

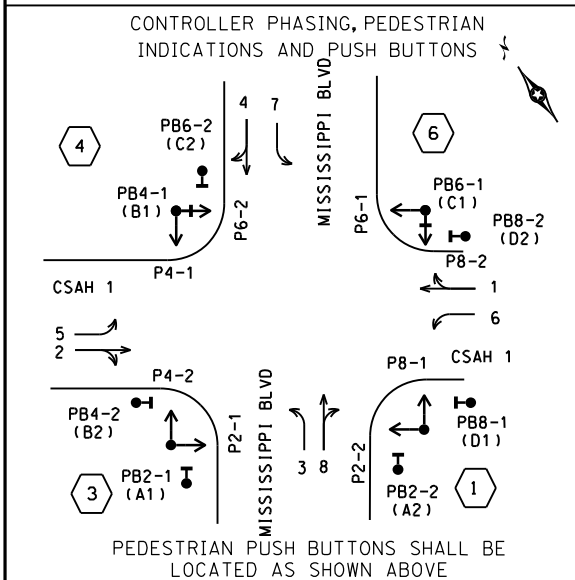
PLOTTED/REVISED: 5/5/2023

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- NOTES:
1. SEE SPECIAL PROVISIONS FOR ACHD FURNISHED MATERIALS.
  2. REFER TO SHEETS FOR INPLACE SIGNAL COMPONENTS.
  3. ENSURE THE EXACT LOCATION OF THE HANDHOLES, POLES, LOOP DETECTORS AND EQUIPMENT PAD ARE VERIFIED IN THE FIELD BY ACHD OFFICE PERSONNEL.
  4. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE TRAFFIC SIGNAL SYSTEM.
  5. FOR SIGN PANELS ON SIGNAL SEE DETAIL SHEET. ALL SIGN PANELS REQUIRED ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL SIGNAL SYSTEM PAY ITEM.
  6. FOR PAVEMENT MARKINGS SEE PAVEMENT MARKINGS SHEETS (NOT INCLUDED IN TRAFFIC CONTROL SIGNAL PAY ITEM).
  7. FOR CONSTRUCTION OF PEDESTRIAN CURB RAMPS, CONCRETE WALK AND MEDIAN WORK SEE DETAIL SHEET. (NOT INCLUDED IN TRAFFIC CONTROL SYSTEM PAY ITEM).
  8. THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD. CONDUITS UNDER THE ROADWAYS REQUIRE BORING.
  9. USE PVC OR HDPE FOR ALL NEW CONDUIT.
  10. CONDUIT SIZES ARE NOMINAL DIAMETER.
  11. ALL WIRES LISTED ARE AWG (AMERICAN WIRE GAUGE).
  12. ITEMS DENOTED WITH AN \* ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
  13. ITEMS DENOTED WITH AN \*\* ARE INCLUDED IN PAYMENT FOR THE INTERCONNECT PAY ITEM.

- (A) EQUIPMENT PAD (SEE DETAIL SHEET)  
SERVICE CABINET (SSB) BATTERY BACKUP SYSTEM  
(BATTERIES INCLUDED)  
CONTROLLER AND CABINET (ACHD FURNISHED)
- 3" CONDUIT TO HH 1: 3" CONDUIT TO HH 20:  
2-6/C 14 2-6/C 14  
4-4/C 14 5-4/C 14  
4-2/C 14 (SHLD) \*1-3/C 14 (EVP)  
\*1-3/C 14 (EVP) \*1-3/C 14 (EVP)  
\*2-3/C 20 (EVP) 1-CAT 5E  
11-2/C 12 1-1/C 6 INS. GR.  
1-1/C 6 INS. GR.
- 3" CONDUIT TO HH 1: 3" CONDUIT TO HH 20:  
2-6/C 14 3-6/C 14  
5-4/C 14 4-4/C 14  
2-2/C 14 (SHLD) 2-2/C 14 (SHLD)  
\*1-3/C 14 (EVP) \*1-3/C 14 (EVP)  
\*2-3/C 20 (EVP) \*1-3/C 20 (EVP)  
4-2/C 12 4-2/C 12  
1-1/C 6 INS. GR. 1-1/C 6 INS. GR.
- GROUND WIRE AND GROUND ROD - MIN 8' OUT FROM PAD  
1-3" CONDUIT STUBBED OUT (CAPPED BOTH ENDS)  
CABINET TO SERVICE CABINET:  
2" CONDUIT  
3-1/C 6  
SERVICE CABINET TO INP HH 1:  
2" CONDUIT  
2-3/C 14 (LUM)  
SERVICE CABINET TO HH 20:  
2" CONDUIT  
2-3/C 14 (LUM)  
SERVICE CABINET TO EXTERNAL GR. RD.  
1" CONDUIT  
1-1/C 6 INS. GR. (SEE EQUIPMENT PAD DETAIL)

