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6/8/2020

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FILE: S:\PTV\Sherb\Common\CSAH 12-13 Signal\Signal\Plan\sheet\CSAH12-13_sgl1.dgn
MODEL: #MODEL\$

ABBREVIATIONS

AWF	ADVANCE WARNING FLASHER
C.D.	COUNT DOWN
D2-1 (e.g.)	DETECTOR (PHASE 2, NO. 1)
DEG	DEGREES
DWK	DON'T WALK
F&I	FURNISH AND INSTALL
FL	FLASH/FLASHING
FYA	FLASHING YELLOW ARROW
FYLA	FLASHING YELLOW LEFT ARROW
GLA	GREEN LEFT ARROW
GRN	GREEN INDICATION
GR. RD.	GROUND ROD
GRA	GREEN RIGHT ARROW
GTA	GREEN THRU ARROW
HH	HANDHOLE
IND	INDICATION
INP	INPLACE
INS. GR.	INSULATED GROUND
JB	JUNCTION BOX
LED	LIGHT EMITTING DIODE
LUM	LUMINAIRE
NEU	NEUTRAL
P1-1 (e.g.)	PEDESTRIAN HEAD (PHASE 1, NO. 1)
PB	PUSH BUTTON
PB2-1 (e.g.)	PUSH BUTTON (PHASE 2, NO. 1)
PED	PEDESTRIAN
RED	RED INDICATION
R&S	REMOVE AND SALVAGE
RLA	RED LEFT TURN ARROW
S&I	SALVAGE AND INSTALL
SPR	SPARE
STA	STATION
WLK	WALK INDICATION
YEL	YELLOW INDICATION
YLA	YELLOW LEFT ARROW
YRA	YELLOW RIGHT ARROW

SYMBOLS

■	HANDHOLE
○	E.O.G CONNECTION
←	EVP CONFIRMATORY LIGHT
→	EVP DETECTOR
←→	EVP DETECTOR AND CONFIRMATORY LIGHT
●	SPLICE
FO	FIBER OPTIC SPLICE VAULT
PV	PULL VAULT
△	LUMINAIRE NO.
3	SIGNAL BASE NO.
3-2	SIGNAL HEAD NO./FLASHER HEAD NO.
BM	BARREL MOUNT BASE NO.
W	WOOD POLE NO.
TV	TELEVISION CAMERA (CCTV)
V	VIDEO DETECTION

FOR PLANS AND UTILITIES SYMBOLS SEE TECHNICAL MANUAL

STANDARD PLATES - SIGNAL SYSTEMS

THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT

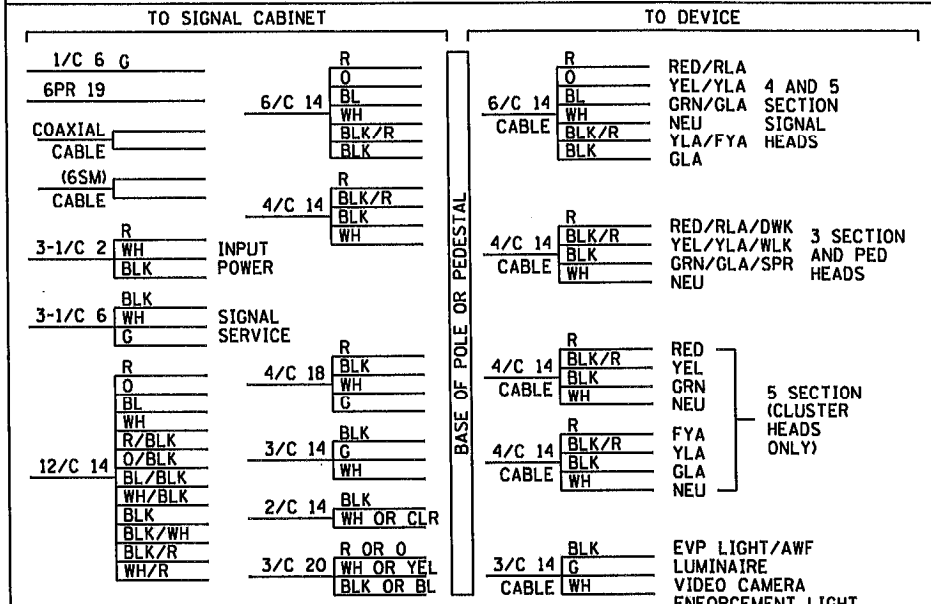
PLATE NO.	DESCRIPTION	PLATE NO.	DESCRIPTION
▶ 8111	E TRAFFIC SIGNAL BRACKETING (PEDESTAL MOUNTED) (3 SHEETS)	▶ 8122	F PEDESTAL & PEDESTAL BASE (FOR TRAFFIC CONTROL SIGNALS SUPPORT) (2 SHEETS)
▶ 8112	I PEDESTAL FOUNDATION (TRAFFIC CONTROL SIGNALS)	▶ 8123	G POLE & MAST ARM - LUMINAIRES AND TRAFFIC LIGHTS ASSEMBLY (2 SHEETS)
▶ 8117	G PRECAST CONCRETE HAND HOLE WITH VEHICLE LOAD	▶ 8126	L POLE FOUNDATION (PA90 AND PA100)
▶ 8118	D SERVICE EQUIPMENT & POLE TRAFFIC CONTROL SIGNALS	▶ 8129	A SHIM AND WASHER (TRAFFIC CONTROL SIGNALS AND ROADWAY LIGHTING)
▶ 8119	C GROUND MOUNTED CABINET FOUNDATION	▶ 8130	E SAW CUT LOOP DETECTORS (3 SHEETS)
▶ 8120	O POLE FOUNDATION (PA 85)	▶ 8132	B PREFORMED RIGID PVC CONDUIT LOOP DETECTOR LAYOUT DETAILS (3 SHEETS)
▶ 8121	H TRANSFORMER BASE & POLE BASE PLATE (2 SHEETS)		

▶ STANDARD PLATES APPLICABLE TO THIS PROJECT

TABULATION OF SIGNAL QUANTITIES

ITEM NO	ITEM	UNIT	TOTAL ESTIMATED QUANTITY	S.A.P. 071-612-008	LOCAL FUNDS
2011	AS BUILT	LUMP SUM	1	1	
2565	EMERGENCY VEHICLE PREEMPTION	SYSTEM	1	0.75	0.25
2565	TRAFFIC CONTROL INTERCONNECT	LUMP SUM	1	1	
2565	TRAFFIC CONTROL SIGNAL SYSTEM	LUMP SUM	1	0.75	0.25

CONDUCTOR COLOR CODE (14 GAUGE)



WIRE SPECIFICATION CHART

Type	Name	Specification Number
1/C 2	Power Conductors	3815.2B.1
1/C 6	Power Conductors	3815.2B.1
1/C 6 INS.GR.	Grounding Conductors	3815.2B.5
2/C 14	Loop Detector Lead-in Cable	3815.2C.4
3/C 14	Signal Control Cable	3815.2C.3
4/C 14	Signal Control Cable	3815.2C.3
6/C 14	Signal Control Cable	3815.2C.3
12/C 14	Signal Control Cable	3815.2C.3
6PR 19	Telephone Cables Outdoor	3815.2C.6.b
3/C 20	EVP Detector Cable	3815.2C.5

WIRE COLOR CODE KEY

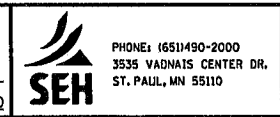
R	Red
O	Orange
BL	Blue
WH	White
BLK	Black
BRN	Brown
CL	Clear
G	Green
R/BLK	Red with Black Stripe
O/BLK	Orange with Black Stripe
BL/BLK	Blue with Black Stripe
WH/BLK	White with Black Stripe
WH/R	White with Red Stripe
BLK/WH	Black with White Stripe
BLK/R	Black with Red Stripe

DESIGN TEAM			
DRAWN BY: MRB			
DESIGNER: JMG			
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: 03/30/2020



SHERBURNE COUNTY, MN
C.S.A.H. 12 RECONSTRUCTION
S.A.P. 071-612-008, S.A.P. 204-020-006

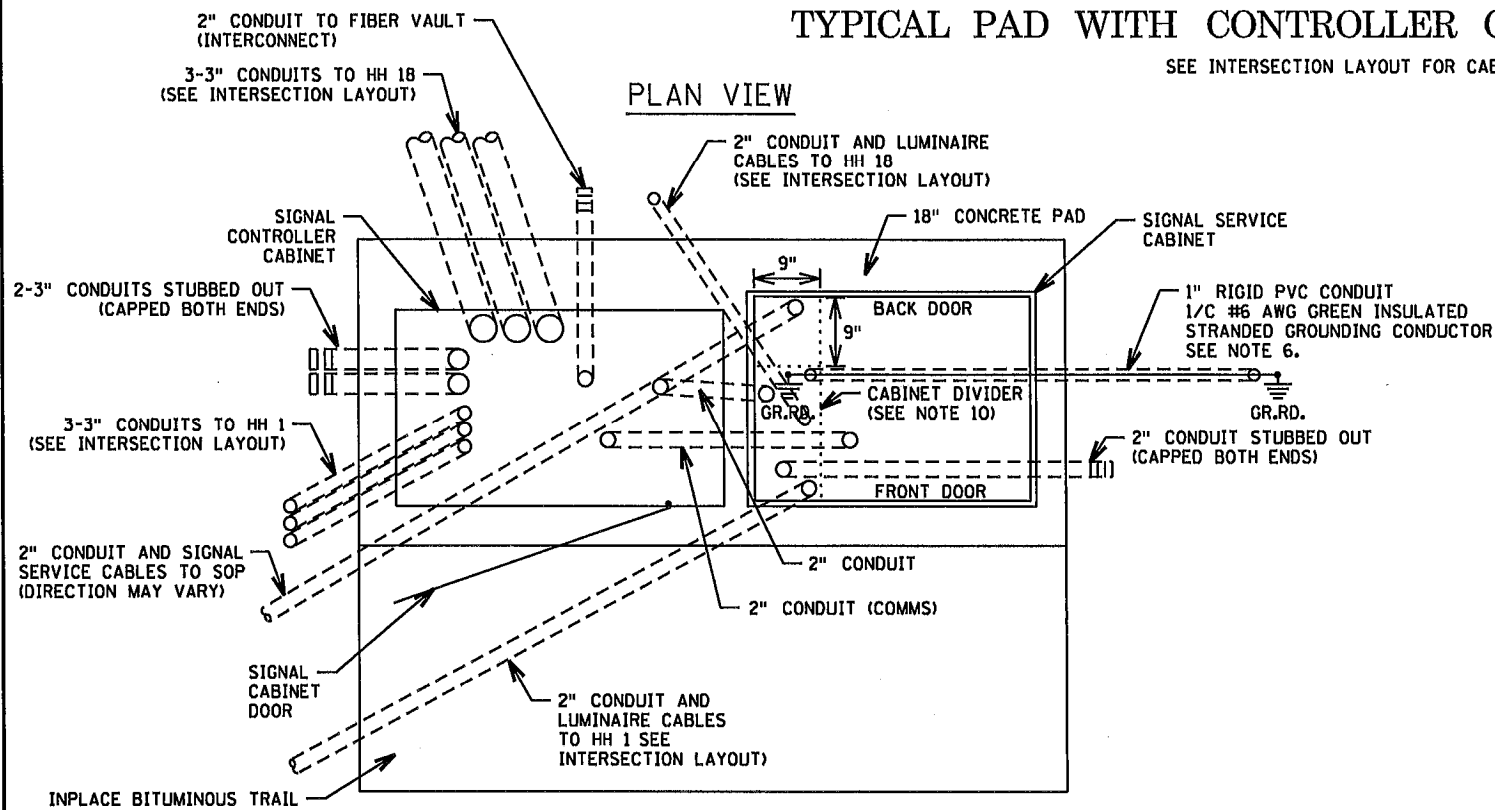
TRAFFIC SIGNAL SYSTEM
DETAILS AND STANDARD PLATES
CSAH 12 AT CSAH 13/TWIN LAKES ROAD NW

FILE NO. SHERB151615
SGL 1
OF SGL13

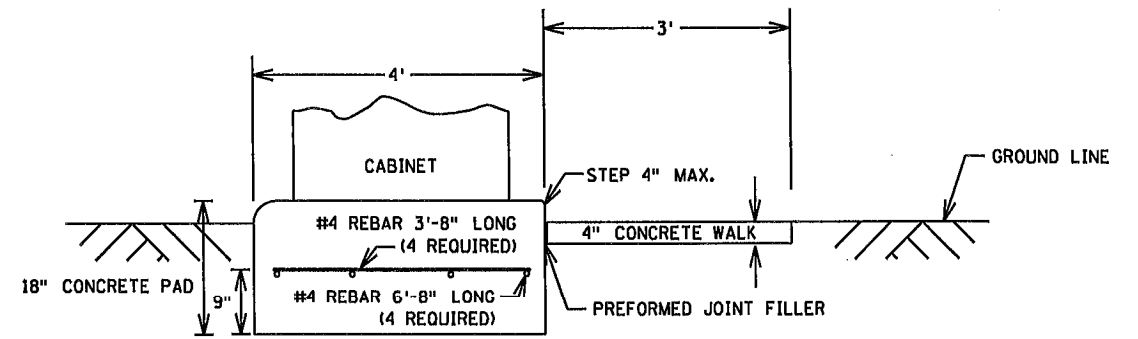
TYPICAL PAD WITH CONTROLLER CABINET AND SERVICE CABINET

SEE INTERSECTION LAYOUT FOR CABLE INFORMATION (NOT TO SCALE)

