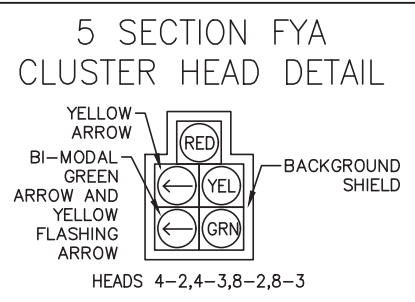


SIGNAL HEAD CHART						
FACE	R	Y	FYA	G	YLA	FYA/GLA
1-1,1-2	←	←	←	←		
2-1,2-2,2-3	●	●	●	●		
4-1	●	●	●	●		
④ 4-2,4-3	●	●	●	●	←	←
5-1,5-2	←	←	←	←		
6-1,6-2,6-3	●	●	●	●		
8-1	●	●	●	●		
⑧ 8-2,8-3	●	●	●	●	←	←

- ALL SIGNAL INDICATIONS SHALL BE 12" LED  
 - ALL SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH REFLECTORIZED BACKGROUND SHIELDS  
 - FYA DENOTES FLASHING YELLOW ARROW  
 - ④ DENOTES 5 SECTION FYA CLUSTER HEADS (BI-MODAL LEFT ARROW)



### LOOP DETECTOR CHART

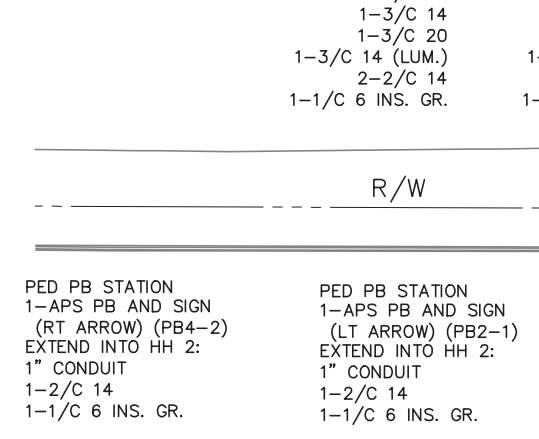
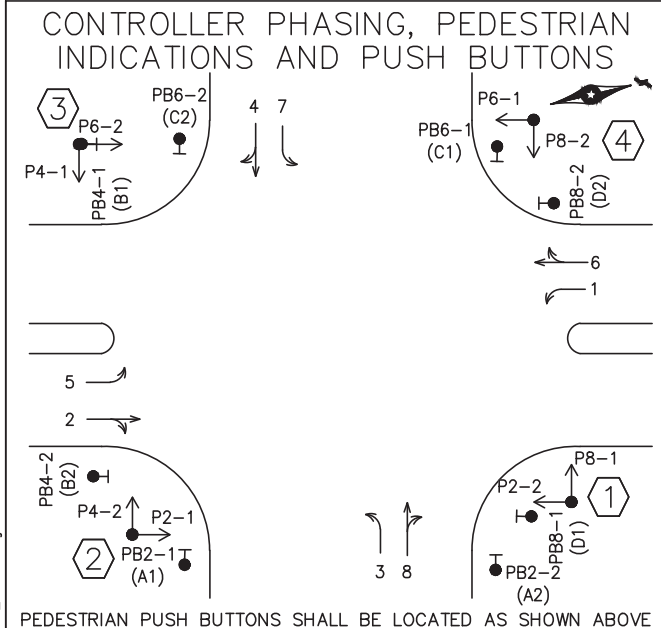
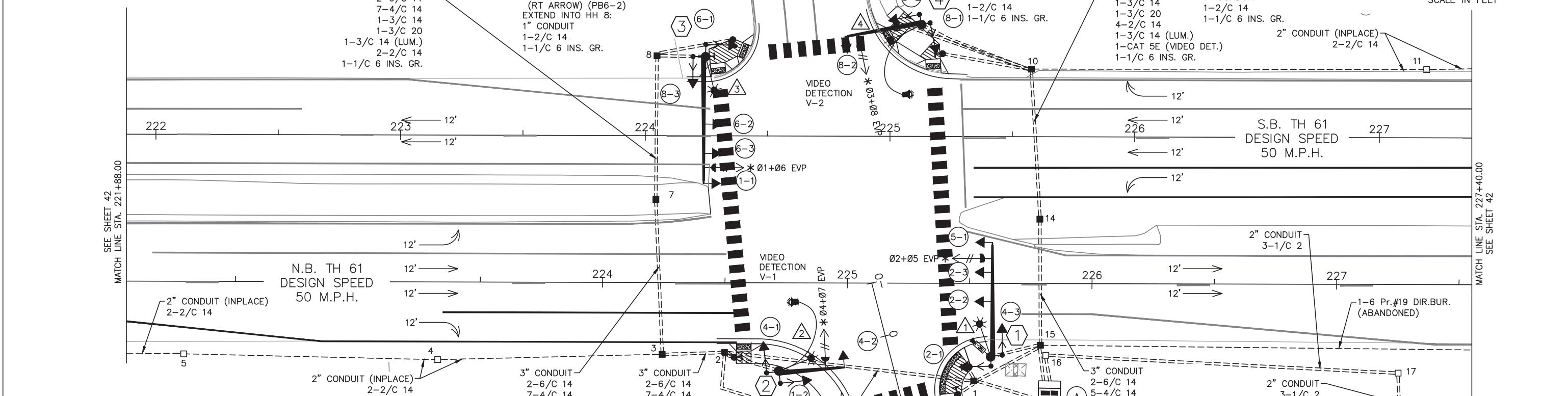
NUMBER	SIZE (FT)	LOCATION
D2-1, D2-2	6x6	395
D6-1, D6-2	6x6	400

