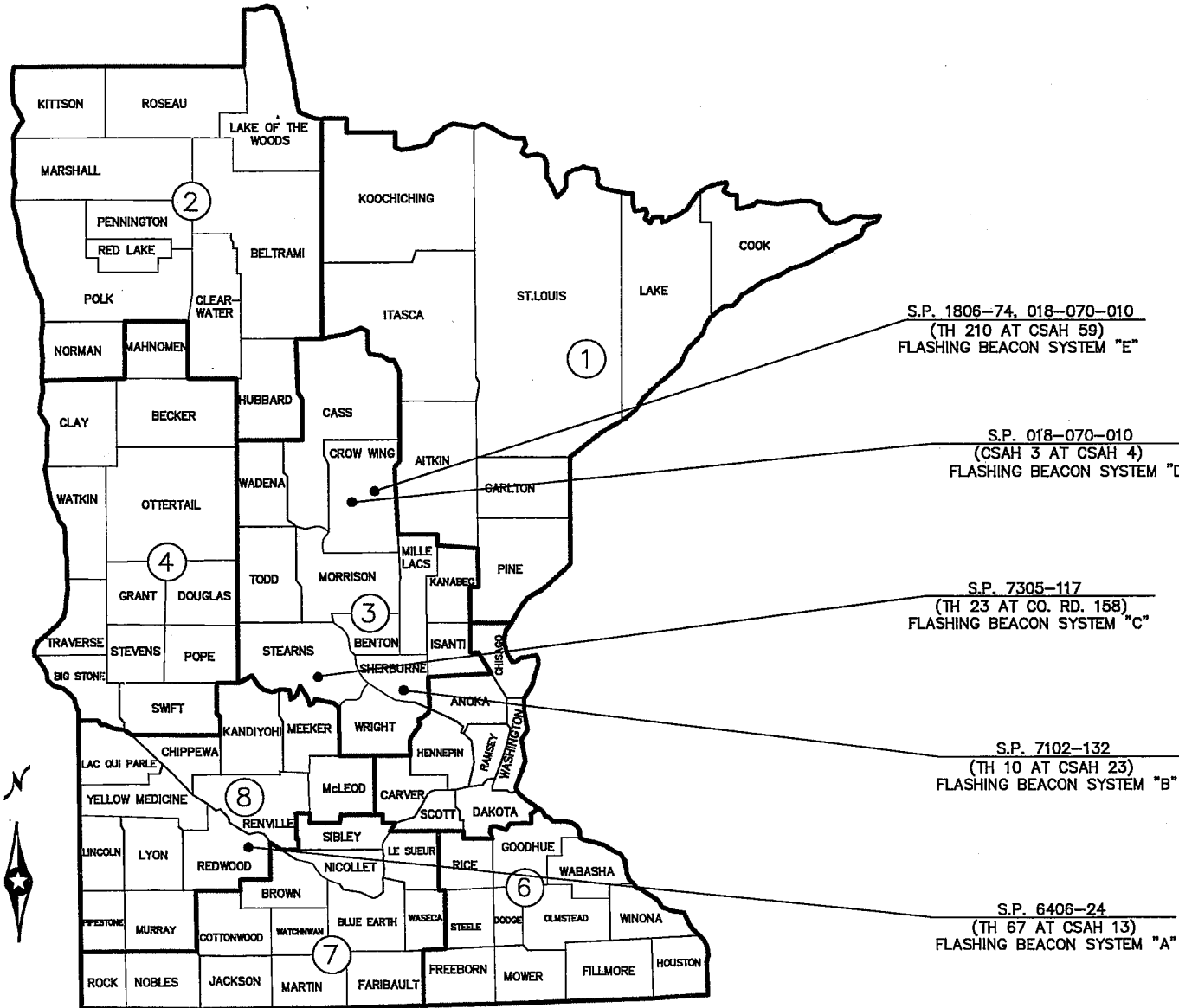


MINNESOTA DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLAN FOR RURAL INTERSECTION CONFLICT WARNING SYSTEMS - PHASE II
STATE PROJECT NO. 8816-2274

- (SYSTEM "A") LOCATED ON TH 67 AT CSAH 13 NEAR MORGAN, MN. (REDWOOD COUNTY) - S.P. 6406-24
(SYSTEM "B") LOCATED ON TH 10 AT CSAH 23 IN BECKER, MN. (SHERBURNE COUNTY) - S.P. 7102-132
(SYSTEM "C") LOCATED ON TH 23 AT CO. RD. 158 NEAR COLD SPRING, MN. (STEARNS COUNTY) - S.P. 7305-117
(SYSTEM "D") LOCATED ON CSAH 3 AT CSAH 4 NEAR MERRIFIELD, MN. (CROW WING COUNTY) - S.P. 018-070-010
(SYSTEM "E") LOCATED ON TH 210 AT CSAH 59 NEAR IRONTON, MN. (CROW WING COUNTY) - S.P. 1806-74, S.P. 018-070-010



MnDOT DISTRICT	COUNTY	STATE PROJECT NO.	CHARGE IDENTIFIER
3	CROW WING	018-070-010	
3	CROW WING	1806-74, 018-070-010	
3	SHERBURNE	7102-132	
3	STEARNS	7305-117	
8	REDWOOD	6406-24	

PLAN REVISIONS		
DATE	SHEET NO.	APPROVED BY

STATE PROJ. NO. 8816-2274 (SUPPORTING STATE PROJ. NOS.
1806-74 (TH 210=002), 6406-24 (TH 67=093), 7102-132 (TH 10=003), 7305-117 (TH 23=023), AND 018-070-010

MINN. PROJECT NO. HSIP 8815(260)

GOVERNING SPECIFICATIONS

THE 2014 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" AND THE 2014 EDITION OF THE "MATERIALS LAB SUPPLEMENTAL SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.
ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MN MUTCD, INCLUDING FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS.

INDEX

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4-7 ESTIMATED QUANTITIES, GENERAL NOTES, AND FLASHER DETAILS
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12-14 FLASHING BEACON SYSTEM "B"
15-18 FLASHING BEACON SYSTEM "C"
19-22 FLASHING BEACON SYSTEM "D"
23-26 FLASHING BEACON SYSTEM "E"
27-41 SIGNING AND STRIPING PLANS/DETAILS

THIS PLAN CONTAINS 41 SHEETS

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.

John M. Gray LIC. NO. 22457 DATE: 3-3-15
JOHN M. GRAY, PE
DESIGN SQUAD JMG, TAS, C.J. MW, MT, BY

RECOMMENDED FOR APPROVAL *John M. Gray* DATE: 3-4-15
DISTRICT 3 ENGINEER

Kurt W. Winters DATE: 3-4-15
DISTRICT 3 STATE AID ENGINEER: REVIEWED FOR COMPLIANCE WITH STATE AID RULES/POLICY

RECOMMENDED FOR APPROVAL *Eric Kar* DATE: 3-9-15
FOR DISTRICT 8 ENGINEER

RECOMMENDED FOR APPROVAL *Susan M. Huth* DATE: 3-10-15
STATE TRAFFIC ENGINEER

Kurt W. Winters DATE: 3-4-15
for APPROVED FOR STATE AID FUNDING: STATE AID ENGINEER

RECOMMENDED FOR APPROVAL *Theresa K. Skurman* DATE: 4/27/15
TRs STATE PRE- LETTING ENGINEER

OFFICE OF LAND MANAGEMENT APPROVAL *John M. Gray* DATE: 4/28/15
DIRECTOR, LAND MANAGEMENT

APPROVED *Christopher R. ...* DATE: 4-30-15
STATE DESIGN ENGINEER

I HEREBY CERTIFY THAT THE FINAL FIELD REVISIONS, IF ANY, OF THIS PLAN WERE MADE BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

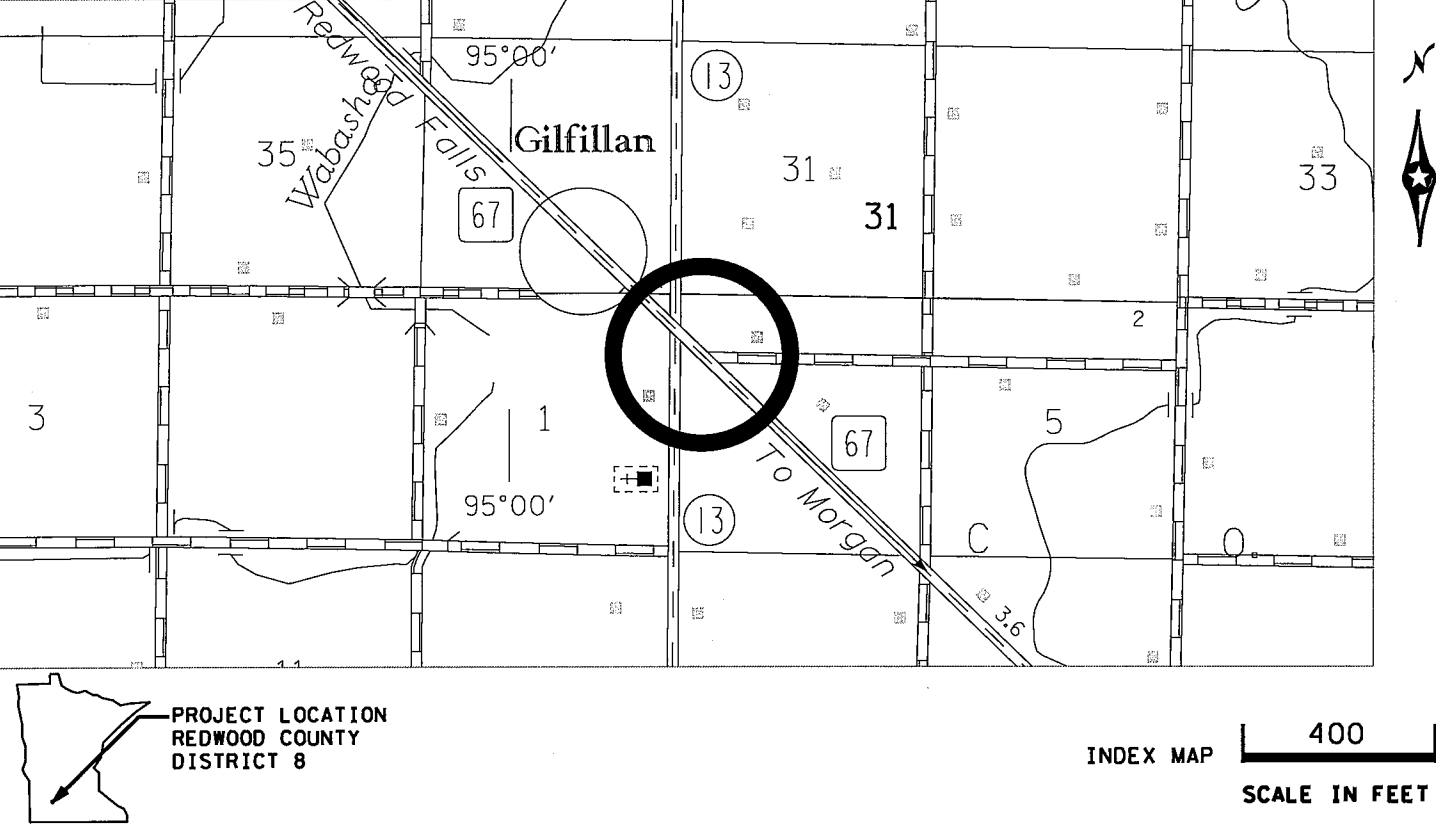
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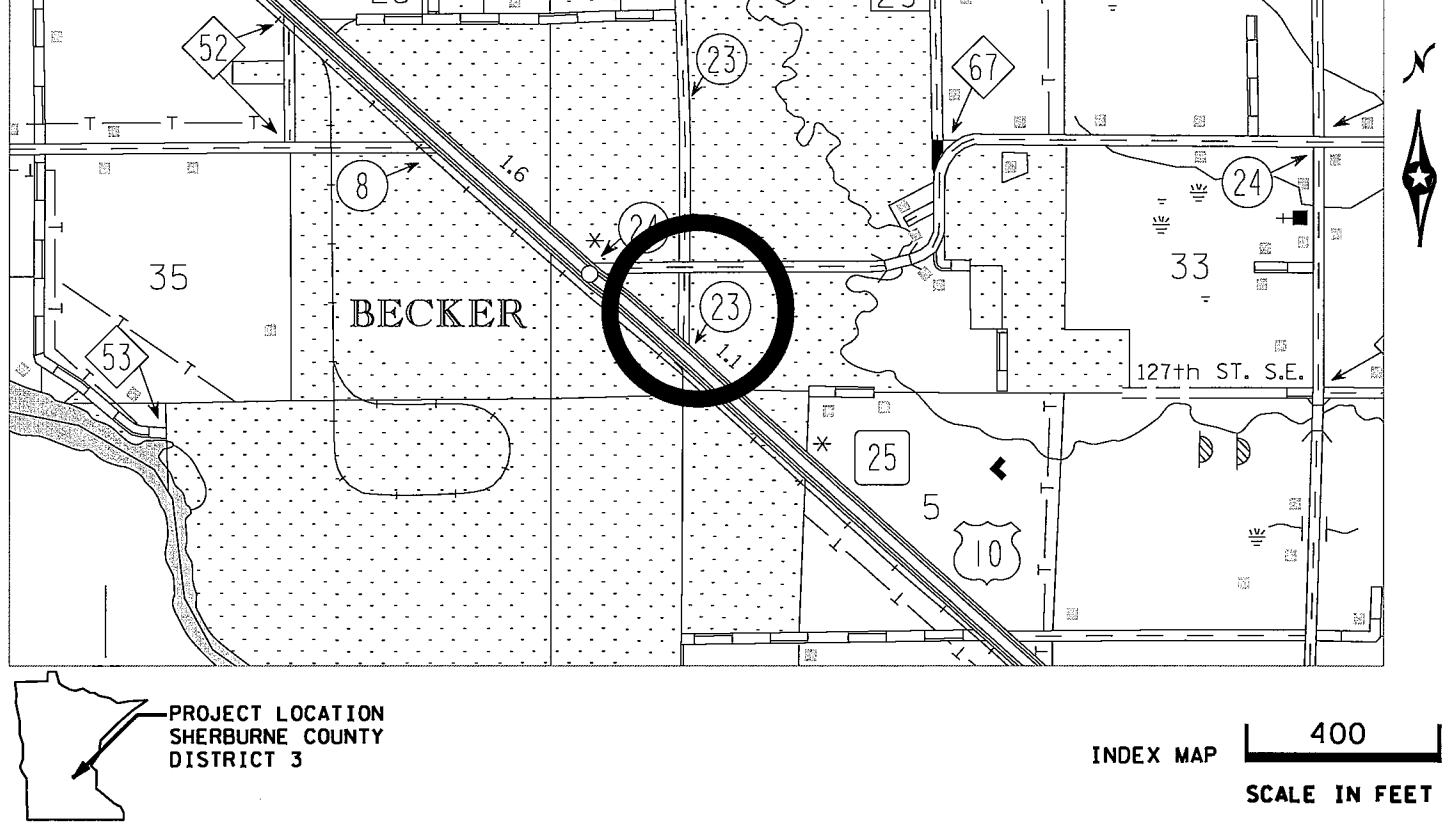
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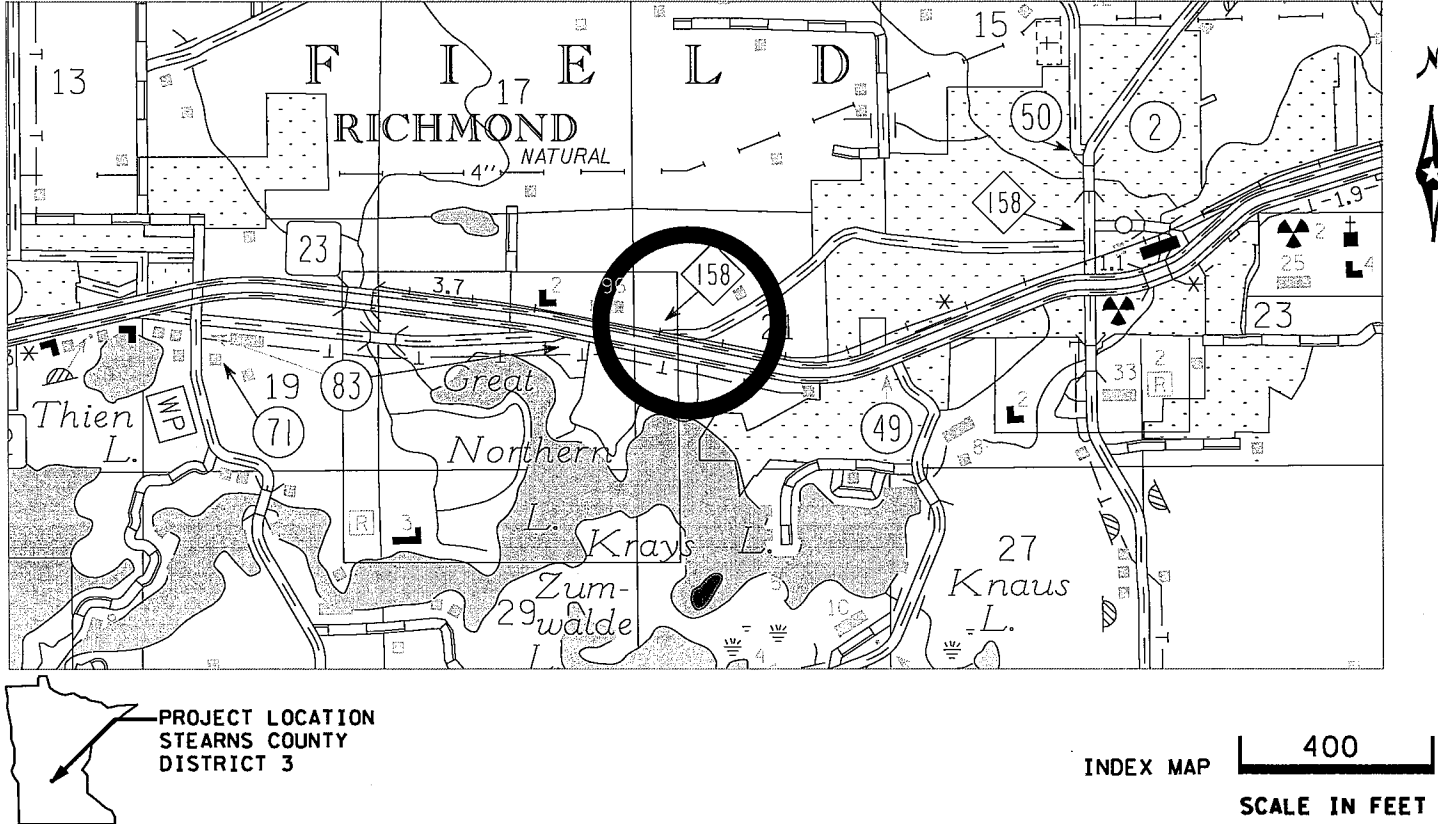
FLASHING BEACON SYSTEM "A" - LOCATED ON TH 67 AT CSAH 13 NEAR MORGAN, MN. (REDWOOD COUNTY) - S.P. 6406-24



FLASHING BEACON SYSTEM "B" - LOCATED ON TH 10 AT CO. RD. 23 IN BECKER, MN. (SHERBURNE COUNTY) - S.P. 7102-132



FLASHING BEACON SYSTEM "C" - LOCATED ON TH 23 AT CO. RD. 158 NEAR COLD SPRING, MN. (STEARNS COUNTY) - S.P. 7305-117



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

I hereby certify that this sheet 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: 03/12/2015

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

MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132,
S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEMS "A-C"
LOCATION MAPS

FILE NO. MNTMD131077

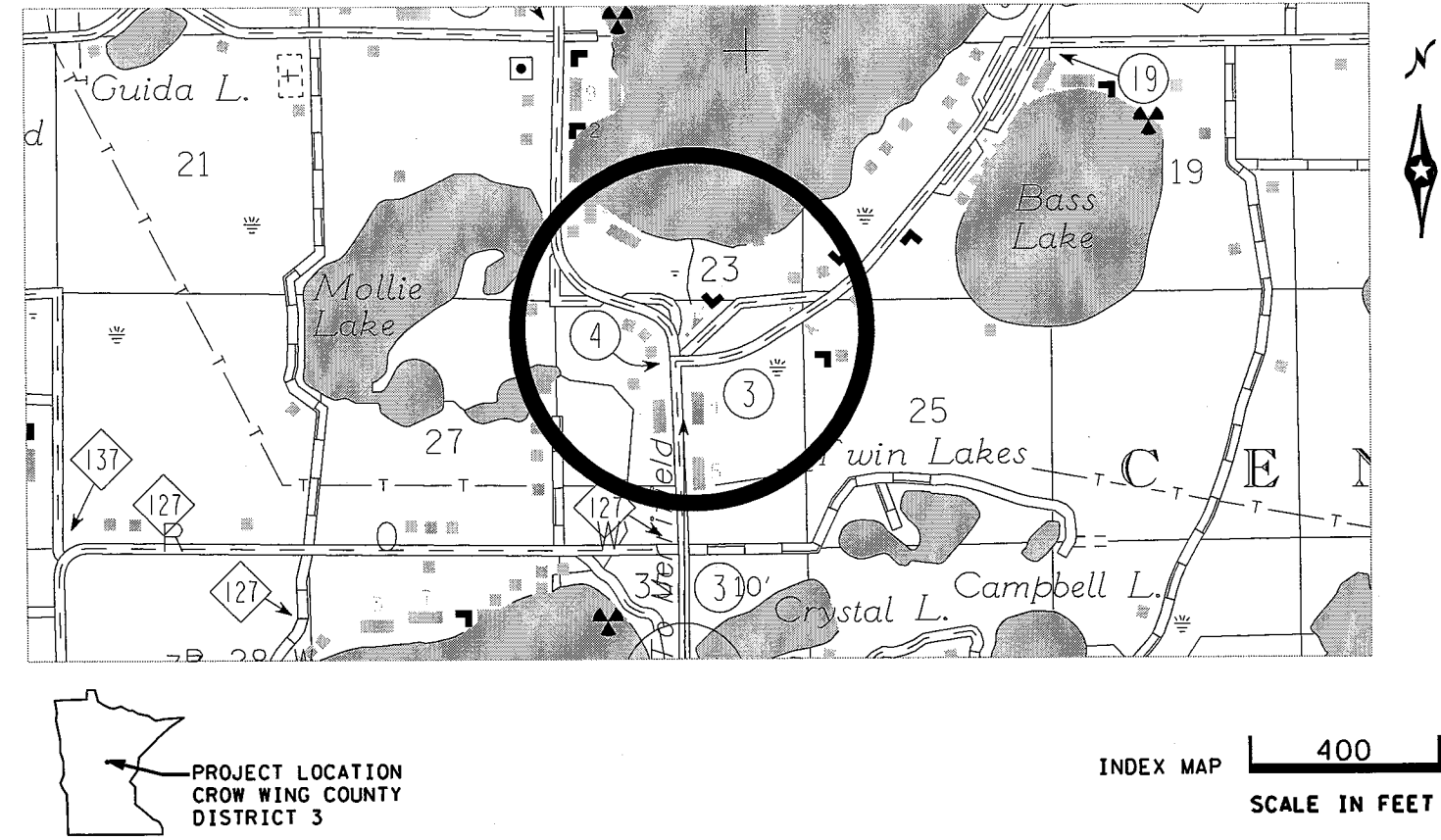
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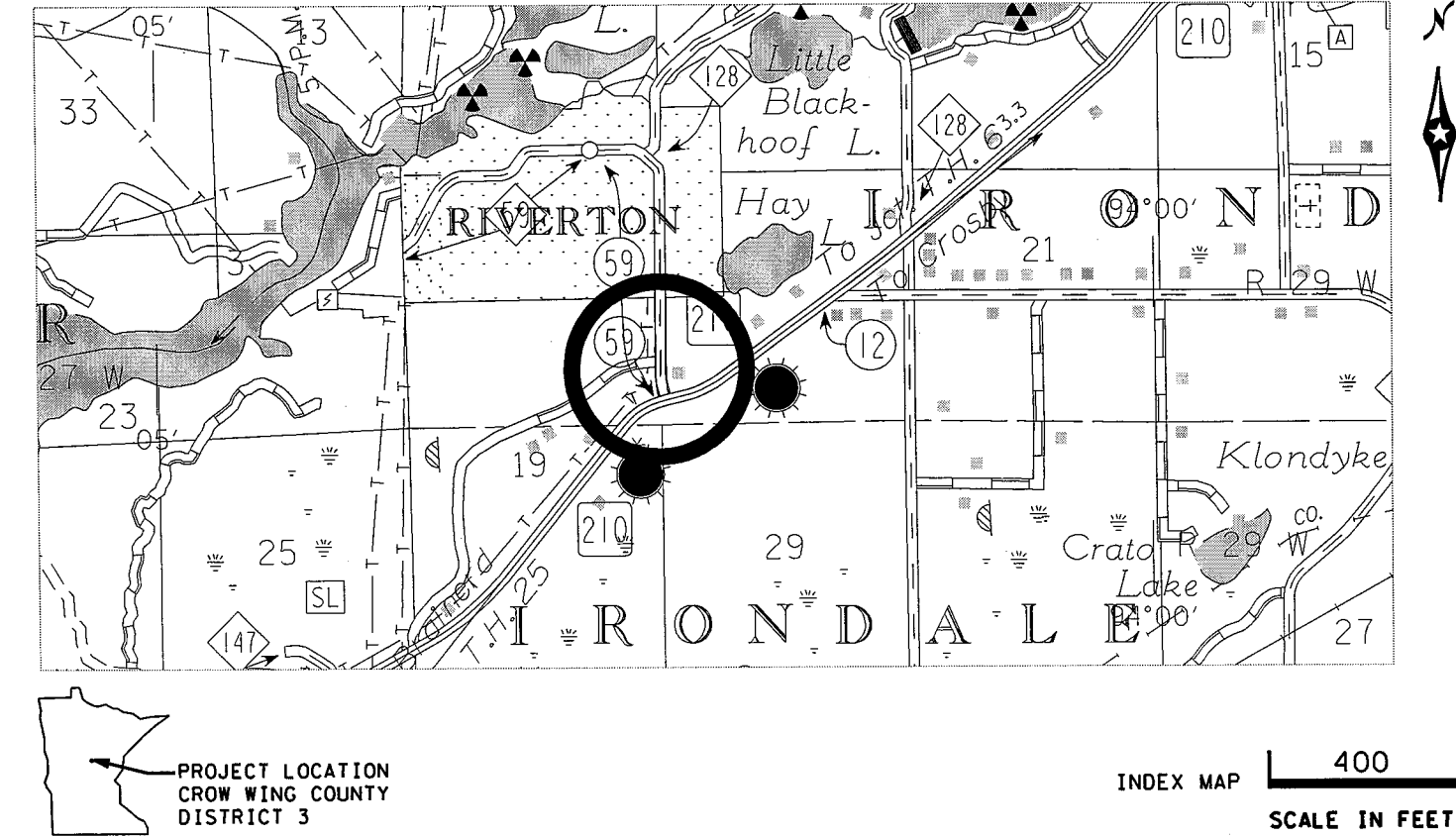
4/23/2015

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FLASHING BEACON SYSTEM "D" - LOCATED ON CSAH 3 AT CSAH 4 NEAR MERRIFIELD, MN. (CROW WING COUNTY) - S.P. 018-070-010



FLASHING BEACON SYSTEM "E" - LOCATED ON TH 210 AT CSAH 59 NEAR IRONTON, MN. (CROW WING COUNTY) - S.P. 1806-74, S.P. 018-070-010



SHEET NO.	DESIGN TEAM				I hereby certify that this sheet 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.				 PHONE: (651)490-2000 3535 VADNAIS CENTER DR. ST. PAUL, MN 55110				MINNESOTA DEPARTMENT OF TRANSPORTATION RURAL INTERSECTION CONFLICT WARNING SYSTEM - PHASE II S.P. 8816-2274, 1806-74, 6406-24, 7102-132 S.P. 7305-117, 018-070-010				FLASHING BEACON SYSTEMS "D" & "E" LOCATION MAPS				FILE NO. MNTMD131077		<div>3</div> <div>41</div>	
	DRAWN BY: <u>CMJ</u>				Certified By:  Lic. No. <u>22457</u>																			
	DESIGNER: <u>JMG</u>				Printed Name: <u>JOHN M. GRAY</u> Date: <u>03/12/2015</u>																			
	CHECKED BY: <u>JMG</u>																							
	NO.				BY				DATE				REVISIONS											

ABBREVIATIONS

APS	ACCESSIBLE PEDESTRIAN SIGNAL
AWF	ADVANCE WARNING FLASHER
C.D.	COUNT DOWN
D2-1 (e.g.)	DETECTOR (PHASE 2, NO. 1)
DEG	DEGREES
DWK	DON'T WALK INDICATION
EQ.G	EQUIPMENT GROUND
EVP	EMERGENCY VEHICLE PRE-EMPTION
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
HPS	HIGH PRESSURE SODIUM
IND	INDICATION
IMC	INTERMEDIATE METAL CONDUIT
INP	INPLACE
INS. GR.	INSULATED GROUND
JB	JUNCTION BOX
LED	LIGHT EMITTING DIODE
LUM	LUMINAIRE
NEU	NEUTRAL
NMC	NONMETALLIC CONDUIT
P1-1 (e.g.)	PEDESTRIAN HEAD (PHASE 1, NO. 1)
PB	PUSH BUTTON
PB2-1 (e.g.)	PUSH BUTTON (PHASE 2, NO. 1)
PEC	PHOTOELECTRIC CELL
PED	PEDESTRIAN
PVC	POLYVINYL CHLORIDE (CONDUIT)
RED	RED INDICATION
R&S	REMOVE AND SALVAGE
RLA	RED LEFT ARROW
RSC	RIGID STEEL CONDUIT
S&I	SALVAGE AND INSTALL
SOP	SOURCE OF POWER
SPR	SPARE
STA	STATION
WLK	WALK INDICATION
YEL	YELLOW INDICATION
YLA	YELLOW LEFT ARROW
YRA	YELLOW RIGHT ARROW

SYMBOLS

■	HANDHOLE
⊖	EQ.G CONNECTION
⊖	EVP CONFIRMATORY LIGHT
⊖	EVP DETECTOR
⊖	EVP DETECTOR AND CONFIRMATORY LIGHT
⊖	FIBER OPTIC VAULT
⊖	LUMINAIRE NO.
⊖	SIGNAL BASE NO.
⊖	SIGNAL HEAD NO./FLASHER HEAD NO.
⊖	BARREL MOUNT BASE NO.
⊖	WOOD POLE NO.
⊖	SPLICE
⊖	VIDEO DETECTION
⊖	MICROWAVE DETECTION
⊖	SONIC DETECTION

FOR PLANS AND UTILITIES SYMBOLS SEE TECHNICAL MANUAL

STATEMENT OF ESTIMATED QUANTITIES

SHEET ID	ITEM NO	ITEM	UNIT	TOTAL ESTIMATED QUANTITY	SP 8816-2274				
					(A)(B) SP 1806-74 SP 018-070-010	(A) SP 6406-24	(A) SP 7102-132	(C) SP 7305-117	(A)(B) SP 018-070-010
-	2011.601	AS BUILT	LUMP SUM	1	0.11	0.22	0.22	0.22	0.23
-	2021.501	MOBILIZATION	LUMP SUM	1	0.11	0.22	0.22	0.22	0.23
27	2104.509	REMOVE SIGN TYPE C	EACH	5		2	1	2	
27	2104.523	SALVAGE SIGN TYPE C	EACH	16	4	4	4	2	2
27	2104.523	SALVAGE SIGN TYPE D	EACH	11	4	1	2	2	2
-	2563.601	TRAFFIC CONTROL	LUMP SUM	1	0.11	0.22	0.22	0.22	0.23
27	2564.531	SIGN PANELS TYPE C	SQ. FT.	18		18			
27	2564.537	INSTALL SIGN TYPE C	EACH	16	4	4	4	2	2
27	2564.537	INSTALL SIGN TYPE D	EACH	11	4	1	2	2	2
8-11	2565.616	FLASHING BEACON SYSTEM A	SYSTEM	1		1			
12-14	2565.616	FLASHING BEACON SYSTEM B	SYSTEM	1			1		
15-18	2565.616	FLASHING BEACON SYSTEM C	SYSTEM	1				1	
19-22	2565.616	FLASHING BEACON SYSTEM D	SYSTEM	1					1
23-26	2565.616	FLASHING BEACON SYSTEM E	SYSTEM	1	1				
-	2575.555	TURF ESTABLISHMENT	LUMP SUM	1	0.11	0.22	0.22	0.22	0.23
28, 32, 36	2582.502	24" SOLID LINE WHITE-EPOXY	LIN. FT.	110	20	30		60	

GENERAL NOTES:

- NO UTILITIES ARE ANTICIPATED TO BE AFFECTED BY THIS PROJECT.
- THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL "D". THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 3802, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."
- THE FOLLOWING LIST SHOWS THE UTILITY COMPANIES WITHIN THE PROJECT LIMITS OF THE ENTIRE PROJECT:
ARVIG COMMUNICATIONS SYSTEMS, CENTERPOINT ENERGY MINNESOTA GAS, CENTURYLINK, CHARTER COMMUNICATIONS, CITY OF BECKER, CONSOLIDATED TELEPHONE COMPANY, CROW WING COOPERATIVE POWER & LIGHT COMPANY, ENVENTIS TELECOM INCORPORATED, MIDCONTINENT COMMUNICATIONS, MINNESOTA DEPARTMENT OF TRANSPORTATION, MINNESOTA POWER, REDWOOD ELECTRIC COOPERATIVE, STEARNS COOPERATIVE ELECTRIC ASSOCIATION, TDS METROCOM, WINDSTREAM COMMUNICATIONS, XCEL ENERGY
- TURF ESTABLISHMENT SHALL BE APPLIED TO ALL DISTURBED AREAS IN ACCORDANCE WITH MnDOT 2575 AND MnDOT 3878 AND AS FOLLOWS:
A. EXISTING VEGETATION SHALL BE REPLACED IN-KIND USING MnDOT SEED MIX 25-121, 25-131 OR 35-241 IF SEEDED PRIOR TO SEPTEMBER 20TH.
B. EXISTING VEGETATION SHALL BE REPLACED IN-KIND USING MnDOT SEED MIX 35-241 IF AFTER SEPTEMBER 20TH AND PRIOR TO OCTOBER 20TH.
C. SEED MIX 25-131 SHALL BE USED IN MOWED OR LAWN AREAS.
D. SEED MIXES SHALL BE APPLIED AT THE RATES NOTED IN MnDOT 2575 AND MnDOT 3878.
- THIS PROJECT DOES NOT MEET THE CRITERIA FOR A NPDES CONSTRUCTION GENERAL PERMIT INCLUDING SWPPP DEVELOPMENT. HOWEVER, THE CONTRACTOR SHALL USE ENVIRONMENTALLY FRIENDLY CONSTRUCTION TECHNIQUES WHILE PERFORMING THE WORK. THESE TECHNIQUES CAN INCLUDE BUT ARE NOT LIMITED TO: DO NOT DISTURB AREAS, PERIMETER CONTROL, INLET PROTECTION, DUST CONTROL, PROPER DEWATERING TECHNIQUES, TEMPORARY SOIL STABILIZATION, AND PERMANENT SOIL STABILIZATION.
- THE CONTRACTOR SHALL STABILIZE ALL EXPOSED SOIL AREAS WITHIN 14 DAYS OF INACTIVITY. ALL AREAS THAT HAVE A POTENTIAL TO DISCHARGE TO AN ENVIRONMENTALLY SENSITIVE AREA MUST BE STABILIZED WITHIN 24 HOURS AS DIRECTED BY THE ENGINEER WITH CHANGING FIELD CONDITIONS.
- ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM AND BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE "MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MnMUTCD), AND PART IV "FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS" (CURRENT EDITION).
- THE CONTRACTOR IS REQUIRED TO PROVIDE TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO COMMENCING ANY FIELD WORK A WRITTEN PLAN ON HOW THE CONTRACTOR INTENDS TO MEET THE CONTRACT REQUIREMENTS FOR MAINTENANCE OF TRAFFIC AND TRAFFIC CONTROL INCLUDING BUT NOT LIMITED TO PROVIDING TO THE ENGINEER A COMPLETE PLAN FOR WHAT MnMUTCD "FIELD MANUAL" LAYOUTS ARE PLANNED TO BE USED FOR EACH FIELD OPERATION. LAYOUTS MUST SHOW ALL DEVICES THE CONTRACTOR PROPOSES TO INSTALL AND MAINTAIN FOR EACH FIELD OPERATION.
- THE CONTRACTOR SHALL NOT USE THE MOBILE AND SHORT DURATION TEMPORARY TRAFFIC CONTROL LAYOUTS FROM THE MnMUTCD "FIELD MANUAL" (WORK ON THIS PROJECT IS RESTRICTED TO USING SHORT TERM STATIONARY TEMPORARY TRAFFIC CONTROL LAYOUTS, UNLESS OTHERWISE APPROVED BY THE ENGINEER).
- CONTRACTOR MUST HAVE ALL REQUIRED TRAFFIC CONTROL SIGNS AND DEVICES ON SITE AND FURNISHED AND INSTALLED IN ACCORDANCE WITH THE APPROVED TRAFFIC CONTROL PLAN AND THE MnMUTCD "FIELD MANUAL" PRIOR TO COMMENCING ANY FIELD OPERATIONS. THE ENGINEER (OR HIS DESIGNATED REPRESENTATIVE) WILL STOP ALL FIELD OPERATIONS AND NOT ALLOW WORK TO COMMENCE UNTIL ALL REQUIRED TRAFFIC CONTROL DEVICES ARE FURNISHED, INSTALLED AND MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION.