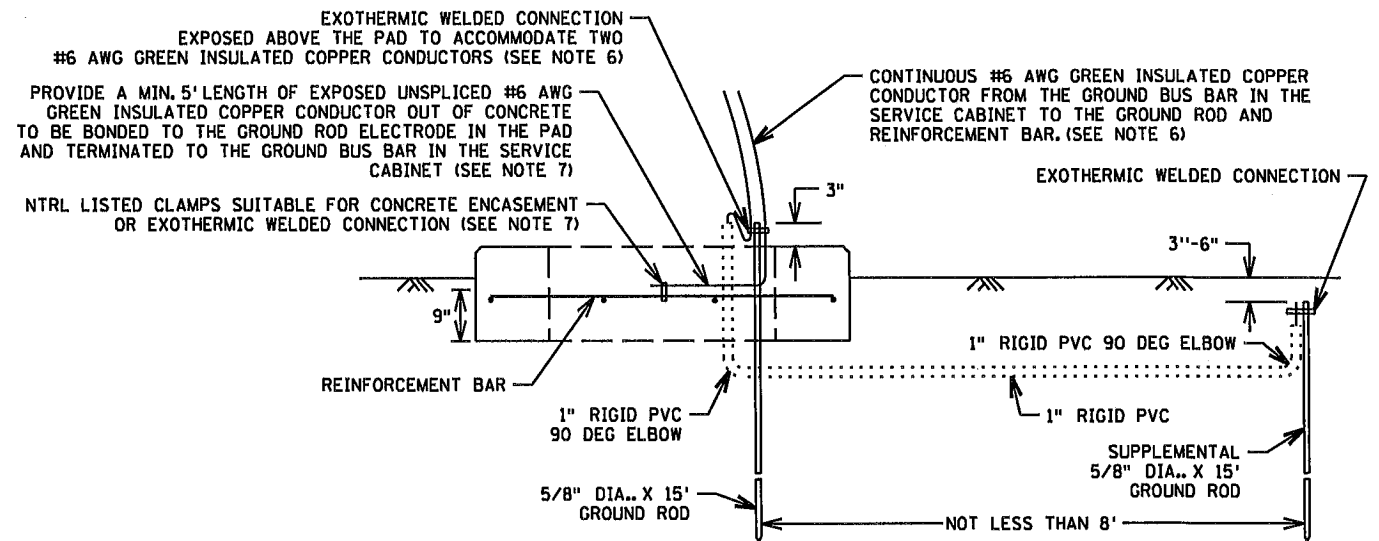
PLAN VIEW



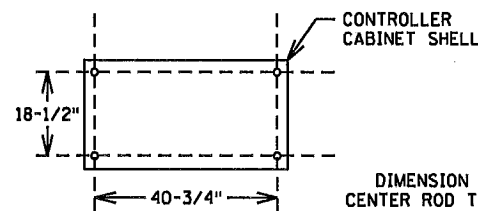
SIDE VIEW



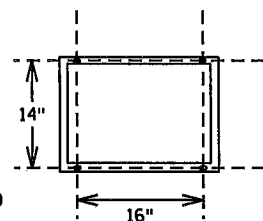
GROUNDING ELECTRODE SYSTEM



CONTROLLER CABINET TYPE "P" & "R" BOLT PATTERN



SERVICE CABINET BOLT PATTERN

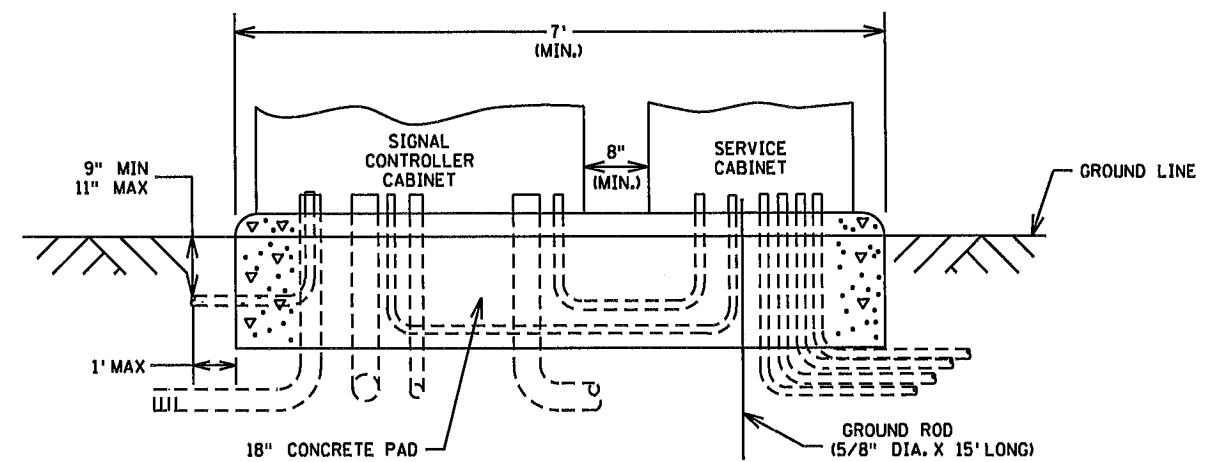


DIMENSION SHOWN ARE
CENTER ROD TO CENTER ROD

NOTES:

1. THE ANCHOR RODS, NUTS, WASHERS AND RUBBER GASKET FOR THE CONTROLLER CABINET SHALL BE FURNISHED BY THE COUNTY.
2. THE OUTER EDGE OF THE ENTIRE EQUIPMENT PAD AND CONCRETE WALK SHALL BE BEVELED OR CHAMFERED IN A NEAT MANNER AS DIRECTED BY THE ENGINEER.
3. THE TOP OF THE CONDUITS SHALL BE CAPPED UNTIL CABLES ARE PULLED IN.
4. CONDUIT SHALL PROJECT A MINIMUM OF 2" ABOVE THE CONCRETE AND SHALL BE LOCATED INSIDE THE CABINET WHERE DIRECTED BY THE ENGINEER, BUT SHALL NOT INTERFERE WITH THE CABINET FUNCTIONS (SUPPORTING MEMBERS, ETC.).
5. CONCRETE MIX 3F52 OR EQUAL SHALL BE USED FOR THE EQUIPMENT PAD AND SIDEWALK.
6. SUPPLY TWO 15 FOOT GROUND ROD ELECTRODES IN ACCORDANCE WITH 2545.3R. PROVIDE ONE GROUND ROD IN THE EQUIPMENT PAD IN ACCORDANCE WITH 2545.3 F.3 AND THE OTHER OUTSIDE OF THE PAD WITH A MINIMUM OF 8 FEET OF SEPARATION BETWEEN ELECTRODES. BOND THE TWO GROUND RODS TOGETHER WITH ONE CONTINUOUS LENGTH UNSPLICED CONDUCTOR FROM THE OUTER MOST GROUND ROD TO THE GROUND BUS BAR IN THE CABINET. EXOTHERMICALLY WELD THE 6 AWG STRANDED GREEN INSULATED CONDUCTOR TO THE GROUND RODS. PLACE THE BONDING CONNECTION TO THE EQUIPMENT PAD GROUND ROD ABOVE THE CONCRETE. APPLY DE-OX COMPOUND TO THE GROUNDING CONNECTIONS AFTER FINAL ASSEMBLY.
7. BOND A #6 AWG GREEN INSULATED GROUNDING CONDUCTOR TO THE REBAR GRID PRIOR TO CONCRETE POURING OPERATIONS. ENSURE THE CONDUCTOR IS PLACED IN THE LOAD SIDE OF THE CABINET. TERMINATE THE GREEN INSULATED 6 AWG GROUND CONDUCTOR ON THE GROUND BUS IN THE SERVICE CABINET WITHOUT SPLICES.
8. CONDUITS WITH BOTH ENDS TERMINATING WITHIN THE PAD SHALL NOT BE PLACED BELOW THE CONCRETE.
9. THE EXACT LOCATION OF CONDUITS WITHIN THE PAD SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD.
10. CORRECT PLACEMENT OF CONDUIT TO THE LEFT OF THE SERVICE CABINET DIVIDER IS CRITICAL.
11. ANCHOR RODS SHALL PROJECT A MINIMUM OF 3" ABOVE THE CONCRETE BUT SHALL NOT INTERFERE WITH THE CABINET FUNCTIONS (SUPPORTING MEMBERS, ETC.).
12. CABINETS TO BE CENTERED (LEFT & RIGHT) ON THE PAD.
13. BRUSH ON ANTI-SEIZE LUBRICANT MUST BE APPLIED TO ALL ANCHOR ROD THREADS PROTRUDING ABOVE THE CONCRETE PAD BEFORE THE CABINET IS SET.
14. CENTER THE 6" X 3" X 8" #4 REINFORCEMENT REBAR GRID IN THE 7' X 4' X 18" CONCRETE PAD.

FRONT VIEW



FILE: S:\P\T\S\Sherb\Common\CSAH 12-13 Signal\Signal\Plansheets\CSAH12-13.sgl.dgn

DESIGN TEAM			
DRAWN BY:	MRR		
DESIGNER:	JMG		
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: 03/30/2020

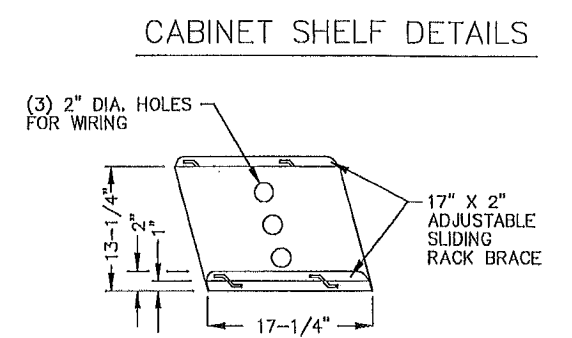
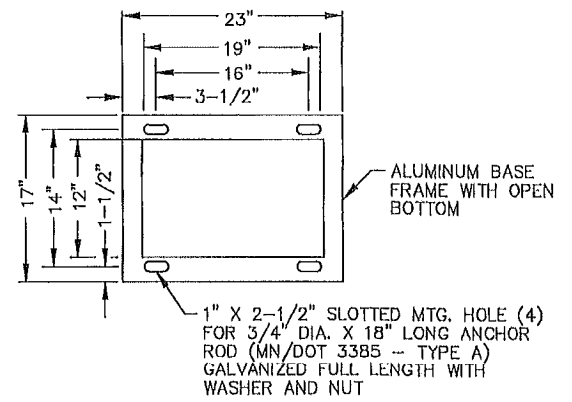
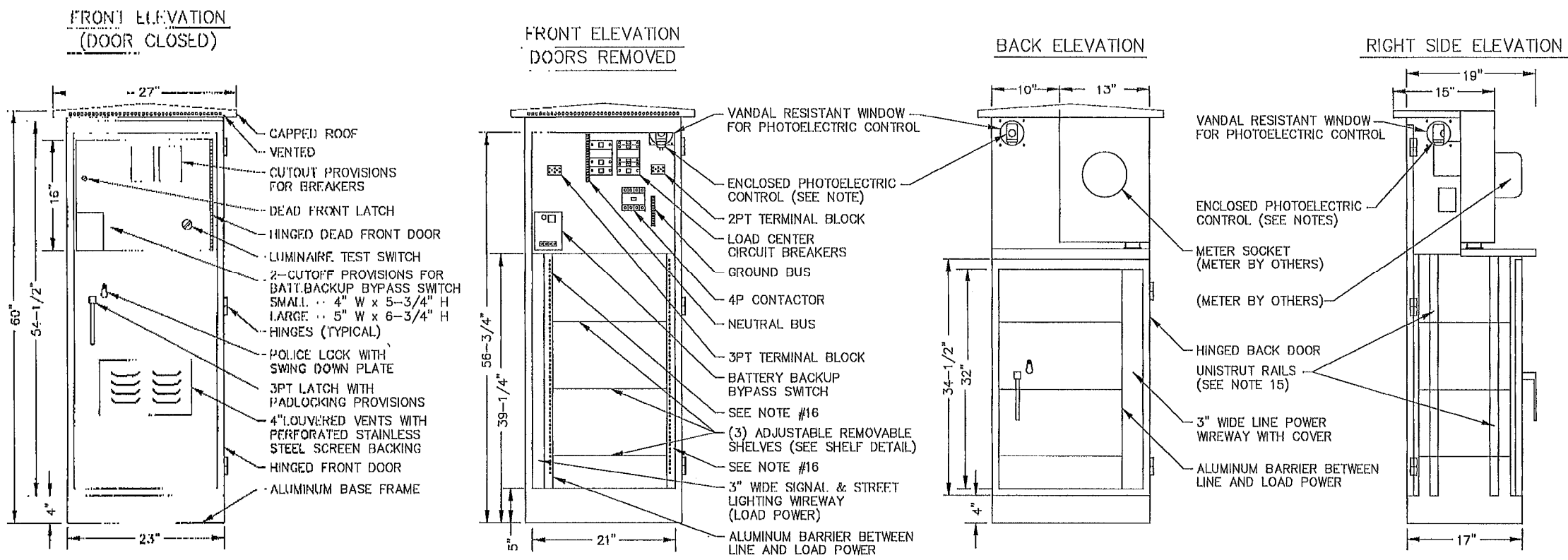
SHERBURNE COUNTY, MN
**C.S.A.H. 12
 RECONSTRUCTION**
 S.A.P. 071-612-008, S.A.P. 204-020-006

**TRAFFIC SIGNAL SYSTEM
 EQUIPMENT PAD DETAILS**
 CSAH 12 AT CSAH 13/TWIN LAKES ROAD NW

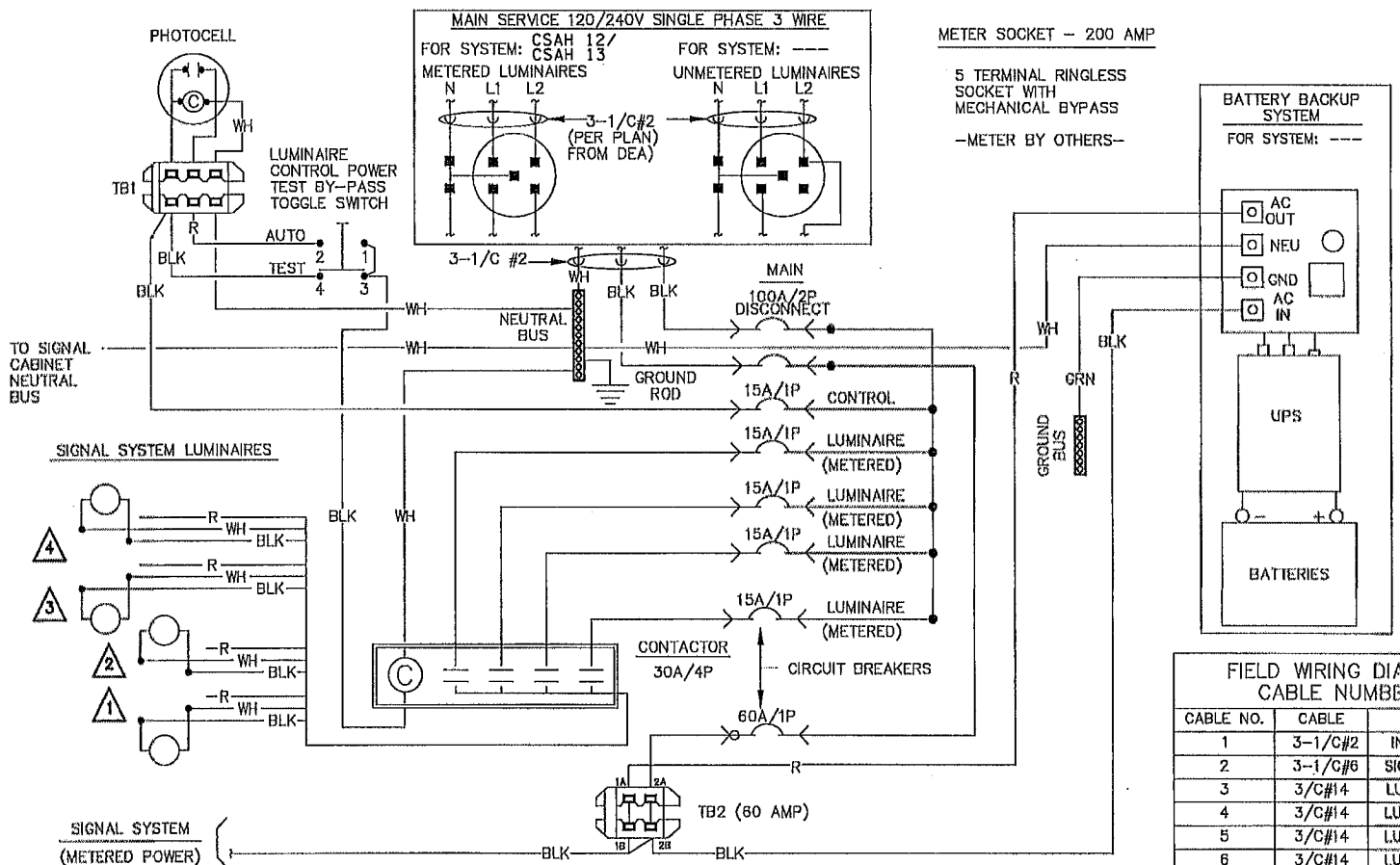
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SGL2
 OF SGL13