- LOCATION: DISTANCE FROM CROSSWALK/STOP BAR IN FEET.

### VIDEO DETECTION

CAMERA	LOCATION		PHASE
	NO.	POLE	
V-1	360 DEG.	2	LUM EXTENSION
V-2	360 DEG.	4	LUM EXTENSION

- VIDEO DETECTION CAMERAS AND MOUNTING HARDWARE ARE STATE FURNISHED.



- ### NOTES:
- SEE SPECIAL PROVISIONS FOR STATE FURNISHED MATERIALS.
  - REFER TO SHEETS 48-52 FOR INPLACE SIGNAL COMPONENTS. ALL ITEMS ARE F&I UNLESS OTHERWISE NOTED.
  - ENSURE THE EXACT LOCATION OF THE POLES AND EQUIPMENT PAD ARE VERIFIED IN THE FIELD BY MNDOT OFFICE PERSONNEL.
  - THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE TRAFFIC SIGNAL SYSTEM.
  - FOR SIGN PANELS ON SIGNAL, SEE SHEET 45. ALL SIGN PANELS REQUIRED ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL SIGNAL SYSTEM PAY ITEM.
  - FOR CONSTRUCTION OF PEDESTRIAN CURB RAMPS, CONCRETE WALK, AND MEDIAN WORK, SEE DETAIL SHEETS.
  - 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 IN DIAMETER.
  - ALL WIRES LISTED ARE AWG (AMERICAN WIRE GAUGE).
  - MAINTAIN INPLACE SIGNAL OPERATION UNTIL PROPOSED SIGNAL IS COMPLETE.
  - REMOVAL OF THE INPLACE SIGNAL SYSTEM IS INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL SIGNAL SYSTEM PAY ITEM.
  - DISCONNECT FIBER OPTIC PIGTAIL FROM EXISTING SIGNAL CABINET. PULL FIBER BACK TO SPLICE VAULT. RECONNECT TO PROPOSED SIGNAL CABINET. CUT, RETERMINATE, AND TEST EXISTING PIGTAIL. ENSURE ALL CONNECTIONS ARE OPERATIONAL TO THE SATISFACTION OF THE ENGINEER. USE CAUTION WORKING AROUND MNDOT FIBER.
  - FOR PAVEMENT MARKINGS, SEE PAVEMENT MARKING PLANS.

TAMS SYSTEM ID: 4465199  
TE NO.: 75701

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.  
Print Name: **CLAYTON W. BAYER**  
*Clayton Bayer*  
Date: **5/10/23** License # **57865**

STATE AID PROJECT NO. \_\_\_\_\_  
DRAWN BY **K. OLM**  
DESIGNED BY **K. OLM**  
CHECKED BY **C. BAYER**  
COMM. NO. **15445**



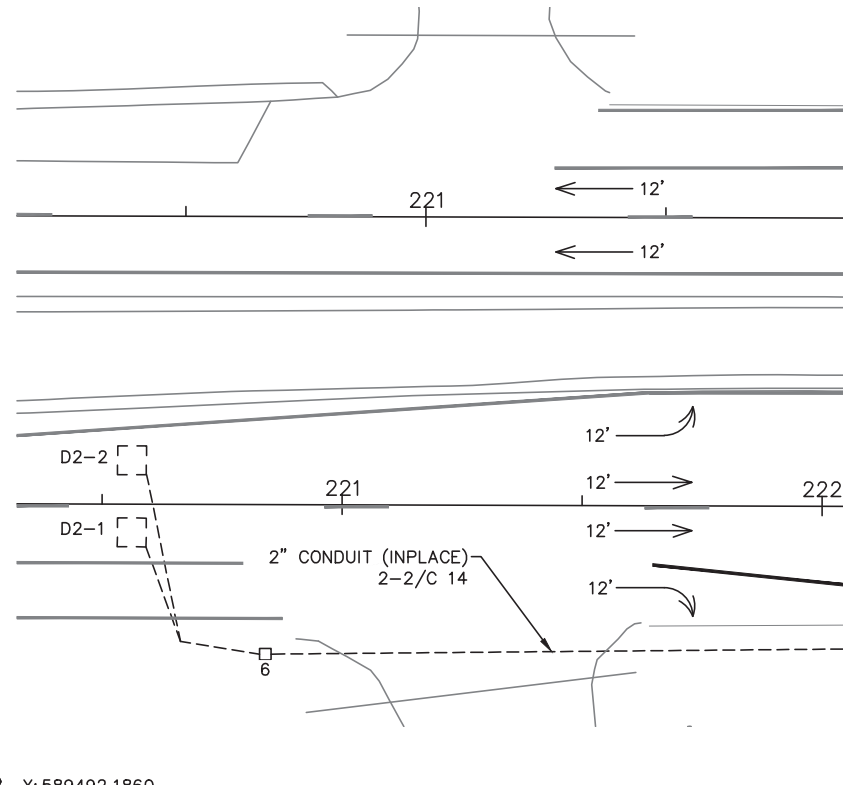
MnDOT  
TRAFFIC SIGNAL PLANS  
TH 61 AND WILLOW LAKE BLVD SIGNAL IMPROVEMENTS  
SIGNAL LAYOUT

