▶ 1 - POLE MOUNTED C.D. PED HEAD AT 90 DEG**  
**F&I ▶ 1 - APS PB AND SIGN (LT ARROW)(PB2-1)**  
**AND APS PB POLE MOUNT ADAPTER**

▲ DENOTES REVISE SIGNAL  
 SYSTEM PAY ITEM WORK.  
 ALL OTHER ITEMS SHOWN  
 ARE INPLACE.

C.S.A.H. 42 AT 35E NORTH RAMP  
 SIGNAL SYSTEM J (MNDOT ID 1735241)

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 JACOB J. BONGARD  
 LIC. NO. 52210 DATE 09-17-2021

DESIGNED  
 ABM  
 DRAWN  
 ABM  
 CHECKED  
 JJB

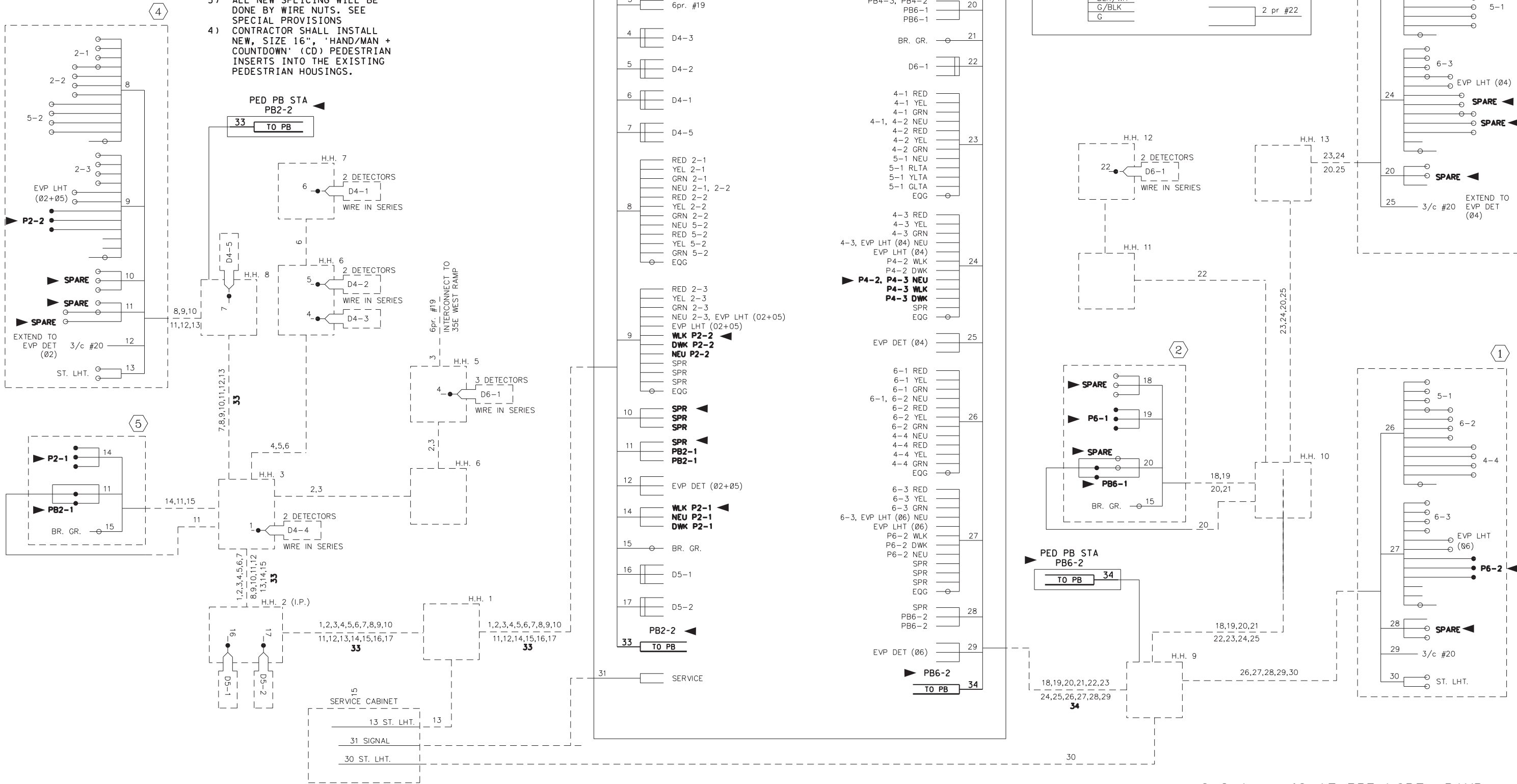
S.P. 019-642-063  
 C.S.A.H. 42 IMPROVEMENTS  
 SIGNAL REVISION PLAN

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 OF  
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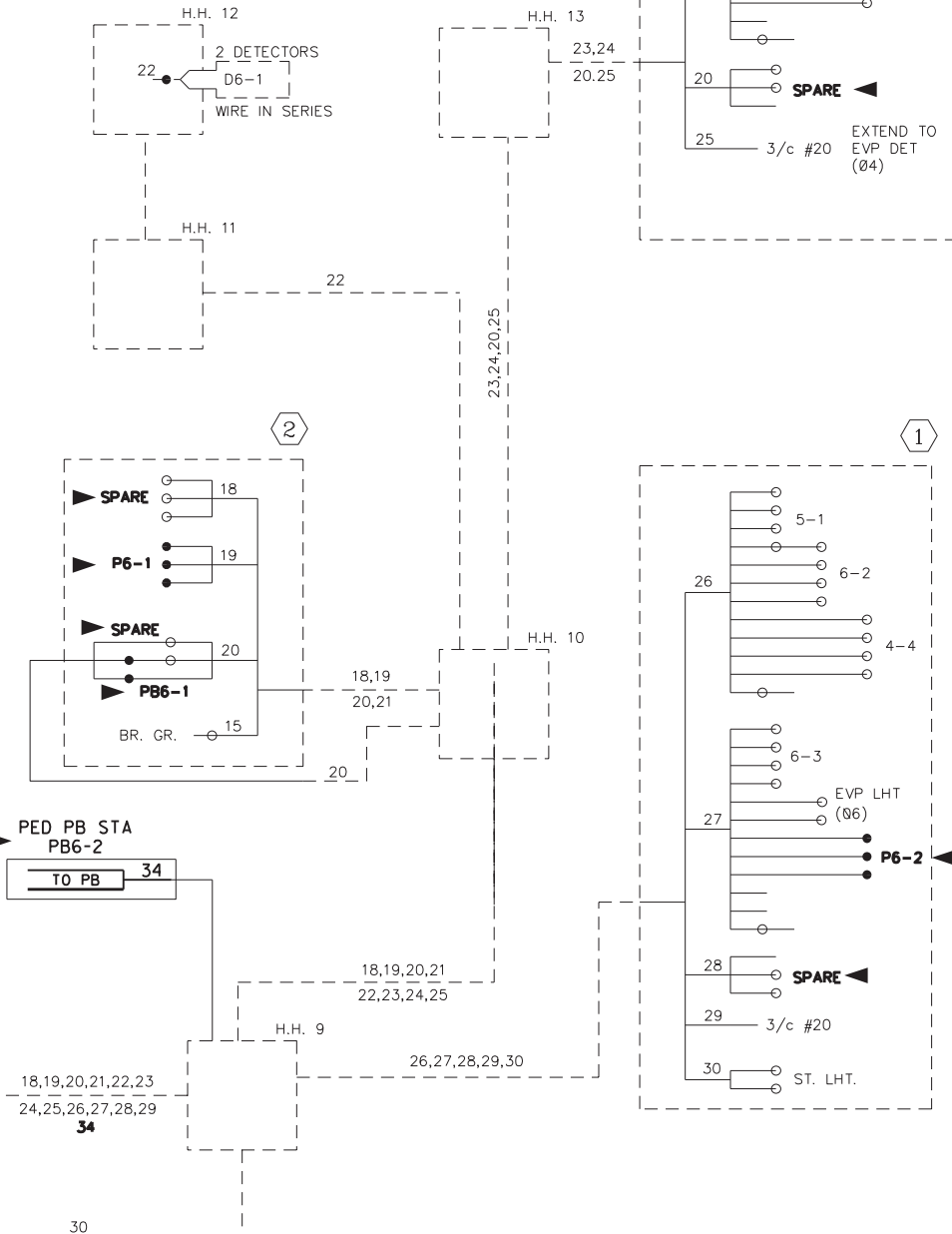
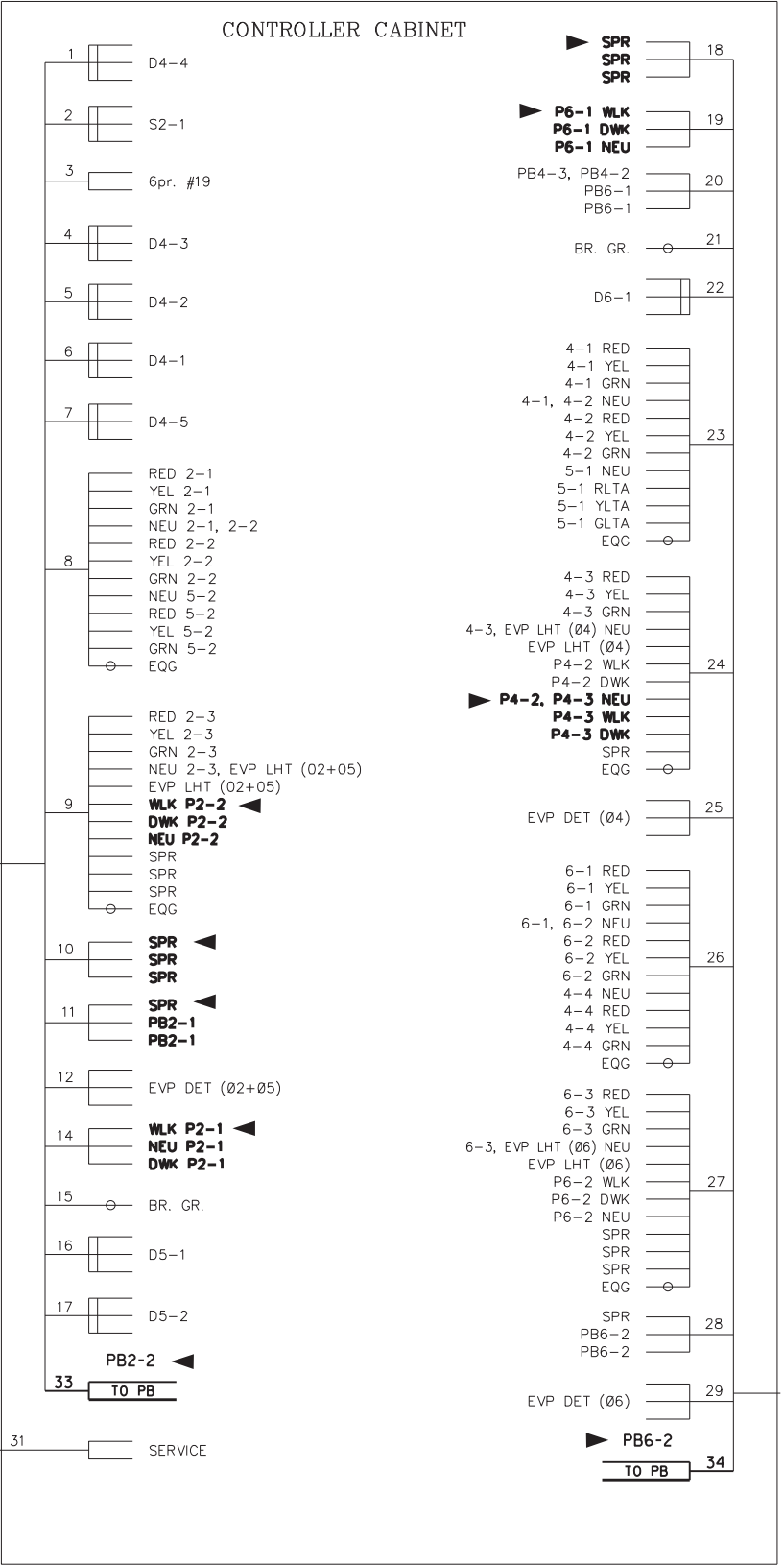
▲ DENOTES REVISE SIGNAL SYSTEM PAY ITEM WORK. ALL OTHER ITEMS SHOWN ARE INPLACE.