- (B) INP SOP (XCEL)  
GROUND MOUNTED  
TRANSFORMER



### SIGNAL SYSTEM OPERATION

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

PED PB STATION  
1-APS PB AND SIGN  
(RT ARROW) (PB4-2)  
EXTEND INTO HH 3:  
1" CONDUIT  
1-2/C 14 (SHLD)  
1-1/C 6 INS. GR.

PED PB STATION  
1-APS PB AND SIGN  
(LT ARROW) (PB2-1)  
EXTEND INTO HH 3:  
1" CONDUIT  
1-2/C 14 (SHLD)  
1-1/C 6 INS. GR.

PED PB STATION  
1-APS PB AND SIGN  
(RT ARROW) (PB6-2)  
EXTEND INTO HH 12:  
1" CONDUIT  
1-2/C 14 (SHLD)  
1-1/C 6 INS. GR.

2" CONDUIT  
1-2/C 12  
1-3/C 20 (EVP)  
1-1/C 6 INS. GR.

2" CONDUIT  
1-2/C 14 (SHLD)  
4-2/C 12  
1-3/C 20 (EVP)  
1-1/C 6 INS. GR.

3" CONDUIT  
2-6/C 14  
5-4/C 14  
2-2/C 14 (SHLD)  
\*1-3/C 14 (EVP)  
\*2-3/C 20 (EVP)  
1-3/C 14 (LUM)  
4-2/C 12  
1-1/C 6 INS. GR.

3" CONDUIT  
2-6/C 14  
5-4/C 14  
2-2/C 14 (SHLD)  
\*1-3/C 14 (EVP)  
\*2-3/C 20 (EVP)  
1-3/C 14 (LUM)  
4-2/C 12  
1-1/C 6 INS. GR.

\*\* F&I:  
1.5" CONDUIT  
S&I:  
12-SM FO CABLE

3" CONDUIT  
2-6/C 14  
5-4/C 14  
2-2/C 14 (SHLD)  
\*1-3/C 14 (EVP)  
\*2-3/C 20 (EVP)  
1-3/C 14 (LUM)  
4-2/C 12  
1-1/C 6 INS. GR.

3" CONDUIT  
2-6/C 14  
5-4/C 14  
2-2/C 14 (SHLD)  
\*1-3/C 14 (EVP)  
\*2-3/C 20 (EVP)  
1-3/C 14 (LUM)  
4-2/C 12  
1-1/C 6 INS. GR.

\* 2" CONDUIT  
1-3/C 20 (EVP)

MATCHLINE B

MATCHLINE D

PED PB STATION  
1-APS PB AND SIGN  
(RT ARROW) (PB8-2)  
EXTEND INTO INP HH 17:  
1" CONDUIT  
1-2/C 14 (SHLD)  
1-1/C 6 INS. GR.

SCALE IN FEET  
0 20 40

### LOOP DETECTOR CHART

| NUMBER           | SIZE (FT) | LOCATION    |
|------------------|-----------|-------------|
| D1-1, D5-1       | 3-6x6     | 20, 35 & 50 |
| D1-2, D5-2       | 6x6       | 5           |
| D2-1, D2-2       | 6x6       | 400         |
| D3-1, D3-2, D7-1 | 3-6x6     | 20, 35 & 50 |
| D3-3, D3-4, D7-2 | 6x6       | 5           |
| D4-1, D8-1       | 6x6       | 120         |
| D4-2             | 2-6x6     | 5 & 20      |
| D6-1, D6-2       | 6x6       | 300         |
| D8-2, D8-3       | 2-6x6     | 5 & 20      |

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

3" CONDUIT  
3-6/C 14  
4-4/C 14  
2-2/C 14 (SHLD)  
\*1-3/C 14 (EVP)  
\*1-3/C 20 (EVP)  
1-3/C 14 (LUM)  
2-2/C 12  
1-1/C 6 INS. GR.