SHEET 41 OF 58

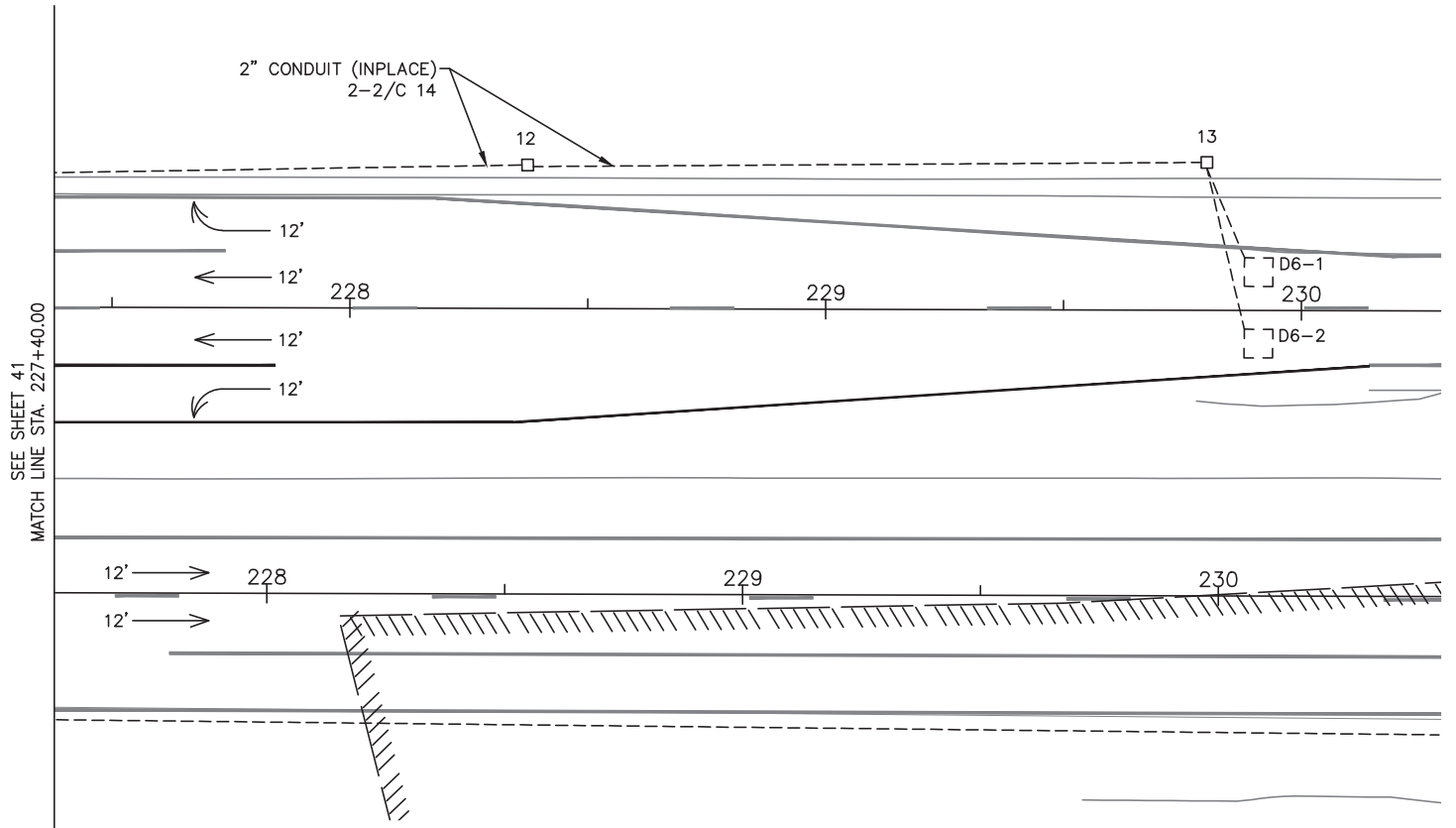
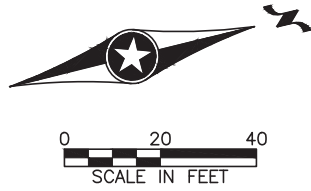
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NO	DATE	BY	CHKD	APPR

