MINNESOTA DEPARTMENT OF TRANSPORTATION

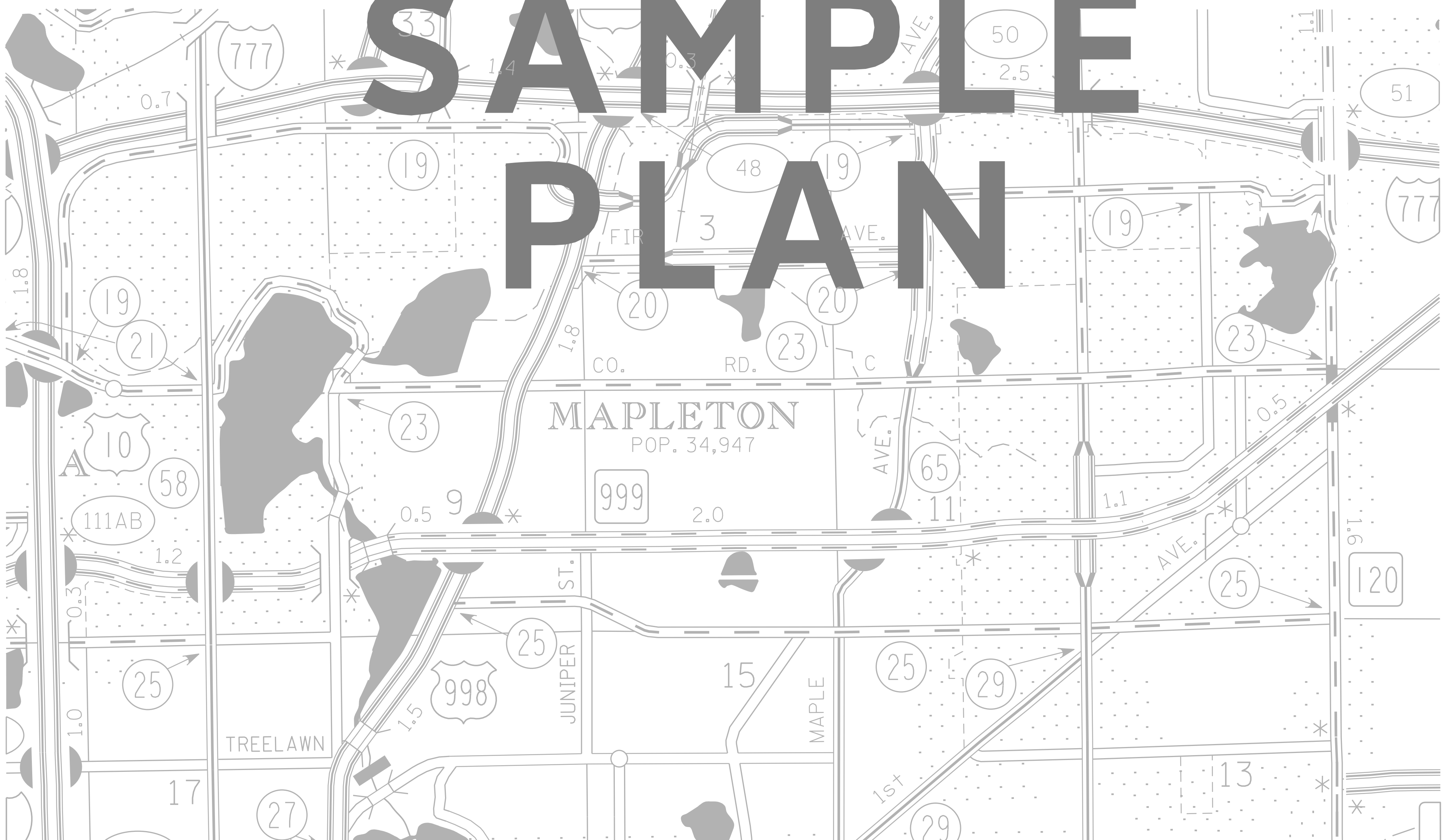
CONSTRUCTION PLAN FOR .... TRAFFIC MANAGEMENT SYSTEM

LOCATED ON TH 999 FROM 998 TO MAPLE AVE

STATE PROJ. NO. XXXX-XX	STATE PROJ. NO. XXXX-XX
MINN. PROJ. NO.	MINN. PROJ. NO. ....
GROSS LENGTH ..... X ..... miles	GROSS LENGTH ..... X ..... miles
BRIDGES-LENGTH .... miles	BRIDGES-LENGTH .... miles
EXCEPTIONS-LENGTH .... miles	EXCEPTIONS-LENGTH .... miles
NET LENGTH .... miles	NET LENGTH .... miles
REF. POINT XXX+0.0 TO REF. POINT XXX+0.0	REF. POINT XXX+0.0 TO REF. POINT XXX+0.0

NOTE: PROJECT LENGTH BASED ON REFERENCE POINT STATIONING

N



FED. PROJ. NO. STATE FUNDS

GOVERNING SPECIFICATIONS

THE 2018 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

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THIS PLAN CONTAINS 54 SHEETS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE .... LIC. NO. .... ENGR. .... NAME

DESIGN SQUAD NAME ....

RECOMMENDED FOR APPROVAL .... 20......
DISTRICT TRANSPORTATION ENGINEER

RECOMMENDED FOR APPROVAL .... 20......
DISTRICT TRAFFIC ENGINEER

RECOMMENDED FOR APPROVAL .... 20......
STATE PRE-LETTING ENGINEER

OFFICE OF LAND MANAGEMENT APPROVAL .... 20......
DIRECTOR, LAND MANAGEMENT

APPROVED .... 20 ....
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 LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

....

DATE .... LIC. NO. ....

FOR PLANS AND UTILITIES SYMBOLS SEE TECHNICAL MANUAL

PROJECT LOCATION

	STATE PROJ. NO.	CHARGE IDENTIFIER
COUNTY : VIKING	9999-999	....
DISTRICT : METRO	....	....

PLAN REVISIONS

DATE	SHEET NO.	APPROVED BY

REV. NO.	DATE: / /
REV. NO.	DATE: / /

ReutlAnl T79CLW161FRW047 TMS

pw:\\pw8i.ad.dot.state.mn.us:cadp\Documents\Projects\...\Special Projects\SamplePlan\Sample Plan_TS.dgn

LEGEND OF SYMBOLS	
- - - - - - - -	CONDUIT - INPLACE
= = = = = = =	CONDUIT - F&I
= = = = = = =	CONDUIT - F&I BORE
- - - - ●● - - - -	CONDUIT FIBER ONLY - INPLACE
==== ●● ====	CONDUIT FIBER ONLY - F&I
==== ●● ====	CONDUIT FIBER ONLY - F&I BORE
——— ●● ———	DIRECT BURIED COMMUNICATION CABLE - INPLACE
——— ● ———	DIRECT BURIED POWER CABLE - INPLACE
□	LOOP DETECTOR-DESIGN (SPECIFY)
P	LOOP DETECTOR- DESIGN PREFORMED
S	LOOP DETECTOR- DESIGN SAWCUT
N	LOOP DETECTOR- DESIGN NMC
V	LOOP DETECTOR- DESIGN VIRTUAL
	WARNING FLASHER - INPLACE
	WARNING FLASHER - F&I
	GATE ARM - INPLACE
	FOUNDATION INPLACE, GATE ARM - F&I
	FOUNDATION F&I, GATE ARM - F&I
	TOLLING BEACON - INPLACE
	TOLLING BEACON - F&I
	TOLLING READER
H	HANDHOLE - INPLACE
	JUNCTION BOX OR CONDULET - INPLACE
	JUNCTION BOX OR CONDULET - F&I
	OVERHEAD SIGN STRUCTURE - INPLACE
	OVERHEAD SIGN STRUCTURE - F&I
	SIGN (TYPE DMS) - (SPECIFY) - INPLACE
	SIGN (TYPE DMS) - (SPECIFY) - F&I
	FOUNDATION/CABINET (SPECIFY) - INPLACE
	FOUNDATION/CABINET (SPECIFY) - F&I
SIG	SIGNAL CABINET

LEGEND OF SYMBOLS	
	PEDESTAL - INPLACE
	PEDESTAL - F&I
	RAMP CONTROL SIGNAL (DESIGN ONE-WAY) - INPLACE
	RAMP CONTROL SIGNAL (DESIGN ONE-WAY) - F&I
	RAMP CONTROL SIGNAL (DESIGN TWO-WAY) - INPLACE
	RAMP CONTROL SIGNAL (DESIGN TWO-WAY) - F&I
	RAMP CONTROL SIGNAL (DESIGN ONE-WAY)(SCREW IN BASE) - INPLACE
	SHELTER CABINET (TMS) - INPLACE
	SHELTER CABINET (TMS) - F&I
S	SPLICE CABINET - (SPECIFY)
FO	SPLICE VAULT (FIBER OPTIC) - (SPECIFY)
TV	TELEVISION CAMERA (CCTV) - (SPECIFY)
	NON-INTRUSIVE DETECTION/POLE - INPLACE
	NON-INTRUSIVE DETECTION/POLE - F&I
TV	NON-INTRUSIVE DETECTION/POLE & CAMERA
I	INTELLIGENT LANE CONTROL SIGN - INPLACE
I	INTELLIGENT LANE CONTROL SIGN - F&I
LCS	LANE CONTROL SIGNAL - SPECIFY
	WOOD POLE - INPLACE
	WOOD POLE - F&I
	WOOD POLE INPLACE, SERVICE INSTALLATION - INPLACE
	WOOD POLE INPLACE, SERVICE INSTALLATION - F&I
PV	PULL VAULT - INPLACE
PV	PULL VAULT - F&I
E	ELECTRICAL SERVICE - INPLACE
E	ELECTRICAL SERVICE - F&I
T	POWER COMPANY TRANSFORMER
E	POWER COMPANY PEDESTAL
GEN	GENERATOR
	PEDESTRIAN GATE - F&I

- - - - - - GPS - - LINESTYLES WITH GPS DESIGNATION HAVE BEEN FIELD LOCATED

STANDARD PLATES

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

PLATE NO.	DESCRIPTION
3131C	PRECAST CONCRETE HEADWALL FOR SUBSURFACE DRAINS
8110E	TRAFFIC SIGNAL BRACKETING (POLE MOUNTED)
8111E	TRAFFIC SIGNAL BRACKETING (PEDISTAL MOUNTED)
8112I	PEDESTAL FOUNDATION (TRAFFIC CONTROL SIGNALS)
8119C	GROUND MOUNTED CABINET FOUNDATION
8120Q	POLE FOUNDATION (PA 85) (1)
8122F	PEDESTAL AND PEDESTAL BASE (FOR TRAFFIC CONTROL SIGNALS SUPPORT)
8127E	LIGHT FOUNDATION - DESIGN E PRECAST 40' POLE OR LESS (2)
8150C	INSTALLATION OF CULVERT MARKERS

(1) MODIFIED TO INCLUDE 3 NUTS AND 2 WASHERS

(2) ANCHOR BOLTS SHALL EXTEND 5" ABOVE FOUNDATION

UTILITY	NOTE
Mn/DOT	LEAVE AS IS
Reliant Energy/Minnegasco	LEAVE AS IS
Qwest	LEAVE AS IS
Xcel Energy	LEAVE AS IS
Koch Pipelines	LEAVE AS IS
Williams Pipeline	LEAVE AS IS
Northern Natural Gas	LEAVE AS IS
MCI/ Worldcom	LEAVE AS IS
ATT Broadband	LEAVE AS IS
Others as Received From Gopher One	

NOTE:

UTILITIES SHOWN ARE A COMPILATION OF INFORMATION PROVIDED BY THE UTILITY COMPANIES AND PREVIOUS PROJECTS WITHIN THE AREA THE UTILITIES WERE NOT FIELD LOCATED.

NO UTILITIES WILL BE AFFECTED BY THIS PROJECT.

THE CONTRACTOR SHALL CALL GOPHER STATE ONE CALL FOR UTILITY LOCATES PRIOR TO BEGINNING ANY CONSTRUCTION.

GOPHER ONE STATE CALL IS MINNESOTA UNDERGROUND FACILITY NOTIFICATION CENTER (1-800-252-1166 OR 651-454-0002). IT SHOULD BE NOTED THAT IN ACCORDANCE WITH MINNESOTA STATUTE 216D, IT IS REQUIRED THAT ALL CONSTRUCTION PROJECTS INVOLVING MAINTENANCE ACTIVITY REQUIRES THE PARTY DOING THE EXCAVATION TO CALL GOPHER STATE ONE. CALL 48 HOURS PRIOR TO EXCAVATION.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUB SURFACE UTILITY DATA"

TMS COMPONENTS

GENERAL CONSTRUCTION NOTES:

1. BURIED FIBER OPTIC CABLE SHALL BE PLACED AT LEAST 20 FEET FROM CULVERT OUTLETS, UNLESS OTHERWISE SPECIFIED OR DIRECTED BY THE ENGINEER. FIBER OPTIC CABLE AT CULVERT LOCATIONS SHALL BE BORED UNDER CULVERTS UNLESS A MINIMUM OF 4' COVER EXISTS FROM THE GROUNDLINE TO THE TOP OF PIPE OR AS OTHERWISE SPECIFIED OR DIRECTED BY THE ENGINEER.

2. BORED FIBER OPTIC CABLE LOCATIONS SHALL BE VERIFIED BY THE ENGINEER PRIOR TO PERFORMING WORK.

3. CCTV/NID POLES SHALL BE PLACED BEHIND GUARDRAIL, WHERE GUARDRAIL EXISTS, OR OUTSIDE OF THE CLEAR ZONE. CCTV POLES IN OPEN AREAS SHALL BE PLACED ON UPPER SIDE OF BACKSLOPE, WHERE POSSIBLE. POLE LOCATIONS SHALL BE AS DIRECTED BY THE ENGINEER.

4. POLES SHALL BE MOUNTED WITH PROPER TIP-DOWN ORIENTATION, PARALLEL TO ROADWAY, FOR SERVICEABILITY. LIGHTNING RODS SHALL BE PLACED AWAY FROM ROADWAY.

5. CO-LOCATION (JOINT TRENCH) OF CONDUITS SHALL BE USED WHENEVER POSSIBLE AND NOTED ON AS-BUILT PLANS.

6. EMPTY CONDUITS, NOT PLACED IN JOINT TRENCH WITH FILLED CONDUITS FOR ENTIRE LENGTH, SHALL HAVE A NO 12 TRACE WIRE FURNISHED AND INSTALLED WITH MINIMUM 3' COIL AT BOTH ENDS OF EMPTY CONDUITS AND TRACE WIRE SHALL BE INCIDENTAL.
   EMPTY CONDUITS SHALL BE CAPPED ON BOTH ENDS - INCIDENTAL.

7. NO OPEN TRENCHING WILL BE ALLOWED IN WETLAND AREAS.

NOTES

(1) INCLUDES ALL MOUNTING STEEL AND HARDWARE
(2) LIST TYPE(S) 334, CCTV, ETC.
(3) LIST DELIVERY LOCATION (METRO TRUCK STATION, ETC.)
(4) ANCHOR BOLTS TO EXTEND 5" ABOVE FOUNDATION
(5) LIST SIZE OF FOUNDATION(S)/SHELTER
(6) LIST TYPE 334, 340 ETC.
(7) LIST IF MAIN BREAKER IS UPSIZED
(8) LIST NO. & HEIGHT OF EACH SIZE
(9) LIST IF MAIN BREAKER IS UPSIZED
(10) LIST POLE HEIGHT(S)
(11) LIST SIZE OF SPLICE/PATCH PANEL(S)
(12) INCLUDE PLACING AND SHAPING

GENERAL NOTES:

TURF ESTABLISHMENT & EROSION CONTROL FOR TRAFFIC MANAGEMENT SYSTEM PLACEMENT SHALL BE CONSIDERED INCIDENTAL, APPLIED TO ALL DISTURBED AREAS, IN ACCORDANCE WITH MNDOT 2575.1, 2575.2, 2575.3, AND THE FOLLOWING

1. SEED MIXTURE 25-141
2. FERTILIZER TYPE 3, ANALYSIS 22-5-10 (NPK) APPLIED AT A RATE OF 350 POUNDS/ACRE.
3. ROLLED EROSION PREVENTION CATEGORY 20 PER MNDOT 2575.3

TABULATION OF TMS ESTIMATED QUANTITIES (SPXXXX-XXX TH XXX) (A)

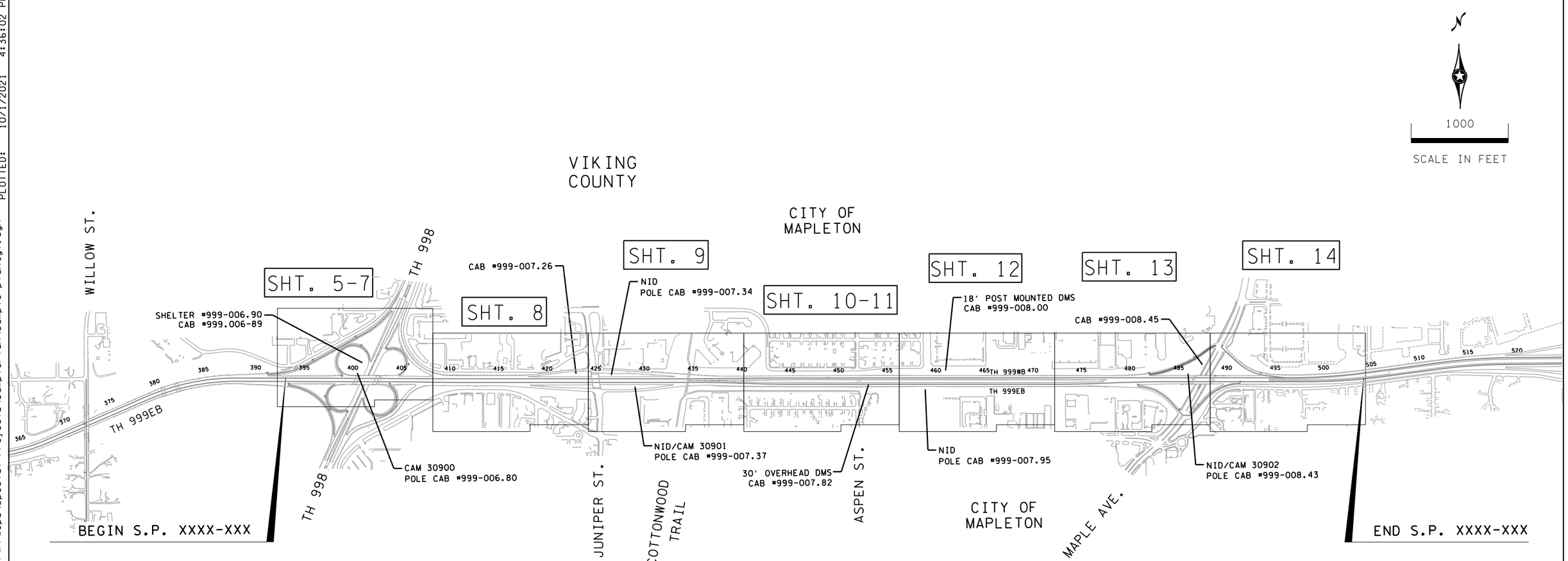
TAB	SHEET NUMBER	ITEM NO.	ITEM	NOTES	UNIT	TOTAL TMS ESTIMATED QUANTITIES	SP 9999-999 QUANTITIES
SZ		2104.502	REMOVE SERVICE EQUIPMENT	(1)	EACH		
SZ		2104.502	REMOVE FOUNDATION	(2)	EACH		
SZ		2104.502	SALVAGE SERVICE EQUIPMENT		EACH		
SZ		2104.502	SALVAGE CCTV HARDWARE		EACH		
SZ		2104.502	SALVAGE CABINET		EACH		
SZ		2104.601	HAUL SALVAGED MATERIAL	(3)	LUMP SUM		
SZ		2104.601	REMOVE CABLES		LUMP SUM		
SZ		2105.507	COMMON BORROW (CV)		CU YD		
SZ		2545.502	LIGHT FOUNDATION DESIGN E MODIFIED	(4)	EACH		
SZ		2550.502	SERVICE FOUNDATION		EACH		
SZ		2550.502	CABINET FOUNDATION		EACH		
SZ		2550.502	CCTV FOUNDATION		EACH		
SZ		2550.502	TMS SHELTER CABINET FOUNDATION	(5)	EACH		
SZ		2550.502	FIBEROPTIC SPLICE VAULT		EACH		
SZ		2550.502	OUTDOOR FIBER SPLICE ENCLOSURE		EACH		
SZ		2550.502	BURIED CABLE SIGN		EACH		
SZ		2550.502	LOOP DETECTOR SPLICE		LIN FT		
SZ		2550.502	RAMP CONTROL SIGNAL DESIGN ONE-WAY		EACH		
SZ		2550.502	FLASHER SIGNAL		EACH		
SZ		2550.502	TMS SHELTER CABINET	(5)	EACH		
SZ		2550.502	CCTV CABINET		EACH		
SZ		2550.502	INSTALL CABINET	(6)	EACH		
SZ		2550.502	SERVICE CABINET	(7)	EACH		
SZ		2550.502	SERVICE INSTALLATION TYPE A		EACH		
SZ		2550.503	1.25" NON-METALLIC CONDUIT		LIN FT		
SZ		2550.503	2" NON-METALLIC CONDUIT		LIN FT		
SZ		2550.503	3" NON-METALLIC CONDUIT		LIN FT		
SZ		2550.503	4" NON-METALLIC CONDUIT		LIN FT		
SZ		2550.503	2" RIGID STEEL CONDUIT		LIN FT		
SZ		2550.503	POWER CABLE 1 CONDUCTOR NO 2		LIN FT		
SZ		2550.503	POWER CABLE 1 CONDUCTOR NO 4		LIN FT		
SZ		2550.503	POWER CABLE 1 CONDUCTOR NO 6		LIN FT		
SZ		2550.503	SIGNAL CONTROL CABLE 3 CONDUCTOR NO 14		LIN FT		
SZ		2550.503	SIGNAL CONTROL CABLE 3 CONDUCTOR NO 12		LIN FT		
SZ		2550.503	SIGNAL CONTROL CABLE 6 CONDUCTOR NO 14		LIN FT		
SZ		2550.503	LEAD-IN CABLE 2 CONDUCTOR NO 14		LIN FT		
SZ		2550.601	FIBER OPTIC CABLE TESTING		LUMP SUM		
SZ		2550.602	NON-INTRUSIVE DETECTION HARDWARE	(8)	EACH		
SZ		2550.602	SERVICE CABINET TYPE SPECIAL	(9)	EACH		
SZ		2550.602	WOOD POLE	(10)	EACH		
SZ		2550.602	INSTALL CCTV HARDWARE		EACH		
SZ		2550.602	FIBER OPTIC SPLICE/PATCH PANEL	(11)	EACH		
SZ		2550.602	FIBER OPTIC CABLE SPLICING		EACH		
SZ		2550.602	ADJUST HANDHOLE		EACH		
SZ		2550.602	FIBER OPTIC PIGTAIL TERMINATION		EACH		
SZ		2550.602	FIBER DISTRIBUTION FRAME		EACH		
SZ		2574.507	COMMON TOPSOIL BORROW (CV)	(12)	CU YD		

(A) XX% FEDERAL/XX% STATE FUNDING

REVISED 8/19/21

REV. NO.	DATE: / /
REV. NO.	DATE: / /

CERTIFIED BY _____ LIC.NO. _____ DATE ___ 2021
LICENSED PROFESSIONAL ENGINEER



TRAFFIC MANAGEMENT SYSTEM
TMS GENERAL LAYOUT

REV. NO.	DATE: / /	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 4 OF 54 SHEETS
REV. NO.	DATE: / /		

Reut1Ani T79CLW161FRW047 TMS
PLOTTED: 10/1/2021 3:03:57 PM
pw:\\pw8i.ad.dot.state.mn.us:cadp\Documents\Projects\DM_ROS\Non_Project\FrwOps\Special Projects\SamplePlan\tms1.dgn

N

100'
SCALE

INSET A
SEE SHEET 6

SB TH998

NB TH998

WB TH999

EB TH999

CAM 30900

443OWQ

2312WX

2315WP

2311WN

2310WX

2300EM

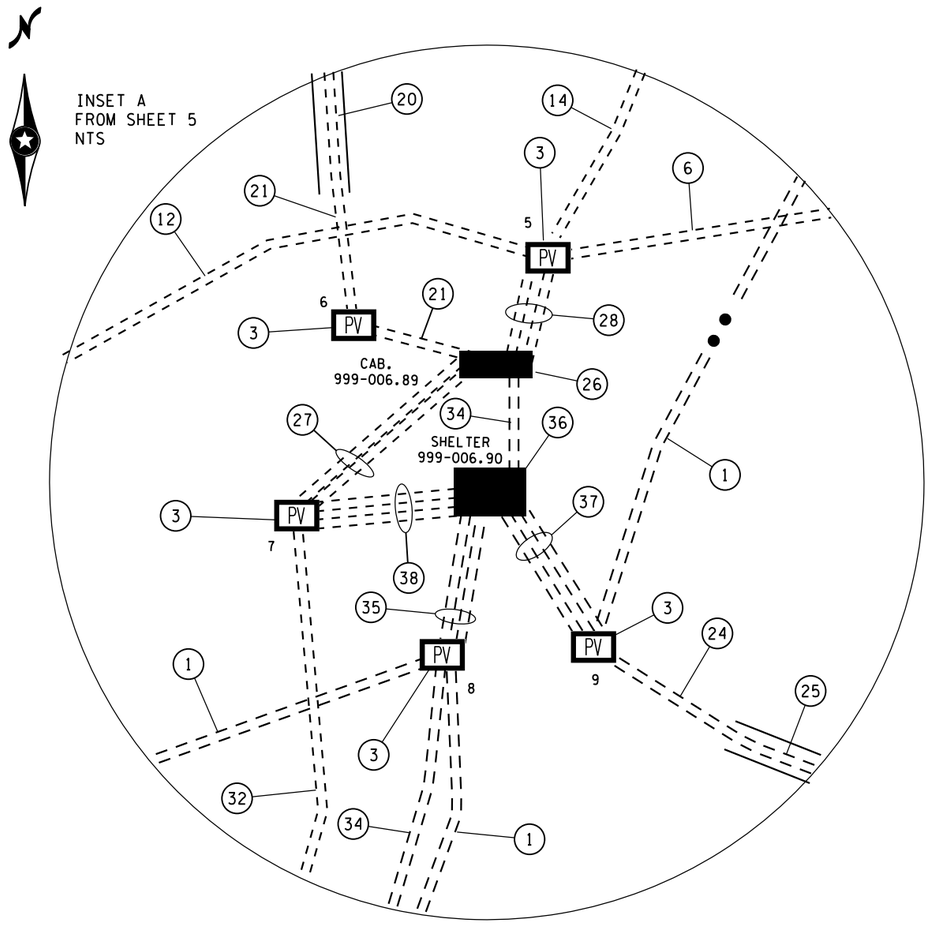
2298EM

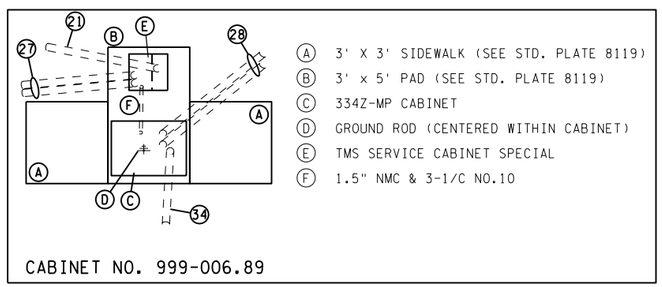
2299EX

2295EX

TRAFFIC MANAGEMENT SYSTEM
TH 999 AT TH 998

REV. NO.	DATE: / /	CERTIFIED BY _____ LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 5 OF 54 SHEETS
REV. NO.	DATE: / /	LICENSED PROFESSIONAL ENGINEER	





CABINET NO. 999-006.89

(1) F&I 1.5" NMC & 1-FO CABLE (36 SM)

(2) F&I 1.5" NMC BORE & 1-FO CABLE (36 SM)

(3) F&I PULL VAULT

(4) F&I 2" NMC & 2-2/C NO. 14

(5) F&I 2" NMC BORE & 2-2/C NO. 14

(6) F&I 2" NMC & 4-2/C NO. 14

(7) F&I 2" NMC BORE 4-2/C NO. 14

(8) F&I RAMP CONTROL SIGNAL FOUNDATION & ONE-WAY RAMP CONTROL SIGNAL
F&I 2" NMC & 1-6/C NO. 14 TO NEAREST PULL VAULT

(9) F&I 2" NMC BORE & 1-6/C NO. 14

(10) F&I 2" NMC, 3-2/C NO. 14, & 2-6/C NO. 14

(11) F&I 2" NMC, 4-2/C NO. 14, & 2-6/C NO. 14

(12) F&I 2" NMC, 5-2/C NO. 14, & 2-6/C NO. 14

(13) F&I RAMP CONTROL SIGNAL FOUNDATION & FLASHER SIGNAL

(14) F&I 2" NMC & 1-3/C NO. 14

(15) F&I 2" NMC BORE & 1-3/C NO. 14

(16) PROPOSED GROUND MOUNTED PEDESTAL (BY OTHERS - POWER COMPANY NAME)

(17) F&I 2" NMC & 3-1/C NO. 2

(18) F&I SERVICE FOUNDATION & TMS SERVICE CABINET
F&I 100 AMP MAIN BREAKER
(SERVICE CABINET ADDRESS)

(19) F&I 2" NMC & 4-1/C NO. 2
F&I 2" NMC (EMPTY)

(20) F&I 2" NMC BORE & 4-1/C NO. 2

(21) F&I 2" NMC & 4-1/C NO. 2

(22) POWER CABLES (BY OTHERS - POWER COMPANY NAME)

(23) INPLACE POWER POLE

(24) F&I 1.5" NMC & 1-FO CABLE (72 SM)

(25) F&I 1.5" NMC BORE & 1-FO PIGTAIL (72 SM)

(26) F&I 334 FOUNDATION
INSTALL 334Z CABINET (CAB #999-006.89)(MNDOT PROVIDED)
F&I 1-FO PIGTAIL TERMINATION
F&I SERVICE CABINET SPECIAL
F&I 100 AMP MAIN BREAKER

(27) F&I 2" NMC, 1-3/C NO. 8, & 4-1/C NO. 2
F&I 2" NMC (EMPTY) TO SERVICE SPECIAL

(28) F&I 2" NMC, 9-2/C NO. 14, 1-3/C NO. 14, & 2-6/C NO. 14
F&I 2" NMC (EMPTY) TO 334Z

(29) F&I LIGHT FOUNDATION DESIGN E (MODIFIED)
F&I NON-INTRUSIVE DETECTION HARDWARE (25' POLE)
POSITION TIP DOWN TO THE WEST
F&I CCTV CABINET (CAB #999-006.80)
F&I 1-FO PIGTAIL TERMINATION
CCTV CAMERA (C30900) INSTALLED BY OTHERS (MNDOT)

(30) F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)
F&I 1.5" NMC & 1-3/C NO. 8
F&I 2" NMC TO FOUNDATION (EMPTY)

(31) F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)
F&I 2" NMC & 1-3/C NO. 8

(32) F&I 2" NMC & 1-3/C NO. 8

(33) F&I 2" NMC BORE & 1-3/C NO. 8

(34) F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)

(35) F&I 2" NMC, 2-FO CABLES (36 SM), & 1-FO PIGTAIL (6 SM)
F&I 2" NMC (EMPTY)

(36) F&I TMS SHELTER CABINET FOUNDATION
F&I 10'X12' SHELTER CABINET (SHELTER #999-006.90)
F&I FIBER DISTRIBUTION FRAME
F&I 3-48 POS. SPLICE/PATCH PANELS
F&I 1-72 POS. SPLICE/PATCH PANEL
F&I FO CABLE SPLICING

(37) F&I 2" NMC, 1-FO CABLES (36 SM), & 1-FO CABLE (72 SM)
F&I 2" NMC (EMPTY)

(38) F&I 2" NMC & 4-1/C NO. 2
F&I 2" NMC (EMPTY)

(39) F&I 1.5" NMC & 1-FO CABLE (36 SM)
F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)

(40) F&I 1.5" NMC BORE & 1-FO CABLE (36 SM)
F&I 1.5" NMC BORE & 1-FO PIGTAIL (6 SM)

(41) F&I LOOP DETECTOR DESIGN SAWCUT

(42) INPLACE 1.5" NMC & 1-FO CABLE (36 SM)

(43) INPLACE PULL VAULT & OUTDOOR FIBER SPLICE ENCLOSURE
F&I FO CABLE SPLICING

(44) F&I 2" NMC BORE & 1-2/C NO. 14

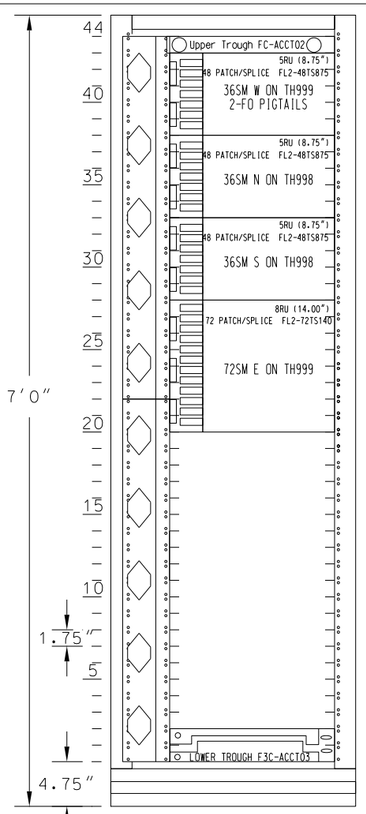
TRAFFIC MANAGEMENT SYSTEM
TH 999 AT TH 998

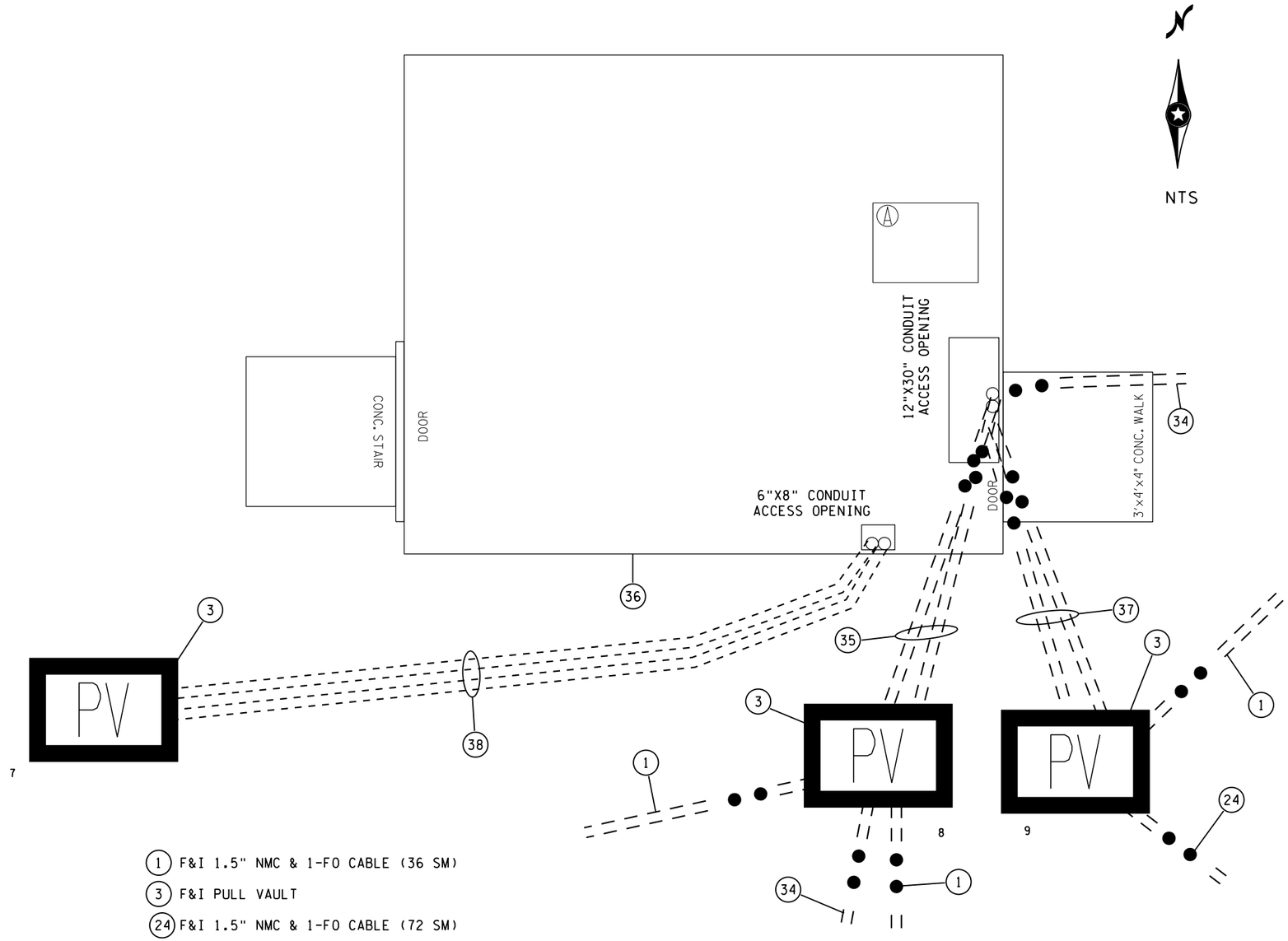
REV. NO.	DATE: / /	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER	LIC.NO. _____	DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 6 OF 54 SHEETS
REV. NO.	DATE: / /				

(A) FIBER DISTRIBUTION FRAME

FO CABLES TERMINATING IN THIS CABINET
1-FO CABLE (36SM-TO WEST)
1-FO CABLE (72SM-TO EAST)
1-FO CABLE (36SM-TO SOUTH)
1-FO CABLE (36SM-TO NORTH)
1-FO PIGTAIL (6SM-CAMERA)
1-FO PIGTAIL (6SM-334Z CAB)

TMS SHELTER CABINET 999-006.90
TH 999 & TH 998





(1) F&I 1.5" NMC & 1-FO CABLE (36 SM)

(3) F&I PULL VAULT

(24) F&I 1.5" NMC & 1-FO CABLE (72 SM)

(34) F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)

(35) F&I 2" NMC, 2-FO CABLES (36 SM), & 1-FO PIGTAIL (6 SM)
F&I 2" NMC (EMPTY)

(36) F&I TMS SHELTER CABINET FOUNDATION
F&I 10'X12' SHELTER CABINET (SHELTER #999-006.90)
F&I FIBER DISTRIBUTION FRAME
F&I 3-48 POS. SPLICE/PATCH PANELS
F&I 1-72 POS. SPLICE/PATCH PANEL
F&I FO CABLE SPLICING

(37) F&I 2" NMC, 1-FO CABLES (36 SM), & 1-FO CABLE (72 SM)
F&I 2" NMC (EMPTY)

(38) F&I 2" NMC & 4-1/C NO. 2
F&I 2" NMC (EMPTY)

TRAFFIC MANAGEMENT SYSTEM
TH 999 AT TH 998

REV. NO.	DATE: / /	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 7 OF 54 SHEETS
REV. NO.	DATE: / /		

(1) F&I 1.5" NMC & 1-FO CABLE (72 SM)

(2) F&I FO SPLICE VAULT & OUTDOOR FIBER SPLICE ENCLOSURE
F&I FO CABLE SPLICING

(3) F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)

(4) F&I 1.5" NMC BORE & 1-FO PIGTAIL (6 SM)

(5) F&I PULL VAULT

(6) F&I 334 CABINET FOUNDATION
INSTALL 334Z CABINET (CAB #999-007.26)(MNDOT PROVIDED)
F&I 2-FO PIGTAIL TERMINATIONS

(7) F&I 1.5" NMC & 2-FO PIGTAILS (6 SM)
F&I 2" NMC (EMPTY)

(8) F&I 2" NMC, 4-2/C NO. 14, & 1-3/C NO. 8
F&I 2" NMC (EMPTY)

(9) F&I 2" NMC, 2-2/C NO. 14, 1-3/C NO. 8, & 3-1/C NO. 6

(10) F&I 2" NMC & 2-2/C NO. 14

(11) F&I 2" NMC BORE & 2-2/C NO. 14

(12) F&I 2" NMC, 2-3/C NO. 8, 3-1/C NO. 6

(13) F&I 2" NMC BORE, 2-3/C NO. 8, & 3-1/C NO. 6

(14) F&I 2" NMC, 2-3/C NO. 8, & 3-1/C NO. 6
F&I 2" NMC (EMPTY)

(15) F&I SERVICE FOUNDATION & TMS SERVICE CABINET
(SERVICE CABINET ADDRESS)

(16) F&I 2" NMC & 3-1/C NO. 6

(17) POWER CABLES (BY OTHERS - POWER COMPANY NAME)

(18) INPLACE POWER POLE

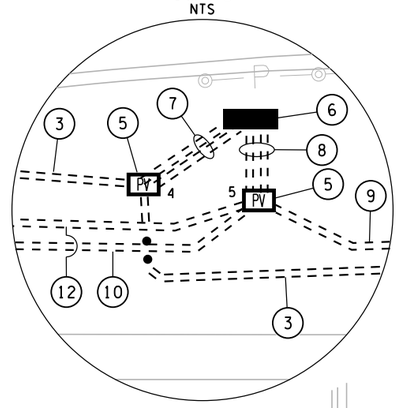
(19) F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)
F&I 2" NMC, 2-2/C NO. 14, 1-3/C NO. 8, & 3-1/C NO. 6