SERVICE CABINET DETAILS

CABINET BASE DETAILS



FEED POINT WIRING DIAGRAM



FIELD WIRING DIAGRAM CABLE NUMBERS

CABLE NO.	CABLE	USE
1	3-1/C#2	INPUT POWER
2	3-1/C#6	SIGNAL SYSTEM
3	3/C#14	LUMINAIRE - 1
4	3/C#14	LUMINAIRE - 2
5	3/C#14	LUMINAIRE - 3
6	3/C#14	LUMINAIRE - 4

CONSTRUCTION NOTES

- THE SERVICE CABINET SHALL BE FABRICATED FROM 0.125" ALUMINUM FOR OUTDOOR WEATHERPROOF SERVICE. AFTER FABRICATION, BOTH INSIDE AND OUTSIDE, SHALL BE PROTECTED WITH AN EXTERNAL THIRTY MINUTE CLEAR ANODIZED FINISH.
- ALL HINGES, HINGE PINS AND LOCKS SHALL BE OF NON-CORRODING CONSTRUCTION.
- THE SERVICE PEDESTAL DOORS SHALL BE ATTACHED TO THE ENCLOSURE WITH LIFT-OFF PHENOLIC HINGES AND SECURED WITH A STANDARD POLICE LOCK (PROVIDE ONE (1) KEY) FOR THE SERVICE DOORS.
- BOTH DOOR OPENINGS SHALL BE PROVIDED WITH A NEOPRENE GASKET TO FORM A COMPLETE SEAL WITH THE ENCLOSURE.
- THE PHOTOELECTRIC CONTROL WINDOWS SHALL BE CLEAR VANDAL RESISTANT MATERIAL (FOUR INCH X FOUR INCH).
- THE CIRCUIT BREAKERS SHALL BE 120/240 VOLT AC, 60 HZ, AND SHALL BE CLEARLY MARKED WITH THE "ON" AND "OFF" POSITIONS AND IDENTIFIED WITH THE LOAD WHICH IT IS CARRYING (E.G. "SIGNALS OR "LUMINAIRE NUMBERS"). ALL CIRCUIT BREAKERS SHALL BE CLEARLY MARKED IN A MANNER THAT WILL NOT DETERIORATE WITH MOISTURE OR AGE.
- SHORT CIRCUIT RATING - 10,000 AIC SYMMETRICAL.
- PROVIDE CLEARANCE TO INSTALL OR REMOVE THE PHOTOELECTRIC CONTROL CELL.
- THE PHOTOELECTRIC CONTROL LENS SHALL BE ORIENTED TO ELIMINATE INTERFERENCE BY MANMADE LIGHT SOURCES. THE PHOTOELECTRIC CONTROL LENSES SHALL NORMALLY FACE NORTH AND EAST.
- ALL CONDUIT ENTERING THE FOUNDATION SHALL BE SEALED WITH AN APPROVED DUCT SEALER.
- THE SERVICE CABINET SHALL BE U.L. LISTED AND LABELED AS "SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT" AND APPROVED FOR OUTDOOR USE.
- THE SERVICE CABINET SHALL BE WELDED TO THE BASE IN ACCORDANCE WITH U.L. STANDARDS.
- SEE THE INTERSECTION LAYOUT FOR THE REQUIRED NUMBER OF LUMINAIRES AT THIS INTERSECTION.
- EACH BASE GASKET SHALL CONSIST OF:
 - FOUR (4) STRIPS, SIZED TO FIT BASE
 - INCLUDE CORNER HOLE/SLOTS TO ACCOMMODATE THE 0.75 INCH ANCHOR RODS
 - GASKET MATERIAL 0.5 INCH THICK SOLID BUTYL RUBBER
 - PROVIDE 0.5 INCH GAP FOR WATER DRAINAGE
- UNISTRUT RAILS (#A400EA OR EQUIVALENT) USED FOR SHELF SUPPORTS FOR (3) ADJUSTABLE REMOVABLE SHELVES SHALL BE MOUNTED TO THE SIDES OF THE CABINET.
- THE 19" RACK IN THE BASE OF THE CABINET SHALL BE CONSTRUCTED TO TIA/EIA 310D STANDARDS.

NOTE: BACKUP BATTERIES/INVERTER ARE REQUIRED WITHIN THE SCOPE OF THIS PROJECT.

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

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Certified By: *John M. Gray* Lic. No. 22457
 Printed Name: JOHN M. GRAY Date: 03/30/2020

SHERBURNE COUNTY, MN
C.S.A.H. 12
RECONSTRUCTION
 S.A.P. 071-612-008, S.A.P. 204-020-006

TRAFFIC SIGNAL SYSTEM
 SERVICE CABINET DETAILS
 CSAH 12 AT CSAH 13/TWIN LAKES ROAD NW

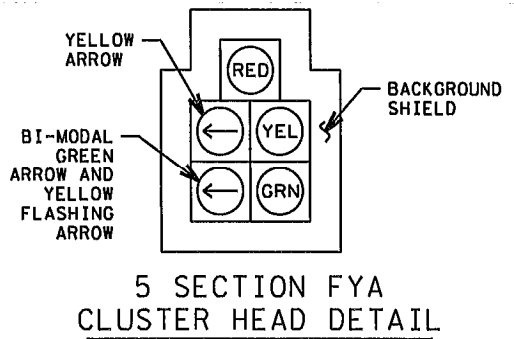
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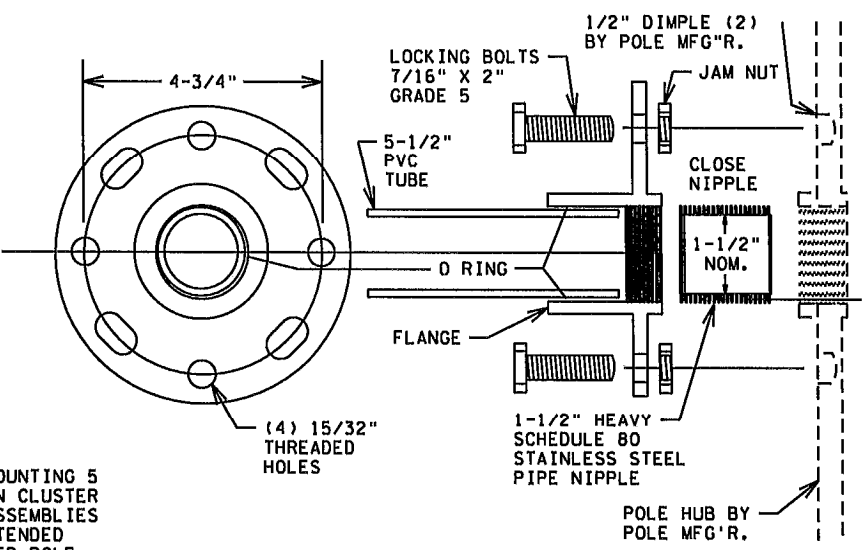
6/8/2020

mbemis

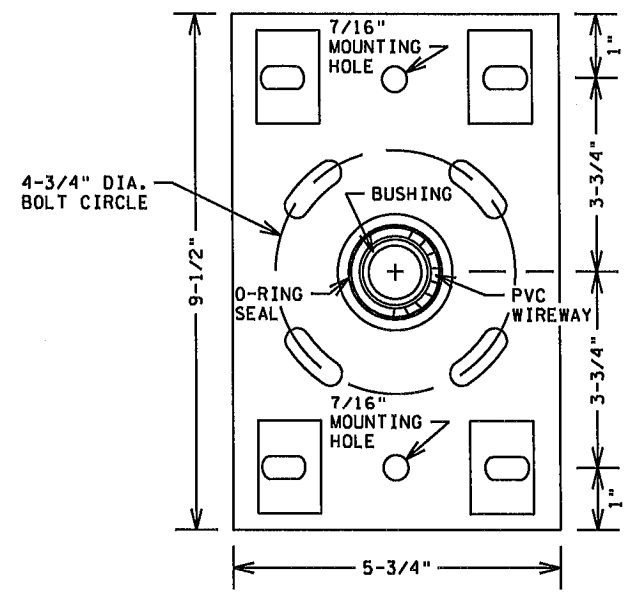
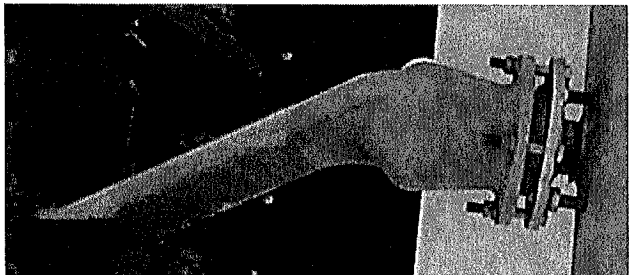
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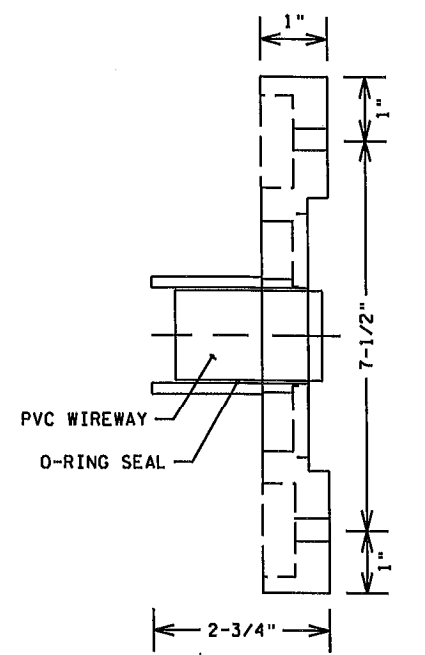
5 SECTION FYA CLUSTER HEAD DETAIL



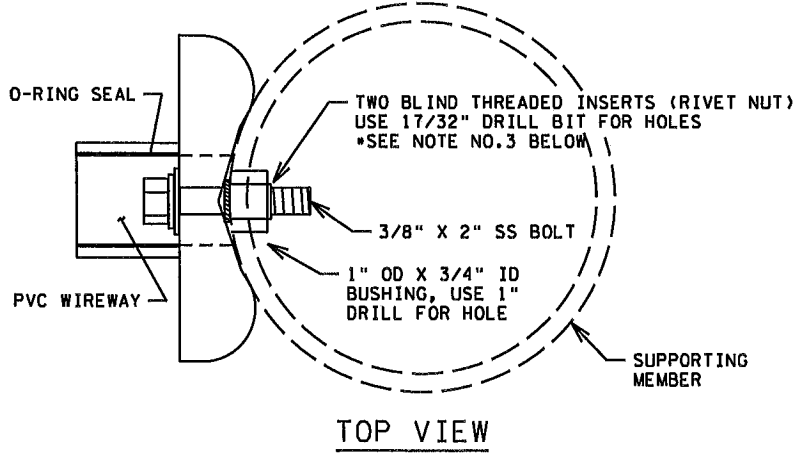
THREADED HUB AND FLANGE POLE ADAPTOR



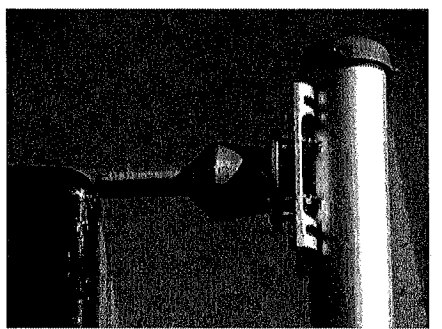
BOLT ON HUB & FLANGE



SIDE VIEW

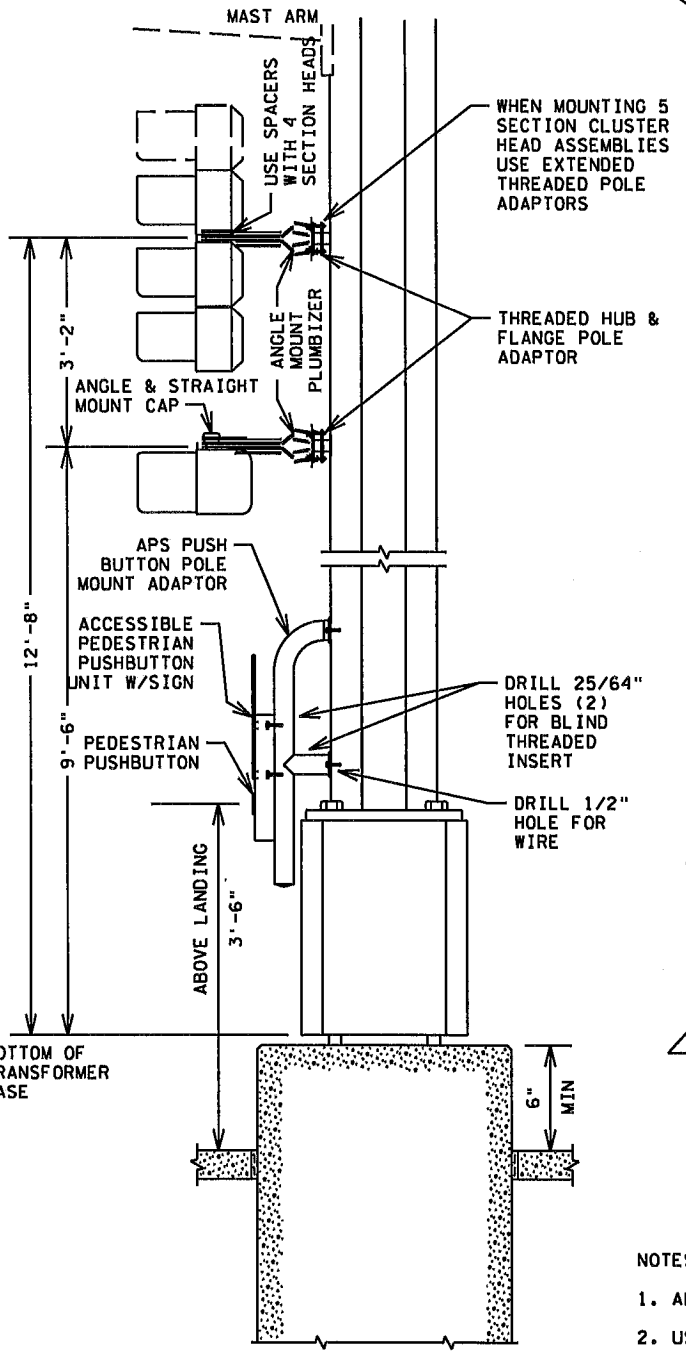


TOP VIEW

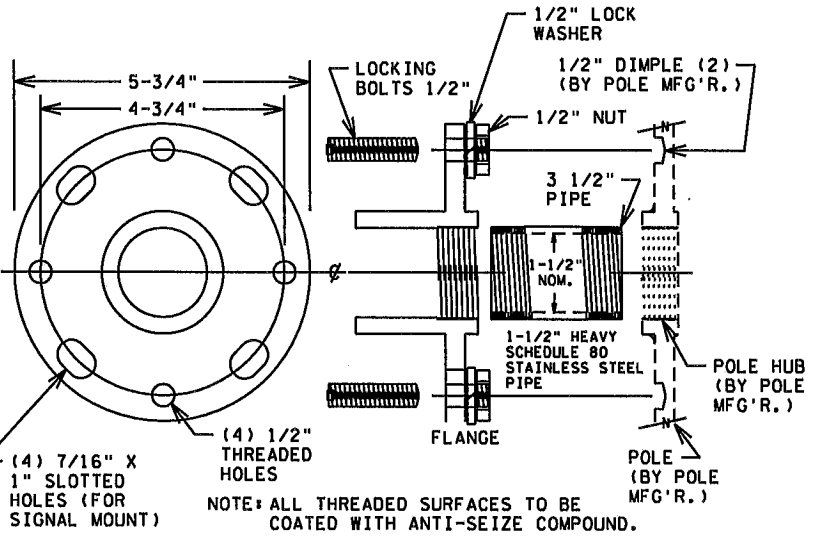


NOTES:

1. ALL THREADED SURFACES TO BE COATED WITH ANTI-SEIZE COMPOUND.
2. USE SIGNAL HEAD MOUNTED SPACERS FOR 4 SECTION POLY HEADS.
3. BLIND THREADED INSERTS (RIVET NUT) MUST BE INSERTED USING MANUFACTURERS SPECIFIC INSERTION TOOL. NO OTHER METHOD IS ACCEPTABLE.
4. SEE STANDARD PLATE NUMBER 8122 FOR ADDITIONAL PEDESTAL POLE DETAILS.