2022 OVERLAY NOTES:

- 1) CONTRACTOR SHALL CAREFULLY REMOVE OLD SPLICES OF THE EXISTING 3/C#12 PUSH BUTTON WIRES
- 2) CONTRACTOR SHALL USE BLACK AND WHITE CONDUCTORS OF THE EXISTING 3/C#12 TO CONNECT NEW APS PB'S
- 3) ALL NEW SPlicing WILL BE DONE BY WIRE NUTS. SEE SPECIAL PROVISIONS
- 4) CONTRACTOR SHALL INSTALL NEW, SIZE 16", 'HAND/MAN + COUNTDOWN' (CD) PEDESTRIAN INSERTS INTO THE EXISTING PEDESTRIAN HOUSINGS.



CONDUCTOR COLOR CODING		
R	BLK or R	2-1/c #4
BL	WH	#6 or #10
WH	R	3/c #12
R/BLK	WH	3/c #20
O/BLK	BLK	3/c #20
BL/BLK		2/c #14
WH/BLK		
BLK		
BLK/WH		
G/BLK		2 pr #22
G		



C.S.A.H. 42 AT 35E NORTH RAMP  
SIGNAL SYSTEM J (MNDOT ID 1735241)

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LIC. NO. 52210 DATE 09-17-2021