STANDARD PLATES - FLASHER SYSTEMS

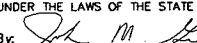
THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT

PLATE NO.	DESCRIPTION
▶ 8000 I	STANDARD BARRICADES
▶ 8111 E	TRAFFIC SIGNAL BRACKETING (PEDESTAL MOUNTED) (3 SHEETS)
▶ 8117 G	PRECAST CONCRETE HANDHOLE WITH VEHICLE LOAD
▶ 8119 C	GROUND MOUNTED CABINET FOUNDATION
▶ 8127 D	LIGHT FOUNDATION - DESIGN E 40' POLE OR LESS (2 SHEETS)
▶ 8132 B	PREFORMED RIGID PVC CONDUIT LOOP DETECTORS (3 SHEETS)

▶ STANDARD PLATES APPLICABLE TO THIS PROJECT

DRAWN BY: JMG
DESIGNER: JMG
CHECKED BY: TAS
DESIGN TEAM

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:  Lic. No. 22457
Printed Name: John M. Gray, PE Date: 3/12/2015



MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEMS - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132,
S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEMS "A-E"
STATEMENT OF ESTIMATED QUANTITIES,
STANDARD PLATES AND GENERAL NOTES

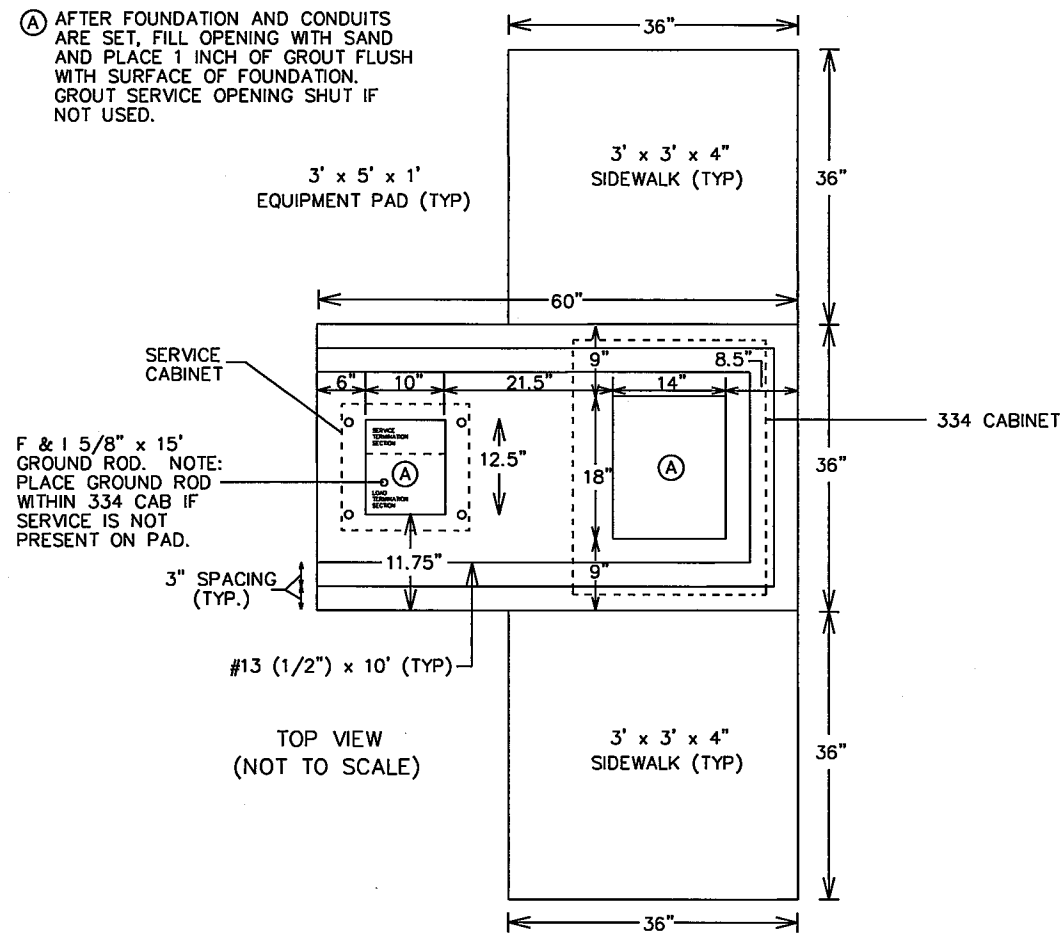
FILE NO.
MNTMD 131077

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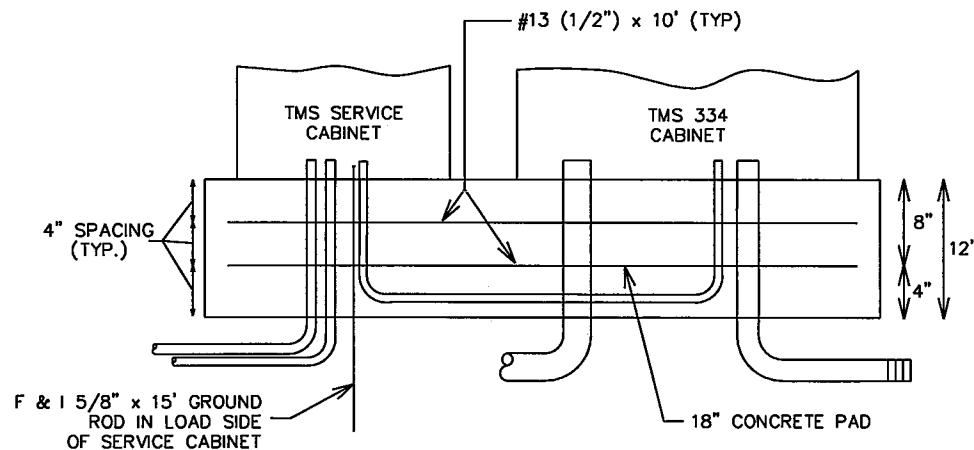
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FUNDING NOTES:

- (A) = 90% FEDERAL / 10% STATE.
(B) = SEE LUMP SUM AGREEMENT NO. 1000027 WITH CROW WING COUNTY.
(C) = 100% STATE.

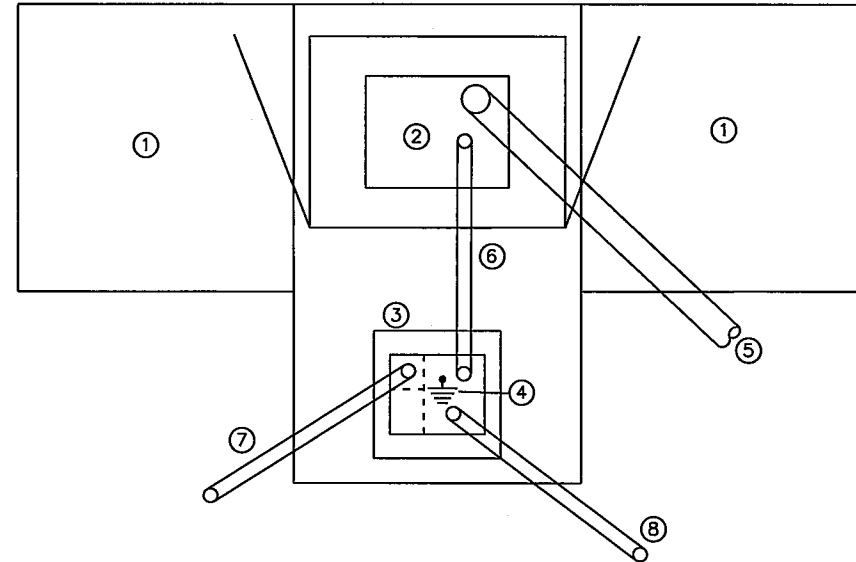


FRONT VIEW (NOT TO SCALE)



TYPICAL 334 SERIES + DMS FOUNDATION WITH SERVICE CABINET
FLASHING BEACON SYSTEMS "A-E"

TYPICAL CABINET INTERSECTION LAYOUT




NOTES:

1. THE ANCHOR RODS, NUTS AND WASHERS FOR THE STATE FURNISHED RICWS CABINET AND CONTROLLER SHALL BE FURNISHED BY THE STATE AND INSTALLED BY CONTRACTOR.
2. THE ANCHOR RODS, NUTS AND WASHERS FOR THE CONTRACTOR FURNISHED SERVICE CABINETS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
3. THE OUTER EDGE OF THE ENTIRE EQUIPMENT PAD AND CONCRETE WALK SHALL BE BEVELLED OR CHAMFERED IN A NEAT MANNER AS DIRECTED BY THE ENGINEER.
4. THE TOP OF THE CONDUITS SHALL BE THREADED AND CAPPED AFTER INSTALLATION (UNTIL CABLES ARE PULLED IN).
5. 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.).
6. CONCRETE MIX 3A32 OR EQUAL SHALL BE USED FOR EQUIPMENT PAD AND SIDEWALK.
7. CONDUITS WITH BOTH ENDS TERMINATING WITHIN THE PAD SHALL NOT BE PLACED BELOW THE CONCRETE.
8. THE EXACT LOCATION OF CONDUITS WITHIN THE PAD SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD.
9. ANCHOR RODS SHALL PROJECT A MINIMUM OF 3" ABOVE THE CONCRETE BUT SHALL NOT INTERFERE WITH THE CABINET FUNCTIONS (SUPPORTING MEMBERS, ETC.).
10. CABINETS TO BE CENTERED (LEFT & RIGHT) ON THE PAD.
11. BRUSH ON ANTI-SEIZE LUBRICANT MUST BE APPLIED TO ALL ANCHOR ROD THREADS PROTRUDING ABOVE THE CONCRETE PAD BEFORE THE CABINETS ARE SET.

DRAWN BY:	MW				
DESIGNER:	JMG				
CHECKED BY:	TAS				
DESIGN TEAM	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:  Lic. No. 22457
Printed Name: John M. Gray, PE Date: 3/12/2015

 PHONE: 651.490.2000
3535 VADNAIS CENTER DR.
ST. PAUL, MN 55110-5196
www.sehinc.com

MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEMS - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132,
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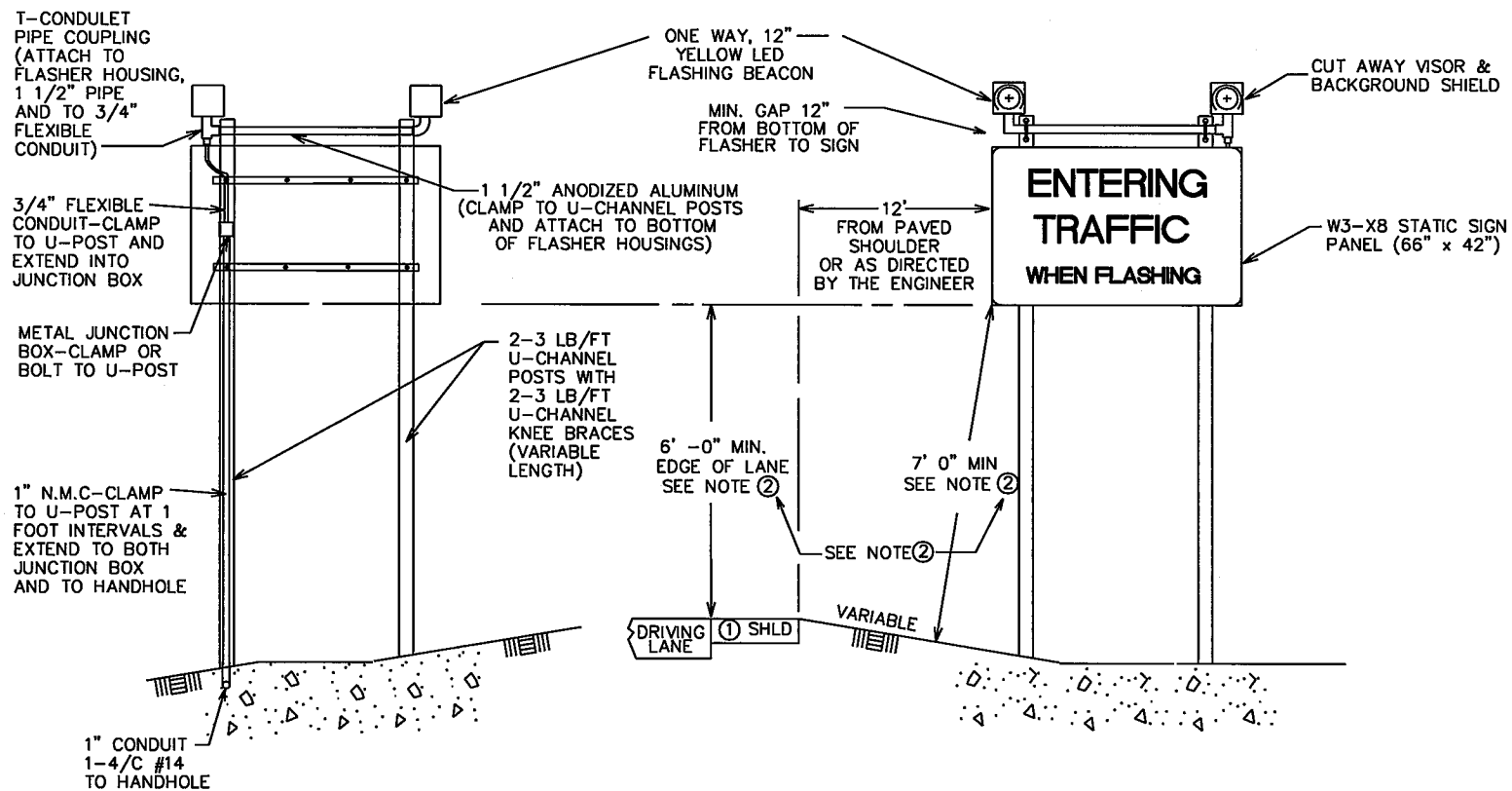
FLASHING BEACON SYSTEMS "A-E"
CABINET PAD LAYOUT

FILE NO.
MNTMD 131077

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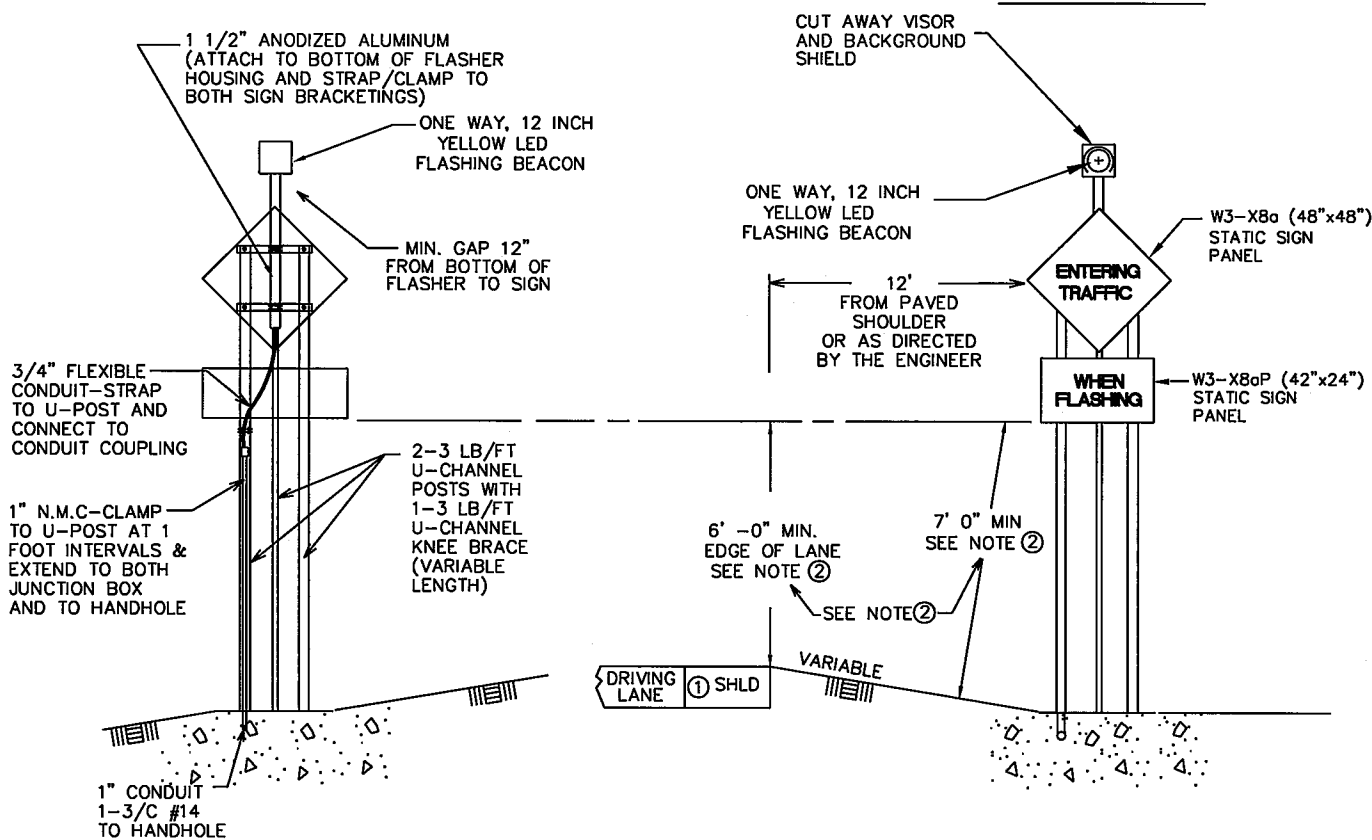
BACK VIEW

FRONT VIEW



BACK VIEW

FRONT VIEW

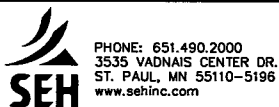


- NOTES: ① WITHOUT PAVED SHOULDER, EDGE OF SIGN SHALL BE 12' - 0" FROM EDGE OF DRIVING LANE.
- ② CONTRACTOR SHALL MEET BOTH MINIMUM REQUIRED MOUNTING HEIGHTS WITH THE SHORTEST U-CHANNEL POSTS POSSIBLE OR AS DIRECTED BY THE ENGINEER.

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

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Certified By: *John M. Gray* Lic. No. 22457
Printed Name: John M. Gray, PE Date: 3/12/2015



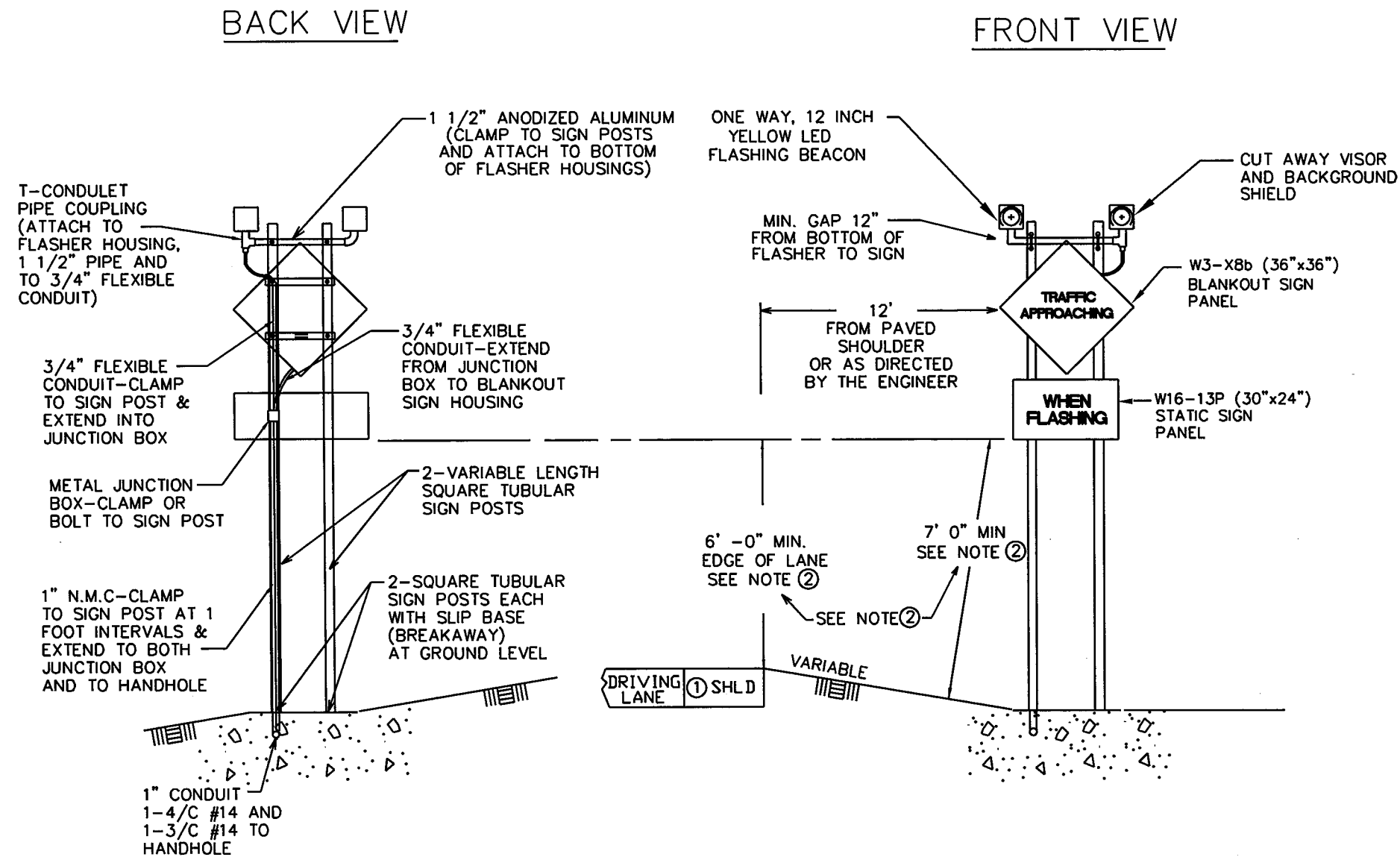
MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEMS - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132,
S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEMS 'A-E'
ADVANCE SIGN INSTALLATION DETAILS

FILE NO.
MNTMD 131077

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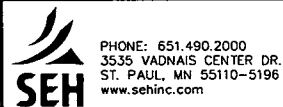


- NOTES: ① WITHOUT PAVED SHOULDER, EDGE OF SIGN SHALL BE 12' - 0" FROM EDGE OF DRIVING LANE.
- ② CONTRACTOR SHALL MEET BOTH MINIMUM REQUIRED MOUNTING HEIGHTS WITH THE SHORTEST SQUARE TUBE POSTS POSSIBLE OR AS DIRECTED BY THE ENGINEER.

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

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Certified By: *John M. Gray* Lic. No. 22457
 Printed Name: John M. Gray, PE Date: 3/12/2015



MINNESOTA DEPARTMENT OF TRANSPORTATION
 RURAL INTERSECTION CONFLICT
 WARNING SYSTEMS - PHASE II
 S.P. 8816-2274, 1806-74, 6406-24, 7102-132
 S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEMS "A", "D", "E"
 INTERSECTION SIGN INSTALLATION DETAILS

FILE NO.
 MNTMD 131077

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41

NOTES:

- THE EXACT LOCATION OF HANDHOLES, FLASHERS/SIGNS, LOOP/CANOGA DETECTORS, AND CABINET PAD SHALL BE FIELD VERIFIED BY THE ENGINEER AND MNDOT DISTRICT TRAFFIC PERSONNEL.
- SEE SPECIAL PROVISIONS FOR STATE FURNISHED MATERIALS.
- COORDINATE SERVICE CONNECTION WITH XCEL ENERGY (AND WITH ENGINEER). CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE NEW FLASHER SYSTEM.
- SEE DETAILS FOR FURTHER INFORMATION REGARDING FLASHER INSTALLATIONS.
- THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD. CONDUITS UNDER EXISTING ROADWAYS AND CULVERTS WILL REQUIRE BORING.
- CONTRACTOR SHALL MAINTAIN 300 FOOT SPACING BETWEEN NEW SIGNS AND EXISTING SIGNS ON MAJOR ROADWAY, UNLESS OTHERWISE DIRECTED BY ENGINEER.
- DEVICES SHALL BE FURNISHED AND INSTALLED AT DISTANCES LISTED FROM THE INTERSECTION.
- SIGNS SHALL BE FURNISHED AND INSTALLED AT A MINIMUM 7-FOOT MOUNTING HEIGHT. SEE MNDOT TRAFFIC ENGINEERING MANUAL FOR TYPICAL MOUNTING AND SIGN PLACEMENT.
- NEW HANDHOLES TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR SHALL BE IN ACCORDANCE WITH MNDOT APPROVED/QUALIFIED PRODUCTS LIST. MAXIMUM SPACING OF HANDHOLES ALLOWED IS 400 FEET.
- ALL NEW CONDUIT SHALL BE PVC-SCHEDULE 80 OR HDPE SCHEDULE 80 AS SHOWN IN THE PLANS.
- ALL ITEMS ARE FURNISH AND INSTALL UNLESS OTHERWISE NOTED.

F & I ROADWAY DETECTORS			
NUMBER	SIZE	LOCATION	TYPE
D2-1	702-3	934'	CANOGA
D2-2	702-3	916'	CANOGA
D4-1	6' x 6'	610'	PVC
D4-2	2-6' x 6'	-5' & 5'	PVC
D6-1	702-3	934'	CANOGA
D6-2	702-3	916'	CANOGA
D6-3	702-3	376'	CANOGA
D8-1	6' x 6'	610'	PVC
D8-2	2-6' x 6'	-5' & 5'	PVC

LOCATION = DISTANCE FROM STOP BAR TO FRONT OF ROADWAY DETECTOR.

- (B) INPLACE - WOOD POLE (S.O.P.-XCEL ENERGY)
- F & I 2" CONDUIT RISER AND WEATHERHEAD
3-1/c#2
EXTEND INTO SERVICE CABINET:
2" CONDUIT
3-1/c#2

- (A) F & I EQUIPMENT PAD FOUNDATION (SEE DETAIL)
RICWS/LIGHTING SERVICE CABINET
SERVICE CABINET TO SOURCE OF POWER:
2" CONDUIT (SEE B NOTES)
SERVICE CABINET TO RICWS CABINET:
2" CONDUIT
3-1/c#6
SERVICE CABINET TO H.H.1:
2" CONDUIT
2-3/c#14 (LUM)
RICWS CABINET TO H.H.1:
4" CONDUIT
2-4/c#14 (FLASHERS)
2-3/c#14 (FLASHERS)
2-3/c#14 (BLANKOUT SIGNS)
9-2/c#14 (DETECTORS)

- (1) F & I 2-SQUARE TUBULAR POSTS AT 30" SPACING (SEE DETAIL)
W16-13P ("WHEN FLASHING") STATIC SIGN (30" x 24")
2-12" LED YELLOW FLASHERS (WITH HOUSINGS, VISORS, AND BACKGROUND SHIELDS)-MOUNT 6" ABOVE
EDGE OF "TRAFFIC APPROACHING" SIGN ON STANDARD
SIGNAL BRACKETING (F-1, F-1A)
EXTEND INTO H.H.1:
1" CONDUIT
1-4/c#14 (FLASHERS)
1-3/c#14 (BLANKOUT SIGN)

INSTALL 334Z CABINET AND CONTROLLER (FURNISHED BY STATE)

INSTALL "TRAFFIC APPROACHING" (36" x 36") BLANK OUT SIGN (FURNISHED BY STATE)

100
SCALE IN FEET

SEE SHEET 10)
MATCHLINE "A"-SYSTEM "A"

MATCHLINE "B"-SYSTEM "A"
(SEE SHEET 10)

ABBREVIATIONS

D2-1 (e.g.)	DETECTOR (PHASE 2, NO. 1)
F & I	FURNISH AND INSTALL
GRD	GROUND
H.H.	HANDHOLE
LED	LIGHT EMITTING DIODE
LUM	LUMINAIRE
PVC	POLYVINYL CHLORIDE (CONDUIT)
SOP	SOURCE OF POWER

LEGEND OF SYMBOLS

FLASHER SIGN NO.	(1)
FLASHER AND SIGN POST	(2)
SINGLE BEACON (ADVANCE INSTALLATION)	(3)
DOUBLE BEACON (INTERSECTION INSTALLATION)	(4)
HANDHOLE	(5)
F & I CONDUIT (SIZE AS NOTED)	(6)
PVC LOOP DETECTOR (SIZE AS NOTED)	(7)
CANOGA 702 (3-CANOGA DETECTORS)	(8)
CABINET, CONTROLLER, AND SERVICE CABINET	(A)
SOURCE OF POWER-INPLACE	(B)
STREET LIGHT AND POLE	(C)
FLASHER FACE NO.	(F-2)

- LOCATION OF UTILITIES SHOWN ARE APPROXIMATE.
- CONTRACTOR SHALL VERIFY ALL LOCATIONS PRIOR TO BEGINNING ANY CONSTRUCTION.
- DAMAGE TO EXISTING UTILITIES DUE TO FLASHER SYSTEM CONSTRUCTION SHALL BE REPAIRED BY CONTRACTOR AT NO EXPENSE TO THE STATE OR THE COUNTY.