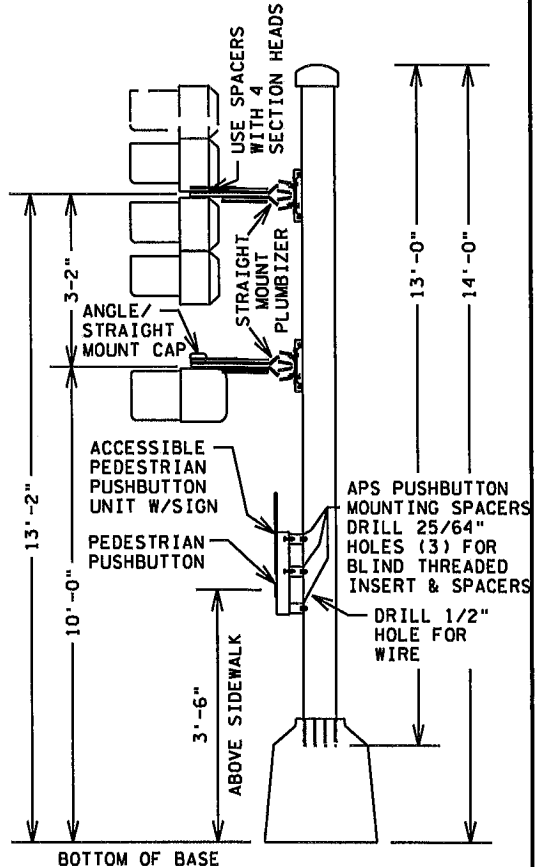
TYPICAL SIGNAL POLE MOUNTING NOT TO SCALE



EXTENDED THREADED POLE ADAPTER

NOTES:

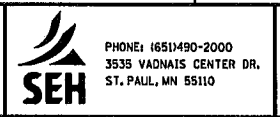
1. ALL THREADED SURFACES TO BE COATED WITH ANTI-SEIZE COMPOUND.
2. USE SIGNAL HEAD MOUNTED SPACERS FOR 4 SECTION POLY HEADS.
3. SEE STANDARD PLATE NUMBER 8123 FOR ADDITIONAL SIGNAL POLE DETAILS.
4. EXTENDED THREADED POLE ADAPTOR ONLY USED WITH 5 SECTION CLUSTER HEADS.



TYPICAL PEDESTAL MOUNTING NOT TO SCALE

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

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Certified By: *John M. Gray* Lico. No. 22457
Printed Name: JOHN M. GRAY Date: 03/30/2020



SHERBURNE COUNTY, MN
C.S.A.H. 12
RECONSTRUCTION
S.A.P. 071-612-008, S.A.P. 204-020-006

TRAFFIC SIGNAL SYSTEM
POLE MOUNTING DETAILS
CSAH 12 AT CSAH 13/TWIN LAKES ROAD NW

FILE NO. SHERB151615
SGL 4 OF SGL13

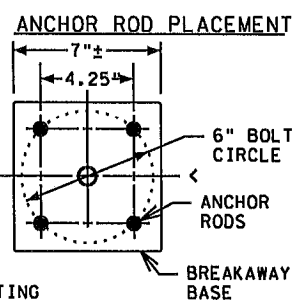
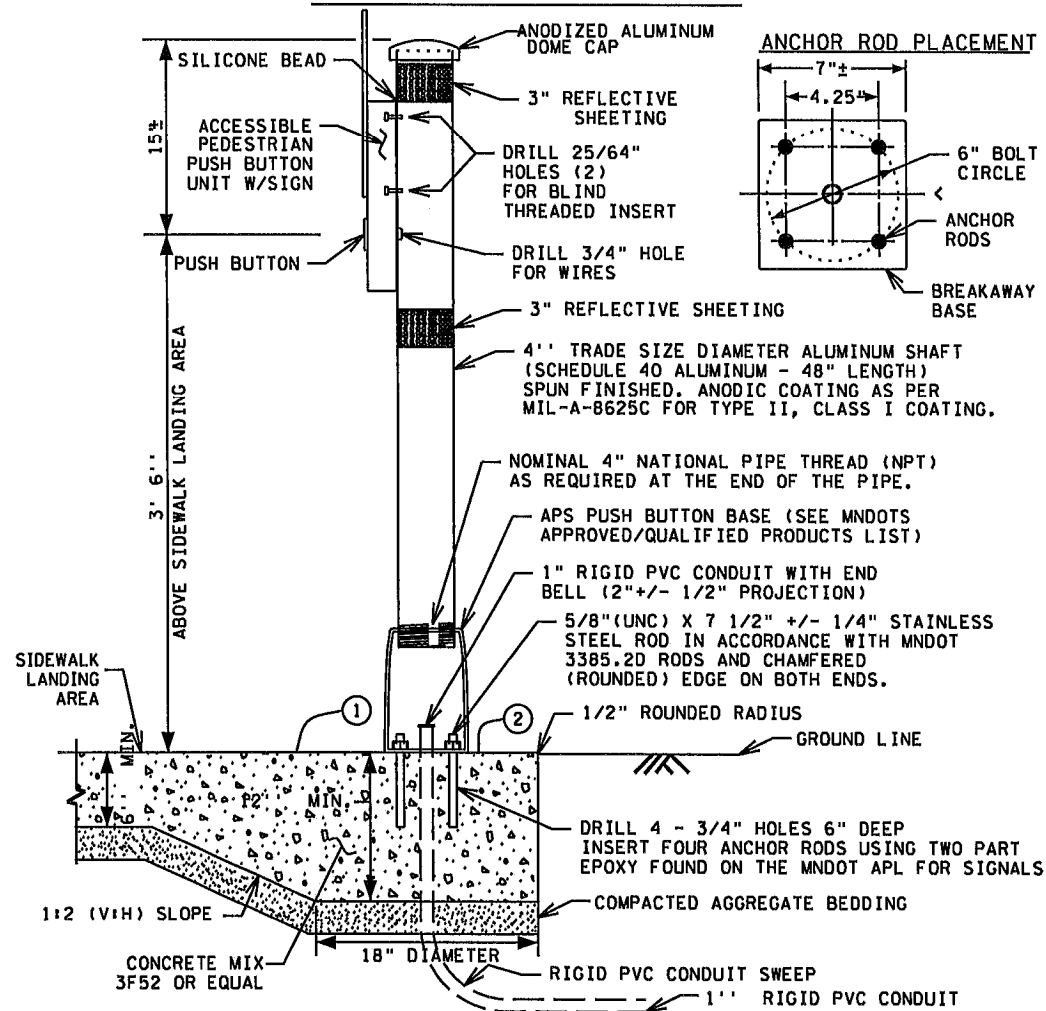
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FILE: S:\PT\Sherb\Common\CSAH 12-13 Signal\Signal\Plansheets\VCSAH12-13.sgl.dgn
MODEL: SMODEL

APS PUSH BUTTON STATION



NOTES:

PLACEMENT AND ORIENTATION OF THE PUSH BUTTON STATION IS CRITICAL. MOUNT THE BUTTON SO THAT THE FACE IS PARALLEL WITH THE ASSOCIATED CROSSWALK. SCREW IN SHAFT TO A TIGHTENED POSITION BEFORE MOUNTING ACCESSIBLE PEDESTRIAN PUSH BUTTON UNIT TO THE SHAFT.

ORIENT ACCESS OPENING ON THE BREAKAWAY PEDESTAL DIRECTLY BELOW THE APS BUTTON.

PLUMB THE PUSH BUTTON STATION WITH LEVELING SHIMS IN ACCORDANCE WITH STANDARD PLATE 8129.

INSTALL BLIND THREADED INSERTS USING MANUFACTURER'S SPECIFIC INSERTION TOOL.

USE ZINC PLATED STEEL 1/4 - 20 UNC BLIND THREADED INSERTS SUITABLE FOR MOUNTING ON SURFACE WALL THICKNESS OF .337. APPROVED BLIND INSERTS ARE LISTED ON MNDOT'S APPROVED/QUALITY PRODUCTS LIST WEBSITE FOR TRAFFIC SIGNALS.

USE APS 1/4 - 20 STAINLESS STEEL MOUNTING BOLTS. APPLY BRUSH ON ANTI SEIZE COMPOUND TO BOLTS PRIOR TO ASSEMBLY.

APPLY A BEAD OF 100% SILICONE SEALANT ALONG THE TOP OF THE PUSH BUTTON UNIT WHERE IT COMES IN CONTACT WITH THE 4" SHAFT.

USE WHITE REFLECTIVE SHEETING AT INTERSECTION CORNERS AND YELLOW REFLECTIVE SHEETING IN CENTER MEDIANS. APPROVED TUBE DELINEATOR SHEETING IS LISTED ON MNDOT'S APPROVED/QUALIFIED PRODUCTS LIST WEBSITE FOR SIGNING.

AN 18" X 6" FIBER FORMING TUBE MAY BE USED FOR THE LOWER HALF OF THE FOUNDATION WHEN CONDITIONS DO NOT ALLOW FOR THE 18" X 6" HOLE TO STAND OPEN.

1 THE PUSH BUTTON STATION FOUNDATION IS MONOLITHIC (POURED AT ONE TIME) WITH THE SIDEWALK. PROVIDE A 1:2 (V:H) SLOPE GRADE WHERE THE 6" MIN SIDEWALK DEPTH TRANSITIONS TO THE 12" MIN FOUNDATION DEPTH. MAINTAIN THE COMPACTED AGGREGATE BEDDING AND THICKNESS USED FOR THE SIDEWALK THROUGHOUT THE SLOPE AND FOUNDATION GRADING. PROVIDE 1:2 (V:H) SLOPE GRADING 360 DEGREES FOR THE TRANSITION FROM THE SIDEWALK TO THE FOUNDATION WHEN THE FOUNDATION IS NOT LOCATED NEAR EDGE OF SIDEWALK AND IS SURROUNDED BY CONCRETE WALK.

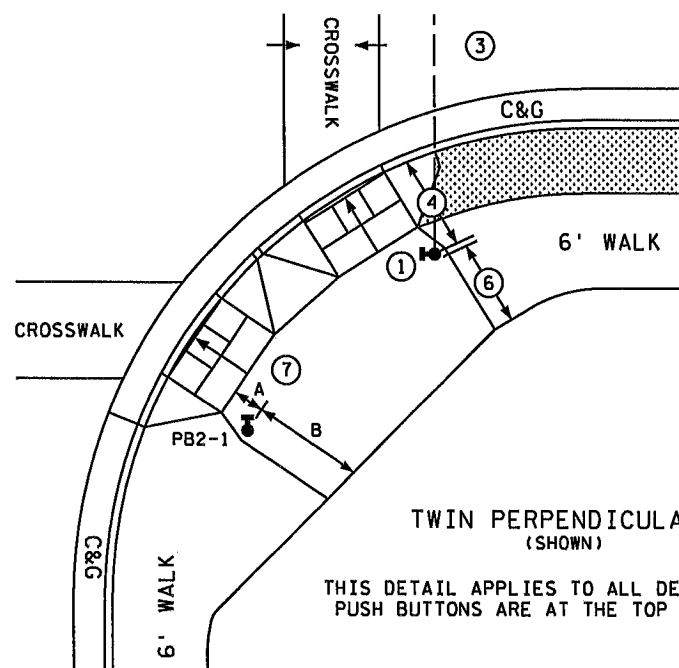
2 ENSURE CONCRETE CONTROL JOINTS AND EDGE OF CONCRETE WALK ARE A MINIMUM 9" FROM THE CENTER OF THE PUSH BUTTON FOUNDATION.

TYPICAL APS PEDESTRIAN PUSH BUTTON LOCATION

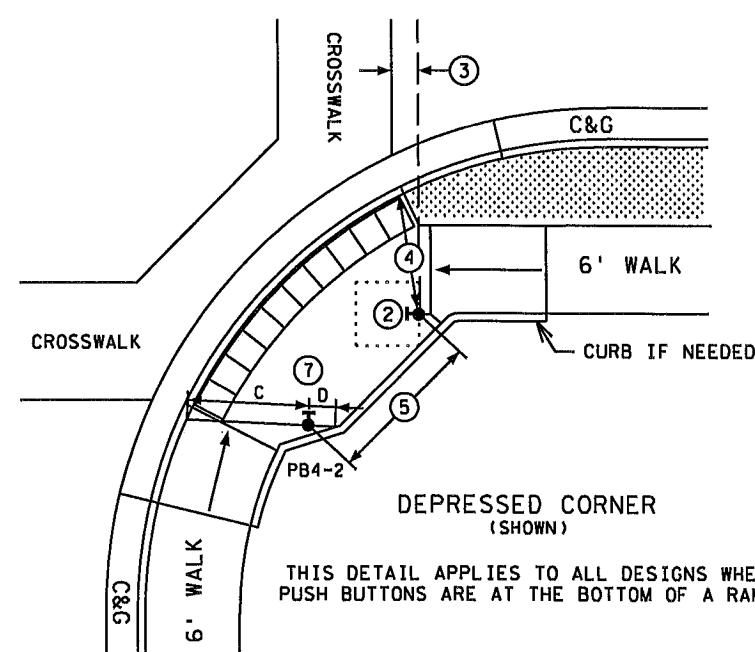
THIS IS A GENERAL DETAIL INTENDED TO SHOW THE REQUIREMENTS OF APS PUSH BUTTON LOCATION. FOR PROJECT SPECIFIC INFORMATION REGARDING PEDESTRIAN RAMP LAYOUT AND PUSH BUTTON LOCATIONS, SEE THE PLAN.

SUPPLEMENTAL GUIDANCE FOR CONSTRUCTING COMPLIANT APS PUSH BUTTONS:

- 1 THE FACE OF THE BUTTON SHALL BE PARALLEL WITH THE OUTSIDE EDGE OF CROSSWALK.
- 2 A MINIMUM 4 FT X 4 FT LANDING AREA SHALL BE PROVIDED ADJACENT TO EACH BUTTON, WITH A 2 PERCENT MAXIMUM SLOPE IN ALL DIRECTIONS.
- 3 BUTTONS SHALL BE WITHIN 5 FT OF THE OUTSIDE EDGE OF THE CROSSWALK.
- 4 BUTTONS SHALL BE BETWEEN 1.5 FT AND 10 FT FROM THE BACK OF CURB OR EDGE OF ROADWAY, MEASURED IN THE DIRECTION OF TRAVEL. STANDALONE PUSH BUTTON STATIONS SHOULD BE 4' MINIMUM FROM THE BACK OF CURB TO AVOID KNOCKDOWNS.
- 5 BUTTONS MINIMUM 10 FT APART.
- 6 PROVIDE A MAINTENANCE ACCESS ROUTE (MAR) WHEREVER POSSIBLE FOR SNOW REMOVAL PURPOSES. A MAR REQUIRES A 6 FT MINIMUM CLEAR DISTANCE BETWEEN A PUSH BUTTON AND ANY OBSTRUCTIONS, INCLUDING BUILDINGS, V-CURB, ELECTRICAL FOUNDATIONS, SIGNAL CABINETS, OR ANOTHER PUSH BUTTON.
- 7 BUTTON SHOULD BE 2 FT MINIMUM FROM RAMP GRADE BREAK AND BACK OF WALK.