DESIGNED  
ABM  
DRAWN  
ABM  
CHECKED  
JJB

S.P. 019-642-063  
C.S.A.H. 42 IMPROVEMENTS  
SIGNAL REVISION PLAN

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**NOTES:**

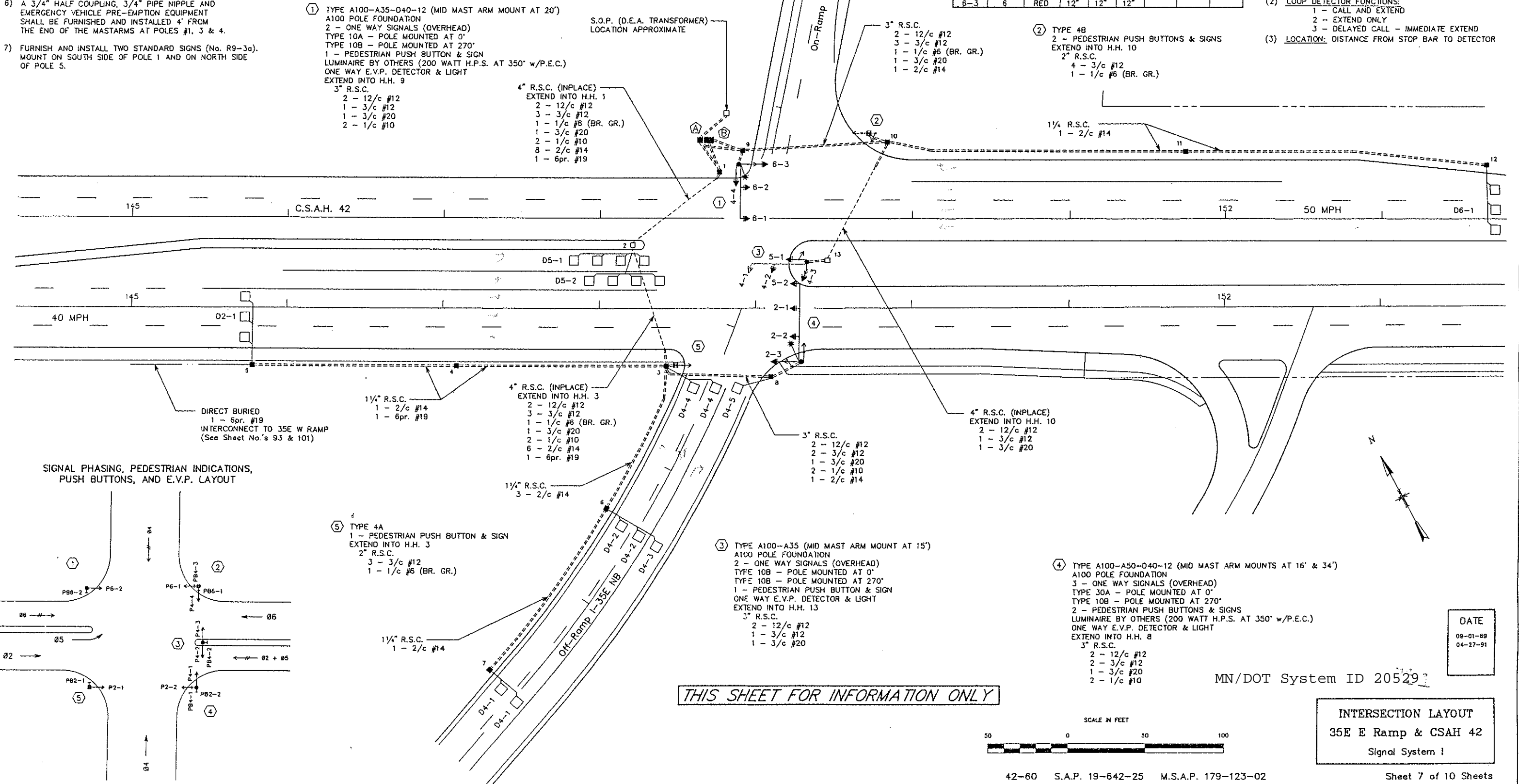
- 1) THE CONTRACTOR SHALL REMOVE AND SALVAGE THE EXISTING SIGNAL SYSTEM AS DIRECTED BY THE ENGINEER.
- 2) SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS.
- 3) ALL PEDESTRIAN INDICATIONS SHALL BE 12" x 12".
- 4) ALL SIGNAL FACES SHALL HAVE BACKGROUND SHIELDS.
- 5) LUMINAIRE AND P.E.C. TO BE FURNISHED AND INSTALLED BY OTHERS. CONTRACTOR SHALL FURNISH AND INSTALL STREET LIGHT CHECK SWITCH AND POWER CONDUCTORS REQUIRED TO MAKE LUMINAIRE AND CHECK SWITCH OPERATIONAL.
- 6) A 3/4" HALF COUPLING, 3/4" PIPE NIPPLE AND EMERGENCY VEHICLE PRE-EMPTION EQUIPMENT SHALL BE FURNISHED AND INSTALLED 4' FROM THE END OF THE MASTARMS AT POLES #1, 3 & 4.
- 7) FURNISH AND INSTALL TWO STANDARD SIGNS (No. R9-3a). MOUNT ON SOUTH SIDE OF POLE 1 AND ON NORTH SIDE OF POLE 5.

