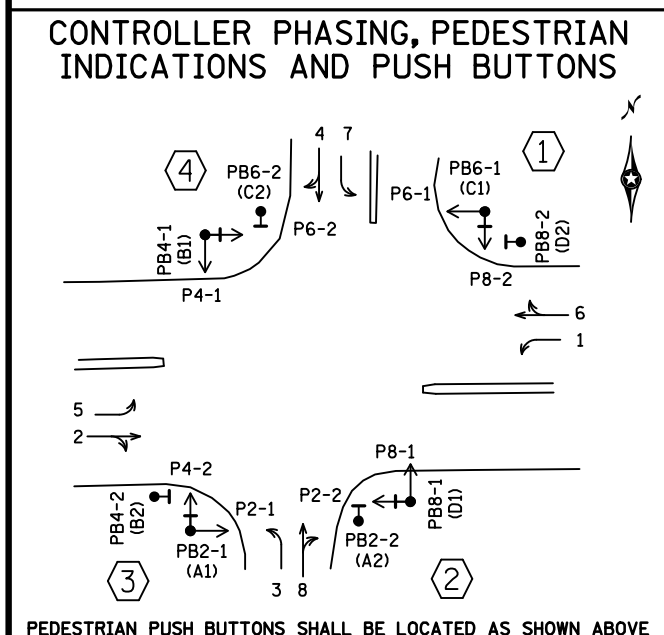
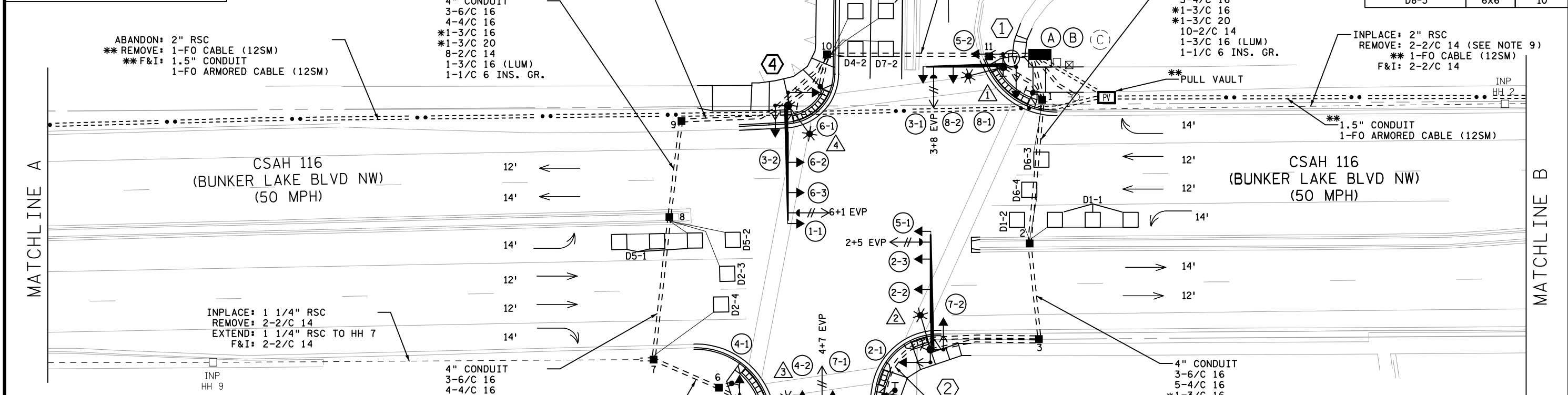


SIGNAL HEAD CHART				
FACE	R	Y	FYA	G
1-1, 1-2	←	←	←	←
2-1, 2-2, 2-3	●	●	●	●
3-1, 3-2	←	←	←	←
4-1, 4-2	●	●	●	●
5-1, 5-2	←	←	←	←
6-1, 6-2, 6-3	●	●	●	●
7-1, 7-2	←	←	←	←
8-1, 8-2	●	●	●	●

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

LOOP DETECTOR CHART		
NUMBER	SIZE (FT)	LOCATION
D1-1, D5-1	3-6x6	25, 40, 55
D1-2, D5-2	6x6	10
D2-1, D2-2	6x6	405
D2-3, D2-4	6x6	10
D3-1, D7-1	3-6x6	25, 40, 55
D3-2, D7-2	6x6	10
D4-1	6x6	25
D4-2	6x6	10
D6-1, D6-2	6x6	405
D6-3, D6-4	6x6	10
D8-1	6x6	205
D8-2	6x6	25
D8-3	6x6	10



**SIGNAL SYSTEM OPERATION**

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

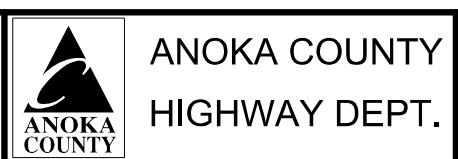
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PRINT NAME: NICK VANGUNST  
 SIGNATURE: *Nick Van Gunst*  
 DATE: 11/26/24 LICENSE NO. 44683

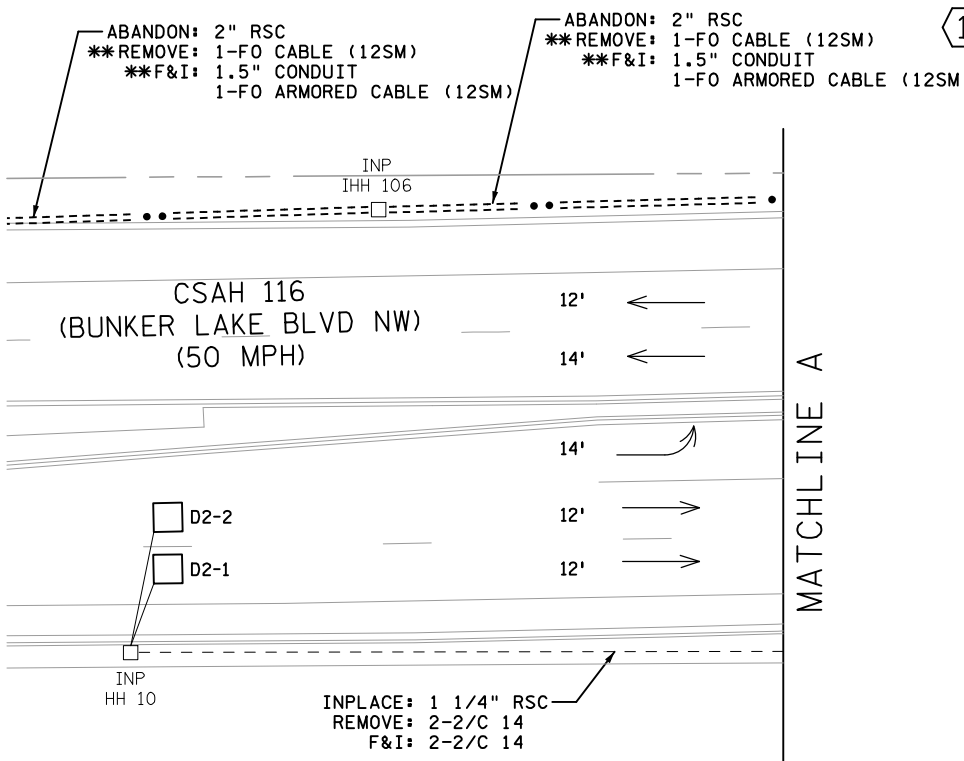
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**TRAFFIC SIGNAL SYSTEM B LAYOUT**  
 BUNKER LAKE BLVD & HEATHER ST  
 COUNTY PROJECT SAP 002-716-024  
 CITY PROJECT SAP 198-020-040