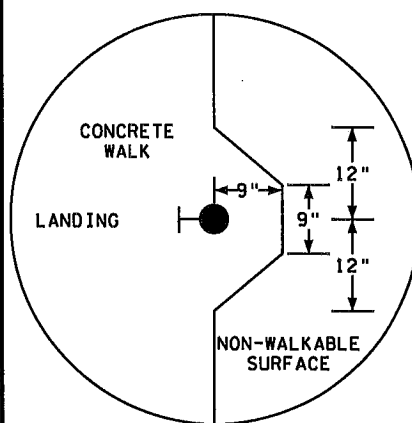
THIS DETAIL APPLIES TO ALL DESIGNS WHEN PUSH BUTTONS ARE AT THE TOP OF A RAMP



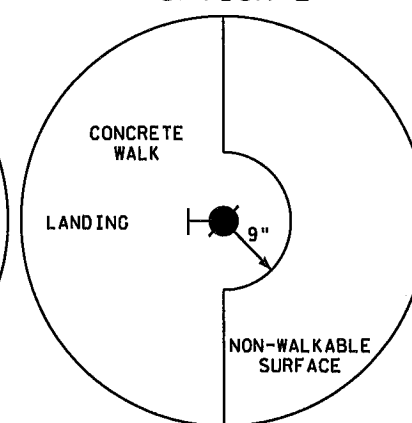
THIS DETAIL APPLIES TO ALL DESIGNS WHEN PUSH BUTTONS ARE AT THE BOTTOM OF A RAMP

CONTRACTOR MUST USE OPTION 1 OR 2 WHEN THE APS PUSH BUTTON IS SHOWN AT THE EDGE OF WALK. OPTION USED (OR SELECTED) MUST BE THE SAME THROUGHOUT THE ENTIRE PROJECT.

OPTION 1



OPTION 2



SIGNAL NO.	X	Y	DISTANCE TO FRONT OF LANDING (FT)	DISTANCE TO BACK OF LANDING (FT)
PB2-1	-	-	A	B
PB4-2	-	-	C	D

- A - DISTANCE MEASURED FROM THE PUSH BUTTON TO THE FRONT OF LANDING/TOP OF RAMP
- B - CLEAR DISTANCE MEASURED FROM THE PUSH BUTTON TO THE BACK OF LANDING/EDGE OF WALK
- C - CLEAR DISTANCE MEASURED FROM THE PUSH BUTTON TO THE OUTSIDE EDGE OF DOMES IN THE DIRECTION OF TRAVEL
- D - CLEAR DISTANCE FROM THE PUSH BUTTON TO THE BACK OF LANDING MEASURED IN THE OPPOSITE DIRECTION OF TRAVEL

DESIGN TEAM			
DRAWN BY:	MRB		
DESIGNER:	JMG		
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: 03/30/2020

SEH
 PHONE: (651)490-2000
 3535 VADNAIS CENTER DR.
 ST. PAUL, MN 55110

SHERBURNE COUNTY, MN
C.S.A.H. 12
RECONSTRUCTION
 S.A.P. 071-612-008, S.A.P. 204-020-006

TRAFFIC SIGNAL SYSTEM
 APS PUSH BUTTON STATION DETAILS
 CSAH 12 AT CSAH 13/TWIN LAKES ROAD NW

FILE NO.
 SHERB151615
SGL5
 OF SGL13

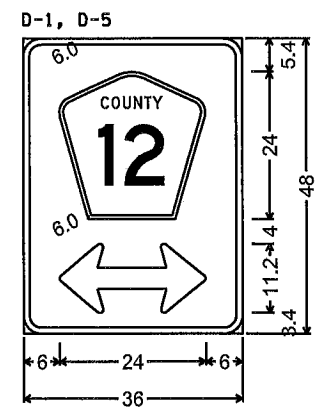
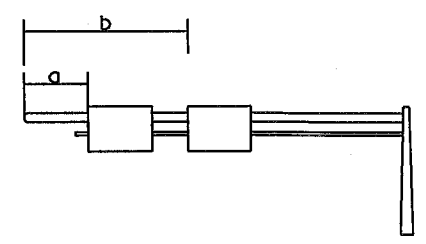
SIGNS FOR TRAFFIC SIGNAL SYSTEM									
SIGN PANELS - TYPE D (SIGNALS) (F & I)									
SIGN PANEL	POLE NO.	a (FT)	b (FT)	SIZE (IN) (1)	MOUNTING BRACKET		AREA/SIGN (SQ FT)	QTY	PANEL LEGEND
					QUANTITY	SPACING			
D-1	1	4'	-	36 x 48	2	-	12.00	1	COUNTY 12 W/ DOUBLE ARROW
D-2	1	-	18'	96 x 24	4	-	16.00	1	181ST AVE NW
D-3	2	-	16'	36 x 48	2	-	12.00	1	COUNTY 13 W/ LEFT ARROW
D-4	2	-	28'	144 x 24	5	-	24.00	1	TWIN LAKES RD NW
D-5	3	-	16'	36 x 48	2	-	12.00	1	COUNTY 12 W/ DOUBLE ARROW
D-6	3	-	28'	96 x 24	4	-	16.00	1	181ST AVE NW
D-7	4	-	16'	36 x 48	2	-	12.00	1	COUNTY 13 W/ RIGHT ARROW
D-8	4	-	28'	144 x 24	5	-	24.00	1	TWIN LAKES RD NW
TOTAL QUANTITIES							128.00	8	

SIGNS FOR TRAFFIC SIGNAL SYSTEM									
SIGN PANELS - TYPE C (SIGNALS) (F & I)									
SIGN PANEL	POLE NO.	a (FT)	b (FT)	SIZE (IN) (1)	MOUNTING BRACKET		AREA/SIGN (SQ FT)	QTY	PANEL LEGEND
					QUANTITY	SPACING			
R10-X12	2,3,4	1'	-	42 x 48	2	-	14.00	3	LEFT TURN YIELD ON FLASHING YELLOW ARROW
R10-X12	5	-	-	42 x 48	①	-	14.00	1	LEFT TURN YIELD ON FLASHING YELLOW ARROW
TOTAL QUANTITIES							56.00	4	

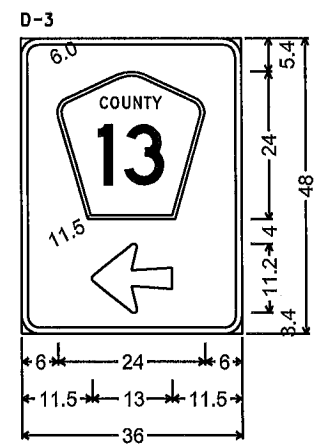
OVERLAYS				
CODE NO.	QTY	SIZE (IN)	LEGEND	SQ. FT. PER OVERLAY
M1-6A	2	24 x 24	COUNTY 12	4.00
M1-6A	2	24 x 24	COUNTY 13	4.00

- SIGNING NOTES:**
- COLOR FOR ALL TYPE D SIGNS SHALL BE WHITE LEGEND AND BORDER ON GREEN BACKGROUND, FULLY REFLECTORIZED.
 - CORNERS OF STANDARD SIGN PANELS WITH MARGINS SHALL BE TRIMMED.
 - SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL FOR ARROW AND OVERLAY DETAILS.
 - SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL FOR DETAILED DRAWINGS OF TYPE C SIGN PANELS.
 - FURNISHING AND INSTALLING NEW TYPE C AND TYPE D SIGN PANELS FOR THE NEW TRAFFIC SIGNAL SYSTEM SHALL BE INCLUDED AS PART OF THE PAY ITEM FOR ITEM NO. 2565 (TRAFFIC CONTROL SIGNAL SYSTEM).
 - ALL NEW MAST ARM AND POLE MOUNTED SIGNS SHALL BE FABRICATED USING TYPE XI SHEETING.
 - FOR STRUCTURAL DETAILS OF MAST ARM MOUNTED SIGNS, SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL, PAGE 105A, AND SPECIAL PROVISIONS.
 - DIMENSIONS ARE IN INCHES.
 - ① = MOUNT R10-X12 SIGN ON MAST ARM POLE 5 (JUST BELOW MAST ARMS).

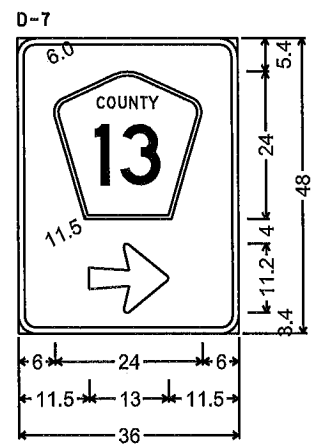
MAST ARM SIGN LOCATION



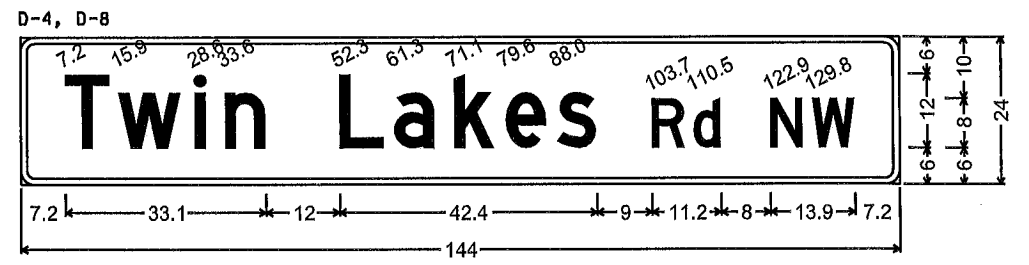
3.0" Radius, 1.0" Border, White on, Green;
Pentagonal County 12 M1-6a;
Double Headed Arrow 5 - 24.0" 0';



3.0" Radius, 1.0" Border, White on, Green;
Pentagonal County 13 M1-6a;
Arrow 5 - 13.0" 180';



3.0" Radius, 1.0" Border, White on, Green;
Pentagonal County 13 M1-6a;
Arrow 5 - 13.0" 0';



2.3" Radius, 1.0" Border, White on, Green;
"Twin Lakes Rd NW", D;



2.3" Radius, 1.0" Border, White on, Green;
"181st Ave NW", D;

DESIGN TEAM			
DRAWN BY:	MRB		
DESIGNER:	JMG		
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: 03/30/2020



SHERBURNE COUNTY, MN
C.S.A.H. 12
RECONSTRUCTION
S.A.P. 071-612-008, S.A.P. 204-020-006

TRAFFIC SIGNAL SYSTEM
SIGNAL SIGN PANEL DETAILS
CSAH 12 AT CSAH 13/TWIN LAKES ROAD NW

FILE NO. SHERBISIG15
SGL 6 OF SGL13

LOOP DETECTOR CHART

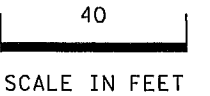
NUMBER	SIZE (FT)	LOCATION
D1-1, D5-1	2-6x6	20' & 50'
D1-2, D5-2	2-6x6	5' & 35'
D3-1, D3-3, D7-1	2-6x6	20' & 50'
D3-2, D3-4, D7-2	2-6x6	5' & 35'
D2-1, D2-2	6x6	250'
D4-1, D4-2	6x6	250'
D4-3, D4-4	2-6x6	5' & 20'
D6-1, D6-2	6x6	250'
D8-1, D8-2	6x6	250'
D8-3, D8-4, D8-5	2-6x6	5' & 20'

- ALL LOOP DETECTORS SHALL BE PVC.
- LOCATION DISTANCE FROM CROSSWALK TO FRONT OF LOOP DETECTOR.

**MATCHLINE TWIN LAKES RD NW
SEE SHEET #SGL9#**

F&I APS PB STATION (SEE DETAILS)
1-APS PB AND SIGN (LT ARROW)(PB4-1)
EXTEND INTO HH14:
1" CONDUIT
1-2/C 14
1-1/C 6 (INS. GR.)

F&I APS PB STATION (SEE DETAILS)
1-APS PB AND SIGN (RT ARROW)(PB6-2)
EXTEND INTO HH15:
1" CONDUIT
1-2/C 14
1-1/C 6 (INS. GR.)



2-3" CONDUITS
3-12/C 14
1-3/C 14
1-2/C 14
1-3/C 20
1-3/C 14 (LUM)
1-1/C 6 (GRD)

INPLACE LUMINAIRE & POLE
(TO BE REMOVED BY ERMU)

2-3" CONDUITS
3-12/C 14
1-3/C 14
1-2/C 14
1-3/C 20
1-3/C 14 (LUM)
1-1/C 6 (GRD)

F&I APS PB STATION (SEE DETAILS)
1-APS PB AND SIGN (LT ARROW)(PB6-1)
EXTEND INTO HH18:
1" CONDUIT
1-2/C 14
1-1/C 6 (INS. GR.)

F&I APS PB STATION (SEE DETAILS)
1-APS PB AND SIGN (RT ARROW)(PB8-2)
EXTEND INTO HH1:
1" CONDUIT
1-2/C 14
1-1/C 6 (INS. GR.)

2-3" CONDUITS
4-12/C 14
1-3/C 14
4-2/C 14
1-3/C 20
1-3/C 14 (LUM)
1-1/C 6 (GRD)

3-3" CONDUITS
6-12/C 14
2-3/C 14
14-2/C 14
4-3/C 20
2-3/C 14 (LUM)
1-1/C 6 (GRD)

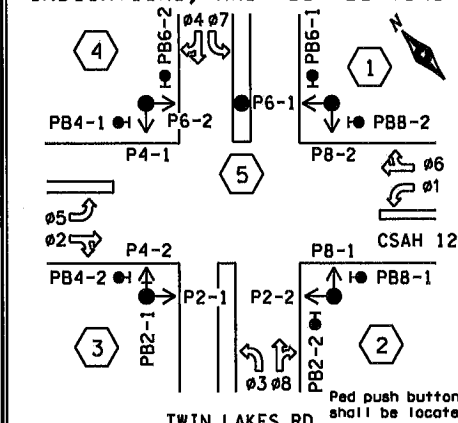
2" CONDUIT
2-2/C 14

FO HH 101 TO FO HH 100
(**) 2-1.5" CONDUITS
(BLUE/ORANGE)
(**) 1-288 SM FO CABLE
(**) 1-1/C 10 (TRACER)

MATCHLINE CSAH 12
STA. 33+00 SEE SHEET #SGL11#

MATCHLINE CSAH 12
STA. 33+00 SEE SHEET #SGL9#

CONTROLLER PHASING, PEDESTRIAN INDICATIONS, AND PUSH BUTTONS



SIGNAL SYSTEM OPERATIONS:
SIGNAL SYSTEM FLASH MODE SHALL BE ALL RED.
NORMAL OPERATION SHALL BE 8 PHASE, WITH PHASES 1, 3, 5, 7 BEING FLASHING YELLOW ARROW SEQUENCING SELECTABLE BY TOD PROGRAMS.
VEHICLE SIGNAL PHASES 2 AND 6 SHALL OPERATE ON RECALL.