3" CONDUIT  
3-6/C 14  
4-4/C 14  
2-2/C 14 (SHLD)  
\*1-3/C 14 (EVP)  
\*1-3/C 20 (EVP)  
1-3/C 14 (LUM)  
4-2/C 12  
1-1/C 6 INS. GR.

PED PB STATION  
1-APS PB AND SIGN  
(LT ARROW) (PB8-1)  
EXTEND INTO HH 1:  
1" CONDUIT  
1-2/C 14 (SHLD)  
1-1/C 6 INS. GR.

### SIGNAL FACE CHART

| FACE          | R | Y | G | RLA | YLA | FYA | GLA |
|---------------|---|---|---|-----|-----|-----|-----|
| 1-1, 1-2      |   |   |   | ←   | ←   | ←   | ←   |
| 2-1, 2-2, 2-3 | ● | ● | ● |     |     |     |     |
| 3-1, 3-2, 3-3 |   |   |   | ←   | ←   | ←   | ←   |
| 4-1, 4-2      | ● | ● | ● |     |     |     |     |
| 5-1, 5-2      |   |   |   | ←   | ←   | ←   | ←   |
| 6-1, 6-2, 6-3 | ● | ● | ● |     |     |     |     |
| 7-1, 7-2      |   |   |   | ←   | ←   | ←   | ←   |
| 8-1, 8-2      | ● | ● | ● |     |     |     |     |

-ALL SIGNAL INDICATIONS SHALL BE 12" LED  
-ALL SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BACKGROUND SHIELDS  
-INCLUDE YELLOW REFLECTIVE TAPE ON THE ENTIRE PERIMETER OF THE BACKGROUND SHIELDS  
-FYA DENOTES FLASHING YELLOW ARROW

| NO. | DATE | BY | CHK | REVISIONS |
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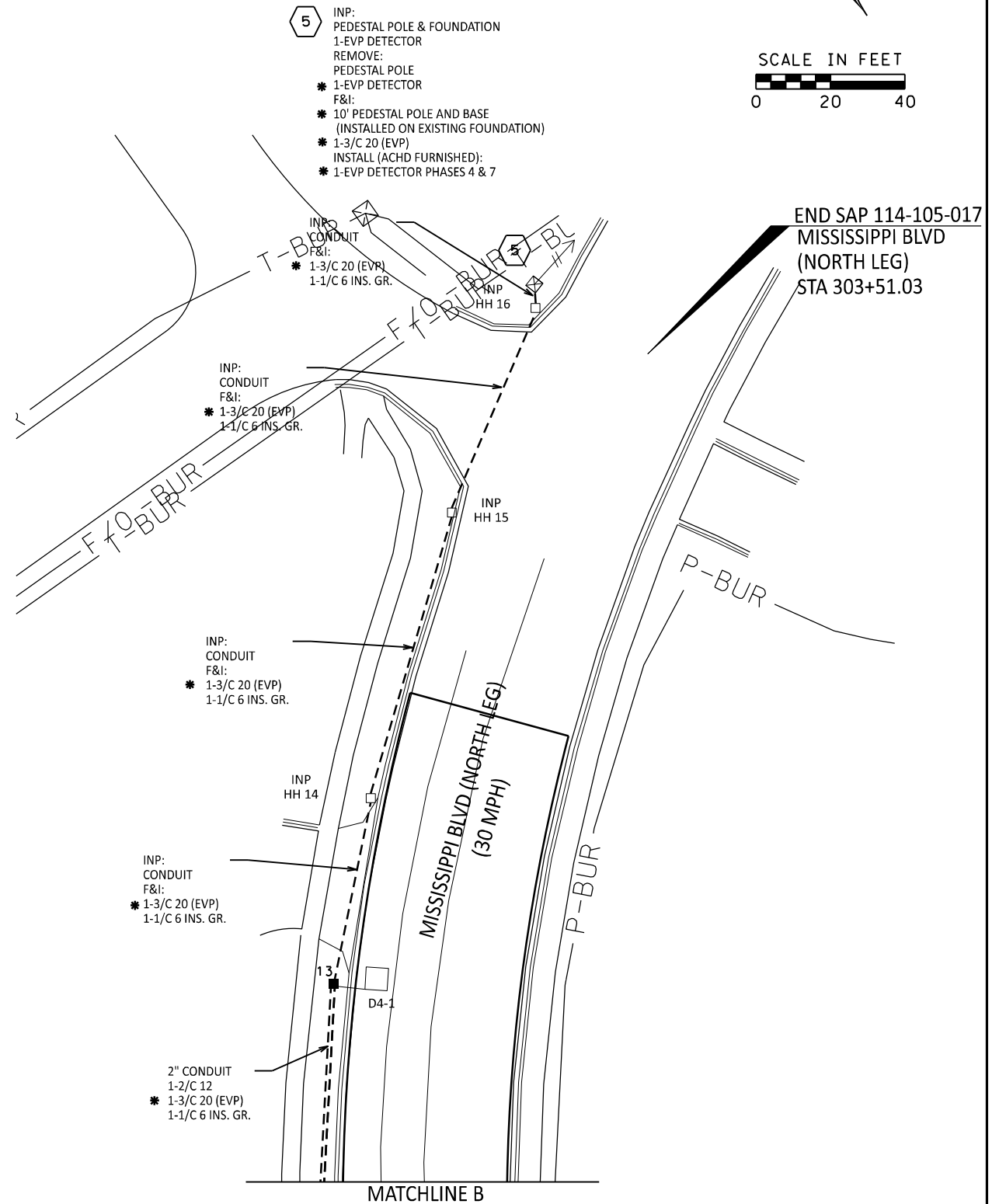
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| Plan By: MAS    |                                                                                                                                                                                                                                    |
| Checked By: SD  |                                                                                                                                                                                                                                    |
| Approved By: SD |                                                                                                                                                                                                                                    |
| DATE: 5/5/2023  | LICENSE #: 40945                                                                                                                                                                                                                   |