**CSAH 116 (BUNKER LAKE BLVD) SIGNAL MODIFICATION & ADA IMPROVEMENTS**

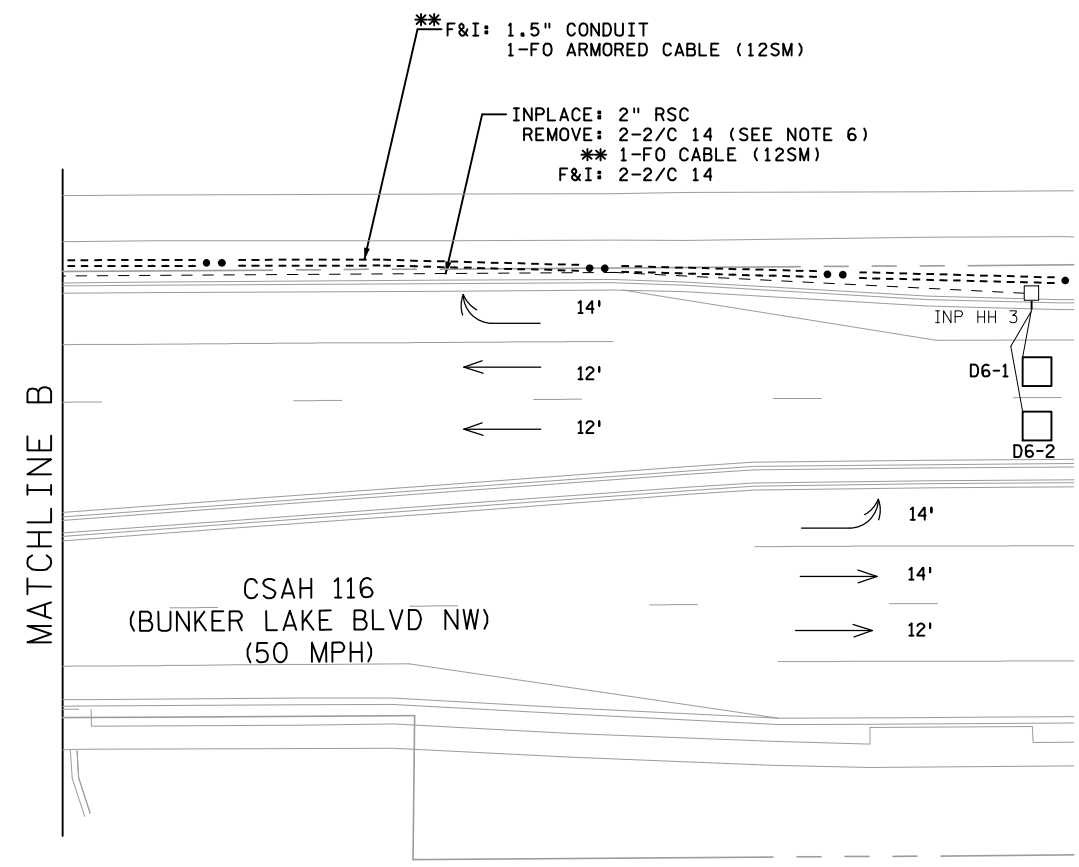
Sheet 95 of 174 Sheets



- ① X:480474.2326  
Y:167268.1927  
PA90 POLE FOUNDATION  
TYPE PA90-A-30-X6-300/CAM 350 EXTENSION  
(DAVIT AT 350°)  
(INCLUDES LIGHTING ROD, 7/16" GROUND BRAID AND GROUND ROD)  
LUMINAIRE-LED (FOR 30' MOUNTING HEIGHT)  
1-TRAFFIC MANAGEMENT CAMERA WITH MOUNT (COUNTY PROVIDED)  
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'  
1-STRAIGHT MOUNT SIGNAL OVERHEAD AT 12'  
2-ANGLE MOUNT SIGNALS AT 90 DEG AND 180 DEG  
2-ANGLE MOUNT C.D. PED HEADS AT 90 DEG AND 180 DEG  
1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 8+3) (COUNTY PROVIDED)  
1-APS PB AND SIGN (LT ARROW) (PB6-1) AND APS PB POLE MOUNT ADAPTOR  
1-R10-X12 SIGN ADJACENT TO HEAD (3-1)  
1-SIGN (BURNER LAKE BLVD) (SEE SIGN DETAILS)  
1-R6-1L (36"X12") MOUNTED AT 0°  
1-R6-1R (36"X12") MOUNTED AT 180°  
3" CONDUIT TO HH 1:  
3-6/C 16  
4-4/C 16  
\*1-3/C 16  
\*1-3/C 20  
1-2/C 14  
1-CAT 5E (CCTV)  
1-3/C 16 (LUM)  
1-1/C 6 INS. GR.

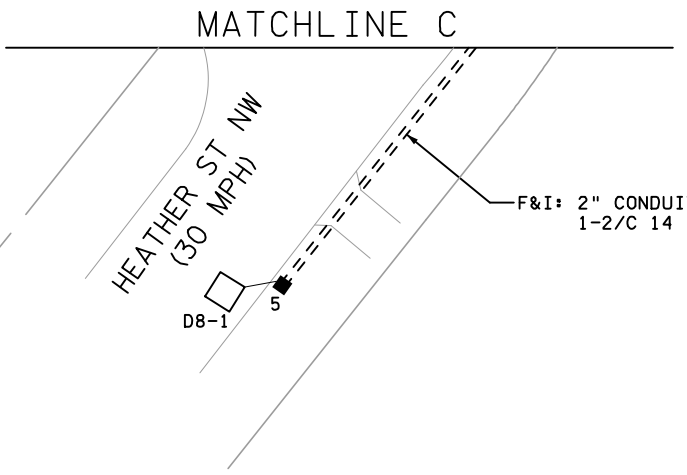
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PA100 POLE FOUNDATION  
TYPE PA100-A-45-D30-9 (DAVIT AT 350°)  
LUMINAIRE-LED (FOR 30' MOUNTING HEIGHT)  
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'  
2-STRAIGHT MOUNT SIGNALS OVERHEAD AT 12' & 24'  
2-ANGLE MOUNT SIGNALS AT 90 DEG AND 180 DEG  
2-ANGLE MOUNT C.D. PED HEADS AT 90 DEG AND 180 DEG  
1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 2+5) (COUNTY PROVIDED)  
1-APS PB AND SIGN (LT ARROW) (PB8-1) AND APS PB POLE MOUNT ADAPTOR  
1-R10-X12 SIGN ADJACENT TO HEAD (5-1)  
1-SIGN (HEATHER ST) (SEE SIGN DETAILS)  
1-R6-1L (36"X12") MOUNTED AT 0°  
1-R6-1R (36"X12") MOUNTED AT 180°  
3" CONDUIT TO HH 3:  
3-6/C 16  
5-4/C 16  
\*1-3/C 16  
\*1-3/C 20  
1-2/C 14  
1-3/C 16 (LUM)  
1-1/C 6 INS. GR.

- ③ X:480374.9336  
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PA90 POLE FOUNDATION  
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LUMINAIRE-LED (FOR 30' MOUNTING HEIGHT)  
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'  
1-STRAIGHT MOUNT SIGNAL OVERHEAD AT 12'  
2-ANGLE MOUNT SIGNALS AT 90 DEG AND 180 DEG  
2-ANGLE MOUNT C.D. PED HEADS AT 90 DEG AND 180 DEG  
1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 4+7) (COUNTY PROVIDED)  
1-APS PB AND SIGN (LT ARROW) (PB2-1) AND APS PB POLE MOUNT ADAPTOR  
1-R10-X12 SIGN ADJACENT TO HEAD (7-1)  
1-SIGN (BUNKER LAKE BLVD) (SEE SIGN DETAILS)  
3" CONDUIT TO HH 6:  
3-6/C 16  
4-4/C 16  
\*1-3/C 16  
\*1-3/C 20  
1-2/C 14  
1-3/C 16 (LUM)  
1-1/C 6 INS. GR.



- ④ X:480389.0326  
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PA100 POLE FOUNDATION  
TYPE PA100-A-45-D30-9 (DAVIT AT 350°)  
LUMINAIRE-LED (FOR 30' MOUNTING HEIGHT)  
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'  
2-STRAIGHT MOUNT SIGNALS OVERHEAD AT 12' & 24'  
2-ANGLE MOUNT SIGNALS AT 90 DEG AND 180 DEG  
2-ANGLE MOUNT C.D. PED HEADS AT 90 DEG AND 180 DEG  
1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 6+1) (COUNTY PROVIDED)  
1-APS PB AND SIGN (LT ARROW) (PB4-1) AND APS PB POLE MOUNT ADAPTOR  
1-R10-X12 SIGN ADJACENT TO HEAD (1-1)  
1-SIGN (HEATHER ST) (SEE SIGN DETAILS)  
1-R6-1L (36"X12") MOUNTED AT 0°  
1-R6-1R (36"X12") MOUNTED AT 180°  
3" CONDUIT TO HH 10:  
3-6/C 16  
5-4/C 16  
\*1-3/C 16  
\*1-3/C 20  
1-2/C 14  
1-3/C 16 (LUM)  
1-1/C 6 INS. GR.