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MATCH LINE STA. 221+88.00  
SEE SHEET 41



SEE SHEET 41  
MATCH LINE STA. 227+40.00

- ① X: 589492.1860  
Y: 193452.5942  
PA100 POLE FOUNDATION  
TYPE PA100-A-45-X6-350/CAM400 EXTENSION (DAVIT AT 350 DEG)  
(INCLUDES LIGHTNING ROD, 7/16" GROUND BRAID AND GROUND ROD)
- S&I- 1-TRAFFIC MANAGEMENT CAMERA (TMC-1) WITH MOUNT  
1-PAIR SWING AWAY HINGES  
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  
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 40' MOUNTING HEIGHT)  
1-R10-X12 SIGN ADJACENT TO HEAD (5-1)  
1-SIGN (WILLOW LAKE BLVD)(SEE SIGN DETAILS)  
3" CONDUIT TO HH 15:  
2-6/C 14  
7-4/C 14  
1-3/C 14  
1-3/C 20  
1-3/C 14 (LUM.)  
1-1/C 6 INS. GR.  
1-7/16" GROUNDING BRAID  
TO GROUND ROD IN HH 16  
1-CAT 5E TRA MGMT CAM

- ③ X: 589344.5926  
Y: 199369.8473  
PA100 POLE FOUNDATION  
TYPE PA100-A-50-D40-9 (DAVIT AT 350 DEG)  
1-PAIR SWING AWAY HINGES  
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  
2-ANGLE MOUNT C.D. PED HEADS AT 90 AND 180 DEG  
1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 1+6)  
LUMINAIRE-LED (FOR 40' MOUNTING HEIGHT)  
1-APS PB AND SIGN (LT ARROW)(PB 4-1) AND APS PB POLE  
MOUNT ADAPTOR  
1-R10-X12 SIGN ADJACENT TO HEAD (1-1)  
1-SIGN (WILLOW LAKE BLVD)(SEE SIGN DETAILS)  
3" CONDUIT TO HH 8:  
2-6/C 14  
7-4/C 14  
1-3/C 14  
1-3/C 20  
1-3/C 14 (LUM.)  
1-2/C 14  
1-1/C 6 INS. GR.

- ② X: 589476.4695  
Y: 193367.3040  
PA90 POLE FOUNDATION  
TYPE PA90-A-25-D40-9 (DAVIT AT 350 DEG)  
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'  
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 (PHASE 4+7)
- INSTALL- 1-SINGLE-BELL CAMERA AND EQUIPMENT (STATE FURNISHED)  
MOUNTED ON LUMINAIRE EXTENSION  
LUMINAIRE-LED (FOR 40' MOUNTING HEIGHT)  
1-SIGN (US61 DBL)(SEE SIGN DETAILS)  
3" CONDUIT TO HH 2:  
2-6/C 14  
5-4/C 14  
1-3/C 14  
1-3/C 20  
1-3/C 14 (LUM.)  
1-CAT 5E (VIDEO DET.)  
1-1/C 6 INS. GR.

- ④ X: 589353.6587  
Y: 193458.6833  
PA90 POLE FOUNDATION  
TYPE PA90-A-30-D40-9 (DAVIT AT 350 DEG)  
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'  
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 (PHASE 3+8)
- INSTALL- 1-SINGLE-BELL CAMERA AND EQUIPMENT (STATE FURNISHED)  
MOUNTED ON LUMINAIRE EXTENSION  
LUMINAIRE-LED (FOR 40' MOUNTING HEIGHT)  
1-SIGN (US61 DBL)(SEE SIGN DETAILS)  
3" CONDUIT TO HH 10:  
2-6/C 14  
5-4/C 14  
1-3/C 14  
1-3/C 20  
1-3/C 14 (LUM.)  
1-CAT 5E (VIDEO DET.)  
1-1/C 6 INS. GR.

- Ⓐ EQUIPMENT PAD (SEE STANDARD PLAN)  
SERVICE CABINET (SSB) NO BATTERY BACKUP SYSTEM OR BATTERIES  
INSTALL- CONTROLLER AND CABINET (STATE FURNISHED)  
3" CONDUIT TO HH 1:  
2-6/C 14  
7-4/C 14  
1-3/C 14  
1-3/C 20  
4-2/C 14  
3" CONDUIT TO HH 1:  
2-6/C 14  
5-4/C 14  
1-3/C 14  
1-3/C 20  
2-2/C 14  
1-CAT 5E (VIDEO DET.)  
1-1/C 6 (INS. GR.)