PUBLIC UTILITIES AT/NEAR INTERSECTION	
UTILITY COMPANY	
ARVIG COMMUNICATIONS SYSTEMS	
REDWOOD ELECTRIC COOPERATIVE	
XCEL ENERGY	

- (3) F & I 2-SQUARE TUBULAR POSTS AT 30" SPACING (SEE DETAIL)
W16-13P ("WHEN FLASHING") STATIC SIGN (30" x 24")
2-12" LED YELLOW FLASHERS (WITH HOUSINGS, VISORS, AND BACKGROUND SHIELDS)-MOUNT 6" ABOVE
EDGE OF "TRAFFIC APPROACHING" SIGN ON STANDARD
SIGNAL BRACKETING (F-3, F-3A)
EXTEND INTO H.H.9:
1" CONDUIT
1-4/c#14 (FLASHERS)
1-3/c#14 (BLANKOUT SIGN)
INSTALL "TRAFFIC APPROACHING" (36" x 36") BLANK OUT SIGN (FURNISHED BY STATE)

- (1) F & I STREET LIGHT POLE FOUNDATION-DESIGN E
TYPE D40-9 STREET LIGHT POLE
LUMINAIRE-LED
EXTEND INTO H.H. 6:
2" CONDUIT
1-3/c#14 (LUM)

- (2) F & I STREET LIGHT POLE FOUNDATION-DESIGN E
TYPE D40-9 STREET LIGHT POLE
LUMINAIRE-LED
EXTEND INTO H.H.14:
2" CONDUIT
1-3/c#14 (LUM)

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

I hereby certify that this sheet 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: 03/12/2015



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

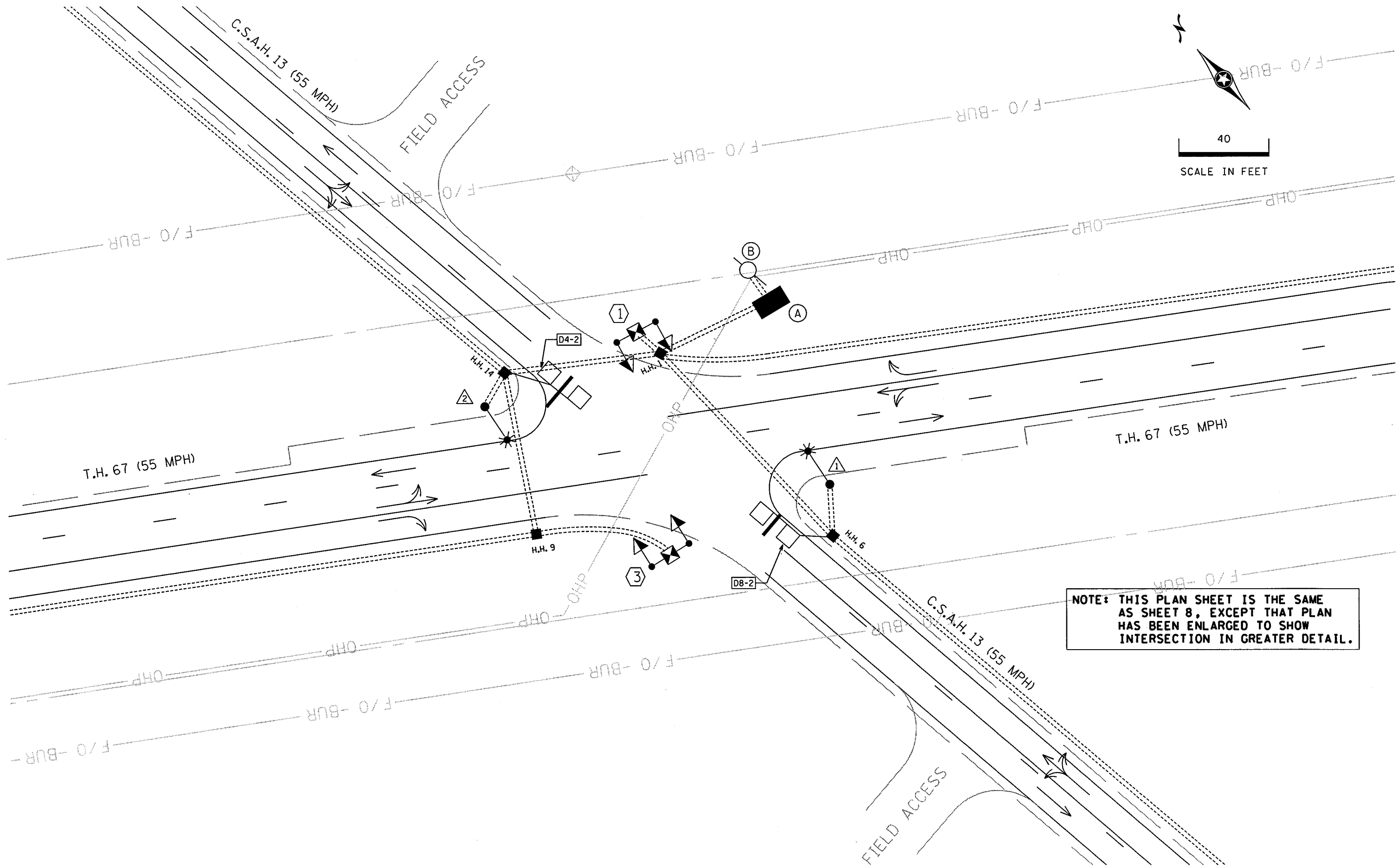
MINNESOTA DEPARTMENT OF TRANSPORTATION
**RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II**
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

**FLASHING BEACON SYSTEM "A"
INTERSECTION LAYOUT
TRUNK HIGHWAY 67 AT CSAH 13**
MORGAN, MINNESOTA - REDWOOD COUNTY

FILE NO.
MNTMD131077

8

41



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

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Certified By: *[Signature]* Lic. No. 22457
Printed Name: JOHN M. GRAY Date: 03/12/2015

SEH
PHONE: (651)490-2000
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ST. PAUL, MN 55110

MINNESOTA DEPARTMENT OF TRANSPORTATION
**RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II**
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

**FLASHING BEACON SYSTEM "A"
INTERSECTION LAYOUT
TRUNK HIGHWAY 67 AT CSAH 13**
MORGAN, MINNESOTA - REDWOOD COUNTY

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4/23/2015

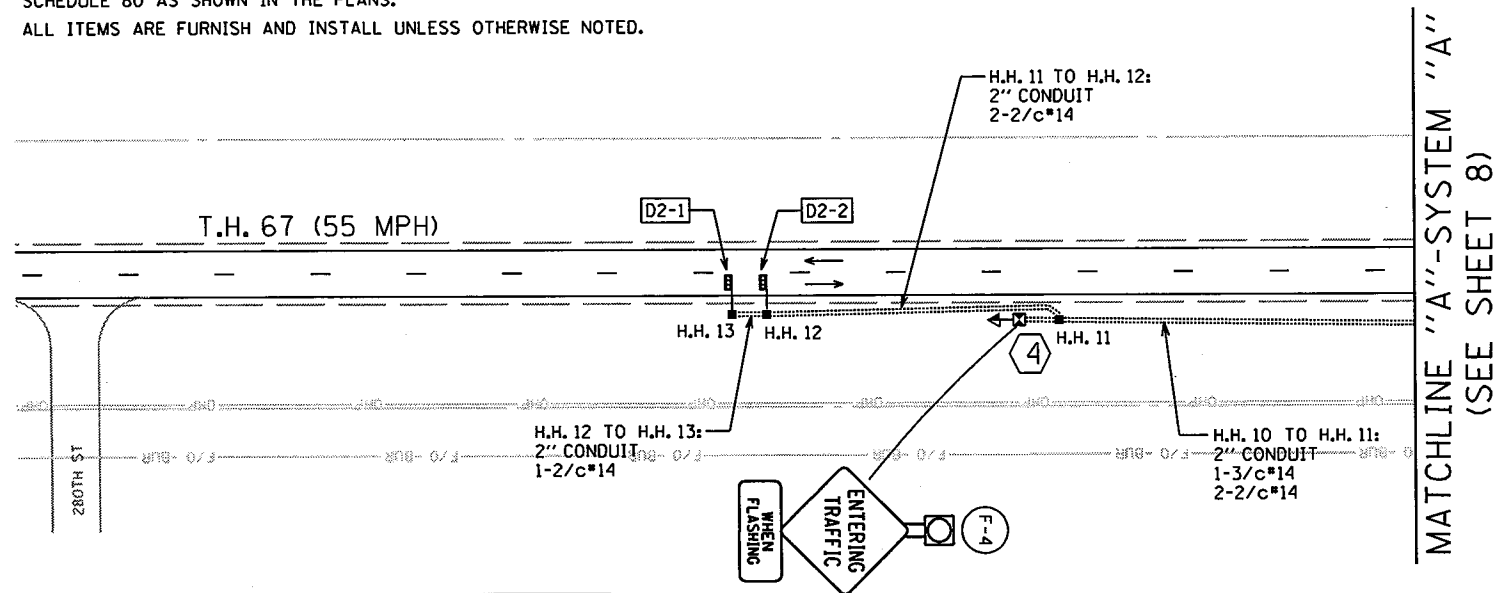
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NOTES:

- 1) THE EXACT LOCATION OF HANDHOLES, FLASHERS/SIGNS, LOOP/CANOGA DETECTORS, AND CABINET PAD SHALL BE FIELD VERIFIED BY THE ENGINEER AND MnDOT DISTRICT TRAFFIC PERSONNEL.
- 2) SEE SPECIAL PROVISIONS FOR STATE FURNISHED MATERIALS.
- 3) COORDINATE SERVICE CONNECTION WITH XCEL ENERGY (AND WITH ENGINEER). CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE NEW FLASHER SYSTEM.
- 4) SEE DETAILS FOR FURTHER INFORMATION REGARDING FLASHER INSTALLATIONS.
- 5) THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD. CONDUITS UNDER EXISTING ROADWAYS AND CULVERTS WILL REQUIRE BORING.
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- 7) DEVICES SHALL BE FURNISHED AND INSTALLED AT DISTANCES LISTED FROM THE INTERSECTION.
- 8) SIGNS SHALL BE FURNISHED AND INSTALLED AT A MINIMUM 7-FOOT MOUNTING HEIGHT. SEE MnDOT TRAFFIC ENGINEERING MANUAL FOR TYPICAL MOUNTING AND SIGN PLACEMENT.
- 9) NEW HANDHOLES TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR SHALL BE IN ACCORDANCE WITH MnDOT APPROVED/QUALIFIED PRODUCTS LIST. MAXIMUM SPACING OF HANDHOLES ALLOWED IS 400 FEET.
- 10) ALL NEW CONDUIT SHALL BE PVC-SCHEDULE 80 OR HDPE SCHEDULE 80 AS SHOWN IN THE PLANS.
- 11) ALL ITEMS ARE FURNISH AND INSTALL UNLESS OTHERWISE NOTED.

④ F & I 2-3 LB/FT U-CHANNEL POSTS AT 30" SPACING WITH 1-3 LB/FT U-CHANNEL KNEE BRACE W3-X80 ("ENTERING TRAFFIC") (48" x 48") AND W3-X80P ("WHEN FLASHING") (42" x 24") STATIC SIGNS (800' FROM INTERSECTION) 1-12" LED YELLOW FLASHER (WITH HOUSING, VISOR, AND BACKGROUND SHIELD)-MOUNT 6" ABOVE EDGE OF "ENTERING TRAFFIC" SIGN ON STANDARD SIGNAL BRACKETING (F-4) EXTEND INTO H.H. 11: 1" CONDUIT 1-3/c*14 (FLASHER)

100
SCALE IN FEET



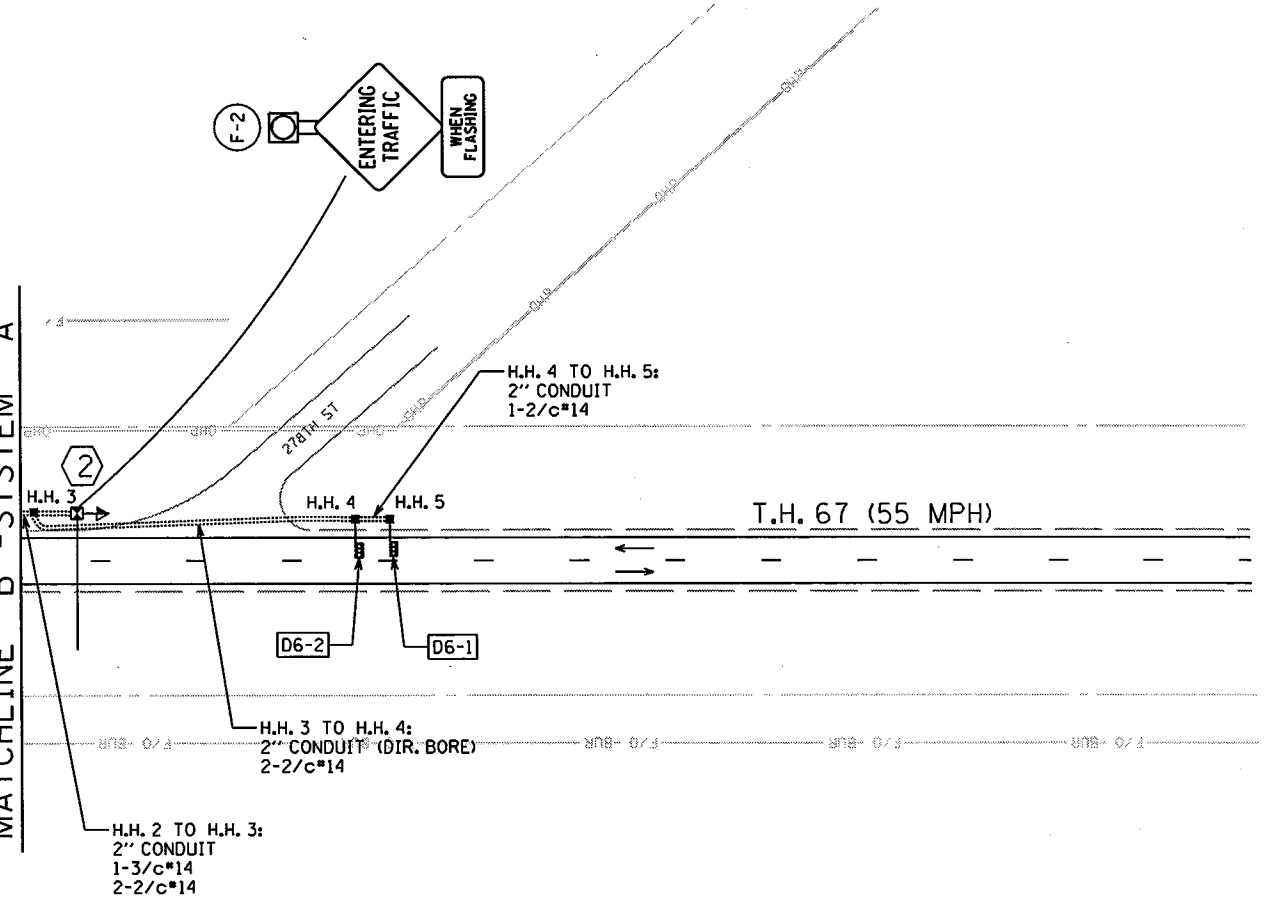
LEGEND OF SYMBOLS

- | | |
|---|-------|
| FLASHER SIGN NO. | ① |
| FLASHER AND SIGN POST | ⊠ |
| SINGLE BEACON (ADVANCE INSTALLATION) | → |
| DOUBLE BEACON (INTERSECTION INSTALLATION) | ↔ |
| HANDHOLE | ■ |
| F & I CONDUIT (SIZE AS NOTED) | ===== |
| PVC LOOP DETECTOR (SIZE AS NOTED) | □ |
| CANOGA 702 (3-CANOGA DETECTORS) | ⊞ |
| CABINET, CONTROLLER, AND SERVICE CABINET | ■ (A) |
| SOURCE OF POWER-INPLACE | ⊙ (B) |
| FLASHER FACE NO. | (F-2) |

ABBREVIATIONS

D2-1 (e.g.)	DETECTOR (PHASE 2, NO. 1)
F & I	FURNISH AND INSTALL
GRD	GROUND
H.H.	HANDHOLE
LED	LIGHT EMITTING DIODE
LUM	LUMINAIRE
PVC	POLYVINYL CHLORIDE (CONDUIT)
SOP	SOURCE OF POWER

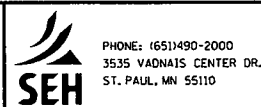
(SEE SHEET 8)
MATCHLINE "B"-SYSTEM "A"



② F & I 2-3 LB/FT U-CHANNEL POSTS AT 30" SPACING WITH 1-3 LB/FT U-CHANNEL KNEE BRACE W3-X80 ("ENTERING TRAFFIC") (48" x 48") AND W3-X80P ("WHEN FLASHING") (42" x 24") STATIC SIGNS (775' FROM INTERSECTION) 1-12" LED YELLOW FLASHER (WITH HOUSING, VISOR, AND BACKGROUND SHIELD)-MOUNT 6" ABOVE EDGE OF "ENTERING TRAFFIC" SIGN ON STANDARD SIGNAL BRACKETING (F-2) EXTEND INTO H.H. 3: 1" CONDUIT 1-3/c*14 (FLASHER)

DESIGN TEAM				
DRAWN BY: CMJ				
DESIGNER: JMC				
CHECKED BY: JMC				
NO.	BY	DATE	REVISIONS	

I hereby certify that this sheet 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: 03/12/2015



MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEM "A"
INTERSECTION LAYOUT
TRUNK HIGHWAY 67 AT CSAH 13
MORGAN, MINNESOTA - REDWOOD COUNTY

FILE NO.
MNTMD131077

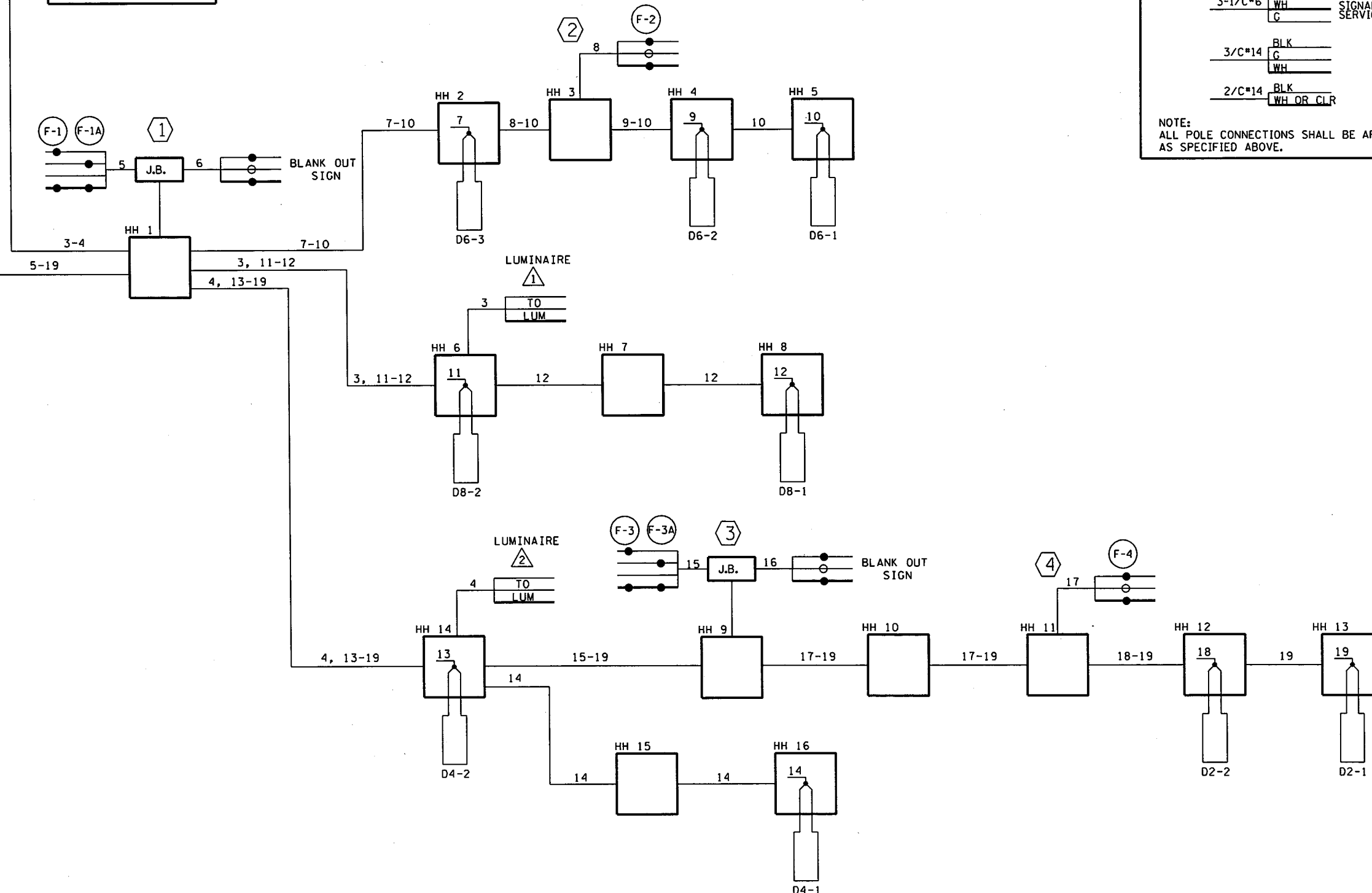
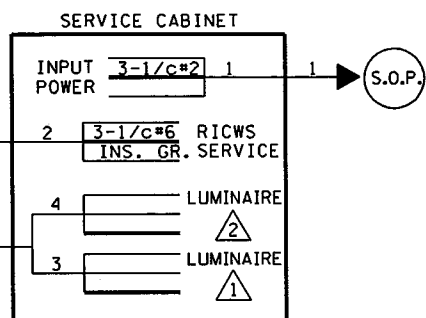
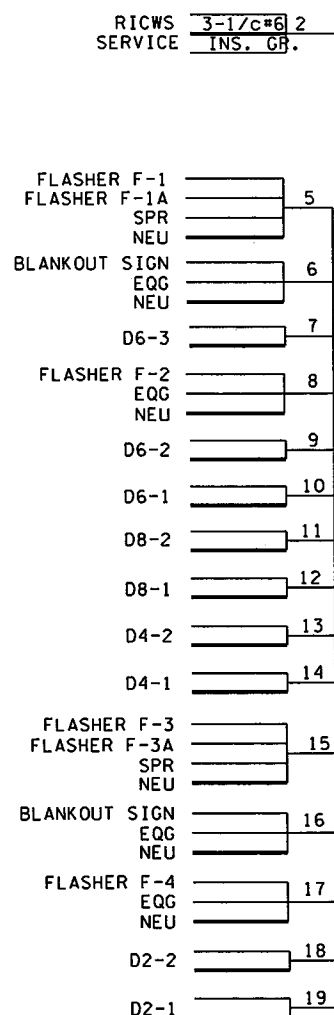
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RICWS CABINET



NOTES:
1) FLASHER SYSTEM AND LUMINAIRES SHALL BE METERED POWER.

CONDUCTOR COLOR CODE (14 GAUGE)	
TO RICWS CABINET/DEVICE	
1/C#6	G
3-1/C#2	R WH BLK
4/C#14	R BLK/R BLK WH
3-1/C#6	BLK WH G
3/C#14	BLK G WH
2/C#14	BLK WH OR CLR

NOTE:
ALL POLE CONNECTIONS SHALL BE ARRANGED AS SPECIFIED ABOVE.

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

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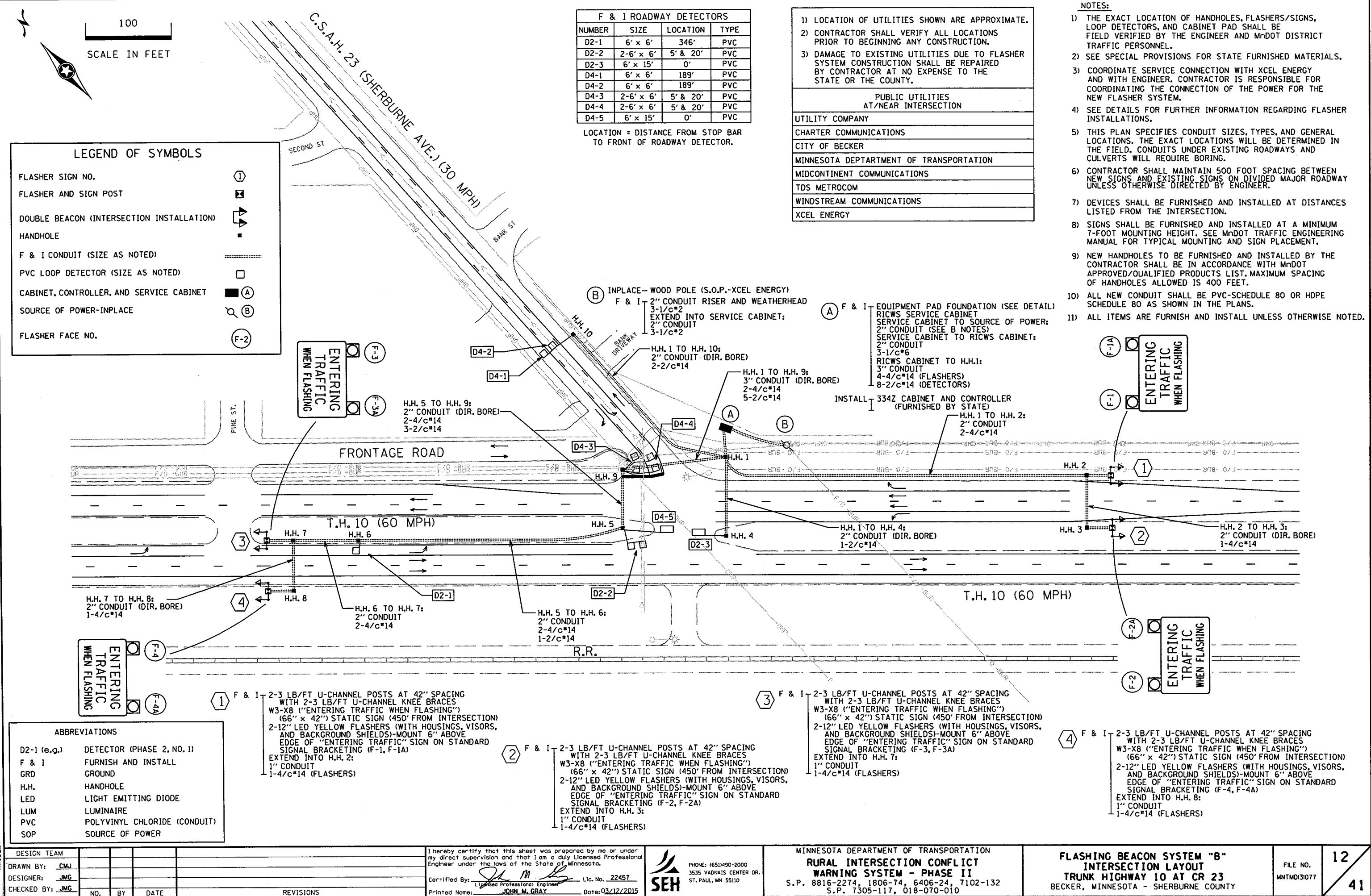
Certified By: *John M. Gray* Lic. No. 22457
Printed Name: JOHN M. GRAY Date: 03/12/2015

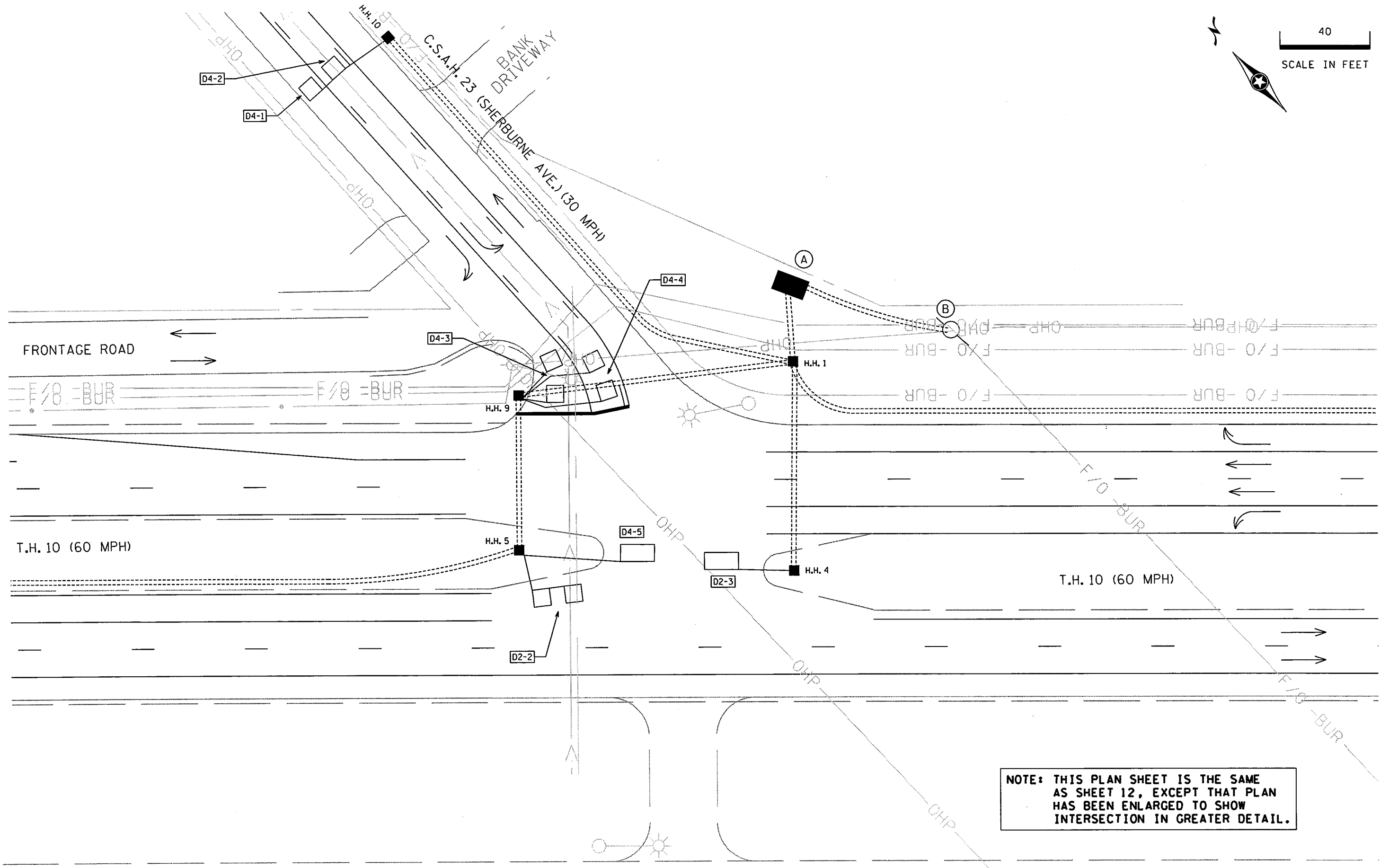
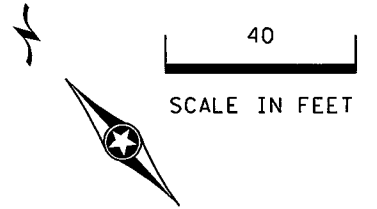
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PHONE: (651)490-2000
3535 VADNAIS CENTER DR.
ST. PAUL, MN 55110

MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEM "A"
FIELD WIRING DIAGRAM
TRUNK HIGHWAY 67 AT CSAH 13
MORGAN, MINNESOTA - REDWOOD COUNTY

FILE NO. 11
MNTMDI31077 41





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DRAWN BY: <u>CMJ</u>									
DESIGNER: <u>JMG</u>									
CHECKED BY: <u>JMG</u>									
NO.	BY	DATE	REVISIONS						

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4/23/2015

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RICWS CABINET

SERVICE CABINET

NOTES:

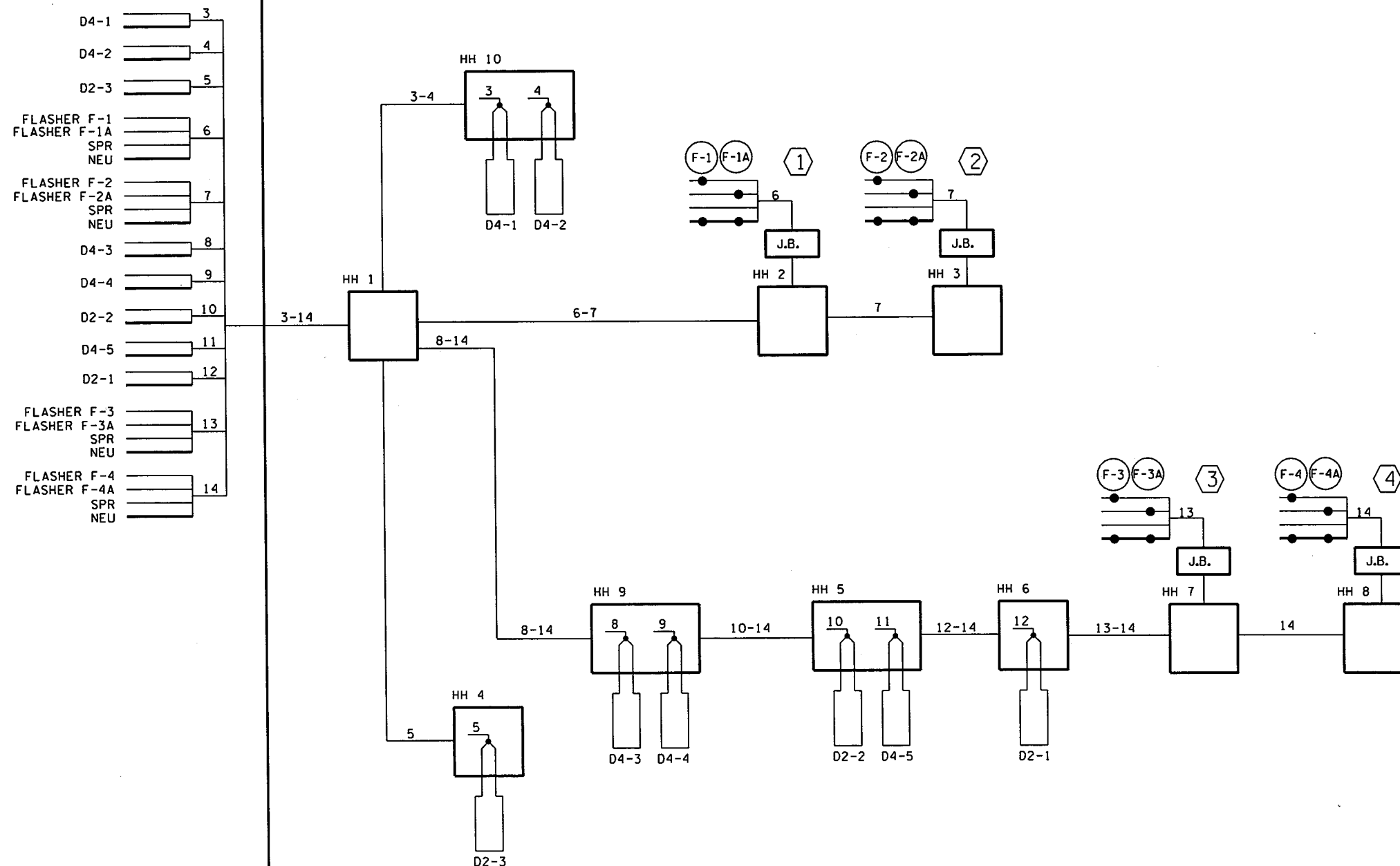
1) FLASHER SYSTEM AND LUMINAIRES SHALL BE METERED POWER.