- Ⓒ INPLACE: POLE MOUNTED SOP  
F&I: 1-2" CONDUIT TO SERVICE CABINET  
3-1/C 2



- Ⓐ Ⓑ EQUIPMENT PAD (SEE DETAIL SHEET)  
SERVICE CABINET WITH BATTERY BACKUP (SEE DETAIL SHEET)  
TS2 CABINET AND CONTROLLER (COUNTY PROVIDED)  
1-4" NMC TO HH 1: 1-4" NMC TO HH 11:  
3-6/C 16 3-6/C 16  
4-4/C 16 4-4/C 16  
\*1-3/C 16 \*1-3/C 16  
\*1-3/C 20 \*1-3/C 20  
5-2/C 14 8-2/C 14  
1-CAT 5E (CCTV)  
1-4" NMC TO HH 1: 1-4" NMC TO HH 11:  
3-6/C 16 3-6/C 16  
5-4/C 16 5-4/C 16  
\*1-3/C 16 \*1-3/C 16  
\*1-3/C 20 \*1-3/C 20  
10-2/C 14 6-2/C 14  
1-1/C 6 INS. GR. 1-1/C 6 INS. GR.

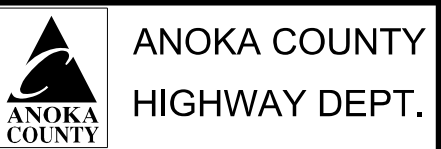
- GROUND WIRE AND GROUND ROD - MIN 8' STUBBED OUT FROM PAD  
2-2" AND 1-3" CONDUIT STUBBED OUT (CAPPED BOTH ENDS)  
\*\* 1.5" CONDUIT TO TMS VAULT:  
\*\* 2-FO ARMORED CABLES (12SM)  
CONTROLLER CABINET TO SERVICE CABINET:  
2" CONDUIT  
3-1/C 6  
CONTROLLER CABINET TO SERVICE CABINET (COMMS):  
2" CONDUIT  
1-6PR 19  
SERVICE CABINET TO POLE MOUNTED TRANSFORMER:  
2" CONDUIT  
3-1/C 2  
SERVICE CABINET TO HH 1:  
2" CONDUIT  
2-3/C 16 (LUM)  
SERVICE CABINET TO HH 11:  
2" CONDUIT  
2-3/C 16 (LUM)  
SERVICE CABINET TO EXTERNAL GR. RD.:  
1" CONDUIT  
1-1/C 6 INS. GR.  
(SEE EQUIPMENT PAD LAYOUT)

- NOTES:  
1. SEE THE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS.  
2. ALL SIGNAL MOUNTED SIGNS ARE INCLUDED IN PAYMENT WITH THE LUMP SUM SIGNAL SYSTEM PAY ITEM. SEE SIGNING DETAIL SHEET FOR PAST ARM MOUNTED SIGNS.  
3. USE PVC OR HDPE FOR NEW CONDUIT. CONDUIT SIZES ARE NOMINAL DIAMETER.  
4. ITEMS DENOTED WITH AN \* ARE INCLUDED IN PAYMENT FOR THE EMERGENCY VEHICLE PREEMPTION SYSTEM C PAY ITEM.  
5. ITEMS DENOTED WITH AN \*\* ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECTION PAY ITEM.  
6. REMOVAL OF THE EXISTING SIGNAL IS INCLUDED IN THE PAYMENT FOR THE REMOVAL SIGNAL SYSTEM PAY ITEM. REFER TO THE "EXISTING SIGNAL SYSTEM AS BUILT" SHEETS FOR INPLACE SIGNAL SYSTEM COMPONENTS.  
7. ALL ITEMS ARE TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.  
8. SEE SECTIONS 1806 (DETERMINATION AND EXTENSION OF CONTRACT TIME) AND 2563 (TRAFFIC CONTROL) IN THE SPECIAL PROVISIONS FOR IMPORTANT TRAFFIC SIGNAL STAGING REQUIREMENTS.

NO	DATE	BY	CKD	APPR	REVISION
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PRINT NAME: NICK VANGUNST  
SIGNATURE: *Nick Van Gunst*  
DATE: 11/26/24 LICENSE NO. 44683

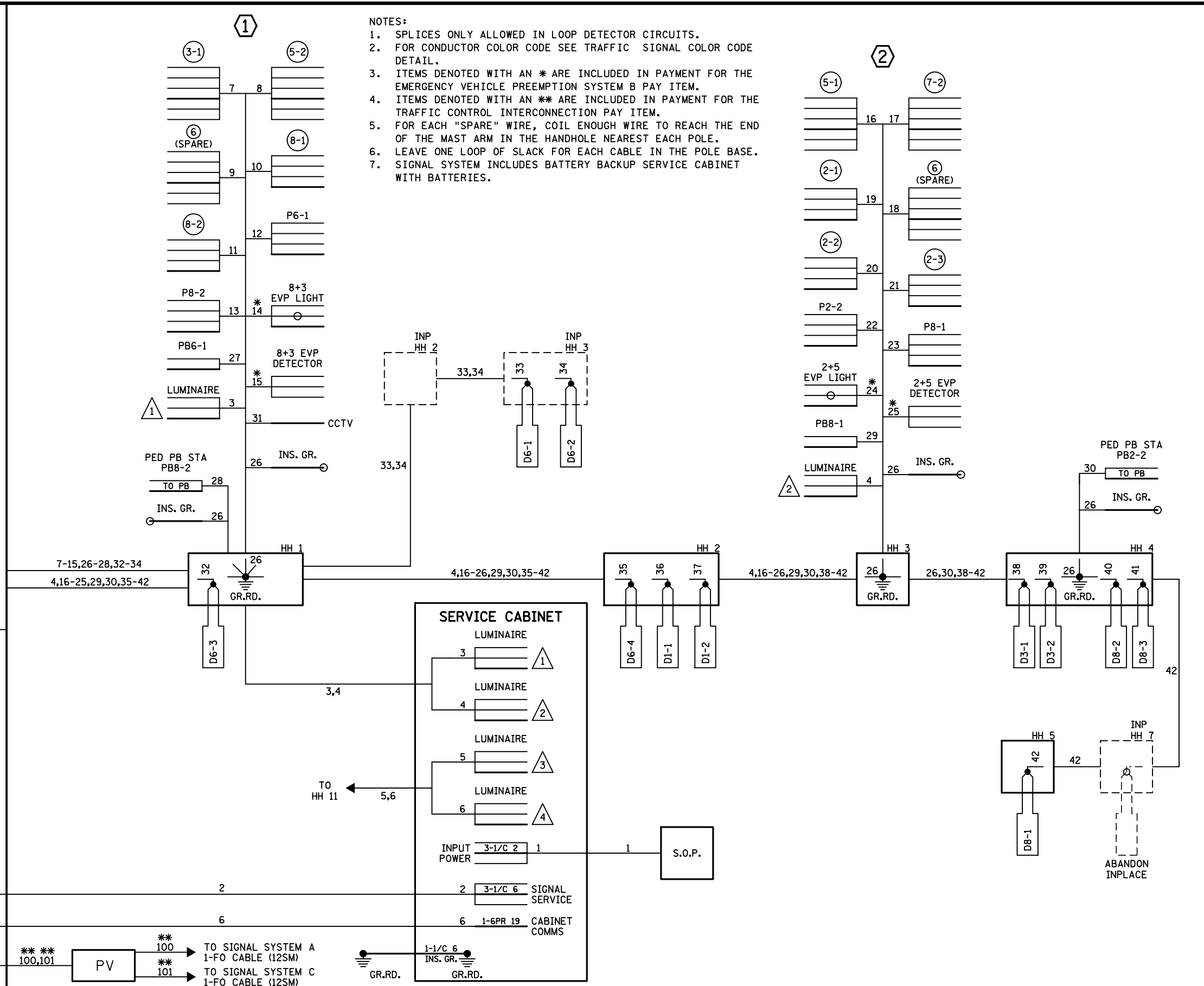
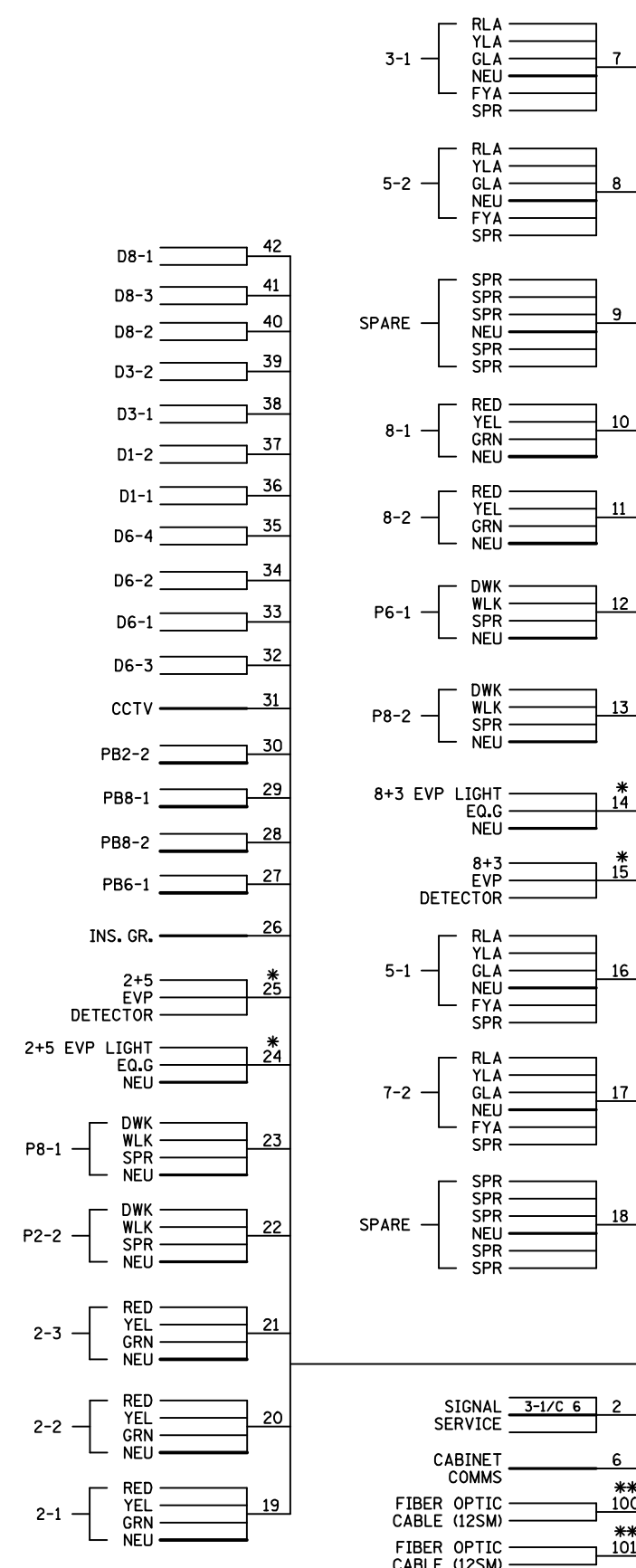
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TRAFFIC SIGNAL SYSTEM B NOTES  
BUNKER LAKE BLVD & HEATHER ST  
COUNTY PROJECT SAP 002-716-024  
CITY PROJECT SAP 198-020-040