(20) F&I LOOP DETECTOR DESIGN PREFORMED

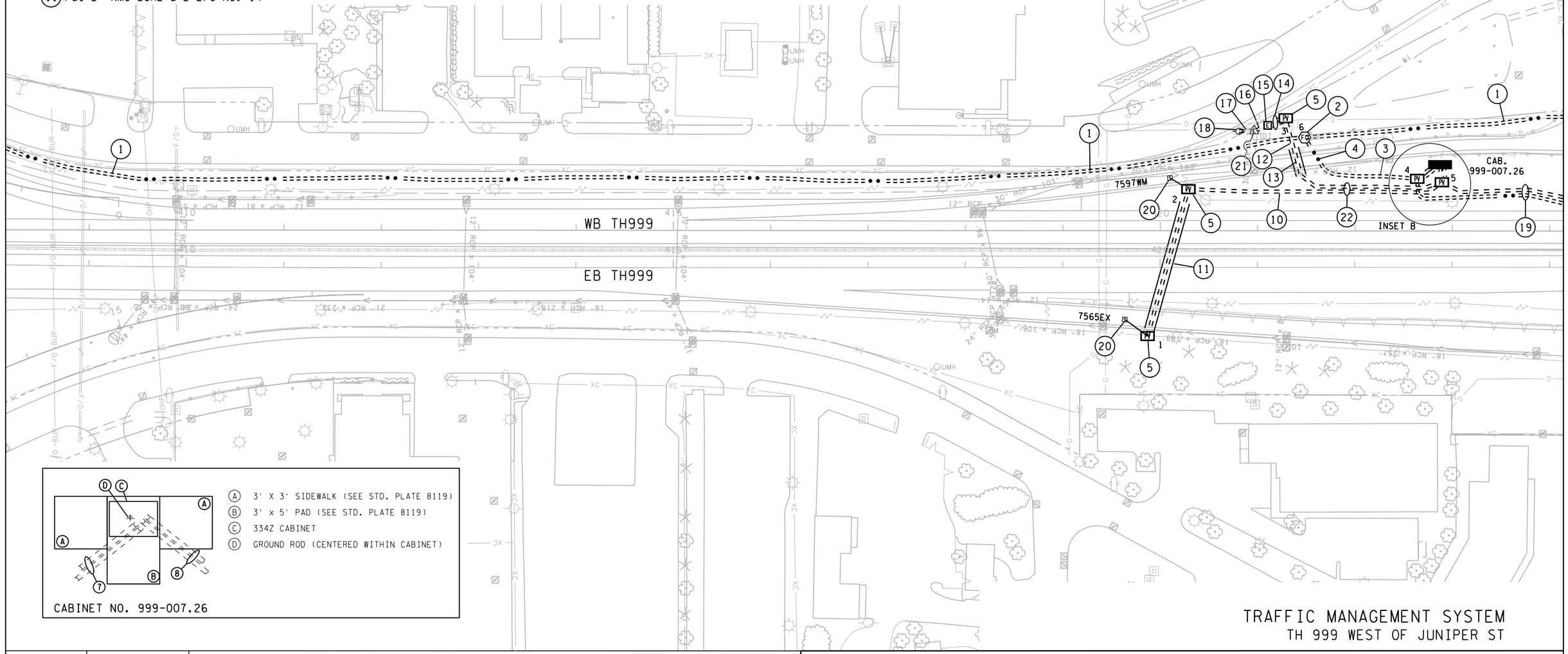
(21) PROPOSED GROUND MOUNTED PEDESTAL (BY OTHERS - POWER COMPANY NAME)

(22) F&I 2" NMC & 2-2/C NO. 14
F&I 2" NMC, 2-3/C NO. 8, & 3-1/C NO. 6

INSET B
NTS



100'
SCALE



(A) 3' X 3' SIDEWALK (SEE STD. PLATE 8119)
(B) 3' x 5' PAD (SEE STD. PLATE 8119)
(C) 334Z CABINET
(D) GROUND ROD (CENTERED WITHIN CABINET)

CABINET NO. 999-007.26

TRAFFIC MANAGEMENT SYSTEM
TH 999 WEST OF JUNIPER ST

REV. NO.	DATE: / /	CERTIFIED BY _____ LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 8 OF 54 SHEETS
REV. NO.	DATE: / /	LICENSED PROFESSIONAL ENGINEER	

(1) F&I 1.5" NMC & 1-FO CABLE (72 SM)

(2) F&I 1.5" NMC BORE & 1-FO CABLE (72 SM)

(3) F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)
F&I 2" NMC, 2-2/C NO. 14, 1-3/C NO. 8, 3-1/C NO. 6

(4) F&I 1.5" NMC BORE & 1-FO PIGTAIL (6 SM)
F&I 2" NMC BORE, 2-2/C NO. 14, 1-3/C NO. 8, 3-1/C NO. 6

(5) F&I PULL VAULT

(6) F&I 1.5" NMC & 2-FO PIGTAILS (6 SM)
F&I 1.5" NMC & 1-3/C NO. 8
F&I 2" NMC TO FOUNDATION (EMPTY)

(7) F&I LIGHT FOUNDATION DESIGN E (MODIFIED)
F&I NON-INTRUSIVE DETECTION HARDWARE (35' POLE)
POSITION TIP DOWN TO THE WEST
F&I CCTV CABINET (CAB #999-007.34)
F&I 2-FO PIGTAIL TERMINATIONS
NID INSTALLED BY OTHERS (MNDOT)

(8) F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)
F&I 2" NMC, 2-2/C NO. 14, & 3-1/C NO. 6

(9) F&I 2" NMC, 2-2/C NO. 14, & 3-1/C NO. 6

(10) F&I 2" NMC, 1-2/C NO. 14, & 3-1/C NO. 6

(11) F&I 1.5" NMC BORE & 1-FO PIGTAIL (6 SM)
F&I 2" NMC BORE, 1-2/C NO. 14, & 3-1/C NO. 6

(12) F&I 1.5" NMC BORE & 1-FO PIGTAIL (6 SM)

(13) F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)

(14) F&I 2" NMC BORE, 1-2/C NO. 14, & 3-1/C NO. 6

(15) F&I LOOP DETECTOR DESIGN PREFORMED

(16) F&I SERVICE FOUNDATION & SERVICE CABINET SPECIAL

(17) F&I 2" NMC & 3-1/C NO. 6
F&I 2" NMC & 1-3/C NO. 14
F&I 2" NMC (EMPTY)

(18) F&I 2" NMC & 1-3/C NO. 14

(19) F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)
F&I 1.5" NMC & 1-3/C NO. 14
F&I 2" NMC TO FOUNDATION (EMPTY)

(20) F&I LIGHT FOUNDATION DESIGN E (MODIFIED)
F&I NON-INTRUSIVE DETECTION HARDWARE (35' POLE)
POSITION TIP DOWN TO THE EAST
F&I CCTV CABINET (CAB #999-007.37)
F&I 1-FO PIGTAIL TERMINATION
CCTV CAMERA (C30901) & NID INSTALLED BY OTHERS (MNDOT)

N

100'
SCALE

JUNIPER ST

WB TH999

EB TH999

COTTONWOOD TRAIL

7596WX

7594W1
7595W2

7568E2
7567E1

CAM
30901

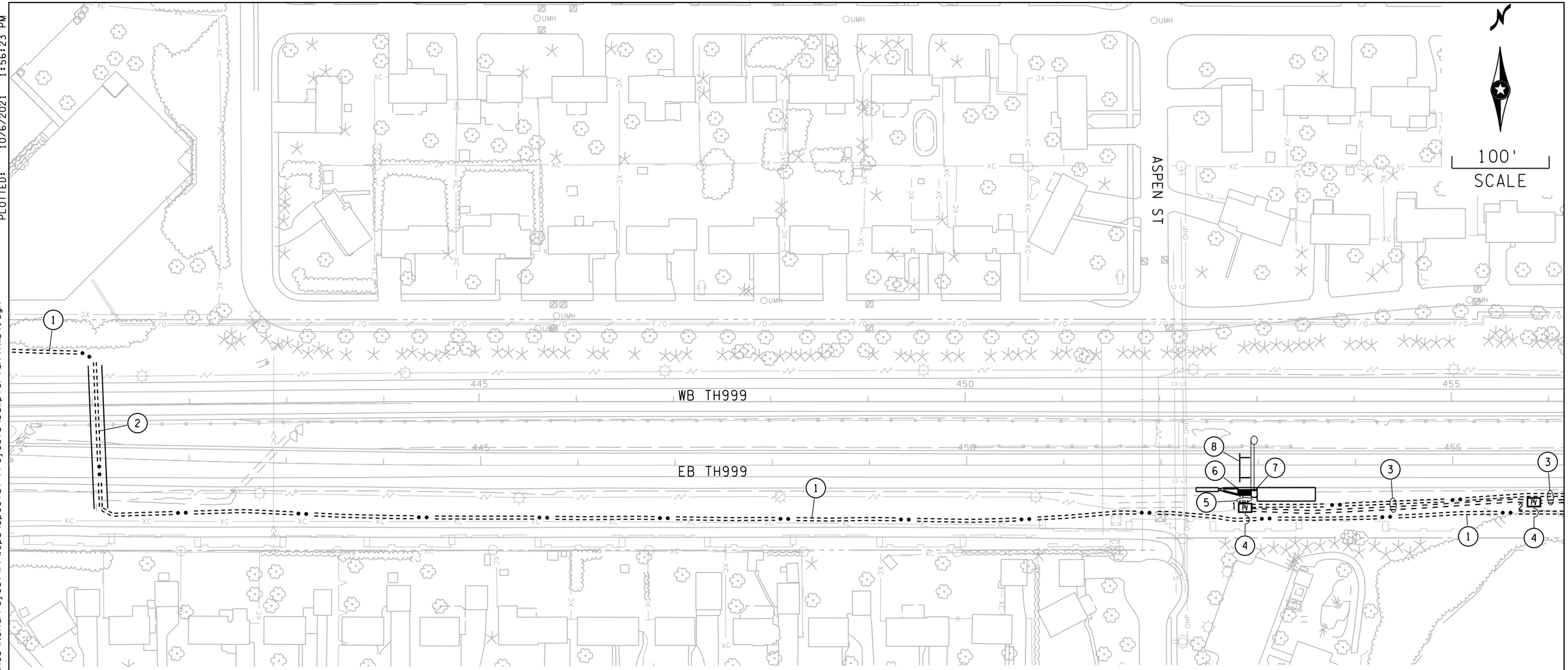
7566EM

INSET C

INSET C
NTS

TRAFFIC MANAGEMENT SYSTEM
TH 999 AT JUNIPER ST

REV. NO.	DATE: / /	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER LIC.NO. _____ DATE ____ 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 9 OF 54 SHEETS
REV. NO.	DATE: / /		



(1) F&I 1.5" NMC & 1-FO CABLE (72 SM)

(2) F&I 1.5" NMC BORE & 1-FO CABLE (72 SM)

(3) F&I 2" NMC & 4-1/C NO. 2
F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)

(4) F&I PULL VAULT

(5) F&I 2" NMC & 4-1/C NO. 2
F&I 2" (EMPTY) TO SERVICE SPECIAL
F&I 3" NMC & 1-FO PIGTAIL (6 SM)
F&I 3" (EMPTY) TO 334-MP

(6) CONCRETE MEDIAN BARRIER DESIGN SPECIAL 1
F&I 334 FOUNDATION
INSTALL 334-MP CABINET (CAB #999-007.82)(MNDOT PROVIDED)
F&I 2-FO PIGTAIL TERMINATIONS
F&I SERVICE CABINET SPECIAL
F&I 60A CB 2P (DMS)

(7) F&I 3" NMC & 4-1/C NO. 6 FROM SERVICE SPECIAL TO SIGN POST
F&I 3" NMC & 1-MICRO FO PIGTAIL (6 MM) FROM 334-MP TO SIGN POST

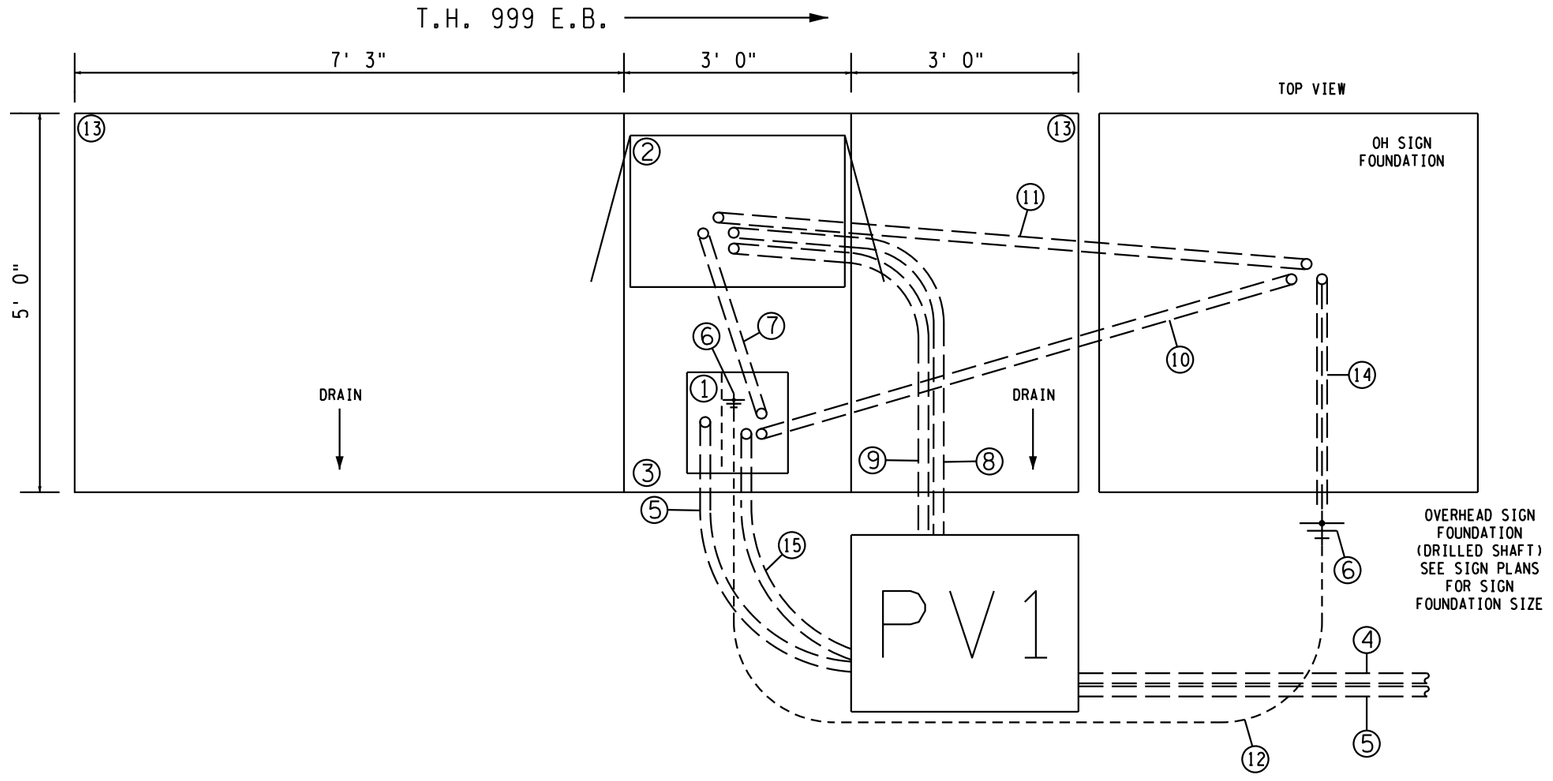
(8) SIGN STRUCTURE OH (I999-XXX)
INSTALL W30C3 DMS (MNDOT PROVIDED)
F&I 2" RSC, 4-1/C NO. 6, & 1-MICRO FO PIGTAIL (6 MM) FROM SIGN POST TO DMS
(F&I LIQUID TIGHT FLEXIBLE CONDUIT FROM RSC TO DMS AT SIGN
& RSC TO SIGN POST (INCIDENTAL))
F&I 1-FO PIGTAIL TERMINATION

TRAFFIC MANAGEMENT SYSTEM
TH 999 EAST OF JUNIPER ST

REV. NO.	DATE: / /	CERTIFIED BY _____ LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 10 OF 54 SHEETS
REV. NO.	DATE: / /	LICENSED PROFESSIONAL ENGINEER	

GENERAL NOTE:

1. TMS FOUNDATION PAD & CABINET FOUNDATION LOCATION SHOWN ON SHEET 10.



AFTER FOUNDATION AND CONDUITS ARE SET, FILL OPENING WITH SAND AND PLACE 1 INCH OF GROUT FLUSH WITH SURFACE OF FOUNDATION

CONCRETE MIX 3A32 OR BETTER

(1) F&I SERVICE CABINET SPECIAL
F&I 60A, 2P C.B. (DMS)

(2) INSTALL 334MP CABINET (CAB #999-007.82)(MNDOT PROVIDED)
F&I 2-FO PIGTAIL TERMINATIONS

(3) F&I 334 SERIES FOUNDATION

(4) F&I 1.5" NMC & 1-FO PIGTAIL (6SM)

(5) F&I 2" NMC & 4-1/C NO. 2

(6) F&I 5/8" DIA. x 15' GROUND ROD (25 OHMS OR LESS COPPER COATED)

(7) F&I 1.5" NMC, 3-1/C NO. 10, & 1-1/C NO. 6 BARE

(8) F&I 3" NMC (EMPTY)

(9) F&I 3" NMC & 1-FO PIGTAIL (6SM)

(10) F&I 3" NMC & 4-1/C NO. 6

(11) F&I 3" NMC & 1-MICRO FO PIGTAIL (6MM)

(12) F&I 1/C NO. 0 BARE

(13) F&I 4" CONCRETE WALK

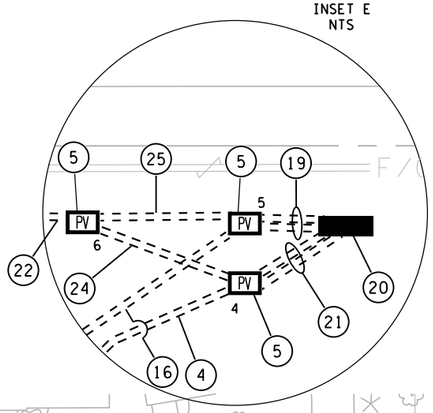
(14) F&I 1" NMC & 1/C NO. 0 BARE

(15) F&I 2" NMC (EMPTY)

TMS FOUNDATION PAD & CABINET LAYOUT
AT E.B. STA. 453+00.00
NOT TO SCALE
TRAFFIC MANAGEMENT SYSTEM
TH 999 EAST OF JUNIPER ST

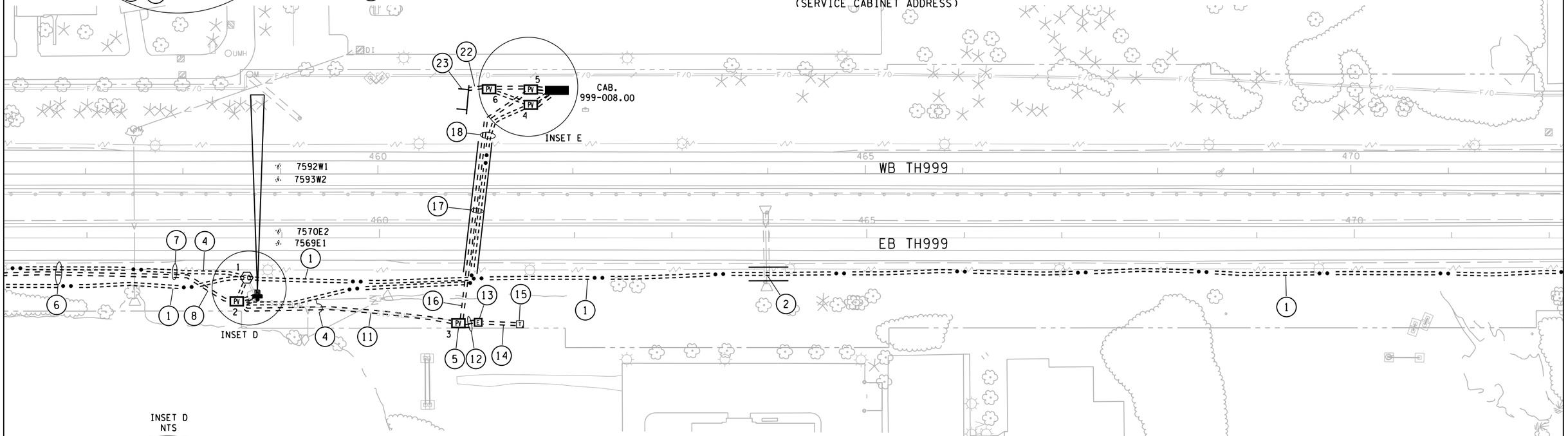
REV. NO.	DATE: / /	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 11 OF 54 SHEETS
REV. NO.	DATE: / /		

INSET E
NTS

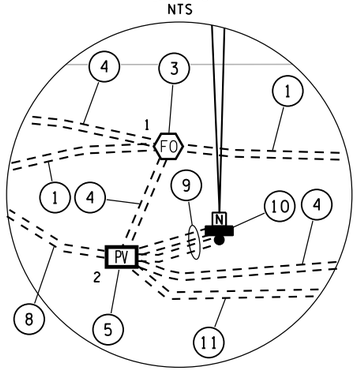


1. F&I 1.5" NMC & 1-FO CABLE (72 SM)
2. F&I 1.5" NMC BORE & 1-FO CABLE (72 SM)
3. F&I FO SPLICE VAULT & OUTDOOR FIBER SPLICE ENCLOSURE
   F&I FO CABLE SPLICING
4. F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)
5. F&I PULL VAULT
6. F&I 1.5" NMC & 1-FO CABLE (72 SM)
   F&I 2" NMC & 4-1/C NO. 2
   F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)
7. F&I 2" NMC & 3-1/C NO. 6
   F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)
8. F&I 2" NMC & 3-1/C NO. 6
9. F&I 1.5" NMC & 2-FO PIGTAILS (6 SM)
   F&I 1.5" NMC & 1-3/C NO. 14
   F&I 2" NMC TO FOUNDATION (EMPTY)
10. F&I LIGHT FOUNDATION DESIGN E (MODIFIED)
    50' OFFSET FROM EDGE OF TRAVEL LANE
    F&I NON-INTRUSIVE DETECTION HARDWARE (40' POLE)
    POSITION TIP DOWN TO THE EAST
    F&I CCTV CABINET (CAB #999-007.95)
    F&I 2-FO PIGTAIL TERMINATIONS
    NID INSTALLED BY OTHERS (MNDOT)
11. F&I 2" NMC, 4-1/C NO. 2, & 1-3/ NO. 14
12. F&I 2" NMC, 4-1/C NO. 2, 4-1/C NO. 6, & 1-3/ NO. 14
    F&I 2" NMC (EMPTY)
13. F&I SERVICE FOUNDATION & TMS SERVICE CABINET
    F&I 2-60A CB 2P (SERVICE SPECIAL)
    (SERVICE CABINET ADDRESS)
14. F&I 2" NMC & 3-1/C NO. 6
15. PROPOSED GROUND MOUNTED TRANSFORMER
    (BY OTHERS - POWER COMPANY NAME)
16. F&I 2" NMC & 4-1/C NO. 6
17. F&I 2" NMC BORE & 4-1/C NO. 6
    F&I 1.5" NMC BORE & 1-FO PIGTAIL (6 SM)
18. F&I 2" NMC & 4-1/C NO. 6
    F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)
19. F&I 2" NMC & 4-1/C NO. 6
    F&I 2" NNC & 1-3/C NO. 8
    F&I 2" NMC (EMPTY) TO SERVICE SPECIAL

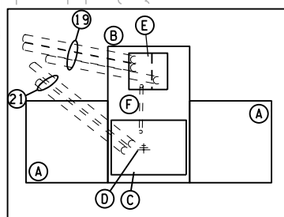
100'
SCALE



INSET D
NTS



20. F&I 334 CABINET FOUNDATION
    INSTALL 334-MP CABINET (CAB #999-008.00)(MNDOT PROVIDED)
    F&I 2-FO PIGTAIL TERMINATIONS
    F&I SERVICE CABINET SPECIAL
    F&I 1-2P 30A CB (INCIDENTAL)
21. F&I 1.5" NMC, 1-FO PIGTAIL (6 SM), & 1-MICRO FO PIGTAIL (6 MM)
    F&I 2" NMC (EMPTY) TO 334-MP
22. F&I 2" NMC, 1-3/C NO. 8, & 1-MICRO FO PIGTAIL (6 MM)
23. INSTALL STRUCTURAL STEEL POSTS - TYPE A
    INSTALL 8'X18' POST MOUNTED DMS (REAR ACCESS) (MNDOT PROVIDED)
    (SKEW SIGN 11° TO ROADWAY)
    F&I 1-FO PIGTAIL TERMINATION
24. F&I 1.5" NMC & 1-MICRO FO PIGTAIL (6 MM)
25. F&I 2" NMC & 1-3/C NO. 8



- (A) 3' X 3' SIDEWALK (SEE STD. PLATE 8119)
- (B) 3' x 5' PAD (SEE STD. PLATE 8119)
- (C) 334Z-MP CABINET
- (D) GROUND ROD (CENTERED WITHIN CABINET)
- (E) TMS SERVICE CABINET SPECIAL
- (F) 1.5" NMC & 3-1/C NO.10

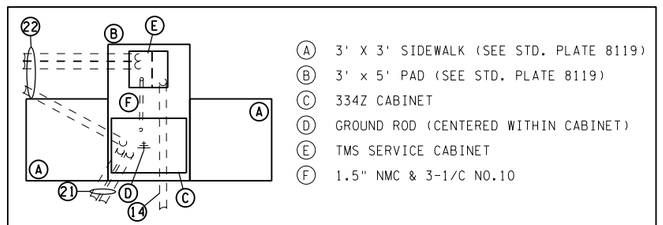
CABINET NO. 999-008.00

TRAFFIC MANAGEMENT SYSTEM
TH 999 WEST OF MAPLE AVE

REV. NO.	DATE: / /	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER LIC.NO. _____ DATE ___ 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 12 OF 54 SHEETS
REV. NO.	DATE: / /		

100'
SCALE

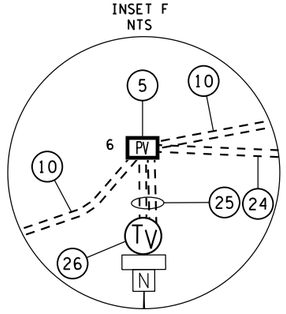
1. F&I 1.5" NMC & 1-FO CABLE (72 SM)
2. F&I 1.5" NMC BORE & 1-FO CABLE (72 SM)
3. INPLACE FO SPLICE VAULT & OUTDOOR SPLICE ENCLOSURE
   F&I FO CABLE SPLICING
4. INPLACE 1.5" NMC & 1-FO CABLE (72 SM)
5. F&I PULL VAULT
6. F&I 2" NMC & 1-2/C NO. 14
7. F&I 2" NMC BORE & 1-2/C NO. 14
8. F&I 2" NMC BORE & 2-2/C NO. 14
9. F&I 2" NMC & 4-2/C NO. 14
   F&I 2" NMC & 1-2/C NO. 14
10. F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)
11. F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)
    F&I 2" NMC & 1-3/C NO. 14
12. F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)
    F&I 2" NMC & 1-3/C NO. 14
    F&I 2" NMC & 4-2/C NO. 14
13. PROPOSED GOUND MOUNTED TRANSFORMER (BY OTHERS - POWER COMPANY NAME)
14. PROPOSED POWER CABLES (BY OTHERS - POWER COMPANY NAME)
15. PROPOSED 1.5" NMC & 1-FO PIGTAIL (6 SM) (SIGNAL INTERCONNECT - SEE SIGNALS PLAN)
16. INPLACE PULL VAULT
17. INPLACE SIGNAL CABINET
18. F&I LOOP DETECTOR DESIGN PREFORMED
19. F&I 2" NMC & 1-3/C NO. 14
20. F&I 2" NMC & 4-2/C NO. 14
21. F&I 2" NMC, 4-2/C NO. 14
    F&I 2" NMC & 1-3/C NO. 14
    F&I 2" NMC (EMPTY)
22. F&I 1.5" NMC & 2-FO PIGTAILS (6 SM)
    F&I 2" NMC (EMPTY)
23. F&I 334 FOUNDATION
    INSTALL 334Z CABINET (CAB #999-008.45)(MNDOT PROVIDED)
    F&I 2-FO PIGTAIL TERMINATIONS
    F&I TMS SERVICE CABINET
    (SERVICE CABINET ADDRESS)
24. F&I 2" NMC & 1-3/C NO. 14
25. F&I 1.5" NMC & 2-FO PIGTAILS (6 SM)
    F&I 1.5" NMC & 1-3/C NO. 14
    F&I 2" NMC TO FOUNDATION (EMPTY)
26. F&I CCTV FOUNDATION
    INSTALL FOUNDATION 60 FEET FROM NEAREST TRAVEL LANE
    F&I CCTV HARDWARE (50' POLE)
    POSITION TIP DOWN TO THE EAST
    F&I CCTV CABINET (CAB #999-008.43)
    F&I 2-FO PIGTAIL TERMINATIONS
    CCTV CAMERA (C30902) & NID INSTALLED BY OTHERS (MNDOT)



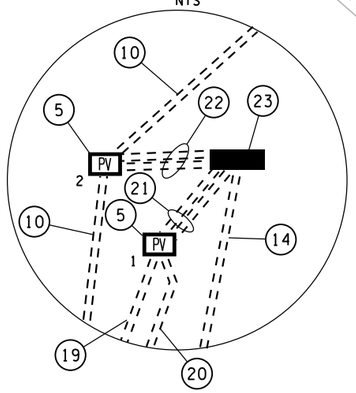
- (A) 3' X 3' SIDEWALK (SEE STD. PLATE 8119)
- (B) 3' x 5' PAD (SEE STD. PLATE 8119)
- (C) 334Z CABINET
- (D) GROUND ROD (CENTERED WITHIN CABINET)
- (E) TMS SERVICE CABINET
- (F) 1.5" NMC & 3-1/C NO.10

CABINET NO. 999-008.45

INSET F
NTS



INSET G
NTS



TRAFFIC MANAGEMENT SYSTEM
TH 999 AT MAPLE AVE

REV. NO.	DATE: / /	CERTIFIED BY _____ LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 13 OF 54 SHEETS
REV. NO.	DATE: / /	LICENSED PROFESSIONAL ENGINEER	

1. INPLACE 1.5" NMC & 1-FO CABLE (36 SM)
2. F&I PULL VAULT
3. F&I 1.5" NMC & 1-FO PIGTAIL (6 SM)
4. F&I 1.5" NMC BORE & 1-FO PIGTAIL (6 SM)
5. F&I 1.5" NMC & 1-FO PIGTAIL (6 SM) & PROPOSED 1-FO PIGTAIL (6 SM) (SIGNAL INTERCONNECT - SEE SIGNALS PLAN)
6. INPLACE SIGNAL CABINET F&I 2-FO PIGTAIL TERMINATIONS
7. PROPOSED 1.5" NMC & 1-FO PIGTAIL (6 SM) (SIGNAL INTERCONNECT - SEE SIGNALS PLAN)
8. F&I 2" NMC BORE & 1-2/C NO. 14
9. F&I 2" NMC & 1-2/C NO. 14
10. F&I LOOP DETECTOR DESIGN PREFORMED
11. PROPOSED CCTV CAMERA (C30903) (SEE SIGNALS PLAN)

100' SCALE

MAPLE AVE
WB TH999
EB TH999
TH 36
SHERREN AVE. E.
CASTLE CT. E.
CASTLE PL. N.
CAM 30903
7588WX

TRAFFIC MANAGEMENT SYSTEM
TH 999 AT MAPLE AVE

REV. NO.	DATE: / /	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 14 OF 54 SHEETS
REV. NO.	DATE: / /		

SHEET NO.	DETAIL
SZ1	TYPICAL FOUNDATION DETAILS
SZ2	PULL VAULT INSTALLATION DETAIL
SZ3	TYPICAL 334 CABINET INSTALLATION
SZ4	TYPICAL DMS 334 CABINET INSTALLATION
SZ5	TYPICAL 334 CABINET WITH TYPE 9 MULCH INSTALLATION
SZ6	TYPICAL 340 CABINET FOUNDATION DETAILS
SZ7	TYPICAL 340 CABINET INSTALLATION
SZ8	TMS SAWCUT LOOP DETECTOR TYPICAL - PART ONE
SZ9	TMS LOOP DETECTOR TYPICAL - PART TWO
SZ10	TMS "PREFORMED" LOOP DETECTOR - PART ONE
SZ11	TMS "PREFORMED" MILLED IN LOOP DETECTOR - PART ONE
SZ12	CCTV POLE INSTALLATION DETAIL
SZ13	NON-INTRUSIVE DETECTION POLE INSTALLATION DETAIL
SZ14	POLE MOUNTED FIBER TERMINATION CCTV CABINET AT CCTV POLE OR NON-INTRUSIVE DETECTION POLE
SZ15	CCTV CABINET MOUNTING BRACKET AT INPLACE POLE LOCATIONS
SZ16	ONE-WAY RAMP CONTROL SIGNAL DETAIL
SZ17	TWO-WAY RAMP CONTROL SIGNAL DETAIL
SZ18	RAMP CONTROL SIGNAL CONTROL CABLE TERMINATION GUIDE
SZ19	FLASHER SIGNAL DETAIL
SZ20	SIGNING LAYOUT DETAIL (WITH HOV)
SZ21	SIGNING LAYOUT DETAIL (WITHOUT HOV)
SZ22	DMS GROUNDING/INSTALLATION TYPICAL
SZ23	SERVICE & GROUNDING INSTALLATIONS
SZ24	FIBER OPTIC SPLICE VAULT INSTALLATION
SZ25	FIBER OPTIC PULL VAULT AT SPLICING LOCATIONS INSTALLATION DETAIL
SZ26	TMS CABLE SLACK INSTALLATION
SZ27	FIBER OPTIC CABLE LABELING DETAIL
SZ28	BURIED CABLE SIGN PLACEMENT TYPICAL
SZ29	PROPOSED 10' X 12' TMS SHELTER DETAIL SHEET 1
SZ30	PROPOSED 10' X 12' TMS SHELTER DETAIL SHEET 2
SZ31	PROPOSED 10' X 12' TMS SHELTER DETAIL SHEET 3
SZ32	PROPOSED 12' X 18' TMS SHELTER DETAIL SHEET 1
SZ33	PROPOSED 12' X 18' TMS SHELTER DETAIL SHEET 2
SZ34	PROPOSED 12' X 18' TMS SHELTER DETAIL SHEET 3
SZ35	HANGER BRACKET DETAIL
SZ36	MNPASS EQUIPMENT TYPICAL DETAILS
SZ37	FIBER OPTIC CABLE ENCASEMENT
SZ38	GENERATOR CONTROL/TRANSFER SWITCH CONNECTIONS
SZ39	LEGEND FOR COMMUNICATION SCHEMATICS

SHOW INSET WITH GUARDRAIL
GRADING AS NECESSARY
FOR INSTALLATION

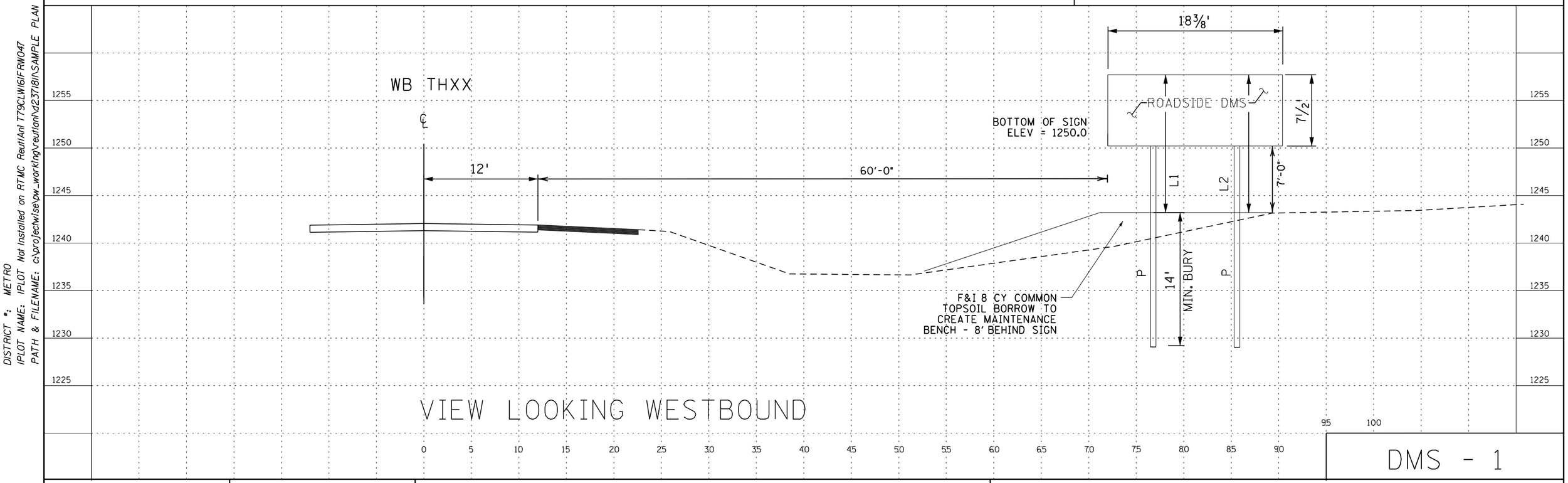
SIGN DMS-1

WNB TH XX
STA. XXX+XX
R.P. 0+00.00

W8 X 31
L1 = 14.5'
L2 = 14.5'
P = 14' MIN.

STRUCTURAL STEEL POSTS-TYPE A
TOTAL 2123 POUND

SKEW SIGN 10° TO ROADWAY



VIEW LOOKING WESTBOUND

DMS - 1

DRAWN BY: SAC | CHECKED BY: | CERTIFIED BY _____ LIC. NO. _____ DATE _____
LICENSED PROFESSIONAL ENGINEER

STATE PROJ 9999-999

SHEET NO. 16 OF 54 SHEETS

PLOTTED/REVISED: 10/1/2021

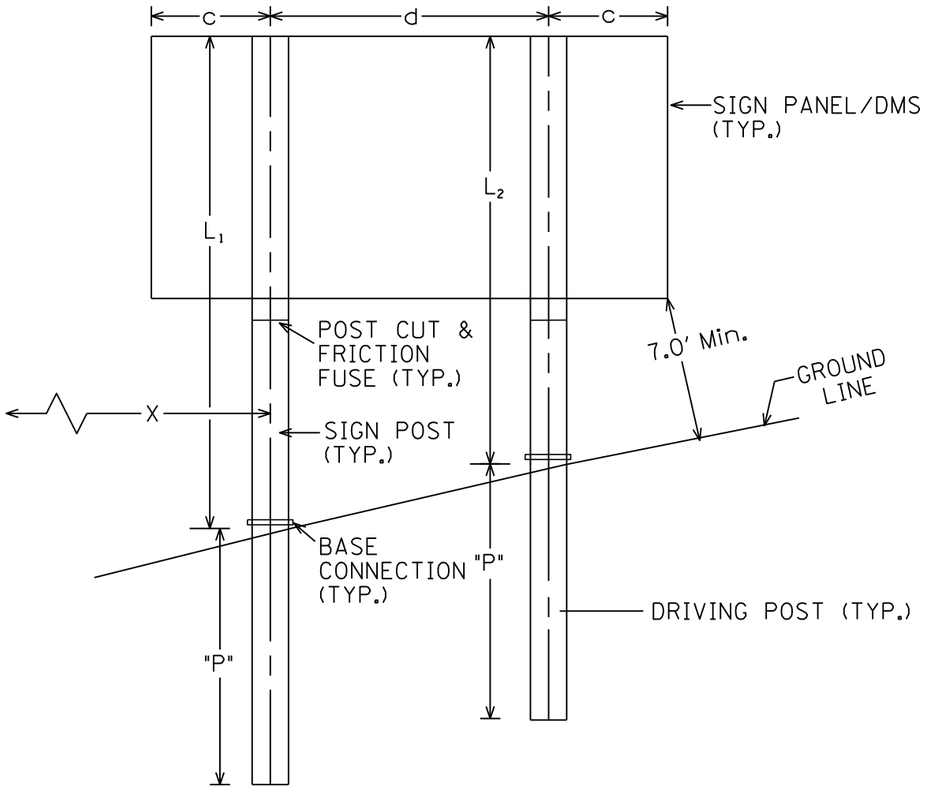
DISTRICT *: METRO
IPLOT NAME: IPLOT Not Installed on RTMC ReutlAnl T79CLW16IFRW047
PATH & FILENAME: c:\projectwise\pw_working\reutlan\d23718\INSAMPLE PLAN DETAILS.dgn

STRUCTURAL STEEL POSTS FOR TYPE A SIGN

① DMS NO	LOCATION	PANEL SIZE (INCH)	PANEL AREA (SQ FT)	POST SIZE	QTY	POST LENGTH L1 (FEET)	POST LENGTH L2 (FEET)	POST WEIGHT	BASE AND STIFFENER PLATES (POUND)	FOOTING PILE DATA c (INCH)	FOOTING PILE DATA d (INCH)	FOOTING PILE DATA "P" (FEET)	FOOTING PILE DATA WEIGHT (POUND)	TOTAL WEIGHT STRUCTURAL STEEL (POUND)
DMS-1	-	220.8 x 90		W 8 x 31	2	14.5	14.5	899.00	356.00	57.5	105.8	14	868	2123
													TOTAL	2123 POUNDS

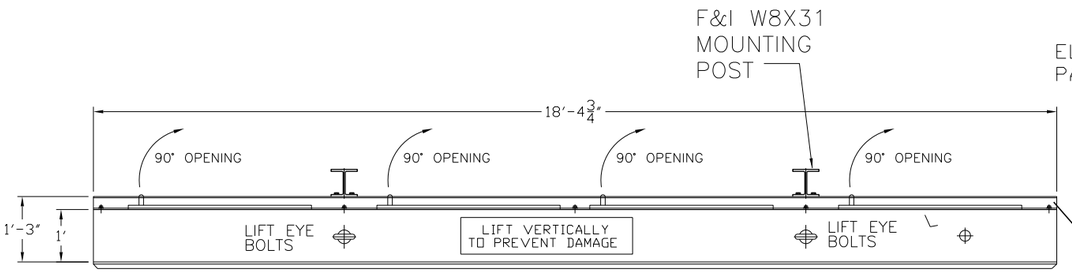
SPECIFIC NOTE:

① DMS WITH Z-BARS TO BE PROVIDED BY MNDOT.