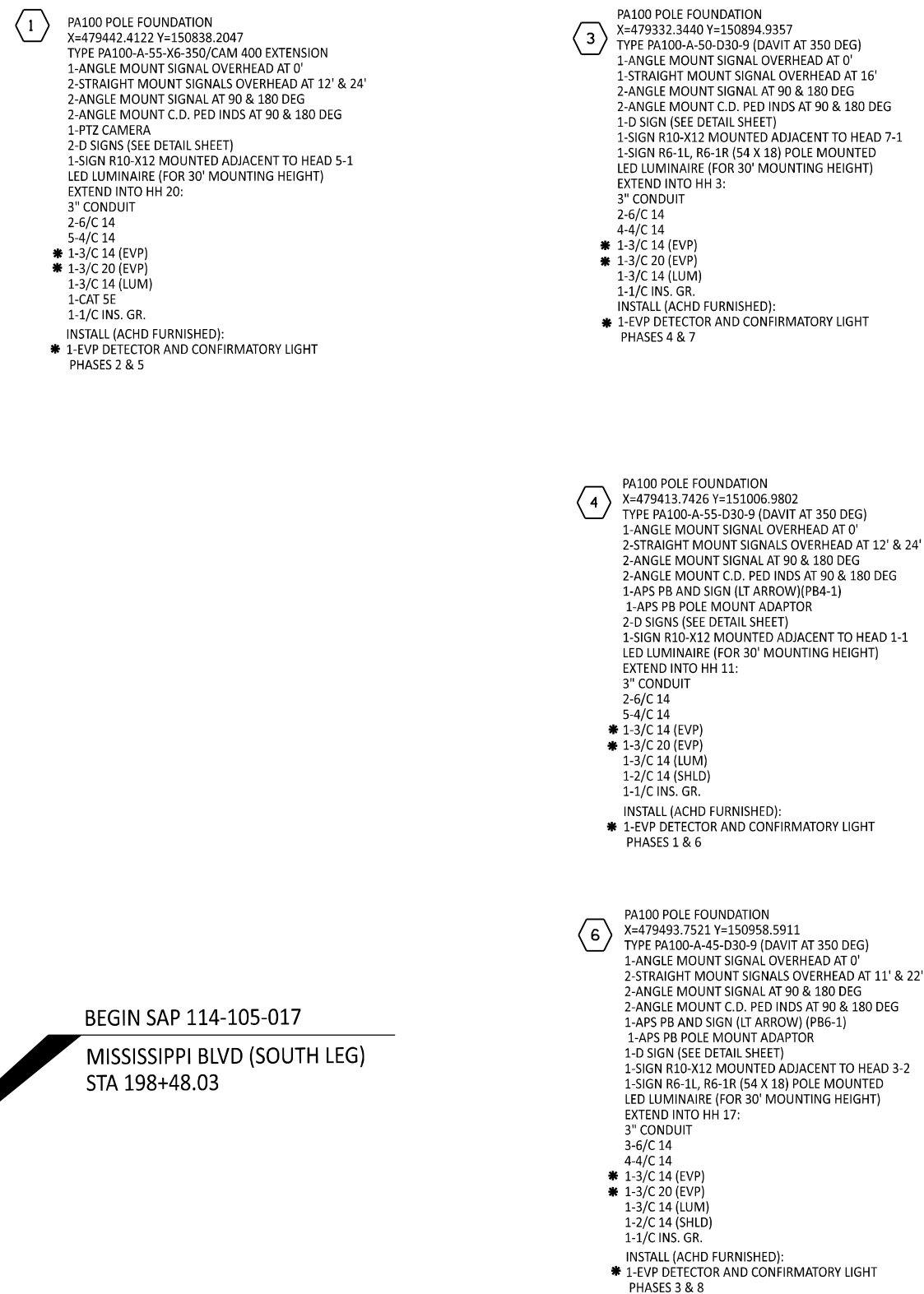
CSAH 1 Improvements  
Anoka County, Minnesota