- Ⓑ WOOD POLE (SOP)  
REMOVE- DISCONNECT SWITCH- WOOD POLE MOUNTED  
F&I- 2" RSC RISER AND WEATHERHEAD FROM INPLACE  
SERVICE EQUIPMENT TO HH 18  
3-1/C 2

- GROUND WIRE AND GROUND ROD - MIN 8' OUT FROM PAD  
2-2" AND 1-3" CONDUIT STUBBED OUT (CAPPED BOTH ENDS)  
1.5" CONDUIT TO INPLACE TMS VAULT:  
1-FO PIGTAIL (6SM)  
CONTROLLER CABINET TO SERVICE CABINET (COMMS):  
S&I- 2" CONDUIT  
1-6PR 19  
SERVICE CABINET TO HH 16:  
2" CONDUIT  
3-1/C 2  
SERVICE CABINET TO HH 15:  
2" CONDUIT  
4-3/C 14 (LUM.)  
SERVICE CABINET TO EXTERNAL GR. RD.:  
1" CONDUIT  
1-1/C 6 (INS. GR.)  
HH 16 TO HH 1:  
2" CONDUIT  
2-3/C 14 (LUM.)

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NO	DATE	BY	CHKD	APPR

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.  
Print Name: CLAYTON W. BAYER  
*Clayton Bayer*  
Date 5/10/23 License # 57865

STATE AID PROJECT NO.  
STATE PROJECT NO. 6222-187 (TH 61=001)  
COUNTY PROJECT NO.  
CITY PROJECT NO.

DRAWN BY K. OLM  
DESIGNED BY K. OLM  
CHECKED BY C. BAYER  
COMM. NO. 15445



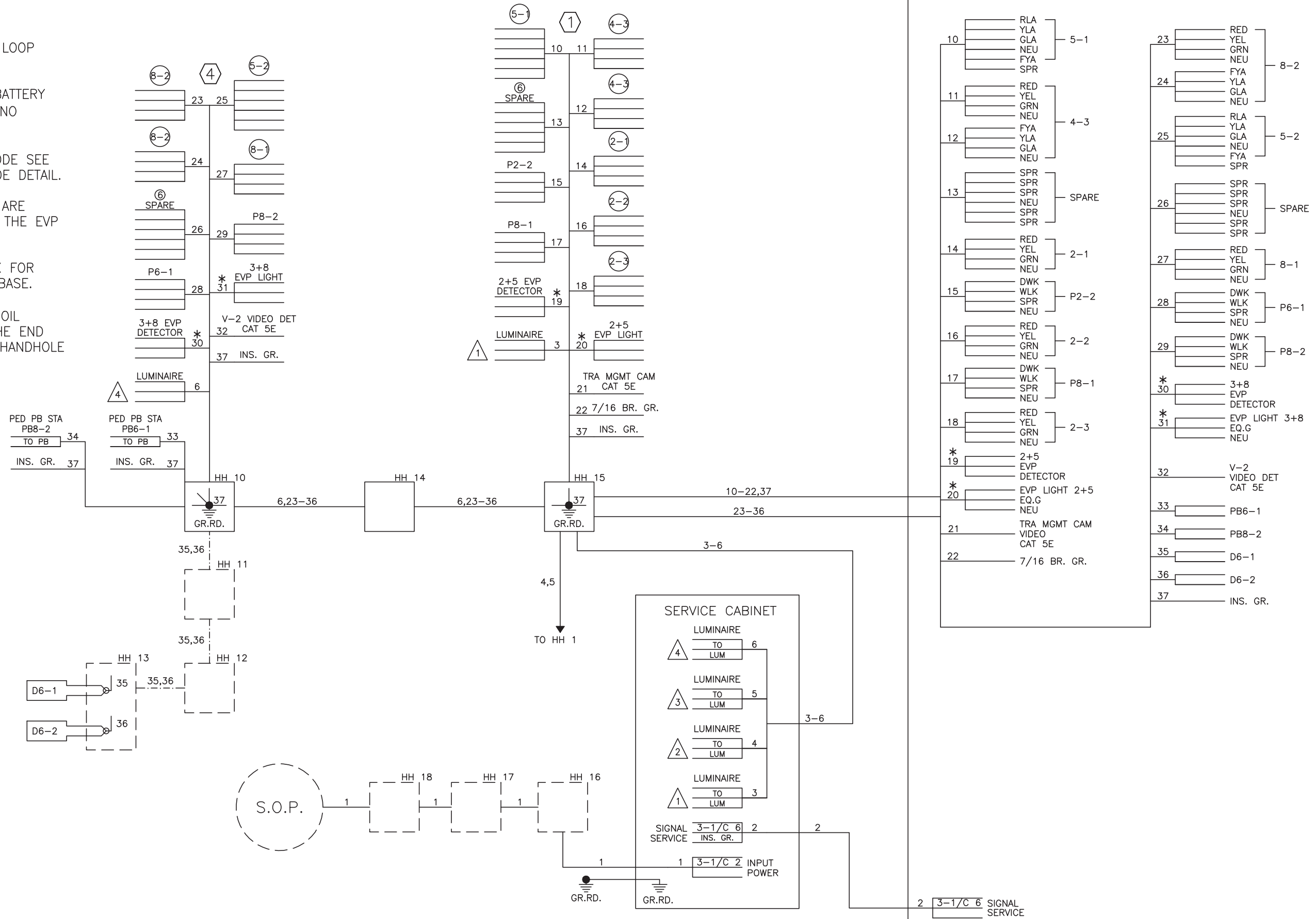
MnDOT  
TRAFFIC SIGNAL PLANS  
TH 61 AND WILLOW LAKE BLVD SIGNAL IMPROVEMENTS  
SIGNAL LAYOUT