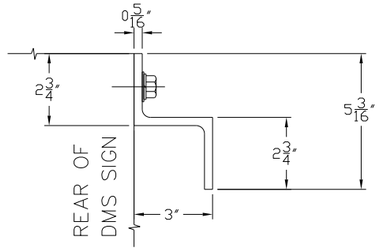


POSTS/PILE FOOTING

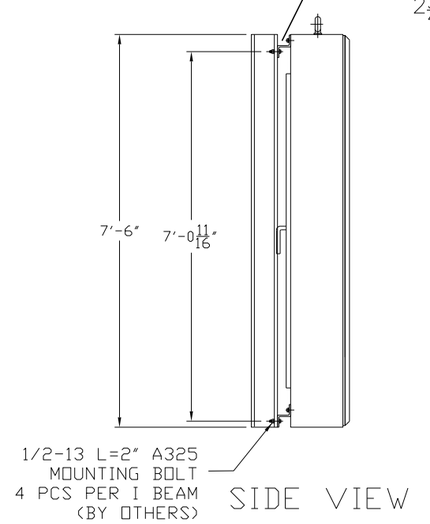
(L_1 IS POST NEAREST ROADWAY)



TOP ELEVATION



'Z-BAR CONNECTION TO DMS (INCLUDED WITH DMS SIGN)



SIDE VIEW

GENERAL NOTES:

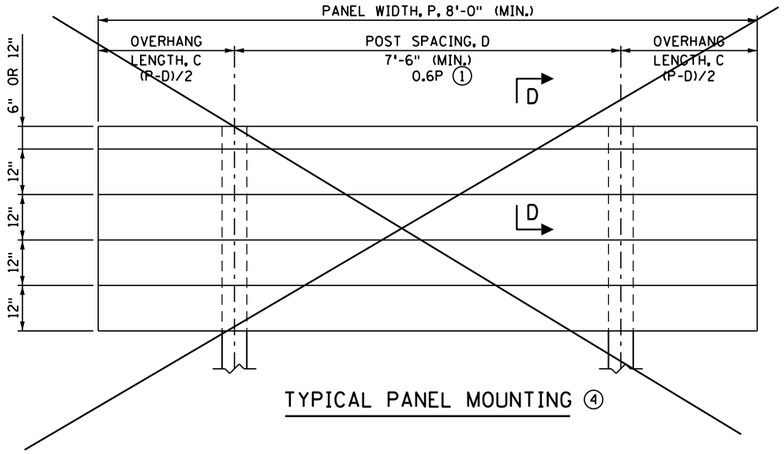
1. DRIVING POST SHALL BE THE SAME SIZE AS THE SIGN POST AND IS TO BE DRIVEN TO A 12 TO 14 TON BEARING CAPACITY.
2. POST LENGTHS ARE APPROXIMATE.
3. X IS THE DISTANCE FROM THE EDGE OF THE THRU LANE TO THE FIRST POST.
4. H IS THE HEIGHT ABOVE THE PAVEMENT EDGE TO THE BOTTOM EDGE OF THE PANEL.
5. P IS THE LENGTH OF DRIVING POST.
6. SEE INDIVIDUAL DMS SITE LOCATION PLAN SHEETS FOR CROSS SECTIONS.
7. WELDING SHALL ONLY BE ALLOWED ABOVE THE BOTTOM OF THE DMS.

REV. NO. 1	DATE: 8 /28/19
REV. NO.	DATE: / /

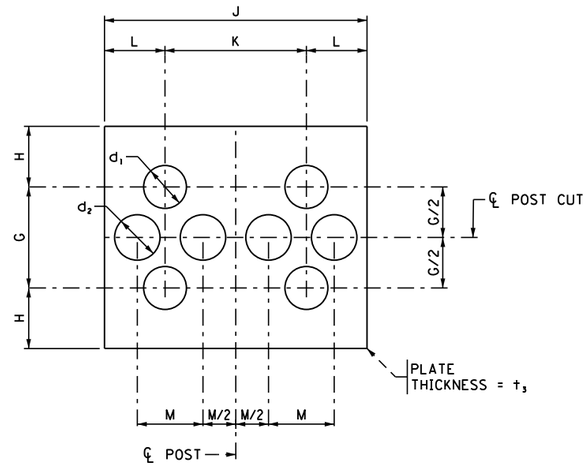
LICENSED PROFESSIONAL ENGINEER

A SIGN DATA SHEET (W8X31 PILE FOOTING & CONNECTION DETAILS)

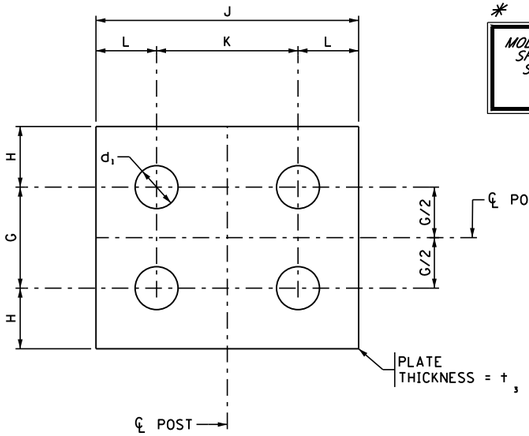
PLOTTED/REVISED: 10/1/2021
DISTRICT •: METRO
IPLOT NAME: IPLOT Not Installed on RTMC ReufAnl T79CLW16IFRW047
PATH & FILENAME: c:\projectwise\pw_working\reutlanh\d2371811\SAMPLE PLAN DETAILS.dgn



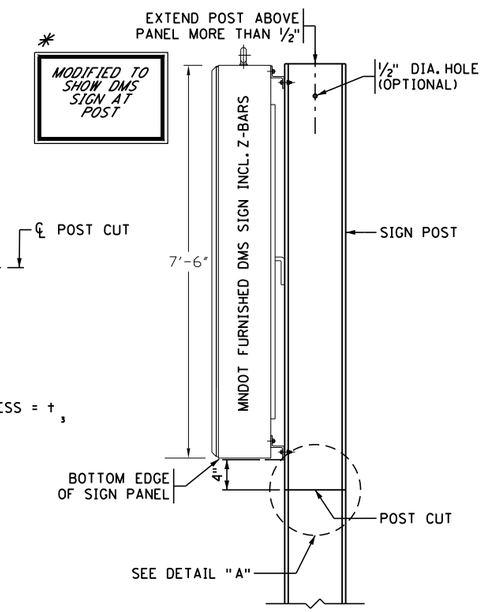
TYPICAL PANEL MOUNTING (4)



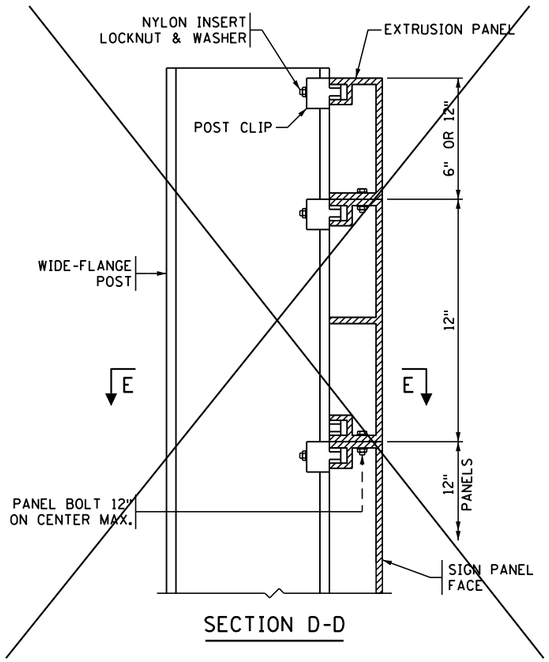
FRICTION FUSE PLATE DETAIL (3)



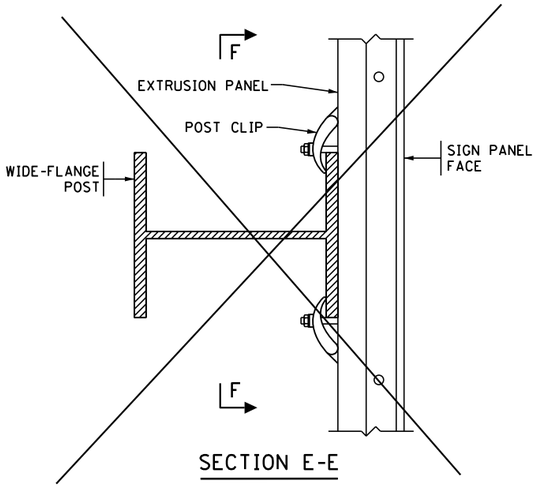
HINGE PLATE DETAIL (3)



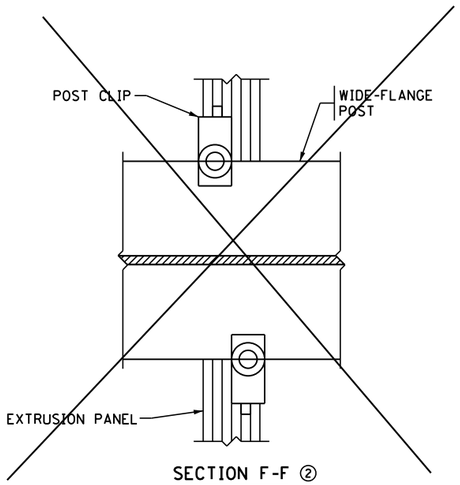
FRICTION FUSE SIDE VIEW



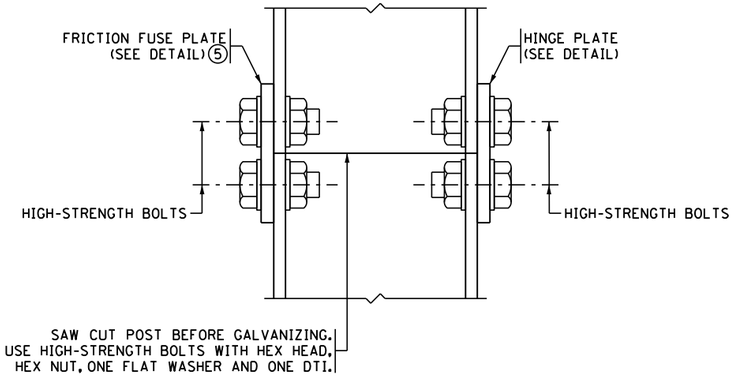
SECTION D-D



SECTION E-E



SECTION F-F (2)



DETAIL 'A" FRICTION FUSE

POST QUANTITIES		
POST SIZE	FLANGE WIDTH	QUANTITY
W4X13	4"	61+13 LBS/FT
W6X20	6"	107+20 LBS/FT
W8X24	6.5"	123+24 LBS/FT
W8X31	8"	178+31 LBS/FT
W10X39	8"	202+39 LBS/FT

GENERAL NOTES:

PROVIDE STRUCTURAL STEEL IN ACCORDANCE WITH SPEC 3308. GALVANIZE STRUCTURAL STEEL ACCORDING TO SPEC. 3394 AND HARDWARE ACCORDING TO SPEC. 3392. FURNISH HIGH-STRENGTH BOLTS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH SPEC. 3391. PLACE HIGH-STRENGTH BOLTS ACCORDING TO SPEC. 2402.

SAW CUT ALL POST CUTS. PLATES MAY BE SHEARED OR FLAME CUT USING A MECHANICALLY GUIDED CUTTING TORCH. PREPARE EDGES IN ACCORDANCE WITH SPEC 2471.3.C.4 AND SPEC 2471.3.D4.

~~(1) ROUND TO THE NEAREST EVEN INCH FOR DIMENSION, D.~~

~~(2) PLACE POST CLIPS ON BOTH SIDES OF EACH POST AT EACH PANEL JOINT AS INDICATED.~~

(3) SEE TABLE ON STANDARD PLAN 5-297.711 FOR DIMENSIONS.

(4) SEE I-BEAM-SUPPORTED SIGN CROSS-SECTION(S) FOR PANEL WIDTH, POST SPACING, AND OVERHANG LENGTHS.

(5) PLACE FRICTION FUSE PLATE ON SIDE OF POST FACING TRAFFIC.

NAME:

DATE: LIC. NO.:

DESIGN SQUAD:

REVISION:

APPROVED: JUNE 4, 2019

KEVIN WESTERN
STATE BRIDGE ENGINEER

MODIFIED

* DENOTES MODIFICATION FROM STANDARD PLAN

MINNESOTA DEPARTMENT OF TRANSPORTATION

~~STANDARD PLAN 5-297.711~~ 2 OF 2

APPROVED: 6-4-2019

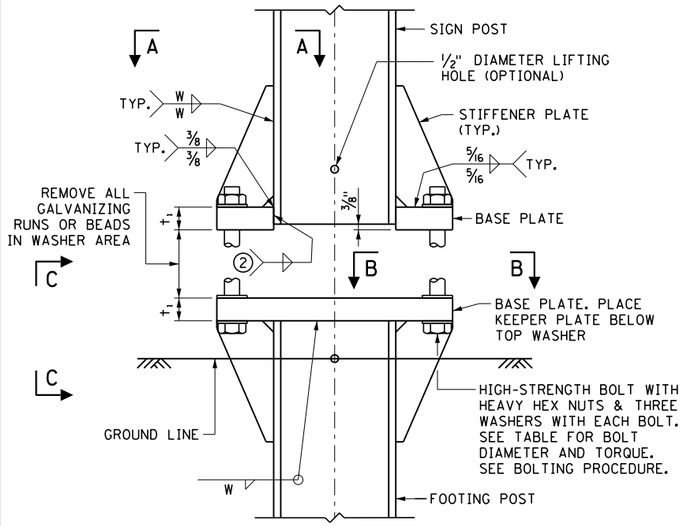
~~REVISED:~~

THOMAS STYRBICKI
STATE DESIGN ENGINEER

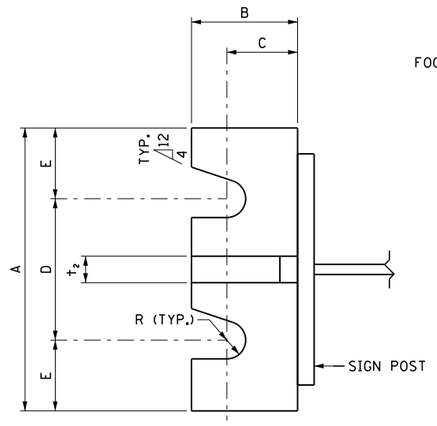
I-BEAM SUPPORTED SIGN STRUCTURAL DETAILS

POST AND PANEL

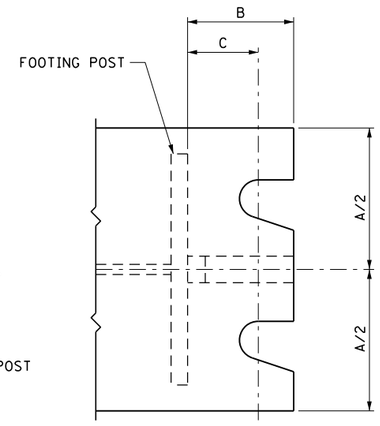
STATE PROJ. 9999-999 SHEET NO. 18 OF 54 SHEETS



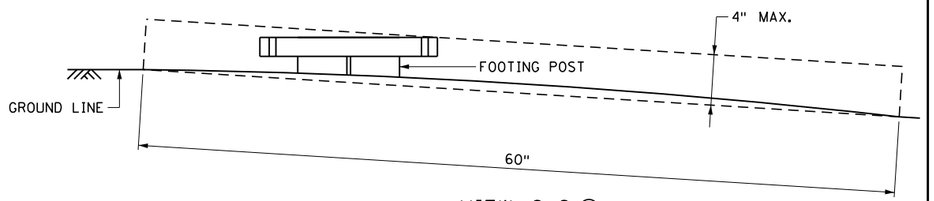
SIGN POST AND FOOTING POST ELEVATION



SECTION A-A ③



SECTION B-B ③



VIEW C-C ④

SOIL PARAMETERS:

THE FOUNDATIONS SHOWN ON THIS SHEET HAVE BEEN DESIGNED WITH THE FOLLOWING ASSUMED SOIL PROPERTIES:

COHESIVE SOILS:		GRANULAR SOILS:	
SHEAR STRENGTH:	C = 1.0 ksf	ANGLE OF FRICTION:	Ø = 30°
UNIT WEIGHT OF SOIL:	γ = 125±10 pcf	UNIT WEIGHT OF SOIL:	γ = 125 pcf
		AT-REST COEFFICIENT:	k = 0.50
		COEFFICIENT OF FRICTION:	μ = 0.70

BOLTING PROCEDURE - BASE CONNECTION

1. ASSEMBLE SIGN POST TO H-PILE FOOTING POST WITH BOLTS AND WITH ONE OF THE FLAT WASHERS ON EACH BOLT BETWEEN PLATES.
2. SHIM AS REQUIRED TO PLUMB POST.
3. TIGHTEN ALL BOLTS THE MAXIMUM POSSIBLE WITH 12" OR 15" WRENCH TO BED WASHERS AND SHIMS AND TO CLEAN BOLT THREADS, THEN LOOSEN EACH BOLT IN TURN AND RETIGHTEN TO THE PRESCRIBED TORQUE (SEE TABLE).
4. BURR THREADS AT JUNCTION WITH NUT USING A CENTER PUNCH TO PREVENT NUT LOOSENING.

GENERAL NOTES:

PROVIDE STRUCTURAL STEEL IN ACCORDANCE WITH SPEC 3308. GALVANIZE STRUCTURAL STEEL ACCORDING TO SPEC. 3394 AND HARDWARE ACCORDING TO SPEC. 3392. FURNISH HIGH-STRENGTH BOLTS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH SPEC. 3391. UNLESS NOTED OTHERWISE, PLACE HIGH-STRENGTH BOLTS ACCORDING TO SPEC. 2402.

① MEASURED FROM TOP OF BASE PLATE.

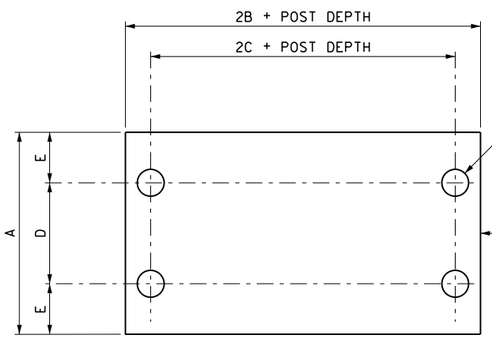
② FLANGE THICKNESS - 1/16" (TYP.).

③ SECTIONS SHOWN ARE FOR PLACEMENTS ON RIGHT SHOULDER AND IN GORE. PLATE SLOT BEVELS ARE OPPOSITE FROM THAT SHOWN FOR PLACEMENT ON LEFT SHOULDER.

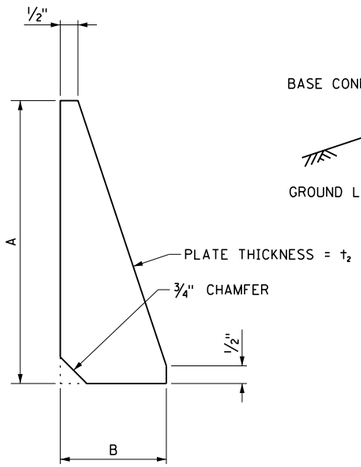
④ PLACE FOOTING POSTS SO THAT IF THEY ARE RUN OVER BY A VEHICLE WITH A 60" WHEELBASE AND 4" GROUND CLEARANCE, THE VEHICLE WILL NOT STRIKE THE FOOTING POST. MAXIMUM PROJECTION OF THE FOOTING POST SHALL NOT EXTEND BEYOND A LINE 4" PARALLEL TO ANY CHORD, WHICH IS PERPENDICULAR TO (OR ALIGNED RADIALLY TO) THE CENTERLINE OF THE HIGHWAY AND HAS THE CHORD'S END POINTS ON THE GROUND SURFACE ON THE OPPOSITE SIDES OF THE FOOTING POST.

⑤ FURNISH TWO 0.012" ± THICK AND TWO 0.032" ± THICK SHIMS PER POST. FABRICATE SHIMS FROM BRASS SHIM STOCK OR STRIP CONFORMING TO ASTM B36.

⑥ FOOTING POST SHALL BE THE SAME SIZE AS THE SIGN POST. A SPECIAL FOUNDATION DESIGN IS REQUIRED IN CASES WHERE THE SOIL PARAMETER VALUES LISTED ABOVE ARE NOT MET.

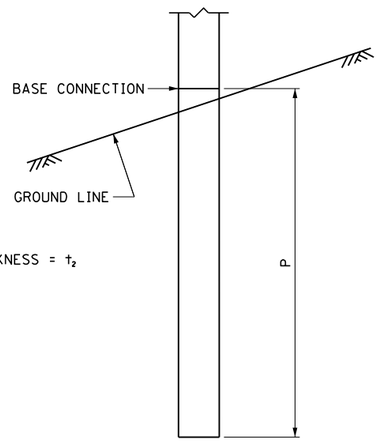


KEEPER PLATE

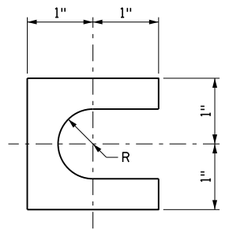


STIFFENER PLATE DETAIL

SEE TABLE FOR DIMENSIONS



FOOTING POST DETAIL ⑥



SHIM DETAIL ⑤

DIMENSION / POST SIZE	BASE CONNECTION DATA: BOLT SIZE AND TORQUE	A	B	C	D	E	t_1	t_2	W	R	FUSE AND HINGE PLATE DATA: G	H	J	K	L	M	d_1	d_2	t_3	BOLT DIA.	BOLT LENGTH	FOOTING POST, P (MIN. LENGTH) ①
W4X13	¾" DIA. x 4½" TORQUE = 50 FT-LBS	6"	3¼"	2¼"	3½"	1¼"	1½"	½"	¼	3/32"	2"	1¼"	4"	2¼"	⅞"	1"	11/16"	¾"	⅜"	⅝"	2"	14' 0"
W6X20	⅞" DIA. x 4¾" TORQUE = 67 FT-LBS	8"	3¾"	2½"	4"	2"	1½"	½"	¼	5/32"	2½"	1¼"	6"	3½"	1¼"	1⅜"	13/16"	1⅛"	⅜"	¾"	2"	14' 0"
W8X24	1" DIA. x 5" TORQUE = 83 FT-LBS	8"	3¾"	2½"	4"	2"	1½"	½"	¼	7/32"	2½"	1½"	6½"	3½"	1½"	1½"	15/16"	1¼"	½"	⅞"	2½"	14' 0"
W8X31	1⅛" DIA. x 6" TORQUE = 100 FT-LBS	9"	4¼"	2¾"	5"	2"	2"	¾"	5/16	19/32"	3"	1¾"	8"	5½"	1¼"	2"	1 1/16"	1½"	½"	1"	2½"	14' 0"
W10X39	1⅛" DIA. x 6" TORQUE = 100 FT-LBS	9"	4¼"	2¾"	5"	2"	2"	¾"	5/16	19/32"	3"	1¾"	8"	5½"	1¼"	1⅞"	1 3/16"	1⅜"	½"	1⅛"	2¾"	14' 0"

REVISION: MAY 26, 2020

APPROVED: JUNE 4, 2019

Kevin Western

KEVIN WESTERN
STATE BRIDGE ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD PLAN 5-297.711 | 1 OF 2

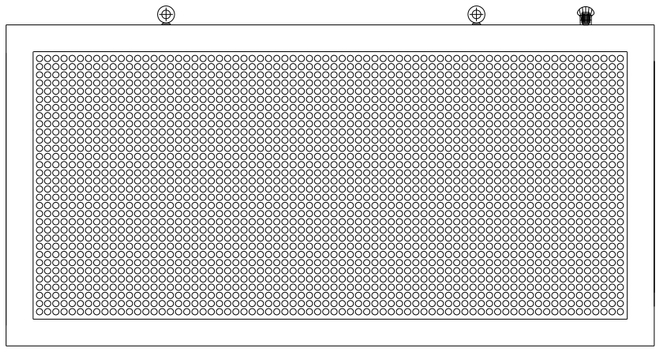
APPROVED: 6-4-2019
REVISED: 5-26-2020

I-BEAM SUPPORTED SIGN STRUCTURAL DETAILS

FOOTINGS AND BASE CONNECTION

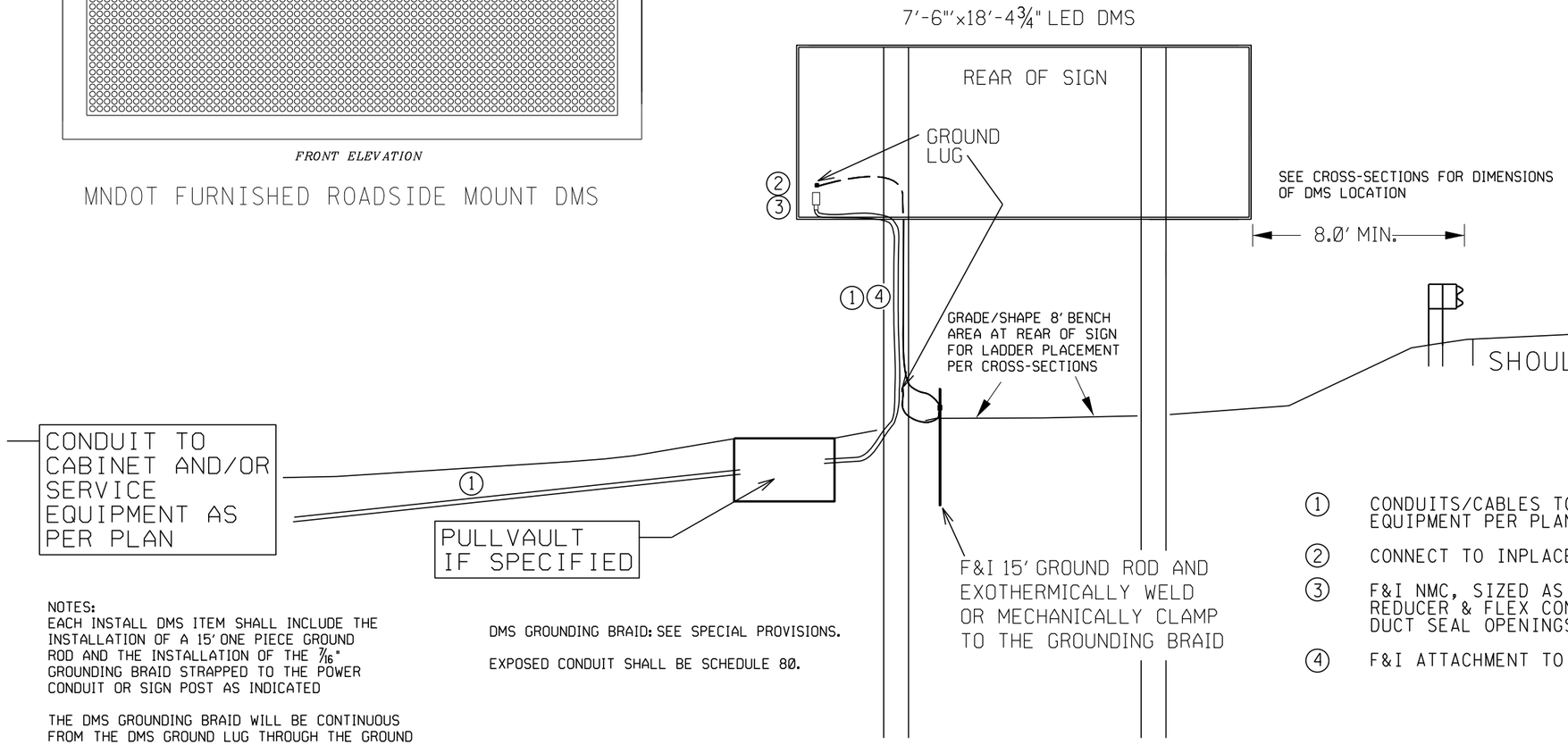
STATE PROJ. 9999-999 | SHEET NO. 19 OF 54 SHEETS

PLOTTED/REVISED: 10/1/2021
DISTRICT #; METRO
PLOT NAME: JPLOT Not Installed on RTMC Reut1Ani T79CLW16IFRW047
PATH & FILENAME: c:\projectwise\pw.working\reut1am\d2371811\SAMPLE PLAN DETAILS.dgn



FRONT ELEVATION

MNDOT FURNISHED ROADSIDE MOUNT DMS



NOTES:
EACH INSTALL DMS ITEM SHALL INCLUDE THE INSTALLATION OF A 15' ONE PIECE GROUND ROD AND THE INSTALLATION OF THE 7/16" GROUNDING BRAID STRAPPED TO THE POWER CONDUIT OR SIGN POST AS INDICATED

THE DMS GROUNDING BRAID WILL BE CONTINUOUS FROM THE DMS GROUND LUG THROUGH THE GROUND ROD CLAMP. F&I SIGN POST GROUND LUG.

STRAP GROUNDING BRAID TO POST OR CONDUIT AWAY FROM VIEW OF TRAFFIC.

DMS GROUNDING BRAID: SEE SPECIAL PROVISIONS.

EXPOSED CONDUIT SHALL BE SCHEDULE 80.

1. CONDUITS/CABLES TO CABINET AND/OR SERVICE EQUIPMENT PER PLAN
2. CONNECT TO INPLACE LB CONDUIT BODY
3. F&I NMC, SIZED AS SPECIFIED IN PLANS - F&I WEATHERTIGHT FITTINGS, REDUCER & FLEX CONDUIT AS NECESSARY AT SIGN (INCIDENTAL). DUCT SEAL OPENINGS AFTER INSTALLATION.
4. F&I ATTACHMENT TO POST (TYPICAL)

ROADSIDE MOUNT DMS ELECTRICAL INSTALLATION

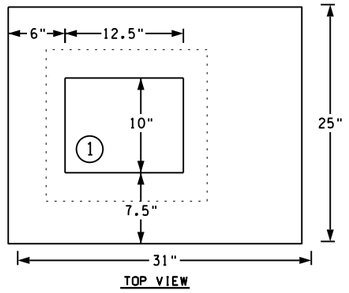
REV. NO.	DATE: / /
REV. NO.	DATE: / /

CERTIFIED BY _____ LIC.NO. _____ _____ 2021
LICENSED PROFESSIONAL ENGINEER

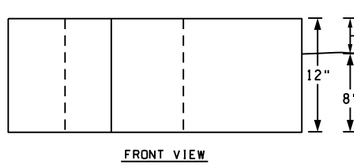
STAND ALONE SERVICE FOUNDATION

(SEE TMS SERVICE EQUIPMENT DETAIL)

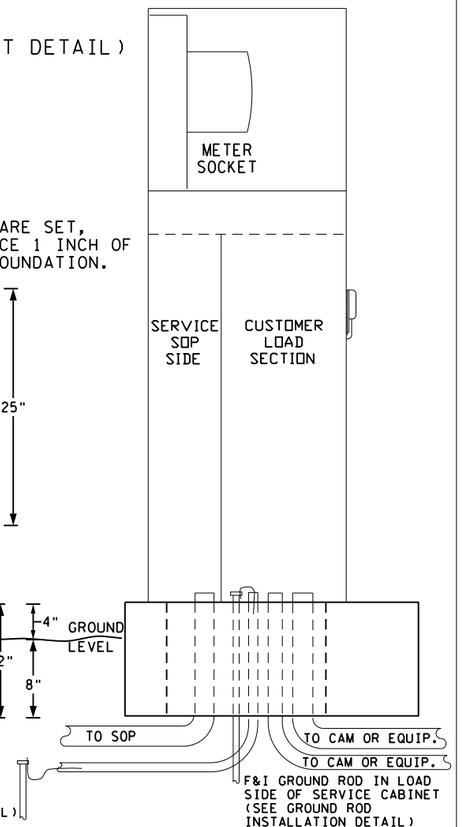
① AFTER FOUNDATION AND CONDUITS ARE SET, FILL OPENING WITH SAND AND PLACE 1 INCH OF GROUT FLUSH WITH SURFACE OF FOUNDATION.



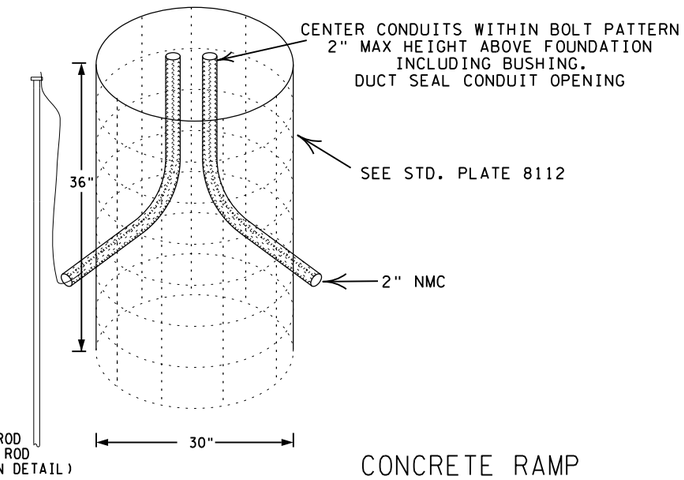
TOP VIEW



FRONT VIEW



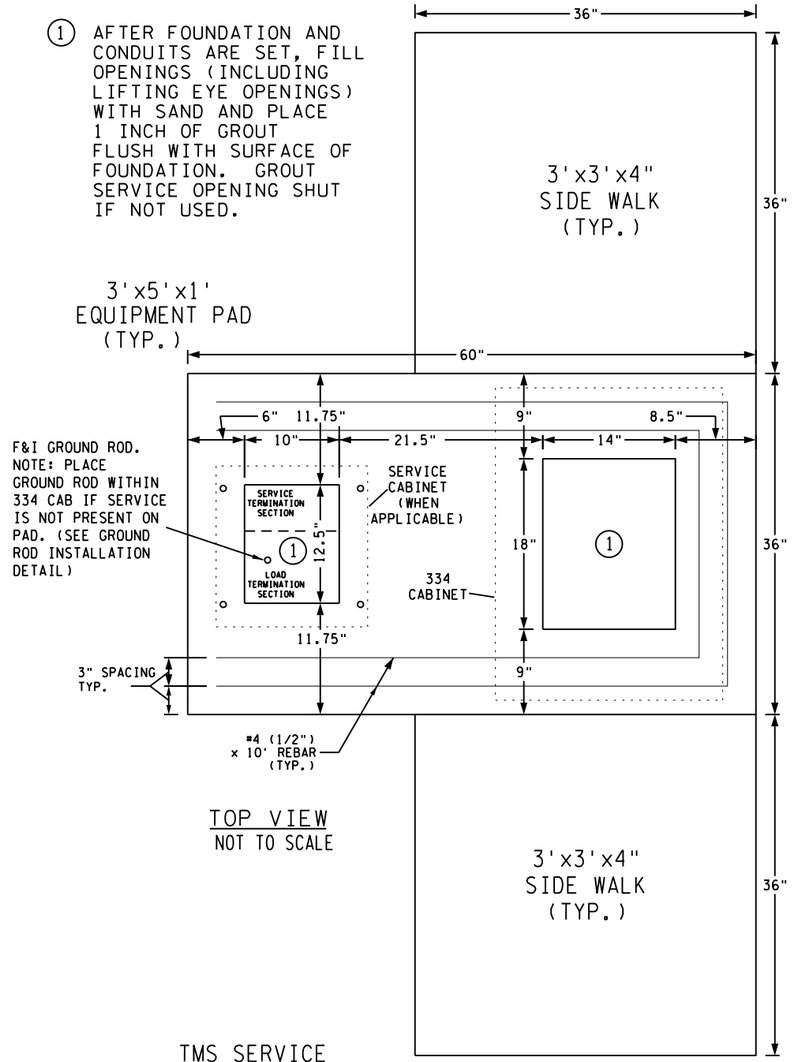
SEE STD. PLATE 8112 FOR ANCHOR BOLT REQUIREMENTS



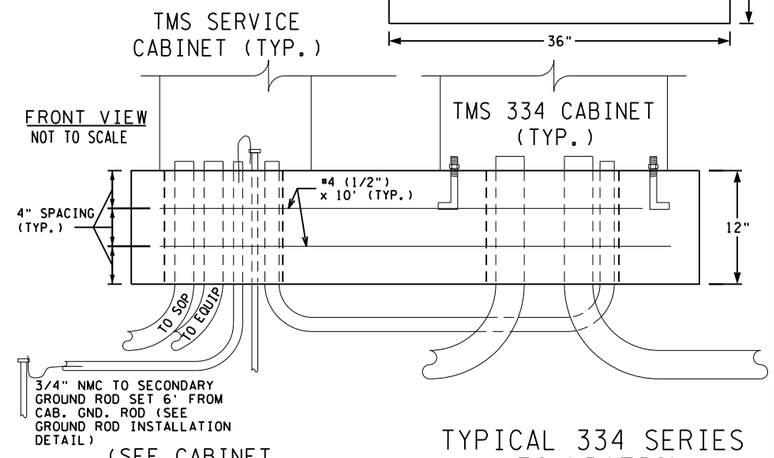
CONCRETE RAMP CONTROL SIGNAL FOUNDATION

(SEE RAMP CONTROL SIGNAL DETAIL)

① AFTER FOUNDATION AND CONDUITS ARE SET, FILL OPENINGS (INCLUDING LIFTING EYE OPENINGS) WITH SAND AND PLACE 1 INCH OF GROUT FLUSH WITH SURFACE OF FOUNDATION. GROUT SERVICE OPENING SHUT IF NOT USED.



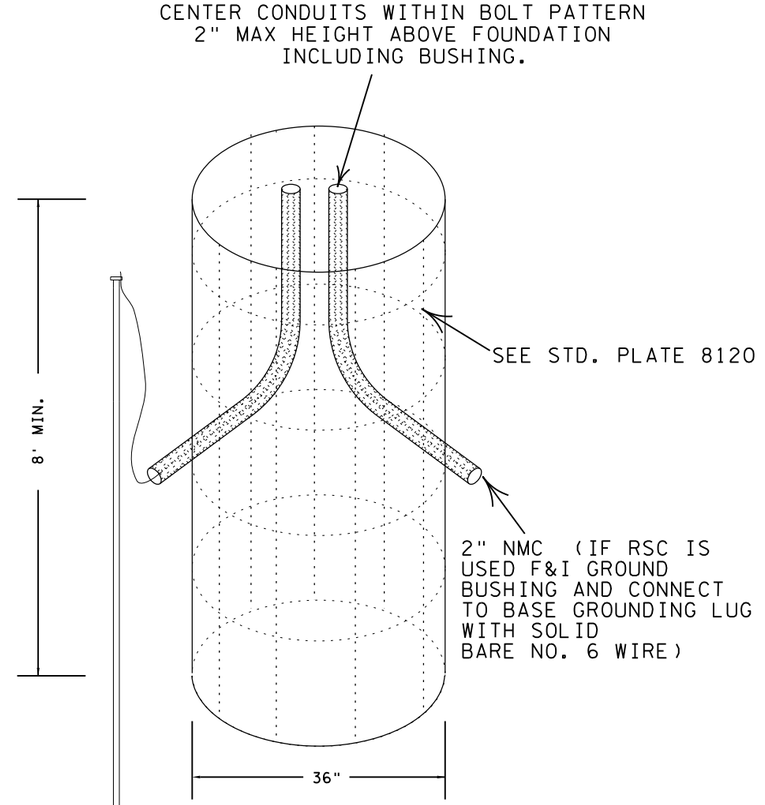
TOP VIEW
NOT TO SCALE



(SEE CABINET INSTALLATION DETAIL)

TYPICAL 334 SERIES FOUNDATION

SEE STD. PLATE 8120 FOR ANCHOR BOLT REQUIREMENTS
NOTE: VERIFY ANCHOR BOLT PATTERN WITH MANUFACTURER PRIOR TO PLACING FOUNDATION. ANCHOR BOLT PATTERN MAY VARY DEPENDING ON CCTV POLE LENGTH.



CCTV POLE FOUNDATION

(SEE CCTV INSTALLATION DETAIL)

NOTE: ALL FOUNDATIONS TO BE SET LEVEL AND PLUMB. PROVIDE COMPACTION OF BACKFILL DURING INSTALLATION.