CONDUCTOR COLOR CODE (14 GAUGE)

TO RICWS CABINET/DEVICE

1/C*6 G
3-1/C*2 R WH BLK INPUT POWER
4/C*14 R BLK/R BLK WH
3-1/C*6 BLK WH G SIGNAL SERVICE
3/C*14 BLK G WH
2/C*14 BLK WH OR CLR

NOTE:
ALL POLE CONNECTIONS SHALL BE ARRANGED AS SPECIFIED ABOVE.



DESIGN TEAM			
DRAWN BY:	CMJ		
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: 03/12/2015

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PHONE: (651)490-2000
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ST. PAUL, MN 55110

MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEM "B"
INTERSECTION LAYOUT
TRUNK HIGHWAY 10 AT CR 23
BECKER, MINNESOTA - SHERBURNE COUNTY

FILE NO.
MNTMD131077
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41

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4/23/2015

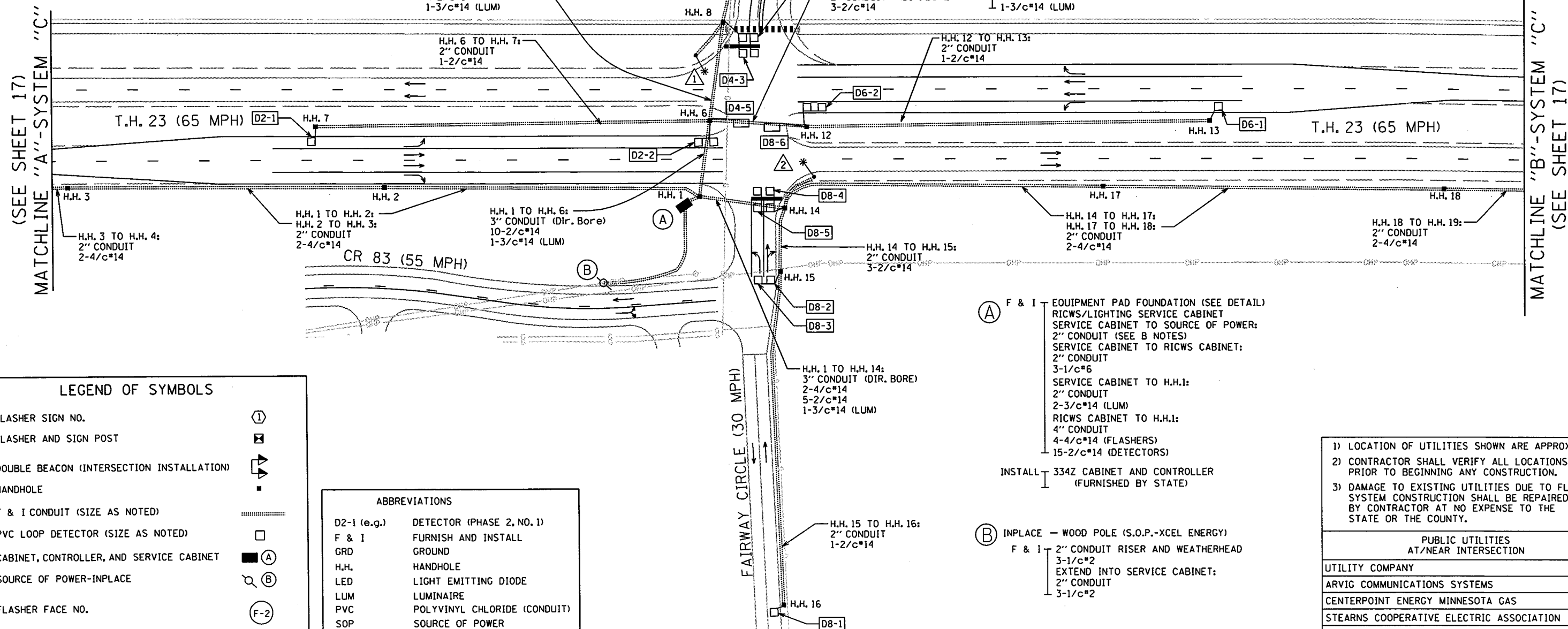
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NOTES:

- 1) THE EXACT LOCATION OF HANDHOLES, FLASHERS/SIGNS, LOOP DETECTORS, AND CABINET PAD SHALL BE FIELD VERIFIED BY THE ENGINEER AND MnDOT DISTRICT TRAFFIC PERSONNEL.
- 2) SEE SPECIAL PROVISIONS FOR STATE FURNISHED MATERIALS.
- 3) COORDINATE SERVICE CONNECTION WITH XCEL ENERGY AND WITH ENGINEER. CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE NEW FLASHER SYSTEM.
- 4) SEE DETAILS FOR FURTHER INFORMATION REGARDING FLASHER INSTALLATIONS.
- 5) THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD. CONDUITS UNDER EXISTING ROADWAYS AND CULVERTS WILL REQUIRE BORING.
- 6) CONTRACTOR SHALL MAINTAIN 500 FOOT SPACING BETWEEN NEW SIGNS AND EXISTING SIGNS ON DIVIDED MAJOR ROADWAY UNLESS OTHERWISE DIRECTED BY ENGINEER.
- 7) DEVICES SHALL BE FURNISHED AND INSTALLED AT DISTANCES LISTED FROM THE INTERSECTION.
- 8) SIGNS SHALL BE FURNISHED AND INSTALLED AT A MINIMUM 7-FOOT MOUNTING HEIGHT. SEE MnDOT TRAFFIC ENGINEERING MANUAL FOR TYPICAL MOUNTING AND SIGN PLACEMENT.
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- 10) ALL NEW CONDUIT SHALL BE PVC-SCHEDULE 80 OR HDPE SCHEDULE 80 AS SHOWN IN THE PLANS.
- 11) ALL ITEMS ARE FURNISH AND INSTALL UNLESS OTHERWISE NOTED.

F & I ROADWAY DETECTORS			
NUMBER	SIZE	LOCATION	TYPE
D2-1	6' x 6'	406'	PVC
D2-2	2-6' x 6'	5' & 20'	PVC
D4-1	6' x 6'	598'	PVC
D4-2	6' x 6'	150'	PVC
D4-3	2-6' x 6'	-5' & 5'	PVC
D4-4	2-6' x 6'	-5' & 5'	PVC
D4-5	6' x 15'	0'	PVC
D6-1	6' x 6'	406'	PVC
D6-2	2-6' x 6'	5' & 20'	PVC
D8-1	6' x 6'	398'	PVC
D8-2	6' x 6'	80'	PVC
D8-3	6' x 6'	80'	PVC
D8-4	2-6' x 6'	-5' & 5'	PVC
D8-5	2-6' x 6'	-5' & 5'	PVC
D8-6	6' x 15'	0'	PVC

LOCATION = DISTANCE FROM STOP BAR TO FRONT OF ROADWAY DETECTOR.



LEGEND OF SYMBOLS

- FLASHER SIGN NO. (1)
- FLASHER AND SIGN POST (2)
- DOUBLE BEACON (INTERSECTION INSTALLATION) (3)
- HANDHOLE (4)
- F & I CONDUIT (SIZE AS NOTED) (5)
- PVC LOOP DETECTOR (SIZE AS NOTED) (6)
- CABINET, CONTROLLER, AND SERVICE CABINET (7)
- SOURCE OF POWER-INPLACE (8)
- FLASHER FACE NO. (9)

ABBREVIATIONS

D2-1 (e.g.)	DETECTOR (PHASE 2, NO. 1)
F & I	FURNISH AND INSTALL
GRD	GROUND
H.H.	HANDHOLE
LED	LIGHT EMITTING DIODE
LUM	LUMINAIRE
PVC	POLYVINYL CHLORIDE (CONDUIT)
SOP	SOURCE OF POWER

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

I hereby certify that this sheet 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: 03/12/2015

SEH

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

MINNESOTA DEPARTMENT OF TRANSPORTATION

RURAL INTERSECTION CONFLICT WARNING SYSTEM - PHASE II

S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEM "C"

INTERSECTION LAYOUT

TRUNK HIGHWAY 23 AT CR 158

COLD SPRING, MINNESOTA - STEARNS COUNTY

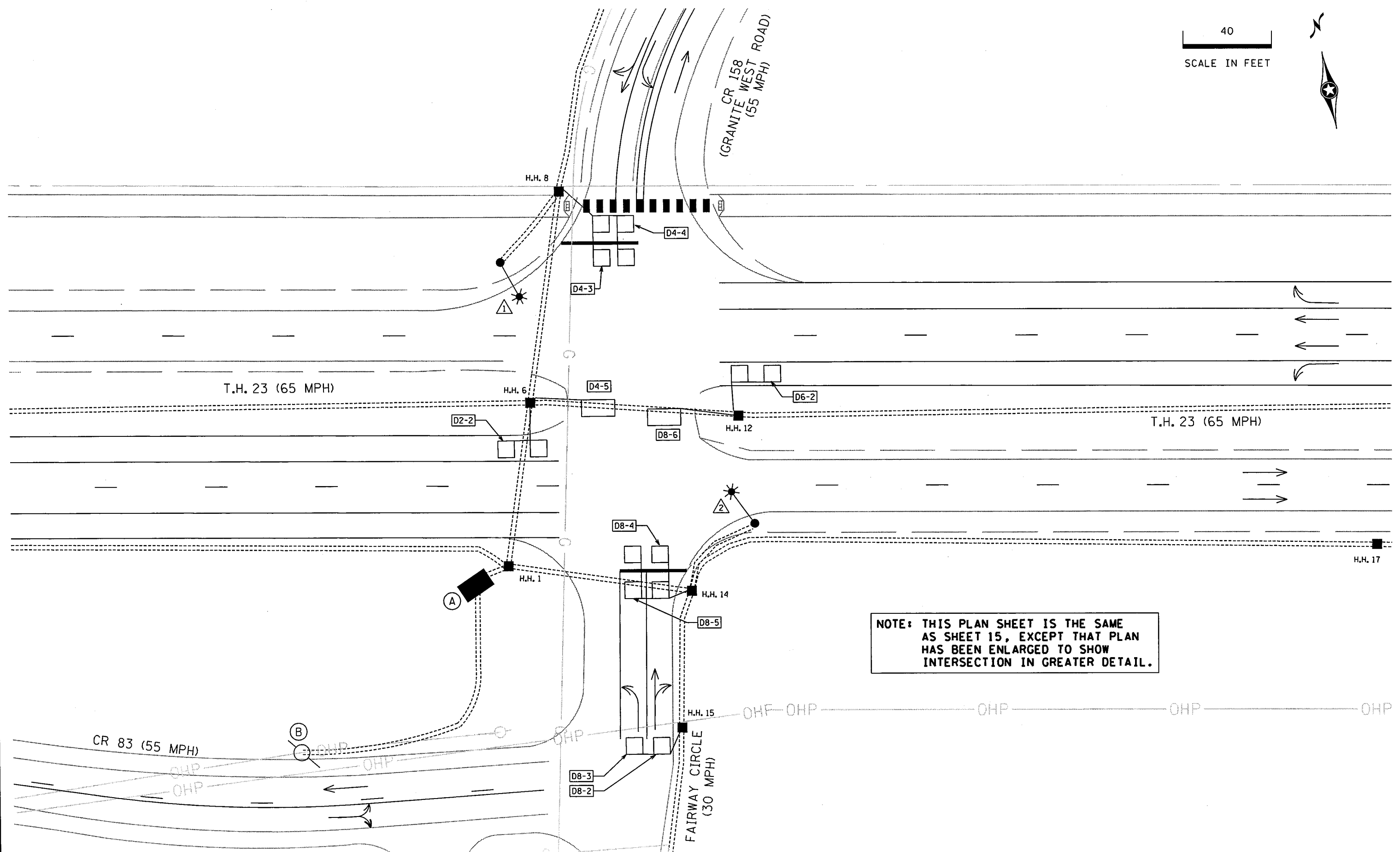
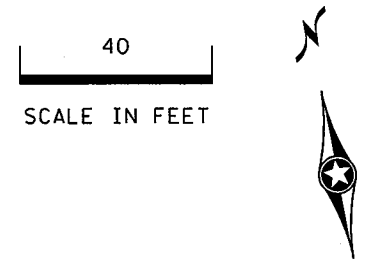
FILE NO.
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- 1) LOCATION OF UTILITIES SHOWN ARE APPROXIMATE.
- 2) CONTRACTOR SHALL VERIFY ALL LOCATIONS PRIOR TO BEGINNING ANY CONSTRUCTION.
- 3) DAMAGE TO EXISTING UTILITIES DUE TO FLASHER SYSTEM CONSTRUCTION SHALL BE REPAIRED BY CONTRACTOR AT NO EXPENSE TO THE STATE OR THE COUNTY.

PUBLIC UTILITIES AT/NEAR INTERSECTION	
UTILITY COMPANY	
ARVIC COMMUNICATIONS SYSTEMS	
CENTERPOINT ENERGY MINNESOTA GAS	
STEARNS COOPERATIVE ELECTRIC ASSOCIATION	
XCEL ENERGY	

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

I hereby certify that this sheet 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: Lic. No. 22457
Printed Name: JOHN M. GRAY Date: 03/12/2015

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

MINNESOTA DEPARTMENT OF TRANSPORTATION
**RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II**
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

**FLASHING BEACON SYSTEM "C"
INTERSECTION LAYOUT
TRUNK HIGHWAY 23 AT CR 158**
COLD SPRING, MINNESOTA - STEARNS COUNTY

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NOTES:

- 1) THE EXACT LOCATION OF HANDHOLES, FLASHERS/SIGNS, LOOP DETECTORS, AND CABINET PAD SHALL BE FIELD VERIFIED BY THE ENGINEER AND MnDOT DISTRICT TRAFFIC PERSONNEL.
- 2) SEE SPECIAL PROVISIONS FOR STATE FURNISHED MATERIALS.
- 3) COORDINATE SERVICE CONNECTION WITH XCEL ENERGY AND WITH ENGINEER. CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE NEW FLASHER SYSTEM.
- 4) SEE DETAILS FOR FURTHER INFORMATION REGARDING FLASHER INSTALLATIONS.
- 5) THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD. CONDUITS UNDER EXISTING ROADWAYS AND CULVERTS WILL REQUIRE BORING.
- 6) CONTRACTOR SHALL MAINTAIN 500 FOOT SPACING BETWEEN NEW SIGNS AND EXISTING SIGNS ON DIVIDED MAJOR ROADWAY UNLESS OTHERWISE DIRECTED BY ENGINEER.
- 7) DEVICES SHALL BE FURNISHED AND INSTALLED AT DISTANCES LISTED FROM THE INTERSECTION.
- 8) SIGNS SHALL BE FURNISHED AND INSTALLED AT A MINIMUM 7-FOOT MOUNTING HEIGHT. SEE MnDOT TRAFFIC ENGINEERING MANUAL FOR TYPICAL MOUNTING AND SIGN PLACEMENT.
- 9) NEW HANDHOLES TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR SHALL BE IN ACCORDANCE WITH MnDOT APPROVED/QUALIFIED PRODUCTS LIST, MAXIMUM SPACING OF HANDHOLES ALLOWED IS 400 FEET.
- 10) ALL NEW CONDUIT SHALL BE PVC-SCHEDULE 80 OR HDPE SCHEDULE 80 AS SHOWN IN THE PLANS.
- 11) ALL ITEMS ARE FURNISH AND INSTALL UNLESS OTHERWISE NOTED.

① F & I 2-3 LB/FT U-CHANNEL POSTS AT 42" SPACING WITH 2-3 LB/FT U-CHANNEL KNEE BRACES W3-X8 ("ENTERING TRAFFIC WHEN FLASHING") (66" x 42") STATIC SIGN (950' FROM INTERSECTION) 2-12" LED YELLOW FLASHERS (WITH HOUSINGS, VISORS, AND BACKGROUND SHIELDS)-MOUNT 6" ABOVE EDGE OF "ENTERING TRAFFIC" SIGN ON STANDARD SIGNAL BRACKETING (F-1, F-1A) EXTEND INTO H.H. 4: 1" CONDUIT 1-4/c*14 (FLASHERS)

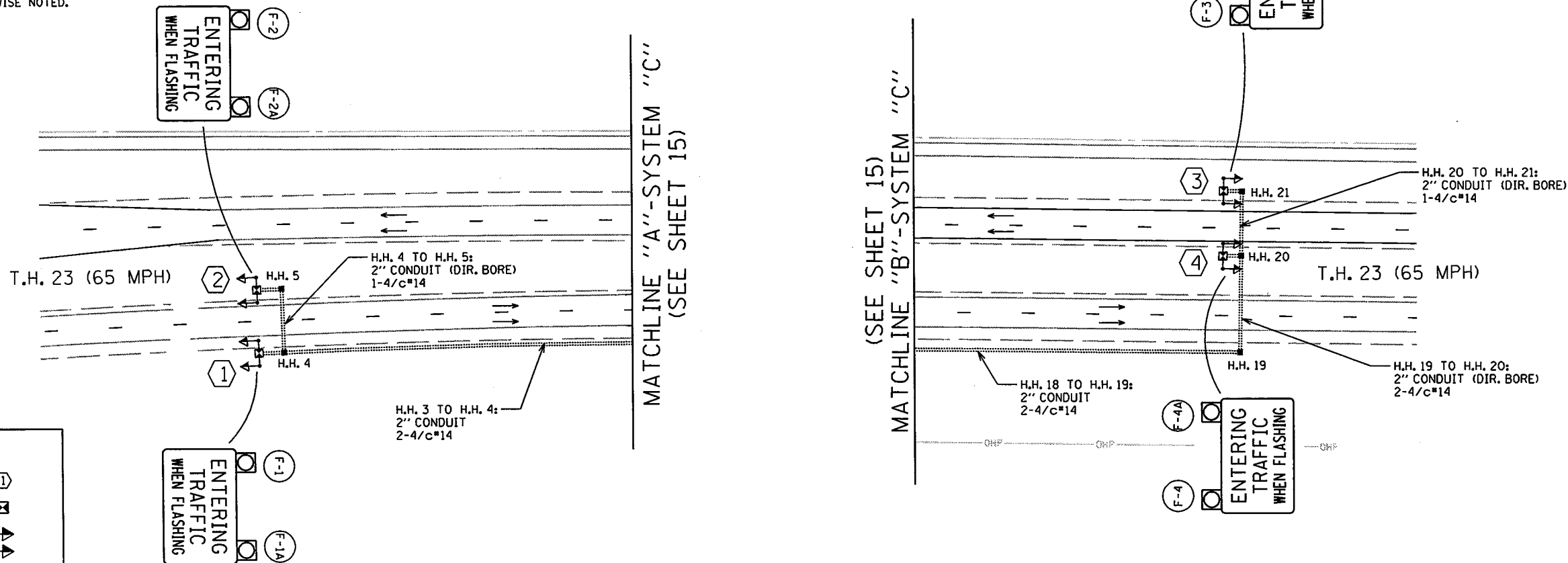
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② F & I 2-3 LB/FT U-CHANNEL POSTS AT 42" SPACING WITH 2-3 LB/FT U-CHANNEL KNEE BRACES W3-X8 ("ENTERING TRAFFIC WHEN FLASHING") (66" x 42") STATIC SIGN (950' FROM INTERSECTION) 2-12" LED YELLOW FLASHERS (WITH HOUSINGS, VISORS, AND BACKGROUND SHIELDS)-MOUNT 6" ABOVE EDGE OF "ENTERING TRAFFIC" SIGN ON STANDARD SIGNAL BRACKETING (F-2, F-2A) EXTEND INTO H.H. 5: 1" CONDUIT 1-4/c*14 (FLASHERS)

④ F & I 2-3 LB/FT U-CHANNEL POSTS AT 42" SPACING WITH 2-3 LB/FT U-CHANNEL KNEE BRACES W3-X8 ("ENTERING TRAFFIC WHEN FLASHING") (66" x 42") STATIC SIGN (950' FROM INTERSECTION) 2-12" LED YELLOW FLASHERS (WITH HOUSINGS, VISORS, AND BACKGROUND SHIELDS)-MOUNT 6" ABOVE EDGE OF "ENTERING TRAFFIC" SIGN ON STANDARD SIGNAL BRACKETING (F-4, F-4A) EXTEND INTO H.H. 20: 1" CONDUIT 1-4/c*14 (FLASHERS)



100
SCALE IN FEET



LEGEND OF SYMBOLS

- FLASHER SIGN NO. ①
- FLASHER AND SIGN POST [Symbol]
- DOUBLE BEACON (INTERSECTION INSTALLATION) [Symbol]
- HANDHOLE [Symbol]
- F & I CONDUIT (SIZE AS NOTED) [Symbol]
- PVC LOOP DETECTOR (SIZE AS NOTED) [Symbol]
- CABINET, CONTROLLER, AND SERVICE CABINET [Symbol] (A)
- SOURCE OF POWER-INPLACE [Symbol] (B)
- FLASHER FACE NO. (F-2)

ABBREVIATIONS

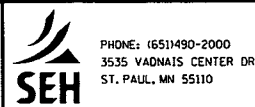
- D2-1 (e.g.) DETECTOR (PHASE 2, NO. 1)
- F & I FURNISH AND INSTALL
- GRD GROUND
- H.H. HANDHOLE
- LED LIGHT EMITTING DIODE
- LUM LUMINAIRE
- PVC POLYVINYL CHLORIDE (CONDUIT)
- SOP SOURCE OF POWER

DESIGN TEAM			
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DESIGNER:			
CHECKED BY:			
NO.	BY	DATE	REVISIONS

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Certified By: *[Signature]* Lic. No. 22457

Printed Name: JOHN M. GRAY Date: 03/12/2015



MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEM "C"
INTERSECTION LAYOUT
TRUNK HIGHWAY 23 AT CR 158
COLD SPRING, MINNESOTA - STEARNS COUNTY

FILE NO.
MNTMD131077

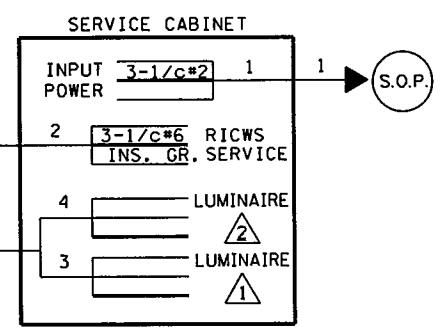
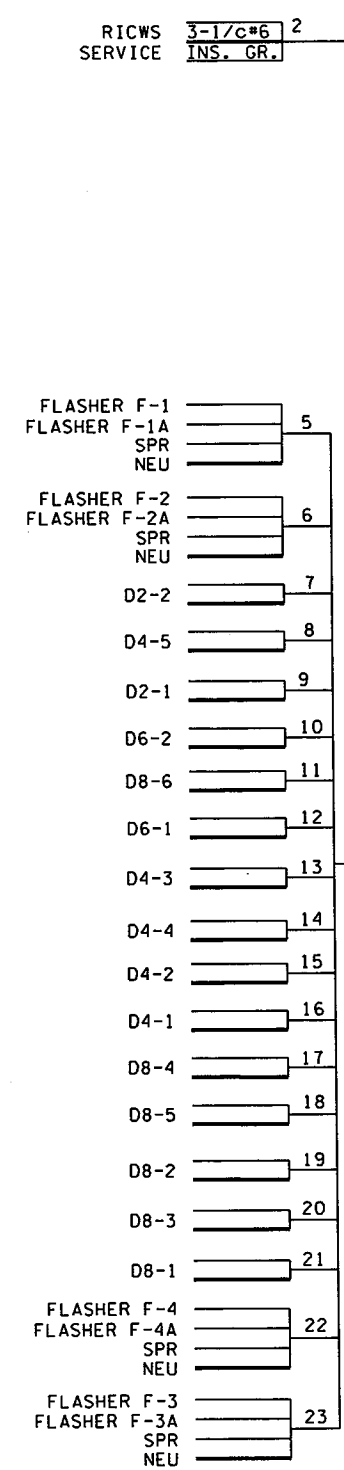
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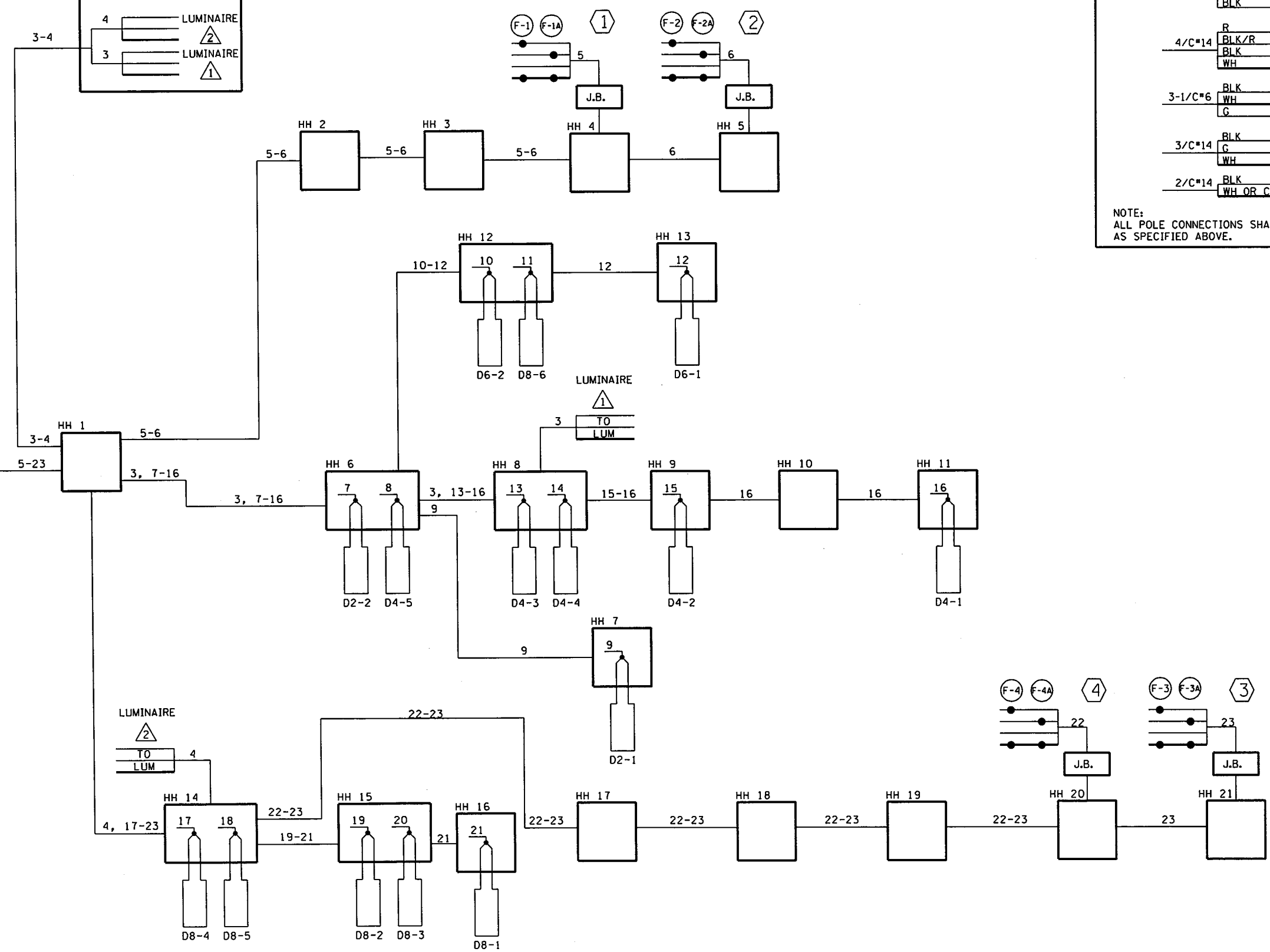
RICWS CABINET



NOTES:
1) FLASHER SYSTEM AND LUMINAIRES SHALL BE METERED POWER.

CONDUCTOR COLOR CODE (14 GAUGE)	
TO RICWS CABINET/DEVICE	
1/C#6	G
3-1/C#2	R WH BLK
4/C#14	R BLK/R BLK WH
3-1/C#6	BLK WH G
3/C#14	BLK G WH
2/C#14	BLK WH OR CLR

NOTE:
ALL POLE CONNECTIONS SHALL BE ARRANGED AS SPECIFIED ABOVE.

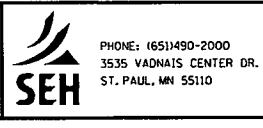


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DRAWN BY:	CMJ		
DESIGNER:	JMG		
CHECKED BY:	JMG		
NO.	BY	DATE	REVISIONS

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Certified By: *John M. Gray* Lic. No. 22457

Printed Name: JOHN M. GRAY Date: 03/12/2015



MINNESOTA DEPARTMENT OF TRANSPORTATION

RURAL INTERSECTION CONFLICT WARNING SYSTEM - PHASE II

S.P. 8816-2274, 1806-74, 6406-24, 7102-132

S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEM "C" FIELD WIRING DIAGRAM

TRUNK HIGHWAY 23 AT CR 158

COLD SPRING, MINNESOTA - STEARNS COUNTY

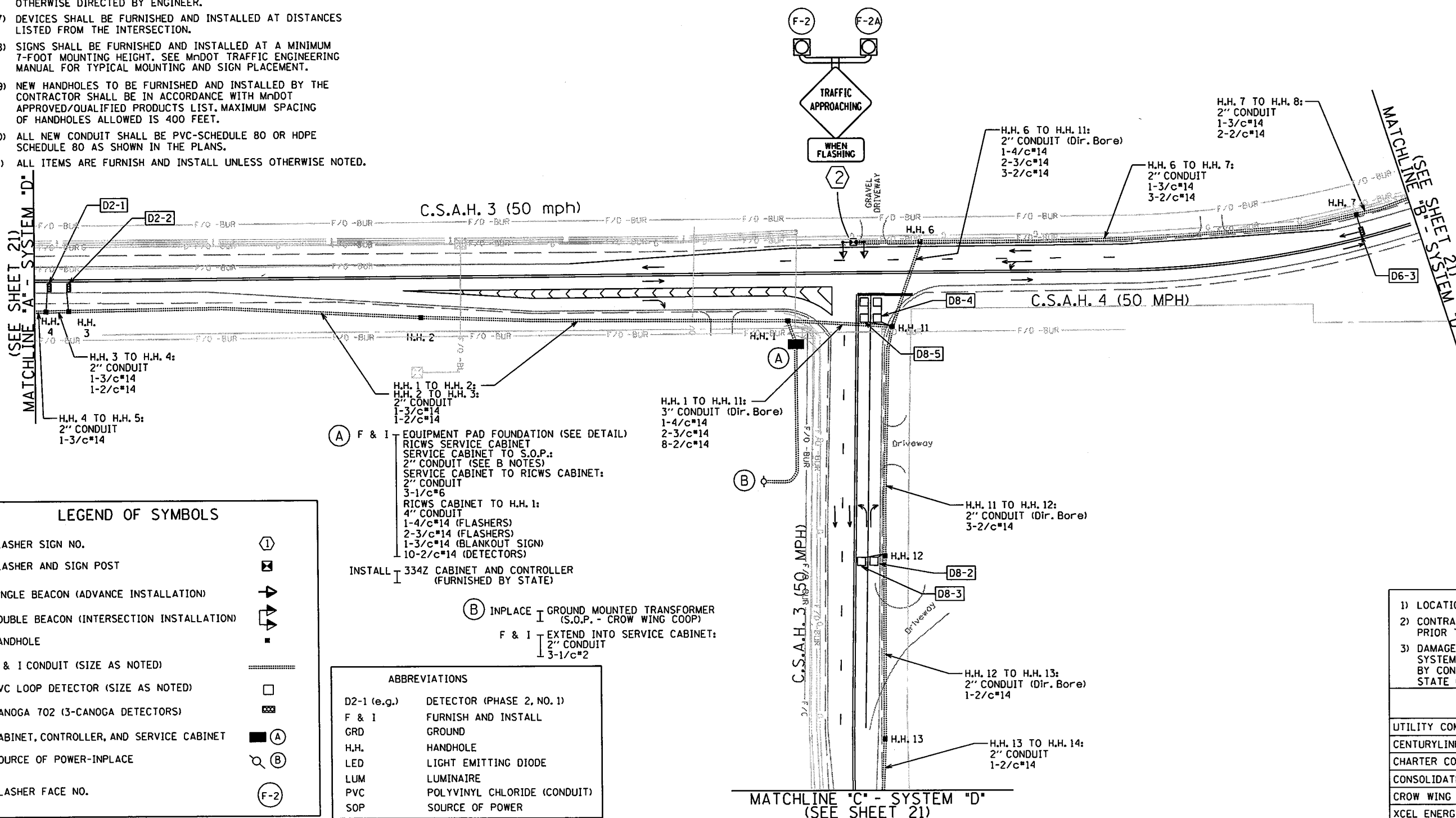
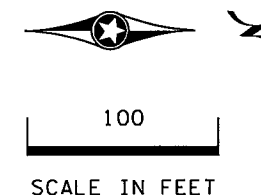
NOTES:

- 1) THE EXACT LOCATION OF HANDHOLES, FLASHERS/SIGNS, LOOP/CANOGA DETECTORS, AND CABINET PAD SHALL BE FIELD VERIFIED BY THE ENGINEER AND MNDOT DISTRICT TRAFFIC PERSONNEL.
- 2) SEE SPECIAL PROVISIONS FOR STATE FURNISHED MATERIALS.
- 3) COORDINATE SERVICE CONNECTION WITH CROW WING COOP POWER AND LIGHT COMPANY AND WITH ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE NEW FLASHER SYSTEM.
- 4) SEE DETAILS FOR FURTHER INFORMATION REGARDING FLASHER INSTALLATIONS.
- 5) THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD. CONDUITS UNDER EXISTING ROADWAYS AND CULVERTS WILL REQUIRE BORING.
- 6) CONTRACTOR SHALL MAINTAIN 300 FOOT SPACING BETWEEN NEW SIGNS AND EXISTING SIGNS ON MAJOR ROADWAY, UNLESS OTHERWISE DIRECTED BY ENGINEER.
- 7) DEVICES SHALL BE FURNISHED AND INSTALLED AT DISTANCES LISTED FROM THE INTERSECTION.
- 8) SIGNS SHALL BE FURNISHED AND INSTALLED AT A MINIMUM 7-FOOT MOUNTING HEIGHT. SEE MNDOT TRAFFIC ENGINEERING MANUAL FOR TYPICAL MOUNTING AND SIGN PLACEMENT.
- 9) NEW HANDHOLES TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR SHALL BE IN ACCORDANCE WITH MNDOT APPROVED/QUALIFIED PRODUCTS LIST. MAXIMUM SPACING OF HANDHOLES ALLOWED IS 400 FEET.
- 10) ALL NEW CONDUIT SHALL BE PVC-SCHEDULE 80 OR HDPE SCHEDULE 80 AS SHOWN IN THE PLANS.
- 11) ALL ITEMS ARE FURNISH AND INSTALL UNLESS OTHERWISE NOTED.