SHEET 42 OF 58

TAMS SYSTEM ID: 4465199  
TE NO.: 75701

NOTES:

1. SPLICES ONLY ALLOWED IN LOOP DETECTOR CIRCUITS.
2. SIGNAL SYSTEM INCLUDES BATTERY BACKUP SERVICE CABINET (NO BATTERIES).
3. FOR CONDUCTOR COLOR CODE SEE TRAFFIC SIGNAL COLOR CODE DETAIL.
4. ITEMS DENOTED WITH AN \* ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
5. LEAVE ONE LOOP OF SLACK FOR EACH CABLE IN THE POLE BASE.
6. FOR EACH "SPARE" WIRE, COIL ENOUGH WIRE TO REACH THE END OF THE MAST ARM IN THE HANDHOLE NEAREST EACH POLE.



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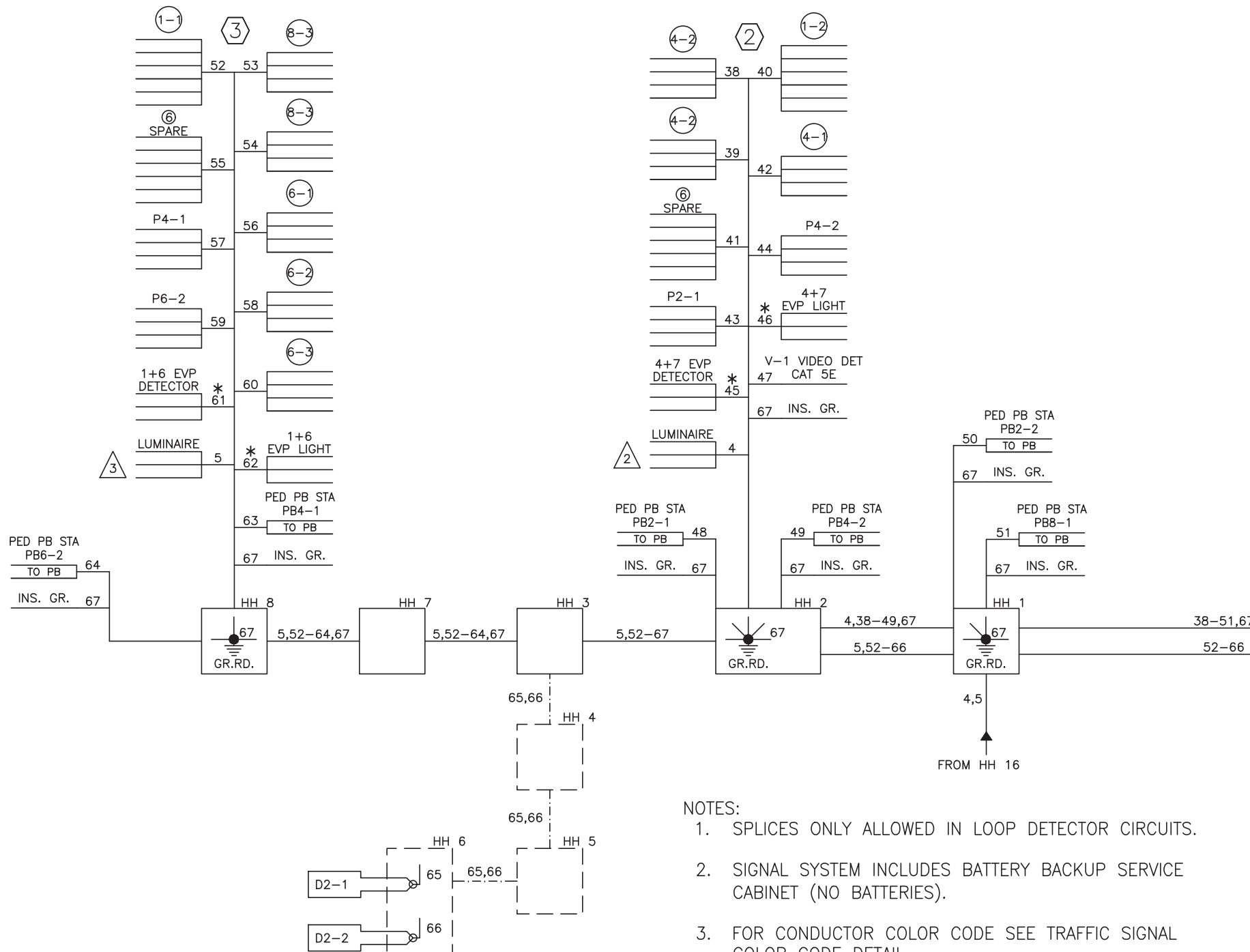
NO	DATE	BY	CKD	APPR