TYPICAL FOUNDATION DETAILS

REVISED 6/27/18

REV. NO.	DATE: / /
REV. NO.	DATE: / /

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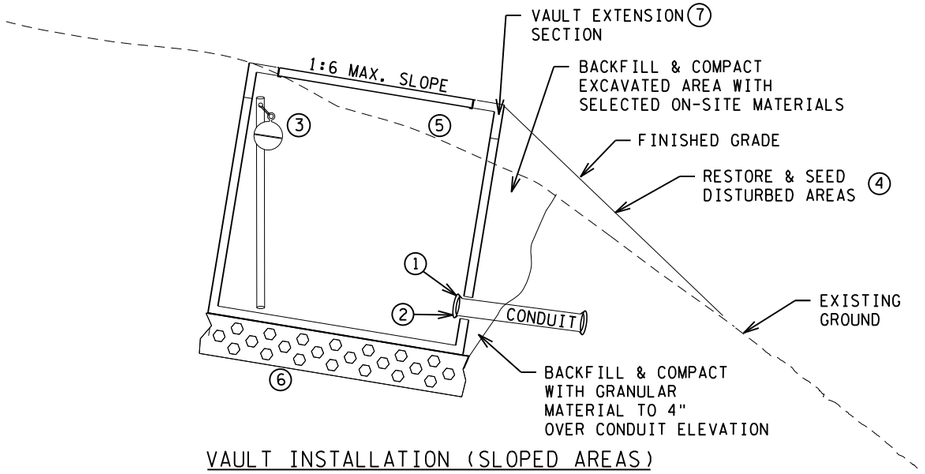
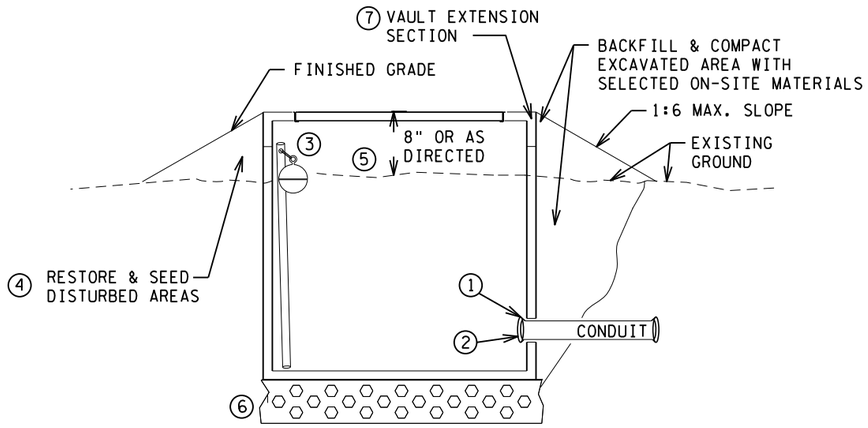


VAULT INSTALLATION (SLOPED AREAS)



VAULT INSTALLATION (LEVEL GROUND)

SPECIFIC NOTES

(1) OPENINGS FOR CONDUIT SHALL BE SEALED WITH MATERIAL COMPATIBLE SEALANT.(INCIDENTAL)

(2) F&I BELL ENDS ON THE CONDUITS PLUG ALL CONDUIT OPENINGS WITH A DRAINABLE COMPOUND

(3) LOCATOR BALL ATTACHED WITH BLACK TIE WRAP TO 40" LENGTH OF 3/4" PVC CONDUIT TO SIT WITHIN 6" OF COVER

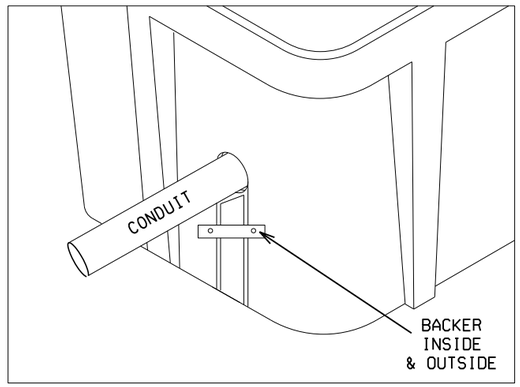
(4) RESTORE DISTURBED AREAS FOR TMS INSTALLATION WITH SEED AND ROLLED EROSION PREVENTION CATEGORY 20 PER MNDOT 2575.3 (INCIDENTAL)

(5) STRIP TOPSOIL FROM VAULT AND SLOPE AREAS PRIOR TO VAULT INSTALLATION (INCIDENTAL)

(6) F&I 1.0' COARSE FILTER AGGREGATE UNDER BASE COMPLYING WITH MN/DOT 3149.2H.(INCIDENTAL)

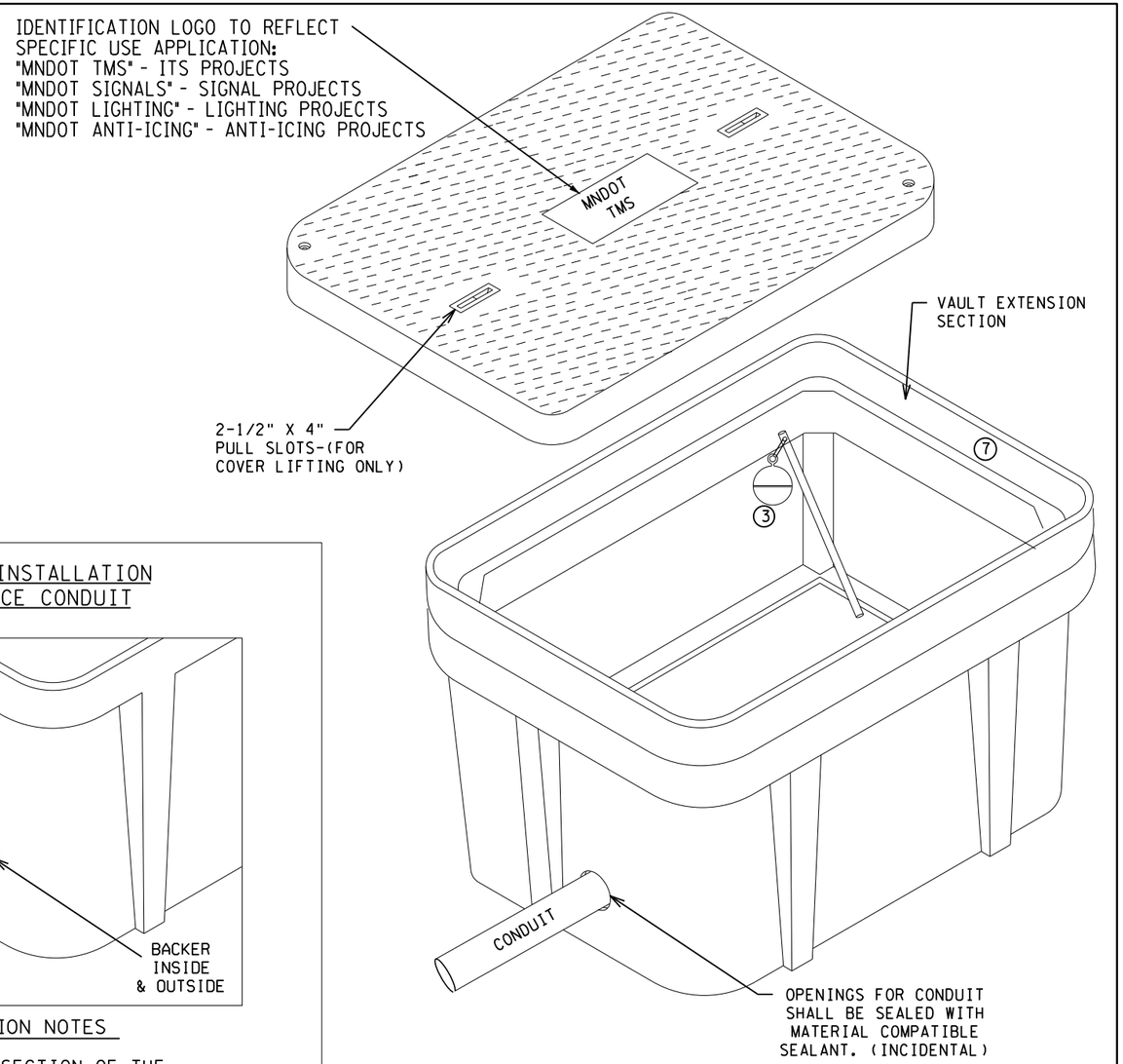
(7) F&I VAULT EXTENSION SECTION AT ALL PULL VAULT INSTALLATIONS TO FACILITATE FUTURE DAMAGE REPAIRS

PULL VAULT INSTALLATION OVER INPLACE CONDUIT



INSTALLATION NOTES

1. REMOVE APPROX. A 2' SECTION OF THE CONDUIT TO BE INTERCEPTED. USE CAUTION NOT TO DAMAGE INPLACE CABLES.
2. F&I BELL ENDS TO THE CONDUITS.
3. CUT A SLOT THE WIDTH OF THE CONDUIT AS HIGH ON THE PULL VAULT SIDE WALL AS NEEDED.
4. SET THE PULL VAULT OVER THE CONDUIT.
5. SET THE CUT OUT PIECE BACK INTO THE OPENING.
6. SCREW/BOLT A BACKER TO THE INSIDE AND OUTSIDE OF THE PULL VAULT TO HOLD THE CUTOUT PIECE IN-PLACE.
7. APPLY A FIBERGLASS RESIN AND MAT OR BODY FILLER ACROSS THE ENTIRE CUTOUT ON THE INSIDE OF THE PULL VAULT.



GENERAL NOTES

1. DO NOT LIFT ENTIRE PULL VAULT WITH COVER ATTACHED BY COVER LIFTING SLOTS.

PULL VAULT INSTALLATION DETAIL

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1. F&I 3-1/C NO. 10 POWER CABLE - TERMINATE AT EACH END
2. F&I 2/C NO. 14 LOOP CONDUCTORS
3. F&I 1-FO PIGTAIL-PLACE 1 LOOP (APPROX. 15') OF PIGTAIL CABLE WITHIN CABINET AGAINST SIDEWALL. CONNECT ARMOUR TO NORSCAN DEVICE-TERMINATE END & LAND IN PATCH PANEL
4. F&I 6/C NO14-TERMINATE EACH END PER RCS DETAIL
5. F&I 1-1/C NO6 BARE GROUND WIRE-COAT CONNECTION WITH ANTI-OXIDIZING AGENT
6. INSTALL NEOPRENE GASKET (SUPPLIED BY MNDOT)
7. LINE TERMINATION GROUND UNIT (LTU)

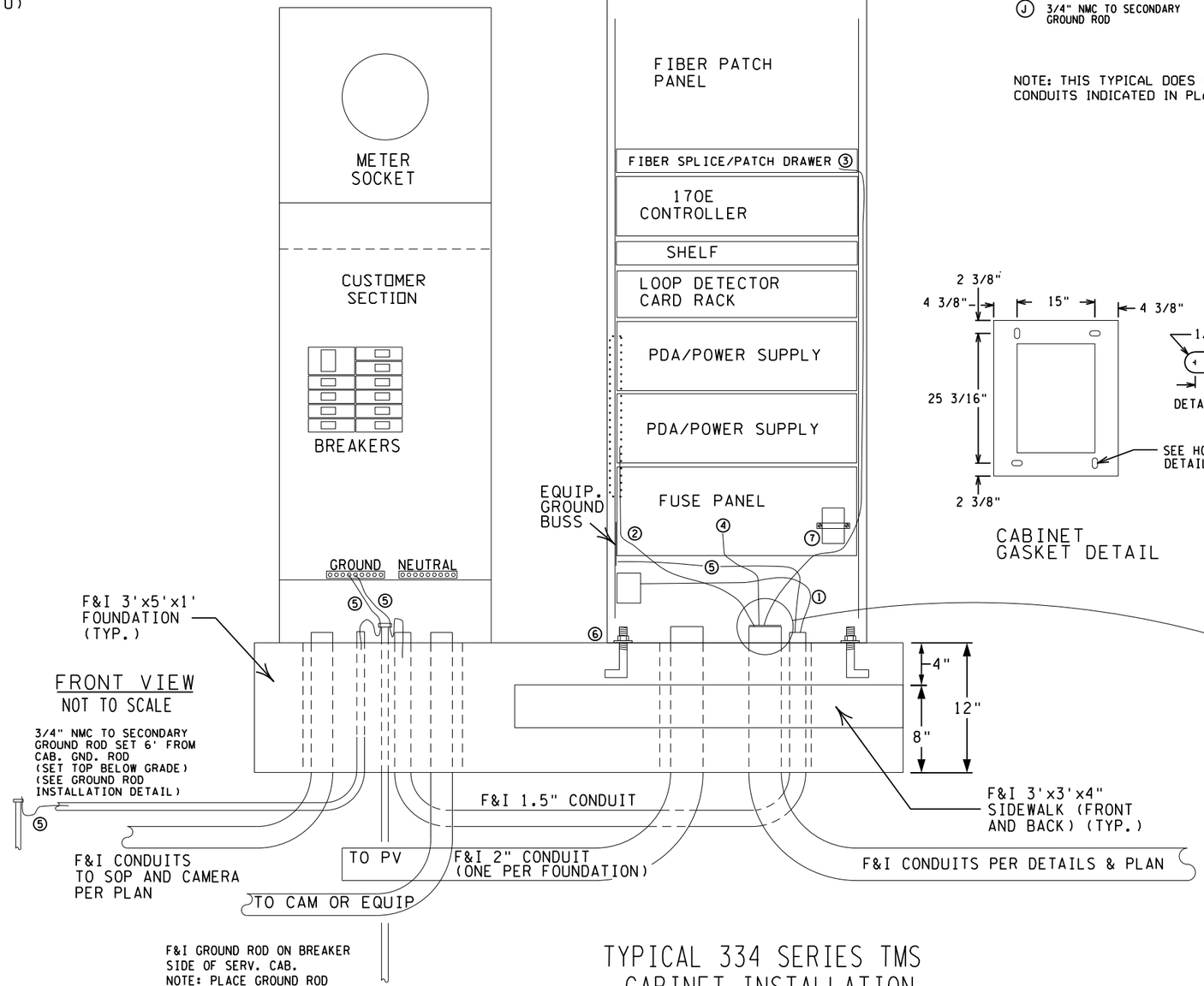
MNDOT PROVIDED

1. TMS 334Z CONTROL CABINET WITH:
   - A) 170 CONTROLLER
   - B) FIBER OPTIC PATCH PANEL
   - C) BREAKER INSIDE CABINET
   - D) NEOPRENE CAB. GASKET

MNDOT PROVIDED & INSTALLED

1. FIBER OPTIC PATCH CORDS
2. FO PIGTAIL & PATCH PANEL LABELS WITHIN DMS CABINET

INSTALL 334 SERIES TMS CONTROL CABINET (MNDOT PROVIDED)



FRONT VIEW
NOT TO SCALE

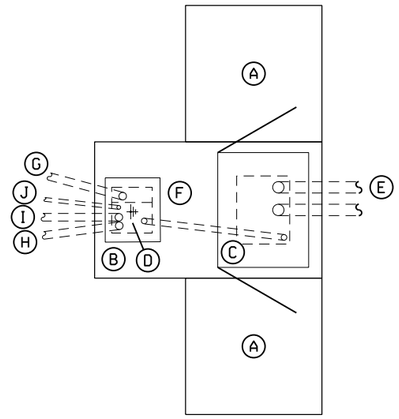
3/4" NMC TO SECONDARY GROUND ROD SET 6' FROM CAB. GND. ROD (SET TOP BELOW GRADE) (SEE GROUND ROD INSTALLATION DETAIL)

F&I GROUND ROD ON BREAKER SIDE OF SERV. CAB.
NOTE: PLACE GROUND ROD WITHIN 334 CAB IF SERVICE IS NOT PRESENT ON PAD.
(SEE GROUND ROD INSTALLATION DETAIL)

TYPICAL 334 SERIES TMS CABINET INSTALLATION

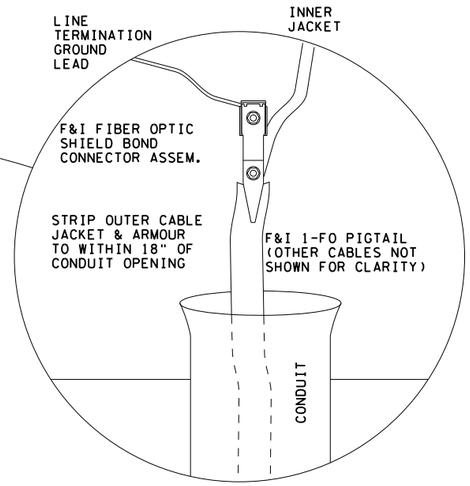
- (A) 3' X 3' SIDEWALK (SEE STD. PLATE 8119)
- (B) 3' X 5' CONC. PAD (SEE STD. PLATE 8119)
- (C) 334Z STYLE CABINET LOCATION
- (D) GROUND ROD
- (E) 3" NMC TO PV (ONE PER FOUNDATION)
- (F) 1.5" NMC & 3-1/C NO.10
- (G) TO ELECTRICAL SOP
- (H) TO CAMERA/NID POLE
- (I) 2" NMC TO PV FOR FUTURE USE
- (J) 3/4" NMC TO SECONDARY GROUND ROD

NOTE: THIS TYPICAL DOES NOT SHOW CONDUITS INDICATED IN PLAN NOTES



TOP VIEW
NOT TO SCALE

CABINET GASKET DETAIL



FO PIGTAIL GROUNDING

TYPICAL 334 CABINET INSTALLATION

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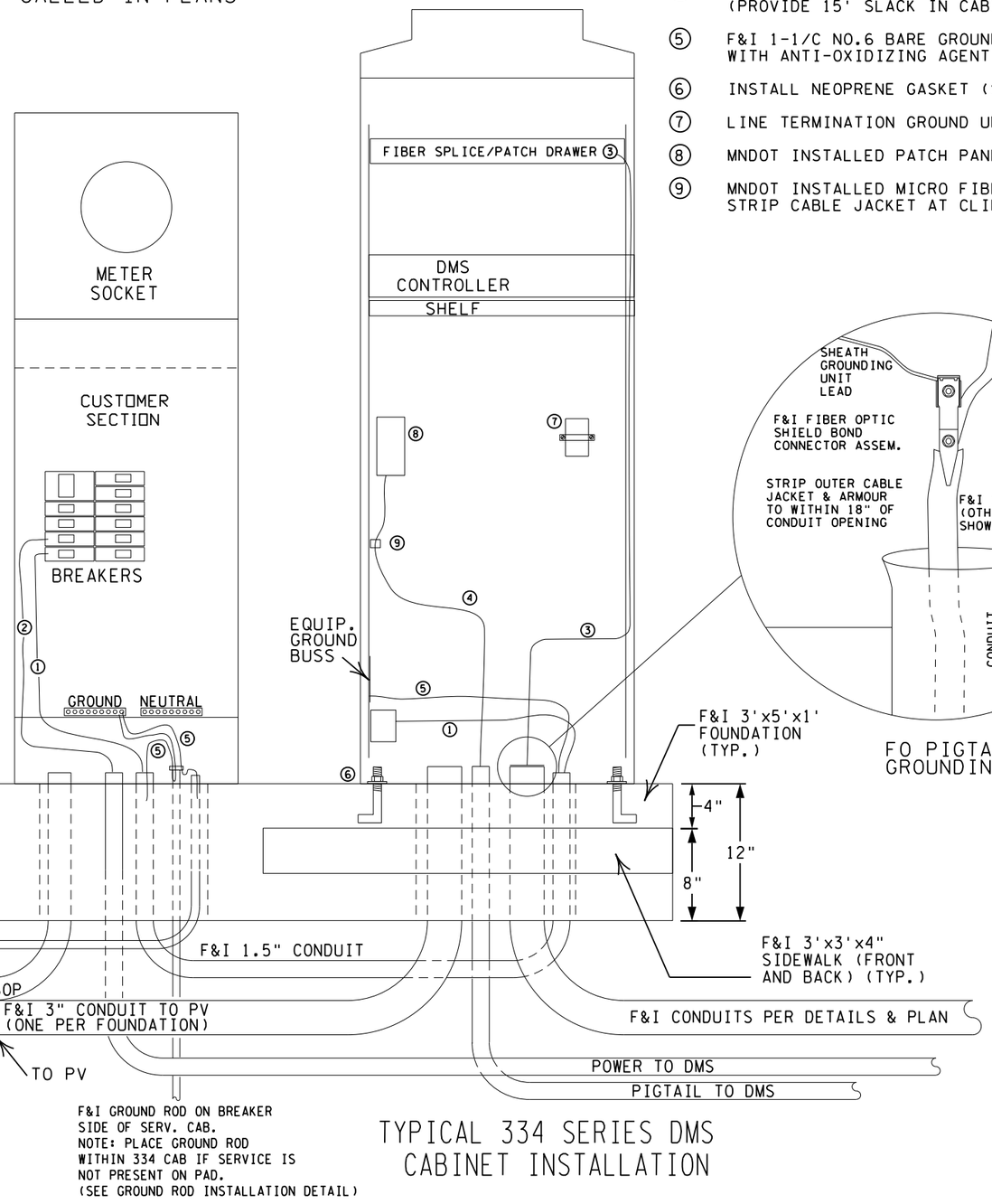
F&I SERVICE CABINET AS CALLED IN PLANS

INSTALL 334MP DMS CONTROL CABINET (MNDOT PROVIDED)



FRONT VIEW
NOT TO SCALE

TYPICAL 334 SERIES DMS CABINET INSTALLATION

① F&I POWER CABLE FROM SOURCE OF POWER-TERMINATE AT TERMINAL BLOCK

② F&I POWER CABLE TO DMS-TERMINATE AT EACH END

③ F&I 1-FO PIGTAIL-PLACE SLACK LOOP OF PIGTAIL CABLE WITHIN CABINET AGAINST SIDEWALL. CONNECT ARMOUR TO SHEATH GROUNDING UNIT-TERMINATE END & LAND IN PATCH PANEL

④ F&I MICRO FO PIGTAIL CABLE (6MM) TO DMS-(TERMINATE EACH END AT PATCH PANELS) (PROVIDE 15' SLACK IN CABINET & 25' SLACK IN SIGN)

⑤ F&I 1-1/C NO.6 BARE GROUND WIRE-COAT CONNECTION WITH ANTI-OXIDIZING AGENT

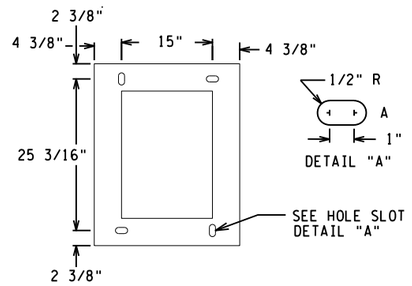
⑥ INSTALL NEOPRENE GASKET (SUPPLIED BY MNDOT)

⑦ LINE TERMINATION GROUND UNIT (LTU)

⑧ MNDOT INSTALLED PATCH PANEL

⑨ MNDOT INSTALLED MICRO FIBER GROUND CLIP-F&I MICRO PIGTAIL, STRIP CABLE JACKET AT CLIP & INSTALL THRU GROUND CLIP

FO PIGTAIL GROUNDING



CABINET GASKET DETAIL

REVISED 6/27/18

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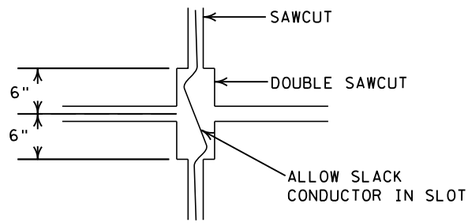
1. SAWCUT DETECTORS IN RAMPS & LOOPS ARE VARIABLE SIZED, AND INSTALLED IN THE CENTER OF THE LANE.
2. THE LOOP DETECTOR CONDUCTOR IS 1/C NO.14 COPPER, XLPE OR XHHW INSULATED WIRE. THE WIRE IS CONTAINED IN A FLEXIBLE POLYETHYLENE TUBING.
3. USE A SEALANT MADE SPECIFICALLY TO SEAL LOOP DETECTOR SAWCUTS IN CONCRETE ROADWAYS. USE AN APPROVED SEALANT IN BITUMINOUS ROADWAYS AND CONCRETE ROADWAYS THAT ARE TO BE OVERLAYED WITH BITUMINOUS.

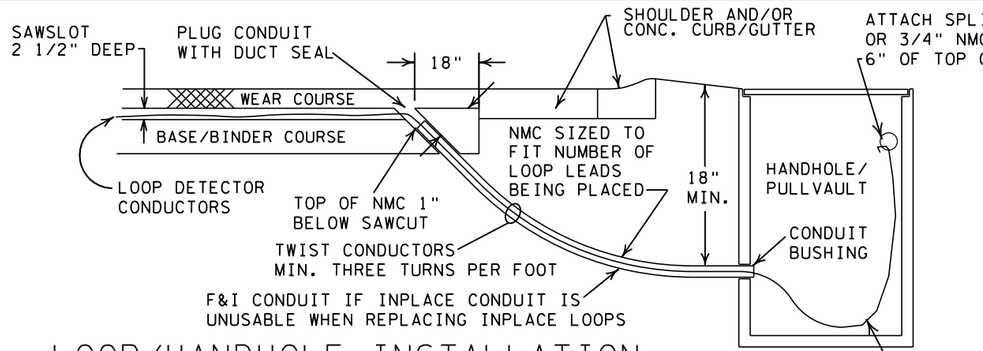
METHOD

4. CLEAN ALL DEBRIS FROM THE ENTIRE LOOP DETECTOR AREA.
5. MARK THE LOOP SAWCUTS ON THE ROADWAY. NOTE: LOCATE LOOPS IN PAVEMENT TO MINIMIZE THE CROSSING OF JOINTS AND CRACKS WITHIN THE PAVEMENT.
6. SAW THE CUT TO 2 1/2" +/- 1/4" DEEP BY 1/8" WIDER THAN THE "OD" OF THE CONDUCTOR. SMOOTH THE BOTTOM AND ANGLES TO PREVENT DAMAGE TO INSULATION.
7. REAM THE CONDUIT ENDS. PLUG THE CONDUIT IN THE ROADWAY TO PREVENT THE LOOP SEALANT FROM ENTERING THE CONDUIT.
8. DRILL THE CORNERS 1/4" DEEPER THAN THE SAW SLOT AND SMOOTH THE HOLE CORNERS.
9. CLEAN AND DRY THE ENTIRE LOOP DETECTOR AREA.
10. F&I BEAD OF LOOP DETECTOR SEALANT TO WITHIN 6" OF LOOP CONDUCTORS CONDUIT. PLACE CLEAN, DRY LOOP CONDUCTOR STAYING TO THE OUTSIDE OF THE CORNERS. DO NOT PLACE THE CONDUCTOR TIGHT. PUSH THE CONDUCTORS TO THE BOTTOM OF THE SAWSLOT WITH A BLUNT TOOL.
11. PLACE 3/4" DIAMETER BY 2" FOAM BACKER ROD AT 2.0' INTERVALS TO HOLD THE CONDUCTOR AT THE BOTTOM OF THE SAWCUT. PLACE LOOP SEALANT.
12. F&I CONDUCTOR PER JOINT/CRACK DETAIL EACH TIME A JOINT OR PAVEMENT CRACK IS CROSSED.
13. TWIST THE CONDUCTORS 3 TURNS PER FOOT IN THE CONDUIT FROM THE ROADWAY TO THE SPLICE WITHIN THE HANDHOLE.
14. SOLDER THE LOOP CONDUCTOR TO LEAD-IN LEAVING THE JOINTS STAGGERED. ROUGHEN CABLE JACKET WITH SANDPAPER. PLACE IT INTO SPLICE ENCAPSULATOR WITH A PLASTIC TUBE AND END CAPS THAT FUNCTION AS SPOUTS. USE A TWO PART INSULATING RESIN, CONFINED IN A UNIPAK, THAT TURNS BLACK WHEN MIXED AND BECOMES HARD WHEN CURED. F&I BOTH LOOP CONDUCTORS AND LEAD-IN WIRE INTO THE SAME END OF THE TUBE AND ENCAPSULATE THE SPLICE.
15. SAWCUTS SHALL REMAIN 2.0' FROM OTHER SAWCUTS.
16. FILL SAW SLOT UNIFORMLY ACCORDING TO THE LOOP SEALANT MANUFACTURERS RECOMMENDED DEPTH. WIPE ALL EXCESS SEALANT MATERIAL FROM THE ROADWAY SURFACE.

NOTE: ALL SAWCUT LOOP DETECTORS SHALL HAVE 4 TURNS

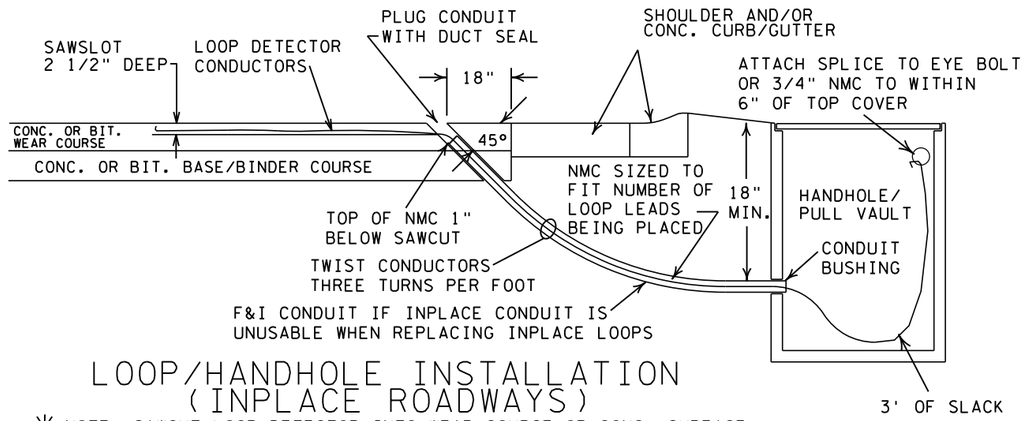


JOINT/CRACK INSTALLATION



LOOP/HANDHOLE INSTALLATION (MILL & OVERLAY CONSTRUCTION)

✳ NOTE: SAWCUT LOOP DETECTOR BETWEEN BINDER AND WEAR COURSES



LOOP/HANDHOLE INSTALLATION (INPLACE ROADWAYS)

✳ NOTE: SAWCUT LOOP DETECTOR INTO WEAR COURSE OR CONC. SURFACE

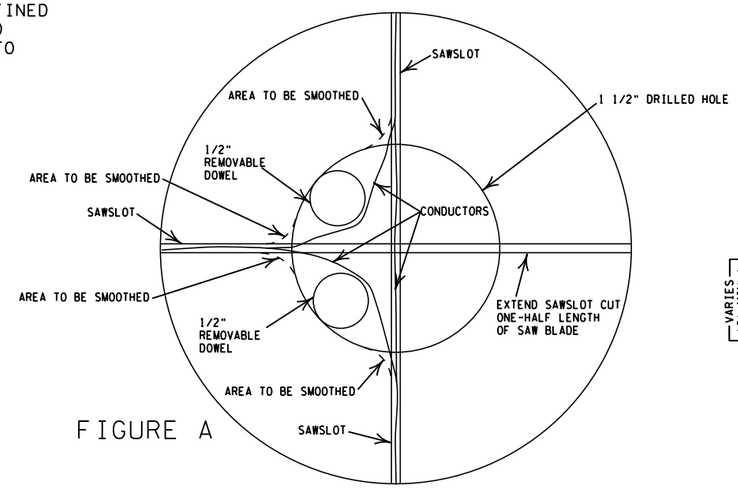
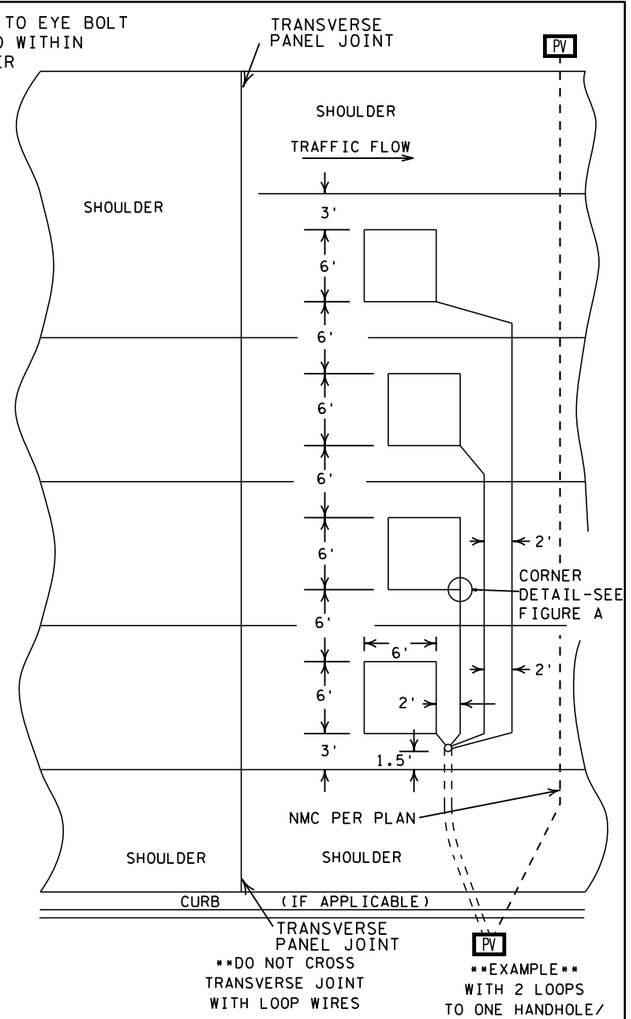


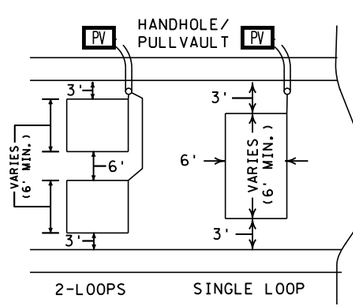
FIGURE A

DRILL SAWCUT CORNERS

NOTE: LOOP LEADS SHALL NOT CROSS TRANSVERSE JOINTS IN CONCRETE PAVEMENT. MOVE A LOOP TO THE NEXT PANEL AND F&I A SEPARATE CONDUIT TO THE HH IF ALL LOOPS WILL NOT FIT ONE PANEL AND MAINTAIN SEPARATIONS SHOWN

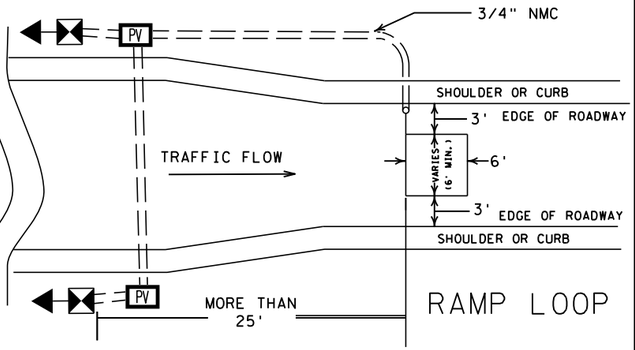


MAINLINE DETECTORS



QUEUE LOOPS

(NOT TO SCALE)



RAMP LOOP

TMS SAWCUT LOOP DETECTOR TYPICAL - PART ONE

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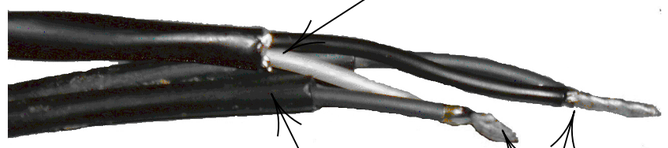
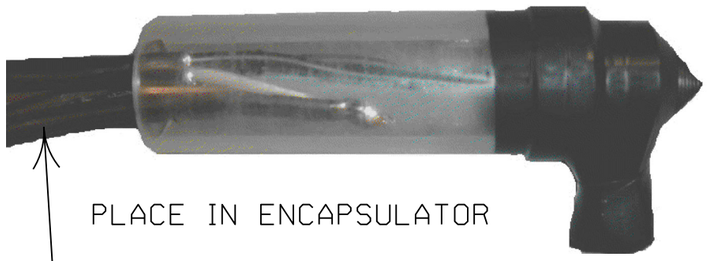
CUT & REMOVE DRAIN WIRE



ROUGHEN 5" OF CABLE JACKET WITH SANDPAPER

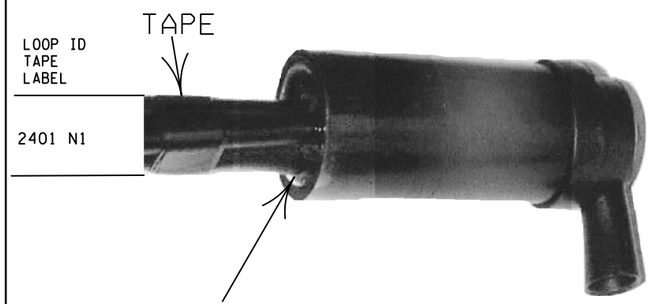
STAGGER SOLDERED BUTT SPLICE



PLACE IN ENCAPSULATOR

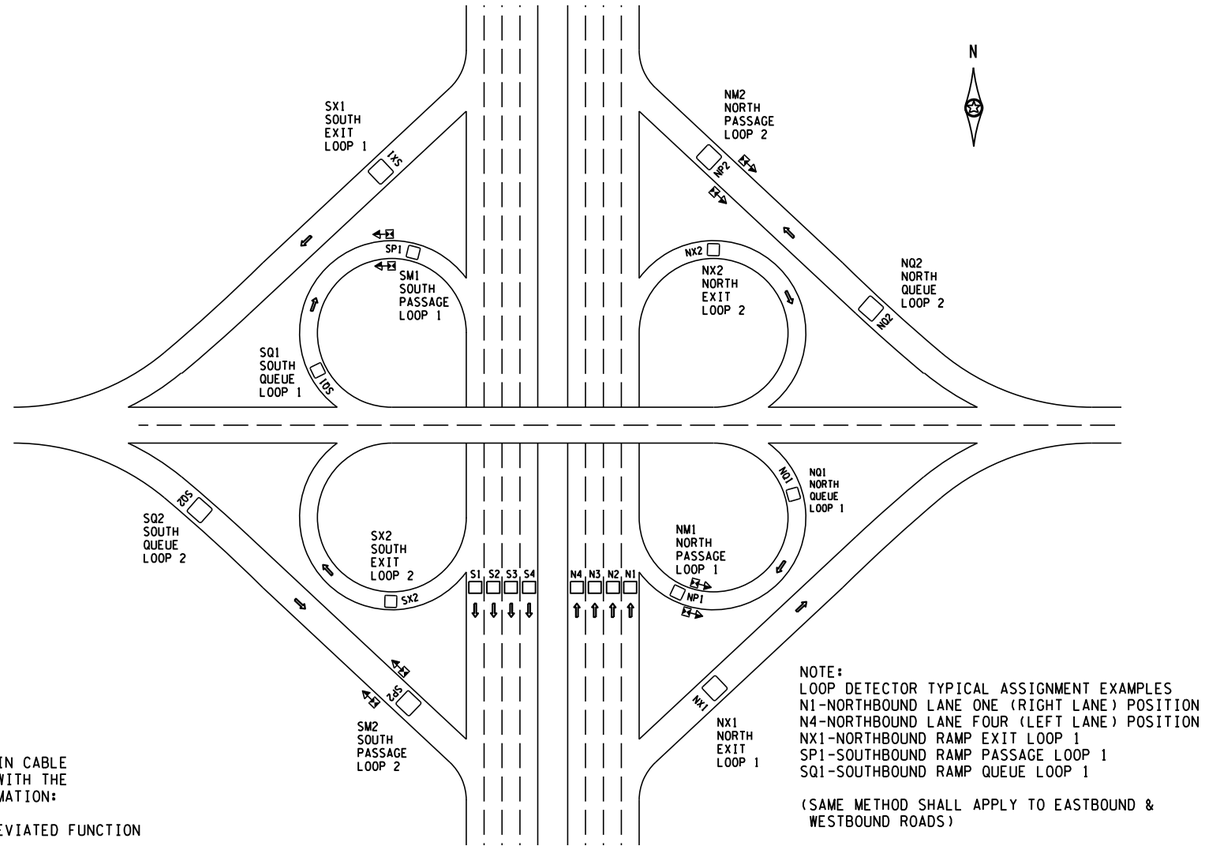
TAPE WIRE TOGETHER BEFORE SPLICE

PLACE WIRE NUT IN ONE END TO BLOCK OPENING



FILL ENCAPSULATOR COMPLETELY-ALLOW FINISHED SPLICE TO CURE SO EPOXY DOES NOT RUN OUT

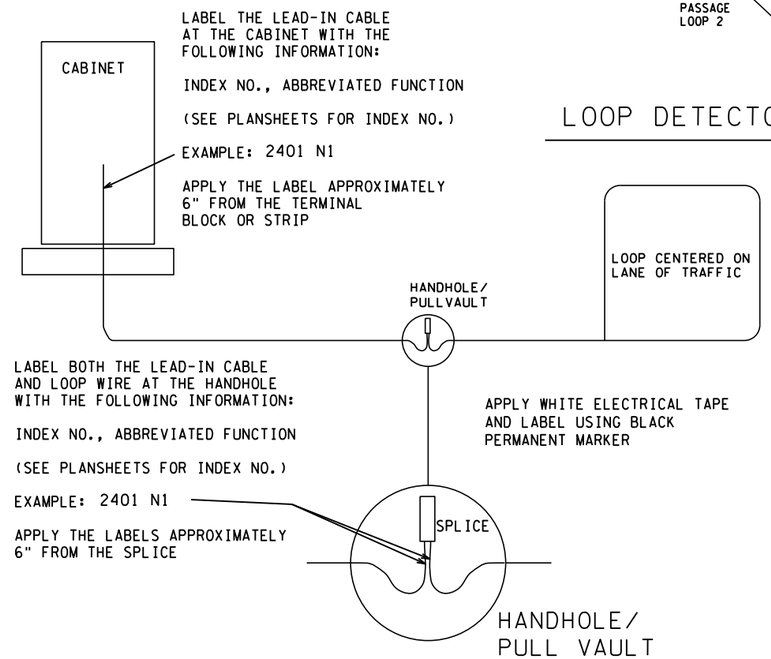
LOOP DETECTOR SPLICE FOR SAWCUT AND PREFORMED LOOPS



NOTE:
LOOP DETECTOR TYPICAL ASSIGNMENT EXAMPLES
N1-NORTHBOUND LANE ONE (RIGHT LANE) POSITION
N4-NORTHBOUND LANE FOUR (LEFT LANE) POSITION
NX1-NORTHBOUND RAMP EXIT LOOP 1
SP1-SOUTHBOUND RAMP PASSAGE LOOP 1
SQ1-SOUTHBOUND RAMP QUEUE LOOP 1

(SAME METHOD SHALL APPLY TO EASTBOUND & WESTBOUND ROADS)

LOOP DETECTOR FUNCTION DESIGNATIONS



LOOP DETECTOR CABLE LABELING

REVISED 6/27/18

TMS LOOP DETECTOR TYPICAL - PART TWO

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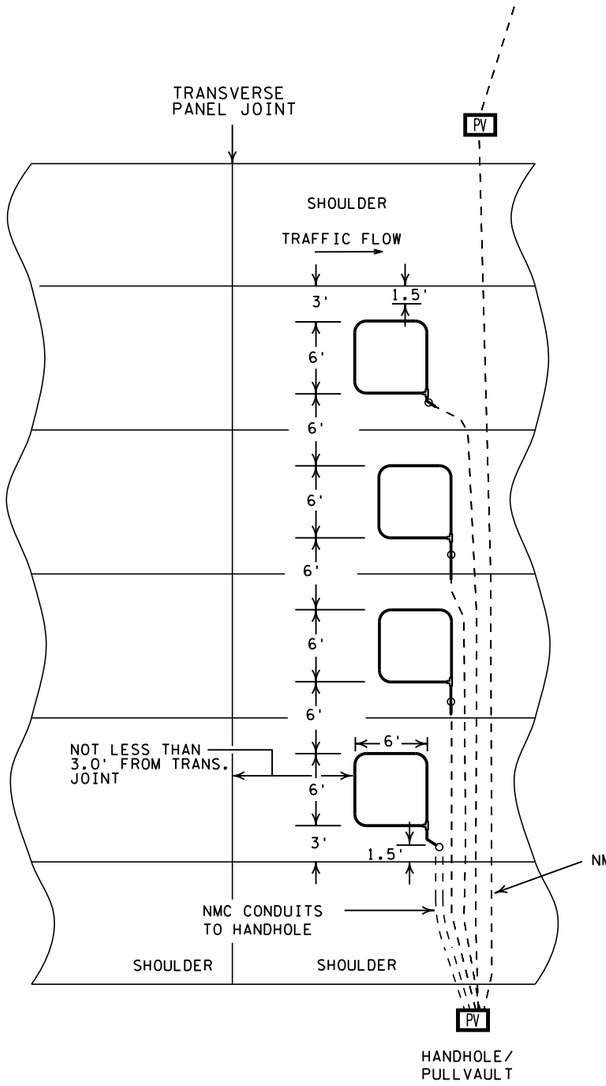
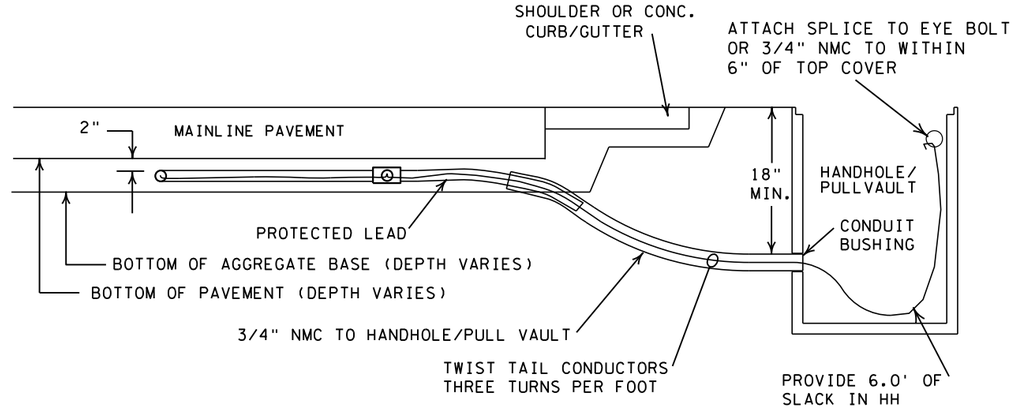
GENERAL NOTES:

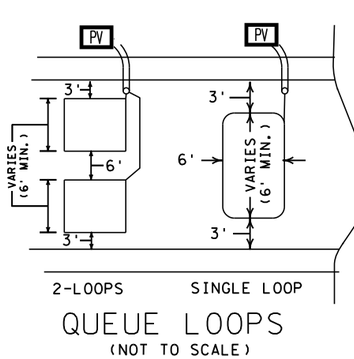
1. SEE SPECIAL PROVISIONS FOR REQUIRED LOOP DETECTOR AND CONDUCTOR SPLICE KIT REQUIREMENTS.
2. PREFORMED LOOP DETECTORS ARE VARIABLE SIZED DEPENDING ON ROADWAY LOCATION AND SHALL BE PLACED IN THE CENTER OF THE LANE. PAVEMENT JOINTS FOR CONCRETE PAVING SHALL BE ESTABLISHED BEFORE LOOP PLACEMENT TO MAINTAIN A MIN. OF 3.0' FROM DOWEL BASKET PLACEMENT
3. THE PROTECTED LEAD PORTION OF LOOP SHALL EXTEND FROM THE TEE CONNECTOR, ENDING A MIN. OF 1.0' INSIDE THE NMC CONDUIT
4. THE LOOP DETECTOR CONDUCTORS SHALL BE TWISTED THREE TURNS PER FOOT FROM THE NMC TEE CONNECTOR TO THE HANDHOLE.
5. EACH LOOP DETECTOR CONDUIT TO THE HANDHOLE SHALL BE SLOPED TOWARDS THE HANDHOLE UNDER THE SHOULDER AND/OR CONC. CURB.
6. THE LOOP DETECTOR CONDUCTORS SHALL END IN THE HANDHOLE.
7. NO SPLICES ALLOWED IN LOOP CONDUCTOR EXCEPT AT HANDHOLE
8. SEE SPECIAL PROVISIONS FOR TESTING REQUIREMENTS OF LOOP DETECTORS
9. THE LOOP DETECTOR CONDUCTORS AND THE LOOP DETECTOR LEAD-IN CABLE CONDUCTORS SHALL BE PROPERLY PREPARED AND CLEANED BEFORE SPLICING. SOLDER THE LOOP CONDUCTOR TO LEAD-IN CONDUCTORS, THEN PLACE IT INTO THE SPLICE ENCAPSULATOR
10. PLACE THE SPLICE IN A PLASTIC TUBE WITH END CAPS THAT FUNCTION AS SPOUTS. USE A TWO PART INSULATING RESIN, CONFINED IN A UNIPAK, THAT TURNS BLACK WHEN MIXED AND BECOMES HARD WHEN CURED. INSTALL BOTH LOOP CONDUCTORS AND LEAD-IN INTO THE SAME END OF THE TUBE AND ENCAPSULATE THE SPLICE.
11. THE LOOP INSULATION RESISTANCE READING MUST BE GREATER THAN 100 MEG OHM.