F & I ROADWAY DETECTORS			
NUMBER	SIZE	LOCATION	TYPE
D2-1	702-3	682'	CANOGA
D2-2	702-3	664'	CANOGA
D6-1	702-3	682'	CANOGA
D6-2	702-3	664'	CANOGA
D6-3	702-3	385'	CANOGA
D8-1	6' x 6'	710'	PVC
D8-2	6' x 6'	240'	PVC
D8-3	6' x 6'	240'	PVC
D8-4	2-6' x 6'	5' & 20'	PVC
D8-5	2-6' x 6'	5' & 20'	PVC

LOCATION = DISTANCE FROM STOP BAR
TO FRONT OF ROADWAY DETECTOR.

- 2 F & I 2-SQUARE TUBULAR POSTS AT 30" SPACING (SEE DETAIL)
(INSTALL BEHIND INPLACE GUARD RAIL)
W16-13P ("WHEN FLASHING") STATIC SIGN (30" x 24")
2-12" LED YELLOW FLASHERS (WITH HOUSINGS, VISORS,
AND BACKGROUND SHIELDS)-MOUNT 6" ABOVE
EDGE OF "TRAFFIC APPROACHING" SIGN ON STANDARD
SIGNAL BRACKETING (F-2, F-2A)
EXTEND INTO H.H. 6:
1" CONDUIT
1-4/c*14 (FLASHERS)
1-3/c*14 (BLANKOUT SIGN)
INSTALL "TRAFFIC APPROACHING" (36" x 36") BLANK OUT SIGN
(FURNISHED BY STATE)



LEGEND OF SYMBOLS

FLASHER SIGN NO.	(1)
FLASHER AND SIGN POST	(2)
SINGLE BEACON (ADVANCE INSTALLATION)	(3)
DOUBLE BEACON (INTERSECTION INSTALLATION)	(4)
HANDHOLE	(5)
F & I CONDUIT (SIZE AS NOTED)	(6)
PVC LOOP DETECTOR (SIZE AS NOTED)	(7)
CANOGA 702 (3-CANOGA DETECTORS)	(8)
CABINET, CONTROLLER, AND SERVICE CABINET	(9)
SOURCE OF POWER-INPLACE	(10)
FLASHER FACE NO.	(11)

ABBREVIATIONS

D2-1 (e.g.)	DETECTOR (PHASE 2, NO. 1)
F & I	FURNISH AND INSTALL
GRD	GROUND
H.H.	HANDHOLE
LED	LIGHT EMITTING DIODE
LUM	LUMINAIRE
PVC	POLYVINYL CHLORIDE (CONDUIT)
SOP	SOURCE OF POWER

- 1) LOCATION OF UTILITIES SHOWN ARE APPROXIMATE.
- 2) CONTRACTOR SHALL VERIFY ALL LOCATIONS PRIOR TO BEGINNING ANY CONSTRUCTION.
- 3) DAMAGE TO EXISTING UTILITIES DUE TO FLASHER SYSTEM CONSTRUCTION SHALL BE REPAIRED BY CONTRACTOR AT NO EXPENSE TO THE STATE OR THE COUNTY.

PUBLIC UTILITIES
AT/NEAR INTERSECTION

UTILITY COMPANY
CENTURYLINK
CHARTER COMMUNICATIONS
CONSOLIDATED TELEPHONE COMPANY
CROW WING COOPERATIVE POWER AND LIGHT COMPANY
XCEL ENERGY (GAS)

DESIGN TEAM			
DRAWN BY:	CMJ		
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: 03/12/2015

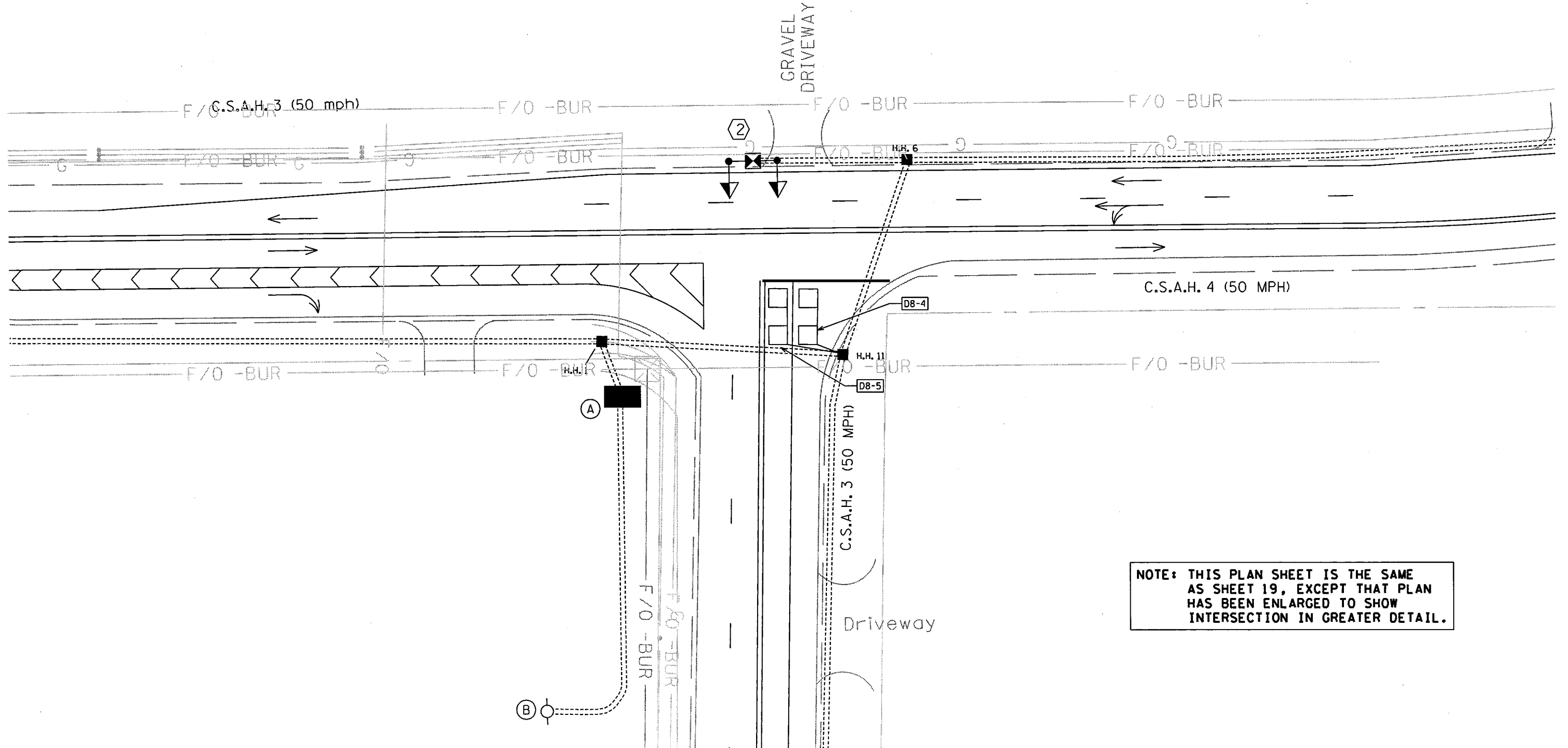
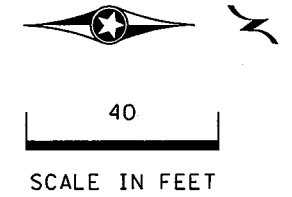
SEH
PHONE: (651)490-2000
3535 VADNAIS CENTER DR.
ST. PAUL, MN 55110

MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEM "D"
INTERSECTION LAYOUT
CSAH 3 AT CSAH 4
MERRIFIELD, MINNESOTA - CROW WING COUNTY

FILE NO.
MNTMD131077

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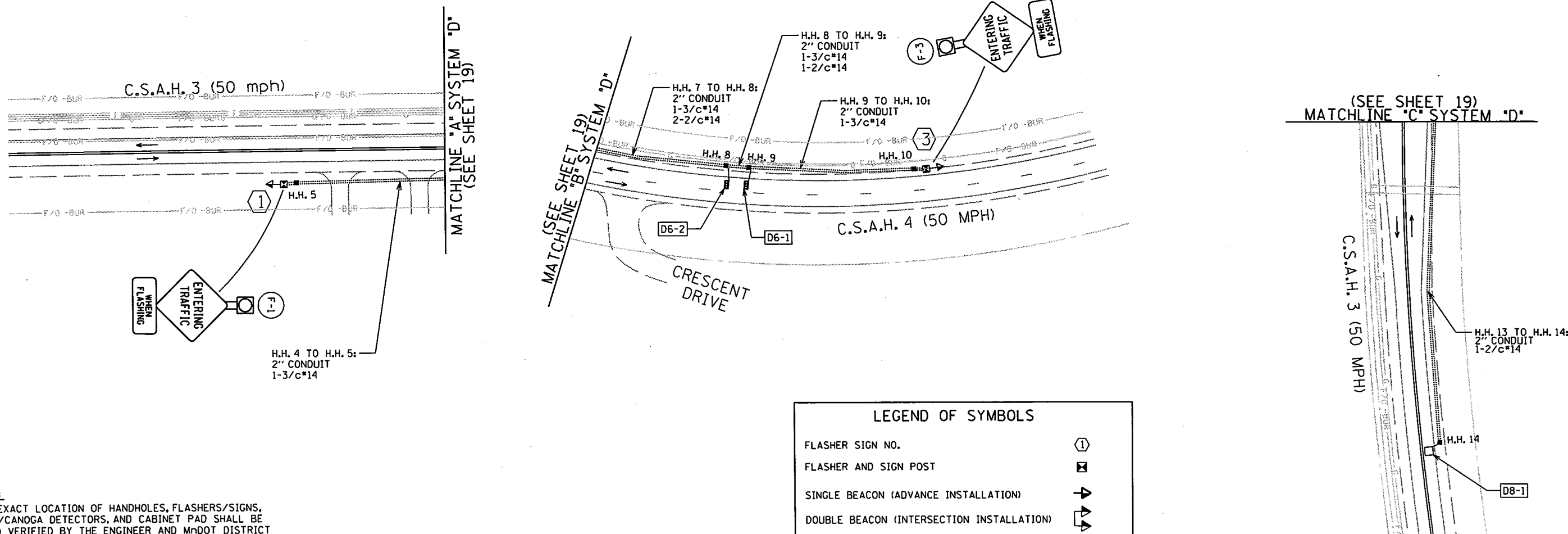
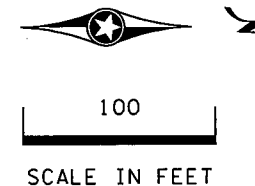
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ST. PAUL, MN 55110

MINNESOTA DEPARTMENT OF TRANSPORTATION
**RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II**
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

**FLASHING BEACON SYSTEM "D"
INTERSECTION LAYOUT
CSAH 3 AT CSAH 4**
MERRIFIELD, MINNESOTA - CROW WING COUNTY

- ① F & I 2-3 LB/FT U-CHANNEL POSTS AT 30" SPACING WITH 1-3 LB/FT U-CHANNEL KNEE BRACE W3-X80 ("ENTERING TRAFFIC") (48" x 48") AND W3-X80P ("WHEN FLASHING") (42" x 24") STATIC SIGNS (850' FROM INTERSECTION)
1-12" LED YELLOW FLASHER (WITH HOUSING, VISOR, AND BACKGROUND SHIELD)-MOUNT 6" ABOVE EDGE OF "ENTERING TRAFFIC" SIGN ON STANDARD SIGNAL BRACKETING (F-1)
EXTEND INTO H.H.5:
1" CONDUIT
1-3/c*14 (FLASHER)

- ③ F & I 2-3 LB/FT U-CHANNEL POSTS AT 30" SPACING WITH 1-3 LB/FT U-CHANNEL KNEE BRACE W3-X80 ("ENTERING TRAFFIC") (48" x 48") AND W3-X80P ("WHEN FLASHING") (42" x 24") STATIC SIGNS (850' FROM INTERSECTION)
1-12" LED YELLOW FLASHER (WITH HOUSING, VISOR, AND BACKGROUND SHIELD)-MOUNT 6" ABOVE EDGE OF "ENTERING TRAFFIC" SIGN ON STANDARD SIGNAL BRACKETING (F-3)
EXTEND INTO H.H.10:
1" CONDUIT
1-3/c*14 (FLASHER)



NOTES:

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- SEE SPECIAL PROVISIONS FOR STATE FURNISHED MATERIALS.
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LEGEND OF SYMBOLS

FLASHER SIGN NO.	①
FLASHER AND SIGN POST	⊠
SINGLE BEACON (ADVANCE INSTALLATION)	➔
DOUBLE BEACON (INTERSECTION INSTALLATION)	⬅➔
HANDHOLE	■
F & I CONDUIT (SIZE AS NOTED)	-----
PVC LOOP DETECTOR (SIZE AS NOTED)	□
CANOGA 702 (3-CANOGA DETECTORS)	⊞
CABINET, CONTROLLER, AND SERVICE CABINET	■ (A)
SOURCE OF POWER-INPLACE	⊙ (B)
FLASHER FACE NO.	(F-2)

ABBREVIATIONS

D2-1 (e.g.)	DETECTOR (PHASE 2, NO. 1)
F & I	FURNISH AND INSTALL
GRD	GROUND
H.H.	HANDHOLE
LED	LIGHT EMITTING DIODE
LUM	LUMINAIRE
PVC	POLYVINYL CHLORIDE (CONDUIT)
SOP	SOURCE OF POWER

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

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**RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II**
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

**FLASHING BEACON SYSTEM "D"
INTERSECTION LAYOUT
CSAH 3 AT CSAH 4**
MERRIFIELD, MINNESOTA - CROW WING COUNTY

FILE NO.
MNTMD131077

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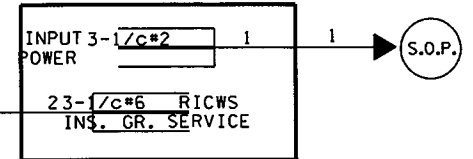
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RICWS CABINET

SERVICE CABINET

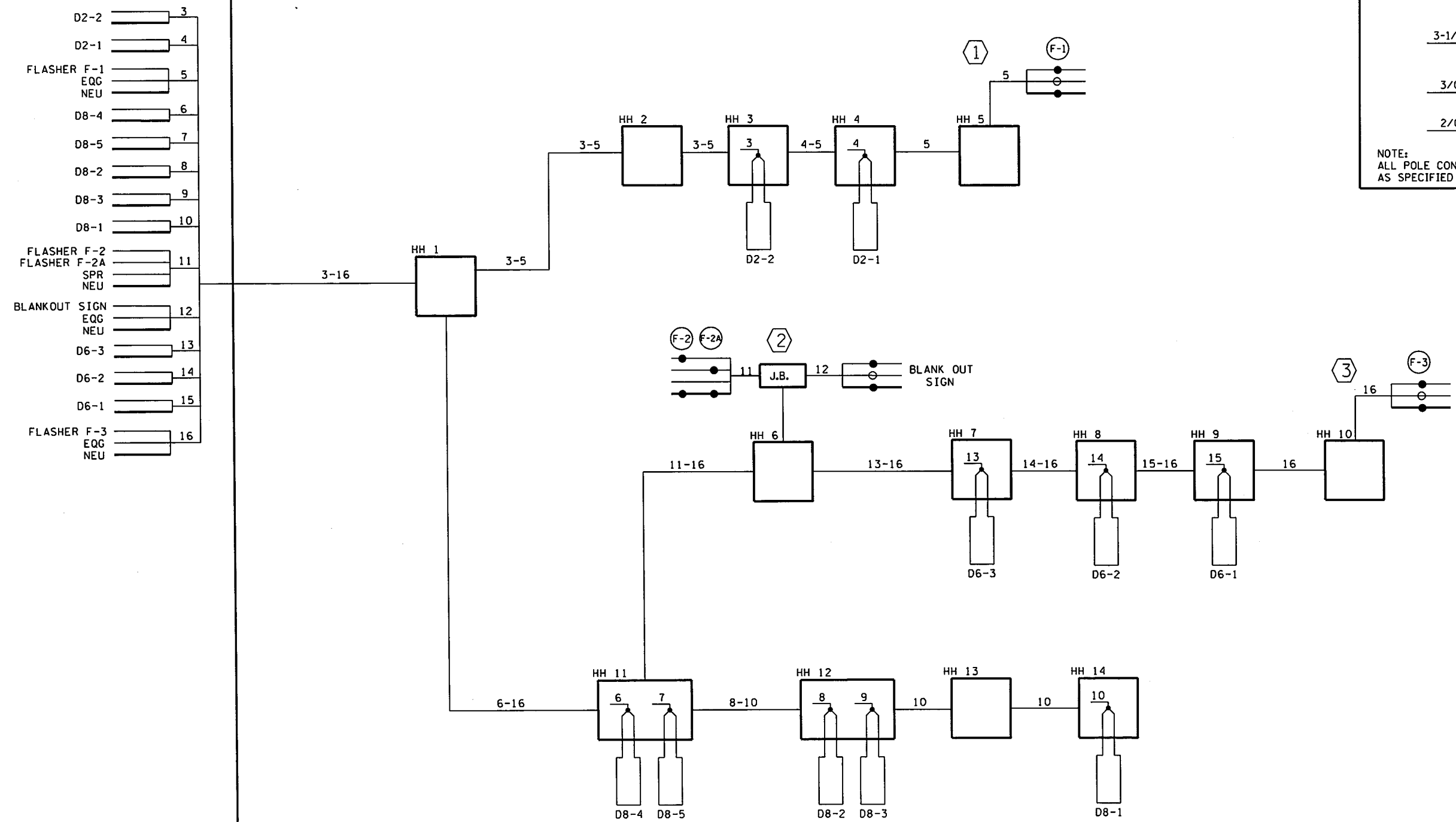
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- D2-2 3
- D2-1 4
- FLASHER F-1 EQC NEU 5
- D8-4 6
- D8-5 7
- D8-2 8
- D8-3 9
- D8-1 10
- FLASHER F-2 FLASHER F-2A SPR NEU 11
- BLANKOUT SIGN EQC NEU 12
- D6-3 13
- D6-2 14
- D6-1 15
- FLASHER F-3 EQC NEU 16



NOTES:
1) FLASHER SYSTEM AND LUMINAIRES SHALL BE METERED POWER.

CONDUCTOR COLOR CODE (14 GAUGE)	
TO RICWS CABINET/DEVICE	
1/C*6	G
3-1/C*2	R WH BLK
4/C*14	R BLK/R BLK WH
3-1/C*6	BLK WH G
3/C*14	BLK G WH
2/C*14	BLK WH OR CLR

NOTE:
ALL POLE CONNECTIONS SHALL BE ARRANGED AS SPECIFIED ABOVE.

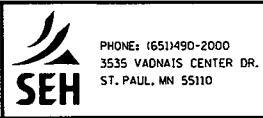


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Printed Name: JOHN M. GRAY Date: 03/12/2015



MINNESOTA DEPARTMENT OF TRANSPORTATION

RURAL INTERSECTION CONFLICT WARNING SYSTEM - PHASE II

S.P. 8816-2274, 1806-74, 6406-24, 7102-132

S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEM "D" FIELD WIRING DIAGRAM

CSAH 3 AT CSAH 4

MERRIFIELD, MINNESOTA - CROW WING COUNTY

NOTES:

- 1) THE EXACT LOCATION OF HANDHOLES, FLASHERS/SIGNS, LOOP/CANOGA DETECTORS, AND CABINET PAD SHALL BE FIELD VERIFIED BY THE ENGINEER AND MnDOT DISTRICT TRAFFIC PERSONNEL.
- 2) SEE SPECIAL PROVISIONS FOR STATE FURNISHED MATERIALS.
- 3) COORDINATE SERVICE CONNECTION WITH MINNESOTA POWER AND WITH ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE NEW FLASHER SYSTEM.
- 4) SEE DETAILS FOR FURTHER INFORMATION REGARDING FLASHER INSTALLATIONS.
- 5) THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD. CONDUITS UNDER EXISTING ROADWAYS AND CULVERTS WILL REQUIRE BORING.
- 6) CONTRACTOR SHALL MAINTAIN 300 FOOT SPACING BETWEEN NEW SIGNS AND EXISTING SIGNS ON MAJOR ROADWAY, UNLESS OTHERWISE DIRECTED BY ENGINEER.
- 7) DEVICES SHALL BE FURNISHED AND INSTALLED AT DISTANCES LISTED FROM THE INTERSECTION.
- 8) SIGNS SHALL BE FURNISHED AND INSTALLED AT A MINIMUM 7-FOOT MOUNTING HEIGHT. SEE MnDOT TRAFFIC ENGINEERING MANUAL FOR TYPICAL MOUNTING AND SIGN PLACEMENT.
- 9) NEW HANDHOLES TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR SHALL BE IN ACCORDANCE WITH MnDOT APPROVED/QUALIFIED PRODUCTS LIST. MAXIMUM SPACING OF HANDHOLES ALLOWED IS 400 FEET.
- 10) ALL NEW CONDUIT SHALL BE PVC-SCHEDULE 80 OR HDPE SCHEDULE 80 AS SHOWN IN THE PLANS.
- 11) ALL ITEMS ARE FURNISH AND INSTALL UNLESS OTHERWISE NOTED.

LEGEND OF SYMBOLS

FLASHER SIGN NO.



FLASHER AND SIGN POST



SINGLE BEACON (ADVANCE INSTALLATION)



DOUBLE BEACON (INTERSECTION INSTALLATION)



HANDHOLE



F & I CONDUIT (SIZE AS NOTED)



PVC LOOP DETECTOR (SIZE AS NOTED)



CANOGA 702 (3-CANOGA DETECTORS)



CABINET, CONTROLLER, AND SERVICE CABINET



SOURCE OF POWER-INPLACE



FLASHER FACE NO.



ABBREVIATIONS

D2-1 (e.g.)	DETECTOR (PHASE 2, NO. 1)
F & I	FURNISH AND INSTALL
GRD	GROUND
H.H.	HANDHOLE
LED	LIGHT EMITTING DIODE
LUM	LUMINAIRE
PVC	POLYVINYL CHLORIDE (CONDUIT)
SOP	SOURCE OF POWER

F & I ROADWAY DETECTORS			
NUMBER	SIZE	LOCATION	TYPE
D2-1	702-3	737'	CANOGA
D2-2	702-3	719'	CANOGA
D4-1	6' x 6'	610'	PVC
D4-2	2-6' x 6'	-5' & 5'	PVC
D6-1	702-3	737'	CANOGA
D6-2	702-3	719'	CANOGA

LOCATION = DISTANCE FROM STOP BAR TO FRONT OF ROADWAY DETECTOR.

- 1) LOCATION OF UTILITIES SHOWN ARE APPROXIMATE.
- 2) CONTRACTOR SHALL VERIFY ALL LOCATIONS PRIOR TO BEGINNING ANY CONSTRUCTION.
- 3) DAMAGE TO EXISTING UTILITIES DUE TO FLASHER SYSTEM CONSTRUCTION SHALL BE REPAIRED BY CONTRACTOR AT NO EXPENSE TO THE STATE OR THE COUNTY.

PUBLIC UTILITIES
AT/NEAR INTERSECTION

UTILITY COMPANY

CHARTER COMMUNICATIONS

CROW WING COOPERATIVE POWER AND LIGHT COMPANY

ENVENTIS TELECOM, INCORPORATED

MINNESOTA POWER



100

SCALE IN FEET

H.H. 1 TO H.H. 2:
H.H. 2 TO H.H. 3:
2" CONDUIT
1-2/c*14

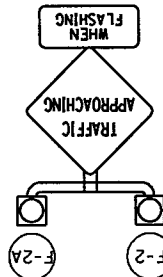
H.H. 2

C.S.A.H. 59 (55 MPH)

- 2 F & I 2-SQUARE TUBULAR POSTS AT 30" SPACING (SEE DETAIL)
W16-13P ("WHEN FLASHING") STATIC SIGN (30" x 24")
2-12" LED YELLOW FLASHERS (WITH HOUSINGS, VISORS,
AND BACKGROUND SHIELDS)-MOUNT 6" ABOVE
EDGE OF "TRAFFIC APPROACHING" SIGN ON STANDARD
SIGNAL BRACKETING (F-2, F-2A)
EXTEND INTO H.H. 8:
1" CONDUIT
1-4/c*14 (FLASHERS)
1-3/c*14 (BLANKOUT SIGN)
INSTALL "TRAFFIC APPROACHING" (36" x 36") BLANK OUT SIGN
(FURNISHED BY STATE)

H.H. 1 TO H.H. 4:
2" CONDUIT (DIR. BORE)
1-3/c*14
2-2/c*14H.H. 4 TO H.H. 5:
H.H. 5 TO H.H. 6:
2" CONDUIT
1-3/c*14
2-2/c*14H.H. 1 TO H.H. 8:
2" CONDUIT (DIR. BORE)
1-4/c*14
2-3/c*14
2-2/c*14H.H. 8 TO H.H. 9:
H.H. 9 TO H.H. 10:
2" CONDUIT
1-3/c*14
2-2/c*14

T.H. 210 (55 MPH)



- A F & I EQUIPMENT PAD FOUNDATION (SEE DETAIL)
RICWS SERVICE CABINET
SERVICE CABINET TO S.O.P.:
2" CONDUIT (SEE B NOTES)
SERVICE CABINET TO RICWS CABINET:
2" CONDUIT
3-1/c*6
RICWS CABINET TO H.H. 1:
4" CONDUIT
1-4/c*14 (FLASHERS)
2-3/c*14 (FLASHERS)
1-3/c*14 (BLANKOUT SIGN)
6-2/c*14 (DETECTORS)
INSTALL 334Z CABINET AND CONTROLLER
(FURNISHED BY STATE)

- B INPLACE- WOOD POLE (S.O.P.)-MINN POWER
F & I 2" CONDUIT RISER AND WEATHERHEAD
3-1/c*2
EXTEND INTO SERVICE CABINET:
2" CONDUIT
3-1/c*2

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

I hereby certify that this sheet 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: Lic. No. 22457
Printed Name: JOHN M. GRAY Date: 03/12/2015



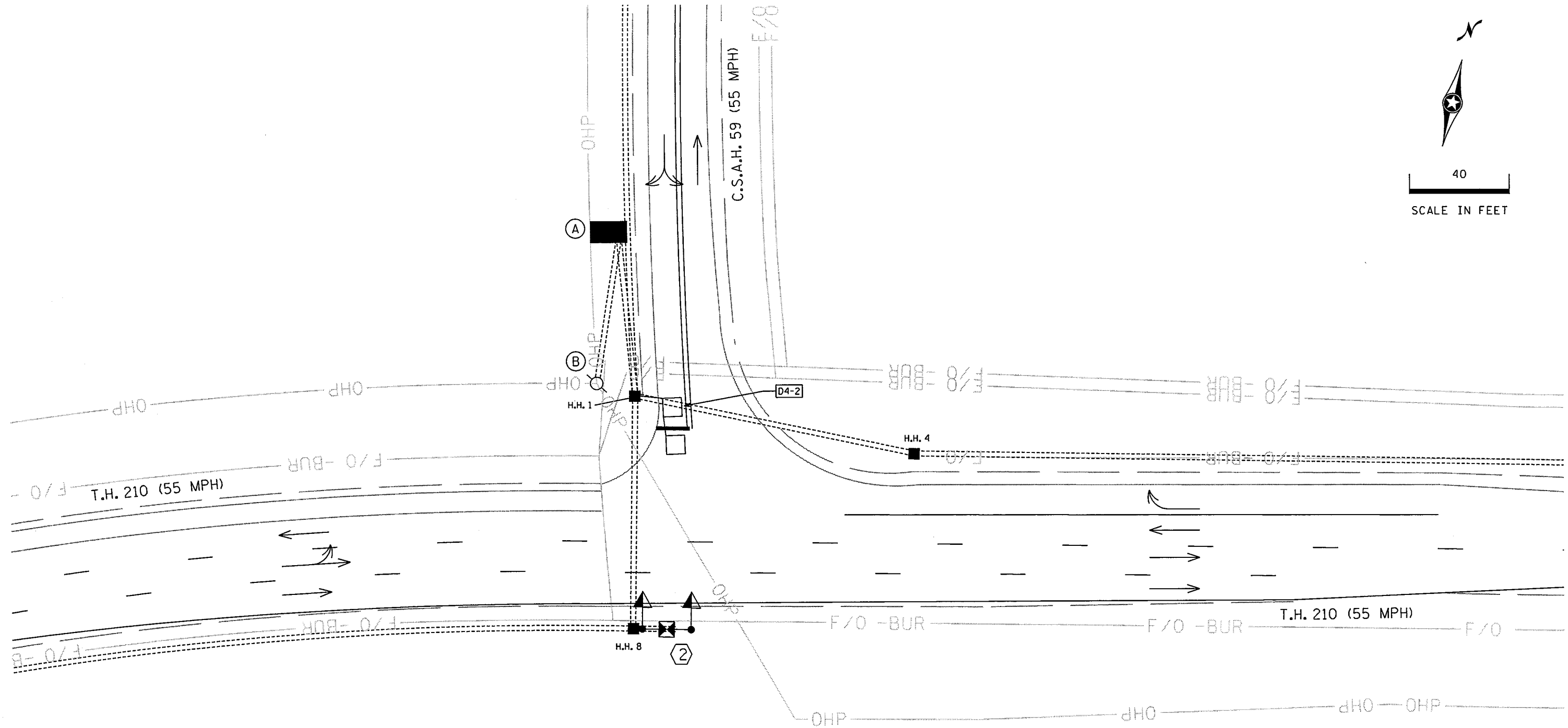
MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEM "E"
INTERSECTION LAYOUT
TRUNK HIGHWAY 210 AT CSAH 59
IRONTON, MINNESOTA - CROW WING COUNTY

FILE NO.
MNTMD131077

23

41



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DESIGNER:	JMG		
CHECKED BY:	JMG		
NO.	BY	DATE	REVISIONS

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Certified By: *[Signature]* Lic. No. 22457
Printed Name: JOHN M. GRAY Date: 03/12/2015

SEH
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MINNESOTA DEPARTMENT OF TRANSPORTATION
**RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II**
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

**FLASHING BEACON SYSTEM "E"
INTERSECTION LAYOUT
TRUNK HIGHWAY 210 AT CSAH 59**
IRONTON, MINNESOTA - CROW WING COUNTY

LEGEND OF SYMBOLS

FLASHER SIGN NO.	①
FLASHER AND SIGN POST	⊠
SINGLE BEACON (ADVANCE INSTALLATION)	→
DOUBLE BEACON (INTERSECTION INSTALLATION)	↔
HANDHOLE	■
F & I CONDUIT (SIZE AS NOTED)	-----
PVC LOOP DETECTOR (SIZE AS NOTED)	□
CANOGA 702 (3-CANOGA DETECTORS)	⊞
CABINET, CONTROLLER, AND SERVICE CABINET	■ (A)
SOURCE OF POWER-INPLACE	○ (B)
FLASHER FACE NO.	⊙ (F-2)

ABBREVIATIONS

D2-1 (e.g.)	DETECTOR (PHASE 2, NO. 1)
F & I	FURNISH AND INSTALL
GRD	GROUND
H.H.	HANDHOLE
LED	LIGHT EMITTING DIODE
LUM	LUMINAIRE
PVC	POLYVINYL CHLORIDE (CONDUIT)
SOP	SOURCE OF POWER