CSAH 116 (BUNKER LAKE BLVD)  
SIGNAL MODIFICATION  
& ADA IMPROVEMENTS  
Sheet 96 of 174 Sheets

# CONTROLLER CABINET



- NOTES:
1. SPLICES ONLY ALLOWED IN LOOP DETECTOR CIRCUITS.
  2. FOR CONDUCTOR COLOR CODE SEE TRAFFIC SIGNAL COLOR CODE DETAIL.
  3. ITEMS DENOTED WITH AN \* ARE INCLUDED IN PAYMENT FOR THE EMERGENCY VEHICLE PREEMPTION SYSTEM B PAY ITEM.
  4. ITEMS DENOTED WITH AN \*\* ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECTION PAY ITEM.
  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. SIGNAL SYSTEM INCLUDES BATTERY BACKUP SERVICE CABINET WITH BATTERIES.

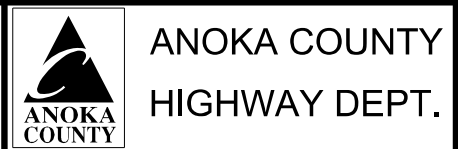
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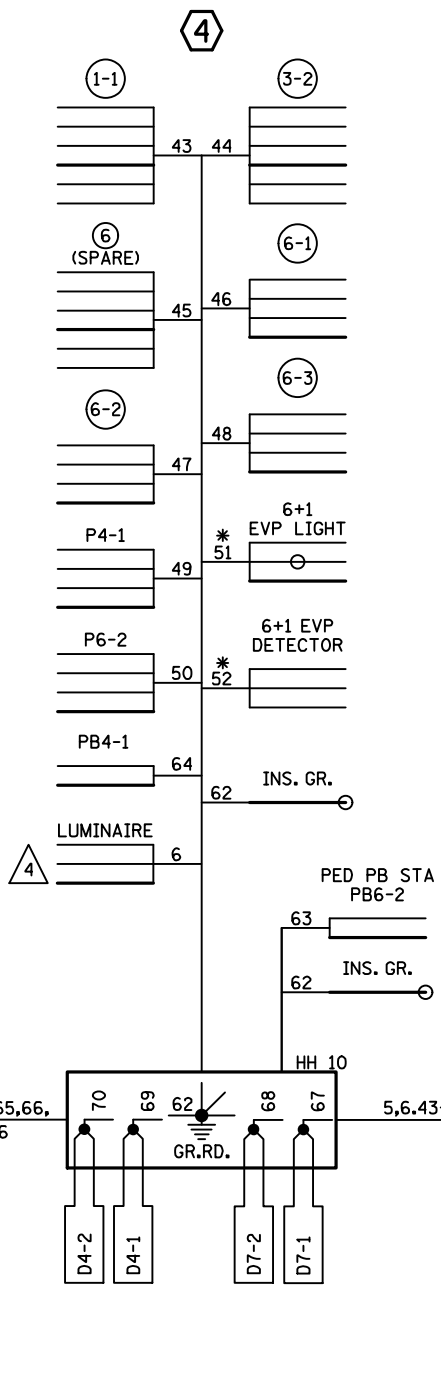
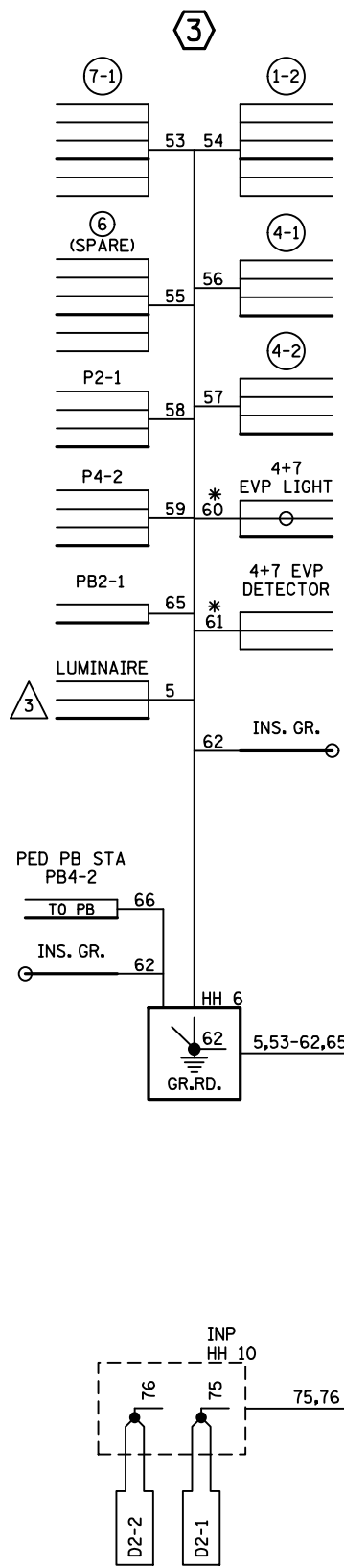


TRAFFIC SIGNAL SYSTEM B WIRING  
 BUNKER LAKE BLVD & HEATHER ST  
 COUNTY PROJECT SAP 002-716-024  
 CITY PROJECT SAP 198-020-040