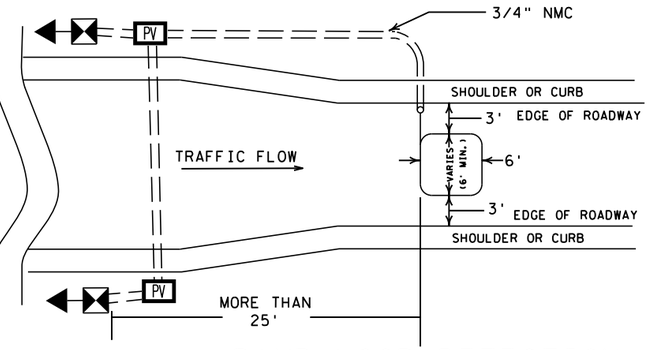
MAINLINE DETECTORS



CONDUIT/PULL VAULT INSTALLATION

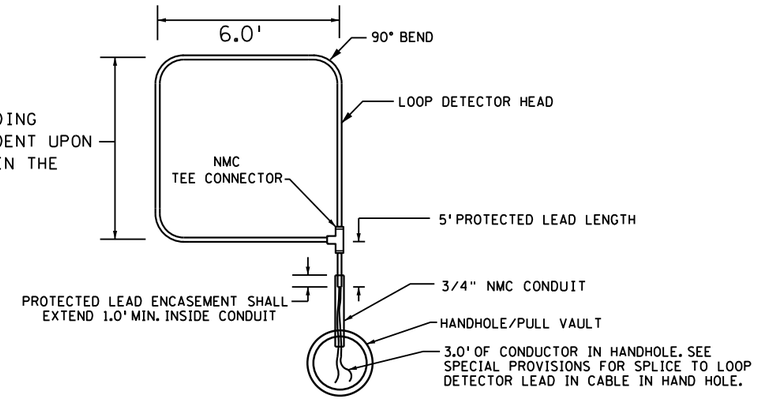


QUEUE LOOPS
(NOT TO SCALE)



RAMP LOOP DETECTION

THIS DIMENSION VARIES ACCORDING TO DETECTOR SIZE & IS DEPENDENT UPON THE DETECTORS LOCATION WITHIN THE ROADWAY, RAMP, OR LOOP



TYPICAL PREFORMED LOOP DETECTOR DETAIL

TMS "PREFORMED" LOOP DETECTOR - PART ONE

REVISED 6/27/18

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	/ /

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CCTV POLE INSTALLATION DETAIL

CAMERA INSTALLATION (BY OTHERS)

7/16" BRAIDED GROUND CONDUCTOR (32 STRAND, 17 GA TINNED COPPER)

SECURE GROUND BRAID TO POLE AT ALL LOCATIONS WITH A PLATED PARALLEL CONNECTOR CASTING WITH 1/2" CLEARANCE HOLE

GREASE HINGE

F&I MULE TAPE OR INSTALL CCTV CABLES THROUGH BOTH UPPER AND LOWER CABLE GUIDES AT HINGE POINT FROM TOP OF POLE TO CCTV CABINET

USE ANTI-SEIZE COMPOUND ON ALL THREADS (PASTE TYPE)

KEEP EXCESS CONDUCTOR TO A MINIMUM USING SHORTEST ROUTE TO GROUND ROD

SEE POLE MOUNTED CCTV CABINET DETAIL FOR CONDUIT ROUTING TO CCTV CABINET

EXOTHERMICALLY WELD OR MECHANICALLY CLAMP CONTINUOUS NO.6 AWG WIRE FROM POLE MOUNTED CABINET GROUND BUSS THRU POLE GROUND LUG AND CCTV POLE GROUND BRAID TO GROUND ROD LOCATED NEXT TO FOUNDATION (SEE GROUND ROD INSTALLATION DETAIL)

F&I RODENT PROTECTION PLATE AT BASE OF POLE

4"

F&I 3.0' X 3.0' X 4" SIDEWALK UNDER CRANK OPENING

TOP OF GRADE

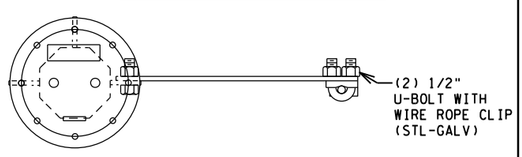
F&I 3.0' X 3.0' X 4" SIDEWALK UNDER POLE CABINET

CENTER CONDUIT IN FOUNDATION TO MATCH RODENT PROTECTION PLATE OPENING

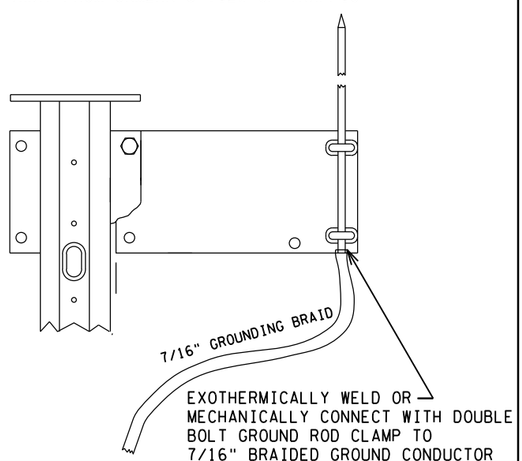
2" NMC TO PULL VAULT-CAP END WITHIN POLE. (FOR FUTURE USE)

POSITION SIDEWALKS 4" BELOW TOP OF CCTV FOUNDATION, BACK FILL AS NEEDED TO CREATE A SMOOTH TRANSITION FROM INPLACE GRADE TO SIDEWALKS

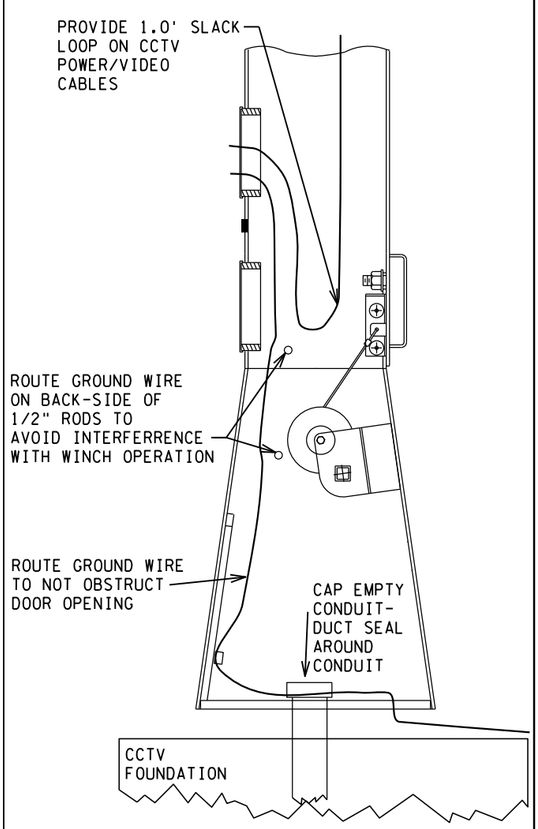
LIGHTNING ROD DETAIL



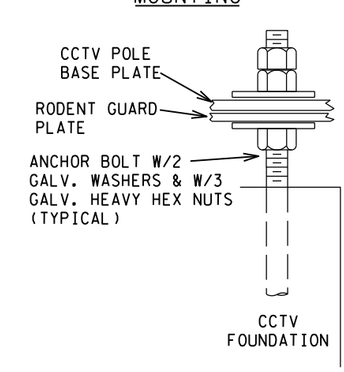
POSITION LIGHTNING ROD ASSEMBLY 90 DEGREES AWAY FROM HIGHWAY CENTERLINE, AWAY FROM CAMERA'S VIEW OF TRAFFIC

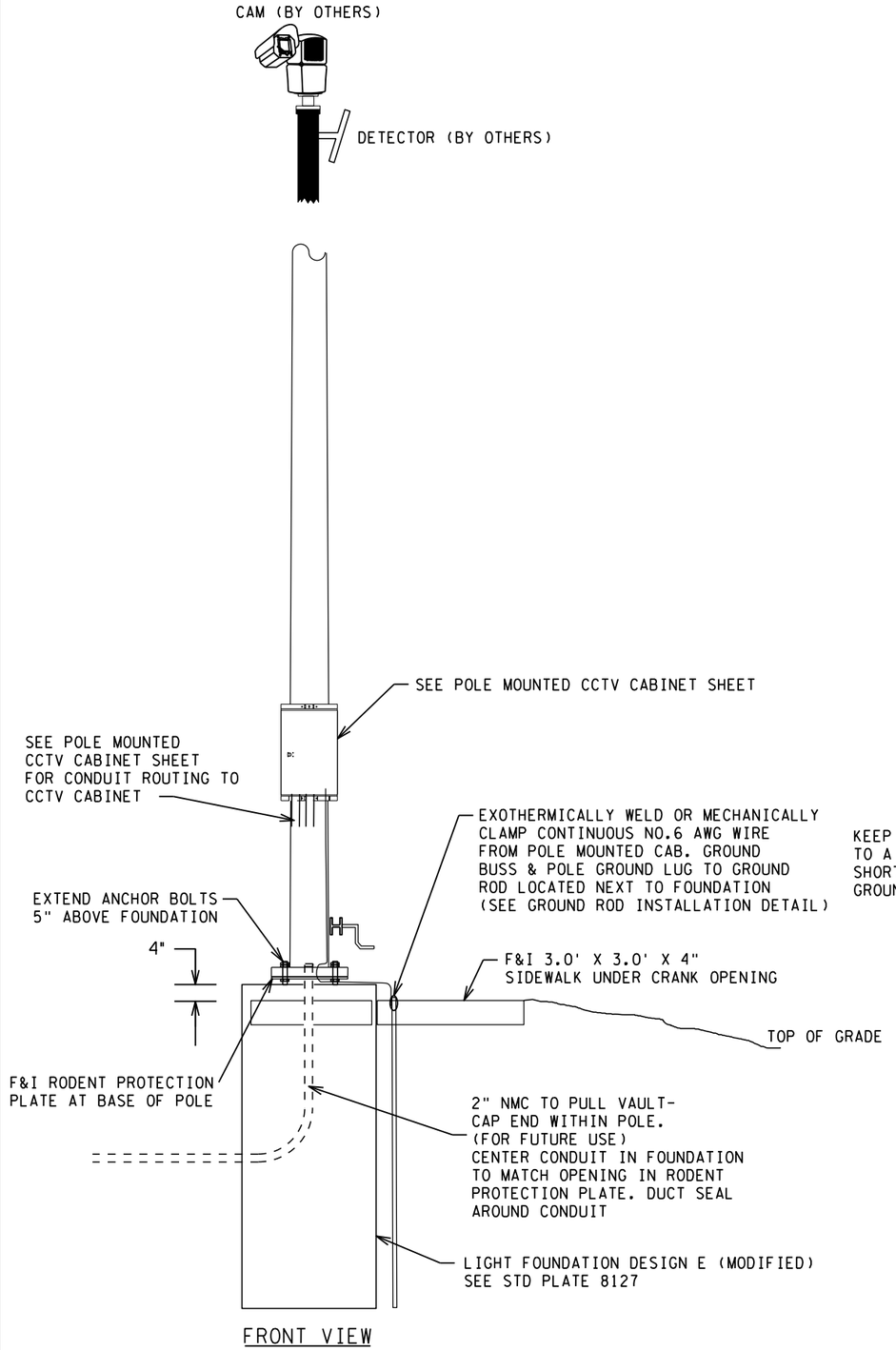


CABLE ROUTING DETAIL

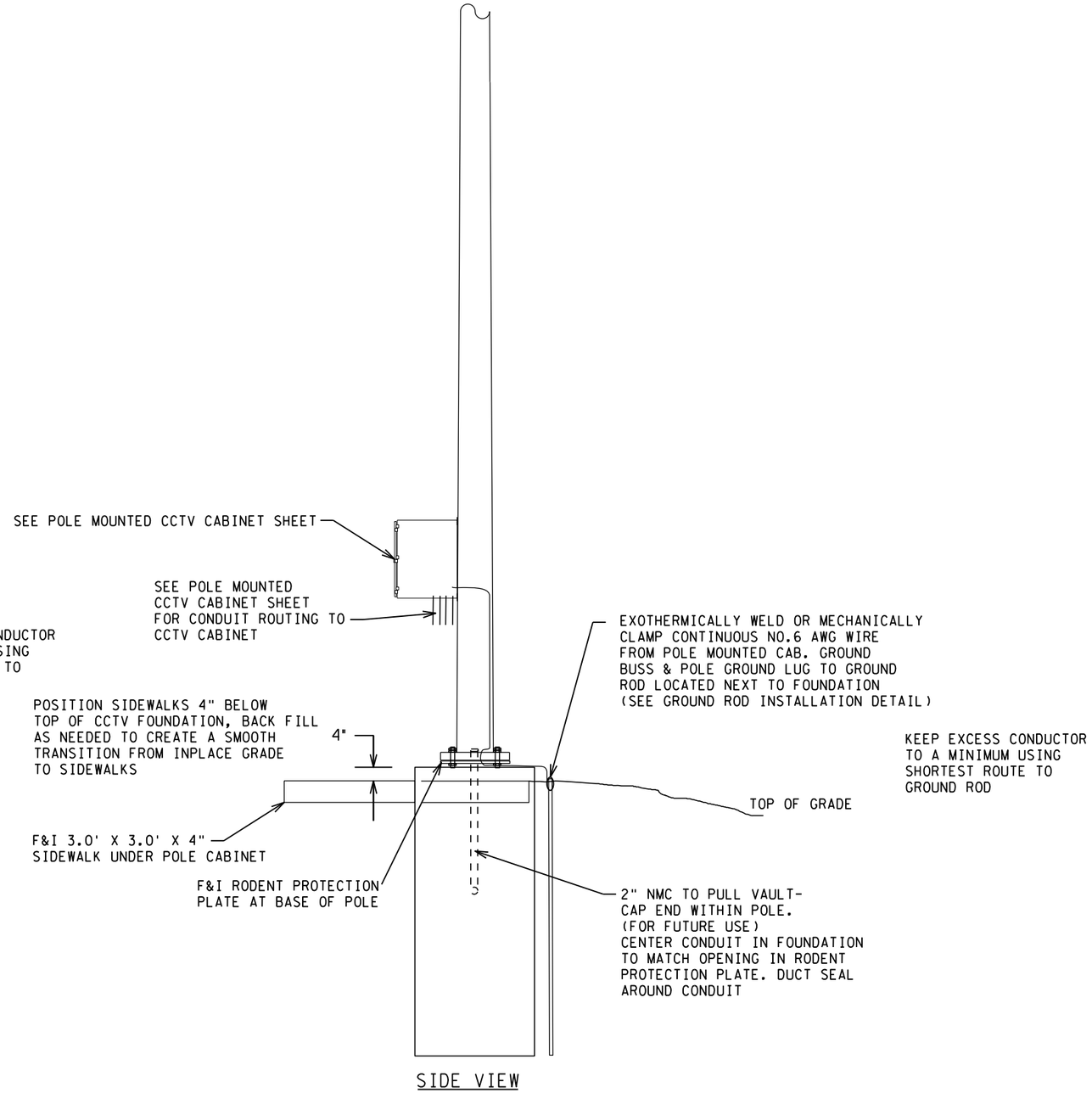


ANCHOR BOLT MOUNTING





FRONT VIEW



SIDE VIEW

NON-INTRUSIVE DETECTION POLE INSTALLATION DETAIL

REVISED 1/04/21

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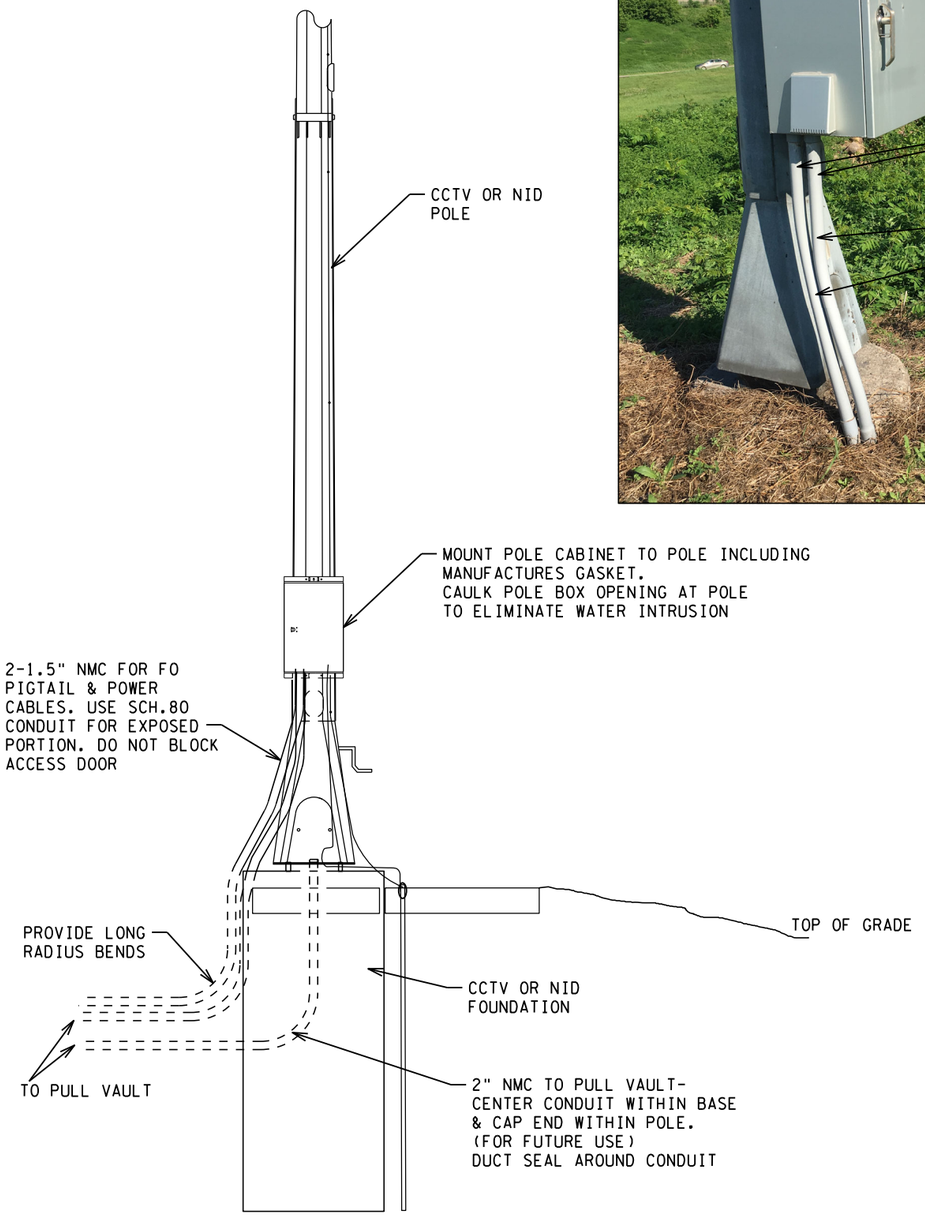
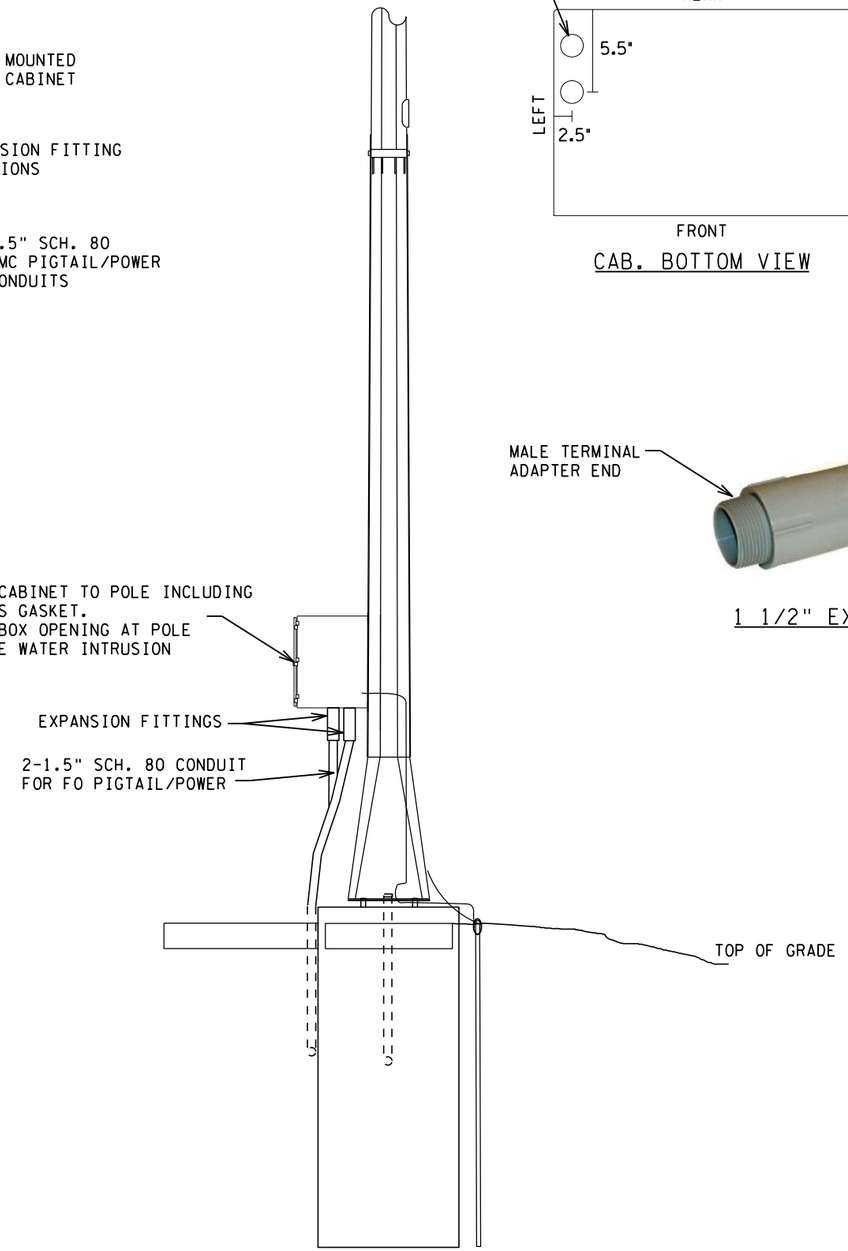
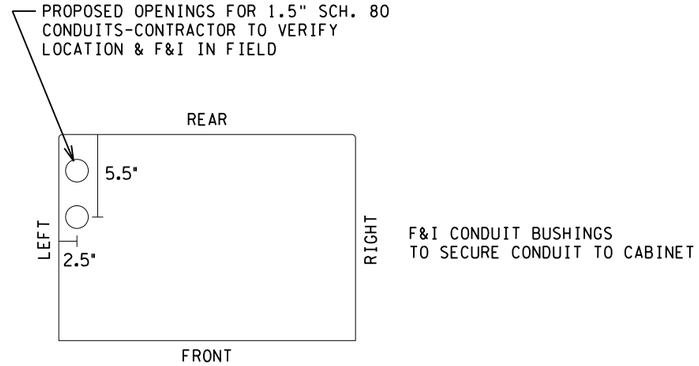
CAM (BY OTHERS)



FRONT VIEW



SIDE VIEW



CAB. BOTTOM VIEW

1 1/2" EXPANSION FITTING

REVISED 1/04/21

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LICENSED PROFESSIONAL ENGINEER

STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 30 OF 54 SHEETS

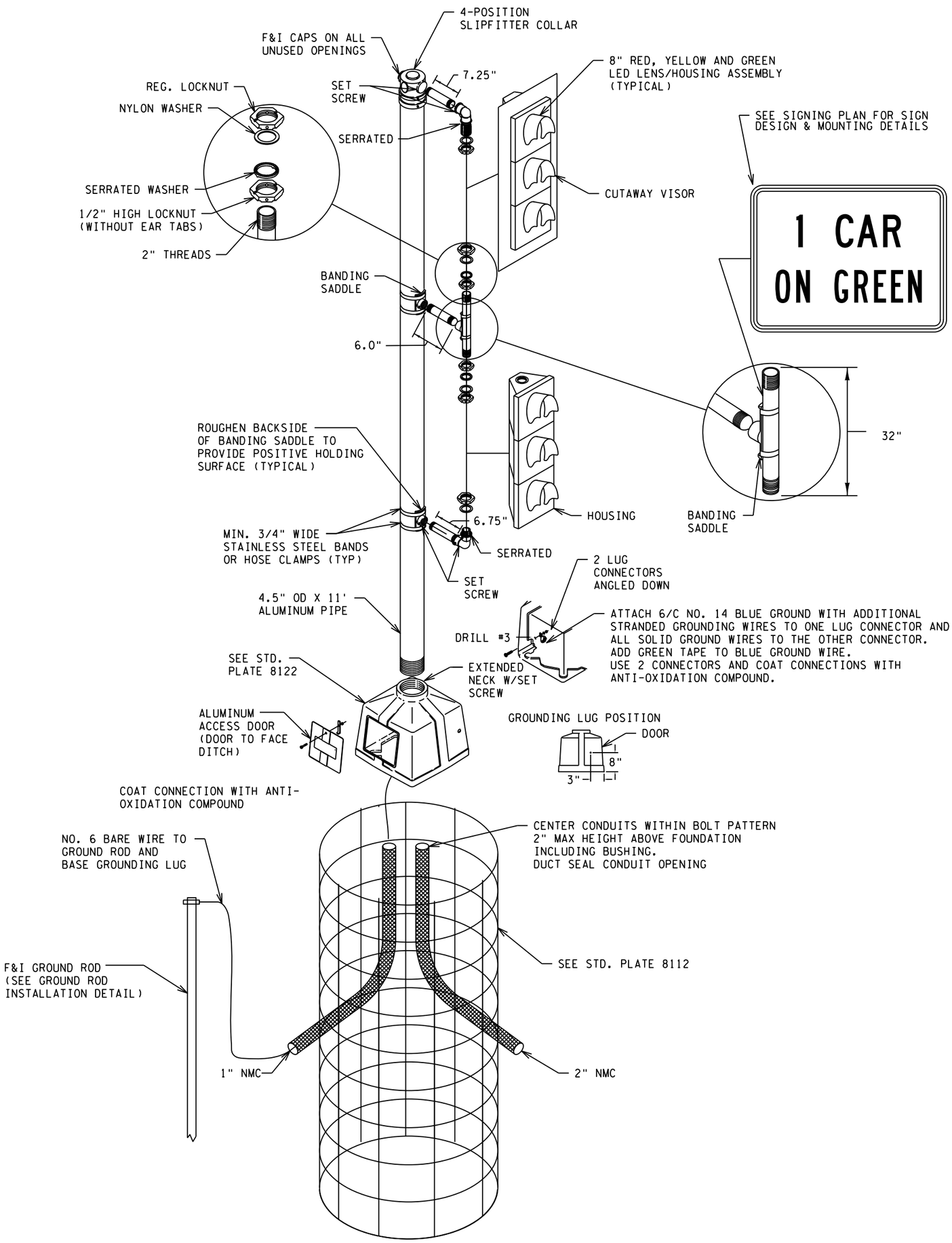
POLE MOUNTED CCTV CABINET AT
CCTV POLE OR NON-INTRUSIVE DETECTION POLE

REVISED 3/17/21

REV. NO.	DATE:
	/ /

CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER LIC.NO. _____ DATE _____ 2021

STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 31 OF 54 SHEETS

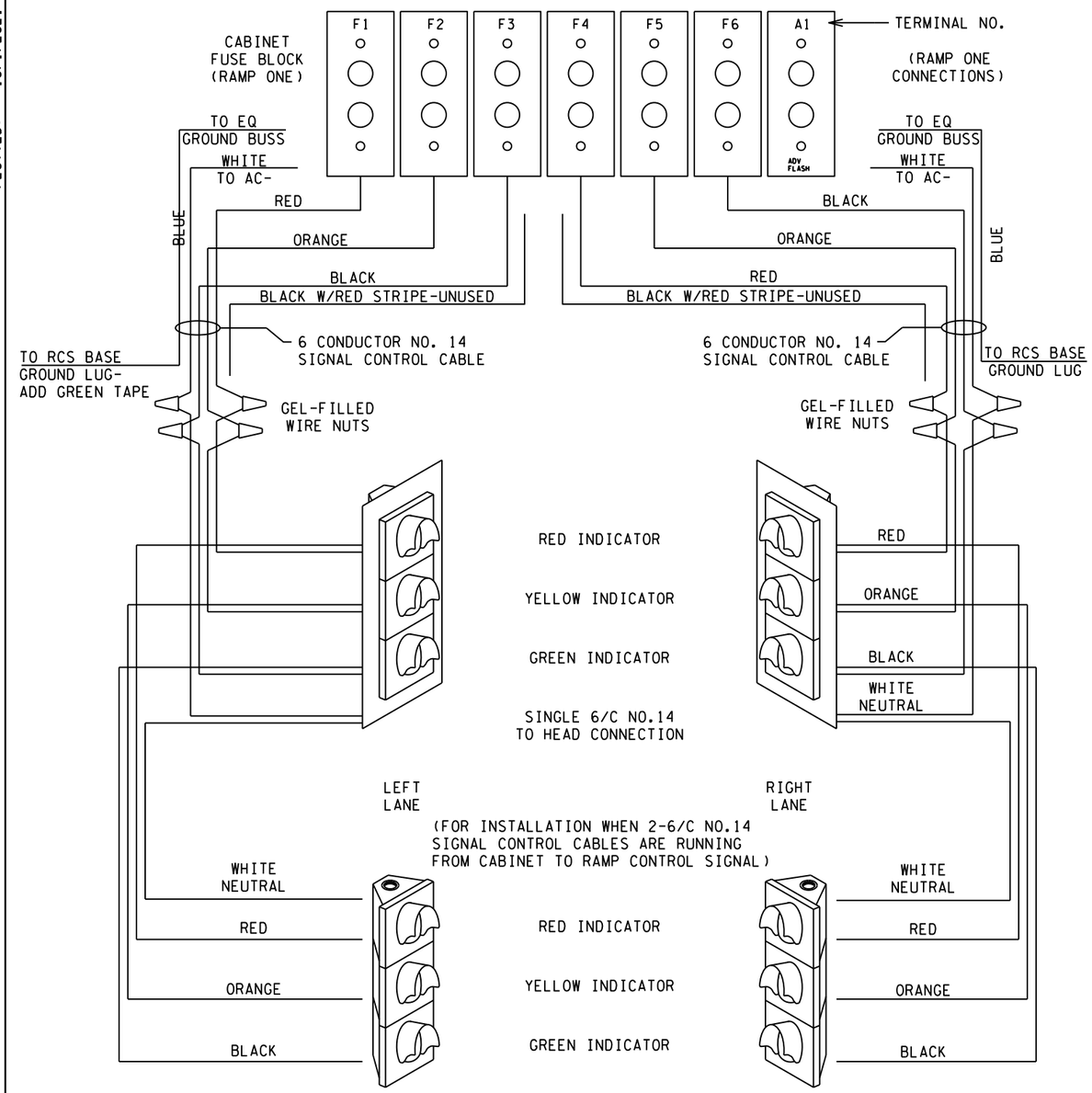


ONE-WAY RAMP CONTROL SIGNAL DETAIL

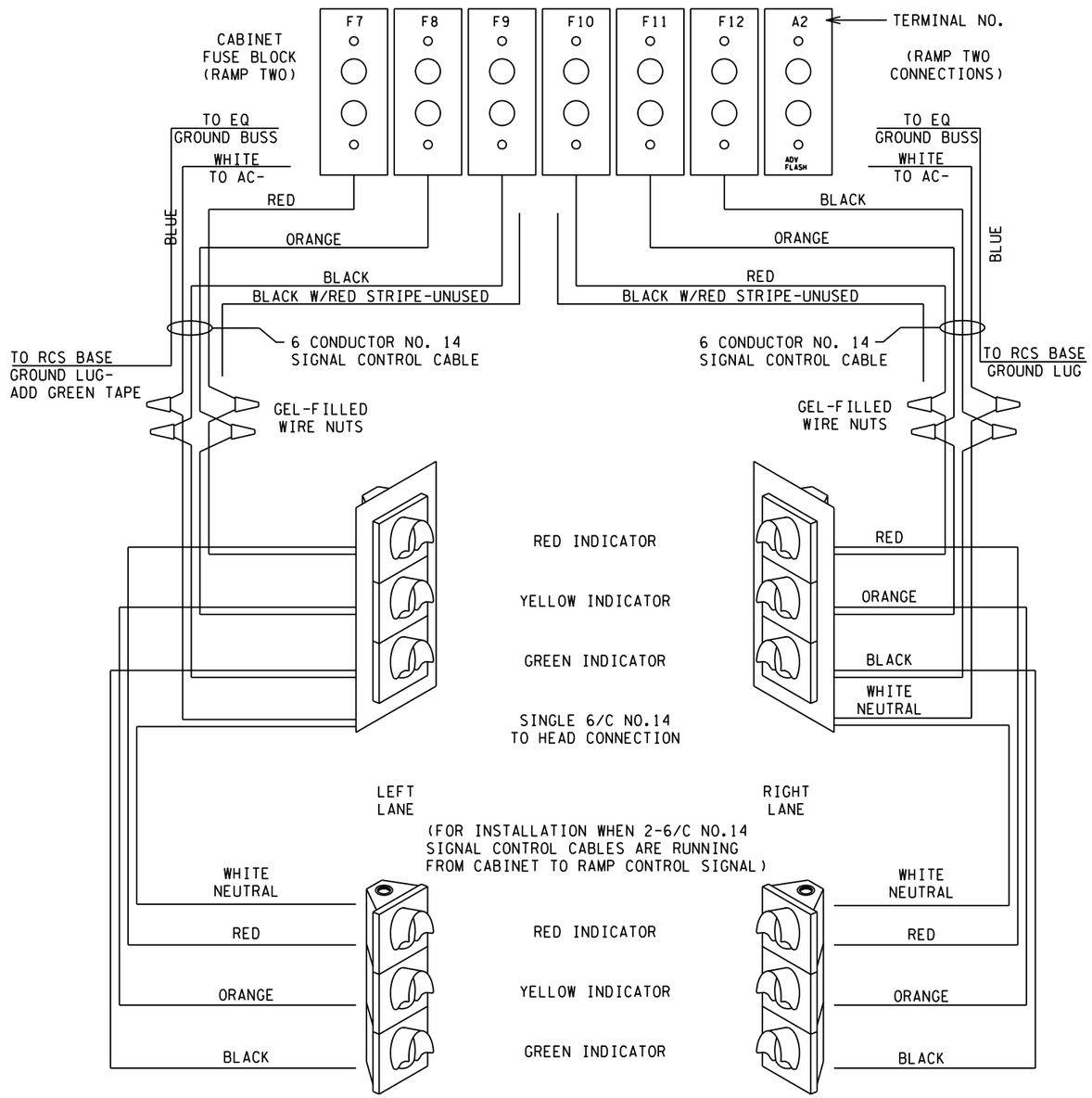
NOTES:

1. ALL METAL FITTINGS SHALL BE ANODIZED ALUMINUM.
2. USE ANTI-SEIZE COMPOUND ON ALL THREADED CONNECTIONS AND SETSCREWS.
3. TURN BOTTOM SIGNAL HEAD AT A 45 DEGREE ANGLE TOWARD RAMP.
4. NO BACKGROUND SHIELD ON LOWER HEADS.
5. SIGNAL HEAD MOUNTING BRACKET PIPES SHALL BE 1.5" ALUMINUM. THREAD 2.0" MIN. ON EACH END.
6. PLACE RAMP METERS 5.0' BEHIND CURB OR DRIVING SURFACE TO CENTER OF FOUNDATION.
7. F&I PEDESTAL BASE ACCESS DOOR TO DITCH SIDE OF ROADWAY.
8. DO NOT USE BARRIER STYLE TERMINALS IN RAMP CONTROL SIGNAL BASE.
9. TERMINATE 6/C NO.14 WIRING INTO GEL-FILLED WIRE NUTS IN PEDESTAL BASE.
10. SIGNAL HEADS SHALL BE YELLOW POLYCARBONATE WITH BLACK POLYCARBONATE BACKGROUND SHIELD.
11. IF SIGNAL HAS LEGACY 1-5/C NO.12 FROM CABINET TO PEDESTAL BASE SIGNAL HEADS SHALL BE CONNECTED BY WIRING IN PARALLEL (DAISY CHAINING) BETWEEN SIGNAL HEAD TERMINALS AND RUNNING A SINGLE WIRE HARNESS TO THE PEDESTAL BASE.
12. IF SIGNAL HAS LEGACY 2-5/C NO.12 OR 1-12/C NO.12 FROM CABINET TO THE PEDESTAL BASE TWO WIRE HARNESSES SHALL BE RUN FROM THE SIGNAL HEADS TO THE BASE AND EACH HARNESS CONNECTED TO THE INDIVIDUAL WIRES USING THE ABOVE CONNECTORS.
13. SIGNAL HEAD MOUNTING LOCKNUTS SHALL BE STANDARD SIGNAL MOUNTING HARDWARE USING STANDARD ROGER/SPANNER WRENCH.

RAMP ONE



RAMP TWO



CONNECTION NOTES:

RAMPS/LOOPS TO A SOUTHBOUND OR EASTBOUND DIRECTION OF TRAVEL SHALL BE CONNECTED AS RAMP ONE.-IF BOTH A SOUTHBOUND AND EASTBOUND RAMP & LOOP, OR A RAMP AND LOOP TO THE SAME DIRECTION OF TRAVEL CONNECT TO THE SAME CABINET, THE LOOP SHALL BE CONNECTED AS RAMP ONE.

RAMPS/LOOPS TO A NORTHBOUND OR WESTBOUND DIRECTION OF TRAVEL SHALL BE CONNECTED AS RAMP TWO.-IF BOTH A NORTHBOUND AND WESTBOUND RAMP & LOOP, OR A RAMP AND LOOP TO THE SAME DIRECTION OF TRAVEL CONNECT TO THE SAME CABINET, THE LOOP SHALL BE CONNECTED AS RAMP ONE.