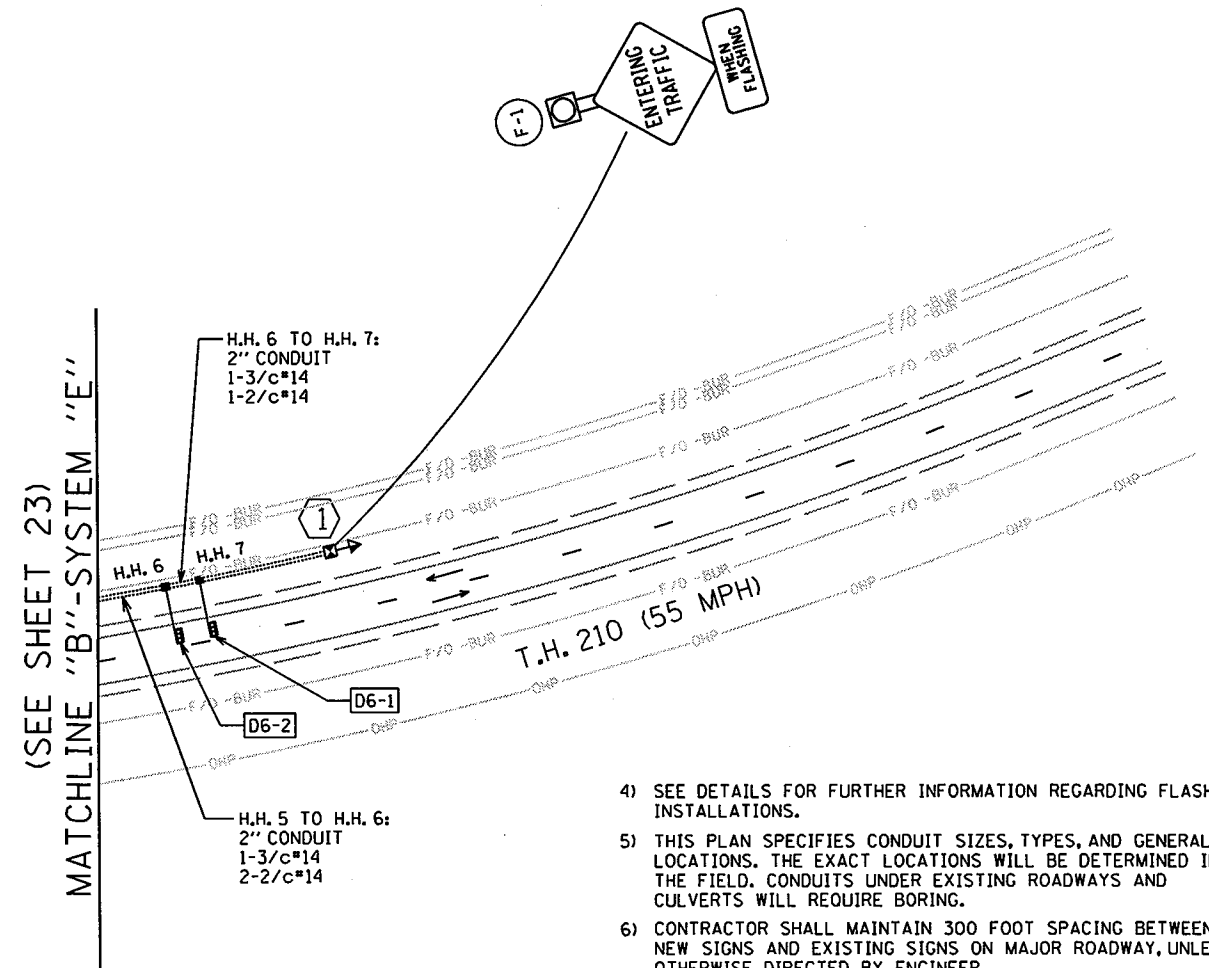
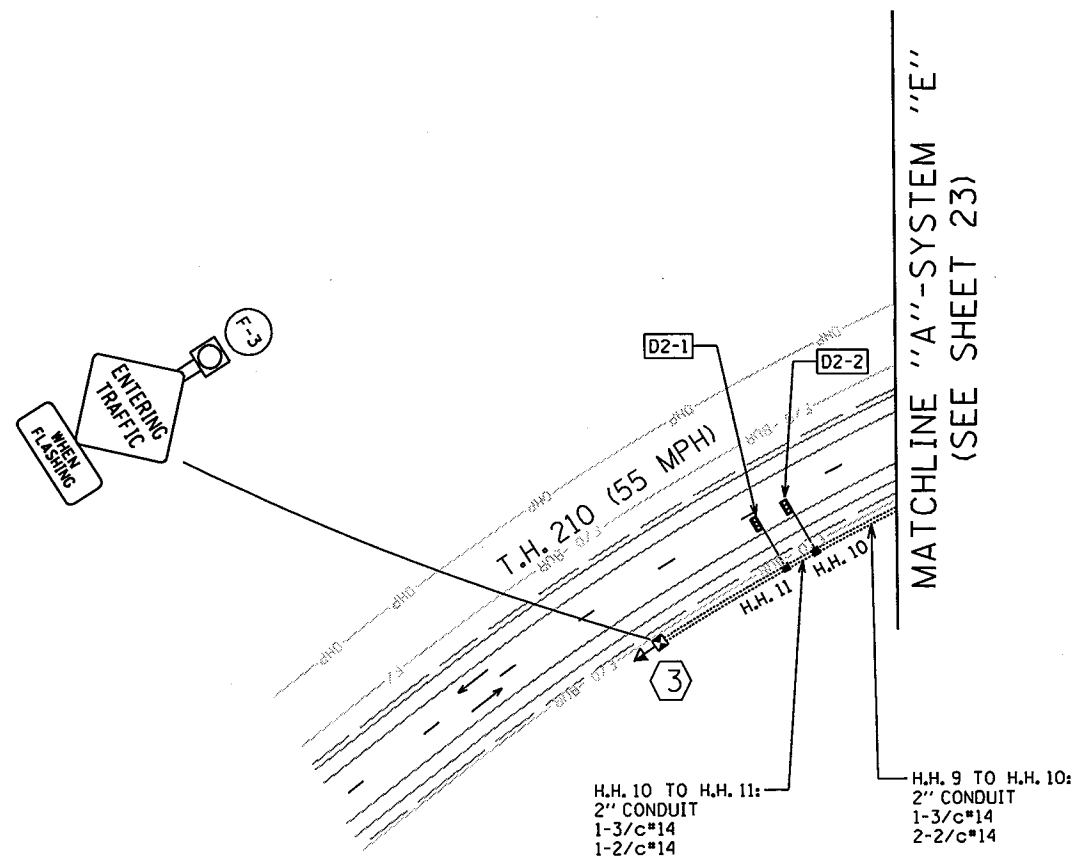
① F & I 2-3 LB/FT U-CHANNEL POSTS AT 30" SPACING WITH 1-3 LB/FT U-CHANNEL KNEE BRACE W3-X8c ("ENTERING TRAFFIC") (48" x 48") AND W3-X8cP ("WHEN FLASHING") (42" x 24") STATIC SIGNS (800' FROM INTERSECTION)
1-12" LED YELLOW FLASHER (WITH HOUSING, VISOR, AND BACKGROUND SHIELD)-MOUNT 6" ABOVE EDGE OF "ENTERING TRAFFIC" SIGN ON STANDARD SIGNAL BRACKETING (F-1)
EXTEND INTO H.H. 7:
1" CONDUIT
1-3/4" (FLASHER)

③ F & I 2-3 LB/FT U-CHANNEL POSTS AT 30" SPACING WITH 1-3 LB/FT U-CHANNEL KNEE BRACE W3-X8c ("ENTERING TRAFFIC") (48" x 48") AND W3-X8cP ("WHEN FLASHING") (42" x 24") STATIC SIGNS (800' FROM INTERSECTION)
1-12" LED YELLOW FLASHER (WITH HOUSING, VISOR, AND BACKGROUND SHIELD)-MOUNT 6" ABOVE EDGE OF "ENTERING TRAFFIC" SIGN ON STANDARD SIGNAL BRACKETING (F-3)
EXTEND INTO H.H. 11:
1" CONDUIT
1-3/4" (FLASHER)



100

SCALE IN FEET



NOTES:

- 1) THE EXACT LOCATION OF HANDHOLES, FLASHERS/SIGNS, LOOP/CANOGA DETECTORS, AND CABINET PAD SHALL BE FIELD VERIFIED BY THE ENGINEER AND MnDOT DISTRICT TRAFFIC PERSONNEL.
- 2) SEE SPECIAL PROVISIONS FOR STATE FURNISHED MATERIALS.
- 3) COORDINATE SERVICE CONNECTION WITH MINNESOTA POWER AND WITH ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE NEW FLASHER SYSTEM.

- 4) SEE DETAILS FOR FURTHER INFORMATION REGARDING FLASHER INSTALLATIONS.
- 5) THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD. CONDUITS UNDER EXISTING ROADWAYS AND CULVERTS WILL REQUIRE BORING.
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- 10) ALL NEW CONDUIT SHALL BE PVC-SCHEDULE 80 OR HDPE SCHEDULE 80 AS SHOWN IN THE PLANS.
- 11) ALL ITEMS ARE FURNISH AND INSTALL UNLESS OTHERWISE NOTED.

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

I hereby certify that this sheet 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: 03/12/2015



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MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEM "E"
INTERSECTION LAYOUT
TRUNK HIGHWAY 210 AT CSAH 59
IRONTON, MINNESOTA - CROW WING COUNTY

FILE NO.
MNTMD131077

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4/23/2015

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RICWS CABINET

- RICWS SERVICE 3-1/C#6 2 INS. GR.
- D4-2 3
- D4-1 4
- D6-2 5
- D6-1 6
- FLASHER F-1 7 EQG NEU
- FLASHER F-2 8 FLASHER F-2A SPR NEU
- BLANKOUT SIGN 9 EQG NEU
- D2-2 10
- D2-1 11
- FLASHER F-3 12 EQG NEU

SERVICE CABINET

INPUT POWER 3-1/C#2 1

2 3-1/C#6 RICWS INS. GR. SERVICE

S.O.P.

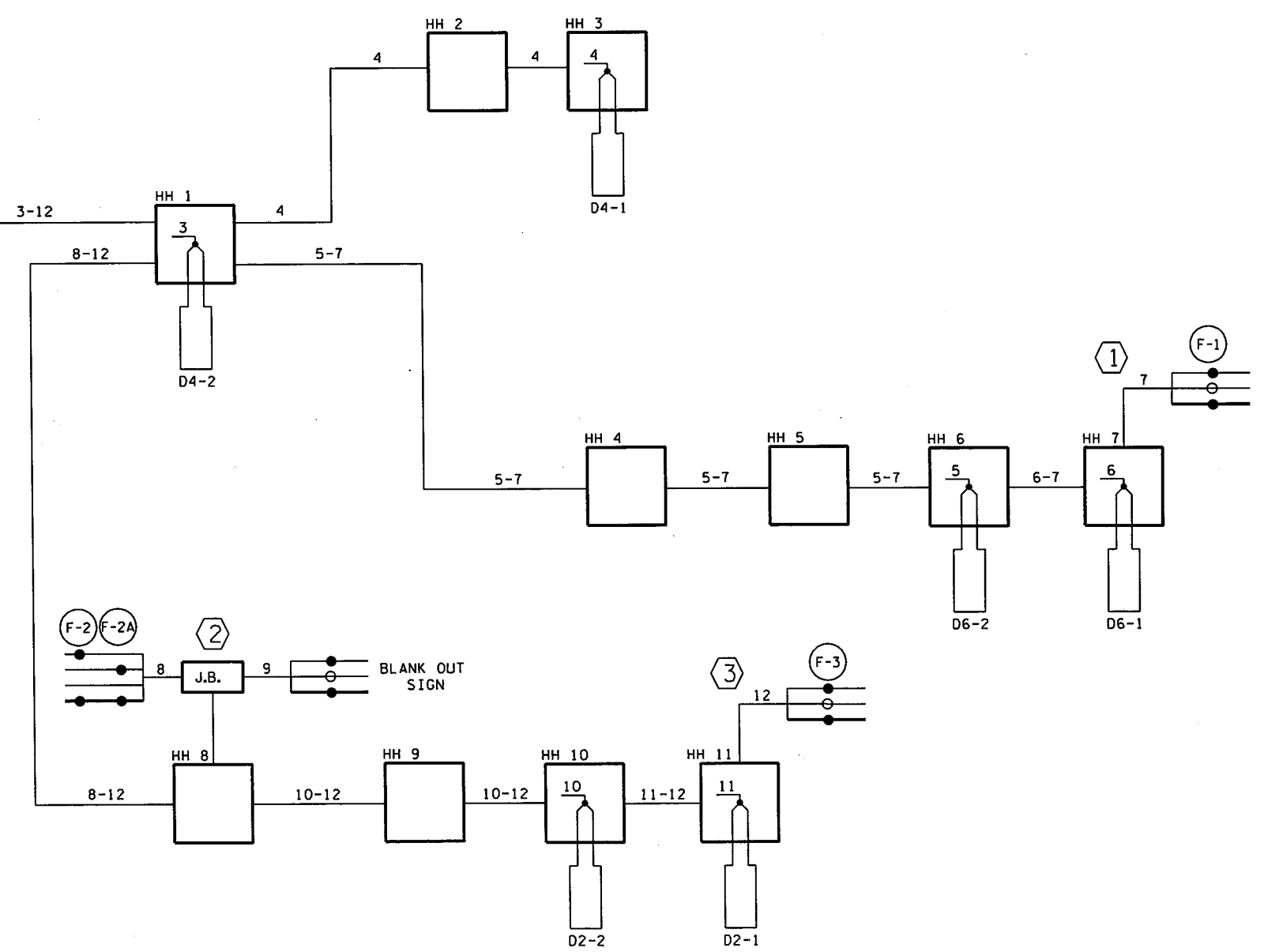
NOTES:
1) FLASHER SYSTEM AND LUMINAIRES SHALL BE METERED POWER.

CONDUCTOR COLOR CODE (14 GAUGE)

TO RICWS CABINET/DEVICE

- 1/C#6 G
- 3-1/C#2 R WH BLK INPUT POWER
- 4/C#14 R BLK/R BLK WH
- 3-1/C#6 BLK WH G SIGNAL SERVICE
- 3/C#14 BLK G WH
- 2/C#14 BLK WH OR CLR

NOTE:
ALL POLE CONNECTIONS SHALL BE ARRANGED AS SPECIFIED ABOVE.



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MINNESOTA DEPARTMENT OF TRANSPORTATION

RURAL INTERSECTION CONFLICT WARNING SYSTEM - PHASE II

S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

FLASHING BEACON SYSTEM "E"
FIELD WIRING DIAGRAM
TRUNK HIGHWAY 210 AT CSAH 59
IRONTON, MINNESOTA - CROW WING COUNTY

SIGN PANELS TYPE C										
SIGN NO.	TOTAL QUANTITY	POSTS			MTG. HT. (FT) (1)	PANEL SIZE (IN.)	AREA (SQ FT)	LOCATION	CODE NO.	PANEL LEGEND
		NO. & TYPE	KNEE BRACES QUANT.	LENGTH (FT)						
C-1	2	2-U	1	16	7	36 x 36	9.00	SYSTEM "A"	R1-1	STOP
TOTAL	2						18.00			

GENERAL FURNISH & INSTALL SIGN TYPE C NOTES:
1. POST LENGTHS ARE APPROXIMATE AND INCLUDE EMBEDMENT, BUT DO NOT INCLUDE ADDITIONAL LENGTH REQUIRED FOR SPLICE.
2. SEE SHEETS 38-40 FOR STRUCTURAL DETAILS.
3. SEE STANDARD SIGNS MANUAL FOR PUNCHING CODE AND DETAILED DRAWINGS OF TYPE C SIGN PANELS.

SPECIFIC FURNISH & INSTALL SIGN TYPE C NOTES:
(1) MOUNTING HEIGHT IS MINIMUM (WITH A +6 INCH TOLERANCE) SEE SHEET NO. 41 FOR TYPICAL MOUNTING.

SALVAGE SIGN TYPE C INSTALL SIGN TYPE C									
SIGN NO.	TOTAL QUANTITY	POSTS			MTG. HT. (FT) (1)	PANEL SIZE (IN.)	LOCATION	CODE NO.	PANEL LEGEND
		NO. & TYPE	KNEE BRACES QUANT.	LENGTH (FT)					
(7) C-201	2	2-U		15	7	24 x 24	SYSTEM "A"	M1-6	REDWOOD COUNTY 13
(7) C-202	2	2-U		16	7	21 x 15	SYSTEM "A"	M2-1A	JCT (BLUE)
						24 x 24		M1-6	REDWOOD COUNTY 13
(8) C-203	1					24 x 24	SYSTEM "B"	I-8	LIBRARY
						21 x 15		M6-1L	ARROW LEFT (GREEN)
(8) C-204	1	2-U	1	16	7	36 x 36	SYSTEM "B"	R3-7L	LEFT LANE MUST TURN LEFT
(8) C-205	1	2-U	1	16	7	36 x 36	SYSTEM "B"	R3-7R	RIGHT LANE MUST TURN RIGHT
(8) C-206	1					24 x 24	SYSTEM "B"	M1-X4	SHERBURNE 23 COUNTY
						21 x 15		M6-1R	ARROW RIGHT (WHITE)
						24 x 24		I-8	LIBRARY
						21 x 15		M6-1R	ARROW RIGHT (GREEN)
(9) C-207	2	2-U		16	7	21 x 15	SYSTEM "C"	M2-1	JCT (WHITE)
						24 x 24		M1-X4	STEARNS 158 COUNTY
(10) C-208	1	2-U	1	15	7	48 x 24	SYSTEM "D"	W1-7	DOUBLE ARROW
(10) C-209	1	2-U	1	18	7	21 x 15	SYSTEM "D"	M2-1	JCT (WHITE)
						24 x 24		M1-X4	CROW WING COUNTY 4
						24 x 24		M1-X4	INTER COUNTY C
						24 x 24		M1-X4	CROW WING COUNTY 3
						21 x 15		M5-1R	ADVANCE TURN ARROW RIGHT (WHITE)
(11) C-210	1	2-U	1	15	7	48 x 24	SYSTEM "E"	W1-7	DOUBLE ARROW
(11) C-211	1	2-U		15	7	30 x 30	SYSTEM "E"	R4-X8	BYPASS LANE
(11) C-212	1	2-U		16	7	24 x 24	SYSTEM "E"	M1-X4	CROW WING COUNTY 59
						21 x 15		M6-1R	ARROW LEFT (WHITE)
(11) C-213	1	2-U		16	7	21 x 15	SYSTEM "E"	M2-1	JCT (WHITE)
						24 x 24		M1-X4	CROW WING COUNTY 59
TOTAL	16								

GENERAL SALVAGE & INSTALL SIGN TYPE C NOTES:
4. FOR ALL SALVAGE AND INSTALLED SIGN PANELS, PROVIDE NEW POSTS AND MOUNTING HARDWARE (REMOVE AND DISPOSE OF OLD POSTS AND MOUNTING HARDWARE).
SPECIFIC SALVAGE & INSTALL SIGN TYPE C NOTES:
(1) MOUNTING HEIGHT IS MINIMUM (WITH A +6 INCH TOLERANCE). SEE SHEET NO. 41 FOR TYPICAL MOUNTING.
(2) MOUNT UNDER D-203. SEE SIGNING PLANS.
(3) MOUNT ABOVE D-203. SEE SIGNING PLANS.
(4) MOUNT UNDER INPLACE "LEFT LANE MUST TURN LEFT" SIGN. SEE SIGNING PLANS.

SALVAGE SIGN TYPE D INSTALL SIGN TYPE D									
SIGN NO.	TOTAL QUANTITY (EACH)	POSTS				MTG. HT. (FT) (1)	LOCATION	PANEL SIZE (IN.) (5)	PANEL LEGEND
		NO. & TYPE	KNEE BRACES QUANT.	SPACING (IN.)	LENGTH (FT)				
(7) D-201	1	2-U	2	54	19	7	SYSTEM "A"	78 x 54	UNSPORT JUNCTION CASINO HOTEL 5 MILES →
								48 x 24	GOLF CLUB 8 MILES →
(8) D-202	1	2-U	2	42	18	7	SYSTEM "B"	72 x 36	Pebble Creek Golf Club
								54 x 24	Becker Community Center 1 mi
(6)(8) D-203	1	2-U	1	30	15	7	SYSTEM "B"	54 x 24	Sherburne Ave →
(9) D-204	1	2-U	1	30	15	7	SYSTEM "C"	54 x 24	Fairway Cir →
(9) D-205	1	2-U	1	30	15	7	SYSTEM "C"	54 x 24	Fairway Cir ←
(10) D-206	1	2-U	2	66	18	7	SYSTEM "D"	114 x 60	Brainard Morrillfield Crosslake
(10) D-207	1	2-U	2	66	18	7	SYSTEM "D"	114 x 60	Breezy Point Nisswa Crosslake →
(11) D-208	1	2-U	2	30	15	7	SYSTEM "E"	54 x 24	Riverton
(11) D-209	1	2-U	2	42	16	7	SYSTEM "E"	66 x 36	Cuyuna County State Rec Area Sagamore Unit
(11) D-210	1	2-U	2	42	16	7	SYSTEM "E"	66 x 36	Riverton →
(11) D-211	1	2-U	2	30	15	7	SYSTEM "E"	54 x 24	Cuyuna County State Rec Area Sagamore Unit
TOTAL	11								

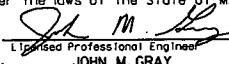
GENERAL SALVAGE & INSTALL SIGN TYPE D NOTES:
1. POST LENGTHS ARE APPROXIMATE AND INCLUDE EMBEDMENT, BUT DO NOT INCLUDE ADDITIONAL LENGTH REQUIRED FOR SPLICE.
2. SEE SHEETS 38-40 FOR STRUCTURAL DETAILS.
3. SEE STANDARD SIGNS MANUAL FOR TYPE D STRINGER AND PANEL JOINT DETAILS.
4. FOR ALL SALVAGE AND INSTALLED SIGN PANELS, PROVIDE NEW POSTS AND MOUNTING HARDWARE (REMOVE AND DISPOSE OF OLD POSTS AND MOUNTING HARDWARE).


SPECIFIC SALVAGE & INSTALL SIGN TYPE D NOTES:
(1) MOUNTING HEIGHT IS MINIMUM (WITH A 6 INCH TOLERANCE). SEE SHEET NO. 41 FOR TYPICAL MOUNTING.
(5) SIZES AND SPACING ARE APPROXIMATE.
(6) MOUNT ON SAME SIGN POST AS SIGN C-206.

SPECIFIC NOTES FOR ALL CHARTS:
(7) QUANTITY INCLUDED UNDER S.P. 6406-24 (SYSTEM "A").
(8) QUANTITY INCLUDED UNDER S.P. 7102-132 (SYSTEM "B").
(9) QUANTITY INCLUDED UNDER S.P. 7305-117 (SYSTEM "C").
(10) QUANTITY INCLUDED UNDER S.P. 018-070-010 (SYSTEM "D")
(11) QUANTITY INCLUDED UNDER S.P. 1806-74 (2/3) AND S.P. 018-070-010 (1/3) (SYSTEM "E")

REMOVE SIGN TYPE C						
SIGN NO.	TOTAL QUANTITY	POSTS		PANEL SIZE (IN.)	LOCATION	PANEL LEGEND
		NO. & TYPE				
(7) C-101	2	1-U		30 x 30	SYSTEM "A"	R1-1 STOP
(8) C-102	1	1-U		36 x 12	SYSTEM "B"	R6-1L ONE WAY LEFT
(9) C-103	2	2-U		48 x 48	SYSTEM "C"	W11-X3 TRUCKS ENTERING
TOTAL	5					

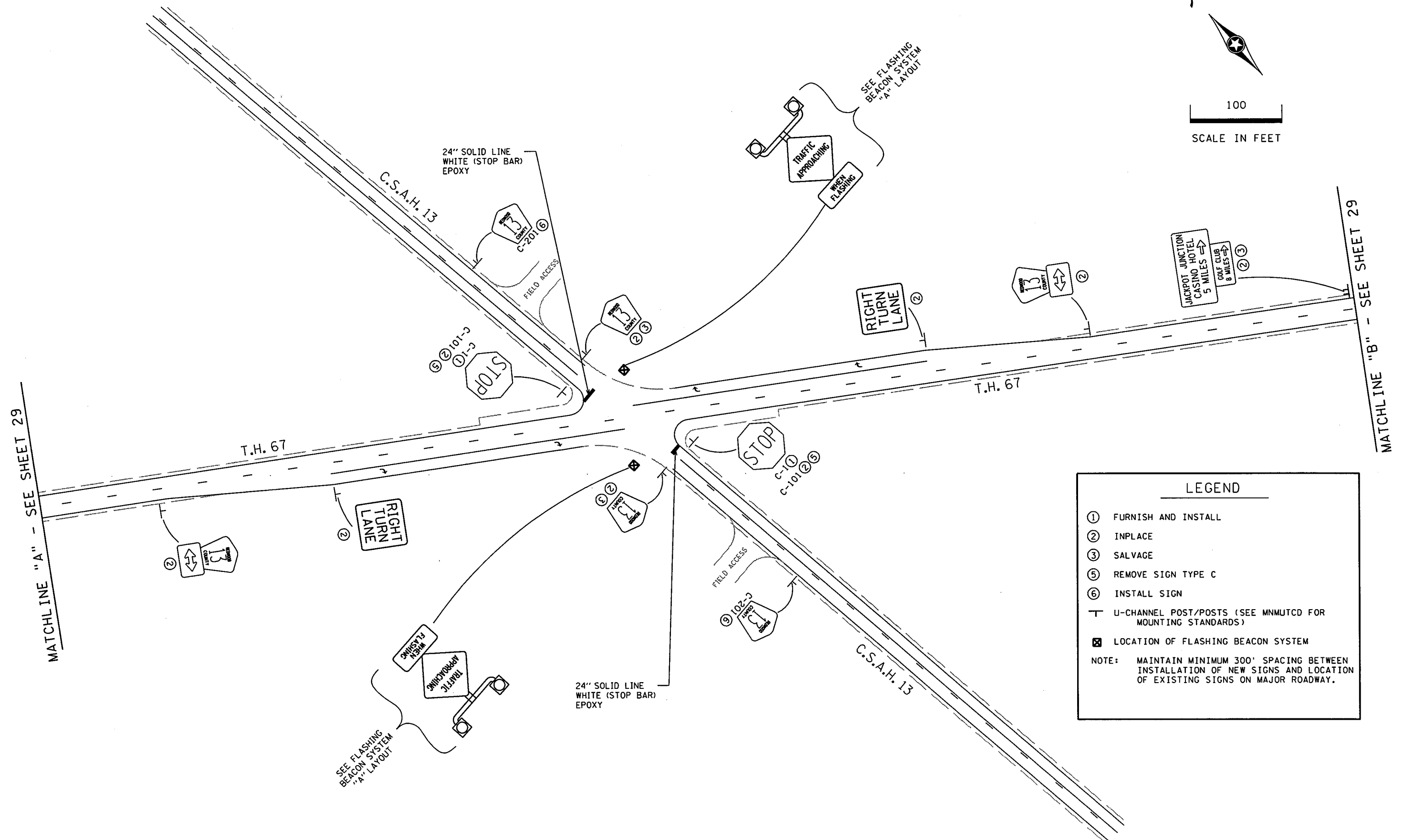
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DRAWN BY: CMJ				
DESIGNER: JMG				
CHECKED BY: JMG				
NO.	BY	DATE	REVISIONS	

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**RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II**
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010



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Certified By: *John M. Gray* Lic. No. 22457
 Printed Name: JOHN M. GRAY Date: 03/12/2015

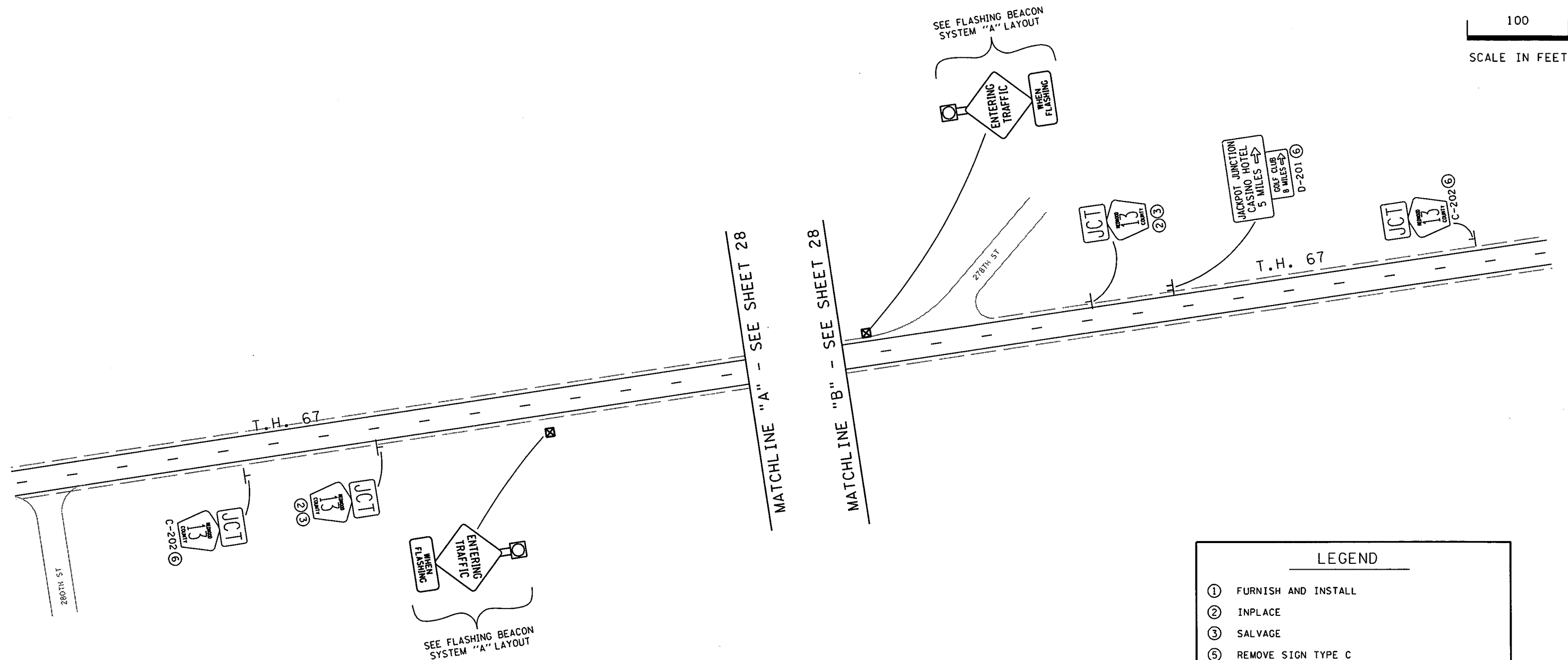


MINNESOTA DEPARTMENT OF TRANSPORTATION
**RURAL INTERSECTION CONFLICT
 WARNING SYSTEM - PHASE II**
 S.P. 8816-2274, 1806-74, 6406-24, 7102-132
 S.P. 7305-117, 018-070-010

**SIGNING & STRIPING PLAN
 TRUNK HIGHWAY 67 AT CSAH 13**
 MORGAN, MINNESOTA - REDWOOD COUNTY

FILE NO.
 MNTMD131077

28
 41



100
SCALE IN FEET

LEGEND

- ① FURNISH AND INSTALL
 - ② INPLACE
 - ③ SALVAGE
 - ⑤ REMOVE SIGN TYPE C
 - ⑥ INSTALL SIGN
 - U-CHANNEL POST/POSTS (SEE MNMUTCD FOR MOUNTING STANDARDS)
 - ☒ LOCATION OF FLASHING BEACON SYSTEM
- NOTE: MAINTAIN MINIMUM 300' SPACING BETWEEN INSTALLATION OF NEW SIGNS AND LOCATION OF EXISTING SIGNS ON MAJOR ROADWAY.