(B) INPLACE WOOD POLE (ERMU)(SOP)
F&I 2" CONDUIT RISER AND WEATHERHEAD
3-1/C 2
EXTEND TO SERVICE CABINET:
2" CONDUIT
3-1/C 2

SIGNAL HEAD CHART

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

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

FILE: S:\PT\5\Sherb\Common\CSAH 12-13 Signal\SignalPlansheets\CSAH12-13.sgl.dgn
MODEL: #MODEL#

DESIGN TEAM

DRAWN BY:	MRR
DESIGNER:	JMG
CHECKED BY:	JMG

REVISIONS

NO.	BY	DATE

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: 03/30/2020



SHERBURNE COUNTY, MN
**C.S.A.H. 12
RECONSTRUCTION**
S.A.P. 071-612-008, S.A.P. 204-020-006

**TRAFFIC SIGNAL SYSTEM
INTERSECTION LAYOUT**
CSAH 12 AT CSAH 13/TWIN LAKES ROAD NW

FILE NO.
SHERB51615
SGL 7
OF SGL13

NOTES:

- 1) THE EXACT LOCATION OF HANDHOLES, POLES, PUSH BUTTON STATIONS, LOOP DETECTORS, AND EQUIPMENT PAD WILL BE VERIFIED IN THE FIELD BY THE ENGINEER.
- 2) SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS.
- 3) THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE NEW SIGNAL SYSTEM.
- 4) A 3/4 INCH HALF COUPLING, 3/4 INCH PIPE NIPPLE AND CONDUIT OUTLET BODY SHALL BE LOCATED 6' FROM END OF EACH MAST ARM (FOR EVP).
- 5) THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD. CONDUITS UNDER EXISTING ROADWAYS WILL REQUIRE BORING.
- 6) FOR TYPE D SIGNS, SEE DETAIL SHEET. ALL TYPE C AND TYPE D SIGNS REQUIRED FOR SIGNAL SYSTEM ARE INCIDENTAL.
- 7) FOR CONSTRUCTION OF PEDESTRIAN CURB RAMPS AND CONCRETE WALK, SEE DETAIL SHEETS.
- 8) USE PVC OR HDPE FOR ALL NEW CONDUIT. CONDUIT SIZES ARE NOMINAL DIAMETER.
- 9) ALL WIRES LISTED ARE AWG (AMERICAN WIRE GAUGE).
- 10) ITEMS DENOTED WITH AN (*) ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
- 11) ITEMS DENOTED WITH AN (**) ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM.
- 12) FOR PAVEMENT MARKINGS, SEE DETAIL SHEETS. PAVEMENT MARKINGS WILL BE MEASURED AND PAID FOR SEPARATELY.
- 13) ALL POLE MOUNTED VEHICLE AND PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED USING ONE-WAY SIGNAL HEAD MOUNTS.
- 14) EACH FIBER OPTIC SPLICE VAULT SHALL BE 30" x 48" (48" DEEP) OPEN BOTTOM WITH ONE PIECE HIGH STRENGTH POLYMER COVER PER MNDOT APPROVED/QUALIFIED PRODUCTS LIST & SPECIAL PROVISIONS.

① F&I PA100 POLE FOUNDATION
 TYPE PA100-A-40-D40-9 (DAVIT AT 350 DEG)
 LUMINAIRE-LED (FOR 40' MOUNTING HEIGHT)
 1-ANGLE MOUNT SIGNAL OVERHEAD AT 0 DEG
 1-STRAIGHT MOUNT SIGNAL-OVERHEAD AT 11'
 FROM END OF MAST ARM
 2-ANGLE MOUNT SIGNALS-POLE MOUNTED 90/180 DEG
 2-SETS CD PED HEADS-POLE MOUNTED (ANGLE MOUNT)
 AT 90/180 DEG
 2-TYPE D SIGNS (D-1, 2) (SEE SIGN DETAILS)
 (*) ONE WAY EVP DETECTOR, CONFIRMATION LIGHT
 AND EVP MOUNTING HARDWARE (#8,3)
 EXTEND INTO HH 18:
 3" CONDUIT
 3-12/C 14
 (*) 1-3/C 14
 (*) 1-3/C 20
 1-3/C 14 (LUM)
 1-1/C 6 (INS. GR.)

② F&I PA100 POLE FOUNDATION
 TYPE PA100-A-55-D40-9 (DAVIT AT 270 DEG)
 LUMINAIRE-LED (FOR 40' MOUNTING HEIGHT)
 1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'
 2-STRAIGHT MOUNT SIGNALS-OVERHEAD AT 11' AND 23'
 FROM END OF MAST ARM
 2-ANGLE MOUNT SIGNALS-POLE MOUNTED 90/180 DEG
 2-SETS CD PED HEADS-POLE MOUNTED (ANGLE MOUNT)
 AT 90/180 DEG
 2-TYPE D SIGNS (D-3, 4) (SEE SIGN DETAILS)
 R10-X12 SIGN PANEL-ADJACENT TO 5-1
 (*) ONE WAY EVP DETECTOR, CONFIRMATION LIGHT
 AND EVP MOUNTING HARDWARE (#2,5)
 EXTEND INTO HH 4:
 3" CONDUIT
 3-12/C 14
 (*) 1-3/C 14
 (*) 1-3/C 20
 1-3/C 14 (LUM)
 1-1/C 6 (INS. GR.)

③ F&I PA100 POLE FOUNDATION
 TYPE PA100-A-45-D40-9 (DAVIT AT 350 DEG)
 LUMINAIRE-LED (FOR 40' MOUNTING HEIGHT)
 1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'
 2-STRAIGHT MOUNT SIGNALS-OVERHEAD AT 11' AND 23'
 FROM END OF MAST ARM
 2-ANGLE MOUNT SIGNALS-POLE MOUNTED 90/180 DEG
 2-SETS CD PED HEADS-POLE MOUNTED (ANGLE MOUNT)
 AT 90/180 DEG
 1-APS PB AND SIGN (LT ARROW) (PB2-1)
 1-APS MAST ARM POLE ADAPTOR
 2-TYPE D SIGNS (D-5, 6) (SEE SIGN DETAILS)
 R10-X12 SIGN PANEL-ADJACENT TO 7-1
 (*) ONE WAY EVP DETECTOR, CONFIRMATION LIGHT
 AND EVP MOUNTING HARDWARE (#4,7)
 EXTEND INTO HH 9:
 3" CONDUIT
 3-12/C 14
 (*) 1-3/C 14
 1-2/C 14
 (*) 1-3/C 20
 1-3/C 14 (LUM)
 1-1/C 6 (INS. GR.)

④ F&I PA100 POLE FOUNDATION
 TYPE PA100-A-45-D40-9 (DAVIT AT 350 DEG)
 LUMINAIRE-LED (FOR 40' MOUNTING HEIGHT)
 1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'
 2-STRAIGHT MOUNT SIGNALS-OVERHEAD AT 11' AND 23'
 FROM END OF MAST ARM
 2-ANGLE MOUNT SIGNALS-POLE MOUNTED 90/180 DEG
 2-SETS CD PED HEADS-POLE MOUNTED (ANGLE MOUNT)
 AT 90/180 DEG
 2-TYPE D SIGNS (D-7, 8) (SEE SIGN DETAILS)
 R10-X12 SIGN PANEL-ADJACENT TO 1-1
 (*) ONE WAY EVP DETECTOR, CONFIRMATION LIGHT
 AND EVP MOUNTING HARDWARE (#6,1)
 EXTEND INTO HH 14:
 3" CONDUIT
 3-12/C 14
 (*) 1-3/C 14
 (*) 1-3/C 20
 1-3/C 14 (LUM)
 1-1/C 6 (INS. GR.)

⑤ F&I PAB5 POLE FOUNDATION
 TYPE PAB5-AHST-4.5/4.5 203 (TEE POLE)
 2-ANGLE MOUNT SIGNALS-OVERHEAD AT 0/180 DEG
 R10-X12 SIGN PANEL-ON POLE BETWEEN HEADS
 EXTEND INTO HH 17:
 3" CONDUIT
 1-12/C 14
 1-1/C 6 (INS. GR.)

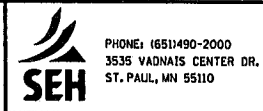
Ⓐ F&I EQUIPMENT PAD FOUNDATION (SEE DETAILS)
 INSTALL CONTROLLER AND CABINET
 (FURNISHED BY COUNTY)
 SIGNAL SERVICE CABINET (NON-SSB, WITH
 BATTERIES & INVERTER)
 GROUND WIRE AND GROUND ROD-MIN 8'
 FROM PAD
 SERVICE CABINET TO HH1:
 2" CONDUIT
 2-3/C 14 (LUM)
 SERVICE CABINET TO HH18:
 2" CONDUIT
 2-3/C 14 (LUM)
 SERVICE CABINET TO SOP POLE B:
 2" CONDUIT
 (SEE B NOTES)
 SERVICE CABINET TO EXTERNAL GR.RD
 1" CONDUIT
 1-1/C 6 INS.GR.
 CONTROLLER CABINET TO SERVICE CABINET:
 2" CONDUIT
 3-1/C 6
 STUB OUT 2-3" CONDUITS FROM
 CONTROLLER CABINET (CAP BOTH
 ENDS - FOR FUTURE USE)

F&I CONTROLLER CABINET TO HH1:
 3-3" CONDUITS
 6-12/C 14
 (*) 2-3/C 14
 16-2/C 14
 (*) 4-3/C 20
 1-1/C 6 (INS. GR.)
 CONTROLLER CABINET TO HH18:
 3-3" CONDUITS
 7-12/C 14
 (*) 2-3/C 14
 14-2/C 14
 (*) 2-3/C 20
 1-1/C 6 (INS. GR.)
 CONTROLLER CABINET TO SERVICE CABINET:
 2" CONDUIT
 1-6 PR. 19 (COMMS)
 CONTROLLER CABINET TO HH101:
 (*) 2" CONDUIT
 (*) 1-6 SM FO PIGTAIL
 CONTROLLER CABINET TO HH19:
 (*) 2" CONDUIT
 (*) 1-3/C 20
 (*) 1-1/C 6 (INS. GR.)

FO F&I (***) FIBER OPTIC SPLICE VAULT (HH101)
 EXTEND INTO CONTROLLER CABINET:
 (***) 2" CONDUIT
 (***) 1-6 SM FO PIGTAIL (SPLICE ENCLOSURE)
 (***) SPLICE 6 SM FO PIGTAIL TO 288 SM FO
 BRANCH CABLE

DESIGN TEAM			
DRAWN BY:	MRB		
DESIGNER:	JMG		
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: 03/30/2020



SHERBURNE COUNTY, MN
C.S.A.H. 12
RECONSTRUCTION
 S.A.P. 071-612-008, S.A.P. 204-020-006

TRAFFIC SIGNAL SYSTEM
 POLE AND CABINET NOTES
 CSAH 12 AT CSAH 13/TWIN LAKES ROAD NW

FILE NO. SHERB151615
SGL 8 OF SGL13

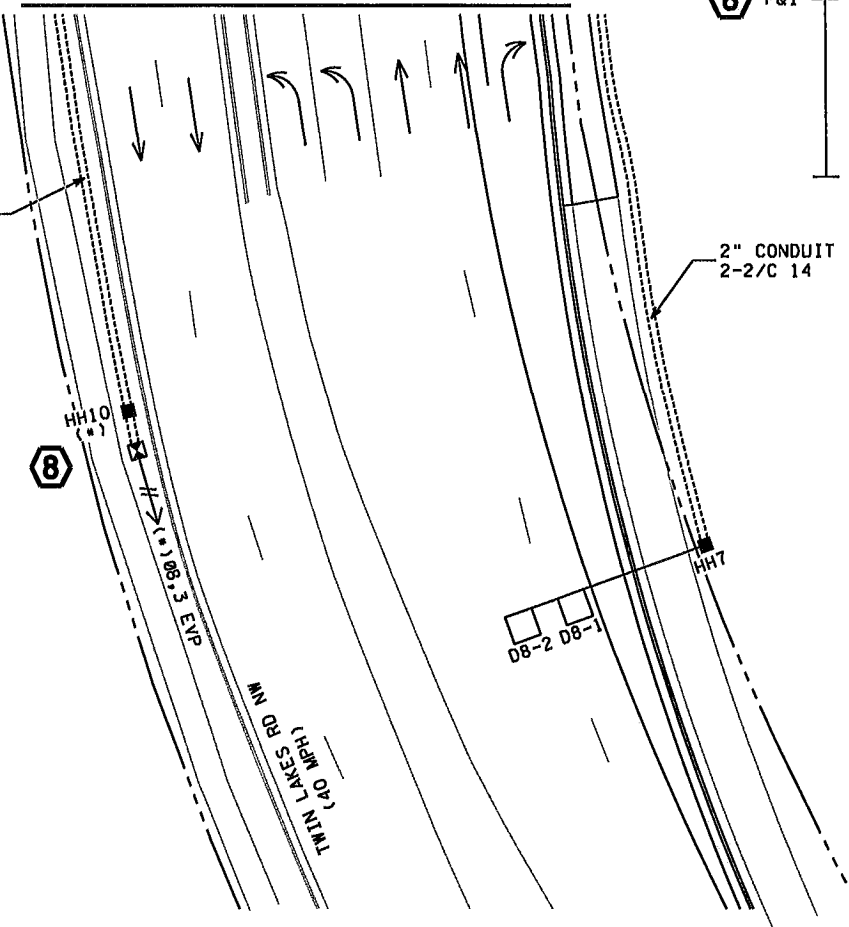
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6/8/2020