NOTES:

1. WIRING SHOWN APPLIES TO 334Z, 334Z-94, 334Z-99, 334Z-2000, 334Z-2005, & 334Z-14 STYLE CABINETS ONLY.

RAMP CONTROL SIGNAL CONTROL CABLE TERMINATION GUIDE

REVISED 6/27/18

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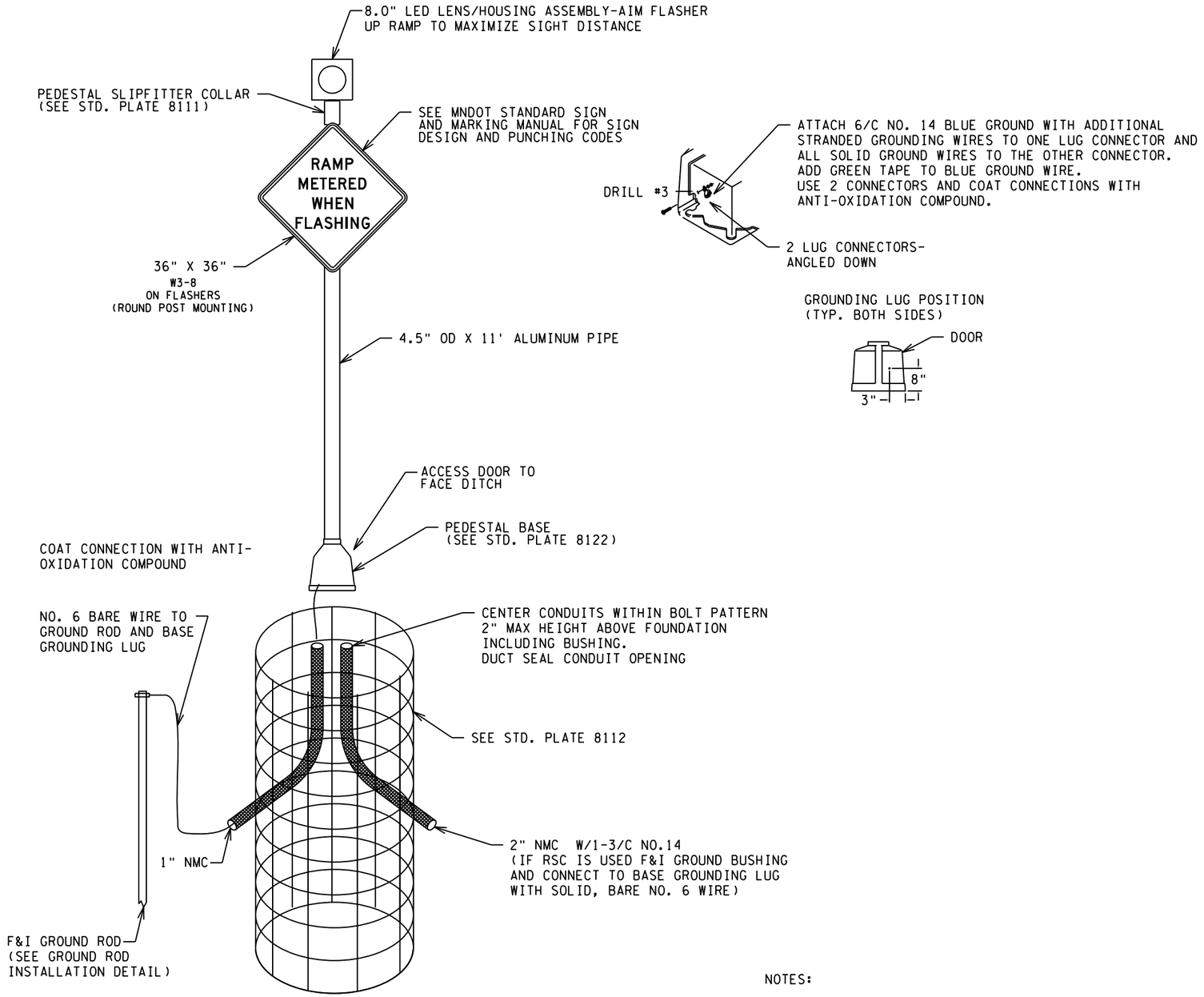

FLASHER DETAIL

NOTES:

1. ALL METAL FITTINGS SHALL BE ANODIZED ALUMINUM.
2. USE ANTI-SEIZE COMPOUND ON ALL FITTINGS.
3. PLACE FLASHER 5.0' BEHIND CURB OR DRIVING SURFACE.

FLASHER SIGNAL DETAIL

REVISED 12/29/20

REV. NO.	DATE: / /
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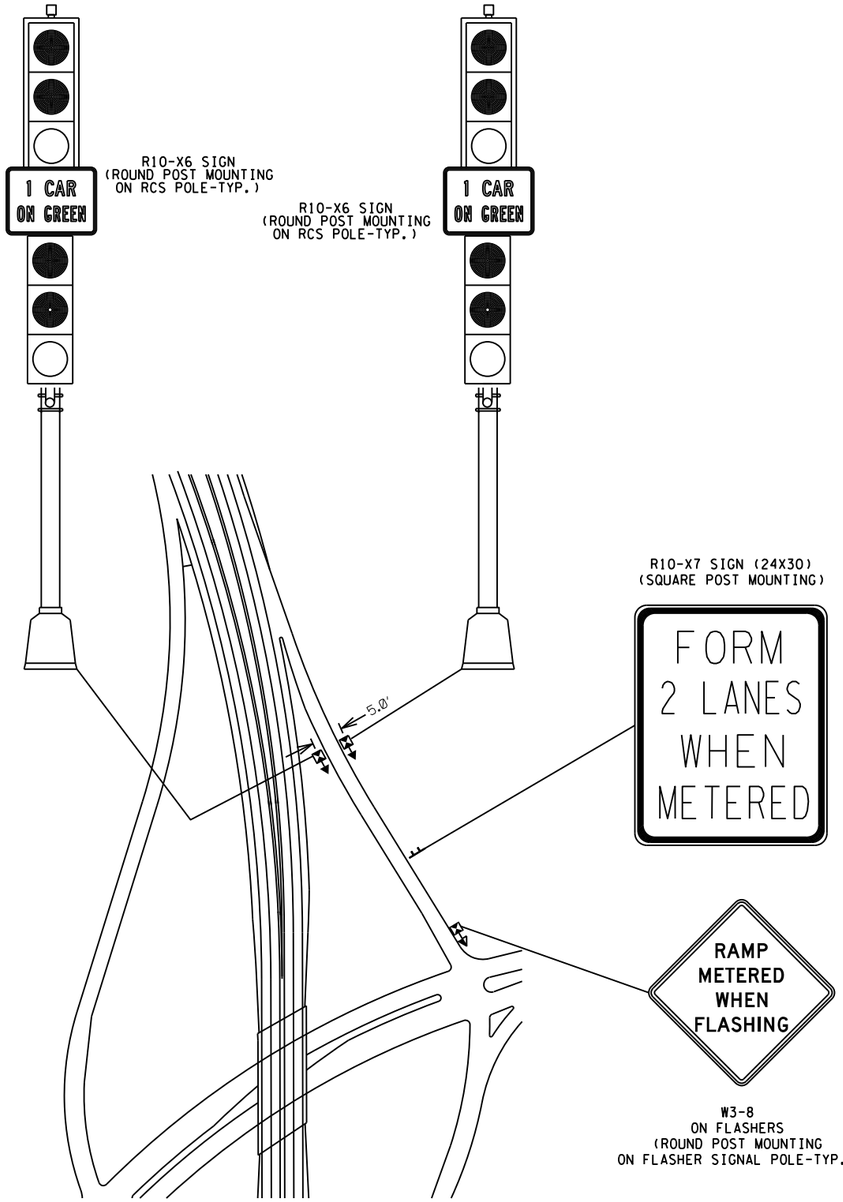
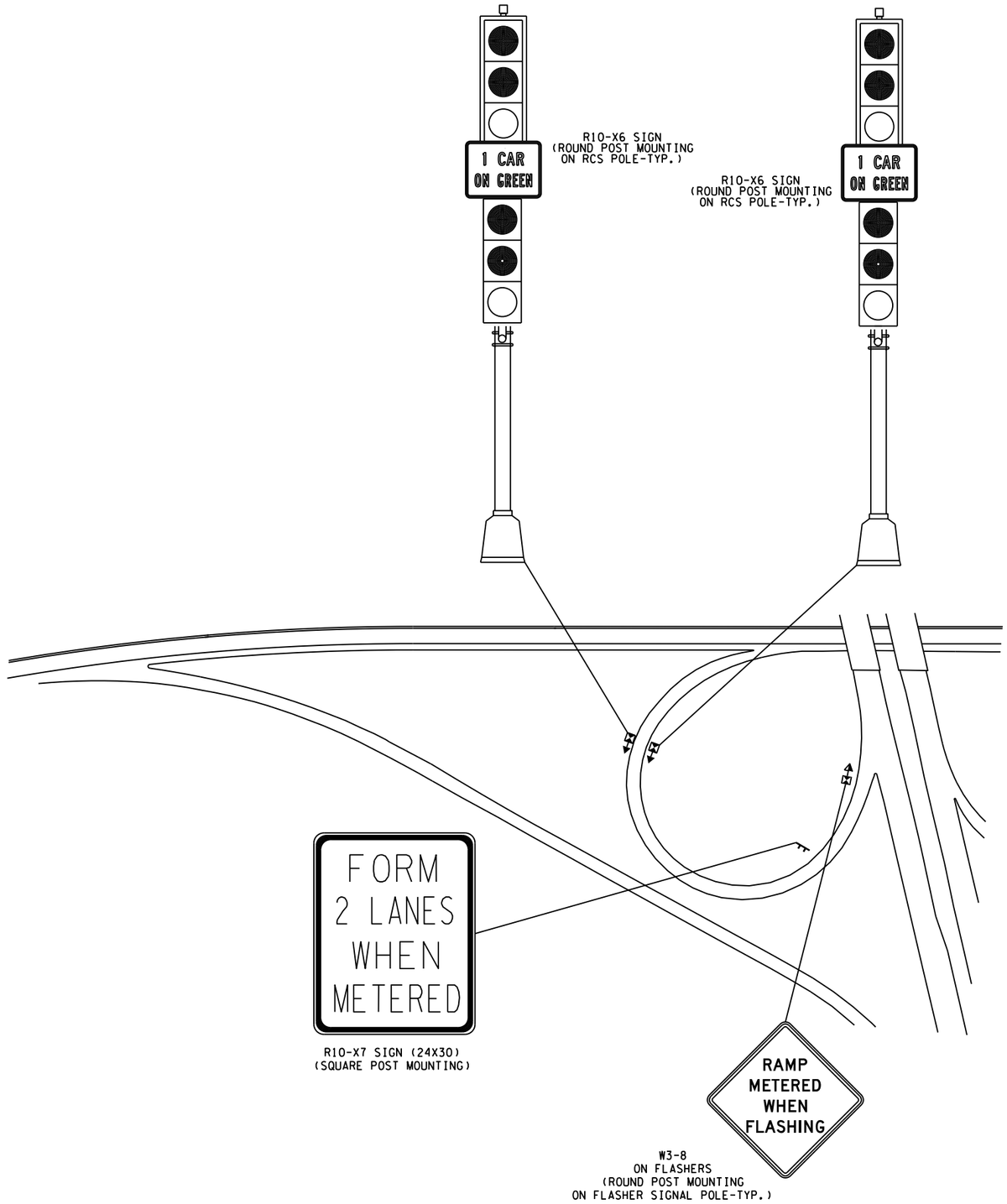
STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 33 OF 54 SHEETS





SIGNING LAYOUT DETAIL (WITHOUT HOV)

REVISED 12/29/20

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REV. NO.	DATE: / /

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STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 34 OF 54 SHEETS

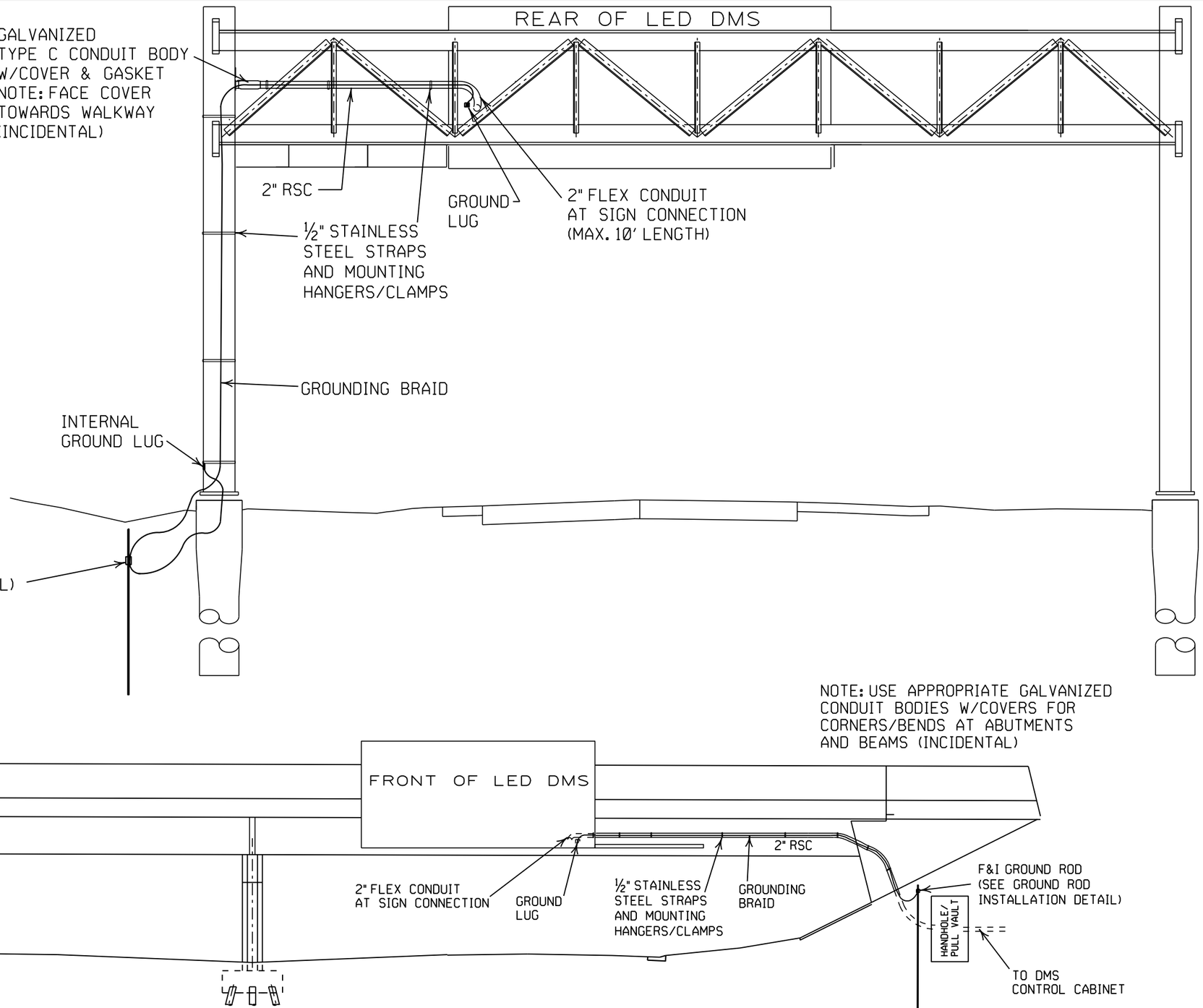
NOTE:
EACH INSTALL DMS ITEM SHALL INCLUDE THE INSTALLATION OF A 15' ONE PIECE GROUND ROD AND THE INSTALLATION OF THE 7/16" GROUNDING BRAID STRAPPED TO THE POWER CONDUIT OR SIGN POST AS INDICATED

THE DMS GROUNDING BRAID WILL BE CONTINUOUS FROM THE DMS GROUND LUG, THROUGH THE GROUND ROD EXOTHERMICAL WELD, TO THE INTERNAL SIGN POST GROUND LUG WHEN APPLICABLE

STRAP GROUNDING BRAID TO POST OR CONDUIT AWAY FROM VIEW OF TRAFFIC.

DMS GROUNDING BRAID IS CONSTRUCTED OF 32 STRANDS OF 17 GAUGE TINNED COPPER WIRE, 7/16" DIAMETER, BRAIDED SMOOTH TWIST, 65,500 CIRCULAR MILLS, NET WEIGHT 215 LBS. PER 1000 FT.

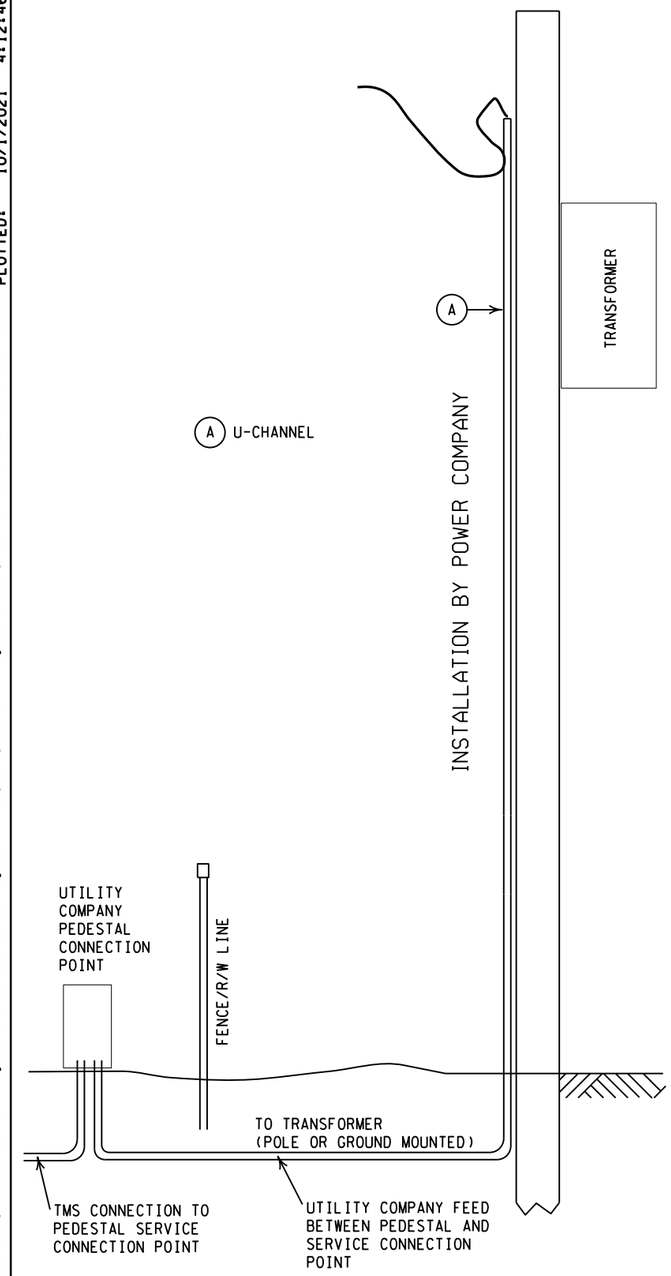
JUNCTION BOXES MAY BE NECESSARY DEPENDING ON CONDUIT CONFIGURATIONS. SEE PLAN NOTES.



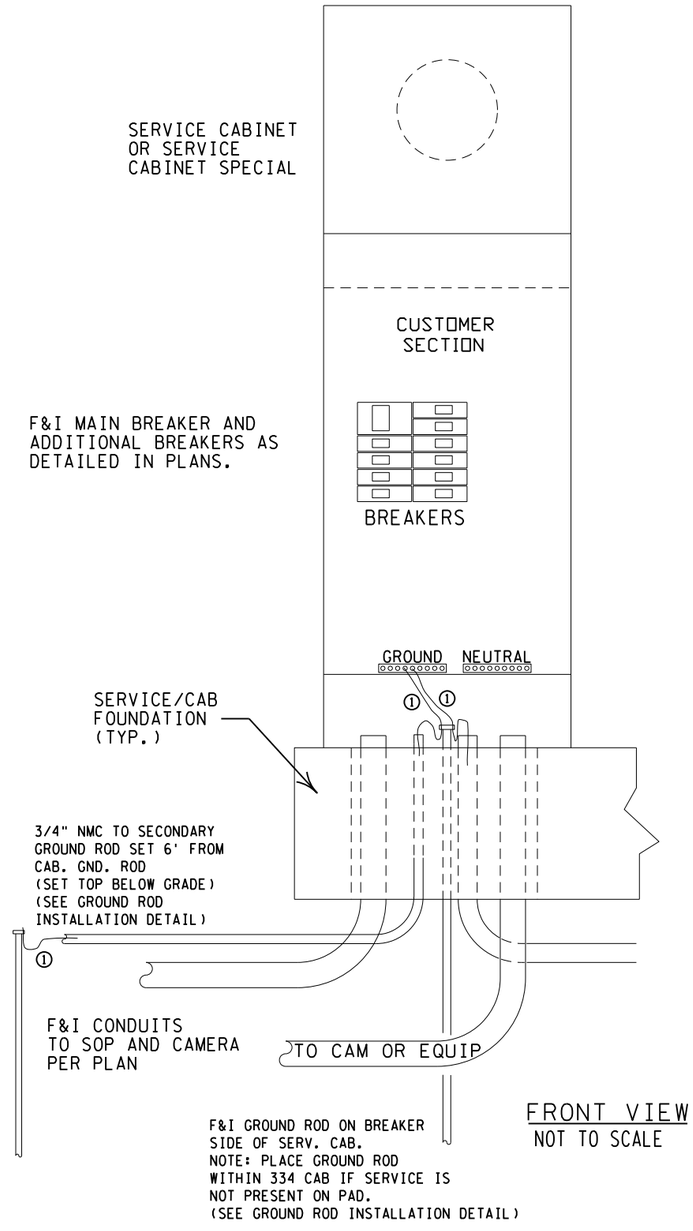
DMS GROUNDING/INSTALLATION TYPICAL

REVISED 6/27/18

REV. NO.	DATE: / /	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 35 OF 54 SHEETS
REV. NO.	DATE: / /		



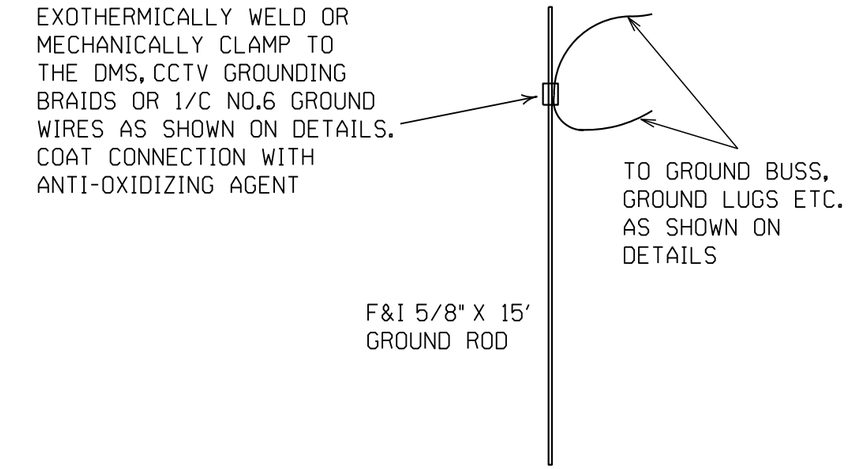
TYPICAL CONNECTION TO UTILITY COMPANY SOURCE OF POWER



FRONT VIEW
NOT TO SCALE

① F&I 1-1/C NO.6 BARE GROUND WIRE-COAT CONNECTION WITH ANTI-OXIDIZING AGENT

SERVICE CABINET/SERVICE CABINET SPECIAL INSTALLATION



SINGLE BOLT GROUND CLAMP FOR USE AT BONDING/GROUND WIRE LOCATIONS

DOUBLE BOLT GROUND CLAMP FOR USE WITH LIGHTNING PROTECTION GROUNDING BRAIDS AT CCTV AND DMS LOCATIONS

GROUND ROD INSTALLATIONS

SERVICE & GROUNDING INSTALLATIONS

REVISED 8/19/21

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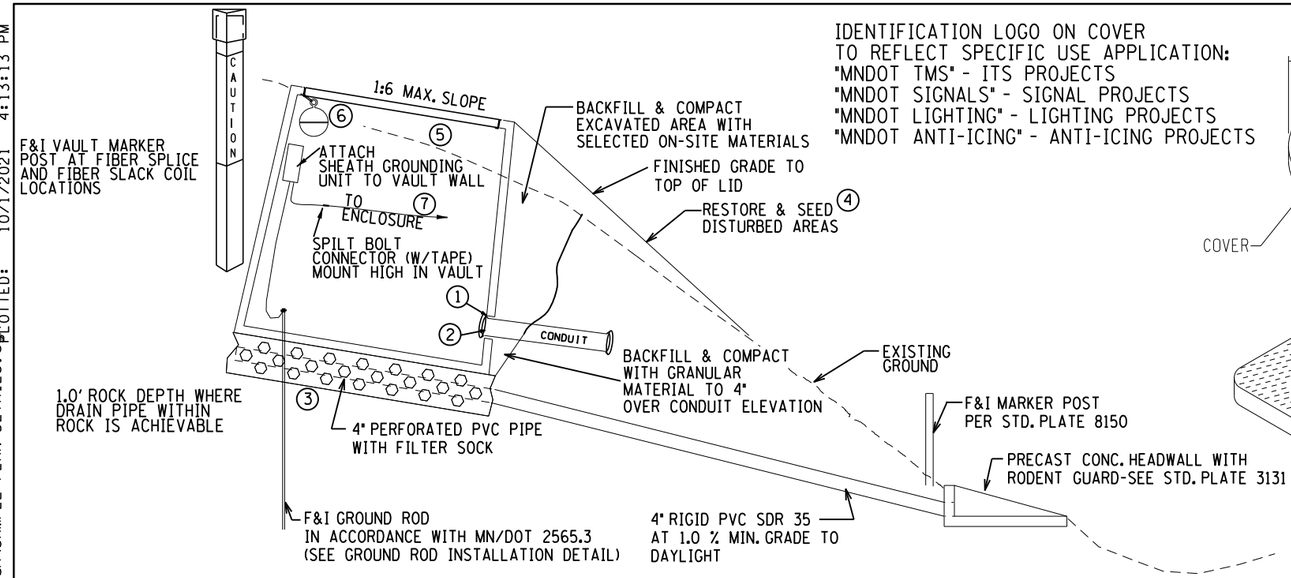
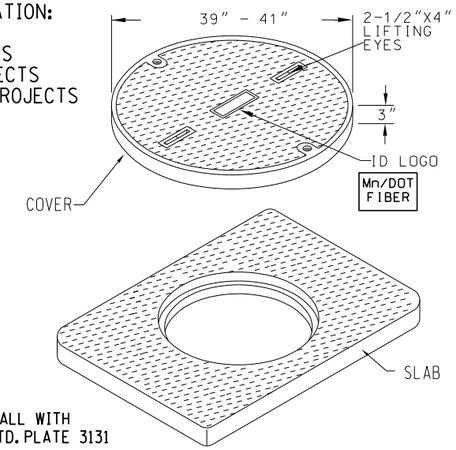
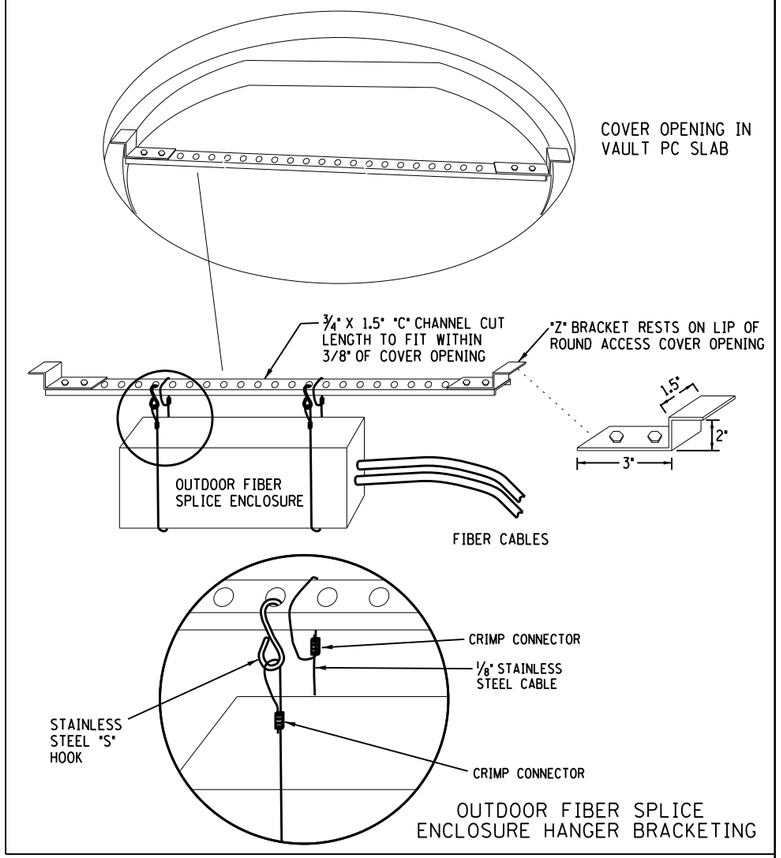


VAULT INSTALLATION & DRAINAGE SYSTEM (SLOPED AREAS)

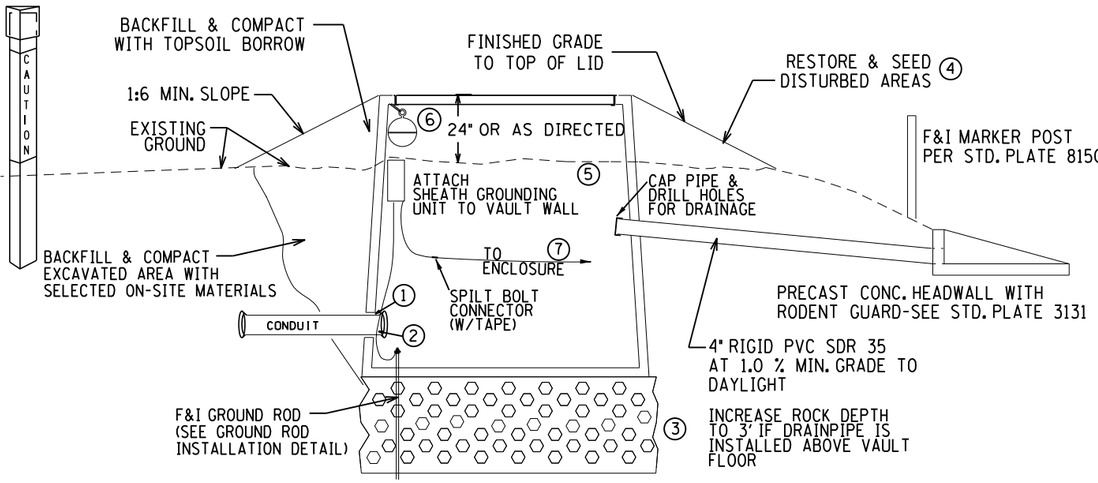
IDENTIFICATION LOGO ON COVER
TO REFLECT SPECIFIC USE APPLICATION:
"MNDOT TMS" - ITS PROJECTS
"MNDOT SIGNALS" - SIGNAL PROJECTS
"MNDOT LIGHTING" - LIGHTING PROJECTS
"MNDOT ANTI-ICING" - ANTI-ICING PROJECTS



ALL HARDWARE SHALL BE STAINLESS STEEL WITH EXCEPTION OF THE "C" CHANNEL MOUNTING BAR.



OUTDOOR FIBER SPLICE ENCLOSURE HANGER BRACKETING



VAULT INSTALLATION & DRAINAGE SYSTEM
(LEVEL GROUND & MINIMUM ACHIEVABLE DRAINAGE AREAS)

SPECIFIC NOTES

① OPENINGS FOR CONDUIT SHALL BE SEALED WITH MATERIAL COMPATIBLE SEALANT. (INCIDENTAL)

② PLUG CONDUIT OPENING WITH A DRAINABLE COMPOUND (INCIDENTAL)

③ F&I COARSE FILTER AGGREGATE UNDER BASE COMPLYING WITH MN/DOT 3149.2H. F&I 4" PERFERATED PVC PIPE WITHIN ROCK AREA WITH FILTER SOCK TO PROVIDE DRAINAGE WHERE ACHIEVABLE. (INCIDENTAL)

④ RESTORE DISTURBED AREAS FOR TMS INSTALLATION WITH SEED AND ROLLED EROSION PREVENTION CATEGORY 20 PER MNDOT 2575.3 (INCIDENTAL)

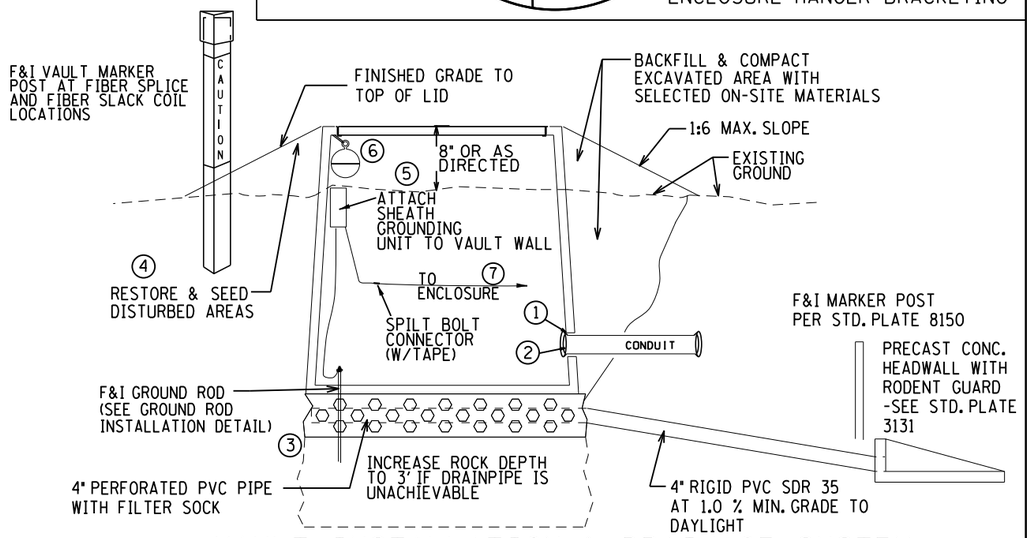
⑤ STRIP TOPSOIL FROM VAULT AND SLOPE AREAS PRIOR TO VAULT INSTALLATION (INCIDENTAL)

⑥ MOUNT LOCATOR BALL WITH TIE WRAP TO COVER LEDGE

⑦ 6' OF NO.6 AWG GREEN INSULATED STRANDED WIRE

GENERAL NOTES

1. GROUND CONNECTIONS SHALL BE COATED WITH OXIDATION PROHIBITING COMPOUND.
2. CABLE SHALL ENTER BELOW THE SUPPORT BRACKETS WITH MIN. 70' OF SLACK OUTSIDE OF THE ENCLOSURE FOR EACH CABLE. CABLE SHALL BE COILED AROUND INSIDE OF SUPPORT BRACKETS. CABLES SHALL BE CUT TO THE SAME LENGTH AT THE ENCLOSURE.
3. ALL HARDWARE SHALL BE STAINLESS STEEL WITH EXCEPTION OF THE "C" CHANNEL MOUNTING BAR.



VAULT INSTALLATION & DRAINAGE SYSTEM
(LEVEL GROUND & ACHIEVABLE DRAINAGE AREAS)

FIBER OPTIC SPLICE VAULT INSTALLATION

REVISED 9/23/20

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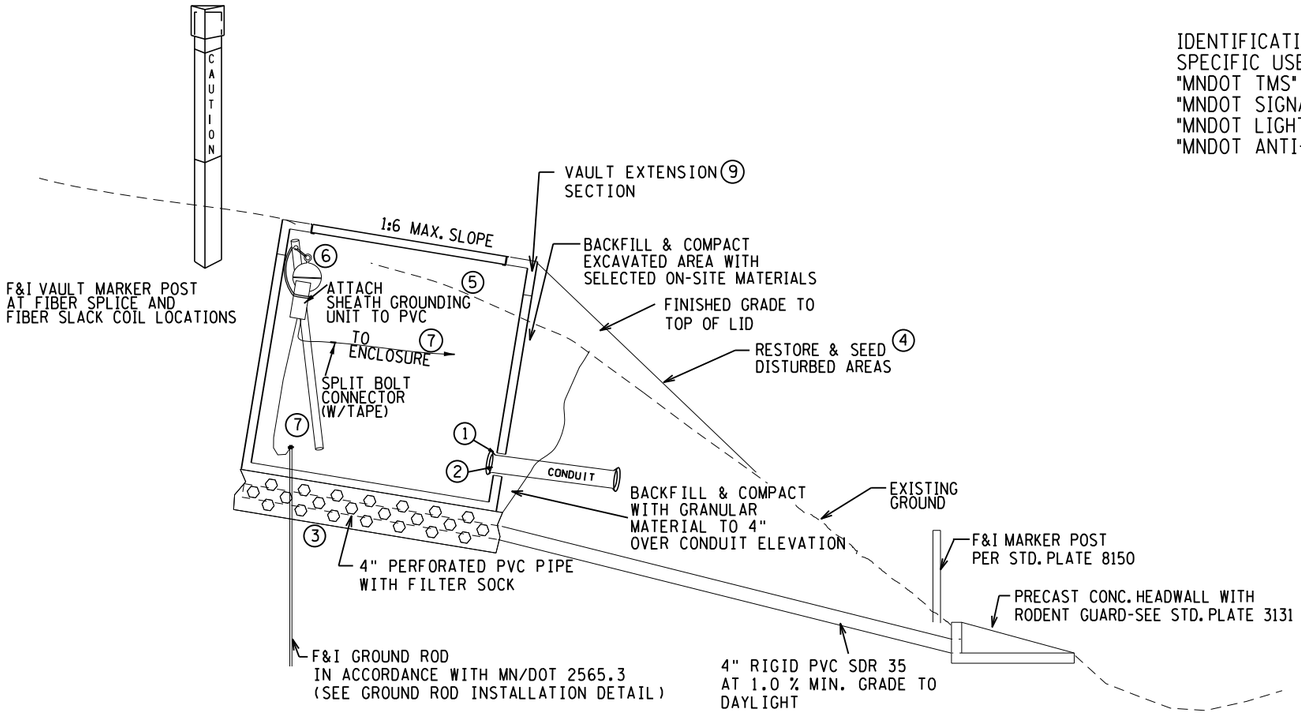
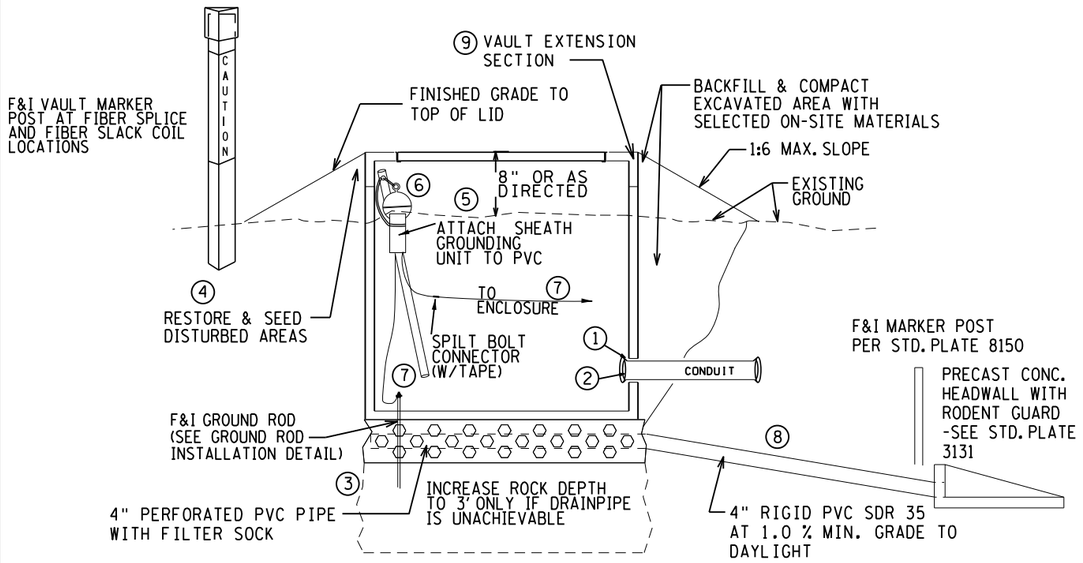
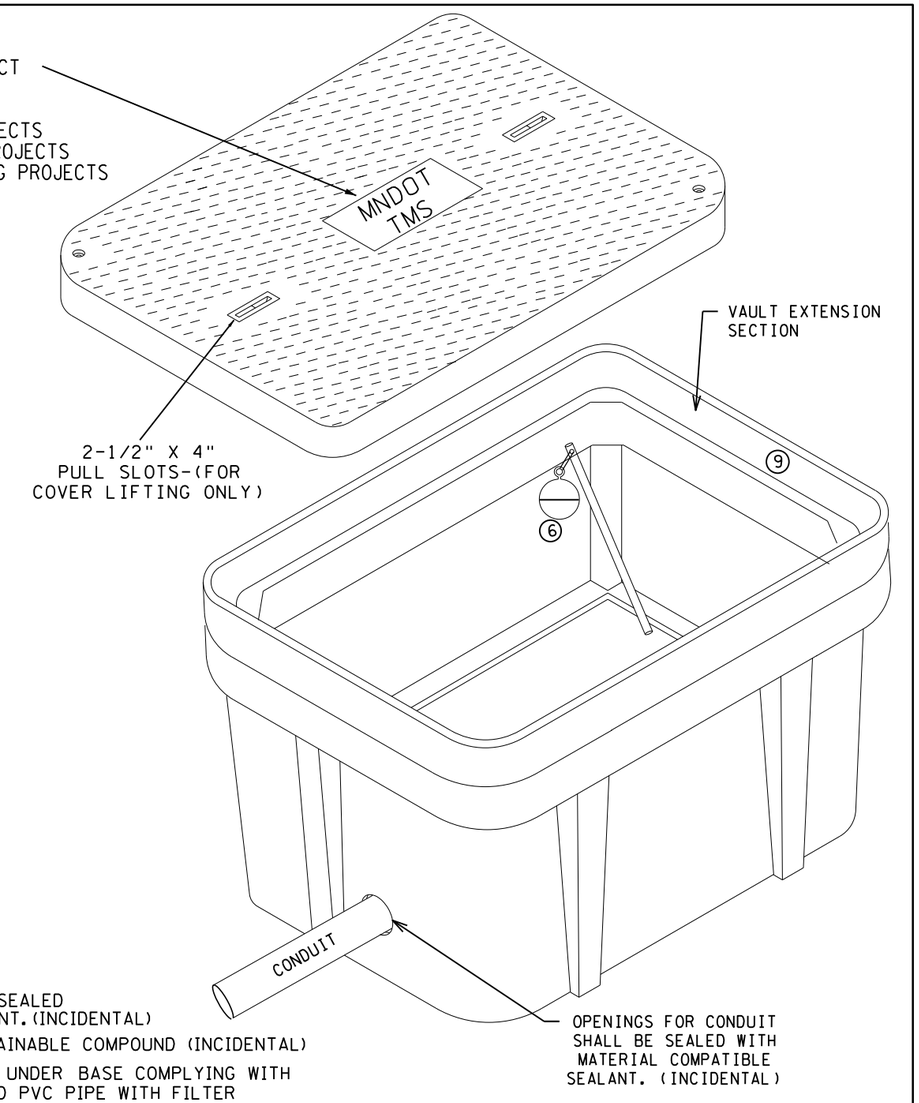


VAULT INSTALLATION & DRAINAGE SYSTEM (SLOPED AREAS)



VAULT INSTALLATION & DRAINAGE SYSTEM
(LEVEL GROUND & ACHIEVABLE DRAINAGE AREAS)



SPECIFIC NOTES

① OPENINGS FOR CONDUIT SHALL BE SEALED WITH MATERIAL COMPATIBLE SEALANT. (INCIDENTAL)

② PLUG CONDUIT OPENING WITH A DRAINABLE COMPOUND (INCIDENTAL)

③ F&I 1.0' COARSE FILTER AGGREGATE UNDER BASE COMPLYING WITH MN/DOT 3149.2H. F&I 4" PERFERATED PVC PIPE WITH FILTER SOCK TO PROVIDE DRAINAGE. (INCIDENTAL)

④ RESTORE DISTURBED AREAS FOR TMS INSTALLATION WITH SEED AND ROLLED EROSION PREVENTION CATEGORY 20 PER MNDOT 2575.3 (INCIDENTAL)

⑤ STRIP TOPSOIL FROM VAULT AND SLOPE AREAS PRIOR TO VAULT INSTALLATION (INCIDENTAL)

⑥ MOUNT LOCATOR BALL ATTACHED WITH BLACK TIE WRAP TO 40" LENGTH OF 3/4" PVC CONDUIT TO SIT WITHIN 6" OF COVER

⑦ 6' OF NO.6 GREEN INSULATED STRANDED WIRE

⑧ DRAIN PIPE MAY BE PLACED IN SIDEWALL OF PULL VAULT TO ACHIEVE DRAINAGE IN AREAS WHERE MINIMUM PIPE OUTFALL IS AVAILABLE INCREASE ROCK DEPTH TO 3.0' IF DRAIN PIPE IS PLACE ABOVE FLOOR HEIGHT.