ANOKA COUNTY, MINNESOTA  
CSAH 1 & MISSISSIPPI BLVD - INTERSECTION LAYOUT  
TRAFFIC CONTROL SIGNAL SYSTEM  
SP 002-601-057, SAP 114-105-017

SHEET  
97  
OF  
103  
SHEETS

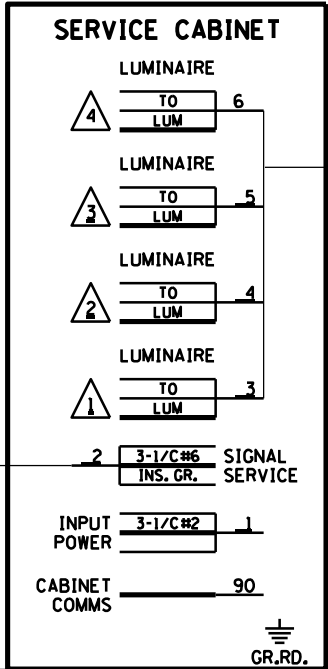
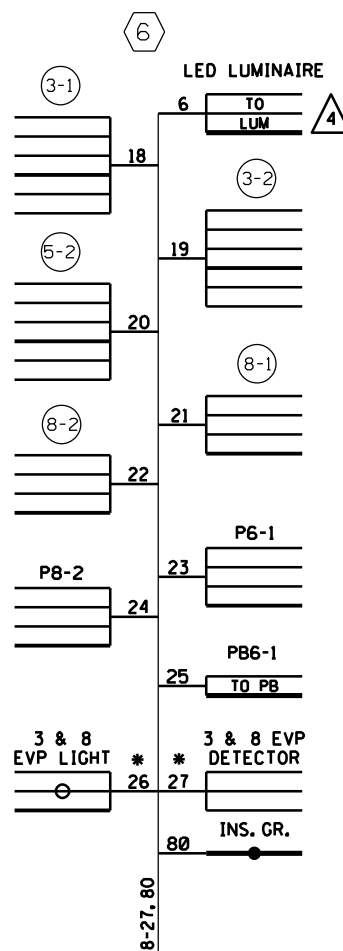
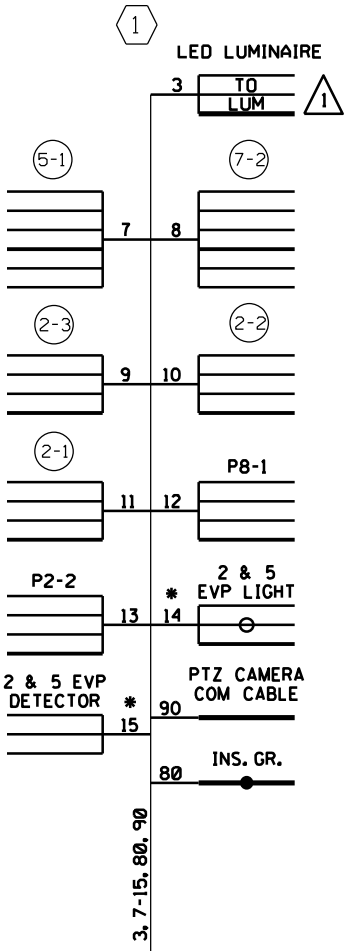
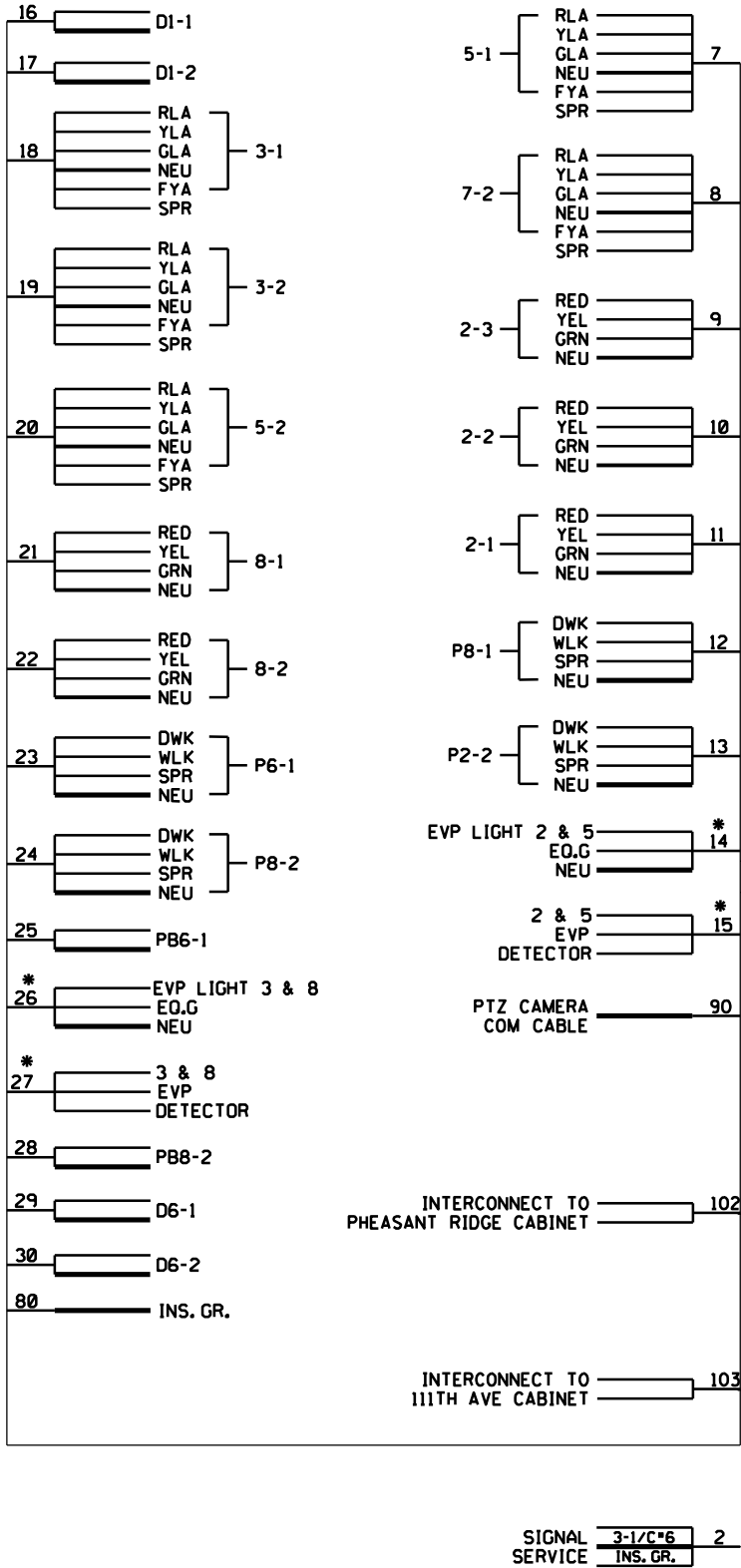