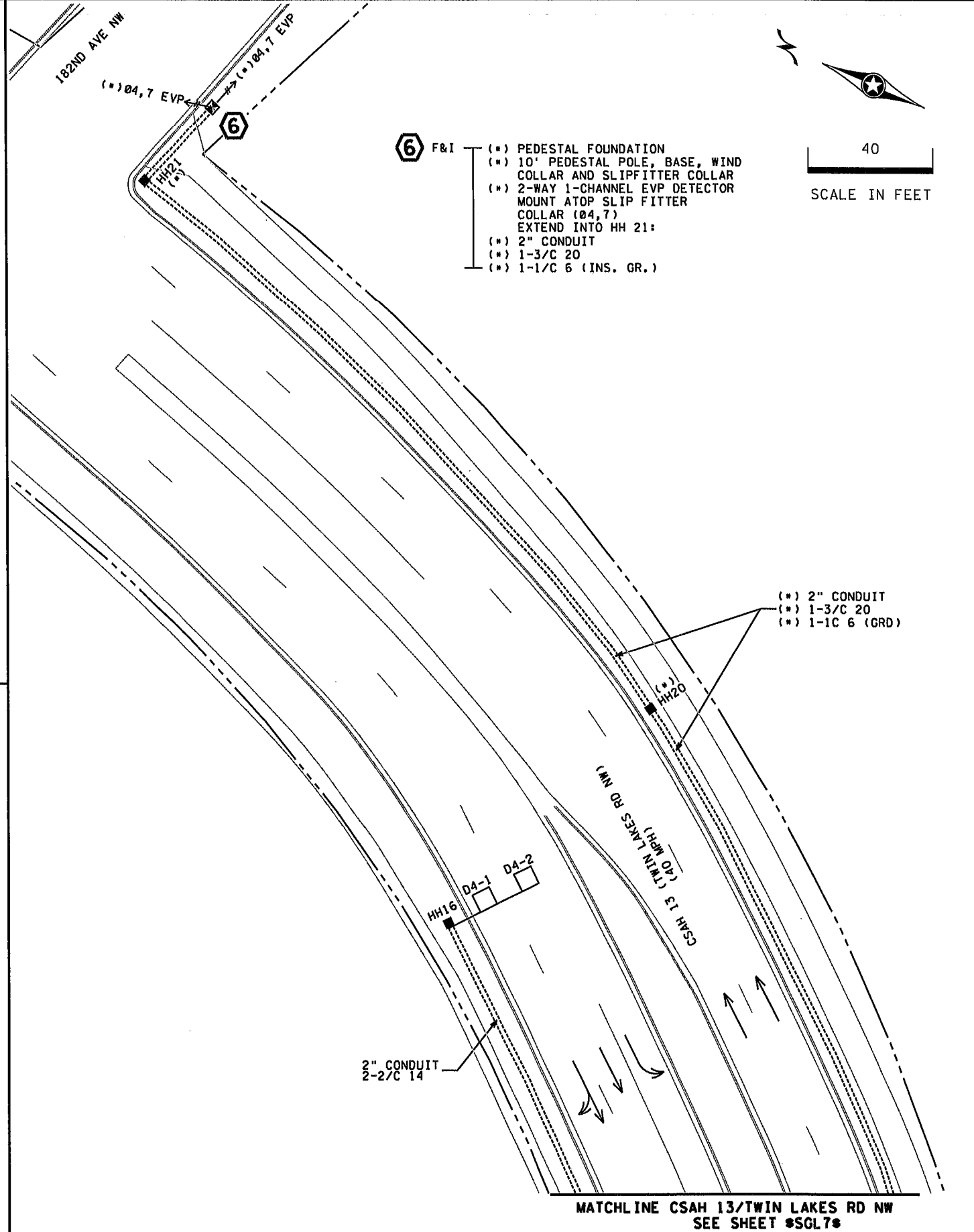
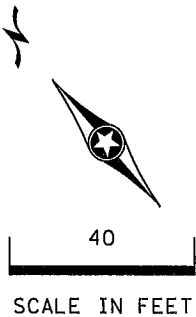
mbemis

MATCHLINE TWIN LAKES RD NW
SEE SHEET #SGL7*

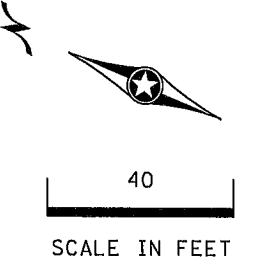
- (*) 2" CONDUIT
- (*) 1-3/C 20
- (*) 1-1/C 6 (GRD)



- 8 F&I
- (*) PEDESTAL FOUNDATION
 - (*) 10' PEDESTAL POLE, BASE, WIND COLLAR AND SLIPFITTER COLLAR
 - (*) 2-WAY 1-CHANNEL EVP DETECTOR MOUNT ATOP SLIP FITTER COLLAR (08,3)
 - EXTEND INTO HH 10:
 - (*) 2" CONDUIT
 - (*) 1-3/C 20
 - (*) 1-1/C 6 (INS. GR.)



- 6 F&I
- (*) PEDESTAL FOUNDATION
 - (*) 10' PEDESTAL POLE, BASE, WIND COLLAR AND SLIPFITTER COLLAR
 - (*) 2-WAY 1-CHANNEL EVP DETECTOR MOUNT ATOP SLIP FITTER COLLAR (04,7)
 - EXTEND INTO HH 21:
 - (*) 2" CONDUIT
 - (*) 1-3/C 20
 - (*) 1-1/C 6 (INS. GR.)



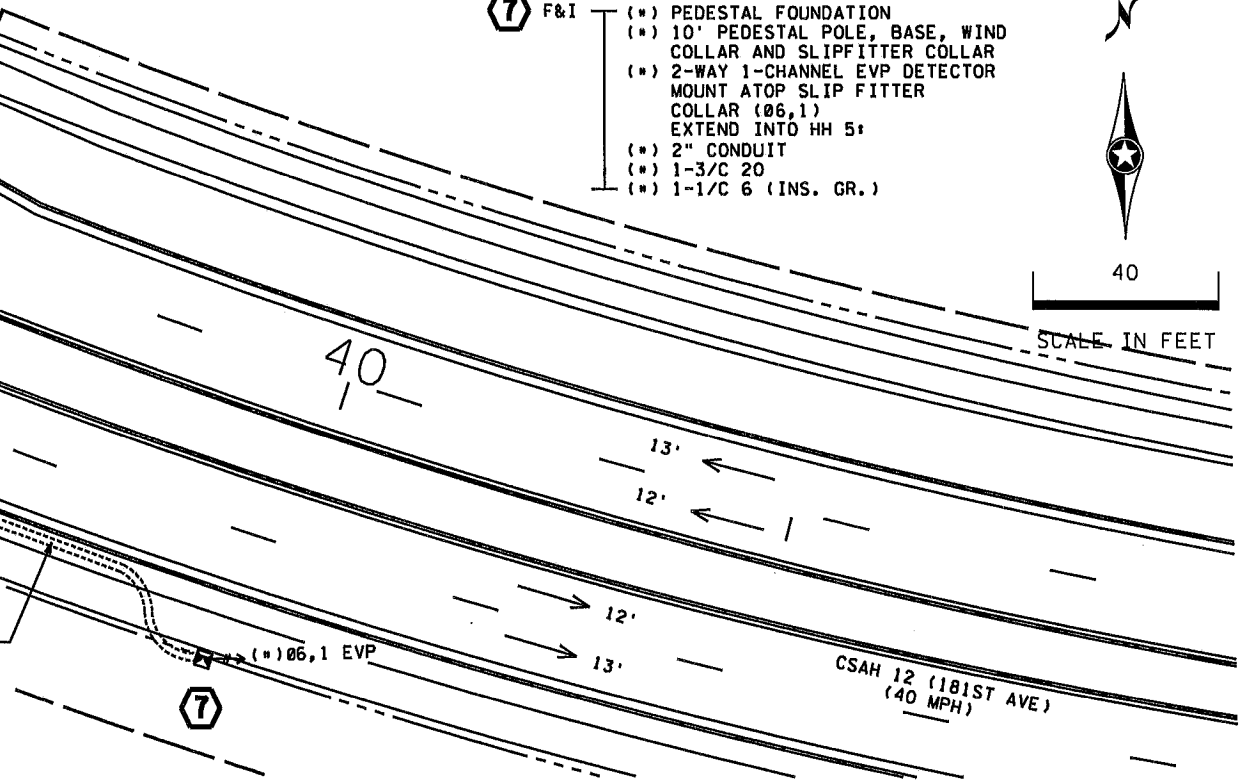
- (*) 2" CONDUIT
- (*) 1-3/C 20
- (*) 1-1/C 6 (GRD)

- 7 F&I
- (*) PEDESTAL FOUNDATION
 - (*) 10' PEDESTAL POLE, BASE, WIND COLLAR AND SLIPFITTER COLLAR
 - (*) 2-WAY 1-CHANNEL EVP DETECTOR MOUNT ATOP SLIP FITTER COLLAR (06,1)
 - EXTEND INTO HH 5:
 - (*) 2" CONDUIT
 - (*) 1-3/C 20
 - (*) 1-1/C 6 (INS. GR.)



MATCHLINE CSAH 12
STA. 39+00 SEE SHEET #SGL7*

- (*) 2" CONDUIT
- (*) 1-3/C 20
- (*) 1-1/C 6 (GRD)



CSAH 12 (181ST AVE)
(40 MPH)

2" CONDUIT
2-2/C 14

MATCHLINE CSAH 13/TWIN LAKES RD NW
SEE SHEET #SGL7*

FILE: S:\PT\Sherb\Common\CSAH 12-13 Signal\Signal\Plansheets\CSAH12-13.sgl.dgn
MODEL: #MODEL\$

DESIGN TEAM				REVISIONS			
NO.	BY	DATE		NO.	BY	DATE	
1	MRR						
2	JMG						
3	JMG						

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: 03/30/2020

SHERBURNE COUNTY, MN
**C.S.A.H. 12
RECONSTRUCTION**
S.A.P. 071-612-008, S.A.P. 204-020-006

**TRAFFIC SIGNAL SYSTEM
INTERSECTION LAYOUT**
CSAH 12 AT CSAH 13/TWIN LAKES ROAD NW

FILE NO.
SHERB151615
SGL 9
OF SGL13

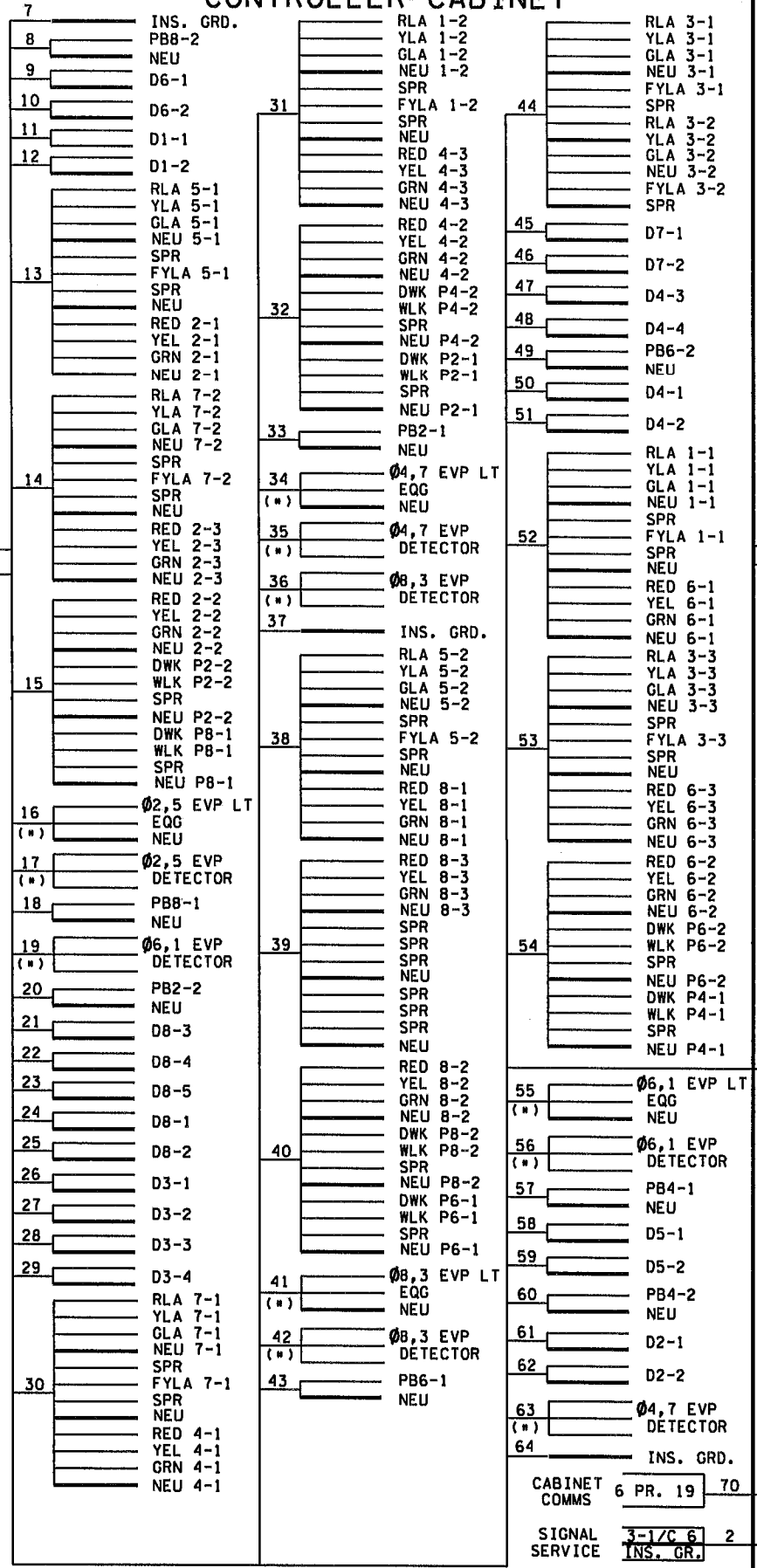
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6/8/2020