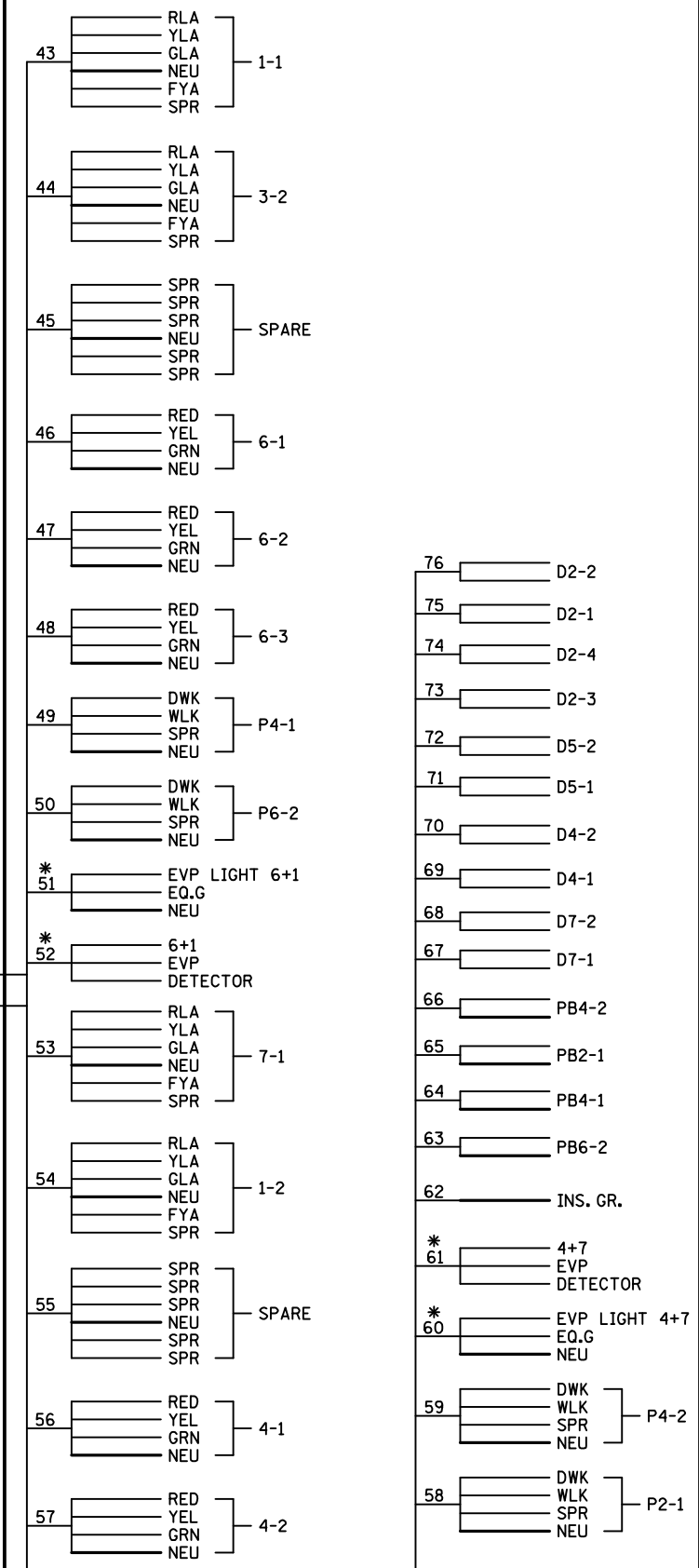
CSAH 116 (BUNKER LAKE BLVD)  
 SIGNAL MODIFICATION  
 & ADA IMPROVEMENTS  
 Sheet 97 of 174 Sheets

NOTES:

1. SPLICES ONLY ALLOWED IN LOOP DETECTOR CIRCUITS.
2. FOR CONDUCTOR COLOR CODE SEE TRAFFIC SIGNAL COLOR CODE DETAIL.
3. ITEMS DENOTED WITH AN \* ARE INCLUDED IN PAYMENT FOR THE EMERGENCY VEHICLE PREEMPTION SYSTEM B PAY ITEM.
4. ITEMS DENOTED WITH AN \*\* ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECTION PAY ITEM.
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. SIGNAL SYSTEM INCLUDES BATTERY BACKUP SERVICE CABINET WITH BATTERIES.



CONTROLLER CABINET



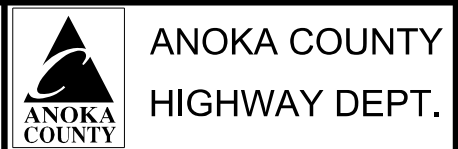
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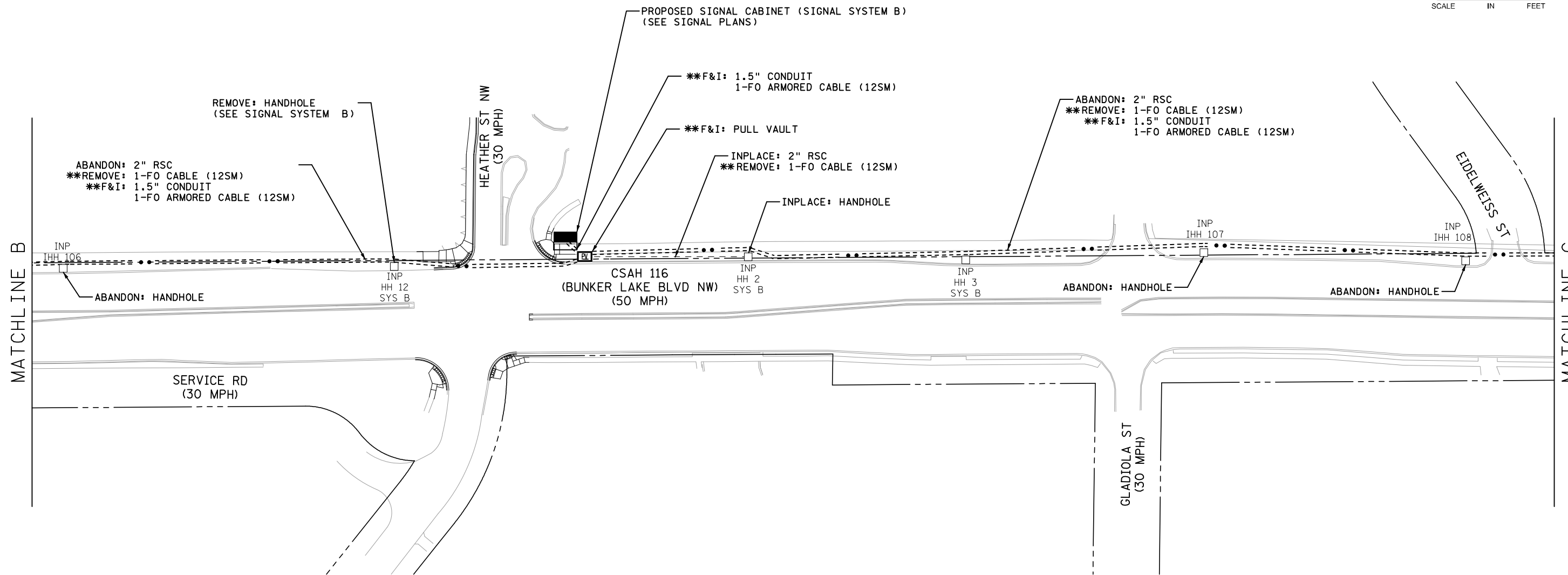
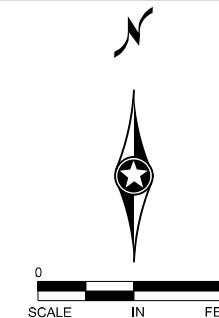
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TRAFFIC SIGNAL SYSTEM B WIRING  
 BUNKER LAKE BLVD & HEATHER ST  
 COUNTY PROJECT SAP 002-716-024  
 CITY PROJECT SAP 198-020-040

CSAH 116 (BUNKER LAKE BLVD)  
 SIGNAL MODIFICATION  
 & ADA IMPROVEMENTS  
 Sheet 98 of 174 Sheets



- NOTES:
1. THE LOCATION OF PULL VAULTS AND CONDUITS SHOWN IN THE PLAN ARE APPROXIMATE. EXACT LOCATIONS SHALL BE COORDINATED WITH ALL UTILITY FACILITIES IN SIDEWALK AND ROADWAY AND SHALL BE VERIFIED IN THE FIELD BY THE ENGINEER.
  2. ALL ITEMS ARE TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.
  3. ITEMS DENOTED WITH \*\* ARE INCLUDED IN THE PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM.
  4. CONTRACTOR SHALL TERMINATE FIBER OPTIC CABLE WITHIN TRAFFIC SIGNAL CABINETS IN THE CONTRACTOR PROVIDED TERMINATION PANEL, SEE SPECIAL PROVISIONS.
  5. DIRECTIONAL BORE INTERCONNECT CONDUIT UNDER ALL HARD SURFACES LIKE SIDEWALKS, ROADS AND DRIVEWAYS.