⑨ F&I VAULT EXTENSION SECTION AT ALL PULL VAULT INSTALLATIONS TO FACILITATE FUTURE DAMAGE REPAIRS

GENERAL NOTES

1. GROUND CONNECTIONS SHALL BE COATED WITH OXIDATION PROHIBITING COMPOUND.
2. CABLE SHALL ENTER BELOW THE SUPPORT BRACKETS WITH MIN. 70' OF SLACK OUTSIDE OF THE ENCLOSURE FOR EACH CABLE. CABLE SHALL BE COILED AROUND INSIDE OF SUPPORT BRACKETS. CABLES SHALL BE CUT TO THE SAME LENGTH AT THE ENCLOSURE.
3. DO NOT LIFT ENTIRE PULL VAULT WITH COVER ATTACHED BY COVER LIFTING SLOTS.
4. SHEATH GROUNDING DEVICE AND GROUND ROD ARE NOT PLACED IN VAULTS WHERE SPLICING DOES NOT TAKE PLACE.

FIBER OPTIC PULL VAULT AT SPLICING LOCATIONS INSTALLATION DETAIL

REVISED 5/13/20

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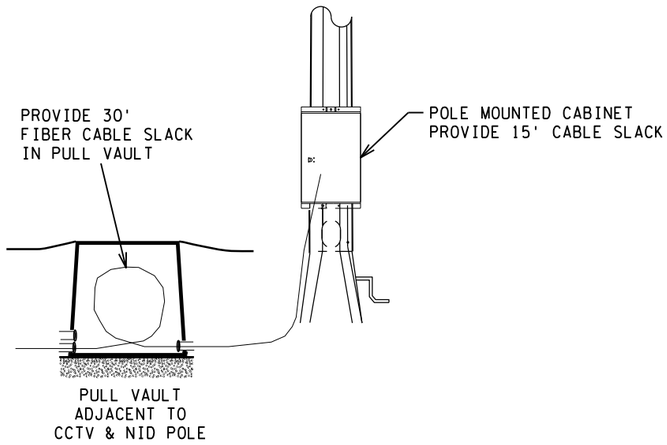
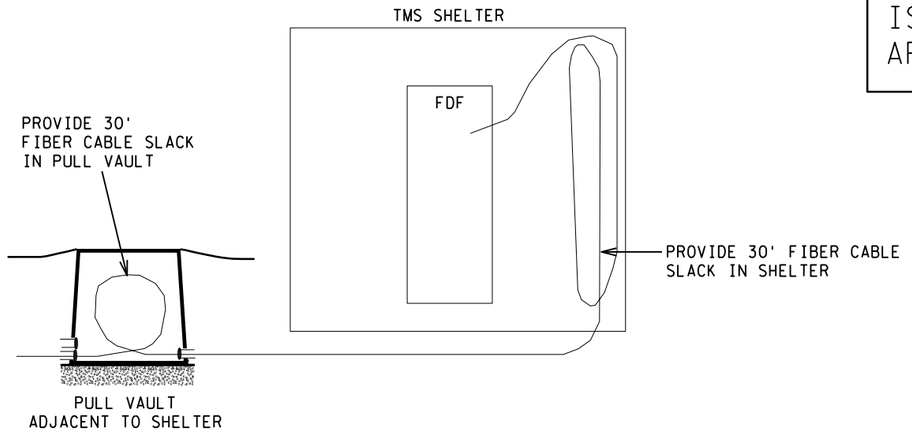
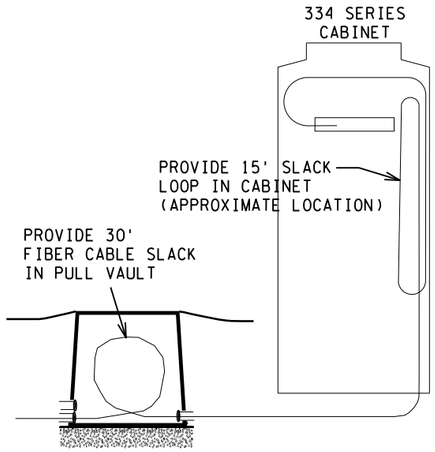
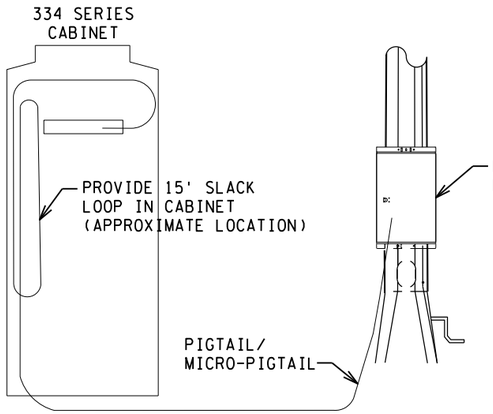
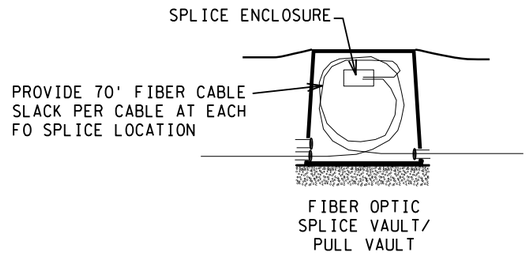
SLACK LENGTH NOTED IN EACH SCENERIO IS THE FINAL SLACK LENGTH REQUIRED AFTER DEVICES ARE CONNECTED

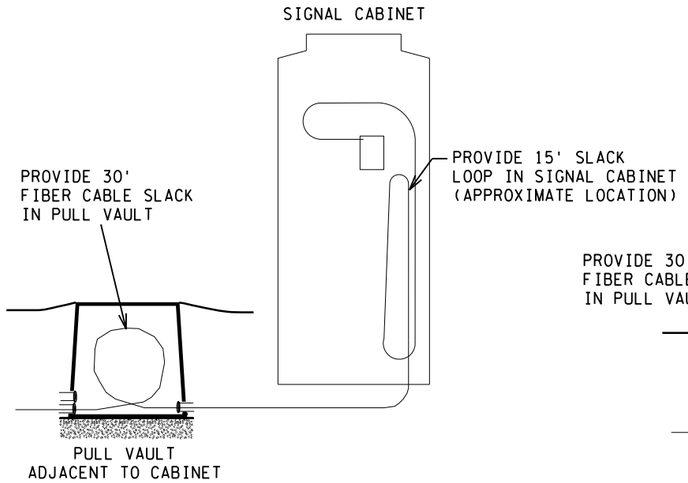


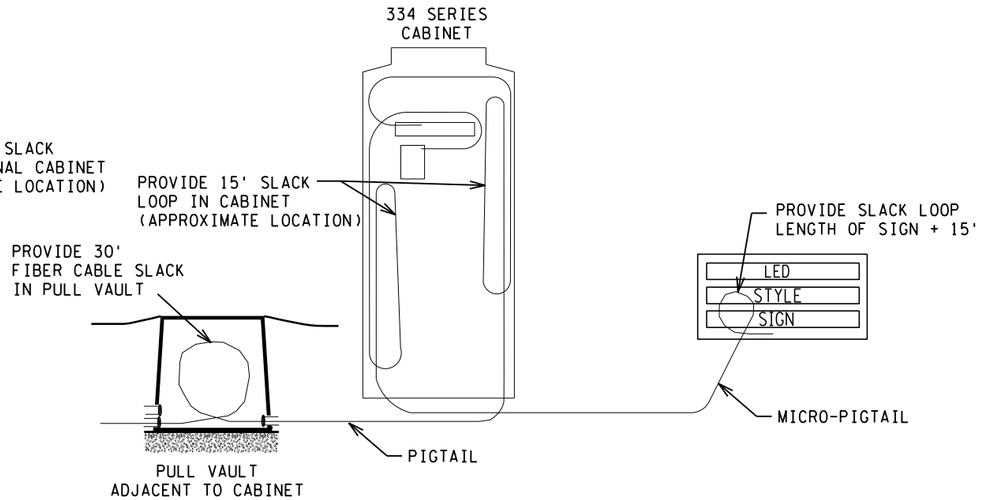


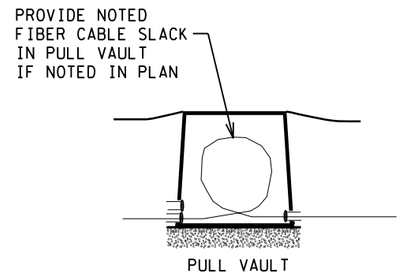












TMS CABLE
FIBER SLACK INSTALLATION DETAIL

REVISED 3/06/20

REV. NO.	DATE: / /
REV. NO.	DATE: / /

CERTIFIED BY _____ LIC.NO. ____ DATE ____ 2021
LICENSED PROFESSIONAL ENGINEER

GENERAL NOTES

* Add cable identifiers to color coded electrical tape with a permanent marker as shown on this detail.

e.g.: 94.41 East 24SM 01467M.

94.41 = Cable ID#
East = Direction
24SM = Cable fiber count
01467 = Nearest cable length marking to where the tape is applied.

* Electrical tape colors:
  NB (Blue)
  SB (Green)
  EB (Yellow)
  WB (Orange)
  Pigtails (White)

* The electrical tape with the identifiers is added to:

  - 334Z-Type Cabinets to within 18" of the entrance conduit on the outer jacket of the fiber optic cable.

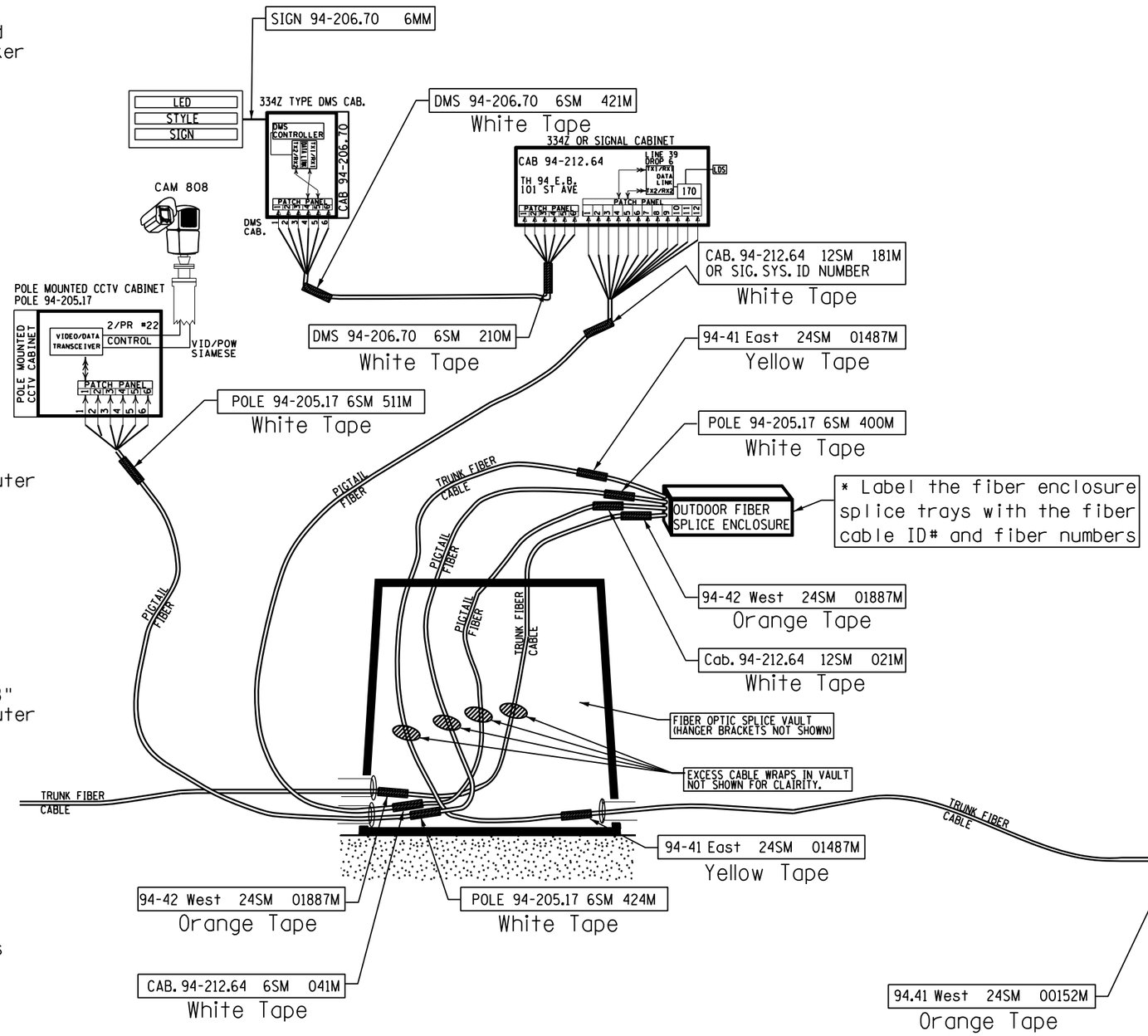
  - Pole Mounted CCTV Cabinet between the entrance point and the fiber termination panel.

  - FO Splice Vaults to within 18" of the splice enclosure and the entrance conduit.

  - TMS Shelter Cabinets to within 18" of the entrance conduit on the outer jacket of the fiber optic cable and again to within 18" of the splice panel on the inner jacket of the fiber optic cable.

* Neatly tape the fiber optic cables together as needed near the fiber enclosure then throughout the length of slack.

* Neatly coil the fiber optic cables into the fiber optic hanger brackets inside the vault.



TMS SHELTER CABINET

SHELTER NOTES

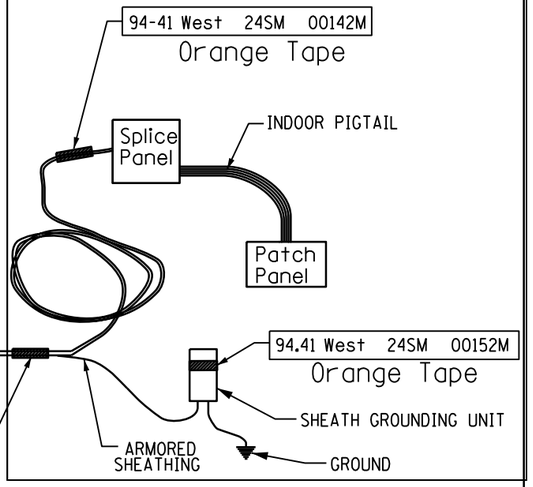
* Label the indoor pigtail six-paks on the outer jacket at both the splice tray/wheel and inside the patch panel to indicate the fiber cable ID # and which six fibers the six-paks are spliced to: (e.g. 94-12 SM7-12)

* Label the front of the splice panels with the fiber cable ID#, direction, and fiber count.

* Label splice trays/wheels with the fiber cable ID# and the fiber count.

* Label the front of patch panels with the fiber cable ID#, direction and fiber count.

* Label the sheath grounding unit with the fiber cable ID#, direction and fiber count.



FIBER OPTIC CABLE LABELING DETAIL

REVISED 6/27/18

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REV. NO.	DATE: / /

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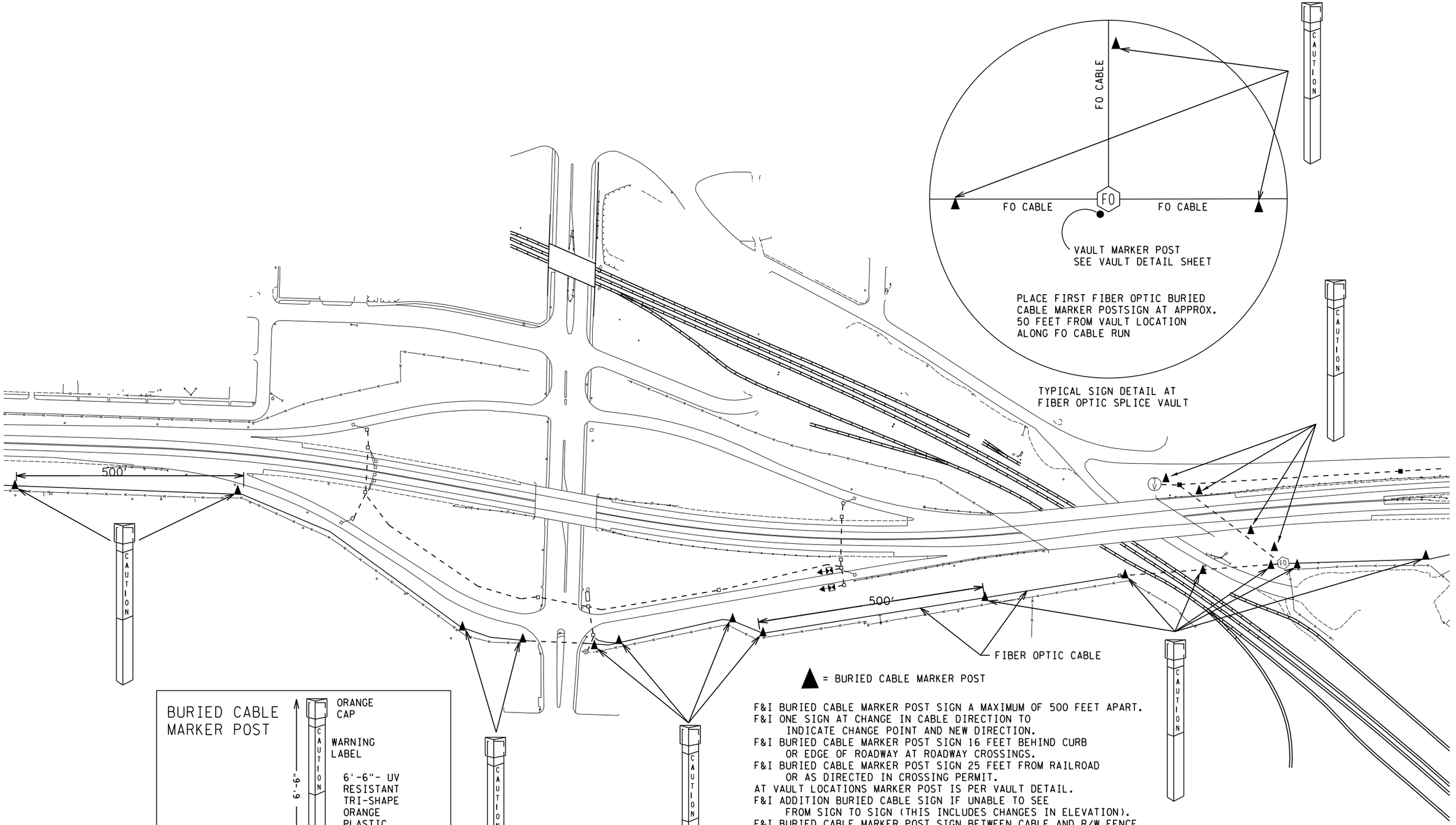


BURIED CABLE MARKER POST

F&I BURIED CABLE MARKER POST SIGN A MAXIMUM OF 500 FEET APART.
F&I ONE SIGN AT CHANGE IN CABLE DIRECTION TO INDICATE CHANGE POINT AND NEW DIRECTION.
F&I BURIED CABLE MARKER POST SIGN 16 FEET BEHIND CURB OR EDGE OF ROADWAY AT ROADWAY CROSSINGS.
F&I BURIED CABLE MARKER POST SIGN 25 FEET FROM RAILROAD OR AS DIRECTED IN CROSSING PERMIT.
AT VAULT LOCATIONS MARKER POST IS PER VAULT DETAIL.
F&I ADDITION BURIED CABLE SIGN IF UNABLE TO SEE FROM SIGN TO SIGN (THIS INCLUDES CHANGES IN ELEVATION).
F&I BURIED CABLE MARKER POST SIGN BETWEEN CABLE AND R/W FENCE, 3.0' FROM CABLE WITH SIGN PANEL PARALLEL TO BURIED CABLE
NOTE: SIGNS MAY BE MOUNTED ON FACE OF WALLS WHERE NECESSARY AND AS APPROVED BY THE ENGINEER

BURIED CABLE SIGN PLACEMENT TYPICAL

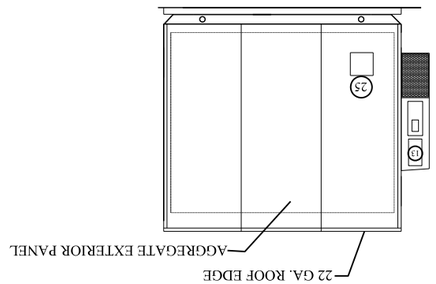
REVISED 4/07/20

REV. NO.	DATE: / /
REV. NO.	DATE: / /

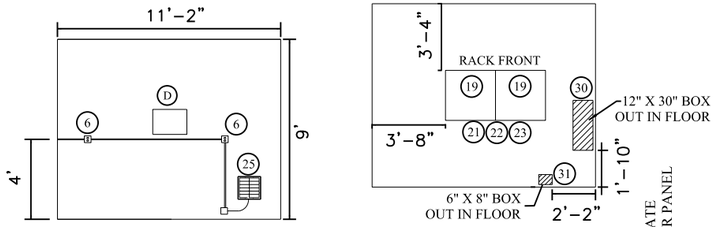
CERTIFIED BY _____ LIC.NO. _____ DATE ____ 2021
LICENSED PROFESSIONAL ENGINEER

STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 41 OF 54 SHEETS

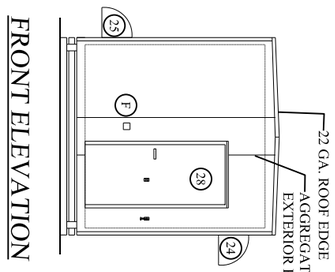
LEFT ELEVATION

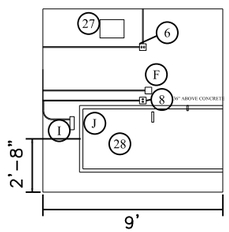


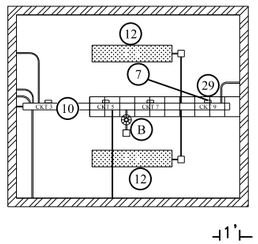
FLOOR LAYOUT

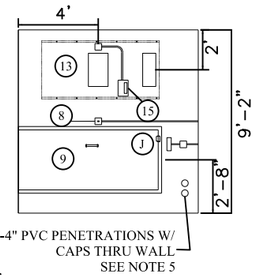


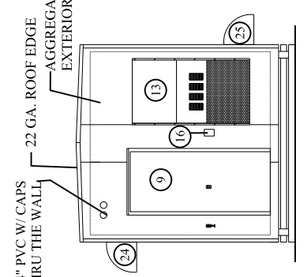
FRONT ELEVATION



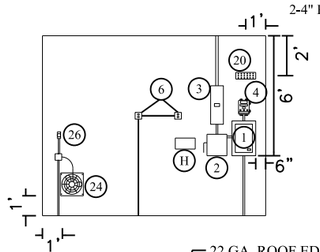


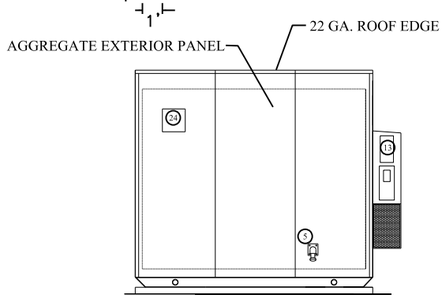






REAR ELEVATION





RIGHT ELEVATION

NOTE:
1. ALL DIMENSIONS SHOWN ARE INSIDE DIMENSIONS.

INTERIOR LAYOUT FOR
10'W. OD X 12'L. OD X 9'H. ID BLDG.

CONSTRUCTION NOTES:

1. SKID ASSEMBLY: THE SKID ASSEMBLY SHALL CONSIST OF 6" X 9" BEAM WELDED TO 3 1/2" O.D. SCHEDULE 40 PIPES RUNNING THROUGH THE BEAMS AND 2" X 2" X 1/4" ANGLES PLACED BETWEEN THE BEAMS EVERY 4'-0" ON CENTER. THE COMPLETE SKID ASSEMBLY SHALL BE PAINTED WITH RUST PREVENTATIVE PAINT AND SECURED TO THE FLOOR WITH 3/8" X 3" LAG BOLTS EVERY 12".

THE TMS SHELTER CABINET SHALL CONTAIN THE FOLLOWING ITEMS:

NO.		DESCRIPTION
	1	ALARM SYSTEM
B.	1	4 WIRE SMOKE, HEAT, RELAY AND SOUNDER
D.	1	ALARM BOX, HINGED 15"X11"X4" AND: CONTROLLER, IP CONNECTION, SUPPORTS 2RDRS W/INPUTS TAMPER SWITCH POWER SUPPLY CIRCUIT BOARD & OPEN FRAME TRANSFORMER
F.	1	CARDKEY READER
H.	1	TEMP ALERT DUAL OUTPUT/HIGH & LOW
I.	1	MOTION DETECTOR
J.	2	MAGNETIC CONTACT ASSEMBLY

NO.	QTY.	DESCRIPTION
1.	1	100A. 120/240V. SINGLE PHASE, 32 POSITION
		DISTRIBUTION PANEL W/ 100A. MAIN BREAKER
	9	20 AMP, SINGLE POLE BREAKER
	3	30 AMP, DOUBLE POLE BREAKER
2.	1	100A MANUAL TRANSFER SWITCH
3.	1	MAIN DISCONNECT 100A.
4.	1	SURGE ARRESTOR
5.	1	GENERATOR RECEPTACLE
6.	5	DUPLEX RECEPTACLES 20A.
7.	4	QUAD RECEPTACLES 20A.
8.	2	VACANCY SENSOR SWITCH
9.	1	3' X 7' STEEL INSULATED DOOR AND FRAME W/ BAKED
		ON ENAMEL PAINT W/S.S. BALL BEARING HINGES W/
		NON REMOVABLE PINS, LEFT HAND OUTSWING
		SCHLAGE PASSAGE
		HYDRAULIC DOOR CLOSURE
		PICK PLATE
		FACTORY BRONZE PAINT
10.	A/R	4" WIRE RACEWAY WITH NON HINGED COVER
11.		NOT USED
12.	2	LIGHT FIXTURE
13.	1	2 TON AIR CONDITIONER W/5KW HEAT
14.		NOT USED
15.	1	DOUBLE HVAC THERMOSTAT WITH ALARM CONTACTS
16.	1	GFI RECEPTACLE 20A.
17.		NOT USED
18.		NOT USED
19.	2	19" RACK
20.	2	12" MASTER GROUND BAR (INTERIOR)
21.	6	19" SHELVES
22.	2	HORIZONTAL POWER STRIPS
23.	2	VERTICAL POWER STRIPS
24.	1	12" EXHAUST FAN (470 CFM)
		18" HOOD
25.	1	12" MOTORIZED INTAKE DAMPER
		18" HOOD
26.	1	THERMOSTAT (VENTILATION)
27.	1	BLACK MANUAL WALL PACK DOCUMENT HOLDER
28.	1	3' X 7' STEEL INSULATED DOOR AND FRAME W/ BAKED
		ON ENAMEL PAINT W/NON REMOVABLE PINS,
		RIGHT HAND OUTSWING
		HYDRAULIC DOOR CLOSURE
		PICK PLATE
		FACTORY BRONZE PAINT
29.	A/R	12" WIRE TRAY W/6 CABLE EXITS
30.	1	12" X 30" X 13" FLOOR INSERT
31.	1	6" X 8" X 13" FLOOR INSERT

PROPOSED 10' X 12' TMS SHELTER
DETAIL SHEET 1

REVISED 6/27/18

REV. NO.	DATE: / /
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CERTIFIED BY _____ LIC.NO. _____ DATE 2021
LICENSED PROFESSIONAL ENGINEER

STATE PROJ. NO. 9999-999 SHEET NO. 42 OF 54 SHEETS

PANEL CIRCUIT AND LOAD SCHEDULE

FROM TRANSFER SWITCH

#6 #3

S/G 100 S/N

SERVICE:
DESIGNATION:
LOCATION:

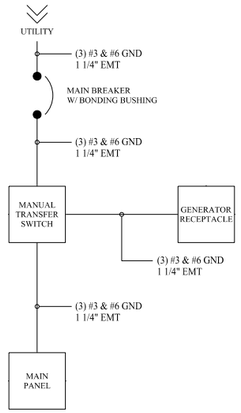
	LOAD DESCRIPTION	QTY.	UNIT V.A.	LOAD PER PHASE (VA) A	LOAD PER PHASE (VA) B	TRIP	POLES	WIRE SIZE	A.I.C.
1	LIGHTS	4	58.8	352.2		20	1	12	10K
3	CEILING OUTLETS	1	360		360	20	1	12	10K
5	CEILING OUTLETS	1	360	360		20	1	12	10K
7	CEILING OUTLETS	1	360		360	20	1	12	10K
9	CEILING OUTLETS	1	360	360		20	1	12	10K
11	WALL OUTLETS	5	180		900	20	1	12	10K
13	GFI	1	180	180		20	1	12	10K
15	SPARE	1				20	1	12	10K
17									
19									
21									
23									
25									
27									
29									
31									
	SUBTOTAL			1264.8	1620				

A.I.C.	WIRE SIZE	POLES	TRIP	LOAD PER PHASE (VA) B	LOAD PER PHASE (VA) A	UNIT V.A.	QTY.	LOAD DESCRIPTION	
10K	10	2	30		5232	5232	1	HVAC	2
				5232					4
10K	10	2	15				1	SPARE	6
									8
10K	12	1	20				1	ALARM CONTROLS	10
									12
									14
									16
									18
									20
									22
									24
									26
									28
10K	10	2	30				1	SURGE ARRESTOR	30
									32
				5232	5232	SUBTOTAL CONTINUOUS			

TOTAL KVA PHASE A	6.497
TOTAL KVA PHASE B	6.852
TOTAL AMPS PHASE A	54.14
TOTAL AMPS PHASE B	57.1

VOLTAGE: 120/240V. CYCLE: 60 PHASE: 1 WIRES: 4
NEUTRAL:
MAIN BREAKER: 100 AMP FRAME A/C: 22 KA TRIP: 100 AMP
MAIN LUGS: MAIN COPPER BUS: 100 AMP
MAINS: TOP [N] BOTTOM [ ]

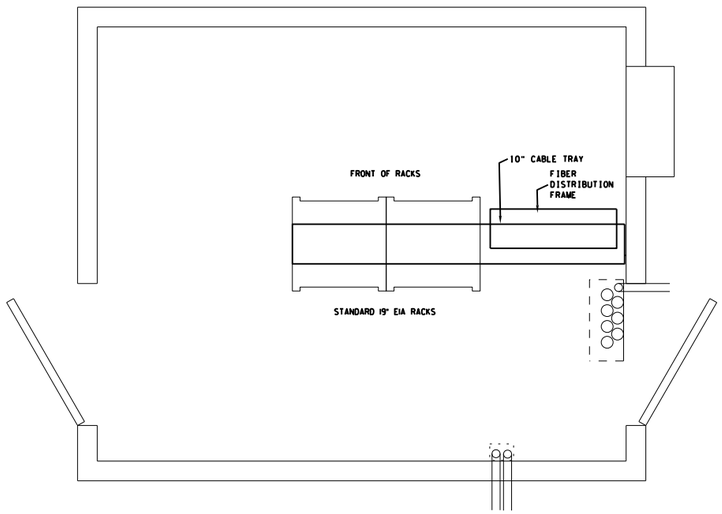
MANUFACTURER: SQUARE D
CATALOG NUMBERS: Q0132M100
NO EQUAL: [ ] APPROVED EQUAL: [N]
MOUNTING: SURFACE [N] FLUSH [ ]



WIRING SCHEMATIC

ELECTRICAL NOTES

1. ALL WIRING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.
2. ALL ELECTRICAL MATERIALS SHALL BE U.L. LISTED AND CLASSIFIED AS SUITABLE FOR THE PURPOSE SPECIFIED.
3. ALL WIRING SHALL BE SURFACE MOUNTED IN A RACEWAY OR EMT CONDUIT USING APPROVED CONNECTORS, COUPLINGS, AND CLAMPS, ALL CONDUIT SHALL BE ANCHORED IN PLACE AT APPROXIMATELY EVERY 4 FT.
4. ALL WIRING SHALL BE A SOLID CONDUCTOR, THHN OR THWN COPPER, NO SMALLER THAN A #12.
5. ALL WIRE RUNS SHALL BE CONTINUOUS.
6. LOW VOLTAGE WIRE MAY BE STRANDED.
7. ALL WIRING SHALL BE TESTED AND INSPECTED PRIOR TO SHIPMENT.
8. GREEN GROUND CONDUCTORS SHALL BE RUN TO ALL OF THE BUILDINGS A/C POWERED DEVICES. CONDUIT SHALL NOT BE USED AS THE SOLE SOURCE OF GROUND.
9. ALL ALARM DEVICES WIRING SHALL BE RUN IN ITS OWN CONDUIT TO THE ALARM CABINET.
10. ALL METALLIC OBJECTS LARGER THAN 4' x 4' SHALL BE GROUNDED.
11. DROP LIGHT FIXTURE IF NECESSARY TO ACCOMMODATE WIRING CONDUIT TO THE WIREWAY.
12. MOUNT OVERHEAD RECEPTACLES IN A VERTICAL POSITION
13. PROVIDE #4 GROUND WIRE FROM SERVICE PANEL BUSS-BAR TO BUILDING BUSS-BAR IN ½" EMT
14. ELECTRICALLY ISOLATE RACKS FROM EACH OTHER AND THE FLOOR



LADDER/RACK LAYOUT

PROPOSED 10' X 12' TMS SHELTER
DETAIL SHEET 2

REVISED 6/27/18

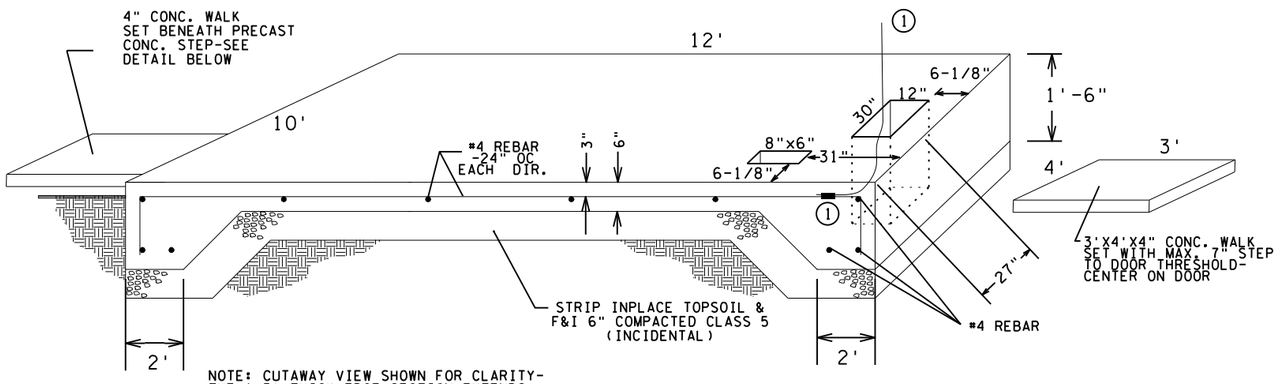
REV. NO.	DATE: / /
REV. NO.	DATE: / /

CERTIFIED BY _____ LIC.NO. _____ DATE ___ 2021
LICENSED PROFESSIONAL ENGINEER

STATE PROJ. NO. 9999-999 SHEET NO. 43 OF 54 SHEETS

NOTE: ALL FOUNDATIONS, WALKS & STEPS TO BE SET LEVEL AND PLUMB. PROVIDE COMPACTION OF BACKFILL DURING INSTALLATION.

FOUNDATION DETAIL (NTS)



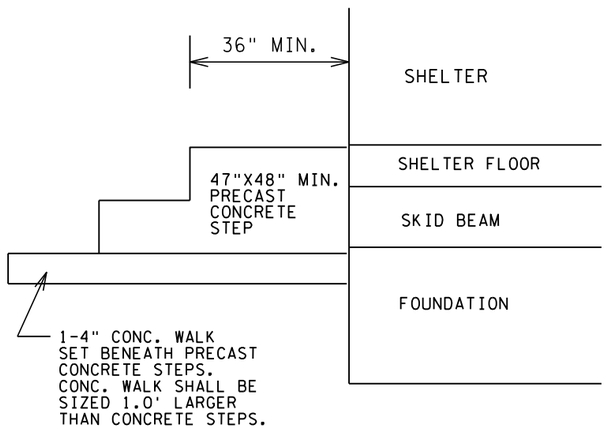
NOTE: CUTAWAY VIEW SHOWN FOR CLARITY-THE 1.5' THICK EDGE SECTION EXTENDS AROUND 4 SIDES OF THE CONCRETE PAD

TOP OF FOUNDATION TO BE SET 4" ABOVE FINISHED GRADE.

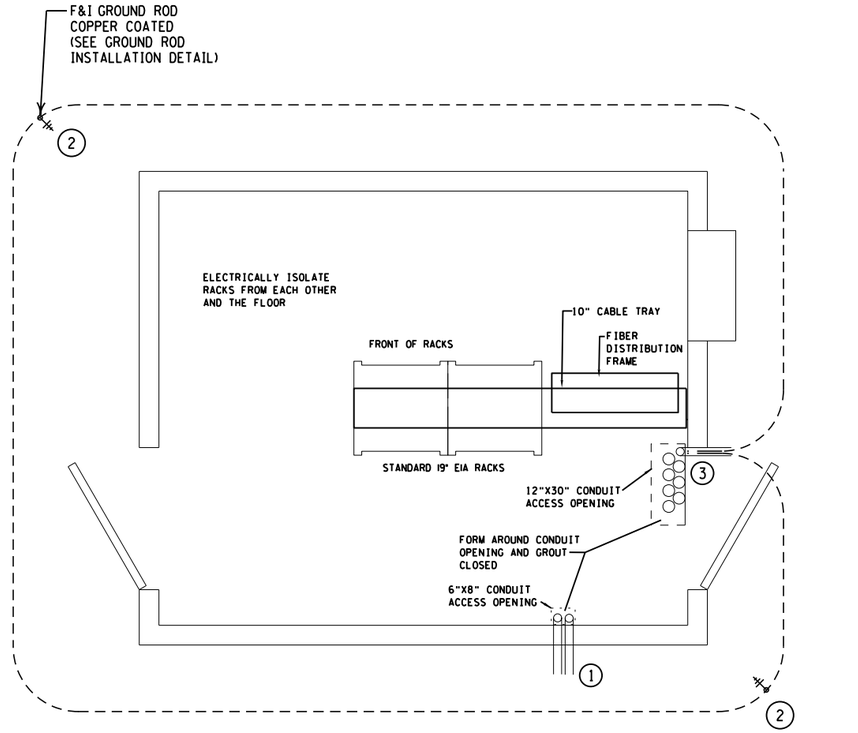
GRADE BENEATH HVAC UNIT TO PROVIDE A FLAT AREA FOR SERVICING UNIT.

FOUNDATION INCLUDES SIDEWALKS AND STEPS

(1) F&I #6 AWG CONNECTION TO 20' OF CONTINUOUS REBAR EMBEDED IN CONCRETE FOUNDATION USING NRTL BONDING CLAMP OR EXOTHERMIC WELDED CONNECTION. TERMINATE OTHER END OF #6 AWG TO SINGLE POINT BUS BAR INSIDE SHELTER. FOLLOW NEC FOR GROUNDING OF CONCRETE ENCASED ELECTRODE.



FRONT ENTRANCE PRECAST CONC. STEP (SIDE VIEW-NTS)

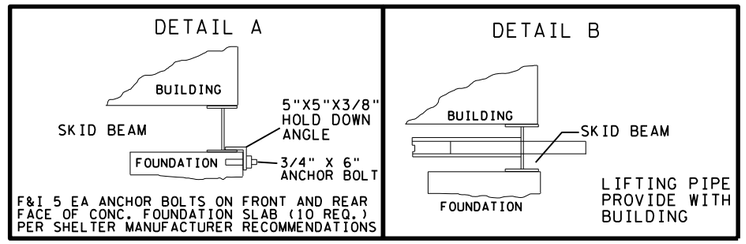


(1) F&I 2" NMC SERVICE CONDUIT & 2" NMC CAPPED STUB-OUT TO HH

(2) EXOTHERMICALLY WELD CONDUCTORS TO GROUND ROD

(3) CONNECT EACH END 1/C NO. 0 BARE WIRE TO SINGLE POINT BUS BAR INSIDE SHELTER

FOUNDATION TIE DOWN DETAIL



REVISED 6/23/21

REV. NO.	DATE: / /
REV. NO.	DATE: / /

CERTIFIED BY _____ LIC.NO. _____ DATE 2021
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PROPOSED 10' X 12' TMS SHELTER
DETAIL SHEET 3

STATE PROJ. NO. 9999-999 SHEET NO. 44 OF 54 SHEETS

INDEX OF REFRACTION

PROVIDE CABLE MANUFACTURERS INDEX OF REFRACTION USED FOR TESTING ON PROJECT.