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| NO. | DATE | BY | CHK | REVISIONS | Design By:   | I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.<br><br>SEAN DELMORE, PE<br>DATE 5/5/2023 LICENSE # 40945 |  | <br><b>CSAH 1 Improvements</b><br>Anoka County, Minnesota | ANOKA COUNTY, MINNESOTA                | SHEET<br><b>98</b><br>OF<br><b>103</b><br>SHEETS |
|     |      |    |     |           | Plan By:     |                                                                                                                                                                                                                                                                                                                                                      |                                                                                       |                                                                                                                                                | CSAH 1 & MISSISSIPPI BLVD - MATCHLINES |                                                  |
|     |      |    |     |           | Checked By:  |                                                                                                                                                                                                                                                                                                                                                      |                                                                                       |                                                                                                                                                | <b>TRAFFIC CONTROL SIGNAL SYSTEM</b>   |                                                  |
|     |      |    |     |           | Approved By: |                                                                                                                                                                                                                                                                                                                                                      |                                                                                       |                                                                                                                                                | SP 002-601-057, SAP 114-105-017        |                                                  |



|     |      |    |     |           |                                                                    |                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                        |                                                  |
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| NO. | DATE | BY | CHK | REVISIONS | Design By: SS<br>Plan By: MAS<br>Checked By: SD<br>Approved By: SD | I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.<br><br>SEAN DELMORE, PE<br>DATE 5/5/2023 LICENSE # 40945 |   <div> <b>CSAH 1 Improvements</b><br/>           Anoka County, Minnesota         </div> | <div> <b>ANOKA COUNTY, MINNESOTA</b><br/>           CSAH 1 &amp; MISSISSIPPI BLVD - MATCHLINES<br/> <b>TRAFFIC CONTROL SIGNAL SYSTEM</b><br/>           SP 002-601-057, SAP 114-105-017         </div> | SHEET<br><b>99</b><br>OF<br><b>103</b><br>SHEETS |
|-----|------|----|-----|-----------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|

CABINET CONTROLLER



- NOTES:
1. SIGNAL SYSTEM INCLUDES BATTERY- BACKUP SERVICE CABINET (BATTERIES NOT INCLUDED).
  2. FOR CONDUCTOR COLOR CODE SEE TRAFFIC SIGNAL COLOR CODE DETAIL.
  3. ITEMS DENOTED WITH AN \* ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
  4. SPLICES ONLY ALLOWED IN LOOP DETECTOR CIRCUITS.
  5. FOR EACH "SPARE" WIRE, COIL ENOUGH WIRE TO REACH THE END OF THE MAST ARM IN THE HANDHOLE NEAREST EACH POLE.
  6. LEAVE ONE LOOP OF SLACK FOR EACH CABLE IN THE POLE BASE.
  7. ITEMS DENOTED WITH AN \*\* ARE INCLUDED IN PAYMENT FOR THE INTERCONNECT PAY ITEM.

| NO. | DATE | BY | CHK | REVISIONS |
|-----|------|----|-----|-----------|
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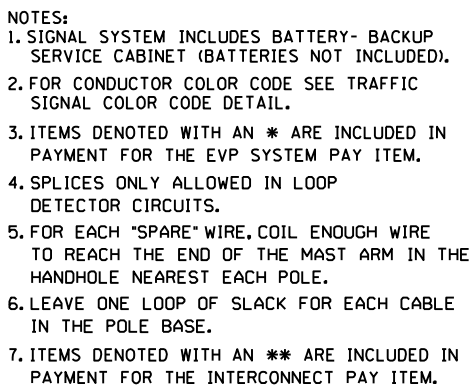
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| Plan By: MAS    |                                                                                                                                                                                                        |
| Checked By: SD  |                                                                                                                                                                                                        |
| Approved By: SD |                                                                                                                                                                                                        |
| DATE 5/5/2023   | LICENSE # 40945                                                                                                                                                                                        |



CSAH 1 Improvements  
Anoka County, Minnesota

ANOKA COUNTY, MINNESOTA  
CSAH 1 & MISSISSIPPI BLVD - WIRING DIAGRAM  
TRAFFIC CONTROL SIGNAL SYSTEM  
SP 002-601-057, SAP 114-105-017