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

I hereby certify that this sheet 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: 03/12/2015

SEH

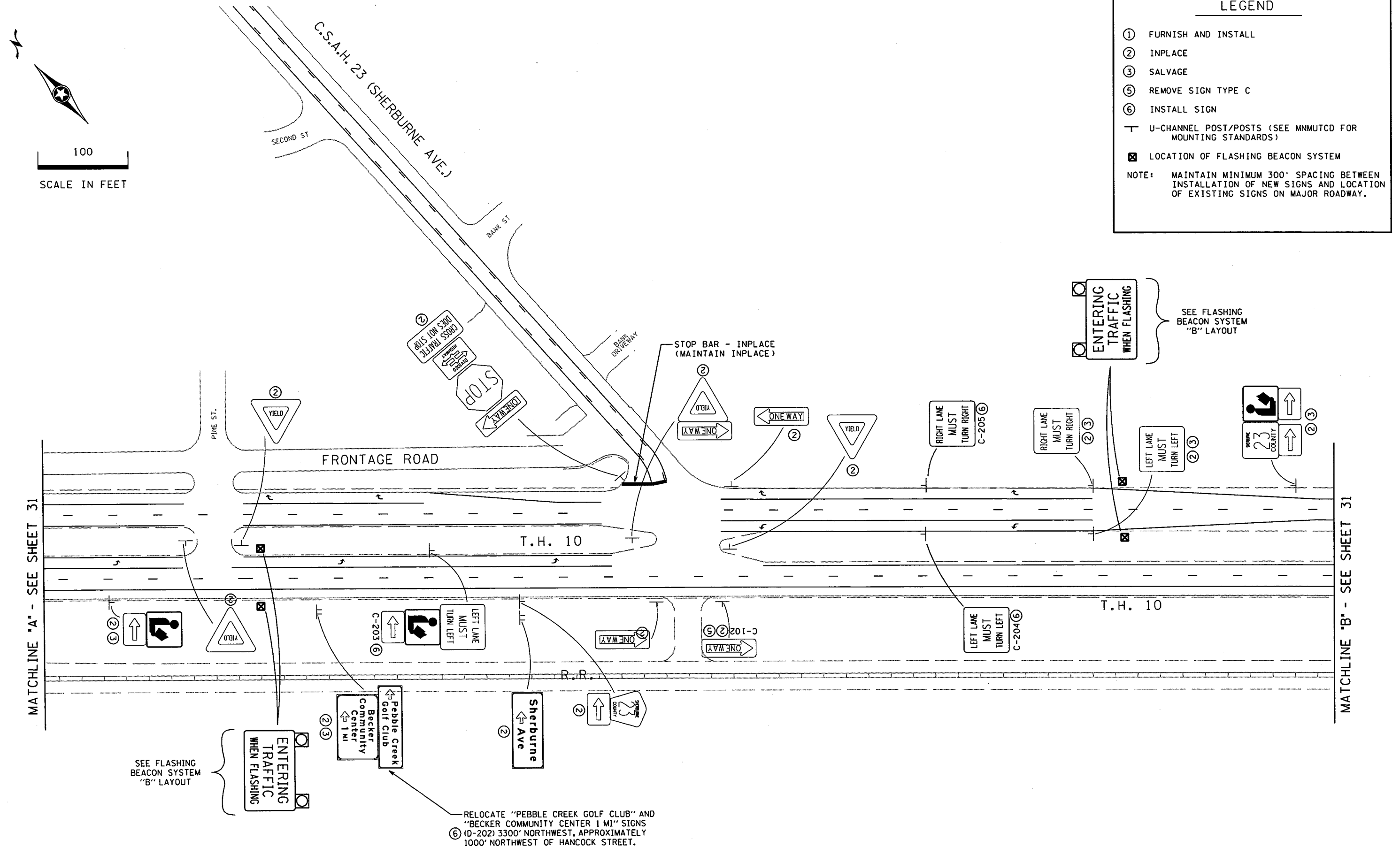
PHONE: (651)490-2000
3535 VADNAIS CENTER DR.
ST. PAUL, MN 55110

MINNESOTA DEPARTMENT OF TRANSPORTATION
**RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II**
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

**SIGNING AND STRIPING PLAN
TRUNK HIGHWAY 67 AT CSAH 13**
MORGAN, MINNESOTA - REDWOOD COUNTY

FILE NO.
MNTMD131077

29
41



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

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SEH

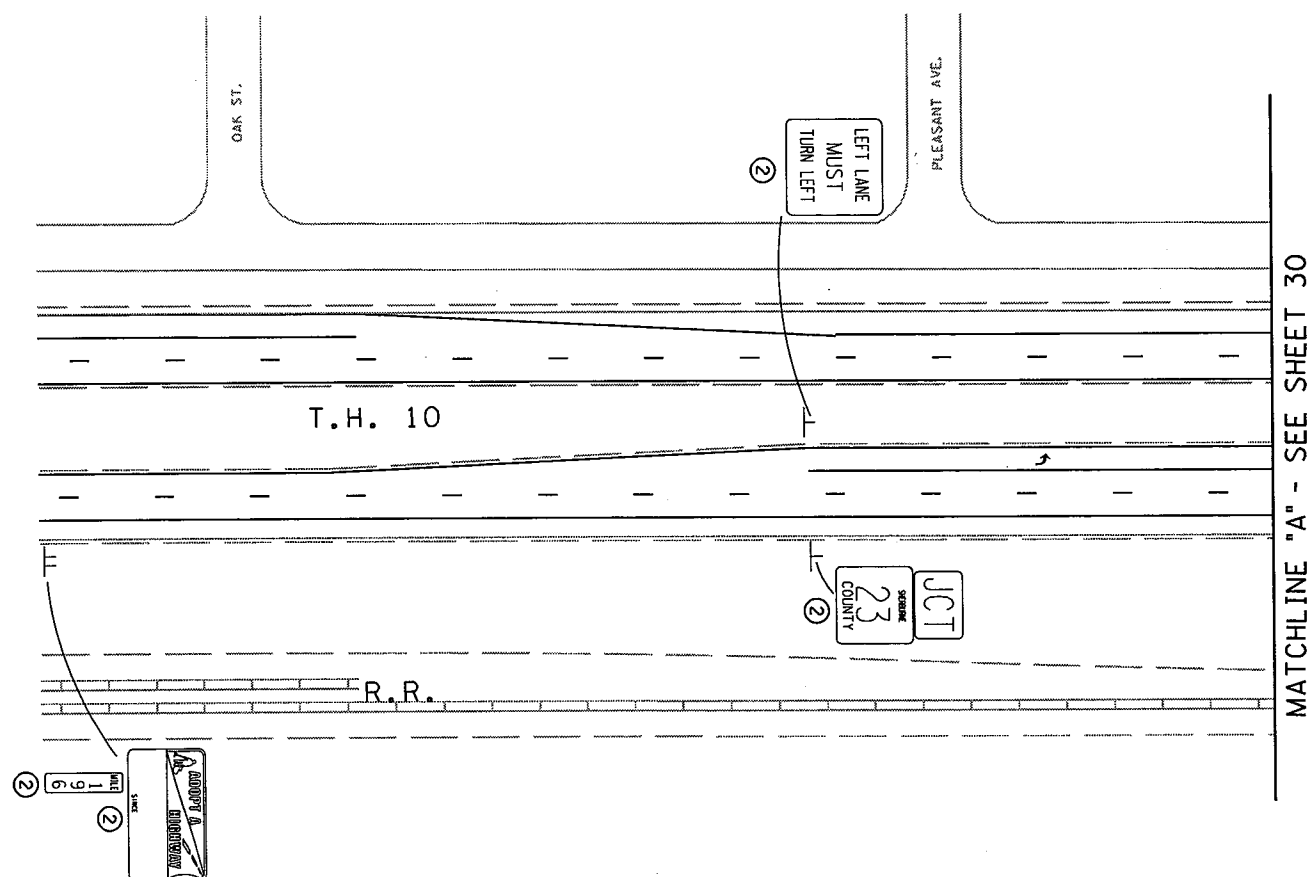
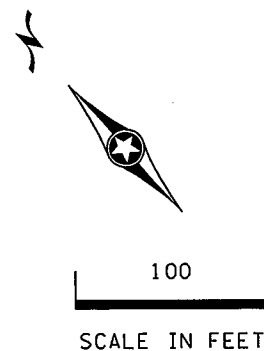
PHONE: (651) 490-2000
 3535 VADNAIS CENTER DR.
 ST. PAUL, MN 55110

MINNESOTA DEPARTMENT OF TRANSPORTATION
**RURAL INTERSECTION CONFLICT
 WARNING SYSTEM - PHASE II**
 S.P. 8816-2274, 1806-74, 6406-24, 7102-132
 S.P. 7305-117, 018-070-010

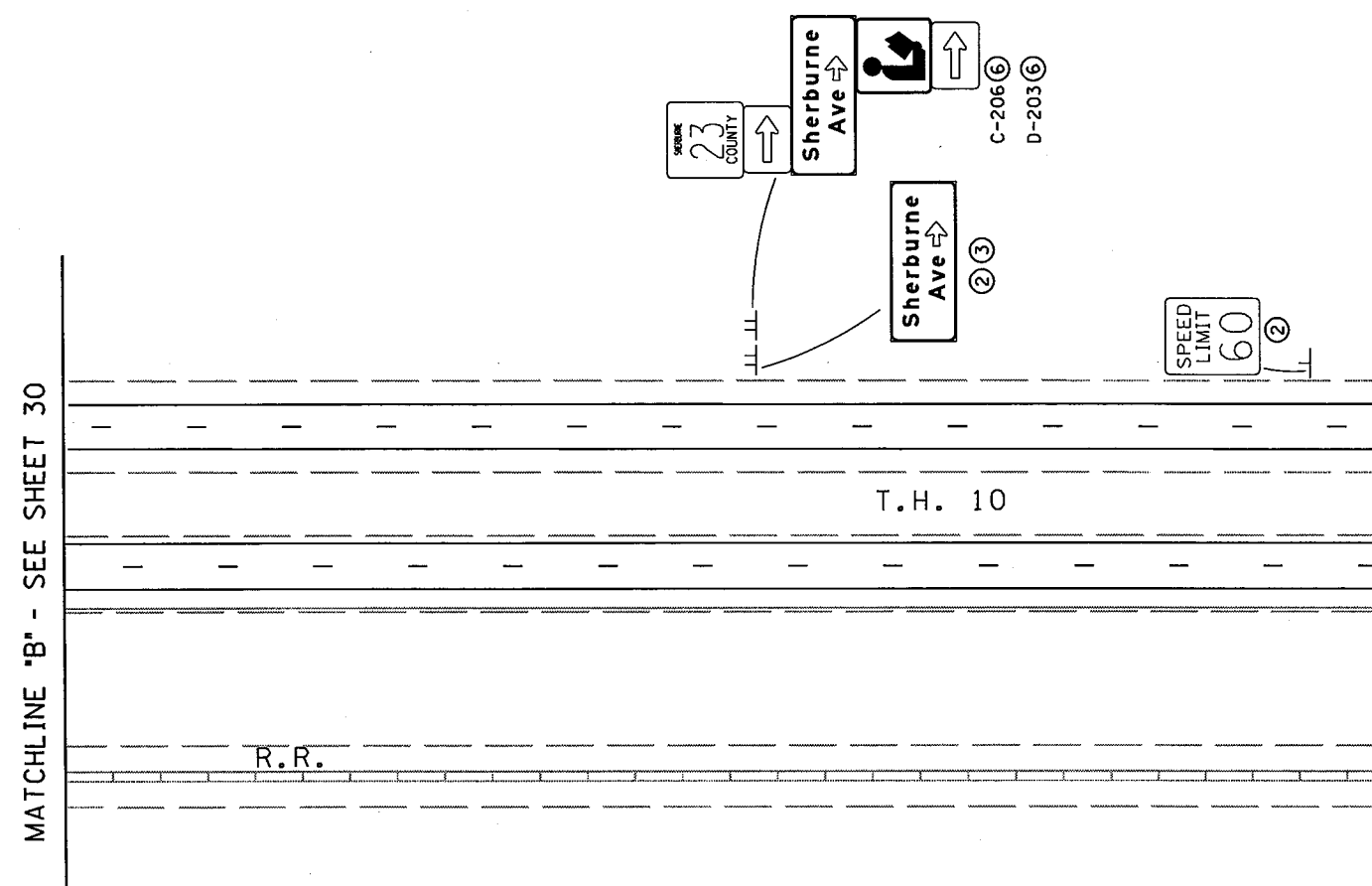
**SIGNING AND STRIPING PLAN
 TRUNK HIGHWAY 10 AT CSAH 23**
 BECKER, MINNESOTA - SHERBURNE COUNTY

FILE NO.
 MNTMD131077

30
 41



MATCHLINE "A" - SEE SHEET 30



LEGEND

- ① FURNISH AND INSTALL
 - ② INPLACE
 - ③ SALVAGE
 - ⑤ REMOVE SIGN TYPE C
 - ⑥ INSTALL SIGN
- └ U-CHANNEL POST/POSTS (SEE MNMUTCD FOR MOUNTING STANDARDS)
- ☒ LOCATION OF FLASHING BEACON SYSTEM

NOTE: MAINTAIN MINIMUM 300' SPACING BETWEEN
INSTALLATION OF NEW SIGNS AND LOCATION
OF EXISTING SIGNS ON MAJOR ROADWAY.

DESIGN TEAM				
DRAWN BY: <u>CMJ</u>				
DESIGNER: <u>JMG</u>				
CHECKED BY: <u>JMG</u>	NO.	BY	DATE	REVISIONS

I hereby certify that this sheet 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
Licensed Professional Engineer

Printed Name: JOHN M. GRAY Date: 03/12/2015



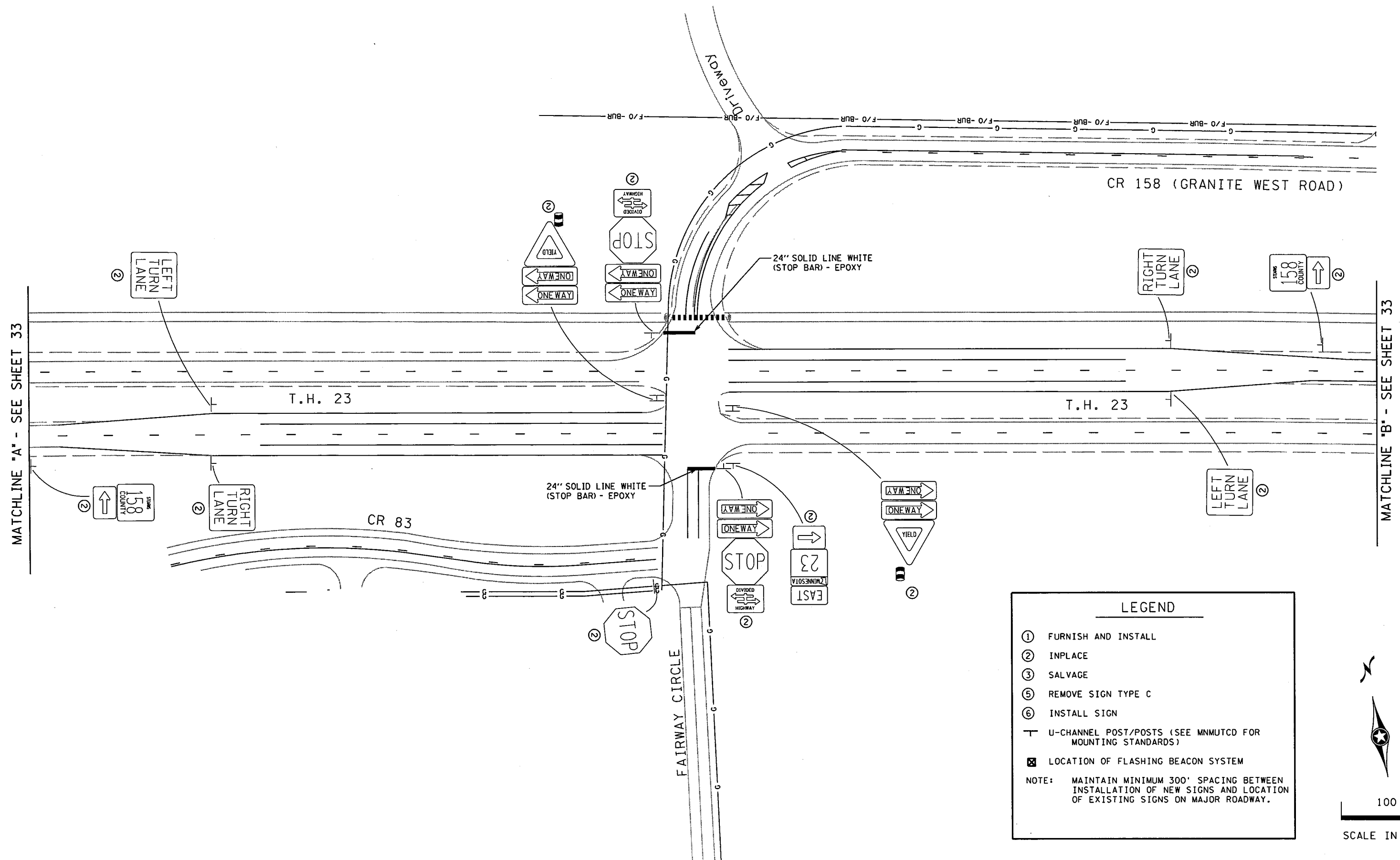
PHONE: (651)490-2000
3535 VADNAIS CENTER DR.
ST. PAUL, MN 55110

MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

SIGNING AND STRIPING PLAN
TRUNK HIGHWAY 10 AT CSAH 23
BECKER, MINNESOTA - SHERBURNE COUNTY

FILE NO.
MNTMDI31077

31



LEGEND

- ① FURNISH AND INSTALL
 - ② INPLACE
 - ③ SALVAGE
 - ⑤ REMOVE SIGN TYPE C
 - ⑥ INSTALL SIGN
- ┐ U-CHANNEL POST/POSTS (SEE MNMUTCD FOR MOUNTING STANDARDS)
- ☒ LOCATION OF FLASHING BEACON SYSTEM

NOTE: MAINTAIN MINIMUM 300' SPACING BETWEEN
INSTALLATION OF NEW SIGNS AND LOCATION
OF EXISTING SIGNS ON MAJOR ROADWAY.

100

SCALE IN FEET

DESIGN TEAM				
DRAWN BY: <u>CMJ</u>				
DESIGNER: <u>JMG</u>				
CHECKED BY: <u>JMG</u>	NO.	BY	DATE	REVISIONS

I hereby certify that this sheet 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: J. M. Gray Lic. No. 22457
Licensed Professional Engineer

Printed Name: JOHN M. GRAY Date: 03/12/2015



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

MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

SIGNING AND STRIPING PLAN
TRUNK HIGHWAY 23 AT CR 158
COLD SPRING, MINNESOTA - STEARNS COUNTY

FILE NO.
MNTMDI31077

32 /

41

LEGEND

- ① FURNISH AND INSTALL
② INPLACE
③ SALVAGE
⑤ REMOVE SIGN TYPE C
⑥ INSTALL SIGN
T U-CHANNEL POST/POSTS (SEE MNMUTCD FOR MOUNTING STANDARDS)
☒ LOCATION OF FLASHING BEACON SYSTEM

NOTE: MAINTAIN MINIMUM 300' SPACING BETWEEN INSTALLATION OF NEW SIGNS AND LOCATION OF EXISTING SIGNS ON MAJOR ROADWAY.

MATCHLINE "B" - SEE SHEET 32

Fairway Cir
②③ENTERING
TRAFFIC
WHEN FLASHINGSEE FLASHING
BEACON SYSTEM
"C" LAYOUTJCT
158
COUNTY
C-207 ⑥JCT
158
COUNTY
②③Fairway Cir
D-205 ⑥TRUCKS
ENTERING
C-103 ②⑤JCT
158
COUNTY
C-207 ⑥

T.H. 23

ENTERING
TRAFFIC
WHEN FLASHINGSEE FLASHING
BEACON SYSTEM
"C" LAYOUTSEE FLASHING
BEACON SYSTEM
"C" LAYOUTENTERING
TRAFFIC
WHEN FLASHINGENTERING
TRAFFIC
WHEN FLASHINGSEE FLASHING
BEACON SYSTEM
"C" LAYOUTFairway Cir
②③

T.H. 23

MATCHLINE "A" - SEE SHEET 32



100

SCALE IN FEET

DESIGN TEAM			
DRAWN BY:	CMJ		
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: 03/12/2015



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

MINNESOTA DEPARTMENT OF TRANSPORTATION
**RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II**
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

**SIGNING AND STRIPING PLAN
TRUNK HIGHWAY 23 AT CR 158**
COLD SPRING, MINNESOTA - STEARNS COUNTY

FILE NO.
MNTMD131077

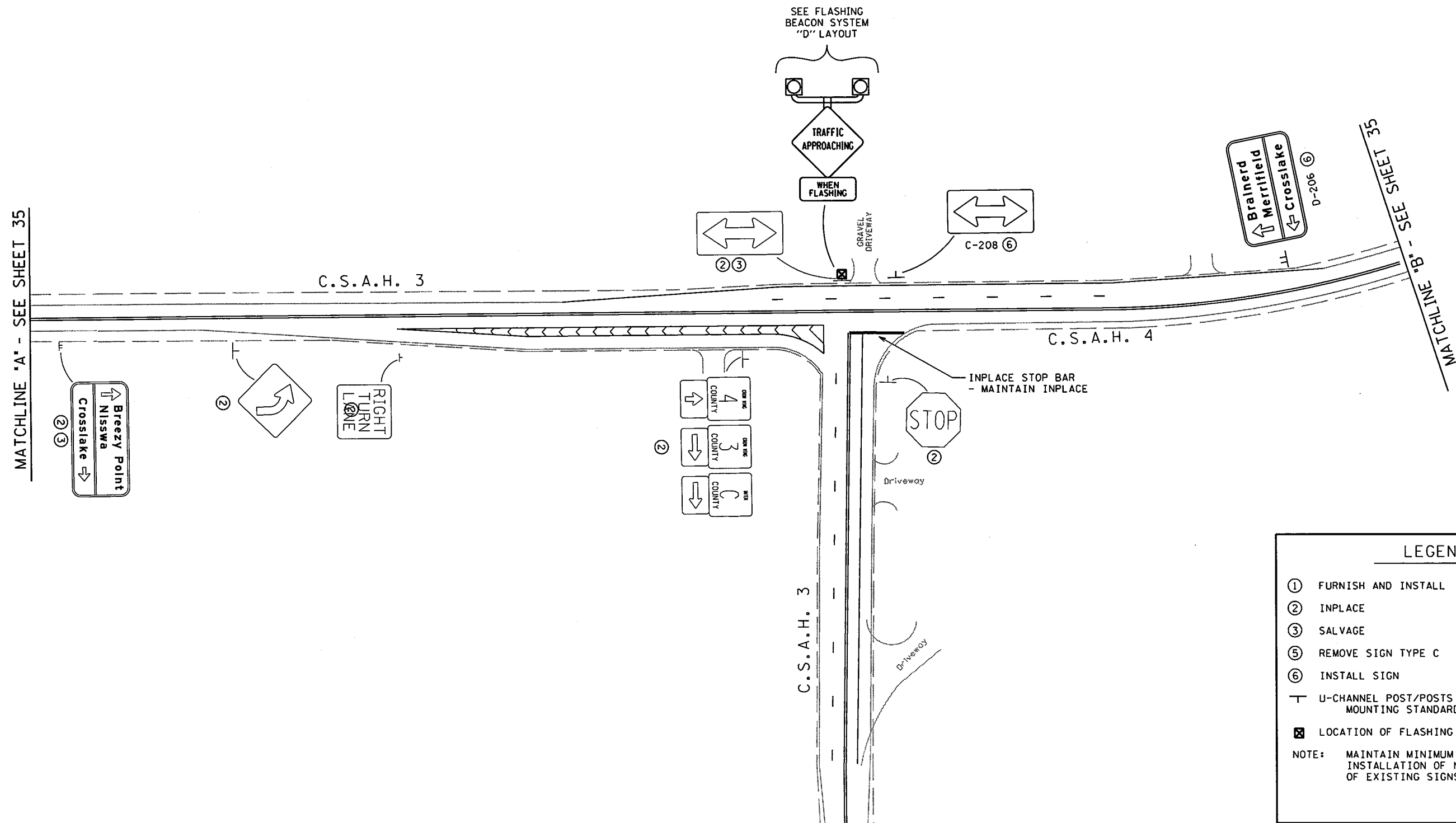
33

41



100

SCALE IN FEET



LEGEND

- ① FURNISH AND INSTALL
 - ② INPLACE
 - ③ SALVAGE
 - ⑤ REMOVE SIGN TYPE C
 - ⑥ INSTALL SIGN
- └ U-CHANNEL POST/POSTS (SEE MNMUTCD FOR MOUNTING STANDARDS)

NOTE: MAINTAIN MINIMUM 300' SPACING BETWEEN
INSTALLATION OF NEW SIGNS AND LOCATION
OF EXISTING SIGNS ON MAJOR ROADWAY.

DESIGN TEAM				
DRAWN BY: <u>CMJ</u>				
DESIGNER: <u>JMG</u>				
CHECKED BY: <u>JMG</u>				
	NO.	BY	DATE	REVISIONS

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Licensed Professional Engineer

Printed Name: JOHN M. GRAY Date: 03/12/2015



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

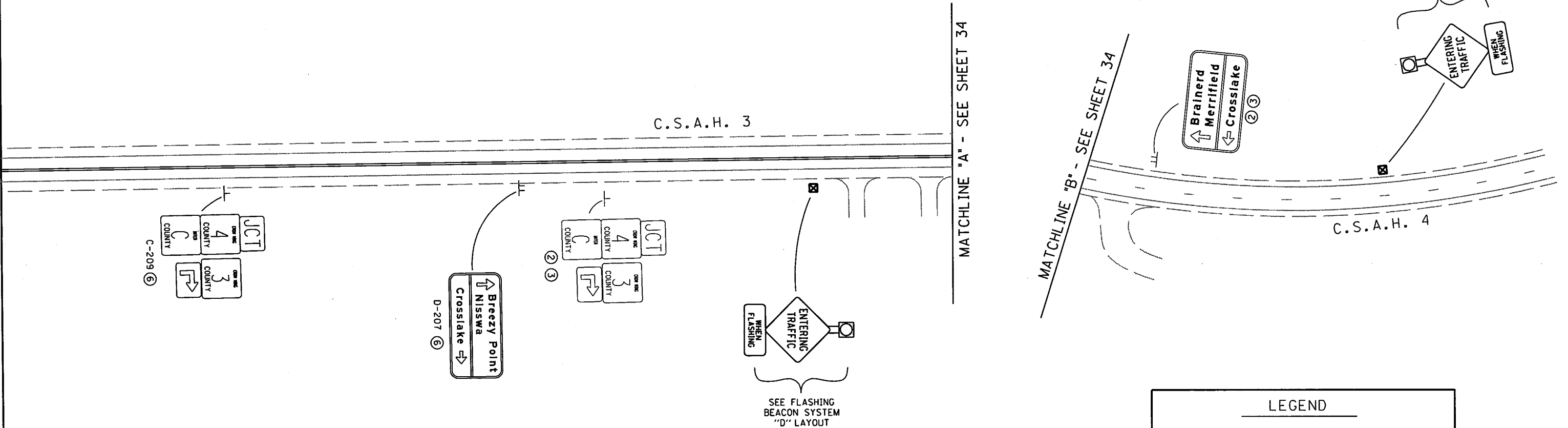
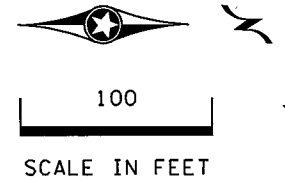
MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

**SIGNING AND STRIPING PLAN
CSAH 3 AT CSAH 4
MERRIFIELD, MINNESOTA - CROW WING COUNTY**

FILE NO.
MNTMDI31077

34 ✓

41



LEGEND

① FURNISH AND INSTALL

② INPLACE

③ SALVAGE

⑤ REMOVE SIGN TYPE C

⑥ INSTALL SIGN

U-CHANNEL POST/POSTS (SEE MNMUTCD FOR MOUNTING STANDARDS)


☒ LOCATION OF FLASHING BEACON SYSTEM

NOTE: MAINTAIN MINIMUM 300' SPACING BETWEEN INSTALLATION OF NEW SIGNS AND LOCATION OF EXISTING SIGNS ON MAJOR ROADWAY.

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

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SEH

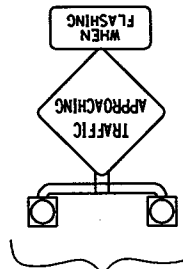
PHONE: (651)490-2000
3535 VADNAIS CENTER DR.
ST. PAUL, MN 55110

MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

SIGNING AND STRIPING PLAN
CSAH 3 AT CSAH 4
MERRIFIELD, MINNESOTA - CROW WING COUNTY

MATCHLINE "A" - SEE SHEET 37

Riverton

BYPASS
LANE
C-212 ⑥BYPASS
LANE
C-211 ⑥CROW WING
COUNTY
C-210 ⑥SEE FLASHING
BEACON SYSTEM
"E" LAYOUT

STOP ②

24" SOLID LINE WHITE
(STOP BAR) - EPOXYRIGHT LANE
MUST
TURN RIGHT ②CROW WING
COUNTY
C-210 ⑥

T.H. 210

C.S.A.H. 59

LEGEND

- ① FURNISH AND INSTALL
② INPLACE
③ SALVAGE
⑤ REMOVE SIGN TYPE C
⑥ INSTALL SIGN
T U-CHANNEL POST/POSTS (SEE MNMUTCD FOR MOUNTING STANDARDS)
☒ LOCATION OF FLASHING BEACON SYSTEM

NOTE: MAINTAIN MINIMUM 300' SPACING BETWEEN
INSTALLATION OF NEW SIGNS AND LOCATION
OF EXISTING SIGNS ON MAJOR ROADWAY.



100

SCALE IN FEET

MATCHLINE "B" - SEE SHEET 37

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

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MINNESOTA DEPARTMENT OF TRANSPORTATION
RURAL INTERSECTION CONFLICT
WARNING SYSTEM - PHASE II
S.P. 8816-2274, 1806-74, 6406-24, 7102-132
S.P. 7305-117, 018-070-010

SIGNING AND STRIPING PLAN
TRUNK HIGHWAY 210 AT CSAH 59
IRONTON, MINNESOTA - CROW WING COUNTY

FILE NO.
MNTMD131077

36
41

MATCHLINE "B" - SEE SHEET 36

SEE FLASHING
BEACON SYSTEM
"E" LAYOUT

T.H. 210 (55 MPH)

Riverton
②③ENTERING
TRAFFICWHEN
FLASHINGCuyuna County
State Rec Area
Sagamore Unit
②③Cuyuna County
State Rec Area
Sagamore Unit
②③

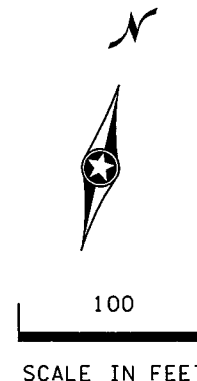
D-212-0

Cuyuna County
State Rec Area
Sagamore Unit
②③Riverton
②③SEE FLASHING
BEACON SYSTEM
"E" LAYOUTENTERING
TRAFFICWHEN
FLASHINGCuyuna County
State Rec Area
Sagamore Unit
②③Cuyuna County
State Rec Area
Sagamore Unit
②③

D-209⑥

Riverton
②③Cuyuna County
State Rec Area
Sagamore Unit
②③Cuyuna County
State Rec Area
Sagamore Unit
②③

MATCHLINE "A" - SEE SHEET 36



LEGEND

- ① FURNISH AND INSTALL
- ② INPLACE
- ③ SALVAGE
- ⑤ REMOVE SIGN TYPE C
- ⑥ INSTALL SIGN
- U-CHANNEL POST/POSTS (SEE MN MUTCD FOR MOUNTING STANDARDS)
- ☒ LOCATION OF FLASHING BEACON SYSTEM

NOTE: MAINTAIN MINIMUM 300' SPACING BETWEEN INSTALLATION OF NEW SIGNS AND LOCATION OF EXISTING SIGNS ON MAJOR ROADWAY.