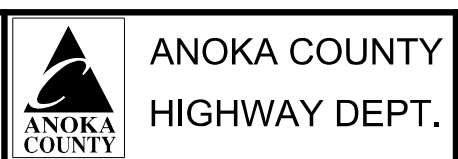
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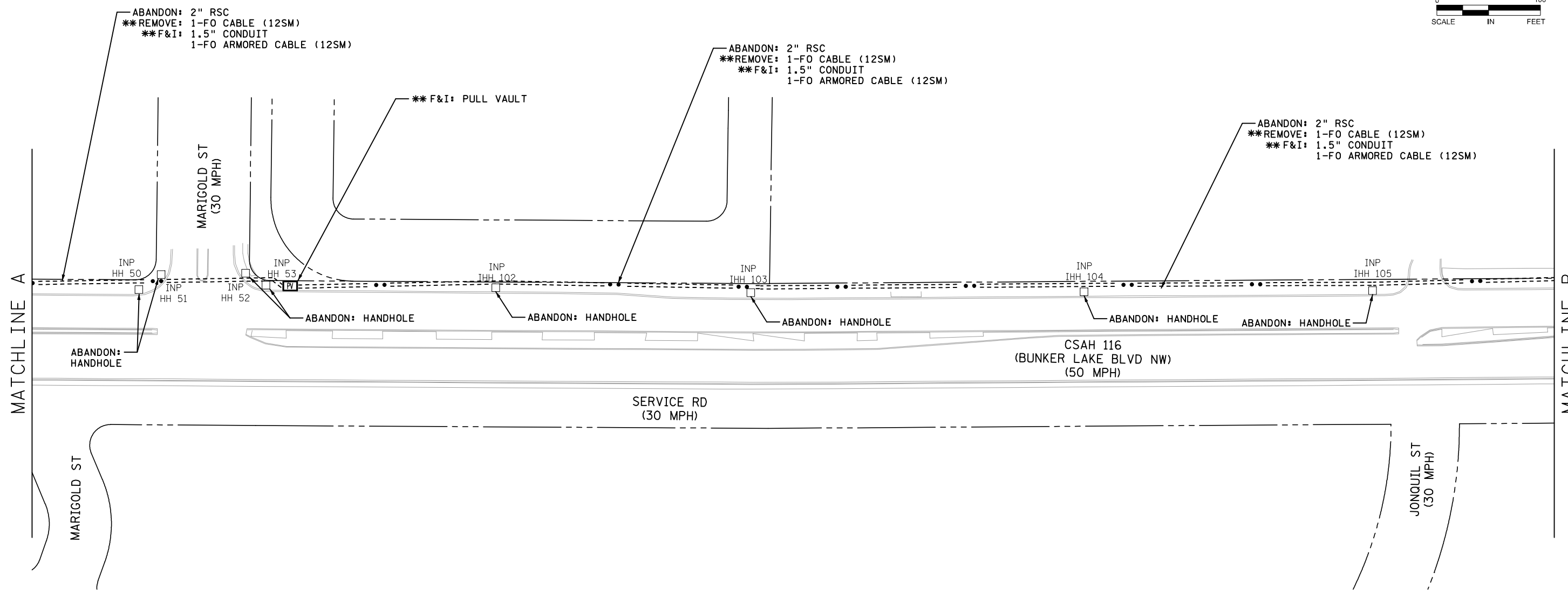
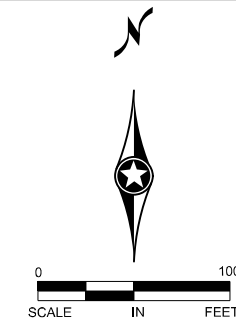
PRINT NAME: NICK VANGUNST  
 SIGNATURE: *Nick Van Gunst*  
 DATE: 11/26/24 LICENSE NO. 44683

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TRAFFIC SIGNAL SYSTEM  
 INTERCONNECT LAYOUT  
 COUNTY PROJECT SAP 002-716-024  
 CITY PROJECT SAP 198-020-040

CSAH 116 (BUNKER LAKE BLVD)  
 SIGNAL MODIFICATION  
 & ADA IMPROVEMENTS  
 Sheet 149 of 174 Sheets



NOTES:

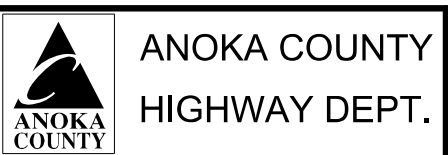
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4. CONTRACTOR SHALL TERMINATE FIBER OPTIC CABLE WITHIN TRAFFIC SIGNAL CABINETS IN THE CONTRACTOR PROVIDED TERMINATION PANEL. SEE SPECIAL PROVISIONS.
5. DIRECTIONAL BORE INTERCONNECT CONDUIT UNDER ALL HARD SURFACES LIKE SIDEWALKS, ROADS AND DRIVEWAYS.

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 DATE: 11/26/24 LICENSE NO. 44683

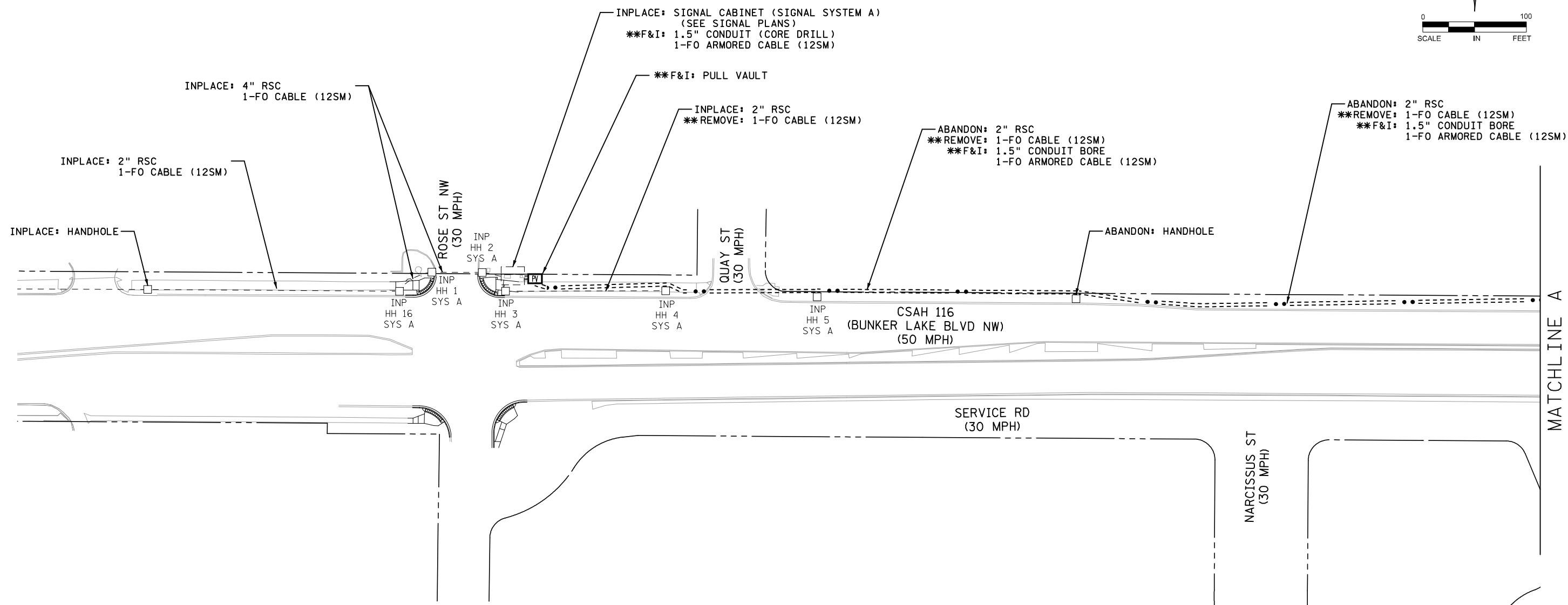
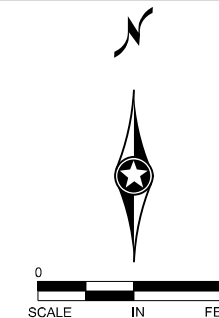
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**TRAFFIC SIGNAL SYSTEM  
INTERCONNECT LAYOUT**  
 COUNTY PROJECT SAP 002-716-024  
 CITY PROJECT SAP 198-020-040