SHEET  
100  
OF  
103  
SHEETS



| Panel | Sample                                 | Genotype                               | Panel                          | Sample | Genotype                               |                          |                          |                          |       |      |                          |    |      |    |      |    |      |    |      |
|-------|----------------------------------------|----------------------------------------|--------------------------------|--------|----------------------------------------|--------------------------|--------------------------|--------------------------|-------|------|--------------------------|----|------|----|------|----|------|----|------|
| A     | 31                                     | D3-1                                   | B                              | 1-1    | RLA<br>YLA<br>GLA<br>NEU<br>FYA<br>SPR |                          |                          |                          |       |      |                          |    |      |    |      |    |      |    |      |
|       | 32                                     | D3-2                                   |                                | 3-3    | RLA<br>YLA<br>GLA<br>NEU<br>FYA<br>SPR |                          |                          |                          |       |      |                          |    |      |    |      |    |      |    |      |
|       | 33                                     | D3-3                                   |                                |        | 6-3                                    | RED<br>YEL<br>GRN<br>NEU |                          |                          |       |      |                          |    |      |    |      |    |      |    |      |
|       | 34                                     | D3-4                                   |                                |        |                                        | 6-2                      | RED<br>YEL<br>GRN<br>NEU |                          |       |      |                          |    |      |    |      |    |      |    |      |
|       | 35                                     | D8-3                                   |                                |        |                                        |                          | 6-1                      | RED<br>YEL<br>GRN<br>NEU |       |      |                          |    |      |    |      |    |      |    |      |
|       | 36                                     | D8-2                                   | P4-1                           |        |                                        |                          |                          | DWK<br>WLK<br>SPR<br>NEU |       |      |                          |    |      |    |      |    |      |    |      |
|       | 37                                     | PB8-1                                  |                                | P6-2   |                                        |                          |                          | DWK<br>WLK<br>SPR<br>NEU |       |      |                          |    |      |    |      |    |      |    |      |
|       | 38                                     | PB2-2                                  |                                |        | PB4-1                                  |                          |                          | DWK<br>WLK<br>SPR<br>NEU |       |      |                          |    |      |    |      |    |      |    |      |
|       | 39                                     | D8-1                                   |                                |        |                                        | EVP LIGHT 1 & 6          |                          | EQ.G<br>NEU              |       |      |                          |    |      |    |      |    |      |    |      |
|       | 40                                     | RLA<br>YLA<br>GLA<br>NEU<br>FYA<br>SPR |                                |        |                                        |                          | 7-1                      | 4-1                      | 4-2   | P2-1 | P4-2                     | 46 | 47   | 48 | 49   | 50 | 51   | 52 | 53   |
| 41    | RLA<br>YLA<br>GLA<br>NEU<br>FYA<br>SPR |                                        |                                |        |                                        |                          |                          |                          |       |      |                          |    |      |    |      |    |      |    |      |
| 42    | RED<br>YEL<br>GRN<br>NEU               |                                        |                                |        |                                        |                          |                          |                          |       |      |                          |    |      |    |      |    |      |    |      |
| 43    | RED<br>YEL<br>GRN<br>NEU               |                                        |                                |        |                                        |                          |                          |                          |       |      |                          |    |      |    |      |    |      |    |      |
| 44    | DWK<br>WLK<br>SPR<br>NEU               |                                        |                                |        |                                        |                          |                          |                          |       |      |                          |    |      |    |      |    |      |    |      |
| 45    | DWK<br>WLK<br>SPR<br>NEU               | 46                                     | EVP LIGHT 4 & 7<br>EQ.G<br>NEU | 47     | 4 & 7<br>EVP<br>DETECTOR               | 48                       | PB2-1                    | 49                       | PB4-2 | 50   | 3 & 8<br>EVP<br>DETECTOR | 51 | D2-1 | 52 | D2-2 | 53 | D5-1 | 54 | D5-2 |

## CSAH 1 Improvements

### Anoka County, Minnesota

CSAH 1 & MISSISSIPPI BLVD - WIRING DIAGRAM  
TRAFFIC CONTROL SIGNAL SYSTEM  
SP 002-601-057, SAP 114-105-017

SHEET  
**101**  
OF  
**103**  
SHEETS