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DESIGNER:	JMG		
CHECKED BY:	JMG		
NO.	BY	DATE	REVISIONS

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

MINNESOTA DEPARTMENT OF TRANSPORTATION
**RURAL INTERSECTION CONFLICT
 WARNING SYSTEM - PHASE II**
 S.P. 8816-2274, 1806-74, 6406-24, 7102-132
 S.P. 7305-117, 018-070-010

**SIGNING AND STRIPING PLAN
 TRUNK HIGHWAY 210 AT CSAH 59**
 IRONTON, MINNESOTA - CROW WING COUNTY

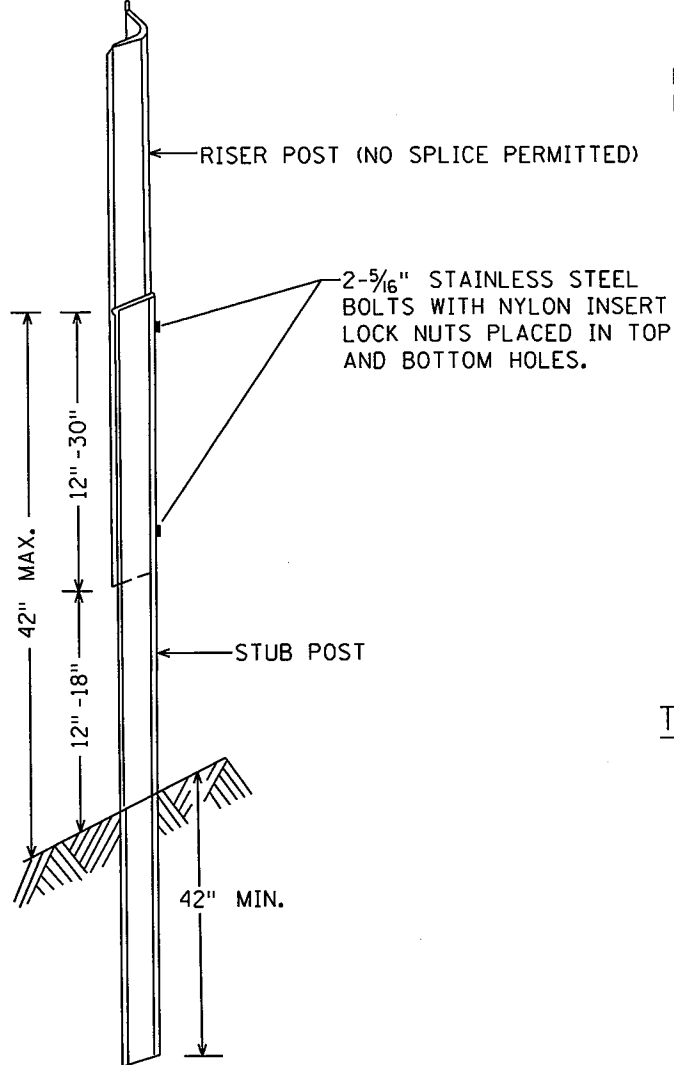
FILE NO.
 MNTMD131077

37
 41

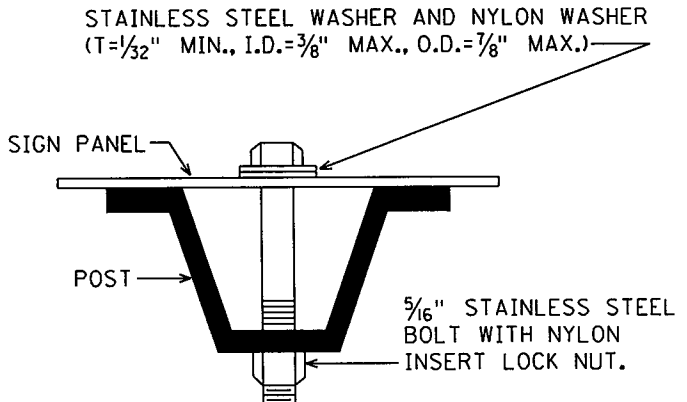
PLOTTED/REVISED: \$\$\$DATE\$\$\$

DISTRICT #: \$\$\$DISTRICT\$\$\$
PLOT NAME: \$\$\$PLOTNAME\$\$\$
PATH & FILENAME: \$\$\$PATHFILENAME\$\$\$

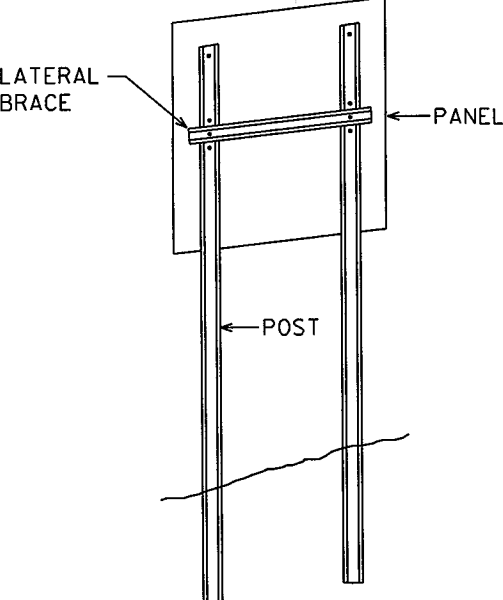
TYPE C & D POST



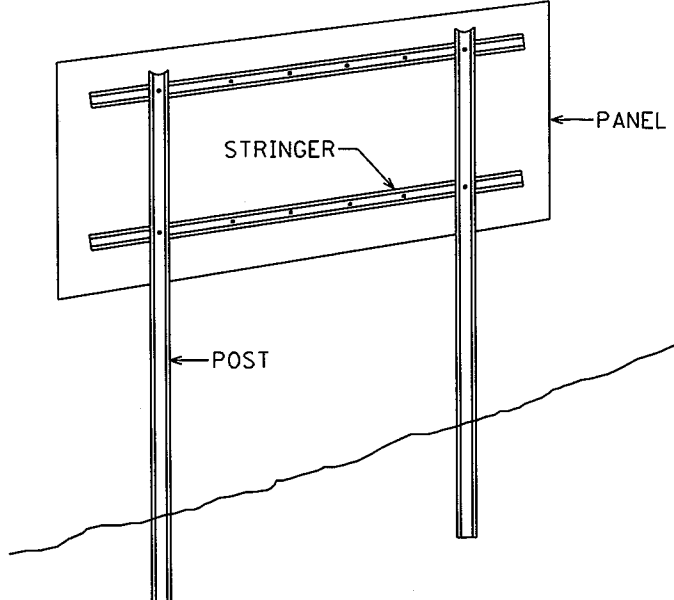
U POST BREAKAWAY SPLICE



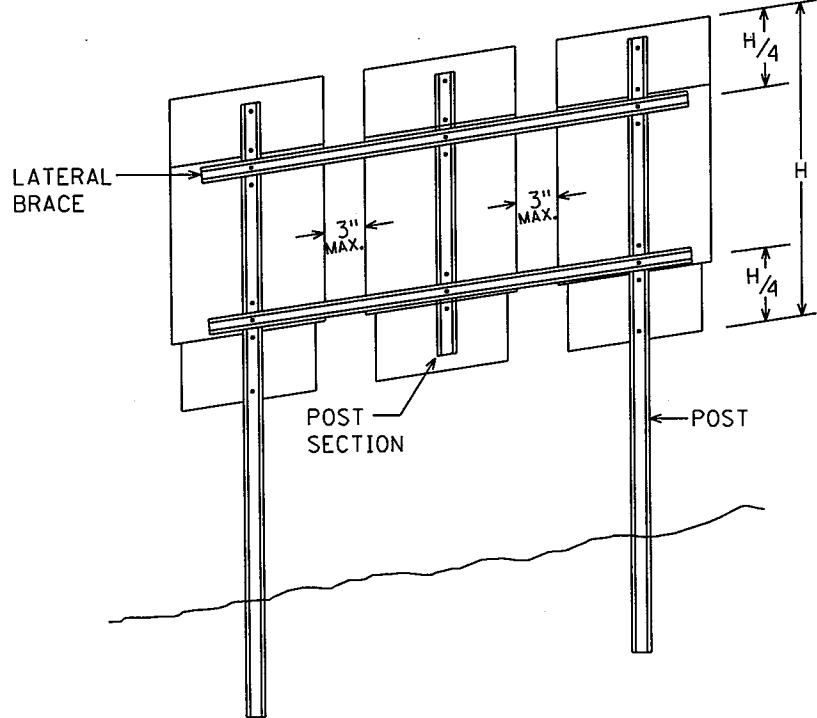
U POST MOUNTING
TYPE C SIGNS



TYPICAL TYPE C INSTALLATION



TYPICAL TYPE D INSTALLATION



MODIFIED TYPE C INSTALLATION

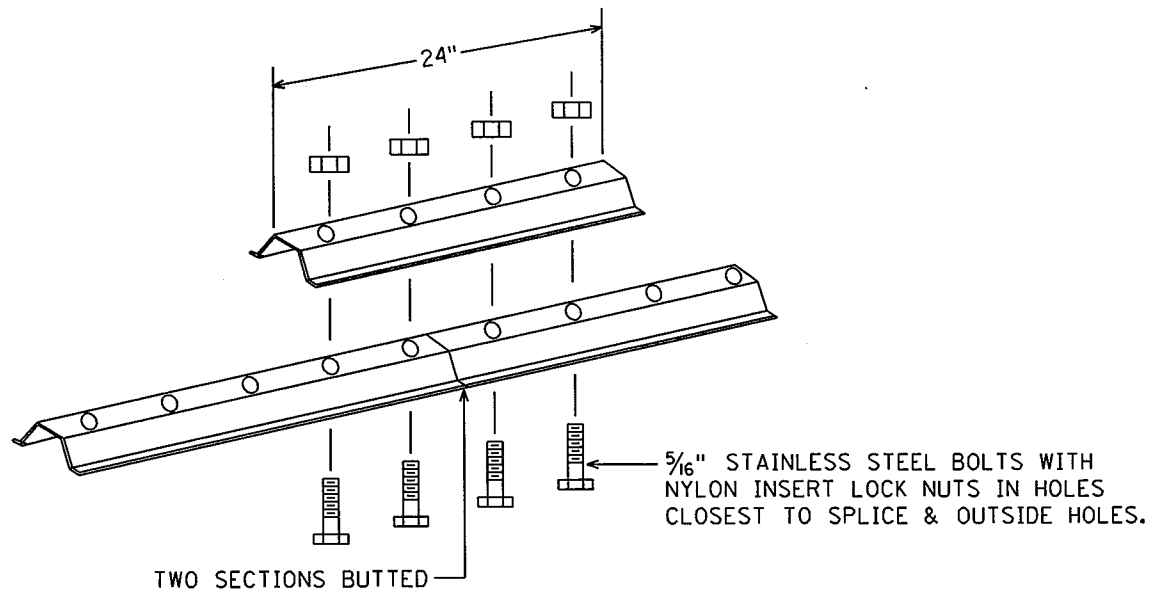
NOTES:

1. USE 3 LB/FT STUB POSTS. SHALL CONFORM TO MNDOT 3401.
2. USE 2.5 LB/FT RISER POSTS, STRINGERS, KNEE BRACES AND LATERAL BRACES. ALL SHALL CONFORM TO MNDOT 3401.
3. SEE SIGN DATA SHEETS FOR NUMBER OF POSTS, KNEE BRACES, POST LENGTHS AND SPACINGS, AS DETERMINED FROM TEM CHARTS 6.3 AND 6.4.
4. IF MORE THAN TWO POSTS ARE NEEDED, THE MINIMUM SPACING SHALL BE 45" BETWEEN POSTS.
5. TYPE D SIGN PANELS SHALL BE BOLTED TO STRINGERS AT 24" MAXIMUM INTERVALS IN ACCORDANCE WITH THE TYPE D STRINGER AND PANEL-JOINT DETAIL (SEE STANDARD SIGNS MANUAL).
6. MOUNTING (PUNCH CODE) FOR TYPE C SIGN PANELS SHALL BE AS INDICATED IN THE STANDARD SIGNS MANUAL UNLESS OTHERWISE SPECIFIED.
7. ALL RISER (VERTICAL) U POSTS SHALL BE SPLICED. DRIVEN STUB POSTS SHALL BE AT LEAST 7' LONG.
8. USE STAINLESS STEEL 5/16" BOLTS, WASHERS AND NYLON INSERT LOCK NUTS AS SHOWN FOR ALL GROUND MOUNTED AND OVERHEAD MOUNTED SIGNS.
9. STAINLESS STEEL WASHER WITH SAME DIMENSIONS SHALL BE PROVIDED BETWEEN ALL NYLON WASHERS AND BOLT HEADS.
10. BRACING STUBS SHALL BE NO MORE THAN 4" ABOVE GROUND AND EMBEDDED AT LEAST 42".
11. A-FRAME BRACKET SHALL BE STEEL CONFORMING TO MNDOT 3306 AND GALVANIZED IN ACCORDANCE WITH MNDOT 3394.
12. COLLARS SHALL BE USED TO SHIM OVERLAYS AND LEGEND COMPONENTS AWAY FROM PANEL WHERE INTERFERENCE WITH BOLT HEADS IS ENCOUNTERED. MNDOT 3352.2A6.
13. 2 POST TYPE C SIGNS SHALL BE REINFORCED WITH AT LEAST ONE LATERAL BRACE. INSTALLATIONS WHERE THE TOTAL PANEL HEIGHT IS 60" OR MORE SHALL HAVE TWO LATERAL BRACES LOCATED APPROXIMATELY AT THE QUARTER POINTS.
14. WHERE 2 SINGLE POST TYPE C SIGNS ARE INSTALLED SIDE BY SIDE, THEY SHALL BE REINFORCED Laterally BY AT LEAST 2 BRACES, BOLTED AT EACH POST AND LOCATED APPROXIMATELY AT THE QUARTER POINTS.
15. WHERE 3 OR MORE TYPE C SIGNS ARE INSTALLED SIDE BY SIDE, THEY SHALL BE REINFORCED Laterally BY AT LEAST 2 BRACES, BOLTED AT EACH POST AND POST SECTION AND LOCATED APPROXIMATELY AT THE QUARTER POINTS AS SHOWN IN MODIFIED TYPE C INSTALLATION.

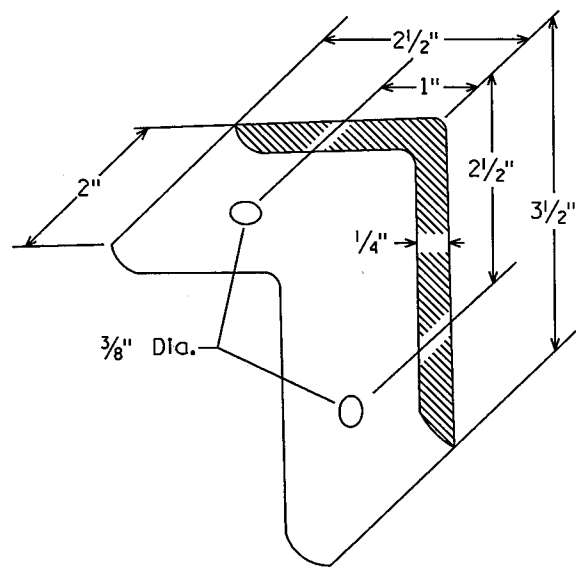
TYPE C & D SIGN
STRUCTURAL DETAILS

PLOTTED/REVISED: \$\$\$DATE\$\$\$

DISTRICT #: \$\$\$DISTRICT\$\$\$
PLOT NAME: \$\$\$PLOTNAME\$\$\$
PATH & FILENAME: \$\$\$PATHFILENAME\$\$\$

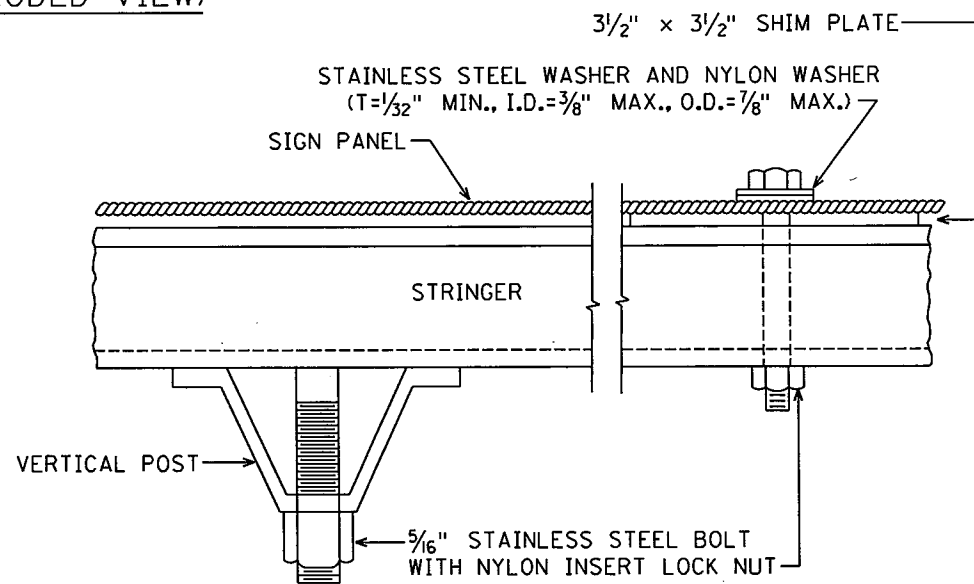


LATERAL BRACE OR STRINGER
SPlice DETAIL (EXPLODED VIEW)

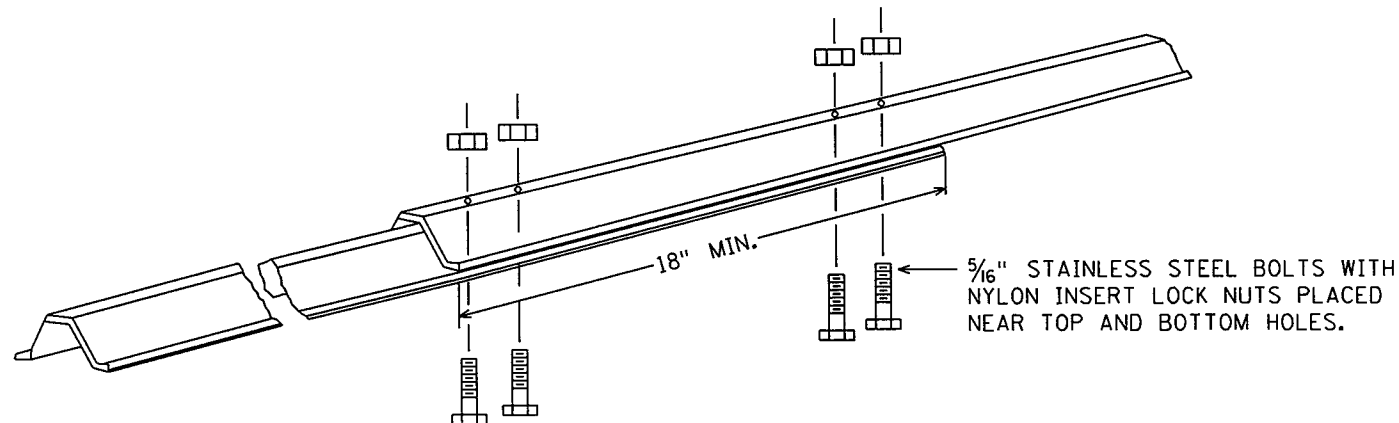


A-FRAME BRACKET

(STEEL MNDOT 3306 GALVANIZED PER MNDOT 3394)

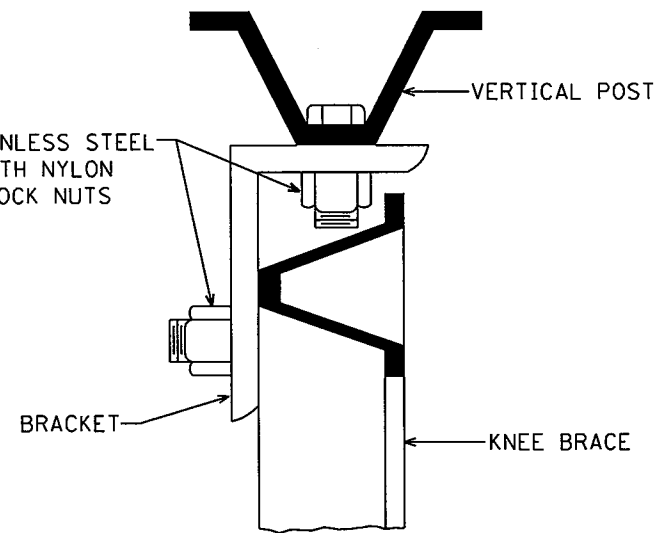


SECTION B-B

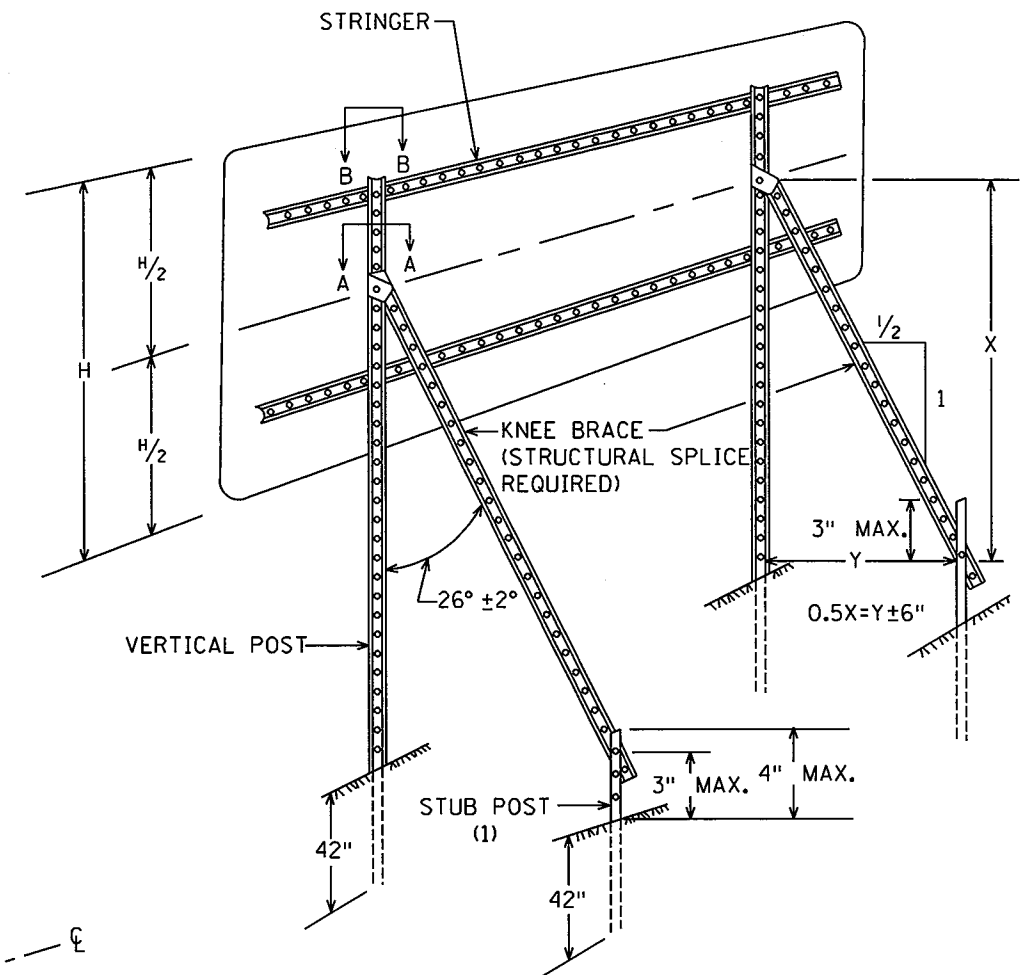


STRUCTURAL SPLICE

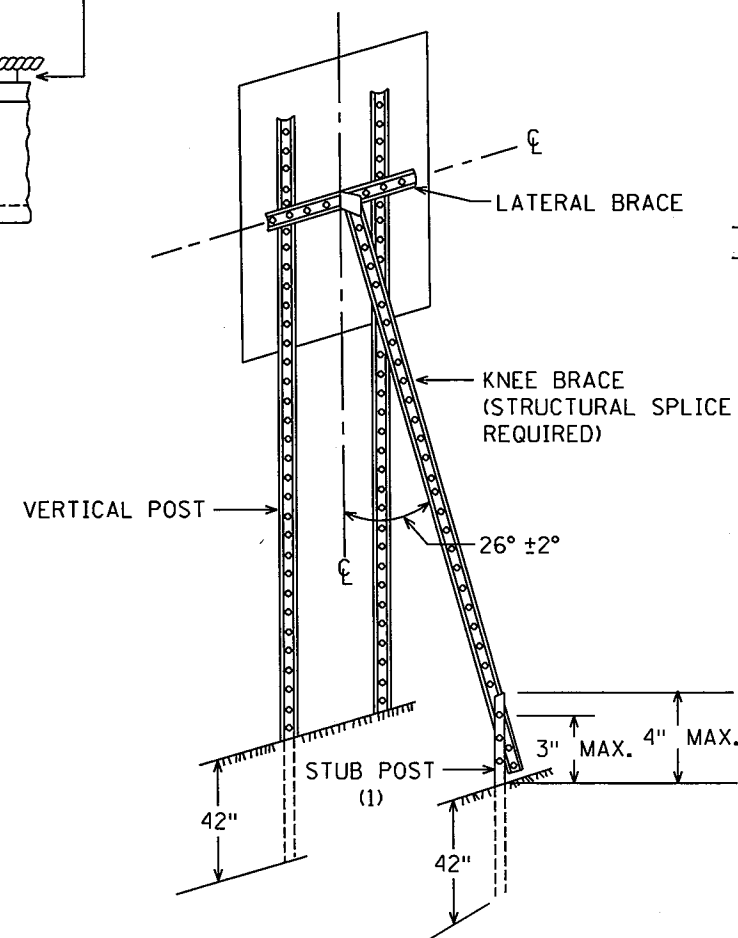
(USE WHEN IT IS NECESSARY TO FABRICATE THE CORRECT LENGTH OF POST FROM TWO PIECES)



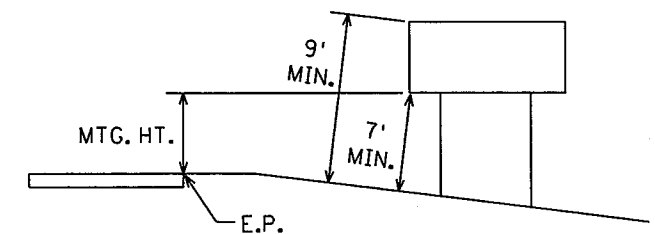
SECTION A-A



TYPICAL "A-FRAME" INSTALLATION
TYPE "D" SIGNS



TYPICAL "A-FRAME" INSTALLATION
TYPE "C" SIGNS

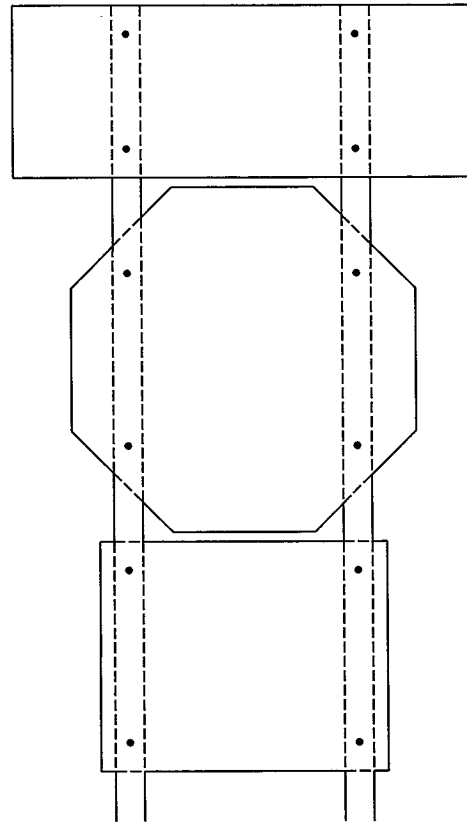


TYPICAL MOUNTING

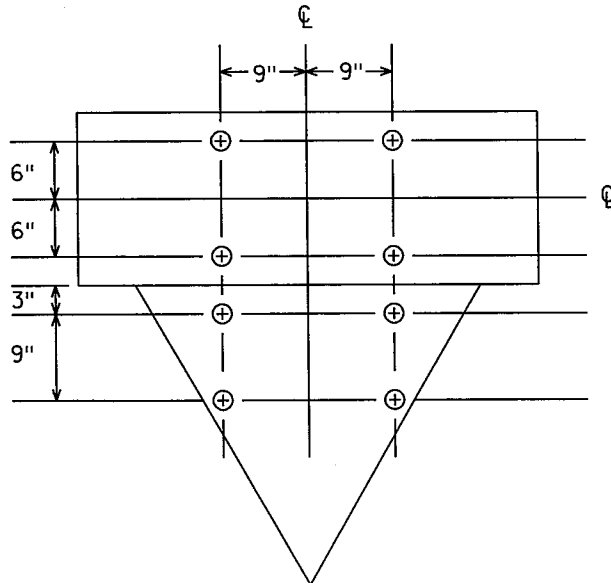
(1) OFFSET STUB POST 1' TOWARD ROADWAY
RELATIVE TO VERTICAL POST. ATTACH STUB
POST AND KNEE BRACE BACK TO BACK.

TYPE C & D SIGN
STRUCTURAL DETAILS

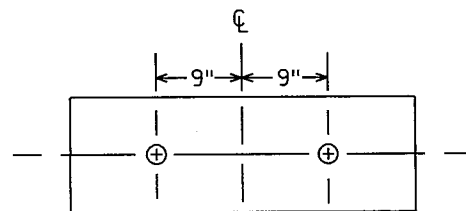
Sheet 2 of 3



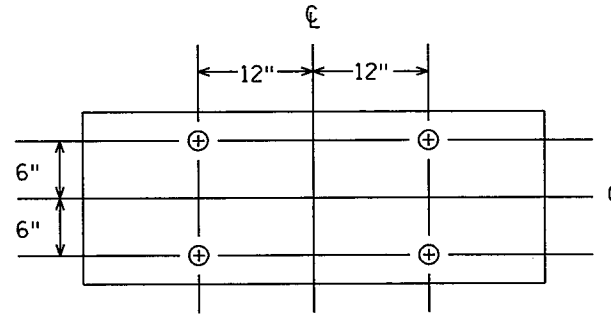
R6-1, R1-1 & (R6-3 OR R6-3a)
MOUNTING



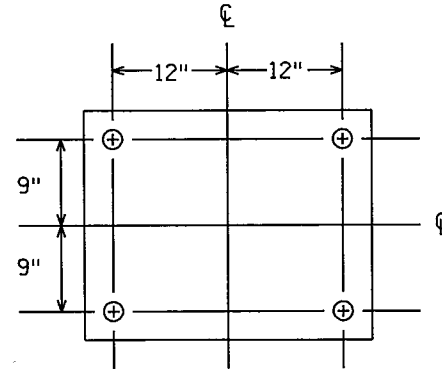
PUNCHING FOR R6-1(54"x18")
& R1-2(36"x36"x36")



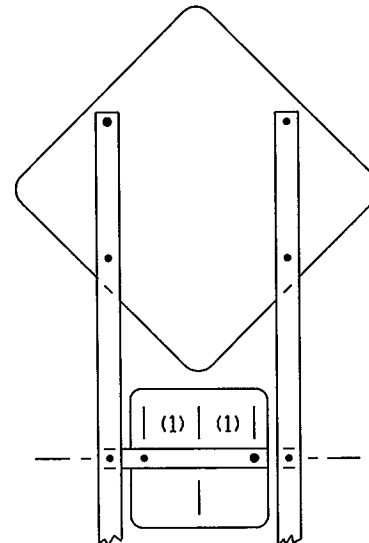
PUNCHING FOR R6-1(36"x12")



PUNCHING FOR R6-1(54"x18")

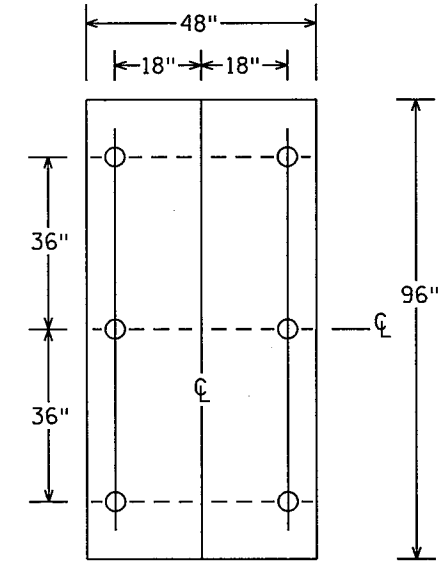


PUNCHING FOR R6-3 OR R6-3a(30"x24")



WARNING SIGN [30"x30 OR 48"x48"] AND
WARNING PLAQUE [18"x18" OR 30"x30"]
PUNCHING AND MOUNTING

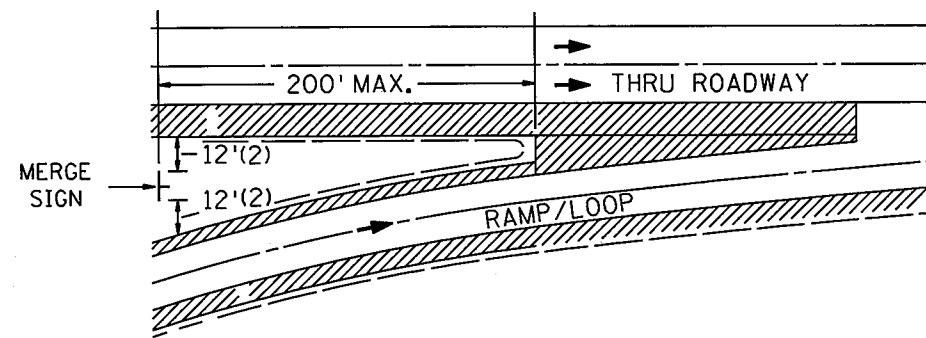
- (1) 6" FOR WARNING PLAQUE (18"x18")
 12" FOR WARNING PLAQUE (30"x30")



PUNCHING FOR R2-4b
SPEED LIMIT

TYPE C & D SIGN STRUCTURAL DETAILS

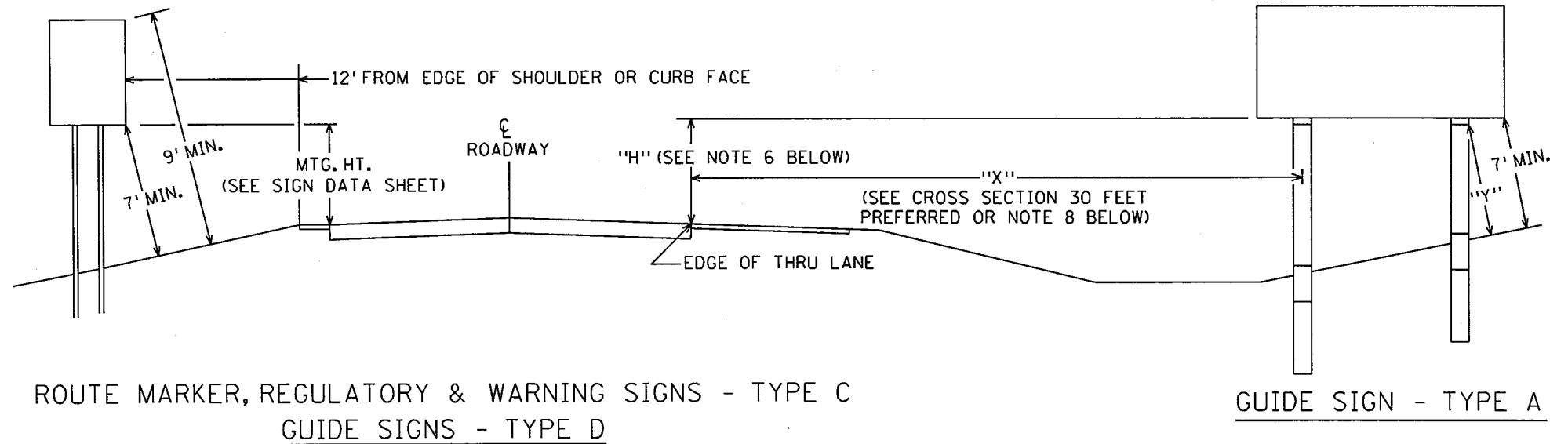
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(1) EXIT SIGNS

(2) MERGE SIGNS

ROADSIDE PLACEMENT



SIGN PLACEMENT

1. ALL ROUTE MARKERS, WARNING & REGULATORY SIGNS SHALL BE AT LEAST 7' ABOVE EDGE OF THRU LANE.
2. SIGN FACES SHALL BE VERTICAL.
3. OVERHEAD SIGNS SHALL BE POSITIONED AT RIGHT ANGLES TO THE THRU ROADWAY UNLESS OTHERWISE NOTED.
4. TO AVOID SPECULAR GLARE, $\angle A$ SHALL BE APPROXIMATELY 93° FOR SIGNS LOCATED LESS THAN 30' FROM THE EDGE OF THRU LANE AND APPROXIMATELY 92° FOR SIGNS LOCATED 30' OR MORE FROM EDGE OF THRU LANE. THIS APPLIES TO SIGNS TYPE A, C, & D AND INCLUDES SIGNS IN THE GORE.
5. "Y" IS THE PERPENDICULAR DISTANCE FROM THE GROUND LINE TO THE FRICTION FUSE ON THE POST. THIS DISTANCE SHALL BE AT LEAST 7'.
6. WHERE "X" IS LESS THAN 30', "H" SHALL BE $7' \pm 6''$. WHERE "X" IS 30' OR GREATER, MINIMUM AND PREFERRED "H" IS 5'.
7. LATERAL CLEARANCES GIVEN APPLY TO RIGHT AND OR LEFT SIDE INSTALLATION.
8. WHEN A TYPE A SIGN IS INSTALLED DIRECTLY BEHIND TRAFFIC BARRIER, THE LEFT EDGE OF THE SIGN PANEL SHALL BE LOCATED A MINIMUM OF 8 FEET BEHIND THE FACE OF THE TRAFFIC BARRIER.