- (A) PAD MOUNTED SERVICE EQUIPMENT**  
 EXTEND INTO CONTROLLER CABINET  
 2" R.S.C.  
 2 - 1/c #6  
 1 - 1/c #6 (BARE)  
 EXTEND INTO H.H. 1  
 2" R.S.C.  
 2 - 1/c #10  
 EXTEND INTO H.H. 9  
 2" R.S.C.  
 2 - 1/c #10  
 EXTEND INTO S.O.P.  
 2" R.S.C.  
 3 - 1/c #2
- (B) CONTROLLER & CABINET**  
 EXTEND INTO H.H. 1  
 4" R.S.C.  
 2 - 12/c #12  
 3 - 3/c #12  
 1 - 1/c #6 (BR. GR.)  
 1 - 3/c #20  
 8 - 2/c #14  
 1 - 6pr. #19  
 EXTEND INTO H.H. 9  
 4" R.S.C.  
 4 - 12/c #12  
 4 - 3/c #12  
 1 - 1/c #6 (BR. GR.)  
 2 - 3/c #20  
 1 - 2/c #14

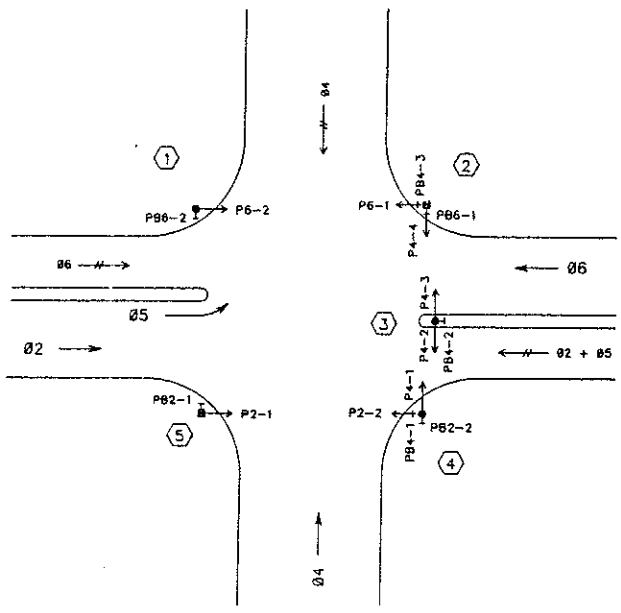
SIGNAL INDICATION CHART								
FACE NO.	PHASE	FLASH	RED	YEL	GRN	RLTA	YLTA	GLTA
2-1	2		RED	12"	12"	12"		
2-2	2		RED	12"	12"	12"		
2-3	2		RED	12"	12"	12"		
4-1	4		RED	12"	12"	12"		
4-2	4		RED	12"	12"	12"		
4-3	4		RED	12"	12"	12"		
4-4	4		RED	12"	12"	12"		
5-1	5		RED			12"	12"	12"
5-2	5		RED			12"	12"	12"
6-1	6		RED	12"	12"	12"		
6-2	6		RED	12"	12"	12"		
6-3	6		RED	12"	12"	12"		

DETECTION CHART				
DET. NO.	PHASE	SIZE	FUNCTION (2)	LOCATION (3)
D2-1	2	3-6' X 6'	1	265'
D4-1	4	2-6' X 6'	2	250'
D4-2	4	2-6' X 6'	1	120'
D4-3	4	6' X 6'	1	120'
D4-4	4	2-6' X 6'	1	15'
D4-5	4	6' X 6'	3	15'
D5-1	5	4-6' X 6'	1	35'
D5-2	5	4-6' X 6'	1	20'
D6-1	6	3-6' X 6'	1	420'

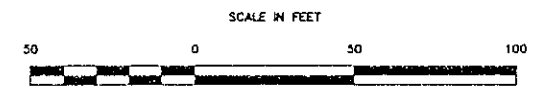
- (1) MULTIPLE LOOP DETECTOR  
 (2) LOOP DETECTOR FUNCTIONS:  
 1 - CALL AND EXTEND  
 2 - EXTEND ONLY  
 3 - DELAYED CALL - IMMEDIATE EXTEND  
 (3) LOCATION: DISTANCE FROM STOP BAR TO DETECTOR



**SIGNAL PHASING, PEDESTRIAN INDICATIONS, PUSH BUTTONS, AND E.V.P. LAYOUT**



**THIS SHEET FOR INFORMATION ONLY**



**INTERSECTION LAYOUT**  
 35E E Ramp & CSAH 42  
 Signal System I

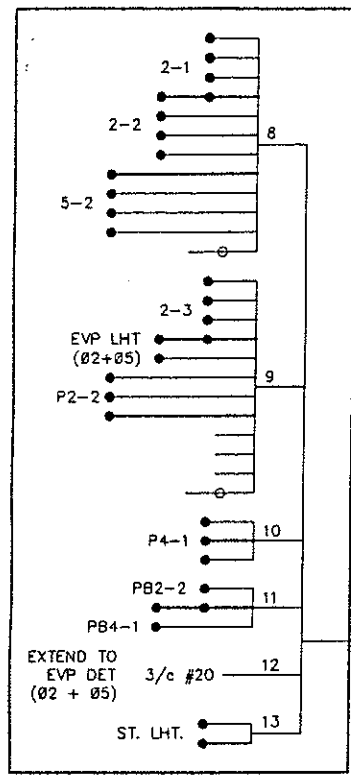
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 04-27-91