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.  
Print Name: **CLAYTON W. BAYER**  
*Clayton Bayer*  
Date: 5/10/23 License # 57865

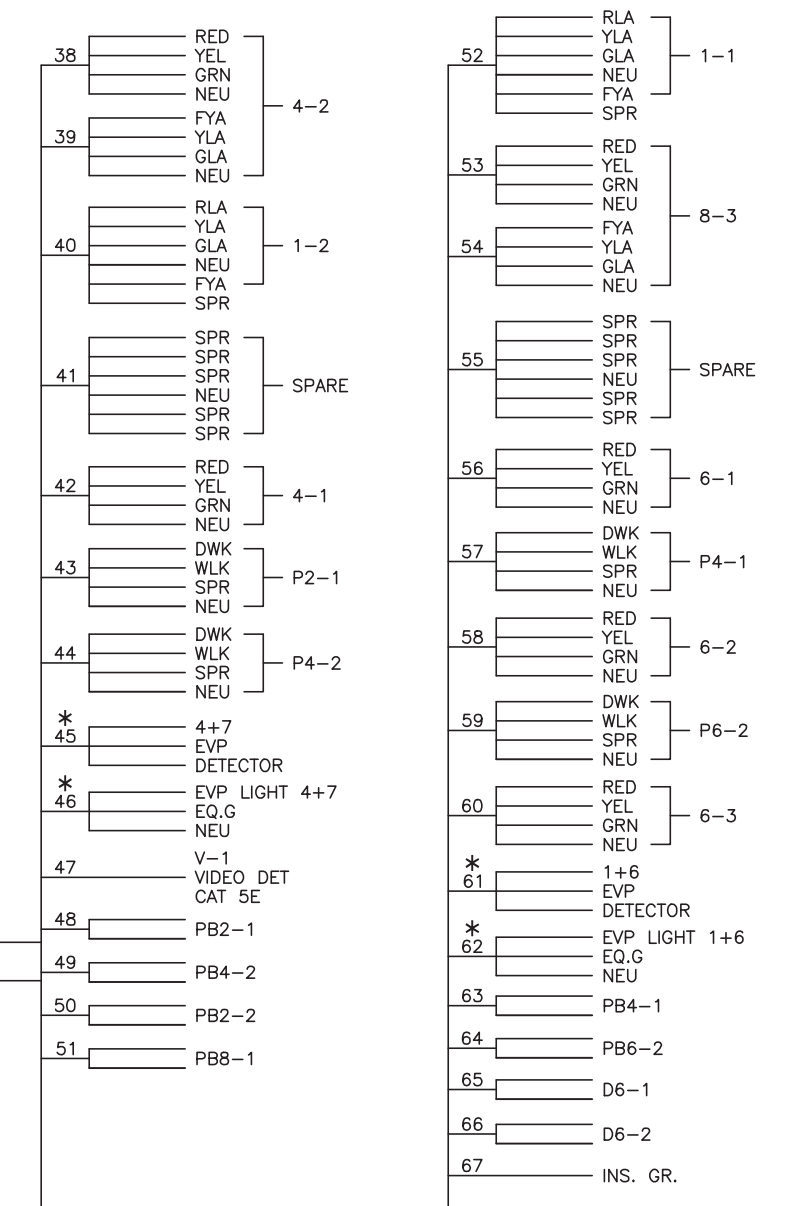
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STATE PROJECT NO. 6222-187 (TH 61=001)  
COUNTY PROJECT NO.  
CITY PROJECT NO.

DRAWN BY K. OLM  
DESIGNED BY K. OLM  
CHECKED BY C. BAYER  
COMM. NO. 15445





CONTROLLER CABINET



- NOTES:
1. SPLICES ONLY ALLOWED IN LOOP DETECTOR CIRCUITS.
  2. SIGNAL SYSTEM INCLUDES BATTERY BACKUP SERVICE CABINET (NO BATTERIES).
  3. FOR CONDUCTOR COLOR CODE SEE TRAFFIC SIGNAL COLOR CODE DETAIL.
  4. ITEMS DENOTED WITH AN \* ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
  5. LEAVE ONE LOOP OF SLACK FOR EACH CABLE IN THE POLE BASE.
  6. FOR EACH "SPARE" WIRE, COIL ENOUGH WIRE TO REACH THE END OF THE MAST ARM IN THE HANDHOLE NEAREST EACH POLE.