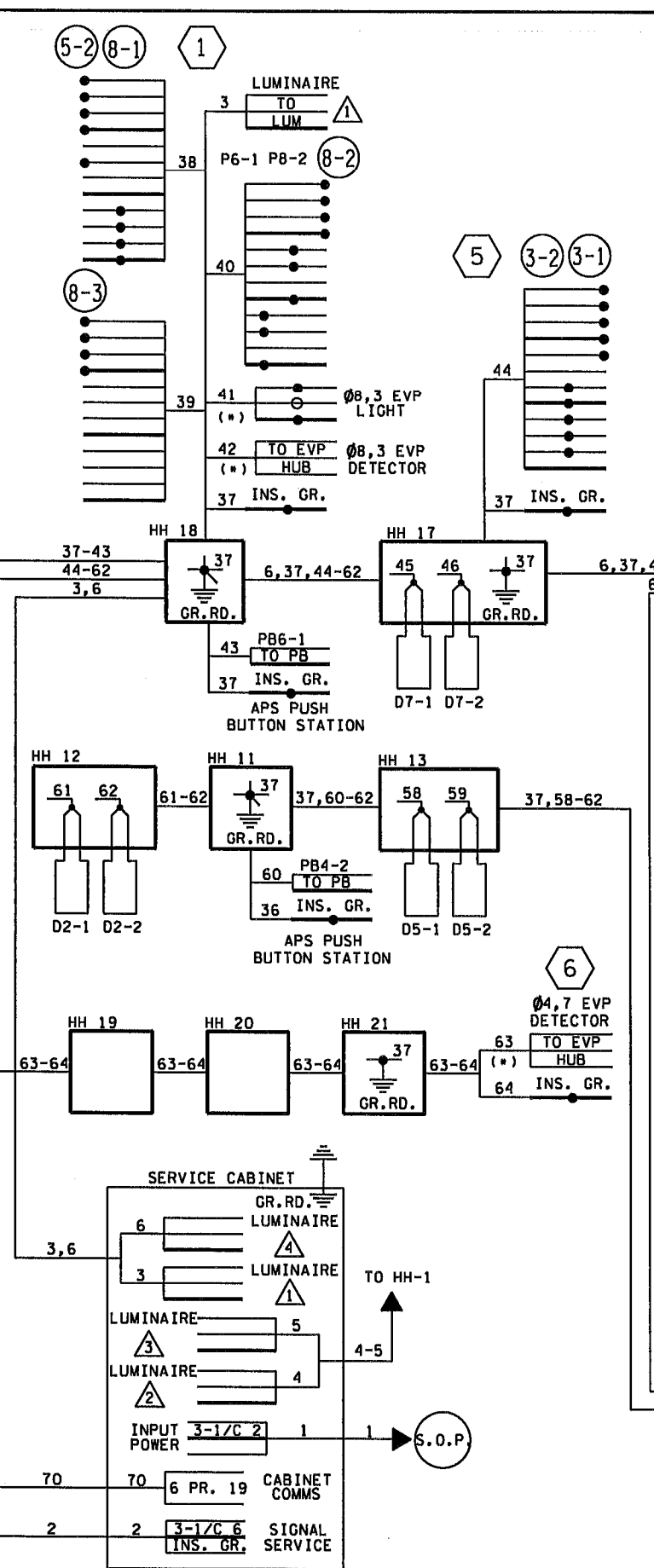
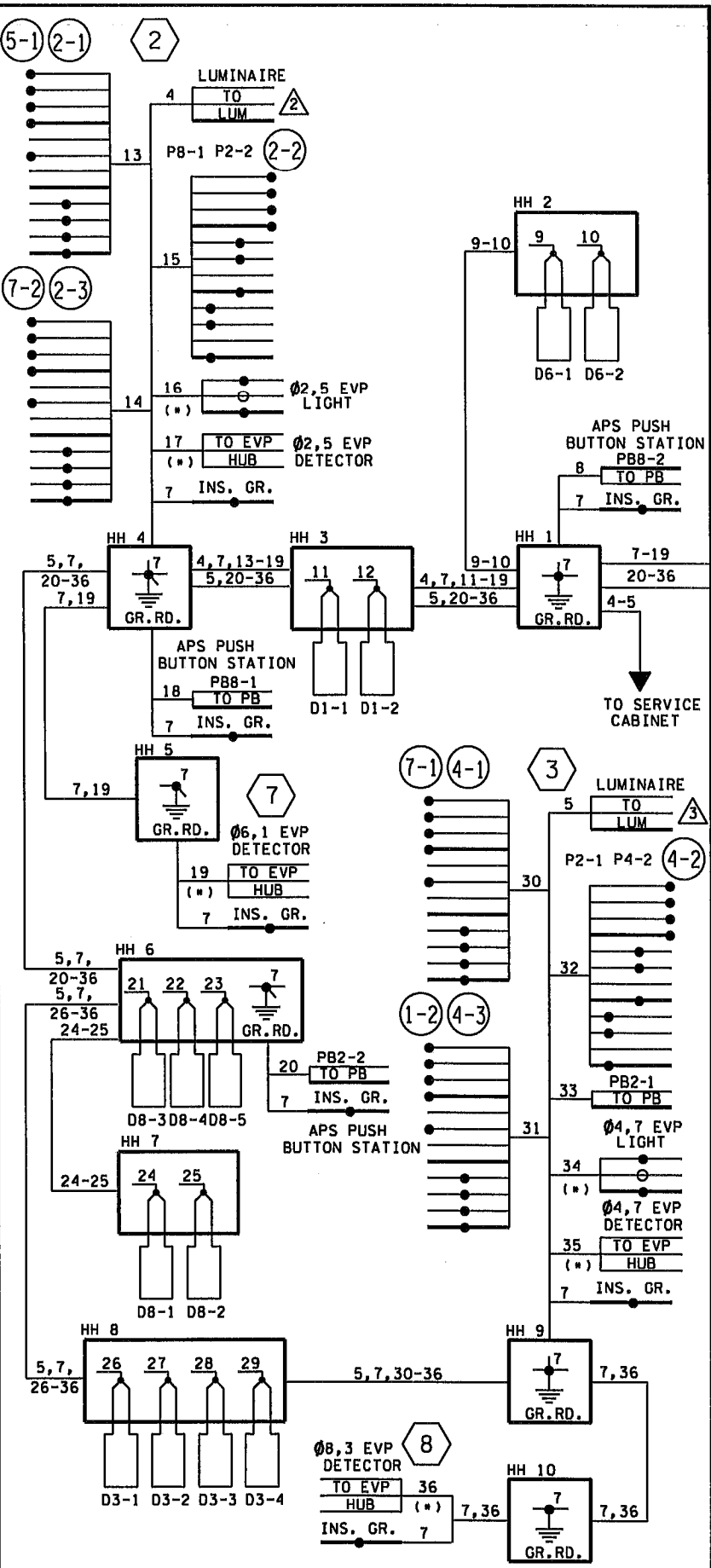
mbemis

FILE: S:\PT\Sherburne\Signal\Plansheets\CSAH12-13.sgl.dgn
MODEL: \$MODEL\$

CONTROLLER CABINET



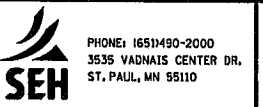
- NOTES:**
- 1) SEE DETAIL SHEETS FOR CONDUCTOR COLOR CODE.
 - 2) LUMINAIRES SHALL BE UNMETERED.
 - 3) SIGNAL SYSTEM INCLUDES BATTERY BACK-UP READY SERVICE CABINET (WITHOUT BATTERIES OR INVERTER).
 - 4) (*) DENOTES CABLES AND CONDUCTORS TO BE F & I AS PART OF "EMERGENCY VEHICLE PREEMPTION SYSTEM" PAY ITEM.
 - 5) (**) DENOTES CABLES TO BE F & I AS PART OF "TRAFFIC CONTROL INTERCONNECT" PAY ITEM.



DESIGN TEAM			
DRAWN BY:	MRB		
DESIGNER:	JMG		
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: 03/30/2020



SHERBURNE COUNTY, MN
C.S.A.H. 12
RECONSTRUCTION
 S.A.P. 071-612-008, S.A.P. 204-020-006

TRAFFIC SIGNAL SYSTEM
 FIELD WIRING DIAGRAM
 CSAH 12 AT CSAH 13/TWIN LAKES ROAD NW

FILE NO.
 SHERBIS615
SGL10
 OF SGL13

9:32:00 AM

6/8/2020

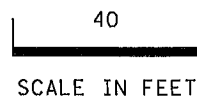
mbemis

FILE: S:\PT\Sherb\Common\CSAH 12-13 Signal\Signal\Plansheets\CSAH12-13.sgl.dgn
MODEL: sgl13

INTERCONNECT NOTES:

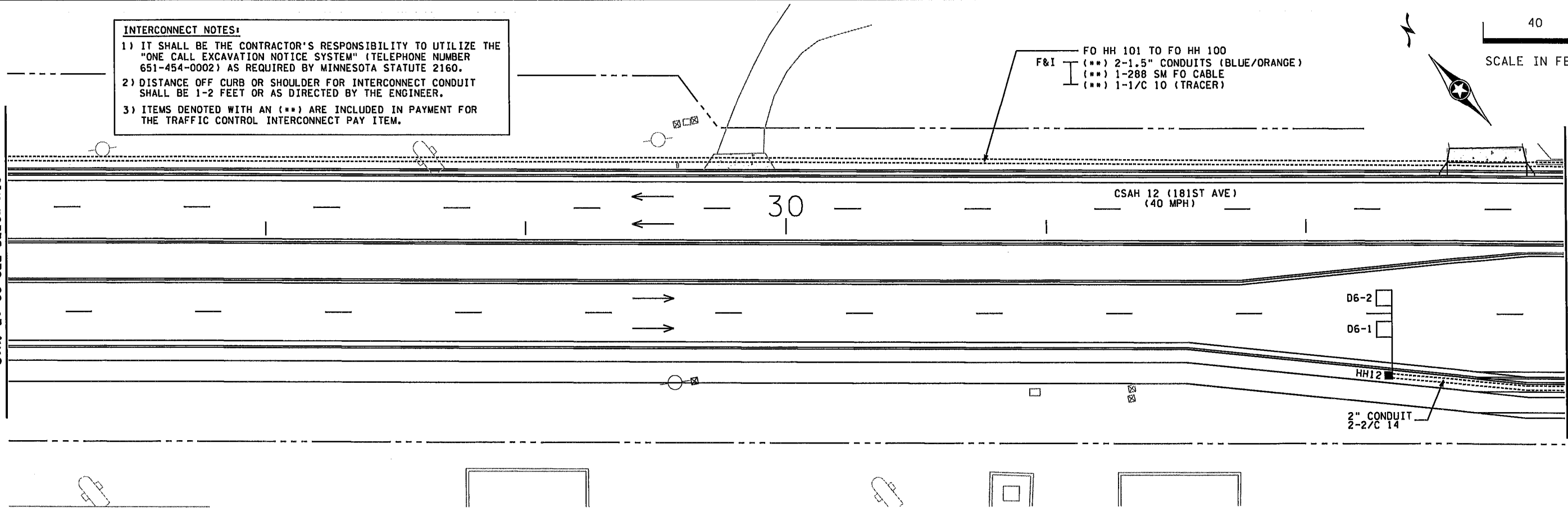
- 1) IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UTILIZE THE "ONE CALL EXCAVATION NOTICE SYSTEM" (TELEPHONE NUMBER 651-454-0002) AS REQUIRED BY MINNESOTA STATUTE 2160.
- 2) DISTANCE OFF CURB OR SHOULDER FOR INTERCONNECT CONDUIT SHALL BE 1-2 FEET OR AS DIRECTED BY THE ENGINEER.
- 3) ITEMS DENOTED WITH AN (***) ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM.

- F&I
- FO HH 101 TO FO HH 100
 - (**) 2-1.5" CONDUITS (BLUE/ORANGE)
 - (**) 1-288 SM FO CABLE
 - (**) 1-1/C 10 (TRACER)



MATCHLINE CSAH 12
STA. 27+00 SEE BELOW RIGHT

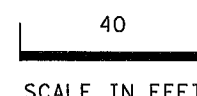
MATCHLINE CSAH 12
STA. 33+00 SEE SHEET SGL 7*



INTERCONNECT NOTES:

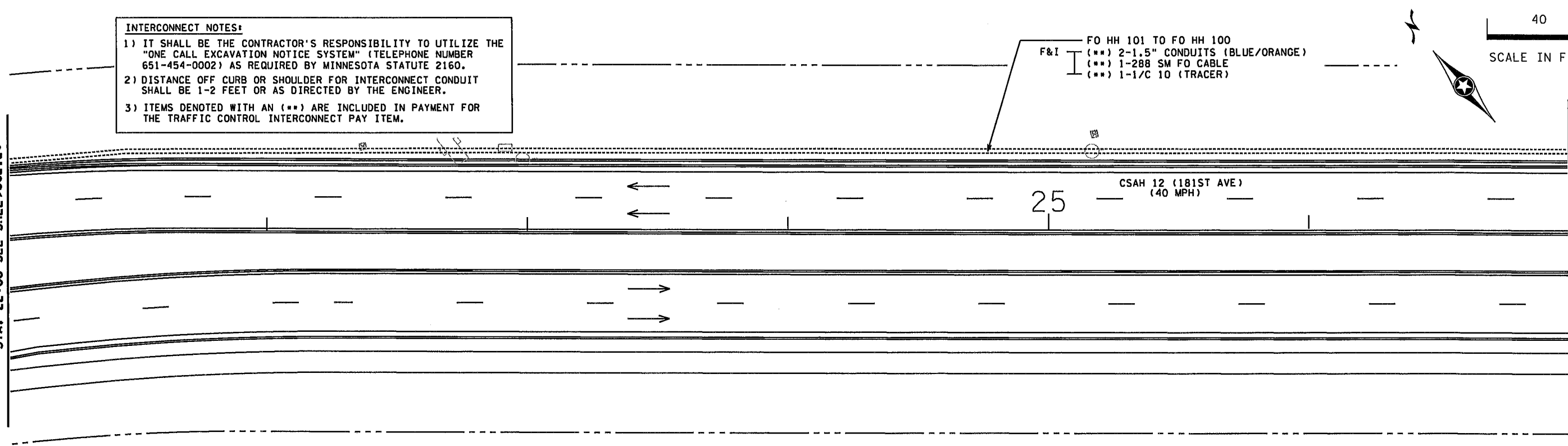
- 1) IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UTILIZE THE "ONE CALL EXCAVATION NOTICE SYSTEM" (TELEPHONE NUMBER 651-454-0002) AS REQUIRED BY MINNESOTA STATUTE 2160.
- 2) DISTANCE OFF CURB OR SHOULDER FOR INTERCONNECT CONDUIT SHALL BE 1-2 FEET OR AS DIRECTED BY THE ENGINEER.
- 3) ITEMS DENOTED WITH AN (***) ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM.

- F&I
- FO HH 101 TO FO HH 100
 - (**) 2-1.5" CONDUITS (BLUE/ORANGE)
 - (**) 1-288 SM FO CABLE
 - (**) 1-1/C 10 (TRACER)



MATCHLINE CSAH 12
STA. 22+00 SEE SHEET SGL 12*

MATCHLINE CSAH 12
STA. 27+00 SEE ABOVE LEFT



DESIGN TEAM			
DRAWN BY:	MRR		
DESIGNER:	JMG		
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: 03/30/2020

PHONE: (651)490-2000
3535 VADNAIS CENTER DR.
ST. PAUL, MN 55110

SHERBURNE COUNTY, MN
C.S.A.H. 12
RECONSTRUCTION
S.A.P. 071-612-008, S.A.P. 204-020-006

TRAFFIC SIGNAL SYSTEM
INTERCONNECT LAYOUT
CSAH 12 AT CSAH 13/TWIN LAKES ROAD NW

FILE NO.
SHERB151615
SGL 11
OF SGL13

9:52:01 AM

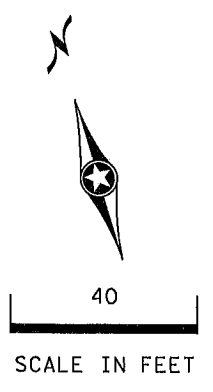
6/8/2020

mbemis

FILE: S:\P\T\S\Sherb\Common\CSAH 12-13 Signal\SignalPlansheets\CSAH12-13.sgl.dgn
MODEL: #MODEL

FO F&I

- (***) FIBER OPTIC SPLICE VAULT (HH 100) EXTEND INTO CONTROLLER CABINET
- (***) 2" CONDUIT - BORE INTO EXISTING CABINET FOUNDATION
- (***) 1-6 SM FO PIGTAIL (SPLICE ENCLOSURE)
- (***) SPLICE 6 SM FO PIGTAIL ONTO 288 SM FO BRANCH CABLE



F&I

- FO HH 101 TO FO HH 100
- (***) 2-1.5" CONDUITS (BLUE/ORANGE)
- (***) 1-288 SM FO CABLE
- (***) 1-1/C 10 (TRACER)

F&I HH100
(***)

A B

FO

LINE AVE NW
(30 MPH)

ZANE ST NW
(30 MPH)

CSAH 12 (181ST AVE)
(40 MPH)

15

20

MATCHLINE CSAH 12
STA. 21+00 SEE SHEET #SGL11#

- INTERCONNECT NOTES:**
- 1) ALL ITEMS ON THIS SIGNAL SYSTEM ARE INPLACE AND SHALL BE REUSED AND MAINTAINED INPLACE UNLESS OTHERWISE BOXED IN AND DENOTED OTHERWISE.
 - 2) IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UTILIZE THE 'ONE CALL EXCAVATION NOTICE SYSTEM' (TELEPHONE NUMBER 651-454-0002) AS REQUIRED BY MINNESOTA STATUTE 2160.
 - 3) DISTANCE OFF CURB OR SHOULDER FOR INTERCONNECT CONDUIT SHALL BE 1-2 FEET OR AS DIRECTED BY THE ENGINEER.
 - 4) ITEMS DENOTED WITH AN (***) ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM.

DESIGN TEAM			
DRAWN BY:	MRR		
DESIGNER:	JMG		
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: 03/30/2020

PHONE: (651)490-2000
3535 VADNAIS CENTER DR.
ST. PAUL, MN 55110

SHERBURNE COUNTY, MN
C.S.A.H. 12 RECONSTRUCTION
S.A.P. 071-612-008, S.A.P. 204-020-006

TRAFFIC CONTROL INTERCONNECT
INTERSECTION LAYOUT
CSAH 12 AT LINE AVE NW/ZANE ST NW

FILE NO. SHERB51615
SGL12
OF SGL13