MN/DOT System ID 20529

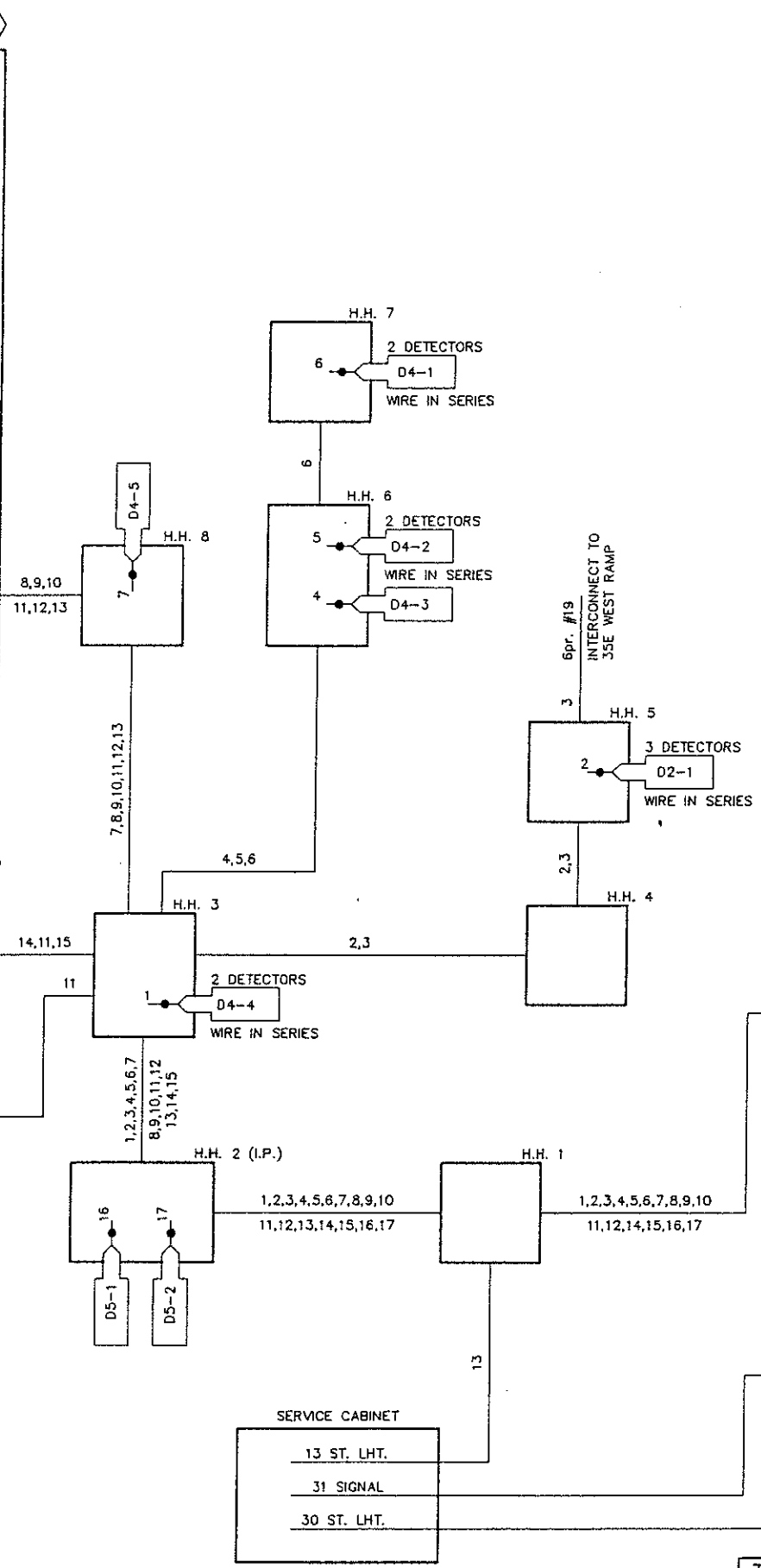
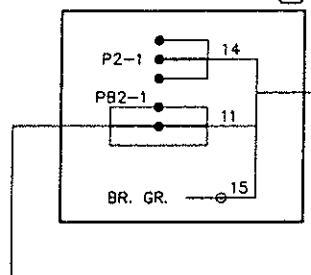
42-60 S.A.P. 19-642-25 M.S.A.P. 179-123-02