**CSAH 116 (BUNKER LAKE BLVD)  
SIGNAL MODIFICATION  
& ADA IMPROVEMENTS**

Sheet 148 of 174 Sheets



NOTES:

1. THE LOCATION OF PULL VAULTS AND CONDUITS SHOWN IN THE PLAN ARE APPROXIMATE. EXACT LOCATIONS SHALL BE COORDINATED WITH ALL UTILITY FACILITIES IN SIDEWALK AND ROADWAY AND SHALL BE VERIFIED IN THE FIELD BY THE ENGINEER.
2. ALL ITEMS ARE TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.
3. ITEMS DENOTED WITH \*\* ARE INCLUDED IN THE PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM.
4. CONTRACTOR SHALL TERMINATE FIBER OPTIC CABLE WITHIN TRAFFIC SIGNAL CABINETS IN THE CONTRACTOR PROVIDED TERMINATION PANEL. SEE SPECIAL PROVISIONS.
5. DIRECTIONAL BORE INTERCONNECT CONDUIT UNDER ALL HARD SURFACES LIKE SIDEWALKS, ROADS AND DRIVEWAYS.

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 SIGNATURE: *Nick Van Gunst*  
 DATE: 11/26/24 LICENSE NO. 44683

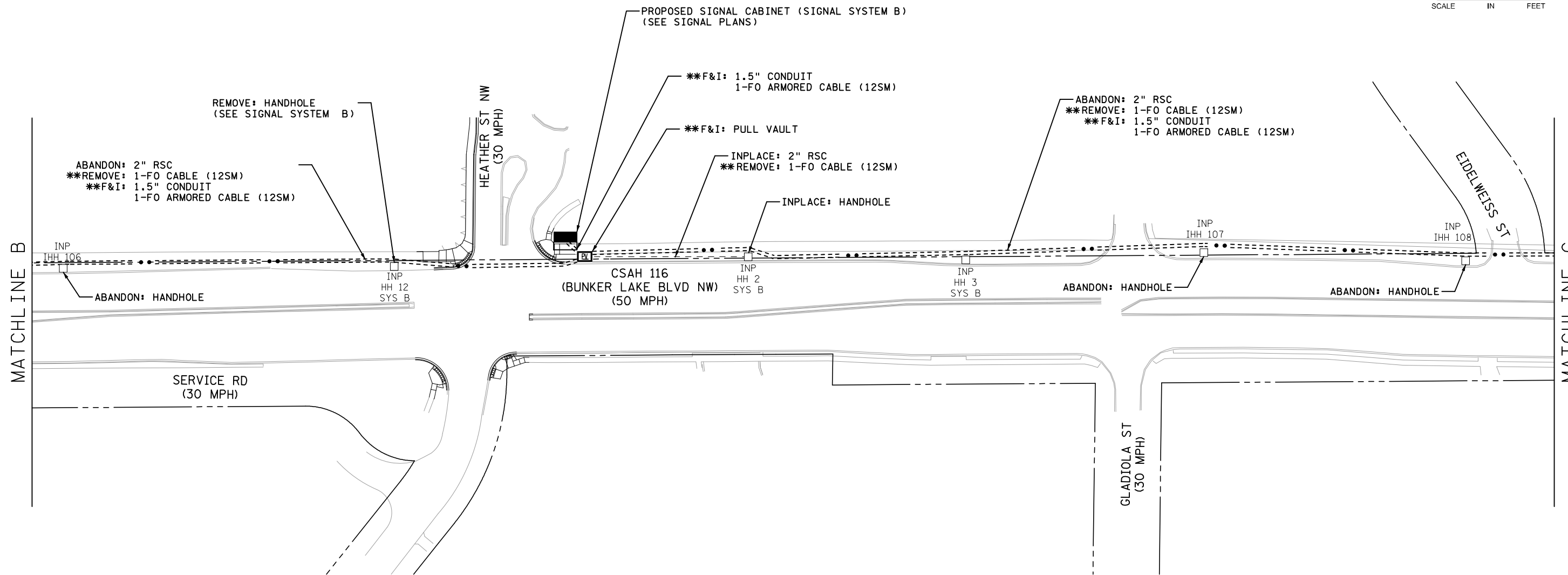
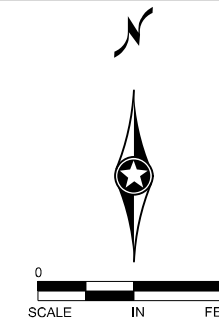
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**ANOKA COUNTY**  
**HIGHWAY DEPT.**

TRAFFIC SIGNAL SYSTEM  
 INTERCONNECT LAYOUT  
 COUNTY PROJECT SAP 002-716-024  
 CITY PROJECT SAP 198-020-040

CSAH 116 (BUNKER LAKE BLVD)  
 SIGNAL MODIFICATION  
 & ADA IMPROVEMENTS  
 Sheet 147 of 174 Sheets



- NOTES:
1. THE LOCATION OF PULL VAULTS AND CONDUITS SHOWN IN THE PLAN ARE APPROXIMATE. EXACT LOCATIONS SHALL BE COORDINATED WITH ALL UTILITY FACILITIES IN SIDEWALK AND ROADWAY AND SHALL BE VERIFIED IN THE FIELD BY THE ENGINEER.
  2. ALL ITEMS ARE TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.
  3. ITEMS DENOTED WITH \*\* ARE INCLUDED IN THE PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM.
  4. CONTRACTOR SHALL TERMINATE FIBER OPTIC CABLE WITHIN TRAFFIC SIGNAL CABINETS IN THE CONTRACTOR PROVIDED TERMINATION PANEL, SEE SPECIAL PROVISIONS.
  5. DIRECTIONAL BORE INTERCONNECT CONDUIT UNDER ALL HARD SURFACES LIKE SIDEWALKS, ROADS AND DRIVEWAYS.