◡ = FURNISHED SPLICE, NO SPLICE OTDR READING REQUIRED AT THIS LOCATION

(X.X) POWER METER/OTDR LAUNCH TEST POINT
INSERT OPTICAL LINK LOSS IN dB
(TEST MULTI MODE FIBER AT 1300)
(TEST SINGLE MODE FIBER AT 1550)

.00 / .00
INSERT OTDR SPLICE LOSS SHOT FROM THIS DIRECTION
INSERT OTDR SPLICE LOSS SHOT FROM THIS DIRECTION

= FO CABLE SPLICE POINT & OTDR TEST SPLICE READING

= OTDR TEST SPLICE READING ON INPLACE CABLE

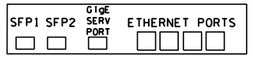
PIGTAIL OTDR LENGTH ____km
OTDR LENGTH ____km TO SHELTER

PROVIDE TRUNK AND PIGTAIL OTDR FIBER LENGTH MEASUREMENTS USING OTDR READINGS FROM CONNECTORS AT SHELTER OR CABINETS TO SPLICE POINTS IN VAULTS

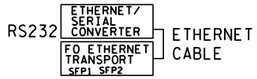
FIBER OPTIC CABLE MARKINGS @
SPLICE ENCLOSURE ____
VAULT ENTRY ____

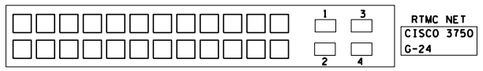
PROVIDE TRUNK CABLE OUTER JACKET LENGTH MARKINGS AT ENTRY TO VAULT AND AT ENTRY TO OUTDOOR FIBER SPLICE ENCLOSURE

FACTORY PRE-TERMINATED/ARMORED FIBER OPTIC PIGTAIL



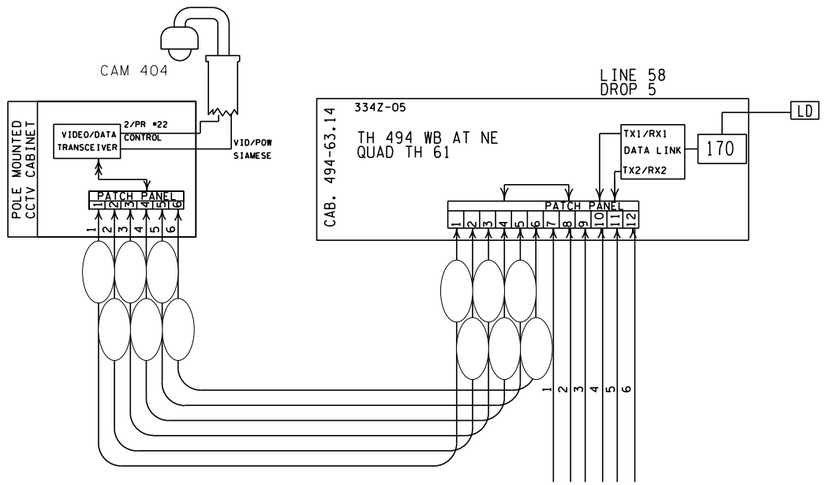
FO ETHERNET TRANSPORT



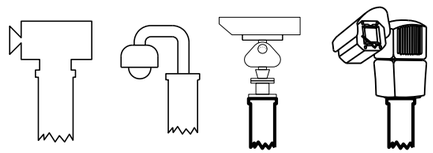


ETHERNET SWITCH

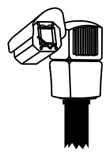
COMMON ETHERNET EQUIPMENT



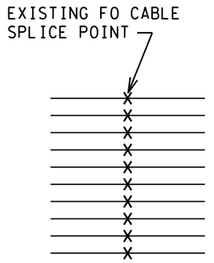
NOTE: CABINET TO CABINET PIGTAILS REQUIRE BOTH POWERMETER AND OTDR TESTING OF CABLE

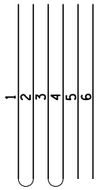


EXISTING CAMERA WITH PAN AND TILT UNIT



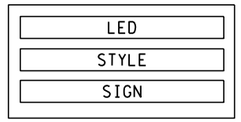
PROPOSED CAMERA WITH PAN AND TILT UNIT (BY OTHERS)





FIBER OPTIC PIGTAIL SPLICE DIAGRAM

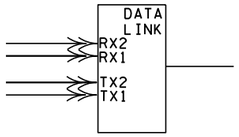
(SPLICE UNUSED FIBERS TOGETHER IN THE SPLICE VAULT SO THAT THE FIBERS CAN BE TESTED)



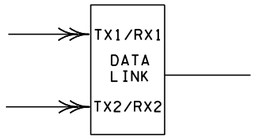
DYNAMIC MESSAGE SIGN

FIBER OPTIC PATCHCORD

TWISTED PAIR INTERCONNECT

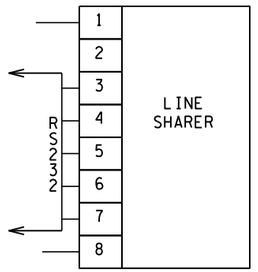


FORCE TRANS. MODEL 2869 DATA LINK



OPTELECOM MODEM DATA LINK

VIDEO & DATA TRANSCEIVER TRANSMITTER



RS 232 LINE SHARER

170	170 CONTROLLER
DMS	CHANGEABLE MESSAGE SIGN
FLS	FLASHER
RCS	RAMP CONTROL SIGNAL
LDS	LOOP DETECTOR STATION
LD	LOOP DETECTOR(S)
ILCS	INTELLIGENT LANE CONTROL SIGN

LEGEND FOR COMMUNICATION SCHEMATICS

REVISED 6/27/18

REV. NO.	DATE: / /
REV. NO.	DATE: / /

CERTIFIED BY _____ LIC.NO. _____ DATE ____ 2021
LICENSED PROFESSIONAL ENGINEER

TWISTED PAIR LINE 28 - PORT 6

999X.1 (WEST)

1 999NET 998 WEST
15 MNET WE TO OAKDALE
20 RTMC / MARYLAND MAN
40 777 NET 888 to 35W
90 RTMC NET PT 16
93 WIS DOT -A
94 WIS DOT -B
96 VIKING CO DISPATCH 2

TO SHEET 16B ROUTER PT 16
TO SHEET 16B ROUTER PT 15

FIBER DISTRIBUTION FRAME

999.5 (EAST)

CAM 30700

VIDEO/DATA TRANSCEIVER

POLE 888-11.69

1 CAMERA 8
2 RTMC NET PT 15
3 MAPLEWOOD/CO CAMERA 7
4 MAPLEWOOD/CO TX 10 GIG
5 MAPLEWOOD/CO RX 10 GIG
9 TH 999 NET TH 998 WEST
TO SHEET 16B ROUTER PT 04
14 TH 999 NET 998 TO WEST
15 MNET WE TO OAKDALE
TO SHEET 16B ROUTER PT 05
22 777NET 888 TO 998 RING
24 888 999 TO 777
25 WIS DOT A
26 WIS DOT B

FDF = FIBER DISTRIBUTION FRAME
= DIRECT PIGTAIL TERMINATION FROM TRUNK LINE TO FRONT OF FDF
= FDF TERMINATED FIBER
= FDF TERMINATED FIBER W/ PATCHCORD CONNECTION
= SINGLE-MODE (MAIN FIBERS ONLY)
= MULTI-MODE (MAIN FIBERS ONLY)
= BAD FIBER (DON'T USE)
D = DROPPED FIBER (DON'T USE)
* = DENOTES 1550 LASER FOR DV 6000

888 & TH 999
SHELTER
999.5-1M

888.2 (SOUTH)

TO 16B 999-05.19 SW 4
TO SHEET 16B ROUTER PT 09

1 CAMERA 38
10 TH 888 WNPASS
23 TRAFFIC SIGNAL
35 TRAFFIC SIGNAL
38 CAMERA 37 BU
40 LARP-FOREST LAKE MAN
41 TEMP COMM TO MARYLAND
48 BAD 425' TO EAST
49 777 NET 94 TO 999
52 DMS LINE 125 TX2/RX2-TX1/RX1
57 OET-VIKING CO CAD EAST1
58 OET-VIKING CO CAD EAST2
61 RTMS NET PT 14
62 VIKING CO. - OET TX EAST RING
63 VIKING CO. - OET RX EAST RING
70 MAPLEWOOD-TX / C.O.-RX 10 GIG
71 MAPLEWOOD-TX / C.O.-RX 10 GIG
72 VIKING CO. DISPATCH 2

TO SHEET 16B ROUTER PT 14

CAM 6

AUX. COPPER PORT SWITCH

CAT5E

PLANET NETWORK MEDIA CONVERTER

CAM 40

CAM 8

888.50 (NORTH)

1 CAM 40
2 CAM 712
11 TH 888 WNPASS 999 TO 777
TO SHT 16B ROUTER PT 6
17 DROPPED @ LITTLE CANADA RD
18 DROPPED @ LITTLE CANADA RD
19 WE TO OAKDALE 10 GIG
20 WE TO OAKDALE 10 GIG
21 777 NET 94 TO 999
22 777NET 888 TO 998 RING
23 TRAFFIC SIGNAL
TO 16B ROUTER PT 10
25 FOREST LK-LARP, MAN
28 999 NET 998 WEST
29 WE TO MAPLETON 10 GIG
30 WE TO MAPLETON 10 GIG
35 TRAFFIC SIGNAL
40 777 NET 888 to 35W
45 RTMC NET PT 13
55 VIKING CO/OET EAST RING
56 VIKING CO/OET EAST RING
57 OET-VIKING CO CAD EAST1
58 OET-VIKING CO CAD EAST2

TO SHEET 16B ROUTER PT 13
TO 16B 35E-111.86 SM 4

888-07

LCAM 39
TH 888 TMS WNPASS
RTMC / MARYLAND MAN

TO SHEET 16B CAB 999-5.10 SW 4

999.4 (WEST)

1 DROPPED @ RICE
2 DROPPED @ RICE
3 DROPPED @ RICE
4 DROPPED @ RICE
5 DROPPED @ RICE
6 DROPPED @ RICE
7 DROPPED @ RICE
8 DROPPED @ RICE
9 DROPPED @ RICE
10 DROPPED @ RICE
11 DROPPED @ RICE
12 DROPPED @ RICE
1 CAMERA 005
11 TH 999 NET
19 WE TO OAKDALE 10 GIG
20 WE TO OAKDALE 10 GIG
23 WE TO MAPLETON 10 GIG
24 WE TO MAPLETON 10 GIG
31 LN 125 DWS TX1/RX1-TX2/RX2 -10.5 db
32 LEDSTAR DWS LN 125 SPARE -10.0 db
36 CAMERA 04

FDF

SHEET 56

TH 888 & TH 999

REV. NO. CL	DATE: 8/19/20	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 46 OF 54 SHEETS
REV. NO. CM	DATE: 04/02/21		

pw:\\pw81.ad.dot.state.mn.us:cadp\Documents\Projects\DM_ROS\Non_Project\FrwOps\Special Projects\SamplePlan\Sample plan_SCM
PLOTTED: 10/11/2021 1:34:10 PM
Reut1Ani T79CLW161FRW047 TMS

WEST TO 888/999 SHELTER

EAST- TO 999/ 998 SHELTER

EB OH SIGN 999-88 — IP ADDRESS — LED STYLE SIGN — DMS CONTROLLER — RS232 — FO ETHERNET SWITCH SFP1 SFP2 — PATCH PANEL — CMS CAB. — CAB 999-5.83

PIGTAIL ID#: DMS999-05.83

WB OH SIGN 999-45 — IP ADDRESS — LED STYLE SIGN — DMS CONTROLLER — RS232 — FO ETHERNET SWITCH SFP1 SFP2 — PATCH PANEL — CMS CAB. — CAB 999-5.84

PIGTAIL ID#: DMS999-05.84

CAM 30701

LD — 170 — RS 232 — ETHERNET CABLE — ETHERNET/ SERIAL CONVERTER — FO ETHERNET SWITCH SFP2 SFP1 — CAT 5 — PATCH PANEL — 334Z-94 — CABINET @ SPRUCE — CAB 999-5.3

PIGTAIL ID#: CAB999-05.3

CAM 30702

CAT 5 CABLE

POLE 999-6.28 — POLE MOUNTED CCTV CABINET — FO ETHERNET SWITCH SFP1 SFP2 — PATCH PANEL

CABINET @ WILLOW — 334Z — LDS — 170 — RS232 — ETHERNET/ SERIAL CONVERTER — FO ETHERNET SWITCH SFP1 SFP2 — PATCH PANEL — CAB. 999-6.3

PIGTAIL ID#: CAB999-06.3

PIGTAIL ID#: POLE999-6.28

TH 999 EB AT WILLOW — POLEBOX 999-7.38 — ETHERNET/ SERIAL CONVERTER — FO ETHERNET SWITCH SFP1 SFP2 — PATCH PANEL — DETECTOR — DETECTOR CABLE

PIGTAIL ID#: POLE999-07.38

F-999.05 F-999.06 F-999.07 F-999.08

1	
2	
3	
4	CAMERA 30701
5	
6	
7	CAMERA 30702
8–36	

FIBER OPTIC CABLE MARKINGS @ SPLICE ENCLOSURE VAULT ENTRY

FIBER OPTIC CABLE MARKINGS @ SPLICE ENCLOSURE VAULT ENTRY

OTDR LENGTH ← TO SHELTER

OTDR LENGTH → TO SHELTER

ENCLOSURE TYPE
SPLIT CASE ☐
DOME ☐
MFG/MODEL

VAULT @ SPRUCE

VAULT @ WILLOW STREET

REV. NO. 1	DATE: 3/12/19	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 47 OF 54 SHEETS
REV. NO.	DATE: / /		

NORTH - TO 777 SHELTER

CAB. 999-006.89 AT TH999/TH998

RCS
LDS
LDS

170 RS232 ETHERNET/ SERIAL CONVERTER

FO ETHERNET SWITCH SFP1 SFP2

PATCH PANEL 1 2 3 4 5 6 7 8 9 10 11 12

PIGTAIL OTDR LENGTH ____ km

PIGTAIL ID#:
POLE 999-006.89

CAB

SHELTER

DISTRIBUTION FRAME

FIBER

F-999.08

WEST- TO 888/ 999 SHELTER

1	
2	CAMERA 30702 BU
3	RTMC NET PT 16
4	CAMERA 30701 BU
5	CO-MAPLETON 10 GIG
6	CO-MAPLETON 10 GIG
7	
8	ETHERNET
9	
10	
11	TH 999 NET (998 TO WEST)
12	TO CAB 999.3 (WILLOW)
13	
14	
15	
16	MNET WE TO OAKDALE
17	
18	
19	
20	
21	
22	777NET 998 TO 888 RING
23	
24	TH 888 NET 999 TO 777 RING
25	WIS DOT A
26	WIS DOT B
27	
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TRUNK ID
998-184

FIBER DISTRIBUTION FRAME

1	
2	
3	
4	
5	WE-MAPLETON 10 GIG
6	WE-MAPLETON 10 GIG
7	
8	
9	
10	
11	
12	
13	
14	TH 998 SIGNALS SO. RING
15	
16	
17	
18	
19	
20	
21	
22	777NET 998 TO 888 RING
23	777NET 998 TO 998 RING
24	TH 888 NET 999 TO 777 RING
25	
26	
27	TH 999 NET 998 TO 777 RING
28	TH 999 NET 998 WEST
29	
30	RTMC NET PT 13
31	
32	
33	
34	
35	TH 998 SIGNALS SO. RING
36	

PIGTAIL OTDR LENGTH ____ km

PIGTAIL ID#:
POLE 999-006.80

POLE CAB

SHELTER

CAM 30900

DETECTOR

DETECTOR CABLE

CAT 5 CABLE

TH 999 AT TH 998

POLEBOX 999-006.80

ETHERNET/ SERIAL CONVERTER

FO ETHERNET SWITCH SFP1 SFP2

PATCH PANEL 1 2 3 4 5 6 7 8 9 10 11 12

F-999.09

170

1	CO-MAPLETON 10 GIG
2	CO-MAPLETON 10 GIG
3	
4	
5	WE-MAPLETON 10 GIG
6	WE-MAPLETON 10 GIG
7	
8	
9	
10	
11	TH 999 NET 998 TO 777 RING
12	
13	TH 999 SIGNALS
14	
15	
16	MNET WE TO OAKDALE
17	
18	
19	
20	
21	
22	
23	
24	777NET 999 TO 998 RING
25	WIS DOT A
26	WIS DOT B
27	
28	
29	
30	RTMC NET PT 15
31	
32	
33	
34	
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EAST - TO 777 / 999 SHELTER

CISCO 9500 16G

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

16 PORT CONTROL

1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16

LWS

CISCO 3750 AUX. SWITCH

1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 PR 49 PR 51
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 PR 50 PR 52

FIBER DISTRIBUTION FRAME

TRUNK ID
998-183

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	TH 998 SIGNALS SO. RING
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	TH 998 SIGNALS SO. RING

SOUTH- TO FROST AVE

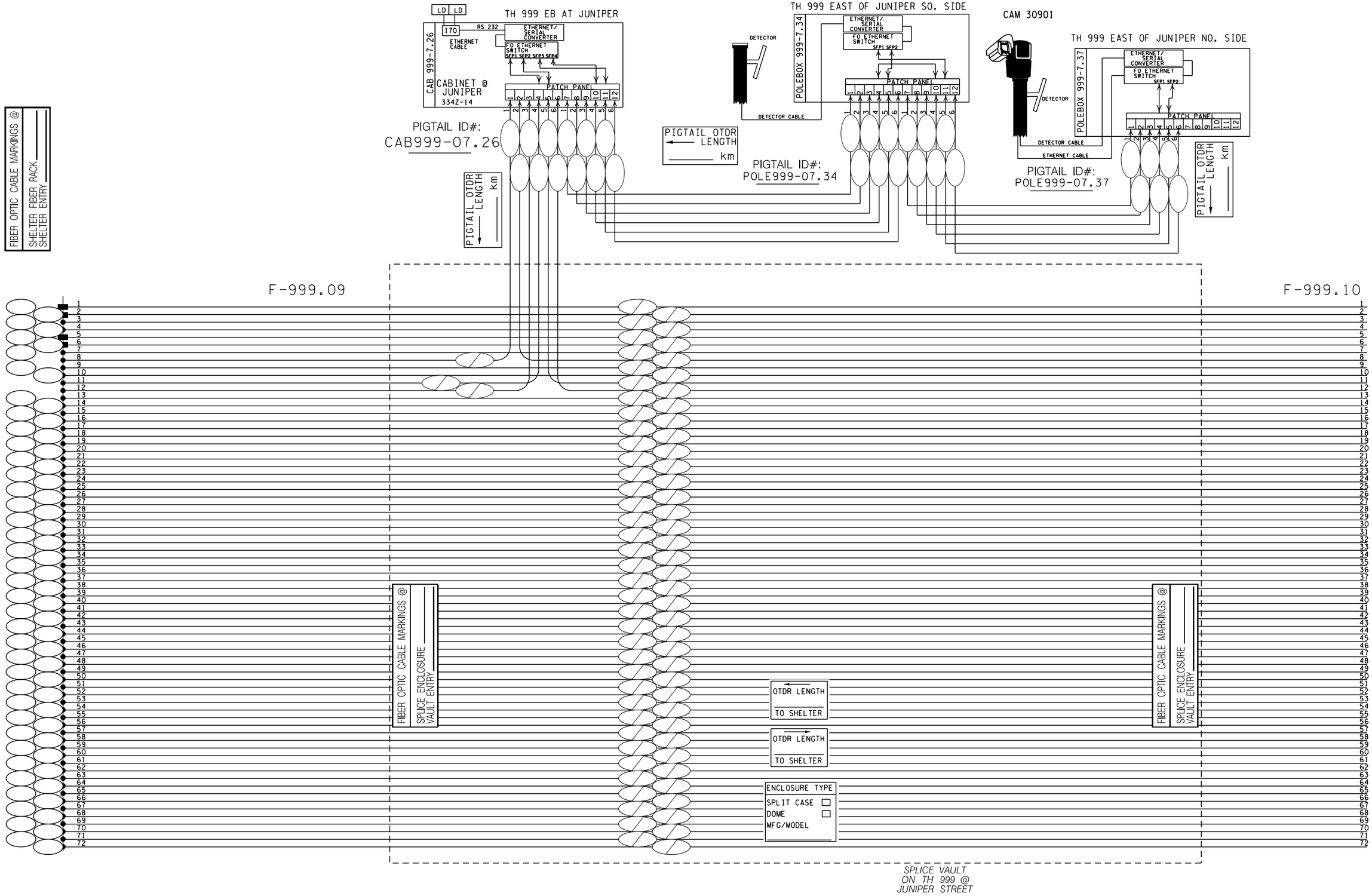
FDF = FIBER DISTRIBUTION FRAME
= DIRECT PIGTAIL TERMINATION FROM TRUNK LINE TO FRONT OF FDF
= FDF TERMINATED FIBER
= FDF TERMINATED FIBER W/ PATCHCORD CONNECTION
———= SINGLE-MODE (MAIN FIBERS ONLY)
—— —= MULTI-MODE (MAIN FIBERS ONLY)
· · · · = BAD FIBER (DON'T USE)
D = DROPPED FIBER (DON'T USE)
* = DENOTES 1550 LASER FOR DV 6000

FIBER OPTIC CABLE MARKINGS @
_____SHELTER FIBER RACK
_____SHELTER ENTRY

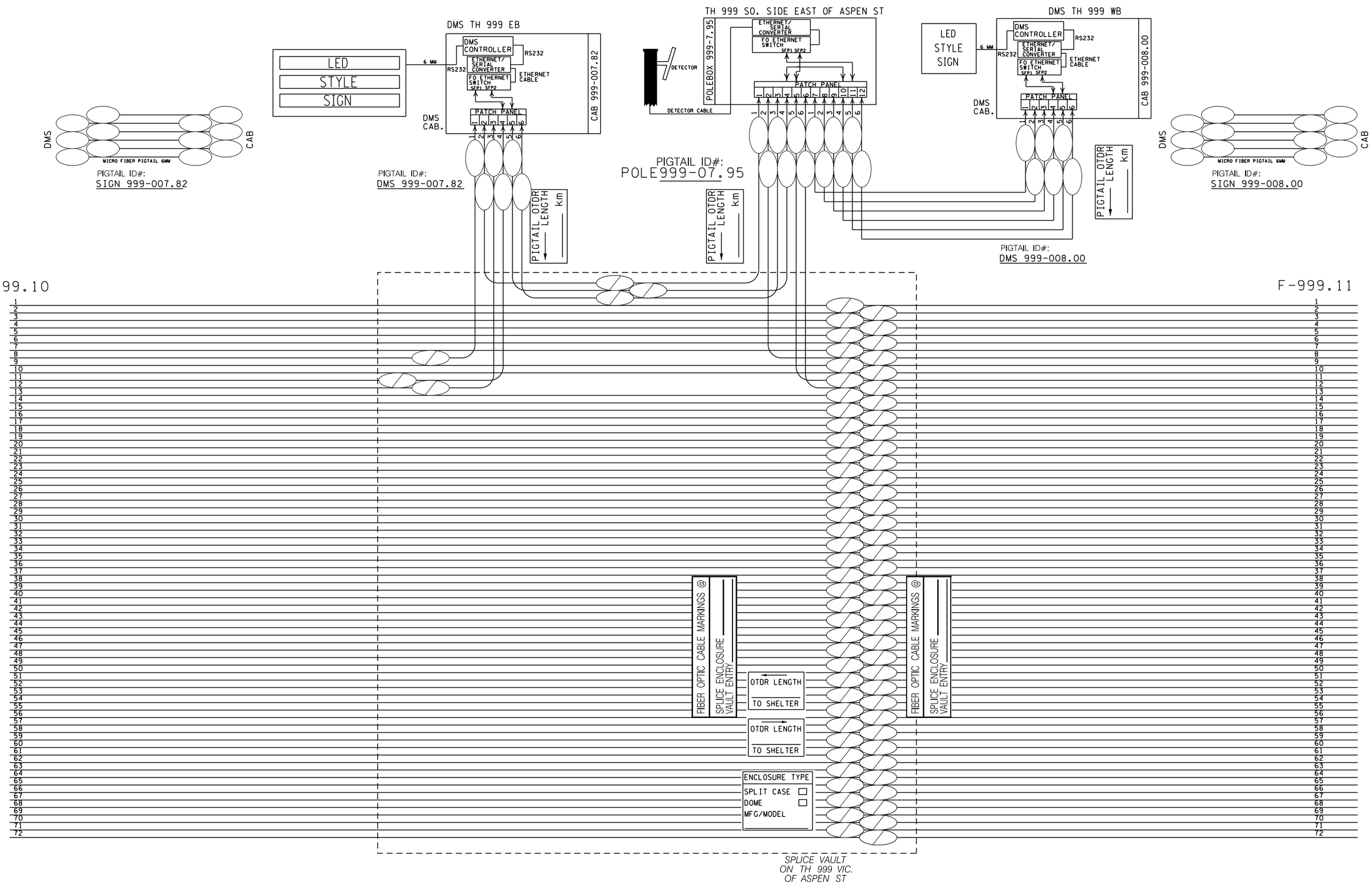
TH999/TH998 SHELTER
(999-6.90)

REV. NO. S	DATE: 04/02/21	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 48 OF 54 SHEETS
REV. NO. R	DATE: 4/08/20		

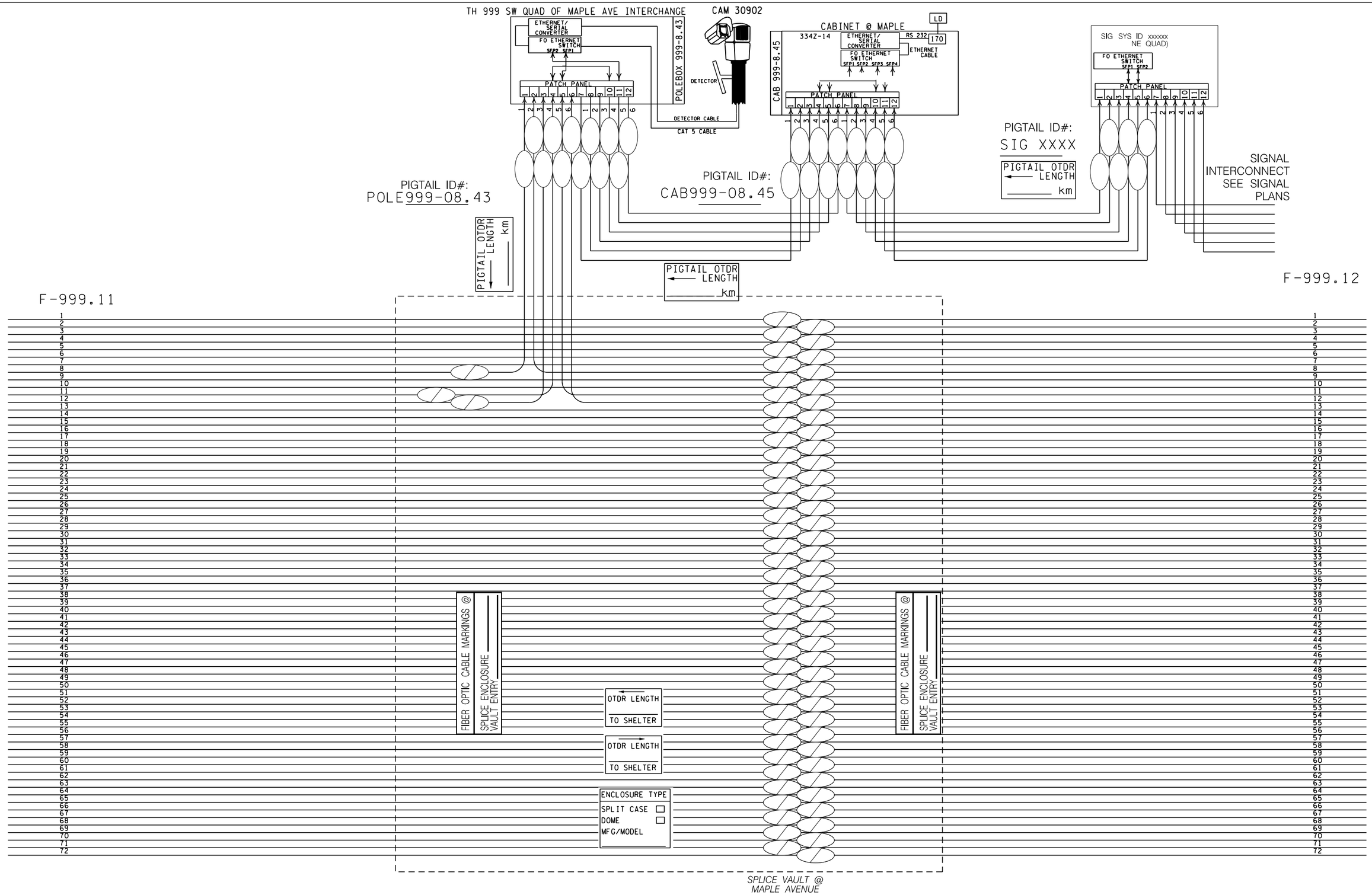
WEST - TO 998 / 999 SHELTER



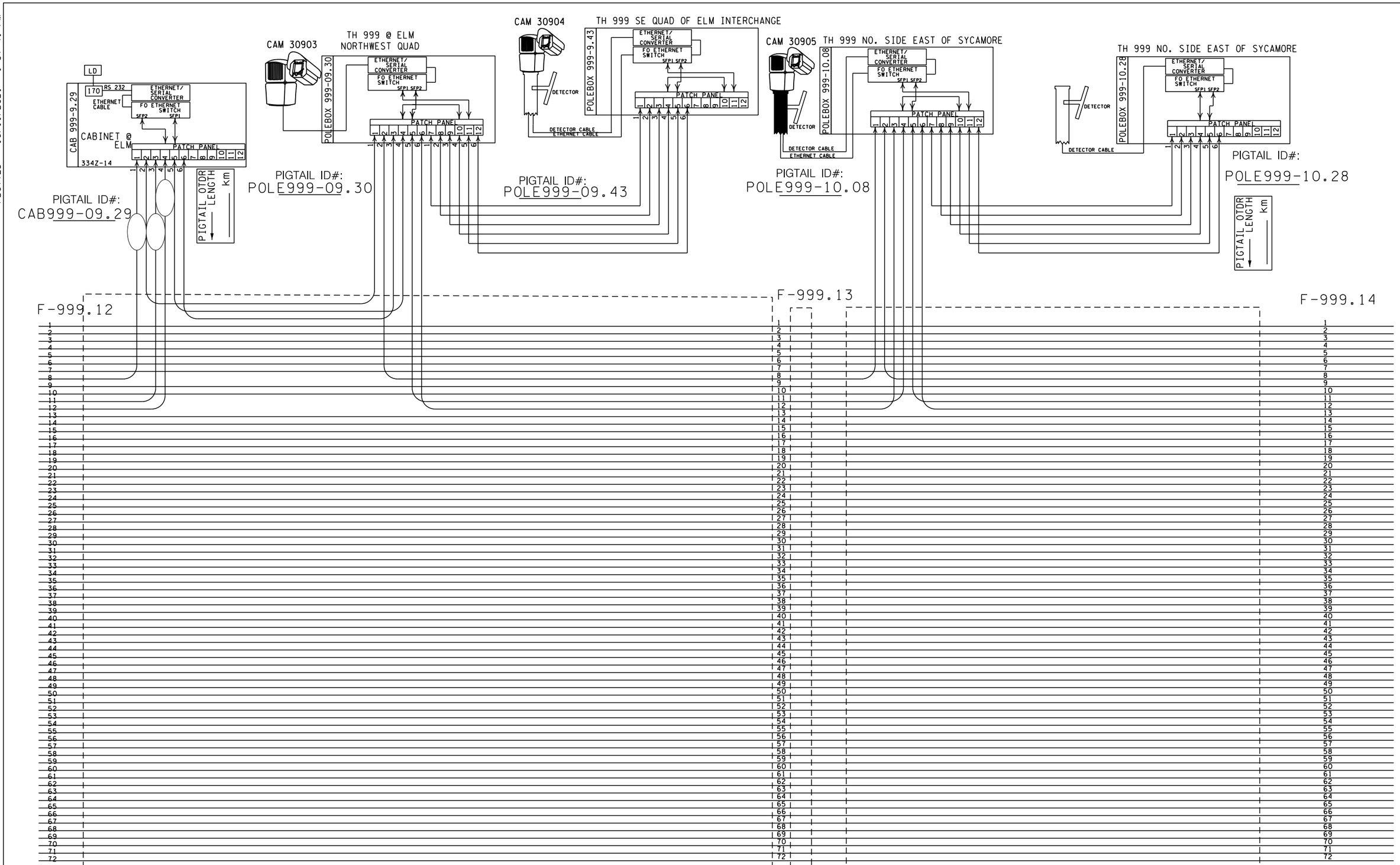
REV. NO.	DATE: / /	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER	LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 49 OF 54 SHEETS
REV. NO.	DATE: / /			



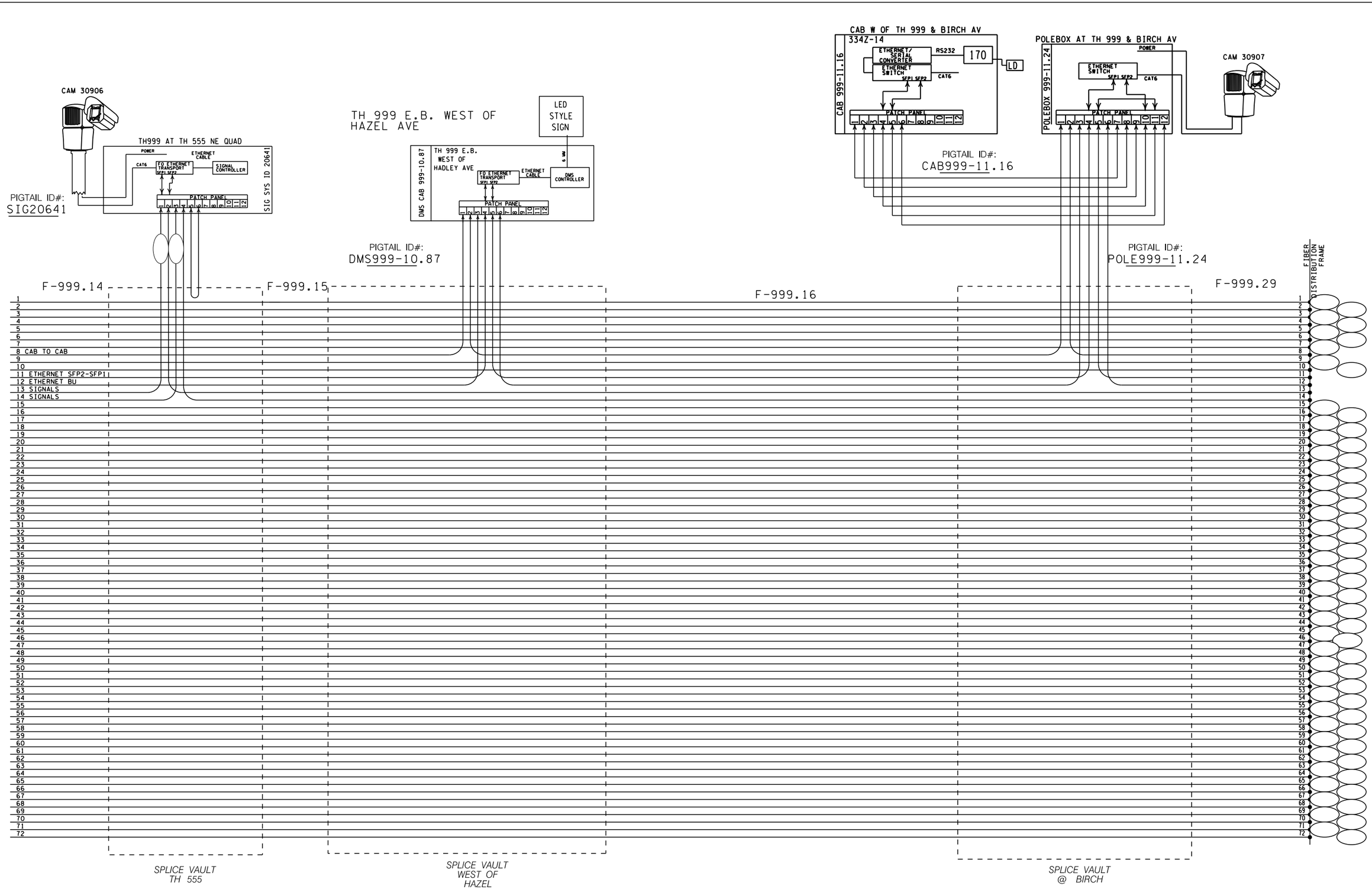
REV. NO. 1	DATE: 3/12/19	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER	LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 50 OF 54 SHEETS
REV. NO.	DATE: / /			



REV. NO. 1	DATE: 3/12/19	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER	LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 51 OF 54 SHEETS
REV. NO.	DATE: / /			



REV. NO. 1	DATE: 3/12/19	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999)	SHEET NO. 52 OF 54 SHEETS
REV. NO.	DATE: / /			



REV. NO.	DATE: / /	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER LIC.NO. _____ DATE 2021	STATE PROJ. NO. 9999-999 (TH 999) SHEET NO. 53 OF 54 SHEETS
REV. NO.	DATE: / /		

FDF = FIBER DISTRIBUTION FRAME
= DIRECT PIGTAIL TERMINATION FROM TRUNK LINE TO FRONT OF FDF
= FDF TERMINATED FIBER
= FDF TERMINATED FIBER W/ PATCHCORD CONNECTION
= SINGLE-MODE (MAIN FIBERS ONLY)
= MULTI-MODE (MAIN FIBERS ONLY)
= BAD FIBER (DON'T USE)
D = DROPPED FIBER (DON'T USE)
* = DENOTES 1550 LASER FOR DV 6000

FIBER OPTIC CABLE MARKINGS @ SHELTER FIBER RACK / SHELTER ENTRY

SHELTER 777-52.43

CAM 30908

OUTSIDE OF SHELTER

POLE MOUNTED CCTV CABINET — VIDEO/DATA TRANSCEIVER — 2/PR #22 CONTROL — VID/POE SIAMESE — PATCH PANEL — CAM 30908

PIGTAIL ID#: CAM30908

OUTSIDE OF SHELTER

3342-05 — 170 — LDS — ETHERNET SWITCH — PATCH PANEL — CAB 777-52.72

TH 777 SOUTH OF TH 999

PIGTAIL ID#: CAB777-52.72

TRUNK ID#: 777-19 (SOUTH)

1 CAMERA 720 (BU)
2 CAMERA 721 (BU)
3 CAMERA 722 (BU)
4 CAMERA 723 (BU)
5 CAMERA 724 (BU)
6 CAMERA 725 (BU)
7
8 CAB TO CAB
9
10 CCTV CAB BU
11 777 NET 94 TO 999
12 CAB TO CAB
13
14
15
16
17
18 RTMC NET PT 14
19
20
21
22
23
24
25
26 WIS DOT A
27 WIS DOT B
28
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55
56
57
58
59
60
61 MNET WE TO OAKDALE
62
63 DROPPED @ OAKDALE
64 WE (TX) - OAKDALE (RX)
65 WE (RX) - OAKDALE (TX)
66 LAB (TX)- OAK. (RX) 10G
67 LAB (RX)- OAK. (TX) 10G
68 DROPPED @ OAKDALE
69 DROPPED @ OAKDALE
70 DROPPED @ OAKDALE
71 DROPPED @ OAKDALE
72 DROPPED @ OAKDALE

TRUNK ID#: (WEST) 999-29

1 LAB (TX)- OAK. (RX) 10G
2 LAB (RX)- OAK. (TX) 10G
3
4
5
6
7
8 CAB TO CAB
9
10
11 TH 999 NET 998-777
12 SP- EB DMS @ HADLEY
13 TH 999 SIGNALS
14 TH 999 SIGNALS RING
15
16 MNET WE TO OAKDALE
17
18
19
20
21
22
23 777NET 999 TO 998 RING
24
25 WIS DOT A
26 WIS DOT B
27
28
29
30 RTMC NET PT 16
31
32 CAB TO CAB SPARE
33
34
35
36
37
38
39
40
41
42
43
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45
46
47
48
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777 NET 999 TO 998 RING

AUX. COPPER PORT SWITCH

SFP1 SFP2

CAMERA 30908

777 NET 999 TO 998

CISCO 9500 CATALYST

EXPANSION EX1-EX8

777 NET 999 TO 998 RING

CAMERA 718
CAMERA 717
CAMERA 716
CAMERA 715

TRUNK ID#: 999-30 (EAST)

1 SPARE TO HILTON CABINET
2 SPARE TO CAMERA 3616
3 SPARE TO CAMERA 3617
4 SPARE TO CAMERA 3619
5 SPARE TO CAMERA 3621
6
7
8 CAB TO CAB
9
10
11 999 NET 777-STLWTR / WISC
12 SPARE TO HILTON CABINET
13 TH 999 SIGNALS
14 TH 999 SIGNALS SPARE
15
16
17
18
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20
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22
23
24
25
26
27
28
29
30 RTMC NET PT 15
31
32
33
34
35 999 NET 777-STLWTR / WI RG
36
37
38 TH 999 SIGNALS RING
39
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TO ROUTER

ETHERNET/ SERIAL CONVERTER — 170 — IN SHELTER — LDS

PIGTAIL ID#: CAB777-51.75

3342-05 — 170 — LDS — TX1/RX1 DATA LINK TX2/RX2 — PATCH PANEL — LINE 83 DROP 01 — CAB 777-51.75 — INSTALL CABINET MNDOT PROVIDED

TH 777 NORTH OF TH 999

OUTSIDE OF SHELTER

777 NET 999 TO 998

TRUNK ID#: 777-18 (WEST)

1 CAMERA 715
2 CAMERA 716
3 CAMERA 717
4 CAMERA 718
5
6
7 CAB TO CAB
8
9 CCTV CAB BU
10 CAB TO CAB
11 777NET 999 TO 998
12
13
14
15 WE (TX) - OAKDALE (RX)
16 WE (RX) - OAKDALE (TX)
17
18
19
20
21 777 NET 94 TO 999
22 TH 120 NET HADLEY TO WOODLANE
23 TH 120 NET HADLEY TO WOODLANE
24
25
26
27
28
29
30 TH 999 NET 998-777 RG FI
31
32
33
34
35
36
37
38
39
40
41
42 999 NET 998-777 RING
43
44
45 RTMC NET PT 13
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60 FIBERS
61
62
63
64 72
65 ABE
66 LOOPED
67 BACK
68 AT
69 TH
70 TO 998
71 EAST
72 SIDE

TH 998 VAULT EAST SIDE

TH 777 & TH 999

REV. NO. AN	DATE: 04/02/21	CERTIFIED BY _____ LICENSED PROFESSIONAL ENGINEER	LIC.NO. _____	DATE 2021
REV. NO. AM	DATE: 8/19/20	STATE PROJ. NO. 9999-999 (TH 999)	SHEET NO. 54	OF 54 SHEETS