Sheet 7 of 10 Sheets

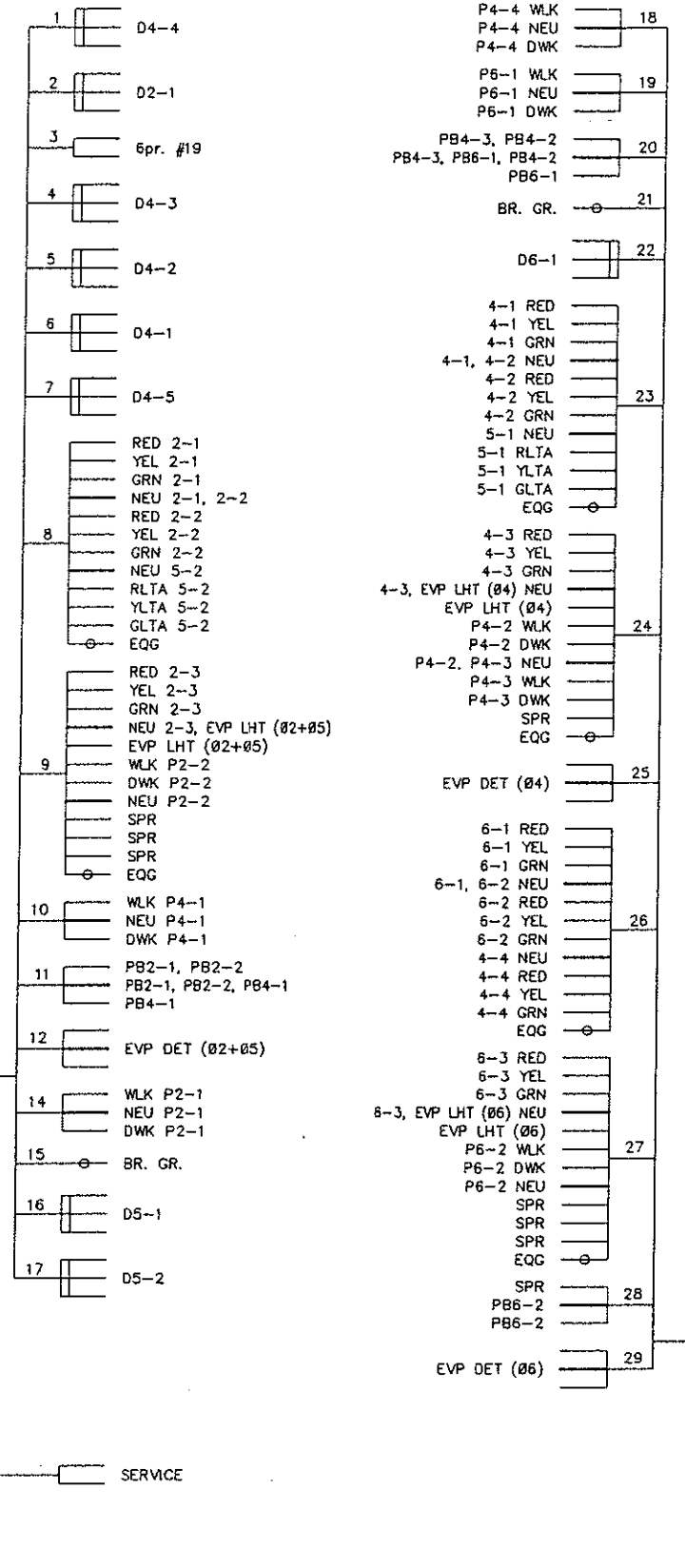
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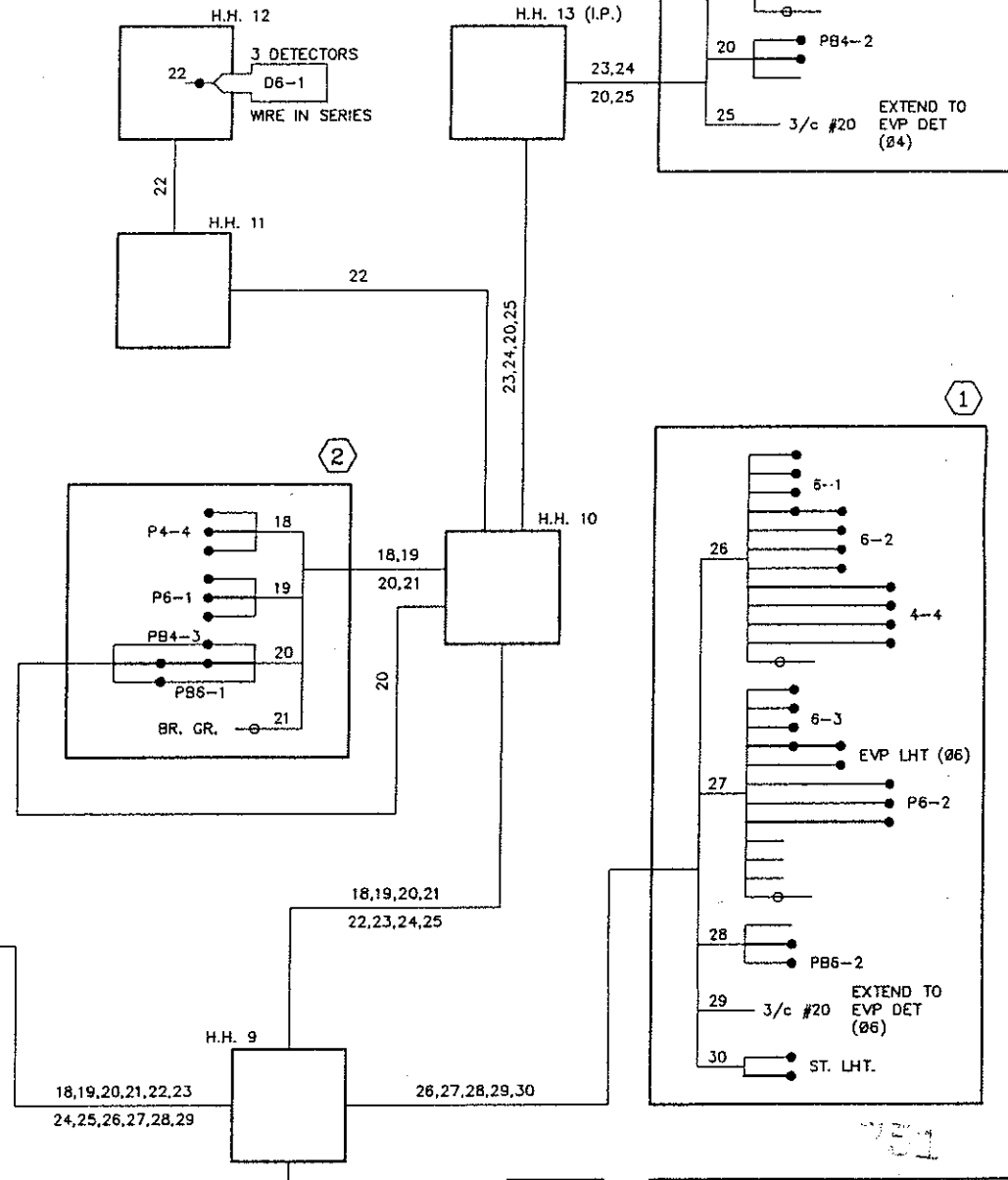