TO FV ← 68 FIBER OPTIC

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NO	DATE	BY	CKD	APPR

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.  
Print Name: CLAYTON W. BAYER  
*Clayton Bayer*  
Date 5/10/23 License # 57865

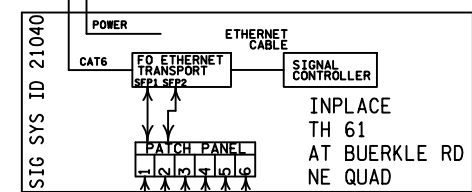
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STATE PROJECT NO. 6222-187 (TH 61=001)  
COUNTY PROJECT NO. \_\_\_\_\_  
CITY PROJECT NO. \_\_\_\_\_

DRAWN BY K. OLM  
DESIGNED BY K. OLM  
CHECKED BY C. BAYER  
COMM. NO. 15445



CAM 1719  
(INPLACE)

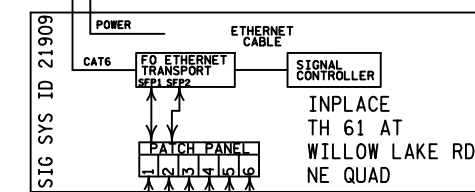
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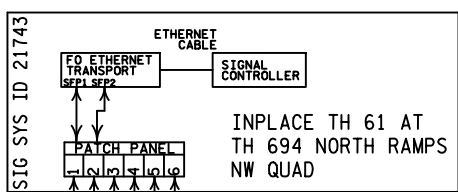
NOTE: THIS PLAN SHEET IS BEING PROVIDED FOR INFORMATIONAL PURPOSES. ALL FIBER INTERCONNECT CABLES, CAMERAS, AND VAULTS SHOWN ON THIS PAGE ARE INPLACE AND SHALL BE REUSED AND MAINTAINED INPLACE (EXCEPT FOR FIBER-OPTIC CABLE TESTING AT ALL SPLICE LOCATION TO BE COMPLETED BY THE CONTRACTOR AND PAID FOR UNDER THE "TRAFFIC CONTROL INTERCONNECT" PAY ITEM (ITEM NO. 2565). SEE SPECIAL PROVISIONS.

CAM 1720  
(INPLACE)

ID 4465199



ID 1735873

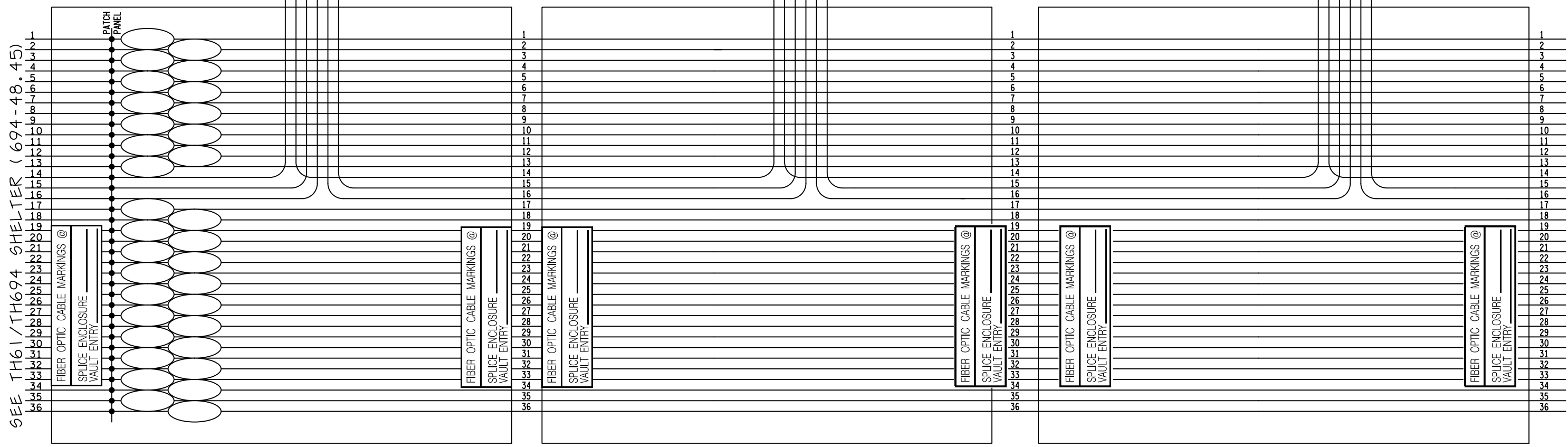


TRUNK ID# 61-188

TRUNK ID# 61-188A

TRUNK ID# 61-189

TRUNK ID# 61-190



INPLACE PULL/SPLICE VAULT TH61 AT TH 694 NW QUAD

INPLACE PULL/SPLICE VAULT TH61 AT BUERKLE RD NE QUAD

INPLACE PULL/SPLICE VAULT TH61 AT WILLOW LK. RD NE QUAD

DESIGN TEAM			
DRAWN BY:	MRB		
DESIGNER:	MRB		
CHECKED BY:	JMG		
NO.	BY	DATE	REVISIONS

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.  
 Certified By: *John M. Gray* Lic. No. 22457  
 Printed Name: JOHN M. GRAY Date: 12/22/2023



RAMSEY COUNTY, MINNESOTA  
**T.H. 61**  
 S.P. 6222-197

**SIGNAL PLAN**  
 FIBER OPTIC SCHEMATIC  
 TRUCK HIGHWAY 61 (TH 694 TO WILLOW LAKE RD)

SEH FILE NO. ISDWB170688	<b>80</b>
SG12 OF 5627	<b>101</b>