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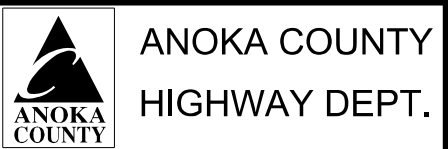
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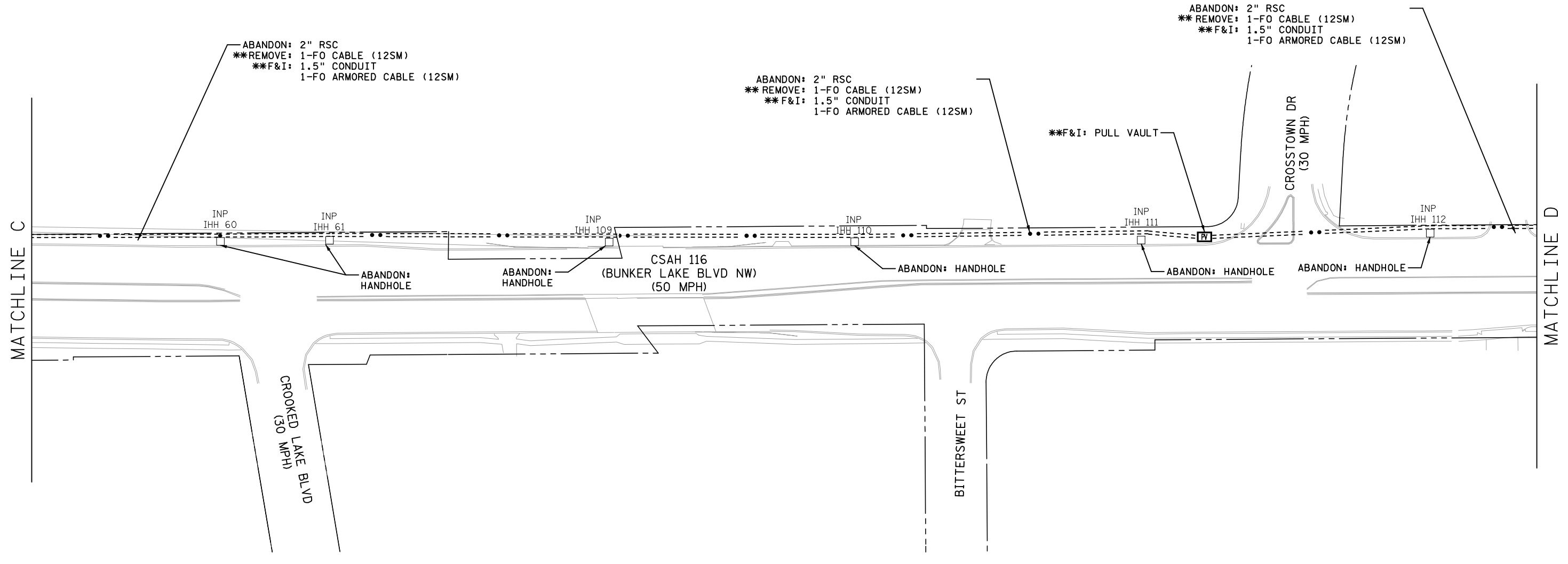
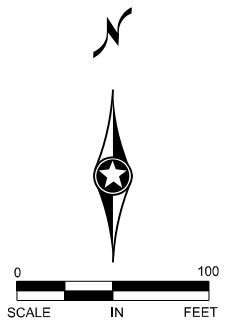
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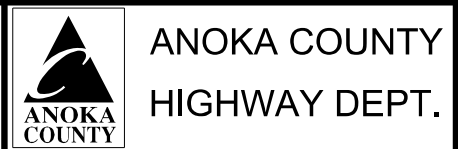
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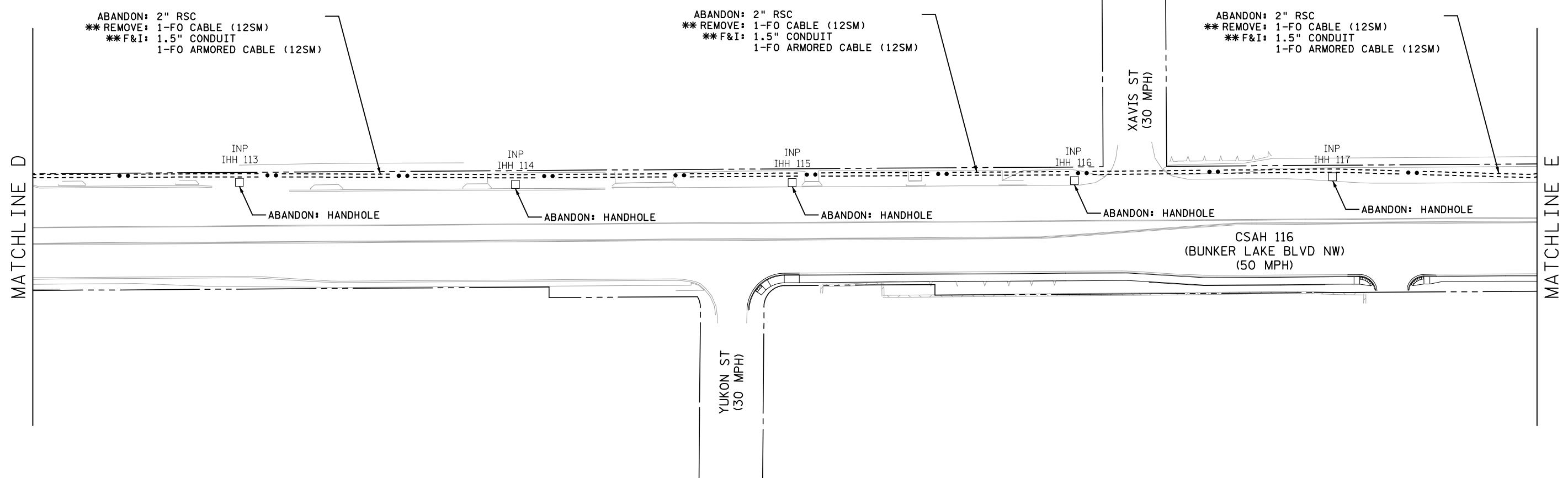
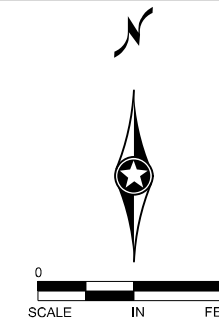
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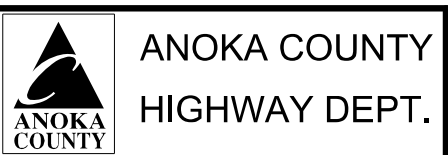
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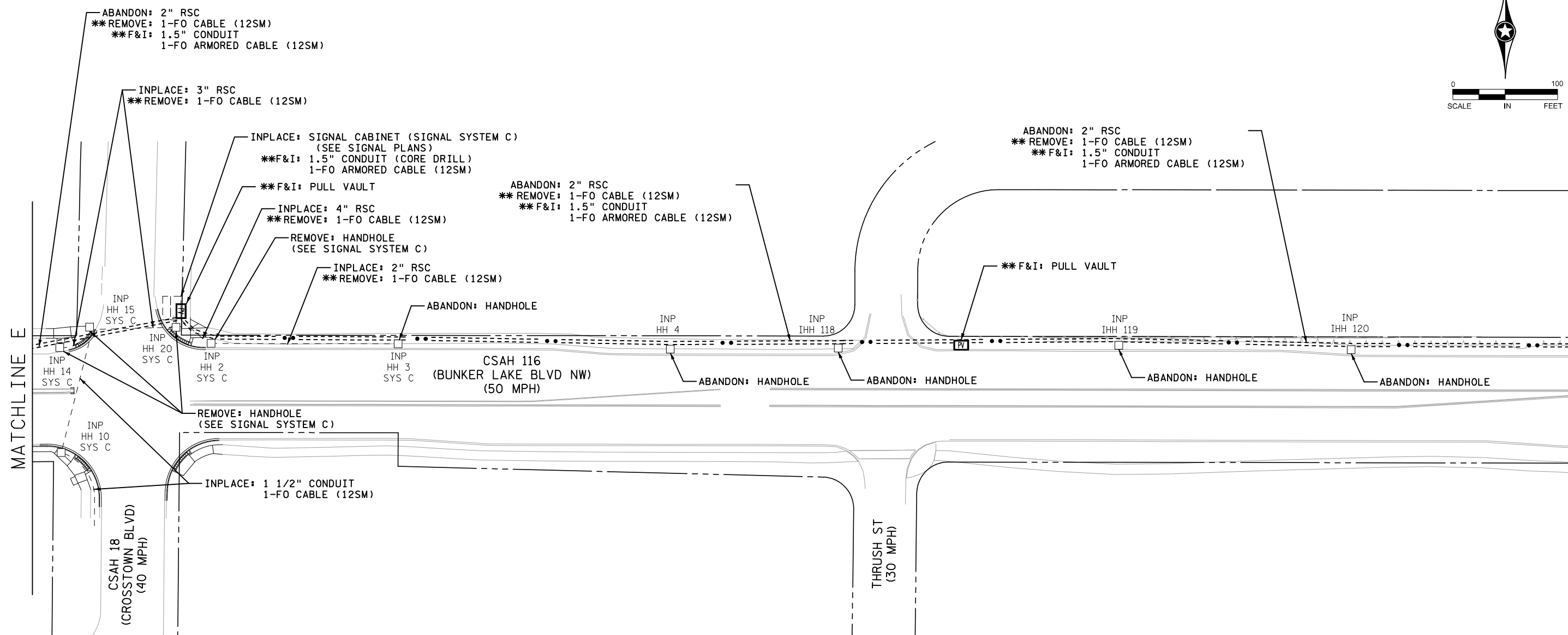
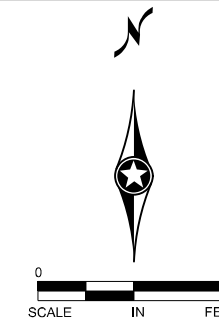


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