### CONTROLLER CABINET

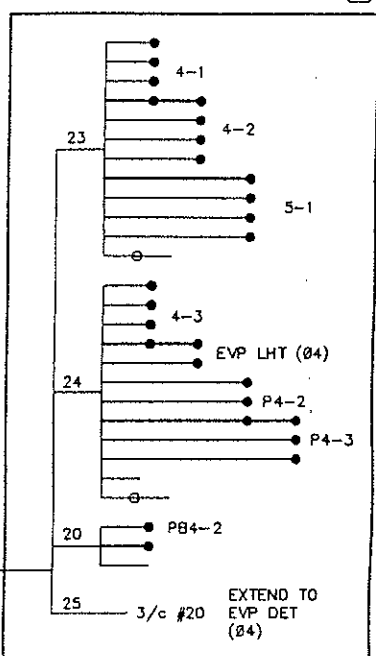


### CONDUCTOR COLOR CODING

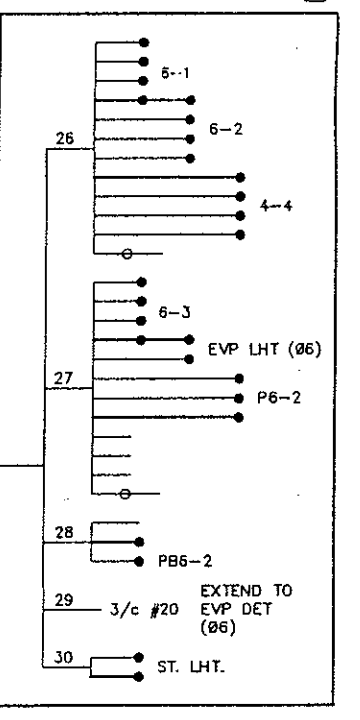
R	BLK or R	2-1/c #4
O	WH	#6 or #10
BL	R	3/c #12
WH	WH	3/c #20
R/BLK	BLK	2/c #14
O/BLK		
BL/BLK		
WH/BLK		
BLK		
BLK/WH		
G/BLK		
G		2 pr #22



3



1



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DATE  
09-01-89  
04-27-91

WIRING DIAGRAM  
35E East Ramp & CSAH 42  
Signal System I

42-60 S.A.P. 19-642-25 M.S.A.P. 179-123-02

Sheet 8 of 10 Sheets

Dakota County Highway Department

Project Number: 42-51 S.P. 19-642-20

Sheet 96 of 172 Sheets